The Americas YASKAWA Representative

- 24-hour Telephone Number: **(937) 847-3200**
  Use for urgent or emergency needs for technical support, service and/or replacement parts
- Routine Technical Inquiries: *techsupport@motoman.com*
  Allow up to 36 hours for response

YASKAWA

YRC1000micro OPTIONS INSTRUCTIONS

FOR Concurrent I/O

Upon receipt of the product and prior to initial operation, read these instructions thoroughly, and retain for future reference.

MOTOMAN INSTRUCTIONS

MOTOMAN-□□□ INSTRUCTIONS
YRC1000micro INSTRUCTIONS
YRC1000micro OPERATOR'S MANUAL
YRC1000micro MAINTENANCE MANUAL
YRC1000micro ALARM CODES (MAJOR ALARMS) (MINOR ALARMS)

Have the following information available when contacting the YASKAWA Representative:

- System
- Primary Application
- Software Version *(Located on Programming Pendant by selecting: {Main Menu} - {System Info} - {Version})*
- Warranty ID *(Located on Robot Controller)*
- Robot Serial Number *(Located on Manipulator data plate)*
- Robot Sales Order Number *(Located on Robot controller data plate)*

MANUAL NO. RE-CKI-A469 ②

Part Number: 181275-1CD
Revision: 2

DANGER

- This manual explains the Concurrent I/O of the YRC1000micro system. Read this manual carefully and be sure to understand its contents before handling the YRC1000micro. Any matter not described in this manual must be regarded as “prohibited” or “improper”.
- General information related to safety are described in “Chapter 1. Safety” of the YRC1000micro INSTRUCTIONS. To ensure correct and safe operation, carefully read “Chapter 1. Safety” of the YRC1000micro INSTRUCTIONS.

CAUTION

- In some drawings in this manual, the protective covers or shields are removed to show details. Make sure to install all the covers and shields in place before operating this product.
- YASKAWA is not responsible for incidents arising from unauthorized modification of its products. Unauthorized modification voids the product warranty.

NOTICE

- The drawings and photos in this manual are representative examples and differences may exist between them and the delivered product.
- YASKAWA may modify this model without notice when necessary due to product improvements, modifications, or changes in specifications. If such modification is made, the manual number will also be revised.
- If your copy of the manual is damaged or lost, contact a YASKAWA representative to order a new copy. Be sure to tell the representative the manual number listed on the front cover.

Notes for Safe Operation

Read this manual carefully before installation, operation, maintenance, or inspection of the YRC1000micro.

In this manual, the Notes for Safe Operation are classified as “DANGER”, “WARNING”, “CAUTION”, or “NOTICE”.

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. Safety Signs identified by the signal word DANGER should be used sparingly and only for those situations presenting the most serious hazards.

Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury. Hazards identified by the signal word WARNING present a lesser degree of risk of injury or death than those identified by the signal word DANGER.

Indicates a hazardous situation, which if not avoided, could result in minor or moderate injury. It may also be used without the safety alert symbol as an alternative to “NOTICE”.

NOTICE is the preferred signal word to address practices not related to personal injury. The safety alert symbol should not be used with this signal word. As an alternative to “NOTICE”, the word “CAUTION” without the safety alert symbol may be used to indicate a message not related to personal injury.

Even items described as “CAUTION” may result in a serious accident in some situations.
At any rate, be sure to follow these important items.

To ensure safe and efficient operation at all times, be sure to follow all instructions, even if not designated as “DANGER”, “WARNING” and “CAUTION”.

DANGER

- Before operating the manipulator, make sure the servo power is turned OFF by performing the following operations. When the servo power is turned OFF, the SERVO ON LED on the programming pendant is turned OFF.
  - Press the emergency stop button on the programming pendant or on the external control device, etc.
  - Disconnect the safety plug of the safety fence. (when in the play mode or in the remote mode).

If operation of the manipulator cannot be stopped in an emergency, personal injury and/or equipment damage may result.

Fig. : Emergency Stop Button

- Before releasing the emergency stop, make sure to remove the obstacle or error caused the emergency stop, if any, and then turn the servo power ON.

Failure to observe this instruction may cause unintended movement of the manipulator, which may result in personal injury.

Fig. : Release of Emergency Stop

- Observe the following precautions when performing a teaching operation within the manipulator's operating range:
  - Be sure to perform lockout by putting a lockout device on the safety fence when going into the area enclosed by the safety fence. In addition, the operator of the teaching operation must display the sign that the operation is being performed so that no other person closes the safety fence.
  - View the manipulator from the front whenever possible.
  - Always follow the predetermined operating procedure.
  - Always keep in mind emergency response measures against the manipulator’s unexpected movement toward a person.
  - Ensure a safe place to retreat in case of emergency.

Failure to observe this instruction may cause improper or unintended movement of the manipulator, which may result in personal injury.

- Confirm that no person is present in the manipulator's operating range and that the operator is in a safe location before:
  - Turning ON the YRC1000micro power
  - Moving the manipulator by using the programming pendant
  - Running the system in the check mode
  - Performing automatic operations

Personal injury may result if a person enters the manipulator's operating range during operation. Immediately press an emergency stop button whenever there is a problem. The emergency stop button is located on the front panel of the YRC1000micro and on the upper right of the programming pendant.

- Read and understand the Explanation of the Warning Labels before operating the manipulator.

DANGER

- In the case of not using the programming pendant, be sure to supply the emergency stop button on the equipment. Then before operating the manipulator, check to be sure that the servo power is turned OFF by pressing the emergency stop button.
  Connect the external emergency stop button to the 4-14 pin and 5-15 pin of the robot system signal connector (CN2).
- Upon shipment of the YRC1000micro, this signal is connected by a jumper cable in the dummy connector. To use the signal, make sure to supply a new connector, and then input it. If the signal is input with the jumper cable connected, it does not function, which may result in personal injury or equipment damage

WARNING

- Perform the following inspection procedures prior to conducting manipulator teaching. If there is any problem, immediately take necessary steps to solve it, such as maintenance and repair.
  - Check for a problem in manipulator movement.
  - Check for damage to insulation and sheathing of external wires.
- Return the programming pendant to a safe place after use.
- If the programming pendant is left unattended on the manipulator, on a fixture, or on the floor, etc., the Enable Switch may be activated due to surface irregularities of where it is left, and the servo power may be turned ON. In addition, in case the operation of the manipulator starts, the manipulator or the tool may hit the programming pendant left unattended, which may result in personal injury and/or equipment damage.

Definition of Terms Used Often in This Manual

The MOTOMAN is the YASKAWA industrial robot product.

The MOTOMAN usually consists of the manipulator, the YRC1000micro controller, manipulator cables, the YRC1000micro programming pendant (optional), and the YRC1000micro programming pendant safety signal short circuit connector (optional).

In this manual, the equipment is designated as follows.

Equipment	Manual Designation
YRC1000micro controller	YRC1000micro
YRC1000micro programming pendant	Programming pendant (optional)
Cable between the manipulator and the controller	Manipulator cable
YRC1000micro programming pendant safety signal short circuit connector	Programming pendant safety signal short circuit connector (optional)

Descriptions of the programming pendant keys, buttons, and displays are shown as follows:

Equipment		Manual Designation
Programming Pendant	Character Keys /Symbol Keys	The keys which have characters or symbols printed on them are denoted with [ ]. e.g. [ENTER]
	Axis Keys /Numeric Keys	[Axis Key] and [Numeric Key] are generic names for the keys for axis operation and number input.
	Keys pressed simultaneously	When two keys are to be pressed simultaneously, the keys are shown with a “+” sign between them, e.g. [SHIFT]+[COORD].
	Mode Switch	Mode Switch can select three kinds of modes that are denoted as follows: REMOTE, PLAY or TEACH. (The switch names are denoted as symbols)
	Button	The three buttons on the upper side of the programming pendant are denoted as follows: START, HOLD, or EMERGENCY STOP. (The button names are denoted as symbols)
	Displays	The menu displayed in the programming pendant is denoted with { }. e.g. {JOB}

Description of the Operation Procedure

In the explanation of the operation procedure, the expression “Select • • • “ means that the cursor is moved to the object item and [SELECT] is pressed, or that the item is directly selected by touching the screen.

Registered Trademark

In this manual, names of companies, corporations, or products are trademarks, registered trademarks, or brand names for each company or corporation. The indications of (R) and ^{TM} are omitted.

Contents

1 Concurrent I/O

Concurrent I/O control is an I/O control function that processes controls relative to the YRC1000micro I/O independent of the manipulator operation (in parallel with manipulator operation).

1.1 Features of Concurrent I/O

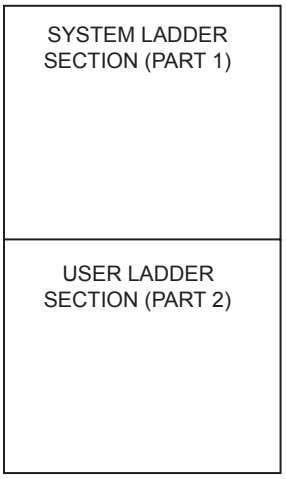
Terminals and connectors to which I/O signals are connected can be used effectively.

- Terminals and connectors are provided for connecting I/O signals.
  - Although the number of connections is limited, the terminals can be used effectively because only the necessary signals can be selected and connected to the desired terminal.
- Instructions relative to the I/O (Robot Language: INFORM III) can be simplified for smooth manipulator operation.
  - Fixed procedures relative to the I/O can be registered as independent ladder programs, thus enabling simplification of I/O instructions of the job (operation program) and reducing interruptions.
- Reserved signals can be accepted while the manipulator is operating.
  - Reserved signals can be accepted during operation since manipulator operation processing and I/O processing can be executed at the same time.

1.2 Construction and Specifications of the Concurrent I/O

The Concurrent I/O consists of the following two blocks.

Fig. 1-1: Construction of Concurrent I/O Ladder Program



System Ladder Section	:	A standard ladder selected for your applications is prepared at the factory. For more information, see *chapter 12 "Standard Ladder Program"* The ladder program cannot be edited.
User Ladder Section	:	Specification of signal connections and interface signal with system ladder are prepared at the factory. The ladder program can be edited including these signals.

Table 1-1: Concurrent I/O Specifications

Item	Contents
Control Method	Scan control by stored program
Programming	Relay ladder program symbology
Scan Time	1 msec
Memory Capacity	1500 steps
Number of Instructions	35 types
GP Input Port	4096 points (Concurrent I/O → Manipulator Control Section)
GP Output Port	4096 points (Concurrent I/O ← Manipulator Control Section)
Specific Input Port	2048 points including unspecified signals (Concurrent I/O → Manipulator Control Section)
Specific Output Port	4096 points including unspecified signals (Concurrent I/O ← Manipulator Control Section)
Hardware Status Signal Points	4096 points (Concurrent I/O ← Manipulator Control Section)
Auxiliary Relays	7992 points
External Inputs	1024 points
External Outputs	1024 points
Register **(Numeric Data)**	GP Register 560 points (0-65535) System Register 360 points (0-65535) Analog output register 40 points (0-65535) Analog input register 40 points (0-65535)
Pseudo Input Signal Points	160 points (Concurrent I/O ← System Parameter)
Power Failure Protective Function	Ladder Program (Battery Back-Up) Output status is reset.
Diagnostic Functions	Error Detection of CPU, system program and ladder programs. Ladder programming error detection as follows: - Double Use of Output Relay - No END Instruction - Circuit Error - Format Error - Exceeded Program Capacity
Monitor Function	Monitor each signal status in concurrent I/O ON CRT window.

