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2.2 SYSTEM VARIABLE LISTING

This section lists all system variables in alphabetical order. [Table 2-2](#) lists and describes the available system variable information. [Table 2-3](#) describes the access rights of system variables.

Table 2-2. 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.
GET/SETVAR	Indicates whether this variable can be accessed using the GET_VAR or SET_VAR built-ins.
Data Type	Indicates the type of value associated with the system variable.
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 2-3. 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.

\$AB_INT_CFG STRUCTURE

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

User Interface Location: SYSTEM Variables screen

\$AB_INT_CFG.\$address

Minimum: 0 Default: 0 Maximum: 255
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Link Address

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

Power Up: N/A

User Interface Location: SYSTEM Variables screen

\$AB_INT_CFG.\$command

Minimum: 0 Default: 0 Maximum: 255
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Command Byte

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

Power Up: N/A

User Interface Location: SYSTEM Variables screen

\$AB_INT_CFG.\$config

Minimum: 0 Default: 0 Maximum: 255
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Configuration

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

Power Up: N/A

User Interface Location: SYSTEM Variables screen

\$AB_INT_CFG.\$dip_sw_0

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: DIP Switch 0

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

Power Up: N/A

User Interface Location: SYSTEM Variables screen

\$AB_INT_CFG.\$dip_sw_1

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: DIP Switch 1

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

Power Up: N/A

User Interface Location: SYSTEM Variables screen

\$AB_INT_CFG.\$gen_flg

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: General Fault Register

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

Power Up: N/A

User Interface Location: SYSTEM Variables screen

\$AB_INT_CFG.\$leds

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: LED State

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

Power Up: N/A

User Interface Location: SYSTEM Variables screen

\$AB_INT_CFG.\$rate

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Data Rate

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

Power Up: N/A

User Interface Location: SYSTEM Variables screen

\$AB_INT_CFG.\$ser_flg

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Serial Fault Register

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

Power Up: N/A

User Interface Location: SYSTEM Variables screen

\$AB_INT_CFG.\$stat_reg

Minimum: 0 Default: 0 Maximum: 65535

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Status Register

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

Power Up: N/A

User Interface Location: SYSTEM Variables screen

\$AC_CRC_ID[1-5]

Minimum: "" Default: " " Maximum: ""

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

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: Changes to this variable take effect through the robot library or option.

User Interface Location: SYSTEM Variables screen

\$AC_CRC_SET[1-5]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: FP GET/SET_VAR: RW Data Type: INTEGER

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: Changes to this variable take effect through the robot library or option.

User Interface Location: SYSTEM Variables screen

\$ANGTOL[9]

Minimum: 0.0 Default: 10.0 Maximum: 360.0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$AP_MAXAX

Minimum: 0 Default: 536870912 Maximum: 536870912
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Application Maximum AX

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

Power Up:

User Interface Location: SYSTEM Variables screen

\$AP_PLUGGED

Minimum: 0 Default: 0 Maximum: 4294967295
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$AP_TOTALAX

Minimum: 0 Default: 0 Maximum: 4278190080
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Number of Tasks in the Application.

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

Power Up:

User Interface Location: SYSTEM Variables screen

\$AP_USENUM[32]

Minimum: 0 Default: 1 Maximum: 255
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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:

User Interface Location: SYSTEM Variables screen

\$APPLICATION[1]

Minimum: "" Default: " " Maximum: ""

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Name of the APPLICATION/TOOL Software

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

Power Up: This variable cannot be changed.

User Interface Location: STATUS Version IDs screen

\$APPLICATION[2]

Minimum: "" Default: " " Maximum: ""

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Version of the APPLICATION/TOOL Software

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

Power Up: This variable cannot be changed.

User Interface Location: STATUS Version IDs screen

\$APPLICATION[3]

Minimum: "" Default: " " Maximum: ""

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

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: This variable cannot be changed.

User Interface Location: STATUS Version IDs screen

\$ASCII_SAVE

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Program Save Mode

Description: Saves programs in ASCII format when set to TRUE. The default is to save program in binary format. The ASCII file save format can be edited off-line.

Power Up: No

User Interface Location: SYSTEM Variables screen

\$AUTOINIT

Minimum: 0 Default: 0 Maximum: 2

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Automatic Initialize

Description: Reserved for Internal use by FANUC Robotics. Do not change this variable. Modifying this will cause severe problems during a Controlled Start.

Power Up:

User Interface Location: SYSTEM Variables screen

\$AUTOMESSAGE

Minimum: 1 Default: 2 Maximum: 3

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: AUTO MESSAGE TYPE

Description:

1 : The "force user screen message function" is disabled.

2 : (Default) The "force user screen message function" is enabled.

3 : The "force user screen message function" is enabled only when the teach pendant is disabled.

Others : As same as 1.

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM variable screen and SYSTEM configuration screen (on the teach pendant)

\$AUTORCV_ENB

Minimum: 0 Default: 1 Maximum: 1


KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: System variables screen



\$BACK_EDIT[1] STRUCTURE

Name: Background Edit

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

Power Up:

User Interface Location: SYSTEM Variables screen

\$BACK_EDIT[1].\$backup_name

Minimum: "" Default: "-BACKUP-" Maximum: ""
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Name of backup program

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

Power Up:

User Interface Location: SYSTEM Variables screen

\$BACK_EDIT[1].\$bck_comment

Minimum: "" Default: " " Maximum: ""
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Background edit comment

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

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen (on the teach pendant)

\$BACK_EDIT[1].\$delete_ok

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: Background edit internal status information

User Interface Location: SYSTEM Variables screen

\$BACK_EDIT[1] . \$sept_idx

Minimum: 0 Default: 0xFFFF Maximum: 0xFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Internal program index

User Interface Location: SYSTEM Variables screen

\$BACK_EDIT[1] . \$open_id

Minimum: -32768 Default: -1 Maximum: 32767
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Internal program access ID

Description:

Power Up:

User Interface Location: SYSTEM Variables screen

\$BACK_EDIT[1] . \$program

Minimum: "" Default: "-BCKEDT- " Maximum: ""
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Background edit program name

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

Power Up:

User Interface Location: SYSTEM Variables screen

\$BACK_EDIT[1] . \$replacing

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: Background edit internal status information

Description:

Power Up:

User Interface Location: SYSTEM Variables screen

\$BACK_EDIT[1] . \$src_name

Minimum: "" Default: " " Maximum: ""

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Background edit source program name

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

Power Up:

User Interface Location: SYSTEM Variables screen

\$BACK_EDIT[1] . \$used_tp_crt

Minimum: -32768 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Background edit internal status information

Description:

Power Up:

User Interface Location: SYSTEM Variables screen

\$BACKGROUND

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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:

User Interface Location: SYSTEM Variables screen

\$BACKUP_NAME

Minimum: "" Default: "BACKUP" Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: Backup name

Description: This is the root name for the .LDC files that will be created from the Controller Backup feature.

Default is "BACKUP," but you can change this from the SYSTEM Variables screen or the Controlled Start File Menu by selecting Controller Backup.

This is a six character alphanumeric string. The files that are created (if BACKUP is the root name) will be BACKUP01.LDC, BACKUP02.LDC, etc.

Power Up: Default is "BACKUP" on first power up.

User Interface Location: SYSTEM Variables screen or the Controlled Start 2 File Menu

\$BGE_PROGRAM

Minimum: "" Default: " " Maximum: ""

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

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: No

User Interface Location: SYSTEM Variables screen

\$BGE_UNUSEND

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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:

User Interface Location: SYSTEM Variables screen

\$BGEAUTOEXIT

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

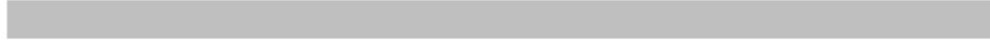
Name: Background Edit Automatic Exit

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:

User Interface Location: SYSTEM Variables screen



\$BLAL_OUT STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

\$BLAL_OUT.\$batalm_or

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$BLAL_OUT.\$do_index

Minimum: 0 Default: 0 Maximum: 256
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$BLT

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: System Build Date

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

Power Up:

User Interface Location: SYSTEM Variables screen

\$BWD_ABORT

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$CD_PAIR STRUCTURE

Name: Coordinated Pair Structure

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

Power Up:

User Interface Location: SYSTEM Variables screen

\$CD_PAIR.\$loc_jog

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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:

User Interface Location: SYSTEM Variables screen

\$CD_PAIR.\$ornt_mask

Minimum: 1 Default: 1 Maximum: 3

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: LONG

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:

User Interface Location: SYSTEM Variables screen. Setup menu of Coord menu in SETUP menu.

\$CD_PAIR.\$ldr_frm_num

Minimum: 0 Default: 1 Maximum: MAX_LDR_FRM
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: LONG

Name: Leader Frame number

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

Power Up:

User Interface Location: SYSTEM Variables screen. Setup menu of Coord menu in SETUP menu.

\$CD_PAIR.\$leader_frm[6]

Minimum: MIN_CD_POINT Default: DEF_CD_POINT Maximum: MAX_CD_POINT
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: POSITION

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:

User Interface Location: SYSTEM Variables screen. Leader Frame menu of Coord menu in SETUP menu.

\$CD_LDR_FRM[4] STRUCTURE

Name: Leader Frame Structure

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

Power Up:

User Interface Location: SYSTEM Variables screen

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

Minimum: MIN_CD_POINT Default: DEF_CD_POINT Maximum: MAX_CD_POINT
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: CD_POINT_T

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:

User Interface Location: SYSTEM Variables screen. Leader Frame menu of Coord menu of SETUP menu.

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

Minimum: MIN_CD_POINT Default: DEF_CD_POINT Maximum: MAX_CD_POINT
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: CD_POINT_T

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:

User Interface Location: SYSTEM Variables screen. Leader Frame menu of Coord menu of SETUP menu.

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

Minimum: MIN_CD_POINT Default: DEF_CD_POINT Maximum: MAX_CD_POINT
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: CD_POINT_T

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:

User Interface Location: SYSTEM Variables screen. Leader Frame menu of Coord menu of SETUP menu.

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

\$CHECKCONFIG

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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:

User Interface Location: SYSTEM Variables screen

\$CMCFG STRUCTURE

Name: IntelliTrak Configuration System Variable

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

Power Up:

User Interface Location: SYSTEM Variables screen

\$CMCFG.\$debug

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Debug

Description: Reserved for Internal use by FANUC Robotics.

Power Up:

User Interface Location: SYSTEM Variables screen

\$CMCFG.\$group_num


Minimum: 1 Default: 1 Maximum: 5
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen



\$CMSCH STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

\$CMSCH[1].\$cmc_type

Minimum: 0 Default: 2 Maximum: 3
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$CMSCH[1].\$cnstnt_path

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$CMSCH[1].\$min_acc_cmc

Minimum: 0 Default: 128 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$CMSCH[1].\$nom_acc_ovr

Minimum: 0.001 Default: 1.0 Maximum: 5.0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$CMSCH[1].\$nom_pth_spd

Minimum: 0.001 Default: 100. Maximum: 3000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$CMSCH[1].\$orient_type

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$CMSCH[1].\$rot_speed_lim

Minimum: 0.001 Default: 120.0 Maximum: 500.0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: IntelliTrak Rotational Speed Limit

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

Power Up:

User Interface Location: SYSTEM Variables screen

\$CMSCH[1].\$warnmessenb

Minimum: 0 Default: 0 Maximum: 4
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$CN_DEBUG

Minimum: 0 Default: 0 Maximum: 1024
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: 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_USR_GRP STRUCTURE

Name: Continuous Turn User Group Variables

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

Power Up:

User Interface Location: 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: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: After changing this variable, the user must perform a COLD start to take effect.

User Interface Location: 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: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: After you change this variable, you must perform a COLD start for the new value to take effect.

User Interface Location: 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: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$CN_USR_GRP[1].\$cn_turn_no

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: This is a read-only variable.

User Interface Location: 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 Default: 32 Maximum: 32
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: In the touch sensing schedule on the DATA screen.

See Also: \$SEARCH_DIST, \$PAUSE_NCONT

\$CORE[1]

Minimum: "" Default: " " Maximum: " "
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Name and Version Application and Core Software

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

Power Up: This variable cannot be changed.

User Interface Location: STATUS Version IDs screen

\$CORE[2]

Minimum: "" Default: " " Maximum: " "

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Reserved

Description: Reserved for future use.

Power Up: This variable cannot be changed.

User Interface Location: STATUS Version IDs screen

\$CRCFG STRUCTURE

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:

User Interface Location:

\$CRCFG.\$scr_enhanced

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Enhanced circular motion

Description: Internal use only.

Power Up:

User Interface Location:

\$CRC FG.\$debug

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Debug flag

Description: Internal use only.

Power Up:

User Interface Location:

\$CRCFG.\$group_mask

Minimum: 0 Default: 1 Maximum: 31

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: group mask

Description: Internal use only.

Power Up:

User Interface Location:

\$CRCFG.\$lgorn_az_sp

Minimum: 0 Default: 120 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Azimuth and Spin Angles.

Description: Internal use only.

Power Up:

User Interface Location:

\$CRCFG.\$lgorn_dbg

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Debug flag

Description: Internal use only.

Power Up:

User Interface Location:

\$CRCFG.\$lgorn_eltol

Minimum: 0 Default: 30 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Elevation Tolerance.

Description: Internal use only.

Power Up:

User Interface Location:

\$CRCFG.\$lgorn_enbl

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes to this variables take effect after the controller is turned off then on.

User Interface Location: SYSTEM variable screen.

\$CRCFG.\$lgorn_meth

Minimum: 0 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Detection Method

Description: Internal use only.

Power Up:

User Interface Location:

\$CRCFG.\$lgorn_rad

Minimum: 0 Default: 200 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Change to this variables takes effect after the controller is turned off then on.

User Interface Location:

\$CRCFG.\$mb_conflict

Minimum: 0 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: sid_mb conflict mask

Description: Internal use only.

Power Up:

User Interface Location:

\$CRCFG.\$mb_required

Minimum: 0 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: sid_mb required mask

Description: Internal use only.

Power Up:

User Interface Location:

\$CRT_DEFPROG

Minimum: "" Default: " " Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: CRT Default Program

Description: Identifies the default program name used by KCL commands that do not specify a program name. It is also the default program that is used on the CRT/KB screens.

Power Up: No

User Interface Location: SYSTEM Variables screen, set using KCL's SET DEF command or the CRT's SELECT menu.

\$CRT_INUSER

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: CRT is in USER Menu

Description: \$CRT_INUSER indicates the USER menu is displayed on the CRT/KB. It is used in conjunction with \$CRT_LCKUSER to tell a program when the CRT menu has been locked to the USER menu.

\$CRT_INUSER automatically is set to TRUE whenever the USER menu is displayed on the CRT/KB.

Power Up: No

User Interface Location: SYSTEM Variables screen

\$CRT_KEY_TBL[256]

Minimum: 0 Default: 255 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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:

User Interface Location: SYSTEM Variables screen

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

\$CRT_LCKUSER

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: CRT Lock USER Menu

Description: Setting \$CRT_LCKUSER = TRUE will allow the KAREL program specified by \$CRT_DEFPROG to lock the USER menu on the CRT while the program is running. When the USER menu is locked, all function keys are accessible by the program. However, they will be blank unless the program writes to them using the CRTFUNC predefined FILE variable.

While the USER menu is locked, the MENUS hardkey will not be active. Therefore, the program has control over which menu is being displayed.

If \$CRT_LCKUSER is FALSE, or the program is paused or aborted, all system-defined function keys will be displayed and active.

If the USER menu is not being displayed when \$CRT_LCKUSER is first set to TRUE, the lock function does not take effect until you select the USER menu on the CRT/KB. The value of \$CRT_INUSER indicates whether or not the USER menu has been selected.

Power Up: No

User Interface Location: SYSTEM Variables screen

\$CRT_USESTAT

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: CRT Status Line in USER Menu

Description: Setting \$CRT_USESTAT = TRUE will allow the KAREL program specified by \$CRT_DEFPROG to control the status line in the USER menu on the CRT while the program is running. The status line will be blank unless the program writes to it using the CRTSTATUS predefined FILE variable.

If \$CRT_USESTAT is FALSE or the program is paused or aborted, the system-defined status line will be displayed and updated.

Power Up: No

User Interface Location: SYSTEM Variables screen

\$CSTOP

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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:

User Interface Location: SYSTEM Variables screen

\$CT_CURSCRN[4] STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

See Also: TP_CURSCRN for equivalent information on the teach pendant

\$CT_CURSCRN[1].\$scrn_id

Minimum: 0 Default: 0 Maximum: 0xFFFFFFFF

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

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: 0 Default: 0 Maximum: 0xFFFFFFFF

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

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_QUICKMEN

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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:

User Interface Location: FCTN key - QUICK/FULL MENUS, SYSTEM Variables screen

\$CT_SCREEN

Minimum: "" Default: "ctsc" Maximum: ""
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: CRT screen

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

Power Up:

User Interface Location: SYSTEM Variables screen

\$CT_USERSCRN

Minimum: "" Default: "c_sc" Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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:

User Interface Location: SYSTEM Variables screen

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

\$CTRL_DELETE


Minimum: 0 Default: 1 Maximum: 2
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: No

User Interface Location: SYSTEM Variables screen



\$DEFLOGIC[3] STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

\$DEFLOGIC[1].\$func_title

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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: Changes take effect immediately

User Interface Location: SYSTEM Variables screen, SYSTEM config screen.

See Also: \$DEFLOGIC.\$total_num

\$DEFLOGIC[1].\$total_num

Minimum: 0 Default: 4 Maximum: 4
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen, SYSTEM config screen.

See Also: \$DEFLOGIC.\$func_title

\$DEFPROG_ENB

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Default program enable/disable.

Description: When this variable is set TRUE, the variable \$TP_DEFPROG is cleared every cold start.

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$DEFPULSE

Minimum: 0 Default: 4 Maximum: 255
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Default Pulse Length

Description: Specifies the length of a PULSE if it is not specified by the user.

Power Up:

User Interface Location: SYSTEM Variables screen

\$DEV_INDEX

Minimum: 0 Default: 3 Maximum: 100
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: System device index

Description: This read-only system variable defines the device index. This is a number that the system uses to define \$DEVICE. To change the default device, you only need to change \$DEVICE; \$DEV_INDEX will be updated internally by the system.

Power Up: No

User Interface Location: SYSTEM Variables screen

See Also: \$DEV_PATH, \$DEV_INDEX

\$DEV_PATH

Minimum: "" Default: " " Maximum: ""

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: System Default Path

Description: This read-only system variable defines the system default path. Any time a file operation is performed, the file must be fully qualified, meaning it must have a device, path, and filename. If the path is not specified by the user during the file operation, then \$DEV_PATH is used by the system.

The default value for \$DEV_PATH is "\", meaning the root directory.

The system will remember the default path for each device. If the user changes \$DEVICE, then \$DEV_PATH is automatically updated to the default path that is associated with the new device.

Power Up: No

User Interface Location: SYSTEM Variables screen

See Also: \$DEV_PATH, \$DEV_INDEX

\$DEVICE

Minimum: "" Default: " " Maximum: ""

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

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: No

User Interface Location: SYSTEM Variables screen

See Also: \$DEV_PATH, \$DEV_INDEX

\$DMAURST

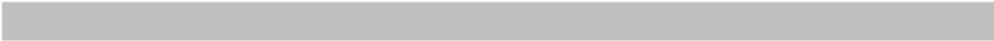
Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: This change takes effect immediately.

User Interface Location: SYSTEM Variables screen



\$DMR_GRP STRUCTURE

Name: Dynamic Mastering Record

Description: Contains all the information related to mastering and overtravel. Individual fields within this structure are described below.

Power Up: Set by the system during mastering/reference position setting.

User Interface Location: SYSTEM Master/Cal screen

\$DMR_GRP[1].\$adapt_col_m[9]

Minimum: -32768 Default: 0 Maximum: 32767
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Adaptive Corioli Minus

Description: Data for adaptive control.

Power Up: Set by the system.

User Interface Location: SYSTEM Variables screen

\$DMR_GRP[1].\$adapt_col_p[9]

Minimum: -32768 Default: 0 Maximum: 32767
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Adaptive Corioli Plus

Description: Data for adaptive control.

Power Up: Set by the system.

User Interface Location: SYSTEM Variables screen

\$DMR_GRP[1].\$adapt_fric[9]

Minimum: -32768 Default: 0 Maximum: 32767
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Adaptive Friction

Description: Data for adaptive control.

Power Up: Set by the system.

User Interface Location: SYSTEM Variables screen

\$DMR_GRP[1].\$adapt_gravity[9]

Minimum: -32768 Default: 0 Maximum: 32767
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Adaptive gravity

Description: Data for adaptive control.

Power Up: Set by the system.

User Interface Location: SYSTEM Variables screen

\$DMR_GRP[1].\$adapt_iner[9]

Minimum: -32768 Default: 0 Maximum: 32767
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Adaptive Inertia

Description: Data for adaptive control.

Power Up: Set by the system.

User Interface Location: SYSTEM Variables screen

\$DMR_GRP[1].\$backlash_sign[9]

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Set by the system.

User Interface Location: SYSTEM Variables screen

\$DMR_GRP[1].\$dsp_status[9]

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Servo (Digital Signal Processor) Status History

Description: Servo status bits set by the servo software.

Power Up: Set by the system.

User Interface Location: SYSTEM Variables screen

\$DMR_GRP[1].\$eachmast_done[9]

Minimum: 0 Default: 0 Maximum: 2

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Set by the system.

User Interface Location: SYSTEM Variables screen

\$DMR_GRP[1].\$master_count[9]

Minimum: INTEGER_MIN Default: 0 Maximum: INTEGER_MAX

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Set by the system.

User Interface Location: SYSTEM Variables screen

\$DMR_GRP[1].\$master_done

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Set by the system.

User Interface Location: SYSTEM Variables screen

\$DMR_GRP[1].\$mch_pls_his[9]

Minimum: INTEGER_MIN Default: 0 Maximum: INTEGER_MAX

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Set by the system.

User Interface Location: SYSTEM Variables screen

\$DMR_GRP[1].\$ot_minus[9]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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 SYSMAS.TSV 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: Set by the system.

User Interface Location: MANUAL OT Release

\$DMR_GRP[1].\$ot_plus[9]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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 SYSMAS.TSV 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: Set by the system.

User Interface Location: MANUAL OT Release

\$DMR_GRP[1].\$ref_count[9]

Minimum: INTEGER_MIN Default: 0 Maximum: INTEGER_MAX

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Reference Count

Description: The encoder pulses at the reference position.

Power Up: Set by the system during reference position setup.

User Interface Location: SYSTEM Master/Cal

\$DMR_GRP[1].\$ref_done

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Set by the system.

User Interface Location: SYSTEM Master/Cal

\$DMR_GRP[1].\$ref_pos[9]

Minimum: -100000.0 Default: 0.0 Maximum: 100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Set by system during reference position setup.

User Interface Location: SYSTEM Master/Cal

\$DMR_GRP[1].\$shift_error

Minimum: INTEGER_MIN Default: 0 Maximum: INTEGER_MAX
KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: INTEGER

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: Set by the system.

User Interface Location: SYSTEM Variables screen

\$DMR_GRP[1].\$spc_cnt_hi s[9]

Minimum: INTEGER_MIN Default: 0 Maximum: INTEGER_MAX
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Set by the system.

User Interface Location: SYSTEM Variables screen

\$DMR_GRP[1].\$spc_count[9]

Minimum: INTEGER_MIN Default: 0 Maximum: INTEGER_MAX
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Set by the system.

User Interface Location: SYSTEM Variables screen

\$DMR_GRP[1].\$spc_move[9]

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Set by the system.

User Interface Location: SYSTEM Variables screen

\$DMR_GRP[1].\$spc_status[9]

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Serial Pulse Coder Status History

Description: SPC (serial pulse coder) status history.

Power Up: Set by the system.

User Interface Location: SYSTEM Variables screen

\$DN_BD_INFO[1-4] STRUCTURE

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.

\$DN_BD_INFO [1].\$dn_bd_baud

Minimum: 0 Default: 0 Maximum: 2
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_bfree

Minimum: 0 Default: 0 Maximum: 16384
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet Daughter-Board Free Byte Count

Description: The number of bytes free in the shared RAM buffer.

Power Up: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_bfrus

Minimum: 0 Default: 0 Maximum: 16384
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_canec

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet CAN Frame Error Count

Description: A count of the frame errors on the CAN connected to the DeviceNet daughter-board.

Power Up: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_canlm

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet CAN Lost Message Count

Description: A count of the lost messages on the CAN connected to the DeviceNet daughter-board.

Power Up: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_canna

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_canov

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_canrc

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet CAN Receive Count

Description: A count of the acknowledged receives from the CAN connected to the DeviceNet daughter-board.

Power Up: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_cantc

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO [1].\$dn_bd_cflag

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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
- 3: STROBE access

Power Up: Changes take effect at power up.

User Interface Location: DeviceNet Board List screen

\$DN_BD_INFO [1].\$dn_bd_cmt

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: DeviceNet Daughter-Board Comment

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

Power Up: Changes take effect immediately.

User Interface Location: DeviceNet Board List screen

\$DN_BD_INFO[1].\$dn_bd_emrqb

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: DeviceNet Daughter-Board Explicit Message Buffer Size

Description: The size (in bytes) of the buffer for explicit messages. Currently not used.

Power Up: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_emrqq

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet Daughter-Board Explicit Message Buffer Offset

Description: The offset of the buffer for explicit messages. Currently not used.

Power Up: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_emrqs

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_emrsb

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: DeviceNet Daughter-Board Explicit Response Buffer Size

Description: The size (in bytes) of the buffer for explicit responses. Currently not used.

Power Up: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_emrso

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet Daughter-Board Explicit Response Buffer Offset

Description: The offset of the buffer for explicit responses. This variable is currently not used.

Power Up: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_emrss

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO [1].\$dn_bd_error

Minimum: "" Default: " " Maximum: ""

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: DeviceNet Daughter-Board Error Buffer

Description: Contains error messages returned by the DeviceNet daughter-board.

Power Up: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_intvl

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet Daughter-Board Periodic Transmission Interval

Description: The interval for periodic transmission of slave data to the remote master. Currently unused.

Power Up: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_macid

Minimum: 0 Default: 0 Maximum: 63

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_slvib

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_slvio

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet Daughter-Board Slave Input Offset

Description: The offset in shared RAM of the slave input area.

Power Up: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_slvob

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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: Changes take effect at power up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO[1].\$dn_bd_slvoo

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet Daughter-Board Slave Output Offset

Description: The offset in shared RAM of the slave output area.

Power Up: Changes take effect at power-up.

User Interface Location: DeviceNet Board Detail screen

\$DN_BD_INFO [1].\$dn_bd_stat

Minimum: 0 Default: 99 Maximum: 99

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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 on-line
- 7: board is currently being initialized
- 99: no DeviceNet variables have been initialized

\$DN_CODE_PTH

Minimum: "" Default: " " Maximum: ""
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: DeviceNet Daughter-Board Code Path

Description: The path name for the binary code file that is loaded on the DeviceNet Interface board at power-up. For internal use. Do not modify this variable.

Power Up: Changes take effect at power-up.

User Interface Location: SYSTEM variable screen.



\$DN_DEV_DEFS[1-40] STRUCTURE

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.

\$DN_DEV_DEFS[1].\$dn_dd_class

Minimum: 0 Default: 0 Maximum: 3
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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

Power Up: Changes take effect immediately.

User Interface Location: DeviceNet Device Definition Detail screen

\$DN_DEV_DEFS[1].\$dn_dd_cmt

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: DeviceNet Device Definition Comment

Description: A comment associated with the device definition.

Power Up: Changes take effect immediately.

User Interface Location: DeviceNet Device Definition Detail screen, Device Definition screen

\$DN_DEV_DEFS[1].\$dn_dd_dvtyp

Minimum: -32767 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: DeviceNet Device Definition Type

Description: The device type code of the DeviceNet device definition.

Power Up: Changes take effect immediately.

User Interface Location: DeviceNet Device Definition Detail screen

\$DN_DEV_DEFS[1].\$dn_dd_name

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: DeviceNet Device Definition Detail screen, Device Definition screen, Device List screen

\$DN_DEV_DEFS[1].\$dn_dd_prkod

Minimum: -32767 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: DeviceNet Device Definition Product Code

Description: The product code of the DeviceNet device definition.

Power Up: Changes take effect immediately.

User Interface Location: DeviceNet Device Definition Detail screen

\$DN_DEV_DEFS[1].\$dn_dd_stat

Minimum: 0 Default: 0 Maximum: 2

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: DeviceNet Device Definition Status

Description: The current status of the device definition. For internal use. Do not modify.

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: Changes take effect immediately.

User Interface Location: DeviceNet Device Definition Detail screen

\$DN_DEV_DEFS[1].\$dn_dd_inp1

Minimum: -32767 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: DeviceNet Device Definition Detail screen

\$DN_DEV_DEFS[1].\$dn_dd_inp2

Minimum: -32767 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: DeviceNet Device Definition Detail screen

\$DN_DEV_DEFS[1].\$dn_dd_inp3

Minimum: -32767 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: DeviceNet Device Definition Detail screen

\$DN_DEV_DEFS[1].\$dn_dd_inp4

Minimum: -32767 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: DeviceNet Device Definition Detail screen

\$DN_DEV_DEFS[1].\$dn_dd_mode

Minimum: 0 Default: 0 Maximum: 3

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: DeviceNet Device Definition Access Mode

Description: The mode by which a DeviceNet device with this definition accesses I/O. For internal use. Do not modify.

