FANUC Robotics SYSTEM R-30*i*A Controller Software Reference Manual

MARACSSRF03061E REV F

Version 7.20 and later

About This Manual

This manual can be used with controllers labeled R-30*i*A or R-J3*i*C. If you have a controller labeled R-J3*i*C, you should read R-30*i*A as R-J3*i*C throughout this manual.

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>
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Patents

One or more of the following U.S. patents might be related to the FANUC Robotics products
described in this manual.

FRA Patent List

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VersaBell, ServoBell and SpeedDock Patents Pending.

Conventions

This manual includes information essential to the safety of personnel, equipment, software, and data.
This information is indicated by headings and boxes in the text.

> ⚠ **Warning**
>
> **Information appearing under WARNING concerns the protection of
> personnel. It is boxed and in bold type to set it apart from other text.**

 Caution

Information appearing under **CAUTION** concerns the protection of equipment, software, and data. It is boxed to set it apart from other text.

Note Information appearing next to **NOTE** concerns related information or useful hints.

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List of Tables

Safety

FANUC Robotics is not and does not represent itself as an expert in safety systems, safety equipment, or the specific safety aspects of your company and/or its work force. It is the responsibility of the owner, employer, or user to take all necessary steps to guarantee the safety of all personnel in the workplace.

The appropriate level of safety for your application and installation can best be determined by safety system professionals. FANUC Robotics therefore, recommends that each customer consult with such professionals in order to provide a workplace that allows for the safe application, use, and operation of FANUC Robotic systems.

According to the industry standard ANSI/RIA R15-06, the owner or user is advised to consult the standards to ensure compliance with its requests for Robotics System design, usability, operation, maintenance, and service. Additionally, as the owner, employer, or user of a robotic system, it is your responsibility to arrange for the training of the operator of a robot system to recognize and respond to known hazards associated with your robotic system and to be aware of the recommended operating procedures for your particular application and robot installation.

Ensure that the robot being used is appropriate for the application. Robots used in classified (hazardous) locations must be certified for this use.

FANUC Robotics therefore, recommends that all personnel who intend to operate, program, repair, or otherwise use the robotics system be trained in an approved FANUC Robotics training course and become familiar with the proper operation of the system. Persons responsible for programming the system-including the design, implementation, and debugging of application programs-must be familiar with the recommended programming procedures for your application and robot installation.

The following guidelines are provided to emphasize the importance of safety in the workplace.

CONSIDERING SAFETY FOR YOUR ROBOT INSTALLATION

Safety is essential whenever robots are used. Keep in mind the following factors with regard to safety:

- The safety of people and equipment
- Use of safety enhancing devices
- Techniques for safe teaching and manual operation of the robot(s)
- Techniques for safe automatic operation of the robot(s)
- Regular scheduled inspection of the robot and workcell
- Proper maintenance of the robot

Keeping People and Equipment Safe

The safety of people is always of primary importance in any situation. However, equipment must be kept safe, too. When prioritizing how to apply safety to your robotic system, consider the following:

- People
- External devices
- Robot(s)
- Tooling
- Workpiece

Using Safety Enhancing Devices

Always give appropriate attention to the work area that surrounds the robot. The safety of the work area can be enhanced by the installation of some or all of the following devices:

- Safety fences, barriers, or chains
- Light curtains
- Interlocks
- Pressure mats
- Floor markings
- Warning lights
- Mechanical stops
- EMERGENCY STOP buttons
- DEADMAN switches

Setting Up a Safe Workcell

A safe workcell is essential to protect people and equipment. Observe the following guidelines to ensure that the workcell is set up safely. These suggestions are intended to supplement and **not** replace existing federal, state, and local laws, regulations, and guidelines that pertain to safety.

- Sponsor your personnel for training in approved FANUC Robotics training course(s) related to your application. Never permit untrained personnel to operate the robots.
- Install a lockout device that uses an access code to prevent unauthorized persons from operating the robot.
- Use anti-tie-down logic to prevent the operator from bypassing safety measures.

- Arrange the workcell so the operator faces the workcell and can see what is going on inside the cell.

- Clearly identify the work envelope of each robot in the system with floor markings, signs, and special barriers. The work envelope is the area defined by the maximum motion range of the robot, including any tooling attached to the wrist flange that extend this range.

- Position all controllers outside the robot work envelope.

- Never rely on software or firmware based controllers as the primary safety element unless they comply with applicable current robot safety standards.

- Mount an adequate number of EMERGENCY STOP buttons or switches within easy reach of the operator and at critical points inside and around the outside of the workcell.

- Install flashing lights and/or audible warning devices that activate whenever the robot is operating, that is, whenever power is applied to the servo drive system. Audible warning devices shall exceed the ambient noise level at the end-use application.

- Wherever possible, install safety fences to protect against unauthorized entry by personnel into the work envelope.

- Install special guarding that prevents the operator from reaching into restricted areas of the work envelope.

- Use interlocks.

- Use presence or proximity sensing devices such as light curtains, mats, and capacitance and vision systems to enhance safety.

- Periodically check the safety joints or safety clutches that can be optionally installed between the robot wrist flange and tooling. If the tooling strikes an object, these devices dislodge, remove power from the system, and help to minimize damage to the tooling and robot.

- Make sure all external devices are properly filtered, grounded, shielded, and suppressed to prevent hazardous motion due to the effects of electro-magnetic interference (EMI), radio frequency interference (RFI), and electro-static discharge (ESD).

- Make provisions for power lockout/tagout at the controller.

- Eliminate *pinch points* . Pinch points are areas where personnel could get trapped between a moving robot and other equipment.

- Provide enough room inside the workcell to permit personnel to teach the robot and perform maintenance safely.

- Program the robot to load and unload material safely.

- If high voltage electrostatics are present, be sure to provide appropriate interlocks, warning, and beacons.

- If materials are being applied at dangerously high pressure, provide electrical interlocks for lockout of material flow and pressure.

Staying Safe While Teaching or Manually Operating the Robot

Advise all personnel who must teach the robot or otherwise manually operate the robot to observe the following rules:

- Never wear watches, rings, neckties, scarves, or loose clothing that could get caught in moving machinery.

- Know whether or not you are using an intrinsically safe teach pendant if you are working in a hazardous environment.

- Before teaching, visually inspect the robot and *work envelope* to make sure that no potentially hazardous conditions exist. The work envelope is the area defined by the maximum motion range of the robot. These include tooling attached to the wrist flange that extends this range.

- The area near the robot must be clean and free of oil, water, or debris. Immediately report unsafe working conditions to the supervisor or safety department.

- FANUC Robotics recommends that no one enter the work envelope of a robot that is on, except for robot teaching operations. However, if you must enter the work envelope, be sure all safeguards are in place, check the teach pendant DEADMAN switch for proper operation, and place the robot in teach mode. Take the teach pendant with you, turn it on, and be prepared to release the DEADMAN switch. Only the person with the teach pendant should be in the work envelope.

> ⚠️ **Warning**
>
> **Never bypass, strap, or otherwise deactivate a safety device, such as a limit switch, for any operational convenience. Deactivating a safety device is known to have resulted in serious injury and death.**

- Know the path that can be used to escape from a moving robot; make sure the escape path is never blocked.

- Isolate the robot from all remote control signals that can cause motion while data is being taught.

- Test any program being run for the first time in the following manner:

> ⚠️ **Warning**
>
> **Stay outside the robot work envelope whenever a program is being run. Failure to do so can result in injury.**

  — Using a low motion speed, single step the program for at least one full cycle.

  — Using a low motion speed, test run the program continuously for at least one full cycle.

  — Using the programmed speed, test run the program continuously for at least one full cycle.

- Make sure all personnel are outside the work envelope before running production.

Staying Safe During Automatic Operation

Advise all personnel who operate the robot during production to observe the following rules:

- Make sure all safety provisions are present and active.

- Know the entire workcell area. The workcell includes the robot and its work envelope, plus the area occupied by all external devices and other equipment with which the robot interacts.

- Understand the complete task the robot is programmed to perform before initiating automatic operation.

- Make sure all personnel are outside the work envelope before operating the robot.

- Never enter or allow others to enter the work envelope during automatic operation of the robot.

- Know the location and status of all switches, sensors, and control signals that could cause the robot to move.

- Know where the EMERGENCY STOP buttons are located on both the robot control and external control devices. Be prepared to press these buttons in an emergency.

- Never assume that a program is complete if the robot is not moving. The robot could be waiting for an input signal that will permit it to continue activity.

- If the robot is running in a pattern, do not assume it will continue to run in the same pattern.

- Never try to stop the robot, or break its motion, with your body. The only way to stop robot motion immediately is to press an EMERGENCY STOP button located on the controller panel, teach pendant, or emergency stop stations around the workcell.

Staying Safe During Inspection

When inspecting the robot, be sure to

- Turn off power at the controller.

- Lock out and tag out the power source at the controller according to the policies of your plant.

- Turn off the compressed air source and relieve the air pressure.

- If robot motion is not needed for inspecting the electrical circuits, press the EMERGENCY STOP button on the operator panel.

- Never wear watches, rings, neckties, scarves, or loose clothing that could get caught in moving machinery.

- If power is needed to check the robot motion or electrical circuits, be prepared to press the EMERGENCY STOP button, in an emergency.

- Be aware that when you remove a servomotor or brake, the associated robot arm will fall if it is not supported or resting on a hard stop. Support the arm on a solid support before you release the brake.

Staying Safe During Maintenance

When performing maintenance on your robot system, observe the following rules:

• Never enter the work envelope while the robot or a program is in operation.

• Before entering the work envelope, visually inspect the workcell to make sure no potentially hazardous conditions exist.

• Never wear watches, rings, neckties, scarves, or loose clothing that could get caught in moving machinery.

• Consider all or any overlapping work envelopes of adjoining robots when standing in a work envelope.

• Test the teach pendant for proper operation before entering the work envelope.

• If it is necessary for you to enter the robot work envelope while power is turned on, you must be sure that you are in control of the robot. Be sure to take the teach pendant with you, press the DEADMAN switch, and turn the teach pendant on. Be prepared to release the DEADMAN switch to turn off servo power to the robot immediately.

• Whenever possible, perform maintenance with the power turned off. Before you open the controller front panel or enter the work envelope, turn off and lock out the 3-phase power source at the controller.

• Be aware that an applicator bell cup can continue to spin at a very high speed even if the robot is idle. Use protective gloves or disable bearing air and turbine air before servicing these items.

• Be aware that when you remove a servomotor or brake, the associated robot arm will fall if it is not supported or resting on a hard stop. Support the arm on a solid support before you release the brake.

> ⚠ **Warning**
>
> **Lethal voltage is present in the controller WHENEVER IT IS CONNECTED to a power source. Be extremely careful to avoid electrical shock. HIGH VOLTAGE IS PRESENT at the input side whenever the controller is connected to a power source. Turning the disconnect or circuit breaker to the OFF position removes power from the output side of the device only.**

• Release or block all stored energy. Before working on the pneumatic system, shut off the system air supply and purge the air lines.

• Isolate the robot from all remote control signals. If maintenance must be done when the power is on, make sure the person inside the work envelope has sole control of the robot. The teach pendant must be held by this person.

- Make sure personnel cannot get trapped between the moving robot and other equipment. Know the path that can be used to escape from a moving robot. Make sure the escape route is never blocked.

- Use blocks, mechanical stops, and pins to prevent hazardous movement by the robot. Make sure that such devices do not create pinch points that could trap personnel.

> ⚠ **Warning**
>
> **Do not try to remove any mechanical component from the robot before thoroughly reading and understanding the procedures in the appropriate manual. Doing so can result in serious personal injury and component destruction.**

- Be aware that when you remove a servomotor or brake, the associated robot arm will fall if it is not supported or resting on a hard stop. Support the arm on a solid support before you release the brake.

- When replacing or installing components, make sure dirt and debris do not enter the system.

- Use only specified parts for replacement. To avoid fires and damage to parts in the controller, never use nonspecified fuses.

- Before restarting a robot, make sure no one is inside the work envelope; be sure that the robot and all external devices are operating normally.

KEEPING MACHINE TOOLS AND EXTERNAL DEVICES SAFE

Certain programming and mechanical measures are useful in keeping the machine tools and other external devices safe. Some of these measures are outlined below. Make sure you know all associated measures for safe use of such devices.

Programming Safety Precautions

Implement the following programming safety measures to prevent damage to machine tools and other external devices.

- Back-check limit switches in the workcell to make sure they do not fail.

- Implement "failure routines" in programs that will provide appropriate robot actions if an external device or another robot in the workcell fails.

- Use *handshaking* protocol to synchronize robot and external device operations.

- Program the robot to check the condition of all external devices during an operating cycle.

Mechanical Safety Precautions

Implement the following mechanical safety measures to prevent damage to machine tools and other external devices.

- Make sure the workcell is clean and free of oil, water, and debris.
- Use software limits, limit switches, and mechanical hardstops to prevent undesired movement of the robot into the work area of machine tools and external devices.

KEEPING THE ROBOT SAFE

Observe the following operating and programming guidelines to prevent damage to the robot.

Operating Safety Precautions

The following measures are designed to prevent damage to the robot during operation.

- Use a low override speed to increase your control over the robot when jogging the robot.
- Visualize the movement the robot will make before you press the jog keys on the teach pendant.
- Make sure the work envelope is clean and free of oil, water, or debris.
- Use circuit breakers to guard against electrical overload.

Programming Safety Precautions

The following safety measures are designed to prevent damage to the robot during programming:

- Establish *interference zones* to prevent collisions when two or more robots share a work area.
- Make sure that the program ends with the robot near or at the home position.
- Be aware of signals or other operations that could trigger operation of tooling resulting in personal injury or equipment damage.
- In dispensing applications, be aware of all safety guidelines with respect to the dispensing materials.

   Note Any deviation from the methods and safety practices described in this manual must conform to the approved standards of your company. If you have questions, see your supervisor.

ADDITIONAL SAFETY CONSIDERATIONS FOR PAINT ROBOT INSTALLATIONS

Process technicians are sometimes required to enter the paint booth, for example, during daily or routine calibration or while teaching new paths to a robot. Maintenance personal also must work inside the paint booth periodically.

Whenever personnel are working inside the paint booth, ventilation equipment must be used. Instruction on the proper use of ventilating equipment usually is provided by the paint shop supervisor.

Although paint booth hazards have been minimized, potential dangers still exist. Therefore, today's highly automated paint booth requires that process and maintenance personnel have full awareness of the system and its capabilities. They must understand the interaction that occurs between the vehicle moving along the conveyor and the robot(s), hood/deck and door opening devices, and high-voltage electrostatic tools.

> ⚠️ **Caution**
>
> Ensure that all ground cables remain connected. Never operate the paint robot with ground provisions disconnected. Otherwise, you could injure personnel or damage equipment.

Paint robots are operated in three modes:

- Teach or manual mode
- Automatic mode, including automatic and exercise operation
- Diagnostic mode

During both teach and automatic modes, the robots in the paint booth will follow a predetermined pattern of movements. In teach mode, the process technician teaches (programs) paint paths using the teach pendant.

In automatic mode, robot operation is initiated at the System Operator Console (SOC) or Manual Control Panel (MCP), if available, and can be monitored from outside the paint booth. All personnel must remain outside of the booth or in a designated safe area within the booth whenever automatic mode is initiated at the SOC or MCP.

In automatic mode, the robots will execute the path movements they were taught during teach mode, but generally at production speeds.

When process and maintenance personnel run diagnostic routines that require them to remain in the paint booth, they must stay in a designated safe area.

Paint System Safety Features

Process technicians and maintenance personnel must become totally familiar with the equipment and its capabilities. To minimize the risk of injury when working near robots and related equipment, personnel must comply strictly with the procedures in the manuals.

This section provides information about the safety features that are included in the paint system and also explains the way the robot interacts with other equipment in the system.

The paint system includes the following safety features:

- Most paint booths have red warning beacons that illuminate when the robots are armed and ready to paint. Your booth might have other kinds of indicators. Learn what these are.

- Some paint booths have a blue beacon that, when illuminated, indicates that the electrostatic devices are enabled. Your booth might have other kinds of indicators. Learn what these are.

- EMERGENCY STOP buttons are located on the robot controller and teach pendant. Become familiar with the locations of all E-STOP buttons.

- An intrinsically safe teach pendant is used when teaching in hazardous paint atmospheres.

- A DEADMAN switch is located on each teach pendant. When this switch is held in, and the teach pendant is on, power is applied to the robot servo system. If the engaged DEADMAN switch is released during robot operation, power is removed from the servo system, all axis brakes are applied, and the robot comes to an EMERGENCY STOP. Safety interlocks within the system might also E-STOP other robots.

> ⚠️ **Warning**
>
> **An EMERGENCY STOP will occur if the DEADMAN switch is released on a bypassed robot.**

- Overtravel by robot axes is prevented by software limits. All of the major and minor axes are governed by software limits. Limit switches and hardstops also limit travel by the major axes.

- EMERGENCY STOP limit switches and photoelectric eyes might be part of your system. Limit switches, located on the entrance/exit doors of each booth, will EMERGENCY STOP all equipment in the booth if a door is opened while the system is operating in automatic or manual mode. For some systems, signals to these switches are inactive when the switch on the SCC is in teach mode.When present, photoelectric eyes are sometimes used to monitor unauthorized intrusion through the entrance/exit silhouette openings.

- System status is monitored by computer. Severe conditions result in automatic system shutdown.

Staying Safe While Operating the Paint Robot

When you work in or near the paint booth, observe the following rules, in addition to all rules for safe operation that apply to all robot systems.

> ⚠️ **Warning**
>
> **Observe all safety rules and guidelines to avoid injury.**

> ⚠️ **Warning**
>
> **Never bypass, strap, or otherwise deactivate a safety device, such as a limit switch, for any operational convenience. Deactivating a safety device is known to have resulted in serious injury and death.**

> ⚠️ **Warning**
>
> **Enclosures shall not be opened unless the area is know to be nonhazardous or all power has been removed from devices within the enclosure. Power shall not be restored after the enclosure has been opened until all combustible dusts have been removed from the interior of the enclosure and the enclosure purged. Refer to the Purge chapter for the required purge time.**

- Know the work area of the entire paint station (workcell).

- Know the work envelope of the robot and hood/deck and door opening devices.

- Be aware of overlapping work envelopes of adjacent robots.

- Know where all red, mushroom-shaped EMERGENCY STOP buttons are located.

- Know the location and status of all switches, sensors, and/or control signals that might cause the robot, conveyor, and opening devices to move.

- Make sure that the work area near the robot is clean and free of water, oil, and debris. Report unsafe conditions to your supervisor.

- Become familiar with the complete task the robot will perform BEFORE starting automatic mode.

- Make sure all personnel are outside the paint booth before you turn on power to the robot servo system.

- Never enter the work envelope or paint booth before you turn off power to the robot servo system.

- Never enter the work envelope during automatic operation unless a safe area has been designated.

- Never wear watches, rings, neckties, scarves, or loose clothing that could get caught in moving machinery.

- Remove all metallic objects, such as rings, watches, and belts, before entering a booth when the electrostatic devices are enabled.

- Stay out of areas where you might get trapped between a moving robot, conveyor, or opening device and another object.

- Be aware of signals and/or operations that could result in the triggering of guns or bells.

- Be aware of all safety precautions when dispensing of paint is required.

- Follow the procedures described in this manual.

Special Precautions for Combustible Dusts (powder paint)

When the robot is used in a location where combustible dusts are found, such as the application of powder paint, the following special precautions are required to insure that there are no combustible dusts inside the robot.

- Purge maintenance air should be maintained at all times, even when the robot power is off. This will insure that dust can not enter the robot.

- A purge cycle will not remove accumulated dusts. Therefore, if the robot is exposed to dust when maintenance air is not present, it will be necessary to remove the covers and clean out any accumulated dust. Do not energize the robot until you have performed the following steps.

1. Before covers are removed, the exterior of the robot should be cleaned to remove accumulated dust.

2. When cleaning and removing accumulated dust, either on the outside or inside of the robot, be sure to use methods appropriate for the type of dust that exists. Usually lint free rags dampened with water are acceptable. Do not use a vacuum cleaner to remove dust as it can generate static electricity and cause an explosion unless special precautions are taken.

3. Thoroughly clean the interior of the robot with a lint free rag to remove any accumulated dust.

4. When the dust has been removed, the covers must be replaced immediately.

5. Immediately after the covers are replaced, run a complete purge cycle. The robot can now be energized.

Staying Safe While Operating Paint Application Equipment

When you work with paint application equipment, observe the following rules, in addition to all rules for safe operation that apply to all robot systems.

Warning

When working with electrostatic paint equipment, follow all national and local codes as well as all safety guidelines within your organization. Also reference the following standards: *NFPA 33 Standards for Spray Application Using Flammable or Combustible Materials* **, and** *NFPA 70 National Electrical Code* **.**

- **Grounding**: All electrically conductive objects in the spray area must be grounded. This includes the spray booth, robots, conveyors, workstations, part carriers, hooks, paint pressure pots, as well as solvent containers. Grounding is defined as the object or objects shall be electrically connected to ground with a resistance of not more than 1 megohms.

- **High Voltage**: High voltage should only be on during actual spray operations. Voltage should be off when the painting process is completed. Never leave high voltage on during a cap cleaning process.

- Avoid any accumulation of combustible vapors or coating matter.

- Follow all manufacturer recommended cleaning procedures.

- Make sure all interlocks are operational.

- No smoking.

- Post all warning signs regarding the electrostatic equipment and operation of electrostatic equipment according to NFPA 33 Standard for Spray Application Using Flammable or Combustible Material.

- Disable all air and paint pressure to bell.

- Verify that the lines are not under pressure.

Staying Safe During Maintenance

When you perform maintenance on the painter system, observe the following rules, and all other maintenance safety rules that apply to all robot installations. Only qualified, trained service or maintenance personnel should perform repair work on a robot.

- Paint robots operate in a potentially explosive environment. Use caution when working with electric tools.

- When a maintenance technician is repairing or adjusting a robot, the work area is under the control of that technician. All personnel not participating in the maintenance must stay out of the area.

- For some maintenance procedures, station a second person at the control panel within reach of the EMERGENCY STOP button. This person must understand the robot and associated potential hazards.

- Be sure all covers and inspection plates are in good repair and in place.

- Always return the robot to the "home" position before you disarm it.

- Never use machine power to aid in removing any component from the robot.

- During robot operations, be aware of the robot's movements. Excess vibration, unusual sounds, and so forth, can alert you to potential problems.

- Whenever possible, turn off the main electrical disconnect before you clean the robot.

- When using vinyl resin observe the following:

  — Wear eye protection and protective gloves during application and removal

  — Adequate ventilation is required. Overexposure could cause drowsiness or skin and eye irritation.

  — If there is contact with the skin, wash with water.

  — Follow the Original Equipment Manufacturer's Material Safety Data Sheets.

- When using paint remover observe the following:

  — Eye protection, protective rubber gloves, boots, and apron are required during booth cleaning.

  — Adequate ventilation is required. Overexposure could cause drowsiness.

  — If there is contact with the skin or eyes, rinse with water for at least 15 minutes. Then, seek medical attention as soon as possible.

  — Follow the Original Equipment Manufacturer's Material Safety Data Sheets.

Chapter 1

GENERAL INFORMATION

Contents

1.1 GENERAL INFORMATION

This manual lists all system variables in alphabetical order. Table 1–1 lists and describes the available system variable information. Table 1–2 describes the access rights of system variables.

Tip To search within the variable listings, click to select the frame in which the system variables are displayed. Then type CTRL-F. In other words, press the CTRL key and while holding the CTRL key down, press the F key. Type the word or characters you want to search for and click "Find Next."

Table 1–1.   System Variable Information

ITEM	DESCRIPTION
Minimum	Provides the minimum value for the system variable when values differ from standard values.
Default	Provides the default value of the system variable.
Maximum	Provides the maximum value for the system variable when values differ from standard values.
KCL/Data	Indicates whether this variable can be accessed from the KCL/Teach Pendant DATA screen.
Program	Indicates whether this variable can be accessed from a KAREL program.
Control Start	Indicates whether this variable can be accessed from the KCL/Teach Pendant DATA screen at controlled start.
Data Type	Indicates the type of value associated with the system variable.
Memory Location	Indicates where in memory the variable is stored. This can be CMOS or RAM. CMOS is battery-backed S-RAM memory. RAM is not backed up.
Name	Provides the name and structure of the system variable.
Description	Provides information about the system variable.
Power Up	Indicates when a change to the system variable takes effect.
User Interface Location	Indicates where you can view or modify the system variable

Table 1–2.   **Access Rights for System Variables**

ACCESS	MEANING
NO	No access
RO	Read only
RW	Read and write
FP	Field protection; if it is a structure, one of the first three protections will apply.

Chapter 2

SYSTEM VARIABLE LISTING

Contents

2.1 "A" System Variables

$AB_INT_CFG STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Allen-Bradley Interface Configuration

Description: This variable structure contains configuration information for the R-J3 style Allen-Bradley interface. It is intended to provide information to FANUC Robotics service personnel and the Hot Line. You cannot modify this information because it is read only. You cannot decode this information because it is packed into the fields of this structure. If you suspect problems with the R-J3 style Allen-Bradley interface, FANUC Robotics service personnel can use the information contained in this structure to help diagnose the problem. If the R-H style Allen-Bradley interface is installed, this structure is not used and should contain 0 in all fields. The individual fields within this structure are described below.

Power Up: N/A

$AB_INT_CFG.$address

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** INTEGER   **Memory:** CMOS

Name: Link Address

Description: This variable is the serial communications link address. Diagnostic information for FANUC Robotics service personnel only.

Power Up: N/A

$AB_INT_CFG.$command

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** INTEGER   **Memory:** CMOS

Name: Command Byte

Description: This variable is the internal board configuration. Diagnostic information for FANUC Robotics service personnel only.

Power Up: N/A

$AB_INT_CFG.$config

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** INTEGER   **Memory:** CMOS

Name: Configuration

Description: This variable is the general board configuration information. Diagnostic information for FANUC Robotics service personnel only.

Power Up: N/A

$AB_INT_CFG.$dip_sw_0

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** INTEGER   **Memory:** CMOS

Name: DIP Switch 0

Description: The settings of DIP switch 0. Diagnostic information for FANUC Robotics service personnel only.

Power Up: N/A

$AB_INT_CFG.$dip_sw_1

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** INTEGER   **Memory:** CMOS

Name: DIP Switch 1

Description: The settings of DIP switch 1. Diagnostic information for FANUC Robotics service personnel only.

Power Up: N/A

$AB_INT_CFG.$gen_flt

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** INTEGER   **Memory:** CMOS

Name: General Fault Register

Description: Internal general fault information. Diagnostic information for FANUC Robotics service personnel only.

Power Up: N/A

$AB_INT_CFG.$leds

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** INTEGER   **Memory:** CMOS

Name: LED State

Description: Status of the LEDs on the interface board. Diagnostic information for FANUC Robotics service personnel only.

Power Up: N/A

$AB_INT_CFG.$rate

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** INTEGER   **Memory:** CMOS

Name: Data Rate

Description: The serial communications data rate. Diagnostic information for FANUC Robotics service personnel only.

Power Up: N/A

$AB_INT_CFG.$ser_flt

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** INTEGER   **Memory:** CMOS

Name: Serial Fault Register

Description: Internal serial fault information. Diagnostic information for FANUC Robotics service personnel only.

Power Up: N/A

$AB_INT_CFG.$stat_reg

Minimum: 0   **Maximum:** 65535   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** INTEGER   **Memory:** CMOS

Name: Status Register

Description: Internal board status register information. Diagnostic information for FANUC Robotics service personnel only.

Power Up: N/A

$AC_CRC_ACCO[1-5]

Minimum: 0   **Maximum:** 5   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** ULONG   **Memory:** CMOS

Name: Small circle acceleration override

Description: This variable is used to relax the acceleration/deceleration time for 90 Degree wall-mounted-robots. If you set some value other than 0, all motion instruction(J,L,C) become ACC($AC_CRC_ACCO)-optioned-motion by default. When this value is 0, this funcion is disabled. If you use the ACC instrucion along with this funcion, both of these take effect. For example, if $AC_CRC_ACCO=xx and ACCyy are used simultaneously, effective ACC is ACC(xx*yy/100). The number of array(5) means the number of the motion group.

Power Up: N/A

$AC_CRC_ID[1-5]

Minimum: ""   **Maximum:** 5   **Default:** " "   **KCL/Data:** RO   **Program:** RO   **UIF:** RW
CRTL: RO   **Data Type:** STRING   **Memory:** CMOS

Name: Small circle id

Description: For internal use only. Do not modify this system variable. When karel program for setting the small circle servo parameters executes the value is set to the version loaded. Number of array(5) means number of motion group.

Power Up: On_Cold_Start

$AC_CRC_SET[1-5]

Minimum: 0   **Maximum:** 5   **Default:** 0   **KCL/Data:** RO   **Program:** FP   **UIF:** RW
CRTL: RW   **Data Type:** INTEGER   **Memory:** CMOS

Name: Small circle set

Description: For internal use only. Do not modify this system variable. When a KAREL program that sets the small circle servo parameters executes, the value is set to 1 to indicate that the option was loaded. The number of the array(5) corresponds to the number of the motion group.

Power Up: N/A

$ANGTOL[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Axis Error Tolerance

Description: The maximum tolerance of each joint for the positional comparison operation. Two positions are considered equal when the difference between each of their respective axis angles (units: in deg) is less than $ANGTOL.

Power Up: N/A

$ANGTOL[9]

Minimum: 0.0   **Maximum:** 360.0   **Default:** 10.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Axis Error Tolerance

Description: The maximum tolerance of each joint for the positional comparison operation. Two positions are considered equal when the difference between each of their respective axis angles (units: in deg) is less than $ANGTOL.

Power Up: N/A

$AP_MAXAX

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Application Maximum AX

Description: Reserved for Internal use by FANUC Robotics. You cannot change this variable.

Power Up: N/A

$AP_PLUGGED

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Application Used Placeholder

Description: This variable is used by the system to determine which application tools slots are occupied. You cannot change this variable.

Power Up: N/A

2. SYSTEM VARIABLE LISTING

MARACSSRF03061E REV F

$AP_TOTALAX

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** RO **UIF:** Not available **CRTL:** Not available **Data Type:** INTEGER **Memory:** Not available

Name: Number of Tasks in the Application.

Description: Reserved for Internal use by FANUC Robotics. You cannot change this variable.

Power Up: N/A

$AP_USENUM[1-32]

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** Not available **UIF:** Not available **CRTL:** Not available **Data Type:** UBYTE **Memory:** Not available

Name: Application Utilization Number

Description: The number of devices that each application uses. Reserved for Internal use by FANUC Robotics. You cannot change this variable.

Power Up: N/A

$AP_USENUM[32]

Minimum: 0 **Maximum:** 255 **Default:** 1 **KCL/Data:** RO **Program:** RO **UIF:** Not available **CRTL:** Not available **Data Type:** BYTE **Memory:** Not available

Name: Application Utilization Number

Description: The number of devices that each application uses. Reserved for Internal use by FANUC Robotics. You cannot change this variable.

Power Up: N/A

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$APPLICATION[1]

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Name of the APPLICATION/TOOL Software

Description: Displays the release time name of the software APPLICATION/TOOL.

Power Up: N/A

Screen: STATUS Version IDs screen

$APPLICATION[2]

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Version of the APPLICATION/TOOL Software

Description: Displays the release time version of the software APPLICATION/TOOL.

Power Up: N/A

Screen: STATUS Version IDs screen

$APPLICATION[3]

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Software Serial Number of the APPLICATION/TOOL Software

Description: Displays the software serial number of the software APPLICATION/TOOL. Typically, this is the FANUC Robotics project number that the robot was ordered against.

Power Up: N/A

Screen: STATUS Version IDs screen

$ARCLINK[1].$can_err

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: CAN 2.0 B error counter for the Arclink Channel.

Description: This is the CAN 2.0 B error counter. This counter is updated by the system whenever can error messages are received on the Arclink channel. If this counter is incrementing at any pace, this indicates that there is a wiring problem and noise is being injected into the connection. Action should be taken to fix the wiring and eliminate the noise or the channel is liable to go into error state and shut down.

Power Up: Takes effect immediately

$ARCLINK[1].$can_recv

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: CAN 2.0 B receive counter for the Arclink channel

Description: This counter represents the number of CAN 2.0 B messages received by the Arclink interface. This counter is updated by the system when the Arclink channel is online. This counter is provided for diagnostic purposes.

Power Up: Takes effect immediately

$ARCLINK[1].$can_xmit

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: CAN 2.0 B transmit counter for the Arclink Channel.

Description: This counter indicates the number of CAN 2.0 B messages transmitted by the Arclink channel. This counter is updated by the system and is provided for diagnostic purposes.

Power Up: Takes effect immediately

$ARCLINK[1].$comment

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: User defined comment

Description: The ArcLink STATUS menu allows you to enter a comment for each ArcLink channel. The string is stored in the variable $comment.

Power Up: N/A

$ARCLINK[1].$mbid

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Motherboard ID

Description: The motherboard ID number indicates which interface board is associated with an ArcLink channel.

Power Up: N/A

$AUTORCV_ENB

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Auto error recovery enable parameter for customer condition

Description: This system variable is used by the customer. When the customer condition isn't satisfied, this parameter should be changed to FALSE using the parameter instruction. This value should be TRUE if you do not use this system variable.

Power Up: Takes effect by cold start.

$AWELEWC[1].$usr_def_di

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: User definable digital inputs

Description: $USR_DEF_DI is a bit map which allows you to override the default settings of some digital input signals from the Lincoln Electric weld power supply. Currently, only the GAS, WIRE, AND WATER FAULT input signals can be reconfigured when using the ArcLink network connection. The bits correspond to the order of the digital output fields in $AWEPRR. For example, to override the ArcLink assignment of the $gas_fault and $water_fault, set $usr_def_di = 2 + 8 = 10 (the second bit and fourth bits ON). This is only possible for ArcLink connections. It is not supported with the DeviceNet interface.

Power Up: On_Cold_Start

See Also: $AWELEWC[1].$usr_def_do

$AWELEWC[1].$usr_def_do

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: User definable digital outputs

Description: $USR_DEF_DO is a bit map which allows you to override the default settings of some digital output signals to the Lincoln Electric weld power supply. Currently, only the GAS START output signal can be reconfigured when using the ArcLink network connection. The bits correspond to the order of the digital input fields in $AWEPRR. For example, to override the ArcLink assignment of the $gas_start, set $usr_def_do = 2 (the second bit ON).

Power Up: On_Cold_Start

See Also: $AWELEWC[1].$usr_def_di

$AWELEWC[1].$wir_mtr_tim

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Wire meter time

Description: $WIR_MTR_TIM sets the rate at which the Lincoln Electric Wire Feeder will send wire feed speed data to the robot when using ArcLink. The units are milliseconds. The valid range is 4 to 100.

Power Up: On_Cold_Start

$AWEPCR[1].$awwv_mode

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Arc welding weave mode

Description: $awwv_mode controls weld and weave synchronization. If $awwv_mode is 0, which is the default, there is no synchronization. If $awwv_mode is 1, the weld schedule changes at the weave dwell. If $awwv_mode is 2, the weld schedule changes gradually from the weave center to the weave dwell.

Power Up: N/A

$AWEPCR[1].$rmtinchrate

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Remote Inch Rate

Description: $RMTINCHRATE is the wire feed speed used for inching wire with the remote inch digital inputs. The units are specified in $WFS_UNITS.

Power Up: N/A

$AWEPOR[1].$arc_is_dsbl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Arc is disabled.

Description: When $ARC_IS_DSBL = TRUE it indicates a weld is executing, but it is disabled.

Power Up: On Immediately

$AWEPOR[1].$error_code

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Error code

Description: This variable is a measure of the energy transferred per second while welding. It is the product of the current and voltage feedback or it is the power reported by the weld controller. The units are Watts, which are J/s.

Power Up: N/A

$AWEPOR[1].$heat_input

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Heat input

Description: $HEAT_INPUT is a measure of the energy transferred per unit length of weld. It is calculated as the ratio of the power to the speed. The units are Joules/mm.

Power Up: Takes effect immediately

$AWEPOR[1].$power

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Power

Description: This variable is a measure of the energy transferred per second while welding. It is the product of the current and voltage feedback or it is the power reported by the weld controller. The units are Watts, which are Joules/second (J/s).

Power Up: Takes effect immediately

$AWEPOR[1].$st_step_dis

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Stitch Step Distance

Description: $ST_STEP_DIS is the distance in millimeters from the start of the current stitch weld or gap segment to the current position of the welding torch.

Power Up: On Immediately

$AWEPOR[1].$st_strt_dis

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Stitch Start Distance

Description: $ST_STRT_DIS is the distance in millimeters from the start of the weld to the start of the current stitch weld or gap segment.

Power Up: On Immediately

<u>$AWEPOR[1].$stitch_gap</u>

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Stitch Gap

Description: $STITCH_GAP is the length between stitch weld segments. It is the result of ($aweupr[eq].$st_ptch_len)-($aweupr[eq].$st_weld_len).

Power Up: On Immediately

<u>$AWEPOR[1].$stitch_stat</u>

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Stitch Status

Description: $STITCH_STAT indicates:

- 0 = not stitch welding,

- 1 = stitch welding, or

- 2 = in between stitch weld segments.

Power Up: On Immediately

<u>$AWEPRODSTAT[1].$dsbl_dist</u>

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Disabled distance

Description: DSBL_DIST is the total non-welded length of a weld when a weld is executed, but some portion of it or all of it is disabled.

Power Up: On Immediately

$AWEPRODSTAT[1].$gap_dist

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Gap Distance

Description: $GAP_DIST is the total non-welded length of a stitch weld.

Power Up: On CNTL Start

$AWEPRODSTAT[1].$weld_dist

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Weld distance

Description: The variable $aweprodstat[1].$weld_dist is updated while welding to reflect the total distance welded. The units are millimeters. The variable will "turnover" to zero at 1,000,000.0 mm. The weld distance can be RESET with the RESET function key in the Weld Status screen. Note there is a $weld_stat field in $aweweldstat[1] that reflects only the distance for the current weld. It is reset at the start of each weld. The distance is not calculated for JOINT welding moves.

Power Up: Takes effect immediately

See Also: $aweweldstat[1].$weld_dist

$AWEPRODSTAT[1].$weld_heat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Weld heat

Description: $WELD_HEAT contains the total heat energy input to the workpiece while welding in Joules. $AWEWELDSTAT[1].$WELD_STAT contains the heat input for each weld and $AWEPRODSTAT[1].$WELD_HEAT contains the heat input for alll welds. This variable will turnover to 0 wheh it reaches 1,000,000. This variable is RESETS to 0 via the RESET function key in the Weld Status screen.

Power Up: Takes effect immediately

$AWEPRR[1].$rmt_gas

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** AWDIO_T   **Memory:** Not available

Name: Remote gas

Description: This variable defines a digital input signal to control the welding gas flow remotely.

Power Up: Takes effect immediately

See Also: $awspcr.$rmt_gas_ena, $awspcr.$rmt_wir_ena.

$AWEPRR[1].$rmt_inchbwd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** AWDIO_T   **Memory:** Not available

Name: Remote inch backward

Description: This variable defines a digital input signal to inch the wire backward remotely. It should be set using the CONFIG function key in the Weld I/O Input screen. An input named "Remote Inch Bwd" appears in the Weld input screen if "Remote wire inch" is enabled in the Weld System Setup screen.

Power Up: On_Cold_Start

See Also: $aweprr[1].$rmt_inchfwd and $awspcr.$rmt_wir_ena

$AWEPRR[1].$rmt_inchfwd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** AWDIO_T   **Memory:** Not available

Name: Remote inch forward

Description: This variable defines a digital input signal to inch the wire forward remotely. It should be set using the CONFIG function key in the Weld I/O Input screen. An input named "Remote Inch Fwd" appears in the Weld input screen if "Remote wire inch" is enabled in the Weld System Setup screen.

Power Up: On_Cold_Start

See Also: $aweprr[1].$rmt_inchbwd and $awspcr.$rmt_wir_ena

$AWEPRR[1].$strike_wfs

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Strike Wire Feed Speed

Description: This variable is the initial wire feed speed used during an Arc Start with the Lincoln Electric PowerWave power supplies.

Power Up: N/A

$AWERAMP[1].$pos_rmp_rsm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Position Ramp Resume

Description: $POS_RMP_RSM controls the command signal levels at which an interrupted position-based ramp will resume. If TRUE, the ramp will begin at the values at the time of the pause. If FALSE, the ramp will restart from the starting values.

Power Up: N/A

$AWERAMP[1].$ramp_crater

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Ramp crater

Description: $RAMP_CRATER enables and disables ramping during craterfill. If TRUE, the craterfill time specified in an Arc End weld schedule will cause the welding analog outputs to ramp to their programmed values in the specified time. If FALSE, the analog signals transition immediately to the programmed values.

Power Up: N/A

$AWERAMP[1].$ramp_to_pos

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Ramp to position

Description: $RAMP_TO_POS is a BOOLEAN variable that enables and disables arc process ramping syncrhonized with motion. If $RAMP_TO_POS is TRUE, welding command signals can be ramped to their programmed values during the move following an Arc Start. To program this type of position-based ramping you must specify the weld schedule time value to be 99 seconds. The variable $AWERAMP[1].$RAMP_ENABLE must also be TRUE. If $RAMP_TO_POS is FALSE, the welding command signals transition immediately to the programmed values or ramp over the specified weld schedule time, if $RAMP_ENABLE is TRUE.

Power Up: N/A

$AWERAMP[1].$tim_rmp_rsm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Time Ramp Resume

Description: $TIM_RMP_RSM controls the command signal levels at which an interrupted time-based ramp will resume. If TRUE, the ramp will begin at the values at the time of the pause. If FALSE, the ramp will restart from the starting values.

Power Up: N/A

$AWERAMP[1].$time_factor

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Time factor

Description: $TIME_FACTOR controls the update frequency of the analog parameters during ramping. It is a multiplier of the variable $AWSCFG.$LOOP_TIME. The maximum frequency is achieved when $TIME_FACTOR is set to 1. Setting it to 2 doubles the ramping time interval (halves the frequency), and so forth. The time duration specified in a weld schedule for ramping is not affected by this variable.

Power Up: Takes effect immediately

$AWEUPR[1].$ae_pre_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Arc End Pre Time

Description: The variables $AE_PRE_TIME allow you to control the timing of the weld start signal relative to motion termination. With $AE_PRE_TIME you can begin craterfill while still moving to the Arc End position.

Power Up: Takes effect immediately

See Also: $AS_PRE_TIME

$AWEUPR[1].$as_pre_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Arc Start Pre Time

Description: The variable $AS_PRE_TIME allows you to control the timing of the weld start signal relative to motion termination. With $AS_PRE_TIME you overlay the small delays in starting the wire feeder with the robot's final motion to the Arc Start position.

Power Up: Takes effect immediately

See Also: $AE_PRE_TIME

$AWEUPR[1].$as_wire_adj

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Arc Start wire feed timing adjustment

Description: This variable is for FANUC Robotics Internal use only.

Power Up: Takes effect immediately

$AWEUPR[1].$st_min_weld

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Stitch Minimum Weld

Description: $ST_MIN_WELD specifies the shortest weld segment that can be left at the end of a series of stitch welds. It is not used at this time.

Power Up: On Immediately

$AWEUPR[1].$st_ptch_len

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Stitch Pitch Length

Description: $ST_PTCH_LEN specifies the distance between the centers of 2 stitch weld segments. The distance between the welds (the gap) is the pitch minus the length of a stich weld segment.

Power Up: On Immediately

$AWEUPR[1].$st_spd_mult

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Stitch Speed Multiplier

Description: $ST_SPD_MULT is used to alter the speed of the robot in between welds while stitch welding. It is not used at this time.

Power Up: On Immediately

$AWEUPR[1].$st_weld_len

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Stitch Weld Length

Description: $ST_WELD_LEN specifies the length of the weld segments in the next stitch weld.

Power Up: On Immediately

$AWSCFG.$stitch_ena

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Stitch Enable

Description: $STITCH_ENA enables and disables the ability to use the the stitch welding feature. Note the feature is optional. Setting this variable has no effect if the option is not loaded.

Power Up: On CNTL Start

$AWSCFG.$weave_synch

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Weave synchronization

Description: $WEAVE_SYNCH enables and disables the ability to synchronize the welding process with the weave profile.

Power Up: N/A

$AWSPCR.$hold_dyn_as

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Hold Dynamic AS and AE

Description: $hold_dyn_as enables and disables the hold of the robot motion during a dynamic Arc Start and dynamic Arc End. Previous versions of ArcTool did not hold the motion during these transtions. The default value is TRUE so the motion is held. This variable can be set to FALSE to return to the earlier specification.

Power Up: On Immediately

$AWSPCR.$rmt_gas_ena

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Remote gas enable

Description: This variable is used to ENABLE or DISABLE remote control of the welding gas.

Power Up: Takes effect immediately

See Also: $aweprr[1].$rmt_gas,$awspcr.$rmt_wir_ena.

$AWSPCR.$rmt_wir_ena

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Remote wire enable

Description: This variable is used to ENABLE or DISABLE remote wire inching.

Power Up: Takes effect immediately

See Also: $aweprr[1].$rmt_inchfwd, $aweprr[1].$rmt_inchbwd, $awspcr.$rmt_gas_ena.

$AWSPCR.$tm_wire_ena

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: TorchMate wire inch enable

Description: $tm_wire_ena enables and disables wire inch support for TorchMate. When enabled ArcTool monitors the wire inch forward and backward digital output signals. At the OFF to ON transition, ArcTool sets the wire inch speed to the value specified in $awepcr[n].$inch_rate. At the ON to OFF transition, ArcTool will set the inch speed to zero. This is supported for all wire feeders including ServoTorch.

Power Up: N/A

<u>**$AWSPCR.$wstk_pause**</u>

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Wirestick pause

Description: The error "ARC-030 Wire stick is still detected" is posted after a RESET if the wire is still in contact with the part after a wirestick. If this variable is FALSE, ARC-030 is a WARN severity error and operation of the robot can be continued even with this alarm. If this variable is TRUE, ARC-030 is a STOP severity error and the system remains in a fault condition and operation cannot continue until the wire is no longer in contact with the part.

Power Up: On Immediately

2.2 "B" System Variables

<u>**$BACK_EDIT[1] STRUCTURE**</u>

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Background Edit

Description: Background Edit variable structure. Individual fields within this structure are described below.

Power Up: N/A

<u>**$BACK_EDIT[1].$backup_name**</u>

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Name of backup program

Description: The name of the backup program is always -BACKUP-.

Power Up: N/A

$BACK_EDIT[1].$bck_comment

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING **Memory:** Not available

Name:

Description: The comment of the background edit program(-BCKEDT-).

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen (on the teach pendant)

$BACK_EDIT[1].$program

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING **Memory:** Not available

Name: Background edit program name

Description: Used by the system. The current name is always "-BCKEDT-" and cannot be changed.

Power Up: N/A

$BACK_EDIT[1].$src_name

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING **Memory:** Not available

Name: Background edit source program name

Description: Contains the name of the program currently being edited.

Power Up: N/A

$background

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Background edit mode

Description: If TRUE the system will allow Program "A" to be edited while program "B" is executing. This implies that all TPE functions and select functions such as create and copy can occur with the teach pendant disabled. Background edit is an optional feature.

Power Up: N/A

$BGE_PROGRAM

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Background Edit Program Mode

Description: If this string is not NIL it contains the name of the program which is being edited in the background. This variable allows a KAREL program to determine whether a program to be run will cause an error or not. This is a read only variable written to by the system.

Power Up: N/A

$bge_unusend

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Background edit automatic exit

Description: If set to TRUE the system will automatically exit background mode if a program is called for editing. If this is FALSE then the system will stop program execution and display a prompt box.

Power Up: N/A

$BGEAUTOEXIT

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Background Edit Automatic Exit

Description: If set to TRUE the system will automatically exit background mode if a program is selected for editing. If this is FALSE then the system will stop program execution and display a prompt box.

Power Up: N/A

$BLAL_OUT STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Low Voltage Alarm for Pulse Coder Backup Battery Output Function

Description: "BLAL" alarm (severity is WARNING) occurs when the pulse code backup battery voltage becomes low, and can be used for preventing "BZAL" (Battery zero alarm). The occurrence of "BLAL" is shown at the teach pendant and it can also be shown as output signals such as DO[] or BATALM (UOP output signal for CPU board backup battery alarm). The individual fields within this structure are described below. NOTE From KCL, a required dummy field, $BLAL_OUT.$PS_BATALM_0, is displayed.

Power Up: N/A

$BLAL_OUT.$batalm_or

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: BATALM signal "OR" switch

Description: This switches the meaning of BATALM UO signal as follows: If TRUE , the BATALM UO signal is turned on if the main CPU board backup battery alarm, or if a BLAL or a BZAL occurs. An alarm message on the TP will identify which battery alarm occurred. If FALSE , the BATALM UO signal is turned on only if the main CPU board backup battery alarm occurs.

Power Up: Takes effect immediately

$BLAL_OUT.$do_index

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: BLAL digital output index

Description: If a non-zero value is specified, turn on DO[] of this index when BLAL or BZAL occurs.

Power Up: Takes effect immediately

$BLT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: System Build Date

Description: Displays the date when the system software was made. You cannot change this variable.

Power Up: N/A

$BWD_ABORT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Backward Abort

Description: This variable determines whether the program is aborted or paused after a completion of a BWD execution at the 1st line of the program. The default value of this variable is FALSE. If this variable is set to FALSE, the program will pause after it completes a BWD execution at the 1st line of program. If this variable is set to TRUE, the program will abort after it completes a BWD execution at the 1st line of program if the program is the main program. Even if the value is TRUE and BWD execution of 1st line is completed, if the program is called from another program at that time, the called program pauses.

Power Up: Takes effect immediately

2.3 "C" System Variables

$cb_vars.$cal_sched[1].$avg_reg_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Robot calibration error output register

Description: This variable defines the error output register number. If it is greater than 0, the calibration software will write the calibration error to the register.

Power Up: N/A

$cb_vars.$cal_sched[1].$calib_mode

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Robot calibration mode

Description: This variable defines the type of calibration result that the calibration software should compute. This variable is bit-mapped to indicate which axis has been calibrated.

Power Up: N/A

$cb_vars.$cal_sched[1].$calib_tcp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Calibrate TCP

Description: If this variable is set to TRUE, robot calibration will compute a new Tool Center Point (TCP).

Power Up: N/A

$cb_vars.$cal_sched[1].$calib_ufrm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Calibrate Uframe

Description: When this variable is set to TRUE, the robot calibration software will calculate the UFRAME change as well.

Power Up: N/A

$cb_vars.$cal_sched[1].$max_ang_chg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Maximum allowed angle change.

Description: This variable indicates the maximum allowed change of joint angles for robot calibration. If the calibration result has a joint angle change that exceeds this value, an error is posted.

Power Up: N/A

$cb_vars.$cal_sched[1].$max_error

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Maximum error allowed

Description: This variable indicates the maximum error allowed for the robot calibration. If the calibration error exceeds this threshold, an error will be posted.

Power Up: N/A

$cb_vars.$cal_sched[1].$update_tcp

Minimum: 0   **Maximum:** 1   **Default:** 1   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** BOOLEAN   **Memory:** CMOS

Name: Update Tool Center Point (TCP)

Description: If this variable is set to TRUE, RobotCal will compute the TCP value as part of the calibration calculation.

Power Up: N/A

$cb_vars.$cb_mlog.$enable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Calibration log enable

Description: When this variable is set to TRUE, the robot calibration log is enabled.

Power Up: N/A

$cb_vars.$cb_mlog.$items[1].$master[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Master count

Description: This variable indicates the logged master count data for joints 1-9.

Power Up: N/A

$cb_vars.$cb_tlog.$enable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enable the tool log

Description: This variable is used to enable or disable the tool log.

Power Up: N/A

$cb_vars.$cb_tlog.$file_name

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Tool log output file name

Description: This variable indicates the tool log output file name when a user presses the Save function key to save the log to a file.

Power Up: N/A

$cb_vars.$dct_sched[1].$motion.$cir_retry

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Circular retry

Description: When a circular detection failed due to excessive fit error or radius error, the Calibration program will re-run the circular detetion again if this variable is set to be larger than 0. This variable defines number of times the re-run should be executed.

Power Up: N/A

$cb_vars.$dct_sched[1].$motion.$learn_spd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Learning motion speed

Description: When TOS all axes is selected as the sensor, the calibration option will do a learning motion before the search. This variable defines the speed of the learning motion.

Power Up: N/A

$cb_vars.$dct_sched[1].$motion.$return_dist

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Return distance

Description: The distance that the robot will move back after it made contact with the part.

Power Up: N/A

$cb_vars.$dct_sched[1].$motion.$return_spd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Search return speed

Description: This variable indicates the speed that moves the robot from the contact position back to its position before the detection motion.

Power Up: N/A

$cb_vars.$dct_sched[1].$motion.$return_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Return motion type

Description: This variable defines the return motion type when the robot moves from the contact position back to its search start position.

Power Up: N/A

$cb_vars.$dct_sched[1].$motion.$srch_dist

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Search distance

Description: This variable defines how far the robot will search before a contact is made. When the search distance is exhausted, the robot will post an error and stop the search.

Power Up: N/A

$cb_vars.$dct_sched[1].$motion.$srch_spd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Detection search speed

Description: This variable indicates the detection search speed setting for all detection motion using the schedule.

Power Up: N/A

$cb_vars.$dct_sched[1].$motion.$tq_thresh

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Torque threshold

Description: This variable indicates the Torqure Observer Sensor threshold for the TOS all axes method. In general, the default value is good for most cases. Increase the threshold number in case of false detections. Be very careful in lowering this number which can cause false detections.

Power Up: N/A

$cb_vars.$dct_sched[1].$sensor

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** CB_SENSOR_T   **Memory:** Not available

Name: I/O sensor data

Description: This variable indicates the digital input/output port setting for contact detection.

Power Up: N/A

$cb_vars.$dct_sched[1].$sensor.$enb_port_t

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Detection input port enable

Description: This variable indicates the output digital port used to enable the I/O detection circuitry.

Power Up: N/A

$cb_vars.$dct_sched[1].$sensor.$err_port_n

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Error port type

Description: When an error occured during calibration, and the error port number is > 0, then the calibration software will turn on the error digital output port to indicated the error. This variable define the type of the output digital port (either be DOUT or ROUT) that will be turned on.

Power Up: N/A

$cb_vars.$dct_sched[1].$sensor.$err_port_t

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Error port type

Description: When an errors occured during calibration, the calibration software will turn on a digital port to indicate the error. This variable defines the type of digital I/O port that will be turned on.

Power Up: N/A

$cb_vars.$dct_sched[1].$sensor.$in_port_n

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Digital input port number

Description: This variable indicates the digital input port number used in contact detection.

Power Up: N/A

$cb_vars.$dct_sched[1].$sensor.$in_port_t

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Input sensor type

Description: When using I/O for detection, the variable defines the type of I/O that is used for the detection.

Power Up: N/A

$cb_vars.$dct_sched[1].$sensor.$sensor_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Digital input port type

Description: This variable is used to set the digital input port type (DIN, RI, etc.) for the detection motion using I/O.

Power Up: N/A

$cb_vars.$frm_sched[1].$auto_update

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Auto Update

Description: When this variable is set to TRUE, the calibration software will automatically update the user frame after the completion of the CellCal program.

Power Up: N/A

$cb_vars.$frm_sched[1].$err_port_n

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Error port number

Description: When the port number is greater than 0, the calibration software will turn on the output port if an error occurs during the calibration.

Power Up: N/A

$cb_vars.$frm_sched[1].$max_error

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Maximum error

Description: This variable indicates the maximum error allowed. If the user frame has shifted more than the amount specified in this variable, the CellCal will post an error to notify the operator.

Power Up: N/A

$cb_vars.$frm_sched[1].$max_ornt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Maximum allowed orientation change

Description: This variable indicates the maximum allowed angular change of the UFRAME.

Power Up: N/A

$cb_vars.$frm_sched[1].$save_offset

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Save calibration offset to position register

Description: When this variable is set to TRUE, the calibration software will write the calibration offset to the position register.

Power Up: N/A

$cb_vars.$recd_pnts.$plate_dir

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Plate direction

Description: This variable defines the calibration plate direction in the program creation menu.

Power Up: N/A

$cb_vars.$recd_pnts.$plate_thk

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Calibration plate thickness

Description: This variable is used in the program creation menu to define the thickness of the calibration plate.

Power Up: N/A

$cb_vars.$recd_pnts.$z_offset

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Z offset

Description: This variable corresponds with the circle Z offset setting in the Program Creation menu.

Power Up: N/A

$cb_vars.$utl_sched[1].$accum_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enable accumulated error calculation

Description: When this variable is set to TRUE, the UTOOL calibration will perform the accumulated error calculation.

Power Up: N/A

$cb_vars.$utl_sched[1].$align_error

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Alignment error threshold

Description: This variable indicates the tool alignment threshold. If the computed tool alignment error is larger than this system variable, an error will be posted to the controller.

Power Up: N/A

$cb_vars.$utl_sched[1].$auto_update

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Auto update the UTOOL

Description: When this variable is set to TRUE, the calibration software will automatically update the UTOOL with the offset after running the calibration program.

Power Up: N/A

$cb_vars.$utl_sched[1].$err_port_n

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Error output port number

Description: When this varialbe is set to be greater than 0, the calibration software will turn on the output port if an error occurs during calibration.

Power Up: N/A

$cb_vars.$utl_sched[1].$max_ornt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Maximum allowed orientation change

Description: If the orientation of a UTOOL exceeds the amount specified in this variable, TCPCal will post an error to notify the operator.

Power Up: N/A

$cb_vars.$utl_sched[1].$save_offset

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Save Tool Offset

Description: If this variable is set to TRUE, TCPCal will save the computed utool change to a position register.

Power Up: N/A

$cb_vars.$utl_sched[1].$z_offset

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Tool Z offset

Description: When this variable is non-zero, the calibration software will add the variable to the computed UTOOL Z axis.

Power Up: N/A

$cb_vars.$z_out

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Tool Z direction defined going out of the tool

Description: For Arc Welding, the tool Z direction is defined as going into the tool while other applications define the tool Z direction going out from the tool. The Calibration option will automatically set this variable during Cold start based on the tool package selected. However, you can override this by setting the z_out variable to either TRUE or FALSE.

Power Up: N/A

$CD_JOG_ENB

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type** INTEGER **Memory:** Not available

Name: Coordinated jogging function enable

Description: This variable is used to turn on/off the functions of coordinated jogging. It has three values, 0, 1 and 2. 0--turn off all coordinated jogging functions; 1--turn on all coordinated jogging functions (fixed orientation and attached orientation jogging functions); 2--turn on attached orientation jogging function only. The default value of this variable is 1 for the market in North America and 2 for the market in Japan.

Power Up: On_Cold_Start

$CD_LDR_FRM[1].$origin[1-6]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** CD_POINT_T   **Memory:** Not available

Name: Leader Frame Origin.

Description: Leader frame origin teaching position. This variable include the teach point of both the leader group position and the follower group position

Power Up: N/A

Screen: SYSTEM Variables screen. Leader Frame menu of Coord menu of SETUP menu.

$CD_LDR_FRM[1].$origin[6]

Minimum: MIN_CD_POINT   **Maximum:** MAX_CD_POINT   **Default:** DEF_CD_POINT **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** CD_POINT_T   **Memory:** Not available

Name: Leader Frame Origin.

Description: Leader frame origin teaching position. This variable include the teach point of both the leader group position and the follower group position

Power Up: N/A

Screen: SYSTEM Variables screen. Leader Frame menu of Coord menu of SETUP menu.

$CD_LDR_FRM[1].$x_pos[1-6]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** CD_POINT_T   **Memory:** Not available

Name: Leader Frame Origin.

Description: Leader frame x-direction teaching position. This variables include the teach point of both the leader group position and the follower group position.

Power Up: N/A

Screen: SYSTEM Variables screen. Leader Frame menu of Coord menu of SETUP menu.

$CD_LDR_FRM[1].$x_pos[6]

Minimum: MIN_CD_POINT   **Maximum:** MAX_CD_POINT   **Default:** DEF_CD_POINT   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** CD_POINT_T   **Memory:** Not available

Name: Leader Frame Origin.

Description: Leader frame x-direction teaching position. This variables include the teach point of both the leader group position and the follower group position.

Power Up: N/A

Screen: SYSTEM Variables screen. Leader Frame menu of Coord menu of SETUP menu.

$CD_LDR_FRM[1].$y_pos[1-6]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** CD_POINT_T   **Memory:** Not available

Name: Leader Frame Origin.

Description: Leader frame y-direction teaching position. This variables include the teach point of both the leader group position and the follower group position.

Power Up: N/A

$CD_LDR_FRM[1].$y_pos[6]

Minimum: MIN_CD_POINT   **Maximum:** MAX_CD_POINT   **Default:** DEF_CD_POINT
KCL/Data: RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
CD_POINT_T   **Memory:** Not available

Name: Leader Frame Origin.

Description: Leader frame y-direction teaching position. This variables include the teach point of both the leader group position and the follower group position.

Power Up: N/A

Screen: SYSTEM Variables screen. Leader Frame menu of Coord menu of SETUP menu.

See Also: $CD_PARAM.$sv_set_enb 0 0 100000000 RW RW RW INTEGER

$CD_LDR_FRM[4] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data
Type:** Not available   **Memory:** Not available

Name: Leader Frame Structure

Description: Leader Frame variable structure. Individual fields within this structure are described below.

Power Up: N/A

$CD_NUM_PAIR

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data
Type:** INTEGER   **Memory:** Not available

Name: Increase or decrease the number of CD_PAIRs

Description: This variable allows the number of CD_PAIR to be increased up to 9 or decreased down to 4. After changing the variable a cold start is required. After cold start the variable indicates the number of CD_PAIR actually allocated.

Power Up: N/A

$CD_PAIR STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Coordinated Pair Structure

Description: Coordinated Pair variable structure. Individual fields within this structure are described below.

Power Up: N/A

$CD_PAIR.$ldr_frm_num

Minimum: 0   **Maximum:** MAX_LDR_FRM   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Leader Frame number

Description: Indicates which leader frame will be used in LDR Coordinate frame when use follower group jogging.

Power Up: N/A

Screen: SYSTEM Variables screen. Setup menu of Coord menu in SETUP menu.

$CD_PAIR.$leader_frm[6]

Minimum: MIN_CD_POINT   **Maximum:** MAX_CD_POINT   **Default:** DEF_CD_POINT   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION   **Memory:** Not available

Name: Leader Frame

Description: The frame attached to the leader group. This frame will be used for Follower group Jogging when the JOG COORD is in LDR coordinate.

Power Up: N/A

Screen: SYSTEM Variables screen. Leader Frame menu of Coord menu in SETUP menu.

$CD_PAIR.$loc_jog

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Follower fixed orientation.

Description: If this flag is set to true, when leader group jogged, the follower will follow the leader's location with fixed orientation.

Power Up: N/A

$CD_PAIR.$ornt_mask

Minimum: 1   **Maximum:** 3   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Follower orientation mask.

Description: This variable allows system level people to limit operator capability to Use "TOGGLE COOR ORNT" function item. This variable has 3 masks: ATTACHED (1) , FIXED (2) and BOTH (3). When this variable is set to ATTACHED, the follower orientation will be attached to leader when jog the leader. The "TOGGLE COOR ORNT" function item is disabled. When this variable is set to FIXED, the follower orientation will be fixed when jog the leader. The "TOGGLE COOR ORNT" function item is disabled. When this variable is set to BOTH, user can use the "TOGGLE COOR ORNT" function item to switch between ATTACHED and FIX orientation.

Power Up: N/A

Screen: SYSTEM Variables screen. Setup menu of Coord menu in SETUP menu.

$CD_PAIR[1].$f_ext_jgdir

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Follower Ext Axis Jog Direction

Description: For Leader and Follower Pair which has an integrated extended axis (either both on the same rail, or their rails are parallel), during Sub-group (ext axis) Coordinated Jog of the leader, this setting defines the rail motion of of the follower as follows:

- 0: default, follower rail axis move same amount and direction as leader

- 1: follower rail axis move same amount but opposite direction as leader

- 2: follower rail does not move

Power Up: N/A

$CHECKCONFIG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Check Configuration

Description: Specifies whether the configuration portion of a position is compared in the positional comparison operation. When set to TRUE, the configuration will be compared. When set to FALSE, the configuration will not be compared. Used to determine if the configuration components of the positions should be compared. $CHECKCONFIG, along with $APPROACHTOL, $LOCTOL, and $ORIENTTOL are used in conjunction with the relational operator ''>=". Power Up:

Power Up: N/A

$CMCFG STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: IntelliTrak Configuration System Variable

Description: This set of variables configure the IntelliTrak Feature. Individual fields within this structure are described below.

Power Up: N/A

$CMCFG.$debug

Minimum: 0x80000000   **Maximum:** 0x7FFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Debug

Description: Reserved for Internal use by FANUC Robotics.

Power Up: N/A

$CMCFG.$group_num

Minimum: 1   **Maximum:** 5   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Group Number

Description: Denotes the motion group number that IntelliTrak feature is applied. The default value is 1, meaning Group number 1 is selected.

Power Up: N/A

$CMSCH STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: IntelliTrak Schedule System Variable

Description: This set of variables controls the mode of operation of IntelliTrak. Individual fields within this structure are described below.

Power Up: N/A

$CMSCH[1].$cmc_type

Minimum: 0   **Maximum:** 3   **Default:** 2   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: IntelliTrak Type Switch

Description: Switch to enable and disable the IntelliTrak algorithm. If it is set to 0, the IntelliTrak function does not work for all programs on the controller. If you want to enable/disable IntelliTrak for a specific program, you should set the IntelliTrak schedule number to 0. You can specify this value using the PROGRAM DETAIL screen.

Power Up: N/A

$CMSCH[1].$cnstnt_path

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Enables/Disables IntelliTrak constant path

Description: This is a switch for controlling the constant path feature. If set to 0, it means the constant path feature is disabled. Therefore, the path traced will vary with the speed and speed override changes. If set to 1 or 2, it means the constant path feature is enabled. The path traced will be maintained regardless of speed and speed override changes. This adjustment only applies to the program motions. If set to 1, the ACC override (optional) field in motion statement is ignored. If set to 2, the ACC override (optional) field in motion statement is active. If set to 1, the robot moves around all corners with the specified speed. This means the actual robot path could have a similar profile for all corners because the actual path depends on the corner speed. If set to 0, the robot moves around all corners using the previous and next path speeds.

Power Up: N/A

$CMSCH[1].$min_acc_cmc

Minimum: 0   **Maximum:** 10000   **Default:** 128   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Minimum IntelliTrak Acceleration Time

Description: This value determines the minimum acceleration time that IntelliTrak will use when the $CMSCH[].$nom_acc_ovr is used to reduce the accel times.

Power Up: N/A

$CMSCH[1].$nom_acc_ovr

Minimum: 0.001   **Maximum:** 5.0   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Intellitrak Global Accel Override

Description: This variable is a global acceleration override that affects the entire program. The default value is 1.0 which means the default acceleration time is used. A value of 0.8 means acceleration time is 0.8 * default acceleration.

Power Up: N/A

$CMSCH[1].$nom_pth_spd

Minimum: 0.001   **Maximum:** 3000.   **Default:** 100.   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: IntelliTrak Nominal Corner speed

Description: This variable affects corner rounding for the entire program. Its value indicates the corner rounding achieved when speed is set to this value. The default value is 100, which means corner rounding is achieved if the travel speed is set to 100 mm/sec. Note that this speed is independent of program speed. If CMSCH[1].$cnstnt_path is 1, the robot moves around all corners using this speed. The taught speed of the previous or next paths are ignored. The robot decelerates or accelerates the specified speed before the corner and accelerates or decelerates the taught speed of the next path at the end of the corner. By keeping this value constant, the same corner rounding will be maintained regardless of program speed. By changing this value, corner rounding of the entire program will change. To reduce corner rounding, reduce this value. To increase corner rounding, increase it.

Power Up: N/A

$CMSCH[1].$orient_type

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: IntelliTrak Orientation Control Type

Description: This system variable allows the user to choose between a one-angle method of orientation control (used prior to V3.06PA) or the standard orientation control method. The standard orientation control method is the same as that which is used when IntelliTrak is disabled. If set to 0, then the standard orientation control method is used. If set to 1, chosen then the one-angle orientation method is used.

Power Up: N/A

$CMSCH[1].$rot_speed_lim

Minimum: 0.001   **Maximum:** 500.0   **Default:** 120.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: IntelliTrak Rotational Speed Limit

Description: Determines the maximum rotational speed for orientation control when IntelliTrak is enabled.

Power Up: N/A

$CMSCH[1].$warnmessenb

Minimum: 0   **Maximum:** 4   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: IntelliTrak Warning Message Enable

Description: This variable allows you to enable/disable posting of the IntelliTrak error message "Can't blend corner." If set to 1, then error message will be posted. If set to 0, then error message will not be posted.

Power Up: N/A

$CN_ADP_CNF[1].$cn_adpenab

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: ControlNet Mode of Operation 0 - Adapter Mode - Default 1 - Scanner Mode

Description: Decides if the board operates in Scanner mode or Adapter mode

Power Up: N/A

$CN_ADP_CNF[1].$cn_bd_dtype

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Daughter-Board Device Type

Description: Goes in the ControlNet ID object Device Type of the board

Power Up: N/A

$CN_ADP_CNF[1].$cn_bd_majrv

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Major Revision

Description: Goes in the ControlNet ID object Major Revision of the Product

Power Up: N/A

$CN_ADP_CNF[1].$cn_bd_minrv

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Minor Revision

Description: Goes in the ControlNet ID object Minor Revision of the Product

Power Up: N/A

$CN_ADP_CNF[1].$cn_bd_pcode

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Daughter-Board Product Code

Description: Goes in the ControlNet ID object Product Code of the board

Power Up: N/A

$CN_ADP_CNF[1].$cn_bd_vndid

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Daughter-Board Vendor ID

Description: Goes in the ControlNet ID object Vendor ID of the Manufacturer of the board

Power Up: N/A

$CN_ADP_CNF[1].$cn_class

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Connection Class for the target (adapter connection)

Description: Provides the Connection Path for the device

Power Up: N/A

$CN_ADP_CNF[1].$cn_conpt0

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Connection point 0 for the target (adapter connection)

Description: Provides the Connection Path for the device

Power Up: N/A

Screen: The System Variables screen

$CN_ADP_CNF[1].$cn_conpt1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Connection point 1 for the target (adapter connection)

Description: Provides the Connection Path for the device.

Power Up: N/A

Screen: The System Variables screen

$CN_ADP_CNF[1].$cn_inst

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Connection Instance for the target (adapter connection)

Description: Provides the Connection Path for the device

Power Up: N/A

$CN_BD_INFO[1].$cn_bd_cmt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: ControlNet Daughter-Board Comment

Description: Provides a short description field for the daughter-board/network.

Power Up: Takes effect immediately

Screen: ControlNet Board List screen

$CN_BD_INFO[1].$cn_bd_dtype

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Daughter-Board Device Type

Description: Goes in the ControlNet ID object Device Type of the board

Power Up: N/A

$CN_BD_INFO[1].$cn_bd_erst

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Error state of Input and Output Ports

Description: This sets what the last state of the input/output ports should be. 0 : Keep last state 1 : Set to zero 2 : Use individual device settings

Power Up: On_Cold_Start

$CN_BD_INFO[1].$cn_bd_kprst

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Daughter-Board ControlNet Keeper State

Description: Contains Keeper State of the Card

Power Up: N/A

$CN_BD_INFO[1].$cn_bd_macid

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Daughter-Board MAC-Id

Description: The Media Access Control Identifier (MAC-Id) for the ControlNet daughter-board. Must be in the range [1..99]. There cannot be a duplicate MAC-Id between the daughter-board and any devices connected to the daughter-board.

Power Up: On_Cold_Start

Screen: ControlNet Board Detail screen

$CN_BD_INFO[1].$cn_bd_majrv

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Major Revision

Description: Goes in the ControlNet ID object Major Revision of the Product

Power Up: N/A

$CN_BD_INFO[1].$cn_bd_mb_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Motherboard ID

Description: Identifies what type of motherboard the ControlNet daughtercard is connected to. This value cannot be changed

Power Up: N/A

Screen: ControlNet Board Detail screen

$CN_BD_INFO[1].$cn_bd_minrv

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Minor Revision

Description: Goes in the ControlNet ID object Minor Revision of the Product

Power Up: N/A

$CN_BD_INFO[1].$cn_bd_pcode

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Daughter-Board Product Code

Description: Goes in the ControlNet ID object Product Code of the board

Power Up: N/A

$CN_BD_INFO[1].$cn_bd_stat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: DeviceNet Daughter-Board Status

Description: Indicates the status of the DeviceNet daughter-board: 0: board is offline and has not been initialized 1: board is offline and cannot be initialized 2: board is offline but has been initialized 3: board is in an error state and has not been initialized 4: board is in an error state and cannot be initialized 5: board is in an error state but has been initialized 6: board is online 7: board is currently being initialized 99: no ControlNet variables have been initialized

Power Up: N/A

$CN_BD_INFO[1].$cn_bd_vndid

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Daughter-Board Vendor ID

Description: Goes in the ControlNet ID object Vendor ID of the Manufacturer of the board

Power Up: N/A

$CN_BD_INFO[1].$cn_dbin_ver

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING **Memory:** Not available

Name: ControlNet Executing Firmware Revision

Description: Provides the revision number for the firmware on the card

Power Up: N/A

Screen: ControlNet Board Detail Screen

$CN_BD_INFO[1].$cn_fbin_ver

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING **Memory:** Not available

Name: ControlNet Card FPGA Firmware Revision

Description: Provides the revision number for the FPGA Firmware on the card

Power Up: N/A

Screen: ControlNet Board Detail Screen

$CN_BD_INFO[1].$cn_firm_loc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Location of ControlNet Firmware file (.BIN)

Description: This sets where the CNET firmware file resides. should be. 0 : CN_FLASH_BIN - Run BIN file from flash - Default Setting 1 : CN_LOAD_BIN - Load BIN file from FRSU:

Power Up: Takes effect immediately

$CN_BD_INFO[1].$cn_firmfile

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: ControlNet Configuration Firmware File (.BIN)

Description: This indicates firmware file to be loaded. The extension of this file is .BIN. If no file is supplied, the file in flash is run.

Power Up: N/A

$CN_BD_INFO[1].$cn_flshfile

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: ControlNet Flash Programming file (.SS1)

Description: This indicates firmware file to be loaded. The extension of this file is .SS1. This is required to update the FPGA Flash EPROM.

Power Up: N/A

$CN_BD_INFO[1].$cn_gbcntr

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Network Guard-band Center

Description: Identifies the guard-band center network parameter. This value cannot be changed

Power Up: N/A

Screen: ControlNet Board Detail screen

$CN_BD_INFO[1].$cn_gbpre

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: ControlNet Network Guard-band Prestart

Description: Identifies the guard-band prestart network parameter. This value cannot be changed

Power Up: N/A

Screen: ControlNet Board Detail screen

$CN_BD_INFO[1].$cn_gbstrt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: ControlNet Network Guard-band Start

Description: Identifies the guard-band start network parameter. This value cannot be changed

Power Up: N/A

Screen: ControlNet Board Detail screen

$CN_BD_INFO[1].$cn_netchang

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Specifies action to be taken when Network Parameter Change event is received

Description: This specifies action to be taken when Network Parameter Change event is received should be. 0 : CN_NETCHNG_WARN - Allow Network Change with Warning Post - Default 1 : CN_NETCHNG_STOP - Post Stop error on Network Change

Power Up: Takes effect immediately

$CN_BD_INFO[1].$cn_nut

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Network Update Time

Description: Identifies the network update time (NUT) of the ControlNet Network. This value cannot be changed

Power Up: N/A

Screen: ControlNet Board Detail screen

$CN_BD_INFO[1].$cn_or_ersv

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Error Severity for device error

Description: Specifies Error severity for errors posted runtime errors remote device connections

Power Up: N/A

Screen: The System Variables screen

$CN_BD_INFO[1].$cn_pgafile

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: ControlNet FPGA Source file (.SSP)

Description: This indicates firmware file to be loaded. The extension of this file is .SSP. This is required to update the FPGA Flash EPROM. This is the file which will be loaded by the FPGA

Power Up: N/A

$CN_BD_INFO[1].$cn_slot

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Network Slot parameter

Description: Identifies the slot network parameter of the ControlNet network. This value cannot be changed

Power Up: N/A

Screen: ControlNet Board Detail screen

$CN_BD_INFO[1].$cn_smax

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet network maximum scheduled MAC ID

Description: Identifies maximum scheduled MAC ID (smax) of the ControlNet network. This value cannot be changed

Power Up: N/A

Screen: ControlNet Board Detail screen

$CN_BD_INFO[1].$cn_stat1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Sys Var for Internal Purposes

Description: This value cannot be changed

Power Up: N/A

Screen: ControlNet Board Detail screen

$CN_BD_INFO[1].$cn_stat2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Sys Var for Internal Purposes

Description: This value cannot be changed

Power Up: N/A

Screen: ControlNet Board Detail screen

$CN_BD_INFO[1].$cn_stat3

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Sys Var for Internal Purposes

Description: This value cannot be changed

Power Up: N/A

Screen: ControlNet Board Detail screen

$CN_BD_INFO[1].$cn_stat4

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Sys Var for Internal Purposes

Description: This value cannot be changed

Power Up: N/A

Screen: ControlNet Board Detail screen

$CN_BD_INFO[1].$cn_stat5

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Sys Var for Internal Purposes

Description: This value cannot be changed

Power Up: N/A

Screen: ControlNet Board Detail screen

$CN_BD_INFO[1].$cn_tg_ersv

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Error Severity for device error

Description: Specifies Error severity for errors posted runtime errors adapter mode connections

Power Up: N/A

Screen: The System Variables screen

$CN_BD_INFO[1].$cn_umax

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet network maximum unscheduled MAC ID

Description: Identifies maximum unscheduled MAC ID (smax) of the ControlNet network. This value cannot be changed

Power Up: N/A

Screen: ControlNet Board Detail screen

$CN_DEBUG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Continuous Turn Debug

Description: The Continuous Turn Debug variable is a bit-mapped variable that is used to locate potential problems in continuous turn. It is not a user variable and should never be set to any value other than 0. Any other values will slow and possibly stop robot motion.

Power Up: Takes effect on next motion.

Screen: Set only from KCL or the SYSTEM Variables screen.

See Also: Contact your FANUC Robotics technical representative if it is absolutely necessary to change this variable.

$CN_DV_LIST[1].$cn_dv_cmt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: ControlNet Device Comment

Description: Provides a short description field for the Device

Power Up: Effective immediately.

Screen: ControlNet Device List screen

$CN_DV_LIST[1].$cn_dv_ihdln

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Device Input Header Length

Description: This reflects the ControlNet Connection Header Length. The total size of data exchanged is equal to 2 bytes of Sequence, header length and the I/O size

Power Up: N/A

$CN_DV_LIST[1].$cn_dv_macid

Minimum: 1   **Maximum:** 99   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Device MAC-Id

Description: The MAC-Id (Media Access Control Identifier) of the ControlNet device. It may not be a duplicate of the MAC-Id for any other device connected to the same daughter-board or of the MAC-Id of the daughter-board itself. The MAC-Id is set when a device is first added to a daughter-board's device list.

Power Up: N/A

Screen: ControlNet Device List screen

$CN_DV_LIST[1].$cn_dv_majrv

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Device Major Revision

Description: Major Revision of Device in Scan list. It this does not match with the remote device, the connection will return an error.

Power Up: N/A

Screen: ControlNet Device Detail screen

$CN_DV_LIST[1].$cn_dv_minrv

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Device Minor Revision

Description: Minor Revision of Device in Scan list. It this does not match with the remote device, the connection will return an error.

Power Up: N/A

Screen: ControlNet Device Detail screen

$CN_DV_LIST[1].$cn_dv_nain

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of Analog Ins (Points)

Description: Identifies Number of Analog Ins in terms of points.

Power Up: N/A

Screen: ControlNet Device Detail screen

$CN_DV_LIST[1].$cn_dv_name

Minimum: ""   **Maximum:** ""   **Default:** "*******************************"   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: ControlNet Device Name

Description: Name of the Device. This field is not editable

Power Up: N/A

Screen: ControlNet Device List screen

$CN_DV_LIST[1].$cn_dv_naout

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of Analog Outs (Points)

Description: Identifies Number of Analog Outs in terms of points.

Power Up: N/A

Screen: ControlNet Device Detail screen

$CN_DV_LIST[1].$cn_dv_ndin

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of Digital Ins (Bits/Points)

Description: Identifies Number of Digital Ins in terms of points/bits

Power Up: N/A

Screen: ControlNet Device Detail screen

$CN_DV_LIST[1].$cn_dv_ndout

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of Digital Outs (Bits/Points)

Description: Identifies Number of Digital Outs in terms of points/bits

Power Up: N/A

Screen: ControlNet Device Detail screen

$CN_DV_LIST[1].$cn_dv_ohdln

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Device Output Header Length

Description: This reflects the ControlNet Connection Header Length. The total size of data exchanged is equal to 2 bytes of Sequence, header length and the I/O size

Power Up: N/A

$CN_DV_LIST[1].$cn_dv_pcode

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Product Code

Description: Identifies Product Code of the device. This ID is assigned by the manufacturer of the device.

Power Up: N/A

Screen: ControlNet Device Detail screen

$CN_DV_LIST[1].$cn_dv_stat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Device Status

Description: The status of the ControlNet device. 0: device is Not used 1: device is offline 2: device is in an error state 3: device is online

Power Up: N/A

Screen: ControlNet Device List screen

$CN_DV_LIST[1].$cn_dv_type

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Device Type code

Description: Identifies device type code. This ID is assigned by the manufacturer of the device as governed by the ControlNet specification

Power Up: N/A

Screen: ControlNet Device Detail screen

$CN_DV_LIST[1].$cn_dv_vndid

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ControlNet Device Vendor ID

Description: Identifies Vendor ID of the manufacturer of this device This ID is assigned by ControlNet International.

Power Up: N/A

Screen: ControlNet Device Detail screen

$CN_TRG_INF_T.$size

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: This specifies the I/O size of this instance

Description:

Power Up: N/A

$CN_TRG_INF_T.$start_pt

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: This specifies the starting point of this instance for a given slot

Description:

Power Up: N/A

$CN_TRG_INF_T.$targ_inst

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Target Instance

Description: This specifies the target Instance for the ControlNet Connection

Power Up: N/A

$CN_USR_GRP STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Continuous Turn User Group Variables

Description: This is an array of group-specific variables for continuous turn.

Power Up: N/A

Screen: Accessible from KAREL, KCL or the SYSTEM Variables screen

See Also: FANUC Robotics SYSTEM R-J3 Controller Continuous Turn User Guide for more information

$CN_USR_GRP[1].$cn_grp_acc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Continuous Turn Group Acceleration.

Description: This variable controls the acceleration time of the robot and continuous turn axis. It is provided for advanced users who wish to change how the robot acceleration is coordinated with the continuous turn axis. When FALSE (default), the group axes' (robot and extended axes) acceleration time is independent of the continuous turn axis acceleration time. When TRUE, then all the axes in the group accelerate at the same rate as the continuous turn axis. This is in effect only during continuous rotation.

Power Up: On_Cold_Start

Screen: Can be changed from a KAREL program, KCL, or the SYSTEM Variables screen

See Also: FANUC Robotics SYSTEM R-J3 Controller Continuous Turn User Guide for more information

$CN_USR_GRP[1].$cn_same_dir

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Continuous Turn rotate in Same Direction.

Description: This variable controls the direction of rotation of the continuous turn axis when ending continuous rotation. If TRUE (default), then when ending continuous rotation, the continuous turn axis will stop and then rotate in the same direction as continuous rotation until it reaches the taught position. If FALSE, then the continuous turn axis will stop and move the shortest rotational distance to the taught position, even if this means rotating in a direction that this opposite to the continuous rotation.

Power Up: On_Cold_Start

Screen: Can be changed from a KAREL program, KCL, or the SYSTEM Variables screen

See Also: FANUC Robotics SYSTEM R-J3 Controller Continuous Turn User Guide for more information

$CN_USR_GRP[1].$cn_step_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Continuous turn step enable

Description: 1 = continuous turn axis will not move during step mode. 0 = continuous turn axis will move to the taught position during step mode.

Power Up: Takes effect immediately

$CN_USR_GRP[1].$cn_turn_no

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Continuous Turn Continuous Rotation Turn Number.

Description: This variable indicates the number of complete turns the continuous turn axis has made since the start of continuous rotation. It is reset to zero at the start of each motion that contains continuous rotation and will maintain the value even after motion ends.

Power Up: N/A

Screen: Can be read from a KAREL program, KCL, or SYSTEM Variables screen.

See Also: FANUC Robotics SYSTEM R-J3 Controller Continuous Turn User Guide for more information.

$CONT_R_NUM

Minimum: 0   **Maximum:** 32   **Default:** 32   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Contact report register number

Description: This variable is valid only when $pause_ncont is set to TRUE. This variable specifies a register that is set to 0 when the robot makes a contact with a part. The register is set to 1 if the robot does not touch a part.

Power Up: Takes effect immediately

Screen: In the touch sensing schedule on the DATA screen.

See Also: $SEARCH_DIST, $PAUSE_NCONT

$CORE[1]

Minimum: ""   **Maximum:** " "   **Default:** " "   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Name and Version Application and Core Software

Description: Displays the release time name and version of the software application and core.

Power Up: N/A

Screen: STATUS Version IDs screen

$CORE[2]

Minimum: ""   **Maximum:** " "   **Default:** " "   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Reserved

Description: Reserved for future use.

Power Up: N/A

Screen: STATUS Version IDs screen

$CP_MCRGRP[1].$rsm_dec_pct

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Resume offset deceleration percentage

Description: This variable indicates a deceleration time for hold when resume offset is enabled. This is expressed as a percentage of the current segment accel time. Lower values will stop the robot faster, but might increase vibration during the stop.

Power Up: N/A

$CP_MCRGRP[1].$rsm_jbf_pct

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Resume offset JBF percentage

Description: This variable indicates the size of the resume offset JBF buffer, expressed as an integer percentage of $cpcfg.$jbf_size. Larger numbers allow larger resume offset times but consume more memory.

Power Up: N/A

$CP_MCRGRP[1].$rsm_ofs_pct

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Resume offset percentage

Description: This variable indicates the percentage of available resume offset to use. Lower values cause smaller resume offset distance, but might not achieve full speed before the original stop point is reached.

Power Up: N/A

$CP_PARAMGRP[1]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** CP_PARAMGP_T   **Memory:** Not available

Name: CP Group Parameters

Description: This variable indicates the CP parameter settings that are unique to each group.

Power Up: N/A

$CP_PARAMGRP[1].$ext_jbf_siz

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: EXT JBF Size

Description: This variable indicates the size of EXT JBF data structure. CPMO-010 will be posted if it is too small.

Power Up: N/A

$CP_PARAMGRP[1].$ext_num_jbf

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of EXT JBF structures.

Description: This variable sets the number of EXT JBF structures. CPMO-086 will be posted if it is too small.

Power Up: N/A

$CP_PARAMGRP[1].$jbf_size

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: JBF Size

Description: This variable indicates the size of the JBF structure. CPMO-010 will be posted if it is too small.

Power Up: N/A

$CP_PARAMGRP[1].$jnt_acc_lim[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Joint Acceleration Limit

Description: This variable sets joint acceleration limits for posting CPMO-095.

Power Up: N/A

$CP_PARAMGRP[1].$jnt_jrk_lim[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Joint Jerk Limit

Description: This variable sets the joint jerk limits for posting CPMO-095.

Power Up: N/A

$CP_PARAMGRP[1].$jnt_vel_lim[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Joint Velocity Limit

Description: This variable sets the joint velocity limits for posting CPMO-095.

Power Up: N/A

$CP_PARAMGRP[1].$num_chn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of Channels

Description: This variable sets the number of channel structures. CPMO-058 will be posted if it is too small.

Power Up: N/A

$CP_PARAMGRP[1].$num_jbf

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of JBFs

Description: This variable indicates the number of JBF structures. CPMO-060 will post if it is too small.

Power Up: N/A

$CP_PARAMGRP[1].$num_jbfset

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of JBF SETs

Description: This variable indicates the number of JBF SET structures. CPMO-059 will be posted if it is too small.

Power Up: N/A

$CP_PARAMGRP[1].$num_rsinfo

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of RSINFOs

Description: This variable indicates the number of RSINFO structures. CPMO-062 will be posted if it is too small.

Power Up: N/A

$CP_PARAMGRP[1].$num_tf

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of TFs

Description: This variable indicates the number of TF structures. CPMO-060 will be posted if it is too small.

Power Up: N/A

$CP_PARAMGRP[1].$tf_size

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Size of TF

Description: This variable indicates the size of the TF structure. CPMO-044 will be posted if it is too small.

Power Up: N/A

$CP_RSMOFST.$ro_max_itp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Resume Offset Maximum ITP

Description: This variable defines the available memory of Constant Path Resume Offset, in multiples of ITP (see $scr.$itp_time). This variable has a direct effect on DRAM used for Constant Path motion. Requires power cycle to take effect. This variable is normally set by the Resume Offset Setup menu.

Power Up: N/A

$CP_T1_MODE.$enable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enhanced T1 Mode Enable

Description: Enables the features of Enhanced T1 Mode.

Power Up: On Cold Start

$CPCFG.$max_pspd

Minimum: 100   **Maximum:** 1000   **Default:** 110   **KCL/Data:** RO   **Program:** Not available   **UIF:** RO   **CRTL:** RO   **Data Type:** INTEGER   **Memory:** CMOS

Name: This variable defines the upperlimit for the value of process speed option (PSPDxxx) that user can type in a teach pendant program.

Description: This variable defines the upperlimit for the value of process speed option (PSPDxxx) that user can type in a teach pendant program.

Power Up: N/A

$CPCFG.$min_pspd

Minimum: 1   **Maximum:** 100   **Default:** 20   **KCL/Data:** RO   **Program:** Not available
UIF: RO   **CRTL:** RO   **Data Type:** INTEGER   **Memory:** CMOS

Name: This variable defines the lowerlimit for the value of process speed option (PSPDxxx) that user can type in a teach pendant program.

Description: This variable defines the lowerlimit for the value of process speed option (PSPDxxx) that user can type in a teach pendant program.

Power Up: N/A

$CPCFG.$resume_ofst

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** CP_RSMOFST_T   **Memory:** Not available

Name: Constant Path Resume Offset variables.

Description: This structure holds variables used by Constant Path Resume Offset.

Power Up: N/A

$CPCFG.$rsm_ofst_en

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** INTEGER   **Memory:** CMOS

Name: Constant Path Resume Offset Enable

Description: This variable enables the constant path resume offset function. When this variable is TRUE it is enabled. When it is FALSE, it is disabled.

Power Up: N/A

$CR_AUTO_DO

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: AUTO mode DO number

Description: If this variable is non-zero, this specifies the DOUT signal which will be set if the controller is in AUTO mode.

Power Up: On_Cold_Start

$CR_T1_DO

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: T1 mode DO number

Description: If this variable is non-zero, this specifies the DOUT signal which will be set if the controller is control reliable and is in T1 mode.

Power Up: On_Cold_Start

$CR_T2_DO

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: T2 mode DO number

Description: If this variable is non-zero, this specifies the DOUT signal which will be set if the controller is control reliable and is in T2 mode. This can be set in the SYSTEM/CONFIG screen.

Power Up: On_Cold_Start

$CRCFG STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Circular softpart configuration data structure.

Description: This data structure shows the circular motion configuration and its dependency with other motion options. Individual fields within this structure are defined below.

Power Up: N/A

$CRCFG.$cr_enhanced

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enhanced circular motion

Description: Internal use only.

Power Up: N/A

$CRCFG.$debug

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Debug flag

Description: Internal use only.

Power Up: N/A

$CRCFG.$group_mask

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: group mask

Description: Internal use only.

Power Up: N/A

$CRCFG.$lgorn_az_sp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Azimuth and Spin Angles.

Description: Internal use only.

Power Up: N/A

$CRCFG.$lgorn_dbg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Debug flag

Description: Internal use only.

Power Up: N/A

$CRCFG.$lgorn_eltol

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Elevation Tolerance.

Description: Internal use only.

Power Up: N/A

$CRCFG.$lgorn_enbl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enable Large Orientation Detection for Small Circle.

Description: To enable detection of large orientation change in small circle (default is disabled). When enabled, and during single step mode, if large orientation change is detected for small circular moves, system will automatically slow down, and post the following warning: MOTN-319 CRC large orient change. If the large orientation is what the user intends to teach, no further action is required. However, if the orientation change is not desirable, user has more opportunity to stop the robot by releasing SHFT key, or press the HOLD key. The circular points can then be retaught.

Power Up: On_Cold_Start

Screen: SYSTEM variable screen.

$CRCFG.$lgorn_meth

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Detection Method

Description: Internal use only.

Power Up: N/A

$CRCFG.$lgorn_rad

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Small Circle Radius in mm.

Description: This specifies the maximum radius of a small circle. Detection of large orientation change will only be performed for circles whose radius is less than this radius. Default is 30mm.

Power Up: On_Cold_Start

$CRCFG.$mb_conflict

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: sid_mb conflict mask

Description: Internal use only.

Power Up: N/A

$CRCFG.$mb_required

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: sid_mb required mask

Description: Internal use only.

Power Up: N/A

$CRT_KEY_TBL[1-256]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Table used to Map CRT/KB Input Keys

Description: This table maps keyboard keys into teach pendant equivalent keycodes. This allows you to map a simple keyboard to perform CRT/KB functions. NOTE: The system software automatically maps VT-compatible function key sequences into a single character. Key sequences which are not VT-compatible will generate multiple input characters. The default setting for this table will map VT-220 and FANUC Robotics' built-in CRT/KB function keys to teach pendant equivalent function keys. If a KAREL program uses the READ_KB built-in for the CRT/KB, 'raw' CRT/KB characters will be returned. In order to retrieve teach pendant equivalent key codes, the KAREL program must perform the following function: tp_key = $CRT_KEY_TBL[crt_key + 1] This mapping allows a KAREL program to use common software between the CRT/KB and teach pendant devices.

Power Up: N/A

See Also: READ_KB built-in in the FANUC Robotics SYSTEM R-J3 Controller KAREL Reference Manual

$CRT_KEY_TBL[256]

Minimum: 0   **Maximum:** 255   **Default:** 255   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Table used to Map CRT/KB Input Keys

Description: This table maps keyboard keys into teach pendant equivalent keycodes. This allows you to map a simple keyboard to perform CRT/KB functions. NOTE: The system software automatically maps VT-compatible function key sequences into a single character. Key sequences which are not VT-compatible will generate multiple input characters. The default setting for this table will map VT-220 and FANUC Robotics' built-in CRT/KB function keys to teach pendant equivalent function keys. If a KAREL program uses the READ_KB built-in for the CRT/KB, "raw" CRT/KB characters will be returned. In order to retrieve teach pendant equivalent key codes, the KAREL program must perform the following function: tp_key = $CRT_KEY_TBL[crt_key + 1] This mapping allows a KAREL program to use common software between the CRT/KB and teach pendant devices.

Power Up: N/A

See Also: READ_KB built-in in the FANUC Robotics SYSTEM R-J3 Controller KAREL Reference Manual

$CSTOP

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Cycle-stop Flag

Description: Intended for use in applications to signal the robot to exit from production mode at the end of the current cycle.

Power Up: N/A

$CT_CURSCRN[1].$scrn_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Current CRT/KB Menu Number

Description: Indicates the menu number of the current menu. Some softparts can handle multiple menus (for example the SYSTEM System Variable menu and the KAREL Variable menu are the same softpart id). The menu number determines the current menu of a given softpart.

Power Up: N/A

See Also: FORCE_SPMENU built-in in the FA NUC Robotics SYSTEM R-J3 Controller KAREL Reference Manual which lists the constants for each menu.

$CT_CURSCRN[1].$sp_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Softpart identifier of the current menu

Description: This softpart identifier can be used to determine exactly which softpart menu is being displayed on the CRT/KB at any time.

Power Up: N/A

See Also: FORCE_SPMENU built-in in the FA NUC Robotics SYSTEM R-J3 Controller KAREL Reference Manual which lists the constants for each menu.

$CT_CURSCRN[4] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Current CRT Menu Descriptor

Description: Contains information for the KAREL user to determine which menu is currently being displayed on the CRT/KB. $CT_CURSCRN[1]: Used during normal operations $CT_CURSCRN[2]: Used during normal operations when $CT_QUICKMEN = TRUE $CT_CURSCRN[3]: Not used $CT_CURSCRN[4]: Not used

Power Up: N/A

See Also: TP_CURSCRN for equivalent information on the teach pendant

$CT_QUICKMEN

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: CRT/KB Quick Menu

Description: Determines whether the user interface displays the quick menu or the full menu when the MENUS key is pressed. When set to TRUE the quick menu will be displayed. When set to FALSE, the full menu is displayed. The quick menu can list up to 16 menus.

Power Up: N/A

Screen: FCTN key - QUICK/FULL MENUS, SYSTEM Variables screen

$CT_SCREEN

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: CRT screen

Description: The name of the current screen on the CRT/KB.

Power Up: N/A

$CT_USERSCRN

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: CRT/KB Screen Displayed in USER Menu

Description: Indicates the name of the screen which will be activated when the USER menu is selected. The ACT_SCREEN built-in will set this system variable. It will be reset to"c_sc" when the KAREL program, which called ACT_SCREEN, is aborted.

Power Up: N/A

See Also: ACT_SCREEN built-in in the FANU C Robotics SYSTEM R-J3 Controller KAREL Reference Manual

$CTRL_DELETE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Delete Controlled Start Program

Description: If set to 1, the controlled start program is deleted after it is used and must be reloaded at each controlled start. Otherwise, the controlled start program is left in CMOS.

Power Up: N/A

$CUSTOMMENU[1-31]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** CUSTOMMENU_T   **Memory:** Not available

Name: Custom Menus

Description: The Custom User Menu Function allows you to add additional menus in most of the MENUS categories.

Power Up: N/A

See Also: The Customizing User Menus section in the application-specific Tool Setup and Operations Manual.

$CUSTOMMENU[1].$option

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Custom Menu Option

Description: This field is currently not used, and should be left uninitialized.

Power Up: N/A

$CUSTOMMENU[1].$prog_name

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Custom Menu Program Name

Description: This is the name of the teach pendant program or KAREL Program to run. It can also be the name of a custom web page to display on the iPendant. In this case, the file should reside on FR: device and the 8.3 file name of the web page is stored in $PROG_NAME.

Power Up: N/A

See Also: The Customizing User Menus section in the application-specific Tool Setup and Operations Manual.

$CUSTOMMENU[1].$title

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Custom Menu Title

Description: This is the title of the custom menu.

Power Up: N/A

See Also: The Customizing User Menus section in the application-specific Tool Setup and Operations Manual.

$CY_CONFIG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** CY_CONFIG_T   **Memory:** Not available

Name: Cycle tracking configuration settings

Description: This variable determines the behaviors of the cycle time tracking option.

Power Up: N/A

$CY_CONFIG.$acumenable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enable accumulation of cycle time data

Description: By default, this variable is set to TRUE which means that during the execution of a teach pendant program, cycle time information is accumulated. Setting it to FALSE disables the accumulation and also disables the feature.

Power Up: N/A

$CY_CONFIG.$autoinit

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Cycle data automatic initialization

Description: When this variable is TRUE, it indicates that the system will set all accumulators to zero when the program starts running. Some applications might want to set some initial values. Typically, this should be set to TRUE.

Power Up: N/A

$CY_CONFIG.$autolog

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data
Type:** BOOLEAN   **Memory:** Not available

Name: Automatically logs the data for the current cycle to the database.

Description: When this variable is TRUE, it indicates to the system that the data should be logged. In
SpotTool+, this is set to FALSE because the spot shell system will log the data to the database after it
has added in appropriate application specific times.

Power Up: N/A

$CY_CONFIG.$binblue[1-12]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not
available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
UBYTE   **Memory:** Not available

Name: Blue color value for each displayed bin

Description: This variable along with $bin_red and $bin_green determine the color of the bar
displayed in the display menu for the corresponding category. The corresponding category is
the index. The value of the index is determined by the following system defined constants:
CYBIN_MOTION = 1; CYBIN_PROCES = 2; CYBIN_APPL = 3; CYBIN_SP1 = 4; CYBIN_SP2
= 5; CYBIN_WAIT = 6; CYBIN_DELAY = 7; CYBIN_KAREL = 8; CYBIN_LOGIC = 9;
CYBIN_HOMIO = 10; CYBIN_IDLE = 11; CYBIN_FAULT = 12;

Power Up: N/A

$CY_CONFIG.$bingreen[1-12]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Green color value for bin display

Description: The variable along with $bin_red and $bin_blue determine the color of the bar displayed in the display menu for the corresponding category. The corresponding category is the index. The value of the index is determined by the following system defined constants: CYBIN_MOTION = 1; CYBIN_PROCES = 2; CYBIN_APPL = 3; CYBIN_SP1 = 4; CYBIN_SP2 = 5; CYBIN_WAIT = 6; CYBIN_DELAY = 7; CYBIN_KAREL = 8; CYBIN_LOGIC = 9; CYBIN_HOMIO = 10; CYBIN_IDLE = 11; CYBIN_FAULT = 12;

Power Up: N/A

$CY_CONFIG.$binred[1-12]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Red color value for displayed bins

Description: The variable along with $bin_green and $bin_blue determine the color of the bar displayed in the display menu for the corresponding category. The corresponding category is the index. The value of the index is determined by the following system defined constants: CYBIN_MOTION = 1; CYBIN_PROCES = 2; CYBIN_APPL = 3; CYBIN_SP1 = 4; CYBIN_SP2 = 5; CYBIN_WAIT = 6; CYBIN_DELAY = 7; CYBIN_KAREL = 8; CYBIN_LOGIC = 9; CYBIN_HOMIO = 10; CYBIN_IDLE = 11; CYBIN_FAULT = 12;

Power Up: N/A

$CY_CONFIG.$cyclenable[1-12]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Bin enabled as part of overall cycle

Description: Designate whether a particular portion of the cycle time should be included as part of the overall cycle time. For example, by default FAULT time is NOT considered part of the overall cycle time. CYBIN_MOTION = 1; CYBIN_PROCES = 2; CYBIN_APPL = 3; CYBIN_SP1 = 4; CYBIN_SP2 = 5; CYBIN_WAIT = 6; CYBIN_DELAY = 7; CYBIN_KAREL = 8; CYBIN_LOGIC = 9; CYBIN_HOMIO = 10; CYBIN_IDLE = 11; CYBIN_FAULT = 12;

Power Up: N/A

$CY_CONFIG.$dispenable[1-12]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Enable bins as part of graphic display

Description: The bin is enabled for display to the user based on the following indexes: CYBIN_MOTION = 1; CYBIN_PROCES = 2; CYBIN_APPL = 3; CYBIN_SP1 = 4; CYBIN_SP2 = 5; CYBIN_WAIT = 6; CYBIN_DELAY = 7; CYBIN_KAREL = 8; CYBIN_LOGIC = 9; CYBIN_HOMIO = 10; CYBIN_IDLE = 11; CYBIN_FAULT = 12;

Power Up: N/A

$CY_CONFIG.$dynamic

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enable dynamic update of cycle display

Description: By default, each time a new cycle is added to the database the display will update to include that cycle. Set this variable to FALSE to disable this feature. For example, if you have a very short cycle time this might cause unacceptable display update timing.