- Although the scan time is as mentioned above, please keep ON or OFF status of the inputting signal sufficiently longer than the scan time so that the signal is correctly recognized.
- When sending or receiving multiple-bit binary data, unexpected data may be sent or received due to an improper signal caused by a board failure, etc.
  When sending or receiving binary data, confirm the setting of parity check and check the signal in the JOB.

2 Classification of I/O Signals

Table 2-1: Classification of I/O Signals

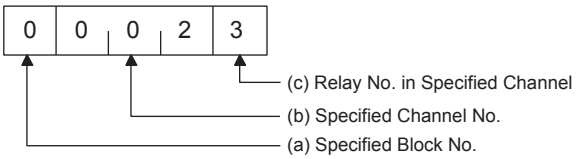
Logic Name	Classification	Description	Range
0 xxxx	GP Input	Referenced with input instruction of the job	00010 - 05127 (4096 signals)
1 xxxx	GP Output	Referenced with output instruction of the job	10010 - 15127 (4096 signals)
2 xxxx	External Input	Signal No. corresponding to the input terminal	20010 - 21287 (1024 signals)
3 xxxx	External Output	Signal No. corresponding to the output terminal	30010 - 31287 (1024 signals)
4 xxxx	Specific Input	Signal to change the operating condition of the robot	40010 - 42567 (2048 signals)
5 xxxx	Specific Output	Signal notifying the operating condition of the robot	50010 - 55127 (4096 signals)
6 xxxx	Interface Panel Input	Signal notifying the operating condition of the interface panel	60010 - 60647 (512 signals)
7 xxxx	Auxiliary Relay	Auxiliary relay in the concurrent I/O	70010 - 79997 (7992 signals)
80 xxx to 85 xxx	Control Status	Monitoring of the hardware signal status of the robot control section	80010 - 85127 (4096 signals)
87 xxx	Pseudo Input	Pseudo input relay reading from the system parameter	87010 - 87207 (160 signals)
27 xxx to 29 xxx	Network Input	Input signal from the network device	27010 - 29567 (2048 signals)
37 xxx to 39 xxx	Network Output	Input signal to the network device	37010 - 39567 (2048 signals)
M xxx	Register	1 word data (16 bits) GP Register: M000 - M559 Analog Output Register: M560 - M599 Analog Input Register: M600 - M639 System Register: M640 - M999	M000 - M999 (1000 signals)

2.1 I/O Signals

2.1.1 Meaning of Number

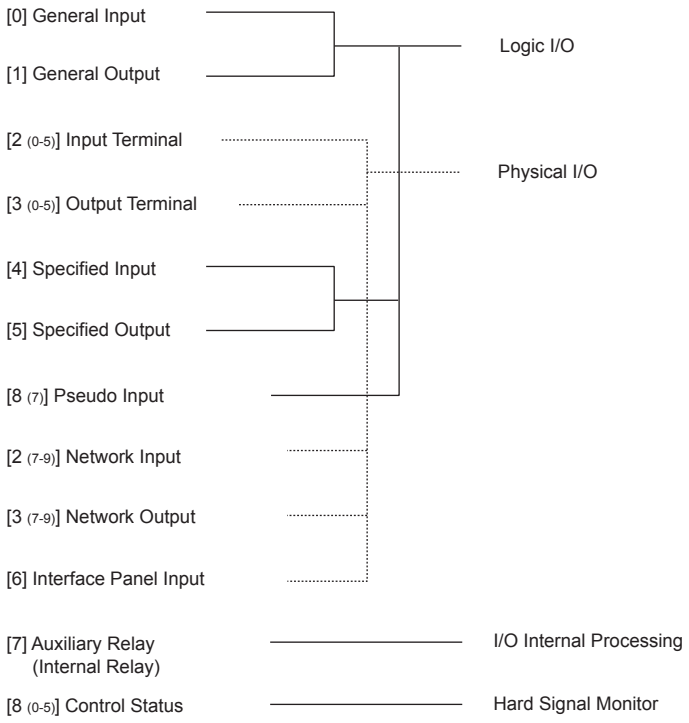
The I/O processing part and the manipulator operation processing part are connected by “Logical I/O”. However, for the function, they are separated as a quite independent function. How to handle each signal is also different from the manipulator operation processing part.

In ladder programming, to specify each signal unitedly, the number is set to as follows. “Relay number” is specified by the numerical value of five digits. This numerical value is composed of the following three information.



1. Specified Block Number

   This is divided into the following block.



2. Specified Channel Number
   Eight signals are defined as one channel.

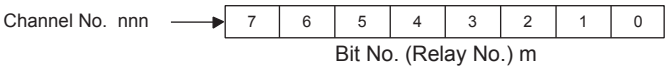
   – [001] Last eight signals

   ↓

   – [nnn] Last eight signals

   Refer to the under mentioned table for concrete channel number.

3. Relay Number in Specified Channel
   One of eight signals is specified by numerical value (0-7).



   – As for each block, a minimum digit is specified by the numerical value to 0-7 for a relay number as understood from the table. In a word, it is a serial number which omits 8 and 9.

   – Moreover, the first relay number of each block starts from xxx10 because channel number enters between digits of 10, 100, and 1000.
   The relay number will be specified by the numerical value of the fifth digit in the frame.
   Block Number: 0
   Relay Number: 0 nnn m

nn:										
Channel01 →	00019	00018	00017	00016	00015	00014	00013	00012	00011	00010
Channel02 →	00029	00028	00027	00026	00025	00024	00023	00022	00021	00020
Channel03 →	00039	00038	00037	00036	00035	00034	00033	00032	00031	00030
Channel04 →	00049	00048	00047	00046	00045	00044	00043	00042	00041	00040
Channel05 →	00059	00058	00057	00056	00055	00054	00053	00052	00051	00050
Channel06 →	00069	00068	00067	00066	00065	00064	00063	00062	00061	00060

There are no relays which correspond to these numbers.
(These numbers cannot be used.)

NOTE The relay is occasionally treated by the units (8 bits) of the byte (channel) or the units (16bits) of the word.

2.2 Register

The register is data of each every word (16 bits).

GP register (M000 - M559) and analog output register (M560 - M599) are readable and writable.

System register (M640 - M999) and analog input register (M600 - M639) are readable only, and the data is set by the system.

NOTE

The register is treated by the unit of one word (16 bits).

Therefore, it is not possible to handle it by the bit specification instruction (STR, AND, OR, and OUT, etc.) and the PLS instructions, etc.

1. GP Register

This is composed of one word (16 bits).

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
M000																
M001																
:								:								
M559																

2. System Register

This is composed of one word (16 bits).

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
M640																
M641																
:								:								
M999																

3. Analog Output Register

This is composed of one word (16 bits). The analog output registers (M560 - M599) correspond to the analog outputs 1 to 40. Since an analog output board with different digital resolution (D/A circuit) is used in common with the analog output register, the data below the resolution is cut off at output.

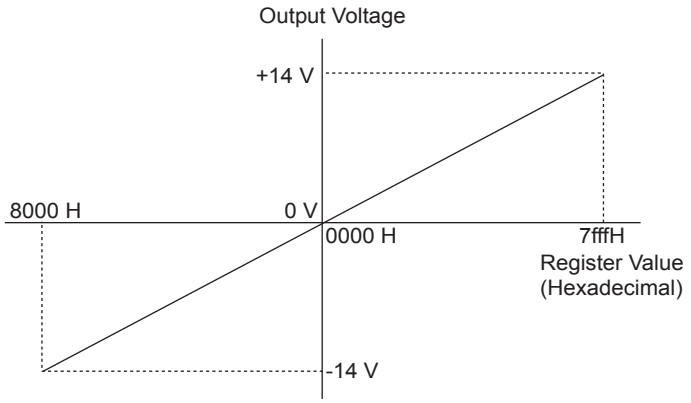
Analog output	Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
AOUT01	M560																
AOUT02	M561																
:	:								:								
AOUT40	M599																

4. Resolution and Valid Data

8-bit resolution : Bit 8 to Bit 15 are valid data.
12-bit resolution: Bit 4 to Bit 15 are valid data.
16-bit resolution: Bit 0 to Bit 15 are valid data.

Resolution	Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
8-bit		■	■	■	■	■	■	■	■								
12-bit		■	■	■	■	■	■	■	■	■	■	■	■				
16-bit		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Regardless of the resolution, the register value per 1 V is:
1 (V) = 32767 (7fffH) / 14 (V) ≒ 2340 (924H)



SUPPLE -MENT

Analog output board (optional) uses a 12-bit resolution D/A circuit.

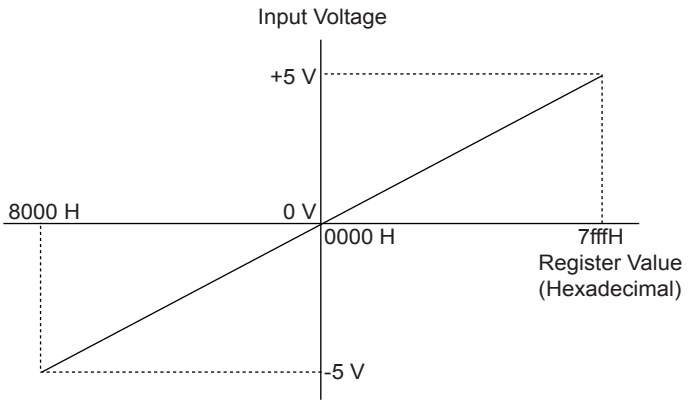
5. Analog Input Register

This is composed of one word (16 bits). The analog input registers (M600 - M639) correspond to the analog inputs 1 to 40.

Analog input	Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
AIN01	M600																
AIN02	M601																
:	:								:								
AIN40	M639																

The register value per 1 V is:

1 (V) = 32767 (7fffH) / 5 (V) ≒ 6553 (1999H)



6. Numeric Data

   – Binary number is the one that the numeric data was expressed by 1(ON) and 0(OFF).

   – Internal data of a usual computer is expressed by the binary number.

   – On the other hand, BCD (Binary Code Decimal) makes one digit of the decimal number by using four bits of the binary number, that is, four digits, combines these, and shows the decimal number.

   – The equipment connected with YRC1000micro occasionally uses BCD as an input and a output signal. When transferring the data between these, it is necessary to convert BCD into the binary number when YRC1000micro receives the data, and it is necessary to convert the binary number into BCD when outputting the data to the equipment.

   – It is possible to convert the data by BIN and the BCD instruction in the concurrent I/O function.