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: Changes take effect immediately.

User Interface Location: DeviceNet Device Definition Detail screen

\$DN_DEV_DEFS[1].\$dn_dd_msgsz

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: DeviceNet Device Definition Detail screen

\$DN_DEV_DEFS[1].\$dn_dd_n_inp

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: DeviceNet Device Definition: Number of Inputs

Description: The number of inputs on a DeviceNet device with this definition.

Power Up: Changes take effect immediately.

User Interface Location: DeviceNet Device Definition Detail screen

\$DN_DEV_DEFS[1].\$dn_dd_n_out

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: DeviceNet Device Definition: Number of Outputs

Description: The number of outputs on a DeviceNet device with this definition.

Power Up: Changes take effect immediately.

User Interface Location: DeviceNet Device Definition Detail screen

\$DN_DEV_DEFS[1].\$dn_dd_outp1

Minimum: -32767 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: DeviceNet Device Definition Output Parameter 1

Description: An output parameter associated with the device definition. Usage to be determined.

Power Up: Changes take effect immediately.

User Interface Location: DeviceNet Device Definition Detail screen

\$DN_DEV_DEFS[1].\$dn_dd_outp2

Minimum: -32767 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: DeviceNet Device Definition Output Parameter 2

Description: An output parameter associated with the device definition. Usage to be determined.

Power Up: Changes take effect immediately.

User Interface Location: DeviceNet Device Definition Detail screen

\$DN_DEV_DEFS[1].\$dn_dd_outp3

Minimum: -32767 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: DeviceNet Device Definition Detail screen

\$DN_DEV_DEFS[1].\$dn_dd_outp4

Minimum: -32767 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: DeviceNet Device Definition Detail screen

\$DN_DEV_DEFS[1].\$dn_dd_pdt

Minimum: -32767 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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. For internal use. Do not modify.

Power Up: Changes take effect at power up.

User Interface Location: SYSTEM variable screen.

\$DN_DEV_DEFS[1].\$dn_dd_vndid

Minimum: -32767 Default: -1 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: DeviceNet Device Definition Vendor ID

Description: The vendor ID for the DeviceNet device definition.

Power Up: Changes take effect immediately.

User Interface Location: DeviceNet Device Definition Detail screen

\$DN_DEV_LIST[1-80] STRUCTURE

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.

\$DN_DEV_LIST[1].\$dn_dv_bdidx

Minimum: 0 Default: 0 Maximum: 4
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: DeviceNet Device Board Index

Description: The number of the DeviceNet daughter-board to which the device is connected. For internal use. Do not modify.

Power Up: Changes take effect immediately.

User Interface Location: DeviceNet Device List screen

\$DN_DEV_LIST[1].\$dn_dv_cmt

Minimum: "" Default: " " Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: DeviceNet Device Comment

Description: A comment associated with a particular DeviceNet Device. It might be used to indicate the use of the device, and so forth.

Power Up: Changes take effect immediately.

User Interface Location: DeviceNet Device List screen

\$DN_DEV_LIST[1].\$dn_dv_dvtyp

Minimum: 0 Default: 0 Maximum: 32767
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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:

User Interface Location: Device Definition Detail screen or Standard Definition Detail screen.

\$DN_DEV_LIST[1].\$dn_dv_fstmd

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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. For internal use. Do not modify.

Power Up: Changes take effect at power up.

User Interface Location: SYSTEM variable screen.

\$DN_DEV_LIST[1].\$dn_dv_mode

Minimum: 0 Default: 0 Maximum: 3

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: DeviceNet Device Access Mode

Description: The access mode of the DeviceNet device (polled or strobed). 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:

User Interface Location: Device Definition Detail screen or Standard Definition Detail screen.

\$DN_DEV_LIST[1].\$dn_dv_nain

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet Device Analog Inputs Count

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:

User Interface Location: Device Definition Detail screen or Standard Definition Detail screen.

\$DN_DEV_L IST[1].\$dn_dv_naout

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet Device Analog Outputs Count

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:

User Interface Location: Device Definition Detail screen or Standard Definition Detail screen.

\$DN_DEV_L IST[1].\$dn_dv_ndin

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet Device Digital Inputs Count

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:

User Interface Location: Device Definition Detail screen or Standard Definition Detail screen.

\$DN_DEV_L IST[1].\$dn_dv_ndout

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet Device Digital Outputs Count

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:

User Interface Location: Device Definition Detail screen or Standard Definition Detail screen.

\$DN_DEV_L IST[1].\$dn_dv_pdt

Minimum: -32767 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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:

User Interface Location: DeviceNet Device List screen

\$DN_DEV_L IST[1].\$dn_dv_prdcd

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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:

User Interface Location: Device Definition Detail screen or Standard Definition Detail screen.

\$DN_DEV_L IST[1].\$dn_dv_vndid

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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:

User Interface Location: Device Definition Detail screen or Standard Definition Detail screen.

\$DN_DEV_LIST[1].\$dn_dv_macid

Minimum: 0 Default: 0 Maximum: 63

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: DeviceNet Device MAC-Id

Description: The MAC-Id (Media Access Control Identifier) of the DeviceNet device. It might 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: Changes take effect at power up.

User Interface Location: DeviceNet Device List screen

\$DN_DEV_LIST[1].\$dn_dv_stat

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: DeviceNet Device Status

Description: The status of the DeviceNet device. For internal use. Do not modify.

0: device is offline

1: device is in an error state

2: device is on-line

Power Up: Changes take effect immediately.

User Interface Location: DeviceNet Device List screen

\$DN_DEV_LIST[1].\$dn_inp_ofst

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet Device Input Buffer Offset

Description: The offset in shared RAM of the first byte of the DeviceNet device's input data buffer. For internal use. Do not modify.

Power Up: Changes take effect at power up.

User Interface Location: SYSTEM variable screen.

\$DN_DEV_LIST[1].\$dn_inp_size

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet Device Input Buffer Size

Description: The size in bytes of the input buffer of the DeviceNet device. For internal use. Do not modify.

Power Up: Changes take effect at power up.

User Interface Location: SYSTEM variable screen.

\$DN_DEV_LIST[1].\$dn_msg_ofst

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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. For internal use. Do not modify.

Power Up: Changes take effect at power up.

User Interface Location: SYSTEM variable screen.

\$DN_DEV_LIST[1].\$dn_msg_size

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet Device Message Buffer Size

Description: The size in bytes of the message buffer of the DeviceNet device. Currently not used. For internal use. Do not modify.

Power Up: Changes take effect at power up.

User Interface Location: SYSTEM variable screen.

\$DN_DEV_LIST[1].\$dn_out_ofst

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet Device Output Buffer Offset

Description: The offset in shared RAM of the first byte of the DeviceNet device's output data buffer. For internal use. Do not modify.

Power Up: Changes take effect at power up.

User Interface Location: SYSTEM variable screen.

\$DN_DEV_LIST[1].\$dn_out_size

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet Device Output Buffer Size

Description: The size in bytes of the output buffer of the DeviceNet device. For internal use. Do not modify.

Power Up: Changes take effect at power up.

User Interface Location: SYSTEM variable screen.

\$DN_DEV_LIST[1].\$dn_stat_p

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: LONG

Name: DeviceNet Device Status Area Address

Description: The address of the area in shared RAM containing the status of the DeviceNet device. For internal use. Do not modify.

Power Up: Changes take effect at power up.

User Interface Location: SYSTEM variable screen.

\$DN_FREE_MOD

Minimum: 0 Default: 0 Maximum: 32767
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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. Do not modify.

Power Up: Changes take effect at power up.

User Interface Location: SYSTEM variable screen.

\$DN_LAST_PDT

Minimum: 0 Default: 0 Maximum: 32767
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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. For internal use. Do not modify.

Power Up: Changes take effect at power up.

User Interface Location: SYSTEM variable screen.

\$DN_MOD_LIST[1-64] STRUCTURE

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.

User Interface Location: DeviceNet Module List screen

\$DN_MOD_LIST[1].\$dn_ml_commt

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: DeviceNet Module List Comment

Description: A comment associated with the particular DeviceNet module; can be used to indicate the use of the module.

Power Up: Changes take effect immediately.

User Interface Location: DeviceNet Module List screen

\$DN_MOD_LIST[1].\$dn_ml_nxtix

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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: Changes take effect immediately.

User Interface Location: DeviceNet Module List screen

\$DN_MOD_LIST[1].\$dn_ml_pmt

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet Module List PMT

Description: The PMT (Permanent Module Type) of the DeviceNet module.

Power Up: Changes take effect immediately.

User Interface Location: DeviceNet Module List screen

\$DN_MOD_LIST[1].\$dn_ml_slot

Minimum: 0 Default: 0 Maximum: 255
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: DeviceNet Module Slot Number

Description: The number of the slot on the device to which the DeviceNet module is connected.

Power Up: Changes to this variables take effect immediately.

User Interface Location: DeviceNet Module List screen

\$DUTY_GRP.\$curve_type[1-9]

Minimum: 0 Default: 0 Maximum: 2
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

\$DUTY_GRP.\$duty_support

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: duty diagnosis support

Description: For internal use only. Do not modify this system variable.

If this value is 1, DUTY diagnosis parameter exists.

Power Up: Changes to this variables take effect immediately.

User Interface Location: None

See Also: This variable is used for Duty diagnosis.

\$DUTY_GRP.\$duty_parameter1[1-9]

Minimum: -10000000000. Default: 0 Maximum: 10000000000.
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

User Interface Location: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

\$DUTY_GRP.\$duty_p aram2[1-9]

Minimum: -10000000000. Default: 0 Maximum: 10000000000.
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

User Interface Location: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

\$DUTY_GRP.\$duty_p aram3[1-9]

Minimum: -10000000000. Default: 0 Maximum: 10000000000.
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

User Interface Location: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

\$DUTY_GRP.\$duty_p aram4[1-9]

Minimum: -10000000000. Default: 0 Maximum: 10000000000.
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

User Interface Location: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

\$DUTY_GRP.\$duty_p aram5[1-9]

Minimum: -10000000000. Default: 0 Maximum: 10000000000.
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

User Interface Location: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

\$DUTY_TEMP

Minimum: -273.15 Default: 25.0 Maximum: 100.0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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

User Interface Location: SYSTEM variables screen/Duty diagnosis screen

See Also: This variable is used for Duty diagnosis.

\$DUTY_UNIT

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: ULONG

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

User Interface Location: SYSTEM variables screen/Duty diagnosis screen

See Also: This variable is used for Duty diagnosis.

\$DXCFG

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: uninit

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.

User Interface Location: 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.

\$DXMOR[1] STRUCTURE

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.

User Interface Location: 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: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: uninit

Name:

Description: Reserved for future use. Do not change this variable.

Power Up:

User Interface Location: SYSTEM Variables screen

\$DXMOR[1].\$deltatool

Minimum: nilpos Default: nilpos Maximum: POSITION
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: POSITION

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.

User Interface Location: 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: 0 Default: 0 Maximum: 2³²
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: 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

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.

User Interface Location: 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].\$ deltaframe

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: uninit

Name:

Description: Reserved for future use. Do not change this variable.

Power Up:

User Interface Location: SYSTEM Variable screen

\$DXOFFSET[sch_num].\$deltatool

Minimum: nilpos Default: nilpos Maximum: POSITION
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: POSITION

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.

User Interface Location: 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

Name: DeltaTool Schedule Variables

Description: This is an array of DeltaTool schedule variables. A maximum of five schedules can be used.

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.

Individual fields within this structure are described below.

User Interface Location: Accessible from KAREL, KCL or the SYSTEM Variables screen

See Also: *FANUC Robotics SYSTEM R-J2 Controller DeltaTool Manual*

\$DXSCH[sch_num].\$dframe_type

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: uninit

Name:

Description: Reserved for future use. Do not change this variable.

Power Up:

User Interface Location: SYSTEM Variable screen

\$DXSCH[sch_num].\$dtool_type

Minimum: DT_OFF Default: DT_OFF Maximum: DT_ACC_XF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: DeltaTool Type

Description: Specifies how the offset data is to be applied according to [Table 2-4](#).

Table 2-4. Applying Offset Data		
\$dtool_type	Offset	Frame
DT_OFF	Disable	UTOOL
DT_LOC	Location	UTOOL
DT_XF	Location+Orientation	UTOOL
DT_ACC_LOC	Accumulated Location	UTOOL
DT_ACC_X	Accumulated Location+Orientation	UTOOL

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.

User Interface Location: 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 Default: 256 Maximum: 1000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: 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 Default: 128 Maximum: 1000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: 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 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: 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*

\$ED_SIZE

Minimum: 10000 Default: 30720 Maximum: 524288
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: SYSTEM Variables screen

\$ED_STATE

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen



\$ENC_STAT[1] STRUCTURE

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

User Interface Location: SYSTEM Variables screen and SETUP Encoders screen

\$ENC_STAT[1].\$enc_average

Minimum: 0 Default: 0 Maximum: 100

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: 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 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: SYSTEM Variables screen

See Also: \$ENC_STAT[1].\$enc_average

\$ENC_STAT[1].\$enc_count

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: SYSTEM Variables screen and SETUP Encoders screen

See Also: \$ENC_STAT[1].\$multipl, \$SCR.\$itp_time

\$ENC_STAT[1].\$enc_dspstat

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: SYSTEM Variables screen

\$ENC_STAT[1].\$enc_enable

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

\$ENC_STAT[1].\$enc_head

Minimum: 0 Default: 0 Maximum: 100

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Encoder Buffer Head Index

Description: This is the index into the \$ENC_STAT[1].\$enc_buffer array used to determine where to store the current encoder velocity value.

Power Up: 0

User Interface Location: SYSTEM Variables screen and SETUP Encoders screen

See Also: \$ENC_STAT[1].\$enc_buffer[]

\$ENC_STAT[1].\$enc_multipl

Minimum: 1 Default: 1 Maximum: 100

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: SYSTEM Variables screen and SETUP Encoders screen

See Also: \$SCR.\$ITP_TIME

\$ENC_STAT[1].\$enc_rate

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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[1].\$enc_average entries within the \$ENC_STAT[1].\$enc_buffer[] array.

Power Up: 0

User Interface Location: SYSTEM Variables screen

See Also: \$ENC_STAT[].\$enc_average, \$ENC_STAT[].\$enc_buffer []

\$ENC_STAT[1].\$enc_ros_tik

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: SYSTEM Variables screen

See Also: \$ENC_STAT[1].\$ENC_COUNT

\$ENC_STAT[1].\$enc_sim_on

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen and SETUP Encoders screen

See Also: \$ENC_STAT[1].\$ENC_SIM_SPD, \$ENC_STAT[].\$ENC_ENABLE

\$ENC_STAT[1].\$enc_sim_spd

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: 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: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: SYSTEM Variables screen

\$ENC_STAT[1].\$enc_stopped

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

\$ENC_STAT[1].\$enc_thresh

Minimum: 1 Default: 1 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: SYSTEM Variables screen

\$ENC_STAT[1].\$enc_value

Minimum: -2147483648 Default: 0 Maximum: 2147483647
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: SYSTEM Variables screen

See Also: \$ENC_STAT[1].\$enc_multipl, \$SCR.\$itp_time

\$ENETMODE STRUCTURE

Name: Ethernet Mode Structure

Description: Individual fields within this structure are described below.

\$ENETMODE.\$auto_port_s

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$ENETMODE.\$coll_detect

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$ENETMODE.\$en_loopback

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$ENETMODE.\$en_tpenable

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$ENETMODE.\$full_duplex

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$ENETMODE.\$polarity_ce

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$ER_AUTO_ENB

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

See Also: The Error Codes Appendix in the *application-specific Setup and Operations Manual* for more information.

\$ER_NO_ALM STRUCTURE

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

User Interface Location: SYSTEM Variables screen

\$ER_NO_ALM[1].\$er_code1-10

Minimum: 0 Default: 0 Maximum: 128000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: SYSTEM Variables screen

\$ER_NO_ALM[1].\$noalm_num

Minimum: 0 Default: 5 Maximum: 10

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Number of no alarm errors

Description: Specifies the number of error codes used.

Power Up: Changes to this variable take effect immediately

User Interface Location: SYSTEM Variables screen

\$ER_NO_ALM[1].\$noalmenble

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: SYSTEM Variables screen

\$ER_NOAUTO STRUCTURE

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-specific Setup and Operations Manual*.

\$ER_NOAUTO.\$noauto_code[1-20]

Minimum: 0 Default: 11001 Maximum: 128000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: LONG

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.

User Interface Location: SYSTEM Variables Screen

\$ER_NOAUTO.\$noauto_enb

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables Screen

\$ER_NOAUTO.\$noauto_num

Minimum: 0 Default: 6 Maximum: 20
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: SYSTEM Variables Screen

\$ER_NOHIS

Minimum: 0 Default: 0 Maximum: 3

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Error storage.

Description: This variable indicates whether or not warnings will be stored in an error history file.

0 = All posted errors and RESET are recorded in the error queue.

1 = WARNING errors are not recorded in the error queue. Other errors and RESET are still recorded in error queue. 2 = RESET is not recorded in error queue. Errors are still recorded in the error queue.

3 = WARNING error and RESET are not recorded in the error queue. Other errors are still recorded in the error queue.

Power Up:

User Interface Location: SYSTEM Variables screen

\$ER_SEV_NOAU[1-5]

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

See Also: Appendix A of the Application-Specific Setup and Operations Manual.

\$ERROR_PROG

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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

User Interface Location: SYSTEM Variables screen TP Editor

\$ERSEVERITY

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Error severity

Description: Reserved for Internal use by FANUC Robotics. Do not change this variable.

Power Up:

User Interface Location: SYSTEM Variables screen

\$ETCP_VER

Minimum: "" Default: "" Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: SYSTEM Variables screen

See Also: *FANUC Robotics SYSTEM R-J Controller KSL Interface Setup and Operations Manual*

\$EXTTOL

Minimum: 0.0 Default: 10.0 Maximum: 1000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$FAST_CLOCK

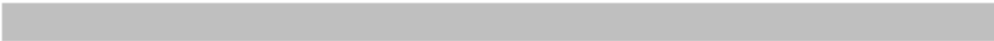
Minimum: 0x80000000 Default: 0 Maximum: 0x7ffffff
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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

User Interface Location: SYSTEM Variables screen



\$FBSTSK[1] STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$FBSTSK[1].\$lun

Minimum: 0 Default: 0 Maximum: 0xFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: TASK LUN

Description: For internal use only. Do not modify this system variable. Task LUN of field bus task.

\$FBSTSK[1].\$priority

Minimum: 0 Default: 0 Maximum: 255
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$FBSTSK[1].\$sid

Minimum: 0 Default: 75 Maximum: 0xFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Softparts ID

Description: For internal use only. Do not modify this system variable. Task Softparts ID of field bus task.

\$FBSTSK[1].\$tid

Minimum: 0 Default: 167 Maximum: 0xFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: TASK ID

Description: For internal use only. Do not modify this system variable. Task ID of field bus task.

\$FEATURE STRUCTURE

Name: Feature Information

Description: Individual variables within this structure are described below.

\$FEATURE.\$NAM[1-128]

Minimum: "" Default: " " Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: STATUS Version IDs screen, SYSTEM Variable screen

\$FEATURE.\$MOD[1-128]

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: None

\$FEATURE.\$VER[1-128]

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: STATUS Version IDs screen, SYSTEM Variable screen

\$FILE_APPBCK[1-20] STRUCTURE

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.

User Interface Location: SYSTEM Variable screen

\$FILE_APPBCK[1].\$file_name

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: SYSTEM Variable screen

\$FILE_APPBCK[1].\$func_code

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Function Code

Description:

0 = Save variable data (file name can be VR or SV)

1 = Save IO configuration

2 = Save only variable data

3 = Load only variable data

Power Up: Used when the BACKUP or RESTORE key is pressed on the FILE menu.

User Interface Location: SYSTEM Variable screen

\$FILE_APPBCK[1].\$modifier

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface SYSTEM Variable screen

\$FILE_APPBCK[1].\$prog_name

Minimum: "" Default: " " Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface SYSTEM Variable screen



\$FILE_AP2BCK[1-20] STRUCTURE

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.

User Interface Location: SYSTEM Variable screen

\$FILE_AP2 BCK[1].\$file_name

Minimum: "" Default: " " Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: SYSTEM Variable screen

\$FILE_AP2BCK[1].\$func_code

Minimum: 0 Default: 0 Maximum: 255
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Function Code

Description:

0 = Save TP program data (file name can be TP, DF or MN)

Power Up: Used when the BACKUP or RESTORE key is pressed on the FILE menu.

User Interface Location: SYSTEM Variable screen

\$FILE_AP2BCK[1].\$modifier

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface SYSTEM Variable screen

\$FILE_AP2BCK[1].\$prog_name

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface SYSTEM Variable screen

\$FILE_BASEPT

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: File base pointer

Description: Pointer to link management data of the file system. This variable is used by the system. Do not change this variable.

Power Up:

User Interface Location: SYSTEM Variables screen

\$FILECOMP

Minimum: MIN_FILECOMP_DATA Default: MIN_FILECOMP_DATA Maximum:
MAX_FILECOMP_DATA
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: File Menu

\$FILECOMP.\$tpp

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: File Menu

\$FILECOMP.\$variable

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: File Menu

\$FILE_ERRBCK[1-10] STRUCTURE

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.

\$FILE_ERRBCK.\$file_name

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: SYSTEM Variable screen.

\$FILE_ERRBCK.\$func_code

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Function Code

Description: Must be set to 0.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variable screen.

\$FILE_ERRBCK.\$prog_name

Minimum: "" Default: " " Maximum: " "

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: SYSTEM Variable screen.

\$FILE_ERRBCK.\$modifier

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Modifier

Description: Must be set to 0.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variable screen.

\$FILE_MASK

Name: File mask

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Description: Determines whether to mask out "unknown" files in the File Menu.

Description: 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.

User Interface Location: SYSTEM Variable screen

\$FILE_MAXSEC

Minimum: -16000 Default: -100 Maximum: 16000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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 always be backed up to an off-line storage device or 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.

User Interface Location: SYSTEM Variables screen

\$FILTSK[1] STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$FILTSK[1].\$I un

Minimum: 0 Default: 158 Maximum: 0xFFFF

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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 Default: 0 Maximum: 255

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$FILTSK[1].\$sid

Minimum: 0 Default: 92 Maximum: 0xFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Softparts ID

Description: For internal use only. Do not modify this system variable. Task Softparts ID of task.

User Interface Location: SYSTEM Variables screen

\$FILTSK[1].\$startmd

Minimum: 0 Default: 0 Maximum: 255
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$FILTSK[1].\$t id

Minimum: 0 Default: 182 Maximum: 0xFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: TASK ID

Description: For internal use only. Do not modify this system variable. Task ID of task.

User Interface Location: SYSTEM Variables screen

\$FRM_CHKTYP

Minimum: -2 Default: -1 Maximum: 2
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$FSAC_DEF_LV

Minimum: -1 Default: -1 Maximum: 5
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Install Level (full write access)
This variable is saved as part of SYSFSAC.SV.

Power Up: Effective immediately.

User Interface Location: SYSTEM Variables screen

See Also: *SYSTEM R-J3 ECBF-FTP Interface Setup and Operations Manual*

\$FSAC_ENABLE

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: FTP Server Access Control Enable Flag

Description: When set to 1, enables checking of remote FTP clients when logging into robot to use robot FTP server. If enabled FTP access through 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.

User Interface Location: SYSTEM Variables screen

See Also: *SYSTEM R-J2 ECBR-FTP Interface Setup and Operations Manual*

\$FSAC_LIST[1-20] STRUCTURE

Name: FTP Server Access Control Default Access Level

Minimum: MIN_FSAC_LST Default: DEF_FSAC_LST Maximum: MAX_FSAC_LST
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: FSAC_LST_T

Description: See \$FSAC_ENABLE. (Saved in SYSFSAC.SV)

Power Up: Effective immediately

User Interface Location: SYSTEM Variables screen

See Also: *SYSTEM R-J2 ECBR-FTP Interface Setup and Operations Manual*

\$FSAC_LIST[1] . \$access_lvl

Minimum: 0 Default: 0 Maximum: 3
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: FTP Server Access Control List Access Level

Description: Contains list of hosts which can use FTP server on robot based on associated Access Level. Access Level can be :

-1 - no access (useful if use \$FSAC_DEF_LVL but want to exclude one)

0 - operator Level (read only)

1 - program level

2 - setup level

3 - installation level (full write permissions)

(Saved in SYSFSAC.SV)

Power Up: Takes effect immediately

User Interface Location: SYSTEM Variables screen

\$FSAC_LIST[1] . \$ip_address

Minimum: "" Default: " " Maximum: " "

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: FTP Server Access Control List

Description: Contains list of hosts which can use FTP server on robot based on associated Access Level. (Saved in SYSFSAC.SV)

Power Up: Takes effect immediately

User Interface Location: SYSTEM Variables screen

\$FTP_DEF_OW

Minimum: 0.0 Default: 0.0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

See Also: *SYSTEM R-J2 ECBR-FTP Interface Setup and Operations Manual*

\$GE_INT_CFG STRUCTURE

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

User Interface Location: SYSTEM Variables screen

\$GE_INT_CFG.\$clr_last_st

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

See Also: \$GE_INT_CFG.\$PC_BUS_ADDR

\$GE_INT_CFG.\$pc_bus_addr

Minimum: -1 Default: -1 Maximum: 31

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

See Also: \$GE_INT_CFG.\$clr_last_st

\$GENOV_ENB

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$GROUP STRUCTURE

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$accel_ovrd

Minimum: 0 Default: 0 Maximum: 500

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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/deceleration time * (\$ACCEL_OVRD/100) * (RELACCEL/100).

Power Up: Effective with next motion

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$accu_num

Minimum: 0 Default: 0 Maximum: 10

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Accuracy Area Number

Description: Accuracy area number used in this motion.

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$a rmload

Minimum: 0.0 Default: 0.0 Maximum: 10000.0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Weight of Arm Payload

Description: Weight of payload on robot arm during current motion in Kg.

Power Up: Effective with next motion

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$asymfiltrenb

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Asymmetric Filter Enable

Description: Reserved for Internal use by FANUC Robotics. Core TurboMove Joint Softpart sets \$asymfiltrenb. If TRUE, asymmetric filter is used for motion with PTP short motion.

Power Up: Effective with next motion

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$cartfiltrenb

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$cnstnt_path

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$cnt_accel1

Minimum: 0 Default: 256 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$cnt_accel2

Minimum: 0 Default: 256 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$cnt_dyn_acc

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$cnt_shortmo

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Continuous Short Motion Enable

Description: Enables/disables acceleration time optimization for NODECEL or VARDECEL termtype moves.

Power Up: Effective with next motion

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$cnt_speedup

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: No

\$GROUP[1].\$contaxisvel

Minimum: 0.001 Default: 100.0 Maximum: 100.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$crrcompenb

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Cartesian Circular Compensation Enable

Description: Reserved for Internal use by FANUC Robotics. Core Cartesian Softpart sets \$crrcompenb. If TRUE, path accuracy improvement for circular motype is enabled.

Power Up: Effective with next motion

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$deceltol

Minimum: 0.0 Default: 0.0 Maximum: 100.0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$dyn_i_comp

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Dynamic Compensation

Description: Enables feature supported by some robot libraries for dynamic speed and acceleration control.

Power Up: Effective with next motion

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$ext_indep

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Independent Extended Axes

Description:

If set to TRUE, the extended axes might stop at a different time from the robot axes. All axes start at the same time, but have different stopping times. If set to TRUE, the variable \$GROUP.\$ext_speed is used as a percentage multiplier of the \$PARAM_GROUP.\$jntvllim for the extended axes to compute the speed for the independent motion. If set to FALSE, both robot and extended axes start and stop at the same time with the total motion time being the maximum of either the planned robot motion time (based on \$GROUP.\$speed) or the planned extended axes motion time (based on \$GROUP.\$ext_speed).

Power Up: Effective on the next motion.

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$ext_speed

Minimum: 0.0 Default: 100.0 Maximum: 100.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

$$\$PARAM_GROUP[].\$jntvllim[] = \$group[].\$ext_speed * 0.01$$

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.

User Interface Location: SYSTEM Variables screen

<="">\$GROUP[1].\$motype

<="">

Minimum: MT_JNT_JOG Default: 6 Maximum: MT_CIRCULAR
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: MOTYPE_E

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$orient_type

Minimum: OR_RS_WORLD Default: 1 Maximum: OR_AES_CIRCLE
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: ORIENT_E

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$pathres_enb

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$payload

Minimum: 0.0 Default: 0.0 Maximum: 10000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Weight of Payload

Description: Weight of payload during current motion in Kg.

Power Up:

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$reserve1

Minimum: INTEGER_MIN Default: 0 Maximum: INTEGER_MAX
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Reserved for future use.

Description: A void variable reserved for future use by FANUC Robotics.