Power Up: N/A

$CY_CONFIG.$gridcolor

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Background grid color

Description: This variable designates the default color of the background grid on the display screen. By default this is a medium grey. The format for this value is RGB Web colors. Setting this to 255 indicates a red background. Setting this to 255*256 indicates a green background.

Power Up: N/A

$CY_CONFIG.$gridlines

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Number of horizontal lines displayed in the grid

Description: This variable specifies the approximate number of horizontal lines that are presented as the background grid for the cycle time display. Setting this to zero means that no lines are displayed.

Power Up: N/A

$CY_CONFIG.$lable_dict

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Dictionary name for bin label text

Description: This variable provides the system with a dictionary name for the bin label text. A defaut set of labels is provided but as a user you can choose to name the bins according to some other dictionary. A user dictionary must be structured like the system default dictionary, as follows: $2, tpcytm_label_c "TOTAL" $- "SAMPLES" $- "MOTION" $- "PROCESS" $- "APPL" $- "SP1" $- "SP2" $- "WAIT" $- "DELAY" $- "KAREL" $- "LOGIC" $- "HOMIO" $- "IDLE" $- "FAULT" $- "\a"

Power Up: N/A

$CY_CONFIG.$lable_elem

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Element number of label dictionary

Description: This variable is the element number of the dictionary for the labels.

Power Up: N/A

$CY_CONFIG.$lablimit

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Minimum width in pixels of a label

Description: This variable tells the system when to NOT try and display a value label along with a bar. For example in hundred (100) cycle mode, the bars are about 5 pixels wide. This is not sufficient room in which to display a time-oriented label. In ten (10) cycle mode, the width is about 50 pixels wide so that the label can be displayed given the default value of 30.

Power Up: N/A

$CY_CONFIG.$lineenable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Line data enable

Description: This variable enables the collection of line by line data during execution. Since this data is saved to a database at each line, it does take some time to save the data. The line accumulation is also not enabled unless you explicitly set $CY_CONFIG.$NUMLINES AND select Clear line data from the [UPDATE] menu on the screen.

Power Up: N/A

$CY_CONFIG.$min_track

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Minimum tracking time

Description: The cycle time tracking system will NOT track any cycle time which is less than this value. This is a floating point number of seconds so 0.001 would be 1 ms.

Power Up: N/A

$CY_CONFIG.$numaverages

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Number of averages kept in the database

Description: This variable determines the size of the database for saving hourly averages. Averages are saved every hour on the hour. The number of hours in the database is a function of how many different parts you run and how many hours you actually run cycles. This variable specifies only the number of averages. NOTE: The system will round up to the nearest kbyte of data. Therefore, it might actually store more than the number specified.

Power Up: N/A

$CY_CONFIG.$numcycles

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Size of cycle by cycle data base

Description: This variable determines the size of the data base for saving cycles. NOTE: The system will round up to the nearest kbyte of data. Therefore, it might actually store more than the number specified. For example the default setting is 100 but the system might actually store 102 cycles after the rounding has occurred.

Power Up: N/A

$CY_CONFIG.$numlines

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Number of lines in the line by line database

Description: This variable determines the number of lines that are saved in the line by line area. This is not effective until you enable this feature from the Cycle status menu. You can do this by pressing [UPDATE] and selecting Clear line data.

Power Up: N/A

$CY_CONFIG.$rout_level

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Routine tracking level

Description: This variable indicates the maximum routine call depth for which indivdual programs are tracked. If this number is the default of zero, cycle time tracking will track only by task. So when the task ends the tracking data is recorded. If this number greater than zero, cycle time data will be recorded each time that the program returns from executing a TPP routine. If the number is 1 it is only tracked when returning to the main routine. Greater than one and it will be tracked to the specified routine call depth.

Power Up: N/A

$CY_CONFIG.$splitmodone

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Split motion into two times

Description: When this variable is set to FALSE, the default, that tells the system to log all the time spent on the motion TPP line as the motion time. When this variable is set to TRUE, the system will log a second time from the end of the motion until the start of the next line as application time. In Arc welding for example this would be the arc start time.

Power Up: N/A

$CY_CONFIG.$thisstyle

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Style number to use when logging

Description: This value will be used as the style number when accumulating cycle time. In most cases the style number is explicitly set by the application shell and this is not used.

Power Up: N/A

$CY_CONFIG.$time24hour

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Time display format

Description: If this variable is set to TRUE, the times are displayed in 24 hour military format such as 14:30. If this variable is set to FALSE, the default, the time is displayed as 2:30PM.

Power Up: N/A

$CY_CONFIG.$track_flags

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Tacking control flags

Description: This variable controls whether tasks with certain attributes are tracked or not. This is a bit mask. The default value indicates that invisible tasks, no busy lamp tasks and system tasks are NOT tracked. If it is set to zero all of these tasks will be tracked. Bit 1 controls no busy, bit 2 invisible and bit 3 system. The variable is considered only when a task starts.

Power Up: N/A

$CY_DATA[1-16]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** CY_DATA_T   **Memory:** Not available

Name: Current cycle data

Description: This system variable saves the cycle time accumlations for the current cycle. The index is the task number for which data is being accumulated.

Power Up: N/A

$CY_DATA[1].$accumulator[1-12]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Cycle time accumulation area

Description: This array holds the accumulated cycle time for a particular task. This is the data which is saved for display in the menu.

Power Up: N/A

$CY_DATA[1].$auxno

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Auxiliary number

Description: This variable is a number that is saved with the data and can be used to store any information that is necessary for the application.

Power Up: N/A

$CY_DATA[1].$numsamp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Number of data samples

Description: In the case of cycle by cycle data, the accumulation is one cycle by default. In the case of hourly averages, the data could be the average of many samples.

Power Up: N/A

$CY_DATA[1].$progname

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Program name

Description: This variable indicates the program name which was running when the cycle data was accumulated.

Power Up: N/A

$CY_DATA[1].$styleno

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Style number

Description: This variable indicates the style number associated with the data being accumulated. This is typically maintained by the application shell and saved with the data.

Power Up: N/A

$CY_DATA[1].$termcond

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Termination condition for the program

Description: When used, this variable holds the termination condition of the program. The system does not set this but relies on the application shell to set it.

Power Up: N/A

$CY_DATA[1].$walltime

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Wall clock cycle time

Description: This is the clock time in MSDOS format. The software converts this to a time string.

Power Up: N/A

2.4 "D" System Variables

$DAQ_GFD_USE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Data Acquisition Global File Descriptor Usage Tracker

Description: A bitmap for the 16 global file descriptors. When a particular bit is on, the GFD is being used.

Power Up: Takes effect immediately

Screen: This variable must not be changed by the user.

$DEFLOGIC[1].$func_title

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Function Key Titles

Description: The function key titles in the teach pendant editor can be user-defined. Each title can be from 0-8 characters. The default logic titles are displayed below: | [TYPE] LOGIC1 LOGIC2 LOGIC3 [EDCMD]>| F1 F2 F3 F4 F5 $DEFLOGIC[1].$FUNC_TITLE is displayed on F2. $DEFLOGIC[2].$FUNC_TITLE is displayed on F3. $DEFLOGIC[3].$FUNC_TITLE is displayed on F4. The default value of each of these variables is *uninit*. Therefore, if you do not set these variables, the key will not work.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen, SYSTEM config screen.

See Also: $DEFLOGIC.$total_num

$DEFLOGIC[1].$total_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Total Number of Default Logic Statements

Description: The maximum number of default logic statements per one function key. This variable can be set from 0 to 4. You can define up to a maximum of this many statements for every function key. If this value is set to 0, the default logic function is disabled. The default value is 0.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen, SYSTEM config screen.

See Also: $DEFLOGIC.$func_title

$DEFLOGIC[3] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Default Logic Setup

Description: This feature is only available if the option is installed. This is not a standard option. Individual fields within this structure are described below.

Power Up: N/A

$DEFPROG_ENB

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Default program enable/disable.

Description: When this variable is set TRUE, the variable $TP_DEFPROG is cleared every cold start.

Power Up: Takes effect immediately

$DEFPULSE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Default Pulse Length

Description: Specifies the length of a PULSE if it is not specified by the user.

Power Up: N/A

$DEVICE

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: System default device

Description: This read-only system variable defines the system default device. This can be set to P3: (floppy disk) or RD: (ram disk). Any time a file operation is performed, the file must be fully qualified, meaning it must have a device, path, and filename. If you do not specify the device during the file operation, then $DEVICE is used by the system.

Power Up: N/A

See Also: $DEV_PATH, $DEV_INDEX

$DHCP_INT.$STATNUM

Minimum: 0   **Maximum:** 0xffffffff   **Default:** 0   **KCL/Data:** RO   **Program:** Not available **UIF:** RO   **CRTL:** RO   **Data Type:** ULONG   **Memory:** CMOS

Name: Status code of DHCP operation

Description: This field is the status of DHCP operation. It is meant to be used internally by the system.

Power Up: On_Cold_Start

$DICT_CONFIG.$lang_suffix

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Current Language Suffix

Description: This variable identifies the current language suffix as follows:

- English: "eg"
- Japanese: "jp"
- Kanji: "kn"
- French: "fr"
- German: "gr"
- Spanish: "sp"
- Chinese: "ch"
- Taiwanese: "tw"
- Other: "ot"

Power Up: N/A

$DMAURST

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: DEADMAN SWITCH automatic reset function

Description: When this system variable is 1 and the teach pendant is enabled, you only need to grip the DEADMAN switch, to automatically reset any faults. You do not need to push the RESET key. The default value is 0.

Power Up: Takes effect immediately

$DMONBUF[1-10]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** DMON_BUF_T   **Memory:** Not available

Name: Data Monitor Buffer for Karel Variable Output

Description: $DMONBUF is a structure containing fields which define the names of Karel variables to which Data Monitor will send data. See individual fields.

Power Up: N/A

$DMONITEM[1-20]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** DMON_ITEM_T   **Memory:** Not available

Name: Data Monitor Item Array

Description: $DMONITEM is an array of structures. Each structure defines a particular data item to be monitored. The fields within the structure are set from the Data Monitor item SETUP menus.

Power Up: N/A

$DMONSCH[1-5]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** DMON_SCH_T   **Memory:** Not available

Name: Data Monitor Schedule Array

Description: $DMONSCH is an array of structures. Each structure defines a Data Monitor schedule. Fields within the structure are set from the Data Monitor schedule SETUP menus.

Power Up: N/A

$DMONSCH[1].$item[1-10]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Item Number

Description: $ITEM is an array which specifies the item numbers to be monitored during the execution of this particular Data Monitor schedule.

Power Up: N/A

$DMONSCH[1].$nominal[1-10]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Nominal Value

Description: $NOMINAL specifies a nominal value for the monitored data item. The $WARN and $PAUS values are considered deltas from this nominal.

Power Up: N/A

$DMONSCH[1].$paus[1-10]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Pause Value

Description: $PAUS specifies a maximum delta from $NOMINAL prior to a pause error.

Power Up: N/A

$DMONSCH[1].$time[1-10]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Limit Time

Description: $TIME specifies the time duration in which a monitored item must exceed its limit before a warn or pause error is reported.

Power Up: N/A

$DMONSCH[1].$warn[1-10]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Warning Value

Description: $WARN specifies a maximum delta from $NOMINAL prior to a warning error.

Power Up: N/A

$DMR_GRP STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Dynamic Mastering Record

Description: Contains all the information related to mastering and overtravel. Individual fields within this structure are described below.

Power Up: N/A

Screen: SYSTEM Master/Cal screen

$DMR_GRP[1].$adapt_col_m[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Adaptive Corioli Minus

Description: Data for adaptive control.

Power Up: N/A

$DMR_GRP[1].$adapt_col_m[9]

Minimum: -32768   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Adaptive Corioli Minus

Description: Data for adaptive control.

Power Up: N/A

$DMR_GRP[1].$adapt_col_p[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Adaptive Corioli Plus

Description: Data for adaptive control.

Power Up: N/A

$DMR_GRP[1].$adapt_col_p[9]

Minimum: -32768   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Adaptive Corioli Plus

Description: Data for adaptive control.

Power Up: N/A

$DMR_GRP[1].$adapt_fric[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Adaptive Friction

Description: Data for adaptive control.

Power Up: N/A

$DMR_GRP[1].$adapt_fric[9]

Minimum: -32768   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Adaptive Friction

Description: Data for adaptive control.

Power Up: N/A

$DMR_GRP[1].$adapt_gravity[9]

Minimum: -32768   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Adaptive gravity

Description: Data for adaptive control.

Power Up: N/A

$DMR_GRP[1].$adapt_iner[9]

Minimum: -32768   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Adaptive Inertia

Description: Data for adaptive control.

Power Up: N/A

$DMR_GRP[1].$bcklsh_sign[9]

Minimum: 0   **Maximum:** 1   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Backlash Compensation Direction

Description: To determine the sign for the new backlash compensation, the previous backlash compensation sign is required. $bcklsh_sign was recorded as the sign of previous compensation. FALSE means plus and TRUE means minus. The backlash compensation amount is stored in the system variable $bcklash_count.

Power Up: N/A

$DMR_GRP[1].$dsp_st_hist[9]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Servo (Digital Signal Processor) Status History

Description: Servo status bits set by the servo software.

Power Up: N/A

$DMR_GRP[1].$eachmst_don[9]

Minimum: 0   **Maximum:** 2   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Individual Axis Mastering Done

Description: A flag indicated each axis master stage. If master has been done on this axis, this flag should be 2.

Power Up: N/A

$DMR_GRP[1].$master_coun[9]

Minimum: INTEGER_MIN   **Maximum:** INTEGER_MAX   **Default:** 0   **KCL/Data:** RW
Program: RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Mastering Count

Description: Displays the mastering count data of the axis of each joint. The system sets it automatically when mastering is performed.

Power Up: N/A

$DMR_GRP[1].$master_done

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Mastering Done

Description: Indicates whether or not the mastering procedure has been performed. If it is set to TRUE, mastering has been done. The system changes this variable automatically when mastering has been performed.

Power Up: N/A

$DMR_GRP[1].$mch_pls_his[9]

Minimum: INTEGER_MIN   **Maximum:** INTEGER_MAX   **Default:** 0   **KCL/Data:** RW
Program: RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Machine Pulse History

Description: This system variable is set to $machine_pls when the pulse mismatch alarm occurs and keeps it after the alarm is reset, so that it can be examined later.

Power Up: N/A

$DMR_GRP[1].$ot_minus[9]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Overtravel Minus

Description: $OT_MINUS is an array with each element representing the overtravel condition for the respective axis. If an element is set TRUE, the corresponding axis has a minus overtravel condition and can be jogged only in the positive direction. When an overtravel does not exist, all of the array elements are reset to FALSE. The appropriate array elements in $OT_MINUS are automatically set to TRUE when an overtravel occurs in the minus direction, and automatically set back to FALSE when the condition is corrected. This variable is saved to the SYSMAST.SV system file automatically every time its value is changed and is automatically loaded into the system at power up. This information is displayed if the axis of each joint is in the state of overtravel of negative direction. When the joint axis enters the state of overtravel of negative direction, the system will change this variable automatically.

Power Up: N/A

Screen: MANUAL OT Release

$DMR_GRP[1].$ot_plus[9]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Overtravel Plus

Description: $OT_PLUS is an array with each element representing the overtravel condition for the respective axis. If an element is set TRUE, the corresponding axis has a plus overtravel condition and can be jogged only in the negative direction. When an overtravel does not exist, all of the array elements are FALSE. The appropriate array elements in $OT_PLUS are automatically set to TRUE when an overtravel occurs in the plus direction, and automatically set back to FALSE when the condition is corrected. This variable is saved to the SYSMAST.SV system file automatically every time its value is changed and is automatically loaded into the system at power up. This information is displayed if the axis of each joint is in the state of overtravel of positive direction. When the joint axis enters the state of overtravel of positive direction, the system will change automatically.

Power Up: N/A

Screen: MANUAL OT Release

$DMR_GRP[1].$ref_count[9]

Minimum: INTEGER_MIN   **Maximum:** INTEGER_MAX   **Default:** 0   **KCL/Data:** RW
Program: RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:**
Not available

Name: Reference Count

Description: The encoder pulses at the reference position.

Power Up: N/A

Screen: SYSTEM Master/Cal

$DMR_GRP[1].$ref_done

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
BOOLEAN   **Memory:** Not available

Name: Reference Position Set

Description: Set by the system when the reference position and reference count have been set. It
is used for quick mastering.

Power Up: N/A

Screen: SYSTEM Master/Cal

$DMR_GRP[1].$ref_pos[9]

Minimum: -100000.0   **Maximum:** 100000.0   **Default:** 0.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Reference Position

Description: Indicates the reference position, in joint angles, for use with quick mastering feature.
When mastering is lost due to battery backup problems with the system, and not due to motor
replacement, the quick mastering feature can be used by moving the robot to be very close to the
reference position using witness marks or other means. The mastering data can be recovered if the
motors are within 1/2 revolution of the reference position.

Power Up: N/A

Screen: SYSTEM Master/Cal

$DMR_GRP[1].$shift_error

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Dynamic Mastering Shift History

Description: Shift_error holds the counts left over from moving the mastering position in dynamic mastering for continuous turn.

Power Up: N/A

$DMR_GRP[1].$spc_cnt_his[9]

Minimum: INTEGER_MIN   **Maximum:** INTEGER_MAX   **Default:** 0   **KCL/Data:** RW **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Serial Pulse Coder Count History

Description: This system variable is set to $spc_count when the pulse mismatch alarm occurs and keeps it after the alarm is reset, so that it can be examined later.

Power Up: N/A

$DMR_GRP[1].$spc_count[9]

Minimum: INTEGER_MIN   **Maximum:** INTEGER_MAX   **Default:** 0   **KCL/Data:** RW **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Serial Pulse Coder Count

Description: This system variable adds another protection for unexpected pulse coder reset. If the machine pulse at power down and power up are different, an alarm occurs. In order to implement this feature, the following new system variables are required. $DMR_GRP.$spc_count[]: FLTR task stores machine pulses every ITP to compare with at the next power up.

Power Up: N/A

$DMR_GRP[1].$spc_move[9]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Serial Pulse Coder Move

Description: This system variable adds another protection for unexpected pulse coder reset. If the machine pulse at power down and power up are different, an alarm occurs. In order to implement this feature, the following new system variables are required. $DMR_GRP.$spc_move[]: FLTR task stores motion status (if motion is in progress or not) every ITP to determine the tolerance at the next power up.

Power Up: N/A

$DMR_GRP[1].$spc_st_hist[9]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Serial Pulse Coder Status History

Description: SPC (serial pulse coder) status history.

Power Up: Set by the system.

$DN_BD_INF2[1].$dn_bd_autrs

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Daughter Board Autorestart

Description: For future use.

Power Up: N/A

$DN_BD_INF2[1].$dn_bd_ipres

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Daughter Board Default Input Resume State

Description: For future use.

Power Up: N/A

$DN_BD_INF2[1].$dn_bd_mb_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Daughter-Board: Motherboard ID

Description: Indicates the type of motherboard to which DeviceNet daughter-board is connected. For internal use only.

Power Up: N/A

Screen: System variables screen.

$DN_BD_INF2[1].$dn_bd_sctyp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Daughter Board Scanner Type

Description: Indicates the type of scanner for the indicated daughter board.

Power Up: N/A

Screen: System variables screen. Scanner type is displayed on Board Detail Screen.

$DN_BD_INF2[4]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** DN_BD_INF2_T   **Memory:** Not available

Name: DeviceNet Board Information Variables - Additional Information

Description: Contains variables which hold information on the operation of each DeviceNet daughter-board and the network associated with each daughter-board. Individual fields are described below. User viewable and configurable fields are viewed and edited on the DeviceNet Board List and Board List Detail screens.

Power Up: On_Cold_Start

Screen: System variables screen.

$DN_BD_INF3[1].$dn_bd_slvst

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: This Indicates the status of the slave connection of the board

Description: The value is set if the board slave mode is enabled.

Power Up: N/A

Screen: Board Detail Screen

$DN_BD_INFO[1-4] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Device Net Board Information Variables

Description: Contains variables which hold information on the operation of each DeviceNet daughter-board and the network associated with each daughter-board. Individual fields are described below. User viewable and configurable fields are viewed and edited on the DeviceNet Board List and Board List Detail screens.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_baud

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Daughter-Board Baud Rate

Description: The speed of the network connected to the DeviceNet daughter-board. 0: 125 KB 1: 250 KB 2: 500 KB

Power Up: On_Cold_Start

Screen: DeviceNet Board Detail screen

$DN_BD_INFO[1].$dn_bd_bfree

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Daughter-Board Free Byte Count

Description: The number of bytes free in the shared RAM buffer.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_bfrus

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Daughter-Board Available Shared RAM Offset

Description: The offset in shared RAM of the next available byte in the pool area. Internal use only.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_canec

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet CAN Frame Error Count

Description: A count of the frame errors on the CAN connected to the DeviceNet daughter-board.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_canlm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet CAN Lost Message Count

Description: A count of the lost messages on the CAN connected to the DeviceNet daughter-board.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_canna

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet CAN Acknowledge Failure Count

Description: A count of the failures to receive acknowledge from the CAN connected to the DeviceNet daughter-board.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_canov

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT
Memory: Not available

Name: DeviceNet CAN Request Over-Run Count

Description: A count of the request over-runs (unprocessed messages) on the CAN connected to the DeviceNet daughter-board.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_canrc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT
Memory: Not available

Name: DeviceNet CAN Receive Count

Description: A count of the acknowledged receives from the CAN connected to the DeviceNet daughter-board.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_cantc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT
Memory: Not available

Name: DeviceNet CAN Transmission Count

Description: A count of the transmissions on the CAN (Controller Area Network) connected to the DeviceNet daughter-board.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_cflag

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Daughter-Board Connection Flags

Description: Determines the type of server (slave) I/O connections allowable in accessing the DeviceNet daughter-board from the DeviceNet network. The following are OR'ed together to determine a field value: 1: explicit messages (currently not supported) 2: POLL access 4: STROBE access

Power Up: On_Cold_Start

$DN_BD_INFO[1].$dn_bd_cmt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: DeviceNet Daughter-Board Comment

Description: Provides a short description field for the daughter-board/network.

Power Up: Takes effect immediately

Screen: DeviceNet Board List screen

$DN_BD_INFO[1].$dn_bd_emrqb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Daughter-Board Explicit Message Buffer Size

Description: The size (in bytes) of the buffer for explicit messages. Currently not used.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_emrqo

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Daughter-Board Explicit Message Buffer Offset

Description: The offset of the buffer for explicit messages. Currently not used.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_emrqs

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Daughter-Board Explicit Message Request Status

Description: The status of an explicit message request made by the DeviceNet daughter-board. Currently not used.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_emrsb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Daughter-Board Explicit Response Buffer Size

Description: The size (in bytes) of the buffer for explicit responses. Currently not used.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_emrso

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Daughter-Board Explicit Response Buffer Offset

Description: The offset of the buffer for explicit responses. Currently not used.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_emrss

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Daughter-Board Explicit Message Response Status

Description: The status of an explicit message response made by the DeviceNet daughter-board. Currently not used.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_error

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: DeviceNet Daughter-Board Error Buffer

Description: Contains error messages returned by the DeviceNet daughter-board.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_intvl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Daughter-Board Periodic Transmission Interval

Description: The interval for periodic transmission of slave data to the remote master. Currently unused.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_macid

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Daughter-Board MAC-Id

Description: The Media Access Control Identifier (MAC-Id) for the DeviceNet daughter-board. Must be in the range [0..63]. There cannot be a duplicate MAC-Id between the daughter-board and any devices connected to the daughter-board.

Power Up: On_Cold_Start

Screen: DeviceNet Board Detail screen

$DN_BD_INFO[1].$dn_bd_slver

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: This Indicates the error severity of the slave if error is posted

Description:

Power Up: N/A

Screen: Board Detail Screen

$DN_BD_INFO[1].$dn_bd_slvib

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Daughter-Board Slave Input Buffer Size

Description: The number of bytes provided as a buffer for slave input data (from the controller to the remote host).

Power Up: On_Cold_Start

Screen: DeviceNet Board Detail screen

$DN_BD_INFO[1].$dn_bd_slvio

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Daughter-Board Slave Input Offset

Description: The offset in shared RAM of the slave input area.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_slvob

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Daughter-Board Slave Output Buffer Size

Description: The number of bytes provided as a buffer for slave output data (to the controller from the remote host).

Power Up: On_Cold_Start

Screen: DeviceNet Board Detail screen

$DN_BD_INFO[1].$dn_bd_slvoo

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Daughter-Board Slave Output Offset

Description: The offset in shared RAM of the slave output area.

Power Up: N/A

$DN_BD_INFO[1].$dn_bd_slvst

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: This Indicates the status of the slave connection of the board

Description: The value is set if the board slave mode is enabled.

Power Up: N/A

Screen: Board Detail Screen

$DN_BD_INFO[1].$dn_bd_stat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Daughter-Board Status

Description: Indicates the status of the DeviceNet daughter-board: 0: board is offline and has not been initialized 1: board is offline and cannot be initialized 2: board is offline but has been initialized 3: board is in an error state and has not been initialized 4: board is in an error state and cannot be initialized 5: board is in an error state but has been initialized 6: board is online 7: board is currently being initialized 99: no DeviceNet variables have been initialized

Power Up: N/A

$DN_DEV_DEFS[1-40] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: DeviceNet Device Definition List

Description: List of device definitions for user-defined devices. Each record contains configuration and operational information; individual fields are described below. Viewable and editable fields are displayed on the DeviceNet Device Definition and Device Definition Detail screens.

Power Up: N/A

$DN_DEV_DEFS[1].$dn_dd_class

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: DeviceNet Device Definition Class

Description: The device class for a DeviceNet device with this definition. 0: digital device 1: analog device 2: multi-module device (not available for user-defined devices) 3: special - devices which require special handling NEW: 0: fixed-I/O 1: multi-module

Power Up: N/A

Screen: DeviceNet Device Definition Detail screen

$DN_DEV_DEFS[1].$dn_dd_cmt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: DeviceNet Device Definition Comment

Description: A comment associated with the device definition.

Power Up: Takes effect immediately

Screen: DeviceNet Device Definition Detail screen, Device Definition screen

$DN_DEV_DEFS[1].$dn_dd_dvtyp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Definition Type

Description: The device type code of the DeviceNet device definition.

Power Up: Takes effect immediately

Screen: DeviceNet Device Definition Detail screen

$DN_DEV_DEFS[1].$dn_dd_inp1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Definition Input Parameter 1

Description: An input parameter associated with the device definition. Usage to be determined.

Power Up: Changes take effect immediately.

Screen: DeviceNet Device Definition Detail screen

$DN_DEV_DEFS[1].$dn_dd_inp2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Definition Input Parameter 2

Description: An input parameter associated with the device definition. Usage to be determined.

Power Up: Changes take effect immediately.

Screen: DeviceNet Device Definition Detail screen

$DN_DEV_DEFS[1].$dn_dd_inp3

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Definition Input Parameter 3

Description: An input parameter associated with the device definition. Usage to be determined.

Power Up: Changes take effect immediately.

Screen: DeviceNet Device Definition Detail screen

$DN_DEV_DEFS[1].$dn_dd_inp4

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Definition Input Parameter 4

Description: An input parameter associated with the device definition. Usage to be determined.

Power Up: Changes take effect immediately.

Screen: DeviceNet Device Definition Detail screen

$DN_DEV_DEFS[1].$dn_dd_mode

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: DeviceNet Device Definition Access Mode

Description: The mode by which a DeviceNet device with this definition accesses I/O. 0: no I/O access - for devices with no inputs or outputs 1: polled access - for devices with outputs (with or without inputs) 2: strobed access - used for devices with inputs only

Power Up: N/A

Screen: DeviceNet Device Definition Detail screen

$DN_DEV_DEFS[1].$dn_dd_msgsz

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Definition Message Size

Description: The size of the explicit message buffer on a device with this device definition. Currently not in use.

Power Up: Changes take effect immediately.

Screen: DeviceNet Device Definition Detail screen

$DN_DEV_DEFS[1].$dn_dd_n_inp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Definition: Number of Inputs

Description: The number of inputs on a DeviceNet device with this definition.

Power Up: Takes effect immediately

Screen: DeviceNet Device Definition Detail screen

$DN_DEV_DEFS[1].$dn_dd_n_out

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Definition: Number of Outputs

Description: The number of outputs on a DeviceNet device with this definition.

Power Up: Takes effect immediately

Screen: DeviceNet Device Definition Detail screen

$DN_DEV_DEFS[1].$dn_dd_name

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: DeviceNet Device Definition Name

Description: The name given to the device definition. This name is used when adding a device on the DeviceNet Device List screen and selecting a device type.

Power Up: Changes take effect immediately.

Screen: DeviceNet Device Definition Detail screen, Device Definition screen, Device List screen

$DN_DEV_DEFS[1].$dn_dd_outp1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Definition Output Parameter 1

Description: An output parameter associated with the device definition. Usage to be determined.

Power Up: Takes effect immediately

Screen: DeviceNet Device Definition Detail screen

$DN_DEV_DEFS[1].$dn_dd_outp2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Definition Output Parameter 2

Description: An output parameter associated with the device definition. Usage to be determined.

Power Up: Takes effect immediately

Screen: DeviceNet Device Definition Detail screen

$DN_DEV_DEFS[1].$dn_dd_outp3

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Definition Output Parameter 3

Description: An output parameter associated with the device definition. Usage to be determined.

Power Up: Changes take effect immediately.

Screen: DeviceNet Device Definition Detail screen

$DN_DEV_DEFS[1].$dn_dd_outp4

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Definition Output Parameter 4

Description: An output parameter associated with the device definition. Usage to be determined.

Power Up: Changes take effect immediately.

Screen: DeviceNet Device Definition Detail screen

$DN_DEV_DEFS[1].$dn_dd_pdt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Definition PDT

Description: The PDT (permanent device type) associated with the device definition. User-defined devices have PDT's greater than zero; installation-defined devices have PDT's less than zero.

Power Up: N/A

$DN_DEV_DEFS[1].$dn_dd_prcod

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Definition Product Code

Description: The product code of the DeviceNet device definition.

Power Up: Changes take effect immediately.

Screen: DeviceNet Device Definition Detail screen

$DN_DEV_DEFS[1].$dn_dd_stat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: DeviceNet Device Definition Status

Description: The current status of the device definition. 0: This entry in the device definition list is unused. 1: This device definition is invalid; the product code, vendor ID, device type, and name fields must contain valid values. 2: This device definition is valid.

Power Up: N/A

Screen: DeviceNet Device Definition Detail screen

$DN_DEV_DEFS[1].$dn_dd_vndid

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Definition Vendor ID

Description: The vendor ID for the DeviceNet device definition.

Power Up: Changes take effect immediately.

Screen: DeviceNet Device Definition Detail screen

$DN_DEV_LIS2[1]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** DN_DV_DAT2_T   **Memory:** Not available

Name: DeviceNet Device List - Additional Information

Description: Additional information for each DeviceNet device.

Power Up: On_Cold_Start

Screen: System Variables screen.

$DN_DEV_LIS2[1].$dn_dv_autrc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Autoreconnect Flag

Description: If set to 1 or TRUE, communication with this device is automatically restarted following the clearing of the device error condition. If set to 0 or FALSE, user must manually bring device online.

Power Up: Changes take effect immediately.

Screen: DeviceNet Device List screen

$DN_DEV_LIS2[1].$dn_dv_scnrt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Scan Rate

Description: For polled I/O, determines how often a device is updated (in milliseconds). For cyclic I/O, determines how often the device sends I/O to the controller.

Power Up: Changes take effect immediately.

Screen: DeviceNet Device List screen

$DN_DEV_LIST[1-80] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: DeviceNet Device List

Description: The list of all DeviceNet devices connected to all daughter-boards. This list is indexed by $DN_DEV_INDX. Each record contains information pertaining to the operation and configuration of the associated device. The fields are individually described below. User-viewable and editable fields are accessed on the DeviceNet Device List screen.

Power Up: N/A

$DN_DEV_LIST[1].$dn_dv_anlgf

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Analog-First Buffer Allocation Flag

Description: This flag indicates whether the data mapping for this device is organized with all analog data (inputs and outputs) preceding all digital data (if TRUE). This variable is used for internal purposes only.

Power Up: N/A

$DN_DEV_LIST[1].$dn_dv_bdidx

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: DeviceNet Device Board Index

Description: The number of the DeviceNet daughter-board to which the device is connected.

Power Up: N/A

Screen: DeviceNet Device List screen

$DN_DEV_LIST[1].$dn_dv_cmt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: DeviceNet Device Comment

Description: A comment associated with a particular DeviceNet Device. It may be used to indicate the use of the device, etc.

Power Up: Changes take effect immediately.

Screen: DeviceNet Device List screen

$DN_DEV_LIST[1].$dn_dv_dvtyp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Type

Description: The device type of the DeviceNet device. Because the MPC860 does not have access to the device definitions, this information is stored in the device system variable structure and transferred to the MPC860 by the PPC603e at startup.

Power Up: N/A

Screen: Device Definition Detail screen or Standard Definition Detail screen.

$DN_DEV_LIST[1].$dn_dv_fstmd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device First-Module Index

Description: Index of the first module connected to the DeviceNet device. Used only for multi-module devices. A value of 255 indicates that no module list exists for this device.

Power Up: N/A

$DN_DEV_LIST[1].$dn_dv_inpfs

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT
Memory: Not available

Name: DeviceNet Device Inputs-First Buffer Allocation Flag

Description: This flag indicates whether the data mapping for this device is organized with all input data (analog or digital) preceding all output data (if TRUE) or if data is organized by data type (either analog first or digital first). This variable is used for internal purposes only.

Power Up: N/A

$DN_DEV_LIST[1].$dn_dv_macid

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE
Memory: Not available

Name: DeviceNet Device MAC-Id

Description: The MAC-Id (Media Access Control Identifier) of the DeviceNet device. It may not be a duplicate of the MAC-Id for any other device connected to the same daughter-board or of the MAC-Id of the daughter-board itself. The MAC-Id is set when a device is first added to a daughter-board's device list.

Power Up: N/A

Screen: DeviceNet Device List screen

$DN_DEV_LIST[1].$dn_dv_mode

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE
Memory: Not available

Name: DeviceNet Device Access Mode

Description: The access mode of the DeviceNet device. Because the MPC860 does not have access to the device definitions, this information is stored in the device system variable structure and transferred to the MPC860 by the PPC603e at startup.

Power Up: N/A

Screen: Device Definition Detail screen or Standard Definition Detail screen.

$DN_DEV_LIST[1].$dn_dv_nain

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Device Analog Inputs Count (Maximum)

Description: The number of analog inputs present on the DeviceNet device. Used internally to configure communications to multi-module devices on the MPC860.

Power Up: N/A

Screen: Device Definition Detail screen or Standard Definition Detail screen.

$DN_DEV_LIST[1].$dn_dv_naout

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Device Analog Outputs Count (Maximum)

Description: The number of analog outputs present on the DeviceNet device. Used internally to configure communications to multi-module devices on the MPC860.

Power Up: N/A

Screen: Device Definition Detail screen or Standard Definition Detail screen.

$DN_DEV_LIST[1].$dn_dv_ndin

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Device Digital Inputs Count (Maximum)

Description: The number of digital inputs present on the DeviceNet device. Used internally to configure communications to multi-module devices on the MPC860.

Power Up: N/A

Screen: Device Definition Detail screen or Standard Definition Detail screen.

$DN_DEV_LIST[1].$dn_dv_ndout

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Device Digital Outputs Count (Maximum)

Description: The number of digital outputs present on the DeviceNet device. Used internally to configure communications to multi-module devices on the MPC860.

Power Up: N/A

Screen: Device Definition Detail screen or Standard Definition Detail screen.

$DN_DEV_LIST[1].$dn_dv_pdt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Device Type

Description: A numeric identifier of the DeviceNet device type. Values less than zero indicate an installation-defined device; values greater than zero indicate a user-defined device.

Power Up: N/A

$DN_DEV_LIST[1].$dn_dv_prdcd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Device Product Code

Description: The product code of the DeviceNet device. Because the MPC860 does not have access to the device definitions, this information is stored in the device system variable structure and transferred to the MPC860 by the PPC603e at startup.

Power Up: N/A

Screen: Device Definition Detail screen or Standard Definition Detail screen.

$DN_DEV_LIST[1].$dn_dv_stat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: DeviceNet Device Status

Description: The status of the DeviceNet device. 0: device is offline 1: device is in an error state 2: device is online

Power Up: N/A

Screen: DeviceNet Device List screen

$DN_DEV_LIST[1].$dn_dv_vndid

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Vendor ID

Description: The vendor ID of the DeviceNet device. Because the MPC860 does not have access to the device definitions, this information is stored in the device system variable structure and transferred to the MPC860 by the PPC603e at startup.

Power Up: N/A

Screen: Device Definition Detail screen or Standard Definition Detail screen.

$DN_DEV_LIST[1].$dn_inp_ofst

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Device Input Buffer Offset

Description: The offset in shared RAM of the first byte of the DeviceNet device's input data buffer.

Power Up: N/A

$DN_DEV_LIST[1].$dn_inp_size

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Device Input Buffer Size

Description: The size in bytes of the input buffer of the DeviceNet device.

Power Up: N/A

$DN_DEV_LIST[1].$dn_msg_ofst

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Message Buffer Offset

Description: The offset in shared RAM of the first byte of the DeviceNet device's message buffer. Currently not used.

Power Up: N/A

$DN_DEV_LIST[1].$dn_msg_size

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Device Message Buffer Size

Description: The size in bytes of the message buffer of the DeviceNet device. Currently not used.

Power Up: N/A

$DN_DEV_LIST[1].$dn_out_ofst

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Device Output Buffer Offset

Description: The offset in shared RAM of the first byte of the DeviceNet device's output data buffer.

Power Up: N/A

$DN_DEV_LIST[1].$dn_out_size

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Device Output Buffer Size

Description: The size in bytes of the output buffer of the DeviceNet device.

Power Up: N/A

$DN_DEV_LIST[1].$dn_stat_p

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG **Memory:** Not available

Name: DeviceNet Device Status Area Address

Description: The address of the area in shared RAM containing the status of the DeviceNet device.

Power Up: N/A

$DN_DUMM_MOD[1].$dn_md_class

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: DeviceNet Module I/O Class

Description: The type of I/O supported by the DeviceNet module. 0: digital I/O 1: analog I/O

Power Up: N/A

$DN_DUMM_MOD[1].$dn_md_dvpdt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Module Compatible Device PDT

Description: The PDT (Permanent Device Type) a DeviceNet device must have in order for the module to be able to be connected to it. A value of zero indicates the module can be connected to all multi-module devices.

Power Up: N/A

$DN_DUMM_MOD[1].$dn_md_name

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING **Memory:** Not available

Name: DeviceNet Module Name

Description: The name given to the DeviceNet module type.

Power Up: N/A

$DN_DUMM_MOD[1].$dn_md_ninp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Module: Number of Inputs

Description: The number of input ports existing on the DeviceNet module.

Power Up: N/A

$DN_DUMM_MOD[1].$dn_md_nout

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Module: Number of Outputs

Description: The number of output ports existing on the DeviceNet module.

Power Up: N/A

$DN_DUMM_MOD[1].$dn_md_p1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Module Parameter 1

Description: Module/device detail parameters; usage to be determined.

Power Up: N/A

$DN_DUMM_MOD[1].$dn_md_p2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Module Parameter 2

Description: See above.

Power Up: N/A

$DN_DUMM_MOD[1].$dn_md_p3

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Module Parameter 3

Description: See above.

Power Up: N/A

$DN_DUMM_MOD[1].$dn_md_p4

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Module Parameter 4

Description: See above.

Power Up: N/A

$DN_DUMM_MOD[1].$dn_md_pmt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT
Memory: Not available

Name: DeviceNet Permanent Module Type

Description: The permanent module type (PMT) designator given to the DeviceNet module.

Power Up: N/A

$DN_DVDEF_IO[1].$dn_dd_algfs

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT
Memory: Not available

Name: DeviceNet Device Definition: Analog I/O First Flag

Description: This flag, if set to 1 or TRUE, indicates that analog I/O is allocated first for this device definition if it supports both digital and analog I/O. I/O allocation: $DN_DD_ALGFS=0, $DN_DD_INPFS=0: DINs, DOUTs, AINs, AOUTs $DN_DD_ALGFS=0, $DN_DD_INPFS=1: DINs, AINs, DOUTs, AOUTs $DN_DD_ALGFS=1, $DN_DD_INPFS=0: AINs, AOUTs, DINs, DOUTs $DN_DD_ALGFS=1, $DN_DD_INPFS=1: AINs, DINs, AOUTs, DOUTs

Power Up: Changes take effect immediately. I/O is assigned at power-up.

Screen: DeviceNet Device Definition Detail screen

$DN_DVDEF_IO[1].$dn_dd_cosai

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT
Memory: Not available

Name: DeviceNet Change-Of-State I/O Analog Input Size

Description: The number of change-of-state analog input ports for this device definition.

Power Up: Changes take effect immediately. I/O is assigned at power-up.

Screen: DeviceNet Device Definition Detail screen

$DN_DVDEF_IO[1].$dn_dd_cosao

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Change-Of-State I/O Analog Output Size

Description: The number of change-of-state analog output ports for this device definition.

Power Up: Changes take effect immediately. I/O is assigned at power-up.

Screen: DeviceNet Device Definition Detail screen

$DN_DVDEF_IO[1].$dn_dd_cosdi

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Change-Of-State I/O Digital Input Size

Description: The number of Change-Of-State digital input ports for this device definition.

Power Up: Changes take effect immediately. I/O is assigned at power-up.

Screen: DeviceNet Device Definition Detail screen

$DN_DVDEF_IO[1].$dn_dd_cosdo

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Change-Of-State I/O Digital Output Size

Description: The number of change-of-state digital output ports for this device definition.

Power Up: Changes take effect immediately. I/O is assigned at power-up.

Screen: DeviceNet Device Definition Detail screen

$DN_DVDEF_IO[1].$dn_dd_cycai

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Cyclic I/O Analog Input Size

Description: The number of cyclic analog input ports for this device definition.

Power Up: Changes take effect immediately. I/O is assigned at power-up.

Screen: DeviceNet Device Definition Detail screen

$DN_DVDEF_IO[1].$dn_dd_cycao

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Cyclic I/O Analog Output Size

Description: The number of cyclic analog output ports for this device definition.

Power Up: Changes take effect immediately. I/O is assigned at power-up.

Screen: DeviceNet Device Definition Detail screen

$DN_DVDEF_IO[1].$dn_dd_cycdi

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Cyclic I/O Digital Input Size

Description: The number of cyclic digital input ports for this device definition.

Power Up: Changes take effect immediately. I/O is assigned at power-up.

Screen: DeviceNet Device Definition Detail screen

$DN_DVDEF_IO[1].$dn_dd_cycdo

Minimum: Not available　　**Maximum:** Not available　　**Default:** Not available　　**KCL/Data:** Not available　　**Program:** RO　　**UIF:** Not available　　**CRTL:** Not available　　**Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Cyclic I/O Digital Output Size

Description: The number of cyclic digital output ports for this device definition.

Power Up: Changes take effect immediately. I/O is assigned at power-up.

Screen: DeviceNet Device Definition Detail screen

$DN_DVDEF_IO[1].$dn_dd_defmd

Minimum: Not available　　**Maximum:** Not available　　**Default:** Not available　　**KCL/Data:** Not available　　**Program:** RO　　**UIF:** Not available　　**CRTL:** Not available　　**Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Device Definition Default I/O Mode

Description: The default I/O mode to be used for this device definition. The mode is decoded by adding together one or more of the following: 0: No I/O supported 1: Explicit messaging 2: Polled I/O 4: Strobed I/O 16: Change-Of-State I/O 32: Cyclic I/O 64: Acknowledgement-suppressed

Power Up: Changes take effect immediately.

Screen: DeviceNet Device Definition Detail screen

$DN_DVDEF_IO[1].$dn_dd_maxai

Minimum: Not available　　**Maximum:** Not available　　**Default:** Not available　　**KCL/Data:** Not available　　**Program:** RO　　**UIF:** Not available　　**CRTL:** Not available　　**Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Maximum Analog Input Size

Description: The maximum number of analog input ports for this device definition.

Power Up: The user cannot change this value.

Screen: System variables screen.

$DN_DVDEF_IO[1].$dn_dd_maxao

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Maximum Analog Output Size

Description: The maximum number of analog output ports for this device definition.

Power Up: The user cannot change this value.

Screen: System variables screen.

$DN_DVDEF_IO[1].$dn_dd_maxdi

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Maximum Digital Input Size

Description: The maximum number of digital input ports for this device definition.

Power Up: The user cannot change this value.

Screen: System variables screen.

$DN_DVDEF_IO[1].$dn_dd_maxdo

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Maximum Digital Output Size

Description: The maximum number of digital output ports for this device definition.

Power Up: The user cannot change this value.

Screen: System variables screen.

$DN_DVDEF_IO[1].$dn_dd_polai

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Polled I/O Analog Input Size

Description: The number of polled analog input ports for this device definition.

Power Up: Changes take effect immediately. I/O is assigned at power-up.

Screen: DeviceNet Device Definition Detail screen

$DN_DVDEF_IO[1].$dn_dd_polao

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Polled I/O Analog Output Size

Description: The number of polled analog output ports for this device definition.

Power Up: Changes take effect immediately. I/O is assigned at power-up.

Screen: DeviceNet Device Definition Detail screen

$DN_DVDEF_IO[1].$dn_dd_poldi

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Polled I/O Digital Input Size

Description: The number of polled digital input ports for this device definition.

Power Up: Changes take effect immediately. I/O is assigned at power-up.

Screen: DeviceNet Device Definition Detail screen

$DN_DVDEF_IO[1].$dn_dd_poldo

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Polled I/O Digital Output Size

Description: The number of polled digital output ports for this device definition.

Power Up: Changes take effect immediately. I/O is assigned at power-up.

Screen: DeviceNet Device Definition Detail screen

$DN_DVDEF_IO[1].$dn_dd_strai

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Strobed I/O Analog Input Size

Description: The number of strobed analog input ports for this device definition.

Power Up: Changes take effect immediately. I/O is assigned at power-up.

Screen: DeviceNet Device Definition Detail screen

$DN_DVDEF_IO[1].$dn_dd_strdi

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Strobed I/O Digital Input Size

Description: The number of strobed digital input ports for this device definition.

Power Up: Changes take effect immediately. I/O is assigned at power-up.

Screen: DeviceNet Device Definition Detail screen

$DN_DVDEF_IO[1].$dn_dd_supmd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Device Definition Supported I/O Modes

Description: The I/O mode supported by this device definition. The mode is decoded by adding together one or more of the following: 0: No I/O supported 1: Explicit messaging 2: Polled I/O 4: Strobed I/O 16: Change-Of-State I/O 32: Cyclic I/O 64: Acknowledgement-suppressed

Power Up: Changes take effect immediately.

Screen: DeviceNet Device Definition Detail screen

$DN_DVDEF_IO[40]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** DN_DVDEF_IO_T   **Memory:** Not available

Name: DeviceNet Device Definition List: I/O Configuration Data

Description: Provides the I/O configuration for each of the device definitions in $DN_DEV_DEFS.

Power Up: Changes take effect at power-up.

Screen: System variables screen.

$DN_FREE_MOD

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: DeviceNet Free Module List Index

Description: Index to the linked list of free module entries. $DN_FREE_MOD is the first module list entry in this list. For internal use only.

Power Up: N/A

$DN_INITSTAT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: DeviceNet Initialization State

Description: Indicates the state of initialization of the DeviceNet Interface system. 0: DeviceNet is uninitialized 1: DeviceNet is in process of initialization 2: DeviceNet is fully initialized

Power Up: This variable cannot be modified by the user.

Screen: System Variables screen.

$DN_LAST_PDT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: DeviceNet Last Used PDT Value

Description: The last PDT value used by a user-defined device. When new device definitions are added, $DN_LAST_PDT is incremented. PDT values less than $DN_LAST_PDT cannot be re-used even if the associated definitions are deleted.

Power Up: N/A

$DN_MOD_LIST[1-64] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: DeviceNet Module List

Description: The list of all DeviceNet modules connected to multi-module device across all daughter-boards. Each record contains configuration and operational information. Fields are individually described below. Viewable/editable fields are displayed on the DeviceNet Module List screen.

Power Up: Changes take effect immediately.

Screen: DeviceNet Module List screen

$DN_MOD_LIST[1].$dn_ml_commt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: DeviceNet Module List Comment

Description: A comment associated with the particular DeviceNet module; may be used to indicate the use of the module.

Power Up: Changes take effect immediately.

Screen: DeviceNet Module List screen

$DN_MOD_LIST[1].$dn_ml_nxtix

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Module List Next-Module Index

Description: Used to link to the next DeviceNet module in the module list of the current device. A value of 255 indicates the end of the module list.

Power Up: N/A

$DN_MOD_LIST[1].$dn_ml_pmt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: DeviceNet Module List PMT

Description: The PMT (Permanent Module Type) of the DeviceNet module.

Power Up: N/A

$DN_MOD_LIST[1].$dn_ml_slot

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: DeviceNet Module Slot Number

Description: The number of the slot on the device to which the DeviceNet module is connected.

Power Up: N/A

Screen: DeviceNet Module List screen

$DN_MOD_LIST[64]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** DN_MOD_LNK_T   **Memory:** Not available

Name: DeviceNet Module List

Description: The list of all DeviceNet modules connected to a multi-module device. Each record contains configuration and operational information. Fields are individually described below. Viewable or editable fields are displayed on the DeviceNet Module List screen.

Power Up: N/A

$DN_SCNR_TYP[1].$dn_code_pth

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** RW **CRTL:** RW   **Data Type:** STRING   **Memory:** CMOS

Name: DeviceNet Scanner Code Path

Description: The path name for the binary code file that is loaded on the DeviceNet scanner at power-up.

Power Up: Changes take effect at power-up.

Screen: System Variables screen.

$DN_SCNR_TYP[1].$dn_scnr_id

Minimum: 0   **Maximum:** 255   **Default:** 255   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** SHORT   **Memory:** CMOS

Name: DeviceNet Scanner Identification Code

Description: A code used by the system to identify this type of scanner. Values: 0 - SST
5136-DN-104 1 - SST 5136-DNP-104

Power Up: Changes take effect at power-up.

$DN_SCNR_TYP[2]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not
available   **CRTL:** Not available   **Data Type:** DN_SCTYP_T   **Memory:** Not available

Name: DeviceNet Daughter-Board Code Path

Description: The path name for the binary code files that are loaded on the DeviceNet Interface
scanner boards at power-up.

Power Up: Changes take effect at power-up.

$DRC_CFG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data
Type:** DRC_CFG_T   **Memory:** Not available

Name: Diagnostic Resource Center configuration, system variable structure.

Description: The variables in this structure are used to configure the DRC controller option.

Power Up: N/A

$DRC_CFG.$email_enabl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data**
Type: BOOLEAN   **Memory:** Not available

Name: Diagnostic Resource Center Email Menu Enable

Description: This variable is used to enable or disable access to the DRC Email menus. The variable
is set from the Data Services Configuration screen which is located by pressing the SHIFT and
DIAG keys on the iPendant.

Power Up: N/A

$DRC_CFG.$host1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not
available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
STRING   **Memory:** Not available

Name: Diagnostic Resource Center Host name #1.

Description: This is reserved for DRC - iPendant Edition controller option for off-line data resources.

Power Up: N/A

$DRC_CFG.$host2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not
available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
STRING   **Memory:** Not available

Name: Diagnostic Resource Center Host name #2

Description: This is reserved for DRC - iPendant Edition controller option for off-line data resources.

Power Up: N/A

$DRC_CFG.$host3

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Diagnostic Resource Center Host name #3

Description: This is reserved for DRC - iPendant Edition controller option for off-line data resources.

Power Up: N/A

$DRC_CFG.$host4

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Diagnostic Resource Center Host name #4

Description: This is reserved space for DRC - iPendant Edition controller option for off-line data resources.

Power Up: N/A

$DRC_CFG.$host5

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Diagnostic Resource Center Host name #5.

Description: This is reserved space for the DRC - iPendant Edition controller option for off-line data resources.

Power Up: N/A

$DUAL_DRIVE[1-3]

Minimum: MIN_DUAL_DRIVE   **Maximum:** 0x7F   **Default:** DEF_DUAL_DRIVE
KCL/Data: RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:**
DUAL_DRIVE_T   **Memory:** CMOS

Name: Dual Motor Drive Variable

Description: $DUAL DRIVE [Group number with dual drive]. $POS_GAP [Dual drive number]
EXAMPLE: Group 2 has 1 dual drive axis. To monitor pos_gap the user should look at $DUAL
DRIVE [2]. $POS_GAP [1]

Power Up: N/A

$DUAL_DRIVE[1].$m_axis_num[1-3]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data
Type:** BYTE   **Memory:** Not available

Name: The software axis of the master motor.

Description: Sets the software axis of the master motor.

Power Up: N/A

$DUAL_DRIVE[1].$pos_gap[1-3]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not
available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
LONG   **Memory:** Not available

Name: Positioning gap between motors

Description: This indicates the start/stop position inconsistency between a master and a slave in
machine pulses (1motor rev = 2^{19} machine pulses). DMDR-005: Large position gap will be reported
if $dual_drive.$pos_gap grows too large(larger than $dual_drive.$pos_gaptol).

Power Up: N/A

$DUAL_DRIVE[1].$pos_gaptol[1-3]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Positioning gap tolerance

Description: Tolerance set in motor pulses for $dual_drive.$pos_gap. The alarm, "DMDR-005: Large position gap" will be reported if $dual_drive.$pos_gap grows larger than $dual_drive.$pos_gaptol.

Power Up: N/A

$DUAL_DRIVE[1].$s_axis_num[1-3]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: The software axis of the slave motor.

Description: This variable sets the software axis of the slave motor.

Power Up: N/A

$DUAL_DRIVE[1].$sync_enb[1-3]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Motor syncronization enable

Description: You can disable synchronous error compensation with $dual_drive.$sync_enb.

- TRUE: Synchronous error compensation is active.
- FALSE: No synchronous error compensation.

Changing takes effect after servo power off (Press the EMERGENCY STOP button). When this variable is set to FALSE, a slave axis will move relatively the same distance as the master. Synchronous error compensation is automatically disabled when the axes are not calibrated.

Power Up: N/A

$DUAL_DRIVE[1].$sync_er[1-3]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Syncronization error

Description: Indicates a synchronous error between a master and a slave in motor pulses due to servo delay in machine pulses (1motor rev = 2^{19} machine pulses). The alarm, "DMDR-009: Large synch error" will be reported if $dual_drive.$sync_err grows larger than $dual_drive.$sync_err_tol.

Power Up: N/A

$DUAL_DRIVE[1].$sync_er_tol[1-3]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Syncronization error tolerance

Description: This is the tolerance set in motor pulses for $dual_drive.$sync_err. The alarm, "DMDR-009: Large synch error" will be reported if $dual_drive.$sync_err grows larger than $dual_drive.$sync_err_tol.

Power Up: N/A

$DUAL_DRIVE[1].$sync_gain[1-3]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Syncronization error compensation gain

Description: Synchronous error compensation gain. If sync_gain = 0, then no compensation will be applied. The default = 0.2.

Power Up: N/A

$DUAL_DRIVE[1].$sync_offset[1-3]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Syncronous compensation offset

Description: Synchronous error compensation offset. If sync_err > sync_offset, then compensation is applied. The default = 9830.

Power Up: N/A

$DUTY_GRP.$curve_type[1-9]

Minimum: 0   **Maximum:** 2   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: duty curve type

Description: For internal use only. Do not modify this system variable. If this variable is 0, duty curve is straight line. If this variable is 1, duty curve is mixed with curve and line. If this variable is 2, duty curve is curve.

Power Up: Changes to this variables take effect immediately.

Screen: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

$DUTY_GRP.$dty_support

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: duty diagnosis support

Description: For internal use only. Do not modify this system variable. If this value is 1, DUTY diagnosis parameter exits.

Power Up: Changes to this variables take effect immediately.

Screen: None

See Also: This variable is used for Duty diagnosis.

$DUTY_GRP.$duty_param1[1-9]

Minimum: -10000000000.   **Maximum:** 10000000000.   **Default:** 0   **KCL/Data:** RO
Program: RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: duty parameter 1

Description: For internal use only. Do not modify this system variable. This variable is used to calculate the duty of the cycle program.

Power Up: Changes to this variables take effect immediately.

Screen: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

$DUTY_GRP.$duty_param2[1-9]

Minimum: -10000000000.   **Maximum:** 10000000000.   **Default:** 0   **KCL/Data:** RO
Program: RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: duty parameter 2

Description: For internal use only. Do not modify this system variable. This variable is used to calculate the duty of the cycle program.

Power Up: Changes to this variables take effect immediately.

Screen: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

$DUTY_GRP.$duty_param3[1-9]

Minimum: -10000000000.   **Maximum:** 10000000000.   **Default:** 0   **KCL/Data:** RO
Program: RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:**
Not available

Name: duty parameter 3

Description: For internal use only. Do not modify this system variable. This variable is used to calculate the duty of the cycle program.

Power Up: Changes to this variables take effect immediately.

Screen: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

$DUTY_GRP.$duty_param4[1-9]

Minimum: -10000000000.   **Maximum:** 10000000000.   **Default:** 0   **KCL/Data:** RO
Program: RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:**
Not available

Name: duty parameter 4

Description: For internal use only. Do not modify this system variable. This variable is used to calculate the duty of the cycle program.

Power Up: Changes to this variables take effect immediately.

Screen: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

$DUTY_GRP.$duty_param5[1-9]

Minimum: -10000000000.   **Maximum:** 10000000000.   **Default:** 0   **KCL/Data:** RO
Program: RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:**
Not available

Name: duty parameter 5

Description: For internal use only. Do not modify this system variable. This variable is used to
calculate the duty of the cycle program.

Power Up: Changes to this variables take effect immediately.

Screen: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

$DUTY_TEMP

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not
available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL
Memory: Not available

Name: Air temperature in duty diagnosis

Description: The value of $DUTY_UNIT means the air temperature set by user. The unit of it is [C].

Power Up: Changes of this variable take effect immediately

Screen: SYSTEM variables screen/Duty diagnosis screen

See Also: This variable is used for Duty diagnosis.

$DUTY_UNIT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Unit of temperature in duty diagnosis

Description: The value of $DUTY_UNIT means the unit of temperature. Currently, 0 means [C] and 1 means [F]

Power Up: Changes of this variable take effect immediately

Screen: SYSTEM variables screen/Duty diagnosis screen

See Also: This variable is used for Duty diagnosis.

$DXCFG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** DX_CFG_T   **Memory:** Not available

Name: DeltaTool Debug Variables

Description: The DeltaTool Debug variables are not user variables and should not be set to any values other than their default values.

Power Up: Changes take effect on the next robot motion.

Screen: Set only using KCL or the SYSTEM Variables screen.

See Also: Contact your FANUC Robotics technical representative if it is necessary to change this variable.

$DXCFG.$comp_switch

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
INTEGER   **Memory:** Not available

Name: Delta Joint filter length compatibility switch

Description: When it is set to 1, filter length defined by user in $DXSCH.$dxaccel1 and $dxaccel2
are used in the delta joint motion. When it is set to 0, filter length from current segment is used.

Power Up: Require a cold start to take effect

Screen: SYSTEM variables screen

See Also: $DXSCH.$dxaccel1, $DXSCH.$dxaccel2

$DXMOR[1] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data
Type:** Not available   **Memory:** Not available

Name: DeltaTool Output Record of Group 1

Description: Contains information about how the offset is being applied. Individual fields within this
structure are described below.

Power Up: This variable is read only.

Screen: Can be read from a KAREL program, KCL, or from the SYSTEM Variables screen.

See Also: FANUC Robotics SYSTEM R-J2 Controller DeltaTool Manual

$DXMOR[1].$deltaframe

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not
available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION
Memory: Not available

Name:

Description: Reserved for future use. Do not change this variable.

Power Up: N/A

$DXMOR[1].$deltatool

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION   **Memory:** Not available

Name: DeltaTool Offset of Group 1

Description: This variable is updated when the APPLY_OFFSET(sch_num) is called and is the latest offset to be applied to the nominal trajectory.

Power Up: This variable is read only.

Screen: Can be read from a KAREL program, KCL, or from the SYSTEM Variables screen.

See Also: FANUC Robotics SYSTEM R-J2 Controller DeltaTool Manual

$DXMOR[1].$intr_tstamp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Interpolator Timestamp of Group 1

Description: The timestamp value, in milliseconds, is updated when the offset is applied.

Power Up: This variable is read only.

Screen: Can be read from a KAREL program, KCL, or from the SYSTEM Variables screen.

See Also: FANUC Robotics SYSTEM R-J2 Controller DeltaTool Manual

$DXOFFSET[sch_num] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Offset Variables

Description: Specifies the offset data for the schedule $DXSCH[sch_num]. It is updated to the system when the KAREL built-in function APPLY_OFFSET(sch_num) is called, and is effective on the next interpolated point of a motion segment. Individual fields within this structure are described below.

Power Up: This variable is initialized only once when DeltaTool is loaded. After this occurs, you must maintain its value. System power up will not affect this variable.

Screen: Can be set from a KAREL program, KCL, or from the SYSTEM Variables screen.

See Also: FANUC Robotics SYSTEM R-J2 Controller DeltaTool Manual

$DXOFFSET[sch_num].$deltatool

Minimum: nilpos   **Maximum:** POSITION   **Default:** nilpos   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION   **Memory:** Not available

Name: DeltaTool Offset

Description: Specifies the offset data for the schedule $DXSCH[sch_num]. It is updated to the system when the KAREL built-in function APPLY_OFFSET(sch_num) is called, and is effective on the next interpolated point of a motion segment.

Power Up: This variable is initialized only once when DeltaTool is loaded. After this occurs, you must maintain this value. System power up will not affect this variable.

Screen: Can be set from a KAREL program, KCL, or from the SYSTEM Variables screen.

See Also: FANUC Robotics SYSTEM R-J2 Controller DeltaTool Manual

$DXSCH[sch_num] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: DeltaTool Schedule Variables

Description: This is an array of DeltaTool schedule variables. A maximum of five schedules can be used. Individual fields within this structure are described below.

Power Up: This variable is initialized only once when DeltaTool is loaded. After this occurs, you must maintain their values. System power up will not affect this variable.

Screen: Accessible from KAREL, KCL or the SYSTEM Variables screen

See Also: FANUC Robotics SYSTEM R-J2 Controller DeltaTool Manual

$DXSCH[sch_num].$dtool_type

Minimum: DT_OFF   **Maximum:** DT_ACC_XF   **Default:** DT_OFF   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: DeltaTool Type

Description:

Power Up: This variable is initialized only once when DeltaTool is loaded. After this occurs, you must maintain its value. System power up will not affect this variable.

Screen: Can be set from a KAREL program, KCL, or from the SYSTEM Variables screen. However, the schedule will only be enabled when the KAREL built-in function START_OFFSET(sch_num) is called.

See Also: FANUC Robotics SYSTEM R-J2 Controller DeltaTool Manual

$DXSCH[sch_num].$dxaccel1

Minimum: 0   **Maximum:** 1000   **Default:** 256   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: DeltaTool CART_ACCEL1

Description: This variable is used, together with $DXSCH[num].$dxaccel2, to determine the acceleration/deceleration time used when the DeltaTool offset is applied.

Power Up: This variable is initialized only once when DeltaTool is loaded. After this occurs, you must maintain its value. System power up will not affect this variable.

Screen: Can be set from a KAREL program, KCL, or from the SYSTEM Variables screen. However, the schedule will only be enabled when the KAREL built-in START_OFFSET(sch_num) is called.

See Also: FANUC Robotics SYSTEM R-J2 Controller DeltaTool Manual , or FANUC Robotics SYSTEM R-J3 Controller KAREL Reference Manual for information on $CART_ACCEL1.

$DXSCH[sch_num].$dxaccel2

Minimum: 0   **Maximum:** 1000   **Default:** 128   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: DeltaTool CART_ACCEL2

Description: This variable is used, together with $DXSCH[num].$dxaccel1, to determine the acceleration/deceleration time used when the DeltaTool offset is applied.

Power Up: This variable is initialized only once when DeltaTool is loaded. After this occurs, you must maintain its value. System power up will not affect this variable.

Screen: Can be set from a KAREL program, KCL, or from the SYSTEM Variables screen. However, the schedule will only be enabled when the KAREL built-in START_OFFSET(sch_num) is called.

See Also: FANUC Robotics SYSTEM R-J2 Controller DeltaTool Manual or FANUC Robotics SYSTEM R-J3 Controller KAREL Reference Manual for information on $CART_ACCEL2

$DXSCH[sch_num].$group_num

Minimum: 1   **Maximum:** 1   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Group Number

Description: Group number for the DeltaTool schedule. Currently, DeltaTool can only be used for group 1.

Power Up: This variable is initialized only once when DeltaTool is loaded. After this occurs, you must maintain its value. System power up will not affect this variable.

Screen: Can be set from a KAREL program, KCL, or from the SYSTEM Variables screen. However, the schedule will only be enabled when the KAREL built-in function START_OFFSET(sch_num) is called.

See Also: FANUC Robotics SYSTEM R-J2 Controller DeltaTool Manual

2.5 "E" System Variables

$E_STOP_DO

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: E-stop DO number

Description: If this variable is non-zero, this specifies the DOUT signal which will be set if a controller signal E-stop is asserted. This can be set in the SYSTEM/CONFIG screen.

Power Up: On_Cold_Start

$ED_SIZE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Text editor size

Description: Determines the amount of memory available for all the edit buffers combined. The memory is allocated during cold start from the C-WORK memory pool.

Power Up: Requires a cold start to take effect

$ED_STATE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG **Memory:** Not available

Name: Text editor state

Description: Used by the system to determine whether a file is currently in the text editor. This variable can also be read by a KAREL program to determine this status. The valid states are 0= No files in text editor 1= Text editor is between states 2= File is in text editor Even though a file is in the text editor, it might not be the current screen on the CRT/KB.

Power Up: N/A

$EIP_CFG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** EIP_CFG_T   **Memory:** Not available

Name: EtherNet IP I/O configuration variables

Description: This variable structure indicates the EtherNet IP I/O configuration variables.

Power Up: N/A

$EIP_CFG.$keep_io_adp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: EtherNet I/O data when adapter connection times out

Description: Indicates whether EtherNet I/O data will be persistent when a connection in which the robot is acting as an adapter times out. If set to FALSE, all I/O associated with the connection will be set to zero.

Power Up: N/A

$EIP_CFG.$keep_io_scn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: EtherNet IP I/O data when adapter connection times out.

Description: Indicates whether EtherNet I/O data will be persistent when a connection in which the robot is acting as an adapter times out. If set to FALSE, all I/O associated with the connection will be set to zero.

Power Up: N/A

$EIP_CONN[1-8]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** EIP_CONN_T   **Memory:** CMOS

Name: Common variables for EtherNet IP connections

Description: This contains the common variables for all the EtherNet IP connections--adapter as well as scanner connections.

Power Up: N/A

$EIP_CONN[1].$cs_sz

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: The I/O consume size for the EtherNet IP connection. The size is in 16-bit words.

Description: The I/O consume size for the EtherNet IP connection. The size is in 16-bit words.

Power Up: N/A

$EIP_CONN[1].$desc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: EtherNet IP connection description.

Description: The description of the EtherNet IP connection. This description is used in the EtherNet IP screen on the Pendent.

Power Up: N/A

$EIP_CONN[1].$enable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Controls the EtherNet IP connection

Description: Controls whether the EtherNet IP connection is enabled or disabled. To enable or disable a connection on-the-fly, use the EtherNet IP screens on the iPendant.

Power Up: N/A

$EIP_CONN[1].$err_sv

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Error Severity

Description: The Error Severity of all posted alarms related to this EtherNet/IP connection. 0 == STOP, 1 == WARN, and 2 == PAUSE.

Power Up: On Cold Start

$EIP_CONN[1].$host

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Host name or IP address of the other side of an EtherNet IP connection

Description: This variable indicates the host name or IP address of the other side of an EtherNet IP connection. For an Adapter connection, this would identify the Originator. For a scanner connections, this identifies the Target.

Power Up: N/A

$EIP_CONN[1].$is_sc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Controls whether the EtherNet IP connection is a scanner or an adapter connection.

Description: Controls whether the EtherNet IP connection is a scanner or an adapter connection: TRUE for scanner, FALSE for adapter.

Power Up: N/A

$EIP_CONN[1].$pr_sz

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: The I/O produce size for the EtherNet IP connection. The size is in 16-bit words.

Description: The I/O produce size for the EtherNet IP connection. The size is in 16-bit words.

Power Up: N/A

$EIP_SC[1-8]

Minimum: 0   **Maximum:** 180   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** EIP_SC_T   **Memory:** CMOS

Name: Contains variables related to an EtherNet IP scanner connection.

Description: Contains variables related to an EtherNet IP scanner connection.

Power Up: N/A

$EIP_SC[1].$analogfmt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Analog input and output format

Description: This indicates the endianization of the analog inputs and outputs. 0 == big endian, and 1 == little endian.

Power Up: On Cold Start

$EIP_SC[1].$cn_path[1-64]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: The EtherNet IP connection path to a Target device.

Description: The EtherNet IP connection path to a Target device. Stored as an array of bytes.

Power Up: N/A

$EIP_SC[1].$cn_size

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: The number of bytes used in the byte array $EIP_SC[1].$CN_PATH[1-64].

Description: This variable indicates the number of bytes used in the byte array $EIP_SC[1].$CN_PATH[1-64]. This is referred to as the connection path size.

Power Up: N/A

$EIP_SC[1].$config[1-400]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Configuration data string

Description: This indicates the configuration data to be sent to an EtherNet/IP adapter device.

Power Up: On Cold Start

$EIP_SC[1].$config_sz

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Length of configuration string

Description: This indicates the length of configuration data to be sent to an EtherNet/IP adapter device.

Power Up: On Cold Start

$EIP_SC[1].$datatype

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Data type of the Ethernet I/O sizes

Description: The data type of the Ethernet I/O size system variables $EIP_CONN[1].$PR_SZ and $EIP_CONN[1].$CS_SZ. A value of 0 (FALSE) indicates 16-bit words. A value of 1 (TRUE) indicates 8-bit bytes.

Power Up: N/A

$EIP_SC[1].$devtype

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: EtherNet IP device type variable target device for electronic keying

Description: This variable indicates the EtherNet IP device type variable target device for electronic keying. This is only valid when the robot is acting as the scanner/originator.

Power Up: N/A

$EIP_SC[1].$multicast

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Specifies a unicast or multicast connection

Description: This is a boolean value that allows an EtherNet/IP Scanner connection to specify a T=>O unicast or multicast connection. When TRUE, the request is for multicast. When FALSE, the request is for unicast.

Power Up: N/A

$EIP_SC[1].$otrpi

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Originater to target requested packet interval for EtherNet IP

Description: This variable indicates the originater to target requested packet interval for EtherNet IP.

Power Up: N/A

$EIP_SC[1].$revision

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: EtherNet IP target device revision number variable for electronic keying

Description: This variable indicates the EtherNet IP target device revision number variable for electronic keying. This is only valid when the robot is acting as the scanner/originator.

Power Up: N/A

$EIP_SC[1].$torpi

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Target to Originater requested packet interval for EtherNet IP

Description: This variable indicates the target to originater requested packet interval for EtherNet IP.

Power Up: N/A

$EIP_SC[1].$vendor

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: EtherNet IP target device vender ID variable for electronic keying

Description: This variable indicates the EtherNet IP target device vender ID variable for electronic keying. This is only valid when the robot is acting as the scanner/originator.

Power Up: N/A

$ENC_STAT[1] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: (External/Tracking) Encoder Status

Description: This is the configuration and status data structure for the external encoder(s) used with Line Tracking and other system options and applications. Individual fields within this structure are described below.

Power Up: 0

Screen: SYSTEM Variables screen and SETUP Encoders screen

$ENC_STAT[1].$enc_average

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Encoder Rate Averaging Number

Description: This is the number of consecutive encoder instantaneous velocity values to be averaged together when computing the $ENC_STAT[].$enc_rate value. This determines the number of elements within the $ENC_STAT[1].$enc_buffer[] array which are used within the encoder rate computation.

Power Up: 0

Screen: SYSTEM Variables screen and SETUP Encoders screen

See Also: $ENC_STAT[].$enc_rate, $ENC_STAT[1].$enc_buffer[]

$ENC_STAT[1].$enc_buffer[100]

Minimum: 0x80000000   **Maximum:** 0x7FFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Encoder Velocity Storage Buffer

Description: This buffer is used for storage of consecutive values of the instantaneous encoder velocity (not $ENC_STAT[].$enc_rate) which are required for the encoder rate averaging. Only the first $ENC_STAT[1].$enc_average elements are used for averaging.

Power Up: 0

See Also: $ENC_STAT[1].$enc_average

$ENC_STAT[1].$enc_count

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Encoder Count (Counts)

Description: This contains the encoder count value which was computed during the most recent encoder access as determined by the system ITP_TIME and the $ENC_STAT[1].$multipl encoder read interval multiplier value. This value is the total accumulated value of encoder counts which results from summing each consecutive value ($ENC_STAT[1].$enc_value) of an incremental encoder.

Power Up: 0

Screen: SYSTEM Variables screen and SETUP Encoders screen

See Also: $ENC_STAT[1].$multipl, $SCR.$itp_time

$ENC_STAT[1].$enc_dspatat

Minimum: 0x80000000   **Maximum:** 0x7FFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Encoder DSP Status Flag

Description: This is a Digital Signal Processor (DSP) alarm status flag for the DSP channel associated with this encoder.

Power Up: 0

$ENC_STAT[1].$enc_enable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Encoder Enable

Description: This value determines whether or not the encoder is active. A value of TRUE indicates that this encoder is being updated at the prescribed interval (either by reading the encoder or by simulating encoder counts). Note: This value must also be TRUE in order to simulate the encoder.

Power Up: 0

$ENC_STAT[1].$enc_exists

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Encoder Exists Status Flag

Description: This is a status flag which indicates that the required external encoder hardware exists and is usable.

Power Up: 0

$ENC_STAT[1].$enc_head

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Encoder Buffer Head Index

Description: This is the index into the $ENC_STAT[1].$enc_b uffer array used to determine where to store the current encoder velocity value.

Power Up: 0

Screen: SYSTEM Variables screen and SETUP Encoders screen

See Also: $ENC_STAT[1].$enc_buffer[]

$ENC_STAT[1].$enc_multipl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Encoder Update Multiplier

Description: This value is multiplied by the $SCR.$itp_time to determine the encoder update rate. A value of 1 indicates that the encoder is updated every ITP_TIME interval. A value of 2 indicates that the encoder is updated every other interval, and so forth.

Power Up: 0

Screen: SYSTEM Variables screen and SETUP Encoders screen

See Also: $SCR.$ITP_TIME

$ENC_STAT[1].$enc_rate

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Encoder Rate (Average Velocity) (Counts/Update)

Description: This is the average encoder velocity (in units of encoder counts per encoder update time). It is the average value of the first $ENC_STAT[].$enc_average entries within the $ENC_STAT[].$enc_buffer[] array.

Power Up: 0

See Also: $ENC_STAT[].$enc_average, $ENC_STAT[].$enc_buffer []

$ENC_STAT[1].$enc_ros_tik

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Encoder ROS Tick TimeStamp (ROS Ticks)

Description: The current ROS Time Tick value when the encoder count ($ENC_STAT[1].$enc_count) was last updated. The unit for this system variable is currently 4 msec. This variable is available to time stamp data and is used in line tracking applications using vision, or other similar applications.

Power Up: 0

See Also: $ENC_STAT[1].$ENC_COUNT

$ENC_STAT[1].$enc_sim_on

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Encoder Simulate Enable

Description: This determines whether the encoder count values are simulated (based upon the value of $ENC_STAT[1].$enc_sim_spd) or read from an actual encoder. TRUE indicates that encoder counts are being simulated. (NOTE: The encoder must also be enabled via $ENC_STAT[].$enc_enable = TRUE in order to simulate encoder counts.)

Power Up: 0

Screen: SYSTEM Variables screen and SETUP Encoders screen

See Also: $ENC_STAT[1].$ENC_SIM_SPD, $ENC_STAT[].$ENC_ENABL E

$ENC_STAT[1].$enc_sim_spd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Encoder Simulation Speed (Counts/Update)

Description: This determines the encoder speed (in units of encoder counts per encoder update) used during encoder simulation. This number of encoder counts is added to the previous value of $ENC_STAT[1].$enc_count to determine the new encoder count value. When simulation is enabled, this number will also be stored in the $ENC_STAT[].$enc_buffer and reported by the $ENC_STAT[].$enc_rate value.

Power Up: 0

Screen: SYSTEM Variables screen and SETUP Encoders screen

See Also: $ENC_STAT[1].$enc_count, $ENC_STAT[].$enc_buffer, $ENC_STAT[].$enc_rate

$ENC_STAT[1].$enc_spcstat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Encoder SPC Status Flag

Description: This is a Serial Pulse Coder (SPC) alarm status flag for the SPC channel associated with this encoder (if a Serial Pulse Coder is being used).

Power Up: 0

$ENC_STAT[1].$enc_stopped

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Encoder Stopped Status Flag

Description: Internal encoder stopped status flag. Reserved for Internal use by FANUC Robotics. Not currently supported. NOTE: Use the TPE LINESTOP instruction to determine the current stopped status.

Power Up: 0

$ENC_STAT[1].$enc_thresh

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Encoder Stopped Threshold

Description: This value specifies the encoder stop threshold (in units of encoder counts per encoder update). This value is used by the LINE_STOP instruction to determine whether or not the line (conveyor) has stopped moving. Line rates which are LESS (smaller magnitude) than the stop threshold value are considered to indicate that the line has stopped.

Power Up: 0

$ENC_STAT[1].$enc_value

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Encoder (Incremental Count) Value

Description: Contains the incremental encoder count value which was read during the most recent encoder access as determined by the system ITP_TIME and the $ENC_STAT[1].$enc_multipl encoder read interval multiplier value. This value is the unaccumulated value of encoder counts which was directly read from the encoder.

Power Up: 0

See Also: $ENC_STAT[1].$enc_multipl, $SCR.$itp_time

$ENETMODE STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Ethernet Mode Structure

Description: Individual fields within this structure are described below.

Power Up: N/A

$ENETMODE.$AUTO_PORT_S

Minimum: 0   **Maximum:** 1   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** BOOLEAN   **Memory:** CMOS

Name: Ethernet Mode selection for Automatic Port Selection

Description: Enables (TRUE) or disables (FALSE) Ethernet Automatic Port Selection. The selection TRUE will automatically select TP (Twisted Pair) or AUI (Access Unit Interface) based on the presence or absence of valid link frames at the Twisted Pair port.

Power Up: Change takes effect immediately.

$ENETMODE.$COLL_DETECT

Minimum: 0   **Maximum:** 1   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** BOOLEAN   **Memory:** CMOS

Name: Ethernet Mode selection for Collision Detection

Description: Enables (TRUE) or disables (FALSE) Ethernet Twisted Pair Signal Quality Error Test Enable. The selection TRUE will enable testing of the internal TP (twisted pair) collision detect circuitry after each transmit operation to the remote host via Ethernet communication.

Power Up: Change takes effect immediately.

$ENETMODE.$EN_LOOPBACK

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** BOOLEAN   **Memory:** CMOS

Name: Ethernet Mode selection for Diagnostic Loopback

Description: Enables (TRUE) or disables (FALSE) Ethernet Diagnostic Loopback. The selection TRUE will cause the TX output to be loopbacked and appeared at the RX input. The current setting for $EN_LOOPBACK is FALSE, and is write protected.

Power Up: Change takes effect immediately.

$ENETMODE.$EN_TPENABLE

Minimum: 0   **Maximum:** 1   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** BOOLEAN   **Memory:** CMOS

Name: Ethernet Mode selection for Twisted Pair Port Enable

Description: Enables (TRUE) or disables (FALSE) Ethernet Twisted Pair Port Enable. If $AUTO_PORT_S (automatic port selection) is set to FALSE (disabled) , then the user will be able to manually select TP port or AUI port, i.e. set $EN_TPENABLE to TRUE for TP port or FALSE for AUI port. If $AUTO_PORT_S is set to TRUE , then the setting of $EN_TPENABLE will have no effect on Ethernet port selection.

Power Up: Change takes effect immediately.

$ENETMODE.$FULL_DUPLEX

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** BOOLEAN   **Memory:** CMOS

Name: Ethernet Mode selection for Twisted Pair Full Duplex

Description: Enables (TRUE) or disables (FALSE) Ethernet Twisted Pair Full Duplex. The selection TRUE will allow simultaneous transmit and receive operation on the twisted pair port without causing collision.

Power Up: Change takes effect immediately.

$ENETMODE.$POLARITY_CE

Minimum: 0   **Maximum:** 1   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** BOOLEAN   **Memory:** CMOS

Name: Ethernet Mode selection for Twisted Pair Automatic Polarity Correction Enable

Description: Enables (TRUE) or disables (FALSE) Ethernet Twisted Pair Automatic Polarity Correction Enable. The selection TRUE will enable automatic polarity correction, and will internally correct polarity fault. The current setting for $POLARITY_CE is TRUE, and is write protected.

Power Up: Change takes effect immediately.

$ENETMODE[1].$ACD_ENABLE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: IP Address Conflict Detection

Description: Address Conflict Detection as defined by the EtherNet/IP workshop. Based on the Cheshire IPv4 ACD Mechanism Internet Draft.

Power Up: On Cold Start

$ER_AUTO_ENB

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Auto display flag

Description: Enables/Disables whether the Active Alarm Screen will automatically be displayed when an error occurs. 1=Automatic Display.

Power Up: You must perform a COLD START for this change to take effect.

See Also: The Error Codes Appendix in the appli cation-specific Setup and Operations Manual for more information.

$ER_NO_ALM STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Output/non-output of Alarm

Description: This system variable is used to prevent specific errors from turning on the FAULT output. Individual fields within this structure are described below.

Power Up: Changes to this variable take effect immediately

$ER_NO_ALM[1].$er_code1-10

Minimum: 0   **Maximum:** 128000   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: No alarm error codes

Description: These variables specify the alarms which will not turn on the FAULT output. The number of alarms specified and the value of $ER_NO_ALM.$noalm_num must be the same. An alarm ID is used to specify the alarm. Refer to the Setup and Operations Manual for alarm ID information.

Power Up: Changes to this variable take effect immediately

$ER_NO_ALM[1].$noalm_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Number of no alarm errors

Description: Specifies the number of error codes used.

Power Up: Changes to this variable take effect immediately

$ER_NO_ALM[1].$noalmenble

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: No alarm enable

Description: Enables/disables the no alarm output feature. 1: Do not turn on the FAULT output for any errors defined in $ER_NO_ALM[1].$er_ code1-10. 0: Output all alarms. This variable will only enable the no alarm output feature if $ER_NO_ALM[1].$no alm_num and $ER_NO_ALM[1].$er_code1-10, are set up properly.

Power Up: Changes to this variable take effect immediately

$ER_NOAUTO STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Auto display flag of the specified alarm

Description: Disables/enables automatic display of the Active Alarm Screen for specified alarms. The variables within this structure are used with $ER_AUTO_ENB. Individual fields within this structure are described below.

Power Up: You must perform a cold start for the changes to take effect.

See Also: Appendix A of the application-specifi c Setup and Operations Manual .

$ER_NOAUTO.$noauto_code[1-20]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Error code

Description: The error code specified here will not force the automatic display of the Active Alarm Screen. There are 6 set by default. Appendix A of the Application-Specific Setup and Operations Manual.

Power Up: You must perform a cold start for the changes to take effect.

Screen: SYSTEM Variables Screen

$ER_NOAUTO.$noauto_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Auto display flag of the specified errors

Description: Disables/enables the automatic display of the Active Alarm Screen for the specified error codes in $ER_NOAUTO.$noauto_code. If set to 1, the errors specified will not force the display of the Active Alarm Screen.

Power Up: You must perform a cold start for the changes to take effect.

Screen: SYSTEM Variables Screen

$ER_NOAUTO.$noauto_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Number of specified error codes

Description: The number of error codes specified in $ER_NOAUTO.$noauto_code must be the same as this value.

Power Up: You must perform a cold start for the changes to take effect.

Screen: SYSTEM Variables Screen

$ER_OUT_PUT.$plcwarn

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: PLCWARN severity from Error Severity Table

Description: This System has to be set to TRUE in order to get PLCWARN severity selection from Error Severity Table

Power Up: Effective immediately

Screen: The System Variables screen.

$ER_SEV_NOAU[1-5]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Auto display flag of every severity type

Description: Disables/enables the automatic display of the Active Alarm Screen for each severity type, except WARN. The elements [1-5] correspond respectively to PAUSE, STOP, SERVO, ABORT and SYSTEM. If set to FALSE, the severity type will not force the automatic display of the Active Alarm Screen. This variable is used with $ER_AUTO_ENB.

Power Up: You must perform a cold start for this change to take effect.

See Also: Appendix A of the Application-Specific Setup and Operations Manual.

$ERR_OPN

Minimum: 0   **Maximum:** 0x000003E7   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** INTEGER   **Memory:** CMOS

Name: FTP Server Access Control Enable Flag

Description: When set to 1, this enables checking of remote FTP clients when logging into the robot to use the robot FTP server. If enabled, FTP access through the robot FTP server is granted based on matching $FSAC_LIST.$IP_ADDRESS[], and using associated access level ($FSAC_LIST.$ACCESS _LVL); or using $FSAC_DEF_LVL if no match. (Saved in SYSFSAC.SV)

Power Up: N/A

See Also: SYSTEM R-J3 ECBR-FTP Interface Setup and Operations Manual

$ERR_ROB[1-2]

Minimum: 0   **Maximum:** ""   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** INTEGER   **Memory:** CMOS

Name: Robot error value representing the current location.

Description: This variable is used to monitor the location of the robot group. As the robot (group 1) moves through its path, macro calls are made from the robot processes, updating the value of $ERR_ROB. The value of $ERR_ROB after a fault occurs determines the functionality of Fast Cancel Recovery (FCR). $ERR_ROB is automatically set to zero at the start and end of every job. Note: $ERR_ROB is not supported with Post v6.31 DualArm. $ERR_ROB[1] = Robot arm - group 1 $ERR_ROB[2] = Robot arm - group 2 (currently not used)

Power Up: N/A

$ERROR_PROG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Error Program

Description: This string can be set from a teach pendant program using the ERROR_PROG instruction. A KAREL "shell" program can access this string during an error recovery process. This string typically contains the name of a program that is run as part of error recovery. Note that this contains the result of the last access to an error_prog instruction from a teach pendant program.

Power Up: No

Screen: SYSTEM Variables screen TP Editor

$ERROR_TABLE

Minimum: 0x80000000   **Maximum:** 0x7FFFFFFF   **Default:** 0x7FFFFFFF   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG **Memory:** Not available

Name: Error Severity Table information

Description: This system variable contain information from Error Severity Table. This is ULONG data type and it is decimal representation of number that is composed of the following: first 16 bits are error code, next 8 bits represent facility or subsystem code, next 4 bits is value for enumerated type for severity level, and last 4 bits is value for enumerated value for logger functionality in Error Severity Table screen.

Power Up: Effective immediately

Screen: The System Variable screen

$ERRSEV_NUM

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Maximum number of entries for Error Severity Table

Description: This system variable define the maximum number of entries in Error Severity Table screen and it can be modified at Ctrl start form Program setup menu.

Power Up: The change to this system variable takes effect at the next cold start.

Screen: The System Variables screen.

$ETCP_VER

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: TCP/IP version

Description: The version of the TCP/IP code in EPROM.

Power Up: Always read from the ETHERNET EPROM after a cold start.

See Also: FANUC Robotics SYSTEM R-J Controller KSL Interface Setup and Operations Manual

$EXTTOL

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Extended Axis Error Tolerance

Description: Specifies the tolerance allowed in extended axis data when two positions are compared in a KAREL program. Two extended axes are considered equal when their difference is below this value. Units are mm for linear axes, degrees for rotational axes.

Power Up: N/A

2.6 "F" System Variables

$FAST_CLOCK

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: High Resolution System Timer

Description: This variable is incremented by 1 every 4 milliseconds. It provides higher resolution timing than is available though KAREL TIMER variables.

Power Up: No

$FAULT_CONFG.$cur_error

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Last error that was detected and is still active.

Description: This indicates the last error that was detected and is still active. For internal use only.

Power Up: NA

Screen: The System Variables screen.

$FAULT_CONFG.$cur_reset

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Reset Current Data

Description: This resets the current data for F and I reporting, when set true. On the next error or reset, the current data will be reset.

Power Up: NA

Screen: The System Variables screen.

$FAULT_CONFG.$hist_reset

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Reset Historical Data

Description: This resets the historical data for F and I reporting, when set true. On the next error or reset, the historical data will be reset.

Power Up: NA

Screen: The System Variables screen.

$FAULT_CONFG.$hreset_time[1]

Minimum: 0   **Maximum:** 0xffffff   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Controller On time

Description: This indicates the time (in minutes) that the historical data for F and I system was started or last reset. This time represenst The total controller on time.

Power Up: NA

Screen: The System Variables screen.

$FAULT_CONFG.$hreset_time[2]

Minimum: 0 **Maximum:** 0xffffff **Default:** 0 **KCL/Data:** RW **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** INTEGER **Memory:** Not available

Name: Servo On time

Description: This indicates the time (in minutes) that the historical data for F and I system was started or lat reset. This time represents Servo on time.

Power Up: NA

Screen: The System Variables screen.

$FAULT_CONFG.$hreset_time[3]

Minimum: 0 **Maximum:** 0xffffff **Default:** 0 **KCL/Data:** RW **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** INTEGER **Memory:** Not available

Name: Fault Time

Description: This indicates the time (in minutes) that the historical data for F and I system was started or lat reset. This time represents the fault time.

Power Up: NA

Screen: The System Variables screen.

$FAULT_CONFG.$hreset_time[4]

Minimum: 0 **Maximum:** 0xffffff **Default:** 0 **KCL/Data:** RW **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** INTEGER **Memory:** Not available

Name: Running time

Description: This indicates the time (in minutes) that the historical data for F and I system was started or lat reset. This time represents the running time.

Power Up: NA

Screen: The System Variables screen.

$FAULT_CONFG.$max_rec

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Maximum errors to record

Description: This indicates the maximum number of errors to record. The system variable $FAULT_DATA is resized to hold this number, so there is a usage of CMOS memory when this value is changed. A value of 0 disable the F and I recording.

Power Up: Requires power cycle to change number of potential errors recorded.

Screen: The System Variables screen.

$FAULT_CONFG.$no_recd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: No Record Failures.

Description: This indicates the numer of errors that were not recorded for some reason. Typically, this means that the number of errors to be recorded is is less tha the number of errors that the system has experienced.

Power Up: NA

Screen: The System Variables screen.

$FAULT_CONFG.$reset_per

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Time change trigger

Description: This is the percentage of a time change that will trigger an automatic historical and current reset. This is based on the most current time and the new time when the system clock is changed.

Power Up: NA

Screen: The System Variables screen.

$FAULT_CONFG.$reset_time[1]

Minimum: 0   **Maximum:** 0xffffff   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Controller On time

Description: This indicates the time (in minutes) that the curent data for F and I system was started or last reset. This time represenst The total controller on time.

Power Up: NA

Screen: The System Variables screen.

$FAULT_CONFG.$reset_time[2]

Minimum: 0   **Maximum:** 0xffffff   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Servo On time

Description: This indicates the time (in minutes) that the curent data for F and I system was started or lat reset. This time represents Servo on time.

Power Up: NA

Screen: The System Variables screen.

$FAULT_CONFG.$reset_time[3]

Minimum: 0   **Maximum:** 0xffffff   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Fault Time

Description: This indicates the time (in minutes) that the curent data for F and I system was started or lat reset. This time represents the fault time.

Power Up: NA

Screen: The System Variables screen.

$FAULT_CONFG.$reset_time[4]

Minimum: 0   **Maximum:** 0xffffff   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Running time

Description: This indicates the time (in minutes) that the curent data for F and I system was started or lat reset. This time represents the running time.

Power Up: NA

Screen: The System Variables screen.

$FAULT_CONFG.$time1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: System time that F and I recording was started.

Description: This indicates the system time (in DOS format) that the curent data for F and I system was started or last reset.

Power Up: NA

Screen: The System Variables screen.

$FAULT_CONFG.$time2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: System time that F and I recording was stopped. System time that F and I recording was stopped.

Description: This indicates the system time (in DOS format) that the curent data for F and I system was stopped (or disabled);.

Power Up: NA

Screen: The System Variables screen.

$FAULT_CONFG.$time3

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: System time that F and I recording was started.

Description: This indicates the system time (in DOS format) that the historical data for F and I system was started or last reset.

Power Up: NA

Screen: The System Variables screen.

$FAULT_CONFG.$time4

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: System time that F and I recording was stopped.

Description: This indicates the system time (in DOS format) that the historical data for F and I system was stopped (or disabled);.

Power Up: NA

Screen: The System Variables screen.

$FAULT_CONFG.$warning_ena

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Warning Enable Flag..

Description: This enables the logging of warnings. The number of warning will be logged. No occurance time is kept for warnings.

Power Up: NA

Screen: The System Variables screen.

$FAULT_DATA[1].$hist_incid

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Historical Incidents

Description: This indicates the number of times that this error has occurred for historical data..

Power Up: NA

Screen: The System Variables screen.

$FAULT_DATA[1].$htime1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Total Time

Description: This indicates the total time (in tenths of minutes) for historical data that this error has been active.

Power Up: NA

Screen: The System Variables screen.

$FAULT_DATA[1].$htime2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL
Memory: Not available

Name: Max Time

Description: This indicates the max time (in tenths of minutes) for historical data that this error has been active.

Power Up: NA

Screen: The System Variables screen.

$FAULT_DATA[1].$htime3

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL
Memory: Not available

Name: Min Time

Description: This indicates the min time (in tenths of minutes) for historical data that this error has been active.

Power Up: NA

Screen: The System Variables screen.

$FAULT_DATA[1].$incidents

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Current Incidents

Description: This indicates the number of times that this error has occurred for current data.

Power Up: NA

Screen: The System Variables screen.

$FAULT_DATA[1].$number

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Error Number

Description: This indicates the error number for the associated data.

Power Up: NA

Screen: The System Variables screen.

$FAULT_DATA[1].$text

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Error string

Description: This indicates the error string.

Power Up: NA

Screen: The System Variables screen.

$FAULT_DATA[1].$time1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Total Time

Description: This indicates the total time (in tenths of minutes) for current data that this error has been active.

Power Up: NA

Screen: The System Variables screen.

$FAULT_DATA[1].$time2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Max Time

Description: This indicates the max time (in tenths of minutes) for current data that this error has been active.

Power Up: NA

Screen: The System Variables screen.

$FAULT_DATA[1].$time3

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Min Time

Description: This indicates the min time (in tenths of minutes) for current data that this error has been active.

Power Up: NA

Screen: The System Variables screen.

$FAULT_DATA[1].$time4

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Last time

Description: This indicates the last time (in DOS format)that this error was reported

Power Up: NA

Screen: The System Variables screen.

$FBSTSK[1] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: PROFIBUS task ID

Description: These system variables are used to create the field bus task. Individual variables within this structure are described below.

Power Up: You must perform a cold or hot start for these change to take effect.

$FBSTSK[1].$lun

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TASK LUN

Description: For internal use only. Do not modify this system variable. Task LUN of field bus task.

Power Up: N/A

$FBSTSK[1].$priority

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Field bus task priority

Description: For internal use only. Do not modify this system variable. 0 : The default priority is used.

Power Up: You must perform a cold or hot start for the change to take effect.

$FBSTSK[1].$sid

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Softparts ID

Description: For internal use only. Do not modify this system variable. Task Softparts ID of field bus task.

Power Up: N/A

$FBSTSK[1].$tid

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: TASK ID

Description: For internal use only. Do not modify this system variable. Task ID of field bus task.

Power Up: N/A

$FC_CONFIG.$data_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: NUMBER OF PROFILE DATA

Description: The element number of pressure profile data. You can change the element of $FC_DATA[] by this variable.

Power Up: You must perform a COLD START for the change to take effect.

Screen: SYSTEM varaible screen (on the teach pendant)

$FC_DATA[1].$fcmd_trq[10]

Minimum: -7282 **Maximum:** 7282 **Default:** 0 **KCL/Data:** RW **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** SHORT **Memory:** Not available

Name: Pressure control target value in each step

Description: Pressure value (unit: torque)

Power Up: N/A

Screen: SYSTEM varaible screen (on the teach pendant)

$FC_DATA[1].$time[10]

Minimum: 0 **Maximum:** 100000 **Default:** 0 **KCL/Data:** RW **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** LONG **Memory:** Not available

Name: Pressure control time

Description: Time of pressure control in each step.(msec)

Power Up: N/A

Screen: SYSTEM varaible screen (on the teach pendant)

$FC_GRP[1].$complete[9]

Minimum: 0 **Maximum:** 1 **Default:** 0 **KCL/Data:** RW **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** BOOLEAN **Memory:** Not available

Name: COMPLETE PRESSURE CONTROL

Description: TRUE: Complete pressure control

Power Up: N/A

Screen: SYSTEM varaible screen (on the teach pendant)

$FC_GRP[1].$fcmd_trq[9]

Minimum: -7282   **Maximum:** 7282   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Pressure control target value

Description: Pressure value (unit: torque)Set the goal of motor torque

Power Up: N/A

Screen: SYSTEM varaible screen (on the teach pendant)

$FC_GRP[1].$fctrl[9]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Pressure control start flag

Description: TRUE: Start pressure control System starts pressure control when this flag becomes TRUE.FALSE: End of pressure control

Power Up: N/A

Screen: SYSTEM varaible screen (on the teach pendant)

$FC_GRP[1].$hold[9]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: HOLD PRESSURE CONTROL

Description: TRUE: System keeps the last pressure vlaue at specified profile dataFALSE: System stops pressure control

Power Up: N/A

Screen: SYSTEM varaible screen (on the teach pendant)

$FC_GRP[1].$restart[9]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: RESTART PRESSURE CONTROL

Description: TRUE: Restart pressure control from pressure holding condition

Power Up: N/A

Screen: SYSTEM varaible screen (on the teach pendant)

$FC_GRP[1].$sch_num[9]

Minimum: 0   **Maximum:** 100   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: SCHDULE NUMBER (PROFILE DATA NUMBER)

Description: The target index of $FC_DATA[]

Power Up: N/A

Screen: SYSTEM varaible screen (on the teach pendant)

$FC_STAT[1].$dizcmp[9]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Dizzer process complete flag

Description: TRUE: dizzer process complete

Power Up: N/A

Screen: SYSTEM varaible screen (on the teach pendant)

$FC_STAT[1].$fcenb[9]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: In Pressure controling flag

Description: Servo soft sets this flag by S-DATATRUE: In pressure control FALSE: In position control

Power Up: N/A

Screen: SYSTEM varaible screen (on the teach pendant)

$FC_STAT[1].$mover_inhib[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Inhibit move error excess alarm

Description: It is normal for move error (count) to become large during force control. $FC_STAT[].$mover_inhib[] indicates that the servogun is in force control (or is exiting force control). When $FC_STAT[].$mover_inhib[]==TRUE: - SRVO-24 occurs, if pulse count-based position exceeds stroke limit; - difference between actual, and commanded position is not checked.

Power Up: N/A

$FEATURE STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Feature Information

Description: Individual variables within this structure are described below.

Power Up: N/A

$FEATURE.$MOD[1-128]

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** RW   **Data Type:** STRING   **Memory:** CMOS

Name: Feature Type

Description: Details the load mechanism of each installed feature: S (standard), L (robot library), O (option), or U (update).

Power Up: This variable cannot be changed.

Screen: None

$FEATURE.$NAM[1-128]

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** RW   **Data Type:** STRING   **Memory:** CMOS

Name: Name of the Standard/Robot Library/Optional/Update Features

Description: Details the release time name of each installed feature (standard, robot library, option, or update).

Power Up: This variable cannot be changed.

Screen: STATUS Version IDs screen, SYSTEM Variable screen

$FEATURE.$VER[1-128]

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** RW   **Data Type:** STRING   **Memory:** CMOS

Name: Version of the Standard/Robot Library/Optional/Update Features

Description: Details the release time version of each installed feature (standard, robot library, option, or update).

Power Up: This variable cannot be changed.

Screen: STATUS Version IDs screen, SYSTEM Variable screen

$FILE_AP2BCK[1-20] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Application-TP (Applic.-TP) file backup table

Description: The entries in this table tell the system what .TP, .DF or .MN programs are loaded or backed up during a "file backup" operation from the teach pendant. This table is used when you select BACKUP or RESTORE and Applic.-TP. This table is used for loading during controlled start when you select a restore operation.

Power Up: Used when the BACKUP or RESTORE key is pressed on the FILE menu.

Screen: SYSTEM Variable screen

$FILE_AP2BCK[1].$file_name

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: File Backup/Restore Name

Description: The name of the file to be restored from or backed up to, for this entry in the table.

Power Up: Used when the BACKUP or RESTORE key is pressed on the FILE menu.

Screen: SYSTEM Variable screen

$FILE_AP2BCK[1].$func_code

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Function Code

Description:

Power Up: Used when the BACKUP or RESTORE key is pressed on the FILE menu.

Screen: SYSTEM Variable screen

$FILE_AP2BCK[1].$modifier

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Modifier

Description: Applies to load operation modifier only. Load operation: 0 - No overwrite on load 1 - Overwrite file on load

Power Up: Used when the BACKUP or RESTORE key is pressed on the FILE menu.

Screen: SYSTEM Variable screen

$FILE_AP2BCK[1].$prog_name

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Program name to backup/restore

Description: Name of the program backed up if this is a backup entry in the table.

Power Up: Used when the BACKUP or RESTORE key is pressed on the FILE menu.

Screen: SYSTEM Variable screen

$FILE_APPBCK[1-20] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Application file backup table

Description: The entries in this table tell the system what files are loaded or what programs are backed up during a "file backup" operation from the teach pendant. This table is used when you select BACKUP or RESTORE and "Application" or "All of the above." This table is used for loading during controlled start when you select a restore operation.

Power Up: Used when the BACKUP or RESTORE key is pressed on the FILE menu.

Screen: SYSTEM Variable screen

$FILE_APPBCK[1-30]

Minimum: MIN_FILE_BACK   **Maximum:** 1   **Default:** DEF_FILE_BACK   **KCL/Data:** RW
Program: Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** FILE_BACK_T   **Memory:**
CMOS

Name: Application file backup table

Description: The entries in this table tell the system what application files are loaded or backed up
during a "file backup" operation from the teach pendant. This table is used when you select BACKUP
or RESTORE and then select "Application" or "All of above" from the list. This table is used for
loading during Controlled start when you select a restore operation.

Power Up: N/A

$FILE_APPBCK[1].$file_name

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not
available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: File Backup/Restore Name

Description: The name of the file to be restored from or backed up to, for this entry in the table.

Power Up: Used when the BACKUP or RESTORE key is pressed on the FILE menu.

Screen: SYSTEM Variable screen

$FILE_APPBCK[1].$func_code

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not
available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Function Code

Description:

Power Up: Used when the BACKUP or RESTORE key is pressed on the FILE menu.

Screen: SYSTEM Variable screen

$FILE_APPBCK[1].$modifier

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Modifier

Description: Applies to system variable type operations only. Load operation: 0 - Normal load 16 - Convert system variable from previous version Save operation: 0 Save all variables 1 Save majority of sysvars 2 Save just DMR 3 Save just SBR 4 Save NOSAVE variable for initialization 5 Save MACRO command related variables 6 Save SPOT application related variables

Power Up: Used when the BACKUP or RESTORE key is pressed on the FILE menu.