Table 2-2: Binary Number

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^{9}	2^{8}	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}

Table 2-3: BCD

	←Digit of 1000→				←Digit of 100→				←Digit of 10→				←Digit of 1→			
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	2^{3}	2^{2}	2^{1}	2^{0}	2^{3}	2^{2}	2^{1}	2^{0}	2^{3}	2^{2}	2^{1}	2^{0}	2^{3}	2^{2}	2^{1}	2^{0}

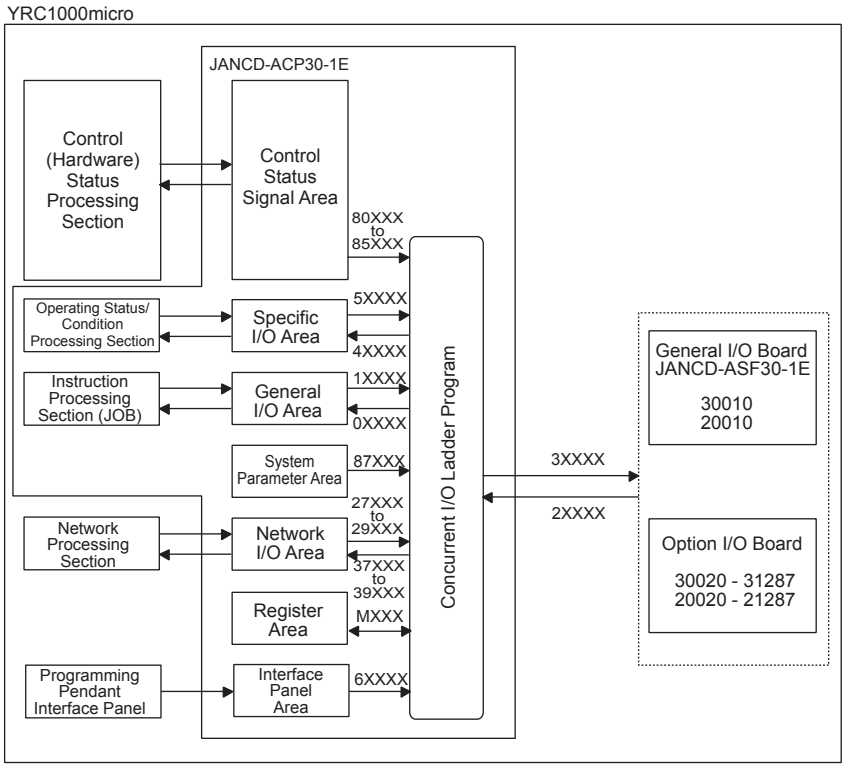
Table 2-4: Binary Number and BCD Expression of the Decimal Number

Decimal Number	Binary	BCD
1	0000 0000 0000 0001	0000 0000 0000 0001

Decimal Number	Binary	BCD
12	0000 0000 0000 1100	0000 0000 0001 0010
123	0000 0000 0111 1011	0000 0001 0010 0011
1234	0000 0100 1101 0010	0001 0010 0011 0100

3 Configuration of I/O Signals

3.1 Material Handling, Press Tending, Cutting, and Other Applications



How to Monitor Signal Status

To monitor a signal, verify the signal status of the signal logic number in the I/O monitor window (refer to *chapter 13.1.1 "I/O Windows"*).

4 Specific I/O Signals

4.1 Specific Input Signals for All Applications

40017	40016	40015	40014	40013	40012	40011	40010
SIN#008	SIN#007	SIN#006	SIN#005	SIN#004	SIN#003	SIN#002	SIN#001
	SAFETY SPEED		ALARM RESET	USER MESSAGE REQUEST	USER ALARM REQUEST	SYSTEM MESSAGERE QUEST	SYSTEM ALARM REQUEST

40027	40026	40025	40024	40023	40022	40021	40020
SIN#016	SIN#015	SIN#014	SIN#013	SIN#012	SIN#011	SIN#010	SIN#009
		SUB TASK 5 ALARM REQUEST	SUB TASK 4 ALARM REQUEST	SUB TASK 3 ALARM REQUEST	SUB TASK 2 ALARM REQUEST	SUB TASK 1 ALARM REQUEST	

40037	40036	40035	40034	40033	40032	40031	40030
SIN#024	SIN#023	SIN#022	SIN#021	SIN#020	SIN#019	SIN#018	SIN#017

40047	40046	40045	40044	40043	40042	40041	40040
SIN#032	SIN#031	SIN#030	SIN#029	SIN#028	SIN#027	SIN#026	SIN#025
PROHIBIT WEAVING	CHECK RUN	EXT SERVO ON	EXT START		CMD REMOTE SELECT	PLAY MODE SEL	TEACH MODE SEL

40057	40056	40055	40054	40053	40052	40051	40050
SIN#040	SIN#039	SIN#038	SIN#037	SIN#036	SIN#035	SIN#034	SIN#033
PROHIBIT I/O	PROHIBIT PP		EXT SERVO OFF 3 (E-STOP CATEGORY 1)		CONTINUE CYCLE SELECT	1 CYCLE SELECT	STEP CYCLE SELECT

40067	40066	40065	40064	40063	40062	40061	40060
SIN#048	SIN#047	SIN#046	SIN#045	SIN#044	SIN#043	SIN#042	SIN#041
EXT HOLD	EXT SERVO OFF 2 (E-STOP CATEGORY 0)	EXT SERVO OFF 1 HOLD STOP	EDIT LOCK	OT RELEASE REQ		SHOCK DETECTION INVALID	MACHINE LOCK

40077	40076	40075	40074	40073	40072	40071	40070
SIN#056	SIN#055	SIN#054	SIN#053	SIN#052	SIN#051	SIN#050	SIN#049
		SUB MASTER JOB 5 CALL	SUB MASTER JOB 4 CALL	SUB MASTER JOB 3 CALL	SUB MASTER JOB 2 CALL	SUB MASTER JOB 1 CALL	MASTER JOB CALL

40087	40086	40085	40084	40083	40082	40081	40080
SIN#064	SIN#063	SIN#062	SIN#061	SIN#060	SIN#059	SIN#058	SIN#057

40097	40096	40095	40094	40093	40092	40091	40090
SIN#072	SIN#071	SIN#070	SIN#069	SIN#068	SIN#067	SIN#066	SIN#065
						STEP BACK R2J	STEP BACK R1J

40107	40106	40105	40104	40103	40102	40101	40100
SIN#080	SIN#079	SIN#078	SIN#077	SIN#076	SIN#075	SIN#074	SIN#073

40117	40116	40115	40114	40113	40112	40111	40110
SIN#088	SIN#087	SIN#086	SIN#085	SIN#084	SIN#083	SIN#082	SIN#081

40127	40126	40125	40124	40123	40122	40121	40120
SIN#096	SIN#095	SIN#094	SIN#093	SIN#092	SIN#091	SIN#090	SIN#089

40137	40136	40135	40134	40133	40132	40131	40130
SIN#104	SIN#103	SIN#102	SIN#101	SIN#100	SIN#099	SIN#098	SIN#097
						WAIT JOB SEQ R2J	WAIT JOB SEQ R1J

40147	40146	40145	40144	40143	40142	40141	40140
SIN#112	SIN#111	SIN#110	SIN#109	SIN#108	SIN#107	SIN#106	SIN#105
					WAIT JOB SEQ STATION 3J	WAIT JOB SEQ STATION 2J	WAIT JOB SEQ STATION 1J

40157	40156	40155	40154	40153	40152	40151	40150
SIN#120	SIN#119	SIN#118	SIN#117	SIN#116	SIN#115	SIN#114	SIN#113

40167	40166	40165	40164	40163	40162	40161	40160
SIN#128	SIN#127	SIN#126	SIN#125	SIN#124	SIN#123	SIN#122	SIN#121

40177	40176	40175	40174	40173	40172	40171	40170
SIN#136	SIN#135	SIN#134	SIN#133	SIN#132	SIN#131	SIN#130	SIN#129
						OPE ORG RET R2	OPE ORG RET R1

40187	40186	40185	40184	40183	40182	40181	40180
SIN#144	SIN#143	SIN#142	SIN#141	SIN#140	SIN#139	SIN#138	SIN#137

40197	40196	40195	40194	40193	40192	40191	40190
SIN#152	SIN#151	SIN#150	SIN#149	SIN#148	SIN#147	SIN#146	SIN#145

40207	40206	40205	40204	40203	40202	40201	40200
SIN#160	SIN#159	SIN#158	SIN#157	SIN#156	SIN#155	SIN#154	SIN#153

40217	40216	40215	40214	40213	40212	40211	40210
SIN#168	SIN#167	SIN#166	SIN#165	SIN#164	SIN#163	SIN#162	SIN#161
			SYSTEM ALARM CODE (BINARY)				
		d5	d4	d3	d2	d1	d0

40227	40226	40225	40224	40223	40222	40221	40220
SIN#176	SIN#175	SIN#174	SIN#173	SIN#172	SIN#171	SIN#170	SIN#169
			USER ALARM CODE (BINARY)				
		d5	d4	d3	d2	d1	d0

40237	40236	40235	40234	40233	40232	40231	40230
SIN#184	SIN#183	SIN#182	SIN#181	SIN#180	SIN#179	SIN#178	SIN#177
			SYSTEM MESSAGE CODE (BINARY)				
		d5	d4	d3	d2	d1	d0

40247	40246	40245	40244	40243	40242	40241	40240
SIN#192	SIN#191	SIN#190	SIN#189	SIN#188	SIN#187	SIN#186	SIN#185
		USER MASSAGE CODE (BINARY)					
		d5	d4	d3	d2	d1	d0

40257	40256	40255	40254	40253	40252	40251	40250
SIN#200	SIN#199	SIN#198	SIN#197	SIN#196	SIN#195	SIN#194	SIN#193
		SUB 5 EXT START	SUB 4 EXT START	SUB 3 EXT START	SUB 2 EXT START	SUB 1 EXT START	MASTER EXT START

40267	40266	40265	40264	40263	40262	40261	40260
SIN#208	SIN#207	SIN#206	SIN#205	SIN#204	SIN#203	SIN#202	SIN#201

40277	40276	40275	40274	40273	40272	40271	40270
SIN#216	SIN#215	SIN#214	SIN#213	SIN#212	SIN#211	SIN#210	SIN#209
		SUB 5 EXT HOLD	SUB 4 EXT HOLD	SUB 3 EXT HOLD	SUB 2 EXT HOLD	SUB 1 EXT HOLD	MASTER EXT HOLD