Power Up: Effective with next motion

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$rotspeed

Minimum: 0.001 Default: 90.0 Maximum: 1440.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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_type 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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$seg_time

Minimum: 0 Default: 0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: SYSTEM Variables screen

<="">\$GROUP[1].\$segtermtype

<="">

Minimum: TT_STOP Default: 1 Maximum: TT_CONTINUOUS
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: TERMTYPE_E

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$sm_profile

Minimum: SM_CLASS_1 Default: 0 Maximum: SM_CLASS_4
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SM_PROFILE_E

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

User Interface Location: SYSTEM Variables screen

<="">\$GROUP[1].\$speed

<="">

Minimum: 0.001 Default: 300.0 Maximum: 3000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$ta_profile

Minimum: TA_DBL_LIN Default: 0 Maximum: TA_SINE
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: TA_PROFILE_E

Name: Time Distance Profile

Description: Time distance acceleration/deceleration profile.

Power Up: Effective with next motion

User Interface Location: SYSTEM Variables screen

<="">\$GROUP[1].\$termtype

<="">

Minimum: TT_STOP Default: 1 Maximum: TT_CONTINUOUS
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: TERMTYPE_E

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$time_shift

Minimum: 0 Default: 0 Maximum: 10000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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).

User Interface Location: SYSTEM Variables screen

<="">\$GROUP[1].\$uframe

<="">

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: POSITION

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$use_cartacc

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$use_config

Minimum: 0 Default: 1 Maximum: 0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$use_pathacc

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Use/unused Path Acceleration (for future use)

Description: Flag for turn on/off path acceleration function.

Power Up: Effective with next motion

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$use_shortmo

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$use_turns

Minimum: 0 Default: 1 Maximum: 0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$use_wjturns

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$usemaxaccel

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$userelaccel

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

\$GROUP[1].\$usetimeshft

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

<="">\$GROUP[1].\$utool

<="">

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: POSITION

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

User Interface Location: SYSTEM Variables screen

\$HBK_IO_IDX

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Mapped HBK (Hand broken signal) I/O index number

Description: Not used

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$HBK_IO_TYPE

Minimum: 0 Default: 1 Maximum: 31

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Mapped HBK (Hand broken signal) I/O type

Description: Not used

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$HBK_MAP_ENB

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Mapped HBK (Hand broken signal) is enabled

Description: Not used

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen **\$HOST_SHARED STRUCTURE**

Name: Host Shared

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. This should not include HOSTNAME or ROUTERNAME entries. This structure is saved in the SYSHOST.SV file, and can be shared between robots.

User Interface Location: 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_addr

Minimum: "" Default: "" Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: 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 Default: 0 Maximum: 99

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Address Type

Description: An integer Internet variable whose value is 2 by default and should not be changed.

Power Up: See \$HOST_SHARED.

User Interface Location: SYSTEM Variables 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_length

Minimum: 0 Default: 0 Maximum: 17

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Length

Description: An integer Internet variable whose value is 4 by default and should not be changed.

Power Up: See \$HOST_SHARED.

User Interface Location: SYSTEM Variables 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_name

Minimum: "" Default: "" Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: 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[8] STRUCTURE

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.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: Host Client Tag Mode

Description: Not currently used.

Power Up: Not currently used.

User Interface Location: 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 Default: 0 Maximum: 2

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: 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].\$pwd_timeout

Minimum: 0 Default: 0 Maximum: 0xFFFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: ULONG

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.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: 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 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: 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 Default: 0 Maximum: 2

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Host Client Tag State

Description: Specifies the current state of the tag.

Power Up: Changes to this variable take effect immediately.

User Interface Location: 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_path

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: 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 Default: 15 Maximum: 2147483646

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: 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

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.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: 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: 0 Default: 0 Maximum: 99

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Address Type

Description: An integer Internet variable whose value is 2 by default and should not be changed.

Power Up: See \$HOSTENT.

User Interface Location: SYSTEM Variables 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_length

Minimum: 0 Default: 0 Maximum: 17

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Length

Description: An integer Internet variable whose value is 4 by default and should not be changed.

Power Up: See \$HOSTENT.

User Interface Location: SYSTEM Variables 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_name

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: 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

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.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: Host Server Tag Mode

Description: Not currently used.

Power Up: Not currently used.

User Interface Location: 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 Default: 0 Maximum: 2

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: 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 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: 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 Default: 0 Maximum: 2

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Host Server Tag State

Description: Specifies the current state of the tag.

Power Up: Effective immediately.

User Interface Location: 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 Default: 0 Maximum: 2147483646

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: 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*

\$HOST_ERR STRUCTURE

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.

User Interface Location: 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_ERR.\$ssc_mask[1-4]

Minimum: 0 Default: 0 Maximum: 0xFFFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: ULONG

Description: An array containing the Facility Mask and Severity Mask for host communications error reporting. Available only if the KSL, MOTET, or MAP options have been installed.

Power Up: Effective immediately.

User Interface Location: 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: 94 Default: 512 Maximum: 4093*
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

* The maximum value differs for each communications package as follows:

KSL	4093
MOTET	1250

Power Up: Requires a cold start to take effect.

User Interface Location: 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_PWRD[1]

Minimum: "" Default: " " Maximum: ""

KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: STRING

Name:

Description: An array containing the passwords associated with each USERNAME.

Power Up: Effective immediately.

User Interface Location: SYSTEM FTP Host Comm Setup 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*

\$IMSAVE_DONE

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen, function pull up for cold start.

\$INCL_ADJUST STRUCTURE

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.

User Interface Location: Torch posture adjustment screen

\$INCL_ADJUST.\$part_of_prg

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: Torch posture adjustment screen

\$INCL_ADJUST.\$stick_out

Minimum: -10 Default: 0 Maximum: 10

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Stick out value

Description: This system variable is stick out value for adjustment.

Power Up: Changes to this variable take effect immediately

User Interface Location: Torch posture adjustment screen

\$INCL_ADJUST.\$travel_angl

Minimum: -5 Default: 0 Maximum: 5

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Travel angle value

Description: This system variable is travel angle value for adjustment.

Power Up: Changes to this variable take effect immediately

User Interface Location: Torch posture adjustment screen

\$INCL_ADJUST.\$work_angle

Minimum: -5 Default: 0 Maximum: 5
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Work angle value

Description: This system variable is work angle value for adjustment.

Power Up: Changes to this variable take effect immediately

User Interface Location: Torch posture adjustment screen

\$INTP_PRTY

Minimum: 0 Default: 0 Maximum: 0x7FFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$INTPMODNTOL

Minimum: 0 Default: 0 Maximum: 255
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Early Motion Completion Time

Description: Specifies the time, in milliseconds, by which the interpreter the motion ends early.

Power Up:

User Interface Location: SYSTEM Variables screen

\$IO_AUTO_CFG

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

\$IO_CYCLE

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$IO_SCRN_UPD

Minimum: 8 Default: 32 Maximum: 250
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: I/O Dynamic Screen Update Time

Description: This is the time, in milliseconds, between dynamic updates of the the I/O related menus on the teach pendant. The shorter this time is made, the more likely it is to affect other system performance areas.

Power Up: No

User Interface Location: SYSTEM Variables screen

\$IOLNK[16] STRUCTURE

Name: I/O Link

Description: I/O link variables. Currently not supported.

Power Up:

User Interface Location: SYSTEM Variables screen

\$IOLNK[1].\$input_n

Minimum: 0 Default: 0 Maximum: 256

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: I/O link input number.

Description: I/O link number of input points. Currently not supported.

Power Up:

User Interface Location: SYSTEM Variables screen

\$IOLNK[1].\$output_n

Minimum: 0 Default: 0 Maximum: 256

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: I/O link output number.

Description: I/O link number of output points. Currently not supported.

Power Up:

User Interface Location: SYSTEM Variables screen

\$IOLNK[1].\$rack

Minimum: 0 Default: 0 Maximum: 15

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

Name: I/O link rack.

Description: I/O link rack number. Currently not supported.

Power Up:

User Interface Location: SYSTEM Variables screen

\$IOLNK[1].\$slot

Minimum: 0 Default: 0 Maximum: 40

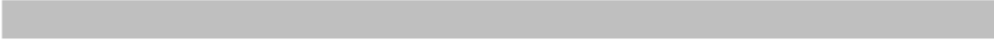
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

Name: I/O link slot.

Description: I/O link slot number. Currently not supported.

Power Up:

User Interface Location: SYSTEM Variables screen



\$IS_DMR STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$IS_DMR.\$ignore_motn

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$IS_DMR.\$master_done

Minimum: -1 Default: -1 Maximum: 1


KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen



\$IS_MCR STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$IS_MCR.\$machinelock

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$IS_MCR.\$no_stop_err

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$IS_MCR.\$spc_reset

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$IS_MOR STRUCTURE

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.

User Interface Location: System global variable screen.

\$IS_MOR.\$error_cnt[1-4]

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: None

\$IS_MOR.\$post_error

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: None

\$IS_MOR.\$servo_ready

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: None

\$IS_MRR STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$IS_MRR.\$endmotn_enb

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$IS_MRR.\$exp_accel[1-4]

Minimum: 0 Default: 120 Maximum: 32767
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: Process Axes Setup Menu or SYSTEM Variables screen

\$IS_MRR.\$gear_ratio[1-4]

Minimum: -10000000000. Default: 0. Maximum: 10000000000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: ISDT System Variable: gear ratio for each process axis

Description: This value should only be changed at Process Axes Setup Menu.

Power Up:

User Interface Location: Process Axes Setup Menu.

\$IS_MRR.\$jntvlim[1-4]

Minimum: -100000. Default: 0 Maximum: 100000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: Process Axes Setup Menu.

\$IS_SCR STRUCTURE

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:

User Interface Location: System global variable screen.

\$IS_SCR.\$axisorder[1-4]

Minimum: 0 Default: 0 Maximum: 16

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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:

User Interface Location: None

\$IS_SCR.\$brk_number[1-4]

Minimum: 0 Default: 0 Maximum: 6

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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.

User Interface Location: None

\$IS_SCR.\$hw_strt_axs

Minimum: 0 Default: 7 Maximum: 16

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: ISDT System Variable: hardware start axis number for process axes

Description: This variable should only be set during process axes setup.

Power Up:

User Interface Location: None

\$IS_SCR.\$num_tot_axs

Minimum: 0 Default: 0 Maximum: 16
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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:

User Interface Location: None

\$IS_SCR.\$rotary_axes[1-4]

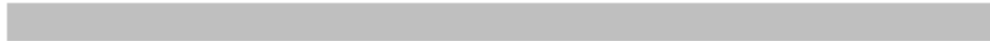
Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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:

User Interface Location: None



\$IS_ERROR STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

\$IS_ERROR.\$bufindx

Minimum: 0 Default: 0 Maximum: ERR_BUF_SIZE
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: ISDT System Variable: the current index of the \$IS_ERROR ring buffer

Description: Updated by ISDT and FLTR task.

Power Up:

User Interface Location: None

\$IS_ERROR.\$err_axis[1 -20]

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: ISDT System Variable: the associated process axis number for posted error

Description: Updated by ISDT and FLTR task.

Power Up:

User Interface Location: None

\$IS_ERROR.\$err_code[2 0]

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: ISDT System Variable: stores error code which was posted for a process axis

Description: Updated by ISDT and FLTR task.

Power Up:

User Interface Location: None

\$JCR STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$JCR.\$jog_dct_ele[1]

Minimum: MIN_INT Default: 0 Maximum: MAX_INT

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$JCR.\$jog_dct_ele[2]

Minimum: MIN_INT Default: 0 Maximum: MAX_INT
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name:

Description: The entries in this array is used to display the element in jog coordinate of the teach pendent. For internal use only.

Power Up:

User Interface Location: SYSTEM Variables screen

\$JCR.\$jog_dct_nam[1]

Minimum: MIN_INT Default: 0 Maximum: MAX_INT
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$JCR.\$jog_dct_nam[2]

Minimum: MIN_INT Default: 0 Maximum: MAX_INT
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name:

Description: The entries in this array are used to determine the softpart name which supports the jog softpart. For internal use only.

Power Up:

User Interface Location: SYSTEM Variables screen

\$JCR.\$jog_gp

Minimum: 1 Default: 1 Maximum: 255

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Jog group

Description: Specify which group will be jogged from the teach pendant.

Power Up: Reset to default value on very cold start.

User Interface Location: SYSTEM Variables screen

\$JCR.\$jog_subgp

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$JCR_GRP[1] STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$JCR_GRP[1].\$cd_jog

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$JCR_GRP[1].\$fix_ornt

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$JCR_GRP[1].\$follower

Minimum: 0 Default: 0 Maximum: 32

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$JCR_GRP[1].\$jog_coord

Minimum: jog_joint Default: 0 Maximum: jog_aux2

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: JOG_COORD_T

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.

User Interface Location: SYSTEM Variables screen

See Also: \$SCR_GRP[1].\$coord_mask

\$JCR_GRP[1].\$jog_fine_md

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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_pcmt.

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.

User Interface Location: SYSTEM Variables screen

See Also: \$JOG_GROUP[1].\$fine_ovrd, \$JOG_GROUP[1].\$fine_dis t, \$SCR_GRP[1].\$fine_pcmt.

\$JCR_GRP[1].\$jog_v_fine

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$JCR_GRP[1].\$jog_wrstjnt

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$JCR_GRP[1].\$leader

Minimum: 0 Default: 0 Maximum: 5

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$JCR_GRP[1].\$prg_run

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$JCR_GRP[1].\$rtcp_jog

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$JCR_GRP[1].\$jog_v_fine

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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 very cold start.

User Interface Location: SYSTEM Variables screen

\$JOBPROC_ENB

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: Appears on the SYSTEM Variables screen.

\$JOG_GROUP STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$JOG_GROUP[1].\$fine_dist

Minimum: 0. Default: 0.5 Maximum: 1.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$JOG_GROUP[1].\$fine_ovrd

Minimum: 1 Default: 100 Maximum: 500
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

See Also: \$SCR_GRP[1].\$fine_pcmt, \$JOG_GROUP[1].\$fine_dist

\$JOG_GROUP[1].\$jogframe

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: POSITION

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.

User Interface Location: SYSTEM Variables screen

\$JPOSREC_ENB

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$KAREL_ENB

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Enable Display of KAREL Programs in SELECT menu

Description: Enables the display of KAREL programs in the SELECT menu. Setting:

1: Display KAREL programs in the SELECT menu
0: Do not display KAREL programs

Power Up:

User Interface Location: SYSTEM Variables screen. The TPE application sets this to 1 during software installation on the SETUP APPLICATION screen

\$KCL_LIN_NUM

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Line numbers for KCL command file output files

Description: Enables the addition of line numbers for KCL command files. **If \$KCL_LIN_NUM is set to FALSE**, no line numbers appear in output. **If set to TRUE**, line numbers appear.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$LANGUAGE

Minimum: "" Default: "DEFAULT " Maximum: ""
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Language

Description: Identifies the current dictionary element. To read, write, or check a dictionary element, the dictionary name and element number are specified. The dictionary is found by searching for it in the language specified by

Power Up: No

User Interface Location: SYSTEM Variables screen. Set using the KCL SET LANG command.

\$LASTPAUSPOS[5]

Minimum: MIN_JPOS Default: DEF_JPOS Maximum: MAX_JPOS
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: JOINTPOS9

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.

User Interface Location: SYSTEM Variables screen

\$LIBRARY[1-5]

Minimum: "" Default: " " Maximum: " "
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Name and of the ROBOT LIBRARY Software

Description: Displays the release time name and version of the software ROBOT LIBRARY.

Power Up: This variable cannot be changed.

User Interface Location: STATUS Version IDs screen

\$LNCFG STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$LNCFG.\$cart_Intk

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: System global variable screen.

\$LNCFG.\$debug

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$LNCFG.\$group_msk

Minimum: 1 Default: 1 Maximum: 5

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: System global variable screen.

\$LNCFG.\$group_num

Minimum: 1 Default: 1 Maximum: 5

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$LNCFG.\$int_no_gone

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$LNCFG.\$no_header

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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 is 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.

User Interface Location: SYSTEM Variables screen

\$LNCFG.\$pIn_no_gone

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$LNCFG.\$rstr_bnds

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$LNCFG.\$slc_pt_trig

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: System global variable screen.

\$LNCFG.\$soft_delay

Minimum: 16 Default: 96 Maximum: 1000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$LNCFG.\$srvo_delay

Minimum: 16 Default: 48 Maximum: 1000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$LNCFG.\$sync_timeout

Minimum: 1 Default: 120 Maximum: 600
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$LNCFG.\$t2s_pst_ccn

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: System global variable screen

\$LNCFG_GRP STRUCTURE

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.

\$LNCFG_GRP.\$int_no_gone

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: System global variable screen

\$LNCFG_GRP.\$pln_no_gone

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: System global variable screen

\$LNCFG_GRP.\$rstr_bnds

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: System global variable screen

\$LNCFG_GRP.\$soft_delay

Minimum: 16 Default: 96 Maximum: 1000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: System global variable screen

\$LNCFG_GRP.\$srvo_delay

Minimum: 16 Default: 48 Maximum: 1000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: System global variable screen

\$LNEDTMOD

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: System global variable screen

See Also: This variable is used for multi-arm linetracking only.

\$LNLPR STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$LNLPR.\$In_holdmotn

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$LNLPR_GRP STRUCTURE

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.

\$LNLPR_GRP.\$ln_holdmotn

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: System global variable screen.

\$LNLPR_GRP.\$seg_predtim

Minimum: 0 Default: 4 Maximum: 10

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: System global variable screen.

See Also: \$SCR.\$ITP_TIME

\$LNSCH[1] STRUCTURE

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.

User Interface Location: SYSTEM Variables screen, teach pendant program DETAIL screen, and the SETUP Tracking screen

\$LNSCH[1].\$bound1[1-10]

Minimum: -3.0E38 Default: 0.0 Maximum: 3.0E38
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen, SETUP Tracking screen

See Also: \$LNSCH[1].\$bound2, LNSCH[1].\$sel_bound

\$LNSCH[1].\$bound2[1-10]

Minimum: -3.0E38 Default: 0.0 Maximum: 3.0E38
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen, SETUP Tracking screen

See Also: \$LNSCH[1].\$bound1, LNSCH[1].\$sel_bound

\$LNSCH[1].\$part_queue

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM System Variable screen

See Also: \$LNSCH[1].\$TRK_AXS_NUM

\$LNSCH[1].\$rec_shift

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

See Also: \$LNSCH[1].\$teach_dist, and \$LNSCH[1].\$scale

\$LNSCH[1].\$ scale

Minimum: -3.0E38 Default: 1.0 Maximum: 3.0E38
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen, SETUP Tracking screen

See Also: \$LNSCH[1].\$teach_dist, \$LNSCH[1].\$rec_shift

\$LNSCH[1].\$sel_bound

Minimum: 1 Default: 1 Maximum: 3
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variable screen, SETUP Tracking screen

See Also: \$LNSCH[1].\$bound1

\$LNSCH[1].\$tcp_xtrm

Minimum: -3.0E38 Default: 1.0E6 Maximum: 3.0E38
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

See Also: \$LNSCH[1].\$trk_frame, \$LNSCH[1].\$trk_axis_num, \$LNSCH[1].\$bound1

\$LNSCH[1].\$teach_dist

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variable screen, SETUP Tracking screen

See Also: \$LNSCH[1].\$rec_shift, \$LNSCH[1].\$scale

\$LNSCH[1].\$trg_din_num

Minimum: 0 Default: 0 Maximum: 256
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen, SETUP Tracking screen

\$LNSCH[1].\$trig_value

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen, SETUP Tracking screen

\$LNSCH[1].\$trk_axs_dir

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen, SETUP Tracking screen

See Also: \$LNSCH[1].\$TRK_AXS_NUM

\$LNSCH[1].\$trk_axs_num

Minimum: 0 Default: 0 Maximum: 3
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen, SETUP Tracking screen

See Also: \$LNSCH[1].\$trk_axs_dir

\$LNSCH[1].\$trk_enc_num

Minimum: 1 Default: 1 Maximum: 2

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variable screen, SETUP Tracking screen

\$LNSCH[1].\$trk_frame

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: POSITION

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.

User Interface Location: SYSTEM Variables screen, SETUP Tracking screen

See Also: \$LNSCH[1].\$trk_axs_num, and \$LNSCH[1].\$trk_axs_dir

\$LNSCH[1].\$trk_grp_num

Minimum: 1 Default: 1 Maximum: 5

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen, SETUP Tracking screen

\$LNSCH[1].\$trk_type

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen, SETUP Tracking screen

\$LNSCH[1].\$vision_trk

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen and the SETUP Tracking screen

See Also: \$LNSCH[1].\$PART_QUEUE

\$LNSNRSCH[1] STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

See Also: \$ENC_STAT[1], \$SCR.\$ENC_AXIS[1], \$SCR.\$ENC_TYPE[1]

\$LNSNRSCH[1].\$average

Minimum: 0 Default: 1 Maximum: 2147483647
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

See Also: \$ENC_STAT[1].\$enc_average

\$LNSNRSCH[1].\$enable

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

See Also: \$ENC_STAT[1].\$enc_enable

\$LNSNRSCH[1].\$sim_on

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

See Also: \$ENC_STAT[1].\$enc_sim_on

\$LNSNRSCH[1].\$sim_spd

Minimum: -2147483648 Default: 0 Maximum: 2147483647
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

See Also: \$ENC_STAT[1].\$enc_sim_spd

\$LNSNRSCH[1].\$thresh

Minimum: 0 Default: 1 Maximum: 2147483647
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

See Also: \$ENC_STAT[1].\$enc_thresh

\$LNSNRSCH[1].\$update_rate

Minimum: 1 Default: 1 Maximum: 100
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

See Also: \$ENC_STAT[1].\$enc_multipl, \$SCR.\$itp_time

\$LNSTAT_GRP STRUCTURE

Name: Line Track Continuous Tracking Status Group structure

Description: This structure provides line tracking continuous tracking functions. The individual fields are described below.

\$LNSTAT_GRP.\$cont_trk_on

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$LNSTAT_GRP.\$trig_diff

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$LNSTAT_GRP.\$wait_4_wndw

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$LOCTOL

Minimum: 0.0 Default: 10.0 Maximum: 1000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Location Tolerance

Description: When position values are compared with the approximately equal operator >=.

Power Up:

User Interface Location: SYSTEM Variables screen

\$MA_PLAN STRUCTURE

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

User Interface Location: SYSTEM Variables screen

\$MACRO_MAXNU

Minimum: 0 Default: 20 Maximum: 99

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

See Also: \$MACROTABLE[n] where n means \$MACRO_MAXNU.

\$MACROLDUIMT

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Old specification of UI macro for R-J2 Mate

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.

User Interface Location: SYSTEM Variables screen

\$MACROMAXDRI

Minimum: 0 Default: 5 Maximum: 24

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$MACROTABLE STRUCTURE

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.

User Interface Location: SYSTEM Variables screen, SETUP Macro screen

\$MACROTABLE[1].\$assign_id

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen, SETUP Macro Screen

\$MACROTABLE[1].\$assign_type

Minimum: 0 Default: 1 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen, SETUP Macro Screen

\$MACROTABLE[1].\$ept_index

Minimum: 0 Default: 65535 Maximum: 65535
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Program EPT Index

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$MACROTABLE[1].\$macro_name

Minimum: " Default: " " Maximum: ""
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

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.

User Interface Location: SYSTEM Variables screen, SETUP Macro Screen

\$MACROTABLE[1].\$mon_no

Minimum: -2147483648 Default: 0 Maximum: 2147483647
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Monitor Number

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$MACROTABLE[1].\$open_id

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Program Opening ID

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$MACROTABLE[1].\$prev_su btyp

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: Previous Sub Type

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$MACROTABLE[1].\$prog_name

Minimum: "" Default: " " Maximum: ""

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

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.

User Interface Location: SYSTEM Variables screen, SETUP Macro Screen

\$MACROTABLE[1].\$user_work

Minimum: 0 Default: 2 Maximum: 255


KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: Work Area for Macro System

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen



\$MACRSOPENBL STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$MACRSOPENBL.\$sop_emgop

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRSOPENBL.\$sop_hold

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRSOPENBL.\$sop_pdi8

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRSOPENBL.\$sop_pdi9

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRSOPENBL.\$sop_pdia

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: Macro Enable, SOP PDla 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.

User Interface Location: SYSTEM Variables screen

\$MACRSOPENBL.\$sop_pdi9

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRSOPENBL.\$sop_pdic

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: Macro Enable, SOP PDlc Input

Description: Enables/disables the execution of macros from the SOP pdlc input. Not currently used.

Power Up: Changes to this variable must be made during a controlled start.

User Interface Location: SYSTEM Variables screen

\$MACRSOPENBL.\$sop_remote

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRSOPENBL.\$sop_reset

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRSOPENBL.\$sop_start

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRSOPENBL.\$sop_tpdsc

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRSOPENBL.\$sop_tprel

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRSOPENBL.\$sop_user1

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRSOPENBL.\$sop_user2

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRTPDSBEX

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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:

User Interface Location: SYSTEM Variables screen



\$MACRUOPENBL STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_cstop

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_enbl

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_estop

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_hold

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_home

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_pdstrt

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_pnstrb

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_reset

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_rsr1

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_rsr2

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_rsr3

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_rsr4

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_rsr5

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_rsr6

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_rsr7

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_rsr8

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_sfspd

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MACRUOPENBL.\$uop_start

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MASTER_ENB

Minimum: 0 Default: 3 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MAXUALRMNUM

Minimum: 1 Default: 10 Maximum: 999

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MCR STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$MCR.\$brk_out_enb

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Brake Cntrl, SYSTEM Variables screen

\$MCR.\$brk_output[6]

Minimum: 0 Default: 0 Maximum: 16

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Brake Cntrl, SYSTEM Variables screen

\$MCR.\$dry_run

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: TEST CYCLE screen, SYSTEM Variables screen

\$MCR.\$enbl

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR.\$fltr_debug

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MCR.\$genoverride

Minimum: 0 Default: 10 Maximum: 100
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: Teach Pendant hard key, SYSTEM Variables screen

\$MCR.\$mjog_debug

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MCR.\$mmgr_debug

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MCR.\$mo_warn_enb

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR.\$otf_lin_no

Minimum: 0 Default: 0 Maximum: 65535
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MCR.\$otf_ofst

Minimum: 0 Default: 0 Maximum: 255
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MCR.\$otf_prg_id

Minimum: 0 Default: 0 Maximum: 65535
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: SYSTEM Variables screen

\$MCR.\$ot_release

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: MANUAL OT Release, SYSTEM Variables screen

\$MCR.\$sfspd

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR.\$spc_reset

Minimum: 0 Default: 0 Maximum: 1

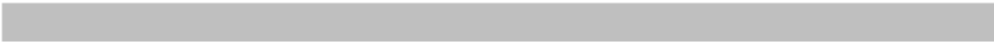
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen



\$MCR_GRP STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$calibrate

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Calibrate

Description: Resets the current position based on mastering data and encoder counts.

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Master/Cal screen

\$MCR_GRP[1].\$chk_jnt_sp d[9]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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 \$jntvlim 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.

User Interface Location: SYSTEM Master/Cal screen

\$MCR_GRP[1].\$crc_rsm_tol

Minimum: 0.0 Default: 0.2 Maximum: 10000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$dry_jog_ovr

Minimum: 1.0 Default: 100.0 Maximum: 100.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location:

\$MCR_GRP[1].\$dry_run_spd

Minimum: 0.001 Default: 300.0 Maximum: 2000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$dryrun_jspd

Minimum: 0.001 Default: 25.0 Maximum: 100.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: TEST CYCLE screen

\$MCR_GRP[1].\$dsp_update[9]

Minimum: 0 Default: 0 Maximum: 2
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$dsp_upd_blk[9]

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$eachmst_sel[9]

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Master/Cal screen

\$MCR_GRP[1].\$fjog_enb

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$fltr_flush

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

Name: FilterFlush

Description: 1: FLTR TASK perform FilterFlush

Users should not change this system variable.

Power Up: Changes to this variable take effect immediately

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$forc_eupdate

Minimum: 0 Default: 0 Maximum: 1000000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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[1].\$current_ang WITH MACHINE PULSE.

Power Up: Changes to this variable take effect immediately

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$hard_hold

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$hold

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$intplockhol

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$intr_debug

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$jnt_prc_enb

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$lckd_caldon

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$lch_edm_enb

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$machinelock

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1]. \$master

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Master/Cal screen

\$MCR_GRP[1].\$master_type

Minimum: 0 Default: 0 Maximum: 2

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: SYSTEM Master/Cal screen

\$MCR_GRP[1].\$otf_org_spd

Minimum: 0.0 Default: 300.0 Maximum: 2000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: Setup On_The_Fly screen

\$MCR_GRP[1].\$otf_spd_chg

Minimum: -100 Default: 0 Maximum: 100
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: Setup On_The_Fly screen

\$MCR_GRP[1].\$otf_spd_upd

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: Setup On_The_Fly screen

\$MCR_GRP[1].\$otf_speed

Minimum: 0.0 Default: 300.0 Maximum: 2000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SETUP On-the-fly screen

\$MCR_GRP[1].\$pg_orig_rsm

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$plan_debug

Minimum: 0x80000000 Default: 0 Maximum: 0xFFFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$pos_can_req

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

See Also:

\$MCR_GRP[1].\$pos_estblsh

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

<="">\$MCR_GRP[1].\$prgoverride

<="">

Minimum: 0.001 Default: 100.0 Maximum: 100.0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Program Override

Description: Specifies the rate of robot movement speed. The robot movement speed when the program is executed is \$MCR.\$genoverride * \$MCR.\$prgoverride. It is requested by \$MCR_GRP.\$prgoverride.