Screen: SYSTEM Variable screen

$FILE_APPBCK[1].$prog_name

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Program name to backup/restore

Description: Name of the program backed up if this is a backup entry in the table.

Power Up: Used when the BACKUP or RESTORE key is pressed on the FILE menu.

Screen: SYSTEM Variable screen

$FILE_ERRBCK.$file_name

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Error Log Name

Description: Specifies the name of the error log to be backed up. $FILE_ERRBCK[1].$file_name is set to "ERRALL.LS" and $FILE_ERRBCK[2].$file_name is set to "ERRACT.LS".

Power Up: Changes take effect immediately.

Screen: SYSTEM Variable screen.

$FILE_ERRBCK.$func_code

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Function Code

Description: Must be set to 0.

Power Up: Changes take effect immediately.

Screen: SYSTEM Variable screen.

$FILE_ERRBCK.$modifier

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Modifier

Description: Must be set to 0.

Power Up: Changes take effect immediately.

Screen: SYSTEM Variable screen.

$FILE_ERRBCK.$prog_name

Minimum: ""   **Maximum:** " "   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Program Name (to backup)

Description: Specifies the program backed up if this is a backup entry in the table. $FILE_ERRBCK[1].$prog_name and $FILE_ERRBCK[2].$prog_name are set to "*SYSTEM*".

Power Up: Changes take effect immediately.

Screen: SYSTEM Variable screen.

$FILE_ERRBCK[1-10] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Error Log Files Backup Table Structure

Description: The entries in this table tell the system what files are backed up during a "file backup" operation from the teach pendant. This table is used when you select [BACKUP]/Error Log. This table is also used when you select [BACKUP]/All of the above. This table is NOT used for loading during controlled start when user selects restore function.

Power Up: N/A

$FILE_MASK

Minimum: 0   **Maximum:** 1   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** BOOLEAN   **Memory:** CMOS

Name: File mask

Description: Determines whether to mask out "unknown" files in the File Menu.Before this variable was created, "unknown" files were masked out in the File Menu. Also, they were limited to two character extensions. To continue to do this, set $FILE_MASK = TRUE. To display 3 character file extensions, set $FILE_MASK = FALSE. When it is false, the File Menu will display files as follows: 1. Wildcard DIR requests, such as *.pc, will display all .pc files as well as any compressed versions (.pcc). 2. For *.*, display ALL files with 2 and 3 char extensions. No masking is done.

Power Up: Changes take effect immediately.

Screen: SYSTEM Variable screen

$FILE_MAXSEC

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: File maximum sector

Description: Determines the number of sectors to allocate for the CMOS RAM disk. One sector is 512 bytes. During the format command, the memory is removed from the CMOS memory pool and set aside as the RAM disk (RD:) storage device. If not enough CMOS memory is available, then $FILE_MAXSEC needs to be set smaller and the RAM disk reformatted. CAUTION: Reformatting a RAM disk removes all the files that were previously stored on the RAM disk. The RAM disk should be backed up to an off-line storage device of the FROM disk (FR:) device before it is formatted. $FILE_MAXSEC may be set to zero if a RAM disk is not required. It may also be set to a negative number in which case the memory is allocated from DRAM instead of CMOS. However, DRAM files will be lost when power is turned off.

Power Up: Only effective during the format command.

$FILE_TD_SEC

Minimum: 100   **Maximum:** 16000   **Default:** 525   **KCL/Data:** RW   **Program:** Not available **UIF:** RW   **CRTL:** RW   **Data Type:** ULONG   **Memory:** CMOS

Name: File TD: sectors

Description: This variable determines the number of sectors to allocate for the Temporary RAM disk, TD:. One sector is 512 bytes. During formatting, the memory is removed from the DRAM memory pool and set aside as the Temporary RAM disk (TD:) storage device. $FILE_TD_SEC can be set to zero if a Temporary RAM disk is not required. It can not however be set to zero from the teach pendant. Changes are effective when the controller is turned on or during a format of the device. A format of the device automatically occurs when the controller is turned on.

Power Up: N/A

$FILECOMP

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** FILECOMP_T   **Memory:** Not available

Name: File Backward Compatibility Switches

Description: Compatibility switches can be set so that older versions of software (V4.40 and earlier) can read variables and TPP programs written for V5.11 and later. There are two switches: $TPP - If set to TRUE, TP programs are backward compatible. $VARIABLE - If set to TRUE, variable files (.VR) are backward compatible.

Power Up: Changes take effect immediately.

Screen: File Menu

$FILECOMP.$tpp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: File Backward Compatibility Switches

Description: Compatibility switches can be set so that older versions of software (V4.40 and earlier) can read variables and TPP programs written for V5.11 and later. There are two switches: $TPP - If set to TRUE, TP programs are backward compatible. $VARIABLE - If set to TRUE, variable files (.VR) are backward compatible.

Power Up: Changes take effect immediately.

Screen: File Menu

$FILECOMP.$variable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: File Backward Compatibility Switches

Description: Compatibility switches can be set so that older versions of software (V4.40 and earlier) can read variables and TPP programs written for V5.11 and later. There are two switches: $TPP - If set to TRUE, TP programs are backward compatible. $VARIABLE - If set to TRUE, variable files (.VR) are backward compatible.

Power Up: Changes take effect immediately.

Screen: File Menu

$FILTSK[1] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: PROFIBUS task ID

Description: This system variables are used to create the task.

Power Up: You must perform a cold or hot start for the change to take effect.

$FILTSK[1].$lun

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 158   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TASK LUN

Description: For internal use only. Do not modify this system variable. Task LUN of task.

Power Up: SYSTEM Variables screen

$FILTSK[1].$priority

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Task priority

Description: For internal use only, Do not modify this system variable. 0 : The default priority is used.

Power Up: You must perform a cold or hot start for the change to take effect.

$FILTSK[1].$sid

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 92   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Softparts ID

Description: For internal use only. Do not modify this system variable. Task Softparts ID of task.

Power Up: N/A

$FILTSK[1].$startmd

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Indicate the start mode when this task run.

Description: For internal use only. Do not modify this system variable. 0 : every mode. 1 : COLDSTART

Power Up: You must perform a cold or hot start for the change to take effect.

$FILTSK[1].$tid

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 182   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TASK ID

Description: For internal use only. Do not modify this system variable. Task ID of task.

Power Up: N/A

$fn_grp[1].$motion.$qstop_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Quick stop enable

Description: This enables the servo quick stop during search motion.

Power Up: On_CNTL_Start

$FORCE_SENSE.$comm_reg1

Minimum: 0x8000   **Maximum:** 0x7FFF   **Default:** 0   **KCL/Data:** RO   **Program:** RW   **UIF:** RO   **CRTL:** RO   **Data Type:** SHORT   **Memory:** CMOS

Name: Force sensor communication register #1

Description: For FANUC Robotics internal use only.

Power Up: This variable is set by the system

Screen: This variable is not directly assessible by menu

$FORCE_SENSE.$counter

Minimum: 0x8000   **Maximum:** 0x7FFF   **Default:** 0   **KCL/Data:** RO   **Program:** RW   **UIF:** RO   **CRTL:** RO   **Data Type:** SHORT   **Memory:** CMOS

Name: Force sensor counter

Description: When the force sensor is active, the counter increments every cycle.

Power Up: This variable is set by the system

Screen: This variable is not directly assessible by menu

$FORCE_SENSE.$enable

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** BOOLEAN   **Memory:** CMOS

Name: Force sensor enable switch

Description: TRUE: Enable reading from force sensor FALSE: Disable reading from force sensor

Power Up: This variable takes effect on powerup

Screen: This is set by Lead-Thru option [MENU][SETUP][Lead Thru]

$FORCE_SENSE.$error_reg1

Minimum: 0x8000   **Maximum:** 0x7FFF   **Default:** 0   **KCL/Data:** RO   **Program:** RW
UIF: RO   **CRTL:** RO   **Data Type:** SHORT   **Memory:** CMOS

Name: FANUC Force sensor error register #1

Description: For FANUC Robotics internal use only.

Power Up: This variable is set by the system

Screen: This variable is not directly assessible by menu

$FORCE_SENSE.$error_reg2

Minimum: 0x8000   **Maximum:** 0x7FFF   **Default:** 0   **KCL/Data:** RO   **Program:** RW
UIF: RO   **CRTL:** RO   **Data Type:** SHORT   **Memory:** CMOS

Name: FANUC Force sensor error register #2

Description: For FANUC Robotics internal use only.

Power Up: This variable is set by the system

Screen: This variable is not directly assessible by menu

$FORCE_SENSE.$filter_coef

Minimum: 0x8000   **Maximum:** 0x7FFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW
UIF: RW   **CRTL:** RW   **Data Type:** SHORT   **Memory:** CMOS

Name: Force sensor filter coefficient

Description: For FANUC Robotics internal use only.

Power Up: This variable is set by the system

Screen: This variable is not directly assessible by menu

$FORCE_SENSE.$filter_time

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** REAL   **Memory:** CMOS

Name: Force sensor filter time constant

Description: For FANUC Robotics internal use only.

Power Up: This variable is set by the system

Screen: This variable is not directly assessible by menu

$FORCE_SENSE.$filter_type

Minimum: 0   **Maximum:** 10   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** INTEGER   **Memory:** CMOS

Name: Force sensor filter type

Description: For FANUC Robotics internal use only.

Power Up: This variable is set by the system

Screen: This variable is not directly assessible by menu

$FORCE_SENSE.$force

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RW   **UIF:** RO
CRTL: RO   **Data Type:** VECTOR   **Memory:** CMOS

Name: Force sensor force value

Description: FANUC integral force sensor force value units are kgf in force sensor coordinates.

Power Up: This variable is set by the system

Screen: This variable is not directly assessible by menu

$FORCE_SENSE.$force_data[1-6]

Minimum: 0x80000000   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** Not available
UIF: RO   **CRTL:** RO   **Data Type:** INTEGER   **Memory:** CMOS

Name: Force sensor raw data

Description: Force sensor raw data, [1..3] : force xyz, [4..6] : moment xyz units are gf and gfcm for FANUC integral force sensor

Power Up: N/A

Screen: This variable is not directly assessible by menu

$FORCE_SENSE.$fs_lowerlim[6]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not
available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Non-integral Force sensor lower alarm limit

Description: Lower limits, excess causes alarm

Power Up: limits effective on powerup

Screen: This is set by Lead-Thru option [MENU][SETUP][Lead Thru]

See Also: See Lead-Thru Teach documentation

$FORCE_SENSE.$fs_upperlim[6]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Non-integral Force sensor

Description: Upper limits, excess causes alarm

Power Up: limits effective on powerup

Screen: This is set by Lead-Thru option [MENU][SETUP][Lead Thru]

See Also: See Lead-Thru Teach documentation

$FORCE_SENSE.$port_type

Minimum: 0   **Maximum:** 5   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** INTEGER   **Memory:** CMOS

Name: Sensor I/O port type

Description: Internal use only

Power Up: This variable is set by the system

Screen: This is set by Lead-Thru option [MENU][SETUP][Lead Thru]

$FORCE_SENSE.$req_zero

Minimum: 0x8000   **Maximum:** 0x7FFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** SHORT   **Memory:** CMOS

Name: Force sensor zero request

Description: For FANUC Robotics internal use only.

Power Up: This variable is set by the system

Screen: This variable is not directly assessible by menu

$FORCE_SENSE.$sensor_data[1-6]

Minimum: 0x80000000   **Maximum:** 5   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** LONG   **Memory:** CMOS

Name: Non-integral Force sensor raw data

Description: Values read from non-integral force sensor

Power Up: N/A

Screen: This variable is not directly assessible by menu

$FORCE_SENSE.$sensor_data[6]

Minimum: 0x80000000   **Maximum:** 0x7FFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Non-integral Force sensor raw data

Description: Values read from the non-integral force sensor.

Power Up: This variable is set by the system

Screen: This variable is not directly assessible by menu

$FORCE_SENSE.$sensor_port[1-6]

Minimum: 0   **Maximum:** 5   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** USHORT   **Memory:** CMOS

Name: Sensor port number

Description: Sensor I/O port number as define by setup menu

Power Up: N/A

Screen: This is set by Lead-Thru option [MENU][SETUP][Lead Thru]

$FORCE_SENSE.$sensor_port[6]

Minimum: 0   **Maximum:** 0x7FFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** USHORT   **Memory:** Not available

Name: Sensor port number

Description: Sensor I/O port number as define by setup menu

Power Up: This variable is set by the system

Screen: This is set by Lead-Thru option [MENU][SETUP][Lead Thru]

$FORCE_SENSE.$sensor_type

Minimum: 0   **Maximum:** 5   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** INTEGER   **Memory:** CMOS

Name: Type of force sensor installed

Description: 0 = integral force sensor 1 = non-integral analog force sensor

Power Up: This variable is set by the system

Screen: This is set by Lead-Thru option [MENU][SETUP][Lead Thru]

$FORCE_SENSE.$sensor_zero[1-6]

Minimum: 0x80000000   **Maximum:** 5   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** LONG   **Memory:** CMOS

Name: Non-integral Force sensor zero request

Description: internal use only

Power Up: N/A

Screen: This is set by Lead-Thru option [MENU][SETUP][Lead Thru]

$FORCE_SENSE.$sensor_zero[6]

Minimum: 0x80000000   **Maximum:** 0x7FFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Non-integral Force sensor zero request

Description: internal use only

Power Up: This variable is set by the system

Screen: This is set by Lead-Thru option [MENU][SETUP][Lead Thru]

$FORCE_SENSE.$sensorcal_a[6]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Non-integral Force sensor zero request

Description: calibration parameter A

Power Up: effective on powerup

Screen: This is set by Lead-Thru option [MENU][SETUP][Lead Thru]

See Also: See Lead-Thru Teach documentation

$FORCE_SENSE.$sensorcal_b[6]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Non-integral Force sensor

Description: calibration parameter B

Power Up: effective on powerup

Screen: This is set by Lead-Thru option [MENU][SETUP][Lead Thru]

See Also: See Lead-Thru Teach documentation

$FORCE_SENSE.$sensorcal_c[6]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Non-integral Force sensor

Description: Calibration parameter C

Power Up: value is effective on powerup

Screen: This is set by Lead-Thru option [MENU][SETUP][Lead Thru]

See Also: See Lead-Thru Teach documentation

$FORCE_TRQ.$hp_dis_trq[6]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Current disturbance torque

Description: Obsolete. Use the $mor_grp.$cur_dis_trq system variable.

Power Up: This variable is set by the system

Screen: This variable is not directly assessible by menu

$FORCE_TRQ.$torque[6]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Torque value

Description: Current torque value.

Power Up: This variable is set by the system

Screen: This variable is not directly assessible by menu

$FQINT_RES[1-4]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** FQIN_RES_T   **Memory:** Not available

Name: Frequency Interface Channel Results and Readings Array

Description: $FQINT_RES is an array of structures. Each structure provides the current results or readings for one of four frequency inputs.

Power Up: N/A

$FQINT_RES[1].$freq_read

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Frequency Reading

Description: The Frequency Reading is supplied as an integer in units of .001 Hz. 1000 equals 1 Hz. For example, a value of 12345 indicates a frequency of 12.345 Hz. The maximum frequency input that is supported is 1,000 Hz. The minimum frequency input that is supported is determined by the setting of $FQINT_SETUP[].$FREQ_THRESH. This defaults to 2.0 Hz. The minimum is .05 Hz. The frequency is limited by the HDI Pulse Module hardware. Switch settings will limit the frequency to approximately 1,000 Hz., or 640 Hz. Any change to the Total Pulses value will indicate that there is a new Frequency Reading available. This system variable is read only to any application tool or user. Optionally, this frequency reading is smoothed or filtered using a sampling algorithm. See also $FQINT_SETUP[].$SAMPLE_AMT.

Power Up: N/A

See Also: See also $FQINT_SETUP[].$SAMPLE_AMT.

$FQINT_RES[1].$max_alrm_rp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: This is the Maximum Frequency Alarm that is reported.

Description: A True value for this variable indicates that a "Max. freq. exceeded" alarm has been posted or that this alarm has been disabled by the application software. This also indicates that the alarm should not be posted again for the specific channel until the controller is repowered or this variable is set to false (by the application software or the user). This variable can disable the alarm under certain conditions or during certain periods by setting it to true(be sure to reset it to false to reenable the alarm).

Power Up: N/A

See Also: See the system variable $FQINT_SETUP[].$FREQ_MAX_AL.

$FQINT_RES[1].$total_pulse

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Total Pulse Count

Description: The Total Pulse Count variable contains a count of the total number of incoming pulse signals from the frequency interface since the last time the variable was reset. If this input is used for a flow meter, then this total pulse count is proportional to the total quantity of material that has passed through the flow meter. To reset this variable, set $FQINT_RES[1].$total_pulse to 0. You can also reset this variable by setting it to a non-zero previous total as required by the application. This total counter is a continuous mode counter. If the upper count limit is exceeded, the counter wraps around to zero. The range of this counter is based on a 4 byte integer, so the maximum value is: 2,147,483,647. The Total Pulses will be set to zero when the controller is turned on. The Total Pulse counter has a limitation that if the maximum frequency is exceeded there are counts lost. Optionally there is an alarm that will occur if the maximum frequency is exceeded (as sensed by the controller).

Power Up: N/A

$FQINT_SETUP[1-4]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** FQIN_SET_T   **Memory:** Not available

Name: Frequency Interface Channel Setup Array

Description: $FQINT_SETUP is an array of structures. Each structure defines one of 4 frequency inputs.

Power Up: N/A

$FQINT_SETUP[1].$disable_avg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Disable Internal Averaging

Description: This variable is a setup configuration byte. Setting it to a value of 1 will disable internal averaging of the available frequency readings. The averaging increases the accuracy of frequency readings by as much as 50%. This does however cause a lag in response of 4 to 8 milliseconds. This internal averaging is completely separate from the sample amount averaging.

Power Up: N/A

$FQINT_SETUP[1].$fast_on

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Fast On From Zero Frequency Enable

Description: If true, this variable ignores the sample amount filter for the first nonzero sample after a zero frequency reading. With the fast on enabled following a 0 reading, the first non-zero reading will be immediately used as the frequency reading without regard to the value of the "Sample Amount." This allows the measured frequency or flow rate to quickly come up to the nominal reading when any enabling controls are turned on. In a fluid control system for example, there will be a flow enable valve or applicator trigger. When the trigger comes on there can be a need to stabilize flow readings as quickly as possible. This applies only to the Frequency Reading, and not the Total Pulses.

Power Up: N/A

$FQINT_SETUP[1].$freq_enable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Frequency Input Channel Enable

Description: This is an input from the operator that indicates there is hardware attached to this specific frequency input or channel. NOTE: If more than two channels are enabled then one of the following two constraints must be applied: 1). All channels must have a maximum frequency of 500 Hz. With this constraint the $FREQ_MAX_AL for all channels should be set to 505 Hz. 2). Only a maximum of two channels should provide an input frequency greater than 0 at the same time. Failure to implement one of these constraints is likely to cause slowed robot motion and slow operation of most any controller function.

Power Up: N/A

$FQINT_SETUP[1].$freq_max_al

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Maximum Alarm Frequency

Description: This is the frequency above which the "Maximum Freq. exceeded" alarm will be posted. If the Frequency Reading of the channel exceeds this frequency at any ,then this alarm will be posted and the system variable $FQINT_RES[].$MAX_ALRM_RP will be set to TRUE. The alarm will not be posted again for that channel until the controller is repowered or the variable $FQINT_RES[].$MAX_ALRM_RP is set to false (by the application software or the user). This alarm can be disabled by setting $FREQ_MAX_AL greater than the interface hardware will allow, or by setting the $MAX_ALRM_RP variable to TRUE at each power up. This alarm can be disabled under certain conditions or during certain periods by setting $MAX_ALRM_RP to TRUE (be sure to return it to FALSE to reenable the alarm). If more than two input frequencies are being supplied at the same time than the maximum frequency for all inputs is 500 Hz. If more than two input frequencies are being supplied, then this system variable should be set to 505 Hz for all channels.

Power Up: N/A

$FQINT_SETUP[1].$freq_thresh

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Frequency Threshold for Non-zero Values

Description: Frequency in units of Hz (cycles/second) below which the frequency is considered zero (0). This does not affect the Total Pulses value. This setting determines how long the frequency interface waits for a pulse before it sets the frequency to zero (0). For example, when this variable is set to 2.0 Hz, and .5 seconds has elapsed with no pulses received, then the frequency reading will be zero (0).

Power Up: N/A

$FQINT_SETUP[1].$sample_amt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Sample Amount Setting for the Averaging Filter

Description: This variable is used to enable and adjust a filter to average a number of frequency samples. The Sample Amount is used to calculate the running Average Frequency Reading ($FQINT_RES[n].$FREQ_READ). The algorithm is as follows: Frequency Reading New = ([{Sample Amount-1} * Frequency Reading Last] + Instantaneous Freq. New) / Sample Amount Setting the "Sample Amount" to a value of 1 disables this filtering such that the Average Frequency Reading will equal the newest, instantaneous frequency reading. The rate at which new samples are obtained is limited to one per 16 ms. For this reason at most higher frequencies there is an "averaging time" that is equal to the sample amount times 16 ms.

Power Up: N/A

$FRM_CHKTYP

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Switch Frame Check Type

Description: -1 = Prohibits FWD/BWD between two points which have different frame numbers. -2 = System does not check frame number at FWD and BWD. System does not change the frame number ($MNUFRAME_NUM, $MNUTOOL_NUM) when user FWD/BWD execute past a frame change. 2 = System does not check frame number at FWD and BWD. System changes the frame number ($MNUFRAME_NUM, $MNUTOOL_NUM) when user FWD/BWD execute past a frame change.

Power Up: Changes to this variable take effect immediately.

$FSAC_DEF_LV

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: FTP Server Access Control Default Access Level

Description: This defines the access level given to a remote FTP client logging into the robot if $FSAC_ENABLE is 1 and if no match is found with IP address in $FSAC_LIST[]. Access levels are:

- -1: No Access
- 0: Operator Level (read only)
- 1: Programmer Level
- 2: Setup Level
- 3-7: User Defined Levels (read only)
- 8: Install Level (full write access)

This variable is saved as part of SYSFSAC.SV.

Power Up: Effective immediately.

See Also: SYSTEM R-J3 ECBR-FTP Interface Setup and Operations Manual

$FSAC_ENABLE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
INTEGER   **Memory:** Not available

Name: FTP Server Access Control Enable Flag

Description: When set to 1, this enables checking of remote FTP clients when logging into
the robot to use the robot FTP server. If enabled, FTP access through the robot FTP server is
granted based on matching $FSAC_LIST.$IP_ADDRESS[], and using associated access level
($FSAC_LIST.$ACCESS _LVL); or using $FSAC_DEF_LVL if no match. (Saved in SYSFSAC.SV)

Power Up: Effective immediately.

See Also: SYSTEM R-J2 ECBR-FTP Interface Setup and Operations Manual

$FSAC_LIST[1-20] STRUCTURE

Minimum: MIN_FSAC_LST   **Maximum:** MAX_FSAC_LST   **Default:** DEF_FSAC_LST
KCL/Data: RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
FSAC_LST_T   **Memory:** Not available

Name: FTP Server Access Control Default Access Level

Description: See $FSAC_ENABLE. (Saved in SYSFSAC.SV)

Power Up: Effective immediately

See Also: SYSTEM R-J2 ECBR-FTP Interface Setup and Operations Manual

$FSAC_LIST[1].$ACCESS_LVL

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: FTP Server Access Control List Access Level

Description: This contains a list of hosts which can use FTP server on robot based on associated Access Level. Access Levels can be:

- -1: No Access (useful if you are using $FSAC_DEF_LVL but want to exclude one)

- 0: Operator Level (read only)

- 1: Programmer Level

- 2: Setup Level

- 3-7: User Defined Levels (read only)

- 8: Install Level (full write access)

This variable is saved as part of SYSFSAC.SV.

Power Up: Takes effect immediately

$FSAC_LIST[1].$APPS

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: FANUC Server Access Control applications

Description: $FSAC_LIST[x].$apps - ULONG - bitmask of which applicationsuse the xth entry in the table for authentication. This field defaults to 255 (bits in last byte set to all 1's. which means that the table entry is used by all applications using the FSAC feature)Applications using this field will interpret this field asfollows:-Least significant bit (bit 7) in the last byte is used by FTP.The next bit (bit 6) in the last byte is used by TELNETThe next bit (bit 5) in the last byte is used by Web server.The next bit (bit 4) in the last byte is used by PMON.All other bits are reserved for future use.An example use of this field is as follows:-If $FSAC_LIST[2].$APPS = 2, then bit 6 in the last byte is set,which means only TELNET will use the 2nd entry in the FSAC tablefor authentication of the client IP address. The addition of this field gives the user the flexibility ofseparating out which PCs are used to log in to the differentservers on the robot.(Saved in SYSFSAC.SV)

Power Up: Takes effect immediately

$FSAC_LIST[1].$CLNT_NAME

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: FTP Server Access Control LIst

Description: This contains a list of hosts which can use FTP or Web server on a robot based on associated Access Level. If $FSAC_LIST[n].$IP_ADDRESS is specified, then $FSAC_LIST[n].$CLNT_NAME is not used. The client name must be in the LOCAL/SHARED host table or DNS must be installed to resolve names. (Saved in SYSFSAC.SV)

Power Up: N/A

See Also: $FSAC_LIST[1].$IP_ADDRESS

$FSAC_LIST[1].$IP_ADDRESS

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: FTP Server Access Control List

Description: This contains a list of hosts which can use the FTP server on a robot based on the associated Access Level. This field contains the IP Address of the host system. Example: 199.5.148.62 $FSAC_LIST.$CLNT_NAME can be used instead to store the host name. (Saved in SYSFSAC.SV)

Power Up: Takes effect immediately

See Also: $FSAC_LIST[1].$CLNT_NAME

$FTP_DEF_OW

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: FTP Default Overwrite behavior

Description: Defines whether FTP server on robot will allow file overwrites on robot or not.

Power Up: Requires cold start to take effect

See Also: SYSTEM R-J2 ECBR-FTP Interface Setup and Operations Manual

$FX_6DOF_ENB

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Six Degrees of Freedom Enable

Description: This variable enables the ability to shim all six degrees of freedom.

Power Up: Changes to this variable take effect immediately

Screen: SYSTEM varaible screen

$FX_CLRSH_EN

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Clear Shim Enable

Description: This varible controls if the shim that is to be applied to a position, will be erased after the APPLY key is pressed.

Power Up: Changes to this variable take effect immediately

Screen: SYSTEM varaible screen

$FX_MAX_DIM

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Maximum Dimension

Description: This variable defines the maximum value allowed for a single shim, that can be applied to a position.

Power Up: Changes to this variable take effect immediately

Screen: SYSTEM varaible screen

$FX_MAX_NUM

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Maximum Number of Shims

Description: This variable defines the maximum number of shims allowed to be applied to a position.

Power Up: Changes to this variable take effect immediately

Screen: SYSTEM varaible screen

$FX_TPSH_ENB

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Teach Pendant Shim Enable

Description: If this variable is FALSE, the shim utility will not adjust TP positions.

Power Up: Changes to this variable take effect immediately

Screen: SYSTEM varaible screen

2.7 "G" System Variables

$GE_INT_CFG STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Genius Interface Configuration

Description: This variable structure contains configuration information for the Genius interface option. This system variable has no effect and might be left at the default value if the Genius interface option is not installed. Individual fields within this structure are described below.

Power Up: N/A

$GE_INT_CFG.$clr_last_st

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** BOOLEAN   **Memory:** CMOS

Name: Clear Last State

Description: This field is used in conjunction with the $GE_INT_CFG.$PC_BUS_ADDR
system variable. If the PC at the bus address specified in $GE_INT_CFG.$PC_BUS_ADDR
is no longer communicating on the bus, the state of the inputs received from that PC are either
zeroed or left at their last state, depending on the setting of $GE_INT_CFG.$CLR_LAST_ST.
If $GE_INT_CFG.$CLR_LAST_ST = TRUE, the inputs will be set to zero. If
$GE_INT_CFG.$CLR_LAST_ST = FALSE, the inputs will be left at their last state.

Power Up: Changes to this variable take effect immediately.

See Also: $GE_INT_CFG.$PC_BUS_ADDR

$GE_INT_CFG.$pc_bus_addr

Minimum: -1   **Maximum:** 31   **Default:** -1   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** INTEGER   **Memory:** CMOS

Name: PC Bus Address

Description: This system variable is used in conjunction with the $GE_INT_CFG.$clr_last_st
to provide fail safe functionality in the event of a communication loss with the GEFanuc PC.
$GE_INT_CFG.$PC_BUS_ADDR is set to the bus address of the GEFanuc PC that is sending
output data to the robot. Accepted settings for this system variable are -1 through 31. However, 0
through 31 are valid bus addresses for the PC. The value -1 is an invalid address which is used to
disable the functionality. If the PC at the bus address specified in this system variable is no longer
communicating on the bus, the state of the inputs received from that PC are either zeroed or left at
their last state, depending on the setting of $GE_INT_CFG.$clr_last_st.

Power Up: Changes to this variable take effect immediately.

See Also: $GE_INT_CFG.$clr_last_st

$GENOV_ENB

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: General Override Enable

Description: Enables changes to the general override via the %UP and %DOWN keys. This variable can be used to prevent unauthorized override changes. If this variable is set to FALSE, changes are prohibited and pressing the %UP and %DOWN keys has no effect.

Power Up: Changes to this variable take effect immediately.

$GROUP STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Group Dependent Motion Variables

Description: Motion parameters that can change from one motion to the other but remain effective for the entire motion interval once the motion is issued and regardless of when subsequent changes to the variables are made. Individual fields within this structure are described below.

Power Up: Effective with next motion

$GROUP[1].$accel_ovrd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Acceleration/deceleration Override

Description: When $USERELACCEL is TRUE: actual acceleration/deceleration time = usual acceleration/deceleration time * $ACCEL_OVRD /100. If $ACCEL_OVRD = 0 it is treated as if it were 100. In the KAREL system, if RELACCEL is defined in associated data, actual acceleration/deceleration time = usual acceleration/dec eleration time * ($ACCEL_OVRD/100) * (RELACCEL/100).

Power Up: Effective with next motion

$GROUP[1].$accu_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Accuracy Area Number

Description: Accuracy area number used in this motion.

Power Up: N/A

$GROUP[1].$armload

Minimum: 0.0   **Maximum:** 10000.0   **Default:** 0.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Weight of Arm Payload

Description: Weight of payload on robot arm during current motion in Kg.

Power Up: Effective with next motion

$GROUP[1].$asymfltrenb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Asymmetric Filter Enable

Description: Reserved for Internal use by FANUC Robotics. Core TurboMove Joint Softpart sets $asymfltrenb. If TRUE, asymmetric filter is used for motion with PTP short motion.

Power Up: Effective with next motion

$GROUP[1].$cartfltrenb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Cartesian filter enable

Description: Internal use. Core Cartesian Softpart sets $cartcartenb. If TRUE, the Cartesian filter is used for motion with Cartesian motype.

Power Up: Effective with next motion

$GROUP[1].$cnstnt_path

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Constant Path

Description: Running the same taught program at different speed overrides will produce the same path if $cnstnt_path is set to TRUE. This is called the constant path feature. This feature can be turned off by setting $cnstnt_path to FALSE, which means the robot path will vary as speed override changes. If this feature is enabled, be careful when changing the speed override after the program has started. In this case the path will not be the same as the taught path. If a change in override setting is required during program run, pause the program (HOLD or release the SHIFT key), change the speed override setting, and then resume the program.

Power Up: Effective with next motion

$GROUP[1].$cnt_accel1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Continuous Acceleration Time 1

Description: Reserved for Internal use by FANUC Robotics. Used for Cartesian Filter Softpart. This is the time in msec of the first stage Cartesian Filter for motions with CNTxx termtype. Not supported in this release.

Power Up: Effective immediately.

$GROUP[1].$cnt_accel2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Continuous Acceleration Time 2

Description: Reserved for Internal use by FANUC Robotics. Used for Cartesian Filter Softpart. This is the time in msec of the second stage Cartesian Filter for motions with CNTxx termtype.

Power Up: Effective immediately

$GROUP[1].$cnt_dyn_acc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Continuous dynamic acceleration.

Description: Allow long filter to short filter switching for a sequence of continuous motions. 0: For continuous motions, the planner only allows short to long filter switching, and it does not allow long filter lengths to become shorter. 1: Allows long filter length to short filter length switching.

Power Up: Effective with next motion

$GROUP[1].$cnt_shortmo

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Continuous Short Motion Enable

Description: Enables/disables acceleration time optimization for NODECEL or VARDECEL termtype moves.

Power Up: Effective with next motion

$GROUP[1].$cnt_speedup

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enable/Disable speedup

Description: This is switch to enable/disable maxaccel function (fast acceleration/ deceleration feature) for Turbo move and standard short motion. If termination type of the motion is cnt 0..100 and $cnt_shortmo = TRUE and the motion is not short motion and $cnt_speedup is TRUE, max acceleration function for Turbo move /Standard short motion is applied.

Power Up: Effective with next motion

Screen: No

$GROUP[1].$contaxisvel

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Continuous Axis Velocity (Used by the Continuous Turn Axis option)

Description: For systems installed with continuous turn axis, $contaxisvel indicates the velocity of continuous turn motion in percentage. $contaxisvel can have values between -100.0 and +100.0. The magnitude is a percentage of maximum joint speed. The sign indicates which (joint) direction (+ or -) to turn continuously.

Power Up: Effective with next motion

$GROUP[1].$crccompenb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Cartesian Circular Compensation Enable

Description: Reserved for Internal use by FANUC Robotics. Core Cartesian Softpart sets $crccompenb. If TRUE, path accuracy improvement for circular motype is enabled.

Power Up: Effective with next motion

$GROUP[1].$deceltol

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Percentage of Deceleration

Description: When VARDECL termtype is selected, $deceltol is used to specify the amount of deceleration in percentage. $deceltol=n means n% deceleration.

Power Up: Effective with next motion

$GROUP[1].$dyn_i_comp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Dynamic Compensation

Description: Enables feature supported by some robot libraries for dynamic speed and acceleration control.

Power Up: Effective with next motion

$GROUP[1].$ext_speed

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Extended Axes Speed Percentage

Description: Used when extended axes are present. If the value is 1..100, then the motion for the extended axes is planned with a speed of: $PARAM_GROUP[].$jntvellim[] = $group[].$ext_speed * 0.01 If the motion is simultaneous ($group.$ext_indep = FALSE), then the motion which dominates, the robot or the extended axes, will determine the total motion interval. If the value is zero, then for JOINT motion and non-integral Cartesian motion, the extended axes speed is determined from the $SPEED value the same as for a JOINT motion. Integral axes motion planning is done with $JNTVELLIM for Cartesian motion if the value is zero.

Power Up: Effective with next motion.

$GROUP[1].$motype

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** MOTYPE_E   **Memory:** Not available

Name: Motion Type

Description: Defines the type of motion interpolation used for KAREL motion statements using the following values: 6 = JOINT 7 = LINEAR 8 = CIRCULAR For the KAREL user, the value of $MOTYPE can be overridden in a path by setting the SEGMOTYPE field in the standard associated data. The default value is set each time a program is executed.

Power Up: Effective with next motion

$GROUP[1].$orient_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ORIENT_E   **Memory:** Not available

Name: Orientation Type

Description: In a Cartesian move, $ORIENT_TYPE specifies the type of orientation control to be used. When $MOTYPE is LINEAR. The choices are: 1 = RSWORLD, two angle orientation control 2 = AESWORLD, three angle orientation control (default) 3 = WRISTJOINT, wrist-joint orientation control For CIRCULAR motion, three angle orientation planning is used regardless of the value of $orient_type. The appropriate default value of $orient_type is set each time a program is executed.

Power Up: Effective with next motion

$GROUP[1].$ornt_mrot

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: MROT Orientation

Description: This variable is used to choose MROT functionality for M-410 series robots (4-axis robots). If this variable is TRUE, then with MROT motion option the system will try to minimize tool orientation change in Cartesian space for the selective motion (JOINT or WJNT) if applicable. If this variable is FALSE (default value), then with MROT motion option the system will try to minimize each individual joint angle change for the selective motin (JOINT or WJNT) if applicable.

Power Up: N/A

$GROUP[1].$pathres_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: (Original) Path resume enable

Description: Reserved for Internal use by FANUC Robotics. Softpart options sets $pathres_enb. If set to TRUE, when a stopped motion is resumed, robot moves to stopped position first before proceeding to destination position. If set to FALSE, robots moves directly from its current position to the destination position.

Power Up: Effective with next motion

$GROUP[1].$payload

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Weight of Payload

Description: Weight of payload during current motion in Kg.

Power Up: N/A

$GROUP[1].$reserve1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Reserved for future use.

Description: A void variable reserved for future use by FANUC Robotics.

Power Up: Effective with next motion

$GROUP[1].$rotspeed

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Rotational Speed

Description: The command speed for orientation change in Cartesian motion. If the orientation change dominates, the rotation of the orientation axes as defined by $GROUP.$orient_ty pe is commanded to this value in deg/sec. This variable is only used for KAREL motion. For TPE motion it is replaced by the deg/sec speed unit in the motion instruction.

Power Up: Effective with next motion

$GROUP[1].$seg_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Segment Time

Description: For KAREL systems only. $seg_time controls the method used to compute segment time (the time to move from a start position to a destination position). Unit is millisecond. Default $seg_time is 0. Also each time a program is executed, $seg_time is set to 0. When $seg_time is 0, system uses $SPEED to plan for the segment time. This is the normal (default) mode of the operation for the system, where the speed remains constant but the travel time varies based on segment distance. For the special case where the user wants to have a direct control over segment time, $seg_time can be used. By setting $seg_time is a positive value in units of msec, the system ignore $SPEED and set the segment time equal to the specified $seg_time. this means that the speed will vary depending on segment distance.

Power Up: Effective with next motion

$GROUP[1].$segtermtype

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** TERMTYPE_E   **Memory:** Not available

Name: Segment Termination Type (for KAREL paths only)

Description: Defines the default termination type at the end of each intermediate path node (all but the last node in a path), using the following values: 1 = FINE 4 = NODECEL 2 = COARSE 5 = VARDECEL 3 = NOSETTLE The value of $SEGTERMTYPE can be overridden in a path by setting the SEGTERMTYPE field in the standard associated data. The default value is set each time a program is executed.

Power Up: Effective with next motion

$GROUP[1].$sm_profile

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SM_PROFILE_E   **Memory:** Not available

Name: Short Motion Profile

Description: Used for computation of the planning segment time when the segment time is not an exact multiple of the Interpolation time. 0: The segment time will be extended to next multiple of interpolation time. 1: The segment time will be rounded off to a multiple of interpolation time. 2: The segment time will be trimmed to a previous multiple of interpolation time.

Power Up: Effective with next motion

$GROUP[1].$speed

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Motion Speed

Description: The motion will proceed for Linear and Circular with the specified command value in mm/sec. For JOINT motion, the command value is a percentage of $param_group.$jntvellim as scaled by the ratio of $speed to $param_group.$speedlimjnt.

Power Up: Effective with next motion

$GROUP[1].$ta_profile

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** TA_PROFILE_E   **Memory:** Not available

Name: Time Distance Profile

Description: Time distance acceleration/deceleration profile.

Power Up: Effective with next motion

$GROUP[1].$termtype

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** TERMTYPE_E   **Memory:** Not available

Name: Termination Type

Description: Defines the type of KAREL motion termination at the end of an interval using the following values: 1 = FINE 4 = NODECEL 2 = COARSE 5 = VARDECEL 3 = NOSETTLE The default value of $TERMTYPE is set each time a program is executed.

Power Up: Effective with next motion

$GROUP[1].$time_shift

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Time Shift (for local condition handlers)

Description: If option is installed, when $USETIMESHFT is TRUE: $time_shift specifies the time, in milliseconds, to shift the triggering of local condition handler (from where the system would normally triggers).

Power Up: N/A

$GROUP[1].$uframe

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION   **Memory:** Not available

Name: User Coordinate Frame

Description: $uframe is used by KAREL system only. For the teach pendant programmer, the corresponding variable is $MNUFRAME. $uframe is the position of a user frame of reference. All programmed positions are defined with respect to $uframe. Any value you assign to $uframe is defined with respect to the world coordinate system. By default, $uframe is identical to the world coordinate system, meaning $uframe = $NILP.

Power Up: Effective with next motion

$GROUP[1].$use_cartacc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use/unused Cartesian Mincycle Algorithm (For systems with this option)

Description: This variable is ignored for systems without the Cartesian mincycle option. If the Cartesian mincycle option is installed, $use_cartacc enables or disables the Cartesian mincycle feature. Cartesian mincycle option is used to improve Cartesian cycle time.

Power Up: Effective with next motion

$GROUP[1].$use_config

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use Configuration

Description: To move along a Cartesian (linear or circular, for example) path, the configuration of the start position and destination position must be identical. Otherwise it is impossible to trace out the Cartesian path. $use_config can be used to decide what to do if the start configuration is inconsistent (different) from the destination configuration in a Cartesian move. If the value of $use_config is TRUE, the inconsistency causes an error that pauses the program. If the value is FALSE, system always chooses the start configuration to perform the Cartesian move (regardless of the taught destination configuration).

Power Up: Effective with next motion

$GROUP[1].$use_pathacc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use/unused Path Acceleration (for future use)

Description: Flag for turn on/off path acceleration function.

Power Up: Effective with next motion

$GROUP[1].$use_shortmo

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use/unused of Short Motion

Description: $use_shortmo enables or disables the optional JOINT motion mincycle algorithm. (TurboMove option). If $use_shortmo is TRUE, minimum motion time is planned making use of motor information in $TSR_GRP and current configuration of the robot. This feature is used in conjunction with sliding mode servo control option.

Power Up: Effective with next motion

$GROUP[1].$use_turns

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use Position Turn Numbers

Description: For JOINT motion, if $USE_TURNS is true (default), then the exact turn number specified in the destination position configuration string will be used for the motion. If $USE_TURNS is false, for JOINT motion, the turn number of the destination position is ignored and the system moves along the shortest joint angle path to the destination.

Power Up: Effective with next motion

$GROUP[1].$use_wjturns

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use Wristjoint Turn Number

Description: If set to TRUE, then use specified destination turn number for wristjoint motion. If set to TRUE, the wristjoint may 'wrap' or 'unwrap' more than 180 degrees during the motion. If set to FALSE, the wristjoint motion will be the same as OR_RSWORLD orient type and take the shortest rotational path.

Power Up: Effective with next motion

$GROUP[1].$usemaxaccel

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use/unused Maximum Acceleration.

Description: $usemaxaccel enables or disables the fast acceleration/deceleration feature. If it set to TRUE, the required acceleration time is reduced as a function of motion speed. If it set to FALSE, the normal acceleration time is applied.

Power Up: Effective with next motion

$GROUP[1].$userelaccel

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use/unused Relative Acceleration (acceleration override).

Description: $userelaccel enables or disables the acceleration override feature. If $userelaccel is TRUE, acceleration time is multiplied by $accel_ovrd. If $userelaccel is FALSE, $accel_ovrd is ignored by the system when computing acceleration time.

Power Up: Effective with next motion

$GROUP[1].$usetimeshft

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use/unused Time Shift for KAREL Path local condition (for future use).

Description: $usetimeshft enables or disables adjusting the timing of local conditions feature. If $usetimeshft is TRUE, the system variable $timeshift can be used to adjust the timing of local condition handlers from outside the KAREL program (optional feature). If $usetimeshft is FALSE, the value of $timeshift will be ignored.

Power Up: Effective with next motion

$GROUP[1].$utool

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION   **Memory:** Not available

Name: Tool Coordinate System

Description: $utool is used by KAREL system only. For TPE user, the corresponding variable is $MNUTOOL. $utool defines the location and orientation of the tool that is attached to the faceplate. The position in $utool is defined with respect to a fixed coordinate system on the robot faceplate and is the origin of the TOOL FRAME. By default, the value of $utool is set to $NILP, which means the position of the TCP is identical to the location and orientation of the faceplate coordinate system. You must change the value of $utool to define the specific tool you are using.

Power Up: Effective with next motion

2.8 "H" System Variables

$HBK_IO_IDX

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Mapped HBK (Hand broken signal) I/O index number

Description: Not used

Power Up: Changes to this variable take effect immediately.

$HBK_IO_TYPE

Minimum: 0   **Maximum:** 31   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Mapped HBK (Hand broken signal) I/O type

Description: Not used

Power Up: Changes to this variable take effect immediately.

$HBK_MAP_ENB

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Host Shared

Description: Not usedArray of structures defining the Internet node name to address mapping on the controller. This array is used for the same purpose as the /etc/hosts file on BSD UNIX systems. Individual members of structure are described below.

Power Up: Changes to this variable take effect immediately.Requires a cold start if the element corresponding to $HOSTNAME is changed. Changes to other elements which correspond to Client connections take effect immediately. This should not include HOSTNAME or ROUTERNAME entries. This structure is saved in the SYSHOST.SV file, and can be shared between robots.

Screen: SYSTEM Variables screen $HOST_SHARED STRUCTURE SETUP MOTET screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOST_ERR

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ERR_MASK_T   **Memory:** Not available

Name: HOST ERROR Structure

Description: Variable used to set the Facility Mask and Severity Mask for host communications error reporting such as by the MMS InformationReport service. Available only if the KSL, MOTET or MAP option has been installed.

Power Up: Changes to this variable take effect immediately.

Screen: SYSTEM System Variables screen or KCL

See Also: SYSTEM R-J KSL Interface Setup and Operations Manual SYSTEM R-J MAP Interface Setup and Operations Manual SYSTEM R-J MOTET Interface Setup and Operations Manual

$HOST_ERR STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Host Error Structure

Description: Variable used to set the Facility Mask and Severity Mask for host communications error reporting such as by the MMS Information Report service. Available only if the KSL, MOTET or MAP options have been installed.

Power Up: Changes to this variable take effect immediately.

Screen: SYSTEM Variables screen or KCL

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOST_PDUSIZ

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name:

Description: Specifies the maximum number of octets or bytes that can be used on one message Protocol Data Unit (PDU). Available only if the KSL, MOTET or MAP options have been installed.

Power Up: Requires a cold start to take effect.

Screen: SYSTEM Variables screen or KCL

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOST_SHARED[1].$h_addr

Minimum: ""   **Maximum:** ""   **Default:** ""   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Node Address

Description: This is the Internet (IP) address of the node defined by the first element of $HOST_SHARED array. It should be unique across the network. It is a string and should have the following format: DDD.DDD.DDD.DDD where DDD is a decimal number, 0 <= DDD <= 255.

Power Up: See $HOST_SHARED.

Screen: SETUP MOTET screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOST_SHARED[1].$h_addrtype

Minimum: 0   **Maximum:** 99   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Address Type

Description: An integer Internet variable whose value is 2 by default and should not be changed.

Power Up: See $HOST_SHARED.

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOST_SHARED[1].$h_length

Minimum: 0   **Maximum:** 17   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Length

Description: An integer Internet variable whose value is 4 by default and should not be changed.

Power Up: See $HOST_SHARED.

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOST_SHARED[1].$h_name

Minimum: ""   **Maximum:** ""   **Default:** ""   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Node Name

Description: A string of up to 32 characters representing the node name of the first element in $HOST_SHARED array. Example: KCL>set var $HOST_SHARED[1].$H_NAME='MICKEY'

Power Up: See $HOST_SHARED.

Screen: SETUP MOTET screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTC_CFG[1].$PWRD_TIMOUT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Host Client Tag Password Timeout

Description: Specifies the default timeout value, after which an existing connection's user name will be set to "anonymous," and password will be set to "guest."

Power Up: Requires a cold start to take effect.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTC_CFG[1].$SERVER_PORT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Server Port Number

Description: Specifies the TCP or UDP port number on the server. For Cn: this is the porton the foreign computer. For Sn: this is the port on the robot controller.

Power Up: Effective immediately.

Screen: None for R-J3 V5.22. Accessed using System Varibles Display Screen.

See Also: SYSTEM R-J3 V5.22 Socket Messaging Interface Setup and Operations Manual

$HOSTC_CFG[1].$STRT_PATH

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Host Client Tag Path (Startup)

Description: Specifies the startup Host path.

Power Up: This variable takes effect at cold start. Upon power-up, the startup Host path is copied into the current Host path, where you can modify it as necessary.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTC_CFG[1].$STRT_REMOTE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Host Client Tag Remote Host Name (Startup)

Description: Specifies the startup (default) remote host name to which a connection will be made. This is used by certain host communications services such as Information Report.

Power Up: Requires a cold start to take effect.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTC_CFG[1].$USERNAME

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Host Client Tag User Name

Description: Specifies the default user name to be used when establishing communications with a remote Host.

Power Up: Takes effect immediately.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTC_CFG[8] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Host Client Tag Configuration Structure

Description: Variable structure containing configuration information for Host Client Tags. This information is used to define how they are used in the R-J3 controller. These variables are arrays of 8 elements and are available only if the KSL, MOTET or MAP option has been installed.

Power Up: Determined on a per-field basis. See individual fields for specifics.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTC_CFG[n].$comment

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Host Client Tag Comment

Description: Provides an area to include up to 16 characters of information used to describe the communications tag being defined.

Power Up: Changes to this variable take effect immediately.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTC_CFG[n].$mode

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Host Client Tag Mode

Description: Not currently used.

Power Up: Not currently used.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTC_CFG[n].$oper

Minimum: 0   **Maximum:** 2   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Host Client Tag Operation

Description: Specifies the state to which the tag will attempt to be set at powerup.

Power Up: Changes to this variable take effect immediately.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTC_CFG[n].$path

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Host Client Tag Path (Current)

Description: Specifies the current (default) Host path. When a file-spec does not include the path, this default value is used.

Power Up: Changes to this variable take effect immediately. Upon power-up, the startup Host path is copied into the current Host path, where you can modify it as necessary.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTC_CFG[n].$port

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Host Client Tag Port

Description: Specifies the serial port over which this tag will operate. This is not required on network based protocols such as MAP and MOTET.

Power Up: Changes to this variable take effect immediately.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTC_CFG[n].$protocol

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Host Client Tag Protocol

Description: Specifies the name of the protocol that will be used with the tag.

Power Up: Changes to this variable take effect immediately.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTC_CFG[n].$remote

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Host Client Tag Remote Host Name

Description: Specifies the remote host name to which a connection will be made. This is used by certain host communications services such as Information Report.

Power Up: Requires a cold start to take effect.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTC_CFG[n].$reperrs

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Host Client Tag Error Reporting Flag

Description: When set to TRUE, indicates that errors sent to the ERROR LOG will also be sent to this tag via the MMS Information Report service.

Power Up: Requires a cold start to take effect.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTC_CFG[n].$state

Minimum: 0   **Maximum:** 2   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Host Client Tag State

Description: Specifies the current state of the tag.

Power Up: Changes to this variable take effect immediately.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTC_CFG[n].$timeout

Minimum: 0   **Maximum:** 2147483646   **Default:** 15   **KCL/Data:** RW   **Program:** RW **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Host Client Tag Timeout

Description: Specifies the number of minutes of inactivity on the network before a connection will be concluded by the R-J2 controller. This variable takes effect at cold start.

Power Up: Requires a cold start to take effect.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTENT[1-12] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Host Entry

Description: Array of structures defining the Internet node name to address mapping on the controller. This array is used for the same purpose as the /etc/hosts file on BSD UNIX systems. Individual members of structure are described below.

Power Up: Requires a cold start if the element corresponding to $HOSTNAME is changed. Changes to other elements which correspond to Client connections take effect immediately.

Screen: SETUP MOTET screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTENT[1].$H_ADDR

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Node Address

Description: This is the Internet (IP) address of the node defined by the first element of $HOSTENT array. It should be unique across the network. It is a string and should have the following format: DDD.DDD.DDD.DDD where DDD is a decimal number, 0 <= DDD <= 255.

Power Up: See $HOSTENT.

Screen: SETUP MOTET screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTENT[1].$H_ADDRTYPE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Address Type

Description: An integer Internet variable whose value is 2 by default and should not be changed.

Power Up: See $HOSTENT.

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTENT[1].$H_LENGTH

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Length

Description: An integer Internet variable whose value is 4 by default and should not be changed.

Power Up: See $HOSTENT.

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTENT[1].$H_NAME

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Node Name

Description: A string of up to 32 characters representing the node name of the first element in HOSTENT array. Example: KCL>set var $HOSTENT[1].$H_NAME='MICKEY'

Power Up: See $HOSTENT.

Screen: SETUP MOTET screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTNAME

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Hostname

Description: A string of up to 32 characters defining the name which represents the robot on the network. It should be unique across the network. It must also be defined as an element in the $HOSTENT array.

Power Up: Requires a cold start to take effect.

Screen: SETUP MOTET screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTS_CFG[8] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Host Server Tag Configuration Structure

Description: Variable structure containing configuration information for Host Server Tags. This information is used to define how they are used in the R-J3 controller. These variables are arrays of 8 elements and are available only if the KSL, MOTET or MAP option has been installed.

Power Up: Determined on a per-field basis. See individual fields for specifics.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTS_CFG[n].$comment

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Host Server Tag Comment

Description: Provides an area to include up to 16 characters of information used to describe the communications tag being defined.

Power Up: Changes to this variable take effect immediately.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTS_CFG[n].$mode

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Host Server Tag Mode

Description: Not currently used.

Power Up: Not currently used.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTS_CFG[n].$oper

Minimum: 0   **Maximum:** 2   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Host Server Tag Operation

Description: Specifies the state to which the tag will attempt to be set at powerup.

Power Up: Changes to this variable take effect immediately.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTS_CFG[n].$port

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Host Server Tag PORT

Description: Specifies the serial port over which this tag will operate. This is not required on network based protocols such as MAP and MOTET.

Power Up: Changes to this variable take effect immediately.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTS_CFG[n].$protocol

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Host Server Tag Protocol

Description: Specifies the name of the protocol that will be used with the tag.

Power Up: Changes to this variable take effect immediately.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTS_CFG[n].$remote

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Host Server Tag Remote Host Name

Description: Specifies the remote host name to which a connection will be made. This is used by certain host communications services such as Information Report.

Power Up: Requires a cold start to take effect.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTS_CFG[n].$reperrs

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Host Server Tag Error Reporting Flag

Description: When set to TRUE, indicates that errors sent to the ERROR LOG will also be sent to this tag via the MMS Information Report service.

Power Up: Requires a cold start to take effect.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTS_CFG[n].$state

Minimum: 0   **Maximum:** 2   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Host Server Tag State

Description: Specifies the current state of the tag.

Power Up: Effective immediately.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HOSTS_CFG[n].$timeout

Minimum: 0   **Maximum:** 2147483646   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Host Server Tag Timeout

Description: Specifies the number of minutes of inactivity on the network before a connection will be concluded by the R-J3 controller. This variable takes effect at cold start.

Power Up: Requires a cold start to take effect.

Screen: SETUP Tags screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$HSCDMNGRP[1-2]

Minimum: MIN_HSCDMNGRP   **Maximum:** ""   **Default:** DEF_HSCDMNGRP   **KCL/Data:** RW   **Program:** Not available   **UIF:** RO   **CRTL:** RW   **Data Type:** HSCD_MNG_T   **Memory:** CMOS

Name: Menu data for COL GUARD SETUP menu

Description: These variables store internal and user data associated with the COL GUARD setup menu. See individual descriptions of the members of $HSCDMNGRP[1] and $HSCDMNGRP[2] for details.

Power Up: N/A

$HSCDMNGRP[1].$auto_reset

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Automatically reset sensitivity on program abort for group 1.

Description: This variable is a flag that, when set to 1, causes the collision guard sensitivity to be reset for group 1 to the value stored in $hscdmngrp[1].$threshold when a teach pendant program that uses COL ADJUST is aborted. When this flag is 0, the sensitivity will not be reset in this way.

Power Up: N/A

$HSCDMNGRP[1].$coll_mode

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Status of high sensitivity collision detection, group 1

Description: When this variable is TRUE, high sensitivity collision detection is enabled for group 1. When this variable is FALSE, standard collision detection is enabled for group 1. This variable is set by the COL GUARD SETUP menu and should not be set directly by the user.

Power Up: N/A

$HSCDMNGRP[1].$do_enable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: DOUT used to indicate whether Collision Guard is enabled on group 1.

Description: This variable indicates which Digital Output will be asserted when High Sensitivity Collision Detection is enabled on group 1.

Power Up: N/A

$HSCDMNGRP[1].$do_err

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: DOUT number set on Group 1 Collision Detect error.

Description: This variable defines which Digital Output will be asserted when a Collision Detected Alarm occurs on group 1.

Power Up: N/A

$HSCDMNGRP[1].$macro_reg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Register number used by the teach pendant instruction COL ADJUST for group 1.

Description: This variable contains the register number that the COL ADJUST teach pendant instruction uses to set the collision guard sensitivity for group 1. This variable is set by the COL GUARD SETUP menu and should not be set directly by the user.

Power Up: N/A

$HSCDMNGRP[1].$param_verid

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Collision guard servo parameter ID for group 1.

Description: This variable is set by the system to indicate the servo parameter version currently in use by collision guard for group 1. This variable should never be modified by the user.

Power Up: N/A

$HSCDMNGRP[1].$param119[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Default values of servo parameter 119 by axis for group 1.

Description: This variable contains the robot library default values of servo parameter 119, by axis, for group 1. It should never be modified by the user.

Power Up: N/A

$HSCDMNGRP[1].$param120[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Default values of servo parameter 120 by axis for group 1.

Description: This variable contains the robot library default values of servo parameter 120, by axis, for group 1. It should never be modified by the user.

Power Up: N/A

$HSCDMNGRP[1].$param121[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Default values of servo parameter 121 by axis for group 1.

Description: This variable contains the robot library default values of servo parameter 121, by axis, for group 1. It should never be modified by the user.

Power Up: N/A

$HSCDMNGRP[1].$param122[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Default values of servo parameter 122 by axis, group 1.

Description: This variable contains the robot library default values of servo parameter 122, by axis, group 1. It should never be modified by the user.

Power Up: N/A

$HSCDMNGRP[1].$param123[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Default values of servo parameter 123 by axis, group 1.

Description: This variable contains the robot library default values of servo parameter 123, by axis, group 1. It should never be modified by the user.

Power Up: N/A

$HSCDMNGRP[1].$param124[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Default values of servo parameter 124 by axis, group 1.

Description: This variable contains the robot library default values of servo parameter 124, by axis, group 1. It should never be modified by the user.

Power Up: N/A

$HSCDMNGRP[1].$param125[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Default values of servo parameter 125 by axis, group 1.

Description: This variable contains the robot library default values of servo parameter 125, by axis, group 1. It should never be modified by the user.

Power Up: N/A

$HSCDMNGRP[1].$stnd_cd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Sensitivity level for standard collision detection, group 1.

Description: This variable contains the sensitivity value for standard collision detection for group 1. It is the value used when $hscdmngrp[1].$coll_mode is set to FALSE.

Power Up: N/A

$HSCDMNGRP[1].$threshold

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Current collision guard sensitivity setting for group 1

Description: This variable contains the current sensitivity setting for group 1. It is set by the COL GUARD setup menu. This variable should not be set directly by the user.

Power Up: N/A

$HSCDMNGRP[1].$upd_groups

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Sensitivity change on group 1 using COL ADJUST.

Description: This variable will be set to 1 when collision guard sensitivity has been changed by the COL ADJUST instruction on group 1 within a teach pendant program.

Power Up: N/A

$HSCDMNGRP[2].$auto_reset

Minimum: 0   **Maximum:** 5   **Default:** 1   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** INTEGER   **Memory:** CMOS

Name: Automatically reset sensitivity on program abort for group 2.

Description: This variable is a flag that, when set to 1, causes the collision guard sensitivity to be reset for group 2 to the value stored in $hscdmngrp[1].$threshold when a teach pendant program that uses COL ADJUST is aborted. When this flag is 0, the sensitivity will not be reset in this way.

Power Up: N/A

$HSCDMNGRP[2].$coll_mode

Minimum: 0   **Maximum:** 1   **Default:** 1   **KCL/Data:** RO   **Program:** Not available   **UIF:** RO   **CRTL:** RO   **Data Type:** BOOLEAN   **Memory:** CMOS

Name: Status of high sensitivity collision detection, group 2.

Description: When this variable is TRUE, high sensitivity collision detection is enabled for group 1. When this variable is FALSE, standard collision detection is enabled for group 1. This variable is set by the COL GUARD SETUP menu and should not be set directly by the user.

Power Up: N/A

$HSCDMNGRP[2].$macro_reg

Minimum: 0   **Maximum:** 32   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** LONG   **Memory:** CMOS

Name: Register number for group 2.

Description: This variable contains the register number that the COL ADJUST teach pendant instruction will use to set the collision guard sensitivity for group 2. This variable is set by the COL GUARD SETUP menu and should not be set directly by the user.

Power Up: N/A

$HSCDMNGRP[2].$param_verid

Minimum: ""   **Maximum:** ""   **Default:** "12345678"   **KCL/Data:** RO   **Program:** Not available   **UIF:** RO   **CRTL:** RO   **Data Type:** STRING   **Memory:** CMOS

Name: Collision guard servo parameter ID for group 2.

Description: This variable is set by the system to indicate the servo parameter version currently in use by collision guard for group 2. This variable should never be modified by the user.

Power Up: N/A

$HSCDMNGRP[2].$param119[1-9]

Minimum: 0   **Maximum:** ""   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RO   **CRTL:** RW   **Data Type:** LONG   **Memory:** CMOS

Name: Default values of servo parameter 119 by axis for group 2.

Description: This variable contains the robot library default values of servo parameter 119, by axis, for group 2. It should never be modified by the user.

Power Up: N/A

$HSCDMNGRP[2].$param120[1-9]

Minimum: 0   **Maximum:** ""   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RO   **CRTL:** RW   **Data Type:** LONG   **Memory:** CMOS

Name: Default values of servo parameter 120 by axis for group 2.

Description: This variable contains the robot library default values of servo parameter 120, by axis, for group 2. It should never be modified by the user.

Power Up: N/A

$HSCDMNGRP[2].$param121[1-9]

Minimum: 0   **Maximum:** ""   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RO   **CRTL:** RW   **Data Type:** LONG   **Memory:** CMOS

Name: Default values of servo parameter 121 by axis for group 2.

Description: This variable contains the robot library default values of servo parameter 121, by axis, for group 2. It should never be modified by the user.

Power Up: N/A

$HSCDMNGRP[2].$param122[1-9]

Minimum: 0   **Maximum:** ""   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RO   **CRTL:** RW   **Data Type:** LONG   **Memory:** CMOS

Name: Default values of servo parameter 122 by axis, group 2.

Description: This variable contains the robot library default values of servo parameter 122, by axis, group 2. It should never be modified by the user.

Power Up: N/A

$HSCDMNGRP[2].$param123[1-9]

Minimum: 0   **Maximum:** ""   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RO   **CRTL:** RW   **Data Type:** LONG   **Memory:** CMOS

Name: Default values of servo parameter 123 by axis, group 2.

Description: This variable contains the robot library default values of servo parameter 123, by axis, group 2. It should never be modified by the user.

Power Up: N/A

$HSCDMNGRP[2].$param124[1-9]

Minimum: 0   **Maximum:** ""   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RO   **CRTL:** RW   **Data Type:** LONG   **Memory:** CMOS

Name: Default values of servo parameter 124 by axis, group 2.

Description: This variable contains the robot library default values of servo parameter 124, by axis, group 2. It should never be modified by the user.

Power Up: N/A

$HSCDMNGRP[2].$param125[1-9]

Minimum: 0   **Maximum:** ""   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RO   **CRTL:** RW   **Data Type:** LONG   **Memory:** CMOS

Name: Default values of servo parameter 125 by axis, group 2.

Description: This variable contains the robot library default values of servo parameter 125, by axis, group 2. It should never be modified by the user.

Power Up: N/A

$HSCDMNGRP[2].$stnd_cd

Minimum: 0   **Maximum:** 100   **Default:** 75   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** LONG   **Memory:** CMOS

Name: Sensitivity level for standard collision detection, group 2.

Description: This variable contains the sensitivity value for standard collision detection for group 2. It is the value used when $hscdmngrp[1].$coll_mode is set to FALSE.

Power Up: N/A

$HSCDMNGRP[2].$threshold

Minimum: 1   **Maximum:** 200   **Default:** 100   **KCL/Data:** RW   **Program:** Not available
UIF: RW   **CRTL:** RW   **Data Type:** LONG   **Memory:** CMOS

Name: Current collision guard sensitivity setting for group 2.

Description: This variable contains the current sensitivity setting for group 2. It is set by the COL GUARD SETUP menu. This variable should not be set directly by the user.

Power Up: N/A

$HSCDMNGRP[2].$upd_groups

Minimum: 0   **Maximum:** 128   **Default:** 0   **KCL/Data:** RO   **Program:** Not available   **UIF:** RO   **CRTL:** RO   **Data Type:** INTEGER   **Memory:** CMOS

Name: Sensitivity change on group 2 using COL ADJUST.

Description: This variable will be set to 1 when collision guard sensitivity has been changed by the COL ADJUST instruction on group 2 within a teach pendant program.

Power Up: N/A

$HTTP_AUTH[1-8]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** HTTP_AUTH_T   **Memory:** Not available

Name: HTTP Authentication Setup

Description: This is an array of eight items each including the object, name, type, and level for a protected HTTP resource.

Power Up: Takes effect immediately

See Also: Refer to the Web Server chapter of the Internet Options Setup and Operations Manual for futher details.

$HTTP_AUTH[1].$LEVEL

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: HTTP Authentication Access Level Field

Description: This is the Access Level (0=operator, 1=programmer, 2=setup, 3=install) associated with a protected HTTP resource.

Power Up: Takes effect immediately

See Also: Refer to the Web Server Chapter of the Internet Options Setup and Operations Manual for further details.

$HTTP_AUTH[1].$NAME

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Username associated with a protected HTTP resource.

Description: This variable is set on the HTTP Authentication Setup Screen.

Power Up: Takes effect immediately

See Also: Refer to the Web Server Chapter in the Internet Options Setup and Operations Manual for further details.

$HTTP_AUTH[1].$OBJECT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Protected HTTP (Web Server) Resource

Description: This variable is set through the HTTP Authentication SETUP Screen.

Power Up: Takes effect immediately

See Also: See the Web Server Chapter of the Internet Options Setup and Operations Manual for details on HTTP Authentication setup.

$HTTP_AUTH[1].$TYPE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: HTTP Authentication Type Field.

Description: This is the type of restriction (Lock(2), Unlock(3), or Authenticate(4)) associated with a protected HTTP resource.

Power Up: Takes effect immediately

See Also: Refer to the Web Server chapter of the Internet Options Setup and Operations Manual for further details.

$HTTP_CTRL.$DBGLVL

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: HTTP Debug Level

Description: Sets HTTPD (Web Server Task) debug level. Not currently used.

Power Up: Takes effect immediately

Screen: None

See Also: Ethernet Options Setup and Operations Manual

$HTTP_CTRL.$ENAB_KAREL

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** INTEGER   **Memory:** CMOS

Name: HTTP ENABLE KAREL Flag

Description: Indicates whether a karel program can be invoked on the robot via the webbrowser. No programs with motion control may be run regardless of the settingof this variable.

Power Up: Takes effect immediately

Screen: None

See Also: Ethernet Options Setup and Operations Manual

$HTTP_CTRL.$ENAB_KCL

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** INTEGER   **Memory:** CMOS

Name: HTTP ENABLE KCL Flag

Description: Indicates whether KCL commands are accepted via the web browser. The karel program HTTP_KCL has variables which can be modified to limit/expand KCL access.

Power Up: Takes effect immediately

Screen: None

See Also: Ethernet Options Setup and Operations Manual

$HTTP_CTRL.$ENAB_SMON

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** INTEGER   **Memory:** CMOS

Name: HTTP ENABLE SMON Flag

Description: Not currently used.

Power Up: Takes effect immediately

Screen: None

See Also: Ethernet Options Setup and Operations Manual

$HTTP_CTRL.$ENABLE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: HTTP ENABLE Task Flag

Description: Indicates whether the HTTP (Web Server) task should be enabled on powerup

Power Up: Requires a cold start to take effect.

Screen: None

See Also: Ethernet Options Setup and Operations Manual

$HTTP_CTRL.$HITCOUNT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: HTTP Hitcount

Description: HTTP Hitcount increments each time a request is made of the web server.

Power Up: Takes effect immediately

Screen: None

$HTTP_CTRL.$KRL_TIMOUT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: HTTP Karel Timeout

Description: HTTP Timeout to run a karel program invoked through the browser. This is thetime the server will wait for a karel program to complete before sendingan error back to the browser.

Power Up: Takes effect immediately

Screen: None

See Also: Ethernet Options Setup and Operations Manual

2.9 "I" System Variables

$IBS_CONFIG[1].$ai_byte

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: AI byte number

Description: AI word number of device

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$ai_mask

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0x1FFF   **KCL/Data:** RO   **Program:** RO
UIF: RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Analog input mask

Description: Set these elements with a decimal representation of the word data in which thevalid analog input bits are 1. For example, if 14 bits are valid, set them with 16383 (decimal), which corresponds to 3FFF (hexadecimal) where bits 0 to13 are 1.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$ai_offset

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: AI offset

Description: Set this element with the offset (in bytes) of the device input data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$ai_start_bi

Minimum: 0   **Maximum:** 0xFF   **Default:** 0x3   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Analog input start bit

Description: The analog input is one word per channel. Set these elements with the first bit in the valid portion of the word data.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$ai_unit

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: 1 CH byte number 0 : 1byte 1 : 2byte

Description: 1 CH byte number

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$alternative

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Alternative

Description: Alternative

Power Up: N/A

Screen: INTERBUS-S SETUP screen

$IBS_CONFIG[1].$an_bit_rev

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Analog Bit Order reverse

Description: Analog Bit Order reverse

Power Up: N/A

$IBS_CONFIG[1].$an_data1[8]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0x0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: 1st Process data

Description: Analog device is set according to this process data

Power Up: N/A

$IBS_CONFIG[1].$an_data2[8]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0x0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: 2st Process data

Description: Analog device is set according to this process data

Power Up: N/A

$IBS_CONFIG[1].$an_exchg

Minimum: 0   **Maximum:** 1   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Exchange Analog byte order

Description: Exchange Analog byte order

Power Up: N/A

$IBS_CONFIG[1].$an_mode

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RO   **UIF:** RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Analog Input mode setting

Description: Analog Input mode setting for 8 Analog input device

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_CONFIG[1].$an_sel_ch

Minimum: 0   **Maximum:** 0xFF   **Default:** 0x04   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Analog CH check data

Description: Analog CH check data

Power Up: N/A

$IBS_CONFIG[1].$ao_byte

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: AO byte number

Description: AO byte number of device

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$ao_mask

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0x1FFF   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Analog output mask

Description: Set these elements with a decimal representation of the word data in which thevalid analog output bits are 1. For example, if 12 bits are valid, set them with 4095 (decimal), which corresponds to FFF (hexadecimal) where bits 0 to 11are 1.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$ao_offset

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Input offset

Description: Set this element with the offset (in bytes) of the slave output data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$ao_start_bi

Minimum: 0   **Maximum:** 0xFF   **Default:** 3   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Analog output start bit

Description: The analog output is one word per channel. Set these elements with the first bit in the valid portion of the word data.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$ao_unit

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: 1 CH byte number 0 : 1byte 1 : 2byte

Description: 1 CH byte number

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$di_byte

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: DI byte number

Description: DI byte number of device

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$di_byte2

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: DI byte number

Description: DI byte number of device

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$di_offset

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Input offset

Description: Set this element with the offset (in bytes) of the device input data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$di_offset2

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Input offset

Description: Set this element with the offset (in bytes) of the device input data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$do_byte

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: DO byte number

Description: DO byte number of device

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$do_byte2

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: DO byte number

Description: DO byte number of device

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$do_offset

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Input offset

Description: Set this element with the offset (in bytes) of the slave output data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$do_offset2

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Input offset

Description: Set this element with the offset (in bytes) of the slave output data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$enable

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: enable to update DI/DO data

Description: Set this element with a value to indicate whether this slave DI/DO data is updated.0: NOT update1: update;

Power Up: N/A

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$group

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: group number

Description: group number

Power Up: N/A

Screen: INTERBUS-S SETUP screen

$IBS_CONFIG[1].$id

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Slave station ID

Description: Slave station ID

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$interface1

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Interface 1 alternative grouping capable

Description: Interface 1 alternative grouping capable0: Interface 1 is not alternative grouping capable1: Interface 1 is alternative grouping capableInterface 1 : local or remote bus branch

Power Up: N/A

$IBS_CONFIG[1].$interface2

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Interface 2 alternative grouping capable

Description: Interface 2 alternative grouping capable0: Interface 2 is not alternative grouping capable1: Interface 2 is alternative grouping capableInterface 2 : remote bus

Power Up: N/A

$IBS_CONFIG[1].$length_code

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Slave length code

Description: Slave length code

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$pos_no

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Alternative

Description: Alternative

Power Up: N/A

Screen: INTERBUS-S SETUP screen

$IBS_CONFIG[1].$prm_load

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: slave parameter loading status

Description: For internal use only, Don't modify this system variable.slave parameter loading status

Power Up: N/A

$IBS_CONFIG[1].$real_len

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Slave length code

Description: Slave length code

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_CONFIG[1].$real_seg

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Bus line install depth

Description: remote bus line, local bus branch

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_CONFIG[1].$seg_no

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: segment number

Description: segment number

Power Up: N/A

Screen: INTERBUS-S SETUP screen

$IBS_CONFIG[1].$segment

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Bus line install depth

Description: remote bus line, local bus branch

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$valid

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: valid

Description: Set this element with a value to indicate whether this slave parameter set is valid.0: Invalid1: Valid;

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$wi_byte

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: WI byte number

Description: WI byte number of device

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$wi_offset

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: WI offset

Description: Set this element with the offset (in bytes) of the device input data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$wo_byte

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: WO byte number

Description: WO byte number of device

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$wo_offset

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: WO offset

Description: Set this element with the offset (in bytes) of the slave output data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$wstk_in_off

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: WSK Input offset

Description: Set this element with the offset (in bytes) of the device input data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$wstk_in_por

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: WSK byte number

Description: WSK byte number of device

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$wstk_out_of

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: WST offset

Description: Set this element with the offset (in bytes) of the slave output data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$wstk_out_p

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** ADDRESS   **Memory:** CMOS

Name: Pointer to I/O sram which is got from IOUTL

Description: For internal use only, Don't modify this system variable.Pointer to I/O sram which is got from IOUTL

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_CONFIG[1].$wstk_out_po

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: WST DO byte number

Description: WST DO byte number of device

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_DIAG[1].$crc_error

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Cecksum error counter

Description: Cecksum error counter

Power Up: N/A

Screen: INTERBUS-S STATUS SLAVE DIAG screen

$IBS_DIAG[1].$error_data[50]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0x0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** USHORT   **Memory:** Not available

Name: Error data

Description: Error data

Power Up: N/A

Screen: INTERBUS-S STATUS SLAVE DIAG screen

$IBS_DIAG[1].$id

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Device real ID code

Description: Device real ID code which is read out from Device

Power Up: N/A

Screen: INTERBUS-S STATUS SLAVE DIAG screen

$IBS_DIAG[1].$length_code

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Device real length code

Description: Device real length code which is read out from Device

Power Up: N/A

Screen: INTERBUS-S STATUS SLAVE DIAG screen

$IBS_DIAG[1].$no_of_error

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Number of error entries

Description: Number of error entries

Power Up: N/A

Screen: INTERBUS-S STATUS SLAVE DIAG screen

$IBS_DIAG[1].$onl_error

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Online error counter

Description: Online error counter

Power Up: N/A

Screen: INTERBUS-S STATUS SLAVE DIAG screen

$IBS_DIAG[1].$status1

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Device status

Description: No_Responce, Error_Buff_Ovfl, Peripheral_Fault, Cfg_FaultReconfiguration,
Interface_2_Error, Interface_1_ErrorDeactivated

Power Up: N/A

Screen: INTERBUS-S STATUS SLAVE DIAG screen

$IBS_DIAG[1].$valid

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: valid

Description: Set this element with a value to indicate whether this diagnostic data set is valid.0: Invalid1: Valid;

Power Up: N/A

Screen: INTERBUS-S STATUS SLAVE DIAG screen

$IBS_GROUP[1].$alternative

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Alternative

Description: Alternative

Power Up: N/A

Screen: INTERBUS-S SETUP screen

$IBS_GROUP[1].$group

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: group number

Description: group number

Power Up: N/A

Screen: INTERBUS-S SETUP screen

$IBS_GROUP[1].$status

Minimum: 0 **Maximum:** 0x7FFFFFFF **Default:** 1 **KCL/Data:** RO **Program:** RO **UIF:** RO **CRTL:** RO **Data Type:** LONG **Memory:** CMOS

Name: GROUP status

Description: Set this element with a value to indicate whether this group is enabled.0: DISABLE1: ENABLE

Power Up: N/A

Screen: INTERBUS-S SETUP MASTER GROUP LIST screen

$IBS_MASTER.$ai_id[1-32]

Minimum: 0 **Maximum:** 0xFFFF **Default:** 126 **KCL/Data:** RO **Program:** Not available **UIF:** RO **CRTL:** RO **Data Type:** UBYTE **Memory:** CMOS

Name: AI device ID

Description: AI device ID

Power Up: On_Cold_Start

$IBS_MASTER.$ai_id[32]

Minimum: 0 **Maximum:** 0xFF **Default:** 0 **KCL/Data:** RO **Program:** RO **UIF:** Not available **CRTL:** Not available **Data Type:** UBYTE **Memory:** Not available

Name: AI device ID

Description: AI device ID

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_MASTER.$ai_len[1-32]

Minimum: 0 **Maximum:** 0xFFFF **Default:** 4 **KCL/Data:** RO **Program:** Not available **UIF:** RO **CRTL:** RO **Data Type:** UBYTE **Memory:** CMOS

Name: AI device length code

Description: AI device length code

Power Up: N/A

$IBS_MASTER.$ai_len[32]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: AI device length code

Description: AI device length code

Power Up: N/A

$IBS_MASTER.$aio_id[1-32]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 51   **KCL/Data:** RO   **Program:** Not available   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: AI/AO device ID

Description: AI/AO device ID

Power Up: N/A

$IBS_MASTER.$aio_id[32]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: AI/AO device ID

Description: AI/AO device ID

Power Up: N/A

$IBS_MASTER.$aio_len[1-32]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 4   **KCL/Data:** RO   **Program:** Not available   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: AI/AO device length code

Description: AI/AO device length code

Power Up: N/A

$IBS_MASTER.$aio_len[32]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: AI/AO device length code

Description: AI/AO device length code

Power Up: N/A

$IBS_MASTER.$ao_id[1-32]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 125   **KCL/Data:** RO   **Program:** Not available **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: AO device ID

Description: AO device ID

Power Up: N/A

$IBS_MASTER.$ao_id[32]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: AO device ID

Description: AO device ID

Power Up: N/A

$IBS_MASTER.$ao_len[1-32]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 4   **KCL/Data:** RO   **Program:** Not available **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: AO device length code

Description: AO device length code

Power Up: N/A

$IBS_MASTER.$ao_len[32]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: AO device length code

Description: AO device length code

Power Up: N/A

$IBS_MASTER.$auto_alti

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Auto grouping capable setting

Description: Auto alternative grouping capable setting

Power Up: N/A

$IBS_MASTER.$auto_cfg

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Setup configuration list

Description: if this flag is set 1, the robot controller setup configuration listinto system variable at startup.

Power Up: On_Cold_Start

$IBS_MASTER.$auto_clear

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Auto_Clear parameter

Description: For Download Message of the Auto_Clear of Master ParameterThis Auto_Clear parameter fixes the behavior of the firmware ifone or many devices are defective in the network or reportingan error.0 : Auto Clear OFF1 : Auto Clear ON (missing error)2 : Auto Clear ON (module error)3 : Auto Clear ON (missing error and module error)

Power Up: N/A

$IBS_MASTER.$auto_segpos

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Auto set seg_no and pos_no of IBS_CONFIG

Description: Auto set seg_no and pos_no of IBS_CONFIG

Power Up: N/A

$IBS_MASTER.$auto_sl_dis

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Auto Slave diable setup

Description: Auto Slave diable setup when sw_cfg Less Than - 1

Power Up: N/A

$IBS_MASTER.$auto_swcfg

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Auto sw_cfg after chg_cfg

Description: Auto sw_cfg after chg_cfg for Softky CHG_CFG of GROUP LIST SCREEN

Power Up: N/A

$IBS_MASTER.$bk_altintr[1-32]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0xFF   **KCL/Data:** RO   **Program:** Not available
UIF: RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: DvFlag setting data for BK device

Description: DvFlag setting data for BK device

Power Up: N/A

$IBS_MASTER.$bk_altintr[32]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0xFF   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: DvFlag setting data for BK device

Description: DvFlag setting data for BK device

Power Up: N/A

$IBS_MASTER.$bk_id[1-32]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 8   **KCL/Data:** RO   **Program:** Not available
UIF: RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: BK device ID

Description: BK device ID

Power Up: N/A

$IBS_MASTER.$bk_id[32]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: BK device ID

Description: BK device ID

Power Up: N/A

$IBS_MASTER.$bundle

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 20   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Max_Num_Of_BundledError

Description: For Download Message of the Bus Parameter

Power Up: N/A

$IBS_MASTER.$bus_fault

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Stop communication after bus fault

Description: Stop communication after bus fault1 : Error occurs by Request IBM_Set_configuration2 : NOTREADY_FLAG OFF

Power Up: N/A

$IBS_MASTER.$cfg_edit

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** ULONG   **Memory:** CMOS

Name: Edit Configuration on TP

Description: Inform Edit Configuration on TP to IBS Task from TPMMInternal use only

Power Up: N/A

$IBS_MASTER.$cfg_timeout

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 10000   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Timeout value for the configuration change and switch

Description: Timeout value for the configuration change and switch

Power Up: N/A

$IBS_MASTER.$clr_cfg

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Clear data base of PC104

Description: if this flag is set 1, the robot controller clear data base of PC104.

Power Up: N/A

$IBS_MASTER.$cycle_time

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: cycletime

Description: cycletime of transferred process data

Power Up: On_Cold_Start

$IBS_MASTER.$cyclecnt

Minimum: 0x80000000   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:**
RW   **UIF:** RW   **CRTL:** RW   **Data Type:** LONG   **Memory:** CMOS

Name: number of driven data cycle

Description: number of driven data cycle

Power Up: N/A

$IBS_MASTER.$dagcyclecnt

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:**
RW   **CRTL:** RW   **Data Type:** ULONG   **Memory:** CMOS

Name: number of driven diagno. cycle

Description: number of driven diagno. cycle

Power Up: N/A

$IBS_MASTER.$datacycle

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 100   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Timeout datacycle

Description: For Download Message of the Bus Parameter

Power Up: N/A

$IBS_MASTER.$def_bus_fal

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Default bus fault value

Description: When the stop communication after bus fault is set to ENABLE by UIF,this value is set to the $bus_fault.

Power Up: N/A

$IBS_MASTER.$def_scan_ti

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 7   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Default Scan_Time_Interval value

Description: When automatic bus fault reset is set to ENABLE by UIF, this value is setto the avobe $scan_time for the Master Parameter.For Download Message of the Master Parameter

Power Up: N/A

$IBS_MASTER.$defcyclecnt

Minimum: 0x80000000   **Maximum:** 0x7FFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** LONG   **Memory:** CMOS

Name: number of defective data cycle

Description: number of defective data cycle

Power Up: N/A

$IBS_MASTER.$defect_cyc

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Defective Datacycle

Description: number of defective data cycle

Power Up: N/A

$IBS_MASTER.$delay_time

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 250   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** ULONG   **Memory:** CMOS

Name: Delay time for IBM_Set_Configuration (Tick)

Description: Delay time for IBM_Set_Configuration (Tick)Wait this time after download the bus parameterAnd send the IBM_Set_Configuration command

Power Up: N/A

$IBS_MASTER.$deverrorcnt

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** ULONG   **Memory:** CMOS

Name: number of reported device errors

Description: number of reported device errors

Power Up: N/A

$IBS_MASTER.$di_id[1-32]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 186   **KCL/Data:** RO   **Program:** Not available   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: DI device ID

Description: DI device ID

Power Up: N/A

$IBS_MASTER.$di_id[32]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: DI device ID

Description: DI device ID

Power Up: N/A

$IBS_MASTER.$di_len[1-32]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 129   **KCL/Data:** RO   **Program:** Not available   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: DI device length code

Description: DI device length code

Power Up: N/A

$IBS_MASTER.$di_len[32]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: DI device length code

Description: DI device length code

Power Up: N/A

$IBS_MASTER.$dio_id[1-32]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 11   **KCL/Data:** RO   **Program:** Not available   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: DI/DO device ID

Description: DI/DO device ID

Power Up: N/A

$IBS_MASTER.$dio_id[32]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: DI/DO device ID

Description: DI/DO device ID

Power Up: N/A

$IBS_MASTER.$dio_len[1-32]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 1   **KCL/Data:** RO   **Program:** Not available   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: DI/DO device length code

Description: DI/DO device length code

Power Up: N/A

$IBS_MASTER.$dio_len[32]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: DI/DO device length code

Description: DI/DO device length code

Power Up: N/A

$IBS_MASTER.$dis_dio_cle

Minimum: 0   **Maximum:** 0xFF   **Default:** 3   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: DI/DO clear

Description: If the slave is disabled, clear DI areaBIT 0 : DI clearBIT 1 : DO clear

Power Up: N/A

$IBS_MASTER.$do_id[1-32]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 189   **KCL/Data:** RO   **Program:** Not available
UIF: RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: DO device ID

Description: DO device ID

Power Up: N/A

$IBS_MASTER.$do_id[32]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: DO device ID

Description: DO device ID

Power Up: N/A

$IBS_MASTER.$do_len[1-32]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 1   **KCL/Data:** RO   **Program:** Not available
UIF: RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: DO device length code

Description: DO device length code

Power Up: On_Cold_Start

$IBS_MASTER.$do_len[32]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: DO device length code

Description: DO device length code

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_MASTER.$enb_rst_eve

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Enable reset Network re-init and Defective data cycle counter and EVE bit

Description: Enable reset Network re-init and Defective data cycle counter and EVE bit

Power Up: N/A

$IBS_MASTER.$err_dev_adr

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Error device address

Description: error source and location

Power Up: N/A

$IBS_MASTER.$err_event

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Error event

Description: corresponding error number

Power Up: N/A

$IBS_MASTER.$format

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Setup configuration list

Description: strage format of process data 0 : INTEL 1 : MOTOROLA

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_MASTER.$gbit_mask

Minimum: 0   **Maximum:** 0xFF   **Default:** 0x01   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Global_bits is masked by this value.

Description: Global_bits is masked by this value.

Power Up: N/A

$IBS_MASTER.$getdiag_enb

Minimum: 0   **Maximum:** 0xFF   **Default:** 2   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Get diag data by using Mailbox1: Get diag data2: Get diag data and check CRC counter

Description: For internal use only, Don't modify this system variable.Get diag data by using Mailbox

Power Up: N/A

$IBS_MASTER.$grp_edit

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** ULONG   **Memory:** CMOS

Name: Edit Group or alternative on TP

Description: Inform Edit Group or Alternative on TP to IBS Task from TPMMInternal use only

Power Up: N/A

$IBS_MASTER.$ibm_state

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: IBM status

Description: IBM main state of the master system

Power Up: N/A

$IBS_MASTER.$ibm_static[1-16]

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** ULONG   **Memory:** CMOS

Name: number of reported device errors

Description: number of reported device errors

Power Up: N/A

$IBS_MASTER.$ibm_static[16]

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: number of reported device errors

Description: number of reported device errors

Power Up: N/A

$IBS_MASTER.$idscan

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 10   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Num_Of_IDScan_AfterError

Description: For Download Message of the Bus Parameter

Power Up: N/A

$IBS_MASTER.$ign_event[1-32]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** Not available   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Ignored Error Event number

Description: Ignored Error Event number

Power Up: N/A

$IBS_MASTER.$ign_event[32]

Minimum: 0　　**Maximum:** 0xFF　　**Default:** 0　　**KCL/Data:** RO　　**Program:** RO　　**UIF:** Not available　　**CRTL:** Not available　　**Data Type:** UBYTE　　**Memory:** Not available

Name: Ignored Error Event number

Description: Ignored Error Event number

Power Up: N/A

$IBS_MASTER.$img_do_p

Minimum: 0　　**Maximum:** 0xFFFFFFFF　　**Default:** 0　　**KCL/Data:** RO　　**Program:** RO　　**UIF:** RO　　**CRTL:** RO　　**Data Type:** ADDRESS　　**Memory:** CMOS

Name: Copy the process data of Master DPRAM

Description: The master task copied the process data of Master DPRAM.Internal use only

Power Up: N/A

$IBS_MASTER.$init_cfg

Minimum: 0　　**Maximum:** 0xFF　　**Default:** 1　　**KCL/Data:** RW　　**Program:** RW　　**UIF:** RW　　**CRTL:** RW　　**Data Type:** UBYTE　　**Memory:** CMOS

Name: Initalize IBS_CONFIG system variable at power-on

Description: Initalize IBS_CONFIG system variable at power-on

Power Up: N/A

$IBS_MASTER.$mode

Minimum: 0　　**Maximum:** 0xFF　　**Default:** 3　　**KCL/Data:** RO　　**Program:** RO　　**UIF:** RO　　**CRTL:** RO　　**Data Type:** UBYTE　　**Memory:** CMOS

Name: Mode number

Description: Mode number for I/O data exchange. Refer to ibs_user.h

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_MASTER.$net_rescan

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Network Rescans

Description: number of necessary network rescans and network reinitialization

Power Up: N/A

$IBS_MASTER.$new_sl_idx[1-48]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0xFF   **KCL/Data:** RO   **Program:** Not available   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Slave Parameter loading status (current)

Description: Slave Parameter loading status (current)

Power Up: N/A

$IBS_MASTER.$new_sl_idx[48]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0xFF   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Slave Parameter loading status (current)

Description: Slave Parameter loading status (current)

Power Up: N/A

$IBS_MASTER.$no_def_slav

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: No define slave parameter

Description: For internal use only, Don't modify this system variable.If No define slave parameter at power-on, then = 1.

Power Up: N/A

$IBS_MASTER.$old_sl_idx[1-48]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0xFF   **KCL/Data:** RO   **Program:** Not available
UIF: RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Slave Parameter loading status (prvious)

Description: Slave Parameter loading status (prvious)

Power Up: N/A

$IBS_MASTER.$old_sl_idx[48]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0xFF   **KCL/Data:** RO   **Program:** RO   **UIF:** Not
available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Slave Parameter loading status (prvious)

Description: Slave Parameter loading status (prvious)

Power Up: N/A

$IBS_MASTER.$pc104_sel

Minimum: 0   **Maximum:** 0xFF   **Default:** 2   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Select PC104 board

Description: Select PC104 board 0 : Auto select 1 : IBSM 2 : IBM

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_MASTER.$rst_bus

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Set the NotReady in the cell DevFlags and then clear it.

Description: For internal use only, Don't modify this system variable.Re-start the network again.

Power Up: N/A

$IBS_MASTER.$rst_eve

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Reset Network re-init and Defective data cycle counter and EVE bit

Description: For internal use only, Don't modify this system variable.Reset Network re-init and Defective data cycle counter and EVE bit

Power Up: N/A

$IBS_MASTER.$scan_time

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Scan time interval value

Description: For Download Message of the Bus Parameter (800 ms)

Power Up: N/A

$IBS_MASTER.$set_cfg

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** ULONG   **Memory:** CMOS

Name: Download slave configuration list

Description: if this flag is set 1, the robot controller download configuration list. 1: Slave parameter only 2: Slave parameter and bus parameter 3: Bus parameter only 4: Reload all slave parameter

Power Up: N/A

$IBS_MASTER.$set_cfg_val

Minimum: 0   **Maximum:** 0xFF   **Default:** 3   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: This value set to set_cfg when reset signal is inputed.

Description: This value set to set_cfg when reset signal is inputed.

Power Up: N/A

$IBS_MASTER.$sl_cfg[1-16]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0x0   **KCL/Data:** RO   **Program:** Not available
UIF: RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Slave config status

Description: bit array to classify every slave as not configured '0' or configured '1'

Power Up: N/A

$IBS_MASTER.$sl_cfg[16]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0x0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Slave config status

Description: bit array to classify every slave as not configured '0' or configured '1'

Power Up: N/A

$IBS_MASTER.$sl_crc_cnt[1-48]

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RO   **Program:** Not available
UIF: RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Check the CRC error increment count

Description: Check the CRC error increment count

Power Up: N/A

$IBS_MASTER.$sl_crc_cnt[48]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** USHORT   **Memory:** Not available

Name: Check the CRC error increment count

Description: Check the CRC error increment count

Power Up: N/A

$IBS_MASTER.$sl_crc_tim[1-48]

Minimum: 0   **Maximum:** 0xFF   **Default:** 250   **KCL/Data:** RO   **Program:** Not available
UIF: RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Check the CRC error interval time (tick)

Description: Check the CRC error interval time (tick)

Power Up: N/A

$IBS_MASTER.$sl_crc_tim[48]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 250   **KCL/Data:** RO   **Program:** RO   **UIF:**
Not available   **CRTL:** Not available   **Data Type:** USHORT   **Memory:** Not available

Name: Check the CRC error interval time (tick)

Description: Check the CRC error interval time (tick)

Power Up: N/A

$IBS_MASTER.$sl_diag[1-16]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0x0   **KCL/Data:** RO   **Program:** Not available
UIF: RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Slave diagnostic data

Description: bit array to classify every slave as no diagnostic data '0' or diagnostic data available '1'

Power Up: N/A

$IBS_MASTER.$sl_diag[16]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0x0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not
available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Slave diagnostic data

Description: bit array to classify every slave as no diagnostic data '0' or diagnostic data available '1'

Power Up: N/A

$IBS_MASTER.$sl_state[1-16]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0x0   **KCL/Data:** RO   **Program:** Not available
UIF: RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Slave I/O exchange status

Description: bit array to classify every slave as not exchanged '0' or exchanged '1'

Power Up: N/A

$IBS_MASTER.$sl_state[16]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0x0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not
available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Slave I/O exchange status

Description: bit array to classify every slave as not exchanged '0' or exchanged '1'

Power Up: N/A

$IBS_MASTER.$slavecnt

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:**
RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Counter of slave module for IBSM

Description: This variable indicates the number of slave which are conected tothe master of robot
controller.

Power Up: N/A

$IBS_MASTER.$stopbits

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Num_Of_StopBits

Description: For Download Message of the Bus Parameter

Power Up: N/A

$IBS_MASTER.$sw_cfg

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** ULONG   **Memory:** CMOS

Name: Switch on/off specific slave device

Description: Switch on/off specific slave deviceBit0 : Switch on/off requestBit1 : Not error post

Power Up: N/A

$IBS_MASTER.$sycon_enb

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: SyCon data enable

Description: SyCon downloads the data base data into PC104.

Power Up: N/A

$IBS_MASTER.$wdog_time

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 1000   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: HOST supervision time in multiples of a msec.

Description: HOST supervision time in multiples of a msec.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$aci

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** ULONG   **Memory:** CMOS

Name: Acyclic Control Interval

Description: For internal use only, Don't modify this system variable.Acyclic Control Interval

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$ali_time

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** USHORT   **Memory:** CMOS

Name: ALI time

Description: For internal use only, Don't modify this system variable.ALI time

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$attr_type

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Connection Type

Description: For internal use only, Don't modify this system variable.Connection Type0 : ATTR_D, defined connection2 : ATTR_O, open connection for default management

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$client[4]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Service Client 1 - 3 and reserve

Description: For internal use only, Don't modify this system variable.Service Client 1

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$comm_ref

Minimum: 0   **Maximum:** 0xFF   **Default:** 2   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Communication Reference

Description: For internal use only, Don't modify this system variable.Communication Reference Number

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$conn_type

Minimum: 0 **Maximum:** 0xFF **Default:** 0 **KCL/Data:** RW **Program:** RW **UIF:** RW **CRTL:** RW **Data Type:** UBYTE **Memory:** CMOS

Name: Connection Type

Description: For internal use only, Don't modify this system variable.MMAZ (Master - Master acyclic)

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$enable

Minimum: 0 **Maximum:** 0xFF **Default:** 1 **KCL/Data:** RW **Program:** RW **UIF:** RW **CRTL:** RW **Data Type:** UBYTE **Memory:** CMOS

Name: This CRL is enable

Description: For internal use only, Don't modify this system variable.Set this element with a value to indicate whether this CRL is enable.0: Disable1: Enable

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$ind_pdu_h

Minimum: 0 **Maximum:** 0xFF **Default:** 0 **KCL/Data:** RW **Program:** RW **UIF:** RW **CRTL:** RW **Data Type:** UBYTE **Memory:** CMOS

Name: max. PDU length indication/confirmation high

Description: For internal use only, Don't modify this system variable.max. PDU length indication/confirmation high

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$ind_pdu_l

Minimum: 0   **Maximum:** 0xFF   **Default:** 246   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: max. PDU length indication/confirmation high

Description: For internal use only, Don't modify this system variable.max. PDU length indication/confirmation high

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$lli_sap

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: LLI SAP

Description: For internal use only, Don't modify this system variable.LLI SAP0 : PMS1 : PNM7

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$local_sap

Minimum: 0   **Maximum:** 0xFF   **Default:** 128   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Local SAP

Description: For internal use only, Don't modify this system variable.Local SAP not used in PCP 2.0

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$max_rac

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: max. RAC

Description: For internal use only, Don't modify this system variable.max. RAC (Receive Ack. Req. Count.)1 : for PMS connection0 : for PNM7 connection

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$max_rcc

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: max. RCC

Description: For internal use only, Don't modify this system variable.max. RCC (Receive Conf. Req. Count.)1 : for PMS connection0 : for PNM7 connection

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$max_sac

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: max. SAC

Description: For internal use only, Don't modify this system variable.max. SAC (Send Ack. Req. Count.)1 : for PMS connection0 : for PNM7 connection

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$max_scc

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: max. SCC

Description: For internal use only, Don't modify this system variable.max. SCC (Send Conf. Req. Count.)1 : for PMS connection0 : for PNM7 connection

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$multiplier

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: multiplier

Description: For internal use only, Don't modify this system variable.multiplier

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$remote_adr

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Remote Address

Description: For internal use only, Don't modify this system variable.Remote Address, Address of remote device for this CR

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$remote_sap

Minimum: 0   **Maximum:** 0xFF   **Default:** 128   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Remote SAP

Description: For internal use only, Don't modify this system variable.Remote SAP not used in PCP 2.0

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$req_pdu_h

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: max. PDU length request/responce high

Description: For internal use only, Don't modify this system variable.max. PDU length request/responce high

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$req_pdu_l

Minimum: 0   **Maximum:** 0xFF   **Default:** 246   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: max. PDU length request/responce high

Description: For internal use only, Don't modify this system variable.max. PDU length request/responce high

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$server[4]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Service Server 1 - 3

Description: For internal use only, Don't modify this system variable.Service Server 1

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_CRL[1].$vfd_pointer

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** ULONG   **Memory:** CMOS

Name: VFD Pointer of CRL Header

Description: VFD Pointer of CRL Header, No (for PCP 2.0)For internal use only, Don't modify this system variable.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_OD[1].$code

Minimum: 0   **Maximum:** 0xFF   **Default:** 7   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Object Code

Description: For internal use only, Don't modify this system variable.Object Code7 : For SYMPLE_VAR object8 : For ARRAY object

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_OD[1].$data_type

Minimum: 0   **Maximum:** 0xFF   **Default:** 3   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Data Type

Description: For internal use only, Don't modify this system variable.Data Type1 : BOOL2 : INT83 : INT164 : INT325 : UINT86 : UINT169 : VISIBLE STRING10 : OCTET STRING

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_OD[1].$enable

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: This OD is enable

Description: For internal use only, Don't modify this system variable.Set this element with a value to indicate whether this OD is enable.0: Disable1: Enable

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_OD[1].$group

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Access Group

Description: For internal use only, Don't modify this system variable.Access Group, not supported

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_OD[1].$index

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0x1000   **KCL/Data:** RW   **Program:** RW
UIF: RW   **CRTL:** RW   **Data Type:** USHORT   **Memory:** CMOS

Name: Object Index

Description: For internal use only, Don't modify this system variable.Object Index

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_OD[1].$length

Minimum: 0   **Maximum:** 0xFF   **Default:** 2   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Object Length

Description: For internal use only, Don't modify this system variable.Object Length, length of element

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_OD[1].$local_adr

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Local Address

Description: For internal use only, Don't modify this system variable.Local Address, not supported

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_OD[1].$password

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Password

Description: For internal use only, Don't modify this system variable.Password, not supported

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_OD[1].$right

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:**
RW   **CRTL:** RW   **Data Type:** USHORT   **Memory:** CMOS

Name: Access Right

Description: For internal use only, Don't modify this system variable.Access Right, not supported

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SL_OD[1].$sub_index

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Sub Index

Description: For internal use only, Don't modify this system variable.Sub Index, length of element

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$abort_cr

Minimum: 0   **Maximum:** 0xFF   **Default:** 2   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Abort Communication Reference

Description: Abort Communication ReferenceFor internal use only, Don't modify this system variable.

Power Up: N/A

$IBS_SLAVE.$add_param

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Additional Parameter

Description: Some of the error events have an additional parameter.

Power Up: N/A

$IBS_SLAVE.$ai_byte

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: AI byte number

Description: AI word number of device

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_SLAVE.$ai_mask

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0xFFFF   **KCL/Data:** RO   **Program:** RO
UIF: RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Analog input mask

Description: Set these elements with a decimal representation of the word data in which the valid
analog input bits are 1. For example, if 14 bits are valid, set them with 16383 (decimal), which
corresponds to 3FFF (hexadecimal) where bits 0 to13 are 1.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$ai_offset

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:**
RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: AI offset

Description: Set this element with the offset (in bytes) of the device input data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_SLAVE.$ai_start_bi

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Analog input start bit

Description: The analog input is one word per channel. Set these elements with the first bit in the
valid portion of the word data.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$ai_unit

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: 1 CH byte number 0 : 1byte 1 : 2byte

Description: 1 CH byte number

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$an_exchg

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Exchange Analog byte order

Description: Exchange Analog byte order

Power Up: N/A

$IBS_SLAVE.$ao_byte

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: AO byte number

Description: AO byte number of device

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_SLAVE.$ao_mask

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0xFFFF   **KCL/Data:** RO   **Program:** RO
UIF: RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Analog output mask

Description: Set these elements with a decimal representation of the word data in which thevalid
analog output bits are 1. For example, if 12 bits are valid, set them with 4095 (decimal), which
corresponds to FFF (hexadecimal) where bits 0 to 11are 1.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$ao_offset

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:**
RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Input offset

Description: Set this element with the offset (in bytes) of the slave output data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_SLAVE.$ao_start_bi

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Analog output start bit

Description: The analog output is one word per channel. Set these elements with the first bit in the
valid portion of the word data.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$ao_unit

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: 1 CH byte number 0 : 1byte 1 : 2byte

Description: 1 CH byte number

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$asguop

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Assign UOP

Description: Whether to assign InterBus-S Slave DI/DO to UOP

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$cntrl_inter

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 1000   **KCL/Data:** RO   **Program:** RO
UIF: RO   **CRTL:** RO   **Data Type:** ULONG   **Memory:** CMOS

Name: Control Interval of CRL Header

Description: Control Interval of CRL Header (in 10 ms) max 60 * 10**6For internal use only,
Don't modify this system variable.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$dbm_enb

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: DBM is enable

Description: DBM is enable then the PCP parameter is not downloaded

Power Up: N/A

$IBS_SLAVE.$detail_code[1-16]

Minimum: 0   **Maximum:** 16   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Abort Detail Code

Description: Abort Detail CodeFor internal use only, Don't modify this system variable.