40287	40286	40285	40284	40283	40282	40281	40280
SIN#224	SIN#223	SIN#222	SIN#221	SIN#220	SIN#219	SIN#218	SIN#217

40297	40296	40295	40294	40293	40292	40291	40290
SIN#232	SIN#231	SIN#230	SIN#229	SIN#228	SIN#227	SIN#226	SIN#225

40307	40306	40305	40304	40303	40302	40301	40300
SIN#240	SIN#239	SIN#238	SIN#237	SIN#236	SIN#235	SIN#234	SIN#233

40317	40316	40315	40314	40313	40312	40311	40310
SIN#248	SIN#247	SIN#246	SIN#245	SIN#244	SIN#243	SIN#242	SIN#241

40327	40326	40325	40324	40323	40322	40321	40320
SIN#256	SIN#255	SIN#254	SIN#253	SIN#252	SIN#251	SIN#250	SIN#249

40337	40336	40335	40334	40333	40332	40331	40330
SIN#264	SIN#263	SIN#262	SIN#261	SIN#260	SIN#259	SIN#258	SIN#257

40347	40346	40345	40344	40343	40342	40341	40340
SIN#272	SIN#271	SIN#270	SIN#269	SIN#268	SIN#267	SIN#266	SIN#265

40357	40356	40355	40354	40353	40352	40351	40350
SIN#280	SIN#279	SIN#278	SIN#277	SIN#276	SIN#275	SIN#274	SIN#273

40367	40366	40365	40364	40363	40362	40361	40360
SIN#288	SIN#287	SIN#286	SIN#285	SIN#284	SIN#283	SIN#282	SIN#281

40377	40376	40375	40374	40373	40372	40371	40370
SIN#296	SIN#295	SIN#294	SIN#293	SIN#292	SIN#291	SIN#290	SIN#289

40387	40386	40385	40384	40383	40382	40381	40380
SIN#304	SIN#303	SIN#302	SIN#301	SIN#300	SIN#299	SIN#298	SIN#297

40397	40396	40395	40394	40393	40392	40391	40390
SIN#312	SIN#311	SIN#310	SIN#309	SIN#308	SIN#307	SIN#306	SIN#305

40407	40406	40405	40404	40403	40402	40401	40400
SIN#320	SIN#319	SIN#318	SIN#317	SIN#316	SIN#315	SIN#314	SIN#313

40417	40416	40415	40414	40413	40412	40411	40410
SIN#328	SIN#327	SIN#326	SIN#325	SIN#324	SIN#323	SIN#322	SIN#321

40427	40426	40425	40424	40423	40422	40421	40420
SIN#336	SIN#335	SIN#334	SIN#333	SIN#332	SIN#331	SIN#330	SIN#329

40437	40436	40435	40434	40433	40432	40431	40430
SIN#344	SIN#343	SIN#342	SIN#341	SIN#340	SIN#339	SIN#338	SIN#337

40447	40446	40445	40444	40443	40442	40441	40440
SIN#352	SIN#351	SIN#350	SIN#349	SIN#348	SIN#347	SIN#346	SIN#345

40457	40456	40455	40454	40453	40452	40451	40450
SIN#360	SIN#359	SIN#358	SIN#357	SIN#356	SIN#355	SIN#354	SIN#353

40467	40466	40465	40464	40463	40462	40461	40460
SIN#368	SIN#367	SIN#366	SIN#365	SIN#364	SIN#363	SIN#362	SIN#361

40477	40476	40475	40474	40473	40472	40471	40470
SIN#376	SIN#375	SIN#374	SIN#373	SIN#372	SIN#371	SIN#370	SIN#369

40487	40486	40485	40484	40483	40482	40481	40480
SIN#384	SIN#383	SIN#382	SIN#381	SIN#380	SIN#379	SIN#378	SIN#377

40497	40496	40495	40494	40493	40492	40491	40490
SIN#392	SIN#391	SIN#390	SIN#389	SIN#388	SIN#387	SIN#386	SIN#385

40507	40506	40505	40504	40503	40502	40501	40500
SIN#400	SIN#399	SIN#398	SIN#397	SIN#396	SIN#395	SIN#394	SIN#393

40517	40516	40515	40514	40513	40512	40511	40510
SIN#408	SIN#407	SIN#406	SIN#405	SIN#404	SIN#403	SIN#402	SIN#401

40527	40526	40525	40524	40523	40522	40521	40520
SIN#416	SIN#415	SIN#414	SIN#413	SIN#412	SIN#411	SIN#410	SIN#409
PP BUZZER							

40537	40536	40535	40534	40533	40532	40531	40530
SIN#424	SIN#423	SIN#422	SIN#421	SIN#420	SIN#419	SIN#418	SIN#417

40547	40546	40545	40544	40543	40542	40541	40540
SIN#432	SIN#431	SIN#430	SIN#429	SIN#428	SIN#427	SIN#426	SIN#425

40557	40556	40555	40554	40553	40552	40551	40550
SIN#440	SIN#439	SIN#438	SIN#437	SIN#436	SIN#435	SIN#434	SIN#433

40567	40566	40565	40564	40563	40562	40561	40560
SIN#448	SIN#447	SIN#446	SIN#445	SIN#444	SIN#443	SIN#442	SIN#441
							AUTO BACKUP

40577	40576	40575	40574	40573	40572	40571	40570
SIN#456	SIN#455	SIN#454	SIN#453	SIN#452	SIN#451	SIN#450	SIN#449

40587	40586	40585	40584	40583	40582	40581	40580
SIN#464	SIN#463	SIN#462	SIN#461	SIN#460	SIN#459	SIN#458	SIN#457
							ENERGY SAVER PROHIBITION

40597	40596	40595	40594	40593	40592	40591	40590
SIN#472	SIN#471	SIN#470	SIN#469	SIN#468	SIN#467	SIN#466	SIN#465

40607	40606	40605	40604	40603	40602	40601	40600
SIN#480	SIN#479	SIN#478	SIN#477	SIN#476	SIN#475	SIN#474	SIN#473
							IO TRACE START

40617	40616	40615	40614	40613	40612	40611	40610
SIN#488	SIN#487	SIN#486	SIN#485	SIN#484	SIN#483	SIN#482	SIN#481

40627	40626	40625	40624	40623	40622	40621	40620
SIN#496	SIN#495	SIN#494	SIN#493	SIN#492	SIN#491	SIN#490	SIN#489

40637	40636	40635	40634	40633	40632	40631	40630
SIN#504	SIN#503	SIN#502	SIN#501	SIN#500	SIN#499	SIN#498	SIN#497

40647	40646	40645	40644	40643	40642	40641	40640
SIN#512	SIN#511	SIN#510	SIN#509	SIN#508	SIN#507	SIN#506	SIN#505

40657	40656	40655	40654	40653	40652	40651	40650
SIN#520	SIN#519	SIN#518	SIN#517	SIN#516	SIN#515	SIN#514	SIN#513

40667	40666	40665	40664	40663	40662	40661	40660
SIN#528	SIN#527	SIN#526	SIN#525	SIN#524	SIN#523	SIN#522	SIN#521

40677	40676	40675	40674	40673	40672	40671	40670
SIN#536	SIN#535	SIN#534	SIN#533	SIN#532	SIN#531	SIN#530	SIN#529

40687	40686	40685	40684	40683	40682	40681	40680
SIN#544	SIN#543	SIN#542	SIN#541	SIN#540	SIN#539	SIN#538	SIN#537

40697	40696	40695	40694	40693	40692	40691	40690
SIN#552	SIN#551	SIN#550	SIN#549	SIN#548	SIN#547	SIN#546	SIN#545

40707	40706	40705	40704	40703	40702	40701	40700
SIN#560	SIN#559	SIN#558	SIN#557	SIN#556	SIN#555	SIN#554	SIN#553

40717	40716	40715	40714	40713	40712	40711	40710
SIN#568	SIN#567	SIN#566	SIN#565	SIN#564	SIN#563	SIN#562	SIN#561

40727	40726	40725	40724	40723	40722	40721	40720
SIN#576	SIN#575	SIN#574	SIN#573	SIN#572	SIN#571	SIN#570	SIN#569

40737	40736	40735	40734	40733	40732	40731	40730
SIN#584	SIN#583	SIN#582	SIN#581	SIN#580	SIN#579	SIN#578	SIN#577

40747	40746	40745	40744	40743	40742	40741	40740
SIN#592	SIN#591	SIN#590	SIN#589	SIN#588	SIN#587	SIN#586	SIN#585

40757	40756	40755	40754	40753	40752	40751	40750
SIN#600	SIN#599	SIN#598	SIN#597	SIN#596	SIN#595	SIN#594	SIN#593

40767	40766	40765	40764	40763	40762	40761	40760
SIN#608	SIN#607	SIN#606	SIN#605	SIN#604	SIN#603	SIN#602	SIN#601

40777	40776	40775	40774	40773	40772	40771	40770
SIN#616	SIN#615	SIN#614	SIN#613	SIN#612	SIN#611	SIN#610	SIN#609

40787	40786	40785	40784	40783	40782	40781	40780
SIN#624	SIN#623	SIN#622	SIN#621	SIN#620	SIN#619	SIN#618	SIN#617
SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 8 SPIN8	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 7 SPIN7	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 6 SPIN6	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 5 SPIN5	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 4 SPIN4	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 3 SPIN3	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 2 SPIN2	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 1 SPIN1

40797	40796	40795	40794	40793	40792	40791	40790
SIN#632	SIN#631	SIN#630	SIN#629	SIN#628	SIN#627	SIN#626	SIN#625
SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 16 SPIN16	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 15 SPIN15	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 14 SPIN14	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 13 SPIN13	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 12 SPIN12	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 11 SPIN11	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 10 SPIN10	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 9 SPIN9

40807	40806	40805	40804	40803	40802	40801	40800
SIN#640	SIN#639	SIN#638	SIN#637	SIN#636	SIN#635	SIN#634	SIN#633
SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 24 SPIN24	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 23 SPIN23	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 22 SPIN22	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 21 SPIN21	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 20 SPIN20	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 19 SPIN19	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 18 SPIN18	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 17 SPIN17

40817	40816	40815	40814	40813	40812	40811	40810
SIN#648	SIN#647	SIN#646	SIN#645	SIN#644	SIN#643	SIN#642	SIN#641
SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 32 SPIN32	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 31 SPIN31	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 30 SPIN30	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 29 SPIN29	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 28 SPIN28	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 27 SPIN27	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 26 SPIN26	SAFETY LOGIC CIRCUIT SPECIFIC INPUTS 25 SPIN25