\$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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$qck_stp_enb

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$rsm_cmd_pth

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$rsm_cmd_pth

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$rsm_motype

Minimum: 1 Default: 1 Maximum: 3

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$rsm_offset

Minimum: -25.0 Default: 0.0 Maximum: 25.0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$rsm_orient

Minimum: 0 Default: 0 Maximum: 3

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$rsm_speed

Minimum: 0.001 Default: 300.0 Maximum: 2000.0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: System Variables screen

\$MCR_GRP[1].\$rsm_termtyp

Minimum: 1 Default: 1 Maximum: 5

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Resume Termtyp

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 termtyp.

Power Up: Changes take effect on next motion.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$servo_disb I[9]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Servo Disable

Description: Reserved for Internal use by FANUC Robotics. Turns off servo power.

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$set_ref

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Master/Cal screen

\$MCR_GRP[1].\$sflt_enb[9]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$sflt_fup

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: Soft Floating Follow Up Enable

Description: Enables soft floating follow up.

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$sflt_val[9]

Minimum: 0 Default: 0 Maximum: 100
KCL/Data: RO Program: RO GET/SET_VAR: RW Data Type: INTEGER

Name: Soft Floating Ratio

Description: The ratio of soft floating.

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$soft_alarm

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$srvo_q_stop

Minimum: 0 Default: 0 Maximum: 2
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$syn_adj_sel

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$tsmod_on

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Tip Stick Mode On

Description: Enables spot welding tip stick detection.

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$turn_on_srv

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MCR_GRP[1].\$uop_imstp

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Immediately Stop From UOP

Description: Immediately a stop is asserted from the UOP.

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$MCTCFG STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

\$MCTCFG.\$debug

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Motion Cycle Time Recording Debug Flag.

Description: Reserved for Internal use by FANUC Robotics.

Power Up:

User Interface Location: SYSTEM Variables screen

\$MCTCFG.\$mct_enbl

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$MEMO STRUCTURE

Name: Memo Structure

Description: Individual fields within this structure are defined below.

Power Up: Perform a cold start for the changes to take effect.

User Interface Location: SYSTEM Variables screen

\$MEMO.\$prc_tbl_siz

Minimum: 0 Default: 256 Maximum: 10000
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MEMO.\$tpe_area

Minimum: 0 Default: 200000 Maximum: 2097152
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MEMO.\$tskwrk_area

Minimum: 0 Default: 60000 Maximum: 1000000
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MEMO.\$wrk_buf_siz

Minimum: 0 Default: 2000 Maximum: 10000
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MISC[1] STRUCTURE

Name: Miscellaneous system variables for each groups.

Description: This system variable has miscellaneous system variables by each motion group

\$MISC[1].\$hpd_trq[9]

Minimum: -100.00 Default: 0.00 Maximum: 100.00
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

See: \$MISC_MSTR.\$hpd_enb

\$MISC_MSTR.\$hpd_enb

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MJPTMIR[1-5] STRUCTURE

Minimum: MIN_MJPTMIR Default: 0 Maximum: MAX_MJPTMIR
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: MJPTMIR_T

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.

User Interface Location: When program paused or path jog is tried, the variable is set up automatically.

\$MJPTMIR[1].\$cir_cnt

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: VECTOR

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.

User Interface Location: When program paused or path jog is tried, the variable is set up automatically.

\$MJPTMIR[1].\$curp x_task

Minimum: -1 Default: -1 Maximum: 16
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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.

User Interface Location: When program paused or path jog is tried, the variable is set up automatically.

\$MJPTMIR[1].\$dirc ton_a

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: VECTOR

Name: Path jog frame

Description: Approach vector of path jog frame.

Power Up: Changes to this variable take effect immediately.

User Interface Location: When program paused or path jog is tried, the variable is set up automatically.

\$MJPTMIR[1].\$dirc ton_n

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: VECTOR

Name: Path jog frame

Description: Normal vector of path jog frame.

Power Up: Changes to this variable take effect immediately.

User Interface Location: When program paused or path jog is tried, the variable is set up automatically.

\$MJPTMIR[1].\$dirc ton_o

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: VECTOR

Name: Path jog frame

Description: Orient vector of path frame.

Power Up: Changes to this variable take effect immediately.

User Interface Location: When program paused or path jog is tried, the variable is set up automatically.

\$MJPTMIR[1].\$dirc ton_l

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: VECTOR

Name: Path jog frame

Description: Location vector of path jog frame.

Power Up: Changes to this variable take effect immediately.

User Interface Location: When program paused or path jog is tried, the variable is set up automatically.

\$MJPTMIR[1].\$moty pe

Minimum: MT_JNT_JOG Default: 6 Maximum: MT_CIRCULAR
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: MOTYPE_E

Name: Program motion type

Description: Joint or linear or circular.

Power Up: Changes to this variable take effect immediately.

User Interface Location: When program paused, the variable is set up automatically.

\$MJPTMIR[1].\$path jog_flg

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: When program paused or path jog is tried, the variable is set up automatically.

\$MJPTMIR[1].\$prb_frm

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: POSITION

Name: Path jog frame

Description: Setup path jog frame.

Power Up: Changes to this variable take effect immediately.

User Interface Location: When program paused or path jog is tried, the variable is set up automatically.

\$MJPTMIR[1].\$r_re verse

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: When program paused or path jog is tried, the variable is set up automatically.

\$MJPTMIR[1].\$tool_frm

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: POSITION

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.

User Interface Location: When program paused or path jog is tried, the variable is set up automatically.

\$MJPTMIR[1].\$used _utool

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: POSITION

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

User Interface Location: Do not change this variable. When the program is paused or path jog is tried, the variable is set up automatically.

\$MJPTMIR[1].\$utool I_num

Minimum: 1 Default: 5 Maximum: 100
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Number of tool

Description: This means the tool number is used in pause program.

Power Up: Changes to this variable take effect immediately.

User Interface Location: When program paused or path jog is tried, the variable is set up automatically.

\$MJPTMIR[1].\$z_r_frm

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: POSITION

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.

User Interface Location: When program paused or path jog is tried, the variable is set up automatically.

\$MKCFG STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$MKCFG.\$debug

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MKCFG.\$group_mask

Minimum: 0 Default: 1 Maximum: 31
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MKCFG.\$mb_conflict

Minimum: 0 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Motion-Basic Conflict mask.

Description: This is a bit-mapped variable. The bit will be set 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.

User Interface Location: SYSTEM Variables screen

\$MK CFG.\$mb_required

Minimum: 0 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MK CFG.\$mo_conflict

Minimum: 0 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MK CFG.\$mo_required

Minimum: 0 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MNDSP_CMNT

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MNUFRAME[1, 6]

\$MNUFRAME[1, 6] = POSITION NIL NIL NIL RW RW RW

Minimum: NIL Default: NIL Maximum: NIL

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: POSITION

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:

User Interface Location: SETUP Frames

\$MNUFRAMENUM[2]

Minimum: 0x0 Default: 0 Maximum: 0x15

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: User Frame Number

Description: Used as the index into \$MNUFRAME.

Power Up:

User Interface Location: SETUP Frames, teach pendant position programming

\$MNUTOOL[1, 6]

Minimum: NIL Default: NIL Maximum: NIL

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: POSITION

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:

User Interface Location: SETUP Frames

\$MNUTOOLNUM[2]

Minimum: 0x0 Default: 0 Maximum: 0x15

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: User Tool Frame Number

Description: Used as the index into \$MNUTOOL.

Power Up:

User Interface Location: SETUP Frames, TOOL teach pendant instruction

\$MONITOR_MSG[32]

Minimum: "" Default: "EXEC1 " Maximum: "EXEC1 "

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

User Interface Location: SYSTEM Variables screen

\$MOR STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$MOR.\$brk_status

Minimum: 0 Default: 0 Maximum: 63
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: Brake Status

Description: Indicates the brake output status.

Power Up: At a cold start, this variable is reset to its default.

User Interface Location: SYSTEM Variables screen

\$MOR.\$ pg_mctl

Minimum: 0 Default: 0 Maximum: 63
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Motion Control Mask

Description: Motion control mask. Indicated which motion group is currently activated by the program. This variable is used by Detached Jog.

Power Up: At a cold start, this variable is reset to its default.

User Interface Location: SYSTEM Variables screen

\$MOR.\$reg_dis_amp[1-16]

Minimum: 0.0 Default: 0.0 Maximum: 0.0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

User Interface Location: \$MOR.\$reg_dis_amp cannot be set by user.

\$MOR.\$safety_stat

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: \$MOR.\$safety_stat cannot be set by user.

\$MOR.\$smh_done

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$apc_counter[9]

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$apc_done

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$atpe_rch

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$cal_done

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: Calibration Done

Description: Displays the completion of the position adjustment (calibration).

Power Up: Data is updated dynamically by the motion system.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$cart fltrem

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$cur_acctime

Minimum: 0 Default: 0 Maximum: -1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$cur_acc[9]

Minimum: 0 Default: 0 Maximum: -1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$cur_crframe

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS

KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: POSITION

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$cur_dis_trq[9]

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Current Disturbance Torque

Description: Current disturbance torque updated automatically by the system.

Power Up: Updated automatically by the system.

User Interface Location: STATUS Axis

\$MOR_GRP[1].\$cur_prframe

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS

KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: POSITION

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

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$cur_prog_id

Minimum: 0 Default: 0 Maximum: -1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$cur_seg_id

Minimum: 0 Default: 0 Maximum: -1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Current Segment Identification

Description: Identification number of the current segment being processed.

Power Up: Data is updated dynamically by the motion system

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$curp thacc

Minimum: 0 Default: 0 Maximum: -1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$current_ang[9]

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

User Interface Location: POSITION

\$MOR_GRP[1].\$current_pos

Minimum: MIN_POSX Default: DEF_POSX Maximum: MAX_POSX

KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: POSITION EXT

Name: Current Position of the Robot

Description: Not currently available.

Power Up: Data is updated dynamically by motion system

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$currentline

Minimum: 0 Default: 0 Maximum: -1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$currentimeacc

Minimum: 0 Default: 0 Maximum: -1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Current time filter length

Description: Display the time filter length that is currently being used. This variable is active only when \$CF_PARAMGP[1].\$timefltrenb is set to TRUE.

Power Up: Data is updated dynamically by the motion system.

User Interface Location: SYSTEM Variables screen

See Also: \$CF_PARAMGP[1].\$timefltrenb

\$MOR_GRP[1].\$dsp_stat[9]

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: STATUS axis status1, status2

\$MOR_GRP[1].\$dvc_axes

Minimum: 0x80000000 Default: 0 Maximum: 0x07FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$dvc_delay

Minimum: 0x80000000 Default: 0 Maximum: 0x07FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: ITPs delayed by Time Scale

Description: [ITP] total of time delayed by time scale

Power Up:

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$dvc_reduce

Minimum: -100000.0 Default: 1.0 Maximum: 100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location:

\$MOR_GRP[1].\$error_cnt[9]

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: STATUS axis pulse

\$MOR_GRP[1].\$nilpos

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: POSITION

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.

User Interface Location:

\$MOR_GRP[1].\$filter_empty

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$filter_type

Minimum: 0 Default: 0 Maximum: 10

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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.

User Interface Location: SYSTEM Variable screen

\$MOR_GRP[1].\$filter_nc_empty

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$in_position[9]

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$jogged

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$line_err_cnt[9]

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: SHORT

Name: Line Tracking Encoder Error Count (not supported)

Description: Line tracking encoder error count.

Power Up:

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$line_offset

Minimum: 0 Default: 0 Maximum: -1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$machine_pls[9]

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: STATUS axis pulse

\$MOR_GRP[1].\$max_dis_trq[9]

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Maximum Disturbance Torque

Description: Maximum disturbance torque updated automatically by system.

Power Up: Automatically updated by Filter task

User Interface Location: STATUS axis

\$MOR_GRP[1].\$max_torque[9]

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Maximum Torque

Description: Maximum torque information updated by DSP

Power Up: Updated automatically by the system

User Interface Location: STATUS axis monitor

\$MOR_GRP[1].\$min_dis_trq[9]

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Minimum Disturbance Torque

Description: Minimum disturbance torque updated automatically by system.

Power Up: Updated automatically by the system

User Interface Location: STATUS axis

\$MOR_GRP[1].\$motion_cmnd[9]

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: STATUS axis pulse

\$MOR_GRP[1].\$move _dist

Minimum: 0.0 Default: 0.0 Maximum: 0.0
KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$over run_cnt

Minimum: INTEGER_MIN Default: 0 Maximum: INTEGER_MAX
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$path _node

Minimum: 0 Default: 0 Maximum: -1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$pend mocount

Minimum: 0 Default: 0 Maximum: -1

KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$pos_valid

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: BOOLEAN

Name: Current Position Valid

Description: Reserved for future use. This specified whether or not the current_pos is valid.

Power Up:

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$segf raction

Minimum: 0.0 Default: 0.0 Maximum: 1.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$segmovedist

Minimum: 0.0 Default: 0.0 Maximum: 100000
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$servo_ready

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$spc_stat[9]

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$syn_err_cnt

Minimum: 0 Default: 0 Maximum: -1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$MOR_GRP[1].\$torque[9]

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Average Torque

Description: Average torque information by DSP.

Power Up: Updated automatically by the system.

User Interface Location: STATUS axis monitor

\$MOR_GRP_SV[] . \$cur_sv_ang

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

See Also: \$MOR.\$smh_done

\$MOTASK_DATA

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Motion Task Data

Description: Reserved for Internal use by FANUC Robotics. Do not change this variable. The system sets this variable on cold start.

Power Up:

User Interface Location: SYSTEM Variables screen

\$NULL_CYCLE

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: System idle cycle counter

Description: This variable is incremented by 1 every time the system executes one idle loop. If this variable is not incremented over a period of time then the CPU is being utilized 100% of the time by an application. This is mainly used for comparison of different approaches to an implementation. If the CPU is 100% utilized, communications will not work because there is no CPU available.

Power Up: No

User Interface Location: SYSTEM Variables screen

\$ODRDSP_ENB

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$OPEN_FILES

Minimum: 10 Default: 10 Maximum: 255
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Open files

Description: Determines the maximum number of open files at one time.

Power Up: Only effective during cold start

User Interface Location: SYSTEM Variables screen

\$OPTION[1] - [20]

Minimum: "" Default: " " Maximum: " "

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

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.

User Interface Location: SYSTEM Variables screen



\$OPWORK STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

\$OPWORK.\$enbl_on

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$OPWORK.\$int_pmask

Minimum: 0 Default: 0xFFFFFFFF Maximum: 0xFFFFFFFF

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Interpreter Mask

Description: Not currently used.

Power Up:

User Interface Location: SYSTEM Variables screen

\$OPWORK.\$intppaused

Minimum: 0 Default: 0 Maximum: 0xFFFFFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Program is Paused

Description: This variable remains > 0 while the program is temporarily stopped. The system updates it automatically.

Power Up:

User Interface Location: SYSTEM Variables screen

\$OPWORK.\$intprunning

Minimum: 0 Default: 0 Maximum: 0xFFFFFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Program is Running

Description: This variable remains > 0 while the program is executing. The system updates it automatically.

Power Up:

User Interface Location: SYSTEM Variables screen

\$OPWORK.\$op_inv_mask[3]

Minimum: 0 Default: 0 Maximum: 0xFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Inverted signal mask

Description: Indicates which signals are inverted.

Power Up:

User Interface Location: SYSTEM Variables screen

\$OPWORK.\$op_prev_img[3]

Minimum: 0 Default: 0 Maximum: 0xFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Operator Panel Previous output image.

Description: Controls the buttons and lamps on the SOP/UOP and teach pendant

Power Up:

User Interface Location: SYSTEM Variables screen

\$OPWORK.\$opt_out

Minimum: 0 Default: 0 Maximum: 256
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

Name: Enable/Disable use of UOP Optional Output.

Description: When set to TRUE enables the optional UOP output signals.

Power Up:

User Interface Location: SYSTEM Variables screen

\$OPWORK.\$orgovrdval

Minimum: 0 Default: 0 Maximum: 100
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$OPWORK.\$outimage[3]

Minimum: 0 Default: 0 Maximum: 0xFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Current output image.

Description: Current output image.

Power Up:

User Interface Location: SYSTEM Variables screen

\$OPWORK.\$sopbusymask

Minimum: 0 Default: 524287 Maximum: 0xFFFFFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$OPWORK.\$sysbusy

Minimum: 0 Default: 0 Maximum: 0xFFFFFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: System Busy

Description: This variable remains > 0 while the system is processing. The system updates it automatically.

User Interface Location: SYSTEM Variables screen

\$OPWORK.\$tpbusymask

Minimum: 0 Default: 524287 Maximum: 0xFFFFFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$OPWORK.\$uop_disable

Minimum: 0 Default: 0 Maximum: 256
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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:

User Interface Location: SYSTEM Variables screen

\$OPWORK.\$uopbusymask

Minimum: 0 Default: 524287 Maximum: 0xFFFFFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$OPWORK.\$user_output[3]

Minimum: 0 Default: 0 Maximum: 0xFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: User Output

Description: Not currently used.

Power Up:

User Interface Location: SYSTEM Variables screen

\$ORIENTTOL

Minimum: 0.0 Default: 10.0 Maximum: 360.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Orientation Error Tolerance

Description:

\$ORIENTTOL is used when comparing the y-axis (orient vector) of two positions. \$ORIENTTOL, along with \$APPROACHTOL, \$LOCTOL, and \$CHECKCONFIG, is used in conjunction with the relational operator ``>=

Power Up:

User Interface Location: SYSTEM Variables screen

\$OVRD_RATE

Minimum: 0 Default: 5 Maximum: 100

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: ULONG

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.

User Interface Location: SYSTEM Variables screen



\$OVRDSLCT STRUCTURE

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.

User Interface Location: SYSTEM Variables screen SETUP Override screen

\$OVRDSLCT.\$off_off_ovr

Minimum: 1 Default: 10 Maximum: 100

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$OVRDSLCT.\$off_on_ovrd

Minimum: 1 Default: 10 Maximum: 100

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$OVRDSLCT.\$on_off_ovrd

Minimum: 1 Default: 10 Maximum: 100

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$OVRDSLCT.\$on_on_ovrd

Minimum: 1 Default: 10 Maximum: 100

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$OVRDSLCT.\$ovsl_enb

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$OVRDSLCT.\$sdi_index1

Minimum: 1 Default: 0x7ffffff Maximum: 0x7ffffff
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$OVRDSLCT.\$sdi_index2

Minimum: 1 Default: 0x7ffffff Maximum: 0x7ffffff
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$acc_pa_uma

Minimum: 0.0 Default: 0.0 Maximum: 50

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$acc_pc_uma

Minimum: 0.0 Default: 1.0 Maximum: 50

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$acc_s cl_uca

Minimum: 0.01 Default: 1.0 Maximum: 50.0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Filter 1 Scale Factor

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$ac cel_param[4]

Minimum: -100000. Default: 0 Maximum: 100000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Acceleration Parameter

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$accel_ratio

Minimum: 0. Default: 0.5 Maximum: 10.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$accel_time1[9]

Minimum: 0 Default: 256 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$accel_time2[9]

Minimum: 0 Default: 128 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$armload[3]

Minimum: 0.0 Default: 0.0 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Arm Payload

Description: Payload on robot arm for inertia calculation (units in Kg).

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$armload_x[3]

Minimum: -10000 Default: 0.0 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Armload_x

Description: X position of armload (units in cm).

Power Up: You must perform a cold start for the change to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$armload_y[3]

Minimum: -10000 Default: 0.0 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Armload_y

Description: Y position of armload (units in cm).

Power Up: You must perform a cold start for the change to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$armload_z[3]

Minimum: -10000 Default: 0.0 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Armload_z

Description: Z position of armload (units in cm).

Power Up: You must perform a cold start for the change to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$auto_sngstp

Minimum: 0.0 Default: 0.0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Singularity stop at auto mode.

Description: Specifies whether or not the robot should stop in auto mode when entering singularity zone.

Power Up: You must perform a cold start for the change to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$axis_im_scl

Minimum: 0.0 Default: 0.0 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Divider of Inertia and Moment

Description: Divider values of inertia (\$axisinertia) and moment (\$axismoment).

Power Up: You must perform a cold start for the change to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$axisinertia[9]

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Reserved for Internal use by FANUC Robotics

Description: Reserved for Internal use by FANUC Robotics (units in Kg).

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$axismoment[9]

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Reserved for Internal use by FANUC Robotics

Description: Reserved for Internal use by FANUC Robotics (units in Kg).

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$bc_klsh_coun[9]

Minimum: 0 Default: 0 Maximum: 100000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$belt_enable

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$cart_accel1

Minimum: 0 Default: 256 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$cart_accel2

Minimum: 0 Default: 128 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$cartmo_mgn

Minimum: 0.0 Default: 0.2 Maximum: 1000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$chklimtyp

Minimum: 0 Default: 0 Maximum: 100

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$circ_rate

Minimum: 1 Default: 1 Maximum: MAX_MOTYPE_RATE
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$clalm_time

Minimum: 0 Default: 200 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Collision Detection Time

Description: Collision detection time.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$cn_gear_n1

Minimum: 0 Default: 0 Maximum: 32767
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen, SETUP Continuous Turn

\$PARAM_GROUP[1].\$cn_gear_n2

Minimum: 0 Default: 0 Maximum: 32767
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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.

User Interface Location: SYSTEM Variables screen, SETUP Continuous Turn

\$PARAM_GROUP[1].cnt_acc_mgn

Minimum: 0.0 Default: 1.0 Maximum: 100.0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Continue acceleration margin.

Description: A scaling factor for tuning the application speed.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$coincident

Minimum: 0 Default: 1.0 Maximum: 1000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Coincidence Limit for Circular Points

Description: Coincident is used for scaling short motion criterion.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$collinear

Minimum: 0 Default: 0.0076 Maximum: 1000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$contaxisnum

Minimum: 0 Default: 0 Maximum: 9
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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.

User Interface Location: SYSTEM Variables screen, SETUP Continuous Turn

\$PARAM_GROUP[1].\$contwindow

Minimum: 0 Default: 0 Maximum: MAX
KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$cp_cutoffov

Minimum: 0 Default: 5 Maximum: 100
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].ddacc_ratio

Minimum: 0.0 Default: 1.0 Maximum: 100.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM variables

\$PARAM_GROUP[1].\$decel_ratio

Minimum: 0. Default: 0.5 Maximum: 10.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$def_maxaccel

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: BOOLEAN

Name:

Description: Reserved for future use (not supported).

Power Up: Effective on cold start.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$duty_enb[1-9]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

\$PARAM_GR OUP[1].\$duty_param1[1-9]

Minimum: -10000000000. Default: 0 Maximum: 10000000000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

\$PARAM_GR OUP[1].\$duty_param2[1]

Minimum: -10000000000. Default: 0 Maximum: 10000000000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: The System Variables screen (on the teach pendant).

See Also: This variable is used for Duty diagnosis.

\$PARAM_GR OUP[1].\$dvc_ac0_max[1-9]

Minimum: -10000000000. Default: 0. Maximum: 10000000000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Time Scale max acceleration0

Description: [cnt/msec/msec] -> [cnt/ITP/ITP]

Power Up: Requires a cold start to take effect.

User Interface Location: The System Variables screen (on the teach pendant).

\$PARAM_GR OUP[1].\$dvc_ac1_max[1-9]

Minimum: -10000000000. Default: 0. Maximum: 10000000000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Time Scale max acceleration1

Description: [cnt/msec/msec] -> [cnt/ITP/ITP]

Power Up:

User Interface Location:

\$PARAM_GR OUP[1].\$dvc_acc_max[1-9]

Minimum: -10000000000. Default: 0. Maximum: 10000000000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Time Scale max acceleration

Description: [cnt/msec/msec] -> [cnt/ITP/ITP]

Power Up:

User Interface Location:

\$PARAM_GR OUP[1].\$dvc_acc_min[1-9]

Minimum: -10000000000. Default: 0. Maximum: 10000000000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Time Scale min acceleration

Description: [cnt/msec/msec] -> [cnt/ITP/ITP]

Power Up:

User Interface Location:

\$PARAM_GR OUP[1].\$dvc_jrk_max[1-9]

Minimum: -10000000000. Default: 0. Maximum: 10000000000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Time Scale max jerk

Description: [cnt/ITP/ITP/ITP] -> [cnt/msec/msec/msec]

Power Up:

User Interface Location:

\$PARAM_GR OUP[1].\$dvc_jrk_min[1-9]

Minimum: -10000000000. Default: 0. Maximum: 10000000000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Time Scale min jerk

Description: [cnt/ITP/ITP/ITP] -> [cnt/msec/msec/msec]

Power Up:

User Interface Location:

\$PARAM_GROUP[1].\$encscales[9]

Minimum: -10000000000. Default: 0 Maximum: 10000000000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$exp_accel[9]

Minimum: 0 Default: 0 Maximum: 32767
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$exp_enbl

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$exp_jog_acc[9]

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Jog Exponential Filter Acceleration.

Description: Exponential filter length for jog motion.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$extacratio

Minimum: 0.0 Default: 0.5 Maximum: 1.0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$ffg_mgn_j2

Minimum: 0. Default: 1. Maximum: 10.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Margin for feed forward (J2)

Description: Not used

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$ffg_mgn_j3

Minimum: 0. Default: 1. Maximum: 10.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Margin for feed forward (J3)

Description: Not used

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$fwp_time1

Minimum: 0 Default: 64 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$fwp_time2

Minimum: 0 Default: 32 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$gear_ratio[9]

Minimum: -10000000000. Default: 0 Maximum: 10000000000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Gear Ratio

Description: Gear ratio of mechanical unit for each axis.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$inp os_time[9]

Minimum: 0 Default: 5000 Maximum: 100000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$inpos_type

Minimum: 0 Default: 0 Maximum: 2

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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 0 but include current and previous command

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$jg_fl tr_scl

Minimum: 0.0 Default: 1.0 Maximum: 2.0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Jog Filter Scale

Description: Scale factor for filter lengths while jogging.

Power Up: Effective on cold start

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$jntv_ellim[9]

Minimum: -100000. Default: 0 Maximum: 100000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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/Robot setup Program.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$jog_time_m

Minimum: 0 Default: 5 Maximum: 30

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$joint_rate

Minimum: 1 Default: 1 Maximum: MAX_MOTYPE_RATE

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$lc_qstp_enb

Minimum: 0.0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$linear_rate

Minimum: 1 Default: 1 Maximum: MAX_MOTYPE_RATE
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$lowerlims[9]

Minimum: -100000. Default: 0 Maximum: 100000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$lowerlimsdf[9]

Minimum: -100000. Default: 0 Maximum: 100000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$master_pos[9]

Minimum: -100000. Default: 0 Maximum: 100000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$max_amp_cur[9]

Minimum: -100000. Default: 0 Maximum: 100000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Maximum Amplifier Current

Description: Reserved for Internal use by FANUC Robotics.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$max_payload

Minimum: 0. Default: -0. Maximum: 100000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Maximum Payload

Description: The maximum payload supported by the robot (units in Kg).

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$max_path_acc

Minimum: 0.001 Default: 3125. Maximum: 20000.
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

Name: Maximum Cartesian Accel Along Path

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$min_acc_cmc

Minimum: 0 Default: 128 Maximum: 10000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Minimum acceleration time for CMC software

Description: This variable is no longer being used.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$min_a cc_shm

Minimum: 0 Default: 128 Maximum: 10000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$min_a cc_uca

Minimum: 0 Default: 128 Maximum: 10000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$min_a cc_uma

Minimum: 0 Default: 128 Maximum: 10000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$min_acctime[9]

Minimum: 0 Default: 128 Maximum: 10000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$min_cat_uma

Minimum: 0 Default: 128 Maximum: 10000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$min_payload

Minimum: 0. Default: -0. Maximum: 100000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$mosign[9]

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$mot_lim_stp

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$mot_spd_lim[9]

Minimum: 0 Default: 2000 Maximum: 100000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$mount_angle

Minimum: -100000. Default: 0. Maximum: 100000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$move er_gain[9]

Minimum: 0.0 Default: 0.0 Maximum: 1000.

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

Name: Move Error Gain Factor

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$move r_offset[9]

Minimum: 0 Default: 524288 Maximum: 100000000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Move Error Offset

Description: . \$move r_offset replaces \$move rlims for move error limit checking

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$move r_scale[9]

Minimum: 0.0 Default: 0.0 Maximum: 100.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Move Error Scale Factor

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$move rlim[9]

Minimum: 0 Default: 0 Maximum: 100000000

KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: INTEGER

Name: Move Error Limit (not supported)

Description:

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$mrrdum2

Minimum: 0 Default: 0 Maximum: 1000

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Pad 2 Byte (Not supported)

Description: Reserved for Internal use by FANUC Robotics.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$path_accel1

Minimum: 0 Default: 256 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$path_accel2

Minimum: 0 Default: 128 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$path_accel3

Minimum: 0 Default: 64 Maximum: 10000

KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: SHORT

Name: Reserved for Future Use

Description: Reserved for future use

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$payload

Minimum: 0 Default: 0 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Payload (not supported)

Description: Payload

Power Up: Requires a cold start to take effect (units in Kg).