Power Up: N/A

$IBS_SLAVE.$detail_code[16]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Abort Detail Code

Description: Abort Detail CodeFor internal use only, Don't modify this system variable.

Power Up: N/A

$IBS_SLAVE.$detail_len

Minimum: 0   **Maximum:** 16   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Abort Detail Length

Description: Abort Detail LengthFor internal use only, Don't modify this system variable.

Power Up: N/A

$IBS_SLAVE.$di_byte

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 20   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: DI byte number

Description: DI byte number of device

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$di_byte2

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: DI byte number

Description: DI byte number of device

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_SLAVE.$di_offset

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Input offset

Description: Set this element with the offset (in bytes) of the device input data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_SLAVE.$di_offset2

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Input offset

Description: Set this element with the offset (in bytes) of the device input data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_SLAVE.$di_p

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** ADDRESS   **Memory:** CMOS

Name: InterBus-S Slave DI IOSRAM address

Description: For internal use only, Don't modify this system variable.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$dio_swap

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: swap low/high byte

Description: swap low/high byte

Power Up: N/A

$IBS_SLAVE.$disp_cnt

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** USHORT   **Memory:** CMOS

Name: display counter of send/receive data of InterBus-S Slave

Description: For internal use only, Don't modify this system variable.display counter of send/receive data of InterBus-S Slave

Power Up: N/A

$IBS_SLAVE.$disp_mbox

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Display mailbox data

Description: Display mailbox data

Power Up: N/A

$IBS_SLAVE.$do_byte

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 20   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: DO byte number

Description: DO byte number of device

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$do_byte2

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: DO byte number

Description: DO byte number of device

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_SLAVE.$do_offset

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Input offset

Description: Set this element with the offset (in bytes) of the slave output data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_SLAVE.$do_offset2

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Input offset

Description: Set this element with the offset (in bytes) of the slave output data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

Screen: INTERBUS-S SETUP MASTER CONFIG LIST screen

$IBS_SLAVE.$do_p

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** ADDRESS   **Memory:** CMOS

Name: InterBus-S Slave DO IOSRAM address

Description: For internal use only, Don't modify this system variable.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$down_crl

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Request to send Download CRL request to device

Description: Request to send PCP parameter download request to deviceFor internal use only, Don't modify this system variable.

Power Up: N/A

$IBS_SLAVE.$down_od

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Request to send Download OD request to device

Description: Request to send PCP parameter download request to deviceFor internal use only,
Don't modify this system variable.

Power Up: N/A

$IBS_SLAVE.$down_vfd

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Request to send Download VFD request to device

Description: Request to send PCP parameter download request to deviceFor internal use only,
Don't modify this system variable.

Power Up: N/A

$IBS_SLAVE.$err_count

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:**
RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Error counter

Description: Error counter

Power Up: N/A

$IBS_SLAVE.$err_event

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Error event

Description: corresponding error number

Power Up: N/A

$IBS_SLAVE.$firm_type

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: IBS/R firmware type

Description: IBS/R firmware type0 : V02.001 1 : V02.002 or later

Power Up: N/A

$IBS_SLAVE.$format

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Setup configuration list

Description: strage format of process data 0 : INTEL 1 : MOTOROLA

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$get_od

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Request to send GET_OD_LOCAL request to device

Description: Request to send GET_OD_LOCAL request to deviceFor internal use only, Don't modify this system variable.

Power Up: N/A

$IBS_SLAVE.$id_code

Minimum: 0   **Maximum:** 0xFF   **Default:** 3   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: ID code of slave module

Description: ID code of InterBus-S Slave

Power Up: N/A

$IBS_SLAVE.$info_code

Minimum: 0   **Maximum:** 0xFF   **Default:** 7   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Information Report Object Code

Description: Information Report Object CodeFor internal use only, Don't modify this system variable.

Power Up: N/A

$IBS_SLAVE.$info_cr

Minimum: 0   **Maximum:** 0xFF   **Default:** 2   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: InformationReport Communication Reference

Description: InformationReport Communication ReferenceFor internal use only, Don't modify this system variable.

Power Up: N/A

$IBS_SLAVE.$info_data[1-16]

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RW   **Program:** Not available
UIF: RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Information Data

Description: Information DataFor internal use only, Don't modify this system variable.

Power Up: N/A

$IBS_SLAVE.$info_data[16]

Minimum: 0   **Maximum:** 0xFF   **Default:** 16   **KCL/Data:** RW   **Program:** RW   **UIF:** Not
available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Information Data

Description: Information DataFor internal use only, Don't modify this system variable.

Power Up: N/A

$IBS_SLAVE.$info_index

Minimum: 0 **Maximum:** 0xFFFF **Default:** 0x1010 **KCL/Data:** RW **Program:** RW
UIF: RW **CRTL:** RW **Data Type:** USHORT **Memory:** CMOS

Name: Information Report Object Index

Description: Information Report Object IndexFor internal use only, Don't modify this system
variable.

Power Up: N/A

$IBS_SLAVE.$info_len

Minimum: 0 **Maximum:** 0xFF **Default:** 2 **KCL/Data:** RW **Program:** RW **UIF:** RW
CRTL: RW **Data Type:** UBYTE **Memory:** CMOS

Name: Information Report Object Length

Description: Information Report Object LengthFor internal use only, Don't modify this system
variable.

Power Up: N/A

$IBS_SLAVE.$info_sub

Minimum: 0 **Maximum:** 0xFF **Default:** 0 **KCL/Data:** RW **Program:** RW **UIF:** RW
CRTL: RW **Data Type:** UBYTE **Memory:** CMOS

Name: Information Report Sub Index

Description: Information Report Sub IndexFor internal use only, Don't modify this system variable.

Power Up: N/A

$IBS_SLAVE.$init_pcp

Minimum: 0 **Maximum:** 0xFF **Default:** 1 **KCL/Data:** RW **Program:** RW **UIF:** RW
CRTL: RW **Data Type:** UBYTE **Memory:** CMOS

Name: Initialize PCP system variable

Description: Initialize PCP system variableFor internal use only, Don't modify this system variable.

Power Up: N/A

$IBS_SLAVE.$length_code

Minimum: 0   **Maximum:** 0xFF   **Default:** 21   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Length code of slave module

Description: Length code of InterBus-S Slave

Power Up: N/A

$IBS_SLAVE.$max_dig_prt

Minimum: 16   **Maximum:** 1024   **Default:** 1024   **KCL/Data:** RO   **Program:** RO   **UIF:**
RO   **CRTL:** RO   **Data Type:** ULONG   **Memory:** CMOS

Name: Number of digital ports displayed

Description: This value is copied to $MAX_DIG_PRT at power-on.This controls the number of DIN and DOUT ports for which the status is is diaplayed in the Digital I/O TP MONITOR screens and which can be configured in the DIGITALA I/O CONFIG screen.

Power Up: The change to this system variable takes effect at the next power-up.

Screen: The System Variables screen.

$IBS_SLAVE.$mode

Minimum: 0   **Maximum:** 0xFF   **Default:** 3   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Mode number

Description: Mode number for I/O data exchange. Refer to ibs_user.h

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$pcp_dio

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Exchange DI/DI when ID code = PCP

Description: Exchange DI/DI when ID code = PCP

Power Up: N/A

$IBS_SLAVE.$poll_sap

Minimum: 0   **Maximum:** 0xFF   **Default:** 128   **KCL/Data:** RO   **Program:** RO   **UIF:**
RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Poll-Lists SAP, not used for PCP 2.0

Description: Poll-Lists SAP, not used for PCP 2.0For internal use only, Don't modify this system
variable.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$reason_code

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Abort Reason Code (1:Disconnect)

Description: Abort Reason CodeFor internal use only, Don't modify this system variable.

Power Up: N/A

$IBS_SLAVE.$rg_exchg

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Exchange register byte order

Description: Exchange register byte order

Power Up: N/A

$IBS_SLAVE.$ri_byte

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Register IN byte number

Description: Register IN byte number

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$ri_number

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Register IN start number

Description: Register IN start number

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$ri_offset

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Register IN byte offset

Description: Set this element with the offset (in bytes) of the slave output data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$ri_type

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Input register type

Description: Input register type

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$ro_byte

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Register IN byte number

Description: Register IN byte number

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$ro_number

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Register OUT start number

Description: Register OUT start number

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$ro_offset

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Register OUT byte offset

Description: Set this element with the offset (in bytes) of the slave output data area

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$ro_type

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Output register type

Description: Output register type

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$send_abort

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Send Abort.Request

Description: Send Abort.RequestFor internal use only, Don't modify this system variable.

Power Up: N/A

$IBS_SLAVE.$send_info

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Send InformationReport.Request

Description: Send InformationReport.RequestFor internal use only, Don't modify this system variable.

Power Up: N/A

$IBS_SLAVE.$stat_err

Minimum: 0   **Maximum:** 0xFF   **Default:** 0xE0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Station Error Indication

Description: Station Error Indication. Refer to ibs_user.h.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$symbol_len

Minimum: 0   **Maximum:** 0xFF   **Default:** 0x0B   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Symbol Length of CRL Header

Description: Symbol Length of CRL HeaderFor internal use only, Don't modify this system variable.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$vfd_support

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: VFD pointer supported

Description: VFD pointer supported, No (for PCP 2.0)For internal use only, Don't modify this
system variable.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SLAVE.$wait_slinit

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 260   **KCL/Data:** RO   **Program:** RO   **UIF:**
RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: wait time for start I/O data read/write

Description: wait time for start I/O data read/write

Power Up: N/A

Screen: Internal use

$IBS_SLAVE.$wdog_time

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 1000   **KCL/Data:** RO   **Program:** RO   **UIF:**
RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: HOST supervision time in multiples of a msec.

Description: HOST supervision time in multiples of a msec.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SYS[1].$cpuid

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** ULONG   **Memory:** CMOS

Name: Logical slot ID number

Description: For internal use only, Don't modify this system variable.PC104 MOTHER PCB Module ID.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SYS[1].$dbm_down

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** ULONG   **Memory:** CMOS

Name: Download InterBus-S database file switch

Description: Download InterBus-S database file switch

Power Up: N/A

$IBS_SYS[1].$dbm_down_er

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** ULONG   **Memory:** CMOS

Name: download database error

Description: download database error

Power Up: N/A

$IBS_SYS[1].$dbm_up

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** ULONG   **Memory:** CMOS

Name: Upload InterBus-S database file switch

Description: Upload InterBus-S database file switch

Power Up: N/A

$IBS_SYS[1].$dbm_up_er

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** ULONG   **Memory:** CMOS

Name: upload database error

Description: upload database error

Power Up: N/A

$IBS_SYS[1].$dev_flag

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Device flag status

Description: Device flag status of Dual Port RAM

Power Up: N/A

$IBS_SYS[1].$dio_clear

Minimum: 0   **Maximum:** 0xFF   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** ULONG   **Memory:** CMOS

Name: DI/DO clear

Description: If error or disable, clear DI/DO areaBIT 0 : DI clearBIT 1 : DO clear

Power Up: N/A

$IBS_SYS[1].$dpr_address

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:**
RO   **CRTL:** RO   **Data Type:** ADDRESS   **Memory:** CMOS

Name: Dual Port RAM top address

Description: For internal use only, Don't modify this system variable.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SYS[1].$err_code[16]

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0x0   **KCL/Data:** RO   **Program:** RO
UIF: Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Error code

Description: For internal use only, Don't modify this system variable.the error code can not be reset.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SYS[1].$error_1post

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Error 1 post

Description: If 1, error is posted once and can reset.

Power Up: N/A

$IBS_SYS[1].$error_cnv

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** UBYTE   **Memory:** CMOS

Name: Error severity convert

Description: If T1 or T2, severity is converted STOP -> WARN

Power Up: N/A

$IBS_SYS[1].$erwaitim

Minimum: 0   **Maximum:** 65535   **Default:** 1250   **KCL/Data:** RO   **Program:** RO   **UIF:**
RO   **CRTL:** RO   **Data Type:** ULONG   **Memory:** CMOS

Name: Error check start wait time

Description: Error check start wait time

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SYS[1].$firm_down

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** ULONG   **Memory:** CMOS

Name: Download InterBus-S firmware switch

Description: Download InterBus-S firmware switch

Power Up: N/A

$IBS_SYS[1].$firm_down_e

Minimum: 0   **Maximum:** 0xRO   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:**
RW   **CRTL:** RW   **Data Type:** ULONG   **Memory:** CMOS

Name: Download InterBus-S firmware error

Description: Download InterBus-S firmware error

Power Up: N/A

$IBS_SYS[1].$global_bit

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Global status bit

Description: InterBus-S Slave comminication status

Power Up: N/A

$IBS_SYS[1].$global_p

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:**
RO   **CRTL:** RO   **Data Type:** ADDRESS   **Memory:** CMOS

Name: Pointer to task global variable.

Description: For internal use only, Don't modify this system variable.Pointer to task global variable.

Power Up: N/A

$IBS_SYS[1].$host_flag

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Host flag status

Description: Host flag status of Dual Port RAM

Power Up: N/A

$IBS_SYS[1].$module_id

Minimum: 0   **Maximum:** 0xFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** ULONG   **Memory:** CMOS

Name: Module ID

Description: For internal use only, Don't modify this system variable.PC104 MOTHER PCB
Module ID.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SYS[1].$rst_bus_tim

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:**
RO   **CRTL:** RO   **Data Type:** ULONG   **Memory:** CMOS

Name: wait time for bus fault reset

Description: For internal use only, Don't modify this system variable.After the controller waits this
time for bus fault reset by spcall SID_DIO,the controller checks the error event of INTERBUS-S
Master.

Power Up: N/A

$IBS_SYS[1].$rst_gtime

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** ULONG   **Memory:** CMOS

Name: wait time for bus fault reset

Description: For internal use only, Don't modify this system variable.After the controller waits this time for bus fault reset by spcall SID_DIO,the controller checks the error event of INTERBUS-S Master.

Power Up: N/A

$IBS_SYS[1].$rst_spcall

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** ULONG   **Memory:** CMOS

Name: spcall by IOFC_RESET_C

Description: For internal use only, Don't modify this system variable.spcall by IOFC_RESET_C

Power Up: N/A

$IBS_SYS[1].$sub_code[16]

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0x0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Error number

Description: Error number of InterBus-S Slave

Power Up: N/A

$IBS_SYS[1].$sub_type[16]

Minimum: 0   **Maximum:** 0xFF   **Default:** 0x0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Error sub code type (0 : none sub_code)

Description: For internal use only, Don't modify this system variable.the error code can not be reset.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SYS[1].$tskcnt

Minimum: 0   **Maximum:** 500   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** ULONG   **Memory:** CMOS

Name: TASK counter

Description: For internal use only, Don't modify this system variable.the interval time which PROFIBUS task runs.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SYS[1].$tskenb

Minimum: 0   **Maximum:** 1   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** ULONG   **Memory:** CMOS

Name: Task enable/disable

Description: Task enable/disable 0 : Disable 1 : Enable

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SYS[1].$wait_init

Minimum: 0   **Maximum:** 65535   **Default:** 1000   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** ULONG   **Memory:** CMOS

Name: Wait READY_FLAG of firmware

Description: For internal use only, Don't modify this system variable.Indicate the time which the main waits for the READY_FLAG of firmware.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SYS[1].$wait_task

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 50   **KCL/Data:** RO   **Program:** RO
UIF: RO   **CRTL:** RO   **Data Type:** ULONG   **Memory:** CMOS

Name: Wait other task for access Dual Port Memory

Description: Wait other task for access Dual Port MemoryFor internal use only, Don't modify this system variable.

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SYS[1].$waitcount

Minimum: 0   **Maximum:** 65535   **Default:** 100   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** ULONG   **Memory:** CMOS

Name: Wait flag count max

Description: Wait DEVICE flag count max

Power Up: You mast perform a COLD or HOT START for the change to take effect.

$IBS_SYS[1].$warn_code[16]

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0x0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: These Error code which is convert to WARNING severity

Description: These Error code which is convert to WARNING severity

Power Up: N/A

$IBS_SYS[1].$wdog_chk

Minimum: 0   **Maximum:** 65535   **Default:** 200   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** ULONG   **Memory:** CMOS

Name: Counter max for watch dog

Description: Counter max for watch dog

Power Up: N/A

$IBS_SYS[1].$wdog_cnt

Minimum: 0   **Maximum:** 0xFFFFFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** RO   **CRTL:** RO   **Data Type:** ULONG   **Memory:** CMOS

Name: Real count max for watch dog

Description: For internal use only, Don't modify this system variable.Real count max for watch dog for internal use

Power Up: N/A

$IDL_CPU_PCT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL
Memory: Not available

Name: Idle CPU time

Description: Percent of MAIN CPU time which is currently idle

Power Up: Updated automatically

Screen: This can be displyed in the System/Variables screen.

$IDL_MIN_PCT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL
Memory: Not available

Name: Minimum Idle CPU time

Description: This indicates the smallest percentage of CPU time, measured over intervals of about 30 seconds, since power-up. If this is set to 100, it will be updated as smaller percentages idle of CPU time are observed.

Power Up: Values are updated automatically as required.

Screen: This can be displayed or set in the System/Variables screen.

$IMSAVE_DONE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Indicator that IMAGE memory has been saved to FROM.

Description: During controlled start the system image area can be saved just one time. Typically, this is done on the transition from controlled to cold start. When $IMSAVE_DONE is FALSE during controlled start, KAREL programs and variables are loaded into image. Also, system options can be loaded before the imsave is done. All system options and KAREL program elements can be permanently saved to FROM when the image save is done.

Power Up: No

Screen: SYSTEM Variables screen, function pull up for cold start.

$INCL_ADJUST STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Setup of torch posture adjustment function

Description: These system variables are used by torch posture adjustment function. Individual fields within this structure are described below.

Power Up: Changes to these variables take effect immediately.

Screen: Torch posture adjustment screen

$INCL_ADJUST.$part_of_prg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: WHOLE/PART of converted range

Description: This system variable is used to select the range of conversion in program where WHOLE : an entire program is converted; PART : a specified range is only converted

Power Up: Changes to this variable take effect immediately

Screen: Torch posture adjustment screen

$INCL_ADJUST.$stick_out

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Stick out value

Description: This system variable is stick out value for adjustment.

Power Up: Changes to this variable take effect immediately

Screen: Torch posture adjustment screen

$INCL_ADJUST.$travel_angl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Travel angle value

Description: This system variable is travel angle value for adjustment.

Power Up: Changes to this variable take effect immediately

Screen: Torch posture adjustment screen

$INCL_ADJUST.$work_angl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Work angle value

Description: This system variable is work angle value for adjustment.

Power Up: Changes to this variable take effect immediately

Screen: Torch posture adjustment screen

$INTP_PRTY

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Interpreter Priority

Description: Priority which interpreter executes as interruption routine. Values should be as follows: 0:interrupt routine runs at higher priority than path planner. This might result in the robot slowing down during path motion. 0 90: Interrupt routine runs at lower priority than teach pendant user interface logic.

Power Up: N/A

$INTPMODNTOL

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Early Motion Completion Time

Description: Specifies the time, in milliseconds, by which the interpreter the motion ends early.

Power Up: N/A

$IO_AUTO_CFG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Automatic I/O configuration

Description: If $IO_AUTO_CFG is TRUE, at power-up, any digital or analog ports that have not been assigned will have assignments generated automatically. If set to FALSE, these assignments will not be made. Note that this does not affect automatic assignment of process I/O board DIN's and DOUT's as user operator panel signals.

Power Up: Requires cold start to take effect

$IO_CYCLE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Start SLC-2 Cycling even if no SLC-2 I/O devices

Description: This feature is not supported.

Power Up: This is only effective at cold start.

$IOLNK[1].$input_n

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: I/O link input number.

Description: I/O link number of input points. Currently not supported.

Power Up: N/A

$IOLNK[1].$output_n

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: I/O link output number.

Description: I/O link number of output points. Currently not supported.

Power Up: N/A

$IOLNK[1].$rack

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: I/O link rack.

Description: I/O link rack number. Currently not supported.

Power Up: N/A

$IOLNK[1].$slot

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: I/O link slot.

Description: I/O link slot number. Currently not supported.

Power Up: N/A

$IOLNK[16] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: I/O Link

Description: I/O link variables. Currently not supported.

Power Up: N/A

$IS_DMR STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Integral Servo Driven Tool (ISDT) Dynamic Master Record Variable Structure

Description: This set of variables provide dynamic mastering information of ESDT Process Axes. See the descriptions of the individual fields below.

Power Up: N/A

$IS_DMR.$ignore_motn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: ISDT System Variable: FLTR task update this variable to disable process axes motion.

Description: This variable is set to TRUE when $IS_DMR.$master_done is set to 0. At that time, all process axes speed commands are ignored. An error is posted to inform Application Tool. You must set $IS_DMR.$ignore_motn to FALSE so that process axes can be controlled again.

Power Up: This value is initialized to FALSE and maintains its previous value over subsequent power cycles.

$IS_DMR.$master_done

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ISDT System Variable: FLTR task update this variable to inform application.

Description: When this variable is set to -1 (default) the master_done function is disabled. Application Tool should set master_done to 1 after mastering process axes. When sever servo errors occur, the ISDT Softpart sets master_done to 0. When Application Tool detects master_done = 0, it should remaster the process axes and set master_done to 1 after mastering.

Power Up: This value is initialized to -1 and maintains its previous value over subsequent power cycles.

$IS_ERROR STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Integral Servo Driven Tool (ISDT) System Error Buffer Structure

Description: IS_ERROR is a ring buffer, which stores the error codes and the associated axis#that are posted by ISDT and FLTR tasks. See the descriptions of the individual fields below.

Power Up: N/A

$IS_ERROR.$bufindx

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ISDT System Variable: the current index of the $IS_ERROR ring buffer

Description: Updated by ISDT and FLTR task.

Power Up: N/A

Screen: None

$IS_ERROR.$err_axis[1-20]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ISDT System Variable: the associated process axis number for posted error

Description: Updated by ISDT and FLTR task.

Power Up: N/A

Screen: None

$IS_ERROR.$err_code[1-40]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ISDT System Variable: stores error code which was posted for a process axis

Description: Updated by ISDT and FLTR task.

Power Up: N/A

Screen: None

$IS_ERROR.$err_code[20]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ISDT System Variable: stores error code which was posted for a process axis

Description: Updated by ISDT and FLTR task.

Power Up: N/A

Screen: None

$IS_MCR STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Integral Servo Driven Tool (ISDT) Motion Control System Variable Structure

Description: This set of variables provide motion control and error handling for ISDT Process Axes. See the descriptions of the individual fields below.

Power Up: N/A

$IS_MCR.$err_stopall

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Stop process axis switch

Description: When it is set to TRUE, any severe servo error of process axis will stops all process axes. When it is set to FALSE, only the process axes that has severe servo error stops.

Power Up: This value is initialized to TRUE and maintains its previous value over subsequent power cycles.

Screen: System global variable screen

$IS_MCR.$hold_stop

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Hold process axis switch

Description: When it is set to TRUE, Hold stops all process axes. When it is set to FALSE, Hold is ignored.

Power Up: This value is initialized to TRUE and maintains its previous value over subsequent power cycles.

Screen: System global variable screen

$IS_MCR.$machinelock

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: ISDT System Variable: lock process axes motion

Description: If this variable is set to TRUE, ISDT process axes will not move when motion command is issued.

Power Up: This value is initialized to FALSE at every power cycles.

$IS_MCR.$no_stop_err

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: ISDT System Variable: revise process axis error severity

Description: When this variable is set to TRUE, the ISDT Softpart and process axes servo errors will not stop robot motion or applications. If it is set to FALSE, process axes servo error will stop robot and all applications.

Power Up: This value is initialized to TRUE and maintains its previous value over subsequent power cycles.

$IS_MCR.$spc_reset

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: ISDT System Variable: serial pulsecoder reset

Description: This system variable is used for performing serial pulsecoder reset. User sets its value to TRUE, and then perform Cold start sequence to reset serial pulsecoder. Note: This is the only way to reset pulsecoder for a process axis.

Power Up: This value is initialized to FALSE. It will automatically reset its value back to FALSE after it has been changed to TRUE.

$IS_MOR STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Integral Servo Driven Tool (ISDT) Motion Output System Variable Structure

Description: This set of variables provide system information for ISDT Process Axes. These variables set by FLTR task to reflect the state of the ISDT system. See the descriptions of the individual fields below.

Power Up: N/A

Screen: System global variable screen.

$IS_MOR.$brk_status

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Process Axes Brake Status

Description: When this variable is set to TRUE, it indicates that the brakes on all process axes are released. When it is set to FALSE, it indicates that the brakes on all process axes are engaged.

Power Up: N/A

$IS_MOR.$error_cnt[1-4]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ISDT System Variable: process axes error count

Description: This variable indicates current error count of each axis. It is set by FLTR at every ITP. (For internal use only. Do not modify this system variable.)

Power Up: The change to this system variable takes effect immediately.

Screen: None

$IS_MOR.$post_error

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: ISDT System Variable: indicate if there is any ISDT system error or process axis servo error has been posted

Description: This flag indicates when TRUE that there has been a ISDT error posted. It can only be reset to FALSE when all errors are cleared and servo power is on.

Power Up: This value is set to FALSE at every power cycles if servo power is on and there is no other ISDT system error.

Screen: None

$IS_MOR.$servo_ready

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: ISDT System Variable: indicate if servo power is on

Description: This flag indicates when TRUE that ISDT process axes servo power is on and is ready to move. When FALSE, it indicates that process axes servo has error and the servo power is off. It is updated by ISDT and FLTR task.

Power Up: This value is set to TRUE at every power cycles if servo power is on.

Screen: None

$IS_MRR STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Integral Servo Driven Tool (ISDT) Motion Reset System Variable Structure

Description: Static variables which are copied on power up from the ISDT User Motion Reset Record. See the descriptions of the individual fields below.

Power Up: N/A

$IS_MRR.$endmotn_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: ISDT System Variable: enable process axes to stop when INTR end motion occurs

Description: When it is set to TRUE. All process axes stop when any robot stops or robot application programs are finished. If it is set to FALSE, process axes motion is independent of robot.

Power Up: This value is initialized to FALSE and maintains its previous value over subsequent power cycles.

$IS_MRR.$exp_accel[1-4]

Minimum: 0   **Maximum:** 32767   **Default:** 120   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: ISDT System Variable: acceleration time constant for each process axis exponential filter

Description: This exponential filter acceleration time constant can be set at Process Axes Setup menu or by revising this system variable.

Power Up: The change to this variable takes effect over subsequent power cycles.

Screen: Process Axes Setup Menu or SYSTEM Variables screen

$IS_MRR.$gear_ratio[1-4]

Minimum: -10000000000.   **Maximum:** 10000000000.   **Default:** 0.   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: ISDT System Variable: gear ratio for each process axis

Description: This value should only be changed at Process Axes Setup Menu.

Power Up: N/A

Screen: Process Axes Setup Menu.

$IS_MRR.$jntvellim[1-4]

Minimum: -100000.   **Maximum:** 100000.   **Default:** 0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: ISDT System Variable: specify joint speed limit for each process axis

Description: This variable specifies the joint speed limit in revolution per minute(RPM). If the issued motion command is greater than this value, a warning message is posted to inform that the joint speed exceeds this limit. And this joint speed limit value is used for that motion. This value should only be changed at the Process Axes Setup Menu.

Power Up: N/A

Screen: Process Axes Setup Menu.

$IS_SCR STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data
Type:** Not available   **Memory:** Not available

Name: Integral Servo Driven Tool (ISDT) System Configuration Variable Structure

Description: IS_SCR record consists of all motion environment set up parameters for process axes. It is set up at the Process Axes Setup Menu. See the descriptions of the individual fields below.

Power Up: N/A

Screen: System global variable screen.

$IS_SCR.$axisorder[1-4]

Minimum: 0   **Maximum:** 16   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not
available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: ISDT System Variable: mapping between software and servo axis order

Description: This variable is set during process axes setup. If a particular axis' axisorder is set to zero, there will be no servo support for that axis.

Power Up: N/A

Screen: None

$IS_SCR.$axs_amp_num[1-8]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Amplifier number of process axis

Description: For internal use only. This value defines the amplifier number for each process axis.

Power Up: This value is initialized to 0 and maintains its previous value over subsequent power cycles.

Screen: For hardware setup only. It should be only set from process axis setup program at installation or CTRL maintenance.

$IS_SCR.$brk_number[1-4]

Minimum: 0   **Maximum:** 6   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: ISDT System Variable: indicates the brake number assigned for each process axis

Description: This variable is set at Process Axes Setup Menu or set by revising this system variable.

Power Up: The change to this variable takes effect over subsequent power cycles.

Screen: None

$IS_SCR.$hw_config

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER_SK   **Memory:** Not available

Name: Process Axes hardware configuration

Description: For internal use only. This value specifies the R-J3 hardware configuration, that is used to set up axis parameter for bringing up process axis servo correctly.

Power Up: This value is initialized to 0 and maintains its previous value over subsequent power cycles.

Screen: This variable is set by process axes setup routine. User should not change it.

$IS_SCR.$hw_strt_axs

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ISDT System Variable: hardware start axis number for process axes

Description: This variable should only be set during process axes setup.

Power Up: N/A

Screen: None

$IS_SCR.$motor_curnt[1-8]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Select CURRENT LIMIT FOR AMPLIFIER

Description: For internal use only. Do not modify this system variable.

Power Up: This value is initialized to 0 and maintains its previous value over subsequent power cycles.

Screen: System global variable screen

$IS_SCR.$motor_size[1-8]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Select MOTOR SIZE

Description: For internal use only. Do not modify this system variable.

Power Up: This value is initialized to 0 and maintains its previous value over subsequent power cycles.

Screen: System global variable screen

$IS_SCR.$motor_type[1-8]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Select MOTOR TYPE

Description: For internal use only. Do not modify this system variable.

Power Up: This value is initialized to 0 and maintains its previous value over subsequent power cycles.

Screen: System global variable screen

$IS_SCR.$num_tot_axs

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: ISDT System Variable: total number of process axes installed

Description: This variable is updated by ISDT during process axes setup. You should not set this value.

Power Up: N/A

Screen: None

$IS_SCR.$rotary_axs[1-4]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: ISDT System Variable: indicates if the axis is rotary or linear axis

Description: For process axis, it is rotary axis, this value should be TRUE. User should not set this value.

Power Up: N/A

Screen: None

2.10 "J" System Variables

$JCR STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Jog configuration record

Description: Assorted system variables that define the jog environment. Individual fields within this structure are described below.

Power Up: Reset to default value on very cold start.

$JCR.$jog_dct_ele[1-2]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name:

Description: The entries in this array are used to display the element in jog coordinate of the teach pendent. For internal use only.

Power Up: N/A

$JCR.$jog_dct_nam[1-2]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name:

Description: The entries in this array are used to determine the softpart name that supports the jog softpart. For internal use only.

Power Up: N/A

$JCR.$jog_gp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Jog group

Description: Specify which group will be jogged from the teach pendant.

Power Up: Reset to default value on very cold start.

$JCR.$jog_subgp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Jog sub-group

Description: Specifies whether the sub-group (extended axis) will be jogged using the teach pendant.

Power Up: Reset to default value on cold start.

$JCR_GRP[1] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Group 1 Jog configuration record

Description: Assorted system variables define the jog environment for robot group 1.

Power Up: Reset to default value on every cold start.

$JCR_GRP[1].$cd_jog

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Coordinate jogging

Description: Specified whether or not current jogging mode is coordinate jogging. In the Coordinate jogging mode when the leader group (current group) is moving.

Power Up: Reset to default value on every cold start.

$JCR_GRP[1].$fix_ornt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Fixed Orientation

Description: This variable indicate whether or not the follower will maintain its orientation when user did a cd jog of leader.

Power Up: Reset to the default value on every cold start.

$JCR_GRP[1].$follower

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Follower group mask

Description: Specifies which groups should follow the current group when coordinate jog mode.

Power Up: Reset to the default value on every cold start.

$JCR_GRP[1].$jog_coord

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** JOG_COORD_T   **Memory:** Not available

Name: Selection of manual feed coordinate system

Description: When you do jog from the teach pendant, specify the kind of jog (manual feed) $JOG_COORD indicates the currently selected jog coordinate system for the teach pendant, using the following values: 0 = JOINT 1 = JOGFRAME 2 = WORLDFRAME 3 = TOOLFRAME 4 = USER FRAME (if option purchased) $JOG_COORD is automatically set by the teach pendant COORD key on the teach pendant.

Power Up: Reset to default value on every cold start.

See Also: $SCR_GRP[1].$coord_mask

$JCR_GRP[1].$jog_fine_md

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Jog fine mode

Description: Specify the fine jogging mode. When in fine jogging mode, the robot will not move continuously, it moves only a fixed distance for one press. To get another move, release and press jog key again. The speed used is 1% times. $JOG_GROUP[1].$fine_ovrd times $SCR_GRP[1].$fine_pcnt. If set to TRUE, the Speed override is 1%. If set to FALSE, the Speed override is 1%-100%.

Power Up: Reset to default value on every cold start.

See Also: $JOG_GROUP[1].$fine_ovrd, $JOG_GROUP[1].$fine_dis t, $SCR_GRP[1].$fine_pcnt.

$JCR_GRP[1].$jog_v_fine

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Jog very fine mode

Description: When $JOG_FINE_MD is TRUE, this flag specify a very fine mode. In this mode the distance and speed is one tenth of the distance and speed of fine mode.

Power Up: Reset to default value on every cold start.

$JCR_GRP[1].$jog_wrstjnt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Wrist Joint Jog

Description: Specifies the orientation method used in the Cartesian jogging is wrist joint. $JOG_WRSTJNT indicates the currently selected orientation method for the teach pendant. If set to TRUE, wrist joint orientation is used. If set to FALSE, two-angle orientation is used.

Power Up: N/A

$JCR_GRP[1].$leader

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Leader

Description: When this variable is other than 0, it means the follower group will jog in leader's frame when select jog frame regardless the leader's position.

Power Up: Reset to the default value on every cold start.

$JCR_GRP[1].$prg_run

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Program running

Description: Specified whether or not program has been run since last jog.

Power Up: Reset to default value on very cold start.

$JCR_GRP[1].$rtcp_jog

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Remote TCP jogging

Description: Specified whether or not current jogging mode is RTCP jogging. In the RTCP jogging mode, when user do the orientation jogging the robot hand will revolve around the remote TCP frame point along the coordinate axis.

Power Up: Reset to default value on very cold start.

$JOBPROC_ENB

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Job and Process of program sub type

Description: When the value of this variable is 1, you will be able to specify the sub type of a teach pendant program by this value. The sub types are Job and Process. The sub type is displayed at the SELECT screen as the follows. Job program : .JB Process program : .PR n generally, Job program is used as main program. Process program is used as sub program. In the SELECT screen, you can display the program list which has the same sub type if you press F1, [TYPE].

Power Up: The change takes effect immediately.

Screen: Appears on the SYSTEM Variables screen.

$JOG_GROUP STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Jog Group System Variables

Description: System variable you can modify specifically for your own jog environment. Individual fields within this structure are described below.

Power Up: Changes to this variable take effect immediately.

$JOG_GROUP[1].$fine_dist

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Distance used in Fine Jog Mode

Description: Specifies the distance used in Cartesian fine jog mode. The unit is millimeters.

Power Up: Changes to this variable take effect immediately.

$JOG_GROUP[1].$fine_ovrd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Percentage at Fine Jog Mode

Description: This system variable is a percentage of 1% speed override. This is used to calculate the jog speed used in the fine jog mode.

Power Up: Changes to this variable take effect immediately.

See Also: $SCR_GRP[1].$fine_pcnt, $JOG_GROUP[1].$fine_dist

$JOG_GROUP[1].$jogframe

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION   **Memory:** Not available

Name: Jog Coordinate System

Description: Specifies the current jog coordinate system being used. The system updates it automatically. $JOGFRAME is used as the frame of reference for jogging when ''JGFRM'' is selected on the teach pendant. For most cases, it is convenient to set it to the same value as $UFRAME. It will allow you to jog the robot along the x,y,z direction defined by $UFRAME. In some cases you might want to set $JOGFRAME to a different value than $UFRAME. This will allow you to jog the robot independently of $UFRAME and still permit you to RECORD positions in reference to $UFRAME.

Power Up: Changes to this variable take effect immediately.

$JPOSREC_ENB

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Record Position Type

Description: Specifies the position type with which to record positions using the RECORD key. If set to 0, the position will be recorded in xyzwpr representation If set to 1, the position will be recorded in JOINT representation

Power Up: N/A

2.11 "L" System Variables

$lastpauspos[1-5]

Minimum: MIN_JPOS   **Maximum:** 1   **Default:** DEF_JPOS   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** JOINTPOS9   **Memory:** CMOS

Name: Last Robot Position When Program is Paused

Description: When the program is paused, the robot position is recorded in this system variable automatically. This position is used to move robot back to the stopped position when a program is resumed. This variable should be maintained by the system only. Do not change this variable.

Power Up: Takes effect immediately

$LASTPAUSPOS[5]

Minimum: MIN_JPOS   **Maximum:** MAX_JPOS   **Default:** DEF_JPOS   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** JOINTPOS9 **Memory:** Not available

Name: Last Robot Position When Program is Paused

Description: When the program is paused, the robot position is recorded in this system variable automatically. This position is used to move robot back to the stopped position when a program is resumed. This variable should be maintained by the system only. Do not change this variable.

Power Up: Changes to this variable take effect immediately.

$LDCFG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LDCFG_T   **Memory:** Not available

Name: Linear Distance configuration.

Description: This variable indicates the linear distance configuration for the linear distance function. It contains several individual fields for you to specify how the Linear Distance function should behave.

Power Up: N/A

$LDCFG.$group_msk

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Linear Distance Group mask.

Description: This is a bit map variable. When the bit is turned on, the Linear Distance is enabled for that group. For example when the value is 1, bit one is turned on, so the Linear Distance function is enabled for group 1. When the value is 3 (bit 1 and bit 2 are turned on), then the Linear distance is enabled for both group 1 and group 2.

Power Up: N/A

$LDCFG.$rsm_proj

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Projection position as stop pos for resume motion.

Description: When this variable is true and you specify org-path-resume by setting application specific variable (such as $MH_ORGRSM.$RET_PTH_ENA for HandlingTool), the org-path-resume will use the projection position as the stop position. The robot will move to this projected position before it moves to its destination.

Power Up: N/A

$LDCFG.$tb_spdup

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Turbo move speed up for AP_LD motion

Description: This variable is used to speed up the AP_LD motion planned by TurboMove. When this is true, TurboMoe will use a shorter acceleration for this motion. In most cases when this is true, the cycle time for this motion will be reduced.

Power Up: N/A

$LNCFG STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Line Track Configuration System Variable Structure

Description: This set of variables controls the mode of operation of Line Tracking. See the descriptions of the individual fields below.

Power Up: N/A

$LNCFG.$cart_lntk

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Cartesian filter line tracking

Description: This variable when TRUE indicates that line tracking support the Cartesian filter scheme.

Power Up: This value initializes to FALSE and maintains its previous value over subsequent power cycles.

Screen: System global variable screen.

$LNCFG.$cont_enable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Continue tracking after fault function enable flag

Description: This variable, when TRUE, indicates that the continue tracking function is turned on. This value initializes to FALSE and maintains its previous value over subsequent power cycles.

Power Up: N/A

$LNCFG.$debug

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Line Tracking Debug Level (Bit mapped)

Description: For internal debugging use only. Setting this variable might drastically change the functionality of this system option.

Power Up: This value initializes to 0 and maintains its previous value over subsequent power cycles.

$LNCFG.$entry_xtrm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Line Tracking Entry Extreme Limit

Description: This variable indicates an upstream limit beyond which tracking of the part will not be permitted. A value of 32767 decimal indicates that the feature is disabled. This value initializes to 32767 and maintains its previous value over subsequent power cycles.

Power Up: N/A

$LNCFG.$exit_xtrm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Line Tracking Exit Extreme Limit

Description: This variable indicates a downstream limit beyond which tracking of the part will not be permitted. A value of 32767 decimal indicates that the feature is disabled. This value initializes to 32767 and maintains its previous value over subsequent power cycles.

Power Up: N/A

$LNCFG.$group_msk

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Line Tracking Group Mask

Description: This system variable specifies which motion groups can perform the line tracking.

Power Up: This value initializes to allow group 1 tracking, and will maintain its value over subsequent power cycles.

Screen: System global variable screen.

$LNCFG.$group_num

Minimum: 1   **Maximum:** 5   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Line Tracking Group Number

Description: This system variable specifies which motion group will perform the line tracking. Currently this value is restricted to group 1.

Power Up: This value initializes to group 1 and will maintain its value over subsequent power cycles.

$LNCFG.$int_no_gone

Minimum: 0   **Maximum:** 1   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Line Tracking INTR Track Destination Gone Error Posting

Description: This variable when TRUE indicates that Track Destination GONE errors which occur during robot motion should NOT be posted. When FALSE, these errors will be posted (causing all robot motion to STOP) any time that the current tracking position moves past the current DOWN Boundary window.

Power Up: This value initializes to TRUE and maintains its previous value over subsequent power cycles.

$LNCFG.$no_header

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Line Tracking Program Header Display Flag

Description: This variable when TRUE indicates that the Line Tracking program header data screen should not be shown within the program DETAIL screens. This value it set by applications such as PaintTool which supply their own header data menu screens. (Note that this value only determines whether or not the data is displayed. The data MUST always be present for tracking programs.)

Power Up: This value initializes to FALSE and maintains its previous value over subsequent power cycles.

$LNCFG.$pln_no_gone

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Line Tracking PLAN Track Destination Gone Error Posting

Description: This variable when TRUE indicates that Track Destination GONE errors which occur during motion planning should NOT be posted. When FALSE, these errors will be posted, and all robot motion will STOP.

Power Up: This value initializes to FALSE and maintains its previous value over subsequent power cycles.

$LNCFG.$rstr_bnds

Minimum: 0   **Maximum:** 1   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Line Tracking Restore Selected Boundary Value

Description: This variable when TRUE indicates that the previously-selected boundary value will be restored upon returning to a tracking program from a call to another (tracking or non-tracking) program. This works in conjunction with the Select Bounds value set within the program Detail header data to set a default boundary pair. When FALSE, the current boundary value remains set.

Power Up: This value initializes to TRUE and maintains its previous value over subsequent power cycles.

$LNCFG.$slc_pt_trig

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use SLC interrupt service to detect the part detect switch.

Description: This variable when TRUE indicates that line tracking will use the slc interrupt service routine to detect the part detect. This provide a more accurate trigger value of part and the fast line tracking feature.

Power Up: This value initializes to FALSE and maintains its previous value over subsequent power cycles.

Screen: System global variable screen.

$LNCFG.$soft_delay

Minimum: 16   **Maximum:** 1000   **Default:** 96   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Line Track Soft (Adjustable) Delay Time (in ROS TICKs)

Description: This system variable adjusts the tracking prediction delay to account for system delays other than those due to the servo system.

Power Up: This value initializes to 96 (TICKS) and maintains its previous value over subsequent power cycles.

$LNCFG.$srvo_delay

Minimum: 16   **Maximum:** 1000   **Default:** 48   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Line Track Servo Delay Time (in ROS TICKs)

Description: This system variable adjusts the tracking prediction delay to account for the servo system delays.

Power Up: This value initializes to 48 (TICKS) and maintains its previous value over subsequent power cycles.

$LNCFG.$stand_alone

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Line Tracking Stand Alone (TPP+ Line Tracking)

Description: This variable indicates when TRUE that the current application is using the full TPP+ Line Tracking feature. It should be set FALSE by PaintTool and other application which do not use the standard TPP+ Line Tracking SETUP menu's.

Power Up: This value initializes to TRUE and maintains its previous value over subsequent power cycles.

Screen: System global variable screen.

$LNCFG.$sync_timout

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Line Tracking Conveyor (Re)Synchronization Time-Out Period

Description: This variable represents the time (in seconds) that the line tracking system will wait for a part to be detected during the automatic conveyor synchronization sequence. Upon time-out you will be warned that a time-out occurred and will be automatically returned to the Program Select menu.

Power Up: This value initializes to 120 (2 minutes) and maintains its previous value over subsequent power cycles.

$LNCFG.$t2s_pst_ccn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Line Tracking Track-To-Stationary Position Post Continuous Tracking Cancel

Description: This variable when TRUE indicates that a continuous tracking cancel will be automatically issued at the first program CALL to a non tracking program after returning from a tracking program. However, when TRUE the cancel routine will cause the robot to pause briefly before moving to the next stationary position.

Power Up: This value initializes to FALSE and maintains its previous value over subsequent power cycles.

Screen: System global variable screen

$LNCFG_GRP STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Line Tracking Configuration Group Structure

Description: This set of variables controls the mode of operation of Line Tracking. See the descriptions of the individual fields below.

Power Up: N/A

$LNCFG_GRP.$int_no_gone

Minimum: 0   **Maximum:** 1   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Line Tracking INTR Track Destination Gone Error Posting

Description: This variable when TRUE indicates that Track Destination GONE errors which occur during robot motion should NOT be posted. When FALSE, these errors will be posted (causing all robot motion will STOP) any time that the current tracking position moves past the current DOWN Boundary window.

Power Up: This value initializes to TRUE and maintains its previous value over subsequent power cycles.

Screen: System global variable screen

$LNCFG_GRP.$pln_no_gone

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Line Tracking PLAN Track Destination Gone Error Posting

Description: This variable when TRUE indicates that Track Destination GONE errors which occur during motion planning should NOT be posted. When FALSE, these errors will be posted, and all robot motion will STOP.

Power Up: This value initializes to FALSE and maintains its previous value over subsequent power cycles.

Screen: System global variable screen

$LNCFG_GRP.$rstr_bnds

Minimum: 0   **Maximum:** 1   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Line Tracking Restore Selected Boundary Value

Description: This variable when TRUE indicates that the previously-selected boundary value will be restored upon returning to a tracking program from a call to another (tracking or non-tracking) program. This works in conjunction with the Select Bounds value set within the program Detail header data to set a default boundary pair. When FALSE, the current boundary value remains set.

Power Up: This value initializes to TRUE and maintains its previous value over subsequent power cycles.

Screen: System global variable screen

$LNCFG_GRP.$soft_delay

Minimum: 16   **Maximum:** 1000   **Default:** 96   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Line Track Soft (Adjustable) Delay Time (in milliseconds)

Description: This system variable adjusts the tracking prediction delay to account for system delays other than those due to the servo system.

Power Up: This value initializes to 96 (in millisecond). It can be adjusted on the fly to tune line tracking accuracy.

Screen: System global variable screen

$LNCFG_GRP.$srvo_delay

Minimum: 16   **Maximum:** 1000   **Default:** 48   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Line Track Servo Delay Time (in milliseconds)

Description: This value initializes to 96 (in milliseconds). It can be adjusted on the fly to tune line tracking accuracy.

Power Up: This value initializes to 48 (in milliseconds) its previous value over subsequent power cycles.

Screen: System global variable screen

$LNCFG_GRP[1].$lmt_chk_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enable the joint limit checking function

Description: This feature functions as MROT inside the tracking program. When this variable is set to TRUE, line tracking will enable this function. Before the line tracking move, it will check to see if the last axis will reach the limit or not. If it will, then the system changes the direction of the last axis movement. This function works only when the all following conditions are satisfied.

- $LNCFG_GRP[gnum].$LMT_CHK_ENB = TRUE. (!!!default is FALSE!!!)

- Line tracking motion.

- Linear motion.

- RS_WORLD motion.

Note $LNCFG_GRP[gnum].$LMT_CHK_ENB Enable/Disable function (default is FALSE) $LNCFG_GRP[gnum].$LMT_CHK_UL Upper soft limit margin (default is 20deg) $LNCFG_GRP[gnum].$LMT_CHK_LL Lower soft limit margin (default is 20deg) For exemple, if J6's stroke range is -360 to 360, and both $LMT_CHK_UL and $LMT_CHK_LL are 20[deg], when the expected next destination exceeds the range from -340 to 340, it takes another direction.

Power Up: On Immediately

$LNCFG_GRP[1].$lmt_chk_ll

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Upper limit for the limit check function

Description: This is part of system variable that will be used by the limit check function for Line tracking. Before the line tracking move, it will check to see if the last axis will reach the limit or not. If it will, then system change the direction of last axis movement. This function works only when the all following conditions are satisfied.

- $LNCFG_GRP[gnum].$LMT_CHK_ENB = TRUE. (!!!default is FALSE!!!)

- Line tracking motion.

- Linear motion.

- RS_WORLD motion.

Setting parameters: $LNCFG_GRP[gnum].$LMT_CHK_ENB Enable/Disable function (default is FALSE) $LNCFG_GRP[gnum].$LMT_CHK_UL Upper soft limit margin (default is 20deg) $LNCFG_GRP[gnum].$LMT_CHK_LL Lower soft limit margin (default is 20deg) For example, if J6's stroke range is -360 to 360, and both $LMT_CHK_UL and $LMT_CHK_LL are 20[deg], when the expected next destination exceeds the range from -340 to 340, it takes another direction.

Power Up: On Immediately

$LNCFG_GRP[1].$lmt_chk_ul

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Upper limit for the limit checking function

Description: This is part of a system variable that will be used by limit check function for Line tracking. Before the line tracking move, it will check to see if the last axis will reach the limit or not. If it will, then system change the direction of last axis movement. This function works only when the all following conditions are satisfied.

- $LNCFG_GRP[gnum].$LMT_CHK_ENB = TRUE. (!!!default is FALSE!!!)

- Line tracking motion.

- Linear motion.

- RS_WORLD motion.

Setting parameters: $LNCFG_GRP[gnum].$LMT_CHK_ENB Enable/Disable function (default is FALSE) $LNCFG_GRP[gnum].$LMT_CHK_UL Upper soft limit margin (default is 20deg) $LNCFG_GRP[gnum].$LMT_CHK_LL Lower soft limit margin (default is 20deg) For example, if J6's stroke range is -360 to 360, and both $LMT_CHK_UL and $LMT_CHK_LL are 20[deg], when the expected next destination exceeds the range from -340 to 340, it takes another direction.

Power Up: On Immediately

$LNCFG_GRP[1].$skip_obndmv

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Skip the motion in which the part will be outside of down stream boundary.

Description: When this variable is set, the line tracking program will skip the motion that its destination will be outside of down stream boundary. Refer to the Line Tracking Manual for more details.

Power Up: On Immediately

$LNCFG_GRP[1].$skp_adj_ms

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Adjust checking of skip move by time in millisecond.

Description: There are 3 tracking motion in a typical pick and place tracking program: above_pick, pick and above_pick. When skip outbound is enabled the robot might skip P3 and stay at p2. This might cause the robot to disturb the part on the conveyor. To prevent this condition, you must set up a system variable $LNCFG_GRP[].$SKP_ADJ_MS to specify the time margin that would prevent this condition. This should be derived from the user program. The value should be the distance between P2 and P3 divided by the program speed of P3. When the system determines whether or not P2 is out of bounds, the system uses this value to determine whether or not it has time to reach P3. If it does not have time to reach P3 then the system will skip P2 also. The system will adjust the time internally for a low override condition. Refer to the "Skip Outbound Move" section of the Linetracking Manual for more details.

Power Up: On Immediately

$LNCFG_GRP[1].$skp_flg_no

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Skip Flag Number

Description: This function will set the flag that the user specified when the skip move condition occurs. You must reset this system variable before you can use it. Refer to the Linetracking Manual for more information.

Power Up: On Immediately

$LNEDTMOD

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Linetracking Editing Mode

Description: When linetracking program is selected and if $LNEDTMOD is 0: user must set trigger value. 1: user can select whether he sets trigger value or not.

Power Up: Change of this variable takes effect immediately

Screen: System global variable screen

See Also: This variable is used for multi-arm linetracking only.

$LNLPR STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Line Track Process Control System Variable Structure

Description: This set of variables provide a process control interface into the Line Tracking system. Individual fields within the structure are defined below.

Power Up: This value initializes to 48 (TICKS) and maintains its previous value over subsequent power cycles.

$LNLPR.$ln_holdmotn

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Line Track Process Hold Motion

Description: This variable can be set by an application process to cause Line Tracking to hold all program motion at the next Extreme Position WAIT-FOR-WINDOW event. In this way the robot can be made to complete only the current motion path rather than all reachable paths under such circumstances as when a conveyor stops moving.

Power Up: This value initializes to FALSE and maintains its previous value over subsequent power cycles.

$LNLPR_GRP STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Line Track Process Control Group System Variable Structure

Description: This set of variables provide a process control interface into the Line Tracking system. Individual fields within the structure are defined below.

Power Up: N/A

$LNLPR_GRP.$ln_holdmotn

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Line Track Process Hold Motion

Description: This variable can be set by an application process to cause Line Tracking to hold all program motion at the next Extreme Position WAIT-FOR-WINDOW event. In this way the robot can be made to complete only the current motion path rather than all reachable paths under such circumstances as when a conveyor stops moving.

Power Up: This value initializes to FALSE and maintains its previous value over subsequent power cycles.

Screen: System global variable screen.

$LNLPR_GRP.$seg_predtim

Minimum: 0   **Maximum:** 10   **Default:** 4   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Line Track Motion Segment Prediction Time

Description: This variable can be adjusted by an application process to modify the prediction time that line tracking uses for intercept position computations. This is an internal variable used during tracking motion planning. It is in units of ITP time intervals.

Power Up: This value initializes to 4 and maintains its previous value over subsequent power cycles.

Screen: System global variable screen.

See Also: $SCR.$ITP_TIME

$LNLPR_GRP.$SYNC_WAIT

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Group synchronization flag

Description: This flag is used in multiple group line tracking system. When this flag is set, this line tracking group would always wait until this flag is reset. If the robot is tracking at the time it is waiting, the robot will continue tracking. If the robot is stop at the time it is waiting, the robot will not move until the flag is reset.

Power Up: This value initializes to false. When user abort program this flag will resetto false.

Screen: System global variable screen.

$LNSCH.$teach_ufm

Minimum: MIN_POS   **Maximum:** MAX_POS   **Default:** DEF_POS   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION   **Memory:** Not available

Name: Tracking User frame: teach user frame

Description: Stores Tracking User frame at teach time for internal use.

Power Up: Changes to this variable take effect immediately

Screen: SYSYTEM variables screen

$LNSCH.$trk_uframe

Minimum: MIN_POS   **Maximum:** MAX_POS   **Default:** DEF_POS   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION   **Memory:** Not available

Name: Tracking User frame

Description: Stores Tracking User frame for internal use.

Power Up: Changes to this variable take effect immediately

Screen: SYSTEM variables screen

$LNSCH.$ufrm_rt_lim

Minimum: 0.0   **Maximum:** 180.0   **Default:** 5.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** real   **Memory:** Not available

Name: Tracking User frame rotation limit

Description: This variable sets the rotation limit (in degrees) between tracking user frames at the program teaching and playback time.

Power Up: Changes to this variable take effect immediately

Screen: SYSTEM variables screen

See Also: $LNSCH.$use_trk_ufm

$LNSCH.$use_trk_ufm

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use Tracking User frame flag

Description: Indicates if Tracking User frame will be used in the schedule.

Power Up: Changes to this variable take effect immediately

Screen: SYSTEM variable screen

$LNSCH.$visufm_dist

Minimum: -3.0E38   **Maximum:** 3.0E38   **Default:** 0.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** real   **Memory:** Not available

Name: Tracking User frame: Vision User farme distance

Description: This variable is taking effect when Tracking User frame instruction VISUFRAME is used. The value represents the distance (in mm) between part detact switch and the part location in which the snapshot is taken by the vision system.

Power Up: Changes to this variable take effect immediately

Screen: SYSTEM variable screen

See Also: $LNSCH.$use_trk_frm

$LNSCH[1].$bound1[1-10]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Boundary Position 1 (Up-Stream) Array

Description: This specifies the up-stream boundary of the workspace window of operation. Values stored here are used as position offsets (in millimeters) relative to either the nominal tracking frame X-axis (for LINE Tracking), or the zero position of the extended axis indicated by the track axis number (for RAIL Tracking). Values stored here MUST be farther up-stream than the corresponding values found in $LNSCH[1].$bound2 (indexed by $LNSCH[1].$sel_bound). During window checking, positions which are farther up-stream than the selected $LNSCH[1].$bound1 value are considered to be IN-BOUND (not yet within the work window), and those which are down-stream of these values are considered to be IN-WINDOW or GONE (depending upon the position's comparison with the corresponding $LNSCH[1].bound2 value).

Power Up: Maintains its previous value.

Screen: SYSTEM Variables screen, SETUP Tracking screen

See Also: $LNSCH[1].$bound2, LNSCH[1].$sel_bound

$LNSCH[1].$bound2[1-10]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Boundary Position 2 (Down-Stream) Array

Description: This specifies the down-stream boundary of the workspace window of operation. Values stored here are used as position offsets (in millimeters) relative to either the nominal tracking frame X-axis (for LINE Tracking), or the zero position of the extended axis indicated by the track axis number (for RAIL Tracking). Values stored here MUST be farther down-stream than the corresponding values found in $LNSCH[1].$bound1 (indexed by $LNSCH[1].$sel_bound). During window checking, positions which are farther up-stream than the selected $LNSCH[1].$bound2 value are considered to be either IN-BOUND or IN-WINDOW (depending upon the position's comparison with the corresponding $LNSCH[1].$bound1 value), and those which are down-stream of these values are considered to be GONE (beyond the work window).

Power Up: Maintains its previous value.

Screen: SYSTEM Variables screen, SETUP Tracking screen

See Also: $LNSCH[1].$bound1, LNSCH[1].$sel_bound

$LNSCH[1].$part_queue

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Vision tracking use part queue

Description: This variable indicates whether or not Vision setup the part queue for the trigger value. This variable is set by vision tracking. All the part queue data also stored by vision tracking.

Power Up: Reset to False.

Screen: SYSTEM System Variable screen

See Also: $LNSCH[1].$TRK_AXS_NUM

$LNSCH[1].$rec_shift

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Record Shift (Encoder Counts)

Description: The Line Tracking record shift value is the offset distance (in units of sensor or encoder counts) between the current conveyor (or other external tracking equipment) position and the position which is associated with the teach distance. This number is combined with the number stored in $LNSCH[1].$teach_dist and multiplied by the scale factor ($LNSCH[1].$scale) to compute the part position offset to use during all position teaching and motion execution. This number is automatically set by the Line Track system at the time that the tracking positions are recorded or updated.

Power Up: Maintains its previous value.

See Also: $LNSCH[1].$teach_dist, and $LNSCH[1].$scale

$LNSCH[1].$scale

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Encoder Scale Factor (in counts/millimeter)

Description: The Line Track scale factor is a SIGNED value which defines the relationship between the conveyor (or other external tracking equipment) FORWARD motion and the encoder (or other sensor) counts. For a typical line tracking application, this scale factor should be a number of encoder counts per millimeter of FORWARD conveyor motion. For example, for a forward counting encoder the number might be: 45.579 counts/mm. For a backward counting encoder the number might be: -59.321 counts/mm. This number might also be used when determining the proper number for the teach distance such that the distance might be measured in millimeters and converted using the scale factor into encoder counts. Note : This value CANNOT be 0.0.

Power Up: Maintains its previous value.

Screen: SYSTEM Variables screen, SETUP Tracking screen

See Also: $LNSCH[1].$teach_dist, $LNSCH[1].$rec_shift

$LNSCH[1].$sel_bound

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Select Boundary Pair Number

Description: Specifies which of the boundary pairs (each pair has an IN-BOUND and an OUT-BOUND position) within this schedule will be used during any window boundary checking.

Power Up: Maintains its previous value.

Screen: SYSTEM Variable screen, SETUP Tracking screen

See Also: $LNSCH[1].$bound1

$LNSCH[1].$tcp_xtrm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Tool Center Point (TCP) Extreme Position

Description: Defines the position to be used for all window boundary checking. - A value of 1,000,000.0 (1.0E6) indicates that no extreme position checking will be performed. Instead, each program position will be checked individually to determine its boundary status. - Any other value is used as a position offset (in millimeters) along the tracking axis (the X-axis of the tracking frame for LINE tracking, or the extended axis indicated by the track axis number for RAIL tracking) which will be used during window boundary checking. The TCP extreme position should indicate the farthest upstream position (the most negative X-axis position relative to the tracking frame for LINE tracking systems) of a path such that the entire path motion is prevented from execution until after the TCP extreme position becomes IN-BOUNDS, thus indicating that all position along the path are reachable.

Power Up: Maintains its previous value.

See Also: $LNSCH[1].$trk_frame, $LNSCH[1].$trk_axis_num, $LNSCH[1].$bound1

$LNSCH[1].$teach_dist

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Teach Distance (Encoder Counts)

Description: The Line Tracking teach distance is the distance (in units of sensor or encoder counts) which is used to define a reference position during path teaching. In many cases this is the measurement from the zero position of the robot to the part detect sensor, measured along the conveyor (or other tracking equipment). This number gets combined with the number stored in $LNSCH[1].$rec_shift and multiplied by the scale factor ($LNSCH[1].$scale) to compute the part position offset to use during all position teaching and motion execution. This number must be set by the application (or manually by the user) prior to any part teaching. This number is most important for systems which include multiple robots where paths taught on one robot must be copied to another robot. In this way, any cell-to-cell placement adjustments (for the relative placement of the part detect switch, for example) can be made.

Power Up: Maintains its previous value.

Screen: SYSTEM Variable screen, SETUP Tracking screen

See Also: $LNSCH[1].$rec_shift, $LNSCH[1].$scale

$LNSCH[1].$trg_din_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Trigger Digital Input Number

Description: Specifies to which digital input the part detect switch (sensor) will be connected.

Power Up: Maintains its previous value.

Screen: SYSTEM Variables screen, SETUP Tracking screen

$LNSCH[1].$trig_value

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Trigger Value (Encoder Counts)

Description: This is the value of the Line Track encoder (or other sensor) which was recorded (by a user application program) when an associated part detect sensor was activated by a passing part. This value must be filled in by an application program prior to attempting any tracking motions (either teaching or playback).

Power Up: Set to UNINITIALIZED at every cold start.

Screen: SYSTEM Variables screen, SETUP Tracking screen

$LNSCH[1].$trk_axs_dir

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Tracking Axis Direction

Description: For RAIL tracking (ONLY), this is used to indicate the coordination between the Tracking Axis and the conveyor. When set to TRUE, this indicates that FORWARD conveyor (or other external tracking equipment) motion is in the POSITIVE direction of the Tracking Axis. When FALSE, this indicates that FORWARD conveyor motion is in the NEGATIVE direction of the Tracking Axis. (Note : This variable has no meaning for LINE tracking configurations and should thus be set to TRUE since the X-axis of the nominal tracking frame should always point in the direction of forward conveyor motion.) NOTE: The Tracking Axis for RAIL tracking systems MUST be parallel to the direction of travel of the conveyor (or other external tracking equipment).

Power Up: Maintains its previous value.

Screen: SYSTEM Variables screen, SETUP Tracking screen

See Also: $LNSCH[1].$TRK_AXS_NUM

$LNSCH[1].$trk_axs_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Tracking (Extended) Axis Number

Description: For RAIL tracking (ONLY). This specifies the extended axis number (from 1 to 3) to be used for all tracking motions. (Note : This variable has no meaning for LINE tracking configurations and should thus be set to 0.) NOTE: The Tracking Axis for RAIL Tracking systems MUST be parallel to the direction of travel of the conveyor (or other external tracking equipment).

Power Up: Maintains its previous value.

Screen: SYSTEM Variables screen, SETUP Tracking screen

See Also: $LNSCH[1].$trk_axs_dir

$LNSCH[1].$trk_enc_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Tracking Encoder Number

Description: Specifies which external tracking encoder data will be used during all tracking position computations and motions within programs which use the specified tracking schedule. One of two external sensor channels can be selected by specifying a value of either 1 or 2. (Note : On some hardware configurations, only one external tracking sensor channel is provided.) This number corresponds with the $ENC_STAT[x], $SCR.$enc_axis[x], and $SCR.$enc_type[x] system variables where x is the sensor (encoder) number specified by the value of this variable ($LNSCH[1].$trk_enc_num).

Power Up: Maintains its previous value.

Screen: SYSTEM Variable screen, SETUP Tracking screen

$LNSCH[1].$trk_frame

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION   **Memory:** Not available

Name: Nominal Tracking Reference Frame

Description: This is the stationary coordinate frame which describes the conveyor direction and orientation for Line Tracking systems. (Note : This is NOT used during Rail Tracking.) The X-axis of this frame MUST be the direction of FORWARD conveyor motion. This frame is automatically used as the UFRAME during all tracking operations (teach and execution). All boundaries and taught positions are stored and referenced relative to this frame. This frame should be set up using the 3-point method to precisely establish the conveyor line (or other external tracking equipment) direction and orientation.

Power Up: Maintains its previous value.

Screen: SYSTEM Variables screen, SETUP Tracking screen

See Also: $LNSCH[1].$trk_axs_num, and $LNSCH[1].$trk_axs_di r

$LNSCH[1].$trk_grp_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Track Group Number

Description: Specifies the motion group number to be associated with this tracking schedule. (Note: Currently tracking is only supported for group 1.)

Power Up: This value initializes to Group 1 and maintains its previous value over subsequent power cycles.

Screen: SYSTEM Variables screen, SETUP Tracking screen

$LNSCH[1].$trk_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Line Tracking Type (Mode)

Description: Allows you to specify either LINE or RAIL Tracking. (0 = LINE, 1 = RAIL) LINE tracking specifies that the robot Tool Center Point (TCP) position be adjusted to follow along (track) a conveyor or other external environment by changing the robot arm configuration (robot joint angles) in accordance with tracking information provided by an external sensor. All extended axis positions (eg. integrated rail positions) remain as programmed. RAIL tracking specifies that the robot TCP position be adjusted to follow along (track) a conveyor or other external environment by changing ONLY the specified extended axis positions (the integrated rail positions, for example) in accordance with tracking information provided by an external sensor. All other robot joint positions and arm configurations remain as programmed.

Power Up: Maintains its previous value.

Screen: SYSTEM Variables screen, SETUP Tracking screen

$LNSCH[1].$vision_trk

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Tracking with vision trigger

Description: This variable indicate whether or not Vision is used for the trigger mechanism. When Vision CPU exist and this schedule is set for vision tracking, the vision CPU will do the part snap shot and find out what is the encoder value at the time the snap shot is taken. The vision CPU will then calculate the trigger value accordingly and set the trigger value for this part.

Power Up: Maintains its previous value.

Screen: SYSTEM Variables screen and the SETUP Tracking screen

See Also: $LNSCH[1].$PART_QUEUE

$LNSCH[8] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Line Track Schedule Structures

Description: The Line Tracking Schedule contains a set of setup and storage parameters for the Line Tracking system (LINE and RAIL tracking). Up to six (6) different schedules can simultaneously exist on the system ($LNSCH[1], ... $LNSCH[6]). These are selected within user and application (teach pendant) programs to set up and run LINE (and/or RAIL) tracking. Each schedule can contain completely different information to allow you to select between different Line Track environments. Examples include specifying choices for tracking sensors (for a multi-conveyor environment), tracking modes (LINE or RAIL), boundaries, and so forth. One schedule must be associated with each tracking program as part of its program header data. (Currently programs are limited to teach pendant programs only, but a KAREL version of Line Track will be included within a future software release.) Program schedule numbers are currently specified using the DETAIL screen during teach pendant program creation. Individual fields within this structure are described below.

Power Up: N/A

Screen: SYSTEM Variables screen, teach pendant program DETAIL screen, and the SETUP Tracking screen

$LNSNRSCH[1].$average

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Sensor Average Number

Description: This is the initialization value which specifies the number of previous sensor (encoder) readings to average (sum and divide) when determining the current sensor rate values.

Power Up: Maintains its previous value.

See Also: $ENC_STAT[1].$enc_average

$LNSNRSCH[1].$enable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Sensor Enable

Description: This is the initialization value which specifies the ON/OFF state of the sensor. (NOTE : The ON/OFF state can also be changed using the Line Track TPE LINE instruction.)

Power Up: Maintains its previous value.

See Also: $ENC_STAT[1].$enc_enable

$LNSNRSCH[1].$sim_on

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Sensor Simulation Enable

Description: This is the initialization value which specifies the sensor simulation ON/OFF state. (NOTE : The ON/OFF state can also be changed using the Line Track TPE LINESIM instruction. Note also: The sensor MUST be enabled in order to simulate sensor input.)

Power Up: Maintains its previous value.

See Also: $ENC_STAT[1].$enc_sim_on

$LNSNRSCH[1].$sim_spd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Sensor Simulation Speed

Description: This is the initialization value which specifies the sensor simulation speed (in encoder counts per encoder update). (NOTE : The simulation speed can also be changed using the Line Track TPE LINESIM instruction.)

Power Up: Maintains its previous value.

See Also: $ENC_STAT[1].$enc_sim_spd

$LNSNRSCH[1].$thresh

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Sensor Stop Threshold

Description: This is the initialization value which specifies the sensor stop threshold in units of sensor counts per sensor update. This value is used by the TPE LINESTOP instruction to determine whether or not the line (conveyor) has stopped moving. Line rates which are LESS than the stop threshold value are considered to indicate that the line has stopped.

Power Up: Maintains its previous value.

See Also: $ENC_STAT[1].$enc_thresh

$LNSNRSCH[1].$update_rate

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Sensor Update Rate

Description: This is the initialization value which specifies the sensor update rate (in ITP_TIME intervals). The sensor (encoder) is ready once every $LNSNRSCH[1].$update_rate itp_time intervals.

Power Up: Maintains its previous value.

See Also: $ENC_STAT[1].$enc_multipl, $SCR.$itp_time

$LNSNRSCH[8] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Line Track Sensor (Encoder) Schedule Structure

Description: The Line Tracking Sensor Schedule contains a set of setup variables for a tracking sensor (encoder). Up to 3 different sensor schedules can simultaneously exist on the system ($LNSNRSCH[1], ... $LNSNRSCH[3]). These are selected within user and application programs to set up the tracking sensor(s). Each schedule can contain completely different information to allow you to select between several sensor (encoder) configurations. Examples include specifying different sensor averaging (signal filtering), update rates, and enabling/disabling sensor simulation. Values within a sensor setup schedule must be transferred into the $ENC_STAT[1] structure using the Line Tracking TPE DEFENC instruction. These values have NO effect except when used to configure a sensor (encoder) using the above instruction. Individual fields within this structure are described below.

Power Up: N/A

See Also: $ENC_STAT[1], $SCR.$ENC_AXIS[1], $SCR.$ENC_TYPE[1]

$LNSTAT_GRP STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Line Track Continuous Tracking Status Group structure

Description: This structure provides line tracking continuous tracking functions. The individual fields are described below.

Power Up: N/A

$LNSTAT_GRP.$cont_trk_on

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Line Track Continuous Tracking Status

Description: This flag contains an internal status value. It has no external meaning.

Power Up: This value initializes to FALSE and maintains its previous value over subsequent power cycles.

$LNSTAT_GRP.$trig_diff

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Line count difference between accutrig and non accutrig.

Description: This is the line count difference between accutrig and non accutrig.

Power Up: This is a monitor variable.

$LNSTAT_GRP.$wait_4_wndw

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Line Track Wait-For-Window Boundary Check Status Flag

Description: This flag indicates when TRUE that the motion system is waiting for a position (or extreme position) to enter the currently-selected boundary window prior to planning the new motion.

Power Up: This value initializes to FALSE and maintains its previous value over subsequent power cycles.

$LOCTOL

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Location Tolerance

Description: When position values are compared with the approximately equal operator >=.

Power Up: N/A

$LOG_BUFF[1]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LOG_BUFF_T   **Memory:** Not available

Name: Log Book buffers

Description: This variable structure defines the buffer which holds the data for each Log Book.

Power Up: N/A

$LOG_BUFF[1].$mem_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Log Book buffer memory type

Description: This variable indicates the memory type of each buffer. If it is set to 0, in SRAM, the log is kept when the controller is turned off. If it is set to 1, in DRAM, the log is cleared when the controller is turned off.

Power Up: N/A

$LOG_BUFF[1].$size

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Log Book buffer size

Description: This variable indicates the size of each Log Book buffer in Kbytes. One record takes about 300 bytes If this value is too big, the maximum available size for the Log Book buffer is allocated. If there is not enough memory to make a Log Book buffer the alarm, SYST - 188 WARN book(%d) was not created, is posted and the book is not created.

Power Up: N/A

$LOG_BUFF[1].$title

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Log Book buffer title

Description: Title of each Log Book buffer. This string is displayed on the top line of the Log Book menu. It is also displayed in the pull up menu of F2,([BOOK]) in the Log Book menu. If the value is , a default title is displayed. The default title of BOOK1 is Operation. The default title of BOOK2 is I/O. The default title of BOOK3 is BOOK 3

Power Up: N/A

$LOG_BUFF[1].$visible

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Log Book buffer visible

Description: If this variable is set to TRUE, the buffer is displayed in the pull up menu of F2([BOOK]) in the Log Book menu. If this variable is set to FALSE, the buffer is not displayed.

Power Up: N/A

$LOG_DIO[1-32]

Minimum: MIN_LOG_DIO   **Maximum:** 1   **Default:** DEF_LOG_DIO   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** LOG_DIO_T   **Memory:** CMOS

Name: Logbook I/O configuration

Description: This variable structure configures I/O logging for Operation Logbook.

Power Up: N/A

$LOG_DIO[1]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LOG_DIO_T   **Memory:** Not available

Name: Logbook I/O configuration

Description: This variable structure configures I/O logging for Operation Logbook.

Power Up: N/A

$LOG_DIO[1].$end_port

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: End port number

Description: This variable indicates the end port number to trace. When this variable is set to -1, all ports after the specified start_port of the specified rack, slot, module type and port type are traced.

Power Up: N/A

$LOG_DIO[1].$mod_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Module type

Description: This variable indicates the module type of the port to trace. When this variable is set to -1, all module type of the specified rack and slot are traced. Normally this does not need to be specified. It is used to specify system ports.

- SOP = 11
- Robot I/O = 13

Power Up: N/A

$LOG_DIO[1].$port_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Physical port type

Description: This variable indicates the phisical port type of the port to trace. When this variable is set to -1, all port types of the specified rack, slot and module type are traced.

- Digital input = 1

- Digital output = 2

- Analog input = 3

- Analog output = 4

- Weld input = 16

- Weld output = 17

- Weld stick input = 26

- Weld stick output = 27

Power Up: N/A

$LOG_DIO[1].$rack

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Rack number

Description: This variable indicates the rack number of the port to trace. When this variable is -1, all racks except the internal devices are traced. Internal devices are PMC internal relays, etc. To trace internal devices, specify the individual rack number.

Power Up: N/A

$LOG_DIO[1].$slot

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Slot number

Description: This variable indicates the lot number of the port to trace. When this variable is set to -1, all slots of the specified rack are traced.

Power Up: N/A

$LOG_DIO[1].$start_port

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Start port number

Description: This indicates the first port number to trace. When this variable is set to -1, all ports of the specified rack, slot, module type and port type are traced.

Power Up: N/A

$LOG_ER_ITM[1]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Filter by individual error

Description: If a positive value is specified, the specified alarm is logged. For example, if 11001 is specified, SRVO-001 is logged. If a negative value is specified, the specified alarm is not logged. For example, if -11001 is specified, SRVO-001 is not logged. The priority of this variable is higher than $LOG_ER_SEV and $LOG_ER_TYP.

Power Up: N/A

$LOG_ER_SEV

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Filter by severity of error

Description: When a bit in this variable structure is TRUE, the corresponding errors are logged.

- Bit 0 (1): Log warning errors.
- Bit 1 (2): Log pause errors.
- Bit 2 (4): Log abort errors.

For example, if a 6 is specified, pause and abort errors are logged. The priority of this variable is lower than $LOG_ER_TYP and $LOG_ER_ITM.

Power Up: N/A

$LOG_ER_TYP[1]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Filter by error type

Description: This variable filters the logging of alarms based on the alarm type. Type is the same as facility code. See the Software Error Code Manual for a full list of facility codes. If a positive value is specified, alarms of the specified type are logged. If a negative value is specified, alarms of the specified type are not logged. For example, 11 is the facility code for SRVO alarms. If 11 is specified, SRVO alarms are logged. If -11 is specified, SRVO alarms are not logged. The priority of this variable is higher than $LOG_ER_SEV but lower than $LOG_ER_ITM.

Power Up: N/A

$LOG_REC_RST

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Record RESET message

Description: If this variable is set to TRUE, a reset of alarms is recorded as RESET. This is valid only when $LOGBOOK.$LOG_ER is not 0.

Power Up: N/A

$LOG_SCRN_FL[1-20]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LOG_SCRN_FL_T   **Memory:** Not available

Name: Screen filter

Description: This variable structure defines the softpart and screen IDs used in screen filtering for Operation Logbook.

Power Up: N/A

$LOG_SCRN_FL[1].$scrn_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Screen ID of screen for filter

Description: This variable contains the screen ID of screens to be filtered by Operation Logbook.

Power Up: N/A

$LOG_SCRN_FL[1].$sp_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Softpart ID of screen for filter

Description: This variable contains the softpart ID of screens to be filtered by Operation Logbook.

Power Up: N/A

$LOG_TPKEY[1-4]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: For FANUC Robotics Internal Use Only

Description: For FANUC Robotics Internal Use Only

Power Up: N/A

$LOGBOOK

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LOGBOOK_T   **Memory:** Not available

Name: Logbook setup

Description: This variable structure contains variables that are used to configure the Operation Logbook function to record controller events.

Power Up: N/A

$LOGBOOK.$analog_tol

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Analog change tolerance

Description: The analog I/O is recorded when the difference is greater than this value.

Power Up: N/A

$LOGBOOK.$available

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Logbook is available

Description: This variable indicates that Operation Logbook is available. Changing this variable has no effect and it will be set to 1 after the next power-up.

Power Up: N/A

$LOGBOOK.$clear_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enable F5(CLEAR) in the Log Book menu

Description: When this variable is TRUE, F5(CLEAR) is displayed in the Log Book menu and all Log data is cleared by pressing F5(CLEAR). When this is FALSE, F5(CLEAR) is not displayed.

Power Up: N/A

$LOGBOOK.$dram_margin

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: DRAM Margin

Description: This variable indicates the number of Kbytes of free DRAM area. This amount of free space must remain in DRAM after allocating a Log Book buffer in DRAM or the Log Book buffer will not be allocated.

Power Up: N/A

$LOGBOOK.$img_ent

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Log entry image

Description: This variable enables the logging of screen images in a Log Book when a value or word is entered. A value greater than 0 specifies the number of the Log Book where the screen image will be posted. A value of 0 disables logging of this screen image.

Power Up: N/A

$LOGBOOK.$img_fnky

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Log function key image

Description: This variable enables the logging of screen images in a Log Book when a function key is pressed. A value greater than 0 specifies the number of the Log Book where the screen image will be posted. A value of 0 disables logging of this screen image.

Power Up: N/A

$LOGBOOK.$img_sel

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Log select image

Description: This variable enables the logging of screen images in a Log Book when an item is selected in a menu. A value greater than 0 specifies the number of the Log Book where the screen image will be posted. A value of 0 disables logging of this screen image.

Power Up: N/A

$LOGBOOK.$img_win

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Log window image

Description: This variable enables the logging of screen images in a Log Book when an item is selected in a window. A value greater than 0 specifies the number of the Log Book where the screen image will be posted. A value of 0 disables logging of this screen image.

Power Up: N/A

$LOGBOOK.$log_crd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log coordinate changes

Description: This variable enables the logging of coordinate changes in a Log Book. Coordinate changes are recorded with the following messages:

- JOINT coordinate

- USER coordinate

- TOOL coordinate

- JOG coordinate

- PATH coordinate

This records all change of coordinate by any method. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_dio

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log I/O

Description: This variable enables the logging of I/O events in a Log Book. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_ent

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log value and word entries

Description: This variable enables the logging of value and word entries in a Log Book. When a value or a word is entered, "x is entered" is recorded. The x in the message is the entered value or word. If screen image is enabled for this event ($LOGBOOK.$IMG_ENT), it will contain the previous value. Values will be recorded even if they are invalid. If you cancel an input, it is not recorded. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_entky

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log ENTER key presses

Description: This variable enables the logging of ENTER key presses in a Log Book. When ENTER is pressed, "ENTER is pressed" is recorded. If SHIFT is held when the key is pressed, the word SHIFT is added to the key name. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_er

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log errors

Description: This variable enables the logging of alarms in a Log Book. When an alarm occurs, the alarm message is recorded. This record is the same as the record in the alarm history menu. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_file

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log file save and load

Description: This variable enables the logging of file save and load operations in a Log Book. When a file is saved or loaded, "Save file x" or "Load file x" is recorded. The x in the message is the file name. These events are ONLY for file save/load in following screens:

- File screen
- Program list screen

A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_fnkey

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log function key presses

Description: This variable enables the logging of function key presses in a Log Book. When F1, F2, F3, F4 or F5 is pressed, "x is pressed" is recorded. The x in the message is replaced with the key name. If SHIFT is held when the key is pressed, the word SHIFT is added to the key name If screen image is enabled for this event ($LOGBOOK.$IMG_FNKY), it will show the screen just before pressing the key. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_focus

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log iPendant focus changes.

Description: This variable enables the logging of iPendant focus changes in a Log Book. When focus is changed to a new pane, "Focus changed to x" is recorded. The 'x' in the message is the menu name. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_fwdky

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log FWD, BWD key presses

Description: This variable enables the logging of FWD, BWD key presses in a Log Book. When FWD or BWD is pressed, "x is pressed" is recorded. The x in the message is replaced with the key name. If SHIFT is held when the key is pressed, the word SHIFT is added to the key name. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_grp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log motion group changes

Description: This variable enables the logging of motion group changes in a Log Book. When motion group is changed, "Motion group x" is recorded. The x in the message is the new motion group. This records all change of motion group by any method. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_helpky

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** Not available **UIF:** Not available **CRTL:** Not available **Data Type:** ULONG **Memory:** Not available

Name: Log HELP key presses

Description: This variable enables the logging of HELP key presses in a Log Book. When HELP is pressed, "HELP is pressed" is recorded. If SHIFT is held when the key is pressed, the word SHIFT is added to the key name A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_hldky

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** Not available **UIF:** Not available **CRTL:** Not available **Data Type:** ULONG **Memory:** Not available

Name: Log HOLD key presses

Description: This variable enables the logging of HOLD key presses in a Log Book. When HOLD is pressed, "HOLD is pressed" is recorded. If SHIFT is held when the key is pressed, the word SHIFT is added to the key name. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_itmky

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** Not available **UIF:** Not available **CRTL:** Not available **Data Type:** ULONG **Memory:** Not available

Name: Log ITEM key presses

Description: This variable enables the logging of ITEM key presses in a Log Book. When ITEM is pressed, "ITEM is pressed" is recorded. If SHIFT is held when the key is pressed, the word SHIFT is added to the key name A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_jgky

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log jog key presses

Description: This variable enables the logging of jog key presses in a Log Book. When +X(J1), -X(J1), +Y(J2), -Y(J2), +Z(J3), -Z(J3), +X^(J4), -X^(J4), +Y^(J5), -Y^(J5), +Z^(J6) or -Z^(J6) is pressed, "x is pressed" is recorded. The x in the message is replaced with the key name. If SHIFT is held when the key is pressed, the word SHIFT is added to the key name. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_jgmu

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log Jog menu selections

Description: This variable enables the logging of Jog menu selections in a Log Book. Operations in the JOG menu are recorded with the following messages:

- JOG menu TOOL x
- JOG menu USER x
- JOG menu JOG x
- JOG menu GROUP x
- JOG menu ROBOT
- JOG menu EXT

The x in the message is the frame or group number. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_menu

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log MENU and FCTN selections

Description: This variable enables the logging of MENUS and FCTN selections in a Log Book. When an item is selected by MENUS key or FCTN key, "x is selected in MENUS" or "x is selected in FCTN" is recorded. The x in the message is the selected item. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_mnchg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log menu changes

Description: This variable enables the logging of menu changes in a Log Book. When a menu is changed, "Menu changed x" is recorded. The x in the message is the title of the new menu. Changes to sub menus such as Config or Detail are not recorded. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_ovr

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log override value changes

Description: This variable enables the logging of override value changes in a Log Book. When override is changed, "Override x%" is recorded. The x in the message is the new override value. This records all change of override by any method such as by pressing the override keys (+%, -%), enabling the teach pendant, or executing an override instruction in a program. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_ovrky

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log override and COORD key presses

Description: This variable enables the logging of override and COORD key presses in a Log Book. When +%, -% or COORD is pressed, "x is pressed" is recorded. The x in the message is replaced with the key name. If SHIFT is held when the key is pressed, the word SHIFT is added to the key name. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_pgchg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log program changes

Description: This variable enables the logging of program changes in a Log Book. The following program changes are recorded with these messages:

- TP program x is created: "Create program x"
- TP program x is deleted: "Delete program x"
- Line x of TP program y is written: "Write line x of y"
- Line x of TP program y is deleted: "Delete line x of y"

A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_prgexe

Minimum: Not available　　**Maximum:** Not available　　**Default:** Not available　　**KCL/Data:** Not available　　**Program:** Not available　　**UIF:** Not available　　**CRTL:** Not available　　**Data Type:** ULONG　　**Memory:** Not available

Name: Log program execution

Description: This variable enables the logging of program execution in a Log Book. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_prgkey

Minimum: Not available　　**Maximum:** Not available　　**Default:** Not available　　**KCL/Data:** Not available　　**Program:** Not available　　**UIF:** Not available　　**CRTL:** Not available　　**Data Type:** ULONG　　**Memory:** Not available

Name: Log program key presses

Description: This variable enables the logging of program key presses in a Log Book. When SELECT, EDIT or DATA is pressed, "x is pressed" is recorded. The x in the message is replaced with the key name. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_prvky

Minimum: Not available　　**Maximum:** Not available　　**Default:** Not available　　**KCL/Data:** Not available　　**Program:** Not available　　**UIF:** Not available　　**CRTL:** Not available　　**Data Type:** ULONG　　**Memory:** Not available

Name: Log PREV key presses

Description: This variable enables the logging of PREV key presses in a Log Book. When PREV is pressed, "PREV is pressed" is recorded. If SHIFT is held when the key is pressed, the word SHIFT is added to the key name. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_rstky

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log RESET key presses

Description: This variable enables the logging of RESET key presses in a Log Book. When RESET is pressed, "RESET is pressed" is recorded. If SHIFT is held when the key is pressed, the word SHIFT is added to the key name A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_sel

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log menu selections

Description: This variable enables the logging of menu selections in a Log Book. When a menu item is selected, "x is selected" or "x is selected in y menu" is recorded. The x in the message is the selected item. If the menu has a title, the y in the message shows the title. If screen image is enabled for this event ($LOGBOOK.$IMG_SEL), it will show the screen just before opening the menu. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_setpos

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log position changes

Description: This variable enables the logging of position changes in a Log Book. When position data P[x] of TP program y is written, "Write P[x] of y" is recorded. This is also recorded when a program is changed internally. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_sgrp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log sub group changes

Description: This variable enables the logging of sub group changes in a Log Book. When sub group is changed, "Sub group ROBOT" or "Sub group EXT" is recorded. This records all change of sub group by any method. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_step

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log step mode ON/OFF changes

Description: This variable enables the logging of step mode ON/OFF changes in a Log Book. When single step is changed, "Single step ON" or "Single step OFF" is recorded. This records all change of single step by any method. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_stmd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log start mode

Description: This variable enables the logging of start mode in a Log Book. Start mode is recorded with the following messages:

- Cold start
- Power failure recovery
- Control start

A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_stpky

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log STEP key presses

Description: This variable enables the logging of STEP key presses in a Log Book. When STEP is pressed, "STEP is pressed" is recorded. If SHIFT is held when the key is pressed, the word SHIFT is added to the key name. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_tpky

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log teach pendant key presses

Description: This variable enables the logging of teach pendant key presses in a Log Book. This records the low level key operation. All key operations of Teach Pendant are recorded. When a key is pressed, TP x ON is recorded. When a key is released, TP x OFF is recorded. ENABLE switch and E-STOP are also recorded. SHIFT key is treated as normal key. CRT operations are not recorded by this event. x in the message is key name, the following keys are recorded: ENABLE, ESTOP PREV, F1, F2, F3, F4, F5, NEXT SHIFT, MENU, SELECT, EDIT, DATA,FCTN UP, DOWN, LEFT, RIGHT, DISP RESET, STEP, BACKSPACE, ITEM, HOLD, FWD, BWD, COORD, +%, -% 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, -/, ., ENTER, HELP/DIAG, UF1, UF2, UF3, UF4, UF5, UF6, UF7, +X(J1), -X(J1), +Y(J2), -Y(J2), +Z(J3), -Z(J3), +X^(J4), -X^(J4), +Y^(J5), -Y^(J5), +Z^(J6), -Z^(J6) A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_uf

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log user frame changes

Description: This variable enables the logging of user frame changes in a Log Book. When user frame number is changed, "User frame x" is recorded. The x in the message is the new user frame number. This records all change of user frame number by any method. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_ufky

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log user function key presses

Description: This variable enables the logging of user function key presses in a Log Book. When UF1, UF2, UF3, UF4, UF5, UF6 or UF7 is pressed, "x is pressed" is recorded. The x in the message is replaced with the key name. If SHIFT is held when the key is pressed, the word SHIFT is added to the key name. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_ut

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log user tool changes

Description: This variable enables the logging of user tool changes in a Log Book. When tool frame number is changed, "Tool frame x" is recorded. The x in the message is the new tool frame number. This records all change of tool frame number by any method. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_win

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log window selections

Description: This variable enables the logging of window selections in a Log Book. When an item is selected in a warning window, "x is selected in y window" is recorded. The x in the message is the selected item. The y in the message is the beginning of the message in the warning window. If screen image is enabled for this event ($LOGBOOK.$IMG_WIN), it will show the warning window. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$log_wtrls

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Log WAIT released

Description: This variable enables the logging of WAIT release operations in a Log Book. When a waiting WAIT instruction is canceled by WAIT RELEASE in program x line y, "WAIT is released (x, y)" is recorded. A value greater than 0 specifies the number of the Log Book where the event will be posted. A value of 0 disables logging of this event.

Power Up: N/A

$LOGBOOK.$num_dio

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Length of $LOG_DIO[ ]

Description: This variable indicates the number of entries in the $LOG_DIO[ ] array.

Power Up: N/A

$LOGBOOK.$num_er_itm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Length of $LOG_ER_ITM[ ]

Description: This variable indicates the number of entries in the $LOG_ER_ITM[ ] array.

Power Up: N/A

$LOGBOOK.$num_er_typ

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Length of $LOG_ER_TYP[ ]

Description: This variable indicates the number of entries in the $LOG_ER_TYP[ ] array.

Power Up: N/A

$LOGBOOK.$num_rec_typ

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: For FANUC Robotics Internal Use Only

Description: For FANUC Robotics Internal Use Only

Power Up: N/A

$LOGBOOK.$num_scrn_fl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Length of $LOG_SCRN_FL[ ]

Description: This variable indicates the number of entries in the $LOG_SCRN_FL[ ] array.

Power Up: N/A

$LOGBOOK.$option

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: For FANUC Robotics Internal Use Only

Description: For FANUC Robotics Internal Use Only

Power Up: N/A

$LOGBOOK.$save_file

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Log Book file

Description: This variable indicates the file name where Operation Logbook is saved. The file extension is not included, and is always ".LS".

Power Up: N/A

$LOGBOOK.$scrn_fl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Screen filter

Description: This variable enables and disables screen filtering for Operation Logbook. When this variable is set to FALSE, the Screen filter is disabled. When this variable is set to TRUE, Screen filter is enabled.

Power Up: N/A

$LOGBOOK.$scrn_no_ent

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Screen filter entry

Description: This variable determines how screen filtering settings are interpreted. When this variable is set to TRUE, events on registered screens are not recorded. However, events on other screens are recorded. When this variable is set to FALSE, events on registered screens are recorded. However, events on other screens are not recorded.

Power Up: N/A

$LOGBOOK.$sram_margin

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: SRAM Margin

Description: This variable is the number of Kbytes of free SRAM area. This amount of free space must remain in SRAM after allocating a Log Book buffer in SRAM or the Log Book buffer will not be allocated.

Power Up: N/A

$LS_CONFIG.$brk_off_lag

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** USHORT   **Memory:** Not available

Name: Brake Off Delay

Description: This is the hardware delay to release the brake.

Power Up: On_Cold_Start

$LS_CONFIG.$brk_on_lag

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** USHORT   **Memory:** Not available

Name: Brake On Delay

Description: This is the hardware delay to engage the brake.

Power Up: On_Cold_Start

$LS_CONFIG.$io_scanrate

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: I/O Scan Rate

Description: This is the time interval to scan the active Local Stop I/O ports.

Power Up: On_Cold_Start

$LS_CONFIG.$ls_debug

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Debug Flag

Description: This is the debug flag used to trace the internal Local Stop system status for diagnosis purposes. Do not change the default value.

Power Up: On_Cold_Start

$LS_CONFIG.$sdi_off_lag

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** USHORT   **Memory:** Not available

Name: SDI1 Off Delay

Description: This is the hardware delay to turn off the SDI1 signal.

Power Up: On_Cold_Start

$LS_CONFIG.$sdi_on_lag

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** USHORT   **Memory:** Not available

Name: Hardware delay for local stop hardware unit on the SDI1 signal.

Description: This variable indicates the maximum delay time before the SDI1 signal is turned on by the local stop hardware unit.

Power Up: On_Cold_Start

$LS_IOPORT[1-3]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LS_IOPORT_T   **Memory:** Not available

Name: Local Stop I/O Port

Description: This is the Local Stop(LS) I/O port assignment to support the Local Stop hardware unit.

Power Up: On_Cold_Start

$LS_IOPORT[1].$mo_grp_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Motion group number

Description: This is the motion group number assigned to support the current local stop hardware unit.

Power Up: On_Cold_Start

$LS_IOPORT[1].$sdi1_p_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: SDI1 Port Number

Description: This is the port number of the SDI1 signal.

Power Up: On_Cold_Start

$LS_IOPORT[1].$sdi1_p_stat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: SDI1 Port Status

Description: This is the port status of the SDI1 signal.

Power Up: On_Cold_Start

$LS_IOPORT[1].$sdi1_p_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** USHORT   **Memory:** Not available

Name: SDI1 Port Type

Description: This is the port type of the SDI1 signal.

Power Up: On_Cold_Start

$LS_IOPORT[1].$sdi2_p_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: SDI2 Port Number

Description: This is the port number of the SDI2 signal.

Power Up: On_Cold_Start

$LS_IOPORT[1].$sdi2_p_stat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: SDI2 Port Status

Description: This is the port status of the SDI2 signal.

Power Up: On_Cold_Start

$LS_IOPORT[1].$sdi2_p_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** USHORT   **Memory:** Not available

Name: SDI2 Port Type

Description: This is the port type of the SDI2 signal.

Power Up: On_Cold_Start

$LS_IOPORT[1].$sdo_p_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: SDO Port Number

Description: This is the port number of the SDO signal.

Power Up: On_Cold_Start

$LS_IOPORT[1].$sdo_p_stat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: SDO Port Status

Description: This is the port status of rhe SDO signal.

Power Up: On_Cold_Start

$LS_IOPORT[1].$sdo_p_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** USHORT   **Memory:** Not available

Name: SDO Port Type

Description: This is the port type of the SDO signal.

Power Up: On_Cold_Start

2.12 "M" System Variables

$MA_GMASK

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Group mask for Multi-Pass.

Description: Specify which group the multi-pass function will be supporting.

Power Up: N/A

$MA_PLAN STRUCTURE

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** Not available **UIF:** Not available **CRTL:** Not available **Data Type:** Not available **Memory:** Not available

Name: Multi-Pass Planning variables

Description: Reserved for Internal use by FANUC Robotics for multi-pass to resume a motion with a multi-pass offset. The variables contain information related to the previous motion.

Power Up: Set by motion system

$MACRO_MAXNU

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** RO **UIF:** Not available **CRTL:** Not available **Data Type:** ULONG **Memory:** Not available

Name: Maximum Number of Macros

Description: This is the number of macros. The default value is 20.

Power Up: Requires a controlled start to take effect.

See Also: $MACROTABLE[n] where n means $MACRO_MAXNU.

$MACROLDUIMT

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** BOOLEAN **Memory:** Not available

Name:

Description: 1: Old specification is used. Macros assigned to UI[1],[2],[3] and [8] are triggered from ON to OFF. 0: New specification is used. Macros assigned to UI[1],[2],[3] and [8] are triggered from OFF to ON. This is available only in R-J2 Mate.

Power Up: Changes to this variable take effect immediately.

$MACROMAXDRI

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
ULONG   **Memory:** Not available

Name: Macro Maximum Number of DI and RI

Description: In the macro function, the macro program can be assigned to DI and RI of the digital
input signal. This is the maximum limitation number of the DI/RI macro. The default value is 5. This
default value is appropriate for most applications.

Power Up: N/A

$MACROTABLE STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data
Type:** Not available   **Memory:** Not available

Name: Macro Setup Table

Description: The variables in this structure define the data for each Macro command. Changes to
this variable must be made using the SETUP Macro screen. Individual fields within this structure
are described below.

Power Up: Changes to this variable take effect immediately.

Screen: SYSTEM Variables screen, SETUP Macro screen

$MACROTABLE[1].$assign_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not
available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG
Memory: Not available

Name: Assign Index

Description: Specifies the position, such as a key, which allocates the macro command. When
$ASSIGN_TYPE is 2 or is 3, 1-7 will be used. When $ASSIGN_TYPE is four, 1-20 will be used.
When $ASSIGN_TYPE is five, 4-5 will be used. Changes to this variable must be made using
the SETUP Macro Screen.

Power Up: Changes to this variable take effect immediately.

Screen: SYSTEM Variables screen, SETUP Macro Screen

$MACROTABLE[1].$assign_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG **Memory:** Not available

Name: Assign Type

Description: Specifies the place where the macro command is allocated. The following values are valid: 1:Unused 2:Teach Pendant User keys 3:Shifted Teach Pendant User keys 4:Manual operation screen 5:User buttons on SOP Changes to this variable must be made using the SETUP Macro Screen.

Power Up: Changes to this variable take effect immediately.

Screen: SYSTEM Variables screen, SETUP Macro Screen

$MACROTABLE[1].$ept_index

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** USHORT **Memory:** Not available

Name: Program EPT Index

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Changes to this variable take effect immediately.

$MACROTABLE[1].$macro_name

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING **Memory:** Not available

Name: Macro Name

Description: The name of the macro command. Changes to this variable must be made using the SETUP Macro Screen.

Power Up: Changes to this variable take effect immediately.

Screen: SYSTEM Variables screen, SETUP Macro Screen

$MACROTABLE[1].$mon_no

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG **Memory:** Not available

Name: Monitor Number

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Changes to this variable take effect immediately.

$MACROTABLE[1].$open_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: Program Opening ID

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Changes to this variable take effect immediately.

$MACROTABLE[1].$prev_subtyp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE **Memory:** Not available

Name: Previous Sub Type

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Changes to this variable take effect immediately.

$MACROTABLE[1].$prog_name

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING **Memory:** Not available

Name: Macro Assigned Program Name

Description: Name of the program assigned to the macro command. Changes to this variable must be made using the SETUP Macro Screen.

Power Up: Changes to this variable take effect immediately.

Screen: SYSTEM Variables screen, SETUP Macro Screen

$MACROTABLE[1].$sys_lev_msk

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE **Memory:** Not available

Name: System Level Mask

Description: Reserved for Internal use by FANUC Robotics

Power Up: Changes to this variable take effect immediately

Screen: SYSTEM Variable screen

$MACROTABLE[1].$user_work

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE **Memory:** Not available

Name: Work Area for Macro System

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Changes to this variable take effect immediately.

$MACRSOPENBL STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Macro Enable/disable, SOP Inputs

Description: The variables in this structure are used to enable/disable the execution of macros from SOP input signals. Individual fields within this structure are described below.

Power Up: Changes to this variable must be made during a controlled start.

$MACRSOPENBL.$sop_emgop

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Macro Enable, SOP Emergency Stop Input

Description: Enables/disables the execution of macros from the SOP Emergency stop input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRSOPENBL.$sop_hold

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Macro Enable, SOP Hold Input

Description: Enables/disables the execution of macros from the SOP HOLD input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRSOPENBL.$sop_pdi8

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Macro Enable, SOP PDI8 Input

Description: Enables/disables the execution of macros from the SOP PDI8 input. Not currently used.

Power Up: Changes to this variable must be made during a controlled start.

$MACRSOPENBL.$sop_pdi9

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Macro Enable, SOP PDI9 Input

Description: Enables/disables the execution of macros from the SOP pdi9 input. Not currently used.

Power Up: Changes to this variable must be made during a controlled start.

$MACRSOPENBL.$sop_pdia

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Macro Enable, SOP PDIa Input

Description: Enables/disables the execution of macros from the SOP pdia input. Not currently used.

Power Up: Changes to this variable must be made during a controlled start.

$MACRSOPENBL.$sop_pdib

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Macro Enable, SOP PDIb Input

Description: Enables/disables the execution of macros from the SOP pdib input. Not currently used.

Power Up: Changes to this variable must be made during a controlled start.

$MACRSOPENBL.$sop_pdic

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Macro Enable, SOP PDIc Input

Description: Enables/disables the execution of macros from the SOP pdic input. Not currently used.

Power Up: Changes to this variable must be made during a controlled start.

$MACRSOPENBL.$sop_remote

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Macro Enable, SOP Remote Input

Description: Enables/disables the execution of macros from the SOP remote input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRSOPENBL.$sop_reset

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Macro Enable, SOP Fault Reset Input

Description: Enables/disables the execution of macros from the SOP fault reset input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRSOPENBL.$sop_start

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Macro Enable, SOP Cycle Start Input

Description: Enables/disables the execution of macros from the SOP cycle start input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRSOPENBL.$sop_tpdsc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Macro Enable, SOP Teach Pendant Disconnect Input

Description: Enables/disables the execution of macros from the SOP Teach Pendant disconnect input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRSOPENBL.$sop_tprel

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Macro Enable, SOP Teach Pendant Release

Description: Enables/disables the execution of macros from the SOP Teach Pendant Release input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRSOPENBL.$sop_user1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Macro Enable, SOP User 1 Input

Description: Enables/disables the execution of macros from the SOP User 1 input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRSOPENBL.$sop_user2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Macro Enable, SOP User 2 Input

Description: Enables/disables the execution of macros from the SOP User 2 input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRTPDSBEX

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enable/disable UK Macro

Description: Enables/disables the UK macro execution while the teach pendant is disabled. If set to TRUE, the UK macro is executable. If set to FALSE, the UK macro is not executable.