40827	40826	40825	40824	40823	40822	40821	40820
SIN#656	SIN#655	SIN#654	SIN#653	SIN#652	SIN#651	SIN#650	SIN#649

40837	40836	40835	40834	40833	40832	40831	40830
SIN#664	SIN#663	SIN#662	SIN#661	SIN#660	SIN#659	SIN#658	SIN#657

40847	40846	40845	40844	40843	40842	40841	40840
SIN#672	SIN#671	SIN#670	SIN#669	SIN#668	SIN#667	SIN#666	SIN#665

40857	40856	40855	40854	40853	40852	40851	40850
SIN#680	SIN#679	SIN#678	SIN#677	SIN#676	SIN#675	SIN#674	SIN#673

40867	40866	40865	40864	40863	40862	40861	40860
SIN#688	SIN#687	SIN#686	SIN#685	SIN#684	SIN#683	SIN#682	SIN#681

40877	40876	40875	40874	40873	40872	40871	40870
SIN#696	SIN#695	SIN#694	SIN#693	SIN#692	SIN#691	SIN#690	SIN#689

40887	40886	40885	40884	40883	40882	40881	40880
SIN#704	SIN#703	SIN#702	SIN#701	SIN#700	SIN#699	SIN#698	SIN#697

40897	40896	40895	40894	40893	40892	40891	40890
SIN#712	SIN#711	SIN#710	SIN#709	SIN#708	SIN#707	SIN#706	SIN#705

40907	40906	40905	40904	40903	40902	40901	40900
SIN#720	SIN#719	SIN#718	SIN#717	SIN#716	SIN#715	SIN#714	SIN#713

40917	40916	40915	40914	40913	40912	40911	40910
SIN#728	SIN#727	SIN#726	SIN#725	SIN#724	SIN#723	SIN#722	SIN#721

40927	40926	40925	40924	40923	40922	40921	40920
SIN#736	SIN#735	SIN#734	SIN#733	SIN#732	SIN#731	SIN#730	SIN#729

40937	40936	40935	40934	40933	40932	40931	40930
SIN#744	SIN#743	SIN#742	SIN#741	SIN#740	SIN#739	SIN#738	SIN#737

40947	40946	40945	40944	40943	40942	40941	40940
SIN#752	SIN#751	SIN#750	SIN#749	SIN#748	SIN#747	SIN#746	SIN#745

40957	40956	40955	40954	40953	40952	40951	40950
SIN#760	SIN#759	SIN#758	SIN#757	SIN#756	SIN#755	SIN#754	SIN#753

40967	40966	40965	40964	40963	40962	40961	40960
SIN#768	SIN#767	SIN#766	SIN#765	SIN#764	SIN#763	SIN#762	SIN#761

40977	40976	40975	40974	40973	40972	40971	40970
SIN#776	SIN#775	SIN#774	SIN#773	SIN#772	SIN#771	SIN#770	SIN#769

40987	40986	40985	40984	40983	40982	40981	40980
SIN#784	SIN#783	SIN#782	SIN#781	SIN#780	SIN#779	SIN#778	SIN#777

40997	40996	40995	40994	40993	40992	40991	40990
SIN#792	SIN#791	SIN#790	SIN#789	SIN#788	SIN#787	SIN#786	SIN#785

41007	41006	41005	41004	41003	41002	41001	41000
SIN#800	SIN#799	SIN#798	SIN#797	SIN#796	SIN#795	SIN#794	SIN#793

41017	41016	41015	41014	41013	41012	41011	41010
SIN#808	SIN#807	SIN#806	SIN#805	SIN#804	SIN#803	SIN#802	SIN#801

41027	41026	41025	41024	41023	41022	41021	41020
SIN#816	SIN#815	SIN#814	SIN#813	SIN#812	SIN#811	SIN#810	SIN#809

41037	41036	41035	41034	41033	41032	41031	41030
SIN#824	SIN#823	SIN#822	SIN#821	SIN#820	SIN#819	SIN#818	SIN#817

41047	41046	41045	41044	41043	41042	41041	41040
SIN#832	SIN#831	SIN#830	SIN#829	SIN#828	SIN#827	SIN#826	SIN#825

41057	41056	41055	41054	41053	41052	41051	41050
SIN#840	SIN#839	SIN#838	SIN#837	SIN#836	SIN#835	SIN#834	SIN#833

41067	41066	41065	41064	41063	41062	41061	41060
SIN#848	SIN#847	SIN#846	SIN#845	SIN#844	SIN#843	SIN#842	SIN#841

41077	41076	41075	41074	41073	41072	41071	41070
SIN#856	SIN#855	SIN#854	SIN#853	SIN#852	SIN#851	SIN#850	SIN#849

41087	41086	41085	41084	41083	41082	41081	41080
SIN#864	SIN#863	SIN#862	SIN#861	SIN#860	SIN#859	SIN#858	SIN#857

41097	41096	41095	41094	41093	41092	41091	41090
SIN#872	SIN#871	SIN#870	SIN#869	SIN#868	SIN#867	SIN#866	SIN#865

41107	41106	41105	41104	41103	41102	41101	41100
SIN#880	SIN#879	SIN#878	SIN#877	SIN#876	SIN#875	SIN#874	SIN#873

41117	41116	41115	41114	41113	41112	41111	41110
SIN#888	SIN#887	SIN#886	SIN#885	SIN#884	SIN#883	SIN#882	SIN#881

41127	41126	41125	41124	41123	41122	41121	41120
SIN#896	SIN#895	SIN#894	SIN#893	SIN#892	SIN#891	SIN#890	SIN#889

4.2 Specific Input Signals for Material Handling, Press Tending, Cutting, and Other Applications

4.2.1 Device 1

41137	41136	41135	41134	41133	41132	41131	41130
SIN#904	SIN#903	SIN#902	SIN#901	SIN#900	SIN#899	SIN#898	SIN#897
					TIME MEASURE	WORK END ANSWER	WORK START ANSWER

41147	41146	41145	41144	41143	41142	41141	41140
SIN#912	SIN#911	SIN#910	SIN#909	SIN#908	SIN#907	SIN#906	SIN#905

41157	41156	41155	41154	41153	41152	41151	41150
SIN#920	SIN#919	SIN#918	SIN#917	SIN#916	SIN#915	SIN#914	SIN#913

41167	41166	41165	41164	41163	41162	41161	41160
SIN#928	SIN#927	SIN#926	SIN#925	SIN#924	SIN#923	SIN#922	SIN#921

41177	41176	41175	41174	41173	41172	41171	41170
SIN#936	SIN#935	SIN#934	SIN#933	SIN#932	SIN#931	SIN#930	SIN#929

41187	41186	41185	41184	41183	41182	41181	41180
SIN#944	SIN#943	SIN#942	SIN#941	SIN#940	SIN#939	SIN#938	SIN#937

4.2.2 Device 2

41197	41196	41195	41194	41193	41192	41191	41190
SIN#952	SIN#951	SIN#950	SIN#949	SIN#948	SIN#947	SIN#946	SIN#945
					TIME MEASURE	WORK END ANSWER	WORK START ANSWER

41207	41206	41205	41204	41203	41202	41201	41200
SIN#960	SIN#959	SIN#958	SIN#957	SIN#956	SIN#955	SIN#954	SIN#953

41217	41216	41215	41214	41213	41212	41211	41210
SIN#968	SIN#967	SIN#966	SIN#965	SIN#964	SIN#963	SIN#962	SIN#961

41227	41226	41225	41224	41223	41222	41221	41220
SIN#976	SIN#975	SIN#974	SIN#973	SIN#972	SIN#971	SIN#970	SIN#969

41237	41236	41235	41234	41233	41232	41231	41230
SIN#984	SIN#983	SIN#982	SIN#981	SIN#980	SIN#979	SIN#978	SIN#977

41247	41246	41245	41244	41243	41242	41241	41240
SIN#992	SIN#991	SIN#990	SIN#989	SIN#988	SIN#987	SIN#986	SIN#985

4.3 Specific Input Signals: Explanation

The following symbols are used in the explanation to represent the signal condition.

The signal takes effect while it is in ON state.

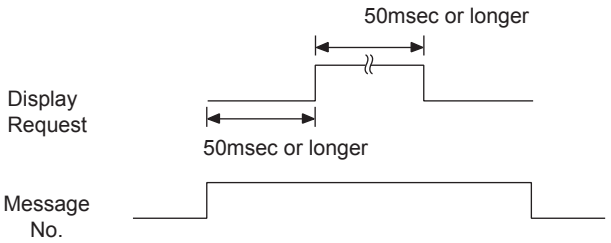
The rising edge is detected as the signal.

4.3.1 Alarm and Message Display

Various information items about the application can be displayed as messages on the programming pendant screen of the YRC1000micro. This section explains how to select already created messages. For registration, refer to “Registration of I/O Alarms and Messages”.

Fig. 4-1: Signal Timing

– Display request signal is a state signal, which continues to update the display while the signal is ON.



■ **40010: SYSTEM ALARM REQUEST**

When this signal is ON, a system alarm occurs and the manipulator stops. At the same time, an alarm message corresponding to the alarm code of the specific inputs (40210 to 40215) appears on the programming pendant screen.

40210 to 40215: System alarm No. (binary)

Up to 64 system alarms can be specified. Assign messages by coding decimals from 0 to 63 into binaries.

No.	Setting Value 0: OFF 1: ON					
	40215	40214	40213	40212	40211	40210
0	0	0	0	0	0	0
1	0	0	0	0	0	1
2	0	0	0	0	1	0
3	0	0	0	0	1	1
:	:	:	:	:	:	:
63	1	1	1	1	1	1

■ 40011: SYSTEM MESSAGE REQUEST

When this signal is ON, the message of the corresponding message code of specific inputs (40230 to 40235) appears on the programming pendant screen.

Manipulator operation will not be affected even if the message is displayed.

40230 to 40235: System alarm No. (binary)

Up to 64 system messages can be specified. Assign messages by coding decimals from 0 to 63 into binaries.

No.	Setting Value 0: OFF 1: ON					
	40235	40234	40233	40232	40231	40230
0	0	0	0	0	0	0
1	0	0	0	0	0	1
2	0	0	0	0	1	0
3	0	0	0	0	1	1
:	:	:	:	:	:	:
63	1	1	1	1	1	1

■ 40012: USER ALARM REQUEST

When this signal is ON, a user alarm occurs and the manipulator stops. At the same time, an alarm message corresponding to the alarm code of the specific input (40220 to 40225) appears on the programming pendant screen.

40220 to 40225: User Alarm No.

Up to 64 system alarms can be specified. Assign messages by coding decimals from 0 to 63 into binaries.

No.	Setting Value 0: OFF 1: ON					
	40225	40224	40223	40222	40221	40220
0	0	0	0	0	0	0
1	0	0	0	0	0	1
2	0	0	0	0	1	0
3	0	0	0	0	1	1
:	:	:	:	:	:	:
63	1	1	1	1	1	1

■ 40013: USER MESSAGE REQUEST

State

When this signal is ON, the message of the corresponding message code of specific inputs (40240 to 40245) appears on the programming pendant screen.

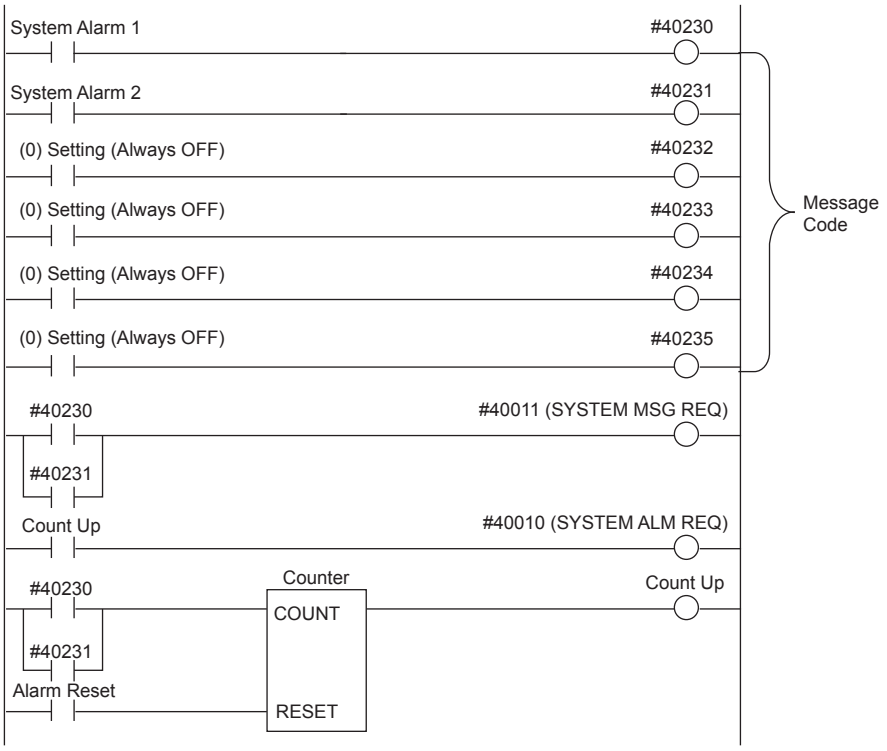
Manipulator operation will not be affected even if the message is displayed.

40240 to 40245: User Message No. (Binary)

Up to 64 user messages can be specified. Assign messages by coding decimals from 0 to 63 into binaries.

No.	Setting Value 0: OFF 1: ON					
	40245	40244	40243	40242	40241	40240
0	0	0	0	0	0	0
1	0	0	0	0	0	1
2	0	0	0	0	1	0
3	0	0	0	0	1	1
:	:	:	:	:	:	:
63	1	1	1	1	1	1

<Example>



■ 40014: ALARM RESET

Rising

This signal clears alarms or errors when there is a minor failure, system alarm, user alarm, or user error. Use this signal when desiring to reset an alarm or error from the outside.

4.3.2 Selecting Mode/Cycle and Calling Master Job

■ **40070: MASTER JOB CALLING**

This signal resets the operating sequence. When the signal is ON, the heading of the master job (Line: 0) will be called up as an execution job. This can be used for executing system initialization automatically when the power is turned ON.