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$payload_ix

Minimum: 0. Default: 0. Maximum: 100000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$payload_iy

Minimum: 0. Default: 0. Maximum: 100000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$payload_iz

Minimum: 0. Default: 0. Maximum: 100000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$payload_x

Minimum: -10000. Default: 0. Maximum: 10000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$payload_y

Minimum: -10000. Default: 0. Maximum: 10000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$payload_z

Minimum: -10000. Default: 0. Maximum: 10000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$perch[9]

Minimum: -100000. Default: 0 Maximum: 100000.
KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$perch tol[9]

Minimum: -100000. Default: 0.1 Maximum: 100000.
KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$ppabn_enbl

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Air Pressure Abnormal Signal

Description: Enable/disable the air pressure abnormal signal.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].proc_spdlim

Minimum: 0.0 Default: 2000.0 Maximum: 2000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].process_spd

Minimum: 0.0 Default: 2000.0 Maximum: 2000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$qstop_tol[1]

Minimum: 0 Default: 10 Maximum: 1000000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$qstop_tol[2 - 3]

Minimum: 0 Default: 28 Maximum: 1000000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$qstop_tol[4 - 5]

Minimum: 0 Default: 20 Maximum: 1000000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$qstop_tol[6 - 9]

Minimum: 0 Default: 0 Maximum: 1000000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$rotspeedlim

Minimum: 0.001 Default: 500. Maximum: 1440.
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$servo_ctrl

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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_tpy[] is used instead.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$shft_erlim

Minimum: 0 Default: 0 Maximum: 100000000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$short mo_mgn

Minimum: 0.0 Default: 0.2 Maximum: 1000.0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$slmt_e1_lw[3]

Minimum: -100000 Default: 0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Software Lower Limit Extended Axis 1

Description: Software lower limit extended axis 1.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$slmt_e1_num

Minimum: 0 Default: 0 Maximum: 3
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$slmt_e1_up[3]

Minimum: -100000 Default: 0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Software Upper Limit Extended Axis 1

Description: Software upper limit extended axis 1.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$slmt_j1_lw[3]

Minimum: -100000 Default: 0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Software Lower Limit Joint 1

Description: Software lower limit for joint 1.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$slmt_j1_num

Minimum: 0 Default: 0 Maximum: 3

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$slmt_j1_up[3]

Minimum: -100000 Default: 0 Maximum: 100000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Software Upper Limit Joint 1

Description: Software upper limit for joint 1.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$snglr ty_stp

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$spcco untol[9]

Minimum: 0 Default: 524287 Maximum: 100000000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$spcmovetol[9]

Minimum: 0 Default: 3670016 Maximum: 100000000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$speedlim

Minimum: 0.001 Default: 2000 Maximum: 100000.
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$speed limjnt

Minimum: 0 Default: 2000 Maximum: 100000
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$spin_ctrl

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$stop_erlim[9]

Minimum: 0 Default: 0 Maximum: 100000000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Stop Error Limit

Description:

\$stoperlim defines an array of the servo following error tolerances while stopping for each axis. It is expressed in units of detector pulses.

The value of \$stoperlim 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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$stoptol[9]

Minimum: 0 Default: 0 Maximum: 100000000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$sv_ctrl_typ[9]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$sv_dbl_smt

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Enables/disables double smoothing of Newton-Euler 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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$sv_dh_a[1-9]

Minimum: -1000000. Default: 0 Maximum: 1000000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GR OUP[1].\$sv_dh_cosa[1-9]

Minimum: -1. Default: 1. Maximum: 1.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GR OUP[1].\$sv_dh_costh[1-9]

Minimum: -1. Default: 1. Maximum: 1.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: D-H parameter cos(theta)

Description: D-H parameter cos(theta) [non]

This parameter is effective only when \$sv_dmy_Ink is TRUE.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$sv_dh_d[1-9]

Minimum: -1000000. Default: 0 Maximum: 1000000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GR OUP[1].\$sv_dh_sina[1-9]

Minimum: -1. Default: 0. Maximum: 1.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: D-H parameter sin(alpha)

Description: D-H parameter $\sin(\alpha)$ [non]

Do not change this system variable.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GR OUP[1].\$sv_dh_sinth[1-9]

Minimum: -1. Default: 0. Maximum: 1.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: D-H parameter $\sin(\theta)$

Description: D-H parameter $\sin(\theta)$ [non]

This parameter is effective only when \$sv_dmy_Ink is TRUE.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GR OUP[1].\$sv_dmy_Ink[1-9]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GR OUP[1].\$sv_grv_x

Minimum: -1000000. Default: 0. Maximum: 1000000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Gravity X

Description: X component of gravity vector [mm/s²]

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GR OUP[1].\$sv_grv_y

Minimum: -1000000. Default: 0. Maximum: 100000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Gravity Y

Description: Y component of gravity vector [mm/s²]

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GR OUP[1].\$sv_grv_z

Minimum: -1000000. Default: 0. Maximum: 100000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Gravity Z

Description: Z component of gravity vector [mm/s²]

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GR OUP[1].\$sv_Ink_ix[1-9]

Minimum: 0. Default: 0 Maximum: 1000000000000000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Inertia about center of gravity of each link X

Description: X component of inertia about center of gravity of each link [kg.mm²]

Do not change this system variable.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GR OUP[1].\$sv_Ink_iy[1-9]

Minimum: 0. Default: 0 Maximum: 1000000000000000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Inertia about center of gravity of each link Y

Description: Y component of inertia about center of gravity of each link [kg.mm²]

Do not change this system variable.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$sv_Ink_iz[1-9]

Minimum: 0. Default: 0 Maximum: 1000000000000000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Inertia about center of gravity of each link Z

Description: Z component of inertia about center of gravity of each link [kg.mm²]

Do not change this system variable.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$sv_Ink_m[1-9]

Minimum: 0. Default: 0 Maximum: 1000000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$sv_Ink_x[1-9]

Minimum: -1000000. Default: 0 Maximum: 1000000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$sv_Ink_y[1-9]

Minimum: -1000000. Default: 0 Maximum: 1000000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$sv_ink_z[1-9]

Minimum: -1000000. Default: 0 Maximum: 1000000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$sv_mcmd_dly

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$sv_off_all

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$sv_off_enb[9]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$sv_off_time[9]

Minimum: 0 Default: 10000 Maximum: 100000000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$sv_thet0[1-9]

Minimum: -6.2832 Default: 0. Maximum: 6.2832

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$sv_z_sign[1-9]

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$syn_e rr_lim

Minimum: 0 Default: 0 Maximum: 100000

KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: INTEGER

Name: Synchronous Error Limit (Not supported)

Description:

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$sync_gain

Minimum: 0 Default: 0 Maximum: 100000

KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: INTEGER

Name: Synchronous Gain Factor (not supported)

Description:

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$sync_offset

Minimum: 0 Default: 0 Maximum: 100000
KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: INTEGER

Name: Synchronous Compensation Offset (not supported)

Description:

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$t1t2_sngstp

Minimum: 0.0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$torque_cons[9]

Minimum: 10000000000. Default: 0. Maximum: 10000000000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$trkerrlim

Minimum: 0 Default: 0 Maximum: 1000000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$tsmod_time

Minimum: 0 Default: 0 Maximum: 100000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Tip Stick Detection Time

Description: Tip stick detection time for spot welding applications.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$upperlims[9]

Minimum: -100000. Default: 0 Maximum: 100000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$upperlimsdf[9]

Minimum: -100000. Default: 0 Maximum: 100000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$use_cal

Minimum: 0 Default: 1 Maximum: 1


KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: SYSTEM Variables screen



\$PARAM_GROUP[1].\$decoup_mgn STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$decoup_mgn[1]

Minimum: -100000. Default: 1 Maximum: 100000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$decoup_mgn[2]

Minimum: -100000. Default: 0 Maximum: 100000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$decoup_mgn[3]

Minimum: -100000. Default: 0 Maximum: 100000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Decoupling torque (between J2 and J3 axes) parameter (3)

Description: Not used.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$decoup_mgn[4]

Minimum: -100000. Default: 0 Maximum: 100000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Decoupling torque (between J2 and J3 axes) parameter (4)

Description: Not used.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$decp_mgn_wr STRUCTURE

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$decp_mgn_wr[1]

Minimum: 0. Default: 1. Maximum: 10.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$decp_mgn_wr[2]

Minimum: 0. Default: 1. Maximum: 10.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$decp_mgn_wr[3]

Minimum: 0. Default: 1. Maximum: 10.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$decp_mgn_wr[4]

Minimum: 0. Default: 1. Maximum: 10.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$decp_mgn_wr[5]

Minimum: 0. Default: 1. Maximum: 10.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$decp_mgn_wr[6]

Minimum: 0. Default: 1. Maximum: 10.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$decp_mgn_wr[7]

Minimum: 0. Default: 1. Maximum: 10.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$decp_mgn_wr[8]

Minimum: 0. Default: 1. Maximum: 10.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_GROUP[1].\$decp_mgn_wr[9]

Minimum: 0. Default: 1. Maximum: 10.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$PARAM_MENU[21]

Minimum: "" Default: " " Maximum: " "

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

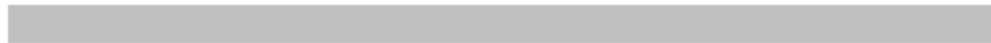
In the SYSTEM Variables screen, it is possible to set a total of 21 parameter names. The parameter names must be within 20 characters.

\$PARAM_MENU[21] has the following 3 strings as default:

`DEFPULSE', `WAITTMOUT', `RCVTMOUT'

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen



\$PASSSUPER STRUCTURE

Name: Super User Password variable structure

Description: This set of variables provides super user password information that controls the password functionality.

Power Up:

User Interface Location: SYSTEM Variables screen.

\$ PASSSUPER.\$level

Minimum: 0 Default: 0 Maximum: 3

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Install Users Level

Description: This variable indicates the password level associated with the install user.

Power Up:

User Interface Location: SYSTEM Variables screen.

\$PASSSUPER.\$name

Minimum: "" Default: " " Maximum: ""

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Install User Password variable structure

Description: This set of variables provides password information on the install user.

Power Up:

User Interface Location: System global variable screen.

\$PASSSUPER.\$time_out

Minimum: -1 Default: 15 Maximum: 10080

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Install Users Time Out

Description: This variable indicates the amount of time that the install user will stay logged in.

Power Up:

User Interface Location: SYSTEM Variables screen.

\$PASSWORD STRUCTURE

Name: Password configuration record

Description: This structure contains password information.

Power Up: Changes take effect immediately.

User Interface Location: SETUP Passwords screen

\$PASSWORD.\$count_down

Minimum: 0 Default: 0 Maximum: 151200000

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: The system decrements the countdown every CPU tick after a password is specified.

User Interface Location: SETUP Passwords screen

See Also: PASSWORD.\$time_out system variable

\$PASSWORD.\$curr_level

Minimum: 0 Default: 0 Maximum: 3
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Current password level

Description: Specifies the current password level. The levels are
OPERATOR = 0
PROGRAM = 1
SETUP = 2,
INSTALL = 3.

Power Up: Changed on the SETUP Passwords screen after a password is entered correctly.

User Interface Location: SETUP Passwords screen

\$PASSWORD.\$curr_user

Minimum: 0 Default: 0 Maximum: 100
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Current User

Description: This indicates which user is currently logged in.

Power Up:

User Interface Location: SYSTEM Variables screen.

\$PASSWORD.\$levels[4]

Minimum: MIN_INT Default: 0 Maximum: MAX_INT
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

User Interface Location:

\$PASSWORD.\$log_events

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: Log Password Events

Description: This indicates whether events that occur will be logged into the Password Log.

Power Up:

User Interface Location: System global variable screen.

\$PASSWORD.\$num_users

Minimum: 10 Default: 10 Maximum: 100

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Number of Users

Description: This indicates how many password users to allow.

Power Up:

User Interface Location: System global variable screen.

\$PASSWORD.\$time_out

Minimum: -1 Default: 15 Maximum: 10080

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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: Change is effective immediately after a password is specified.

User Interface Location: SETUP Passwords screen

See Also: PASSWORD.\$count_down

\$PATH_ADJUST STRUCTURE

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.

User Interface Location: Torch posture conversion screen

\$PATH_ADJUST.\$c onv_enbl

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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.

User Interface Location: Torch posture conversion screen

\$PATH_ADJUST.\$c reate

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: Torch posture conversion screen

\$PATH_ADJUST.\$m atch_first

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: ABSOLUTE/MATCH first selection for reference torch posture

Description: ABSOLUTE : Direct entered 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.

User Interface Location: Torch posture conversion screen

\$PATH_ADJUST.\$n um_addpnt

Minimum: 0 Default: 1 Maximum: 9

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Number of additional points

Description: This indicates the number of additional points.

Power Up: Changes to this variable take effect immediately.

User Interface Location: Torch posture conversion screen

\$PATH_ADJUST.\$p art_of_prg

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes to this variable take effect immediately.

User Interface Location: Torch posture conversion screen

\$PATH_ADJUST.\$p itch_len

Minimum: 0 Default: 3 Maximum: 20

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Pith length of additional points

Description: This indicates the distance between additional points.

Power Up: Changes to this variable take effect immediately.

User Interface Location: Torch posture conversion screen

\$PATH_ADJUST.\$r ef_plane

Minimum: 1 Default: 1 Maximum: 3
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes to this variable take effect immediately.

User Interface Location: Torch posture conversion screen

\$PATH_ADJUST.\$s mooth_enbl

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: ENABLE/DISABLE for corner smoothing function

Description: ENABLE : Corner smoothing function is enabled. DISABLE: Corner smoothing function is disabled.

Power Up: Changes to this variable take effect immediately.

User Interface Location: Torch posture conversion screen

\$PATH_ADJUST.\$t ravel_angl

Minimum: -360 Default: 0 Maximum: 360
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Travel angle for direct entried

Description: This system variable is travel angle at the direct entry.

Power Up: Changes to this variable take effect immediately.

User Interface Location: Torch posture conversion screen

\$PATH_ADJUST.\$w ork_angl

Minimum: -360 Default: 90 Maximum: 360
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: Torch posture conversion screen

\$PATHAJ_AJST STRUCTURE

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: Changes to these variables take effect immediately.

User Interface Location: Torch posture conversion screen

\$PATHAJ_AJST.\$d ummy

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: UBYTE

Name: Dummy variable

Description: For internal use only. Do not modify this system variable.

Power Up: Changes to this variable take effect immediately.

User Interface Location: System Variables screen

\$PATHAJ_AJST.\$d ummy1

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: UBYTE

Name: Dummy variable

Description: For internal use only. Do not modify this system variable.

Power Up: Changes to this variable take effect immediately.

User Interface Location: System Variables screen

\$PATHAJ_AJST.\$d ummy2

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: UBYTE

Name: Dummy variable

Description: For internal use only. Do not modify this system variable.

Power Up: Changes to this variable take effect immediately.

User Interface Location: System Variables screen

\$PATHAJ_AJST.\$g rp_num

Minimum: 0 Default: 1 Maximum: 5

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: UBYTE

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: Changes to this variable take effect immediately.

User Interface Location: Torch posture conversion screen

\$PATHAJ_AJST.\$i ndex

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes to this variable take effect immediately.

User Interface Location: Torch posture conversion screen

\$PATHAJ_AJST.\$p os_type

Minimum: 0 Default: 0 Maximum: 10

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: Torch posture conversion screen

\$PATHAJ_AJST.\$p osdat

Minimum: MIN_POSX Default: DEF_POSX Maximum: MAX_POSX
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: POSEXT

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: Changes to this variable take effect immediately.

User Interface Location: Torch posture conversion screen



\$PATHAJ_3POS[1] Structure

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: Changes to these variables take effect immediately.

User Interface Location: Torch posture conversion screen

\$PATHAJ_3POS[1].\$approach_x

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes to this variable take effect immediately

User Interface Location: Torch posture conversion screen

\$PATHAJ_3POS[1].\$approach_y

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes to this variable take effect immediately.

User Interface Location: Torch posture conversion screen

\$PATHAJ_3POS[1].\$approach_z

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes to this variable take effect immediately.

User Interface Location: Torch posture conversion screen

\$PATHAJ_3 POS[1].\$e[1-2]

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: Torch posture conversion screen

\$PATHAJ_3 POS[1].\$grp_num

Minimum: 0 Default: 1 Maximum: 5

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: UBYTE

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: Changes to this variable take effect immediately.

User Interface Location: Torch posture conversion screen

\$PATHAJ_3 POS[1].\$index

Minimum: 0 Default: 0 Maximum: 32767
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes to this variable take effect immediately.

User Interface Location: Torch posture conversion screen

\$PATHAJ_3 POS[1].\$pos_type

Minimum: 0 Default: 0 Maximum: 10
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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.

User Interface Location: Torch posture conversion screen

\$PATHAJ_3POS[1].\$x

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes to this variable take effect immediately.

User Interface Location: Torch posture conversion screen

\$PATHAJ_3POS[1].\$y

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes to this variable take effect immediately.

User Interface Location: Torch posture conversion screen

\$PATHAJ_3POS[1].\$z

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes to this variable take effect immediately.

User Interface Location: Torch posture conversion screen

\$PAUSE_NCONT

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes take effect immediately.

User Interface Location: 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*

\$PC_TIMEOUT

Minimum: 0 Default: 25 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: ULONG

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: Effective at cold start or when the controller client is reconnected.

User Interface Location: SYSTEM Variables screen

\$PCCRT

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PCCRT_HOST

Minimum: "" Default: "PCCRT " Maximum : ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PCTP

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PCTP_HOST

Minimum: "" Default: "PCTP " Maximum : ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$PG_DEFSPD STRUCTURE

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: Changes to this variable take effect immediately

User Interface Location: SYSTEM Variables screen and application setup screen
(WELD system setup screen and so forth)

\$PG_DEFSPD.\$ap_def_spd

Minimum: 0 Default: 0 Maximum: 65535
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen and Application Setup screen
(WELD system setup screen and so forth)

\$PG_DEFSPD.\$ap_def_unit

Minimum: 0 Default: 1 Maximum: 5
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen and Application Setup screen (WELD system setup screen and so forth)

\$PG_DEFSPD.\$apsp_pr exe

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PG_DEFSPD.\$dly_las tps

Minimum: 0 Default: 2000 Maximum: 4000

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Changes to this variable take effect immediately

User Interface Location: SYSTEM variable screen

See Also: This is not related to application speed statement.

\$PG_MAX_SPED[5] STRUCTURE

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen. This variable is set by MAX SPEED instruction.

\$PG_MAX_SPED[1].\$jnt_speed[9]

Minimum: 0.001 Default: 0.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Joint Speed

Description: The joint motion speed in program is clamped by this value. (Units are in deg/sec)

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen. This variable is set by MAX SPEED instruction.

\$PG_MAX_SPED[1].\$cart_speed

Minimum: 0.001 Default: 0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Cartesian Speed

Description: The Cartesian motion speed in program is clamped by this value. (Units are in mm/sec)

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen. This variable is set by MAX SPEED instruction.

\$PGDEBUG

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Program Debugging

Description: Not currently used.

Power Up:

User Interface Location: SYSTEM Variables screen

\$PGINP_WORD[5]

Minimum: "" Default: "PRG " Maximum: " "
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen, SYSTEM Config screen

\$PGTRACE_UP Structure

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PGTRACE_UP.\$disp _pxnn

Minimum: 0 Default: 0 Maximum: 255
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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: Changes to this variable take effect immediately

User Interface Location: SYSTEM Variables screen

\$PGTRACE_UP.\$trc_ update

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PGTRACECTL[1] STRUCTURE

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PGTRACECTL [1].\$task_id

Minimum: 0 Default: 0 Maximum: 255
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PGTRACECTL[1].\$task_status

Minimum: -2 Default: 2 Maximum: 10
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: PX task status

Description: For internal use only. Do not modify this system variable. This system variable means PX task status.

Power Up: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PGTRACECTL[1].\$trc_btm_idx

Minimum: -32768 Default: 1 Maximum: 32767
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PGTRACECTL[1].\$trc_top_idx

Minimum: -32768 Default: 1 Maximum: 32767
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PGTRACED T[1,1].\$ept_index

Minimum: -32768 Default: -1 Maximum: 32767
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PGTRACED T[1,1].\$exec_type

Minimum: 1 Default: 1 Maximum: 3
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PGTRACED T[1,1].\$file_ofst

Minimum: -32768 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PGTRACED T[1,1].\$line_num

Minimum: -32768 Default: 0 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PGTRACED T[1,1].\$line_st

Minimum: 1 Default: 4 Maximum: 4

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PGTRACELEN

Minimum: 1 Default: 200 Maximum: 1000

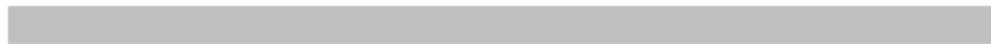
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Length of execution history list

Description: This system variable indicates the length of execution history list.

Power Up: You must perform a cold start for the change of take effect.

User Interface Location: SYSTEM Variables screen



\$PLID_GRP Structure

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.

User Interface Location: SYSTEM Variables screen

\$PLID_GRP.\$armload1

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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].

\$PLID_GRP.\$armload2

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

\$PLID_GRP.\$cal_pos[1-9]

Minimum: 0 Default: 0 Maximum: -1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

\$PLID_GRP.\$cal_tcmd[1-9]

Minimum: 0 Default: 0 Maximum: -1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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.

\$PLID_GRP.\$calaxes

Minimum: 0 Default: 0 Maximum: 9

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

\$PLID_GRP.\$caldone

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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 \$scaldone is FALSE, Payload estimation cannot be executed.

\$PLID_GRP.\$scalexec

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: Payload calibration executing flag

Description: For internal use only. Do not modify this system variable.

When Payload calibration starts, \$scalexec is set to TRUE. And while \$scalexec is TRUE, torque command(\$cal_tcmd) is received from servo. When Payload calibration finishes, \$scalexec returns to FALSE.

\$PLID_GRP.\$dsp_enbl

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

\$PLID_GRP.\$error_mgn

Minimum: 0 Default: 200 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PLID_GRP.\$est_tcmd[1-9]

Minimum: 0 Default: 0 Maximum: -1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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.

\$PLID_GRP.\$estdone

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

\$PLID_GRP.\$estexec

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

\$PLID_GRP.\$id_result[1-10]

Minimum: .0 Default: .0 Maximum: -0.1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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

\$PLID_GRP.\$max_diff

Minimum: -1.0 Default: 0.0 Maximum: 1.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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 $\sin(J2 \text{ axis}) < \min_diff , Payload identification will not work.

\$PLID_GRP.\$min_diff

Minimum: -1.0 Default: 0.0 Maximum: 1.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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 \text{ axis}) < \max_diff , Payload identification will not work.

\$PLID_GRP.\$payload

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

\$PLID_GRP.\$payload_ix

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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[kgcm²] of test work piece.

\$PLID_GRP.\$payload_iz

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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[kgcm²] of test work piece.

\$PLID_GRP.\$payload_ix

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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[kgcm²] of test work piece.

\$PLID_GRP.\$payload_x

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

\$PLID_GRP.\$payload_y

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

\$PLID_GRP.\$payload_z

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

\$PLID_GRP.\$tcmdsucc

Minimum: 0 Default: 0 Maximum: -1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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.

\$PLID_SV Structure

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.

\$PLID_SV.\$armload1

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

\$PLID_SV.\$armload2

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

\$PLID_SV.\$cal_pos_sav[1 -9]

Minimum: 0 Default: 0 Maximum: -1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

\$PLID_SV.\$cur_group

Minimum: 1 Default: 1 Maximum: 5

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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.

\$PLID_SV.\$cur_scrn

Minimum: 1 Default: 1 Maximum: 2

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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.

\$PLID_SV.\$flag_save

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: \$PLID_GRP.\$scaldone 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 \$scaldone, 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.

\$PLID_SV.\$no_recover

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

\$PLID_SV.\$payload

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

Name: Saved payload

Description: For internal use only. Do not modify this system variable.

Before modifying \$PARAM_GROUP/\$GROUP.\$payload in the Payload setup/identification screen, this \$payload is set from \$GROUP.\$payload. If power down in modifying, \$PARAM_GROUP/\$GROUP.\$payload 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.

\$PLID_SV.\$payload_ix

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

\$PLID_SV.\$payload_iy

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

\$PLID_SV.\$payload_iz

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

\$PLID_SV.\$payload_x

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

\$PLID_SV.\$payload_y

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

\$PLID_SV.\$payload_z

Minimum: 0.0 Default: 0.0 Maximum: 0.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

\$PLID_SV.\$pi_type

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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

\$PLID_SV.\$result_sav[1- 10]

Minimum: .0 Default: .0 Maximum: -0.1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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.

\$PLID_SV.\$save_done

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

\$PLID_SV.\$tcmd_save[1-9]

Minimum: 0 Default: 0 Maximum: -1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

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.

\$PMON_LOGGER STRUCTURE

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: Requires a cold start to take effect.

User Interface Location: SYSTEM variables screen.

\$PMON_LOGGER.\$hostname

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen.

\$PMON_LOGGER.\$servname

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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.

\$PMON_LOGGER.\$filter

Minimum: 0 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen.

\$PMON_LOGGER.\$serverok

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen.

\$PMR STRUCTURE

Name: Path Modification Record Route Correction Record Variable Delta Axis Coordinate System

Description: Scheduled to be removed.

Power Up:

User Interface Location: SYSTEM Variables screen

\$PMR.\$delta_axis[9]

Minimum: -100000. Default: 0. Maximum: 100000.
KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$PMR_GRP[1] STRUCTURE

Name:

Description: Scheduled to be removed

Power Up:

User Interface Location: SYSTEM Variables screen

\$PMR_GRP[1].\$delta_frame

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS
KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: POSITION

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:

User Interface Location: SYSTEM Variables screen

\$PMR_GRP[1].\$delta_speed

Minimum: -100000.0 Default: 0.0 Maximum: 100000.0
KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: REAL

Name: Delta Speed

Description: Scheduled to be removed.

Power Up:

User Interface Location: SYSTEM Variables screen

\$PMR_GRP[1].\$delta_tool

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS
KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: POSITION

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:

User Interface Location: SYSTEM Variables screen

\$PMR_GRP[1].\$delta_world

Minimum: MIN_POS Default: DEF_POS Maximum: MAX_POS
KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: POSITION

Name: Delta World Coordinate System

Description: Scheduled to be removed

Power Up:

User Interface Location: SYSTEM Variables screen

\$PNS_CUR_LIN

Minimum: 0 Default: 0 Maximum: 65535
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

See Also: \$PNS_END_EXE, \$PNS_NUMBER, \$PNS_TASK_ID

\$PNS_END_CUR

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen, SYSTEM Config screen

\$PNS_END_EXE

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

See Also: \$PNS_CUR_LIN, \$PNS_NUMBER, \$PNS_TASK_ID

\$PNS_NUMBER

Minimum: 0 Default: 0 Maximum: 65535

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variable screen

See Also: \$PNS_CUR_LIN, \$PNS_END_EXE, \$PNS_TASK_ID

\$PNS_PROGRAM

Minimum: "" Default: "PNS" Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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:

User Interface Location: SYSTEM Variables screen

\$PNS_TASK_ID

Minimum: 0 Default: 0 Maximum: 65535

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

See Also: \$PNS_CUR_LIN, \$PNS_END_EXE, \$PNS_NUMBER

\$POWERFL

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: No longer used

Description:

Power Up:

User Interface Location: SYSTEM Variables screen

\$PPA_IO_IDX

Minimum: 0 Default: 0 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Mapped PPABN (Pneumatic pressure abnormal signal) I/O index number

Description: Not used

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM variables screen

\$PPA_IO_TYPE

Minimum: 0 Default: 1 Maximum: 31
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Mapped PPABN (Pneumatic pressure abnormal signal) I/O type

Description: Not used

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM variables screen

\$PPA_MAP_ENB

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Mapped PPABN (Pneumatic pressure abnormal signal) is enabled

Description: Not used

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PRGADJ STRUCTURE

Name: Program Adjust

Description: On-line position correction variables. Individual fields within this structure are described below.

Power Up:

User Interface Location: SYSTEM Variables screen

\$PRGADJ.\$next_cycle

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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:

User Interface Location: SYSTEM Variables screen

\$PRGADJ.\$p_limit

Minimum: 0 Default: 0.5 Maximum: 0x100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$PRGADJ.\$r_limit

Minimum: 0 Default: 0.5 Maximum: 0x100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$PRGADJ.\$speed_adj

Minimum: 0 Default: 100 Maximum: 200
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$PRGADJ.\$w_limit

Minimum: 0 Default: 0.5 Maximum: 0x100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$PRGADJ.\$x_limit

Minimum: 0 Default: 26.0 Maximum: 0x100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$PRGADJ.\$y_limit

Minimum: 0 Default: 26.0 Maximum: 0x100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$PRGADJ.\$z_limit

Minimum: 0 Default: 26.0 Maximum: 0x100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$PGDEBUG

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Program Debugging

Description: Not currently used.