Power Up: N/A

$MACRUOPENBL STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Macro Enable/disable, UOP Inputs

Description: The variables in this structure are used to enable/disable the execution of macros from the UOP input signals. Individual fields within this structure are described below.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_cstop

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Macro Enable, UOP Cycle Stop Input

Description: Enables/disables the execution of macros from the UOP Cycle stop input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_enbl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Macro Enable, UOP Enable Input

Description: Enables/disables the execution of macros from the UOP Enable input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_estop

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Macro Enable, UOP Emergency Stop Input

Description: Enables/disables the execution of macros from the UOP Emergency stop input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_hold

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Macro Enable, UOP HOLD Input

Description: Enables/disables the execution of macros from the UOP HOLD input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_home

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Macro Enable, UOP Home Input

Description: Enables/disables the execution of macros from the UOP Home input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_pdstrt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Macro Enable, UOP Production Start Input

Description: Enables/disables the execution of macros from the UOP Production start input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_pnstrb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Macro Enable, UOP PNS Strobe Input

Description: Enables/disables the execution of macros from the UOP PNS Strobe input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_reset

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Macro Enable, UOP Fault Reset Input

Description: Enables/disables the execution of macros from the UOP Fault reset input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_rsr1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Macro Enable, UOP RSR1/PNS1 Input

Description: Enables/disables the execution of macros from the UOP RSR1/PNS1 input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_rsr2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Macro Enable, UOP RSR2/PNS2 Input

Description: Enables/disables the execution of macros from the UOP RSR2/PNS2 input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_rsr3

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN
Memory: Not available

Name: Macro Enable, UOP RSR3/PNS3 Input

Description: Enables/disables the execution of macros from the UOP RSR3/PNS3 input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_rsr4

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN
Memory: Not available

Name: Macro Enable, UOP RSR4/PNS4 Input

Description: Enables/disables the execution of macros from the UOP RSR4/PNS4 input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_rsr5

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN
Memory: Not available

Name: Macro Enable, UOP RSR5/PNS5 Input

Description: Enables/disables the execution of macros from the UOP RSR5/PNS5 input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_rsr6

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Macro Enable, UOP RSR6/PNS6 Input

Description: Enables/disables the execution of macros from the UOP RSR6/PNS6 input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_rsr7

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Macro Enable, UOP RSR7/PNS7 Input

Description: Enables/disables the execution of macros from the UOP RSR7/PNS7 input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_rsr8

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Macro Enable, UOP RSR8/PNS8 Input

Description: Enables/disables the execution of macros from the UOP RSR8/PNS8 input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_sfspd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Macro Enable, UOP Safety Speed Input

Description: Enables/disables the execution of macros from the UOP Safety speed input.

Power Up: Changes to this variable must be made during a controlled start.

$MACRUOPENBL.$uop_start

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Macro Enable, UOP Cycle Start Input

Description: Enables/disables the execution of macros from the UOP Cycle start input.

Power Up: Changes to this variable must be made during a controlled start.

$MASTER_ENB

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Mastering Enable

Description: Specifies whether or not the SYSTEM Master/Cal screen will be displayed. If set to 1, the SYSTEM Master/Cal screen is displayed. If set to 0, the SYSTEM Master/Cal screen is not displayed.

Power Up: Changes to this variable take effect immediately.

$MAX_DIG_PRT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Number of digital ports displayed

Description: This variable controls the number of Digital Input and Digital Output ports which are displayed in the MONITOR screen and the range of port numbers that can be configured in the CONFIG screen when Digital is selected in the standard TP screens.

Power Up: Values take effect at power-up.

Screen: This can be set in the System/Variables screen.

$MAXUALRMNUM

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Maximum Number of User-defined Alarm Messages that can be Defined

Description: Determines the size of the array $UALRM_MSG. Note that a controlled start is required to changed the size of the array. These messages are displayed by executing a UALM statement.

Power Up: Requires a controlled start to take effect.

$MCR STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Motion Control Record

Description: Assorted Motion control records that cause an immediate effect on the motion system. Individual fields within this structure are described below.

Power Up: Changes to this variable take effect immediately.

$MCR.$brk_out_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: Brake Output Enable

Description: Indicates whether or not manual setting of brake outputs is allowed. If it is set to TRUE, the brakes can be set or released manually as specified by the value of $brk_output. If it is set to FALSE, the brakes cannot be set or released manually. By default, the value of $brk_out_enb is set to FALSE. $brk_out_enb is also set to FALSE when an emergency stop, overtravel condition, or DEADMAN switch error occurs.

Power Up: Changes to this variable take effect immediately.

Screen: SYSTEM Brake Cntrl, SYSTEM Variables screen

$MCR.$brk_output[1-8]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** BOOLEAN   **Memory:** CMOS

Name: Brake Output

Description: $brk_output is an array that you can use to set the brake output bits manually, if $brk_out_enb is TRUE. Note that the elements in this array do not correspond to individual axes. Several brakes might be released by a single brake output.

Power Up: Takes effect immediately

Screen: SYSTEM Brake Cntrl, SYSTEM Variables screen

$MCR.$brk_output[6]

Minimum: 0   **Maximum:** 16   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Brake Output

Description: $brk_output is an array that you can use to set the brake output bits manually, if $brk_out_enb is TRUE. Note that the elements in this array do not correspond to individual axes. Several brakes might be released by a single brake output.

Power Up: Changes to this variable take effect immediately.

Screen: SYSTEM Brake Cntrl, SYSTEM Variables screen

$MCR.$dry_run

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Dry Run

Description: If set to TRUE, then motion is executed with $MCR_GRP.$dry_run_spd (or $dryrun_jspd), ignoring programmed speed. All motion tracking and weaving features are disabled.

Power Up: Changes take effect on the next motion.

Screen: TEST CYCLE screen, SYSTEM Variables screen

$MCR.$enbl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: UOP Enable

Description: If set to TRUE, indicates that the UOP enbl input signal is on.

Power Up: Changes to this variable take effect immediately.

<u>$MCR.$fltr_debug</u>

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Debug Flag for FLTR Task

Description: Reserved for Internal use by FANUC Robotics. This is a debug mask used by FLTR task.

Power Up: Changes to this variable take effect immediately.

<u>$MCR.$genoverride</u>

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER_SK   **Memory:** Not available

Name: General Override

Description: Specifies the rate of robot movement speed. The robot movement speed when the program is executed is $MCR.$genoverride * $MCR_GRP.$progoverride. $genoverride, a scaling factor, is expressed as a percentage of the program motion speed. For all programmed motion $genoverride is multiplied with $progoverride to obtain a total override value, which is then multiplied by the motion speed. As a safety feature, the value of $genoverride is automatically set to 10 if you do not confirm the setting before jogging the robot. You can set the value of $genoverride using the teach pendant OVERRIDE UP and DOWN keys or KCL commands.

Power Up: Changes to this variable take effect immediately.

Screen: Teach Pendant hard key, SYSTEM Variables screen

<u>$MCR.$mjog_debug</u>

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Debug Flag for MJOG Task

Description: Reserved for Internal use by FANUC Robotics. This is a debug mask used by MJOG task.

Power Up: Changes to this variable take effect immediately.

$MCR.$mmgr_debug

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Debug Flag for MMGR Task

Description: Reserved for Internal use by FANUC Robotics. This is a debug mask used by MMGR task.

Power Up: Changes to this variable take effect immediately.

$MCR.$mo_warn_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Motion Warning Enable

Description: Provision for future implementation of motion warning enable/disable. Not Supported in this release.

Power Up: Changes to this variable take effect immediately.

$MCR.$ot_release

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: Overtravel Release

Description: When set to TRUE, the robot can be jogged out of overtravel.

Power Up: Changes to this variable take effect immediately.

Screen: MANUAL OT Release, SYSTEM Variables screen

$MCR.$otf_lin_no

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER_SK   **Memory:** Not available

Name: Program Line Number Executed in the On-the- fly Feature

Description: The program line number that is currently executing in the on-the-fly feature.

Power Up: Output from the motion system.

$MCR.$otf_ofst

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER_SK   **Memory:** Not available

Name: On_The_Fly Offset

Description: The offset from the statement start to the motion statement portion of the TPE internal instruction.

Power Up: Output from the motion system.

$MCR.$otf_prg_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER_SK   **Memory:** Not available

Name: Program ID used in the On_the_fly Feature

Description: The program id that is currently used in the on-the-fly feature.

Power Up: Output from the Motion System

$MCR.$sfspd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: Safe Speed

Description: If set to TRUE, indicates the fence is open, UOP sfspd input signal.

Power Up: Changes to this variable take effect immediately.

$MCR.$spc_reset

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: Serial Pulse Coder Reset

Description: If the software detects that the serial pulse coder has changed more than the tolerance during the cycle power, an alarm will be posted. The system variable $MCR.$spc_reset allows you to reset the pulse code mismatch error.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Group Motion Control Record

Description: This variable structure contains motion control information for individual group. Individual fields within this structure are described below.

Power Up: Changes to this variable take effect immediately. At a cold start, this variable is reset to its default.

$MCR_GRP[1].$calibrate

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: Calibrate

Description: Resets the current position based on mastering data and encoder counts.

Power Up: Changes to this variable take effect immediately.

Screen: SYSTEM Master/Cal screen

$MCR_GRP[1].$chk_jnt_spd[9]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Check Joint Speed

Description: Only the first element $chk_jnt_spd[1] is used. $chk_jnt_spd[1] indicates whether or not joint speed is checked against the system variable $jntvellim during Cartesian motion. If it is set to TRUE, the speed of each joint is checked against the corresponding joint speed limit. If a limit is exceeded, all joint speeds are reduced at the same ratio. If it is set to FALSE, joint speed limits are not checked. Note that the motor speed limits ($mot_spd_lim) are always checked regardless of this variable.

Power Up: Changes to this variable take effect immediately.

Screen: SYSTEM Master/Cal screen

$MCR_GRP[1].$crc_rsm_tol

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Circular Resume Tolerance

Description: Determines the tolerance that the current position must be at when resuming a circular motion, with respect to the start, via, or dest positions. If the current position is within the tolerance of the destination position, a linear motion is used to complete the motion. If the current position is within the tolerance of the start or via positions, the current position replaces the start or via position in the circular motion calculations internally.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$dry_jog_ovr

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name:

Description: Provides special speed control for linear and joint jogging during dry run. When DRY RUN is enabled, the jog speed is further reduced by setting Jog dry run override to less than 100% in DRY RUN setup menu. The dry run override has no effect on jog speed if it is set to 100%. Its value will be reset to the default (100%) on COLD start.

Power Up: N/A

$MCR_GRP[1].$dry_run_spd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL_SK   **Memory:** Not available

Name: Dry Run Speed

Description: The speed, in mm/sec, that the robot will travel for LINEAR and CIRCULAR motion when $MCR.$dry_run is set to TRUE. The programmed speed is ignored in this case.

Power Up: Changes take effect on the next motion.

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$MCR_GRP[1].$dryrun_jspd

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** REAL_SK **Memory:** Not available

Name: Dry Run Jog Speed

Description: The speed as a percentage of $PARAM_GROUP.$jnt vellim, that the robot will travel for JOINT motion when $MCR.$dry_run is TRUE. The programmed speed is travel for JOINT motion when $MCR.$dry_run is set to TRUE. The programmed speed is ignored in this case.

Power Up: Changes take effect on the next motion.

Screen: TEST CYCLE screen

$MCR_GRP[1].$dsp_upd_blk[9]

Minimum: 0 **Maximum:** 1 **Default:** 0 **KCL/Data:** RW **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** BYTE **Memory:** Not available

Name: DSP Update Block Number

Description: The block number for servo parameter update to DSP memory.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$dsp_update[9]

Minimum: 0 **Maximum:** 2 **Default:** 0 **KCL/Data:** RW **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** BYTE **Memory:** Not available

Name: DSP Update Request

Description: Requests a copy of the servo parameter block defined by $dsp_upd_blk to DSP memory.

Power Up: Changes to this variable take effect immediately.

2–500

$MCR_GRP[1].$eachmst_sel[9]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Single Axis Mastering Select

Description: Specifies the axis to be mastered if single axis mastering is selected.

Power Up: Changes to this variable take effect immediately.

Screen: SYSTEM Master/Cal screen

$MCR_GRP[1].$fjog_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Fast Jogging Mode Enable

Description: Enables a fast mode of jogging. In this mode jogging motion accelerate and decelerate faster. The lower override the faster the acceleration.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$fltr_flush

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: FilterFlush

Description: 1: FLTR TASK perform FilterFlush Users should not change this system variable.

Power Up: Changes to this variable take effect immediately

$MCR_GRP[1].$forceupdate

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Update current angle with machine puls

Description: Do not change this system variable. 0 : NOTHING 1 : PUT ON ECC BIT AND FORCE UPDATE $MOR_GRP[].$current_ang WITH MACHINE PULSE.

Power Up: Changes to this variable take effect immediately

$MCR_GRP[1].$hard_hold

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Hard Hold

Description: Causes motion to stop and when motion filters are empty and brakes are engaged.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$hold

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Hold

Description: Temporarily stops execution of a program. When $hold is TRUE, the robot decelerates and all motion stops. Interpolation of the motion is suspended. The robot remains stopped until $hold is FALSE. Pressing the operator panel HOLD button or teach pendant HOLD key sets the value of $hold to TRUE. To set $HOLD to FALSE, use the KCL> RESUME command.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$intplockhol

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Interpreter Lock Hold

Description: If set to TRUE, only the interpreter (teach pendant program or KAREL program) can clear the hold status.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$intr_debug

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Debug Flag for INTR Task

Description: Reserved for Internal use by FANUC Robotics. This is a debug mask used by INTR task.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$jnt_prc_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: Joint Process Enable

Description: Provision for future implementation of enabling the application process during a joint motion. Not Supported in this release.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$lch_edm_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Local Condition End Motion Enable

Description: Reserved for Internal use by FANUC Robotics for keeping an already completed motion within the motion subsystem so that it may be resumed in case an error occurs before an application specified local condition is triggered.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$lckd_caldon

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: Locked Cal Done

Description: Backup value for cal_done at machinelock. You should not change this system variable.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$machinelock

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Machine Lock

Description: Brakes are engaged and subsequent motion is executed normally, but the final output to the servo system is disabled. Motion appears to have moved from all system aspects, but the mechanical robot has not moved. Current position reflects the virtual robot position and not the locked robot position. When $machinelock is set to FALSE after having been TRUE, the calibration sequence is executed and the robot position is reset to reflect the actual mechanical position.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$master

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: Mastering

Description: When $master is TRUE, mastering data is updated in $DMR_GRP, and $DMR_GRP.$master_done is set to TRUE.

Power Up: Changes to this variable take effect immediately.

Screen: SYSTEM Master/Cal screen

$MCR_GRP[1].$master_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Master Type

Description: When $MCR_GRP.$master is set to TRUE, the type of mastering depends on this variable: 0 = Normal mastering using $DMR_GRP.$master_pos 1 = Zero position mastering (joint angles are at zero)2 = Quick mastering using $DMR_GRP.$ref_pos and $DMR_GRP.$ref_count

Power Up: Changes take effect the next time the robot is mastered.

Screen: SYSTEM Master/Cal screen

$MCR_GRP[1].$otf_org_spd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: On-The-Fly Original Speed

Description: The original program speed at the time the motion statement is executed. This is used as a reference for the softpart support of the On-The-Fly function.

Power Up: Changes to this variable take effect immediately.

Screen: Setup On_The_Fly screen

$MCR_GRP[1].$otf_spd_chg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: On-The-Fly Speed Change

Description: The speed change, in increments of 5% units, as modified by the On-The-Fly softpart.

Power Up: Changes to this variable take effect immediately.

Screen: Setup On_The_Fly screen

$MCR_GRP[1].$otf_spd_upd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: On-The-Fly Speed Update Request

Description: As set by the On-The-Fly softpart, this variable enables the update of the program with the current speed.

Power Up: Changes take effect at the end of the current motion.

Screen: Setup On_The_Fly screen

$MCR_GRP[1].$otf_speed

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: On-The-Fly Speed

Description: The current speed used during the On-The-Fly function. The application softpart supported by On-The-Fly, updates this variable to dynamically change the motion speed.

Power Up: Changes to this variable take effect immediately.

Screen: SETUP On-the-fly screen

$MCR_GRP[1].$pg_org_rsm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: PG original path resume function

Description: 1: PG original path resume function is enabled. 0: PG original path resume function is disabled. Do not change this system variable.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$plan_debug

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Debug Flag for PLAN Task

Description: Reserved for Internal use by FANUC Robotics. Setting this variable without loading MODEBUG softpart may crash system. This is a debug mask used by PLAN task. PLAN task will display certain debug messages on the debug consol when a certain bit is set.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$pos_can_req

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: post cancel request

Description: When $pos_can_req is becomes TRUE, FLTR TASK posts cancel request and finish cancel request to MMGR TASK. User should not use this.

Power Up: Effective immediately

$MCR_GRP[1].$pos_estblsh

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
BOOLEAN_SK   **Memory:** Not available

Name: position establishment

Description: When $pos_estblsh is becomes TRUE, $MOR_GRP.$current_ang is re-established
with encoder counts. User should not use this.

Power Up: Effective immediately

$MCR_GRP[1].$prgoverride

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
REAL_SK   **Memory:** Not available

Name: Program Override

Description: Specifies the rate of robot movement speed. The robot movement speed when
the program is executed is $MCR.$genoverride * $MCR.$progoverride. It is requested by
$MCR_GRP.$progoverride. $prgoverride, a scaling factor, is expressed as a percentage of the
motion speed. For all programmed motion, $prgoverride is multiplied by $genoverride to obtain a
total override value, which is then multiplied by the motion speed. $prgoverride has no effect for
motions other than program motions. You can assign a value to $prgoverride from a program or
from the teach pendant.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$qck_stp_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
BOOLEAN   **Memory:** Not available

Name: Quick Stop Enable

Description: Allows motion to stop quicker than if the filters were to run out normally. Not as
fast as E-stop, but faster than hold.

Power Up: Changes take effect on the next motion stop or hold.

$MCR_GRP[1].$rsm_cmd_pth

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Resume Command Path

Description: For org_pth_resume feature, this specifies the stopped position that the resume motion moves to is the last command position, not the position the robot is at after brakes are engaged.

Power Up: Changes to this variable take effect immediately with next emergency stop motion.

$MCR_GRP[1].$rsm_motype

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Resume Motion Type

Description: When the original path resume feature is enabled (usually by a TOOL application), the return to the position where program motion was stopped will use a motype based on this variable. JOINT = 1 LINEAR = 2 PROGRAM = 3 If $rsm_motype is PROGRAM, the motype of the program will be used for the return to the stopped position. In this case, if program motype was CIRCULAR, LINEAR will be used. In all cases, the original program motype will be used for the subsequent motion to the original destination position.

Power Up: Changes take effect on next motion.

$MCR_GRP[1].$rsm_offset

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Resume Offset

Description: When the original path resume feature is enabled (usually by a TOOL application), this variable will cause the motion to return to a point on the path that is closer to the start position by this distance in millimeters. This feature is not effective for CIRCULAR motion. The motion will never return past the original start position.

Power Up: Changes take effect on the next resumed motion.

$MCR_GRP[1].$rsm_orient

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Resume Orient Type

Description: Used for the org_pth_resume feature, to specify the orient_type that is used for the resumed motion. The meaning is: Programmed Value: 0 OR_RS_WORLD: 1 OR_AES_WORLD: 2 OR_WRIST_JOINT: 3 The default value is 0 which uses the orient_type specified with the original motion.

Power Up: Changes to this variable take effect immediately with next org_path_resume motion.

$MCR_GRP[1].$rsm_speed

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Resume Speed

Description: When the original path resume feature is enabled (usually by a TOOL application), this is the speed in mm/sec of the return to the position where program motion was stopped.

Power Up: Changes take effect on the next resumed motion.

$MCR_GRP[1].$rsm_termtyp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Resume Termtype

Description: When the original path resume feature is enabled (usually by a TOOL application), the motion to the stopped position will use this termination. The subsequent motion to the original programmed destination position will use the programmed termtype.

Power Up: Changes take effect on next motion.

$MCR_GRP[1].$servo_disbl[9]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Servo Disable

Description: Reserved for Internal use by FANUC Robotics. Turns off servo power.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$set_ref

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: Set Reference

Description: Causes the system to set the reference position for use with the quick mastering feature.

Power Up: Changes to this variable take effect immediately.

Screen: SYSTEM Master/Cal screen

$MCR_GRP[1].$sflt_enb[9]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Soft Floating

Description: Flag for Soft Floating. In this mode user can block the robot arm motion without being swept away. Only valid when Soft Floating option is installed.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$sflt_fup

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: Soft Floating Follow Up Enable

Description: Enables soft floating follow up.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$sflt_val[9]

Minimum: 0   **Maximum:** 100   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Soft Floating Ratio

Description: The ratio of soft floating.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$soft_alarm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Soft Alarm

Description: Causes a servo alarm to occur, servo power to go off, programs to pause, and brakes to engage.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$srvo_q_stop

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Internal data of Servo Quick Stop function

Description: For internal use only. Do not modify this system variable.

Power Up: Change to this variable take effect immediately.

$MCR_GRP[1].$syn_adj_mod

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Synchronous Adjust Mode

Description: For robot models with dual drive (synchronous) control, $syn_adj_mod indicates whether or not the synchronous adjust mode is enabled. If it is set to TRUE, synchronous adjust mode is enabled and you can jog only the master or the slave motor. You cannot move any of the other axes while synchronous adjust mode is enabled. If it is set to FALSE, you axes while synchronous adjust mode is enabled. If it is FALSE, you cannot jog the master and slave motors independently. $syn_adj_mod should remain FALSE for all normal operations. If it is set to TRUE, the robot loses its calibration and must be recalibrated after $syn_adj_mod is set back to FALSE.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$syn_adj_sel

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Synchronous Adjust Selection

Description: For robot models with dual drive (synchronous) control, $syn_adj_sel indicates which axis, either master or slave, is selected for synchronous adjust mode. If it is set to TRUE, the slave axis is selected. If it is set to FALSE, the master axis is selected.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$tsmod_on

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Tip Stick Mode On

Description: Enables spot welding tip stick detection.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$turn_on_srv

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: Turn On Servos

Description: When servo power is off, this variable causes servo power to return if the system is not in error status.

Power Up: Changes to this variable take effect immediately.

$MCR_GRP[1].$uop_imstp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Immediately Stop From UOP

Description: Immediately a stop is asserted from the UOP.

Power Up: Changes to this variable take effect immediately.

$MCTCFG STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Motion Cycle Time Recording Configuration System Variables

Description: These system variables allow the user to turn the Motion Cycle Time Recording On or OFF and allow the debug flag to be set for internal use only. Individual fields within this structure are described below.

Power Up: N/A

$MCTCFG.$debug

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Motion Cycle Time Recording Debug Flag.

Description: Reserved for Internal use by FANUC Robotics.

Power Up: N/A

$MCTCFG.$mct_enbl

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Motion Cycle Time Recording Enable Flag

Description: This system variable allows the user to turn the Motion Cycle Time Recording softpart On or OFF.

Power Up: N/A

$MEMO STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Memo Structure

Description: Individual fields within this structure are defined below.

Power Up: Perform a cold start for the changes to take effect.

$MEMO.$prc_tbl_siz

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Process table size

Description: This system variable is not used now. This system variable will be used to change the size of the process table. The process table is used by memory manager only. Do not change this system variable.

Power Up: Perform a cold start for the changes to take effect.

$MEMO.$tpe_area

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Limit size of TPE memory area

Description: This system variable determines the TPE memory size internally. The user cannot create the program more than this system variable even though there are plenty memory in the system. This system variable is set the same value which is set from BMON as a default value. Do not change this system variable. The unit of this system variable is BYTE.

Power Up: Perform a cold start for the changes to take effect.

$MEMO.$tskwrk_area

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: System task work area in temporary memory

Description: This system variable limits the allocation from temporary memory for TPE program. When the user creates or teaches the TPE program, if the rest of the temporary memory becomes under this system variable, the system prevents from creating or teaching the program for safety. The default value is 60000. The unit of this system variable is BYTE. Do not change this system variable.

Power Up: Perform a cold start for the changes to take effect.

$MEMO.$wrk_buf_siz

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Work buffer size

Description: This system variable is not used now. This system variable will be used to change the work buffer size. This work buffer is only for memory manager. Do not change this system variable.

Power Up: Perform a cold start for the changes to take effect.

$MISC[1] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Miscellaneous system variables for each groups.

Description: This system variable has miscellaneous system variables by each motion group

Power Up: N/A

$MISC[1].$hpd_trq[9]

Minimum: -100.00   **Maximum:** 100.00   **Default:** 0.00   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: High Precision Disturbance Torque

Description: This system variable shows disturbance torque(%) of each servo motor. This value is more precise than $MOR_GRP.$CUR_DIS_TRQ.

Power Up: Does not apply. The system updates this variable.

See Also: $MISC_MSTR.$hpd_enb

$MISC_MSTR.$hpd_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: High Precision Disturbance Torque Enable

Description: If TRUE: System will update $MISC.$HPD_TRQ[]. If FALSE: System does not update $MISC.$HPD_TRQ[].

Power Up: You must perform a cold start for the change to take effect.

$MIX_BG[1]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** MIX_BG_T   **Memory:** Not available

Name: Background Logic

Description: This variable structure is used to configure the Background Logic function.

Power Up: N/A

$MIX_BG[1].$mode

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Background execution mode

Description: This variable indicates the background execution mode, as follows:

- 0: Auto
- 1: Normal
- 2: Fast

This variable is set to read only and cannot be changed.

Power Up: N/A

$MIX_BG[1].$modify_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Teach pendant program modify time

Description: This variable is used to check whether the program is modified or not. If the program is modified, background execution is stopped when the controller is turned on. This variable is set to read only and cannot be changed.

Power Up: N/A

$MIX_BG[1].$prog_name

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Background program name

Description: This variable indicates the name of the program that is executed in the background. This variable is set to read only and cannot be changed.

Power Up: N/A

$MIX_BG[1].$status

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Background execution status

Description: This variable indicates the background execution status, as follows:

- 1: Stop
- 2: Running(Normal)
- 3: Running(Fast)
- 4: Error

This variable is set to read only and cannot be changed.

Power Up: N/A

$MIX_LOGIC

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** MIX_LOGIC_T   **Memory:** Not available

Name: Mixed Logic

Description: This variable structure indicates the configuration variables for the Mixed Logic function.

Power Up: N/A

$MIX_LOGIC.$item_count

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Item count

Description: Background Logic executes the specified number of items in one scan. If the value is decreased, the execution time of Background Logic is reduced. If it is too big, robot motion and program execution are affected.

Power Up: N/A

$MIX_LOGIC.$max_tmr_val

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Maximum time value

Description: When TIMER[ ] is used in a Background program, the TIMER[ ] is counted up to the specifie value. If the TIMER[ ] reaches the value, TIMER_OVERFLOW[ ] is turned on and the TIMER[ ] value is kept.

Power Up: N/A

$MIX_LOGIC.$num_bg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Length of $MIX_BG[ ]

Description: This variable indicates that the number of entries in the $MIX_BG[ ] array are reallocated to the specified number at the next Controlled start.

Power Up: N/A

$MIX_LOGIC.$num_flg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of flags

Description: Number of flags is changed to the specified number at the next Controlled start.

Power Up: N/A

$MIX_LOGIC.$num_mkr

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of markers

Description: Number of entries in the $MIX_MKR[ ] array is reallocated to the specified number at the next Controlled start.

Power Up: N/A

$MIX_LOGIC.$num_scan

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of scans

Description: This variable indicates the number of scans in one cycle. The scanning time of Background Logic is : $MIX_LOGIC.$NUM_SCAN * $SCR.ITP_TIME This variable is set to read only and cannot be changed.

Power Up: N/A

$MIX_LOGIC.$proc_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Scan processing time

Description: This variable indicates the the processing time of one scan as msec. This variable is set to read only and cannot be changed.

Power Up: N/A

$MIX_LOGIC.$save_idx

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Saved index

Description: When the expression of Markers or TC_ONLINE is changed, the expression is saved in $save_line in case of power failure. This variable has the index of the Marker, where:

- 0 means TC_ONLINE.

- -1 means no line is saved.

This variable is set to read only and cannot be changed.

Power Up: N/A

$MIX_LOGIC.$save_line

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** MIX_MKR_T   **Memory:** Not available

Name: Saved line

Description: When the expression of Markers or TC_ONLINE is changed, the expression is saved here in case of a power failure. This variable is set to read only and cannot be changed.

Power Up: N/A

$MIX_LOGIC.$tcol_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enable/Disable TC_ONLINE

Description: This variable is changed by executing the "TC_ONLINE ENABLE/DISABLE" instruction. When this variable is set to TRUE, TC_ONLINE is enabled. When this variable is set to FALSE, TC_ONLINE is disabled. This variable is set to read only and cannot be changed.

Power Up: N/A

$MIX_LOGIC.$tcol_line

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** MIX_MKR_T   **Memory:** Not available

Name: TC_ONLINE expression

Description: This variable holds the defined expression of TC_ONLINE when the controller is turned on. It is changed by executing the "TC_ONLINE (...)" instruction. This variable is set to read only and cannot be changed.

Power Up: N/A

$MIX_LOGIC.$tcol_sim

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: TC_ONLINE simulation

Description: This variable shows the status of the TC_ONLINE simulation. This variable is set to read only and cannot be changed.

Power Up: N/A

$MIX_LOGIC.$tcol_stat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: TC_ONLINE Status

Description: This variable shows the result of the TC_ONLINE expression. When this variable is set to TRUE, Programs can run. When this variable is set to FALSE, all programs are paused. This variable is set to read only and cannot be changed.

Power Up: N/A

$MIX_LOGIC.$use_flg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use flag (F[ ])

Description: If this variable is set to FALSE, the flag monitor menu is not displayed on the F1, [TYPE] key pullup on the I/O menu, and "F[ ]" item is not displayed in data list of the teach pendant editor.

Power Up: N/A

$MIX_LOGIC.$use_mkr

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use marker (M[ ])

Description: If this variable is set to FALSE, the marker monitor menu is not displayed on the F1, [TYPE] key pullup on the I/O menu, and "M[ ]" item is not displayed in data list of the teach pendant editor.

Power Up: N/A

$MIX_LOGIC.$use_tcol

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use TC_ONLINE

Description: If FALSE, TC_ONLINE monitor menu is not displayed on the F1, [TYPE] key pullup on the I/O menu, and "TC_ONLINE" instruction is not displayed in [INST] menu of the teach pendant editor.

Power Up: N/A

$MIX_LOGIC.$use_tcolsim

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use TC_ONLINE simulation

Description: When this variable is set to TRUE, TC_ONLINE ENABLE/DISABLE instructions are not available. When this variable is set to FALSE, TC_ONLINE ENABLE/DISABLE instructions are available

Power Up: N/A

$MIX_MKR[1]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** MIX_MKR_T   **Memory:** Not available

Name: Marker variables

Description: This variable structure is used to store internal information for MARKER and TC_ONLINE instructions.

Power Up: N/A

$MIX_MKR[1].$line[1-256]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Line code

Description: Internal line code of defined expression set by TC_ONLINE or MARKER instructions. This variable is set to read only and cannot be changed.

Power Up: N/A

$MIX_MKR[1].$line_size

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Line size

Description: Size of line code set by TC_ONLINE or MARKER instructions. This variable is set to read only and cannot be changed.

Power Up: N/A

$MJPTMIR[1-5] STRUCTURE

Minimum: MIN_MJPTMIR   **Maximum:** MAX_MJPTMIR   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** MJPTMIR_T   **Memory:** Not available

Name: Information of path jog

Description: This system variable is set up information of path jog.

Power Up: Changes to this variable take effect immediately.

Screen: When program paused or path jog is tried, the variable is set up automatically.

$MJPTMIR[1].$cir_cnt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** VECTOR   **Memory:** Not available

Name: Circular center position

Description: Center position of circular motion. This is need to path jog.

Power Up: Changes to this variable take effect immediately.

Screen: When program paused or path jog is tried, the variable is set up automatically.

$MJPTMIR[1].$curpx_task

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: current task ID

Description: This means the current task ID when program pause. When program pause is selected task ID.

Power Up: Changes to this variable take effect immediately.

Screen: When program paused or path jog is tried, the variable is set up automatically.

$MJPTMIR[1].$dircton_a

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** VECTOR **Memory:** Not available

Name: Path jog frame

Description: Approach vector of path jog frame.

Power Up: Changes to this variable take effect immediately.

Screen: When program paused or path jog is tried, the variable is set up automatically.

$MJPTMIR[1].$dircton_l

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** VECTOR **Memory:** Not available

Name: Path jog frame

Description: Location vector of path jog frame.

Power Up: Changes to this variable take effect immediately.

Screen: When program paused or path jog is tried, the variable is set up automatically.

$MJPTMIR[1].$dircton_n

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** VECTOR **Memory:** Not available

Name: Path jog frame

Description: Normal vector of path jog frame.

Power Up: Changes to this variable take effect immediately.

Screen: When program paused or path jog is tried, the variable is set up automatically.

$MJPTMIR[1].$dircton_o

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** VECTOR **Memory:** Not available

Name: Path jog frame

Description: Orient vector of path frame.

Power Up: Changes to this variable take effect immediately.

Screen: When program paused or path jog is tried, the variable is set up automatically.

$MJPTMIR[1].$motype

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** MOTYPE_E **Memory:** Not available

Name: Program motion type

Description: Joint or linear or circular.

Power Up: Changes to this variable take effect immediately.

Screen: When program paused, the variable is set up automatically.

$MJPTMIR[1].$pathjog_flg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Check flag of task ID.

Description: Task ID check flag between program pause and path jog is tried.

Power Up: Changes to this variable take effect immediately.

Screen: When program paused or path jog is tried, the variable is set up automatically.

$MJPTMIR[1].$prb_frm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION **Memory:** Not available

Name: Path jog frame

Description: Setup path jog frame.

Power Up: Changes to this variable take effect immediately.

Screen: When program paused or path jog is tried, the variable is set up automatically.

$MJPTMIR[1].$r_reverse

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: path jog frame direction flag

Description: The flag setup reverse or no reverse each direction of path jog frame.

Power Up: Changes to this variable take effect immediately.

Screen: When program paused or path jog is tried, the variable is set up automatically.

$MJPTMIR[1].$tool_frm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION   **Memory:** Not available

Name: Tool frame

Description: This means the tool frame is used in pause program. This is used at circular path jog.

Power Up: Changes to this variable take effect immediately.

Screen: When program paused or path jog is tried, the variable is set up automatically.

$MJPTMIR[1].$used_utool

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION   **Memory:** Not available

Name: Utool used in MIR by INTP

Description: This means the UTool data is used in pause program.

Power Up: Changes to this variable take effect immediately

Screen: Do not change this variable. When the program is paused or path jog is tried, the variable is set up automatically.

$MJPTMIR[1].$utool_num

Minimum: 1   **Maximum:** 100   **Default:** 5   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of tool

Description: This means the tool number is used in pause program.

Power Up: Changes to this variable take effect immediately.

Screen: When program paused or path jog is tried, the variable is set up automatically.

$MJPTMIR[1].$z_r_frm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION   **Memory:** Not available

Name: z direction of path jog frame

Description: This mean the z direction of path jog frame Setup robot pose position.

Power Up: Changes to this variable take effect immediately.

Screen: When program paused or path jog is tried, the variable is set up automatically.

$MKCFG STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: KAREL Motion (Motion-KAREL) Configuration System Variable Structure

Description: This set of variables controls the mode of operation of KAREL Motion. See the descriptions of the individual fields below.

Power Up: N/A

$MKCFG.$debug

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Debug Flag.

Description: This variable is used for general debugging of KAREL Motion during development and should not be used by users.

Power Up: This value initializes to 0 and will maintain its value over subsequent power cycles.

$MKCFG.$group_mask

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: KAREL Motion Group Mask Bit Map

Description: This system variable specifies which motion group can perform the KAREL motion.

Power Up: This value initializes to 1 and will maintain its value over subsequent power cycles.

$MKCFG.$mb_conflict

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Motion-Basic Conflict mask.

Description: This is a bit-mapped variable. The bit will be set if if KAREL Motion is in conflict with any other softparts in the SID_MB socket.

Power Up: This value initializes to 0 and will maintain its value over subsequent power cycles.

$MKCFG.$mb_required

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Motion Basic Required Mask.

Description: This is a bit-mapped variable to indicate that KAREL Motion is required by another softpart in SID_MB.(NOTE: Currently, it is not used.)

Power Up: This value initializes to 0 and will maintain its value over subsequent power cycles.

$MKCFG.$mo_conflict

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: General Motion Conflict mask.

Description: This is a bit-mapped variable. The bit will be set if KAREL Motion is in conflict with any softpart in the SID_MO socket.

Power Up: This value initializes to 0 and will maintain its value over subsequent power cycles.

$MKCFG.$mo_required

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: General Motion Basic Required Mask.

Description: This is a bit-mapped variable to indicate that KAREL Motion is required by a softpart in SID_MO.(NOTE : Currently, it is not used.)

Power Up: This value initializes to 0 and will maintain its value over subsequent power cycles.

$MNDSP_CMNT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Enable Display of Program Comment

Description: Enables/disables the display of a program comment in SELECT screen.

Power Up: Changes to this variable take effect immediately.

$MNDSP_POSCF

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Teach Pendant Editor Position Confirmation

Description: This variable is used to enable the different modes of Position Confirmation in the Teach Pendant Editor. 0 = Disable Position Confirmation in TP Editor 1 = Enable Position Confirmation in TP Editor. The "@" symbol will be display on any taught position that equals the robots current position. 2 = Enable Position Confirmation in TP Editor. The "@" symbol will be display when the cursor is on the line in which the taught position equals the robot''s current position.

Power Up: Takes effect immediately

$MNUFRAME[1,6]

Minimum: NIL   **Maximum:** NIL   **Default:** NIL   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION   **Memory:** Not available

Name: User Frame Array

Description: This system variables contains the positional value of the user frame used by the teach pendant system. This is a two dimensional array. The inner dimension is the frame number (1-6). The outer dimension is the group number (gnum). The frame number is $MNUFRAMENUM[gnum]. When $MNUFRAMENUM[gnum] is between 1 and 6 the system uses the following userframe: $MNUFRAME[gnum, $MNUFRAMENUM[gnum]] If $MNUFRAMENUM[gnum] is zero the null frame is used. If $MNUFRAMENUM[gnum] is 14 $GROUP[gnum].$UFRAME is used.

Power Up: N/A

Screen: SETUP Frames

$MNUFRAMENUM[2]

Minimum: 0x0   **Maximum:** 0x15   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: User Frame Number

Description: Used as the index into $MNUFRAME.

Power Up: N/A

Screen: SETUP Frames, teach pendant position programming

$MNUTOOL[1,6]

Minimum: NIL   **Maximum:** NIL   **Default:** NIL   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION   **Memory:** Not available

Name: Tool Frame Array

Description: This system variables contains the positional value of the tool frame used by the teach pendant system. This is a two dimensional array. The inner dimension is the tool number (1-6).The outer dimension is the group number (gnum). The tool number is $MNUTOOLNUM[gnum]. When $MNUTOOLNUM[gnum] is between 1 and 6 the system uses the following toolframe: $MNUTOOL[gnum, $MNUTOOLNUM[gnum]] If $MNUTOOLNUM[gnum] is zero the null frame is used. If $MNUTOOLNUM[gnum] is 14 $GROUP[gnum].$UTOOL is used.

Power Up: N/A

Screen: SETUP Frames

$MNUTOOLNUM[2]

Minimum: 0x0   **Maximum:** 0x15   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: User Tool Frame Number

Description: Used as the index into $MNUTOOL.

Power Up: N/A

Screen: SETUP Frames, TOOL teach pendant instruction

$MODEM_INF[1].$MDM_ANSWER

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Modem ANSWER indication

Description: ASCII string that the software expects to be sent from the modem as an ANSWER indiaction

Power Up: Not used at powerup

$MODEM_INF[1].$MDM_DIAL

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Modem DIAL

Description: ASCII string sent to the modem to cause it to dial out.

Power Up: Not used at powerup

$MODEM_INF[1].$MDM_HANGUP

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Modem HANGUP string

Description: ASCII string sent to the modem to cause the modem to HANGUP

Power Up: Not used at powerup

$MODEM_INF[1].$MDM_INIT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Primary modem INITIALIZATION string

Description: ASCII string sent to the modem for PRIMARY initialization of modem settings

Power Up: Not used at powerup

$MODEM_INF[1].$MDM_INIT1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Secondary modem INITIALIZATION string

Description: ASCII string sent to the modem for SECONDARY initialization of modem settings

Power Up: Not used at powerup

$MODEM_INF[1].$MDM_RESET

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Modem RESET string

Description: ASCII string sent to the modem to cause RESET

Power Up: Not used at powerup

$MONITOR_MSG[32]

Minimum: ""   **Maximum:** "EXEC1 "   **Default:** "EXEC1 "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Task Message in the Monitor Screen

Description: In the multi-task system, you can confirm the tasks in execution on the monitor screen. This screen displays the name of task. This variable defines the task name with less than 9 characters. The relations between these system variables and the names of tasks are the following: $MONITOR_MSG [1] : name of task No.1 [2] : name of task No.2 [32] : name of task No.32

Power Up: Changes to this variable take effect immediately.

$MOR STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Motion Output Record

Description: Variable structure containing motion status information. Individual fields within this structure are described below.

Power Up: At a cold start, this variable is reset to its default. Data is then updated dynamically by the motion system.

$MOR.$brk_status

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER_SK   **Memory:** Not available

Name: Brake Status

Description: Indicates the brake output status.

Power Up: At a cold start, this variable is reset to its default.

$MOR.$pg_mctl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT_SK   **Memory:** Not available

Name: Motion Control Mask

Description: Motion control mask. Indicated which motion group is currently activated by th program. This variable is used by Detached Jog.

Power Up: At a cold start, this variable is reset to its default.

$MOR.$reg_dis_amp[1-16]

Minimum: 0.   **Maximum:** 1   **Default:** 0.   **KCL/Data:** RO   **Program:** RO   **UIF:** RO
CRTL: RO   **Data Type:** REAL   **Memory:** CMOS

Name: Regenerative discharge of amplifier

Description: $MOR.$reg_dis_amp are calculated in FLTR task with servo data. You cannot set this variable. It means that the regenerative discharge of amplifier.

Power Up: At a cold start, this variable is reset to its default.

Screen: $MOR.$reg_dis_amp cannot be set by user.

$MOR.$safety_stat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
INTEGER_SK   **Memory:** Not available

Name: Safety signals status

Description: $MOR.$safety_stat is bit parameter of safety signals. The bits assignment of $MOR.$safety_stat is as follows. * Bit position for $safety_stat MFS_EMGOP 1 MFS_EMGTP 2 MFS_DEADMAN 4 MFS_FENCE 8 MFS_ROT 16 MFS_HBK 32 MFS_EMGEX 64 MFS_PPABN 128 MFS_BELTBREAK 256 MFS_ENABLE 512 MFS_FALM 1024 When FLTR task detects the above alarms, FLTR set the bit which corresponds to the alarm.

Power Up: At a cold start, this variable is reset to its default.

Screen: $MOR.$safety_stat cannot be set by user.

$MOR.$smh_done

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
BOOLEAN_SK   **Memory:** Not available

Name: semi-hot start done

Description: If hot start recover processed this flag will be true.

Power Up: At a cold start, this variable is reset to its default.

$MOR_GRP STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Motion Output Record

Description: Variable structure containing motion status information for individual group. Individual fields within this structure are described below.

Power Up: At a cold start, this variable is reset to its default. Data is then updated dynamically by the motion system.

$MOR_GRP[1].$apc_counter[9]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Absolute Pulse Coder Pulse Counter

Description: The absolute pulse coder pulse count.

Power Up: At a cold start, this variable is reset to its default.

$MOR_GRP[1].$apc_done

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Absolute Pulse Code Communication Done

Description: When set to TRUE, $apc_done indicates the successful completion of absolute pulse coder (APC) communication for robots with APC motors. When set to FALSE, it indicates communication has not been successfully completed. The value of $apc_done is set and updated automatically.

Power Up: At a cold start, this variable is reset to its default.

$MOR_GRP[1].$atperch

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: At Perch Position Status

Description: If the robot is within the perch position tolerance, the flag will be automatically set.

Power Up: $atperch will be set automatically by the system if the feature is enabled. At a cold start, this variable is reset to its default.

$MOR_GRP[1].$cal_done

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: Calibration Done

Description: Displays the completion of the position adjustment (calibration).

Power Up: Data is updated dynamically by the motion system.

$MOR_GRP[1].$cartfltremp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Cartesian Filter Empty

Description: When set to TRUE, the stage 1 and stage 2 cartesian filters are empty. Not currently supported.

Power Up: Data is updated dynamically by the motion system.

$MOR_GRP[1].$cur_acctime

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Current Acceleration Time

Description: Total acceleration time currently being used. Units are in ticks of $scr.$itp_time. Includes sum of stage 1 and stage 2 Joint filters, but does not include exponential filter, S filter or D filter.

Power Up: Data is updated dynamically by the motion system.

$MOR_GRP[1].$cur_axs_acc[9]

Minimum: 0   **Maximum:** -1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Current Axis Acceleration Time

Description: Current axis acceleration time in ticks with units of $SCR.$itp_time.

Power Up: Updated automatically by the system.

$MOR_GRP[1].$cur_crframe

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION_SK   **Memory:** Not available

Name: Current CR Frame

Description: Reserved for future use. $cur_crframe is updated by the system, which indicates the current circular reference frame defined by the arc of the motion. It is used in conjunction with $cur_prframe and $pfr_resume to resume a stopped motion smoothly for moves in the Path Relative Frame.

Power Up: Data is updated dynamically by the motion system.

$MOR_GRP[1].$cur_dis_trq[9]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Current Disturbance Torque

Description: Current disturbance torque updated automatically by the system.

Power Up: Updated automatically by the system.

Screen: STATUS Axis

$MOR_GRP[1].$cur_prframe

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION_SK   **Memory:** Not available

Name: Current PR Frame

Description: Reserved for future use. $cur_prframe is effective for linear moves only in Path Relative Frame (optional feature). $cur_prframe indicates the current Path Relative Frame with respect to the World Coordinate Frame and is updated by the system. It is used in conjunction with $cur_crframe and $pfr_resume to resume a stopped motion for moves in the Path Relative Frame.

Power Up: Data is updated dynamically by the motion system

$MOR_GRP[1].$cur_prog_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG_SK   **Memory:** Not available

Name: Current Program Identification

Description: Indicates the identification number of the program that generated the current or last motion.

Power Up: Data is updated dynamically by the motion system. At a cold start, this variable is reset to its default.

$MOR_GRP[1].$cur_seg_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Current Segment Identification

Description: Identification number of the current segment being processed.

Power Up: Data is updated dynamically by the motion system

$MOR_GRP[1].$curpthacc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Current Total Cartesian Acceleration Length For Cartesian Filter

Description: Not currently supported. Indicates the total Cartesian acceleration length currently being used, 1 length unit corresponds to cartesian_rate * $SCR.$itp_time. Includes sum of stage 1 and stage 2 filters, but does not include exponential filter.

Power Up: Data is updated dynamically by the motion system.

$MOR_GRP[1].$current_ang[9]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Current Angle

Description: Indicates the joint angles, in radians, of the output of the filter. This is the motion command to the servo system.

Power Up: Data is updated dynamically by the motion system. At a cold start, this variable is reset to its default.

Screen: POSITION

$MOR_GRP[1].$current_pos

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITIONEXT_SK   **Memory:** Not available

Name: Current Position of the Robot

Description: Not currently available.

Power Up: Data is updated dynamically by motion system

$MOR_GRP[1].$currentline

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG_SK   **Memory:** Not available

Name: Current Line Number

Description: The line number in the source program that generated the current or last motion.

Power Up: This variable is dynamically updated by the motion system. At a cold start, this variable is reset to its default.

$MOR_GRP[1].$curtimeacc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Current time filter length

Description: Display the time filter length that is currently being used. This variable is active only when $CF_PARAMGP[].$timefltrenb is set to TRUE.

Power Up: Data is updated dynamically by the motion system.

See Also: $CF_PARAMGP[].$timefltrenb

$MOR_GRP[1].$dsp_stat[9]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: DSP (Digital Signal Processor) Status

Description: Status returned from the servo system DSP of each axis. bit 2 CKAL Abnormality of clock for revolution counter bit 3 BZAL Zero voltage of battery bit 4 RCAL Abnormality of revolution counter bit 5 PHAL Abnormality of signal phase bit 6 BLAL Lower voltage of battery bit 7 CSAL Alarm of check sum bit 8 OHAL Alarm of motor over heat bit 9 DTERR Alarm concerning receiving failure of all serial pulse coder data for servo CPU bit 10 CRCERR Alarm of data transfer error bit 11 STBERR Alarm of stop bit error bit 12 SPHAL Soft phase alarm

Power Up: Data is updated dynamically by the motion system. At a cold start, this variable is reset to its default.

Screen: STATUS axis status1, status2

$MOR_GRP[1].$dvc_axes

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Time Scale axes image

Description: Each bit corresponds to one axis. The bit is set to 1 when the motion command from INTR exceeds the motor speed limit.

Power Up: N/A

$MOR_GRP[1].$dvc_delay

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: ITPs delayed by Time Scale

Description: [ITP] total of time delayed by time scale

Power Up: N/A

$MOR_GRP[1].$dvc_reduce

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Velocity reduction ratio by time scale

Description: Output velocity(FLTR) / input velocity(INTR). When there is no slow down caused by time scale it is set to 1.0

Power Up: N/A

$MOR_GRP[1].$err_value[9]

Minimum: -10000000.   **Maximum:** 10000000.   **Default:** 0.   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Error counter monitor

Description: Error value monitor Max value of current Error counter compared with limit of move error (%) Max value is held on program execution

Power Up: The change to this system variable takes effect immediately.

Screen: None

See Also: None

$MOR_GRP[1].$error_cnt[9]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Error Count

Description: The error, in pulse counts, from the actual position as seen by the encoders to the command position.

Power Up: Data is updated dynamically by the motion system. At a cold start, this variable is reset to its default.

Screen: STATUS axis pulse

$MOR_GRP[1].$fb_comp_cnt[9]

Minimum: 0 **Maximum:** 0 **Default:** 0 **KCL/Data:** RW **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** INTEGER **Memory:** Not available

Name: Feedback compensation monitor

Description: Compensation counts of speed feedback on SRVO are deisplayed

Power Up: The change to this system variable takes effect immediately.

Screen: None

See Also: None

$MOR_GRP[1].$filter_empt

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** RO **UIF:** Not available **CRTL:** Not available **Data Type:** BOOLEAN_SK **Memory:** Not available

Name: Filter Empty

Description: When set to TRUE, the stage 1 and stage 2 joint filters are empty for all axes.

Power Up: Data is updated dynamically by the motion system.

$MOR_GRP[1].$filter_type

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** RO **UIF:** Not available **CRTL:** Not available **Data Type:** SHORT **Memory:** Not available

Name: Current Filter Type

Description: Reserved for Internal use by FANUC Robotics. It indicates the type of filter being used.

Power Up: Data is updated dynamically by the motion system.

Screen: SYSTEM Variable screen

$MOR_GRP[1].$fltr_nc_emp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: Non-continuous Filter Empty

Description: When set to TRUE, the stage 1 and stage 2 joint filters are empty for all non-continuous turn axes.

Power Up: Data is updated dynamically by the motion system.

$MOR_GRP[1].$in_position[9]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: In Position

Description: $in_position is an array of flags indicating the axes that are in position. At the beginning of a segment the flags are automatically set to FALSE. By the end of the segment all of the flags are TRUE, indicating each axis is within the tolerance for the specified position. The value of $in_position is set and updated automatically.

Power Up: Data is updated dynamically by the motion system. At a cold start, this variable is reset to its default.

$MOR_GRP[1].$jogged

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: Robot jogged

Description: When set to TRUE, the robot has been jogged since the last program motion. Execution of any user program will reset the flag.

Power Up: Data is updated dynamically by the motion system and reset by program execution.

$MOR_GRP[1].$line_er_cnt[9]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** NO   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Line Tracking Encoder Error Count (not supported)

Description: Line tracking encoder error count.

Power Up: N/A

$MOR_GRP[1].$line_offset

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Current Line Number

Description: Current motion statement offset from the beginning of TPE line. Valid only when On_The_Fly option is enable.

Power Up: At a cold start, this variable is reset to its default.

$MOR_GRP[1].$machine_pls[9]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Machine Pulse Count

Description: The absolute encoder pulse count reading of the current robot position.

Power Up: Data is updated dynamically by the motion system.

Screen: STATUS axis pulse

$MOR_GRP[1].$max_dis_trq[9]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Maximum Disturbance Torque

Description: Maximum disturbance torque updated automatically by system.

Power Up: Automatically updated by Filter task

Screen: STATUS axis

$MOR_GRP[1].$max_torque[9]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Maximum Torque

Description: Maximum torque information updated by DSP

Power Up: Updated automatically by the system

Screen: STATUS axis monitor

$MOR_GRP[1].$min_dis_trq[9]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Minimum Disturbance Torque

Description: Minimum disturbance torque updated automatically by system.

Power Up: Updated automatically by the system

Screen: STATUS axis

$MOR_GRP[1].$motion_cmnd[9]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Motion Command Pulses

Description: The current actual motion command in pulse counts to the servo system

Power Up: Data is updated dynamically by the motion system.

Screen: STATUS axis pulse

$MOR_GRP[1].$move_dist

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL_SK   **Memory:** Not available

Name: Distance Moved

Description: Reserved for future use. The total distance moved by this motion statement.

Power Up: At a cold start, this variable is reset to its default.

$MOR_GRP[1].$nilpos

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION_SK   **Memory:** Not available

Name: Zero Position

Description: The position data of (0, 0, 0, 0, 0, 0, 0) is specified. $NILP defines a nil or zero position, which is useful in program assignment statements. For example, the statement $UTOOL = $NILP assigns a nil position to $UTOOL.

Power Up: The data is never modified.

$MOR_GRP[1].$ogdst_ratio

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL_SK   **Memory:** Not available

Name: Original path resume offset information

Description: Ratio of (actual offset) / (Specified offset)where, 'specified offset' is the resume offset value which is specified by user. 'actual offset' is the actual offset which is appliedThis variable is used by Original Path Resume feature.It indicates resume offset status. If user set too long offset,and shorter offset is available, then the system change offsetshorter.If value == 1.0: specified offset is used.If 0.0 Less Than Equal To value Less Than 1.0: shorter offset is used.(value shows the ratio)If value Less Than 0.0 : resume offset is not used.If value Greater Than 1.0 : Invalid (Something is wrong)

Power Up: The change to this system variable takes effect immediately.

Screen: None

See Also: None

$MOR_GRP[1].$overrun_cnt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG_SK   **Memory:** Not available

Name: Overrun Count

Description: Indicates the number of interpolator cycles since a COLD start that the interpolator do not have enough time to finish its path interpolation. Updated by the interpolator.

Power Up: Data is updated dynamically by the motion system.

$MOR_GRP[1].$path_node

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type** INTEGER **Memory:** Not available

Name: Path Node Number

Description: $path_node indicates the path node to which the robot is moving or has most recently moved. After an error, KAREL programs can test to determine the node toward which the robot is or was most recently moving when the error occurred. For emergency stops or errors that cause brakes to be applied and drive power to the servo system to be shut off, $path_node might be ahead of the robot's actual position. The value of $path_node is set and updated automatically.

Power Up: Data is updated dynamically by the motion system. At a cold start, this variable is reset to its default.

$MOR_GRP[1].$pccomer_cnt[9]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Pulse corder comminucation error count

Description: Ignored counts of pulse corder comminucation error on SERVO are displayed

Power Up: The change to this system variable takes effect immediately.

Screen: None

See Also: None

$MOR_GRP[1].$pendmocount

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER_SK   **Memory:** Not available

Name: Reserved for future use (not supported)

Description: $pendmocount keeps track of how many motions have been issued but have not yet been completed. It is automatically incremented each time the program interpreter issues a motion and decremented each time the motion interpolator finishes a motion.

Power Up: At a cold start, this variable is reset to its default.

$MOR_GRP[1].$pos_valid

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: Current Position Valid

Description: Reserved for future use. This specified whether or not the current_pos is valid.

Power Up: N/A

$MOR_GRP[1].$segfraction

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL_SK **Memory:** Not available

Name: Fraction of Segment Completed

Description: Reserved for future use. $segfraction indicates what fraction of the current segment has been interpolated. For example: 0.0 means the interpolation is just beginning. 0.5 means the interpolation is half complete. 1.0 means interpolation is complete, and the robot is starting to decelerate toward the destination. Note that when the value is 1.0, the robot will not be exactly at the indicated position because of the digital filters. The robot still needs to decelerate. $segfraction is set and updated automatically.

Power Up: At a cold start, this variable is reset to its default.

$MOR_GRP[1].$segmovedist

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL_SK **Memory:** Not available

Name: Distance Moved in this Segment

Description: Reserved for future use. The total distance moved for this segment.

Power Up: At a cold start, this variable is reset to its default.

$MOR_GRP[1].$servo_ready

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN_SK   **Memory:** Not available

Name: Servo Ready

Description: $servo_ready indicates whether or not servo power is active. The value of $servo_ready is set and updated automatically.

Power Up: Data is updated dynamically by the motion system.

$MOR_GRP[1].$spc_stat[9]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: SPC (Serial Pulse Coder) Status

Description: The status returned by the serial pulse coder.

Power Up: Data is updated dynamically by the motion system.

$MOR_GRP[1].$syn_err_cnt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Synchronous Error Counter

Description: $SYN_ERR_CNT is the value of the error counter for robot models with dual drive (synchronous) control.

Power Up: Data is updated dynamically by the motion system. At a cold start, this variable is reset to its default.

$MOR_GRP[1].$torque[9]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Average Torque

Description: Average torque information by DSP.

Power Up: Updated automatically by the system.

Screen: STATUS axis monitor

$MOR_GRP[1].$tune[9]

Minimum: MIN_TUNE   **Maximum:** MAX_TUNE   **Default:** DEF_TUNE   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** TUNE_T   **Memory:** Not available

Name: Tuning information

Description: Tuning information for motion auto tuning

Power Up: Changes to this variable take effect immediately.#

Screen: None

See Also: None

$MOR_GRP[1].$tune_val

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Tuning variables

Description: Internal use

Power Up: N/A

$MOR_GRP_SV[].$cur_sv_ang

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Current saved angles

Description: When $MOR.$shm_done is set to true. Filter will save the most current joint angle to this variable.

Power Up: At a cold start, this variable is reset to its default.

See Also: $MOR.$smh_done

2.13 "O" System Variables

$ODRDSP_ENB

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Order File Display Enable

Description: Determines whether the order file screen is selectable or not. If $ODRDSP_ENB is set to 1, the order file screen is selectable. This variable is only effective when the corresponding software option is loaded.

Power Up: Changes to this variable take effect immediately.

$OFFSET_CART

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use TP OFFSETS as frames

Description: If $OFFSET_CART is TRUE, offsets for Cartesian positions are used as frames and to pre-multiply positions. If this is FALSE, offsets for XYZWPR positions are added field by field (e.g., target.w = pos.w + offset.w)

Power Up: N/A

$OPEN_FILES

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Open files

Description: Determines the maximum number of open files at one time.

Power Up: Only effective during cold start

$OPTION[1]-[20]

Minimum: ""   **Maximum:** " "   **Default:** " "   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Name of a standard/optional features.

Description: Displays the release time name of a standard feature or the release time name and version of an optional feature that been installed.

Power Up: This variable cannot be changed.

$OPWORK STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Operator Work

Description: Controls the buttons and lamps on the SOP/UOP and teach pendant. Individual fields within this structure are described below.

Power Up: N/A

$OPWORK.$enbl_on

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: ENBL input is ON

Description: When this value is set to TRUE, ENBL of UI is regarded as ON even if the actual input is OFF.

Power Up: Changes to this variable take effect immediately.

$OPWORK.$intpmask

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Interpreter Mask

Description: Not currently used.

Power Up: N/A

$OPWORK.$intppaused

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Program is Paused

Description: This variable remains > 0 while the program is temporarily stopped. The system updates it automatically.

Power Up: N/A

$OPWORK.$intprunning

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG **Memory:** Not available

Name: Program is Running

Description: This variable remains > 0 while the program is executing. The system updates it automatically.

Power Up: N/A

$OPWORK.$op_inv_mask[1-3]

Minimum: 0   **Maximum:** 256   **Default:** 0   **KCL/Data:** RO   **Program:** Not available   **UIF:** RW   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Inverted signal mask

Description: Indicates which signals are inverted.

Power Up: N/A

$OPWORK.$op_inv_mask[3]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Inverted signal mask

Description: Indicates which signals are inverted.

Power Up: N/A

$OPWORK.$op_prev_img[1-3]

Minimum: 0   **Maximum:** 256   **Default:** 0   **KCL/Data:** RO   **Program:** Not available   **UIF:** RW   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Operator Panel Previous output image.

Description: Controls the buttons and lamps on the SOP/UOP and teach pendant

Power Up: N/A

$OPWORK.$op_prev_img[3]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Operator Panel Previous output image.

Description: Controls the buttons and lamps on the SOP/UOP and teach pendant

Power Up: N/A

$OPWORK.$opt_out

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Enable/Disable use of UOP Optional Output.

Description: When set to TRUE enables the optional UOP output signals.

Power Up: N/A

$OPWORK.$orgovrdval

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Original Override Value

Description: When the safety fence is opened (i.e. *SFSPD turns off), the override value is recorded in this system variable automatically. This value is used to recover the override value when the safety fence is closed (i.e. *SFSPD turns on). This value is cleared if you change the override value while the safety fence is opened. In this case, the override is not recovered when the safety fence is closed. This variable should be maintained by the system only. Do not change this variable.

Power Up: Changes to this variable take effect immediately.

$OPWORK.$outimage[1-3]

Minimum: 0   **Maximum:** 256   **Default:** 0   **KCL/Data:** RO   **Program:** Not available   **UIF:** RW   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: Current output image.

Description: Current output image.

Power Up: N/A

$OPWORK.$outimage[3]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Current output image.

Description: Current output image.

Power Up: N/A

$OPWORK.$sopbusymsk

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: System Operator Panel Busy Mask

Description: This is the task mask indicating not to turn on the SOP busy lamp. This is output when the operator control panel I/O is being processed. When it is > 0, a BUSY signal is output from the operator control panel. The system updates it automatically.

Power Up: N/A

$OPWORK.$sysbusy

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG **Memory:** Not available

Name: System Busy

Description: This variable remains > 0 while the system is processing. The system updates it automatically.

Power Up: N/A

$OPWORK.$tpbusymsk

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG **Memory:** Not available

Name: Teach Pendant Busy Mask

Description: Task mask indicating not to turn on the teach pendant busy lamp. This is output when the teach pendant is processing. When it is > 0, the lamp will be lit while the teach pendant is processing. The system updates it automatically.

Power Up: N/A

$OPWORK.$uop_disable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE **Memory:** Not available

Name: Enable/disable UOP signal.

Description: Peripheral devices I/O invalidity. Invalidate all peripheral devices I/O at one. 0 = Enable 1 = Disable

Power Up: N/A

$OPWORK.$uopbusymsk

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: User Operator Panel Busy Mask

Description: Task mask indicating not to turn on UOP busy lamp. This is output when the peripheral device I/O is being processed. When it is > 0, the operator control panel BUSY signal will be lit. The system updates it automatically.

Power Up: N/A

$OPWORK.$user_output[1-3]

Minimum: 0   **Maximum:** 100   **Default:** 0   **KCL/Data:** RO   **Program:** Not available   **UIF:** RO   **CRTL:** RO   **Data Type:** USHORT   **Memory:** CMOS

Name: User Output

Description: Not currently used.

Power Up: N/A

$OPWORK.$user_output[3]

Minimum: 0   **Maximum:** 0xFFFF   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: User Output

Description: Not currently used.

Power Up: N/A

$OVRD_RATE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Override change rate

Description: The value of $OVRD_RATE indicates the rate of changing override of 10%-100%. For example, when $OVRD_RATE = 25, override is changed as follows. V.FINE - FINE - 1 - 2 - 3 - 4 - 5 - 10 - 25 - 50 - 75 - 100

Power Up: Changes to this variable take effect immediately.

$OVRDSLCT STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Override Select Setup

Description: Sets the override to predefined values based on digital inputs. This feature is only available if the option is installed. This is not a standard option. Individual fields within this structure are described below.

Power Up: Changes to this variable take effect immediately.

Screen: SYSTEM Variables screen SETUP Override screen

$OVRDSLCT.$off_off_ovr

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Override Setting when Both SDI 1 and 2 are OFF

Description: This variable contains the override value used when both SDI signals 1 and 2 are OFF.

Power Up: Changes to this variable take effect immediately.

$OVRDSLCT.$off_on_ovrd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Override Setting when SDI 1 is OFF and SDI 2 is ON

Description: This variable contains the override value used when SDI signal 1 is OFF and 2 is ON.

Power Up: Changes to this variable take effect immediately.

$OVRDSLCT.$on_off_ovrd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Override Setting when SDI 1 is ON and SDI 2 is OFF

Description: This variable contains the override value used when SDI signal 1 is ON and 2 is OFF.

Power Up: Changes to this variable take effect immediately.

$OVRDSLCT.$on_on_ovrd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Override Setting when Both SDI 1 and 2 are ON

Description: This variable contains the override value used when both SDI signals 1 and 2 are ON.

Power Up: Changes to this variable take effect immediately.

$OVRDSLCT.$ovsl_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Override Select Feature Enable

Description: This enables the override select feature if the option is installed. This is not a standard option.

Power Up: Changes to this variable take effect immediately.

$OVRDSLCT.$sdi_index1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: SDI Number for Signal 1

Description: Digital input which, along with $OVRDSLCT.$sdi _index2, selects one of four override values.

Power Up: Changes to this variable take effect immediately.

$OVRDSLCT.$sdi_index2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: SDI Number for Signal 2

Description: Digital input which, along with $OVRDSLCT.$sdi _index1, selects one of four override values.

Power Up: Changes to this variable take effect immediately.

2.14 "P" System Variables

$PARAM_GROUP STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Parameter Group

Description: Motion parameters that are generally robot dependent. These can be modified at any time, but require a cold start to take effect. Individual fields within this structure are described below.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP.$jogaccratio[4]

Minimum: 0.0   **Maximum:** 1.0   **Default:** 0.5 to 0.9   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** real   **Memory:** Not available

Name: Jog acceleration ratio coeffcients

Description: The values are used in jogging filter length calcuations

Power Up: Require a cold start to take effect

Screen: SYSTEM variables screen

$PARAM_GROUP[1].$acc_pa_uma

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Scaling Parameter A for Maxaccel/standard Short Motion

Description: Scaling factor A for maxaccel and standard short motion.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$acc_pc_uma

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Scaling Parameter C for Maxaccel/standard Short Motion

Description: Scaling factor C for maxaccel and standard short motion.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$acc_scl_uca

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Filter 1 Scale Factor

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$accel_param[1-4]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: s-filter acc/dec parameters

Description: S-filter acceleration/deceleration parameters.

Power Up: N/A

$PARAM_GROUP[1].$accel_param[4]

Minimum: -100000.   **Maximum:** 100000.   **Default:** 0   **KCL/Data:** RW   **Program:** RW **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Acceleration Parameter

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$accel_ratio

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Acceleration Ratio

Description: The ratio of the second stage acceleration time to the first stage acceleration time.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$accel_time1[9]

Minimum: 0   **Maximum:** 10000   **Default:** 256   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Acceleration Time 1

Description: $accel_time1 is an array of times, one per axis, for the first stage of the second order acceleration/deceleration algorithm for joint motion. The value is in milliseconds. $accel_time1 is set by the controlled start robot setup program, and should not be changed. For the extended axes, you are responsible for setting this variable using the Control Start Extended axes/Nobot setup Program.

Power Up: On_Cold_Start

$PARAM_GROUP[1].$accel_time2[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Length of 2nd stage filter for joint motion

Description: Length of 2nd stage filter for joint motion

Power Up: N/A

$PARAM_GROUP[1].$accel_time2[9]

Minimum: 0   **Maximum:** 10000   **Default:** 128   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Acceleration Time 2

Description: $accel_time2 is an array of times, one per axis, for the second stage of the second order acceleration/deceleration algorithm for joint motion. The value is in milliseconds. $accel_time2 is set by the controlled start robot setup program, and should not be changed. For the extended axes, you are responsible for setting this variable using the Control Start Extended axes/Nobot setup Program.

Power Up: On_Cold_Start

$PARAM_GROUP[1].$armload[3]

Minimum: 0.0   **Maximum:** 10000   **Default:** 0.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Arm Payload

Description: Payload on robot arm for inertia calculation (units in Kg).

Power Up: On_Cold_Start

$PARAM_GROUP[1].$armload_x[3]

Minimum: -10000   **Maximum:** 10000   **Default:** 0.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Armload_x

Description: X position of armload (units in cm).

Power Up: On_Cold_Start

$PARAM_GROUP[1].$armload_y[3]

Minimum: -10000   **Maximum:** 10000   **Default:** 0.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Armload_y

Description: Y position of armload (units in cm).

Power Up: On_Cold_Start

$PARAM_GROUP[1].$armload_z[3]

Minimum: -10000   **Maximum:** 10000   **Default:** 0.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Armload_z

Description: Z position of armload (units in cm).

Power Up: On_Cold_Start

$PARAM_GROUP[1].$auto_sngstp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
BOOLEAN   **Memory:** Not available

Name: Singularity stop at auto mode.

Description: Specifies whether or not the robot should stop in auto mode when entering singularity
zone.

Power Up: On_Cold_Start

$PARAM_GROUP[1].$axis_im_scl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
SHORT   **Memory:** Not available

Name: Divider of Inertia and Moment

Description: Divider values of inertia ($axisinertia) and moment ($axismoment).

Power Up: On_Cold_Start

$PARAM_GROUP[1].$axisinertia[9]

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not
available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Reserved for Internal use by FANUC Robotics

Description: Reserved for Internal use by FANUC Robotics (units in Kg).

Power Up: On_Cold_Start

$PARAM_GROUP[1].$axismoment[9]

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Reserved for Internal use by FANUC Robotics

Description: Reserved for Internal use by FANUC Robotics (units in Kg).

Power Up: On_Cold_Start

$PARAM_GROUP[1].$bcklsh_coun[9]

Minimum: 0   **Maximum:** 100000   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Backlash Compensation Count

Description: Backlash compensation count for anti-bac klash compensation. This value is normally determined by experiment for each individual mechanical unit.

Power Up: On_Cold_Start

$PARAM_GROUP[1].$belt_enable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Belt Break Detect Enable

Description: $belt_enable enables the belt breakage detection feature. If it is set to TRUE, the controller will generate an error message if a drive belt breaks. For robots that are equipped with belt-driven axes, such as the A-510, $belt_enable should be TRUE. For all other robots, $belt_enable should be set to FALSE. If your system is equipped with belt-driven axes, setting $belt_enable to TRUE changes the normal message of OVERTRAVEL to BELT BROKEN.

Power Up: On_Cold_Start

$PARAM_GROUP[1].$cart_accel1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Cartesian Acceleration Time 1

Description: $cart_accel1 is the length, in milliseconds, of the first stage of the second order acceleration/deceleration filter for Cartesian motion. The total acceleration/deceleration time for either linear or circular Cartesian motion (except where speed override is used) is the sum of $cart_accel1 and $cart_accel2. The value of $cart_accel1 is set by the controlled start robot setup program and should not be changed for robot axes.

Power Up: On_Cold_Start

$PARAM_GROUP[1].$cart_accel2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Cartesian Acceleration Time 2

Description: $cart_accel2 is the length, in milliseconds, of the second stage of the second order acceleration/deceleration filter for Cartesian motion. The total acceleration/deceleration time for either linear or circular Cartesian motion (except where speed override is used) is the sum of $cart_accel1 and $cart_accel2. The value of $cart_accel2 is set by the controlled start robot setup program and should not be changed for robot axes.

Power Up: On_Cold_Start

$PARAM_GROUP[1].$cartmo_mgn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Standard Short Motion Acceleration Scale for Cartesian Motion

Description: Scale factor for Cartesian standard short motion. One of the system variables for Cartesian standard short motion support.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$chklimtyp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Limit Check Type

Description: Limit check type for S-420 robots only. If set to 0, the limit is checked from joint 3. If set to 1, the limit is checked from vertical.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$circ_rate

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Circular Rate

Description: The number of $scr.$itp_time cycles is used in one interpolation of circular motion.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$clalm_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Collision Detection Time

Description: Collision detection time.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$cn_gear_n1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Numerator of Continuous Turn Axis Gear Ratio

Description: $cn_gear_n1 gives the exact integer value of the numerator of the gear ratio for the continuous turn axis. The gear ratio for the continuous turn axis is specified by cn_gear_n1/cn_gear_n2 where typically cn_gear_n1 > cn_gear_n2. $cn_gear_n1 gives the number of motor revolutions per $cn_gear_n2 revolutions of the joint. In addition to the maximum value, the continuous turn option does not allow gear ratios over 4000. I.E. cn_gear_n1/cn_gear_n2 must be 4000 or less. The value should be set only through the Setup menu in the continuous turn option.

Power Up: On_Cold_Start

Screen: SYSTEM Variables screen, SETUP Continuous Turn

$PARAM_GROUP[1].$cn_gear_n2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Denominator of Continuous Turn Axis Gear Ratio

Description: $cn_gear_n2 gives the exact integer value of the denominator of the gear ratio for the continuous turn axis. The gear ratio for the continuous turn axis is specified by cn_gear_n1/cn_gear_n2 where typically cn_gear_n1 > cn_gear_n2. The value should be set only through the Setup menu in the continuous turn option.

Power Up: Requires a cold start to take effect.

Screen: SYSTEM Variables screen, SETUP Continuous Turn

$PARAM_GROUP[1].$cnt_acc_mgn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Continue acceleration margin.

Description: A scaling factor for tuning the application speed.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$coincident

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Coincidence Limit for Circular Points

Description: Coincident is used for scaling short motion criterion.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$collinear

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Collinearity Limit for Circular Pts

Description: Collinear is used as a scale factor for the torque used by $mr_max_trq.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$contaxisnum

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Continuous Turn Axis Number

Description: $contaxisnum indicates which axis operates in continuous turn mode (optional feature) and enables continuous turn for that axis. The valid values for $contaxisnum are only the highest robot axis number or an extended axis number and should be set only through the Setup Menu in the continuous turn option. The default value indicates that no axis will operate in continuous mode (all axes operate normally.)

Power Up: Requires a cold start to take effect.

Screen: SYSTEM Variables screen, SETUP Continuous Turn

$PARAM_GROUP[1].$contwindow

Minimum: 0   **Maximum:** MAX   **Default:** 0   **KCL/Data:** NO   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Continuous Turn Window (Not supported)

Description: The range of pulse count that master reference count have to be updated when the distance between the current robot position and master reference count exceed this range.

Power Up: Effective on cold start.

$PARAM_GROUP[1].$cp_cutoffov

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Lower cutoff value for override when $GROUP.$CNSTNTPT HJT is TRUE.

Description: Constant path is not maintained for override values that are less than the setting for this variable.

Power Up: Effective on cold start.

$PARAM_GROUP[1].$ddacc_ratio

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Double D filter acceleration ratio.

Description: This is a robot tuning variable for splitting the double D filter at the process_spd. This variable is in effect only when process_spd is in effect.

Power Up: Effective on cold start.

Screen: SYSTEM variables

$PARAM_GROUP[1].$decel_ratio

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Deceleration Ratio for Short Motion

Description: Deceleration ratio for short motion. This will be used to determine whether or not to use short motion algorithm.

Power Up: Effective on cold start.

$PARAM_GROUP[1].$decoup_mgn STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Decoupling torque (between J2 and J3 axes) parameters

Description: Decoupling torque (between J2 and J3 axes) parameters

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$decoup_mgn[1]

Minimum: -100000.   **Maximum:** 100000.   **Default:** 1   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Decoupling torque (between J2 and J3 axes) parameter (1)

Description: Margin parameter for coupling torque between J2 and J3 axes.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$decoup_mgn[2]

Minimum: -100000.   **Maximum:** 100000.   **Default:** 0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Decoupling torque (between J2 and J3 axes) parameter (2)

Description: This value is added to the J3 axis angle when calculating coupling torque between J2 and J3 axes. [radian]

Power Up: On_Cold_Start

$PARAM_GROUP[1].$decoup_mgn[3]

Minimum: -100000.   **Maximum:** 100000.   **Default:** 0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Decoupling torque (between J2 and J3 axes) parameter (3)

Description: Not used.

Power Up: On_Cold_Start

$PARAM_GROUP[1].$decoup_mgn[4]

Minimum: -100000.   **Maximum:** 100000.   **Default:** 0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Decoupling torque (between J2 and J3 axes) parameter (4)

Description: Not used.

Power Up: On_Cold_Start

$PARAM_GROUP[1].$decp_mgn_wr STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Decoupling torque (considering wrist axes) control parameters

Description: Decoupling torque (considering wrist axes) control parameters

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$decp_mgn_wr[1]

Minimum: 0.   **Maximum:** 10.   **Default:** 1.   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Decoupling torque (considering wrist axes) parameter (1)

Description: Margin parameter for gravity of J4 axis

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$decp_mgn_wr[2]

Minimum: 0.   **Maximum:** 10.   **Default:** 1.   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Decoupling torque (considering wrist axes) parameter (2)

Description: Margin parameter for position of gravity center of J4 axis

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$decp_mgn_wr[3]

Minimum: 0.   **Maximum:** 10.   **Default:** 1.   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Decoupling torque (considering wrist axes) parameter (3)

Description: Margin parameter for inertia at gravity center of J4 axis

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$decp_mgn_wr[4]

Minimum: 0.   **Maximum:** 10.   **Default:** 1.   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Decoupling torque (considering wrist axes) parameter (4)

Description: Margin parameter for gravity of J5 axis

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$decp_mgn_wr[5]

Minimum: 0.   **Maximum:** 10.   **Default:** 1.   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Decoupling torque (considering wrist axes) parameter (5)

Description: Margin parameter for position of gravity center of J5 axis

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$decp_mgn_wr[6]

Minimum: 0.   **Maximum:** 10.   **Default:** 1.   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Decoupling torque (considering wrist axes) parameter (6)

Description: Margin parameter for inertia at gravity center of J5 axis

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$decp_mgn_wr[7]

Minimum: 0.   **Maximum:** 10.   **Default:** 1.   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Decoupling torque (considering wrist axes) parameter (7)

Description: Margin parameter for gravity of J6 axis

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$decp_mgn_wr[8]

Minimum: 0. **Maximum:** 10. **Default:** 1. **KCL/Data:** RW **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** REAL **Memory:** Not available

Name: Decoupling torque (considering wrist axes) parameter (8)

Description: Margin parameter for position of gravity center of J6 axis

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$decp_mgn_wr[9]

Minimum: 0. **Maximum:** 10. **Default:** 1. **KCL/Data:** RW **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** REAL **Memory:** Not available

Name: Decoupling torque (considering wrist axes) parameter (9)

Description: Margin parameter for inertia at gravity center of J6 axis

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$duty_enb[1-9]

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** BOOLEAN **Memory:** Not available

Name: Duty calculation enable flag

Description: For internal use only. Do not modify this system variable. If this variable is TRUE, duty calculation for that axis is done.

Power Up: Requires a cold start to take effect.

Screen: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

$PARAM_GROUP[1].$duty_param1[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Duty parameter 1

Description: For internal use only. Do not modify this system variable. This variable is used to calculate the duty of the cycle program.

Power Up: Requires a cold start to take effect.

Screen: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

$PARAM_GROUP[1].$duty_param2[1]

Minimum: -10000000000.   **Maximum:** 10000000000.   **Default:** 0   **KCL/Data:** RW **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Duty parameter 2

Description: For internal use only. Do not modify this system variable. This variable is used to calculate the duty of the cycle program.

Power Up: Requires a cold start to take effect.

Screen: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

$PARAM_GROUP[1].$dvc_ac0_max[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Time Scale max acceleration0

Description: [cnt/msec/msec] -> [cnt/ITP/ITP]

Power Up: Requires a cold start to take effect.

Screen: The System Variables screen (on the teach pendant).

$PARAM_GROUP[1].$dvc_ac1_max[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Time Scale max acceleration1

Description: [cnt/msec/msec] -> [cnt/ITP/ITP]

Power Up: N/A

$PARAM_GROUP[1].$dvc_acc_max[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Time Scale max acceleration

Description: [cnt/msec/msec] -> [cnt/ITP/ITP]

Power Up: N/A

$PARAM_GROUP[1].$dvc_acc_min[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Time Scale min acceleration

Description: [cnt/msec/msec] -> [cnt/ITP/ITP]

Power Up: N/A

$PARAM_GROUP[1].$dvc_jrk_max[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Time Scale max jerk

Description: [cnt/ITP/ITP/ITP] -> [cnt/msec/msec/msec]

Power Up: N/A

$PARAM_GROUP[1].$dvc_jrk_min[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Time Scale min jerk

Description: [cnt/ITP/ITP/ITP] -> [cnt/msec/msec/msec]

Power Up: N/A

$PARAM_GROUP[1].$encscales[9]

Minimum: -10000000000.   **Maximum:** 10000000000.   **Default:** 0   **KCL/Data:** RW **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Encoder Scale Factor

Description: For rotational axes, $encscales[i] specifies the number of encoder pulses per degree of movement of axis i. For translational axes, $encscales[i] specifies the number of encoder pulse per mm of movement of axis i. $encscales is set by the controlled start robot setup program, and should not be changed. For the extended axes, you are responsible for setting this variable using the Control Start Extended axes/Nobot setup Program.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$exp_accel[9]

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Exponential Acceleration Time Constant

Description: Time constant, in milliseconds, of the exponential filter which is enabled by $PARAM_GROUP.$exp_enbl.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$exp_enbl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Exponential Filter Enable

Description: Enables the use of the exponential filter. The time constant of the exponential filter is $PARAM_GROUP.$exp_accel[i].

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$exp_jog_acc[9]

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Jog Exponential Filter Acceleration.

Description: Exponential filter length for jog motion.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$extaccratio

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Acceleration Ratio for Extended Axes

Description: Motion system uses this variable to split the total filter length between the first and second stage filter for the extended axes.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$ffg_mgn_j2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Margin for feed forward (J2)

Description: Not used

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$ffg_mgn_j3

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Margin for feed forward (J3)

Description: Not used

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$fwp_time1

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** SHORT **Memory:** Not available

Name: Follow up Acceleration Time 1

Description: Follow up acceleration time 1 for the first stage filter if motor speed limit occurs.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$fwp_time2

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** SHORT **Memory:** Not available

Name: Follow Up Acceleration Time 2

Description: Follow up Acceleration Time 2 for the first stage filter if motor speed limit occurs.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$gear_ratio[9]

Minimum: -10000000000. **Maximum:** 10000000000. **Default:** 0 **KCL/Data:** RW **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** REAL **Memory:** Not available

Name: Gear Ratio

Description: Gear ratio of mechanical unit for each axis.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$inpos_time[9]

Minimum: 0   **Maximum:** 100000   **Default:** 5000   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: In-position Detection Time

Description: In position detection time after command output is zero. If the robot does not come in the position within specified time values, an alarm will be posted.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$inpos_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: In-position Type

Description: Type of inposition checking. 0 : use error and counts in filter 1 : use error only and ignore exp filter 2 : same as o but include current and previous command

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$jg_fltr_scl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Jog Filter Scale

Description: Scale factor for filter lengths while jogging.

Power Up: Effective on cold start

$PARAM_GROUP[1].$jnt23_lowli

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Lower combined limit of axes 2 and 3

Description: $jnt23_lowlim is the lower combined limit of axes 2 and 3 for those robots where the joint limits of axes 2 and 3 are related. Default value of this variable is 0.0, which means joint limits of axes 2 and 3 can be checked independently.

Power Up: N/A

$PARAM_GROUP[1].$jnt23_uplim

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Upper combined limit of axes 2 and 3

Description: $jnt23_uplim is the upper combined limit of axes 2 and 3 for those robots where the joint limits of axes 2 and 3 are related. Default value of this variable is 0.0, which means joint limits of axes 2 and 3 can be checked independently.

Power Up: N/A

$PARAM_GROUP[1].$jntvellim[9]

Minimum: -100000.   **Maximum:** 100000.   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Joint Velocity Limits

Description: $jntvellim defines joint speed limits in units of degrees per second or millimeters per second for each robot joint. It is used to calculate the speed of all joint interpolated motion. If motion speed of any joint exceeds the value of $jntvellim during linear or circular motion, the robot speed will slow down so that the joint velocity becomes within its limit, and the warning message, ''Joint speed limit used,'' will be displayed. Since the accuracy of motion is not guaranteed in this case, this condition should be avoided by reteaching the positions. The value of $jntvellim is set by the controlled start robot setup program and should not be increased beyond the default values for robot axes. For the extended axes, you are responsible for setting the value correctly using the Control Start Extended axes/Nobot setup Program.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$jog_time_m

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Jog Time

Description: The number of $SCR.$itp_time cycles that are used for each jog motion interval.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$joint_rate

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Joint Rate

Description: The number of $SCR.$itp_time cycles is used in one interpolation of joint motion.

Power Up: Effective on cold start.

$PARAM_GROUP[1].$lc_qstp_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Local condition enable flag at quick stop.

Description: Specifies local condition handler handling at quick stop. If TRUE, normal logic, local condition handler trigger is sent at quick stop. If FALSE, lch trig is not sent at quick stop.

Power Up: Effective on cold start.

$PARAM_GROUP[1].$lchwarn_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enable LCH (Local Condition Handler) warning

Description: If true, MOTN-200 warning message is posted when segment is too short for specified time-before value

Power Up: Requires a cold start to take effect.

Screen: SYSTEM Variable screen

$PARAM_GROUP[1].$linear_rate

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Linear Rate

Description: The number of $SCR.$itp_time cycles is used in one interpolation of linear motion.

Power Up: Effective on cold start.

$PARAM_GROUP[1].$lowerlims[9]

Minimum: -100000.   **Maximum:** 100000.   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Axis Lower Limits

Description: $lowerlims defines the lower joint limits in degrees or millimeters. The value of $lowerlims is set by the controlled start robot setup program and should not be changed for robot axes. For extended axes, you are responsible for setting the value correctly by the controlled start extended axes setup program.

Power Up: Effective on cold start.

$PARAM_GROUP[1].$lowerlimsdf[9]

Minimum: -100000.   **Maximum:** 100000.   **Default:** 0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Default Axis Lower Limits

Description: This variable contains the default value of the lower joint limits in degrees or millimeters. This value is used for resetting $PARAM_GROUP[1].$lowerlims[9].

Power Up: Effective on cold start.

$PARAM_GROUP[1].$master_pos[9]

Minimum: -100000.   **Maximum:** 100000.   **Default:** 0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Master Position

Description: $master_pos defines the mastering position of the robot as determined by the mastering fixture. The value of $master_pos is in degrees for rotary axes and millimeters for linear axes. $master_pos is set by the controlled start robot setup program and should not be changed for robot axes. For extended axes, you are responsible for setting the value correctly using the controlled start extended axes setup program.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$max_amp_cur[9]

Minimum: -100000.   **Maximum:** 100000.   **Default:** 0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Maximum Amplifier Current

Description: Reserved for Internal use by FANUC Robotics.

Power Up: N/A

$PARAM_GROUP[1].$max_payload

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Maximum Payload

Description: The maximum payload supported by the robot (units in Kg).

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$max_pth_acc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Maximum Cartesian Accel Along Path

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$mijntchklmt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Joint motion check limit

Description: The flag to check joint limit per ITP for joint motion.

Power Up: Requires a cold start to take effect.

Screen: SYSTEM Variable screen

$PARAM_GROUP[1].$min_acc_cmc

Minimum: Not available　**Maximum:** Not available　**Default:** Not available　**KCL/Data:** Not available　**Program:** RW　**UIF:** Not available　**CRTL:** Not available　**Data Type:** INTEGER　**Memory:** Not available

Name: Minimum acceleration time for CMC software

Description: This variable is no longer being used.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$min_acc_shm

Minimum: Not available　**Maximum:** Not available　**Default:** Not available　**KCL/Data:** Not available　**Program:** RW　**UIF:** Not available　**CRTL:** Not available　**Data Type:** INTEGER　**Memory:** Not available

Name: Minimum Accel Time for Joint Short Motion

Description: Minimum acceleration time for JOINT short motion. It is used for standard short move softparts and Turbo move softparts.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$min_acc_uca

Minimum: Not available　**Maximum:** Not available　**Default:** Not available　**KCL/Data:** Not available　**Program:** RW　**UIF:** Not available　**CRTL:** Not available　**Data Type:** INTEGER　**Memory:** Not available

Name: Minimum Cartesian Acceleration Time for Short Motion

Description: This defines the minimum Cartesian acceleration time that will be used in case of short motion. On V3.06P This defines the minimum acceleration time that will be used in case $GROUP[1].$use_cartacc is turned on.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$min_acc_uma

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Minimum Joint Acceleration Time for Use Maxaccel Case

Description: This defines the minimum joint acceleration time that will be used in case $GROUP[1].$usemaxaccel is turned on. It is used for standard short move softpart and Turbo move softpart. On V3.06P and later it is used for the minimum joint and Cartesian acceleration time in case $GROUP[1].$usemaxaccel is turned on.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$min_acctime[9]

Minimum: 0   **Maximum:** 10000   **Default:** 128   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Minimum Acceleration Time

Description: This defines the minimum acceleration time that will be used for any motion.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$min_cat_uma

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Minimum Cartesian Acceltime for Usemaxaccel

Description: Minimum Cartesian acceltime when a value of $GROUP[*].$usemaxaccel is enabled. It is used for standard short move softpart and Turbo move softpart.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$min_payload

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Minimum payload for robot

Description: $min_payload is a minimum payload for robot (units in Kg). This variable is not used from V4.10P.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$mosign[9]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Motor Sign

Description: Defines the direction of axis motor rotation for each axis during calibration of robots with absolute encoders. The value of $mosign is set using the controlled start robot setup program and should not be changed for robot axes. For extended axes, you are responsible for setting the value correctly using the controlled start extended axes setup program.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$mot_lim_stp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Motor speed limit stop

Description: If true, when motor speed limit occurs a STOP severity error is issued and the current motion is cancelled. If FALSE, the error is WARNING severity.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$mot_spd_lim[9]

Minimum: 0   **Maximum:** 100000   **Default:** 2000   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Motor Speed Limit

Description: $mot_spd_lim defines an array of motor speed limits, one per motor, in units of RPM. The value of $mot_spd_lim is set by the controlled start robot setup program and should not be changed.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$mount_angle

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Mount Angle

Description: For robots that support angle mounting, this is the angle of inclination.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$mover_gain[9]

Minimum: 0.0   **Maximum:** 1000.   **Default:** 0.0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Move Error Gain Factor

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$mover_offst[9]

Minimum: 0   **Maximum:** 100000000   **Default:** 524288   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Move Error Offset

Description: .$mover_offset replaces $moverrlims for move error limit checking

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$mover_scale[9]

Minimum: 0.0   **Maximum:** 100.   **Default:** 0.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Move Error Scale Factor

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$moverrlim[9]

Minimum: 0   **Maximum:** 100000000   **Default:** 0   **KCL/Data:** NO   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Move Error Limit (not supported)

Description:

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$mrrdum2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Pad 2 Byte (Not supported)

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$path_accel1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Path Acceleration Time 1

Description: Used for IntelliTrak. This is the time, in milliseconds, of the first stage Cartesian filter.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$path_accel2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Path Acceleration Time 2

Description: Used for IntelliTrak. This is the time, in milliseconds, of the second stage Cartesian filter.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$path_accel3

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Reserved for Future Use

Description: Reserved for future use

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$payload

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Payload (not supported)

Description: Payload

Power Up: Requires a cold start to take effect (units in Kg).

$PARAM_GROUP[1].$payload_ix

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Inertia of payload (x)

Description: The X direction component of the load's inertia around the load's centroid on the tool coordinate whose setting is (x:0, y:0, z:0, w:0, p:0, r:0). Units in Kg cm2 .

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$payload_iy

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Inertia of payload (y)

Description: The Y direction component of the load's inertia around the load's centroid on the tool coordinate whose setting is (x:0, y:0, z:0, w:0, p:0, r:0). Units in Kg cm2 .

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$payload_iz

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Inertia of payload (z)

Description: The Z direction component of the load's inertia around the load's centroid on the tool coordinate whose setting is (x:0, y:0, z:0, w:0, p:0, r:0). Units in Kg cm2 .

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$payload_x

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL
Memory: Not available

Name: X position of payload

Description: The X direction position of the load's centroid on the tool coordinate whose setting is (x:0, y:0, z:0, w:0, p:0, r:0). Units in cm.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$payload_y

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL
Memory: Not available

Name: Y position of payload

Description: The Y direction position of the load's centroid on the tool coordinate whose setting is (x:0, y:0, z:0, w:0, p:0, r:0). Units in cm.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$payload_z

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL
Memory: Not available

Name: Z position of payload

Description: The Z direction position of the load's centroid on the tool coordinate whose setting is (x:0, y:0, z:0, w:0, p:0, r:0). Units in cm.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$perch[9]

Minimum: -100000.   **Maximum:** 100000.   **Default:** 0   **KCL/Data:** NO   **Program:** NO
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Perch Position (Reserved for future use).

Description: $perch is used to set the perch position. The $atperch system variable can be used to determine if the current position of the robot is the same position as specified by $perch. For robot axes, $perch[i] is in degrees or millimeters depending on the value of $rotary_axis. for extended axes, $perch[i] is in the coordinates determined by $encscales. $perch is set using the SETPERCH built-in procedure. A softpart is available for perch detection which does not use this system variable.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$perchtol[9]

Minimum: -100000.   **Maximum:** 100000.   **Default:** 0.1   **KCL/Data:** NO   **Program:** NO
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Perch Tolerance (Reserved for future use)

Description: $perchtol is used to define the tolerance used when the robot position is checked using $perch. For robot axes, $perchtol[i] is in degrees or millimeters depending on the value of $rotary_axis. For the extended axes, $perchtol[i] is in the coordinates determined by $enscales. If $perchtol[i] is negative, perch checking is turned off for axis i. $perchtol normally is set using the built-in function SETPERCH. A softpart is available for perch detection which does not use this system variable.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$ppabn_enbl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Air Pressure Abnormal Signal

Description: Enable/disable the air pressure abnormal signal.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$proc_spdlim

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Application process speed limit

Description: The upper limit for the application process speed. If the program speed is larger than this speed, Cartesian filter uses double D filters.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$process_spd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Application process speed

Description: Application process speed. A tuning variable for Cartesian filter. The unit is in mm. When this speed is greater than 0 and less than 2000, then a special filtering technique will be apply for tighter corner rounding. However, if Turbo Move is loaded and enabled, this speed does not take an effect.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$qstop_tol[1]

Minimum: 0   **Maximum:** 1000000   **Default:** 10   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Quick Stop Speed Tolerance.

Description: This is the maximum speed (in degrees/second) of quick stop for the first axis. If speed is greater than this value, quick stop does not work to protect mechanism.

Power Up: Changes to this variable take effect immediately.

$PARAM_GROUP[1].$qstop_tol[2-3]

Minimum: 0   **Maximum:** 1000000   **Default:** 28   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Quick Stop Speed Tolerance.

Description: This is the maximum speed (in degrees/second) of quick stop for the first axis. If speed is greater than this value, quick stop does not work to protect mechanism.

Power Up: Changes to this variable take effect immediately.

$PARAM_GROUP[1].$qstop_tol[4-5]

Minimum: 0   **Maximum:** 1000000   **Default:** 20   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Quick Stop Speed Tolerance.

Description: This is the maximum speed (in degrees/second) of quick stop for the first axis. If speed is greater than this value, quick stop does not work to protect mechanism.

Power Up: Changes to this variable take effect immediately.

$PARAM_GROUP[1].$qstop_tol[6-9]

Minimum: 0   **Maximum:** 1000000   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Quick Stop Speed Tolerance.

Description: This is the maximum speed (in degrees/second) of quick stop for the first axis. If speed is greater than this value, quick stop does not work to protect mechanism.

Power Up: Changes to this variable take effect immediately.

$PARAM_GROUP[1].$rotspeedlim

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Rotational Speed Limit

Description: The maximum value, in degrees per second, for the rotational speed of the orientation vectors in a programmed Cartesian motion. The default value can be reset to a higher value to increase the speed of the robot. If the new value is too large, the error message, ''Joint Velocity Limit ($jntvellim)'' will be displayed.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$servo_ctrl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Servo Control Scheme

Description: Servo control scheme where: $servo_ctrl = 0 : PI_CONTROL (PI servo control scheme) $servo_ctrl = 1 : SM_CONTROL (Sliding Mode servo control scheme) constants are defined in MOCONS.HC. From V3.07P, $sv_ctrl_typ[] is used instead.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$shft_erlim

Minimum: 0   **Maximum:** 100000000   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Soft Floating Error Limit

Description: These parameters are used for searching errors exceeding with soft floating ON.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$shortmo_mgn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Standard Short motion Acceleration Scale for Joint Motion

Description: Scale factor for JOINT standard short motion. One of the system variables for joint standard short motion support.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$slmt_e1_lw[3]

Minimum: -100000   **Maximum:** 100000   **Default:** 0   **KCL/Data:** RW   **Program:** RW **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Software Lower Limit Extended Axis 1

Description: Software lower limit extended axis 1.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$slmt_e1_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Software Limit Number for Extended Axis 1

Description: Software limit number for extended axis 1. Three choices can be selected from $slmt_j1_up or $slmt_j1_lw.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$slmt_e1_up[3]

Minimum: -100000   **Maximum:** 100000   **Default:** 0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Software Upper Limit Extended Axis 1

Description: Software upper limit extended axis 1.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$slmt_j1_lw[3]

Minimum: -100000   **Maximum:** 100000   **Default:** 0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Software Lower Limit Joint 1

Description: Software lower limit for joint 1.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$slmt_j1_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Software Limit Number Joint 1

Description: Software limit number for joint 1. Three choices can be selected from $slmt_j1_up or $slmt_j1_lw.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$slmt_j1_up[3]

Minimum: -100000   **Maximum:** 100000   **Default:** 0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Software Upper Limit Joint 1

Description: Software upper limit for joint 1.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$snglrty_stp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Singularity Stop Control Switch

Description: Singularity stop control switch. If $snglrty_stp is set to TRUE, the robot will stop near the singularity point.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$spccounttol[9]

Minimum: 0   **Maximum:** 100000000   **Default:** 524287   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Serial Pulse Coder Checking Tolerance

Description: Serial pulse coder for pulse coder reset checking. This checking is performed during the power up by comparing the current encoder value with previous stored value of pulse code machine pulse just prior to power down. The difference is then compared with this variable, if this axis is not moving at the time of power down. This is checked only if this axis has brake on it.

Power Up: Set by filter task internally.

$PARAM_GROUP[1].$spcmovetol[9]

Minimum: 0   **Maximum:** 100000000   **Default:** 3670016   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Serial Pulse Coder Checking Moving Tolerance

Description: Serial pulse coder for pulse coder reset checking. This checking is performed during the power up by comparing the current encoder value with previous stored value of pulse code machine pulse just prior to power down. The difference of it is then compared with this variable, if this axis is moving at the time of power down. This is checked only if this axis has brake on it.

Power Up: Set by filter task internally.

$PARAM_GROUP[1].$speedlim

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Speed Limit

Description: The maximum programmed speed. If the instruction speed exceeds this value, then a run-time error is posted.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$speedlimjnt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Joint Speed Limit

Description: When JOINT motion is issued, the units of $group.$speed are used and are in mm/sec. However,internally this is converted to a percentage of maximum speed, so that at maximum speed the command joint velocity is the same as $PARAM_GROUP.$jntvellim. $PARAM_GROUP.$speedlimjnt is used as the maximum speed for joint motion.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$spin_ctrl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Wrist Joint Speed Control

Description: This flag is used to enable or disable usage of maximum wrist joint speed. When user specify a linear motion with the wrist joint option, if the wrist joint motion dominates, not much of linear motion but lots of wrist motion, this flag will affect the motion time. When this flag is false, the maximum wrist joint speed is used. This means the wrist joint option will not affect the motion time. When this flag is true, the programmed wrist joint speed is used. This means the wrist joint option will slow down the motion time.

Power Up: N/A

$PARAM_GROUP[1].$stoperlim[9]

Minimum: 0   **Maximum:** 100000000   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Stop Error Limit

Description:

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$stoptol[9]

Minimum: 0   **Maximum:** 100000000   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Stop Tolerance

Description: Defines how close the current position must be to the command position for the motion to be considered complete for FINE termination type. $param_group.$stoptol is set by the controlled start robot setup program and should not be changed for robot axes. For extended axes, you are responsible for setting the value correctly by the controlled start extended axes setup program.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_ctrl_typ[9]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Servo Control Type

Description: Servo control scheme where $sv_ctrl_typ = 0 : PI servo control scheme $sv_ctrl_typ = 1 : Sliding Mode servo control scheme

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_dbl_smt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enables/disables double smoothing of Newton-Eul er compensation torque

Description: TRUE: Enables double smoothing of Newton-Euler compensation torque FALSE: Disables double smoothing of Newton-Euler compensation torque This system variable is a motion parameter and is tuned by FANUC. Normally, users should not change this system variable. Note that the path and cycle time will be changed after modifying this system variable.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_dh_a[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: D-H parameter a

Description: D-H parameter a [mm] Do not change this system variable.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_dh_cosa[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: D-H parameter cos(alpha)

Description: D-H parameter cos(alpha) [non] Do not change this system variable.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_dh_costh[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: D-H parameter cos(theta)

Description: D-H parameter cos(theta) [non] This parameter is effective only when $sv_dmy_lnk is TRUE.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_dh_d[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: D-H parameter d

Description: D-H parameter d [mm] Do not change this system variable.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_dh_sina[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: D-H parameter sin(alpha)

Description: D-H parameter sin(alpha) [non] Do not change this system variable.

Power Up: On_Cold_Start

$PARAM_GROUP[1].$sv_dh_sinth[1-9]

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** REAL **Memory:** Not available

Name: D-H parameter sin(theta)

Description: D-H parameter sin(theta) [non] This parameter is effective only when $sv_dmy_lnk is TRUE.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_dmy_lnk[1-9]

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** BOOLEAN **Memory:** Not available

Name: Dummy link

Description: If this variable is TRUE, the link is dummy link. If FALSE, it is not.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_grv_x

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** REAL **Memory:** Not available

Name: Gravity X

Description: X component of gravity vector [mm/s^2]

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_grv_y

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL
Memory: Not available

Name: Gravity Y

Description: Y component of gravity vector [mm/s^2]

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_grv_z

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL
Memory: Not available

Name: Gravity Z

Description: Z component of gravity vector [mm/s^2]

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_lnk_ix[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL
Memory: Not available

Name: Inertia about center of gravity of each link X

Description: X component of inertia about center of gravity of each link [kg.mm^2] Do not change this system variable.

Power Up: On_Cold_Start

$PARAM_GROUP[1].$sv_lnk_iy[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Inertia about center of gravity of each link Y

Description: Y component of inertia about center of gravity of each link [kg.mm^2] Do not change this system variable.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_lnk_iz[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Inertia about center of gravity of each link Z

Description: Z component of inertia about center of gravity of each link [kg.mm^2] Do not change this system variable.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_lnk_m[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Mass of each link

Description: Mass of each link [kg] Do not change this system variable.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_lnk_x[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Center of gravity of each link X

Description: X component of center of gravity of each link [mm] Do not change this system variable.

Power Up: On_Cold_Start

$PARAM_GROUP[1].$sv_lnk_y[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Center of gravity of each link Y

Description: Y component of center of gravity of each link [mm] Do not change this system variable.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_lnk_z[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Center of gravity of each link Z

Description: Z component of center of gravity of each link [mm] Do not change this system variable.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_mcmd_dly

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enables/disables motion command delay

Description: TRUE: Enables motion command delay when using Newton-Euler FALSE: Disables motion command delay when using Newton-Euler The calculation of Newton-Euler compensation torque takes 1 ITP or more. If this variable is TRUE, the motion command delays for the time of the calculation of Newton-Euler compensation torque. If FALSE, the motion command does not delay. This system variable is a motion parameter and is tuned by FANUC. Normally, users should not change this system variable. Note that the path and cycle time will be changed after modifying this system variable.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_off_all

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: All Axes Control Switch for Automatic Servo on/off

Description: If $sv_off_all is set to TRUE, automatic servo on/off will be applied to all axes simultaneously. If $sv_off_all is set to FALSE, automatic servo on/off will be applied to individual axes.