However, it is invalid in the following cases:

• While the manipulator is operating (job is executing)

• While the servo power is ON in the teach mode.

• “MASTER CALLING UP PROHIBIT” is shown on the operating condition window.

■ **40040, 40041: Selection of Modes**

These signals have the same function as the mode key on the programming pendant. Use these signals when desiring to change mode specifications from the outside.

If two or more modes are specified at the same time, TEACH MODE has a priority over another.
They are invalid when “EXT. MODE SWITCH PROHIBIT” is shown on the operating condition window, and when the mode key on the programming pendant is set to “TEACH” or “PLAY”. (The mode specified with the mode key prevails.)

■ **40042, 40056, 40057: Selection of Operating Modes**

40042 CMD REMOTE SELECT

This signal selects a command remote function such as transmission. When the system transmission function (optional) is valid, “CMD REMOTE SETTING” (50056) signal goes ON and the YRC1000micro gets ready for transmission with the master computer.

40056 PROHIBIT PP OPERATION

When this signal is ON, cycle, start and servo ON master job call from the programming pendant are prohibited. However, this prohibition is released by setting the PP Operation at Remote Mode parameter (S2C230).

40057 PROHIBIT IO

When this signal is ON, the following operation from external input is prohibited.

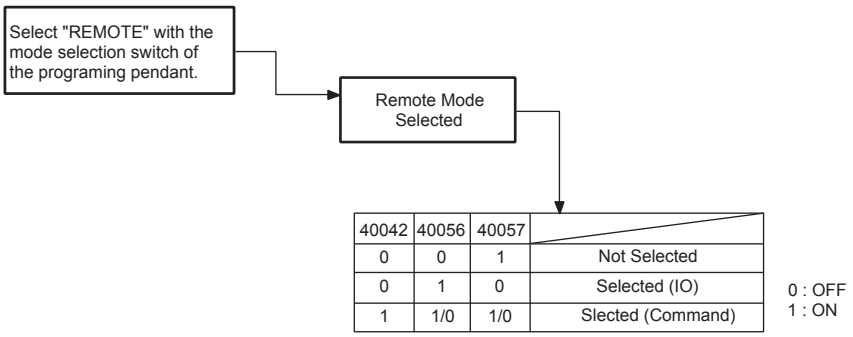
Selection of Cycle (40050 to 40052)

Calling Up Master Job (40070)

External Servo On (40045)

External Start (40044)

Fig. 4-2: Operation Mode Processing Standard Ladders



- For remote function selection, refer to the "*chapter 7.1 "Pseudo Input Signals"*".
- Transmission function is an optional function.

■ **40050 to 40052: Selection of Cycles**

Use the signals when desiring to change cycle specifications from the outside. These can also be used when desiring to fix a specified cycle.

If two or more cycles are specified at the same time, or it is operated with the programming pendant at the same time, the cycle will not change.

These are invalid when "EXT. MODE SWITCH PROHIBIT" is shown on the operating condition window.

4.3.3 Start and Stop Signals

■ **40044: EXTERNAL START**

This signal has the same function as the “START” button on the programming pendant. Automatic operation starts in accordance with cycle specifications. When this signal is accepted, “OPERATING” (50070) and “PERMISSIBLE WORK OPERATING” (50490) signals will be turned ON. The signal can be used when starting from a panel other than the YRC1000micro programming pendant such as an external operator’s panel.

Specify PERMIT/PROHIBIT on the operating condition window.

This signal is invalid under the following conditions:

• Servo power supply is turned OFF.

• Remote mode is not selected.

• “EXTERNAL START” is set to “PROHIBIT” on the operating condition window.

• Manipulator is still operating. [When “OPERATING” (50070) signal is ON].

• When “HOLDING” (50071) signal is ON.

• “EXTERNAL HOLD” (40067) signal is ON.

■ **40045: EXTERNAL SERVO ON**

This signal turns ON the servo power. Use the signal when turning ON the servo power from the outside.

This signal is disabled under the following conditions.

• Not under the remote mode

• “EXTERNAL SERVO ON” is set to “PROHIBIT” on the operating condition window.

■ **40054, 40065, 40066: EXTERNAL SERVO OFF**

When these signals are ON in a state of servo ON (the specific output signal #50073 is on), the servo power supply is cut OFF and the manipulator stops. Use the signals when desiring to cut OFF the servo power supply from the outside or by ladder conditions for reasons other than the emergency stop. While these signals are ON, the servo power remains OFF even if the servo ON reference (from programming pendant, or outside) is turned ON.

40065: EXTERNAL SERVO OFF 1 (Deceleration stop)

40066: EXTERNAL SERVO OFF 2 (Emergency stop category 0)

40054: EXTERNAL SERVO OFF 3 (Emergency stop category 1)

■ **40067: EXTERNAL HOLD**

This signal has the same function as the “HOLD” button on the programming pendant. Use the signal when instructing “HOLD” from a location other than the programming pendant. While the signal is ON, the “HOLD” lamp on the programming pendant is blinking and the “HOLDING” (50071) signal goes ON.

4.3.4 Operating Instructions

■ **40016: In-Guard Safe Operating Instruction**

When this signal is ON, the playback operating speed is limited by in-guard safe operation speed. If approaching the manipulator during operation for unavoidable reasons, the operating speed can be limited by turning the signal ON. It will therefore be convenient to interlink the signal with the safety guardrail or safety mat.

This signal is only to limit speed. Since the manipulator operates as taught, prepare the “EMERGENCY STOP” button so that it can be pressed at any time in the event of an emergency when one approaches the robot.

■ **40046: Check Operation**

This signal is not a start instruction. When the signal is ON, the work instruction in the job is not executed. Use the signal to check the taught steps and motions. This signal is invalid when “CHECK/ MACHINE LOCK PROHIBIT” on the operating condition window is ON.

■ **40047: PROHIBIT WEAVING**

When this signal is ON, weaving in the job are not executed. Use the signal to check the taught steps and motions with weaving OFF.

■ **40060: MACHINE LOCK**

When this signal is ON, the machine lock mode is selected.

■ **40061: INVALID SHOCK DETECTION**

When this signal is ON, the shock detection function is invalid.

■ **40063: OVERRUN RELEASE REQUEST**

When this signal is ON, the overrun status is released.

This signal has the same function as the overrun release operation in the overrun and shock sensor release window; however, setting the value for S2C575 allows whether to enable the function depending on the window displayed on the programming pendant screen.

0: Standard (The function is enabled when any window is displayed)

1: Enabled with interface panel (The function is enabled only when interface panel is displayed)

■ **40090, 40091: 1-Step Back Operating Instruction**

When these signals are ON at start up, the manipulator moves to one step before the displayed step at low speed and stops there disregarding the cycle. These can be used for performing the operation one step before since some operations are difficult to be executed.

For a system with one manipulator, use signal No. 40090.

■ **40130, 40131: SEQUENCE WAIT**

The manipulator pauses while this signal is ON. Although it is functionally the same as “HOLD”, it differs in the following ways:

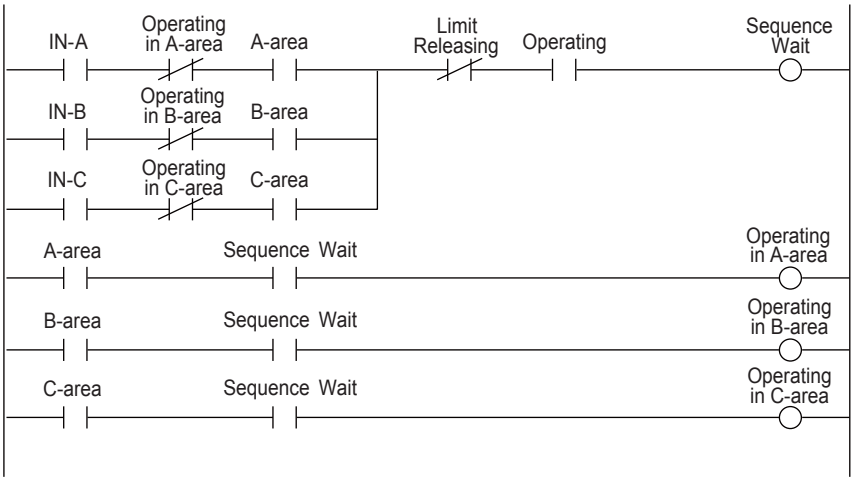
When these signals are turned ON while the manipulator is operating, the manipulator pauses temporarily, but it is still in an operating state. If these signals are turned ON during an instruction other than a moving instruction (MOV), the instruction is continued. The “START” lamp remains lit and the “OPERATING” signal remains ON. If these signals are turned ON while the manipulator is operating at high speed, the manipulator reduces its speed and stops.

The status of these signals are controlled. Motion of the manipulator is automatically resumed when changing from ON to OFF.

For a system with one manipulator, use signal No. 40130.

<Example 1>

The following is an example of using the signal to check S-Axis/ Cube Interference.



Explanation of ladder

Meaning of above terms	
A, B, C:	Area Name e.g. S-Axis (right), Cube 1, etc
IN-A, IN-B, IN-C:	Status of the combined equipment input externally
Area A, Area B, Area C:	Individual status signals The signals indicate whether the manipulator is in the area.
Operating in A-area, Operating in B-area, Operating in C-area:	ON when operating in the area The signals are assigned to the combined equipment.

If the signal “Area A”, “Area B”, or “Area C” is turned ON while the combined equipment is outside the area, the signal “Operating in A-area”, “Operating in B-area”, or “Operating in C-area” is turned ON and the operation continues.

If the combined equipment is in the area first, the SEQUENCE WAIT signal goes ON and robot operation is stopped until the combined equipment leaves the area. When the combined equipment leaves the area, the SEQUENCE WAIT signal goes OFF and manipulator operation resumes.

■ 40170, 40171: Work Home Position Return Request

The manipulator moves to the work home position at the speed of parameter SICxG056 at joint operation by starting up these signals in the play mode.

During returning to the home position, the “START” lamp is lit (“during start” is entered) and the message “Operation Origin Returning” is displayed on the programming pendant screen.

Do not use these signals unless interlocking to check that the manipulator is at a position from which it can return to the home position.

For a system with one manipulator, use signal No. 40170.

4.3.5 GP Signals

■ **40064: EDIT LOCK**

When this signal is turned ON, the editing operation for jobs, various files and so on is prohibited.

■ **40527: PP Buzzer**

When this signal is ON, the buzzer of programming pendant sounds.

■ **40560: AUTO BACKUP**

If the specific input backup of the auto backup function is valid, when this signal is turned ON, the auto backup starts.

■ **40580: ENERGY SAVER PROHIBITION**

When this signal is turned ON, the energy saver mode is invalid.

■ **40600: IO TRACE START**

When this signal is turned ON, the trace operation is ready to start.

■ **40780 to 40817: SAFETY LOGIC CIRCUIT SPECIFIC INPUT**

The input status of this signal is reflected in SPIN [xx] in the safety logic circuit.

4.3.6 Independent Control Signals (Optional)

■ **40021 to 40025: SUB 1 to 5 ALARM REQUEST**

These signals are used to stop the specified sub task with an alarm when system section alarm request (40010) or user section alarm request (40012) is issued.

Input the alarm request (40010 or 40012) after setting the conditions of individual requirements.

■ **40071 to 40075: SUB1 to 5 MASTER CALL**

Operation sequence is reset. When these signals are turned ON, the head of the master job in sub take 1 to 5 is called up as an execution job.