Power Up:

User Interface Location: SYSTEM Variables screen

\$PRIORITY

Minimum: 0 Default: 128 Maximum: 255
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$PROTOENT STRUCTURE

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: Requires a cold start to take effect.

User Interface Location: System Variables 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*

\$PROTOENT[1].\$p_name

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: Protocol Name

Description: Name of an available protocol on the controller.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables 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*

\$PROTOENT[1].\$p_proto

Minimum: 0 Default: 0 Maximum: 2500

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Protocol Number

Description: Number associated with this particular protocol.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables 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*

\$PRPORT_NUM

Minimum: 3 Default: 4 Maximum: 4

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: No

User Interface Location: SYSTEM Variables screen

\$PURGE_ENBL

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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:

User Interface Location: SYSTEM Variables screen

\$PWF

Minimum: 1 Default: 4 Maximum: 4

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type:

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: This variable can be set at any time but has effect only at power-up.

User Interface Location: SYSTEM Variables screen

See Also: \$SEMIPOWERFL

\$PWFENBDO

Minimum: 0 Default: 0 Maximum: 256

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: No longer used

Description:

Power Up:

User Interface Location: SYSTEM Variables screen

\$PWR_HOT

Minimum: "" Default: "" Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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:

User Interface Location: SYSTEM Variables screen

\$PWR_NORMAL

Minimum: "" Default: "" Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$PWR_SEMI

Minimum: " " Default: " " Maximum: " "

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type:

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: This can be set at any time but has effect only on power up

User Interface Location: SYSTEM Variables screen

See Also: \$SEMIPWFAIL

\$PWR_UP_RTN STRUCTURE

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:

User Interface Location: None

\$QSKIP_GRP[1] Structure

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: Changes to these system variables take effect immediately.

\$QSKIP_GR P[1-9].\$error_cnt2[1]

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes to this system variable take effect immediately.

\$QSKIP_GRP[1].\$qskp_curan(g, 1-9)

Minimum: 0. Default: 0. Maximum: 0.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes to this system variable take effect immediately.

\$QSKIP_GRP[1] . \$qskp_errcnt[1-9]

Minimum: 0 Default: 0 Maximum: 0x7ffffff

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes to this system variable take effect immediately.

\$RCVTMOUT

Minimum: 0 Default: 3000 Maximum: 0x7FFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$RE_EXEC_ENB

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes to this variable take effect immediately

User Interface Location: SYSTEM Variables screen (on the teach pendant)



\$REFPOS1 STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

See Also: \$REFPOS2, \$REFPOS3, \$REFPOS4, \$REFPOS5, \$REFPOSxx_T Structure



\$REFPOS2 STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

See Also: \$REFPOS1, \$REFPOS3, \$REFPOS4, \$REFPOS5, \$REFPOSxx_T Structure



\$REFPOS3 STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

See Also: \$REFPOS1, \$REFPOS2, \$REFPOS4, \$REFPOS5, \$REFPOSxx_T Structure



\$REFPOS4 STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

See Also: \$REFPOS1, \$REFPOS2, \$REFPOS3, \$REFPOS5, \$REFPOSxx_T Structure



\$REFPOS5 STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

See Also: \$REFPOS1, \$REFPOS2, \$REFPOS3, \$REFPOS4, \$REFPOSxx_T Structure

\$REFPOSxx_T.\$atperch

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Reference point position.

Description: Displays if there is a robot currently at reference point. xx represents 11,21,31,41,51.

Power Up:

User Interface Location: SYSTEM Variables screen

\$REFPOSxx_T.\$comment

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: Comment

Description: Text providing additional information at the reference point. xx represents 11,21,31,41,51.

Power Up:

User Interface Location: SYSTEM Variables screen

\$REFPOSxx_T.\$dout_indx

Minimum: 0 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Signal Number of Reference Point General-Purpose 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:

User Interface Location: SYSTEM Variables screen

\$REFPOSxx_T.\$dout_type

Minimum: 0 Default: 2 Maximum: 50

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$REFPOSxx_T.\$enabled

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Reference Point Effective.

Description: Makes the function effective at reference point. xx represent 11,21,31,41,51.

Power Up:

User Interface Location: SYSTEM Variables screen

\$REFPOSxx_T.\$perchpos[9]

Minimum: -1000000. Default: 0 Maximum: 1000000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$REFPOSxx_T.\$perchtol[9]

Minimum: -1000000. Default: 0 Maximum: 1000000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$REFPOSMAXNO[5]

Minimum: 1 Default: 1 Maximum: 10
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$REMOTE

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$RESUME_PROG

Minimum: "" Default: " " Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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: No

User Interface Location: SYSTEM Variables screen

\$RGSPD_PREXE

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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-execution. 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: Changes to this variable take effect after power up.

User Interface Location: SYSTEM Variables screen

\$RMT_MASTER

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$ROBOT_NAME

Minimum: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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: Requires a cold start to take effect.

User Interface Location: SYSTEM System Variables screen or KCL

See Also: *FANUC Robotics SYSTEM R-J Controller MAP Interface Setup and Operations Manual*

\$RPC_TIMEOUT

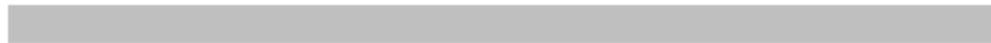
Minimum: 0 Default: 35 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: ULONG

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: Effective at cold start or when the PC client is reconnected.

User Interface Location: SYSTEM Variables screen



\$RPM_CFG STRUCTURE

Name: RPM Configuration Record

Description: Variable structure containing configuration information for the RPM. Individual fields within this structure are described below.

User Interface Location: SYSTEM Variables screen

\$RPM_CFG.\$data_size

Minimum: 4 Default: 16 Maximum: 32
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$RPM_CFG.\$debug

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Debug flag used in RPM

Description: Debug flag used in RPM.

Power Up: Effective immediately.

User Interface Location: SYSTEM Variables screen

\$RPM_CFG.\$group_num

Minimum: 1 Default: 1 Maximum: 5
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: RPM Group Number

Description: Specifies in which group RPM is available.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$RPM_CFG.\$n_buffers

Minimum: 1 Default: 5 Maximum: 100
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Number of Available Buffers

Description: The number of buffers allocated to be used. You can expand this number if memory available.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$RPM_GSB STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

\$RPM_GSB.\$last_bfr

Minimum: 1 Default: 1 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Last Buffer Used

Description: The buffer number that was last used to record RPM data.

Power Up:

User Interface Location: SYSTEM Variables screen

\$RPM_GSB.\$last_posn

Minimum: 1 Default: 1 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Last Position Recorded

Description: The position that is the destination of last RPM recorded segment.

Power Up:

User Interface Location: SYSTEM Variables screen

\$RPM_GSB.\$last_prog

Minimum: 1 Default: 1 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Last Program Recorded

Description: The program that is the last one to use the RPM function.

Power Up:

User Interface Location: SYSTEM Variables screen



\$RPM_PG STRUCTURE

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: Effective immediately

User Interface Location: SYSTEM Variables screen

\$RPM_PG.\$buffer_no

Minimum: 1 Default: 1 Maximum: 32767

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Buffer Number Used

Description: The buffer number that is currently used for RPM recording or playing back.

Power Up:

User Interface Location: SYSTEM Variables screen

\$RPM_PG.\$pitch

Minimum: 0 Default: 1 Maximum: 1000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Effective immediately.

User Interface Location: SYSTEM Variables screen

See Also: *FANUC Robotics SYSTEM R-J3 Controller ArcTool Setup and Operations Manual*

\$RPM_PG.\$pitch_mode

Minimum: 0 Default: 0 Maximum: 1


KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Pitch Mode used in RPM

Description: Specifies the RPM recording mode. 0 : distance 1 : time

Power Up: Effective immediately.

User Interface Location: SYSTEM Variables screen



\$RPM_PLAN STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

\$RPM_PLAN.\$bfr_stat[5]

Minimum: 0 Default: 0 Maximum: 0


KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: RPM_GSB_T

Name: Buffer Status Record

Description: The buffer status record for each group.

Power Up:

User Interface Location: SYSTEM Variables screen



\$RSM_DIALM[3]

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: Changes to some variables take effect immediately and the other system variables need cold/controlled start to do available.

User Interface Location: Auto error recovery setup screen

See Also: Do not change these system variables from system variable screen.

\$RSM_DIALM[1].\$edge

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Requires a cold start to take effect.

User Interface Location: Error recovery function setup screen

\$RSM_DIALM[1].\$port_num

Minimum: 0 Default: 0 Maximum: 999

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Port number of DI alarm

Description: It specifies the port number to be monitored for DI alarm.

Power Up: Requires a cold start to take effect.

User Interface Location: Error recovery function setup screen

\$RSM_DIALM[1].\$port_type

Minimum: 1 Default: 1 Maximum: 99

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Port type of DI alarm

Description: It specifies the port type to be monitored for DI alarm.

Power Up: Requires a cold start to take effect.

User Interface Location: Error recovery function setup screen

\$RSM_DIALM[1].\$sev_alarm

Minimum: 1 Default: 1 Maximum: 2

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: Error recovery function setup screen

\$RSM_DIALM[1].\$ualm_msg_no

Minimum: 0 Default: 0 Maximum: 999

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: Error recovery function setup screen

\$RS232_CFG[1 - 5] STRUCTURE

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: Yes

User Interface Location: 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_CFG.\$auxtask

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Internal task number

Description: Reserved for internal use by FANUC Robotics.

Power Up: Reserved

User Interface Location: Read only from KCL and SYSTEM Variables screen

\$RS232_CFG.\$comment

Minimum: "" Default: " " Maximum: ""

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Comment

Description: Text describing serial port use.

Power Up: No

User Interface Location: Read only from KCL and SYSTEM Variables screen

\$RS232_CFG.\$custom

Minimum: 0x00000000 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Custom (reserved)

Description: Reserved for internal use by FANUC Robotics.

Power Up: Reserved

User Interface Location: Read only from KCL and SYSTEM Variables screen

\$RS232_CFG.\$deviceuse

Minimum: 0 Default: 0 Maximum: 9

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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

User Interface Location: 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: 0x80000000 Default: 275 Maximum: 0x0FFFFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Yes

User Interface Location: Read only from KCL and SYSTEM Variables screen

\$RS232_CFG.\$parity

Minimum: 0 Default: 0 Maximum: 3
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Parity

Description: Parity used for serial port.

None 1 Odd 2 Even 3

Power Up: Yes

User Interface Location: 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: 0 Default: 0 Maximum: 6
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Baud rate

Description: Baud rate used for serial port.

1200 baud 4 2400 baud 3 4800 baud 2 9600 baud 1

Power Up: Yes

User Interface Location: 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: 0 Default: 0 Maximum: 3

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Yes

User Interface Location: 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: 0 Default: 0 Maximum: 3600

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Time limit

Description: Internally used timeout limit.

Power Up: No.

User Interface Location: Read only from KCL and SYSTEM Variables screen

Use the "Port Init" menu to change this value after a cold start.

\$RS232_NPORT

Minimum: 1 Default: 4 Maximum: 8

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Yes

User Interface Location: Set from KCL and SYSTEM Variables screen

\$RSM DIO.\$port_num

Minimum: MIN Default: DEF Maximum: MAX


KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Resume Program DO

Description: It shows the assignment of the resume program DO

Power Up: Takes effect by cold start

User Interface Location: Error recovery function setup screen



\$RSMFST_SV STRUCTURE

Name: Resume Fast Fault

Description: Individual fields within this structure are listed below.

\$RSMFST_SV.\$ffast_dsp

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Requires a cold start to take effect.

User Interface Location: Error recovery SETUP menu.

\$RSMFST_SV.\$ffast_enbl

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes to this variable take effect immediately.

User Interface Location: Error Recovery SETUP menu.

\$RSMFST_SV.\$use_dry_run

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes to this variable take effect immediately.

User Interface Location: Error Recovery SETUP menu.

\$RSMFST_SV.\$def_maint

Minimum: " " Default: " " Maximum: " "

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

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: Changes to this variable take effect immediately.

User Interface Location: Error Recovery SETUP menu.

\$RSMFST_SV.\$fastdo_stat

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes to this variable take effect immediately.

User Interface Location: Error Recovery SETUP menu.

\$RSMPRG_ALARM[1-10]

Minimum: 0 Default: 0 Maximum: 0xFFFFFFFF

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Alarm code to be monitored

Description: This system variable is used by error recovery function.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen, Resume program function setup screen

\$RSMPRG_DSBL

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RW Data Type: BOOLEAN

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$RSMPRG_SV STRUCTURE

Name: Error Recovery (Resume program) function data

Description: This system variable is used by error recovery function.

Power Up: Changes to some variables take effect immediately and the other system variables need cold/controlled start to do available.

User Interface Location: SYSTEM Variables screen

\$RSMPRG_SV.\$alarm_h apen

Minimum: 1 Default: 2 Maximum: 3

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Defined alarm happens

Description: This is the status parameter.

Power Up: Takes effect immediately

User Interface Location: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

\$RSMPRG_SV.\$alarm_inf

Minimum: 0 Default: 0 Maximum: 0xFFFFFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Alarm information for each PX task

Description: It means the alarm information for each PX task.

Power Up: Do not change.

User Interface Location: SYSTEM Variables screen

See Also: Do not change this variable because of the internal data.

\$RSMPRG_SV.\$autorcv_enb

Minimum: 1 Default: 2 Maximum: 3
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Auto error recovery enable parameter for customer condition

Description: This is the status parameter.

Power Up: Takes effect immediately

User Interface Location: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

\$RSMPRG_SV.\$chk_remote

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

\$RSMPRG_SV.\$cont_exec

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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

User Interface Location: SYSTEM Variables screen

\$RSMPRG_SV.\$cur_mode

Minimum: 1 Default: 1 Maximum: 3

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Current mode

Description: This is the status parameter.

Power Up: Takes effect immediately

User Interface Location: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

\$RSMPRG_SV.\$defined_prg

Minimum: 1 Default: 2 Maximum: 3

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Resume program is defined ?

Description: This is the status parameter.

Power Up: Takes effect immediately

User Interface Location: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

\$RSMPRG_SV.\$desire_mode

Minimum: 1 Default: 2 Maximum: 3

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Desired mode

Description: This is the status parameter.

Power Up: Takes effect immediately

User Interface Location: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

\$RSMPRG_SV.\$di_on

Minimum: 1 Default: 2 Maximum: 3

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Resume DI is ON

Description: This is the status parameter.

Power Up: Takes effect immediately

User Interface Location: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

\$RSMPRG_SV.\$incomp_di

Minimum: MIN Default: DEF Maximum: MAX

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: RSMDIO_T

Name: Reset DI for incomplete end DO

Description: It shows the assignment of the incomplete reset DI

Power Up: Requires a cold start to take effect.

User Interface Location: Error recovery function setup screen

\$RSMPRG_SV.\$incomp_do

Minimum: MIN Default: DEF Maximum: MAX

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: RSMDIO_T

Name: Resume program incomplete end DO

Description: It shows the assignment of the resume program incomplete DO

Power Up: Requires a cold start to take effect.

User Interface Location: Error recovery function setup screen

\$RSMPRG_SV.\$max_count

Minimum: 0 Default: 2 Maximum: 100

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: Auto error recovery setup screen

\$RSMPRG_SV.\$mo_group

Minimum: 1 Default: 2 Maximum: 3

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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

User Interface Location: Error recovery function manual function screen

\$RSMPRG_SV.\$mode

Minimum: 1 Default: 1 Maximum: 3

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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

User Interface Location: Error recovery function manual function screen

\$RSMPRG_SV.\$no_dsb_optn

Minimum: 1 Default: 2 Maximum: 3

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: No disable option

Description: This is the status parameter. This is internal parameter. Do not change this value.

Power Up: Takes effect immediately

User Interface Location: Error recovery function manual function screen

\$RSMPRG_SV.\$no_step

Minimum: 1 Default: 2 Maximum: 3
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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

User Interface Location: Error recovery function manual function screen

\$RSMPRG_SV.\$num_alarm

Minimum: 0 Default: 10 Maximum: 20
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Number of monitored alarm

Description: It means the number of alarm codes to be monitored.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

See Also: Do not set more than 32 to this data

\$RSMPRG_SV.\$num_di_alm

Minimum: 0 Default: 3 Maximum: 5
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Number of monitored DI alarm

Description: It means the number of DI alarm codes to be monitored.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

See Also: Do not set more than 5 to this data

\$RSMPRG_SV.\$pxno_defprg

Minimum: 0 Default: 0 Maximum: 32
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: TP_DEFPROG PX No.

Description: PX task number specified by \$TP_DEFPROG

Power Up: Takes effect immediately

User Interface Location: SYSTEM Variables screen

See Also: This is internal parameter. Do not change this value.

\$RSMPRG_SV.\$reg_index

Minimum: 0 Default: 0 Maximum: 999

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$RSMPRG_SV.\$remote

Minimum: 1 Default: 2 Maximum: 3

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Remote condition

Description: This is the status parameter.

Power Up: Takes effect immediately

User Interface Location: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

\$RSMPRG_SV.\$rsmprg_di

Minimum: MIN Default: DEF Maximum: MAX

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: RSMDIO_T

Name: Resume Program DI

Description: It shows the assignment of the resume program DI

Power Up: Requires a cold start to take effect.

User Interface Location: Error recovery SETUP menu.

\$RSMPRG_SV.\$rsmprg_do

Minimum: MIN Default: DEF Maximum: MAX

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: RSMDIO_T

Name: Resume Program DO

Description: It shows the assignment of the resume program DO

Power Up: Requires a cold start to take effect.

User Interface Location: Error recovery SETUP menu.

\$RSMPRG_SV.\$rsmprg_enb

Minimum: 1 Default: 2 Maximum: 3

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Original and resume program status

Description: This is the status parameter.

Power Up: Takes effect immediately

User Interface Location: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

\$RSMPRG_SV.\$rspgdo_stat

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: Resume program DO status

Description: It means the resume program DO status

Power Up: Do not change.

User Interface Location: SYSTEM Variables screen

See Also: Do not change this variable because of the internal data.

\$RSMPRG_SV.\$svprg_enble

Minimum: 1 Default: 2 Maximum: 3

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Auto error recovery function enable

Description: This is the status parameter.

Power Up: Takes effect immediately

User Interface Location: Error recovery function manual function screen

See Also: This is internal parameter. Do not change this value.

\$RSR[8]

Minimum: 0 Default: 1 Maximum: 255

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen or Setting/RSR/PNS screen or the teach pendant command (RSR[i]=ON/OFF)

\$SBR[16] STRUCTURE

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SBR[i].\$axis_num

Minimum: 0 Default: 1 Maximum: 16

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SBR[i].\$grp_num

Minimum: 0 Default: 1 Maximum: 5
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Software Group Number

Description: Indicates to which motion group the hardware servo axis i is connected.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SBR[i].\$mtr_id

Minimum: "" Default: "123456789012345678" Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: Motor ID String

Description: Motor identification string of the motor to which the hardware servo axis i is connected.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SBR[i].\$mtr_inf_id

Minimum: "" Default: "1234567890" Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: Motor Information ID String

Description: Information string for the motor to which the hardware servo axis i is connected.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SBR[i].\$param[151 - 300]

Minimum: -32768 Default: 0 Maximum: 32767
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Servo Parameter

Description: List of servo parameters for hardware servo axis i.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SBR[i].\$sv_param_id

Minimum: "" Default: "12345678" Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: Servo Parameter ID String

Description: Servo parameter ID string for hardware servo axis i.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCAN_TIME

Minimum: 0 Default: 16 Maximum: 0x7FFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$SCR STRUCTURE

Name: System Configuration Record

Description: Displays the variable concerning system configuration.

Power Up: Set only during a controlled start.

\$SCR.\$amp_type[16]

Minimum: 0 Default: 0 Maximum: 6

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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: Set only during a controlled start

User Interface Location: SYSTEM Variables screen

\$SCR.\$brkhold_enb

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Break Hold Enable

Description: Specifies whether or not to use the temporary stop alarm.

Power Up: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$cabinet_typ

Minimum: 0 Default: 0 Maximum: 10

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Cabinet Type field

Description: Stores cabinet type for R-J3 controller cabinet_type.

0 = i cabinet

1 = B cabinet

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR.\$cap_amp_dis[16]

Minimum: 0.0 Default: 0.0 Maximum: 1000000.0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location: SYSTEM variables screen

\$SCR.\$coldovrd

Minimum: 1 Default: 10 Maximum: 100

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Cold Start Override

Description: The speed override value on a cold start.

Power Up: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$cond_time

Minimum: 8 Default: 8 Maximum: 127

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Condition Time

Description: The condition handler scan time (in milliseconds).

Power Up: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$coordovrd

Minimum: 1 Default: 10 Maximum: 100

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$dsp_type

Minimum: 0 Default: 3 Maximum: 100

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$SCR.\$dvc_c_ratio

Minimum: -1.0 Default: 0.004 Maximum: 1.0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$SCR.\$dvc_dbg

Minimum: 0x80000000 Default: 0 Maximum: 0x07FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$SCR.\$ dvc_enb

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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.

\$SCR.\$dvc_mode

Minimum: 0x80000000 Default: 0 Maximum: 0x07FFFFFFF

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$SCR.\$dvc_mode1

Minimum: 0x80000000 Default: 0 Maximum: 0x07FFFFFFF

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Time Scale mode 1

Description: Reserved for future enhancement.

Power Up:

User Interface Location: SYSTEM Variables screen

\$SCR.\$dvc_mode2

Minimum: 0x80000000 Default: 0 Maximum: 0x07FFFFFFF

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Time Scale mode 2

Description: Reserved for future enhancement.

Power Up:

User Interface Location: SYSTEM Variables screen

\$SCR.\$dvc_mode3

Minimum: 0x80000000 Default: 1 Maximum: 0x07FFFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$SCR.\$enc_axis[2]

Minimum: 0 Default: 0 Maximum: 16
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Encoder Axis

Description: Used for line tracking. Specify which DSP axis is setup for line tracking.

Power Up: Set only during a controlled start or in SETUP Encoder menu. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen, SETUP Encoder screen.

\$SCR.\$enc_type[2]

Minimum: 0 Default: 0 Maximum: 2
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Encoder Type

Description: Used for line tracking. A 0 indicates incremental. A 1 indicates absolute.

Power Up: Set only during a controlled start or in SETUP Encoder menu. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen, SETUP Encoder screen.

\$SCR.\$fenceovrd

Minimum: 1 Default: 10 Maximum: 100
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$fine_pcmt

Minimum: 1 Default: 10 Maximum: 100

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Fine Jog Mode Speed Percentage

Description: The speed used in fine jog mode is: $(1\% * \$JOG_GROUP[1].\$fine_ovrd) * \$SCR_GRP[1].\$fine_pcmt$

Power Up: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$fwdenblovr

Minimum: 0 Default: 10 Maximum: 100

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Override Value When Disable Forward State is Changed

Description: The override value when disable forward state is changed.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$SCR.\$hw_c1_time1

Minimum: 0 Default: 800 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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: Effective after cold start.

User Interface Location: SYSTEM Variables screen.

\$SCR.\$hw_c1_time2

Minimum: 0 Default: 200 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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: Effective after cold start.

User Interface Location: SYSTEM Variables screen.

\$SCR.\$intask_ovru

Minimum: 0 Default: 0 Maximum: 0x07FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$SCR.\$itp_time

Minimum: 4 Default: 24 Maximum: 124
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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.

User Interface Location: SYSTEM Variables screen

\$SCR.\$jg_dsbl_msk

Minimum: 0 Default: 0 Maximum: 31
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Set only during a controlled start

User Interface Location: SYSTEM variables screen

\$SCR.\$jog_aux_enb

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes to this variable take effect immediately

User Interface Location: SYSTEM Variables screen

\$SCR.\$joglim

Minimum: 1 Default: 12 Maximum: 100

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$joglimrot

Minimum: 1 Default: 4 Maximum: 100

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Rotation Jog Speed Limit

Description: The percentage of maximum rotspeed applied during the orientation jogging.

Power Up: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$jogovlim

Minimum: 1 Default: 100 Maximum: 100

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$jogwst_mode

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes take effect immediately.

User Interface Location: SYSTEM variables screen.

\$SCR.\$kept_mirlim

Minimum: 1 Default: 5 Maximum: 8

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$kinem_enb

Minimum: 0 Default: 2 Maximum: 2

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$SCR.\$lchdly_time

Minimum: -1000 Default: 0 Maximum: 5000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Local Condition Delay Time

Description: Allows local condition trigger times to be adjusted by this amount (in msec).

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$SCR.\$made_pg_amr

Minimum: 0 Default: 0 Maximum: 10
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Number of AMRs used in PG was made

Description: Not used

Power Up: Set only during a controlled start

User Interface Location: SYSTEM Variables screen

\$SCR.\$made_pg_mir

Minimum: 0 Default: 0 Maximum: 10
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Number of MIRs used in PG was made

Description: Not used

Power Up: Set only during a controlled start

User Interface Location: SYSTEM Variables screen

\$SCR.\$madegroups

Minimum: 0 Default: 0 Maximum: 5
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Number of groups made

Description: Not used

Power Up: Set only during a controlled start

User Interface Location: SYSTEM Variables screen

\$SCR.\$madepgtasks

Minimum: 0 Default: 0 Maximum: 16

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Number of PG tasks made .

Description: Not used

Power Up: Set only during a controlled start

User Interface Location: SYSTEM Variables screen

\$SCR.\$max_pre_fdo

Minimum: 0 Default: 1 Maximum: 10

KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: INTEGER

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR.\$maxnumtask

Minimum: 0 Default: 1 Maximum: 4

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Maximum Number of Tasks

Description: The maximum number of user programs which can be run simultaneously.

Power Up: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$maxnumufram

Minimum: 1 Default: 9 Maximum: 9

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Maximum Number of User Frames

Description: Displays the total number of user frames the coordinate system can register.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR.\$maxnumutool

Minimum: 1 Default: 9 Maximum: 9

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Maximum Number of Tool Frames

Description: Displays the total number of tool frames the coordinate system can register.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR.\$maxpreapl

Minimum: 0 Default: 3 Maximum: 10

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Max Pre-planned Application

Description: The maximum number of application instructions that the system can pre-plan.

Power Up: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$maxpremtn

Minimum: 0 Default: 3 Maximum: 10

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$mb_dsbl_msk

Minimum: 0 Default: 0 Maximum: 1000000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$mb_ld_msk

Minimum: 0 Default: 0 Maximum: 1000000

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Set only during a controlled start

User Interface Location: SYSTEM Variables screen

\$SCR.\$motn_ld_idx[1-32]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: Motion Softpart Load Index

Description: Internal variable which indicates which slot is loaded with which softpart.

Power Up:

User Interface Location: System Variables screen

\$SCR.\$motn_ld_msk

Minimum: 0 Default: 0 Maximum: 1000000

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Set only during a controlled start

User Interface Location: SYSTEM Variables screen

\$SCR.\$motn_pc_run[1-32]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR.\$ ne_mode

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Newton-Euler mode

Description: 1: Newton-Euler is enabled

0: Newton-Euler is disabled

Do not change this system variable.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$ne_sin_reso

Minimum: 0x80000000 Default: 1 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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 not use sin table (compatible mode)

Users should not change this system variable.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$num_dsp_axs

Minimum: 0 Default: 6 Maximum: 16

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: Number of DSP Axes

Description: The number of DSP axes supported by servo hardware on the system.

Power Up: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$num_gp_made

Minimum: 0 Default: 1 Maximum: 5

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: Number of Groups Requested to Create

Description: Reserved for internal use by FANUC Robotics. The number of groups that you have requested to create at control start.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR.\$num_group

Minimum: 1 Default: 1 Maximum: 5

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$num_motnsoc

Minimum: 0 Default: 0 Maximum: 10

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR.\$num_pg_amr

Minimum: 1 Default: 10 Maximum: 10

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Maximum number of AMR

Description: The number of AMR should be created by the system to be used for Program.

Power Up: Set only during a controlled start

User Interface Location: SYSTEM Variables screen

\$SCR.\$num_pg_mir

Minimum: 1 Default: 10 Maximum: 10

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$num_rlibsoc

Minimum: 0 Default: 0 Maximum: 5

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR.\$num_sys_mir

Minimum: 3 Default: 10 Maximum: 10

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$num_tot_axs

Minimum: 0 Default: 6 Maximum: 16
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: Number of Total Axes

Description: The total number of all axes, for all groups, installed in the system.

Power Up: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$ofstincval

Minimum: -1000 Default: 0 Maximum: 1000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Offset Register Incremental Number

Description: The increment number with new TPE offset execution.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR.\$pg_dsbl_msk

Minimum: 0 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$SCR.\$pre_exe_enb

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Pre-execution Enable

Description: Allows pre-execution of certain program statements, if set to TRUE.

Power Up: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$pre_mb_cmp

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: Pre MB Version Compatibility

Description: Requires that the system is compatible with pre MB version if set to TRUE.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR.\$prev_ctrl

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR.\$recov_ovrd

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$SCR.\$resetinvert

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Reset Signal Inverted

Description: If set to TRUE, the rising edge of the reset signal is used.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$SCR.\$runovlim

Minimum: 1 Default: 50 Maximum: 100

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$SCR.\$sfjogovlim

Minimum: 1 Default: 50 Maximum: 100

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$sfrunovlim

Minimum: 1 Default: 30 Maximum: 100

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$sfspd_ovrd[2]

Minimum: 0 Default: 50 Maximum: 100

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Safety Override

Description: The override value when the SFSPD signal is turned off.