Power Up: On_Cold_Start

$PARAM_GROUP[1].$sv_off_enb[9]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Servo Off Enable

Description: $sv_off_enb controls whether or not each servo motor uses a timed servo shutdown feature. It is used with $sv_off_time to shut off servo motors after motion has been completed. This feature is used primarily for energy saving purposes.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_off_time[9]

Minimum: 0   **Maximum:** 100000000   **Default:** 10000   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Servo Off Time

Description: $sv_off_time defines the time interval, in milliseconds, after which the servo motors are shut down.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_param[30]

Minimum: -10000000.   **Maximum:** 10000000.   **Default:** 0.   **KCL/Data:** RW   **Program:**
RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Local condition enable flag at quick stop Lower cutoff value for override when
$GROUP.$CNSTNTPTHJT is TRUE Distance from elbow to obstruction.param

Description: Specify lch handling at quick stop, TRUE: normal logic, lch trig is sent at quick stop,
FALSE: lch trig is not sent at quick stop. Constant path is not maintained for override values that are
less than the setting for this variable, parameters for a variety of functions

Power Up: You must perform a COLD START for the change to take effect.You must perform a
COLD START for the change to take effect.Changes to this variable take effect immediately

Screen: The System Variables screen (on the teach pendant). The System Variables screen (on
the teach pendant).SYSTEM Variables screen

$PARAM_GROUP[1].$sv_thet0[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not
available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL
Memory: Not available

Name: Theta0

Description: When calculating theta from each joint axis, this Theta0 is added as an offset angle.
[rad] Do not change this system variable.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$sv_z_sign[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Z sign

Description: If this variable is TRUE, Z direction of the link frame is the same as the rotational direction of the link when the motor moves to positive direction. If FALSE, it is opposite. Do not change this system variable.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$t1t2_sngstp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Singularity stop at T1 and T2 mode.

Description: Specifies whether or not the robot should stop in T1 or T2 mode when entering a singularity zone.

Power Up: On_Cold_Start

$PARAM_GROUP[1].$torque_cons[9]

Minimum: 10000000000.   **Maximum:** 10000000000.   **Default:** 0.   **KCL/Data:** RW **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Torque Constants

Description: $The static torque constants of motor. These values are generally set in robot library.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$trkerrlim

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Tracking Error Limit

Description: Tracking error limit for sliding mode control. If the servo tracking error exceeds $trkerrlim in sliding mode control, the ''move error limit'' alarm will be posted.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$tsmod_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Tip Stick Detection Time

Description: Tip stick detection time for spot welding applications.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$upperlims[9]

Minimum: -100000.   **Maximum:** 100000.   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Axis Upper Limits

Description: $upperlims defines the upper joint limits, in degrees or millimeters. The value of $upperlims is set using the controlled start robot setup program and should not be changed for robot axes. For extended axes, you are responsible for setting the value correctly using the controlled start extended axes setup program.

Power Up: Requires a cold start to take effect.

$PARAM_GROUP[1].$upperlimsdf[9]

Minimum: -100000.   **Maximum:** 100000.   **Default:** 0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Default Axis Upper Limits

Description: This variable contains the default value of the upper joint limits in degrees or millimeters. This value is used for resetting $PARAM_GROUP[1].$upperlims[9].

Power Up: Effective on cold start.

$PARAM_GROUP[1].$use_cal

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Alarm Type Switch for Motor Speed Limit

Description: If set to true, a servo alarm will occur when motor speed limit is exceeded during CMC motion. If set to FALSE, only a warning will occur.

Power Up: Requires a cold start to take effect.

$PARAM_MENU[1-21]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Menu of PARAMETER statement in TPE

Description: This variable contains the items displayed in the CHOICE menu for the PARAMETER statement in the teach pendant editor. This allows you to setup default values for easy selection in the PARAMETER statement and avoid the use of alpha entry. In the SYSTEM Variables screen, it is possible to set a total of 21 parameter names. The parameter names must be within 20 characters. $PARAM_MENU[21] has the following 3 strings as default: 'DEFPULSE', 'WAITTMOUT', 'RCVTMOUT'

Power Up: Takes effect immediately

$PARAM_MENU[21]

Minimum: ""   **Maximum:** " "   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Menu of PARAMETER statement in TPE

Description: This variable contains the items displayed in the CHOICE menu for the PARAMETER statement in the teach pendant editor. This allows you to setup default values for easy selection in the PARAMETER statement and avoid the use of alpha entry. In the SYSTEM Variables screen, it is possible to set a total of 21 parameter names. The parameter names must be within 20 characters. $PARAM_MENU[21] has the following 3 strings as default: 'DEFPULSE', 'WAITTMOUT', 'RCVTMOUT'

Power Up: Takes effect immediately

$PASSSUPER STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Super User Password variable structure

Description: This set of variables provides super user password information that controls the password functionality.

Power Up: N/A

Screen: SYSTEM Variables screen.

$PASSSUPER.$level

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Install Users Level

Description: This variable indicates the password level associated with the install user.

Power Up: N/A

Screen: SYSTEM Variables screen.

$PASSSUPER.$name

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING **Memory:** Not available

Name: Install User Password variable structure

Description: This set of variables provides password information on the install user.

Power Up: N/A

Screen: System global variable screen.

$PASSSUPER.$time_out

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: Install Users Time Out

Description: This variable indicates the amount of time that the install user will stay logged in.

Power Up: N/A

Screen: SYSTEM Variables screen.

$PASSWORD STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Password configuration record

Description: This structure contains password information.

Power Up: Takes effect immediately

Screen: SETUP Passwords screen

$PASSWORD.$count_down[1-8]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Countdown of Password Time-out

Description: The system will automatically begin a countdown of the time-out value after a password is entered. When the countdown value reaches 0, the password will expire. The countdown value is specified in CPU ticks.

Power Up: N/A

Screen: SETUP Passwords screen

See Also: PASSWORD.$time_out system variable

$PASSWORD.$count_down[4]

Minimum: 0   **Maximum:** 151200000   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Countdown of Password Time-out

Description: The system will automatically begin a countdown of the time-out value after a password is entered. When the countdown value reaches 0, the password will expire. The countdown value is specified in CPU ticks.

Power Up: N/A

Screen: SETUP Passwords screen

See Also: PASSWORD.$time_out system variable

$PASSWORD.$curr_level[1-8]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Current password level

Description: Specifies the current password level. The levels are OPERATOR = 0 PROGRAM = 1 SETUP = 2, INSTALL = 3.

Power Up: N/A

Screen: SETUP Passwords screen

$PASSWORD.$curr_level[4]

Minimum: 0   **Maximum:** 3   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Current password level

Description: Specifies the current password level. The levels are OPERATOR = 0 PROGRAM = 1 SETUP = 2, INSTALL = 3.

Power Up: N/A

Screen: SETUP Passwords screen

$PASSWORD.$curr_user[1-8]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Current User

Description: This indicates which user is currently logged in.

Power Up: N/A

Screen: SYSTEM Variables screen.

$PASSWORD.$curr_user[4]

Minimum: 0   **Maximum:** 100   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Current User

Description: This indicates which user is currently logged in.

Power Up: N/A

Screen: SYSTEM Variables screen.

$PASSWORD.$levels[1-4]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Bit Mask of the Password Levels

Description: The system uses this variable to determine which level of access is required for any given component.

Power Up: N/A

$PASSWORD.$levels[4]

Minimum: MIN_INT   **Maximum:** MAX_INT   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Bit Mask of the Password Levels

Description: The system uses this variable to determine which level of access is required for any given component.

Power Up: This variable cannot be modified.

$PASSWORD.$log_events

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Log Password Events

Description: This indicates whether events that occur will be logged into the Password Log.

Power Up: N/A

Screen: System global variable screen.

$PASSWORD.$num_users

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Number of Users

Description: This indicates how many password users to allow.

Power Up: N/A

Screen: System global variable screen.

$PASSWORD.$time_out[1-8]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Password Time-out

Description: Indicates a time-out value, in minutes, until a given password is automatically disabled. This will prevent an advanced user from leaving a system unprotected. If the time-out value is > 0, then the system will automatically reset to the OPERATOR level password after the time expires or after the next cold start. If the time-out value is 0, the given password will never expire.

Power Up: Takes effect immediately

Screen: SETUP Passwords screen

See Also: PASSWORD.$count_down

$PASSWORD.$time_out[4]

Minimum: -1   **Maximum:** 10080   **Default:** 15   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Password Time-out

Description: Indicates a time-out value, in minutes, until a given password is automatically disabled. This will prevent an advanced user from leaving a system unprotected. If the time-out value is > 0, then the system will automatically reset to the OPERATOR level password after the time expires or after the next cold start. If the time-out value is 0, the given password will never expire.

Power Up: Takes effect immediately

Screen: SETUP Passwords screen

See Also: PASSWORD.$count_down

$PATH_ADJUST STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Setup of torch posture conversion function

Description: These system variables are used by the torch posture conversion function. Individual fields within this structure are described below.

Power Up: Changes to these variable take effect immediately.

Screen: Torch posture conversion screen

$PATH_ADJUST.$conv_enbl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: ENABLE/DISABLE for torch posture conversion function

Description: ENABLE : Posture conversion function is enabled. DISABLE: Posture conversion function is disabled.

Power Up: Changes to this variable take effect immediately.

Screen: Torch posture conversion screen

$PATH_ADJUST.$create

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: REPLACE/CREATE of converted program

Description: This system variable is used to select which the converted part is created as a new program or is replaced on the original program. REPLACE : The converted part is replaced on the original program. CREATE : The converted part is created as a new program.

Power Up: Changes to this variable take effect immediately.

Screen: Torch posture conversion screen

$PATH_ADJUST.$match_first

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: ABSOLUTE/MATCH first selection for reference torch posture

Description: ABSOLUTE : Direct entried values for travel and work angle are used. MATCH_1 : Posture of top in specified range is used for travel and work angles.

Power Up: Changes to this variable take effect immediately.

Screen: Torch posture conversion screen

$PATH_ADJUST.$num_addpnt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of additional points

Description: This indicates the number of additional points.

Power Up: Changes to this variable take effect immediately.

Screen: Torch posture conversion screen

$PATH_ADJUST.$part_of_prg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: WHOLE/PART of converted range

Description: This system variable is used to select the range of conversion in program. WHOLE : whole of program is converted PART : Specified range is only converted

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PATH_ADJUST.$pitch_len

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Pith length of additional points

Description: This indicates the distance between additional points.

Power Up: Changes to this variable take effect immediately.

Screen: Torch posture conversion screen

$PATH_ADJUST.$ref_plane

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Kind of base plane

Description: 1(HORIZON): Horizontal plane is used as base plane. 2(3POINTS): Plane created from 3 taught positions is used as base plane. 3(ADJUST) : Plane whose normal vector matches approach vector of 1 taught positions is used as base plane.

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PATH_ADJUST.$smooth_enbl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: ENABLE/DISABLE for corner smoothing function

Description: ENABLE : Corner smoothing function is enabled. DISABLE: Corner smoothing function is disabled.

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PATH_ADJUST.$travel_angl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Travel angle for direct entried

Description: This system variable is travel angle at the direct entry.

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PATH_ADJUST.$work_angl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Work angle for direct entried

Description: This system variable is work angle at the direct entry.

Power Up: Changes to this variable take effect immediately.

Screen: Torch posture conversion screen

$PATHAJ_3POS[1] Structure

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Information of base plane (3POINTS)

Description: This is normal vector information of base plane when 3POINTS (3 taught positions) is selected in base plane selection screen. Individual fields within this structure are described below.

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PATHAJ_3POS[1].$approach_x

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: X element of approach vector in position data

Description: For internal use only. Do not modify this system variable. This system variable indicates X element of approach vector in the recorded position.

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PATHAJ_3POS[1].$approach_y

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Y element of approach vector in position data

Description: For internal use only. Do not modify this system variable. This system variable indicates Y element of approach vector in the recorded position.

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PATHAJ_3POS[1].$approach_z

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Z element of approach vector in position data

Description: For internal use only. Do not modify this system variable. This system variable indicates Z element of approach vector in the recorded position.

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PATHAJ_3POS[1].$e[1-2]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Extended axis element of position data

Description: For internal use only. Do not modify this system variable. This system variable extended axis element of the recorded position.

Power Up: Changes to this variable take effect immediately.

Screen: Torch posture conversion screen

$PATHAJ_3POS[1].$grp_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Recorded position group number

Description: For internal use only. Do not modify this system variable. This system variable indicates the recorded position group number.

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PATHAJ_3POS[1].$index

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Recorded position index

Description: For internal use only. Do not modify this system variable. This system variable indicates the recorded position index.

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PATHAJ_3POS[1].$pos_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Recorded position type

Description: For internal use only. Do not modify this system variable. This system variable indicates the recorded position type.

Power Up: Changes to this variable take effect immediately.

Screen: Torch posture conversion screen

$PATHAJ_3POS[1].$x

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: X element of position data

Description: For internal use only. Do not modify this system variable. This system variable indicates X element of the recorded position.

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PATHAJ_3POS[1].$y

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Y element of position data

Description: For internal use only. Do not modify this system variable. This system variable indicates Y element of the recorded position.

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PATHAJ_3POS[1].$z

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Z element of position data

Description: For internal use only. Do not modify this system variable. This system variable indicates Z element of the recorded position.

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PATHAJ_AJST STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Information of base plane (ADJUST)

Description: This is normal vector information of base plane when ADJUST (torch posture) is selected in base plane selection screen. Individual fields within this structure are described below.

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PATHAJ_AJST.$dummy

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Dummy variable

Description: For internal use only. Do not modify this system variable.

Power Up: Takes effect immediately

$PATHAJ_AJST.$dummy1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Dummy variable

Description: For internal use only. Do not modify this system variable.

Power Up: Takes effect immediately

$PATHAJ_AJST.$dummy2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Dummy variable

Description: For internal use only. Do not modify this system variable.

Power Up: Changes to this variable take effect immediately.

$PATHAJ_AJST.$grp_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Recorded position group number

Description: For internal use only. Do not modify this system variable. This system variable indicates the recorded position group number.

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PATHAJ_AJST.$index

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Recorded position index

Description: For internal use only. Do not modify this system variable. This system variable indicates the recorded position index.

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PATHAJ_AJST.$pos_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Recorded position type

Description: For internal use only. Do not modify this system variable. This system variable indicates the recorded position type.

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PATHAJ_AJST.$posdat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
POSEXT   **Memory:** Not available

Name: Position data for base plane of ADJUST

Description: For internal use only. Do not modify this system variable. This system variable
indicates the position data.

Power Up: Takes effect immediately

Screen: Torch posture conversion screen

$PAUSE_NCONT

Minimum: 0   **Maximum:** 1   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not
available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Pause when no contact. In the menu, it is defined as Error on Failure.

Description: If this variable is set to true, the teach pendant program will pause when robot can not
make a contact with a part after it exhausts its search distance. If this variable is set to FALSE, the
robot will only post a warning message and continue to the next TPE instruction

Power Up: Takes effect immediately

Screen: In touch schedule under Data screen.

See Also: $SEARCH_DIST, $CONT_R_NUM The chapter on "Touch Sensing" in the FANUC
Robotics SYSTEM R-J3 Controller ArcTool Setup and Operations Manual

<u>$PAUSE_PROG</u>

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name:

Description: This system variable contains program name. When there is a request for halt, this program is runned before system is really halted.

Power Up: Takes effect immediately

Screen: The System Variables screen.

See Also: Function spec and design spec of VAG special dry run function.

<u>$PC_TIMEOUT</u>

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: RPC Client Timeout

Description: Specifies the time in seconds for a client connection to wait for a reply from the PC before cancelling the read operation.

Power Up: On_Cold_Start

<u>$PCCRT</u>

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: PC CRT/KB Feature Enable

Description: Enables (1) or disables (0) the PC CRT/KB. $PCCRT_HOST is the host name of the PC CRT/KB.

Power Up: Takes effect immediately

$PCCRT_HOST

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: PC CRT/KB Host Name

Description: A string of up to 32 characters defining the name which represents the PC for the CRT/KB on the network. It should be unique across the network. It must also be defined as an element in the $HOSTENT array.

Power Up: On_Cold_Start

$PCHAMP_CFG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** na   **UIF:** Not available   **CRTL:** Not available   **Data Type:** PCHAMP_T **Memory:** Not available

Name: Process Champion option

Description: Process Champion configuration parameters

Power Up: N/A

See Also: na

$PCHAMP_CFG.$Enable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Process Champion enable/disable flag

Description: Specifies the enable/disable for the Process Champion option. This parameter defaults to ENABLED (1) when this option is loaded.

Power Up: Takes effect immediately

Screen: SYSTEM variables screen.

See Also: na

$PCHAMP_CFG.$EventCount

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE **Memory:** Not available

Name: Process Champion event counter

Description: Specifies the number of valid events the Process Champion found during processing of the Data Input Configuration file (FR:\CHAMP.DT).

Power Up: Takes effect immediately

Screen: SYSTEM variables screen.

See Also: na

$PCHAMP_CFG.$EventEnable[1-26]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Process Champion events enable

Description: Specifies the enable/disable for each valid event the Process Champion found during processing of the Data Input Configuration file (FR:\CHAMP.DT). By default, the Process Champion ENABLES each valid event during processing of the Data Input Configuration file (FR:\CHAMP.DT).

Power Up: Takes effect immediately

Screen: SYSTEM variables screen.

$PCHAMP_CFG.$EVENTENABLE[26]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Process Champion events enable

Description: Specifies the enable/disable for each valid event the Process Champion found during processing of the Data Input Configuration file (FR:\CHAMP.DT). By default, the Process Champion ENABLES each valid event during processing of the Data Input Configuration file (FR:\CHAMP.DT).

Power Up: Takes effect immediately

Screen: SYSTEM variables screen.

See Also: na

$PCHAMP_CFG.$InputFile

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Process Champion Data Input Configuration filename

Description: Specifies the filename, including device name, of the Data Input Configuration file. The default filename is FR:\CHAMP.DT.

Power Up: Takes effect immediately

Screen: SYSTEM variables screen.

See Also: na

$PCHAMP_CFG.$OutFileExt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Process Champion Output Listing file extension

Description: Specifies the output listing file extension for each output listing file found in the Data Input Configuration file (FR:\CHAMP.DT).

Power Up: Takes effect immediately

Screen: SYSTEM variables screen.

See Also: na

$PCHAMP_CFG.$SeqCount

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Process Champion file sequence event counter

Description: Specifies the file sequence number of the next output listing file to be generated by the Process Champion. This parameter will be incremented after each Stop Recording event until this parameter exceeds the Generic field in the Start Recording event in the Data Input Configuration file (FR:\CHAMP.DT).

Power Up: Takes effect immediately

Screen: SYSTEM variables screen.

See Also: na

$PCHAMP_CFG.$Setup

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE **Memory:** Not available

Name: Process Champion setup flag

Description: Specifies the setup state of the Process Champion option, if the Data Input Configuration file was configured successfully w/o major errors, this parameter will be set to ENABLED. If major errors were encountered in the Data Input Configuration file, this parameter will be DISABLED and an error listing file (FR:\CHAMP.LS) will be generated to describe the errors found during processing.

Power Up: Takes effect immediately

Screen: SYSTEM variables screen.

See Also: na

$PCHAMP_CFG.$TimeOut

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Process Champion every 'n' second TimeOut event

Description: Specifies the increment value in seconds of when the Process Champion option is instructed to record data for the TimeOut event specified in the Data Input Configuration file. The interval of this parameter can be changed to occur more/less frequently based on the value of this parameter.

Power Up: Takes effect immediately

Screen: SYSTEM variables screen.

See Also: na

$PCTP

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: PC Teach Pendant Feature Enable

Description: Enables (1) or disables (0) the PC teach pendant. $PCTP_HOST is the host name of the PC teach pendant.

Power Up: Takes effect immediately

$PCTP_HOST

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: PC Teach Pendant Host Name

Description: A string of up to 32 characters defining the name which represents the PC teach pendant on the network. It should be unique across the network. It must also be defined as an element in the $HOSTENT array.

Power Up: On_Cold_Start

$PG_CFG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** PG_CFG_T   **Memory:** Not available

Name: Interpreter task configuration.

Description: This variable controls the operational characteristics of the interpreter tasks for both KAREL and TPP. This includes the number of tasks and subtasks, builtin jmp label delay times, and whether the task information is saved in DRAM or SRAM.

Power Up: N/A

$PG_CFG.$jmpwait_low

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Delay time for a forward jump

Description: In a TPP program, when the JMP LBL instruction jumps forward (to a lower part of the program), the interpreter waits for this time (ticks). An adjustment might be required if loops run significant iterations without allowing other tasks to run. The effect of this variable is to introduce a delay at the JMP LBL of the specified number if of ticks (currently 4ms) to allow other programs to run. The default value is 0 ticks.

Power Up: N/A

$PG_CFG.$jmpwait_upr

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Delay time for a backward jump

Description: In a TPP program, when the JMP LBL instruction jumps backward (to a previous part of the program), the interpreter waits for this time(ticks). An adjustment might be required if loops run significant iterations without allowing other tasks to run. The effect of this variable is to introduce a delay at the JMP LBL of the specified number if of ticks (currently 4ms) to allow other programs to run. The default value is 4 ticks.

Power Up: N/A

$PG_CFG.$num_tasks

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Controls the total numer of interpreter (PG) tasks

Description: This variable sets the number of interpreter (PG) tasks that the system will start. Variable is read only and configured by the application.

Power Up: N/A

$PG_CFG.$subtasknum

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Configures the number of additional user interpreter (PG) tasks

Description: This variable is used to configure additional interpreter (PG) tasks availible to the user. These are in addition to the number specified by the application in $PG_CFG.$NUM_TASKS.

Power Up: N/A

See Also: $SCR.$MAXNUMTASKS

$PG_DEFSPD STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Default motion speed and unit for application motion speed statement

Description: This variables are used with application motion speed statements; for example, the WELD_SPEED statement in ArcTool.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen and application setup screen (WELD system setup screen and so forth)

$PG_DEFSPD.$ap_def_spd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** USHORT   **Memory:** Not available

Name:

Description: For internal use only. Do not modify this system variable. When application speed statement (WELD_SPEED) is executed without application start statement (ARC START), this variable is used as the default speed. It is also used in step mode and backward execution.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen and Application Setup screen (WELD system setup screen and so forth)

$PG_DEFSPD.$ap_def_unit

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Application default speed unit

Description: For internal use only. Do not modify this system variable. When application speed statement (WELD_SPEED) is executed without application start statement (ARC START), this variable is used as the default speed unit. It is also used in step mode and backward execution. 0:%, 1:mm/sec, 2:cm/min, 3:IPM, 4:deg/sec, 5:sec

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen and Application Setup screen (WELD system setup screen and so forth)

$PG_DEFSPD.$apsp_prexe

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Pre-execution of application default speed statement

Description: Enable/disable for pre-execution when application speed statement (WELD_SPEED) is executed. 0: Disable of pre-execution for application speed statement 1: Enable of pre-execution for application speed statement

Power Up: Takes effect immediately

$PG_DEFSPD.$dly_lastps

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Delay time for adjustment of taking last paused position data

Description: For internal use only. Do not modify this system variable. When original path resume without motion statement is executed, the last paused position used, which is recorded as the last pausing position. When the data is not recorded at appropriate timing, the robot moves back at restart. This variable is used for adjustment of this timing.

Power Up: Takes effect immediately

Screen: SYSTEM variable screen

See Also: This is not related to application speed statement.

$PG_MAX_SPED[1].$cart_speed

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Cartesian Speed

Description: The Cartesian motion speed in program is clamped by this value. (Units are in mm/sec)

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen. This variable is set by MAX SPEED instruction.

$PG_MAX_SPED[1].$jnt_speed[9]

Minimum: 0.001   **Maximum:** 100000   **Default:** 0.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Joint Speed

Description: The joint motion speed in program is clamped by this value. (Units are in deg/sec)

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen. This variable is set by MAX SPEED instruction.

$PG_MAX_SPED[5] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data
Type:** Not available   **Memory:** Not available

Name: Program Maximum Speed Structure

Description: These system variables are used to control maximum motion speed. Individual fields
within this structure are described below.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen. This variable is set by MAX SPEED instruction.

$PGDEBUG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
INTEGER   **Memory:** Not available

Name: Program Debugging

Description: Not currently used.

Power Up: N/A

$PGINP_WORD[1-5]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Word for Program Name Input

Description: Used to set the text string for the Word field in the program create screen. $PGINP_WORD[i] corresponds to softkey Fi (where i=1 - 5). You can use these variables to reset the softkey labels if you frequently use the same word for the program name. By default, $PGINP_WORD[1] PRG$PGINP_WORD[2] MAIN$PGINP_WORD[3] SUB$PGINP_WORD[4] TEST$PGINP_WORD[5] *uninit*

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen, SYSTEM Config screen

$PGINP_WORD[5]

Minimum: ""   **Maximum:** " "   **Default:** "PRG "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Word for Program Name Input

Description: Used to set the text string for the Word field in the program create screen. $PGINP_WORD[i] corresponds to softkey Fi (where i=1 - 5). You can use these variables to reset the softkey labels if you frequently use the same word for the program name. By default, $PGINP_WORD[1] PRG$PGINP_WORD[2] MAIN$PGINP_WORD[3] SUB$PGINP_WORD[4] TEST$PGINP_WORD[5] *uninit*

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen, SYSTEM Config screen

$PGTRACE_UP Structure

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Update information of execution history

Description: For internal use only. Do not modify this system variable. This system variable updates execution history information. Individual fields within this structure are described below.

Power Up: Takes effect immediately

$PGTRACE_UP.$disp_pxnn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Current displayed PX task number

Description: For internal use only. Do not modify this system variable. This system variable means the current displayed PX task number.

Power Up: Takes effect immediately

$PGTRACE_UP.$trc_update

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Update flag for execution history

Description: For internal use only. Do not modify this system variable. This system variable means the update flag for execution history.

Power Up: Takes effect immediately

$PGTRACECTL[1] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Control data of execution history

Description: For internal use only. Do not modify this system variable. This system variable controls data for execution history. Individual fields within this structure are described below.

Power Up: Takes effect immediately

$PGTRACECTL[1].$task_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: PX task ID which controls this buffer

Description: For internal use only. Do not modify this system variable. This system variable means PX task ID which controls this trace buffer.

Power Up: Takes effect immediately

$PGTRACECTL[1].$task_status

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: PX task status

Description: For internal use only. Do not modify this system variable. This system variable means PX task status.

Power Up: Takes effect immediately

$PGTRACECTL[1].$trc_btm_idx

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: Index of bottom of execution history buffer

Description: For internal use only. Do not modify this system variable. This system variable means the index in history buffer which is displayed at the bottom in execution history.

Power Up: Takes effect immediately

$PGTRACECTL[1].$trc_top_idx

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: Index of top of execution history buffer

Description: For internal use only. Do not modify this system variable. This system variable means the index in history buffer which is displayed at the top in execution history.

Power Up: Takes effect immediately

$PGTRACEDT[1,1].$ept_index

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: EPT index of executing program

Description: For internal use only. Do not modify this system variable. This system variable means the EPT index of executing program. EPT index is internal index number of the program.

Power Up: Takes effect immediately

$PGTRACEDT[1,1].$exec_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: FWD/BWD execution type

Description: For internal use only. Do not modify this system variable. 1:No execution 2:FWD execution 3:BWD execution

Power Up: Takes effect immediately

$PGTRACEDT[1,1].$file_ofst

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: Executed line number

Description: For internal use only. Do not modify this system variable. This system variable means the file offset for the KAREL program.

Power Up: Takes effect immediately

$PGTRACEDT[1,1].$line_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT **Memory:** Not available

Name: Executed line number

Description: For internal use only. Do not modify this system variable. This system variable means the executed line number of the executing program.

Power Up: Takes effect immediately

$PGTRACEDT[1,1].$line_st

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Line status

Description: For internal use only. Do not modify this system variable. 1:Line is not executed. 2:Line is executing. 3:Line is finished. 4:Program is aborted.

Power Up: Takes effect immediately

$PGTRACELEN

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Length of execution history list

Description: This system variable indicates the length of execution history list.

Power Up: On_Cold_Start

$PH_CONFIG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** PH_CONFIG_T   **Memory:** Not available

Name: Configuration information for process highway

Description: This variable indicates the configuration information for Ethernet process communications. This is specific for multi-robot communications protocols. Two options use this variable setting: Robot-Link and ROS Interprocessor Packets. The setting in this variable controls how these protocols communicate. Robot-Link is a feature which is documented as an option. ROS interprocessor packets are used by other features which may refer to the settings in this variable.

Power Up: N/A

$PH_MEMBERS[1-2]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** PH_MEMBER_T   **Memory:** Not available

Name: Provides output information on member status

Description: This variable provides status information on all members which are defined in rosipcfg.xml.

Power Up: N/A

$PH_MEMBERS[1].$cont_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Specified Member Controller ID

Description: This variable indicates a unique numerical ID whih can be used to refer to this member in certain operations. A member is a controller specified in the local ring as part of Process Highway.

Power Up: N/A

$PH_MEMBERS[1].$errorcnt

Minimum: 0   **Maximum:** 0x7FFFFFFF   **Default:** 0x7FFFFFFF   **KCL/Data:** RO   **Program:** Not available   **UIF:** RO   **CRTL:** RO   **Data Type:** INTEGER   **Memory:** CMOS

Name: Total errors logged by this member

Description: This variable indicates the total number of errors (retransmits to or from) associated with this member. A member is a controller specified in the local ring as part of Process Highway. This variable is the sum of the other suberrors. If this number is large then there might be noise problems on your network. Ideally, this number is zero. However, typically there are a few errors.

Power Up: N/A

$PH_MEMBERS[1].$ipadd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Member IP address

Description: This variable indicates the IP address of this member. This is a numerical value of the IP address so is difficult to translate to a xxx.xx.xx.xx notation. A member is a controller specified in the local ring as part of Process Highway. This address is set as part of rosipcfg.xml.

Power Up: N/A

$PH_MEMBERS[1].$max_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Maxmimum response time from this member

Description: This variable indicates the maximum time that it took for an acknowledge to be received from this member. If the maximum time is long it is likely because of other traffic on the network. ROS packets should be running on an isolated network and not a general purpose network. A member is a controller specified in the local ring as part of Process Highway.

Power Up: N/A

$PH_MEMBERS[1].$mean_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Mean time to acknowledge

Description: This variable indicates the mean time for an acknowledge packet to be received from this member. In a well behaved system this should be only slightly larger than the minimum time. A member is a controller specified in the local ring as part of Process Highway.

Power Up: N/A

$PH_MEMBERS[1].$min_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Minimum time for acknowledge

Description: This variable indicates the minimum packet transmission/acknowledge time.

Power Up: N/A

$PH_MEMBERS[1].$name

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Member name

Description: This variable indicates the name of member as specified in rosipcfg.xml. A member is a controller specified in the local ring as part of Process Highway.

Power Up: N/A

$PH_MEMBERS[1].$pkt_number

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of packets transmitted

Description: This variable indicates the total number of transmitted packets.

Power Up: N/A

$PH_MEMBERS[1].$prob_time

Minimum: 0   **Maximum:** 0x7FFFFFFF   **Default:** 0x7FFFFFFF   **KCL/Data:** RO   **Program:** Not available   **UIF:** RO   **CRTL:** RO   **Data Type:** INTEGER   **Memory:** CMOS

Name: Most probable packet transit time

Description: This variable indicates the most probable transit time based on statistical analysis. This would be your best guess at how long a packet would take to transit to this member. A member is a controller specified in the local ring as part of Process Highway.

Power Up: N/A

$PH_MEMBERS[1].$revision

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Revision of member robot

Description: This variable indicates the MU level or re-issue level of the member.

Power Up: N/A

$PH_MEMBERS[1].$state

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Online/offline member state

Description: This variable indicates whether a member is 0-Offline, 1- Online, 2- Synchronized. Synchronized menas that the robot is online AND the tick times are synchronized. A member is a controller specified in the local ring as part of Process Highway.

Power Up: N/A

$PH_MEMBERS[1].$version

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Version number of the member

Description: This is the 5 digit version number of the member. For example, 64117 for Version 6.41. A member is a controller specified in the local ring as part of Process Highway.

Power Up: N/A

$PH_ROSIP

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** PH_ROSIP_T   **Memory:** Not available

Name: ROS Packet option status

Description: This variable provides status information on the ROS Packet option.

Power Up: N/A

$PH_ROSIP.$change_tick

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Change tick

Description: This variable indicates the tick on which the $nettick_off variable was changed. Whenever $ph_rosip.$nettick_off is changed the $change_tick is set to the current tick. This allows an application to predict when the next change might occur.

Power Up: N/A

$PH_ROSIP.$my_index

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: The index of this robot into the member array.

Description: This variable indicates the position of this robot in the RIPE ring. This can be used as an index into the member array to get other information about the robot.

Power Up: N/A

$PING_CTRL.$DATALEN

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: data size of ping packet.

Description: defaults to 56 (causing a 64 byte ping packet). Max value of packet is 4096

Power Up: Takes effect immediately

Screen: None

See Also: Ethernet Options Setup and Operations Manual

$PING_CTRL.$DEBUG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: enable debug code

Description: enables detailed debug messages on console for diagnostics

Power Up: Takes effect immediately

Screen: None

See Also: Ethernet Options Setup and Operations Manual

$PING_CTRL.$NPACKETS

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Number of ping packets

Description: decides how many ping requests are sent out. The ping routine is going to timeoutafter (NPACKETS*TIMEOUT) seconds.

Power Up: Takes effect immediately

Screen: None

See Also: Ethernet Options Setup and Operations Manual

$PING_CTRL.$TIMEOUT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: PING timeout value

Description: Indicates number of seconds before ping times out.defaults to 2. Note that the user normally need notchange any of the PING system variables

Power Up: Takes effect immediately

Screen: None

See Also: Ethernet Options Setup and Operations Manual

$PL_MOD

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Switch for hide calibration and overload warning

Description: This variable indicates the switch for hide calibration and overload warning. If this is TRUE, hide calibration and overload warning is enabled.

Power Up: N/A

$PL_THR_INRT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Threshold for overload of inertia

Description: This variable indicates the threshold for overload of inertia [%].

Power Up: N/A

$PL_THR_MASS

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Threshold for overload of mass

Description: This variable indicates the threshold for overload of mass [%].

Power Up: N/A

$PL_THR_MMNT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Threshold for overload of moment

Description: This variable indicates the threshold for overload of moment [%].

Power Up: N/A

$PLID_GRP Structure

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Payload identification

Description: $PLID_GRP is used to identify the payload parameters of the each robot. Individual variables within this structure are described below.

Power Up: Changes to these variables take effect immediately.

$PLID_GRP.$armload1

Minimum: 0.0   **Maximum:** 0.0   **Default:** 0.0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Default armload

Description: For internal use only. Do not modify this system variable. This variable is used to set the "DEFAULT" value in the Payload setup screen. If you press F4, DEFAULT, in the Payload setup screen, this is set to $PARAM_GROUP.$ARMLOAD[1]. This value is based on the acceptable armload (ex. mounted to J3 axis in S-420iF)[kg].

Power Up: N/A

$PLID_GRP.$armload2

Minimum: 0.0   **Maximum:** 0.0   **Default:** 0.0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Default armload

Description: For internal use only. Do not modify this system variable. This variable is used to set the "DEFAULT" value in Payload setup screen. If you press F4, DEFAULT in the Payload setup screen, this is set to $PARAM_GROUP.$ARMLOAD[2]. And this value is based on the the acceptable armload.

Power Up: N/A

$PLID_GRP.$cal_pos[1-9]

Minimum: 0   **Maximum:** -1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Robot position at Payload calibration.

Description: For internal use only. Do not modify this system variable. This variable is the position where Payload calibration is done. It is set in the end of Payload calibration. When Payload estimation is executed, robot must be the same position as Payload calibration, because gravity that affects to robot relies on robot position.

Power Up: N/A

$PLID_GRP.$cal_tcmd[1-9]

Minimum: 0   **Maximum:** -1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Torque command at Payload calibration.

Description: For internal use only. Do not modify this system variable. This variable is the torque command of each axis received from the servo at Payload calibration. "$est_tcmd - $cal_tcmd" is used for calculating payload.

Power Up: N/A

$PLID_GRP.$calaxes

Minimum: 0   **Maximum:** 9   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of axes in group that Payload calibration was done.

Description: For internal use only. Do not modify this system variable. This variable is used to check whether the system that Payload estimation is executed is the same as one that Payload calibration was. For example, when the calibration system has no extended axis but the estimation one has it, the payload estimation might not have a good result because the extended axis can affect to gravity moment of robot axes.

Power Up: N/A

$PLID_GRP.$caldone

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Payload calibration completion flag

Description: For internal use only. Do not modify this system variable. This variable indicates that Payload calibration is already done or not. It is set to TRUE when Payload calibration is completed. It is used to check whether Payload estimation can be executed or not. If $caldone is FALSE, Payload estimation cannot be executed.

Power Up: N/A

$PLID_GRP.$calexec

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Payload calibration executing flag

Description: For internal use only. Do not modify this system variable. When Payload calibration starts, $calexec is set to TRUE. And while $calexec is TRUE, torque command($cal_tcmd) is received from servo. When Payload calibration finishes, $calexec returns to FALSE.

Power Up: N/A

$PLID_GRP.$dsp_enbl

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enable or disable flag to display Payload identification screen.

Description: For internal use only. Do not modify this system variable. This variable is used to check whether the Payload identification screen can be displayed or not. It is set to TRUE in the robot which is supported for Payload identification.

Power Up: N/A

$PLID_GRP.$error_mgn

Minimum: 0   **Maximum:** 10000   **Default:** 200   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Acceptable margin of servo position error.

Description: Payload identification needs the real robot position because it uses the gravity that affects each robot axis. So fewer servo position errors are better for Payload identification. $error_mgn means how much servo position error is acceptable, unit is [pulse]. Users can tune this value to improve identification performance. Generally, the smaller $error_mgn is, the longer executing identification time is and the better the performance of identification is. But if $error_mgn is set to so small to improve the performance, executing identification time is very long because the servo error does not intend to be smaller than $error_mgn.

Power Up: Takes effect immediately

$PLID_GRP.$est_tcmd[1-9]

Minimum: 0   **Maximum:** -1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Torque command at Payload estimation.

Description: For internal use only. Do not modify this system variable. This variable is the torque command of each axis received from servo at Payload estimation. "$est_tcmd - $cal_tcmd" is used for calculating payload.

Power Up: N/A

$PLID_GRP.$estdone

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Payload estimation completion flag

Description: For internal use only. Do not modify this system variable. This variable indicates Payload estimation is already done or not. It is used to check whether Estimation result can be displayed in Payload identification screen or not. It is set to TRUE when Payload estimation is completed. It is set to FALSE when Payload calibration is re-executed and completed.

Power Up: N/A

$PLID_GRP.$estexec

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Payload estimation executing flag

Description: For internal use only. Do not modify this system variable. When Payload estimation starts, $estexec is set to TRUE. And while $estexec is TRUE, torque command ($est_tcmd) is received from servo. When Payload estimation finishes, $estexec returns to FALSE.

Power Up: N/A

$PLID_GRP.$id_result[1-10]

Minimum: .0   **Maximum:** -0.1   **Default:** .0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Identification result.

Description: For internal use only. Do not modify this system variable. This variable identifies the result of payload parameters. $id_result[1] -- payload $id_result[2] -- payload_x $id_result[3] -- payload_y $id_result[4] -- payload_z $id_result[5] -- payload_ix $id_result[6] -- payload_iy $id_result[7] -- payload_iz $id_result[8] -- armload 1 $id_result[9] -- armload 2 $id_result[10] -- armload 3

Power Up: N/A

$PLID_GRP.$max_diff

Minimum: -1.0   **Maximum:** 1.0   **Default:** 0.0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Difference from gravity 0 position to large side.

Description: For internal use only. Do not modify this system variable. Payload identification uses the gravity moment that affects J2 axis in current spec. So J2 axis must be in the position where gravity intends to affect. Both $max_diff and $min_diff means broader position that identification works well. And both of them are described in sine of axis. Concretely, if $min_diff < sin(J2 axis) < $max_diff, Payload identification will not work.

Power Up: N/A

$PLID_GRP.$min_diff

Minimum: -1.0 **Maximum:** 1.0 **Default:** 0.0 **KCL/Data:** RO **Program:** RO **UIF:** Not available **CRTL:** Not available **Data Type:** REAL **Memory:** Not available

Name: Difference from gravity 0 position to small side.

Description: For internal use only. Do not modify this system variable. Payload identification uses the gravity moment that affects the J2 axis in current spec. The J2 axis must be in the position where gravity intends to affect. Both $max_diff and $min_diff means broader position that identification works well. And both of them are described in sine of axis. Concretely, if $min_diff < sin(J2 axis) < $max_diff, Payload identification will not work.

Power Up: N/A

$PLID_GRP.$payload

Minimum: 0.0 **Maximum:** 0.0 **Default:** 0.0 **KCL/Data:** RO **Program:** RO **UIF:** Not available **CRTL:** Not available **Data Type:** REAL **Memory:** Not available

Name: Payload of test work piece.

Description: For internal use only. Do not modify this system variable. This variable is used to set the "DEFAULT" value in Payload setup screen. If you press F4, DEFAULT, in the Payload setup screen, this is set to $PARAM_GROUP.$PAYLOAD and $GROUP.$PAYLOAD. This value is based on the weight[kg] of test work piece.

Power Up: N/A

$PLID_GRP.$payload_ix

Minimum: 0.0 **Maximum:** 0.0 **Default:** 0.0 **KCL/Data:** RO **Program:** RO **UIF:** Not available **CRTL:** Not available **Data Type:** REAL **Memory:** Not available

Name: Payload_ix of test work piece.

Description: For internal use only. Do not modify this system variable. This variable is used to set the "DEFAULT" value in Payload setup screen. If you press F4, DEFAULT, in the Payload setup screen, this is set to $PARAM_GROUP.$PAYLOAD_IX. This value is based on the inertia around center of gravity[kgcm^2] of test work piece.

Power Up: N/A

$PLID_GRP.$payload_iy

Minimum: 0.0   **Maximum:** 0.0   **Default:** 0.0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Payload_iy of test work piece.

Description: For internal use only. Do not modify this system variable. This variable is used to set the "DEFAULT" value in Payload setup screen. If you press F4, DEFAULT, in the Payload setup screen, this is set to $PARAM_GROUP.$PAYLOAD_IY. This value is based on the inertia around center of gravity[kgcm^2] of test work piece.

Power Up: N/A

$PLID_GRP.$payload_iz

Minimum: 0.0   **Maximum:** 0.0   **Default:** 0.0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Payload_iz of test work piece.

Description: For internal use only. Do not modify this system variable. This variable is used to set the "DEFAULT" value in Payload setup screen. If you press F4, DEFAULT, in the Payload setup screen, this is set to $PARAM_GROUP.$PAYLOAD_IZ. This value is based on the inertia around center of gravity[kgcm^2] of test work piece.

Power Up: N/A

$PLID_GRP.$payload_x

Minimum: 0.0   **Maximum:** 0.0   **Default:** 0.0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Payload_x of test work piece.

Description: For internal use only. Do not this system variable. This variable is used to set the "DEFAULT" value in Payload setup screen. If you press F4, DEFAULT, in the Payload setup screen, this is set to $PARAM_GROUP.$PAYLOAD_X. And this value is based on the center of gravity[cm] of test work piece.

Power Up: N/A

$PLID_GRP.$payload_y

Minimum: 0.0   **Maximum:** 0.0   **Default:** 0.0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Payload_y of test work piece.

Description: For internal use only. Do not this system variable. This variable is used to set the "DEFAULT" value in Payload setup screen. If you press F4, DEFAULT, in the Payload setup screen, this is set to $PARAM_GROUP.$PAYLOAD_Y. And this value is based on the center of gravity[cm] of test work piece.

Power Up: N/A

$PLID_GRP.$payload_z

Minimum: 0.0   **Maximum:** 0.0   **Default:** 0.0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Payload_z of test work piece.

Description: For internal use only. Do not this system variable. This variable is used to set the "DEFAULT" value in Payload setup screen. If you press F4, DEFAULT, in the Payload setup screen, this is set to $PARAM_GROUP.$PAYLOAD_Z. And this value is based on the center of gravity[cm] of test work piece.

Power Up: N/A

$PLID_GRP.$tcmdsucc

Minimum: 0   **Maximum:** -1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Success of torque command reception.

Description: For internal use only. Do not modify this system variable. This variable is used to check whether some error occurs or not in receiving torque command. If $tcmdsucc is not SUCCESS, some error occurs and receiving torque command will be stopped. The kinds of errors are the following. - No system variables pointers. - Angle mounted robot. - Some axes are SRDY off. - Robot is not mastered or not calibrated. - Payload calibration has been not done yet. (Only Payload estimation error) - Input Motion command while receiving torque command. - Robot is not in the same position as Payload calibration. (Only Payload estimation error) - Robot axes number at estimation is different from one at calibration. (Only Payload estimation error) - Few gravity affects to J2 axis.

Power Up: N/A

$PLID_GRP[1].$calc_result

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** CALC_RESULT_T   **Memory:** Not available

Name: Payload Calculation result

Description: This variable indicates the payload calculation result.

Power Up: N/A

$PLID_GRP[1].$CALC_RESULT.$comb_load4

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: The ratio of combination load users set to max combination load at J4 axis.

Description: This variable indicates the ratio of combination load users set to max combination load at the J4 axis.

Power Up: N/A

$PLID_GRP[1].$CALC_RESULT.$comb_load5

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: The ratio of combination load users set to max combination load at J5 axis.

Description: This variable indicates the ratio of combination load users set to max combination load at the J5 axis.

Power Up: N/A

$PLID_GRP[1].$CALC_RESULT.$comb_load6

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: The ratio of combination load users set to max combination load at J6 axis.

Description: This variable indicates the ratio of combination load users set to max combination load at the J6 axis.

Power Up: N/A

$PLID_GRP[1].$CALC_RESULT.$inertia4

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: The ratio of inertia users set to max inertia at J4 axis.

Description: This variable indicates the ratio of inertia users set to max inertia at the J4 axis.

Power Up: N/A

$PLID_GRP[1].$CALC_RESULT.$inertia5

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: The ratio of inertia users set to max inertia at J5 axis.

Description: This variable indicates the ratio of inertia users set to max inertia at the J5 axis.

Power Up: N/A

$PLID_GRP[1].$CALC_RESULT.$inertia6

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: The ratio of inertia users set to max inertia at J6 axis.

Description: This variable indicates teh ratio of inertia users set to max inertia at the J6 axis.

Power Up: N/A

$PLID_GRP[1].$CALC_RESULT.$moment4

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: The ratio of moment users set to max moment at J4 axis.

Description: This variable indicates the ratio of moment users set to max moment at the J4 axis.

Power Up: N/A

$PLID_GRP[1].$CALC_RESULT.$moment5

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: The ratio of moment users set to max moment at J5 axis.

Description: This variable indicates the ratio of moment users set to max moment at the J5 axis.

Power Up: N/A

$PLID_GRP[1].$CALC_RESULT.$moment6

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: The ratio of moment users set to max moment at J6 axis.

Description: This variable indicates the ratio of moment users set to max moment at the J6 axis.

Power Up: N/A

$PLID_GRP[1].$CALC_RESULT.$payload

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: The ratio of payload users set to max payload.

Description: This variable indicates the ratio of payload users set to max payload.

Power Up: N/A

$PLID_GRP[1].$CALC_RESULT.$pld_j3arm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Max payload considering J3 arm load

Description: This variable indicates the maximum payload considering the J3 arm load.

Power Up: N/A

$PLID_GRP[1].$CALC_RESULT.$pub_inrt5

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Subtract inertia users set from nominal inertia at J5 axis.

Description: This variable indicates the subtract inertia users set from nominal inertia at the J5 axis.

Power Up: N/A

$PLID_GRP[1].$CALC_RESULT.$pub_inrt6

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Subtract inertia users set from nominal inertia at J6 axis.

Description: This variable indicates the subtract inertia users set from nominal inertia at the J6 axis.

Power Up: N/A

$PLID_GRP[1].$calc_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Flag for payload calculation method

Description: This variable indicates the flag for payload calculation method. If this is 0, the payload calculation method is conventional. If this is 1, the payload calculation method is same as payload checker(EXCEL sheet).

Power Up: N/A

$PLID_GRP[1].$comb_load[1-3]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: The ratio of combination load users set to max combination load at J4 axis.

Description: This variable indicates the ratio of combination load users set to max combination load at the J4 axis.

Power Up: N/A

$PLID_GRP[1].$over_level

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Level of warning "over capacity"

Description: This variable indicates the value(%) that posts the warning message, "over capacity".

Power Up: N/A

$PLID_GRP[1].$warn_disp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Flag for warning post.

Description: This variable indicates the flag for warning post. It is a flag to decide that MOTN-170, 171 warning is posted in executing PAYLOAD[] instruction. 0: No post MOTN-170, 171 1: post only MOTN-171 3: post MOTN-170, 171

Power Up: N/A

$PLID_GRP[1].$warn_level

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Level of warning "close to capacity"

Description: This variable indicates the value that posts the warning message, "close to capacity".

Power Up: N/A

$PLID_SV Structure

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Payload identification power failure recovery

Description: For internal use only. Do not modify this system variable. This variable is used to recover the payload identification/setup data at start-up after power down while identifying or inputting them. Individual variables within this structure are described below.

Power Up: N/A

$PLID_SV.$armload1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Saved armload

Description: For internal use only. Do not modify this system variable. Before modifying $PARAM_GROUP.$armload[1] in the Payload setup/identification screen, This $armload1 is set from $PARAM_GROUP.$armload[1]. If you turn off the controller while you are modifying, $PARAM_GROUP.$armload[1], it is recovered at the next hot start.

Power Up: N/A

$PLID_SV.$armload2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Saved armload

Description: For internal use only. Do not modify this system variable. Before modifying $PARAM_GROUP.$armload[2] in Payload setup/identification screen, this $armload2 is set from $PARAM_GROUP.$armload[2]. If you turn off the controller while you are modifying, $PARAM_GROUP.$armload[2], it is recovered at the next hot start.

Power Up: N/A

$PLID_SV.$cal_pos_sav[1-9]

Minimum: 0   **Maximum:** -1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Saved calibration position

Description: For internal use only. Do not modify this system variable. This variable is used in Payload identification screen and calibration only. Before executing calibration, $cal_pos_sav is set from $PLID_GRP.$cal_pos. If you turn off the controller while you are modifying, $cal_pos is recovered from $cal_pos_sav at the next hot start.

Power Up: N/A

$PLID_SV.$cur_group

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Current group.

Description: For internal use only. Do not modify this system variable. This variable indicates what group is operated when the controller is turned OFF. At hot start, $cur_group is used to decide what group data should be displayed and recovered.

Power Up: N/A

$PLID_SV.$cur_scrn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Current screen.

Description: For internal use only. Do not modify this system variable. This variable indicates which screen is displayed when the controller is turned OFF. At hot start, $cur_scrn is used to decide which screen should be displayed. -- 1 : Payload setup screen. -- 2 : Payload identification screen.

Power Up: N/A

$PLID_SV.$flag_save

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: $PLID_GRP.$caldone or $PLID_GRP.$estdone flag status.

Description: For internal use only. Do not modify this system variable. This variable is used in only Payload identification screen. It indicates the status of $caldone, if $pi_type is 0, or $estdone, if $pi_type is 1, when the controller is turned OFF. At hot start and when $cur_scrn is 2, $flag_save is used to recover status flag according to $pi_type.

Power Up: N/A

$PLID_SV.$no_recover

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Flag to show the necessity of power failure recovery .

Description: For internal use only. Do not modify this system variable. In Payload identification/setup screen, when modification is completed, $no_recover is set to TRUE. So $no_recover means the necessity of power failure recovery. If $no_recover is TRUE, power failure recovery will not be needed because any modification is completed when the controller is turned OFF.

Power Up: N/A

$PLID_SV.$payload

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Saved payload

Description: For internal use only. Do not modify this system variable. Before modifying $PARAM_GROUP/$GROUP.$payload in the Payload setup/identificati on screen, this $payload is set from $GROUP.$payload. If power down in modifying, $PARAM_GROUP/$GROUP.$p ayload are recovered at next hot start. And when F4, DEFAULT, is selected in the Payload setup screen, then power down and power failure recovery is needed, the all below parameters, $PARAM_GROUP.$payload_x - $PARAM_GROUP.$armload[2], must be recovered with $PARAM_GROUP/$GROUP.$payload.

Power Up: N/A

$PLID_SV.$payload_ix

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Saved payload_ix

Description: For internal use only. Do not modify this system variable. Before modifying $PARAM_GROUP.$payload_ix in the Payload setup/identification screen, this $payload_ix is set from $PARAM_GROUP.$payload_ix. If you turn off the controller while you are modifying, $PARAM_GROUP.$payload_ix is recovered at the next hot start.

Power Up: N/A

$PLID_SV.$payload_iy

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Saved payload_iy

Description: For internal use only. Do not modify this system variable. Before modifying $PARAM_GROUP.$payload_iy in the Payload setup/identification screen, this $payload_iy is set from $PARAM_GROUP.$payload_iy. If you turn off the controller while you are modifying, $PARAM_GROUP.$payload_iy is recovered at the next hot start.

Power Up: N/A

$PLID_SV.$payload_iz

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Saved payload_iz

Description: For internal use only. Do not modify this system variable. Before modifying $PARAM_GROUP.$payload_iz in the Payload setup/identification screen, this $payload_iz is set from $PARAM_GROUP.$payload_iz. If you turn off the controller while you are modifying, $PARAM_GROUP.$payload_iz is recovered at the next hot start.

Power Up: N/A

$PLID_SV.$payload_x

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Saved payload_x

Description: For internal use only. Do not modify this system variable. Before modifying $PARAM_GROUP.$payload_x in the Payload setup/identification screen, this $payload_x is set from $PARAM_GROUP.$payload_x. If you turn off the controller while modifying, $PARAM_GROUP.$payload_x is recovered at the next hot start.

Power Up: N/A

$PLID_SV.$payload_y

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Saved payload_y

Description: For internal use only. Do not modify this system variable. Before modifying $PARAM_GROUP.$payload_y in the Payload setup/identification screen, this $payload_y is set from $PARAM_GROUP.$payload_y. If you turn off the controller while modifying, $PARAM_GROUP.$payload_y is recovered at the next hot start.

Power Up: N/A

$PLID_SV.$payload_z

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Saved payload_z

Description: For internal use only. Do not modify this system variable. Before modifying $PARAM_GROUP.$payload_z in the Payload setup/identification screen, this $payload_z is set from $PARAM_GROUP.$payload_z. If you turn off the controller while modifying, $PARAM_GROUP.$payload_z is recovered at the next hot start.

Power Up: N/A

$PLID_SV.$pi_type

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Payload Identification type.

Description: For internal use only. Do not modify this system variable. This variable indicates which operation is executing in the Payload identification screen at power down. It is used in only Payload identification screen. At hot start and when $cur_scrn is 2, $pi_type is used to decide which data should be recovered, calibration or estimation. -- 0 : Calibration -- 1 : Estimation

Power Up: N/A

$PLID_SV.$result_sav[1-10]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Saved identification result

Description: For internal use only. Do not modify this system variable. This variable is used in the Payload identification screen and estimation only. Before executing estimation, $result_sav is set from $PLID_GRP.$id_result. If you turn off the controller while modifying, $id_result is recovered from $result_sav at the next hot start.

Power Up: N/A

$PLID_SV.$save_done

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Flag to finish saving data for power failure recovery.

Description: For internal use only. Do not modify this system variable. In Payload identification/setup screen, all current necessary data are saved before modification. This variable is set to TRUE after finishing saving all data to be saved. If $save_done is FALSE, power failure recovery, except screen and group, will not be needed because any necessary data are not modified when the controller is turned OFF.

Power Up: N/A

$PLID_SV.$tcmd_save[1-9]

Minimum: 0   **Maximum:** -1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Saved torque command

Description: For internal use only. Do not modify this system variable. This variable is used in Payload identification screen only. Before executing calibration or estimation, $tcmd_save is set from $PLID_GRP.$cal_tcmd or $PLID_GRP.$est_tcmd. If the controller is turned OFF during calibration execution or estimation, according to $pi_type, $cal_tcmd or $est_tcmd is recovered from $tcmd_save at next hot start.

Power Up: N/A

$PMON_LOGGER STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: PC Monitor Event Logger Configuration

Description: This structure contains configuration information for the PC Monitor Event Logger, which is a mechanism by which events (like alarms) generated on the controller are logged through the network to a PMON server running on a PC. This structure contains details pertaining to the server. The individual fields are described below.

Power Up: On_Cold_Start

Screen: SYSTEM variables screen.

$PMON_LOGGER.$FILTER

Minimum: 0   **Maximum:** 4294967295   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** INTEGER   **Memory:** CMOS

Name: PMON logger filter mask

Description: The $FILTER field is used to determine what class of events will be posted to the event logger. This integer is divided into 32 boolean bit fields. Setting this integer to zero (all FALSE) disables event logging. The various bit values are OR ed together. (Saved in SYSVARS.SV)

Power Up: On_Cold_Start

Screen: SYSTEM Variables screen.

$PMON_LOGGER.$HOSTNAME

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** STRING   **Memory:** CMOS

Name: PMON logger hostname

Description: Contains information regarding the host system to connect to. $HOSTNAME is the node name of the host (typically a PC, which PMON connects to send alarms as they occur). The network node name referred to by $HOSTNAME should be entered in the $HOSTENT system variable.

Power Up: On_Cold_Start

Screen: SYSTEM Variables screen.

$PMON_LOGGER.$SERVEROK

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** BOOLEAN   **Memory:** CMOS

Name: PMON event logger Server OK flag

Description: $SERVEROK is used as a means to check if the PMON server on the PC is up and running. PMON initializes it to TRUE. When a send fails, it sets this variable to FALSE. When the connection is reestablished, the PC side sets this variable to TRUE again . (Saved in SYSVARS.SV)

Power Up: On_Cold_Start

Screen: SYSTEM Variables screen.

$PMON_LOGGER.$SERVNAME

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** RW
CRTL: RW   **Data Type:** STRING   **Memory:** CMOS

Name: PMON logger service port name

Description: Specifies the service name of the PC running the PMON server. This variable should be set to "EVENT_LOGGER." This entry should also exist in the $SERVENT array.

Power Up: N/A

$PMR STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Path Modification Record Route Correction Record Variable Delta Axis Coordinate System

Description: Scheduled to be removed.

Power Up: N/A

$PMR.$delta_axis[9]

Minimum: -100000.   **Maximum:** 100000.   **Default:** 0.   **KCL/Data:** NO   **Program:** NO
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Path Modification Record Route Correction Record Variable for the Delta Axis Coordinate
System

Description: Scheduled to be removed Indicates the initial value of positioning form.

Power Up: N/A

$PMR_GRP[1].$delta_frame

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not
available   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION
Memory: Not available

Name: Delta Frame Coordinate System

Description: Scheduled to be removed. $deltaframe represents the positional data needed to integrate
the robot motion with an external sensor. The value of $deltaframe is used to provide dynamic path
modification by incorporating it into path planning to change the nominal path. $deltaframe can be
set based on external sensor data, internal auxiliary axes positions (table coordinates), a generated
vector (for weaving applications), or by some other method. Its value can be with respect to the world
coordinate system or the user frame, based on the application and on the value of $tframenum.

Power Up: N/A

$PMR_GRP[1].$delta_speed

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not
available   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL
Memory: Not available

Name: Delta Speed

Description: Scheduled to be removed.

Power Up: N/A

$PMR_GRP[1].$delta_tool

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION **Memory:** Not available

Name: Delta Tool Coordinate System

Description: Scheduled to be removed. $deltatool represents the position change with respect to the tool frame based on external sensor data. The value of $deltatool, is incorporated into path planning to change the nominal path dynamically. Its value can be used with respect to the tool coordinate system or the path relative coordinate system attached to the path trajectory depending on the value of $ttoolnum. $ttoolnum can be set in a KAREL program to determine the desired coordinate system. The difference between cases -1 and -2 and cases -3 and -4 are as follows: In cases -1 and -2, the direction of the x-vector of Path Relative Frame is pointing from the start position of the segment to the destination position; while in cases -3 and -4, the direction of the x-vector of Path Relative Frame is pointing from the destination position of the segment to the start position.

Power Up: N/A

$PMR_GRP[1].$delta_world

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** POSITION **Memory:** Not available

Name: Delta World Coordinate System

Description: Scheduled to be removed

Power Up: N/A

$PNS_CUR_LIN

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Current Line Number for PNS Program

Description: This system variable holds the current line number of the current executing PNS program. If the currently executing program is not a PNS program, this variable is not updated. The ME-NET function uses this system variable to inform the current status of program execution to the host computer. This variable should be maintained by system only. Never change this variable manually.

Power Up: Takes effect immediately

See Also: $PNS_END_EXE, $PNS_NUMBER, $PNS_TASK_ID

$PNS_END_CUR

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Keep Cursor at END of Line

Description: If this system variable is TRUE, the cursor remains at the [END] line or END command line when program execution is completed. If this system variable is FALSE, the cursor moves to the first line when program execution is completed. The default value is FALSE. If you do not want the program to start again unexpectedly after program is completed, this variable should be set to TRUE. After this system variable is set to TRUE, you must move cursor manually when you try to start the program again.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen, SYSTEM Config screen

$PNS_END_EXE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: [END] Line or END Command is Executed

Description: When PNS program is started, this system variable is set to FALSE. When [END] line or END command is executed, this system variable is set to TRUE. The ME-NET function uses this system variable to inform the current status of program execution to the host computer. This variable should be maintained by system only. Do not change this variable.

Power Up: Takes effect immediately

See Also: $PNS_CUR_LIN, $PNS_NUMBER, $PNS_TASK_ID

$PNS_NUMBER

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: PNS Program Number

Description: When the PNS program is started, the PNS program number (last 4 digit in PNS program name) is stored in this variable automatically. The ME-NET function uses this system variable to inform the current status of program execution to host computer. This variable should be maintained by system only. Do not change this variable.

Power Up: Takes effect immediately

Screen: SYSTEM Variable screen

See Also: $PNS_CUR_LIN, $PNS_END_EXE, $PNS_TASK_ID

$PNS_OPTION

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: PNS program select option

Description: This variable is set to TRUE when the Common Shell PNS Option is enabled.

Power Up: na

See Also: na

$PNS_PROGRAM

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: PNS Program Name

Description: Not currently used. This is the name of the selected PNS program, which can be different than the selected program on the TP SELECT MENU (i.e. $TP_DEFPROG).

Power Up: N/A

$PNS_TASK_ID

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: PNS Task ID

Description: When the PNS program is started, the task ID for the PNS program is stored in this variable automatically. The ME-NET function uses this system variable to inform the current status of program execution to the host computer. This variable should be maintained by system only. Do not change this variable.

Power Up: Takes effect immediately

See Also: $PNS_CUR_LIN, $PNS_END_EXE, $PNS_NUMBER

$PPA_IO_IDX

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Mapped PPABN (Pneumatic pressure abnormal signal) I/O index number

Description: Not used

Power Up: Changes take effect immediately.

Screen: SYSTEM variables screen

$PPA_IO_TYPE

Minimum: 0   **Maximum:** 31   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Mapped PPABN (Pneumatic pressure abnormal signal) I/O type

Description: Not used

Power Up: Takes effect immediately

Screen: SYSTEM variables screen

$PPA_MAP_ENB

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Mapped PPABN (Pneumatic pressure abnormal signal) is enabled

Description: Not used

Power Up: Takes effect immediately

$PRGADJ STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Program Adjust

Description: On-line position correction variables. Individual fields within this structure are described below.

Power Up: N/A

$PRGADJ.$next_cycle

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Program Adjust Enable Flag

Description: Not currently used. When implemented and if set to TRUE, means that the enabled Prog Adjust schedule will not take affect until the next cycle.

Power Up: N/A

$PRGADJ.$p_limit

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Program Adjust P Adjustment Min/max

Description: Defines the maximum value that you can enter in the Program Adjust menu for the P adjustment value. The minimum P adjustment value you can enter is -($PRGADJ.$p_limit).

Power Up: N/A

$PRGADJ.$r_limit

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Program Adjust R Adjustment Min/max

Description: Defines the maximum value that you can enter in the Program Adjust menu for the R adjustment value. The minimum R adjustment value you can enter is -($PRGADJ.$r_limit).

Power Up: N/A

$PRGADJ.$speed_adj

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Program Adjust Speed Adjustment Min/max

Description: Movement speed correction value. Not currently used. When implemented will define the maximum value that you can enter in the Program Adjust menu for the Speed adjustment value. The default of 100 means the program will run at programmed speed, 50 means at half the programmed speed, 200 means twice the programmed speed, and so forth.

Power Up: N/A

$PRGADJ.$w_limit

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Program Adjust W Adjustment Min/max

Description: Defines the maximum value that you can enter in the Program Adjust menu for the W adjustment value. The minimum W adjustment value you can enter is -($PRGADJ.$w_limit).

Power Up: N/A

$PRGADJ.$x_limit

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Program Adjust X Adjustment Min/max

Description: Defines the maximum value that you can enter in the Program Adjust menu for the X adjustment value. The minimum X adjustment value you can enter is -($PRGADJ.$x_limit).

Power Up: N/A

$PRGADJ.$y_limit

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Program Adjust Y Adjustment Min/max

Description: Defines the maximum value that you can enter in the Program Adjust menu for the Y adjustment value. The minimum Y adjustment value you can enter is -($PRGADJ.$y_limit).

Power Up: N/A

$PRGADJ.$z_limit

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Program Adjust Z Adjustment Min/max

Description: Defines the maximum value that you can enter in the Program Adjust menu for the Z adjustment value. The minimum Z adjustment value you can enter is -($PRGADJ.$z_limit).

Power Up: N/A

$PRIORITY

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Priority Level of Interrupting

Description: $PRIORITY is used to specify the default priority of execution for routine call actions (interrupt routines) in KAREL condition handler statements. $PRIORITY can also be used in a condition handler statement WITH clause. In this case, the indicated routine will execute at the priority specified without actually changing the default value of $PRIORITY. An interrupt routine with a low priority will not be executed until control is returned to the program from a higher-priority routine. Therefore, the actual priority value specified is not important; only that one must be larger than the other. When $PRIORITY is not specified, interrupt routines will interrupt each other, thereby executing in reverse order from which they appear in the condition handler definition.

Power Up: N/A

$PROTOENT STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Protocol Entry

Description: An array of structures defining the available protocols on the controller. Individual fields within this structure are described below.

Power Up: On_Cold_Start

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$PROTOENT[1].$P_NAME

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Protocol Name

Description: Name of an available protocol on the controller.

Power Up: On_Cold_Start

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$PROTOENT[1].$P_PROTO

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Protocol Number

Description: Number associated with this particular protocol.

Power Up: On_Cold_Start

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$PROXY_CFG.$list_port

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: This variable lists the port on which the Robot HTTP proxy server will listen for incoming requests.

Description: The default value is port 8080. Most proxy servers typically use port 8080 as the default listening port.

Power Up: On_Cold_Start

$PRPORT_NUM

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Printer Port Number

Description: This is the serial port to which the printer is attached. The serial port configuration must also be set up in the SETUP Port Init screen.

Power Up: N/A

$PURGE_ENBL

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Purge enabled

Description: Enables the purging of the FROM disk. If $PURGE_ENBL is set to FALSE, the FROM disk cannot be purged. You can set $PURGE_ENBL to FALSE before running a program or application which requires fast cycle time.

Power Up: N/A

$PWF_IO

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Restore pre-powerfail I/O status

Description: This controls whether the values for digital and analog output signals are restored on semi-hot start to their values immediately before power-down, and whether pre-power -down simulation status of all ports is to be restored. Values are as follows: 1: Output port values are not restored and simulation is turned off on all ports 2: Output port values are not restored and but simulation status of all ports is restored. 3: Output port values are restored but simulation is turned off on all ports 4: (default) Output port values and simulation of all ports are restored

Power Up: N/A

See Also: $SEMIPOWERFL

$PWR_HOT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Power Hot

Description: Specifies the name of the program that is automatically started when the controller powers up in power fail recovery mode (hot start). Motion instructions cannot be used in the hot start program. The execution time for the power hot program is limited to 5 seconds. This program should be used for very limited functions only.

Power Up: N/A

$PWR_NORMAL

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Power Normal

Description: Specifies the name of the KAREL program, TPP program or Command File that is executed when the system does a normal powerup (cold start). The system only runs a Command File of the specified name if a program of that name cannot be found. You are responsible for setting the value of $PWR_NORMAL if you want a program or Command File to be executed at power up.

Power Up: Takes effect immediately

$PWR_SEMI

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Program to execute on semi-hot start

Description: If this is not blank, this is the name of a program that is executed during semi-hot power-fail recovery.

Power Up: On_Cold_Start

See Also: $SEMIPWFAIL

$PWR_UP_RTN STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Power up Routine Name

Description: 1. At semi-hot power up, if PX status is "PAUSED", power-up ISR runs for each PX. 2. After power-up ISR starts running, it works the same as normal ISR. 3. For power-up ISR, user can use PWR_UP_RTN built-in. User can use any strings as parameter of PWR_UP_RTN, if it's length is within 12. (This built-in doesn't check whether the program name is correct one or not about item 4. Only string length is checked.) 4. At start of power-up ISR, if specified program by the built-in is as follows, an error is posted: Non exist one TPE program KAREL built-in KAREL routine KAREL program which has motion group All that which is not KAREL program In above case, error is posted with wrong program name. Only a KAREL program which has no motion group can run as power-up ISR. 5. Differ from PWR_HOT or PWR_SEMI, power-up ISR doesn't have time-out limitation. 6. If it is single step status at power-up, power-up ISR runs with single-step status too. 7. System variable $PWR_UP_RTN[1]--[16] is cleared by cold start. 8. In KAREL program AAA.PC if $PWR_UP_RTN[*] is set, $PWR_UP_RTN[*] is cleared at end of AAA.PC

Power Up: N/A

Screen: None

2.15 "Q" System Variables

$QSKIP_GRP[1-9].$error_cnt2[1]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Error count.

Description: Current error count of each axis. This is set by FLTR at every ITP. For internal use only. Do not modify this system variable.

Power Up: Takes effect immediately

$QSKIP_GRP[1] Structure

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: QUICK SKIP function internal data for each group.

Description: For internal use only. Do not modify this system variable. Individual variables within this structure are described below.

Power Up: Takes effect immediately

$QSKIP_GRP[1].$qskp_curan(g,1-9)

Minimum: 0.   **Maximum:** 0.   **Default:** 0.   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Current angle of each axis

Description: Current angle of each axis set by CHND. For internal use only. Do not modify this system variable.

Power Up: Takes effect immediately

$QSKIP_GRP[1].$qskp_errcnt[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Error count at skip condition triggered

Description: Error count of each axis when the skip condition is triggered. This is copied from $error_cnt2 by CHND when skip condition is completed. For internal use only. Do not modify this system variable.

Power Up: Takes effect immediately

2.16 "R" System Variables

$RA_PARAMGRP[1].$appr_weight

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: This is the weight of the approach vector of a tool in the optimized cost function.

Description: When a singularity occurs, a tool orientation error is expected since the robot has fewer degrees of freedom. If applicable, the auto singularity avoidance function will minimize the orientation error for the tool. This variable defines the weight between the approach vector and orientation vector of the tool. The effective range of the variable is [1, 99]. It represents the percentage of the approach vector weighed in the optimization function. The larger it is, the more accuracy the approach vector is intended to pursue. However, by increasing the value might not necessarily increase orientation accuracy of the approach vector.

Power Up: N/A

$RA_PARAMGRP[1].$enable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: This variable enables the auto singularity avoidance function. If it is set to TRUE, the function is enabled. If it is set to FALSE, the function is disabled.

Description: When this variable is set to TRUE, the singularity avoidance function is enabled for this motion group. When this is set to FALSE, the singularity avoidance function is disabled for this motion group.

Power Up: N/A

$RA_PARAMGRP[1].$j4chg_tol

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: This is the minimal joint angle change in axis 4.

Description: This defines the minimal change in joint angles of axis 4 between the start position and destination position in which to apply the singularity avoidance control for the program motion. The effective range of the variable is [90.0 180.0]. The larger it is, the less chance the singularity avoidance function takes effect. The smaller it is, the more chance axis 4 of the robot is controlled and the more orientation error is expected at the same time for the program motion.

Power Up: N/A

$RA_PARAMGRP[1].$sngrlty_tol

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Singularity Tolerance

Description: This system variable defines the size of a singularity zone that is used in the function to predict singularity. The larger it is, the more chance axis 4 of the robot is controlled. Keep in mind while passing through the singularity zone, the robot will sacrifice orientation accuracy. The smaller it is, the less chance the singularity avoidance function takes effect. The range of the variable is [3.5 30.0](in degrees). If the angle of axis 5 for the position is less than the tolerance, the position is viewed as a singular position.

Power Up: N/A

$RA_PARAMGRP[1].$use_strt_j4

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: This is the switch to keep the joint angle of axis 4 the same as the starting position.

Description: When this is set to TRUE and the singularity avoidance function is enabled, if taught position in a program is inside a pre-defined singularity zone, then the system will internally modify the orientation data at the taught position in the following way:

- Keep location exactly the same as taught.
- Keep the joint angle of axis 4 of the destination point the same as the starting position
- Match the taught orientation as much as possible.

If this is set to FALSE, the system will NOT modify the taught position even if it is inside the singularity zone.

Power Up: N/A

$RA_PARAMGRP[1].$use_wjnt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: This is the choice of orientation control methods for singular motions.

Description: If this is set to TRUE, this function predicts a singularity for a programmed motion. Then this function will use wrist joint motion to get rid of the singularity. If this is set to FALSE, this function predicts a singularity for a programmed motion. Then this function will use a new orientation control method that minimizes orientation error for the motion if applicable.

Power Up: N/A

$RA_PARAMGRP[1].$warnmessenb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: This is the variable used to enable the warning message display.

Description: If this is set to TRUE, the singularity avoidance function predicts a singularity during programmed motion. During T1/T2 mode, the system will post a warning message on teach pendant (which can also be seen in ALARM history screen) to display the program line where singularity occurs. During AUTO mode, no such a message can be seen. If this is set to FALSE, no warning message will be displayed.

Power Up: N/A

$RACFG.$no_header

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: This is the switch to display the function header information.

Description: The auto singularity avoidance function will not take effect for program motions unless the header information of the teach pendant program is set to enable the function. When this is set to TRUE, the header information of this function will be displayed for review and modification. When this is set to FALSE, the header information of this function will NOT be displayed.

Power Up: N/A

$RCVTMOUT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: RCV Instruction Time-out Time

Description: If RCV (Received data from V120) statement cannot get any data from the V120 within the $RCVTMOUT time, the program jumps to the specified LABEL statement. $RCVTMOUT is in units of 0.01 seconds.

Power Up: N/A

$RE_EXEC_ENB

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: RE-EXECution Enable/disable

Description: If TRUE, when the last line executed by BWD is executed by FWD, the line is re-executed. This means that the motion option instruction of the last line is executed. TRUE = Enable and FALSE = Disable.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen (on the teach pendant)

$REFPOS1 STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Reference Point (Group 1) Variable

Description: Stores a set value of movement for group 1 at a reference point. It is set automatically using the SETUP Reference Position screen. $REFPOS1 uses the REFPOS11_T structure.

Power Up: N/A

See Also: $REFPOS2, $REFPOS3, $REFPOS4, $REFPOS5, $REFPOSxx_T Structure

$REFPOS2 STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Reference Point (Group 2) Variable

Description: Stores a set value of movement for group 2 at a reference point. It is set automatically using the SETUP Reference Position screen. $REFPOS2 uses the REFPOS21_T structure.

Power Up: N/A

See Also: $REFPOS1, $REFPOS3, $REFPOS4, $REFPOS5, $REFPOSxx_T Structure

$REFPOS3 STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Reference Point (Group 3) Variable

Description: Stores a set value of movement for group 3 at a reference point. It is set automatically using the SETUP Reference Position screen. $REFPOS3 uses the REFPOS31_T structure.

Power Up: N/A

See Also: $REFPOS1, $REFPOS2, $REFPOS4, $REFPOS5, $REFPOSxx_T Structure

$REFPOS4 STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Reference Point (Group 4) Variable

Description: Stores a set value of movement for group 4 at a reference point. It is set automatically using the SETUP Reference Position screen. $REFPOS4 uses the REFPOS41_T structure.

Power Up: N/A

See Also: $REFPOS1, $REFPOS2, $REFPOS3, $REFPOS5, $REFPOSxx_T Structure

$REFPOS5 STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Reference Point (Group 5) Variable

Description: Stores a set value of movement for group 5 at a reference point. It is set automatically using the SETUP Reference Position screen. $REFPOS5 uses the REFPOS51_T structure.

Power Up: N/A

See Also: $REFPOS1, $REFPOS2, $REFPOS3, $REFPOS4, $REFPOSxx_T Structure

$REFPOSMAXNO[1-5]

Minimum: 1   **Maximum:** 1   **Default:** 3   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** INTEGER   **Memory:** CMOS

Name: Maximum number of reference positions

Description: Individually, set the number at reference point ($REFPOS 1-5) which can be the registration in each group.

Power Up: N/A

$REFPOSMAXNO[5]

Minimum: 1   **Maximum:** 10   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Maximum number of reference positions

Description: Individually, set the number at reference point ($REFPOS 1-5) which can be the registration in each group.

Power Up: N/A

$REFPOSxx_T.$atperch

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Reference point position.

Description: Displays if there is a robot currently at reference point. xx represents 11,21,31,41,51.

Power Up: N/A

$REFPOSxx_T.$comment

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Comment

Description: Text providing additional information at the reference point. xx represents 11,21,31,41,51.

Power Up: N/A

$REFPOSxx_T.$dout_indx

Minimum: 0   **Maximum:** 0x7FFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Signal Number of Reference Point General-Purpos e Output

Description: Indicates how many digital signals are output when there is a robot at reference point. 0 shows a non-setting. xx represents 11,21,31,41,51.

Power Up: N/A

$REFPOSxx_T.$dout_type

Minimum: 0   **Maximum:** 50   **Default:** 2   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Signal Form of Reference Point General-purpose Output

Description: Digital signal indicating there is a robot at reference point. xx represents 11,21,31,41,51. Setting 2:Digital signal (SDO) and 8:Robot signal (RDO)

Power Up: N/A

$REFPOSxx_T.$enabled

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Reference Point Effective.

Description: Makes the function effective at reference point. xx represent 11,21,31,41,51.

Power Up: N/A

$REFPOSxx_T.$homepos

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Will specify reference position as home.

Description: This variable is used to specify if this reference position is a possible home position. It will only be checked if your system is has the capabilities to do this, i.e. using an extended shell, or an application tool that supports this feature.

Power Up: Takes effect immediately

Screen: This variable is set using the reference position menu.

$REFPOSxx_T.$perchpos[9]

Minimum: -1000000.   **Maximum:** 1000000.   **Default:** 0   **KCL/Data:** RW   **Program:** RW **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Reference Point Position

Description: Set the coordinate value of reference point of each axis at the position. xx represent 11,21,31,41,51.

Power Up: N/A

$REFPOSxx_T.$perchtol[9]

Minimum: -1000000.   **Maximum:** 1000000.   **Default:** 0   **KCL/Data:** RW   **Program:** RW **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Perch Tolerance

Description: Range of error tolerance at a reference point position. This variable sets the range of error tolerance of the coordinate value of the reference point for each axis from the position. xx represents 11,21,31,41,51.

Power Up: N/A

$REMOTE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Remote Operation

Description: Displays the state of the remote switch of operator control panel. The system updates it automatically. 1:The remote switch is ON 0:The remote switch is OFF $REMOTE indicates the operator panel REMOTE keyswitch setting. It is 1 when the key is set to ON and a remote device has motion control. It is 0 when the key is set to OFF and the operator panel has motion control. The value of $REMOTE is set and updated automatically.

Power Up: N/A

$RESM_DRYPRG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name:

Description: This system variable contains program name. When there is a request for resume, this program is runned before system is resumed.

Power Up: On_Cold_Start

Screen: The System Variables screen.

See Also: Function spec and design spec of VAG special dry run function.

$RESUME_PROG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Resume Program

Description: This string can be set from a teach pendant program using the RESUME_PROG instruction. A KAREL "shell" program can access this string during an error recovery process. This string typically contains the name of a program that is run as part of error recovery. Note that this contains the result of the last access to an resume_prog instruction from a teach pendant program.

Power Up: N/A

$RGSPD_PREXE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Register Speed Pre Execution

Description: This variable controls the interpreter pre-execution when a register value is used for the speed parameter. The default value is FALSE which means to stop the pre-execut ion. If it is set to TRUE then pre-planning is not stopped. In this case, if the user changes the register used for the speed immediately before executing the motion the speed which is used will be the previous value of the register. If the register is not typically changed right before issuing the motion then it may be safe to allow the pre-execution to occur.

Power Up: On_Cold_Start

$RMT_MASTER

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Remote Master

Description: Determines which remote device is in control of motion when the remote switch is set to REMOTE. 0:User Operator Panel 1:CRT/KB 2:Host computer 3:Remote device none.

Power Up: N/A

$ROBOT_NAME

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Robot Name

Description: Specifies the application entity name that represents this node on the network. Available only if the KSL, MOTET or MAP option has been installed. Used only for MAP.

Power Up: On_Cold_Start

Screen: SYSTEM System Variables screen or KCL

See Also: FANUC Robotics SYSTEM R-J Controller MAP Interface Setup and Operations Manual

$RPC_TIMEOUT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: RPC Server Timeout

Description: Specifies the time in seconds for a server connection to wait for a reply from the PC before cancelling the read operation.

Power Up: On_Cold_Start

$RPM_CFG STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: RPM Configuration Record

Description: Variable structure containing configuration information for the RPM. Individual fields within this structure are described below.

Power Up: N/A

$RPM_CFG.$data_size

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: The Record Size for each Root Pass Memorization (RPM) Data

Description: The size, in bytes, of the data that RPM records. Size depends on which sensor uses RPM option.

Power Up: On_Cold_Start

$RPM_CFG.$debug

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Debug flag used in RPM

Description: Debug flag used in RPM.

Power Up: Takes effect immediately

$RPM_CFG.$group_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: RPM Group Number

Description: Specifies in which group RPM is available.

Power Up: On_Cold_Start

$RPM_CFG.$n_buffers

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of Available Buffers

Description: The number of buffers allocated to be used. You can expand this number if memory available.

Power Up: On_Cold_Start

$RPM_GSB STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Root Pass Memorization (RPM) Global Status Block

Description: Root Pass Memorization (RPM) global status block. Reserved for Internal use by FANUC Robotics. Individual fields within this structure are defined below.

Power Up: N/A

$RPM_GSB.$last_bfr

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Last Buffer Used

Description: The buffer number that was last used to record RPM data.

Power Up: N/A

$RPM_GSB.$last_posn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Last Position Recorded

Description: The position that is the destination of last RPM recorded segment.

Power Up: N/A

$RPM_GSB.$last_prog

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Last Program Recorded

Description: The program that is the last one to use the RPM function.

Power Up: N/A

$RPM_PG STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Root Pass Memorization (RPM) Program Record

Description: Variable structure containing configuration information of the way the RPM function is executed in the program. Individual fields within this structure are described below.

Power Up: Takes effect immediately

$RPM_PG.$buffer_no

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER
Memory: Not available

Name: Buffer Number Used

Description: The buffer number that is currently used for RPM recording or playing back.

Power Up: N/A

$RPM_PG.$pitch

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL
Memory: Not available

Name: RPM Pitch Value

Description: Specifies how often RPM will record the offset into its buffer. When the pitch mode is time, RPM records offset data into specified buffer every $pitch (ms). When the pitch mode is distance, RPM records offset data every $pitch (millimeter). If every recording point is less than 100 ms apart the error, "Pitch too small," will be displayed. If this occurs, you should adjust the speed.

Power Up: Takes effect immediately

See Also: FANUC Robotics SYSTEM R-J3 Controller ArcTool Setup and Operations Manual

$RPM_PG.$pitch_mode

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Pitch Mode used in RPM

Description: Specifies the RPM recording mode. 0 : distance 1 : time

Power Up: Takes effect immediately

$RPM_PLAN STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: RPM Plan Status Record

Description: RPM internal planning record. Reserved for Internal use by FANUC Robotics. Individual fields within this structure are defined below.

Power Up: N/A

$RPM_PLAN.$bfr_stat[1-5]

Minimum: 0   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** RPM_GSB_T   **Memory:** CMOS

Name: Buffer Status Record

Description: The buffer status record for each group.

Power Up: N/A

$RPM_PLAN.$bfr_stat[5]

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** RPM_GSB_T   **Memory:** Not available

Name: Buffer Status Record

Description: The buffer status record for each group.

Power Up: N/A

$RS232_CFG.$AUXTASK

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Internal task number

Description: Reserved for internal use by FANUC Robotics.

Power Up: N/A

Screen: Read only from KCL and SYSTEM Variables screen

$RS232_CFG.$COMMENT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING **Memory:** Not available

Name: Comment

Description: Text describing serial port use.

Power Up: No

Screen: Read only from KCL and SYSTEM Variables screen

$RS232_CFG.$CUSTOM

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Custom (reserved)

Description: Reserved for internal use by FANUC Robotics.

Power Up: Reserved

Screen: Read only from KCL and SYSTEM Variables screen

$RS232_CFG.$DEVICEUSE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Device use

Description: Numeric representation of serial port use. No Use 1 Teach Pendant 2 Debug Console 3 PS-100/200 Disk 4 FANUC Floppy 5 Handy File 6 Sensor 7 Host Comm 8 Printer 9 KCL/CRT 10

Power Up: Yes

Screen: Read only from KCL and SYSTEM Variables screen. Use the "Port Init" menu to change this value after a cold start.

$RS232_CFG.$FLOWCONTROL

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Flow control

Description: Flow control used on serial port. None 0 Optional XOFF 255 XON/XOFF 256 RTS 512 DTR 1024 DSR 2048

Power Up: N/A

Screen: Read only from KCL and SYSTEM Variables screen

$RS232_CFG.$PARITY

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Parity

Description: Parity used for serial port. None 1 Odd 2 Even 3

Power Up: N/A

Screen: Read only from KCL and SYSTEM Variables screen. Use the "Port Init" menu to change this value after a cold start.

$RS232_CFG.$SPEED

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Baud rate

Description: Baud rate used for serial port. 1200 baud 4 2400 baud 3 4800 baud 2 9600 baud 1

Power Up: N/A

Screen: Read only from KCL and SYSTEM Variables screen. Use the "Port Init" menu to change this value after a cold start.

$RS232_CFG.$STOPBITS

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Stop bits

Description: Stop bits used for serial port. 1 stop bit 1 1.5 stop bits 2 2 stop bits 3

Power Up: N/A

Screen: Read only from KCL and SYSTEM Variables screen. Use the "Port Init" menu to change this value after a cold start.

$RS232_CFG.$TIMEOUT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Time limit

Description: Internally used timeout limit.

Power Up: No.

Screen: Read only from KCL and SYSTEM Variables screen. Use the "Port Init" menu to change this value after a cold start.

$RS232_CFG[1-10] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Communication port variable

Description: Defines the purpose of each serial communication port. It is set automatically by input from the "Port Init" Menu. Ports 1-4 are standard, ports 5-8 are optional. Individual fields within this structure are defined below.

Power Up: N/A

Screen: Read only from KCL and SYSTEM Variables screen. Can only be set by uif from CTRL start.

See Also: FANUC Robotics SYSTEM R-J3 Controller application-specific Setup and Operations Manual

$RS232_NPORT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Maximum number of serial ports

Description: This is the maximum number of serial ports that can be used by the system. You must set this to the actual number of serial ports used, if it is greater than four.

Power Up: N/A

Screen: Set from KCL and SYSTEM Variables screen

$RSM_DIALM[1].$edge

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Trigger timing, turn on or off.

Description: This variable can be set to On or Off. 0: Turn off 1: Turn on

Power Up: On_Cold_Start

Screen: Error recovery function setup screen

$RSM_DIALM[1].$port_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Port number of DI alarm

Description: It specifies the port number to be monitored for DI alarm.

Power Up: On_Cold_Start

Screen: Error recovery function setup screen

$RSM_DIALM[1].$port_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Port type of DI alarm

Description: It specifies the port type to be monitored for DI alarm.

Power Up: On_Cold_Start

Screen: Error recovery function setup screen

$RSM_DIALM[1].$sev_alarm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Severity of DI alarm

Description: This variable can be set to either a Local or Global alarm. 1: Local alarm 2: Global alarm

Power Up: Takes effect immediately

Screen: Error recovery function setup screen

$RSM_DIALM[1].$ualm_msg_no

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: User alarm message number

Description: The user alarm message specified by this value is displayed at the error post.

Power Up: Takes effect immediately

Screen: Error recovery function setup screen

$RSM_DIALM[3] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: DI alarm monitor function table.

Description: This system variable is used by DI alarm monitor feature in the auto error recovery function.

Power Up: On_Cold_Start

Screen: Auto error recovery setup screen

See Also: Do not change these system variables from system variable screen.

$RSMDIO.$port_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Resume Program DO

Description: It shows the assignment of the resume program DO

Power Up: On_Cold_Start

Screen: Error recovery function setup screen

$RSMFST_SV STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Resume Fast Fault

Description: Individual fields within this structure are listed below.

Power Up: N/A

$RSMFST_SV.$def_maint

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Default Maintenance Program Name

Description: This variable contains the name of the maintenance program to run during error recovery if the user program has not yet defined one using the MAINT_PROG instruction.

Power Up: Takes effect immediately

Screen: Error Recovery SETUP menu.

$RSMFST_SV.$fastdo_stat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Resume Program Status DO Value

Description: This variable is a boolean variable that indicates if a Resume Program will execute at the next START input.

Power Up: Takes effect immediately

Screen: Error Recovery SETUP menu.

$RSMFST_SV.$ffast_dsp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Fast Fault Display

Description: This variable enables and disables the display of the maintenance program setup menu items and also the execution of maintenance programs. If $ffast_dsp is TRUE, the setup menu items are displayed and maintenance programs can be executed. If FALSE, the Error Recovery setup menu does not display the maintenance program section and maintenance programs can not be executed. The Error Recovery sequence of exiting a paused program, running a maintenance program, and entering the program to the point of the error is sometimes referred to as "Fast Fault Recovery."

Power Up: On_Cold_Start

Screen: Error recovery SETUP menu.

$RSMFST_SV.$ffast_enbl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Fast Fault Enable

Description: This variable enables and disables the execution of Error Recovery programs. If TRUE, resume programs and maintenance programs can be executed.

Power Up: Takes effect immediately

Screen: Error Recovery SETUP menu.

$RSMFST_SV.$use_dry_run

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use Dry Run

Description: This variable enables and disables the use of dry run speeds during maintenance program EXIT and ENTRY paths. It also enables and disables weaving during the EXIT and ENTRY moves.

Power Up: Takes effect immediately

Screen: Error Recovery SETUP menu.

$RSMPRG_ALRM[1-10]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Alarm code to be monitored

Description: This system variable is used by error recovery function.

Power Up: On_Cold_Start

Screen: SYSTEM Variables screen, Resume program function setup screen

$RSMPRG_DSBL

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Auto error recovery disable parameter

Description: This system variable is used by the system. When load the optional function which doesn't support the auto error recovery function, the optional function should set this variable to 1. If set, the auto error recovery function is disabled.

Power Up: On_Cold_Start

$RSMPRG_SV STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Error Recovery (Resume program) function data

Description: This system variable is used by error recovery function.

Power Up: N/A

$RSMPRG_SV.$alarm_hapen

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Defined alarm happens

Description: This is the status parameter.

Power Up: Takes effect immediately

Screen: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

$RSMPRG_SV.$alarm_inf

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Alarm information for each PX task

Description: It means the alarm information for each PX task.

Power Up: N/A

See Also: Do not change this variable because of the internal data.

$RSMPRG_SV.$autorcv_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Auto error recovery enable parameter for customer condition

Description: This is the status parameter.

Power Up: Takes effect immediately

Screen: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

$RSMPRG_SV.$chk_remote

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Remote condition check

Description: 1: when TP is disabled and $RMT_MASTER is 0, add remote condition check to error recovery DO 0: Do not check remote condition

Power Up: Takes effect immediately

$RSMPRG_SV.$cont_exec

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Continuous execution

Description: 1: When the defined alarm occurs, the fault is not output and resume program is executed continuously. 0: This feature is disabled.

Power Up: Takes effect immediately

$RSMPRG_SV.$cur_mode

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Current mode

Description: This is the status parameter.

Power Up: Takes effect immediately

Screen: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

$RSMPRG_SV.$defined_prg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Resume program is defined ?

Description: This is the status parameter.

Power Up: Takes effect immediately

Screen: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

$RSMPRG_SV.$desire_mode

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Desired mode

Description: This is the status parameter.

Power Up: Takes effect immediately

Screen: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

$RSMPRG_SV.$di_on

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Resume DI is ON

Description: This is the status parameter.

Power Up: Takes effect immediately

Screen: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

$RSMPRG_SV.$incomp_di

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** RSMDIO_T   **Memory:** Not available

Name: Reset DI for incomplete end DO

Description: It shows the assignment of the incomplete reset DI

Power Up: On_Cold_Start

Screen: Error recovery function setup screen

$RSMPRG_SV.$incomp_do

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** RSMDIO_T   **Memory:** Not available

Name: Resume program incomplete end DO

Description: It shows the assignment of the resume program incomplete DO

Power Up: On_Cold_Start

Screen: Error recovery function setup screen

$RSMPRG_SV.$max_count

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Maximum counter of automatic start feature

Description: This is a maximum value of the automatic start. This value is compared with the internal counter which is incremented by the execution of resume program. And the internal counter is cleared at motion complete and CLEAR_RESUME_PROG execution.

Power Up: Takes effect immediately

Screen: Auto error recovery setup screen

$RSMPRG_SV.$mo_group

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Original program has Mo group

Description: This is the status parameter. This is internal parameter. Do not change this value.

Power Up: Takes effect immediately

Screen: Error recovery function manual function screen

$RSMPRG_SV.$mode

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Execution mode of error recovery function

Description: 1: AUTO: Execute resume program according to the conditions. 2: NOEXEC: Do not execute the resume program 3: TP_TEST: Execute resume program always from TP

Power Up: Takes effect immediately

Screen: Error recovery function manual function screen

$RSMPRG_SV.$no_dsb_optn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: No disable option

Description: This is the status parameter. This is internal parameter. Do not change this value.

Power Up: Takes effect immediately

Screen: Error recovery function manual function screen

$RSMPRG_SV.$no_step

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: No single step mode

Description: This is the status parameter. This is internal parameter. Do not change this value.

Power Up: Takes effect immediately

Screen: Error recovery function manual function screen

$RSMPRG_SV.$num_alarm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of monitored alarm

Description: It means the number of alarm codes to be monitored.

Power Up: On_Cold_Start

See Also: Do not set more than 32 to this data

$RSMPRG_SV.$num_di_alm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of monitored DI alarm

Description: It means the number of DI alarm codes to be monitored.

Power Up: On_Cold_Start

See Also: Do not set more than 5 to this data

$RSMPRG_SV.$pxno_defprg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TP_DEFPROG PX No.

Description: PX task number specified by $TP_DEFPROG

Power Up: Takes effect immediately

See Also: This is internal parameter. Do not change this value.

$RSMPRG_SV.$reg_index

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Index number of register to count for continuous execution

Description: This register is cleared when $TP_DEFPROG PX task is RUN, KRUN, BRUN, CONT and BCONT. This register should be referred in the resume program.

Power Up: On_Cold_Start

$RSMPRG_SV.$remote

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Remote condition

Description: This is the status parameter.

Power Up: Takes effect immediately

Screen: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

$RSMPRG_SV.$rsmprg_di

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** RSMDIO_T   **Memory:** Not available

Name: Resume Program DI

Description: It shows the assignment of the resume program DI

Power Up: On_Cold_Start

Screen: Error recovery SETUP menu.

$RSMPRG_SV.$rsmprg_do

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** RSMDIO_T   **Memory:** Not available

Name: Resume Program DO

Description: It shows the assignment of the resume program DO

Power Up: On_Cold_Start

Screen: Error recovery SETUP menu.

$RSMPRG_SV.$rsmprg_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Original and resume program status

Description: This is the status parameter.

Power Up: Takes effect immediately

Screen: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

$RSMPRG_SV.$rspgdo_stat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Resume program DO status

Description: It means the resume program DO status

Power Up: N/A

See Also: Do not change this variable because of the internal data.

$RSMPRG_SV.$svprg_enble

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Auto error recovery function enable

Description: This is the status parameter.

Power Up: Takes effect immediately

Screen: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

$RSR[1-8]

Minimum: 0   **Maximum:** 0x7ffffff   **Default:** 1   **KCL/Data:** RW   **Program:** Not available
UIF: RW   **CRTL:** RW   **Data Type:** BYTE   **Memory:** CMOS

Name: Enable/disable Robot Service Request

Description: Enables/disables the RSR function. For example, if $RSR[1] is TRUE, you can select
and start a program by using RSR1 input signal.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen or Setting/RSR/PNS screen or the teach pendant command
(RSR[i]=ON/OFF)

$RSR[8]

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not
available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Enable/disable Robot Service Request

Description: Enables/disables the RSR function. For example, if $RSR[1] is TRUE, you can select
and start a program by using RSR1 input signal.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen or Setting/RSR/PNS screen or the teach pendant command
(RSR[i]=ON/OFF)

$RSR_OPTION

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
LONG   **Memory:** Not available

Name: RSR program select option

Description: This variable is set to TRUE when the Common Shell RSR Option is enabled.

Power Up: N/A

See Also: na

2.17 "S" System Variables

$SA_IDX[1-2]

Minimum: MIN_SA_IDX   **Maximum:** MAX_SACFG   **Default:** DEF_SA_IDX   **KCL/Data:** RW   **Program:** Not available   **UIF:** FP   **CRTL:** RW   **Data Type:** SA_IDX_T   **Memory:** CMOS

Name: Interchange Servo Axis

Description: This variable defines which group will be used as an interchange servo axis, how many index positions, what are their positions, which digital output will be associated with which index position and status of which index this axis is currently on.

Power Up: On_CNTL_Start

$SA_IDX[1].$dout[1]

Minimum: 1   **Maximum:** 255   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Digital output port number

Description: The value define which digital output port will be turn on when the position of the index device is within the tolerance of the specified index position. This value will be automatically set when user load the index device robot library.

Power Up: N/A

Screen: The System Variables screen.

See Also: N/A

$SA_IDX[1].$dout_on[1-8]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Digital output status

Description: This variable indicates whether or not the digital output is on (logically). This means the servo axis is at this index position.

Power Up: On_CNTL_Start

$SA_IDX[1].$dout_on[1]

Minimum: FALSE   **Maximum:** TRUE   **Default:** FALSE   **KCL/Data:** RO   **Program:** RO
UIF: Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Digital output port on/off status

Description: The value reflect whether or not the position of the index device is within the tolerance of the specified index position, Regardless the digital output port is simulated or actual connected.

Power Up: N/A

Screen: The System Variables screen.

See Also: N/A

$SA_IDX[1].$dout_type[1-8]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Digital output port type

Description: This variable indicates which type of digital output will be used for this index position. 1: Digital Output 2: device_net output. 3: PMC output. Currently only digital outputs are supported.

Power Up: On_CNTL_Start

$SA_IDX[1].$dout_type[1]

Minimum: 1   **Maximum:** 10   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Digital output port type

Description: This value specify the digital output port type. 1: For normal digit output port type and also device net port type. 2-10: for future use.

Power Up: N/A

Screen: The System Variables screen.

See Also: N/A

$SA_IDX[1].$group_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Group number of the index device

Description: Specify which group is used as index device. The system will set this value when user load the index device robot library.

Power Up: N/A

Screen: The System Variables screen.

See Also: N/A

$SA_IDX[1].$index_tol

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Tolerance of index position

Description: The unit is degree/mm. This value specify the in position tolerance of index position. All the index position in this group use this value as tolerance.

Power Up: N/A

Screen: The System Variables screen.

See Also: N/A

$SA_IDX[1].$index_val[1]

Minimum: -1000000   **Maximum:** 100000   **Default:** 0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Index position

Description: The unit is degree/mm. The value indicate where is the index position of the index
device. This value will be automatically set when user load the index device robot library.

Power Up: N/A

Screen: The System Variables screen.

See Also: N/A

$SA_IDX[1].$num_index

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
INTEGER   **Memory:** Not available

Name: Number of index position

Description: Specify how many index positions exist in this index device. The system will set this
value when user load the index device robot library.

Power Up: N/A

Screen: The System Variables screen.

See Also: N/A

$SACFG.$debug

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Debug flag

Description: This variable is used internally by FANUC Robotic for software debug purpose.

Power Up: N/A

Screen: The System Variables screen.

See Also: N/A

$SACFG.$loop_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Loop time for in position checking

Description: The unit is millisecond. This variable specify how often the system do the in position checking for the index position.

Power Up: N/A

Screen: The System Variables screen.

See Also: N/A

$SBR[16] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Array of Servo Block Record Variable

Description: Displays the data for the servo motors of all joint axes (16 axes or less) controlled with R-J3 controller. Individual fields within this structure are described below.

Power Up: On_Cold_Start

$SBR[i].$axis_num

Minimum: 0   **Maximum:** 16   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Software Axis Number

Description: Indicates to which software axis number (within the specified motion group) that the hardware servo axis i is connected.

Power Up: On_Cold_Start

$SBR[i].$grp_num

Minimum: 0   **Maximum:** 5   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Software Group Number

Description: Indicates to which motion group the hardware servo axis i is connected.

Power Up: On_Cold_Start

$SBR[i].$mtr_id

Minimum: ""   **Maximum:** ""   **Default:** "123456789012345678"   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Motor ID String

Description: Motor identification string of the motor to which the hardware servo axis i is connected.

Power Up: On_Cold_Start

$SBR[i].$mtr_inf_id

Minimum: ""   **Maximum:** ""   **Default:** "1234567890"   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Motor Information ID String

Description: Information string for the motor to which the hardware servo axis i is connected.

Power Up: On_Cold_Start

$SBR[i].$param[151-300]

Minimum: -32768   **Maximum:** 32767   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Servo Parameter

Description: List of servo parameters for hardware servo axis i.

Power Up: On_Cold_Start

$SBR[i].$sv_param_id

Minimum: ""   **Maximum:** ""   **Default:** "12345678"   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Servo Parameter ID String

Description: Servo parameter ID string for hardware servo axis i.

Power Up: On_Cold_Start

$SCAN_TIME

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Scanning Time

Description: $SCAN_TIME can be used only in a condition handler statement WITH clause. This condition handler qualifier is not a normal system variable. It cannot be accessed by KCL (NO) and has write only (WO) access by programs. $SCAN_TIME is used to specify the time in milliseconds between scans in a condition handler. The syntax for $SCAN_TIME = time_in_ms where time_in_ms is an INTEGER expression. Actual time_in_ms values will be one of the following: 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, times the value of the $COND_TIME system variable. Any value less than $COND_TIME will default to the value of $COND_TIME. Any value greater than (512 * $COND_TIME) ms will default to (512 * $COND_TIME). Any value between one of the above intervals will default to the next lower value.