These signals are invalid in any of the following cases:

The manipulator is operating (during job execution).

While the servo power is ON in the teach mode.

“MASTER CALLING UP PROHIBIT” is shown on the operating condition window.

Master job is not registered.

■ **40250 to 40255: SUB 1 to 5 and MASTER START**

When the signals are turned ON, the robot starts its operation automatically by each sub task 1 to 5 and the master job individually. When the signals are accepted, the signals “RUN”, 50640 to 50645 are turned ON. The signals can be used when starting from a panel such as an external operator’s panel other than the programming pendant. Specify the condition on the operating condition window.

These signals are invalid in any of the following cases: ì

- The servo power is not turned ON.
- The PLAY mode is not set.
- The “EXTERNAL START PROHIBIT” is shown on the operating condition window.
- The corresponding signal “RUN” is ON. That is the robot is operating.
- The signal “HOLDING” is ON.
- The signal “EXTERNAL HOLD” is ON
- The corresponding signal “HOLDING” is ON.

■ **40270 to 40275: SUB 1 to 5 HOLD**

When these signals are turned ON, the manipulator, which is running individually in accordance with each sub task 1 to 5 and the master job, pauses. The corresponding signal “HOLDING” (50660 to 50665) is turned ON when this signal is ON.

4.3.7 Signals for Material Handling, Press Tending, Cutting, and Other Applications

Signals from 41130 to 41247 are classified into two blocks and allocated to input signals which have each different meanings depending on the application. As most of these input signals are used for the system, they cannot be used from the outside of the YRC1000micro.

This section explains exceptional signals that are available for external use.

■ **41130, 41190**
: WORK START RESPONSE

These signals are used for response to “WORK START INSTRUCTION” (51530, 51590) signal. The work start instruction is completed by the response.

For a system with one application, use signal No. 41130.

■ **41131, 41191**
: WORK END RESPONSE

These signals are used for response to “WORK END INSTRUCTION” (51531, 51591) signal.

For a system with one application, use signal No. 41131.

■ **41132, 41192**
: WORK TIME MEASURE

The time during which these signals are ON is measured as the operating time.

This operating time can be checked on the system monitoring time window.

For a system with one application, use signal No. 41132.

4.4 Specific Output Signals for All Applications

50017	50016	50015	50014	50013	50012	50011	50010
SOUT#008	SOUT#007	SOUT#006	SOUT#005	SOUT#004	SOUT#003	SOUT#002	SOUT#001
COOLING FAN ERROR	ENCODER BATTERY WEAK	MEM BATTERY WEAK	ERROR OCCUR	USER ALARM OCCUR	SYSTEM ALARM OCCUR	MINOR ALARM OCCUR	MAJOR ALARM OCCUR

50027	50026	50025	50024	50023	50022	50021	50020
SOUT#016	SOUT#015	SOUT#014	SOUT#013	SOUT#012	SOUT#011	SOUT#010	SOUT#009
		TOP SUB 5 MASTER	TOP SUB 4 MASTER	TOP SUB 3 MASTER	TOP SUB 2 MASTER	TOP SUB 1 MASTER	TOP MASTER JOB

50037	50036	50035	50034	50033	50032	50031	50030
SOUT#024	SOUT#023	SOUT#022	SOUT#021	SOUT#020	SOUT#019	SOUT#018	SOUT#017

50047	50046	50045	50044	50043	50042	50041	50040
SOUT#032	SOUT#031	SOUT#030	SOUT#029	SOUT#028	SOUT#027	SOUT#026	SOUT#025

50057	50056	50055	50054	50053	50052	50051	50050
SOUT#040	SOUT#039	SOUT#038	SOUT#037	SOUT#036	SOUT#035	SOUT#034	SOUT#033
	CMD REMOTE SET		PLAY MODE SET	TEACH MODE SET	CONT CYCLE SET	1-CYCLE SET	STEP CYCLE SET

50067	50066	50065	50064	50063	50062	50061	50060
SOUT#048	SOUT#047	SOUT#046	SOUT#045	SOUT#044	SOUT#043	SOUT#042	SOUT#041
RUNNING AT FULL-SPEED	POSITION CHECKED		CHECK RUN SET	SOFT LIMIT SET RELEASE	MACHINE LOCK SET	DRY RUN SET	SAFETY SPEED SET

50077	50076	50075	50074	50073	50072	50071	50070
SOUT#056	SOUT#055	SOUT#054	SOUT#053	SOUT#052	SOUT#051	SOUT#050	SOUT#049
OVERRUN RELEASE	JOG OPERATION INFORM	JOB EDIT INFORM	I/O SIMULATED	SERVO ON		HOLDING (HOLD LAMP)	RUNNING

50087	50086	50085	50084	50083	50082	50081	50080
SOUT#064	SOUT#063	SOUT#062	SOUT#061	SOUT#060	SOUT#059	SOUT#058	SOUT#057
CUBE INTERFERENCE							
8	7	6	5	4	3	2	1

50097	50096	50095	50094	50093	50092	50091	50090
SOUT#072	SOUT#071	SOUT#070	SOUT#069	SOUT#068	SOUT#067	SOUT#066	SOUT#065
CUBE INTERFERENCE							
16	15	14	13	12	11	10	9

50107	50106	50105	50104	50103	50102	50101	50100
SOUT#080	SOUT#079	SOUT#078	SOUT#077	SOUT#076	SOUT#075	SOUT#074	SOUT#073
CUBE INTERFERENCE							
24	23	22	21	20	19	18	17

50117	50116	50115	50114	50113	50112	50111	50110
SOUT#088	SOUT#087	SOUT#086	SOUT#085	SOUT#084	SOUT#083	SOUT#082	SOUT#081
CUBE INTERFERENCE							
32	31	30	29	28	27	26	25

50127	50126	50125	50124	50123	50122	50121	50120
SOUT#096	SOUT#095	SOUT#094	SOUT#093	SOUT#092	SOUT#091	SOUT#090	SOUT#089
CUBE INTERFERENCE							
40	39	38	37	36	35	34	33

50137	50136	50135	50134	50133	50132	50131	50130
SOUT#104	SOUT#103	SOUT#102	SOUT#101	SOUT#100	SOUT#099	SOUT#098	SOUT#097
CUBE INTERFERENCE							
48	47	46	45	44	43	42	41

50147	50146	50145	50144	50143	50142	50141	50140
SOUT#112	SOUT#111	SOUT#110	SOUT#109	SOUT#108	SOUT#107	SOUT#106	SOUT#105
CUBE INTERFERENCE							
56	55	54	53	52	51	50	49

50157	50156	50155	50154	50153	50152	50151	50150
SOUT#120	SOUT#119	SOUT#118	SOUT#117	SOUT116	SOUT#115	SOUT#114	SOUT#113
CUBE INTERFERENCE							
64 (WORK HOME POSITION R1)	63 (WORK HOME POSITION R2)						

50167	50166	50165	50164	50163	50162	50161	50160
SOUT#128	SOUT#127	SOUT#126	SOUT#125	SOUT#124	SOUT#123	SOUT122	SOUT121
S-AXIS INTERFERENCE							
				R2 (LEFT)	R2 (RIGHT)	R1 (LEFT)	R1 (RIGHT)

50177	50176	50175	50174	50173	50172	50171	50170
SOUT#136	SOUT#135	SOUT#134	SOUT#133	SOUT#132	SOUT#131	SOUT#130	SOUT#129
S-AXIS INTERFERENCE							

50187	50186	50185	50184	50183	50182	50181	50180
SOUT#144	SOUT#143	SOUT#142	SOUT#141	SOUT#140	SOUT#139	SOUT#138	SOUT#137

50197	50196	50195	50194	50193	50192	50191	50190
SOUT#152	SOUT#151	SOUT#150	SOUT#149	SOUT#148	SOUT#147	SOUT#146	SOUT#145

50207	50206	50205	50204	50203	50202	50201	50200
SOUT#160	SOUT#159	SOUT#158	SOUT#157	SOUT#156	SOUT#155	SOUT#154	SOUT#153

50217	50216	50215	50214	50213	50212	50211	50210
SOUT#168	SOUT#167	SOUT#166	SOUT#165	SOUT#164	SOUT#163	SOUT#162	SOUT#161

50227	50226	50225	50224	50223	50222	50221	50220
SOUT#176	SOUT#175	SOUT#174	SOUT#173	SOUT#172	SOUT#171	SOUT#170	SOUT#169

50237	50236	50235	50234	50233	50232	50231	50230
SOUT#184	SOUT#183	SOUT#182	SOUT#181	SOUT#180	SOUT#179	SOUT#178	SOUT#177

50247	50246	50245	50244	50243	50242	50241	50240
SOUT#192	SOUT#191	SOUT#190	SOUT#189	SOUT#188	SOUT#187	SOUT#186	SOUT#185

50257	50256	50255	50254	50253	50252	50251	50250
SOUT#200	SOUT#199	SOUT#198	SOUT#197	SOUT#196	SOUT#195	SOUT#194	SOUT#193

50267	50266	50265	50264	50263	50262	50261	50260
SOUT#208	SOUT#207	SOUT#206	SOUT#205	SOUT#204	SOUT#203	SOUT#202	SOUT#201

50277	50276	50275	50274	50273	50272	50271	50270
SOUT#216	SOUT#215	SOUT#214	SOUT#213	SOUT#212	SOUT#211	SOUT#210	SOUT#209
						OPERATION TARGET CONTROL GROUP ROBOT 2	OPERATION TARGET CONTROL GROUP ROBOT 1

50287	50286	50285	50284	50283	50282	50281	50280
SOUT#224	SOUT#223	SOUT#222	SOUT#221	SOUT#220	SOUT#219	SOUT#218	SOUT#217
						OPERATION TARGET CONTROL GROUP BASE 2	OPERATION TARGET CONTROL GROUP BASE 1

50297	50296	50295	50294	50293	50292	50291	50290
SOUT#232	SOUT#231	SOUT#230	SOUT#229	SOUT#228	SOUT#227	SOUT#226	SOUT#225
					OPERATION TARGET CONTROL GROUP STATION 3	OPERATION TARGET CONTROL GROUP STATION 2	OPERATION TARGET CONTROL GROUP STATION 1

50307	50306	50305	50304	50303	50302	50301	50300
SOUT#240	SOUT#239	SOUT#238	SOUT#237	SOUT#236	SOUT#235	SOUT#234	SOUT#233

50317	50316	50315	50314	50313	50312	50311	50310
SOUT#248	SOUT#247	SOUT#246	SOUT#245	SOUT#244	SOUT#243	SOUT#242	SOUT#241

50327	50326	50325	50324	50323	50322	50321	50320
SOUT#256	SOUT#255	SOUT#254	SOUT#253	SOUT#252	SOUT#251	SOUT#250	SOUT#249
						SERVO ON STATUS R2	SERVO ON STATUS R1

50337	50336	50335	50334	50333	50332	50331	50330
SOUT#264	SOUT#263	SOUT#262	SOUT#261	SOUT#260	SOUT#259	SOUT#258	SOUT#257
					SERVO ON STATUS S3	SERVO ON STATUS S2	SERVO ON STATUS S1

50347	50346	50345	50344	50343	50342	50341	50340
SOUT#272	SOUT#271	SOUT#270	SOUT#269	SOUT#268	SOUT#237	SOUT#266	SOUT#265

50357	50356	50355	50354	50353	50352	50351	50350
SOUT#280	SOUT#279	SOUT#278	SOUT#277	SOUT#276	SOUT#275	SOUT#274	SOUT#273

50367	50366	50365	50364	50363	50362	50361	50360
SOUT#288	SOUT#287	SOUT#286	SOUT#285	SOUT#284	SOUT#283	SOUT#282	SOUT#281
						WAIT JOB SEQ R2J	WAIT JOB SEQ R1J