Power Up: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$subcpu

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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:

User Interface Location: SYSTEM Variables screen

\$SCR.\$sv_code_opt

Minimum: 0 Default: 0 Maximum: 5

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Servo Code Option

Description: The servo code option.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR.\$svstat

Minimum: 0 Default: 0 Maximum: 2
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Set only during the first controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR.\$tpenbleovrd

Minimum: 1 Default: 10 Maximum: 100
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Teach Pendant Enable Override

Description: The ceiling speed override value when the teach pendant 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: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$tpmotnenabl

Minimum: 0 Default: 0 Maximum: 3
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Teach Pendant Motion Enable

Description: Disables jogging if set to 1.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$SCR.\$turn_axis[3]

Minimum: 0 Default: 4 Maximum: 9
Minimum: 0 Default: 0 Maximum: 9
Minimum: 0 Default: 6 Maximum: 9
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$update_map1

Minimum: 0x80000000 Default: 1 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: update map 1

Description: Each bit means update status of each modification Do not change this system variable.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR.\$update_map2

Minimum: 0x80000000 Default: 1 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: update map 2

Description: Each bit means update status of each modification Do not change this system variable.

Power Up: Effective after COLD start

User Interface Location: SYSTEM Variables screen

\$SCR.\$update_time

Minimum: 0 Default: 80 Maximum: 100000
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Inertia calculation update time

Description: The interval time for performing inertia/moment calculations. The unit is msec.

Power Up: Set only during a controlled start

User Interface Location: SYSTEM Variables screen

\$SCR_GRP STRUCTURE

Name: Group System Configuration Record

Description: System configuration record for each group.

Power Up: Some fields in this structure will take effect immediately. Some can only be set at a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$arm_type

Minimum: 0 Default: 0 Maximum: 20

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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_HOODDECK 20 = Right Hood/deck opener
L_HOODDECK 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.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$axisorder[9]

Minimum: 0 Default: 0 Maximum: 16
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$axs_amp_num[1 - 2]

Minimum: 0 Default: 1 Maximum: 16
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$axs_amp_num[3 - 4]

Minimum: 0 Default: 2 Maximum: 16
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$axs_amp_num[5 - 6]

Minimum: 0 Default: 3 Maximum: 16
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$axs_amp_num[7 - 9]

Minimum: 0 Default: 0 Maximum: 16
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$axs_xyz_map[9]

Minimum: 0 Default: 0 Maximum: 255
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen, SETUP COORD CAL screen.

\$SCR_GRP[1].\$brk_number[9]

Minimum: 0 Default: 0 Maximum: 6

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: Brake Number

Description: Defines the brake number associated with the axis.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$config_mask

Minimum: 0,0,0,0,0,0,0,0 Default: -1 Maximum: 0,0,0,0,0,0,0,0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: CONFIG_T

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$coord_mask

Minimum: 0 Default: 27 Maximum: 32767

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$dd_motor[9]

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: Direct Drive Motor

Description: Indicates the axis uses a direct drive motor, if set to TRUE. Not supported in this release.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$ext_length[3]

Minimum: 0. Default: 0. Maximum: 100000.
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

Name: Extended Axis Length

Description: Defines the link length of the extended axis.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$ext_offset[3]

Minimum: 0. Default: 0. Maximum: 100000.
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

Name: Extended Axis Offset

Description: Defines the joint offset (in mm) of the extended axis.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$ext_order[3]

Minimum: 0 Default: 0 Maximum: 9
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$ext_xyz_map[3]

Minimum: 0 Default: 0 Maximum: 3
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$flextooltyp

Minimum: 0 Default: 0 Maximum: 100
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

Name: FlexTool Type

Description: A value more than 0 means that this group is a FlexTool Robot.

Power Up: FlexTool robot set up program set this during Controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$hw_strt_axs

Minimum: 0 Default: 0 Maximum: 16
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Hardware Start Axis

Description: Indicates the first hardware axis associated with the motion group.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$joglim_jnt[9]

Minimum: 0 Default: 12 Maximum: 100

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$kinem_enb

Minimum: 0 Default: 2 Maximum: 2

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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: Changes to this variable take effect immediately. You should not change this variable.

User Interface Location:

\$SCR_GRP[1].\$link_length[6]

Minimum: 0. Default: 0. Maximum: 100000.

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$loadratio[9]

Minimum: 0. Default: 0. Maximum: 15.
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

Name: Load Ratio

Description: Defines the ratio between the external load inertia and the motor inertia.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1]. \$num_axes

Minimum: 0 Default: 0 Maximum: 9
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: Number of Axes

Description: The total number of axes that exist in the motion group.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1]. \$num_dual

Minimum: 0 Default: 0 Maximum: 3
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

Name: The number of dual axes config

Description: The number of dual axes in this group.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1]. \$num_pt

Minimum: 0 Default: 14 Maximum: 22
KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: BYTE

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$num_rob_axs

Minimum: 0 Default: 0 Maximum: 9

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$num_seg

Minimum: 0 Default: 6 Maximum: 10

KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: BYTE

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$ofst[9]

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: AX_OFS_T

AX_OFS_T = < \$x-100000.0 0.0 10000.0 RW RW RW REAL

\$y -100000.0 0.0 100000.0 RW RW RW REAL

\$z -100000.0 0.0 100000.0 RW RW RW REAL

Name: Axis Offset

Description: Defines the offsets (in mm) between neighboring axes.

Power Up: Set only during a controlled start. Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen, SETUP COORD CAL screen.

\$SCR_GRP[1].\$op_brk_num[9]

Minimum: 0 Default: 0 Maximum: 6

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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: No

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$robot_id

Minimum: "" Default: "12345678901234567890" Maximum: ""
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Robot Identification

Description: Defines the robot identification string.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$robot_model

Minimum: "" Default: "12345678" Maximum: ""
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Robot Model

Description: Defines the robot model string.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$rotary_axs[9]

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: Rotary Axis

Description: Indicates the axis is rotary, if set to TRUE; otherwise, it is a linear axis.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$sv_code_id

Minimum: "" Default: "12345678" Maximum: ""
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Servo Code Identification

Description: Defines the servo code identification string.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$sync_m_axis

Minimum: 1 Default: 0 Maximum: 9

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$sync_s_axis

Minimum: 1 Default: 0 Maximum: 9

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP.\$turn_axis[3]

Minimum: 0 Default: 4 Maximum: 9

Minimum: 0 Default: 0 Maximum: 9

Minimum: 0 Default: 6 Maximum: 9

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$update_map

Minimum: 0x80000000 Default: 1 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: update map

Description: Each bit means update status of the modification for this group. Do not change this system variable.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$use_tbcart

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$use_tbjnt

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Can be set at any time.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$wrist_type

Minimum: 0 Default: 0 Maximum: 20
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

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: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$wrst_axis_e

Minimum: 1 Default: 6 Maximum: 9
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: Wrist Axis End

Description: The axis number of the last wrist axis. For a 6 axis robot, this is normally 6.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SCR_GRP[1].\$wrst_axis_s

Minimum: 1 Default: 4 Maximum: 9
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: Wrist Axis Start

Description: The axis number of the first wrist axis. For a 6 axis robot, this is normally 4.

Power Up: Set only during a controlled start.

User Interface Location: SYSTEM Variables screen

\$SEL_DEFAULT

Minimum: 0 Default: 16 Maximum: 0xFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SELECT screen, SYSTEM Variables screen

See Also: \$KAREL_ENB, \$JOBPROC_ENB

\$SEMIPWFO

Minimum: 0 Default: 0 Maximum: 256
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type:

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: This variable can be set at any time but has effect only at power-up.

User Interface Location: SYSTEM Variables screen

See Also: \$SEMIPOWERFL

\$SEMIPOWERFL

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type:

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: This variable can be set at any time but has effect only at power-up.

User Interface Location: SYSTEM Variables screen

See Also: \$SEMIPWFDO, \$PWR_SEMI, \$PWF_IO

\$SERIALTHROT STRUCTURE

Name: Serial Throttle

Description: Enables and controls the serial throttling feature.

If enabled, output through serial ports can be performed on a polled basis, one character approximately every 4 milliseconds, when motion is on-going.

Power Up: Determination is made at every cold start whether to enable this feature.

User Interface Location: SYSTEM Variables screen

\$SERIALTHRO T.\$enable

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Serial Throttle Enable

Description: Enable flag. At cold start, if \$ENABLE is 0 then the feature is not enabled and \$pointer will be set to 0. If \$enable is non-zero at cold start, the feature is enabled and \$pointer will be non-zero.

Power Up: Requires a cold start to take effect.

User Interface Location: KCL, SYSTEM Variables screen

\$SERIALTHROT. \$flags

Minimum: 0x0 Default: 0x000000FF Maximum: 0xFFFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Serial Throttle Port Flags

Description: Bit mask to enable/disable serial throttling for each individual port.

lowest bit, bit 0 - P1 (Teach Pendant)

bit 1 = P2

bit 2 = P3

bit 3 = P4

bit 4 = P5 (P5 thru P8 are optional serial ports)

bit 5 = P6

bit 6 = P7
bit 7 = P8

Power Up: No

User Interface Location: KCL, SYSTEM Variables screen

\$SERIALTHROT.\$pointer

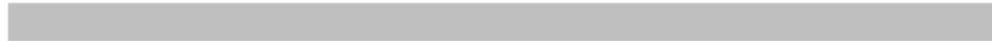
Minimum: 0x0 Default: 0 Maximum: 0xFFFFFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Serial Throttle Pointer

Description: Internal address used to check if motion is on-going. Write access is not available. If set to 0, serial throttling is not being used. If set to a non-zero value, serial throttling is in effect as further specified by \$FLAGS.

Power Up: Requires a cold start to take effect.

User Interface Location: Can not be set from KCL or SYSTEM Variables screen



\$SERVENT[1-2] STRUCTURE

Name: Server Entry

Description: An array of structures defining the Internet Protocol Services. Individual fields within this structure are described below.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables 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_name

Minimum: "" Default: " " Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: Service name

Description: Identifies the service.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables 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_port

Minimum: 0 Default: 0 Maximum: 30000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Port

Description: Port number associated with this service.

Power Up: Requires a cold start to take effect.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: Server Protocol

Description: Name of the Protocol associated with this service.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables 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*

\$SERVICE_KL[1-16]

Minimum: "" Default: "SVCPRG[1-16] " Maximum: " "

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen and Auto Error Recovery Setup screen

\$SERVICE_KRL[1-5]

Minimum: "" Default: "SVCPRG_[1-5]" Maximum: ""
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$SERVICE_PRG[1- 16]

Minimum: "" Default: " " Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$SFLT_WAILIM

Minimum: 0 Default: 1000 Maximum: 2000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Waiting limiter for SOFTFLOAT ON

Description: Waiting limiter for SOFTFLOAT ON [ms]

Power Up: Changes to this variable take effect immediately

User Interface Location: SYSTEM Variables screen

\$SHFTOV_ENB

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG STRUCTURE

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: Yes

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$com_timeout

Minimum: 0 Default: 1000 Maximum: 99999
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Communication timeout

Description:

Power Up:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$cont_only

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$err_report

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Error Report

Description: A report containing the errors that occurred.

Power Up:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$invert_chk

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name:

Description:

Power Up:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$job_base

Minimum: 0 Default: 0 Maximum: 9999

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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 to 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:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$job_root

Minimum: "" Default: "RSR" Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$karel_sop

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$karel_uop

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$num_rsr[4]

Minimum: 0 Default: 0 Maximum: 9999

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$options

Minimum: 0x00000000 Default: 0x00000000 Maximum: 0xFFFFFFFF FF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Options

Description:

Power Up:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$pns_enable

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$prodstartyp

Minimum: 0 Default: 0 Maximum: 0xFFFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Production start type

Description:

Power Up:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$que_enable

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Queue Enable

Description:

Power Up:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$rsr_ack_pul

Minimum: 0 Default: 400 Maximum: 9999
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$rsr_ackenbl

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$rsr_enable[4]

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: RSR enable

Description:

Power Up:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$rsr1_name

Minimum: "" Default: "RSR" Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: RSR1 Name

Description: Not currently used. This is the name of the job that will be run when RSR1 is detected.

Power Up:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$rsr2_name

Minimum: "" Default: "RSR" Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: RSR2 Name

Description: Not currently used. This is the name of the job that will be run when RSR2 is detected.

Power Up:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$rsr3_name

Minimum: "" Default: "RSR" Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: RSR3 Name

Description: Not currently used. This is the name of the job that will be run when RSR3 is detected.

Power Up:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$rsr4_name

Minimum: "" Default: "RSR" Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: RSR4 Name

Description: Not currently used. This is the name of the job that will be run when RSR4 is detected.

Power Up:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$shell_name

Minimum: "" Default: "" Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$start_mode

Minimum: 0 Default: 0 Maximum: 0xFFFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name:

Description:

Power Up:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$tpfwd_karel

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$uop_sel_sta

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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:

User Interface Location: SYSTEM Variables screen

\$SHELL_CFG.\$use_abort

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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:

User Interface Location: SYSTEM Variables screen



\$SHELL_WRK STRUCTURE

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: Yes

User Interface Location: SYSTEM Variables screen

\$SHELL_WRK.\$by_manual

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: Cursor Moved Manually

Description: Indicates that you has manually moved the cursor in the edited program.

Power Up:

User Interface Location: SYSTEM Variables screen

\$SHELL_WRK.\$curr_line

Minimum: 0 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Yes

User Interface Location: Based on the program being edited

\$SHELL_WRK.\$rout_name

Minimum: "" Default: "" Maximum: ""

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

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: Yes

User Interface Location: Based on the program being edited

\$SHELL_WRK.\$rsr_stat_p

Minimum: 0 Default: 0 Maximum: 0xFFFFFFFF

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: ADDRESS

Name:

Description:

Power Up:

User Interface Location: SYSTEM Variables screen

\$SHELL_WRK.\$shell_start

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: UNINIT

Name: Shell Start

Description: Not currently used.

Power Up:

User Interface Location: SYSTEM Variables screen

\$SHELL_WRK.\$task_num

Minimum: 0 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Task Number

Description: Contains the task number of the routine which is currently executing via the teach pendant edit system.

Power Up: Yes

User Interface Location: Based on program being edited

\$SHELL_WRK.\$wrk_busy

Minimum: 0 Default: 0 Maximum: 0

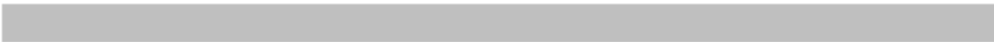
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: UNINIT

Name: Work Busy

Description: Not currently used.

Power Up:

User Interface Location: SYSTEM Variables screen



\$SSR STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

\$SSR.\$bwdstep

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

Name: Single Step Backward

Description: If set to TRUE, then single step backward is enabled.

Power Up: Change takes effect immediately.

User Interface Location: SYSTEM Variables screen

\$SSR.\$sglsteptask[14]

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: Single Step Task Name

Description: Task name for single step operation.

Power Up: Change takes effect immediately.

User Interface Location: SYSTEM Variables screen

\$SSR.\$singlestep

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

Name: Single Step

Description: If set to TRUE, then single step forward is enabled.

Power Up: Change takes effect immediately.

User Interface Location: TEST CYCLE

\$SSR.\$steptasknum

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: Single Step Task Id

Description: The identification number of the motion source task.

Power Up: Change takes effect immediately.

User Interface Location: SYSTEM Variables screen

\$SSR.\$stepstmttyp

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: Single Step Statement Type

Description: Single step statement type where:

case 1 : Task is paused at each statement

case 2 : Task is paused at motion statement only

case 3 : Task is paused at each mnemonic statement and karel motion statement

case 4 : Execution continue in routine

Power Up: Change takes effect immediately.

User Interface Location: SYSTEM Variables screen

\$SSR.\$stpsegtype

Minimum: 0 Default: 0 Maximum: 255
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BYTE

Name: Single Step Segment Type

Description: Single step segment type.

Power Up: Change takes effect immediately.

User Interface Location: SYSTEM Variables screen

\$STOP_ON_ERR

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: KCL Stop On Error

Description: \$STOP_ON_ERR indicates whether or not the system stops on a KCL command file error. If TRUE, execution of the command procedure stops if any error condition is found.

You can set and clear \$STOP_ON_ERR within a command procedure to control the execution of command files depending on the desired response to errors.

Note that \$STOP_ON_ERR applies only to errors that can be detected by the KCL command interpreter. For example, a KCL> RUN command can cause an error during program execution, but the KCL command interpreter will continue because the command itself has succeeded.

Power Up: No

User Interface Location: SYSTEM Variables screen Usually set using KCL's SET VAR command.

\$SVPRG_COUNT

Minimum: 0 Default: 0 Maximum: 999
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Changes to this variable take effect immediately

User Interface Location: SYSTEM variable screen

\$SVPRG_ENB

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen and Application Setup screen (WELD system setup screen etc.)

\$SVPRG_TBL[1-5]

Minimum: 0 Default: 0 Maximum: 255

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen

\$SVPRM_ENB

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Servo Parameter Enable

Description: Displays the servo parameter screen if one exists.

Power Up:

User Interface Location: SYSTEM Variables screen

\$SYSDSP_PASS

Minimum: 0 Default: 0 Maximum: 999999


KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: System Variable Screen Display Password

Description: Not currently used.

Power Up:

User Interface Location: SYSTEM Variables screen



TB_PARAM[1] STRUCTURE

Name: TurboMove joint softpart parameter

Description: The motion parameter for TurboMove joint softpart. Individual fields within this structure are described below.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$m a_brk_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$m a_grav_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Gravity margin for acceleration of joint motion

Description: Margin parameter of Gravity torque for acceleration of TurboMove joint motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$m a_load_trq

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$m a_nold_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$m a_stal_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$max_trq_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Max torque margin for joint motion

Description: Margin parameter for max motor torque for TurboMove joint motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$m d_brk_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$m d_grav_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Gravity margin for deceleration of joint motion

Description: Margin parameter of Gravity torque for deceleration of TurboMove joint motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$m d_load_trq

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$m d_nold_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$m d_stal_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$m r_brk_trq

Minimum: -100000. Default: 2.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Break torque of motor

Description: The torque of the motor at break point of motor torque curve for TurboMove joint motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$m r_brk_vel

Minimum: -100000. Default: 2.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Break velocity of motor

Description: The velocity of the motor at break point of motor torque curve for TurboMove joint motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$m r_max_trq

Minimum: -100000. Default: 2.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Max torque of motor

Description: Max torque of the motor for TurboMove joint motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$m r_nold_vel

Minimum: -100000. Default: 5.0 Maximum: 100000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Nold velocity of motor

Description: The maximum motor velocity without load.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

See Also: *TurboMove* Technote

\$TB_PARAM[1].\$m r_stal_trq

Minimum: -100000. Default: 2.0 Maximum: 100000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Stal torque of motor

Description: The torque of the motor at 0 velocity for TurboMove joint motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$p th_brk_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$p th_grv_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Gravity margin for joint cont motion

Description: Margin parameter of Gravity torque for TurboMove joint cont motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$p th_nld_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TB_PARAM[1].\$p th_stl_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP STRUCTURE

Name: TurboMove Cartesian group variable

Description: TBC softpart motion parameter. Individual fields within this structure are described below.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].\$cnt_scale

Minimum: 0. Default: 1 Maximum: 100.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: CNT motion scale

Description: This parameter is used to tune cont motion accel time for TurboMove cartesian motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].\$min_acc_uca

Minimum: 0 Default: 128 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Minimum accel time for TurboMove cartesian short motion

Description: Minimum accel time for TurboMove cartesian short motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].\$min_c_id_e1

Minimum: "" Default: "12345678" Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: TurboMove parameter version id

Description: TurboMove parameter version id.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].\$min_c_id_e2

Minimum: "" Default: "12345678" Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: TurboMove parameter version id

Description: TurboMove parameter version id.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].\$min_c_id_e3

Minimum: "" Default: "12345678" Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: TurboMove parameter version id

Description: TurboMove parameter version id.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].\$min_cat_uma

Minimum: 0 Default: 128 Maximum: 10000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Minimum accel time for TurboMove cartesian long motion

Description: Minimum accel time for TurboMove cartesian long motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].\$min_cyc_id

Minimum: "" Default: "12345678" Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: TurboMove parameter version id

Description: TurboMove parameter version id.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].\$path_ratio

Minimum: 0 Default: 1.0 Maximum: 10000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Accel time ratio for CF fine motion

Description: The ratio of 2nd/1st accel time for CF fine motion.

Power Up: A cold start is required to change this value.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].\$payload_mgn

Minimum: 0. Default: 0 Maximum: 1000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Payload margin

Description: Margin parameter for payload value.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].\$shortmo_scl

Minimum: 0. Default: 1 Maximum: 100.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Short motion scale

Description: This parameter is used to short motion accel time for TurboMove cartesian motion. Currently not used.

Power Up: A cold start is required to change this value.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].\$tbc_accel1

Minimum: 0 Default: 256 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: 1st default accel time for JF cartesian motion

Description: 1st default accel time for JF cartesian motion.

Power Up: A cold start is required to change this value.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].\$tbc_accel2

Minimum: 0 Default: 128 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: 2nd default accel time for JF cartesian motion

Description: 2nd default accel time for JF cartesian motion.

Power Up: A cold start is required to change this value.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].\$tbc_path1

Minimum: 0 Default: 256 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].\$tbc_path2

Minimum: 0 Default: 128 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].TBC_PARAM STRUCTURE

Name: TurboMove cartesian softpart parameter

Description: The motion parameter for TurboMove cartesian softpart. Individual fields within this structure are described below.

Power Up: The change effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].TBC_PARAM[1].\$max_trq_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Cartesian motion max torque margin

Description: Margin parameter for max torque of the motor for TurboMove Cartesian motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].TBC_PARAM[1].\$mc_brk_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Cartesian motion break torque margin.

Description: Margin parameter of Break torque (\$TBJ_GRP.\$MR_BRK_TRQ) for TurboMove Cartesian motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].TBC_PARAM[1].\$mc_grav_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Cartesian motion gravity margin.

Description: Margin parameter of Gravity torque for TurboMove Cartesian motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].TBC_PARAM[1].\$mc_max_trq

Minimum: -100000. Default: 2.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Cartesian motion max. torque

Description: Max torque of the motor for TurboMove Cartesian motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].TBC_PARAM[1].\$mc_nold_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].TBC_PARAM[1].\$mc_stal_mgn

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].\$TBC_PARAM[1].\$shortmo_lim

Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$TBC_GRP[1].\$TBC_PARAM[1].\$shortmo_mgn


Minimum: -100000. Default: 1.0 Maximum: 100000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen



\$TBCCFG STRUCTURE

Name: TurboMove Cartesian configuration variable

Description: Sets or indicates TBC softpart configuration. Individual fields within this structure are described below.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TBCCFG.\$debug

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: TBC softpart debug flag

Description: Flag for debug TBC softpart.

User Interface Location: SYSTEM Variables screen

\$TBCCFG.\$group_mask

Minimum: 0 Default: 1 Maximum: 31
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: TBC softpart Group Mask

Description: Indicates TBC softpart group mask.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TBCCFG.\$mb_conflict

Minimum: 0 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: TBC softpart conflict information

Description: Indicates TBC softpart conflict information.

User Interface Location: SYSTEM Variables screen

\$TBCCFG.\$mb_required

Minimum: 0 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: TBC softpart conflict information

Description:

User Interface Location: SYSTEM Variables screen

\$TBJ_GRP STRUCTURE

Name: TurboMove Joint group variable

Description: TBJ softpart motion parameter. Individual fields within this structure are described below.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TBJ_GRP[1].\$asym_param

Minimum: -100000. Default: 2 Maximum: 100000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Asymmetrical acc/dec parameter

Description: This parameter is used for asymmetrical acc/dec ratio setting.

Power Up: A cold start is required to change this value.

User Interface Location: SYSTEM Variables screen

\$TBJ_GRP[1].\$long mo_mgn

Minimum: 0. Default: 1 Maximum: 100.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Long motion scale

Description: Margin parameter of minimum accel time according to J1 inertia value.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBJ_GRP[1].\$long mo_scl

Minimum: 0. Default: 1 Maximum: 100.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Long motion scale

Description: Margin parameter of minimum accel time according to J1 inertia value.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBJ_GRP[1].\$min_acc_shm

Minimum: 0 Default: 128 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Minimum accel time for TurboMove joint short motion

Description: Minimum accel time for TurboMove joint short motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBJ_GRP[1].\$min_acc_uma

Minimum: 0 Default: 128 Maximum: 10000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Minimum accel time for TurboMove joint long motion

Description: Minimum accel time for TurboMove joint long motion.

Power Up: The change effect immediately

User Interface Location: SYSTEM Variables screen

\$TBJ_GRP[1].\$min_c_id_e1

Minimum: "" Default: "12345678" Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: TurboMove parameter version id

Description: TurboMove parameter version id.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBJ_GRP[1].\$min_c_id_e2

Minimum: "" Default: "12345678" Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: TurboMove parameter version id

Description: TurboMove parameter version id.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBJ_GRP[1].\$min_c_id_e3

Minimum: "" Default: "12345678" Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: TurboMove parameter version id

Description: TurboMove parameter version id.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBJ_GRP[1].\$min_cyc_id

Minimum: "" Default: "12345678" Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: TurboMove parameter version id

Description: TurboMove parameter version id.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBJ_GRP[1].\$payload_mgn

Minimum: 0. Default: 0 Maximum: 1000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Payload margin

Description: Margin parameter for payload value.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TBJ_GRP[1].\$shor tmo_mgn

Minimum: 0. Default: 1 Maximum: 100.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Short motion scale

Description: Currently not used.

User Interface Location: SYSTEM Variables screen

\$TBJ_GRP[1].\$shor tmo_scl

Minimum: 0. Default: 1 Maximum: 100.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Short motion scale

Description: Currently not used.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TBJ_GRP[1].\$tbj_ accel1[i]

Minimum: 0 Default: 256 Maximum: 100000.

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: 1st default accel time for i th joint motion

Description: 1st default accel time for i th joint motion.

Power Up: A cold start is required to change this value.

User Interface Location: SYSTEM Variables screen

\$TBJ_GRP[1].\$tbj_ accel2[i]

Minimum: 0 Default: 256 Maximum: 100000.

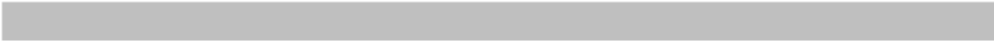
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: 2nd default accel time for i th joint motion

Description: 2nd default accel time for i th joint motion .

Power Up: A cold start is required to change this value.

User Interface Location: SYSTEM Variables screen



\$TBJCFG STRUCTURE

Name: TurboMove Joint configuration variable

Description: Set or indicate TBJ softpart configuration. Individual fields within this structure are described below.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TBJCFG.\$debug

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: TBJ softpart debug flag

Description: Flag for debug TBJ softpart.

User Interface Location: SYSTEM Variables screen

\$TBJCFG.\$group_mask

Minimum: 0 Default: 1 Maximum: 31
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: TBJ softpart Group Mask

Description: Indicate TBJ softpart group mask.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TBJCFG.\$mb_conflict

Minimum: 0 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: TBJ softpart conflict information

Description: Indicate TBJ softpart conflict information.

User Interface Location: SYSTEM Variables screen

\$TBJCFG.\$mb_required

Minimum: 0 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: TBJ softpart conflict information

Description:

User Interface Location: SYSTEM Variables screen

\$TBJCFG.\$tbj_select

Minimum: 1 Default: 1 Maximum: 2

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: You must perform a cold start for the change to take effect.

\$TBJCFG.\$update_time

Minimum: 0 Default: 100 Maximum: 100000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Update time for inertia/moment calculation

Description: Update time for inertia/moment calculation. Currently not used.

User Interface Location: SYSTEM Variables screen

\$TBPARAM.\$dyn_frc_mgn

Minimum: -100000 Default: 0.0 Maximum: 100000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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.

User Interface Location: SYSTEM Variables screen

\$TCPP_CFG STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

\$TCPP_CFG.\$debug_main

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: This value initializes to 0 and maintains its previous value over subsequent power cycles.

User Interface Location: SYSTEM Variables screen

\$TCPP_CFG.\$debug_task

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: This value initializes to 0 and maintains its previous value over subsequent power cycles.

User Interface Location: SYSTEM Variables screen

\$TCPP_CFG.\$group_num

Minimum: 1 Default: 1 Maximum: 5

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: This value initializes to group 1 and will maintain its value over subsequent power cycles.

User Interface Location: SYSTEM Variables screen

\$TCPP_CFG.\$num_tcpseg

Minimum: 1 Default: 6 Maximum: 15

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: This value initializes to the result of the system variable \$SCR_GRP[grp_num]. \$num_seg + 1 and will maintain its value over subsequent power cycles.

User Interface Location: SYSTEM Variables screen

\$TCPP_CFG.\$soft_tim_en

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: This value initializes to TRUE and maintains its previous value over subsequent power cycles.