Power Up: N/A

$SCR STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: System Configuration Record

Description: Displays the variable concerning system configuration.

Power Up: On_Cold_Start

$SCR.$amp_type[1-16]

Minimum: 0   **Maximum:** 1000000   **Default:** 0   **KCL/Data:** RO   **Program:** Not available   **UIF:** RO   **CRTL:** RO   **Data Type:** BYTE   **Memory:** CMOS

Name: Amplifier type

Description: $SCR.$amp_type are set in robot library or on SYSTEM variables screen at Controlled start. It means what the type of this index amplifier is. 0= Not Used 1= 6 axis amplifier 2= Alpha series amplifier (which has 3 PWM lines) 3= Alpha series amplifier (which has 6 PWM lines) 4= C series amplifier 5= C series amplifier + conversion board for R-J3 For example, if $SCR.$amp_type[1] is 1, it means that the type of amplifier 1 is 6 axis one.

Power Up: On_CNTRL_Start

$SCR.$amp_type[16]

Minimum: 0   **Maximum:** 6   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Amplifier type

Description: $SCR.$amp_type are set in robot library or on SYSTEM variables screen at Controlled start. It means what the type of this index amplifier is. 0= Not Used 1= 6 axis amplifier 2= Alpha series amplifier (which has 3 PWM lines) 3= Alpha series amplifier (which has 6 PWM lines) 4= C series amplifier 5= C series amplifier + conversion board for R-J3 For example, if $SCR.$amp_type[1] is 1, it means that the type of amplifier 1 is 6 axis one.

Power Up: On_Cold_Start

$scr.$brk_number[9]

Minimum: 0   **Maximum:** 8   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Brake number

Description: Defines the brake number assoicated with the axis. A maximum of four brakes lines is supported on a 6 channel amplifier.

Power Up: On_Cold_Start

$SCR.$brkhold_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Break Hold Enable

Description: Specifies whether or not to use the temporary stop alarm.

Power Up: On_Cold_Start

$SCR.$cabinet_typ

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Cabinet Type field

Description: Stores cabinet type for R-J3 controller cabinet_type. 0 = i cabinet 1 = B cabinet

Power Up: On_Cold_Start

$SCR.$cap_amp_dis[1-16]

Minimum: 0.0   **Maximum:** 1000000   **Default:** 0.0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RO   **CRTL:** RW   **Data Type:** REAL   **Memory:** CMOS

Name: Capacity of amplifier for regenerative discharge.

Description: $SCR.$cap_amp_dis are set in robot library or on SYSTEM variables screen. It means capacity of amplifier for regenerative discharge.

Power Up: Takes effect immediately

Screen: SYSTEM variables screen

$SCR.$cap_amp_dis[16]

Minimum: 0.0   **Maximum:** 1000000.0   **Default:** 0.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Capacity of amplifier for regenerative discharge.

Description: $SCR.$cap_amp_dis are set in robot library or on SYSTEM variables screen. It means capacity of amplifier for regenerative discharge.

Power Up: Takes effect immediately

Screen: SYSTEM variables screen

$SCR.$chain_rsdn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Status of chain failure reset_done

Description: Status of chain failure reset_done Bit 1 : Chain 1 (+24V) -- Chain reset has been done Bit 2 : Chain 2 (0V) -- Chain reset has been done

Power Up: Takes effect immediately

$SCR.$chain_stat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Chain failure status

Description: Status of chain failure. Bit 1 : Chain 1 (+24V) failure Bit 2 : Chain 2 (0V) failure

Power Up: Takes effect immediately

$SCR.$chain_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Chain failure timer

Description: Wait for the value (ms) after SVEMG signal is ON on CE sign/GM hardware, and chack chain failure

Power Up: Takes effect immediately

$SCR.$chk_ch_sctm

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: enable checking of scan time in CHND task

Description: If the value is non-zero (default), checking for excessive time betweencondition handler scans in enabled. Setting to zero disables this checking.

Power Up: Takes effect immediately

$SCR.$coldovrd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Cold Start Override

Description: The speed override value on a cold start.

Power Up: On_Cold_Start

$SCR.$cond_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Condition Time

Description: The condition handler scan time (in milliseconds).

Power Up: On_Cold_Start

$SCR.$coordovrd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Coordinates Override

Description: The ceiling speed override value when the coordinate system is changed. If the current speed override is greater than this ceiling speed override, the current speed override will be updated to the ceiling speed override.

Power Up: On_Cold_Start

$SCR.$dsp_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: DSP hardware type

Description: Software checks the type of DSP on the R-J3 controller during a controlled or cold start. DSP types are: 0 = DSP V and DSP IV are mounted 1 = DSP IV (320C51) (old DSP) 2 = DSP V (320C52) (new DSP from V4.20P) If both DSPV and DSP IV are mounted on the hardware, this variable is set to 0.

Power Up: N/A

$SCR.$dvc_c_ratio

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Time Scale catch up ratio

Description: After motor speed overflow Time Scale will increase the output ratio of FDO by the value of this variable ($SCR.$dvc_c_ratio) to catch up with the FDO input.

Power Up: N/A

$SCR.$dvc_dbg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Time Scale debug mode flag

Description: Time Scale function will print out the internal data on debug console when the bit is set to 1.

Power Up: N/A

$SCR.$dvc_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: Enable Time Scale

Description: TRUE : enable time scale. FALSE : disable time scale. Compatible with motor speed limit used until V4.10P turned off for offset wrist robots, dual drive, FlexTool.

Power Up: N/A

$SCR.$dvc_mode

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Time Scale mode

Description: 0x1<0 : : velocity limit, ignored 0x1<1-5 : : reserved for future enhancement. 0x1<6 : 1 : synchronize groups when velocity is reduced 0 : non group synchronization 0x1<7 : 1 : perform Discharge current calculation 0 : skip calculation/disable screen 0x1<8 : 1 : ignore time scale buffer for inposition calculation. 0 : include time scale buffer for inposition calculation.

Power Up: N/A

$SCR.$dvc_mode1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Time Scale mode 1

Description: Reserved for future enhancement.

Power Up: N/A

$SCR.$dvc_mode2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Time Scale mode 2

Description: Reserved for future enhancement.

Power Up: N/A

$SCR.$dvc_mode3

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Time Scale mode 3

Description: Upper limit of FDOs piled in filter mail box This restriction was added to avoid timing problems caused by excessive FDO pile up.

Power Up: N/A

$SCR.$enc_axis[1-8]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Encoder Axis

Description: Used for line tracking. Specify which DSP axis is setup for line tracking.

Power Up: On_Cold_Start

Screen: SYSTEM Variables screen, SETUP Encoder screen.

$SCR.$enc_axis[2]

Minimum: 0   **Maximum:** 16   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Encoder Axis

Description: Used for line tracking. Specify which DSP axis is setup for line tracking.

Power Up: On_Cold_Start

Screen: SYSTEM Variables screen, SETUP Encoder screen.

$SCR.$enc_type[1-8]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Encoder Type

Description: Used for line tracking. A O indicates incremental. A 1 indicates absolute.

Power Up: On_Cold_Start

Screen: SYSTEM Variables screen, SETUP Encoder screen.

$SCR.$enc_type[2]

Minimum: 0   **Maximum:** 2   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Encoder Type

Description: Used for line tracking. A O indicates incremental. A 1 indicates absolute.

Power Up: N/A

Screen: SYSTEM Variables screen, SETUP Encoder screen.

$SCR.$fenceovrd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Fence Override

Description: The ceiling speed override value when the SFSPD signal is cut. If the current speed override is greater than the ceiling speed override, the current speed override will be updated to the ceiling speed override.

Power Up: On_Cold_Start

$SCR.$fine_pcnt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Fine Jog Mode Speed Percentage

Description: The speed used in fine jog mode is:(1% * $JOG_GROUP[1].$fine_ovrd) * $SCR_GRP[1].$fine_pcnt

Power Up: On_Cold_Start

$SCR.$fssb1[1-6]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: FSSB 1 diagnosis information

Description: When SRVO-57 FSSB disconnect alarm,SRVO-55,56,60 occurs, FSSB information is saved to the following variables. FSSB 1 information $FSSB1[1] : FSSB mode register $FSSB1[2] : FSSB status register $FSSB1[3] : FSSB correct error counter $FSSB1[4] : FSSB uncorrectable error counter $FSSB1[5] : FSSB start code miss counter

Power Up: N/A

$SCR.$fssb1[6]

Minimum: 0x80000000   **Maximum:** 0x7FFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: FSSB 1 diagnosis information

Description: When SRVO-57 FSSB disconnect alarm,SRVO-55,56,60 occurs, FSSB information is saved to the following variables. FSSB 1 information $FSSB1[1] : FSSB mode register $FSSB1[2] : FSSB status register $FSSB1[3] : FSSB correct error counter $FSSB1[4] : FSSB uncorrectable error counter $FSSB1[5] : FSSB start code miss counter

Power Up: N/A

$SCR.$fssb2[1-6]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: FSSB 2 diagnosis information

Description: When SRVO-57 FSSB disconnect alarm,SRVO-55,56,60 occurs, FSSB information is saved to the following variables. FSSB 2 information $FSSB2[1] : FSSB mode register $FSSB2[2] : FSSB status register $FSSB2[3] : FSSB correct error counter $FSSB2[4] : FSSB uncorrectable error counter $FSSB2[5] : FSSB start code miss counter

Power Up: N/A

$SCR.$fssb2[6]

Minimum: 0x80000000   **Maximum:** 0x7FFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: FSSB 2 diagnosis information

Description: When SRVO-57 FSSB disconnect alarm,SRVO-55,56,60 occurs, FSSB information is saved to the following variables. FSSB 2 information $FSSB2[1] : FSSB mode register $FSSB2[2] : FSSB status register $FSSB2[3] : FSSB correct error counter $FSSB2[4] : FSSB uncorrectable error counter $FSSB2[5] : FSSB start code miss counter

Power Up: N/A

$SCR.$fssbdiagenb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Switch to enable dynamic FSSB diagnosis function

Description: Switch to enable dynamic FSSB diagnosis function : T Enable dynamic FSSB diagnosis function : F Disable (default) When it is enabled, current FSSB information is copied to $FSSB1/FSSB2 After FSSB diagnosis is done, please set it to F.

Power Up: Takes effect immediately

$SCR.$fwdenblovrd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Override Value When Disable Forward State is Changed

Description: The override value when disable forward state is changed.

Power Up: Takes effect immediately

$SCR.$hw_c1_time1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: GM RS-1 Class 1 Stop Mode Deceleration Time

Description: For Class 1 stop mode, servo code stops robot before this timer expires. This variable defines the worst case deceleration time during class 1 stop.

Power Up: On_Cold_Start

Screen: SYSTEM Variables screen.

$SCR.$hw_c1_time2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: GM RS-1 Class 1 Stop Mode Deceleration Time

Description: For Class 1 stop mode, servo code stops robot before this timer expires. This variable defines the worst case deceleration time during class 1 stop.

Power Up: On_Cold_Start

Screen: SYSTEM Variables screen.

$SCR.$intask_ovru

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Overrun count for inertia task

Description: The value is increased when inertia task can not execute in interval time, which is defined by $update_time. If the value is not zero, overrun of inertia task occurs. This values are not initialized during cold start.

Power Up: N/A

$SCR.$itp_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: ITP Time

Description: The time in milliseconds of a basic motion cycle.

Power Up: Set only during a controlled start. Requires a cold start to take effect.

$SCR.$jg_dsbl_msk

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Jog group disable mask

Description: Group mask for disabling jogging. If the bit corresponding to the group is set, jogging is disabled for that group.

Power Up: On_Cold_Start

Screen: SYSTEM variables screen

$SCR.$jog_aux_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: auxiliary axis jogging enable

Description: 1: allow user to jog auxiliary axis in non sub group jog mode for 3-5 axes robot 0: Only allow user to jog auxiliary axes in sub group jog mode. User may disable this capability by turn off this flag.

Power Up: Takes effect immediately

$SCR.$joglim

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Jog Limit

Description: The percentage of system maximum speed you can jog the robot. It is set by the individual robot library to ensure ISO safety standards (maximum speed of 250 mm/sec at TCP).

Power Up: On_Cold_Start

$SCR.$joglimrot

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Rotation Jog Speed Limit

Description: The percentage of maximum rotspeed applied during the orientation jogging.

Power Up: On_Cold_Start

$SCR.$jogovlim

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Jog Override

Description: The ceiling speed override value when you jog the robot. If the current speed override is greater than the ceiling speed override, the current speed override will be updated to the ceiling speed override.

Power Up: On_Cold_Start

$SCR.$jogwst_mode

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Wrist jog mode selection.

Description: Selects wrist jog modes. When set to TRUE the selected wrist jog function allows you to jog x, y, and z while maintaining the orientation of the wrist. When set to FALSE, the wrist jog function allows you to jog x, y, and z while fixing the wrist axes. In both cases, when you jog a wrist axis the other wrist axes will remain stationary, and the rest of the robot axes will move to accommodate the movement of the wrist axes.

Power Up: Takes effect immediately

Screen: SYSTEM variables screen.

$SCR.$kept_mirlim

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Kept Motion Instruction Record Limits

Description: The number of motion instruction records kept in the path planning system during motion. Adjusting this value makes it possible to recover all interrupted motions after a servo error (for example, EMERGENCY STOP). The range of $kept_mirlim is 0-9, but must be less than or equal to ($NUM_MIR - 3).

Power Up: On_Cold_Start

$SCR.$kinem_enb

Minimum: 0   **Maximum:** 2   **Default:** 2   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Kinematics Enable

Description: $kinem_enb shows whether forward and inverse kinematics are defined or not. 2: Both forward and inverse kinematics has been defined. 1: Only forward kinematics has been defined. 0: kinematics has not been defined.

Power Up: Takes effect immediately

$SCR.$lchdly_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Local Condition Delay Time

Description: Allows local condition trigger times to be adjusted by this amount (in msec).

Power Up: Takes effect immediately

$SCR.$made_pg_amr

Minimum: 0   **Maximum:** 10   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of AMRs used in PG was made

Description: Not used

Power Up: On_Cold_Start

$SCR.$made_pg_mir

Minimum: 0   **Maximum:** 10   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of MIRs used in PG was made

Description: Not used

Power Up: On_Cold_Start

$SCR.$madegroups

Minimum: 0   **Maximum:** 5   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of groups made

Description: Not used

Power Up: On_Cold_Start

$SCR.$madepgtasks

Minimum: 0   **Maximum:** 16   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of PG tasks made .

Description: Not used

Power Up: On_Cold_Start

$SCR.$max_pre_fdo

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Max Pre-planned FDOs

Description: This integer variable gives the number of pre-planned motion FDOs that the system will send, while waiting for the motion to start. It is used by the motion system to cut the delay time by one interpolation period when starting a motion from a full stop. A zero value disables the pre-planning. The default is 1. Higher values of $max_pre_fdo will not give any additional delay reduction and are allowed only for future expansion.

Power Up: On_Cold_Start

$SCR.$maxnumtask

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Maximum Number of Tasks

Description: The maximum number of user programs which can be run simultaneously.

Power Up: On_Cold_Start

$SCR.$maxnumufram

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Maximum Number of User Frames

Description: Displays the total number of user frames the coordinate system can register.

Power Up: On_Cold_Start

$SCR.$maxnumutool

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Maximum Number of Tool Frames

Description: Displays the total number of tool frames the coordinate system can register.

Power Up: On_CNTRL_Start

$SCR.$maxpreapl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Max Pre-planned Application

Description: The maximum number of application instructions that the system can pre-plan.

Power Up: On_Cold_Start

$SCR.$maxpremtn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Max Pre-planned Motions

Description: The maximum number of motion statements that the system can pre-plan. Pre-planning allows the motion statement to be executed immediately after the previous statement finishes.

Power Up: On_Cold_Start

$SCR.$mb_dsbl_msk

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Motion Basic Softpart Disable Mask

Description: If the bit is set then the softpart in that particular slot of SID_MB will be disabled.

Power Up: On_Cold_Start

$SCR.$mb_ld_msk

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Motion Basic Softpart loaded mask

Description: This is a bit map of existing Motion Basic softpart. This variable shows which softpart is loaded.

Power Up: On_Cold_Start

$SCR.$motn_ld_idx[1-32]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Motion Softpart Load Index

Description: Internal variable which indicates which slot is loaded with which softpart.

Power Up: N/A

$SCR.$motn_ld_msk

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** RO **UIF:** Not available **CRTL:** Not available **Data Type:** INTEGER **Memory:** Not available

Name: Motion Application Softpart loaded mask

Description: This is a bit map of existing Motion Application softpart. This variable shows which softpart is loaded.

Power Up: On_Cold_Start

$SCR.$motn_pc_run[1-32]

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** RO **UIF:** Not available **CRTL:** Not available **Data Type:** BYTE **Memory:** Not available

Name: Motion Softpart PC Program Executed

Description: Reserved for internal used by FANUC Robotics. This indicates whether or not the softpart PC program has been executed to initialize the softpart variable.

Power Up: On_Cold_Start

$SCR.$ne_mode

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** INTEGER **Memory:** Not available

Name: Newton-Euler mode

Description: 1: Newton-Euler is enabled 0: Newton-Euler is disabled Do not change this system variable.

Power Up: On_Cold_Start

$SCR.$ne_sin_reso

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Newton-Euler sin table resolution parameter

Description: n (>= 2): Resolution of angle of sin table for NE is PI/2^n 1: Resolution of angle of sin table for NE is PI/2^10 (10 was decided by experiment)0: Do no use sin table (compatible mode) Users should not change this system variable.

Power Up: On_Cold_Start

$SCR.$num_dsp_axs

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Number of DSP Axes

Description: The number of DSP axes supported by servo hardware on the system.

Power Up: On_Cold_Start

$SCR.$num_gp_made

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Number of Groups Requested to Create

Description: Reserved for internal used by FANUC Robotics. The number of groups that you have requested to create at control start.

Power Up: On_Cold_Start

$SCR.$num_group

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Number of Motion Groups

Description: The number of motion groups installed in the system. A robot and extended axes are considered one motion group. Additional groups can be installed to allow concurrent or independent group motion.

Power Up: On_Cold_Start

$SCR.$num_motnsoc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Number of Motion Softpart Sockets

Description: Reserved for internal use by FANUC Robotics. The number of motion softparts that have been plugged into the motion case socket.

Power Up: On_Cold_Start

$SCR.$num_pg_amr

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Maximum number of AMR

Description: The number of AMR should be created by the system to be used for Program.

Power Up: On_Cold_Start

$SCR.$num_pg_mir

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of Program MIRs

Description: Total number of program MIRs (Motion Instruction Records) which exist per motion group. Program MIRs are only used by program motion sources.

Power Up: On_Cold_Start

$SCR.$num_rlibsoc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Number of Robot Libraries in Socket

Description: Reserved for internal use by FANUC Robotics. The number of robot libraries that have been plugged into the robot library case socket.

Power Up: On_Cold_Start

$SCR.$num_sys_mir

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Number of System MIRs

Description: Total number of system MIRs (Motion Instruction Records) which exist per motion group. System MIRs are used by all motion sources except programs.

Power Up: On_Cold_Start

$SCR.$num_tot_axs

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Number of Total Axes

Description: The total number of all axes, for all groups, installed in the system.

Power Up: On_Cold_Start

$SCR.$ofstincval

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Offset Register Incremental Number

Description: The increment number with new TPE offset execution.

Power Up: On_Cold_Start

$SCR.$pg_dsbl_msk

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: PG function disable mask

Description: 1: PG original path resume function is disabled. 0: All PG function is enabled. Do not change this system variable.

Power Up: Takes effect immediately

$SCR.$pre_exe_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Pre-execution Enable

Description: Allows pre-execution of certain program statements, if set to TRUE.

Power Up: On_Cold_Start

$SCR.$pre_mb_cmp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Pre MB Version Compatibility

Description: Requires that the system is compatible with pre MB version if set to TRUE.

Power Up: On_Cold_Start

$SCR.$prev_ctrl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Previous Start State is Control Start

Description: Reserved for internal use by FANUC Robotics. This variable specifies whether or not the previous start state is a control start.

Power Up: On_Cold_Start

$scr.$proc_axs

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Process control axis

Description: Process control axis: T -> Process Control axis

Power Up: Takes effect immediately

$SCR.$proc_ctrl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: process axis control

Description: Status of process axis control 0: Position Control 1: Flow Control

Power Up: Takes effect immediately

$SCR.$recov_ovrd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: When Open Fence is Closed Whether or Not to Restore the Override

Description: If set to TRUE and the open fence is closed, this variable restores the override.

Power Up: Takes effect immediately

$SCR.$resetinvert

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Reset Signal Inverted

Description: If set to TRUE, the rising edge of the reset signal is used.

Power Up: Takes effect immediately

$SCR.$runovlim

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Program Run Speed Limit

Description: The ceiling speed override value when you execute a program. If the current speed override is greater than the ceiling speed override, the current speed override will be updated to the ceiling speed override.

Power Up: Takes effect immediately

$SCR.$sfjogovlim

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Safety Jog Speed Limit

Description: The ceiling speed override value when you jog the robot while the SFSPD signal is turned off. If the current speed override is greater than the ceiling speed override, the current speed override will be updated to the ceiling speed override.

Power Up: On_Cold_Start

$SCR.$sfrunovlim

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Program Run Override Limit

Description: The ceiling speed override value when you execute a program while the SFSPD signal is turned off. If the current speed override is greater than the ceiling speed override, the current speed override will be updated to the ceiling speed override.

Power Up: On_Cold_Start

$SCR.$sfspd_ovrd[1-2]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Safety Override

Description: The override value when the SFSPD signal is turned off.

Power Up: On_Cold_Start

$SCR.$sfspd_ovrd[2]

Minimum: 0   **Maximum:** 100   **Default:** 50   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Safety Override

Description: The override value when the SFSPD signal is turned off.

Power Up: On_Cold_Start

$SCR.$subcpu

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: subcpu exist flag

Description: 1: subcpu hardware and software exist in current system. 0: either subcpu hardware or software does not exist in this system. This is a read only variable. Used for system to determine itp_time.

Power Up: N/A

$SCR.$sv_code_opt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Servo Code Option

Description: The servo code option.

Power Up: On_CNTRL_Start

$SCR.$svstat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Servo Code Loading Status

Description: System set loading status of servo code software. During system initialization, it set as follows 0 : Servo code is NOT loaded 1 : Standard servo code is loaded 2 : Sliding mode servo code is loaded

Power Up: On_CNTRL_Start

$SCR.$tpenbleovrd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Teach Pendent Enable Override

Description: The ceiling speed override value when the teach pendent is enabled. If the current speed override is greater than the ceiling speed override, the current speed override will be updated to the ceiling speed override.

Power Up: On_Cold_Start

$SCR.$tpmotnenabl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Teach Pendant Motion Enable

Description: Disables jogging if set to 1.

Power Up: Takes effect immediately

$SCR.$turn_axis[1]

Minimum: 0   **Maximum:** 9   **Default:** 4   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Robot multiple turn axis

Description: $scr.$turn_axis is an array of three elements. It defines the robot axis which could have multiple turns.

Power Up: On_Cold_Start

$SCR.$turn_axis[2]

Minimum: 0   **Maximum:** 9   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Robot multiple turn axis

Description: $scr.$turn_axis is an array of three elements. It defines the robot axis which could have multiple turns.

Power Up: On_Cold_Start

$SCR.$turn_axis[3]

Minimum: 0   **Maximum:** 9   **Default:** 6   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Robot multiple turn axis

Description: $scr.$turn_axis is an array of three elements. It defines the robot axis which could have multiple turns.

Power Up: On_Cold_Start

$SCR.$update_map1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: update map 1

Description: Each bit means update status of each modification Do not change this system variable.

Power Up: On_Cold_Start

$SCR.$update_map2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: update map 2

Description: Each bit means update status of each modification Do not change this system variable.

Power Up: On_Cold_Start

$SCR.$update_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Inertia calculation update time

Description: The interval time for performing inertia/moment calculations. The unit is msec.

Power Up: On_Cold_Start

$SCR_GRP STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Group System Configuration Record

Description: System configuration record for each group.

Power Up: On_Cold_Start

$SCR_GRP.$turn_axis[1]

Minimum: 0   **Maximum:** 9   **Default:** 4   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Robot multiple turn axis

Description: $scr.$turn_axis is an array of three elements. It defines the robot axis which could have multiple turns.

Power Up: On_Cold_Start

$SCR_GRP.$turn_axis[2]

Minimum: 0   **Maximum:** 9   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Robot multiple turn axis

Description: $scr.$turn_axis is an array of three elements. It defines the robot axis which could have multiple turns.

Power Up: On_Cold_Start

$SCR_GRP.$turn_axis[3]

Minimum: 0   **Maximum:** 9   **Default:** 6   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Robot multiple turn axis

Description: $scr.$turn_axis is an array of three elements. It defines the robot axis which could have multiple turns.

Power Up: On_Cold_Start

$SCR_GRP[1].$arm_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Robot Arm Type

Description: Defines the robot arm type. The meanings associated with these values depend on which robot is being described. The following are possible arm type definitions: FLOOR_MOUNT 0 = floor mount ANGLE_MOUNT 1 = angle mount RACK_MOUNT 2 = rack mount STUD_ARM 3 = stud robot KAI_ARM 4 = Kai robot W_ARM 5 = W type robot S_5 6 = S 5 S_10 7 = S 10 S_5UD 8 = S 5 upside down NORMAL_FLANGE 9 = normal flange SPECIAL_FLANGE 10 = special flange AREA_GANTRY 11 = area gantry LINEAR_GANTRY 12 = linear gantry RIGHT_SIDE 13 = right coordinates robot LEFT_SIDE 14 = left coordinates robot RIGHT_NORMAL 15 = right coordinates robot with normal arm length RIGHT_EXTEND 16 = right coordinates robot with extended arm length LEFT_NORMAL 17 = left coordinates robot with normal arm length LEFT_EXTEND 18 = left coordinates robot with extended arm length S_10UD 19 = S10 upside-down R_HOODECK 20 = Right Hood/deck opener L_HOODECK 21 = Left Hood/deck opener R_DOOR 22 = Right Door opener L_DOOR 23 = Left Door opener FRONT_SIDE 24 = front side for S450 BACK_SIDE 25 = back side for S450 S_TYPE 26 = S type for S450 NO_KINEMATICS 27 = for nobot with no kinematics LR_MATE 28 = LR Mate LR_MATE_UD 29 = LR Mate Upside-Down LR_MATE_L 30 = LR Mate left LR_MATE_L_UD 31 = LR mate left and upside down H_ARM 32 = for S900 L_ARM 33 = for S900 UPSIDE_DOWN 34 = for S700/S800 upside-down

Power Up: Set only during a controlled start.

$SCR_GRP[1].$axisorder[9]

Minimum: 0   **Maximum:** 16   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Axis Order

Description: A mapping array from the software axis index to servo hardware registers. It indicates which axis is controlled by a particular servo motor. For example, $axisorder[i]=j, where axis index i is connected to servo register j; (Axis i is controlled by servo motor j. i is commonly referred to as the software number and j as the hardware number). $axisorder[i]=0 indicates that there is no servo register associated with axis i.

Power Up: On_Cold_Start

$SCR_GRP[1].$axs_amp_num[1-2]

Minimum: 0   **Maximum:** 16   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Amplifier number of axis

Description: $SCR_GRP[].$axs_amp_num are set on SYSTEM variables screen at Control start. It mean which amplifier this index axis belongs to. For example, if $SCR_GRP[1].$axs_amp_num [1] is 1, The J1 axis of Group 1 belongs to the amplifier 1. This amplifier index is equal to one of $SCR.$amp_type.

Power Up: Set only during a controlled start.

$SCR_GRP[1].$axs_amp_num[3-4]

Minimum: 0   **Maximum:** 16   **Default:** 2   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Amplifier number of axis

Description: $SCR_GRP[].$axs_amp_num are set on SYSTEM variables screen at Control start. It mean which amplifier this index axis belongs to. For example, if $SCR_GRP[1].$axs_amp_num [1] is 1, The J1 axis of Group 1 belongs to the amplifier 1. This amplifier index is equal to one of $SCR.$amp_type.

Power Up: On_Cold_Start

$SCR_GRP[1].$axs_amp_num[5-6]

Minimum: 0   **Maximum:** 16   **Default:** 3   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Amplifier number of axis

Description: $SCR_GRP[].$axs_amp_num are set on SYSTEM variables screen at Control start. It mean which amplifier this index axis belongs to. For example, if $SCR_GRP[1].$axs_amp_num [1] is 1, The J1 axis of Group 1 belongs to the amplifier 1. This amplifier index is equal to one of $SCR.$amp_type.

Power Up: On_Cold_Start

$SCR_GRP[1].$axs_amp_num[7-9]

Minimum: 0   **Maximum:** 16   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Amplifier number of axis

Description: $SCR_GRP[].$axs_amp_num are set on SYSTEM variables screen at Control start. It mean which amplifier this index axis belongs to. For example, if $SCR_GRP[1].$axs_amp_num [1] is 1, The J1 axis of Group 1 belongs to the amplifier 1. This amplifier index is equal to one of $SCR.$amp_type.

Power Up: Set only during a controlled start.

$SCR_GRP[1].$axs_xyz_map[9]

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Axis Cartesian Map

Description: For positioners (robots with unknown kinematics) use coordinated motion. In the case of a linear axis, $axs_xyz_map defines the direction of the axis for base frame. In the case of a rotary axis, $axs_xyz_map defines the direction of the axis rotation. 0 = no map 1 = +x -1 = -x 2 = +y -2 = -y 3 = +z -3 = -z

Power Up: On_Cold_Start

Screen: SYSTEM Variables screen, SETUP COORD CAL screen.

$SCR_GRP[1].$brk_number[9]

Minimum: 0   **Maximum:** 6   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Brake Number

Description: Defines the brake number associated with the axis.

Power Up: On_Cold_Start

$SCR_GRP[1].$config_mask

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** CONFIG   **Memory:** Not available

Name: Config Mask

Description: Indicates which configuration bits are tested in the solution programs. The value depends on the robot type. $config_mask also indicates when multiple-turn joints are used. $config_mask affects the input and display of the configuration string when you specify or display positions.

Power Up: On_Cold_Start

$SCR_GRP[1].$coord_mask

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Mask for Available Jog Coordinate Frames

Description: Controls what jog frames the coordinate key cycles through. There is a bit defined for each coordinate system available: Bit 0 = Joint Mode Bit 1 = Jog Frame Bit 2 = World Frame Bit 3 = Tool Frame Bit 4 = User Frame

Power Up: Takes effect immediately

$SCR_GRP[1].$dd_motor[9]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Direct Drive Motor

Description: Indicates the axis uses a direct drive motor, if set to TRUE. Not supported in this release.

Power Up: On_Cold_Start

$SCR_GRP[1].$dest_data_p[8]

Minimum: 0x80000000 **Maximum:** 0x07FFFFFF **Default:** 0 **KCL/Data:** RO **Program:** RO **UIF:** Not available **CRTL:** Not available **Data Type:** INTEGER **Memory:** Not available

Name: MIR pointer for Distance Before

Description: When SFMTIME is loaded, Pointer of MIR is set.

Power Up: Takes effect immediately

$SCR_GRP[1].$dpos_dst

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** REAL **Memory:** Not available

Name: Distance to destination position

Description: When $M_POS_ENB = T, distance between current position and destination position on the program is set.

Power Up: Takes effect immediately

$SCR_GRP[1].$dsp_ercnt[9]

Minimum: 0 **Maximum:** 0x7FFF **Default:** 0 **KCL/Data:** RW **Program:** RW **UIF:** Not available **CRTL:** Not available **Data Type:** SHORT **Memory:** Not available

Name: Error counter from DSP

Description: When SRVO-57 FSSB disconnect alarm,SRVO-55,56,60 occurs, error counts on DSP is saved to this variable. Axis number is based on HOST axis number $scr_grp[g].$dsp_ercnt[n] : Error counter on DSP (group g, axis n)

Power Up: Takes effect immediately

$SCR_GRP[1].$dst_mir_p

Minimum: Not available **Maximum:** Not available **Default:** Not available **KCL/Data:** Not available **Program:** RO **UIF:** Not available **CRTL:** Not available **Data Type:** INTEGER **Memory:** Not available

Name: MIR pointer to destination position

Description: When $M_POS_ENB = T, Pointer of current MIR is set.

Power Up: Takes effect immediately

$SCR_GRP[1].$ext_length[3]

Minimum: 0. **Maximum:** 100000. **Default:** 0. **KCL/Data:** RO **Program:** RO **UIF:** Not available **CRTL:** Not available **Data Type:** REAL **Memory:** Not available

Name: Extended Axis Length

Description: Defines the link length of the extended axis.

Power Up: On_CNTRL_Start

$SCR_GRP[1].$ext_offset[3]

Minimum: 0. **Maximum:** 100000. **Default:** 0. **KCL/Data:** RO **Program:** RO **UIF:** Not available **CRTL:** Not available **Data Type:** REAL **Memory:** Not available

Name: Extended Axis Offset

Description: Defines the joint offset (in mm) of the extended axis.

Power Up: On_CNTRL_Start

$SCR_GRP[1].$ext_order[3]

Minimum: 0 **Maximum:** 9 **Default:** 0 **KCL/Data:** RO **Program:** RO **UIF:** Not available **CRTL:** Not available **Data Type:** BYTE **Memory:** Not available

Name: Extended Axis Order

Description: Maps the extended axis 1-3 to the software axis 1-9. The variable $SCR_GRP.$axisorder further maps all software axes to hardware axes. For example, if $ext_order[1] = 7 then axis [7] is the first extended axis.

Power Up: On_Cold_Start

$SCR_GRP[1].$ext_xyz_map[3]

Minimum: 0   **Maximum:** 3   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Extended Axis Cartesian Map

Description: For integrating an extended axis to the robot for coordinated Cartesian motion. $ext_xyz_map defines if the axis corresponds to the x, y, or z robot base coordinate frame and linear axes. For rotary axes, $ext_xyz_map defines the axis of rotation of the rotary axis. 0 = no map 1 = x axis 2 = y axis 3 = z axis

Power Up: On_Cold_Start

$SCR_GRP[1].$flextooltyp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: FlexTool Type

Description: A value more than 0 means that this group is a FlexTool Robot.

Power Up: On_Cold_Start

$SCR_GRP[1].$hw_strt_axs

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Hardware Start Axis

Description: Indicates the first hardware axis associated with the motion group.

Power Up: On_Cold_Start

$SCR_GRP[1].$joglim_jnt[9]

Minimum: 0   **Maximum:** 100   **Default:** 12   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Jog Speed Limit In Joint Jogging

Description: Percentage of joint speed limit during joint jogging. The value is different based on the individual robot model.

Power Up: On_Cold_Start

$SCR_GRP[1].$kinem_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Kinematics Enabled information

Description: This value shows kinematics information of the robot library: 0: Kinematics has not been defined. 1: Only forward kinematics has been defined. 2: Both forward and inverse kinematics have been defined.

Power Up: On_Cold_Start

$SCR_GRP[1].$link_length[6]

Minimum: 0.   **Maximum:** 100000.   **Default:** 0.   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Robot Link Length

Description: Reserved for internal used by FANUC Robotics. This variable is used in the Kinematic calculation for certain robots.

Power Up: On_Cold_Start

$SCR_GRP[1].$loadratio[9]

Minimum: 0.   **Maximum:** 15.   **Default:** 0.   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Load Ratio

Description: Defines the ratio between the external load inertia and the motor inertia.

Power Up: On_Cold_Start

$SCR_GRP[1].$m_dst_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Moving distance accumulation function

Description: Switch to enable Moving distance accumulation function. When it is enabled, it accumulates moving distance of TCP position and it writes to $SCR_GRP[].$MOVE_DST. It starts to accumulate when it is enabled. : T Enable : F Disable

Power Up: Takes effect immediately

$SCR_GRP[1].$m_pos_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Current position from machine pulse

Description: Switch to enable current position function from machine pulse : T Enable : F Disable When it is enabled ,Joint angle and X,Y,Z data of TCP position are copied to # $MCH_ANG[] and $MCH_POS

Power Up: Takes effect immediately

$SCR_GRP[1].$mch_ang[9]

Minimum: -10000000.   **Maximum:** 10000000.   **Default:** 0.   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Current joint position from machine pulse

Description: Current Joint position When $m_pos_enb = T and program motion or jogging executes, it sets current TCP position

Power Up: Takes effect immediately

$SCR_GRP[1].$move_dst

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Moving distance accumulation

Description: When $M_DST_ENB = T, accumulation of TCP moving distance is set

Power Up: Takes effect immediately

$SCR_GRP[1].$num_axes

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Number of Axes

Description: The total number of axes that exist in the motion group.

Power Up: On_Cold_Start

$SCR_GRP[1].$num_dual

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: The number of dual axes config

Description: The number of dual axes in this group.

Power Up: On_Cold_Start

$SCR_GRP[1].$num_pt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Number of Point Records

Description: Reserved for internal use by FANUC Robotics. The number of point records that will be created in this group.

Power Up: On_Cold_Start

$SCR_GRP[1].$num_rob_axs

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Number of Robot Axes

Description: The number of robot axes that exist in a motion group. All remaining axes, that are not in a motion group, are considered extended axes.

Power Up: On_Cold_Start

$SCR_GRP[1].$num_seg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Number of Segments

Description: Reserved for internal use by FANUC Robotics. The number of segments that will be created in this group.

Power Up: On_Cold_Start

$SCR_GRP[1].$ofst[9] STRUCTURE

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** AX_OFS_T   **Memory:** Not available

Name: Axis Offset Variable Structure

Description: Defines the offsets (in mm) between neighboring axes.

Power Up: On_Cold_Start

Screen: SYSTEM Variables screen, SETUP COORD CAL screen.

$SCR_GRP[1].$ofst[9].$X

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** AX_OFS_T   **Memory:** Not available

Name: Axis Offset

Description: Defines the offsets (in mm) between neighboring axes.

Power Up: On_Cold_Start

Screen: SYSTEM Variables screen, SETUP COORD CAL screen.

$SCR_GRP[1].$ofst[9].$Y

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** AX_OFS_T   **Memory:** Not available

Name: Axis Offset

Description: Defines the offsets (in mm) between neighboring axes.

Power Up: On_Cold_Start

Screen: SYSTEM Variables screen, SETUP COORD CAL screen.

$SCR_GRP[1].$ofst[9].$Z

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** AX_OFS_T   **Memory:** Not available

Name: Axis Offset

Description: Defines the offsets (in mm) between neighboring axes.

Power Up: On_Cold_Start

Screen: SYSTEM Variables screen, SETUP COORD CAL screen.

$SCR_GRP[1].$op_brk_num[9]

Minimum: 0   **Maximum:** 6   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Option Brake Number

Description: When one axis has two brakes (ex. M-500), this variable is used to assign the brake DO number for the second brake for this axis.

Power Up: N/A

$SCR_GRP[1].$robot_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING **Memory:** Not available

Name: Robot Identification

Description: Defines the robot identification string.

Power Up: On_Cold_Start

$SCR_GRP[1].$robot_model

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING **Memory:** Not available

Name: Robot Model

Description: Defines the robot model string.

Power Up: On_Cold_Start

$SCR_GRP[1].$rotary_axs[9]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Rotary Axis

Description: Indicates the axis is rotary, if set to TRUE; otherwise, it is a linear axis.

Power Up: On_Cold_Start

$SCR_GRP[1].$sv_code_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING **Memory:** Not available

Name: Servo Code Identification

Description: Defines the servo code identification string.

Power Up: Set only during a controlled start.

$SCR_GRP[1].$sync_m_axis

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Synchronous Master Axis (not supported)

Description: Indicates which robot axis motor has been designated as the master axis for robot models with dual drive (synchronous) control. Not supported in this release.

Power Up: On_Cold_Start

$SCR_GRP[1].$sync_s_axis

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Synchronous Slave Axis (not supported)

Description: Indicates which robot axis motor has been designated as the slave axis for robot models with dual drive, or synchronous, control. Not supported in this release.

Power Up: On_Cold_Start

$SCR_GRP[1].$update_map

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: update map

Description: Each bit means update status of the modification for this group. Do not change this system variable.

Power Up: On_Cold_Start

$SCR_GRP[1].$use_tbcart

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Turbo Move Switch for Cartesian Motion

Description: If set to TRUE, the Cartesian (linear and circular) turbo move softpart is used for the motion system. If set to FALSE, the Cartesian standard short move softpart is used for the motion system. This flag is initialized during robot library initialization.

Power Up: On_Cold_Start

$SCR_GRP[1].$use_tbjnt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Turbo Move Switch for Joint Motion

Description: If set to TRUE, the Joint turbo move softpart is used for the motion system. If set to FALSE, the Joint standard short move softpart is used for the motion system. This flag is initialized during robot library initialization.

Power Up: Takes effect immediately

$SCR_GRP[1].$wrist_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Wrist Type

Description: Defines the type of wrist and the number of robot axes used with that wrist. The meanings associated with the values 0 through 9 depend on which robot is being described: NORMAL_WRIST 0 = normal wrist F_FORWARD 1 = F forward wrist F_DOWN 2 = F down wrist E_FORWARD 3 = E forward wrist E_DOWN 4 = E down wrist NO_WRIST 5 = no wrist F_FORWARD_HS 6 = high speed F forward wrist F_DOWN_HS 7 = high speed F down wrist E_FORWARD_HS 8 = high speed E forward wrist E_DOWN_HS 9 = high speed E down wrist INLINE 10 = in line wrist OFFSET 11 = offset wrist INLINE_HS 12 = high speed in line wrist OFFSET_HS 13 = high speed offset wrist

Power Up: On_Cold_Start

$SCR_GRP[1].$wrst_axis_e

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Wrist Axis End

Description: The axis number of the last wrist axis. For a 6 axis robot, this is normally 6.

Power Up: On_Cold_Start

$SCR_GRP[1].$wrst_axis_s

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Wrist Axis Start

Description: The axis number of the first wrist axis. For a 6 axis robot, this is normally 4.

Power Up: On_Cold_Start

$SEL_DEFAULT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Select Default

Description: This system variable is used in the program SELECT screen to determine what set of programs are displayed at cold start. You can override this setting using the [TYPE] function key on the SELECT screen. Values are defined by the program type constants in TPE.KE as follows: PT_KRLPRG : INTEGER = 2 -- KAREL program PT_MNE_UNDEF: INTEGER = 1 -- (hex 0001) TPE program of undefined sub type PT_MNE_JOB : INTEGER = 257 -- (hex 0101) TPE job PT_MNE_PROC : INTEGER = 513 -- (hex 0201) TPE process PT_MNE_MACRO: INTEGER = 769 -- (hex 0301) TPE macro The default, 16, indicates all programs.

Power Up: N/A

Screen: SELECT screen, SYSTEM Variables screen

See Also: $KAREL_ENB, $JOBPROC_ENB

$SEMIPOWERFL

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enable semi-hot start power-fail recovery

Description: If $SEMIPOWERFL is TRUE, TPP programs which running or paused when the controller is powered-down are in paused state and on the same line when the controller is powered-up. If it is false, all programs will be in ABORTED state at power-up.

Power Up: On_Cold_Start

See Also: $SEMIPWFDO, $PWR_SEMI, $PWF_IO

$SEMIPWFDO

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Digital output port to be turned on at sem-hot start

Description: If non-zero, this indicates a digital output port to be turned ON at the start of semi-hot power-fail recovery. This is turned off near the end of semi-hot power-fail recover.

Power Up: On_Cold_Start

See Also: $SEMIPOWERFL

$SERV_OUTPUT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Inernal use variable

Description: Internal use variable

Power Up: N/A

$SERVENT[1-2] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Server Entry

Description: An array of structures defining the Internet Protocol Services. Individual fields within this structure are described below.

Power Up: On_Cold_Start

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$SERVENT[1].$S_NAME

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Service name

Description: Identifies the service.

Power Up: On_Cold_Start

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$SERVENT[1].$S_PORT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Port

Description: Port number associated with this service.

Power Up: On_Cold_Start

Screen: SYSTEM Variable screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$SERVENT[1].$S_PROTO

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Server Protocol

Description: Name of the Protocol associated with this service.

Power Up: On_Cold_Start

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$SERVICE_KL[1-16]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Karel program to execute resume program

Description: For internal use only. Do not modify this system variable. The RESUME program is executed through these KAREL programs. The number of the array[16], indicates the number of PX task. The RESUME PROGRAM for PX task 1 is executed through SVCPRG_1.PC.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen and Auto Error Recovery Setup screen

$SERVICE_KRL[1-5]

Minimum: ""   **Maximum:** ""   **Default:** "SVCPRG_[1-5] "   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: KAREL program to execute resume program

Description: For internal use only. Do not modify this system variable. RESUME program is executed through these KAREL programs. The length of the array[5], indicates the number of motion groups. RESUME PROGRAM for motion group 1 is executed through SVCPRG_1.PC.

Power Up: Takes effect immediately

$SERVICE_PRG[1-16]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Resume program

Description: For internal use only. Do not modify this system variable. When RESUME PROGRAM function is enabled and a RESUME PROGRAM statement is executed, the specified program is assigned to this variable. The length of the array[16], indicates the number of PX tasks.

Power Up: Takes effect immediately

$SFLT_WAILIM

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Waiting limiter for SOFTFLOAT ON

Description: Waiting limiter for SOFTFLOAT ON [ms]

Power Up: Takes effect immediately

$SGGUN1.$ATUN.$pos_err_mgn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Position error margin (to be added to move error count, observed during autotuning)

Description: This variable provides a margin to ensure that move error excess is not mis-detected, during position control. A series of exercises are executed during autotuning, and move error count is observed. After the exercise completes $param_group[].$mover_offst[] is set to the larger of(a,b) where: a = ($SGGUN#.$ATUN.$pos_err_mgn * encscales) + (max observed error) b = 2 * (max observed error)

Power Up: On Cold Start

$SGGUN1.$SETUP.$mver_inh_mg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Move error inhibit margin

Description: This variable provides a margin to ensure that the move error inhibit flag is not cleared too soon. Note that move error checking is re-enabled after either:

- The distance moved since force control became false > push depth + margin, or

- The Move error drops below $param_group[].$mover_offst[]/2 The default value of $SGGUN1.$SETUP.$mver_inh_mg = 5.0mm.

Normally, it is not necessary to modify this value.

Power Up: N/A

$SGGUN1.$SETUP.$tc_almiopls

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Pulse width for thickness check alarm output

Description: If part thickness out of tolerance is detected (at thickness check), then an output will be asserted for the duration specified by: $SGGUN1.$SETUP.$tc_almiopls (default=500ms).

Power Up: N/A

$SGPXDATA.$INFO[1].$g1_prs_pos[1-2]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Pressure position for gun1

Description: When a synchronized move to pressure (function) is enabled this variable is automatically set based on contact speed, part thickness, push margin, and pushing depth.

Power Up: N/A

$SGPXDATA.$INFO[1].$g1_sync_pos[1-2]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Synchronization (pressure start) position for gun1.

Description: When synchronized move to pressure (function) is enabled, this variable is automatically set to a value that ensures synchronized contact for a movable and fixed tip.

Power Up: N/A

$SGPXDATA.$INFO[1].$g2_prs_pos[1-2]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Pressure position for gun2

Description: When the synchronized move to pressure (function) is enabled this variable is automatically set based on contact speed, part thickness, push margin, and pushing depth.

Power Up: N/A

$SGPXDATA.$INFO[1].$g2_sync_pos[1-2]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Synchronization (pressure start) position for gun2

Description: When the synchronized move to pressure (function) is enabled, this variable is automatically set to a value that ensures synchronized contact for a movable and fixed tip.

Power Up: N/A

$SGPXDATA.$INFO[1].$utl_prg_typ

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Utility program type

Description: This variable indicates whether one of the special servogun utility programs is executing. This variable is automatically set, at spot or press_motn instruction execution. Program ids are as follows: none = 0 AT_TPXX = 1 AT_TP006 = 2 TW_LIBXX = 3 SGTDFLUT = 4 TWTZRCLB = 5

Power Up: N/A

$SGSCH1[1].$prs_spd_rat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Press speed rate

Description: This variable is used to scale the calibrated pressure speed as follows: $sgsch#[].$prs_spd_rat / 100 * calibrated speed.

Power Up: N/A

$SGSYSCFG.$auto_calpus

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** BOOLEAN   **Memory:** CMOS

Name: Automatically sets the pushing depth during force calibration

Description: This variable determines whether pushing depth is automatically calculated during force calibration. If $SGSYSCFG.$auto_calpus ==FALSE, then you have to enter the pushing depth manually. If $SGSYSCFG.$auto_calpus ==TRUE, then the pushing depth is estimated based on data from tuning.

Power Up: On_Cold_Start

$SGSYSCFG.$sho_prs_spd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Show press speed

Description: This variable determines whether press speed rate (and calibrated press speed) appear on the pressure schedule screens. If sho_prs_spd = TRUE, then press speed rate is displayed.

Power Up: N/A

$SGSYSCFG.$sho_pshdpth

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Show pushing depth

Description: This variable determines whether pushing depth is displayed on the pressure schedule DETAIL screen. If sho_pushdpth = TRUE, then pushing depth is displayed.

Power Up: N/A

$SGSYSCFG.$sho_twd_prg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Show tip wear down program

Description: This variable is used to show or hide the following tip wear programs. At power-up, if the bit number (left column) is set, then the invisible attribute is written to the program in the right column. Conversely, if the bit is not set, then the invisible attibute is cleared. /0: TWTRETRY /1: TWTRSCLB /2: TWTOPNGN /3: TWTOFSET

Power Up: N/A

$SGSYSDG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SG_SYSDG_T   **Memory:** Not available

Name: Dual servogun system configuration

Description: Elements within this structure are used to specify dual servogun configuration settings. These settings are system-wide: they apply to all guns and equipment.

Power Up: N/A

$SGSYSDG.$dg_upd_msk

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Dual gun update mask

Description: This variable is a compatibility switch to enable/disable functions specific to dual gun. This switch is not used.

Power Up: N/A

$SGSYSDG.$mstinst_sgl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Master instruction single

Description: This sysvar specifies whether the Gun Zero Master[] tp instruction performs a single axis master or a group master. If $sgsysdg.$mstinst_sglit is TRUE, Single axis master is performed. If it is FALSE(default), Group master is performed.

Power Up: N/A

$SGSYSDG.$mstscrn_sgl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Single axis master for screen-initiated master

Description: This variable specifies whether single axis master or group master is performed when mastering is performed on the gun master screen or gun SETUP Utility screen. If $sgsysdg.$mstscrn_sgl is TRUE: Single axis master is performed. If it is FALSE(default): Group master is performed.

Power Up: N/A

$SGSYSDG.$uga_idx_4gb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use GunA index for GunB

Description: This variable specifies whether 1 or 2 parameters appear in the spot instruction. This variable has no effect on single gun systems. FALSE: Gun A and Gun B data indices are specified in spot instruction. SPOT[SD=(1,1), P=(2,2), S=(3,3), ED=(4,4)] TRUE: Data indices are specified for Gun A only, in spot instruction. SPOT[SD=1, P=2, S=(3,3), ED=4]Gun B uses the same data indices

Power Up: N/A

$SGSYSDG.$uga4cmndat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Use GunA for common data

Description: This variable specifies whether GunA is used for non-axis (common) data only. Note: If uga_tbl_4gb=TRUE, then this setting practically has no effect, since gun B data is never used. If $SGSYSDG.$uga4cmndat TRUE: Gun A data (distance, pressure schedule) is used for non-axis (group/common) data during the S=(0,1) operation. If it is FALSE: Gun B data (distance, pressure schedule) is used for non-axis (group/common) data during the S=(0,1) operation. Note: GunA data is used during other operations (S=1,1), S=(1,0).

Power Up: N/A

$SGSYSTWD.$wr_alm_sev

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Cap wear severity

Description: This variable defines the severity of a cap wear exceeded fault. The values are:

- -1: No alarm
- 0: Warn
- 1: Fault

Power Up: N/A

$SHELL_CFG STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Shell Configuration

Description: Describes how the main system control functions are performed. The R-J3 controller "main" program is called the shell. This program can be run when the controller is turned on and might be the "system" shell. Individual fields within this structure are defined below.

Power Up: N/A

$SHELL_CFG.$CONT_ONLY

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Continue Only

Description: UOP Cycle Start Continue Only Function Used to start the program under the forced ending according to the START signal. Setting Start only the program under the interruption for TRUE. Start the program selected now from the line for FALSE now. If $SHELL_CFG.$cont_only is FALSE, then UOP CYCLE START acts like SOP CYCLE START, i.e it can run a program or continue a paused program. If $SHELL_CFG.$cont_only is TRUE, then UOP CYCLE START can only continue a paused program, and has no effect if no program is running.

Power Up: N/A

$SHELL_CFG.$do_home_sop

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: $SHELL_CFG.$DO_HOME_SOP

Description: This variable is only effective when the common shell is installed. If common shell is installed and enabled, and $SHELL_CFG.$DO_HOME_SOP = TRUE, then when the robot is at home SOP USER LED 2 will be on.

Power Up: N/A

$SHELL_CFG.$e_recov_msk

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Error recovery mask

Description: In SpotTool+ and HandlingTool with the MH plugin, this variable allows you to configure whether the error recovery menu is automatically displayed for you when an error occurs. Bit 1 of this variable means that forcing of the error recovery menu is enabled. The other bits of this mask are currently undefined, so currently setting this variable to 1 will enable the forcing of the recovery menu. If ou do not want the error recovery menu automatically forced, then set bit 1 of this variable = 0.

Power Up: N/A

$SHELL_CFG.$ERR_REPORT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Error Report

Description: A report containing the errors that occurred.

Power Up: N/A

$SHELL_CFG.$ext_sem1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Extended Shell semaphore to KAREL shell

Description: Specifies the system semaphore used to communicate with the KAREL extended shell. This should only be changed if it conflicts with another semaphore.

Power Up: On_Cold_Start

Screen: SYSTEM variables screen.

See Also: na

$SHELL_CFG.$ext_sem2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Extended Shell semaphore from KAREL shell

Description: Specifies the system semaphore used to communicate with the KAREL extended shell. This should only be changed if it conflicts with another semaphore.

Power Up: On_Cold_Start

Screen: SYSTEM variables screen.

See Also: na

$SHELL_CFG.$extend_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Enable KAREL extension logic

Description: Bit mask that sets which extended logic requests are enabled. This is used to save processing time when customized logic is not required.

Power Up: N/A

Screen: SYSTEM variables screen.

See Also: na

$SHELL_CFG.$init_tmo

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Initialization timeout

Description: Timeout, in seconds, for the initialization of the KAREL shell extension. This is required in order for the C shell to verify that the KAREL shell extension is operational. The default is 30 seconds. It is recommended to lengthen this only if the application requires it.

Power Up: On_Cold_Start

Screen: SYSTEM variables screen.

See Also: na

$SHELL_CFG.$isol_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Isolate and interlock feature

Description: Set TRUE to enable support for the interlock and isolate modes. This feature also requires the "control reliable" hardware option.

Power Up: On_Cold_Start

Screen: SYSTEM variables screen.

See Also: na

$SHELL_CFG.$JOB_BASE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Shell Job Base

Description: Sets the base number when the RSR and the PNS functions are used. It can be updated using the the SETUP RSR/PNS screen. The PNS binary input is added to $SHELL_CFG.$job_base. The result is converted to a 4 character string (0 padded if necessary). This string is appended to $SHELL_CFG.$job_root to create the name of the job be run when UOP PROD START is asserted. The name of the program is stored in $PNS_PROGRAM for comparison with other run requests.

Power Up: N/A

$SHELL_CFG.$JOB_ROOT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Job Root

Description: The shell job root string. Not currently used. This string is the starting root name of the job to run when a PNS signal is detected. A 4 character string that consists of $SHELL_CFG.$job_root + $SHELL_CFG.$job_base (with leading 0s if needed) is concatenated to $SHELL_CFG.$job_root.

Power Up: N/A

$SHELL_CFG.$karel_sop

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: SOP Flag

Description: Flag that determines which task will detect SOP input signals. If $SHELL_CFG.$KAREL_SOP is FALSE then the KAREL shell, if running, will not detect SOP signals, the system condition handler task will. If $SHELL_CFG.$KAREL_SOP is TRUE, then the KAREL shell, if running, detects any SOP input signals (except for USER PB1 and USER PB2, if assigned to a macro).

Power Up: N/A

$SHELL_CFG.$karel_uop

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: UOP Flag

Description: Determines which task will detect UOP input signals. If $SHELL_CFG.$karel_uop is FALSE then the KAREL shell, if running, will not detect UOP signals, the system condition handler task will. If $SHELL_CFG.$karel_uop is TRUE, then the KAREL shell, if running, detects any UOP input signals.

Power Up: N/A

$SHELL_CFG.$maint_styl

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Maintenance style table option

Description: If TRUE, the style table entries 27 - 31 are treated special.

Power Up: On_Cold_Start

Screen: SYSTEM variables screen.

See Also: na

$SHELL_CFG.$manrq_tmo

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Manual request timeout

Description: Maximum time, in seconds, that the shell will wait for the PLC to trigger a style select following a manual style request by the controller. If zero, there will not be a timeout and the request will only be cancelled if the controller is switched to interlock mode.

Power Up: On_Cold_Start

Screen: SYSTEM variables screen.

See Also: na

$SHELL_CFG.$NUM_RSR[1-8]

Minimum: 0   **Maximum:** 9999   **Default:** 0   **KCL/Data:** RW   **Program:** Not available
UIF: RW   **CRTL:** RW   **Data Type:** SHORT   **Memory:** CMOS

Name: RSR Number

Description: Defines the RSRs in a multi-tasking group and displays the number of the signal that can be registered with RSR. Used when the optional RSR multi-tasking feature is purchased. Allows RSR multi-tasking by defining the number of RSR signals assigned for each group of RSRs. For this optional feature, there are 8 RSR input signals therefore the sum of all $num_rsr array elements cannot exceed 8. This sysvar is not used for a single tasking RSR system where one RSR job is executed at a time, and others are put into a queue. For example, if $SHELL_CFG.$num_rsr[1] = 3, then RSR's 1, 2, 3 are grouped together to run one task. If one of these 3 is already running, then it is queued. If $SHELL_CFG.$num_rsr[2] = 3 then RSR's 4, 5, 6 are grouped together to run a second task, and so on.

Power Up: N/A

$SHELL_CFG.$num_rsr[4]

Minimum: 0   **Maximum:** 9999   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: RSR Number

Description: Defines the RSRs in a multi-tasking group and displays the number of the signal that can be registered with RSR. Used when the optional RSR multi-tasking feature is purchased. Allows RSR multi-tasking by defining the number of RSR signals assigned for each group of RSRs. For this optional feature, there are 8 RSR input signals therefore the sum of all $num_rsr array elements cannot exceed 8. This sysvar is not used for a single tasking RSR system where one RSR job is executed at a time, and others are put into a queue. For example, if $SHELL_CFG.$num_rsr[1] = 3, then RSR's 1, 2, 3 are grouped together to run one task. If one of these 3 is already running, then it is queued. If $SHELL_CFG.$num_rsr[2] = 3 then RSR's 4, 5, 6 are grouped together to run a second task, and so on.

Power Up: N/A

$SHELL_CFG.$PNS_ENABLE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Effective/invalidity of PNS

Description: Determines whether RSR or PNS is enabled on a system (they both cannot be enabled at the same time). If $SHELL_CFG.$pns_enable = TRUE, then PNS is active, and RSRs are disabled.

Power Up: On_Cold_Start

$SHELL_CFG.$prod_mode

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Production start signal type

Description: Indicates what type of input is used for the production start signal; 1 = UOP, 2 = DIN.

Power Up: On_Cold_Start

Screen: SETUP Program Selection menu and SYSTEM variables screen.

See Also: na

$SHELL_CFG.$refps_pr_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: $SHELL_CFG.$refps_pr_id

Description: This sysvar is used along with the MOVE_HOME macro supplied with the common shell. This sysvar holds the reference position index that will be used to copy the home position into, and then move to when the MOVE_HOME macro is executed. The default is reference position 1. Choose a reference position that is not used in your setup.

Power Up: N/A

$SHELL_CFG.$RSR_ACK_PUL

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: RSR Acknowledgement Pulse Length

Description: Defines the length of the pulse sent out on ACK1-ACK4 when $SHELL_CFG.$rsr_ackenbl = TRUE.

Power Up: N/A

$SHELL_CFG.$RSR_ACKENBL

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Effective/invalidity of RSR Reception Check Signal

Description: RSR Acknowledgement Enable Flag If this is set to TRUE, then when an RSR is detected, an acknowledgement is returned to the PLC on the corresponding ACK1-ACK8 UOP output signals. The pulse width is specified in $SHELL_CFG.$rsr_ack_pul.

Power Up: N/A

$SHELL_CFG.$rsr_enable[4]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: RSR enable

Description:

Power Up: N/A

$SHELL_CFG.$RSR1_NAME

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: RSR1 Name

Description: Not currently used. This is the name of the job that will be run when RSR1 is detected.

Power Up: N/A

$SHELL_CFG.$RSR2_NAME

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: RSR2 Name

Description: Not currently used. This is the name of the job that will be run when RSR2 is detected.

Power Up: N/A

$SHELL_CFG.$RSR3_NAME

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: RSR3 Name

Description: Not currently used. This is the name of the job that will be run when RSR3 is detected.

Power Up: N/A

$SHELL_CFG.$RSR4_NAME

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: RSR4 Name

Description: Not currently used. This is the name of the job that will be run when RSR4 is detected.

Power Up: N/A

$SHELL_CFG.$sel_type

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Program selection type

Description: Specifies the program selection option: 0=RSR, 1=PNS, 2=Style table, 9=custom.

Power Up: On_Cold_Start

Screen: SETUP Program Selection menu and SYSTEM variables screen.

See Also: na

$SHELL_CFG.$shell_ext

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Extended Shell Support

Description: If TRUE, the extended shell support will be started, including the KAREL extension program, If FALSE, the shell will work as it did in the previous release. Either the C shell or a KAREL shell will run depending on a name specified in $SHELL_CFG.$SHELL_NAME.

Power Up: On_Cold_Start

Screen: SYSTEM variables screen.

See Also: na

$SHELL_CFG.$SHELL_NAME

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Name of the Shell Task

Description: This is the name of the shell task to be run automatically at each cold start. If this is uninitialized or nil, then the system 'C' shell task is run. If this is set to a valid task name, then the name of the task is run.

Power Up: N/A

$SHELL_CFG.$TPFWD_KAREL

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: TP FWD/BWD Flag

Description: Determines which task will detect TP FWD/BWD input signals. If $SHELL_CFG.$tpfwd_karel is FALSE then the KAREL shell, if running, will not detect SOP signals, the teach pendant task will. If $SHELL_CFG.$tpfwd_karel is TRUE, then the KAREL shell, if running, detects any TW FWD/BWD input signals (except for USER PB1 and USER PB2, if assigned to a macro).

Power Up: N/A

$SHELL_CFG.$UOP_SEL_STA

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: PNS Selected Program

Description: If this is TRUE, then the UOP PROGRUN and PAUSED output LED's reflect the status of $PNS_PROGRAM, regardless of any other task being run. If this is FALSE, then the UOP PROGRUN and PAUSED output signals reflect the status of $TP_DEFPROG.

Power Up: N/A

$SHELL_CFG.$USE_ABORT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
BOOLEAN   **Memory:** Not available

Name: UOP Cycle Stop Abort Function

Description: If $SHELL_CFG.$USE_ABORT is FALSE, then the UOP CYCLE STOP will stop the
program after the current cycle is over. Pressing CYCLE STOP does not immediately stop program
execution. If $SHELL_CFG.$use_abort is TRUE, then UOP CYCLE STOP will abort the program at
the end of the current cycle.

Power Up: N/A

$SHELL_CHK[1-16]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not
available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
SHELL_CHK_T   **Memory:** Not available

Name: Job startup checking

Description: These variables are specifically for the job startup checking feature. Each index in the
array is assigned to a specific check. 1 home position check 2 resume position check 3 simulated I/O
check 4 general speed override check 5 Program speed override check 6 Machine lock check 7 Single
step check 8 Process ready (application specific)

Power Up: na

Screen: na

See Also: na

$SHELL_CHK[1].$enable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Shell startup check enable

Description: TRUE enables this check when initially running a program.

Power Up: N/A

Screen: SETUP Prog Select Checks DETAIL menu, and SYSTEM variables screen.

See Also: na

$SHELL_CHK[1].$errpost

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Shell startup check post error

Description: #If TRUE and the check ultimately fails, an error message is posted.

Power Up: N/A

Screen: SETUP Prog Select Checks DETAIL menu, and SYSTEM variables screen.

See Also: na

$SHELL_CHK[1].$force

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Shell startup check force

Description: If TRUE, the shell will force the condition to the proper state (e.g., set the speed override to 100%). This is not available for all checks.

Power Up: N/A

Screen: SETUP Prog Select Checks DETAIL menu, and SYSTEM variables screen.

See Also: na

$SHELL_CHK[1].$prompt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Shell startup check prompt

Description: If TRUE and the check fails, the user will be prompted for what action to take. Depending on the specific check, the options can be to force the condition, ignore it, recheck, or abort the program startup.

Power Up: N/A

Screen: SETUP Prog Select Checks DETAIL menu, and SYSTEM variables screen.

See Also: na

$SHELL_CHK[1].$resume

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Shell startup check resume

Description: TRUE enables this check when continuing a paused program.

Power Up: N/A

Screen: SETUP Prog Select Checks DETAIL menu, and SYSTEM variables screen.

See Also: na

$SHELL_CHK[1].$warn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Shell startup was forced warning

Description: If TRUE and the check is forced (see $FORCE above), an informational warning message is posted.

Power Up: N/A

Screen: SETUP Prog Select Checks DETAIL menu, and SYSTEM variables screen.

See Also: na

$SHELL_CHK[16]

Minimum: na   **Maximum:** na   **Default:** na   **KCL/Data:** na   **Program:** na   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRUCTURE   **Memory:** Not available

Name: Job startup checking

Description: These variables are specifically for the job startup checking feature. Each index in the array is assigned to a specific check. 1 home position check 2 resume position check 3 simulated I/O check 4 general speed override check 5 Program speed override check 6 Machine lock check 7 Single step check 8 Process ready (application specific)

Power Up: N/A

Screen: na

See Also: na

$SHELL_COMM

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** na   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHELL_COMM_T   **Memory:** Not available

Name: Shell Communication

Description: These variables are used to communicate between the C Shell and KAREL Extension Shell.

Power Up: N/A

Screen: na

See Also: na

$SHELL_COMM.$func

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Shell function code (Internal use only)

Description: Function code from C to KAREL Extension Shell

Power Up: N/A

Screen: System Variables screen.

See Also: na

$SHELL_COMM.$parm1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Shell parameter 1 (Internal use only)

Description: Parameter between C and KAREL extension shells.

Power Up: na

Screen: System Variable screen.

See Also: na

$SHELL_COMM.$parm2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Shell parameter 2 (Internal use only)

Description: Parameter between C and KAREL extension shells.

Power Up: na

Screen: System Variable screen.

See Also: na

$SHELL_COMM.$parm3

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Shell parameter 3 (Internal use only)

Description: Parameter between C and KAREL extension shells.

Power Up: na

Screen: System Variable screen.

See Also: na

$SHELL_COMM.$parm4

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Shell parameter 4 (Internal use only)

Description: Parameter between C and KAREL extension shells.

Power Up: N/A

Screen: System Variable screen.

See Also: na

$SHELL_COMM.$status

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Shell status code

Description: Status code returned from KAREL extension shell to the C shell.

Power Up: N/A

See Also: na

$SHELL_WRK STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Shell Work Area

Description: This variable describes the current state of the system. The variables in this structure are read only. They are set by the teach pendant editor. Individual fields within this structure are described below.

Power Up: N/A

$SHELL_WRK.$by_manual

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Cursor Moved Manually

Description: Indicates that you has manually moved the cursor in the edited program.

Power Up: N/A

$SHELL_WRK.$chk_force

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Forced pre-startup checks

Description: A bit-mask that indicates which pre-startup checks were forced to the correct state on the most recent program startup or continue.

Power Up: N/A

Screen: SYSTEM variables screen.

See Also: na

$SHELL_WRK.$chk_ignore

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Bypasses pre-startup checks

Description: A bit-mask that indicates which pre-startup checks failed, but were bypassed by the user in response to a prompt.

Power Up: N/A

Screen: SYSTEM variables screen.

See Also: na

$SHELL_WRK.$chk_raw

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Original pre-startup checks

Description: A bit-mask that indicates which pre-startup checks initially failed on the most recent program startup or continue.

Power Up: N/A

Screen: SYSTEM variables screen.

See Also: na

$SHELL_WRK.$chk_stat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Final pre-startup checks

Description: A bit-mask that indicates the final status of the pre-startup checks. If this is non-zero, then the program did not start or continue

Power Up: N/A

Screen: SYSTEM variables screen.

See Also: na

$SHELL_WRK.$cur_decsn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Current decision code

Description: Current value of the decision code as read at the time that the current style #program was initiated.

Power Up: N/A

Screen: SYSTEM variables screen.

See Also: na

$SHELL_WRK.$cur_opta

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Current option A value

Description: Current values (0 or 1) of the style option bits as read at the time that the current style program was initiated.

Power Up: N/A

Screen: SYSTEM variables screen.

See Also: na

$SHELL_WRK.$cur_optb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Current option B value

Description: Current values (0 or 1) of the style option bits as read at the time that the current style program was initiated.

Power Up: N/A

Screen: SYSTEM variables screen.

See Also: na

$SHELL_WRK.$cur_optc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Current option C value

Description: Current values (0 or 1) of the style option bits as read at the time that the current style program was initiated.

Power Up: N/A

Screen: SYSTEM variables screen.

See Also: na

$SHELL_WRK.$cur_option

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: current option

Description: (not currently used)

Power Up: na

Screen: SYSTEM variables screen.

See Also: na

$SHELL_WRK.$cur_style

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Current style

Description: Current style program number.

Power Up: na

Screen: SYSTEM variables screen.

See Also: na

$SHELL_WRK.$curr_line

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Current Line

Description: This is the line number that the teach pendant system is currently displaying. The line number is in the routine contained in the field $ROUT_NAME.

Power Up: N/A

Screen: Based on the program being edited

$SHELL_WRK.$cust_name

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Custom program name

Description: When using the "custom" program start option ($SHELL_CFG.$SEL_MODE = 9), this string must be initialized with the name of the program to run when the production start signal is received by the shell.

Power Up: N/A

Screen: SYSTEM variables screen.

See Also: na

$SHELL_WRK.$isol_mode

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Isolate mode

Description: TRUE if the controller is in "isolated" and FALSE if it is "interlocked". Only valid if interlock/isolate mode support is enabled.

Power Up: N/A

Screen: SYSTEM variables screen

See Also: na

$SHELL_WRK.$karel_iouop

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: KAREL UOP control

Description: If TRUE and KAREL_UOP=TRUE then KAREL controls UOP INS, and the system will do ATPERCH.

Power Up: N/A

Screen: SYSTEM variables screen.

See Also: na

$SHELL_WRK.$man_decsn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Manual decision code

Description: Manual value of the decision code as read at the time that the manual style program was initiated.

Power Up: N/A

Screen: SYSTEM variables screen.

See Also: $SHELL_WRK.$MAN_OPTA, $SHELL_WRK.$MAN_OPTA, $SHELL_WRK.$MAN_OPTA, $SHELL_WRK.$MAN_STYLE, $SHELL_WRK.$MAN_OPTION

$SHELL_WRK.$man_opta

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Manual options A

Description: The $man_opt'x' and $man_style and $man_decsn are used as outputs to the PLC when making a manual style request. These locations must be initialized before setting the $SHELL_WRK.$MAN_OPTION location to make the request.

Power Up: N/A

Screen: SYSTEM variables screen.

See Also: na

$SHELL_WRK.$man_optb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Manual options A

Description: The $man_opt'x' and $man_style and $man_decsn are used as outputs to the PLC when making a manual style request. These locations must be initialized before setting the $SHELL_WRK.$MAN_OPTION location to make the request.

Power Up: N/A

Screen: SYSTEM variables screen.

See Also: na

$SHELL_WRK.$man_optc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Manual options C

Description: The $man_opt'x' and $man_style and $man_decsn are used as outputs to the PLC when making a manual style request. These locations must be initialized before setting the $SHELL_WRK.$MAN_OPTION location to make the request.

Power Up: N/A

Screen: SYSTEM variables screen.

See Also: na

$SHELL_WRK.$man_option

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Manual option requested

Description: This location is set non-zero to cause a manual style request to be issued by the shell to the PLC.

Power Up: N/A

Screen: SYSTEM variables screen.

See Also: $SHELL_WRK.$MAN_OPTA, $SHELL_WRK.$MAN_OPTA, $SHELL_WRK.$MAN_OPTA, $SHELL_WRK.$MAN_STYLE, $SHELL_WRK.$MAN_DECSN

$SHELL_WRK.$man_style

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Manual style

Description: Manual style program number.

Power Up: N/A

Screen: SYSTEM variables screen.

See Also: na

$SHELL_WRK.$rout_name

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Current Routine

Description: Name of the routine which is currently being edited. This might not be the same as $TP_DEFPROG. When the teach pendant system goes into a subroutine, $TPDEFPROG is not set but this variable will be.

Power Up: N/A

Screen: Based on the program being edited

$SHELL_WRK.$shell_start

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: When set to TRUE, this variable is used to tell the Shell to process the Cycle Start signal. When the UOP Cycle Start is processed, the Shell will select and run the program in $SHELL_WRK.$CUST_NAME.

Description: This variable is not currently used.

Power Up: N/A

$SHELL_WRK.$strtchk_ept

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Ept index for start check from abort program

Description: When the abort program is started except 1st line, if the user answer Yes to the question that 'Are you sure to start?', the ept_index is saved in this variable. This variable is used to check if it is possible to start or not at the next start.

Power Up: N/A

Screen: SYSTEM variables screen.

$SHELL_WRK.$strtchk_lin

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Current line number for start check from abort program

Description: When the abort program is started except 1st line, if the user answer Yes to the question that 'Are you sure to start?', the current line number is saved in this variable. This variable is used to check if it is possible to start or not at the next start.

Power Up: N/A

Screen: SYSTEM variables screen.

$SHELL_WRK.$task_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Task Number

Description: Contains the task number of the routine which is currently executing via the teach pendant edit system.

Power Up: N/A

Screen: Based on program being edited

$SHELL_WRK.$wrk_busy

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Work Busy

Description: Not currently used.

Power Up: N/A

$SHFTOV_ENB

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Enables Shifted Override Setting

Description: If set to 0, the override will step up and down in fine increments of 5%. This occurs regardless of whether you press the SHIFT key. If set to 1, the override steps up and down from 50% to 100% and back if the SHIFT key is pressed. If the shift key is not pressed the override moves in fine increments.

Power Up: N/A

$SI_UNIT_ENB

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: SI unit

Description: When this variable is TRUE, the SI unit is used.

Power Up: N/A

$SMTP_CTRL.$CC_ADDR

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Default email Copy Address

Description: A default email Copy Address, which is appended to the list of Copy Addresses of any email sent from the robot.

Power Up: N/A

$SMTP_CTRL.$ENABLE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enable the SMTP interface

Description: This variable enables the SMTP interface.

Power Up: N/A

$SMTP_CTRL.$FROM_ADDR

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Default email From Address

Description: This is the From Address that all email messages will have when they are sent to the SMTP server. Although the robot cannot receive email, some SMTP servers block email messages without a From Address.

Power Up: N/A

$SMTP_CTRL.$PORT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: SMTP server port number

Description: This is the port number of the SMTP server. Typically this is port 25.

Power Up: N/A

$SMTP_CTRL.$POST_DLVR

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Posted delivery message

Description: This is a boolean value which determines whether or not an alarm is displayed on a successful email delivery. If set to TRUE, a warning alarm will be posted on the successful delivery of an email message to an SMTP server. If FALSE, no alarm will be posted on successful delivery. An alarm will always be posted on delivery failure.

Power Up: N/A

$SMTP_CTRL.$RT_ADDR

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Reply To Address

Description: This is the Reply To Address that all email messages will have when sent to the SMTP server. Although the robot cannot receive email, some SMTP servers block email messages without a Reply To Address.

Power Up: N/A

$SMTP_CTRL.$SERVER

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: IP address of the SMTP server

Description: This variable indicates the IP address of the SMTP server.

Power Up: N/A

$SMTP_CTRL.$TIMEOUT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: SMTP timeout

Description: This determines the time in seconds that the SMTP client will wait for a response from the SMTP server before giving up.

Power Up: N/A

$SNTP_CFG

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SNTP_CFG_T   **Memory:** Not available

Name: SNTP Configuration Variables

Description: This variable structure contains variables that can set up the SNTP configuration.

Power Up: N/A

$SNTP_CFG.$CUR_OFFSET

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: SNTP Current offset from UTC(GMT)

Description: This variable contains the current offset in minutes from the Universal Time Clock (UTC(GMT)). This will be automatically adjusted when Daylight Saving Time(DST) takes effect.

Power Up: N/A

$SNTP_CFG.$DST

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: SNTP Daylight Saving Time (DST) Enable

Description: This variable enables/disables Daylight Saving Time (DST).

Power Up: N/A

$SNTP_CFG.$ENABLE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: SNTP Enable

Description: This variable enables/disables the SNTP option.

Power Up: N/A

$SNTP_CFG.$SERVER

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: SNTP Server address

Description: This variable contains the NTP server address. If the DHCP option is enabled and configured to provide the NTP server address, this field is automatically set. If not, contact your Information System (IS) department to obtain NTP server address. You can enter either the host name or IP address of NTP server. If the host name is used, ensure that DNS option is installed or the host name is entered in the host entry table.

Power Up: N/A

$SNTP_CFG.$TIME_WIN

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: SNTP Time Window

Description: The local clock is adjusted only if the difference between the local clock and the time server clock is greater than $TIME_WIN in seconds.

Power Up: N/A

$SNTP_CFG.$TZ_INDEX

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: SNTP Timezone Index

Description: This variable indicates the current index value of Timezone in the user interface screen.

Power Up: N/A

$SNTP_CFG.$TZ_OFFSET

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: SNTP Timezone Offset

Description: This variable indicates the current offset from UTC(GMT) timezone in minutes without the Daylight Saving Time (DST) adjustment.

Power Up: N/A

$SNTP_CUSTOM

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SNTP_CUSTOM_T   **Memory:** Not available

Name: SNTP Custom Variables

Description: This variable structure contains SNTP custom variables.

Power Up: N/A

$SNTP_CUSTOM.$END_DATE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: SNTP Custom End Date

Description: This variable indicates the date on which Daylight Saving Time (DST) ends.

Power Up: N/A

$SNTP_CUSTOM.$END_HOUR

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: SNTP Custom End Hour

Description: This variable indicates the time (in hours) when Daylight Saving Time (DST) ends. Set time in 24 hours scale. For example, if DST ends at 4 pm, set it to 16. Also, set the DST end time based on the local standard time not based on local Daylight Saving Time. For example, if your area ends DST on 10/17 at 3 am, based on the local Daylight Saving Time, use 10/17 2 am based on the local standard time.

Power Up: N/A

$SNTP_CUSTOM.$END_MONTH

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: SNTP Custom End Month

Description: This variable indicates the Month in which Daylight Saving Time (DST) ends.

Power Up: N/A

$SNTP_CUSTOM.$LOCAL_TIME

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: SNTP Custom Local Time

Description: If your Daylight Saving Time (DST) is based on the local time, set this variable to TRUE. If your DST is based on GMT(UTC), set it FALSE. Some countries set DST start/end times based on GMT rather than their local time. For example, DST starts in Berlin at 1 am GMT on 3/28. In this case, set required system variables in terms of GMT timezone and set $LOCAL_TIME = FALSE.

Power Up: N/A

$SNTP_CUSTOM.$NORTH_HEM

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: SNTP Custom North Hemisphere

Description: If you live in the Northern Hemisphere, set this variable to TRUE. If you live in the Southern Hemisphere, set this variable to FALSE.

Power Up: N/A

$SNTP_CUSTOM.$START_DATE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: SNTP Custom Start Date

Description: This variable indicates the date on which Daylight Saving Time (DST) starts.

Power Up: N/A

$SNTP_CUSTOM.$START_HOUR

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: SNTP Custom Start Hour

Description: This variable indicates the time (in hours) that Daylight Savings Time (DST) starts. Set times in 24 hours scale. For example, if DST starts at 4 pm, set it to 16.

Power Up: N/A

$SNTP_CUSTOM.$START_MONTH

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: SNTP Custom Start Month

Description: This variable indicates the Month in which Daylight Saving Time (DST) starts.

Power Up: N/A

$SPOTAPCOUPL[1].$coupled_eq[1-5]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Spottool+ application equipment coupling.

Description: This variable specifies whether the application automatically changes to SPOT when a an equipment that is mapped to SPOT is selected. This variable defines the equipment number that gets activated when the equipment number is changed. For example if group 1 is selected and $SPOTAPCOUPL[1].$coupled_eq[1] = TRUE, then equipment number 1 will be activated.

Power Up: On_Cold_Start

$SPOTCONFIG.$sim_warn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Weld simulate warning

Description: This variable specifies whether or not a warn message is posted at each simulated weld. The message specifies the program and line number. The default is FALSE.

Power Up: N/A

$SPOTWELDIO[1].$lvl_comp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Level type weld complete signal

Description: This variable specifies whether the weld complete input signal is edge (transition) or level based. $SPOTWELDIO[1].$lvl_comp=FALSE means that the signal is edge based. $SPOTWELDIO[1].$lvl_comp=TRUE means that the signal is level based.

Power Up: Takes effect immediately

$SSR STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Single Step Record Structure

Description: Defines dynamic data set by the system concerning single stepping forward and backward through program execution. Individual fields within this structure are described below.

Power Up: N/A

$SSR.$bwdstep

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Single Step Backward

Description: If set to TRUE, then single step backward is enabled.

Power Up: Takes effect immediately

$SSR.$sglsteptask[1-14]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** Not available   **UIF:** RW   **CRTL:** RO   **Data Type:** BYTE   **Memory:** CMOS

Name: Single Step Task Name

Description: Task name for single step operation.

Power Up: Takes effect immediately

$SSR.$sglsteptask[14]

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Single Step Task Name

Description: Task name for single step operation.

Power Up: Takes effect immediately

$SSR.$singlestep

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: Single Step

Description: If set to TRUE, then single step forward is enabled.

Power Up: Takes effect immediately

Screen: TEST CYCLE

$SSR.$stepstmttyp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Single Step Statement Type

Description: Single step statement type where: case 0 : Task is paused at each statement case 1 : Task is paused at motion statement only case 2 : Task is paused at each mnemonic statement and karel motion statement case 3 : Execution continue in routine

Power Up: Takes effect immediately

$SSR.$steptasknum

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Single Step Task Id

Description: The identification number of the motion source task.

Power Up: Takes effect immediately

$SSR.$stpsegtype

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE **Memory:** Not available

Name: Single Step Segment Type

Description: Single step segment type.

Power Up: Takes effect immediately

$SVPRG_COUNT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: auto start maximum counter of auto error recovery

Description: Counter of automatic start feature in auto error recovery function. This variable should be set internally by system software (Program control software and auto error recovery software). So the customer must not change this value.

Power Up: Takes effect immediately

Screen: SYSTEM variable screen

$SVPRG_ENB

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Resume program enable/disable

Description: For internal use only. Do not modify this system variable. This variable should be set internally by system software. 0 = Disable 1 = Enable

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen and Application Setup screen (WELD system setup screen etc.)

$SVPRG_TBL[1-5]

Minimum: 0   **Maximum:** 255   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Resume program table

Description: For internal use only. Do not modify this system variable. When KAREL program for resume program is executed, the KAREL program executes the resume program ($SERVICE_PRG) specified with the number. The length of the array[5] indicates the number of motion groups.

Power Up: Takes effect immediately

$SVPRM_ENB

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Servo Parameter Enable

Description: Displays the servo parameter screen if one exists.

Power Up: N/A

$SVT_CONFIG[1].$tch_ret_ena

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Touch Retract Enable

Description: This variable is used to enable and disable the ServoTorch Touch Retract feature. Touch retract is an Arc Start technique which involves touching the wire to the workpiece and then retracting the wire to draw an arc. It is used most often with aluminum welding applications.

Power Up: N/A

$SYS_TIME

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SYS_TIME_T   **Memory:** Not available

Name: The current time broken down into month, day, hour, minute, and day of the week based on the system clock.

Description: This indicates the current time broken down into month, day, hour, minute, and day of the week based on the system clock. This variable is updated by the controller and is not to be used to configure the system clock.

Power Up: N/A

$SYS_TIME.$DAY

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: The current day based on the system clock.

Description: This indicates the current day based on the system clock. This variable is set by the controller and should not be used to configure the system clock.

Power Up: N/A

$SYS_TIME.$DOW

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: The current day of the week based on the system clock

Description: This indicates the current day of the week based on the system clock. 0 == Sunday, 1 == Monday, etc... This variable is set by the controller and is not to be used to configure the system clock.

Power Up: N/A

$SYS_TIME.$HOUR

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: The current hour based on the system clock.

Description: This indicates the current hour based on the system clock (0 to 23). This variable is set by the controller and is not to be used to configure the system clock.

Power Up: N/A

$SYS_TIME.$MINUTE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: The current minute based on the system clock

Description: This indicates the current minute based on the system clock. This variable is set by the controller and should not be used to configure the system clock.

Power Up: N/A

$SYS_TIME.$MONTH

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: The current month based on the system clock.

Description: This indicates the current month based on the system clock. 1 == Jan, 2 == Feb, and so forth... This variable is set by the controller and should not be used to set the system clock.

Power Up: N/A

$SYSDSP_PASS

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: System Variable Screen Display Password

Description: Not currently used.

Power Up: N/A

2.18 "T" System Variables

$TB_PARAM[1] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: TurboMove joint softpart parameter

Description: The motion parameter for TurboMove joint softpart. Individual fields within this structure are described below.

Power Up: N/A

$TB_PARAM[1].$ma_brk_mgn

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Break torque margin for acceleration of joint motion

Description: Margin parameter of Break torque ($TBJ_GRP.$mr_brk_trq) for acceleration of TurboMove joint motion.

Power Up: Takes effect immediately

$TB_PARAM[1].$ma_grav_mgn

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Gravity margin for acceleration of joint motion

Description: Margin parameter of Gravity torque for acceleration of TurboMove joint motion.

Power Up: Takes effect immediately

$TB_PARAM[1].$ma_load_trq

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Load torque of motor for acceleration

Description: Load torque of motor for acceleration. But currently, this parameter has other meaning. This is used as the margin parameter for minimum accel time according to arm height.

Power Up: Takes effect immediately

$TB_PARAM[1].$ma_nold_mgn

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Nold torque margin for acceleration of joint motion

Description: Margin parameter of torque at nold velocity ($TBJ_GRP.$mr_nold_vel) for acceleration of TurboMove joint motion.

Power Up: Takes effect immediately

$TB_PARAM[1].$ma_stal_mgn

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Stal torque margin for acceleration of joint motion

Description: Margin parameter of Stale torque ($TBJ_GRP.$mr_max_trq) for acceleration of TurboMove joint motion.

Power Up: Takes effect immediately

$TB_PARAM[1].$max_trq_mgn

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Max torque margin for joint motion

Description: Margin parameter for max motor torque for TurboMove joint motion.

Power Up: Takes effect immediately

$TB_PARAM[1].$md_brk_mgn

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Break torque margin for deceleration of joint motion

Description: Margin parameter of Break torque ($TBJ_GRP.$mr_brk_trq) for deceleration of
TurboMove joint motion.

Power Up: Takes effect immediately

$TB_PARAM[1].$md_grav_mgn

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Gravity margin for deceleration of joint motion

Description: Margin parameter of Gravity torque for deceleration of TurboMove joint motion.

Power Up: Takes effect immediately

$TB_PARAM[1].$md_load_trq

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Load torque of motor for acceleration

Description: Load torque of motor for acceleration. But currently, this parameter has other meaning.
This is used as the margin parameter for minimum accel time according to arm height.

Power Up: Takes effect immediately

$TB_PARAM[1].$md_nold_mgn

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Nold torque margin for deceleration of joint motion

Description: Margin parameter of torque at nold velocity ($TBJ_GRP.$mr_nold_vel) for deceleration
of TurboMove joint motion.

Power Up: Takes effect immediately

$TB_PARAM[1].$md_stal_mgn

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Stal torque margin for deceleration of joint motion

Description: Margin parameter of Stale torque ($TBJ_GRP.$mr_max_trq) for deceleration of TurboMove joint motion.

Power Up: Takes effect immediately

$TB_PARAM[1].$mr_brk_trq

Minimum: -100000.   **Maximum:** 100000   **Default:** 2.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Break torque of motor

Description: The torque of the motor at break point of motor torque curve for TurboMove joint motion.

Power Up: Takes effect immediately

$TB_PARAM[1].$mr_brk_vel

Minimum: -100000.   **Maximum:** 100000   **Default:** 2.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Break velocity of motor

Description: The velocity of the motor at break point of motor torque curve for TurboMove joint motion.

Power Up: Takes effect immediately

$TB_PARAM[1].$mr_max_trq

Minimum: -100000.   **Maximum:** 100000   **Default:** 2.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Max torque of motor

Description: Max torque of the motor for TurboMove joint motion.

Power Up: Takes effect immediately

$TB_PARAM[1].$mr_nold_vel

Minimum: -100000. **Maximum:** 100000 **Default:** 5.0 **KCL/Data:** RW **Program:** RW
UIF: Not available **CRTL:** Not available **Data Type:** REAL **Memory:** Not available

Name: Nold velocity of motor

Description: The maximum motor velocity without load.

Power Up: Takes effect immediately

See Also: TurboMove Technote

$TB_PARAM[1].$mr_stal_trq

Minimum: -100000. **Maximum:** 100000 **Default:** 2.0 **KCL/Data:** RW **Program:** RW
UIF: Not available **CRTL:** Not available **Data Type:** REAL **Memory:** Not available

Name: Stal torque of motor

Description: The torque of the motor at 0 velocity for TurboMove joint motion.

Power Up: Takes effect immediately

$TB_PARAM[1].$pth_brk_mgn

Minimum: -100000. **Maximum:** 100000 **Default:** 1.0 **KCL/Data:** RW **Program:** RW
UIF: Not available **CRTL:** Not available **Data Type:** REAL **Memory:** Not available

Name: Break torque margin for joint cont motion

Description: Margin parameter of Break torque ($TBJ_GRP.$mr_brk_trq) for TurboMove joint
cont motion.

Power Up: Takes effect immediately

$TB_PARAM[1].$pth_grv_mgn

Minimum: -100000. **Maximum:** 100000 **Default:** 1.0 **KCL/Data:** RW **Program:** RW
UIF: Not available **CRTL:** Not available **Data Type:** REAL **Memory:** Not available

Name: Gravity margin for joint cont motion

Description: Margin parameter of Gravity torque for TurboMove joint cont motion.

Power Up: Takes effect immediately

$TB_PARAM[1].$pth_nld_mgn

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Nold torque margin for joint cont motion

Description: Margin parameter of torque at nold velocity ($TBJ_GRP.$Mr_nold_vel) for TurboMove joint cont motion.

Power Up: Takes effect immediately

$TB_PARAM[1].$pth_stl_mgn

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Stal torque margin for joint cont motion

Description: Margin parameter of Stale torque ($TBJ_GRP.$mr_max_trq) for TurboMove joint cont motion.

Power Up: Takes effect immediately

$TBC_GRP STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: TurboMove Cartesian group variable

Description: TBC softpart motion parameter. Individual fields within this structure are described below.

Power Up: Takes effect immediately

$TBC_GRP[1].$cnt_scale

Minimum: 0.   **Maximum:** 100.   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: CNT motion scale

Description: This parameter is used to tune cont motion accel time for TurboMove cartesian motion.

Power Up: Takes effect immediately

$TBC_GRP[1].$min_acc_uca

Minimum: 0   **Maximum:** 10000   **Default:** 128   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Minimum accel time for TurboMove cartesian short motion

Description: Minimum accel time for TurboMove cartesian short motion.

Power Up: Changes take effect immediately.

$TBC_GRP[1].$min_c_id_e1

Minimum: ""   **Maximum:** ""   **Default:** "12345678"   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: TurboMove parameter version id

Description: TurboMove parameter version id.

Power Up: Takes effect immediately

$TBC_GRP[1].$min_c_id_e2

Minimum: ""   **Maximum:** ""   **Default:** "12345678"   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: TurboMove parameter version id

Description: TurboMove parameter version id.

Power Up: Takes effect immediately

$TBC_GRP[1].$min_c_id_e3

Minimum: ""   **Maximum:** ""   **Default:** "12345678"   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: TurboMove parameter version id

Description: TurboMove parameter version id.

Power Up: Takes effect immediately

$TBC_GRP[1].$min_cat_uma

Minimum: 0   **Maximum:** 10000   **Default:** 128   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Minimum accel time for TurboMove cartesian long motion

Description: Minimum accel time for TurboMove cartesian long motion.

Power Up: Takes effect immediately

$TBC_GRP[1].$min_cyc_id

Minimum: ""   **Maximum:** ""   **Default:** "12345678"   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: TurboMove parameter version id

Description: TurboMove parameter version id.

Power Up: Takes effect immediately

$TBC_GRP[1].$path_ratio

Minimum: 0   **Maximum:** 10000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Accel time ratio for CF fine motion

Description: The ratio of 2nd/1st accel time for CF fine motion.

Power Up: On_Cold_Start

$TBC_GRP[1].$payload_mgn

Minimum: 0.   **Maximum:** 1000.   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Payload margin

Description: Margin parameter for payload value.

Power Up: Takes effect immediately

$TBC_GRP[1].$shortmo_scl

Minimum: 0.   **Maximum:** 100.   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Short motion scale

Description: This parameter is used to short motion accel time for TurboMove cartesian motion. Currently not used.

Power Up: On_Cold_Start

$TBC_GRP[1].$tbc_accel1

Minimum: 0   **Maximum:** 10000   **Default:** 256   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: 1st default accel time for JF cartesian motion

Description: 1st default accel time for JF cartesian motion.

Power Up: On_Cold_Start

$TBC_GRP[1].$tbc_accel2

Minimum: 0   **Maximum:** 10000   **Default:** 128   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: 2nd default accel time for JF cartesian motion

Description: 2nd default accel time for JF cartesian motion.

Power Up: On_Cold_Start

$TBC_GRP[1].$TBC_PARAM STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: TurboMove cartesian softpart parameter

Description: The motion parameter for TurboMove cartesian softpart. Individual fields within this structure are described below.

Power Up: Takes effect immediately

$TBC_GRP[1].$TBC_PARAM[1].$max_trq_mgn

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Cartesian motion max torque margin

Description: Margin parameter for max torque of the motor for TurboMove Cartesian motion.

Power Up: Takes effect immediately

$TBC_GRP[1].$TBC_PARAM[1].$mc_brk_mgn

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Cartesian motion break torque margin.

Description: Margin parameter of Break torque ($TBJ_GRP.$MR_BRK_TRQ) for TurboMove Cartesian motion.

Power Up: Takes effect immediately

$TBC_GRP[1].$TBC_PARAM[1].$mc_grav_mgn

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Cartesian motion gravity margin.

Description: Margin parameter of Gravity torque for TurboMove Cartesian motion.

Power Up: Changes take effect immediately.

$TBC_GRP[1].$TBC_PARAM[1].$mc_max_trq

Minimum: -100000.   **Maximum:** 100000   **Default:** 2.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Cartesian motion max. torque

Description: Max torque of the motor for TurboMove Cartesian motion.

Power Up: Changes take effect immediately.

$TBC_GRP[1].$TBC_PARAM[1].$mc_nold_mgn

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Cartesian motion nold torque margin

Description: Margin parameter of torque at nold velocity ($TBJ_GRP.$MR_NOLD_VEL) for TurboMove Cartesian motion.

Power Up: Changes take effect immediately.

$TBC_GRP[1].$TBC_PARAM[1].$mc_stal_mgn

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Cartesian motion stal torque margin

Description: Margin parameter of Stale torque ($TBJ_GRP.$MR_MAX_TRQ) for TurboMove Cartesian motion.

Power Up: Changes take effect immediately.

$TBC_GRP[1].$TBC_PARAM[1].$shortmo_lim

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Short motion limit

Description: This parameter is used to tune short motion accel time for TurboMove Cartesian motion.

Power Up: Changes take effect immediately.

$TBC_GRP[1].$TBC_PARAM[1].$shortmo_mgn

Minimum: -100000.   **Maximum:** 100000   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Short motion limit

Description: This parameter is used to tune short motion accel time for TurboMove Cartesian motion.

Power Up: Changes take effect immediately.

$TBC_GRP[1].$tbc_path1

Minimum: 0   **Maximum:** 10000   **Default:** 256   **KCL/Data:** RW   **Program:** RW   **UIF:** Not
available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: 1st default accel time for CF cont cartesian motion

Description: 1st default accel time for CF cont cartesian motion.

Power Up: A cold start is required to change this value.

$TBC_GRP[1].$tbc_path2

Minimum: 0   **Maximum:** 10000   **Default:** 128   **KCL/Data:** RW   **Program:** RW   **UIF:** Not
available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: 2nd default accel time for CF cont cartesian motion

Description: 2nd default accel time for CF cont cartesian motion.

Power Up: A cold start is required to change this value.

$TBCCFG STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data
Type:** Not available   **Memory:** Not available

Name: TurboMove Cartesian configuration variable

Description: Sets or indicates TBC softpart configuration. Individual fields within this structure
are described below.

Power Up: N/A

$TBCCFG.$debug

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TBC softpart debug flag

Description: Flag for debug TBC softpart.

Power Up: N/A

$TBCCFG.$group_mask

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TBC softpart Group Mask

Description: Indicates TBC softpart group mask.

Power Up: N/A

$TBCCFG.$mb_conflict

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TBC softpart conflict information

Description: Indicates TBC softpart conflict information.

Power Up: N/A

$TBJ_GRP STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: TurboMove Joint group variable

Description: TBJ softpart motion parameter. Individual fields within this structure are described below.

Power Up: N/A

$TBJ_GRP[1].$asym_param

Minimum: -100000.   **Maximum:** 100000.   **Default:** 2   **KCL/Data:** RW   **Program:** RW **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Asymmetrical acc/dec parameter

Description: This parameter is used for asymmetrical acc/dec ratio setting.

Power Up: On_Cold_Start

$TBJ_GRP[1].$longmo_mgn

Minimum: 0.   **Maximum:** 100.   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Long motion scale

Description: Margin parameter of minimum accel time according to J1 inertia value.

Power Up: Takes effect immediately

$TBJ_GRP[1].$longmo_scl

Minimum: 0.   **Maximum:** 100.   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Long motion scale

Description: Margin parameter of minimum accel time according to J1 inertia value.

Power Up: Takes effect immediately

$TBJ_GRP[1].$min_acc_shm

Minimum: 0   **Maximum:** 10000   **Default:** 128   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Minimum accel time for TurboMove joint short motion

Description: Minimum accel time for TurboMove joint short motion.

Power Up: Takes effect immediately

$TBJ_GRP[1].$min_acc_uma

Minimum: 0   **Maximum:** 10000   **Default:** 128   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Minimum accel time for TurboMove joint long motion

Description: Minimum accel time for TurboMove joint long motion.

Power Up: Takes effect immediately

$TBJ_GRP[1].$min_c_id_e1

Minimum: ""   **Maximum:** ""   **Default:** "12345678"   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: TurboMove parameter version id

Description: TurboMove parameter version id.

Power Up: Takes effect immediately

$TBJ_GRP[1].$min_c_id_e2

Minimum: ""   **Maximum:** ""   **Default:** "12345678"   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: TurboMove parameter version id

Description: TurboMove parameter version id.

Power Up: Takes effect immediately

$TBJ_GRP[1].$min_c_id_e3

Minimum: ""   **Maximum:** ""   **Default:** "12345678"   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: TurboMove parameter version id

Description: TurboMove parameter version id.

Power Up: Takes effect immediately

$TBJ_GRP[1].$min_cyc_id

Minimum: ""   **Maximum:** ""   **Default:** "12345678"   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: TurboMove parameter version id

Description: TurboMove parameter version id.

Power Up: Takes effect immediately

$TBJ_GRP[1].$payload_mgn

Minimum: 0.   **Maximum:** 1000.   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Payload margin

Description: Margin parameter for payload value.

Power Up: Takes effect immediately

$TBJ_GRP[1].$shortmo_mgn

Minimum: 0.   **Maximum:** 100.   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Short motion scale

Description: Currently not used.

Power Up: N/A

$TBJ_GRP[1].$shortmo_scl

Minimum: 0.   **Maximum:** 100.   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Short motion scale

Description: Currently not used.

Power Up: N/A

$TBJ_GRP[1].$tbj_accel1[i]

Minimum: 0   **Maximum:** 100000.   **Default:** 256   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: 1st default accel time for i th joint motion

Description: 1st default accel time for i th joint motion.

Power Up: On_Cold_Start

$TBJ_GRP[1].$tbj_accel2[i]

Minimum: 0   **Maximum:** 100000.   **Default:** 256   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: 2nd default accel time for i th joint motion

Description: 2nd default accel time for i th joint motion .

Power Up: On_Cold_Start

$TBJCFG STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: TurboMove Joint configuration variable

Description: Set or indicate TBJ softpart configuration. Individual fields within this structure are described below.

Power Up: N/A

$TBJCFG.$debug

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TBJ softpart debug flag

Description: Flag for debug TBJ softpart.

Power Up: N/A

$TBJCFG.$group_mask

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TBJ softpart Group Mask

Description: Indicate TBJ softpart group mask.

Power Up: N/A

$TBJCFG.$mb_conflict

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TBJ softpart conflict information

Description: Indicate TBJ softpart conflict information.

Power Up: N/A

$TBJCFG.$tbj_select

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TBJ selection flag

Description: For internal use only. Do not modify this system variable. If this value is 2, asymmetric filter can be used for J CNT motion. If this value is 1, asymmetric filter is used for only J PTP motion.

Power Up: On_Cold_Start

$TBJCFG.$update_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Update time for inertia/moment calculation

Description: Update time for inertia/moment calculation. Currently not used.

Power Up: N/A

$TBPARAM.$dyn_frc_mgn

Minimum: -100000   **Maximum:** 100000   **Default:** 0.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Dynamic friction margin.

Description: For internal use only. Do not modify this system variable. Torque curve can be changed with this parameter for reducer dynamic friction. This value will be tuned by FANUC Robotics, so user must not change this value.

Power Up: N/A

$TCPIPCFG.$CLASSMASK

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Classful or classless addressing

Description: When set to TRUE, classful addressing will be used by the TCP/IP stack. When set to FALSE, classless addressing will be used by the TCP/IP stack.

Power Up: On Cold Start

$TCPIPCFG.$HW_MCFILTER

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: When this system variable is enabled, or set to 1, IP address filtering is done at the hardware level.

Description: This is especially useful to have enabled when connected to networks with multicast traffic, as processor time is not wasted on un-wanted multicast network packets. To disable this variable, set it to 0.

Power Up: N/A

$TCPP_CFG STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: TCP Speed Prediction Configuration System Variable Structure

Description: This set of variables controls the mode of operation of TCP Speed Prediction. The individual fields within this structure are defined below.

Power Up: N/A

$TCPP_CFG.$debug_main

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TCP Seed Prediction Debug Level for Main Softpart (Bit mapped)

Description: For internal debugging use only. Setting this variable could change the functionality of this system option.

Power Up: N/A

$TCPP_CFG.$debug_task

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TCP Seed Prediction Debug Level for Task Softpart (Bit mapped)

Description: For internal debugging use only! Setting this variable could change the functionality of this system option.