User Interface Location: SYSTEM Variables screen

See Also: \$TCPPIR.\$tcdelay

\$TCPP_CFG.\$tcpp_time

Minimum: 16 Default: 28 Maximum: 5000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: This value initializes to the result of \$SCR.\$itp_time * \$PARAM_GROUP[grp_num]. \$linear_rate and will maintain its previous value over subsequent power cycles.

User Interface Location: SYSTEM Variables screen

\$TCPP_CFG.\$vc_present

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: This value initializes to FALSE and maintains its previous value over subsequent power cycles.

User Interface Location: SYSTEM Variables screen

\$TCPP_CFG.\$warning_en b

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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 Ovrdr Mode at line:nn"

Power Up: This value initializes to TRUE and maintains its previous value over subsequent power cycles.

User Interface Location: SYSTEM Variables screen

\$TCPPIR STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

\$TCPPIR.\$enable_tcp

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: This value initializes to FALSE and maintains its previous value over subsequent power cycles.

User Interface Location: SYSTEM Variables screen

\$TCPPIR.\$tcdelay

Minimum: -2000 Default: 200 Maximum: 2000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: This value initializes to 200 (msec) and maintains its previous value over subsequent power cycles.

User Interface Location: SYSTEM Variables screen

\$TCPSPPEED STRUCTURE

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 TCP task softpart at the interval specified by the value of \$T_CPP_CFG.\$tcp_time. The individual fields within this structure are defined below.

Power Up:

User Interface Location: SYSTEM Variables screen

See Also: \$T_CPP_CFG.\$tcp_time

\$T_CPPSPEED.\$accel

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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 (\$T_CPPSPEED.\$speed). It is a directionless value, but its sign is valid (positive for increasing TCP speed, negative for decreasing TCP speed).

Power Up: This value initializes to 0 at each power cycle and is automatically updated by the TCP task softpart.

User Interface Location: SYSTEM Variables screen

See Also: \$T_CPPSPEED.\$speed

\$T_CPPSPEED.\$motype

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: MOTYPE

Name: TCP Speed Prediction Programmed Motion Type

Description: This is the programmed motion type of the last active TCP motion segment at the time of the most recent TCP Speed prediction update.

Power Up: This value initializes to 0 at each power cycle and is automatically updated by the TCP task softpart.

User Interface Location: SYSTEM Variables screen

\$T_CPPSPEED.\$prog_speed

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

Name: TCP Speed Prediction Programmed Speed

Description: This is the programmed speed of the last active TCP motion segment at the time of the most recent TCP Speed prediction update.

Power Up: This value initializes to 0 at each power cycle and is automatically updated by the TCP task softpart.

User Interface Location: SYSTEM Variables screen

\$TCPPSPEED.\$speed

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

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: This value initializes to 0 at each power cycle and is automatically updated by the TCP task softpart.

User Interface Location: SYSTEM Variables screen

See Also: \$TCPPSPEED.\$vspeed

\$TCPPSPEED.\$tcdelay_mon

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

Name: TCP Speed Prediction Delay Time Monitor (milliseconds)

Description: This is a copy of the TCP equipment delay time (\$TCPPIR.\$tcdelay) which is currently being used as the prediction time within the TCP softpart. This value is presented within this structure to provide a convenient monitor point for the user.

Power Up: This value initializes to 0 at each power cycle and is automatically updated by the TCP task softpart.

User Interface Location: SYSTEM Variables screen

See Also: \$TCPPIR.\$Tcdelay

\$TCPPSPEED.\$timestamp

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: This value initializes to 0 at each power cycle and is automatically updated by the TCP task softpart.

User Interface Location: SYSTEM Variables screen

See Also: \$TCPPSPEED

\$TCPPSPEED.\$vspeed

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: VECTOR

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: These values initialize to 0.0 at each power cycle and are automatically updated by the TCP task softpart.

User Interface Location: SYSTEM Variables screen

\$TH_CIRCUIT

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: Changes take effect immediately.

User Interface Location: 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: 0 Default: 0 Maximum: 1


KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen



\$TH_DEFAULT STRUCTURE

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

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 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

See Also: Touch sensing schedule, master_flag.

\$TH_DEFAULT.\$th_m ax_spd

Minimum: 0 Default: 50 Maximum: 150

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_DEFAULT.\$th_m in_dist

Minimum: 0 Default: 10 Maximum: 200

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_DEFAULT.\$th_m in_spd

Minimum: 0 Default: 5 Maximum: 50

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Minimum search speed

Description: The minimum allowable search speed. You cannot specify a search speed less than this variable.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_DEFAULT.\$th_p tn_reg

Minimum: 0 Default: 10 Maximum: 10

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_DEFAULT.\$th_s rch_reg

Minimum: 0 Default: 9 Maximum: 10

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Default search output position register number


Description: This variable is used when you specify an invalid search output position register number.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_MOTION STRUCTURE

Name: Touch sensor motion data structure

 **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.

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.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_MOTION.\$accel_time

Minimum: 0 Default: 28 Maximum: 500
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Acceleration time.

Description: The motion acceleration time during a search motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_MOTION.\$re_term typ

Minimum: 1 Default: 1 Maximum: 5
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: SHORT

Name: Return motion termination type

Description: The termination type of a search return motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_MOTION.\$return_dist

Minimum: 0 Default: 20000 Maximum: 2000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_MOTION.\$return_spd

Minimum: 0 Default: 100 Maximum: 1000

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

Name: Return Speed

Description: This variable specifies a return speed of a search motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_MOTION.\$search_dist

Minimum: 0 Default: 100 Maximum: 2000

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

Name: Search distance

Description: Maximum searching distance for a search motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_MOTION.\$search_on

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: Search On flag

Description: If this system variable is ON, it is a search motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_MOTION.\$search_spd

Minimum: 0 Default: 50 Maximum: 500

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

Name: Search speed

Description: Speed of search motion.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_MOTION.\$sim_detect

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_MOTION.\$srchne_on

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: Search no effect flag

Description: Reserved for Internal use by FANUC Robotics. Not currently used.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_MOTION.\$time_stamp

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Time stamp

Description: The time when robot touches a part.

Power Up: Changes take effect immediately.

\$TH_MOTION.\$touch_pos

Minimum: 9 Default: {REAL} Maximum: 9

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: REAL

Name: Touched position

Description: The joint position where the robot is in contact with a part.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_MOTION.\$ref_grp

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: ref_grp

Description: Copy of the data from current touch sensing schedule.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_WRKFRAME.\$ref_grp[1-32]

Minimum: 1 Default: 1 Maximum: 5

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_SEARCH

Minimum: 0 Default: 0 Maximum: 1


KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen



\$TH_SENSOR STRUCTURE

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: Changes take effect immediately.

User Interface Location: Touch I/O on the I/O screen.

\$TH_SENSOR.\$port_number

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: I/O Port number

Description: Digital I/O port number.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_SENSOR.\$port_type

Minimum: 0 Default: 0 Maximum: 0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

Name: I/O Port type.

Description: The digital I/O port type.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_SENSOR.\$threshold

Minimum: 0x80000000 Default: 0 Maximum: 0x7fffffff
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Threshold

Description: The threshold number for analog inputs.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_SRCHNE

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Search no effect flag

Description: Reserved for Internal use by FANUC Robotics. Not currently used.

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_SRCHST

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen

\$TH_WELD STRUCTURE

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: Changes take effect immediately.

User Interface Location: Touch I/O on the I/O screen.

\$THSCHEDULE STRUCTURE

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: Changes take effect immediately.

User Interface Location: 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: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes take effect immediately.

User Interface Location: 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: "" Default: "" Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: Comment field for a touch sensing schedule.

Description: Allow users write comment about a touch schedule.

Power Up: Changes take effect immediately.

User Interface Location: 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: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes take effect immediately.

User Interface Location: 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].\$master_flag

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Master search flag.

Description:

The operation for a "master search" is similar to the operation of a "non-master search". The only difference is when doing mastering, the touch sensing software records the contact position for each search, and it does not compute an offset. These recorded positions are used as the reference positions for later "non-master" searches to compute an offset.

When this system variable is set to TRUE, it will touch enable touch sensing software to record the touch position. When set to FALSE, the touch sensing software will use the current touch position and the reference position previously recorded to compute an offset.

Note that the "simple search" does not use this flag, since it computes an absolute position, no previous reference positions are needed.

Power Up: Changes take effect immediately.

User Interface Location: 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].\$pattern_typ

Minimum: 0 Default: 1 Maximum: 5
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes take effect immediately.

User Interface Location: 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].\$ref_grp

Minimum: 1 Default: 1 Maximum: 5
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Touch offset reference group

Description: User sets this value in touch sensing schedule to specify how the offset is recorded.

Power Up: Changes take effect immediately.

User Interface Location: In the touch sensing schedule on the DATA screen.

\$THSCHEDULE [1].\$return_dist

Minimum: 0 Default: 2000 Maximum: 2000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location:

\$THSCHEDULE [1].\$re_termtyp

Minimum: 1 Default: 1 Maximum: 5
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes take effect immediately.

User Interface Location: 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].\$return_spd

Minimum: 0 Default: 100 Maximum: 1000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Search motion Return Speed.

Description: Defines the search return speed when \$auto_return is set to TRUE.

Power Up: Changes take effect immediately.

User Interface Location: 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: 0 Default: 100 Maximum: 2000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location: 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: 1 Default: 32 Maximum: 32
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes take effect immediately.

User Interface Location: 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: 0 Default: 1 Maximum: 32
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes take effect immediately.

User Interface Location: 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: 0 Default: 50 Maximum: 500
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location: 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: 0 Default: 1 Maximum: 32

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes take effect immediately.

User Interface Location: 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

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:

User Interface Location: SYSTEM Variables screen

\$TIMER[1].\$comment

Minimum: "" Default: "" Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: Timer Comment

Description: Text used to describe the use of the timer.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TIMER[1].\$end_ept_idx

Minimum: 0 Default: 65535 Maximum: 65535
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Reserved for Internal use by FANUC Robotics

Description: Reserved for Internal use by FANUC Robotics

Power Up:

User Interface Location: SYSTEM Variables screen

\$TIMER[1].\$end_lin_num

Minimum: 0 Default: 0 Maximum: 65535
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Timer Ending Line Number

Description: Line number where the timer stopped.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TIMER[1].\$str_ept_idx

Minimum: 0 Default: 65535 Maximum: 65535
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Reserved for Internal use by FANUC Robotics.

Description: Reserved for Internal use by FANUC Robotics.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TIMER[1].\$str_lin_num

Minimum: 0 Default: 0 Maximum: 65535
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: SHORT

Name: Timer Starting Line Number

Description: The line number where the timer started.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TIMER[1].\$tid_num

Minimum: 0 Default: 0 Maximum: 255
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: UBYTE

Name: Task ID which uses the program timer

Description: This field stores the task ID which uses the program timer.

Power Up:

User Interface Location: This field is for internal use only.

\$TIMER[1].\$timer_val

Minimum: 0 Default: 0 Maximum: 0x7ffffff
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Timer Value

Description: Indicates the count, in ms, since the timer started.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TMI_CHAN

Minimum: 0 Default: 32 Maximum: 32
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Channels

Description: The number of simultaneous open connections which MOTET can support.

Power Up: Requires a cold start to take effect.

User Interface Location: SYSTEM Variables 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_DBGLVL

Minimum: 0 Default: 0 Maximum: 5

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables 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_ETHERAD

Minimum: "" Default: " " Maximum : ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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: Requires a cold start to take effect.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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: Requires a cold start to take effect.

User Interface Location: 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: "" Default: " " Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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 $0 \leq DDD \leq 255$, 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: Change takes effect immediately.

User Interface Location: SYSTEM Variables 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*

\$TORQCTRL STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

\$TORQCTRL.\$debug

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Debug flag

Description: Not used at all.

Power Up: Changes will not effect the robot.

User Interface Location: SYSTEM Variables screen

\$TORQCTRL.\$grp_stt[1]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: If the value is 1 when the controller is turned ON, torque of that group will be turned on. Otherwise it is left alone.

User Interface Location: SYSTEM Variables screen

\$TORQCTRL.\$sbr_pam21_v[1]

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Only used by torque control function. Should not be changed.

User Interface Location: SYSTEM Variables screen

See Also: \$SBR[axes].\$PARAM[21]

\$TORQCTRL.\$sv_err_mod [1]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Only used by torque control function. Should not be changed.

User Interface Location: SYSTEM Variables screen

\$TORQCTRL.\$sv_err_clr [1]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

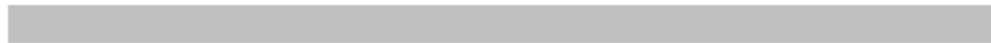
Name: Servo error clear flag

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: Only used by torque control function. Should not be changed.

User Interface Location: SYSTEM Variables screen

See Also:



\$TP_CURSCRN[4] STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

See Also: \$CT_CURSCRN for equivalent information on the CRT/KB

\$TP_CURSCRN[1].\$scrn_id

Minimum: 0 Default: 0 Maximum: 0xFFFFFFFF

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Screen Number of the Current Menu

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

Power Up:

User Interface Location: SYSTEM Variables screen

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

\$TP_CURSCRN [1].\$sp_id

Minimum: 0 Default: 0 Maximum: 0xFFFFFFFF
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

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_DEFPROG

Minimum: "" Default: " " Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: Teach Pendant's Default Program

Description: \$TP_DEFPROG identifies the default program name that is used on the teach pendant.

Power Up: No

User Interface Location: SYSTEM Variables screen, SELECT menu

\$TP_DISPLAY

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Teach Pendant Output Display Device

Description: If set to 1, the display which normally goes to the teach pendant will go to terminal attached to P4. Reserved for Internal use by FANUC Robotics.

Power Up: Yes

User Interface Location: SYSTEM Variables screen

\$TP_INST_MSK[2]

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: No

User Interface Location: SYSTEM Variables screen

\$TP_INUSER

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: BOOLEAN

Name: Teach Pendant is in USER Menu

Description: \$TP_INUSER indicates the USER menu is displayed on the teach pendant. It is used in conjunction with \$TP_LCKUSER to tell a program when the teach pendant menu has been locked to the USER menu.

\$TP_INUSER automatically is set to TRUE whenever the USER menu is displayed on the teach pendant.

Power Up: No

User Interface Location: SYSTEM Variables screen

\$TP_LCKUSER

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Teach Pendant Lock USER Menu

Description: Setting \$TP_LCKUSER = TRUE will allow the KAREL program specified by \$TP_DEFPROG to lock the USER menu on the teach pendant while the program is running. When the USER menu is locked, all function keys are accessible by the program. However, they will be blank unless the program writes to them using the TPFUNC predefined FILE variable.

While the USER menu is locked, the MENUS hardkey will not be active. Therefore, the program has control over which menu is being displayed.

If \$TP_LCKUSER is FALSE or the program is paused or aborted, all system-defined function keys will be displayed and active.

If the USER menu is not being displayed when \$TP_LCKUSER is first set to TRUE, the lock function does not take effect until you select the USER menu on the teach pendant. The value of \$TP_INUSER indicates whether or not the USER menu has been selected. The FORCE_MENU built-in can be used to force the USER menu to be displayed.

Power Up: No

User Interface Location: SYSTEM Variables screen

\$TP_QUICKMEN

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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:

User Interface Location: SYSTEM Variables screen, FCTN - QUICK/FULL MENUS

\$TP_SCREEN

Minimum: "" Default: "tpsc" Maximum: ""

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Teach Pendant Screen

Description: The name of the current screen on the teach pendant.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TP_USERSCRN

Minimum: "" Default: "t_sc" Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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:

User Interface Location: SYSTEM Variables screen

See Also: ACT_SCREEN built-in in the *FANUC Robotics SYSTEM R-J3 Controller application-specific Reference Manual*.

\$TP_USESTAT

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Teach Pendant Status Line in USER Menu

Description: Setting \$TP_USESTAT = TRUE will allow the KAREL program specified by \$TP_DEFPROG to control the status line in the USER menu on the teach pendant while the program is running. The status line will be blank unless the program writes to it using the TPSTATUS predefined FILE variable.

If \$TP_USESTAT is FALSE, or the program is paused or aborted, the system-defined status line will be displayed and updated.

Power Up: No

User Interface Location: SYSTEM Variables screen

\$TP_WATCHDOG

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: This is referred only once in a power up sequence.

User Interface Location: System Variables screen

\$TPE_DETAIL

Minimum: 0 Default: 0 Maximum: 1


KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen



\$TPP_MON STRUCTURE

Name: TPP monitor

Description: This system variable is used to TPP monitor function.

Power Up: Takes effect after the controller is turned ON.

User Interface Location: SYSTEM Variables screen

\$ TPP_MON.\$global_mt

Minimum: 0 Default: 0 Maximum: 10

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Takes effect after the controller is turned ON.

User Interface Location: SYSTEM Variables screen

\$TPP_MON.\$gmon_tid

Minimum: 0 Default: 0 Maximum: 16

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Global monitor task id

Description: For internal use only. Do not modify this system variable. The task number of global monitor.

Power Up: Takes effect after the controller is turned ON

User Interface Location: Do not modify this system variable.

\$T PP_MON.\$local_mt

Minimum: 1 Default: 1 Maximum: 10

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

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: Takes effect after the controller is turned ON.

User Interface Location: SYSTEM Variables screen

\$TP P_MON.\$mon_num

Minimum: 1 Default: 50 Maximum: LIM_MONNUM_C

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: Number of monitors

Description: For internal use only. Do not modify this system variable.

Power Up: Takes effect after the controller is turned ON.

User Interface Location: SYSTEM Variables screen

\$TPP_MON.\$sysmon_adr

Minimum: 0 Default: 0 Maximum: 0

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: INTEGER

Name: System monitor address

Description: For internal use only. Do not modify this system variable.

Power Up: Takes effect after the controller is turned ON

User Interface Location: SYSTEM Variables screen SYSTEM Variables screen

\$TSR_GRP STRUCTURE

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:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$ma_brk_mgn[9]

Minimum: -100000.0 Default: 1.0 Maximum: 100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Motor Acceleration Break Margin

Description: Defines the acceleration torque safety margin at the break in the torque vs. velocity curve.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$ma_grav_mgn[9]

Minimum: -100000.0 Default: 1.0 Maximum: 100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Motor Acceleration Gravity Margin

Description: Defines a scale of the acceleration load torque due to the effect of gravity

Power Up:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$ma_load_torque[9]

Minimum: -100000.0 Default: 0.0 Maximum: 100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$md_load_torque[9]

Minimum: -100000.0 Default: 0.0 Maximum: 100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$ma_stal_mgn[9]

Minimum: -100000.0 Default: 1.0 Maximum: 100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Motor Acceleration Stall Margin

Description: Defines the motor acceleration torque safety margin at stall or zero velocity.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$mc_acc_mgn[9]

Minimum: -100000.0 Default: 1.0 Maximum: 100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Cartesian Motor Acceleration Margin

Description: Defines a scale factor to be used with linear motion accelerations.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$mc_brk_mgn[9]

Minimum: -100000.0 Default: 1.0 Maximum: 100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$mc_stal_mgn[9]

Minimum: -100000.0 Default: 1.0 Maximum: 100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Cartesian Motor Stall Margin

Description: Defines the motor torque safety margin for cartesian motions at stall or zero velocity.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$md_brk_mgn[9]

Minimum: -100000.0 Default: 1.0 Maximum: 100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Motor Deceleration Break Margin

Description: Defines the deceleration torque safety margin at the break in the torque vs. velocity curve.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$md_grav_mg n[9]

Minimum: -100000.0 Default: 1.0 Maximum: 100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Motor Deceleration Gravity Margin

Description: Defines a scale of the deceleration load torque due to the effect of gravity

Power Up:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$md_stal_mg n[9]

Minimum: -100000.0 Default: 1.0 Maximum: 100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Motor Deceleration Stall Margin

Description: Defines the motor deceleration torque safety margin at stall or zero velocity.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$min_c_id_e1

Minimum: "" Default: "12345678" Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: Mincycle Version ID extra_1

Description: Reserved for Internal use by FANUC Robotics.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$min_c_id_e2

Minimum: "" Default: "12345678" Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: Mincycle Version ID extra_2

Description: Reserved for Internal use by FANUC Robotics.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$min_c_id_e3

Minimum: "" Default: "12345678" Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: Mincycle Version ID extra_3

Description: Reserved for Internal use by FANUC Robotics.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$min_cyc_id

Minimum: "" Default: "12345678" Maximum: ""

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

Name: Mincycle Version ID

Description: Used to determine the mincycle parameter version.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$mj_acc_mgn[9]

Minimum: -100000.0 Default: 1.0 Maximum: 100000.0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Joint Filter Acceleration Margin

Description: Defines a scale factor for use with non-filter acceleration.

Power Up:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$mr_brk_trq[9]

Minimum: -100000.0 Default: 2.0 Maximum: 100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$mr_brk_vel[9]

Minimum: -100000.0 Default: 2.0 Maximum: 100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$mr_max_trq[9]

Minimum: -100000.0 Default: 2.0 Maximum: 1000000.
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$mr_nold_ve I[9]

Minimum: -100000.0 Default: 5.0 Maximum: 100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$TSR_GRP[1].\$mr_stal_tr q[9]

Minimum: -100000.0 Default: 2.0 Maximum: 100000.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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:

User Interface Location: SYSTEM Variables screen

\$UALRM_MSG[10]

Minimum: "" Default: "" Maximum: ""
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: STRING

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen, ALARM screen

\$UALRM_SEV[10]

Minimum: 0 Default: 6 Maximum: 255
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BYTE

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: Changes to this system variable take effect immediately.

User Interface Location: SYSTEM Variables screen.

\$UNDO_CFG STRUCTURE

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: Power up is required after changing these variables.

User Interface Location: SYSTEM variable screen.

\$UNDO_CFG.\$undo_enb

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Undo Function Enable/Disable Switch

Description: 1: Enable undo function
0: Disable undo function

Power Up: Power up is required after changing this variable.

User Interface Location: SYSTEM variable screen

\$UNDO_CFG.\$warn_enb

Minimum: 0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Power up is required after changing this variable.

User Interface Location: SYSTEM variable screen

\$USEUFRAME

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen, Teach Pendant and KAREL Editor

See Also: \$MNUFRAME, \$MNUFRAMENUM

\$USRTOL_ENB

Minimum: 0 Default: 1 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes to this variable take effect immediately

User Interface Location: SYSTEM Variables screen

\$USRTOL_MENU

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: NO Program: NO GET/SET_VAR: NO Data Type: BOOLEAN

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: Changes to this variable take effect immediately

User Interface Location: This is internal data.

\$USRTOL_GRP[5] STRUCTURE

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen.

\$USRTOL_GRP[1].\$enable

Minimum: 0.0 Default: 1 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen.

\$USRTOL_GRP[1].\$dist_tol

Minimum: 0.1 Default: 250 Maximum: 1000
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Position xyz tolerance

Description: Distance tolerance between robot current TCP and stop position. (Units in mm.)

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen.

\$USRTOL_GRP[1].\$ornt_tol

Minimum: 0.1 Default: 20 Maximum: 80
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Position xyz tolerance

Description: Orientation tolerance between robot current TCP and stop position. (Units in degrees.)

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen.

\$USRTOL_GRP[1].\$raux_tol

Minimum: 0.1 Default: 20 Maximum: 80

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen.

\$USRTOL_GRP[1].\$taux_tol

Minimum: 0.1 Default: 250 Maximum: 1000

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: Translational axes tolerance

Description: The distance tolerance between current robot position and the stop position for translational axes (including aux. axes).

Power Up: Changes take effect immediately.

User Interface Location: SYSTEM Variables screen.

\$VC_MORGRP STRUCTURE

Name: AccuPath Status Variable Structure

Description: This is the AccuPath status variable. Refer to the descriptions of the individual fields that follow.

Power Up: System updates dynamically. It is status data and not setup data.

User Interface Location: SYSTEM Variables screen.

\$VC_MORGRP[1] . \$hist_cdists[1-20]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: System updates dynamically. It is status data and not setup data.

User Interface Location: SYSTEM Variables screen.

See Also: \$hist_index, \$hist_progid[], \$hist_lineno[],

\$VC_MORGRP[1] . \$hist_cspspeed[1-20]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: System updates dynamically. It is status data and not setup data.

User Interface Location: SYSTEM Variables screen.

See Also: \$hist_index, \$hist_progid[], \$hist_lineno[],

\$VC_MORGRP[1] . \$hist_index

Minimum: 0 Default: 0 Maximum: 20

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: System updates dynamically. It is status data and not setup data.

User Interface Location: 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: 0 Default: 0 Maximum: -1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: System updates dynamically. It is status data and not setup data.

User Interface Location: SYSTEM Variables screen.

See Also: \$hist_index, \$hist_progid[], \$hist_short[], \$hist_cspeed[], \$hist_cdist[], \$hist_orndom[]

\$VC_MORGRP[1] . \$hist_orndom[1-20]

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: System updates dynamically. It is status data and not setup data.

User Interface Location: SYSTEM Variables screen.

See Also: \$hist_index, \$hist_progid[], \$hist_lineno[],

\$VC_MORGRP[1] . \$hist_progid[1-20]

Minimum: 0 Default: 0 Maximum: -1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: System updates dynamically. It is status data and not setup data.

User Interface Location: SYSTEM Variables screen.

See Also: \$hist_index, \$hist_lineno[], \$hist_short[], \$hist_cspped[], \$hist_cdist[], \$hist_orndom[]

\$VC_MORGRP[1].\$hist_short[1-20]

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: System updates dynamically. It is status data and not setup data.

User Interface Location: SYSTEM Variables screen.

See Also: \$hist_index, \$hist_progid[], \$hist_lineno[],

\$VC_MORGRP[1].\$speed

Minimum: 0.0 Default: 0.0 Maximum: 10000.0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: TCP speed information

Description: TCP speed in mm/sec is updated dynamically when AccuPath is active.

Power Up: System updates the current command TCP speed dynamically.

User Interface Location: SYSTEM Variables screen.

\$VC_PARAMGRP STRUCTURE

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen.

\$VC_PARAMGRP[1].\$cnstnt_spd

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen.

\$VC_PARAMGRP[1].\$dcdh_ratio

Minimum: 0.0 Default: 1.0 Maximum: 1.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen.

\$VC_PARAMGRP[1].\$hist_spdlim

Minimum: 0 Default: 100 Maximum: 100
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen.

\$VC_PARAM GRP[1].\$shortmo_imp

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen.

\$VC_PARAM GRP[1].\$shrt_ratio

Minimum: 0.0 Default: 1.0 Maximum: 1.0

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variables screen.

\$VC_PARAM GRP[1].\$warnmessenb

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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: Changes to this variable take effect immediately.

User Interface Location: SYSTEM Variable screen

\$VDATE

Minimum: "" Default: "12/03/95" Maximum: ""

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Software Release Date

Description: Displays the application software release date.

Power Up: This variable cannot be changed.

User Interface Location: STATUS Version IDs screen

\$VERSION

Minimum: "" Default: "V4.2038 12/03/95" Maximum: ""

KCL/Data: RO Program: RO GET/SET_VAR: RO Data Type: STRING

Name: Software Build Version

Description: Displays the software build version and build date.

Power Up: This variable cannot be changed.

User Interface Location: STATUS Version IDs screen

\$VISIONMOUT

Minimum: 0 Default: 3000 Maximum: 0x7FFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: Vision Timeout

Description: Not currently used.

Power Up:

User Interface Location: SYSTEM Variables screen

\$WAITTMOUT

Minimum: 0 Default: 3000 Maximum: 0x7FFF

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

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:

User Interface Location: SYSTEM Variables screen

\$WAITRELEASE

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

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:

User Interface Location: FCTN WAIT RELEASE

\$WVWRIST.\$deb ug

Minimum: 0x80000000 Default: 0 Maximum: 0x7FFFFFFF
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: INTEGER

Name: debug

Description: Internal use only.

Power Up: Changes to this system variable take effect immediately.

User Interface Location:

\$WVWRIST.\$run_ang

Minimum: -90.0 Default: 10.0 Maximum: 90.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

Name: run_ang

Description: System returns the actual angle between the TOOL Z-X plane and the TOOL Z-PATH during execution.

Power Up: The change to this system variable takes effect immediately.

User Interface Location:

\$WVWRIST.\$tol_ang

Minimum: 0.0 Default: 10.0 Maximum: 90.0
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: REAL

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: The change to this system variable takes effect immediately.

User Interface Location:

See Also: \$run_ang definition.

\$WVWRIST.\$wrist_enb

Minimum: 0 Default: 0 Maximum: 1
KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: wrist_enb

Description: 1: wrist axis weaving is enabled.
0: wrist axis weaving is disabled. (default)

Power Up: The change to this system variable takes effect immediately.

User Interface Location:

See Also: Wrist Axes Weaving

\$WVWRIST.\$wst_accel1

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Wrist Acceleration 1

Description: Defines acceleration time for wrist axes motion during wrist axes weave operation.

Power Up: Changes take effect after power up.

\$WVWRIST.\$wst_accel2

Minimum: 0 Default: 0 Maximum: 1

KCL/Data: RW Program: RW GET/SET_VAR: RW Data Type: BOOLEAN

Name: Wrist Acceleration 2

Description: Defines acceleration 2 time for wrist axes motion during wrist axes weave operation.

Power Up: Changes take effect after power up.