Power Up: N/A

$TCPP_CFG.$group_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TCP Speed Prediction Motion Group Number

Description: This system variable sets the number of the motion group for which the TCP Speed Prediction softpart will predict TCP speed. Currently this value is restricted to group 1.

Power Up: N/A

$TCPP_CFG.$num_tcppseg

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TCP Speed Prediction Segment List Size

Description: This item is not currently used, but will be within a future software release. This is intended to be used to configure the number of motion segments which the TCP Speed Prediction softpart option uses to store motion data. Currently TCPP uses a hard coded value of 15 motion segments.

Power Up: N/A

$TCPP_CFG.$oft_tim_enb

Minimum: 0   **Maximum:** 1   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: TCP Speed Prediction On-The-Fly delay time update enable.

Description: This system variable when true allows for on-the-fly updating of the TCPP delay time value ($TCPPIR.$tcdelay). Since on-the-fly changes to the TCPP delay time might result in predicted speed value discontinuities, this variable might be set to false which will prevent delay time changes until the robot has stopped moving at the end of a program.

Power Up: N/A

See Also: $TCPPIR.$tcdelay

$TCPP_CFG.$tcpp_time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TCP Speed Prediction Task Update Rate (msec)

Description: This is the rate in milliseconds that the TCP Speed Prediction task softpart will execute and update the predicted speed output value $TCPPSPEED.$speed.

Power Up: N/A

$TCPP_CFG.$vc_present

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: TCP Seed Prediction Velocity Control Present Flag

Description: This variable when set TRUE by the motion system indicates the Velocity Control motion system is presently installed on the controller.

Power Up: N/A

$TCPP_CFG.$warning_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: TCP Speed Prediction Warning Message Enable

Description: This system variable when true allows the posting of warning level error messages. (These are warnings only, not faults, which the user might wish not to be displayed.) Currently these include the following: - TCPP-011 "Pred time skips first motion" - TCPP-018 "Begin Error Mode at line:nn" - TCPP-019 "Speed Ovrd Mode at line:nn"

Power Up: N/A

$TCPPIR STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: TCP Speed Prediction Instruction Record System Variable Structure

Description: This set of variables allow the user to enable the TCP Speed Prediction softpart and set the equipment delay (prediction) time. The individual fields within this structure are defined below.

Power Up: N/A

$TCPPIR.$enable_tcpp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: TCP Speed Prediction Enable Switch

Description: This allows the user to enable or disable the TCP Speed Prediction softpart. A predicted speed output is generated when the softpart is enabled.

Power Up: N/A

$TCPPIR.$tcdelay

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: TCP Speed Prediction (Equipment) Delay Time (milliseconds)

Description: This value allows the user to specify the equipment delay time to be used as the prediction time by the TCP Speed Prediction softpart. NOTE: A negative value causes TCP Speed Prediction to generate a historical value instead of a predicted value.

Power Up: N/A

$TCPPSPEED STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: TCP Speed Prediction Speed Output System Variable Structure

Description: These are the output system variables that involve the predicted speed of the robot Tool Center Point (TCP) which are updated by the TCPP task softpart at the interval specified by the value of $TCPP_CFG.$tcpp_time. The individual fields within this structure are defined below.

Power Up: N/A

See Also: $TCPP_CFG.$tcpp_time

$TCPPSPEED.$accel

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: TCP Speed Prediction Acceleration (millimeters/second)

Description: This is the predicted acceleration of the robot TCP which corresponds with the value of the predicted speed ($TCPPSPEED.$speed). It is a directionless value, but its sign is valid (positive for increasing TCP speed, negative for decreasing TCP speed).

Power Up: N/A

See Also: $TCPPSPEED.$speed

$TCPPSPEED.$motype

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TCP Speed Prediction Programmed Motion Type

Description: This is the programmed motion type of the last active TCPP motion segment at the time of the most recent TCP Speed prediction update.

Power Up: N/A

$TCPPSPEED.$prog_speed

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: TCP Speed Prediction Programmed Speed

Description: This is the programmed speed of the last active TCPP motion segment at the time of the most recent TCP Speed prediction update.

Power Up: N/A

$TCPPSPEED.$speed

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL
Memory: Not available

Name: TCP Speed Prediction Speed (Absolute Velocity Magnitude) (millimeters / second)

Description: This is the predicted speed of the robot TCP computed as the absolute value of the magnitude of the predicted Cartesian velocity ($TCPPSPEED.$vspeed). It is referenced (without sign or direction) to the WORLD frame for normal prediction, and to the currently selected Remote TCP frame (also without sign or direction) for Remote TCP operation.

Power Up: N/A

See Also: $TCPPSPEED.$vspeed

$TCPPSPEED.$tcdelay_mon

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL
Memory: Not available

Name: TCP Speed Prediction Delay Time Monitor (milliseconds)

Description: This is a copy of the TCPP equipment delay time ($TCPPIR.$tcdelay) which is currently being used as the prediction time within the TCPP softpart. This value is presented within this structure to provide a convenient monitor point for the user.

Power Up: N/A

See Also: $TCPPIR.$Tcdelay

$TCPPSPEED.$timestamp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type** INTEGER **Memory:** Not available

Name: TCP Speed Prediction Timestamp (ROS Ticks)

Description: This is the timestamp (in ROS ticks) corresponding to the most recent time when the current values of the $TCPPSPEED data structure were computed and recorded.

Power Up: N/A

See Also: $TCPPSPEED

$TCPPSPEED.$vspeed

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** VECTOR **Memory:** Not available

Name: TCP Speed Prediction Velocity Vector (millimeters / second)

Description: This system variable is the predicted speed of the TCP recorded as a vector with components x, y, and z. It is referenced to the WORLD frame for normal TCP operation, and to the currently selected Remote TCP frame for Remote TCP operation.

Power Up: N/A

$TGCFG.$tg_sch_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: TG schedule based enable

Description: This system variable is a compatibility switch. When it is set to TRUE, the $COM_ENABLE member of each item in the $TGSCHED array is used to select $COM_VALUE or $ALT_VALUE, so that such selection is schedule based. When it is set to FALSE, the old method is used ($TGCFG.$TG_ENABLE), which is not schedule based.

Power Up: N/A

$TGSCHED[1].$ev_enabled[1-10]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Schedule event enable flag

Description: This flag, when FALSE, causes the corresponding event to be ignored by TG, even though it has valid setup data. If the flag is TRUE (the default), the event is processed normally.

Power Up: N/A

$TH_CIRCUIT STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Touch sensor circuit enable port.

Description: The touch sensing software uses this output port to turn on/off the touch sensing circuitry.

Power Up: Takes effect immediately

Screen: Touch I/O on the I/O screen.

See Also: The chapter on "Touch Sensing" in the FANUC Robotics SYSTEM R-J3 Controller ArcTool Setup and Operations Manual

$th_debug

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Touch sensor debug flag

Description: Reserved for Internal use by FANUC Robotics. If this variable is set to a value other than 0, the touch sensing software will print out debug information on a debug console.

Power Up: Takes effect immediately

$TH_DEFAULT STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Touch sensing default data structure.

Description: This structure defines all the default values for the touch sensing softpart. Individual fields within this structure are defined below.

Power Up: Takes effect immediately

See Also: The chapter on "Touch Sensing" in the FANUC Robotics SYSTEM R-J3 Controller ArcTool Setup and Operations Manual

$TH_DEFAULT.$prog_master

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Program Master

Description: If set to TRUE, the program is in master mode. If set to FALSE, the individual touch sensing schedule takes control over mastering.

Power Up: Takes effect immediately

See Also: Touch sensing schedule, master_flag.

$TH_DEFAULT.$th_max_spd

Minimum: 0   **Maximum:** 150   **Default:** 50   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Maximum search speed

Description: The allowable maximum search speed. You cannot define a search speed that exceeds this number. If an attempt is made, the search speed will be set to the value of this variable.

Power Up: Takes effect immediately

$TH_DEFAULT.$th_min_dist

Minimum: 0   **Maximum:** 200   **Default:** 10   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Minimum search distance

Description: This variable specifies the minimum search distance. You cannot specify a search speed less than this number. If an attempt is made, the search distance will be set to the value of this variable.

Power Up: Takes effect immediately

$TH_DEFAULT.$th_min_spd

Minimum: 0   **Maximum:** 50   **Default:** 5   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Minimum search speed

Description: The minimum allowable search speed. You cannot specify a search speed less than this variable.

Power Up: Takes effect immediately

$TH_DEFAULT.$th_ptn_reg

Minimum: 0   **Maximum:** 10   **Default:** 10   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Default search pattern output position register

Description: This variable is used only when you specify an invalid position register number in a Search Start [] PR[] instruction.

Power Up: Takes effect immediately

$TH_DEFAULT.$th_srch_reg

Minimum: 0   **Maximum:** 10   **Default:** 9   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Default search output position register number

Description: This variable is used when you specify an invalid search output position register number.

Power Up: Takes effect immediately

$TH_MOTION STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Touch sensor motion data structure

Description: The touch sensor sends this data structure to the motion subsystem when requesting a service. This structure is for internal use by FANUC Robotics. CAUTION: This is an internal data structure. You should not access or change any of the fields in this structure. Otherwise, you could corrupt your software.

Power Up: Takes effect immediately

$TH_MOTION.$accel_time

Minimum: 0   **Maximum:** 500   **Default:** 28   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Acceleration time.

Description: The motion acceleration time during a search motion.

Power Up: Takes effect immediately

$TH_MOTION.$re_termtyp

Minimum: 1   **Maximum:** 5   **Default:** 1   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Return motion termination type

Description: The termination type of a search return motion.

Power Up: Takes effect immediately

$TH_MOTION.$ref_grp

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: ref_grp

Description: Copy of the data from current touch sensing schedule.

Power Up: Takes effect immediately

$TH_MOTION.$return_dist

Minimum: 0   **Maximum:** 2000   **Default:** 20000   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: return_dist

Description: Copy of the data from current touch sensing schedule. Motion system uses it to control the automatic return distance.

Power Up: Takes effect immediately

$TH_MOTION.$return_spd

Minimum: 0   **Maximum:** 1000   **Default:** 100   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Return Speed

Description: This variable specifies a return speed of a search motion.

Power Up: Takes effect immediately

$TH_MOTION.$search_dist

Minimum: 0   **Maximum:** 2000   **Default:** 100   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Search distance

Description: Maximum searching distance for a search motion.

Power Up: Takes effect immediately

$TH_MOTION.$search_on

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Search On flag

Description: If this system variable is ON, it is a search motion.

Power Up: Takes effect immediately

$TH_MOTION.$search_spd

Minimum: 0   **Maximum:** 500   **Default:** 50   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Search speed

Description: Speed of search motion.

Power Up: Takes effect immediately

$TH_MOTION.$sim_detect

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Simulated detection

Description: Used to simulate a touch input to the controller. Therefore, the touch sensor program can run without hardware setup.

Power Up: Takes effect immediately

$TH_MOTION.$srchne_on

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Search no effect flag

Description: Reserved for Internal use by FANUC Robotics. Not currently used.

Power Up: Takes effect immediately

$TH_MOTION.$time_stamp

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Time stamp

Description: The time when robot touches a part.

Power Up: Takes effect immediately

$TH_MOTION.$touch_pos

Minimum: 9   **Maximum:** 9   **Default:** {REAL}   **KCL/Data:** RO   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Touched position

Description: The joint position where the robot is in contact with a part.

Power Up: Takes effect immediately

$TH_SEARCH

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Search flag

Description: Reserved for Internal use by FANUC Robotics. It is set when a search motion is executed. It is turned off when the search motion is completed.

Power Up: Takes effect immediately

$TH_SENSOR STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Touch sensor port

Description: The touch sensing software checks this port for a contact signal. Individual fields within this structure are defined below.

Power Up: Takes effect immediately

Screen: Touch I/O on the I/O screen.

$TH_SENSOR.$port_number

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: I/O Port number

Description: Digital I/O port number.

Power Up: Takes effect immediately

$TH_SENSOR.$port_type

Minimum: 0   **Maximum:** 0   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: I/O Port type.

Description: The digital I/O port type.

Power Up: Takes effect immediately

$TH_SENSOR.$threshold

Minimum: 0x80000000   **Maximum:** 0x7fffffff   **Default:** 0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Threshold

Description: The threshold number for analog inputs.

Power Up: Takes effect immediately

$TH_SRCHNE

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not
available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Search no effect flag

Description: Reserved for Internal use by FANUC Robotics. Not currently used.

Power Up: Takes effect immediately

$TH_SRCHST

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not
available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Search start flag

Description: Reserved for Internal use by FANUC Robotics. This variable is set when a Touch Offset
Start PR[] instruction is executed, and it is turned off when a Touch offset End instruction is executed.

Power Up: Takes effect immediately

$TH_WELD STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: The welding I/O port.

Description: The touch sensor uses this data structure to check whether the welding port is enabled. It is an error if both the touch sensing circuit and welding are enabled. This variable is not being used in current software.

Power Up: Takes effect immediately

Screen: Touch I/O on the I/O screen.

$th_wrkframe.$ref_grp[1-32]

Minimum: 1   **Maximum:** 32   **Default:** 1   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** SHORT   **Memory:** CMOS

Name: Touch frame reference group

Description: User set this value in Touch Frame Setup manual to specify which motion group the touch frame is with respect to.

Power Up: Takes effect immediately

$THSCHEDULE STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Touch sensor schedule

Description: This system variable defines an array of 32 touch sensing schedules. Each schedule defines run-time properties of the touch sensing search motion, search pattern and offset calculations.

Power Up: Takes effect immediately

Screen: In touch schedule under DATA screen, or under SYSTEM Variables screen

See Also: The chapter on "Touch Sensing" in the FANUC Robotics SYSTEM R-J3 Controller ArcTool Setup and Operations Manual

$thschedule[1].$auto_return

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Search motion auto return.

Description: Determines the position of the robot after a touch is performed. When auto return is set to true, the robot will return to its search start position. Otherwise, the robot will remain at the contact point.

Power Up: Takes effect immediately

Screen: In the touch sensing schedule on the DATA screen.

See Also: The chapter on "Touch Sensing" in the FANUC Robotics SYSTEM R-J3 Controller ArcTool Setup and Operations Manual

$thschedule[1].$comment

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Comment field for a touch sensing schedule.

Description: Allow users write comment about a touch schedule.

Power Up: Takes effect immediately

Screen: In the touch sensing schedule on the DATA screen.

See Also: The chapter on "Touch Sensing" in the FANUC Robotics SYSTEM R-J3 Controller ArcTool Setup and Operations Manual

$thschedule[1].$incremental

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Incremental search

Description: When incremental is on, all the motion instructions within the Search Start [] PR[] and Search End instructions will be offset by previous search results.

Power Up: Takes effect immediately

Screen: In the touch sensing schedule on the DATA screen.

See Also: The chapter on "Touch Sensing" in the FANUC Robotics SYSTEM R-J3 Controller ArcTool Setup and Operations Manual

$thschedule[1].$pattern_typ

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Touch sensing search pattern sub-type.

Description: Each search pattern can have several sub_pattern types. For example, fillet/lap has four sub-types: one dimensional search, two dimensional search, three dimensional search and two dimensional shift and rotate search.

Power Up: Takes effect immediately

Screen: In the touch sensing schedule on the DATA screen.

See Also: The chapter on "Touch Sensing" in the FANUC Robotics SYSTEM R-J3 Controller ArcTool Setup and Operations Manual

$thschedule[1].$re_termtyp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Return motion termination type

Description: Defines the termination type of the search return motion if $THSCHEDULE.$auto_return is set to TRUE.

Power Up: Takes effect immediately

Screen: In the touch sensing schedule on the DATA screen.

See Also: AUTO_RETURN The chapter on "Touch Sensing" in the FANUC Robotics SYSTEM R-J3 Controller ArcTool Setup and Operations Manual

$thschedule[1].$ref_grp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Touch offset reference group

Description: User sets this value in touch sensing schedule to specify how the offset is recorded.

Power Up: Takes effect immediately

Screen: In the touch sensing schedule on the DATA screen.

$thschedule[1].$return_dist

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Automatic return distance

Description: User sets this value in touch sensing schedule to specify the auto return distance if Auto_Return function is enabled.

Power Up: Takes effect immediately

$thschedule[1].$return_spd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Search motion Return Speed.

Description: Defines the search return speed when $auto_return is set to TRUE.

Power Up: Takes effect immediately

Screen: In the touch sensing schedule on the DATA screen.

See Also: AUTO RETURN The chapter on "Touch Sensing" in the FANUC Robotics SYSTEM R-J3 Controller ArcTool Setup and Operations Manual

$thschedule[1].$search_dist

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Touch sensing Search Distance.

Description: Allowable traveling distance for a search motion. This system variable defines how much part deviation are allowed for a search before the touch sensing software posts an error.

Power Up: Takes effect immediately

Screen: In touch schedule under DATA screen.

See Also: $PAUSE_NCONT and $CONT_R_NUM The chapter on "Touch Sensing" in the FANUC Robotics SYSTEM R-J3 Controller ArcTool Setup and Operations Manual

$thschedule[1].$search_pr

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Search position register number

Description: Defines a position register that records the contact position during a search motion. NOTE: This recording takes place regardless of the value of $master_flag, and it only contains the latest contact position.

Power Up: Takes effect immediately

Screen: In the touch sensing schedule on the DATA screen.

See Also: The chapter on "Touch Sensing" in the FANUC Robotics SYSTEM R-J3 Controller ArcTool Setup and Operations Manual

$thschedule[1].$search_ptn

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Touch Sensing Search Pattern.

Description: Touch sensing supports several search patterns. Each pattern is defined in terms of the geometry of the part in question. A search pattern may comprised of one to fifteen search motions. Currently, four search patterns are supported: fillet/lap v groove ID/OD simple search

Power Up: Takes effect immediately

Screen: In the touch sensing schedule on the DATA screen.

See Also: $PATTERN_TYP system variable The chapter on "Touch Sensing" in the FANUC Robotics SYSTEM R-J3 Controller ArcTool Setup and Operations Manual

$thschedule[1].$search_spd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Touch sensor search speed.

Description: This variable defines the search speed for a search schedule. When this particular schedule is specified in "SEARCH START[] PR[]" instruction, this speed is take effect for all the motion with the search option. For example, the TPE instruction, "J P[1] 100% FINE SEARCH[X]", does not use 100% speed for the search motion. Instead, it uses a search speed defined in a search schedule.

Power Up: Takes effect immediately

Screen: In touch schedule under DATA screen.

See Also: The chapter on "Touch Sensing" in the FANUC Robotics SYSTEM R-J3 Controller ArcTool Setup and Operations Manual

$thschedule[1].$work_frame

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Work frame number.

Description: A search motion, "J P[1] 100% FINE SEARCH[Y]", is a motion in the Y direction of a work frame. This work frame number in the schedule defines which work frame is used for the search motion.

Power Up: Takes effect immediately

Screen: In the touch sensing schedule on the DATA screen.

See Also: The chapter on "Touch Sensing" in the FANUC Robotics SYSTEM R-J3 Controller ArcTool Setup and Operations Manual

$TIMER STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Program Timer Variable

Description: Time counter which can be started, stopped and reset by the teach pendant program. See the following for an example. TIMER[n]=START(/STOP/RESET) ---------------------- $TIMER[n] Individual fields within this structure are described below.

Power Up: N/A

$TIMER[1].$comment

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Timer Comment

Description: Text used to describe the use of the timer.

Power Up: N/A

$TIMER[1].$end_ept_idx

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Reserved for Internal use by FANUC Robotics

Description: Reserved for Internal use by FANUC Robotics

Power Up: N/A

$TIMER[1].$end_lin_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Timer Ending Line Number

Description: Line number where the timer stopped.

Power Up: N/A

$TIMER[1].$str_ept_idx

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Reserved for Internal use by FANUC Robotics.

Description: Reserved for Internal use by FANUC Robotics.

Power Up: N/A

$TIMER[1].$str_lin_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Timer Starting Line Number

Description: The line number where the timer started.

Power Up: N/A

$TIMER[1].$tid_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE **Memory:** Not available

Name: Task ID which uses the program timer

Description: This field stores the task ID which uses the program timer.

Power Up: N/A

Screen: This field is for internal use only.

$TIMER[1].$timer_val

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Timer Value

Description: Indicates the count, in ms, since the timer started.

Power Up: N/A

$tm_motion.$ornt_toler

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Orientational tolerance

Description: This is for the TCP_ALIGN mode only. If the orientation change of the TCP exceeds this tolerance, TCPMate will post an error.

Power Up: On_CNTL_Start

$TMI_CHAN

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Channels

Description: The number of simultaneous open connections which MOTET can support.

Power Up: On_Cold_Start

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$TMI_DBGLVL

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Debug Level

Description: Defines the level of detail of debug messages. A system console is required to display the debug messages. This should be set to zero. Other values will slow performance.

Power Up: Takes effect immediately

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$TMI_ETHERAD

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RO   **Program:** RW   **UIF:** RO   **CRTL:** RO   **Data Type:** STRING   **Memory:** CMOS

Name: ETHERNET address

Description: This is the ETHERNET board address and should be unique. Ethernet addresses have the following format: HH:HH:HH:HH:HH:HH where H is a hexadecimal number.

Power Up: On_Cold_Start

Screen: BMON DIAG screen

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$TMI_ROUTER

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Router

Description: A string of up to 32 characters defining the network router node name. Although a value is required for this variable, MOTET Interface does not make use of routers.

Power Up: On_Cold_Start

Screen: SETUP MOTET screens

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$TMI_SNMASK

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** STRING   **Memory:** CMOS

Name: Ethernet Subnet Mask

Description: It is a string with the following format: DDD.DDD.DDD.DDD, where DDD is a three digit decimal with range 0 <= DDD <= 255, e.g. the default subnet mask for a class C type network is 255.255.255.0. Please consult your network administrator for the proper Ethernet subnet mask configuration for your network environment.

Power Up: Takes effect immediately

See Also: FANUC Robotics SYSTEM R-J2 Controller KSL Interface Setup and Operations Manual, FANUC Robotics SYSTEM R-J3 Controller MOTET Interface Setup and Operations Manual

$TOCMOS[1-344]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: CMOS data for TOTRCK softpart

Description: The system will reallocate memory at Cold start. This variable is used to support the semi-hot start feature.

Power Up: On Cold Start

$TORQCTRL STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Torque on/off control

Description: Holds information used by torque on/off control function. Individual fields within this structure are described below.

Power Up: N/A

$TORQCTRL.$debug

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Debug flag

Description: Not used at all.

Power Up: N/A

$TORQCTRL.$grp_stt[1]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Torque group status.

Description: Indicates whether the torque of that group is turned on/off. 0 means torque on (standard) 1 means torque off (used for jig mastering) Used only by torque control function. Should not be changed.

Power Up: N/A

$TORQCTRL.$sbr_pam21_v[1]

Minimum: 0x80000000   **Maximum:** 0x7FFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: SBR[axes].PARAM[21] value

Description: Value of SBR[axes].PARAM[21] is stored when torque is tuned off. Used only by torque control function. Should not be changed.

Power Up: N/A

See Also: $SBR[axes].$PARAM[21]

$TORQCTRL.$sv_err_clr[1]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Servo error clear flag

Description: Servo error clear flag. If set to 1 then servo error is cleared while torqctrl. SV_ERR_MOD[GRP] is 1. Used only by torque control function. Should not be changed.

Power Up: N/A

$TORQCTRL.$sv_err_mod[1]

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Servo error modification flag

Description: Servo error is cleared if the sv_err_clr[grp] is set to 1. It will be modified to 0 after servo error is actually turned off. Used only by torque control function. Should not be changed.

Power Up: N/A

$TP_CURSCRN[1].$sp_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG **Memory:** Not available

Name: Softpart Identifier of the Current Menu

Description: This softpart identifier can be used to determine exactly which softpart menu is being displayed on the teach pendant screen at any time.

Power Up: N/A

See Also: FORCE_SPMENU built-in in the FA NUC Robotics SYSTEM R-J3 Controller application-specific Reference Manual which lists the constants for each menu.

$TP_CURSCRN[4] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Current Teach Pendant Menu Descriptor

Description: Contains information for the KAREL user to determine which menu is currently being displayed on the teach pendant. $TP_CURSCRN[1]: used during normal operations $TP_CURSCRN[2]: used during normal operations when $TP_QUICKMEN = TRUE $TP_CURSCRN[3]: used during controlled start $TP_CURSCRN[4]: used during controlled start when $TP_QUICKMEN = TRUE Individual fields within this structure are described below.

Power Up: N/A

See Also: $CT_CURSCRN for equivalent information on the CRT/KB

$TP_INST_MSK[2]

Minimum: 0x80000000   **Maximum:** 0x7FFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Teach pendant editor instruction mask

Description: Index 1 is used as a mask to turn on selected teach pendant instructions. Index 2 is used as a mask to turn off selected teach pendant instructions. This mask only applies to instructions which you have loaded as options.

Power Up: N/A

$TP_QUICKMEN

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Teach Pendant Quick Menu

Description: Determines whether the user interface displays a quick menu or a full menu configuration when the MENUS key is pressed. If $TP_QUICKMEN is set to TRUE, less than 16 menus are available.

Power Up: N/A

Screen: SYSTEM Variables screen, FCTN - QUICK/FULL MENUS

$TP_SCREEN

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Teach Pendant Screen

Description: The name of the current screen on the teach pendant.

Power Up: N/A

2. SYSTEM VARIABLE LISTING

MARACSSRF03061E REV F

$TP_USERSCRN

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Teach Pendant Screen While in the USER Menu

Description: The name of the screen which will be activated when the USER menu is selected. The ACT_SCREEN built-in will set this system variable. It will be reset to "t_sc" when the KAREL program, which called ACT_SCREEN, aborts.

Power Up: N/A

See Also: ACT_SCREEN built-in in the FANU C Robotics SYSTEM R-J3 Controller application-specific Reference Manual.

$TP_WATCHDOG

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Teach pendant communication watch dog switch

Description: This system variable is not currently used. This system variable enables teach pendant communication watch dog functionality. This system variable is for future use.

Power Up: N/A

$TPE_DETAIL

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: TPP+ Create DETAIL Menu Required

Description: If $TPE_DETAIL is 0, the system does not require that you display the DETAIL screen when a program is created. If set to 1, the system requires that you must perform any DETAIL setup functions required for your application. For example, if line tracking is loaded as an option, you are required to display this screen in order for the line tracking program to work correctly.

Power Up: Takes effect immediately

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$TPP_MON STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: TPP monitor

Description: This system variable is used to TPP monitor function.

Power Up: On_Cold_Start

$TPP_MON.$global_mt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Global monitor

Description: This system variable, user can select the two type mode at cold start for system monitor. 1: If monitor is executing before power off, system deletes the monitor at cold start. 2: If monitor is executing before power off, system starts monitoring at cold start automatically.

Power Up: On_Cold_Start

$TPP_MON.$gmon_tid

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Global monitor task id

Description: For internal use only. Do not modify this system variable. The task number of global monitor.

Power Up: On_Cold_Start

Screen: Do not modify this system variable.

$TPP_MON.$local_mt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Local monitor

Description: This system variable, user can select the two type mode when program is PAUSED for program monitor. 1:Stop the monitoring at program is PAUSED. 2:Keep on monitoring even if program is PAUSED.

Power Up: On_Cold_Start

$TPP_MON.$mon_num

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: Number of monitors

Description: For internal use only. Do not modify this system variable.

Power Up: On_Cold_Start

$TPP_MON.$sysmon_adr

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER **Memory:** Not available

Name: System monitor address

Description: For internal use only. Do not modify this system variable.

Power Up: On_Cold_Start

Screen: SYSTEM Variables screen SYSTEM Variables screen

$TQ_GRP.$delta_lim[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Sensitivity limits for TOS Wrist

Description: This variable should not be changed. It is set by the Calibration Options softpart based on current active detection schedule value for TOS sensitivity.

Power Up: N/A

$TQ_GRP.$enable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enable Calibration Options detection

Description: This variable should not be changed. It is set by the Calibration Options when a search motion is executed. It enables the Calibration Options to monitor contact detection.

Power Up: N/A

$TQ_GRP.$enb_qstop

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Enable Quick Stop

Description: This variable Enables Quick stop to be used when contact is detected.

Power Up: N/A

$TQ_GRP.$lowerlim[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Torque Lower Limit for Calibration Options

Description: This variable indicates the lower torque limit set by the Calibration based on the the current torque value and the TOS Tolerance specified in the current detection schedule.

Power Up: N/A

$TQ_GRP.$lowertol[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Lower torque tolerance for Calibration Options

Description: This variable is set by the Calibration Options based on the TOS Tolerance specified in the current detection schedule.

Power Up: N/A

$TQ_GRP.$torque[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TOS Torque value

Description: Set by Calibration Options during TOS detection. It is the disturbance torque at the time of detection.

Power Up: N/A

$TQ_GRP.$trig_source

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Trigger source

Description: Set by Calibration Options when detection occurs to identify source of trigger.

- 0=No TOS trigger
- 1=TOS Wrist upper sensitivity
- 2=TOS Wrist, lower sensitivity
- 3=TOS Wrist, Upper tolerance
- 4=TOS Wrist, Lower tolerance
- 6=TOS All Axes, lower limit
- 7=TOS All Axes, upper limit
- 8=TOS Single axis, lower limit
- 9=TOS Single axis, upper limit

Power Up: N/A

$TQ_GRP.$trigger_ang[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Trigger joint angles

Description: Set by Calibration Options, joint angles when detection occurs.

Power Up: N/A

$TQ_GRP.$triggered

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Detection has occured

Description: This variable is set and used by Calibration Options. It indicates that a detection has occurred.

Power Up: N/A

$TQ_GRP.$triggertime

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Trigger monitoring time

Description: During TOS All Axes, this is the number of milliseconds that the learning period is extended into the search motion.

Power Up: N/A

$TQ_GRP.$upperlim[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Upper torque limits

Description: Set and used by Calibration Options during detection motion. It is the total torque upper limit for a detection to occur.

Power Up: N/A

$TQ_GRP.$uppertol[1-9]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Upper torque tolerance

Description: Set by Calibration Options based on the current detection schedule. It is the TOS tolerance value.

Power Up: N/A

$TQ_GRP[1]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** TQ_GRP_T   **Memory:** Not available

Name: Calibration Options detection data

Description: These variables are related to the Calibration Options detection. It includes variables for all modes of detection, TOS Wrist, I/O, and TOS All Axes.

Power Up: N/A

$TSR_GRP STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Time-optimal Control Variables

Description: Set the torque curve and the speed curve of each motor of each axis. It is used for time-optimal control and cannot be changed. Individual fields within this structure are described below.

Power Up: N/A

$TSR_GRP[1].$ma_brk_mgn[9]

Minimum: -100000.0   **Maximum:** 100000.0   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Motor Acceleration Break Margin

Description: Defines the acceleration torque safety margin at the break in the torque vs. velocity curve.

Power Up: N/A

$TSR_GRP[1].$ma_grav_mgn[9]

Minimum: -100000.0   **Maximum:** 100000.0   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Motor Acceleration Gravity Margin

Description: Defines a scale of the acceleration load torque due to the effect of gravity

Power Up: N/A

$TSR_GRP[1].$ma_load_trq[9]

Minimum: -100000.0   **Maximum:** 100000.0   **Default:** 0.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Motor Acceleration Torque due to Static Load

Description: Defines the acceleration torque on the motor due to a static load. Units are Kg-cm.

Power Up: N/A

$TSR_GRP[1].$ma_stal_mgn[9]

Minimum: -100000.0   **Maximum:** 100000.0   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Motor Acceleration Stall Margin

Description: Defines the motor acceleration torque safety margin at stall or zero velocity.

Power Up: N/A

$TSR_GRP[1].$mc_acc_mgn[9]

Minimum: -100000.0   **Maximum:** 100000.0   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Cartesian Motor Acceleration Margin

Description: Defines a scale factor to be used with linear motion accelerations.

Power Up: N/A

$TSR_GRP[1].$mc_brk_mgn[9]

Minimum: -100000.0   **Maximum:** 100000.0   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Cartesian Motor Torque Break Margin

Description: Defines the motor torque safety margin for cartesian motions at the break in the torque vs. velocity curve.

Power Up: N/A

$TSR_GRP[1].$mc_stal_mgn[9]

Minimum: -100000.0   **Maximum:** 100000.0   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Cartesian Motor Stall Margin

Description: Defines the motor torque safety margin for cartesian motions at stall or zero velocity.

Power Up: N/A

$TSR_GRP[1].$md_brk_mgn[9]

Minimum: -100000.0   **Maximum:** 100000.0   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Motor Deceleration Break Margin

Description: Defines the deceleration torque safety margin at the break in the torque vs. velocity curve.

Power Up: N/A

$TSR_GRP[1].$md_grav_mgn[9]

Minimum: -100000.0   **Maximum:** 100000.0   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Motor Deceleration Gravity Margin

Description: Defines a scale of the deceleration load torque due to the effect of gravity

Power Up: N/A

$TSR_GRP[1].$md_load_trq[9]

Minimum: -100000.0   **Maximum:** 100000.0   **Default:** 0.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Motor Deceleration Torque due to Static Load

Description: Defines the deceleration torque on the motor due to a static load. Unit is Kg-cm.

Power Up: N/A

$TSR_GRP[1].$md_stal_mgn[9]

Minimum: -100000.0   **Maximum:** 100000.0   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Motor Deceleration Stall Margin

Description: Defines the motor deceleration torque safety margin at stall or zero velocity.

Power Up: N/A

$TSR_GRP[1].$min_c_id_e1

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Mincycle Version ID extra_1

Description: Reserved for Internal use by FANUC Robotics.

Power Up: N/A

$TSR_GRP[1].$min_c_id_e2

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Mincycle Version ID extra_2

Description: Reserved for Internal use by FANUC Robotics.

Power Up: N/A

$TSR_GRP[1].$min_c_id_e3

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Mincycle Version ID extra_3

Description: Reserved for Internal use by FANUC Robotics.

Power Up: N/A

$TSR_GRP[1].$min_cyc_id

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Mincycle Version ID

Description: Used to determine the mincycle parameter version.

Power Up: N/A

$TSR_GRP[1].$mj_acc_mgn[9]

Minimum: -100000.0   **Maximum:** 100000.0   **Default:** 1.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Joint Filter Acceleration Margin

Description: Defines a scale factor for use with non-filter acceleration.

Power Up: N/A

$TSR_GRP[1].$mr_brk_trq[9]

Minimum: -100000.0   **Maximum:** 100000.0   **Default:** 2.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Motor Torque at Break in Torque vs Velocity Curve

Description: Defines the motor torque available at the break in the motor torque vs velocity curve.
Unit is Kg-cm.

Power Up: N/A

$TSR_GRP[1].$mr_brk_vel[9]

Minimum: -100000.0   **Maximum:** 100000.0   **Default:** 2.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Motor Velocity at Break in Torque vs Velocity Curve

Description: Defines the motor velocity at the break in the motor torque vs velocity curve. Unit is
radian/sec.

Power Up: N/A

$TSR_GRP[1].$mr_max_trq[9]

Minimum: -100000.0   **Maximum:** 1000000.   **Default:** 2.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Maximum Motor Torque

Description: This variables is used to set the maximum allowable motor torque for each axis. This
maximum torque is used to determine the maximum acceleration. Unit is Kg-cm.

Power Up: N/A

$TSR_GRP[1].$mr_nold_vel[9]

Minimum: -100000.0   **Maximum:** 100000.0   **Default:** 5.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Maximum Motor Velocity at No Load

Description: Defines the maximum motor velocity achievable when no load is seen at the motor.
Unit is radian/sec.

Power Up: N/A

$TSR_GRP[1].$mr_stal_trq[9]

Minimum: -100000.0   **Maximum:** 100000.0   **Default:** 2.0   **KCL/Data:** RW   **Program:** RW
UIF: Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Maximum Motor Torque at Zero Velocity

Description: This variable defines the maximum available motor torque at stall or zero velocity.
Unit is Kg-cm.

Power Up: N/A

$TX.$blnk_enable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data
Type:** BOOLEAN   **Memory:** Not available

Name: Teach Pendant Blank Enable

Description: If $TX.$BLNK_ENABLE is TRUE, then $TX.$BLNK_TIMER is the amount of time
in minutes before the teach pendant screen becomes blank. This will prolong the life of the teach
pendant screen. Pressing any key will redisplay the screen.

Power Up: N/A

See Also: $TX.$BLNK_TIMER

$TX.$blnk_timer

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Teach Pendant Blank Timer

Description: If $TX.$BLNK_ENABLE is TRUE, then $BLNK_TIMER is the amount of time in minutes before the teach pendant screen becomes blank. This will prolong the life of the teach pendant screen. Pressing any key will redisplay the screen.

Power Up: On_Cold_Start

See Also: $TX.$BLNK_ENABLE

$TX.$connected

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: iPendant Connected

Description: When the iPendant is connected, $TX.$CONNECTED will be TRUE. If the monochrome teach pendant or no teach pendant is connected, then $TX.$CONNECTED will be FALSE.

Power Up: N/A

$TX.$coreversion

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Teach Pendant CORE Version information

Description: This variable indicates the version of the Core iPendant firmware when the iPendant is connected. $COREVERSION does not apply to the monochrome (LEGACY) teach pendant.

Power Up: N/A

$TX.$input_port

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Teach Pendant Input Port

Description: The iPendant firmware sends data to this input port on the controller. This port can be modified by finding $SERVENT[n].$S_NAME which equals TP_INPUT and setting $SERVENT[n].$S_PORT to a new unique port number.

Power Up: N/A

See Also: $SERVENT

$TX.$remote

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Teach Pendant Remote Operation

Description: When $TX.$REMOTE is set TRUE, a remote iPendant can connect to this robot over Ethernet and operate it. This variable can only be set by a multi-robot configuration file at powerup.

Power Up: N/A

$TX.$slow_timer

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Teach Pendant Watchdog Timer when no keys are pressed.

Description: This is the watchdog timer, in milliseconds, that occurs when no keys are pressed. If the teach pendant does not communicate with the controller within this amount of time, a teach pendant communication error is posted.

Power Up: On_Cold_Start

$TX.$version

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Teach Pendant Version

Description: This is the version of the Browser Plugins when the iPendant is connected. $VERSION does not apply to the legacy (monochrome) teach pendant.

Power Up: On_Cold_Start

See Also: STATUS Version ID Menu - Browser Plugins

$TX.$wdog_enable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Teach Pendant Watchdog Enable

Description: This enables the watchdog timer. If the teach pendant does not communicate with the controller within a specified milliseconds of time, a teach pendant communication error is posted.

Power Up: N/A

See Also: $TX.$WDOG_ERPOST, $TX.$WDOG_TIMER, $TX.$SLOW_TIMER

$TX.$wdog_timer

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Teach Pendant Watchdog Timer

Description: This is the watchdog timer, in milliseconds, that occurs when keys are pressed. If the teach pendant does not communicate with the controller within this amount of time, a teach pendant communication error is posted.

Power Up: N/A

See Also: $TX.$SLOW_TIMER

$TX_DIAGHOST[1-5]

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** STRING   **Memory:** CMOS

Name: Host names for Diagnostics on Intelligent Teach Pendant

Description: Each element in the array consists of a string of up to 32 characters defining the name which represents a diagnostics server on the network. It should be unique across the network.

Power Up: N/A

Screen: n/a

See Also: n/a

$TX_DIAGHOST[5]

Minimum: ""   **Maximum:** ""   **Default:** " "   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Host names for Diagnostics on Intelligent Teach Pendant

Description: Each element in the array consists of a string of up to 32 characters defining the name which represents a diagnostics server on the network. It should be unique across the network.

Power Up: N/A

Screen: n/a

See Also: n/a

2.19 "U" System Variables

$UALRM_MSG[1-10]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: User Alarm Message

Description: This system variable holds alarm messages for user alarm (INTP-213 UALM[i]). A user alarm occurs when UALM[i] command in the teach pendant program is executed and the alarm message stored in $UALRM_MSG[i] is displayed. Default length of this system variables is 10. You can increase or decrease the length of this system variable during a Controlled Start.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen, ALARM screen

$UALRM_MSG[10]

Minimum: ""   **Maximum:** ""   **Default:** ""   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: User Alarm Message

Description: This system variable holds alarm messages for user alarm (INTP-213 UALM[i]). A user alarm occurs when UALM[i] command in the teach pendant program is executed and the alarm message stored in $UALRM_MSG[i] is displayed. Default length of this system variables is 10. You can increase or decrease the length of this system variable during a Controlled Start.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen, ALARM screen

$UALRM_SEV[10]

Minimum: 0   **Maximum:** 255   **Default:** 6   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BYTE   **Memory:** Not available

Name: User alarm severity

Description: This variable has 20 arrays and this number is the same with the user alarm one. Each value designates the severity of each user alarm. This default value is 6. This means STOP.L of error severity. You can set each severity under the following specification. WARN 0 STOP.L 6 STOP.G 38 ABORT.L 11 ABORT.G 43

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen.

$UI_CONFIG.$browse_enab

Minimum: 0   **Maximum:** 1   **Default:** 1   **KCL/Data:** RW   **Program:** Not available   **UIF:** RW   **CRTL:** RW   **Data Type:** UBYTE   **Memory:** CMOS

Name: Removed

Description: Removed.

Power Up: Takes effect immediately

$UI_CONFIG.$color_crt

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Color CRT terminal

Description: If this variable is set to TRUE, the system will send ANSI VT-320 color codes to the attached CRT device.

Power Up: On_Cold_Start

$UI_CONFIG.$config_chan[1-5]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Configuration change count

Description: This variable is incremented each time the configuration changes. An application can monitor this variable to know that a configuration change has occurred.

Power Up: N/A

$UI_CONFIG.$dspmen_mask

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: DISPLAY menu mask

Description: This is a mask for the DISPLAY menu entries. Changing this will have the effect of changing the content of the DISPLAY menu. This can allow you to exclude functions from the DISPLAY menu.

Power Up: N/A

$UI_CONFIG.$extstatus[1-5]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Extended status pages

Description: This variable is the number of available pages in the extended status pane. This is set by the system.

Power Up: N/A

$UI_CONFIG.$focus[1-5]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Currently focused pane

Description: For each connection, this variable provides the pane number that currently has focus. This is set by the system.

Power Up: N/A

$UI_CONFIG.$hlpmen_dict[1-5]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Help menu dictionary name

Description: This variable provides a dictionary name for the HELP menu text for entries 5-8. By default entry 5 is set to Menu Help." The HELP menu is entry 5 under the DISPLAY menu.

Power Up: N/A

$UI_CONFIG.$hlpmen_elem[1-5]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Help menu element

Description: This variable provides a dictionary element for the HELP menu text for entries 5-8. By default entry 5 is set to "Menu Help." The HELP menu is entry 5 under the DISPLAY menu.

Power Up: N/A

$UI_CONFIG.$hlpmen_url[1-5]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Help menu url

Description: This variable provides a URL that executes when you select entries 5-8. By default, entry 5 is set to /md/tpmenus.dg. The URL format is a complex link format. That is a specific destination pane that is specified as part of the link.

Power Up: N/A

$UI_CONFIG.$hmi_mask

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: HMI mask

Description: $HMI_MASK is used to turn ON or OFF different features of the iPendant HMI function. Each bit corresponds to the following feature:

- Bit #1 = Full Menu HMI Enable
- Bit #2 = Quick Menu HMI Enable
- Bit #3 = Select Key is disabled in iPendant HMI Mode
- Bit #4 = Edit Key is disabled in iPendant HMI Mode
- Bit #5 = Data Key is disabled in iPendant HMI Mode

These variables are set up in the iPendant SETUP Screens.

Power Up: N/A

$UI_CONFIG.$mem_limit

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Low memory limit

Description: The system will allow an external IE connection only if the amount of temporary memory in this variable is available. If the amount in this variable is not available, then the connection will be refused and an error will be posted.

Power Up: N/A

$UI_CONFIG.$menu_favs[1-8]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Menu favorites

Description: This variable contains the list of menu favorites you have selected in the Display menu. To clear favorites, set this variable to .

Power Up: N/A

$UI_CONFIG.$mode[1-5]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Status of iPendant connections.

Description: For each connection, this varialbe provides the current display mode:

- 3 - Single pane mode
- 4 Extended status mode
- 5 - Double pane mode
- 6 - Triple pane mode

Power Up: Takes effect immediately

$UI_CONFIG.$mwin_limit

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Multi-window memory limit

Description: This variable prevents the system from executing in multi-window mode if there is less DRAM memory available than this limit setting. The units are 1024 bytes. Therefore, the default of 2500 bytes implies that 2.5Meg of DRAM must be available in order to enable this mode. Multi-window mode is disabled on startup by setting the file $UI_CONFIG.$NUM_MENUS = 1. In order to re-enable multi-window mode, you must also set $UI_CONFIG.$NUM_MENUS > 1.

Power Up: On_Cold_Start

See Also: $UI_CONFIG.$NUM_MENUS, Status Memory screen

$UI_CONFIG.$num_connect

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Number of external (Internet Explorer) connections available

Description: This variable contains the maximum number of external connections allowed. If this is set to zero, no IE connections are allowed. NOTE: In order for an IE connection to be allowed, connections must be enabled in the HTTP setup screen also.

Power Up: N/A

$UI_CONFIG.$num_extstat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Extended status entry number

Description: This is the current selection in the extended status page. One is provided per connection. This is set when you execute an extended status link.

Power Up: N/A

$UI_CONFIG.$num_menus

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Number of user menus displayed at any given time

Description: This variable contains the maximum number of menus that can be active at any given time. The maximum and the default value for this is eight. This means that the iPendant itself can have three menus. Any external CGTP connections can have a total of five additional menus. That could be single mode on three connection and double mode on one. Or it could be triple mode on one connection and double mode on a second connection. In all cases the total available is five plus the CGTP. If this value is set to one then it indicates that multiple window mode is disabled. If the amount of available DRAM memory is limited then the system will force this to one. See the definition of $ui_config.$mwin_limit.

Power Up: N/A

$UI_CONFIG.$panemap[1-16]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** USHORT   **Memory:** Not available

Name: Pane mapping array

Description: This variable provides a mapping between connect ID, device ID and pane ID. The index into the array is (3*connect ID) + (Device id 1). The value is the pane ID. The same information is more easily obtained by calling the built-in GET_DEV_INFO.

Power Up: N/A

$UI_CONFIG.$readonly[1-3]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Read-only enable

Description: This variable specifies whether a particular connection type is read-only or read-write. Typically, an external IE connection are read-only meaning that a user can look at data but cannot change anything. This field is an array of three with the following meanings:

- [1] Indicates a teach pendant.
- [2] Indicates an IE connection.
- [3] Indicates CRT.

Power Up: N/A

$UI_CONFIG.$recovermenu

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: SYSTEM menu recovery behavior

Description: This variable set the SYSTEM menu recovery behavior. When it is set to zero (0) at Cold start, the system will display the HINTS screen in single window mode. When this variable is set to one (1) at Cold start, the system will display (in single window mode) the last screen displayed before the controller was turned off. When this variable is set to two (2) at powerup, the system will use whatever display mode was used when the controller was turned off. So if the controller was turned off in two window display, the system will turn on in two window display. When this variable is set to three (3) at Cold start, both settings (1) and (2) apply. When this variable is set to four (4) at Hot start, the system will display (in single window mode) the last screen displayed before the controller was turned off. When this variable is set to six (6) at Cold start, both settings (4) and (2) apply. This is the default setting.

Power Up: On_Cold_Start

$UI_CONFIG.$rotimeout[1-3]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Read-only time out

Description: This variable specifies the time in minutes during which read-write is effective. If the value of this variable is zero, then this implies that there is no time out and read-write will remain in effect until a user resets the $READONLY field. This field is an array of three with the following meanings:

- [1] Indicates a teach pendant.
- [2] Indicates an IE connection.
- [3] Indicates a CRT.

Power Up: N/A

$UI_CONFIG.$timeout

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** SHORT   **Memory:** Not available

Name: Menu time out in seconds

Description: This variable is the number of seconds that an IE connection will remain open. After this time has elapsed with no activity, the connection will be closed and the browser will be sent to the robot home page.

Power Up: N/A

$UI_CONFIG.$touch_mask

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: iPendant touch screen mask

Description: This variable allows touch capability for the iPendant menus to be disabled. It is a bit mask, such that:

- 1 means disable touch on TITLE bar.

- 2 means disable touch on MENUS.

Power Up: N/A

$UI_PANEDATA[1].$MOUSE.$time

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Time-stamp of the mouse action.

Description: The system time is recorded in this variable when the mouse action occurs. The value is in milliseconds.

Power Up: On Immediately

$UNDO_CFG STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: Undo Configuration Structure

Description: This structure contains variables which allow you to undo the last operation in the TPP editor. Individual fields are described below.

Power Up: On_Cold_Start

Screen: SYSTEM variable screen.

$UNDO_CFG.$undo_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Undo Function Enable/Disable Switch

Description: 1: Enable undo function 0: Disable undo function

Power Up: On_Cold_Start

Screen: SYSTEM variable screen

$UNDO_CFG.$warn_enb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Warning for undo enable/disable switch

Description: This variable allows you to turn on or turn off a warning message telling you that the operation you about to perform can not be undone. The default is 1, warning box will be displayed.

Power Up: On_Cold_Start

Screen: SYSTEM variable screen

$USER_CONFIG.$cust_name

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Customer Name

Description: This indicates the Customer Name. Must be manually entered.

Power Up: N/A

Screen: The System Variables screen.

$USER_CONFIG.$env_corr

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Environmental Corrosive Factor

Description: This indicates the Corrosive factor (from 1 to 255). Must be manually entered.

Power Up: N/A

Screen: The System Variables screen.

$USER_CONFIG.$env_dust

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Environmental Dust Factor

Description: This indicates the Dust factor (from 1 to 255). Must be manually entered.

Power Up: N/A

Screen: The System Variables screen.

$USER_CONFIG.$env_heat

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Environmental Heat Factor

Description: This indicates the Heat factor (from 1 to 255). Must be manually entered.

Power Up: N/A

Screen: The System Variables screen.

$USER_CONFIG.$env_vib

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
UBYTE   **Memory:** Not available

Name: Environmental Vibration Factor

Description: This indicates the Vibration factor (from 1 to 255). Must be manually entered.

Power Up: N/A

Screen: The System Variables screen.

$USER_CONFIG.$line

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
STRING   **Memory:** Not available

Name: Line Name

Description: This indicates the Line Name. Must be manually entered.

Power Up: N/A

Screen: The System Variables screen.

$USER_CONFIG.$plant

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
STRING   **Memory:** Not available

Name: Plant Name

Description: This indicates the Plant Name. Must be manually entered.

Power Up: N/A

Screen: The System Variables screen.

$USER_CONFIG.$process

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Process Type

Description: This indicates the Process Type. Must be manually entered.

Power Up: NA

Screen: The System Variables screen.

$USER_CONFIG.$ship_date

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Ship Date

Description: This indicates the Ship Date. Must be manually entered.

Power Up: N/A

Screen: The System Variables screen.

$USER_CONFIG.$warr_date

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Warranty Date

Description: This indicates the Warranty Date. Must be manually entered.

Power Up: N/A

Screen: The System Variables screen.

$USEUFRAME

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: User Frame Feature Enable

Description: Enables the user frame feature if the option is installed. This is not a standard option. With the user frame feature enabled, you are prompted for user frame related input in the editor. Also, the user frame offsets will be applied during program execution.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen, Teach Pendant and KAREL Editor

See Also: $MNUFRAME, $MNUFRAMENUM

$USRTOL_ENB

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: User Tolerance Enable

Description: If this flag is TRUE, the check for User Definable Tolerance function is executed when program is resumed.

Power Up: Takes effect immediately

$USRTOL_GRP[1].$dist_tol

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Position xyz tolerance

Description: Distance tolerance between robot current TCP and stop position. (Units in mm.)

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen.

$USRTOL_GRP[1].$enable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: User Tolerance Enable flag

Description: If this flag is TRUE (1), the check for user definable tolerance function is executed when the program is resumed.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen.

$USRTOL_GRP[1].$ornt_tol

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Position xyz tolerance

Description: Orientation tolerance between robot current TCP and stop position. (Units in degrees.)

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen.

$USRTOL_GRP[1].$raux_tol

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Rotary joint axes tolerance

Description: The joint angle tolerance between current robot position and the stop position for rotary axes (including aux. axes).

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen.

$USRTOL_GRP[1].$taux_tol

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: Translational axes tolerance

Description: The distance tolerance between current robot position and the stop position for translational axes (including aux. axes).

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen.

$USRTOL_GRP[5] STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: User Tolerance Group Structure

Description: This variable defines the user tolerance value of each motion group. When the paused program is resumed, and if the distance between the robot position and the stop position is distant from the user defined tolerance in this group, a warning message will be posted on the teach pendant.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen.

$USRTOL_MENU

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** NO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN **Memory:** Not available

Name: User Tolerance Menu

Description: When the pop-up menu is displayed, this flag is TRUE. This flag is used to check whether the pop up menu is displayed.

Power Up: Takes effect immediately

Screen: This is internal data.

2.20 "V" System Variables

$VC_MORGRP STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: AccuPath Status Variable Structure

Description: This is the AccuPath status variable. Refer to the descriptions of the individual fields that follow.

Power Up: N/A

Screen: SYSTEM Variables screen.

$VC_MORGRP[1].$hist_cdist[1-20]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Maintain CD value indicator

Description: If the motion option CDy is used and the system can maintain y(mm) corner distance, it is TRUE; otherwise, it is FALSE. If the motion option CDy is not used, it is TRUE. The history buffer is updated if it is set to FALSE.

Power Up: N/A

Screen: SYSTEM Variables screen.

See Also: $hist_index, $hist_progid[], $hist_lineno[],

$VC_MORGRP[1].$hist_cspeed[1-20]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Constant corner speed indicator

Description: It is TRUE if constant corner speed can be maintained; otherwise, it is set to FALSE. It is TRUE if the location travel time is greater than orientation travel time; otherwise, it is set to FALSE. The history buffer is updated if this is set to FALSE.

Power Up: N/A

Screen: SYSTEM Variables screen.

See Also: $hist_index, $hist_progid[], $hist_lineno[],

$VC_MORGRP[1].$hist_index

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Current index of history buffer

Description: All $hist_XXXX variables are used together as a history buffer to inform the user concerning various warning status of AccuPath that occurs during program motion. It is implemented as a ring buffer. The total size is 20. The value of $hist_index points to the latest recorded data. Data is recorded only when certain events occur, such as when it is a short segment, when corner speed cannot be maintained, when corner distance specified cannot be maintained, and so forth. Refer to the individual $hist_XXXX variables for details on warning events.

Power Up: N/A

Screen: SYSTEM Variables screen.

See Also: $hist_progid[], $hist_lineno[],$hist_short[], $hist_cspeed[], $hist_cdist[], $hist_orndom[]

$VC_MORGRP[1].$hist_lineno[1-20]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Program line number field of history buffer

Description: When the history buffer is updated, this field records the current program line number.

Power Up: N/A

Screen: SYSTEM Variables screen.

See Also: $hist_index, $hist_progid[],$hist_short[], $hist_cspeed[], $hist_cdist[], $hist_orndom[]

$VC_MORGRP[1].$hist_maxacc[20]

Minimum: 0.0   **Maximum:** 100000.0   **Default:** 0.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Array of Real   **Memory:** Not available

Name: maximum acceleration values

Description: Internal use only. Record maximum acceleration values for debug purpose

Power Up: Takes effect immediately

$VC_MORGRP[1].$hist_maxjrk[20]

Minimum: 0.0   **Maximum:** 10000000.0   **Default:** 0.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Array of Real   **Memory:** Not available

Name: maximum jerk values

Description: Internal use only. Record maximum jerk values for debug purpose

Power Up: Takes effect immediately

$VC_MORGRP[1].$hist_minspd[20]

Minimum: 0.0   **Maximum:** 2000.0   **Default:** 0.0   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Array of Real   **Memory:** Not available

Name: minimum corner speeds

Description: Internal use only. Record minimum corner speeds for debug purpose

Power Up: Takes effect immediately

$VC_MORGRP[1].$hist_orndom[1-20]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Orientation dominant indicator

Description: It is TRUE if orientation travel time is greater than location travel time, else FALSE. History buffer is updated if TRUE.

Power Up: N/A

Screen: SYSTEM Variables screen.

See Also: $hist_index, $hist_progid[], $hist_lineno[],

$VC_MORGRP[1].$hist_progid[1-20]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Program ID field of history buffer

Description: When the history buffer is updated, this field records the current program ID. The program ID is a unique number assigned internally to each program.

Power Up: N/A

Screen: SYSTEM Variables screen.

See Also: $hist_index, $hist_lineno[],$hist_short[], $hist_cspeed[], $hist_cdist[], $hist_orndom[]

$VC_MORGRP[1].$hist_short[1-20]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Short segment indicator

Description: It is TRUE if short segment; otherwise, it is set to FALSE. The history buffer is updated if it is set to TRUE.

Power Up: N/A

Screen: SYSTEM Variables screen.

See Also: $hist_index, $hist_progid[], $hist_lineno[],

$VC_MORGRP[1].$speed

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: TCP speed information

Description: TCP speed in mm/sec is updated dynamically when AccuPath is active.

Power Up: N/A

Screen: SYSTEM Variables screen.

$VC_MORGRP[1].$ttl_maxacc

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: maximum acceleration value

Description: Internal use only. Record maximum acceleration value for debug purpose

Power Up: Takes effect immediately

$VC_MORGRP[1].$ttl_maxjrk

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: maximum jerk value

Description: Internal use only. Record maximum jerk value for debug purpose

Power Up: Takes effect immediately

$VC_MORGRP[1].$ttl_minspd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL **Memory:** Not available

Name: minimum corner speed

Description: Internal use only. Record minimum corner speed for debug purpose

Power Up: Takes effect immediately

$VC_PARAMGRP STRUCTURE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** Not available   **Memory:** Not available

Name: AccuPath Parameter Group Variable Structure

Description: This is the AccuPath setup parameter, which is robot or application tool dependent. Refer to the descriptions of the individual fields that follow.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen.

$VC_PARAMGRP[1].$cnstnt_spd

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Constant speed switch

Description: This variable controls the use of constant speed feature for CNT100 termtype motion. When the variable is FALSE, the system will not maintain constant speed when moving around path corner. When the variable is TRUE, the system will maintain constant speed when moving around a path corner by default, but might slow down if it is not possible. In order to do so, the corner distance might be increased compared to the case of when $cnstnt_spd = FALSE. This variable is set by the application tool. It is set to TRUE for the P-200 robot.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen.

$VC_PARAMGRP[1].$dcdh_ratio

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL   **Memory:** Not available

Name: Corner distance ratio

Description: Internal use only. This variable is set by the application tool. It is used when $shortmo_imp is TRUE.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen.

$VC_PARAMGRP[1].$hist_spdlim

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
INTEGER   **Memory:** Not available

Name: Threshold of speed limit

Description: Internal use only. This variable is set by the application tool. When the planned speed is slower than the rate of program speed specified by this variable, system detect speed slowdown and history buffer in $VC_MORGRP[] is updated.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen.

$VC_PARAMGRP[1].$shortmo_imp

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:**
Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:**
BOOLEAN   **Memory:** Not available

Name: Short motion improvement switch

Description: Internal use only. This variable is set by the application tool. Default: FALSE. If TRUE, short motion is improved when half distance rule is applied.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen.

$VC_PARAMGRP[1].$shrt_ratio

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not
available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** REAL
Memory: Not available

Name: Short ratio

Description: Internal use only. This variable is set by the application tool. It is used when $shortmo_imp is TRUE.

Power Up: Takes effect immediately

Screen: SYSTEM Variables screen.

$VC_PARAMGRP[1].$warnmessenb

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Warning message enable switch

Description: FALSE: Warning message for AccuPath is not displayed. When the variable is TRUE, the warning message for AccuPath is displayed. This has to be set to FALSE during the production cycle.

Power Up: Takes effect immediately

Screen: SYSTEM Variable screen

$VCCFG.$comp_switch

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Compatibility switch

Description: This variable is used to switch among different versions of Accupath software for comparison purpose. Default value is 251, which means V5.20P Accupath is used. To use V5.11P Accupath software, set the value to be 123.

Power Up: Takes effect immediately

$VDATE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Software Release Date

Description: Displays the application software release date.

Power Up: N/A

Screen: STATUS Version IDs screen

$VERSION

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RO   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Software Build Version

Description: Displays the software build version and build date.

Power Up: N/A

Screen: STATUS Version IDs screen

$VISION_CFG.$asyn_run

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** UBYTE   **Memory:** Not available

Name: Number of asynchronous runtime buffers

Description: This variable determines how many buffers are allocated to support asynchronous run mode. The values 2-5 are valid. If the value is less than two (2), two (2) buffers are allocated. If the value is more than five (5), only five (5) buffers are allocated.

Power Up: On Cold Start

$VISION_CFG.$data_cache

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Vision Data Cache

Description: This value is the size in bytes of the data cache on the TD: device. The TD: device uses TEMP memory and is fast to read and write files. Typically vision data files reside on FR: device which is slower to read and write files. Therefore, the vision data files are copied to TD: device when used. The files are cached in and out as required.

Power Up: N/A

$VISION_CFG.$data_path

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Vision Data Path

Description: Vision data files (*.VD) will be created in the path specified by this variable. The device and directory should be specified, such as FR:\.

Power Up: N/A

$VISION_CFG.$hostname

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Hostname of Vision Setup

Description: Hostname or IP Address of the PC that last connected into Integrated Vision Setup from the robot's HOME page.

Power Up: N/A

$VISION_CFG.$log_disable

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: Disable Vision Logging

Description: Set this variable to TRUE to disable Vision Logging. The default value is FALSE.

Power Up: N/A

$VISION_CFG.$log_limit

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** ULONG   **Memory:** Not available

Name: Vision Logging Limit

Description: This variable specifies the size in bytes which should remain free on the vision logging device. See $VISION_CFG.$LOG_PATH. After this size is exceeded, then the oldest log directory is removed. The default value is 1000000 bytes (1 MB).

Power Up: On Immediately

$VISION_CFG.$log_path

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** STRING   **Memory:** Not available

Name: Vision Logging Path

Description: When vision logging is enabled, vision log files (*.VL) will be created in the path specified by this variable. The device and directory should be specified, such as MC:\VISION\LOG\.

Power Up: N/A

$VISIONMOUT

Minimum: 0   **Maximum:** 0x7FFF   **Default:** 3000   **KCL/Data:** RW   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Vision Timeout

Description: Not currently used.

Power Up: N/A

$VISPOOL_SIZ

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** LONG   **Memory:** Not available

Name: Vision memory pool size

Description: This variable sets the size of the temporary memory pool for iRVision. Note: Setting this value too small will cause the controller's temporary memory to fragment faster, resulting in performance degradation. Setting this value too large will cause the controller's temporary memory pool to be too small.

Power Up: On Cold Start

2.21 "W" System Variables

$WAITRELEASE

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** BOOLEAN   **Memory:** Not available

Name: WAIT release

Description: If a program is waiting for an input or timer to expire, setting this variable to TRUE will cause the program to move to the next statement without satisfying the wait condition.

Power Up: N/A

Screen: FCTN WAIT RELEASE

$WAITTMOUT

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** RW   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: TIMEOUT Time for WAIT instructions

Description: If a WAIT instruction includes a TIMEOUT clause, this specifies the time. Units are in 100ths of a second.

Power Up: N/A

$WV_OTF_GP[1]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** OTF_WV_T   **Memory:** Not available

Name: Weave On-The-Fly group variables

Description: This variable is the group-based weave On-The-Fly system variable. Each group has its own system variable to specify the weave On-The-Fly feature/function.

Power Up: N/A

$WVSCHG[1-10]

Minimum: Not available   **Maximum:** Not available   **Default:** Not available   **KCL/Data:** Not available   **Program:** Not available   **UIF:** Not available   **CRTL:** Not available   **Data Type:** INTEGER   **Memory:** Not available

Name: Weave schedule group mask

Description: This variable indicates the group associated with the weave schedule ($WVSCH[]). For example, if $WVSCHG[1] is 1. Then group 1 will weave with the frequency and amplitude and dwell specified in the weave schedule 1. If $WVSCHG[1] is 3. Then group 1 and group 2 will weave with the frequency and amplitude and dwell specified in the weave schedule 1. When $WVSCHG[1] is 0, then all the groups that program has control over will weave with the frequency and amplitude and dwell specified in the weave schedule 1.

Power Up: N/A

$WVWRIST.$debug

Minimum: 0x80000000   **Maximum:** 0x7FFFFFFF   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** INTEGER   **Memory:** CMOS

Name: debug

Description: Internal use only.

Power Up: Takes effect immediately

$WVWRIST.$run_ang

Minimum: -90.0   **Maximum:** 90.0   **Default:** 10.0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** REAL   **Memory:** CMOS

Name: run_ang

Description: System returns the actual angle between the TOOL Z-X plane and the TOOL Z-PATH during execution.

Power Up: Takes effect immediately

$WVWRIST.$tol_ang

Minimum: 0.0   **Maximum:** 90.0   **Default:** 10.0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** REAL   **Memory:** CMOS

Name: tol_ang

Description: This is the upper limit for $run_ang. When actual run_ang reaches its limit value, the robot will stop executing and display the error message, "run_ang exceeds tol_ang".

Power Up: Takes effect immediately

See Also: $run_ang definition.

$WVWRIST.$wrist_enb

Minimum: 0   **Maximum:** 1   **Default:** 0   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** BOOLEAN   **Memory:** CMOS

Name: wrist_enb

Description: 1: wrist axis weaving is enabled. 0: wrist axis weaving is disabled. (default)

Power Up: Takes effect immediately

See Also: Wrist Axes Weaving

$WVWRIST.$wst_accel1

Minimum: 8   **Maximum:** 1000   **Default:** 32   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** INTEGER   **Memory:** CMOS

Name: Wrist Acceleration 1

Description: Defines acceleration time for wrist axes motion during wrist axes weave operation.

Power Up: On_Cold_Start

$WVWRIST.$wst_accel2

Minimum: 8   **Maximum:** 1000   **Default:** 32   **KCL/Data:** RW   **Program:** RW   **UIF:** RW   **CRTL:** RW   **Data Type:** INTEGER   **Memory:** CMOS

Name: Wrist Acceleration 2

Description: Defines acceleration 2 time for wrist axes motion during wrist axes weave operation.

Power Up: On_Cold_Start

Glossary

A

abort

Abnormal termination of a computer program caused by hardware or software malfunction or operator cancellation.

absolute pulse code system

A positional information system for servomotors that relies on battery-backed RAM to store encoder pulse counts when the robot is turned off. This system is calibrated when it is turned on.

A/D value

An analog to digital-value. Converts a multilevel analog electrical system pattern into a digital bit.

AI

Analog input.

AO

Analog output.

alarm

The difference in value between actual response and desired response in the performance of a controlled machine, system or process. Alarm=Error.

algorithm

A fixed step-by-step procedure for accomplishing a given result.

alphanumeric

Data that are both alphabetical and numeric.

AMPS

Amperage amount.

analog

The representation of numerical quantities by measurable quantities such as length, voltage or resistance. Also refers to analog type I/O blocks and distinguishes them from discrete I/O blocks. Numerical data that can vary continuously, for example, voltage levels that can vary within the range of -10 to +10 volts.

AND

An operation that places two contacts or groups of contacts in series. All contacts in series control the resulting status and also mathematical operator.

ANSI

American National Standard Institute, the U.S. government organization with responsibility for the development and announcement of technical data standards.

APC

See absolute pulse code system.

APC motor

See servomotor.

application program

The set of instructions that defines the specific intended tasks of robots and robot systems to make them reprogrammable and multifunctional. You can initiate and change these programs.

arm

A robot component consisting of an interconnecting set of links and powered joints that move and support the wrist socket and end effector.

articulated arm

A robot arm constructed to simulate the human arm, consisting of a series of rotary motions and joints, each powered by a motor.

ASCII

Abbreviation for American Standard Code for Information Interchange. An 8-level code (7 bits plus 1 parity bit) commonly used for the exchange of data.

automatic mode

The robot state in which automatic operation can be initiated.

automatic operation

The time during which robots are performing programmed tasks through unattended program execution.

axis

> 1. A straight line about which a robot joint rotates or moves. 2. One of the reference lines or a coordinate system. 3. A single joint on the robot arm.

B

backplane

> A group of connectors mounted at the back of a controller rack to which printed circuit boards are mated.

BAR

> A unit of pressure equal to 100,000 pascals.

barrier

> A means of physically separating persons from the restricted work envelope; any physical boundary to a hazard or electrical device/component.

battery low alarm

> A programmable value (in engineering units) against which the analog input signal automatically is compared on Genius I/O blocks. A fault is indicated if the input value is equal to or less than the low alarm value.

baud

> A unit of transmission speed equal to the number of code elements (bits) per second.

big-endian

> The adjectives big-endian and little-endian refer to which bytes are most significant in multi-byte data types and describe the order in which a sequence of bytes is stored in a computer's memory. In a big-endian system, the most significant value in the sequence is stored at the lowest storage address (i.e., first). In a little-endian system, the least significant value in the sequence is stored first.

binary

> A numbering system that uses only 0 and 1.

bit

> Contraction of binary digit. 1. The smallest unit of information in the binary numbering system, represented by a 0 or 1. 2. The smallest division of a programmable controller word.

bps

> Bits per second.

buffer

> A storage area in the computer where data is held temporarily until the computer can process it.

bus

> A channel along which data can be sent.

bus controller

A Genius bus interface board for a programmable controller.

bus scan

One complete communications cycle on the serial bus.

Bus Switching Module

A device that switches a block cluster to one bus or the other of a dual bus.

byte

A sequence of binary digits that can be used to store a value from 0 to 255 and usually operated upon as a unit. Consists of eight bits used to store two numeric or one alpha character.

C

calibration

The process whereby the joint angle of each axis is calculated from a known reference point.

Cartesian coordinate system

A coordinate system whose axes (x, y, and z) are three intersecting perpendicular straight lines. The origin is the intersection of the axes.

Cartesian coordinates

A set of three numbers that defines the location of a point within a rectilinear coordinate system and consisting of three perpendicular axes (x, y, z).

cathode ray tube

A device, like a television set, for displaying information.

central processing unit

The main computer component that is made up of a control section and an arithmetic-logic section. The other basic units of a computer system are input/output units and primary storage.

channel

The device along which data flow between the input/output units of a computer and primary storage.

character

One of a set of elements that can be arranged in ordered groups to express information. Each character has two forms: 1. a man-intelligible form, the graphic, including the decimal digits 0-9, the letters A-Z, punctuation marks, and other formatting and control symbols; 2. a computer intelligible form, the code, consisting of a group of binary digits (bits).

circular

A MOTYPE option in which the robot tool center point moves in an arc defined by three points. These points can be positions or path nodes.

clear

To replace information in a storage unit by zero (or blank, in some machines).

closed loop

A control system that uses feedback. An open loop control system does not use feedback.

C-MOS RAM

Complementary metal-oxide semiconductor random-access memory. A read/write memory in which the basic memory cell is a pair of MOS (metal-oxide semiconductor) transistors. It is an implementation of S-RAM that has very low power consumption, but might be less dense than other S-RAM implementations.

coaxial cable

A transmission line in which one conductor is centered inside and insulated from an outer metal tube that serves as the second conductor. Also known as coax, coaxial line, coaxial transmission line, concentric cable, concentric line, concentric transmission line.

component

An inclusive term used to identify a raw material, ingredient, part or subassembly that goes into a higher level of assembly, compound or other item.

computer

A device capable of accepting information, applying prescribed processes to the information, and supplying the results of these processes.

configuration

The joint positions of a robot and turn number of wrist that describe the robot at a specified position. Configuration is designated by a STRING value and is included in positional data.

continuous path

A trajectory control system that enables the robot arm to move at a constant tip velocity through a series of predefined locations. A rounding effect of the path is required as the tip tries to pass through these locations.

controller memory

A medium in which data are retained. Primary storage refers to the internal area where the data and program instructions are stored for active use, as opposed to auxiliary or external storage (magnetic tape, disk, diskette, and so forth.)

continuous process control

The use of transducers (sensors) to monitor a process and make automatic changes in operations through the design of appropriate feedback control loops. While such devices historically have been mechanical or electromechanical, microcomputers and centralized control is now used, as well.

continuous production

A production system in which the productive equipment is organized and sequenced according to the steps involved to produce the product. Denotes that material flow is continuous during the production process. The routing of the jobs is fixed and set-ups are seldom changed.

controlled stop

A controlled stop controls robot deceleration until it stops. When a safety stop input such as a safety fence signal is opened, the robot decelerates in a controlled manner and then stops. After the robot stops, the Motor Control Contactor opens and drive power is removed.

controller

A hardware unit that contains the power supply, operator controls, control circuitry, and memory that directs the operation and motion of the robot and communications with external devices. See control unit.

control, open-loop

An operation where the computer applies control directly to the process without manual intervention.

control unit

The portion of a computer that directs the automatic operation of the computer, interprets computer instructions, and initiates the proper signals to the other computer circuits to execute instructions.

coordinate system

See Cartesian coordinate system.

CPU

See central processing unit.

CRT

See cathode ray tube.

cps (viscosity)

Centipoises per second.

CRT/KB

Cathode ray tube/keyboard. An optional interface device for the robot system. The CRT/KB is used for some robot operations and for entering programs. It can be a remote device that attaches to the robot via a cable.

cycle

1. A sequence of operations that is repeated regularly. The time it takes for one such sequence to occur. 2. The interval of time during which a system or process, such as seasonal demand or a manufacturing operation, periodically returns to similar initial conditions. 3. The interval of time during which an event or set of events is completed. In production control, a cycle is the length of time between the release of a manufacturing order and shipment to the customer or inventory.

cycle time

1. In industrial engineering, the time between completion of two discrete units of production. 2. In materials management, the length of time from when material enters a production facility until it exits. See throughput.

cursor

An indicator on a teach pendant or CRT display screen at which command entry or editing occurs. The indicator can be a highlighted field or an arrow (> or ^).

cylindrical

Type of work envelope that has two linear major axes and one rotational major axis. Robotic device that has a predominantly cylindrical work envelope due to its design. Typically has fewer than 6 joints and typically has only 1 linear axis.

D

D/A converter

A digital-to-analog converter. A device that transforms digital data into analog data.

D/A value

A digital-to-analog value. Converts a digital bit pattern into a multilevel analog electrical system.

daisy chain

A means of connecting devices (readers, printers, etc.) to a central processor by party-line input/output buses that join these devices by male and female connectors. The last female connector is shorted by a suitable line termination.

daisy chain configuration

A communications link formed by daisy chain connection of twisted pair wire.

data

A collection of facts, numeric and alphabetical characters, or any representation of information that is suitable for communication and processing.

data base

A data file philosophy designed to establish the independence of computer program from data files. Redundancy is minimized and data elements can be added to, or deleted from, the file designs without changing the existing computer programs.

DC

Abbreviation for direct current.

DEADMAN switch

A control switch on the teach pendant that is used to enable servo power. Pressing the DEADMAN switch while the teach pendant is on activates servo power and releases the robot brakes; releasing the switch deactivates servo power and applies the robot brakes.

debugging

The process of detecting, locating and removing mistakes from a computer program, or manufacturing control system. See diagnostic routine.

deceleration tolerance

The specification of the percentage of deceleration that must be completed before a motion is considered finished and another motion can begin.

default

The value, display, function or program automatically selected if you have not specified a choice.

deviation

Usually, the absolute difference between a number and the mean of a set of numbers, or between a forecast value and the actual data.

device

Any type of control hardware, such as an emergency-stop button, selector switch, control pendant, relay, solenoid valve, or sensor.

diagnostic routine

A test program used to detect and identify hardware/software malfunctions in the controller and its associated I/O equipment. See debugging.

diagnostics

Information that permits the identification and evaluation of robot and peripheral device conditions.

digital

A description of any data that is expressed in numerical format. Also, having the states On and Off only.

digital control

The use of a digital computer to perform processing and control tasks in a manner that is more accurate and less expensive than an analog control system.

digital signal

A single point control signal sent to or from the controller. The signal represents one of two states: ON (TRUE, 1. or OFF (FALSE, 0).

directory

A listing of the files stored on a device.

discrete

Consisting of individual, distinct entities such as bits, characters, circuits, or circuit components. Also refers to ON/OFF type I/O blocks.

disk

A secondary memory device in which information is stored on a magnetically sensitive, rotating disk.

disk memory

A non-programmable, bulk-storage, random-access memory consisting of a magnetized coating on one or both sides of a rotating thin circular plate.

drive power

  The energy source or sources for the robot servomotors that produce motion.

DRAM

  Dynamic Random Access Memory. A read/write memory in which the basic memory cell is a capacitor. DRAM (or D-RAM) tends to have a higher density than SRAM (or S-RAM). Due to the support circuitry required, and power consumption needs, it is generally impractical to use. A battery can be used to retain the content upon loss of power.

E

edit

  1. A software mode that allows creation or alteration of a program. 2. To modify the form or format of data, for example, to insert or delete characters.

emergency stop

  The operation of a circuit using hardware-based components that overrides all other robot controls, removes drive power from the actuators, and causes all moving parts of to stop. The operator panel and teach pendant are each equipped with EMERGENCY STOP buttons.

enabling device

  A manually operated device that, when continuously activated, permits motion. Releasing the device stops the motion of the robot and associated equipment that might present a hazard.

encoder

  1. A device within the robot that sends the controller information about where the robot is. 2. A transducer used to convert position data into electrical signals. The robot system uses an incremental optical encoder to provide position feedback for each joint. Velocity data is computed from the encoder signals and used as an additional feedback signal to assure servo stability.

end effector

  An accessory device or tool specifically designed for attachment to the robot wrist or tool mounting plate to enable the robot to perform its intended tasks. Examples include gripper, spot weld gun, arc weld gun, spray paint gun, etc.

end-of-arm tooling

  Any of a number of tools, such as welding guns, torches, bells, paint spraying devices, attached to the faceplate of the robot wrist. Also called end effector or EOAT.

engineering units

  Units of measure as applied to a process variable, for example, psi, Degrees F., etc.

envelope, maximum

  The volume of space encompassing the maximum designed movements of all robot parts including the end effector, workpiece, and attachments.

EOAT

See end of arm tooling, tool.

EPROM

Erasable Programmable Read Only Memory. Semiconductor memory that can be erased and reprogrammed. A non-volatile storage memory.

error

The difference in value between actual response and desired response in the performance of a controlled machine, system or process. Alarm=Error.

error message

A numbered message, displayed on the CRT/KB and teach pendant, that indicates a system problem or warns of a potential problem.

Ethernet

A Local Area Network (LAN) bus-oriented, hardware technology that is used to connect computers, printers, terminal concentrators (servers), and many other devices together. It consists of a master cable and connection devices at each machine on the cable that allow the various devices to "talk" to each other. Software that can access the Ethernet and cooperate with machines connected to the cable is necessary. Ethernets come in varieties such as baseband and broadband and can run on different media, such as coax, twisted pair and fiber. Ethernet is a trademark of Xerox Corporation.

execute

To perform a specific operation, such as one that would be accomplished through processing one statement or command, a series of statements or commands, or a complete program or command procedure.

extended axis

An optional, servo-controlled axis that provides extended reach capability for a robot, including in-booth rail, single- or double-link arm, also used to control motion of positioning devices.

F

faceplate

The tool mounting plate of the robot.

feedback

1. The signal or data fed back to a commanding unit from a controlled machine or process to denote its response to the command signal. The signal representing the difference between actual response and desired response that is used by the commanding unit to improve performance of the controlled machine or process. 2. The flow of information back into the control system so that actual performance can be compared with planned performance, for instance in a servo system.

field

A specified area of a record used for a particular category of data. 2. A group of related items that occupy the same space on a CRT/KB screen or teach pendant LCD screen. Field name is the name of the field; field items are the members of the group.

field devices

User-supplied devices that provide information to the PLC (inputs: push buttons, limit switches, relay contacts, an so forth) or perform PLC tasks (outputs: motor starters, solenoids, indicator lights, and so forth.)

file

1. An organized collection of records that can be stored or retrieved by name. 2. The storage device on which these records are kept, such as bubble memory or disk.

filter

A device to suppress interference that would appear as noise.

Flash File Storage

A portion of FROM memory that functions as a separate storage device. Any file can be stored on the FROM disk.

Flash ROM

Flash Read Only Memory. Flash ROM is not battery-backed memory but it is non-volatile. All data in Flash ROM is saved even after you turn off and turn on the robot.

flow chart

A systems analysis tool to graphically show a procedure in which symbols are used to represent operations, data, flow, and equipment. See block diagram, process chart.

flow control

A specific production control system that is based primarily on setting production rates and feeding work into production to meet the planned rates, then following it through production to make sure that it is moving. This concept is most successful in repetitive production.

format

To set up or prepare a memory card or floppy disk (not supported with version 7.20 and later) so it can be used to store data in a specific system.

FR

See Flash ROM.

F-ROM

See Flash ROM.

FROM disk

See Flash ROM.

G

general override stat

A percentage value that governs the maximum robot jog speed and program run speed.

Genius I/O bus

The serial bus that provides communications between blocks, controllers, and other devices in the system especially with respect to GE FANUC Genius I/O.

gripper

The "hand" of a robot that picks up, holds and releases the part or object being handled. Sometimes referred to as a manipulator. See EOAT, tool.

group signal

An input/output signal that has a variable number of digital signals, recognized and taken as a group.

gun

See applicator.

H

Hand Model.

Used in Interference Checking, the Hand Model is the set of virtual model elements (spheres and cylinders) that are used to represent the location and shape of the end of arm tooling with respect to the robot's faceplate.

hardware

1. In data processing, the mechanical, magnetic, electrical and electronic devices of which a computer, controller, robot, or panel is built. 2. In manufacturing, relatively standard items such as nuts, bolts, washers, clips, and so forth.

hard-wire

To connect electric components with solid metallic wires.

hard-wired

1. Having a fixed wired program or control system built in by the manufacturer and not subject to change by programming. 2. Interconnection of electrical and electronic devices directly through physical wiring.

hazardous motion

Unintended or unexpected robot motion that can cause injury.

hexadecimal

A numbering system having 16 as the base and represented by the digits 0 through 9, and A through F.

hold

A smoothly decelerated stopping of all robot movement and a pause of program execution. Power is maintained on the robot and program execution generally can be resumed from a hold.

HTML.

Hypertext Markup Language. A markup language that is used to create hypertext and hypermedia documents incorporating text, graphics, sound, video, and hyperlinks.

http.

Hypertext transfer protocol. The protocol used to transfer HTML files between web servers.

I

impedance

A measure of the total opposition to current flow in an electrical circuit.

incremental encoder system

A positional information system for servomotors that requires calibrating the robot by moving it to a known reference position (indicated by limit switches) each time the robot is turned on or calibration is lost due to an error condition.

index

An integer used to specify the location of information within a table or program.

index register

A memory device containing an index.

industrial robot

A reprogrammable multifunctional manipulator designed to move material, parts, tools, or specialized devices through variable programmed motions in order to perform a variety of tasks.

industrial robot system

A system that includes industrial robots, end effectors, any equipment devices and sensors required for the robot to perform its tasks, as well as communication interfaces for interlocking, sequencing, or monitoring the robot.

information

The meaning derived from data that have been arranged and displayed in a way that they relate to that which is already known. See data.

initialize

1. Setting all variable areas of a computer program or routine to their desired initial status, generally done the first time the code is executed during each run. 2. A program or hardware circuit that returns a program a system, or hardware device to an original state. See startup, initial.

input

The data supplied from an external device to a computer for processing. The device used to accomplish this transfer of data.

input device

A device such as a terminal keyboard that, through mechanical or electrical action, converts data from the form in which it has been received into electronic signals that can be interpreted by the CPU or programmable controller. Examples are limit switches, push buttons, pressure switches, digital encoders, and analog devices.

input processing time

The time required for input data to reach the microprocessor.

input/output

Information or signals transferred between devices, discreet electrical signals for external control.

input/output control

A technique for controlling capacity where the actual output from a work center is compared with the planned output developed by CRP. The input is also monitored to see if it corresponds with plans so that work centers will not be expected to generate output when jobs are not available to work on.

integrated circuit

A solid-state micro-circuit contained entirely within a chip of semiconductor material, generally silicon. Also called chip.

interactive

Refers to applications where you communicate with a computer program via a terminal by entering data and receiving responses from the computer.

interface

1. A concept that involves the specifications of the inter-connection between two equipments having different functions. 2. To connects a PLC with the application device, communications channel, and peripherals through various modules and cables. 3. The method or equipment used to communicate between devices.

interference zone

An area that falls within the work envelope of a robot, in which there is the potential for the robot motion to coincide with the motion of another robot or machine, and for a collision to occur.

interlock

An arrangement whereby the operation of one control or mechanism brings about, or prevents, the operations of another.

interrupt

A break in the normal flow of a system or program that occurs in a way that the flow can be resumed from that point at a later time. Interrupts are initiated by two types of signals: 1. signals originating within the computer system to synchronize the operation of the computer system with the outside

world; 2. signals originating exterior to the computer system to synchronize the operation of the computer system with the outside world.

I/O

Abbreviation for input/output or input/output control.

I/O block

A microprocessor-based, configurable, rugged solid state device to which field I/O devices are attached.

I/O electrical isolation

A method of separating field wiring from logic level circuitry. This is typically done through optical isolation devices.

I/O module

A printed circuit assembly that is the interface between user devices and the Series Six PLC.

I/O scan

A method by which the CPU monitors all inputs and controls all outputs within a prescribed time. A period during which each device on the bus is given a turn to send information and listen to all of the broadcast data on the bus.

ISO

The International Standards Organization that establishes the ISO interface standards.

isolation

1. The ability of a logic circuit having more than one inputs to ensure that each input signal is not affected by any of the others. 2. A method of separating field wiring circuitry from logic level circuitry, typically done optically.

item

1. A category displayed on the teach pendant on a menu. 2. A set of adjacent digits, bits, or characters that is treated as a unit and conveys a single unit of information. 3. Any unique manufactured or purchased part or assembly: end product, assembly, subassembly, component, or raw material.

J

jog coordinate systems

Coordinate systems that help you to move the robot more effectively for a specific application. These systems include JOINT, WORLD, TOOL, and USER.

JOG FRAME

A jog coordinate system you define to make the robot jog the best way possible for a specific application. This can be different from world coordinate frame.

jogging

Pressing special keys on the teach pendant to move the robot.

jog speed

> Is a percentage of the maximum speed at which you can jog the robot.

joint

> 1. A single axis of rotation. There are up to six joints in a robot arm (P-155 swing arm has 8). 2. A jog coordinate system in which one axis is moved at a time.

JOINT

> A motion type in which the robot moves the appropriate combination of axes independently to reach a point most efficiently. (Point to point, non-linear motion).

joint interpolated motion

> A method of coordinating the movement of the joints so all joints arrive at the desired location at the same time. This method of servo control produces a predictable path regardless of speed and results in the fastest cycle time for a particular move. Also called joint motion.

K

K

> Abbreviation for kilo, or exactly 1024 in computer jargon. Related to 1024 words of memory.

KAREL

> The programming language developed for robots by the FANUC Robotics America, Inc.

L

label

> An ordered set of characters used to symbolically identify an instruction, a program, a quantity, or a data area.

LCD

> See liquid crystal display.

lead time

> The span of time needed to perform an activity. In the production and inventory control context, this activity is normally the procurement of materials and/or products either from an outside supplier or from one's own manufacturing facility. Components of lead time can include order preparation time, queue time, move or transportation time, receiving and inspection time.

LED

> See Light Emitting Diode.

LED display

> An alphanumeric display that consists of an array of LEDs.

Light Emitting Diode

> A solid-state device that lights to indicate a signal on electronic equipment.

limiting device

A device that restricts the work envelope by stopping or causing to stop all robot motion and that is independent of the control program and the application programs.

limit switch

A switch that is actuated by some part or motion of a machine or equipment to alter the electrical circuit associated with it. It can be used for position detection.

linear

A motion type in which the appropriate combination of axes move in order to move the robot TCP in a straight line while maintaining tool center point orientation.

liquid crystal display

A digital display on the teach pendant that consists of two sheets of glass separated by a sealed-in, normally transparent, liquid crystal material. Abbreviated LCD.

little-endian

The adjectives big-endian and little-endian refer to which bytes are most significant in multi-byte data types and describe the order in which a sequence of bytes is stored in a computer's memory. In a big-endian system, the most significant value in the sequence is stored at the lowest storage address (i.e., first). In a little-endian system, the least significant value in the sequence is stored first.

load

1. The weight (force) applied to the end of the robot arm. 2. A device intentionally placed in a circuit or connected to a machine or apparatus to absorb power and convert it into the desired useful form. 3. To copy programs or data into memory storage.

location

1. A storage position in memory uniquely specified by an address. 2. The coordinates of an object used in describing its x, y, and z position in a Cartesian coordinate system.

lockout/tagout

The placement of a lock and/or tag on the energy isolating device (power disconnecting device) in the off or open position. This indicates that the energy isolating device or the equipment being controlled will not be operated until the lock/tag is removed.

log

A record of values and/or action for a given function.

logic

A fixed set of responses (outputs) to various external conditions (inputs). Also referred to as the program.

loop

The repeated execution of a series of instructions for a fixed number of times, or until interrupted by the operator.

M

mA

    See milliampere.

machine language

    A language written in a series of bits that are understandable by, and therefore instruct, a computer. This is a "first level" computer language, as compared to a "second level" assembly language, or a "third level" compiler language.

machine lock

    A test run option that allows the operator to run a program without having the robot move.

macro

    A source language instruction from which many machine-language instructions can be generated.

magnetic disk

    A metal or plastic floppy disk (not supported on version 7.10 and later) that looks like a phonograph record whose surface can store data in the form of magnetized spots.

magnetic disk storage

    A storage device or system consisting of magnetically coated metal disks.

magnetic tape

    Plastic tape, like that used in tape recorder, on which data is stored in the form of magnetized spots.

maintenance

    Keeping the robots and system in their proper operating condition.

MC

    See memory card.

mechanical unit

    The robot arm, including auxiliary axis, and hood/deck and door openers.

medium

    plural **media** . The physical substance upon which data is recorded, such as a memory card (or floppy disk which is not supported on version 7.10 and later).

memory

    A device or media used to store information in a form that can be retrieved and is understood by the computer or controller hardware. Memory on the controller includes C-MOS RAM, Flash ROM and D-RAM.

memory card

    A C-MOS RAM memory card or a flash disk-based PC card.

menu

A list of options displayed on the teach pendant screen.

message

A group of words, variable in length, transporting an item of information.

microprocessor

A single integrated circuit that contains the arithmetic, logic, register, control and memory elements of a computer.

microsecond

One millionth (0.000001) of a second

milliampere

One one-thousandth of an ampere. Abbreviated mA.

millisecond

One thousandth of a second. Abbreviated msec.

module

A distinct and identifiable unit of computer program for such purposes as compiling, loading, and linkage editing. It is eventually combined with other units to form a complete program.

motion type

A feature that allows you to select how you want the robot to move from one point to the next. MOTYPES include joint, linear, and circular.

mode

1. One of several alternative conditions or methods of operation of a device. 2. The most common or frequent value in a group of values.

N

network

1. The interconnection of a number of devices by data communication facilities. "Local networking" is the communications network internal to a robot. "Global networking" is the ability to provide communications connections outside of the robot's internal system. 2. Connection of geographically separated computers and/or terminals over communications lines. The control of transmission is managed by a standard protocol.

non-volatile memory

Memory capable of retaining its stored information when power is turned off.

O

Obstacle Model.

Used in Interference Checking, the Obstacle Model is the set of virtual model elements (spheres, cylinders, and planes) that are used to represent the shape and the location of a given obstacle in space.

off-line

Equipment or devices that are not directly connected to a communications line.

off-line operations

Data processing operations that are handled outside of the regular computer program. For example, the computer might generate a report off-line while the computer was doing another job.

off-line programming

The development of programs on a computer system that is independent of the "on-board" control of the robot. The resulting programs can be copied into the robot controller memory.

offset

The count value output from a A/D converter resulting from a zero input analog voltage. Used to correct subsequent non-zero measurements also incremental position or frame adjustment value.

on-line

A term to describe equipment or devices that are connected to the communications line.

on-line processing

A data processing approach where transactions are entered into the computer directly, as they occur.

operating system

Lowest level system monitor program.

operating work envelope

The portion of the restricted work envelope that is actually used by the robot while it is performing its programmed motion. This includes the maximum the end-effector, the workpiece, and the robot itself.

operator

A person designated to start, monitor, and stop the intended productive operation of a robot or robot system.

operator box

A control panel that is separate from the robot and is designed as part of the robot system. It consists of the buttons, switches, and indicator lights needed to operate the system.

operator panel

A control panel designed as part of the robot system and consisting of the buttons, switches, and indicator lights needed to operate the system.

optional features

Additional capabilities available at a cost above the base price.

OR

An operation that places two contacts or groups of contacts in parallel. Any of the contacts can control the resultant status, also a mathematical operation.

orientation

The attitude of an object in space. Commonly described by three angles: rotation about x (w), rotation about y (p), and rotation about z (r).

origin

The point in a Cartesian coordinate system where axes intersect; the reference point that defines the location of a frame.

OT

See overtravel.

output

Information that is transferred from the CPU for control of external devices or processes.

output device

A device, such as starter motors, solenoids, that receive data from the programmable controller.

output module

An I/O module that converts logic levels within the CPU to a usable output signal for controlling a machine or process .

outputs

Signals, typically on or off, that controls external devices based upon commands from the CPU.

override

See general override.

overtravel

A condition that occurs when the motion of a robot axis exceeds its prescribed limits.

overwrite

To replace the contents of one file with the contents of another file when copying.

P

parity

The anticipated state, odd or even, of a set of binary digits.

parity bit

A binary digit added to an array of bits to make the sum of all bits always odd or always even.

parity check

A check that tests whether the number of ones (or zeros) in an array of binary digits is odd or even.

parity error

A condition that occurs when a computed parity check does not agree with the parity bit.

part

A material item that is used as a component and is not an assembly or subassembly.

pascal

A unit of pressure in the meter-kilogram-second system equivalent to one newton per square meter.

path

1. A variable type available in the KAREL system that consists of a list of positions. Each node includes positional information and associated data. 2. The trajectory followed by the TCP in a move.

PCB

See printed circuit board.

PC Interface

The PC Interface software uses Ethernet connections to provide file transfer protocol (FTP) functions, PC send macros, telnet interface, TCP/IP interface web server functions, and host communications.

pendant

See teach pendant.

PLC

See programmable logic controller or cell controller.

PMC

The programmable machine controller (PMC) functions provide a ladder logic programming environment to create PMC functions. This provides the capability to use the robot I/O system to run PLC programs in the background of normal robot operations. This function can be used to control bulk supply systems, fixed automation that is part of the robot workcell, or other devices that would normally require basic PLC controls.

printed circuit board

A flat board whose front contains slots for integrated circuit chips and connections for a variety of electronic components, and whose back is printed with electrically conductive pathways between the components.

production mode

See automatic mode.

program

1. A plan for the solution of a problem. A complete program includes plans for the transcription of data, coding for the computer, and plans for the absorption of the results into the system. 2. A sequence of instructions to be executed by the computer or controller to control a robot/robot system. 3. To furnish a computer with a code of instructions. 4. To teach a robot system a specific set of movements and instructions to do a task.

programmable controller

       See programmable logic controller or cell controller.

programmable logic controller

       A solid-state industrial control device that receives inputs from user-supplied control devices, such as switches and sensors, implements them in a precise pattern determined by ladder diagram-based programs stored in the user memory, and provides outputs for control of processes or user-supplied devices such as relays and motor starters.

Program ToolBox

       The Program ToolBox software provides programming utilities such as mirror image and flip wrist editing capabilities.

protocol

       A set of hardware and software interfaces in a terminal or computer that allows it to transmit over a communications network, and that collectively forms a communications language.

psi

       Pounds per square inch.

Q

queue.

       1. Waiting lines resulting from temporary delays in providing service. 2. The amount of time a job waits at a work center before set-up or work is performed on the job. See also job queue.

R

RAM

       See Random Access Memory.

random access

       A term that describes files that do not have to be searched sequentially to find a particular record but can be addressed directly.

Random Access Memory

       1. Volatile, solid-state memory used for storage of programs and locations; battery backup is required. 2. The working memory of the controller. Programs and variable data must be loaded into RAM before the program can execute or the data can be accessed by the program.

range

       1. A characterization of a variable or function. All the values that a function can possess. 2. In statistics, the spread in a series of observations. 3. A programmable voltage or current spectrum of values to which input or output analog signals can be limited.

RI

       Robot input.

RO

Robot output.

read

To copy, usually from one form of storage to another, particularly from external or secondary storage to internal storage. To sense the meaning of arrangements of hardware. To sense the presence of information on a recording medium.

Read Only Memory

A digital memory containing a fixed pattern of bits that you cannot alter.

record

To store the current set or sets of information on a storage device.

recovery

The restoration of normal processing after a hardware or software malfunction through detailed procedures for file backup, file restoration, and transaction logging.

register

1. A special section of primary storage in a computer where data is held while it is being worked on.
2. A memory device capable of containing one or more computer bits or words.

remote/local

A device connection to a given computer, with remote devices being attached over communications lines and local devices attached directly to a computer channel; in a network, the computer can be a remote device to the CPU controlling the network.

repair

To restore robots and robot systems to operating condition after damage, malfunction, or wear.

repeatability

The closeness of agreement among the number of consecutive movements made by the robot arm to a specific point.

reset

To return a register or storage location to zero or to a specified initial condition.

restricted work envelope

That portion of the work envelope to which a robot is restricted by limiting devices that establish limits that will not be exceeded in the event of any reasonably foreseeable failure of the robot or its controls. The maximum distance the robot can travel after the limited device is actuated defines the restricted work envelope of the robot.

RIA

Robotic Industries Association Subcommittee of the American National Standards Institute, Inc.

robot

A reprogrammable multifunctional manipulator designed to move material, parts, tools, or specialized devices, through variable programmed motions for the performance of a variety of tasks.

Robot Model.

Used in Interference Checking, the Robot Model is the set of virtual model elements (sphere and cylinders) that are used to represent the location and shape of the robot arm with respect to the robot's base. Generally, the structure of a six axes robot can be accurately modeled as a series of cylinders and spheres. Each model element represents a link or part of the robot arm.

ROM

See Read Only Memory.

routine

1. A list of coded instructions in a program. 2. A series of computer instructions that performs a specific task and can be executed as often as needed during program execution.

S

saving data.

Storing program data in Flash ROM, to a floppy disk (not supported on version 7.10 and later), or memory card.

scfm

Standard cubic feet per minute.

scratch start

Allows you to enable and disable the automatic recovery function.

sensor

A device that responds to physical stimuli, such as heat, light, sound pressure, magnetism, or motion, and transmits the resulting signal or data for providing a measurement, operating a control or both. Also a device that is used to measure or adjust differences in voltage in order to control sophisticated machinery dynamically.

serial communication

A method of data transfer within a PLC whereby the bits are handled sequentially rather than simultaneously as in parallel transmission.

serial interface

A method of data transmission that permits transmitting a single bit at a time through a single line. Used where high speed input is not necessary.

Server Side Include (SSI)

A method of calling or "including" code into a web page.

servomotor

An electric motor that is controlled to produce precision motion. Also called a "smart" motor.

SI

System input.

signal

The event, phenomenon, or electrical quantity that conveys information from one point to another.

significant bit

A bit that contributes to the precision of a number. These are counted starting with the bit that contributes the most value, of "most significant bit," and ending with the bit that contributes the least value, or "least significant bit."

slip sheet

A sheet of material placed between certain layers of a unit load. Also known as tier sheet.

SO

System output.

specific gravity

The ratio of a mass of solid or liquid to the mass of an equal volume of water at 45C. You must know the specific gravity of the dispensing material to perform volume signal calibration. The specific gravity of a dispensing material is listed on the MSDS for that material.

SRAM

A read/write memory in which the basic memory cell is a transistor. SRAM (or S-RAM) tends to have a lower density than DRAM. A battery can be used to retain the content upon loss of power.

slpm

Standard liters per minute.

Standard Operator Panel (SOP).

A panel that is made up of buttons, keyswitches, and connector ports.

state

The on or off condition of current to and from and input or output device.

statement

See instruction.

storage device

Any device that can accept, retain, and read back one or more times. The available storage devices are SRAM, Flash ROM (FROM or F-ROM), floppy disks (not available on version 7.10 and later), memory cards, or a USB memory stick.

system variable

An element that stores data used by the controller to indicate such things as robot specifications, application requirements, and the current status of the system.

T

Tare

The difference between the gross weight of an object and its contents, and the object itself. The weight of an object without its contents.

TCP

See tool center point.

teaching

Generating and storing a series of positional data points effected by moving the robot arm through a path of intended motions.

teach mode

1. The mode of operation in which a robot is instructed in its motions, usually by guiding it through these motions using a teach pendant. 2. The generation and storage of positional data. Positional data can be taught using the teach pendant to move the robot through a series of positions and recording those positions for use by an application program.

teach pendant

1. A hand-held device used to instruct a robot, specifying the character and types of motions it is to undertake. Also known as teach box, teach gun. 2. A portable device, consisting of an LCD display and a keypad, that serves as a user interface to the KAREL system and attaches to the operator box or operator panel via a cable. The teach pendant is used for robot operations such as jogging the robot, teaching and recording positions, and testing and debugging programs.

telemetry

The method of transmission of measurements made by an instrument or a sensor to a remote location.

termination type

Feature that controls the blending of robot motion between segments.

tool

A term used loosely to define something mounted on the end of the robot arm, for example, a hand, gripper, or an arc welding torch.

tool center point

1. The location on the end-effector or tool of a robot hand whose position and orientation define the coordinates of the controlled object. 2. Reference point for position control, that is, the point on the tool that is used to teach positions. Abbreviated TCP.

TOOL Frame

The Cartesian coordinate system that has the position of the TCP as its origin to stet. The z-axis of the tool frame indicates the approach vector for the tool.

TP.

See teach pendant.

transducer

A device for converting energy from one form to another.

U

UOP

See user operator panel.

URL

Universal Resource Locator. A standard addressing scheme used to locate or reference files on web servers.

USB memory stick

The controller USB memory stick interface supports a USB 1.1 interface. The USB Organization specifies standards for USB 1.1 and 2.0. Most memory stick devices conform to the USB 2.0 specification for operation and electrical standards. USB 2.0 devices as defined by the USB Specification must be backward compatible with USB 1.1 devices. However, FANUC Robotics does not support any security or encryption features on USB memory sticks. The controller supports most widely-available USB Flash memory sticks from 32MB up to 1GB in size.

USER Frame

The Cartesian coordinate system that you can define for a specific application. The default value of the User Frame is the World Frame. All positional data is recorded relative to User Frame.

User Operator Panel

User-supplied control device used in place of or in parallel with the operator panel or operator box supplied with the controller. Abbreviated UOP .

V

variable

A quantity that can assume any of a given set of values.

variance

The difference between the expected (or planned) and the actual, also statistics definitions.

vision system

A device that collects data and forms an image that can be interpreted by a robot computer to determine the position or to "see" an object.

volatile memory

Memory that will lose the information stored in it if power is removed from the memory circuit device.

W

web server

An application that allows you to access files on the robot using a standard web browser.

warning device

An audible or visible device used to alert personnel to potential safety hazards.

work envelope

The volume of space that encloses the maximum designed reach of the robot manipulator including the end effector, the workpiece, and the robot itself. The work envelope can be reduced or restricted by limiting devices. The maximum distance the robot can travel after the limit device is actuated is considered the basis for defining the restricted work envelope.

write

To deliver data to a medium such as storage.

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