50377	50376	50375	50374	50373	50372	50371	50370
SOUT#296	SOUT#295	SOUT#294	SOUT#293	SOUT#292	SOUT#291	SOUT#290	SOUT#289
					WAIT JOB SEQ S3J	WAIT JOB SEQ S2J	WAIT JOB SEQ S1J

50387	50386	50385	50384	50383	50382	50381	50380
SOUT#304	SOUT#303	SOUT#302	SOUT#301	SOUT#300	SOUT#299	SOUT#298	SOUT#297

50397	50396	50395	50394	50393	50392	50391	50390
SOUT#312	SOUT#311	SOUT#310	SOUT#309	SOUT#308	SOUT#307	SOUT#306	SOUT#305

50407	50406	50405	50404	50403	50402	50401	50400
SOUT#320	SOUT#319	SOUT#318	SOUT#317	SOUT#316	SOUT#315	SOUT#314	SOUT#313
						CONTINUE JOB SEQ R2J	CONTINUE JOB SEQ R1J

50417	50416	50415	50414	50413	50412	50411	50410
SOUT#328	SOUT#327	SOUT#326	SOUT#325	SOUT#324	SOUT#323	SOUT#322	SOUT#321
					CONTINUE JOB SEQ S3J	CONTINUE JOB SEQ S2J	CONTINUE JOB SEQ S1J

50427	50426	50425	50424	50423	50422	50421	50420
SOUT#336	SOUT#335	SOUT#334	SOUT#333	SOUT#332	SOUT#331	SOUT#330	SOUT#329

50437	50436	50435	50434	50433	50432	50431	50430
SOUT#344	SOUT#343	SOUT#342	SOUT#341	SOUT#340	SOUT#339	SOUT#338	SOUT#337

50447	50446	50445	50444	50443	50442	50441	50440
SOUT#352	SOUT#351	SOUT#350	SOUT#349	SOUT#348	SOUT#347	SOUT#346	SOUT#345
						CONTROL GROUP ON R2	CONTROL GROUP ON R1

50457	50456	50455	50454	50453	50452	50451	50450
SOUT#360	SOUT#359	SOUT#358	SOUT#357	SOUT#356	SOUT#355	SOUT#354	SOUT#353
					CONTROL GROUP ON STATION 3	CONTROL GROUP ON STATION 2	CONTROL GROUP ON STATION 1

50467	50466	50465	50464	50463	50462	50461	50460
SOUT#368	SOUT#367	SOUT#366	SOUT#365	SOUT#364	SOUT#363	SOUT#362	SOUT#361

50477	50476	50475	50474	50473	50472	50471	50470
SOUT#376	SOUT#375	SOUT#374	SOUT#373	SOUT#372	SOUT#371	SOUT#370	SOUT#369

50487	50486	50485	50484	50483	50482	50481	50480
SOUT#384	SOUT#383	SOUT#382	SOUT#381	SOUT#380	SOUT#379	SOUT#378	SOUT#377
						WORK RESTART PROHIBIT R2J	WORK RESTART PROHIBIT R1J

50497	50496	50495	50494	50493	50492	50491	50490
SOUT#392	SOUT#391	SOUT#390	SOUT#389	SOUT#388	SOUT#387	SOUT#386	SOUT#385
						WORK PERMIT RUN R2J	WORK PERMIT RUN R1J

50507	50506	50505	50504	50503	50502	50501	50500
SOUT#400	SOUT#399	SOUT#398	SOUT#397	SOUT#396	SOUT#395	SOUT#394	SOUT#393
						SEARCHING R2J	SEARCHING R1J

50517	50516	50515	50514	50513	50512	50511	50510
SOUT#408	SOUT#407	SOUT#406	SOUT#405	SOUT#404	SOUT#403	SOUT#402	SOUT#401
						SERVO FLOAT ON R2	SERVO FLOAT ON R1

50527	50526	50525	50524	50523	50522	50521	50520
SOUT#416	SOUT#415	SOUT#414	SOUT#413	SOUT#412	SOUT#411	SOUT#410	SOUT#409
						LOCUS DEVIATE R2	LOCUS DEVIATE R1

50537	50536	50535	50534	50533	50532	50531	50530
SOUT#424	SOUT#423	SOUT#422	SOUT#421	SOUT#420	SOUT#419	SOUT#418	SOUT#417

50547	50546	50545	50544	50543	50542	50541	50540
SOUT#432	SOUT#431	SOUT#430	SOUT#429	SOUT#428	SOUT#427	SOUT#426	SOUT#425

50557	50556	50555	50554	50553	50552	50551	50550
SOUT#440	SOUT#439	SOUT#438	SOUT#437	SOUT#436	SOUT#435	SOUT#434	SOUT#433

50567	50566	50565	50564	50563	50562	50561	50560
SOUT#448	SOUT#447	SOUT#446	SOUT#445	SOUT#444	SOUT#443	SOUT#442	SOUT#441
						SHOCK DETECTIONVALID R2	SHOCK DETECTION VALID R1

50577	50576	50575	50574	50573	50572	50571	50570
SOUT#456	SOUT#455	SOUT#454	SOUT#453	SOUT#452	SOUT#451	SOUT#450	SOUT#449

50587	50586	50585	50584	50583	50582	50581	50580
SOUT#464	SOUT#463	SOUT#462	SOUT#461	SOUT#460	SOUT#459	SOUT#458	SOUT#457

50597	50596	50595	50594	50593	50592	50591	50590
SOUT#472	SOUT#471	SOUT#470	SOUT#469	SOUT#468	SOUT#467	SOUT#466	SOUT#465

50607	50606	50605	50604	50603	50602	50601	50600
SOUT#480	SOUT#479	SOUT#478	SOUT#477	SOUT#476	SOUT#475	SOUT#474	SOUT#473
		SUB TASK 5 HELD	SUB TASK 4 HELD	SUB TASK 3 HELD	SUB TASK 2 HELD	SUB TASK 1 HELD	

50617	50616	50615	50614	50613	50612	50611	50610
SOUT#488	SOUT#487	SOUT#486	SOUT#485	SOUT#484	SOUT#483	SOUT#482	SOUT#481

50627	50626	50625	50624	50623	50622	50621	50620
SOUT#496	SOUT#495	SOUT#494	SOUT#493	SOUT#492	SOUT#491	SOUT#490	SOUT#489
		SUB TASK 5 ALARM OCCUR	SUB TASK 4 ALARM OCCUR	SUB TASK 3 ALARM OCCUR	SUB TASK 2 ALARM OCCUR	SUB TASK 1 ALARM OCCUR	

50637	50636	50635	50634	50633	50632	50631	50630
SOUT#504	SOUT#503	SOUT#502	SOUT#501	SOUT#500	SOUT#499	SOUT#498	SOUT#497

50647	50646	50645	50644	50643	50642	50641	50640
SOUT#512	SOUT#511	SOUT#510	SOUT#509	SOUT#508	SOUT#507	SOUT#506	SOUT#505
		SUB TASK 5 RUN	SUB TASK 4 RUN	SUB TASK 3 RUN	SUB TASK 2 RUN	SUB TASK 1 RUN	MASTER JOB RUN

50657	50656	50655	50654	50653	50652	50651	50650
SOUT#520	SOUT#519	SOUT#518	SOUT#517	SOUT#516	SOUT#515	SOUT#514	SOUT#513

50667	50666	50665	50664	50663	50662	50661	50660
SOUT#528	SOUT#527	SOUT#526	SOUT#525	SOUT#524	SOUT#523	SOUT#522	SOUT#521
		SUB TASK 5 HOLD	SUB TASK 4 HOLD	SUB TASK 3 HOLD	SUB TASK 2 HOLD	SUB TASK 1 HOLD	MASTER JOB HOLD

50677	50676	50675	50674	50673	50672	50671	50670
SOUT#536	SOUT#535	SOUT#534	SOUT#533	SOUT#532	SOUT#531	SOUT#530	SOUT#529

50687	50686	50685	50684	50683	50682	50681	50680
SOUT#544	SOUT#543	SOUT#542	SOUT#541	SOUT#540	SOUT#539	SOUT#538	SOUT#537

50697	50696	50695	50694	50693	50692	50691	50690
SOUT#552	SOUT#551	SOUT#550	SOUT#549	SOUT#548	SOUT#547	SOUT#546	SOUT#545
SHOCK DTCT ALM	WRONG DATA			SECURITY SAFETY MODE SET	SECURITY MANAGEMENT MODE SET	SECURITY EDITING MODE SET	SECURITY OPERATION MODE SET

50707	50706	50705	50704	50703	50702	50701	50700
SOUT#560	SOUT#559	SOUT#558	SOUT#557	SOUT#556	SOUT#555	SOUT#554	SOUT#553
		SUB TASK 5 SELECT JOB	SUB TASK 4 SELECT JOB	SUB TASK 3 SELECT JOB	SUB TASK 2 SELECT JOB	SUB TASK 1 SELECT JOB	MASTER JOB SELECT JOB

50717	50716	50715	50714	50713	50712	50711	50710
SOUT#568	SOUT#567	SOUT#566	SOUT#565	SOUT#564	SOUT#563	SOUT#562	SOUT#561

50727	50726	50725	50724	50723	50722	50721	50720
SOUT#576	SOUT#575	SOUT#574	SOUT#573	SOUT#572	SOUT#571	SOUT#570	SOUT#569
IN ENERGY SAVER MODE	MOTOR TEMPERATURE RAISED (85°C)	DIALOG DISPLAYED AT START					

50737	50736	50735	50734	50733	5073	50731	50730
SOUT#584	SOUT#583	SOUT#582	SOUT#581	SOUT#580	SOUT#579	SOUT#578	SOUT#577

50747	50746	50745	50744	50743	50742	50741	50740
SOUT#592	SOUT#591	SOUT#590	SOUT#589	SOUT#588	SOUT#587	SOUT#586	SOUT#585

50757	50756	50755	50754	50753	50752	50751	50750
SOUT#600	SOUT#599	SOUT#598	SOUT#597	SOUT#596	SOUT#595	SOUT#594	SOUT#593

50767	50766	50765	50764	50763	50762	50761	50760
SOUT#608	SOUT#607	SOUT#606	SOUT#605	SOUT#604	SOUT#603	SOUT#602	SOUT#601
AUTO BACKUP DATA TRANSMITTED	AUTO BACKUP DATA CREATED						

50777	50776	50775	50774	50773	50772	50771	50770
SOUT#616	SOUT#615	SOUT#614	SOUT#613	SOUT#612	SOUT#611	SOUT#610	SOUT#609
		SUB TASK 5 JOB STACK	SUB TASK 4 JOB STACK	SUB TASK 3 JOB STACK	SUB TASK 2 JOB STACK	SUB TASK 1 JOB STACK	MASTER JOB JOB STACK

50787	50786	50785	50784	50783	50782	50781	50780
SOUT#624	SOUT#623	SOUT#622	SOUT#621	SOUT#620	SOUT#619	SOUT#618	SOUT#617

50797	50796	50795	50794	50793	50792	50791	50790
SOUT#632	SOUT#631	SOUT#630	SOUT#629	SOUT#628	SOUT#627	SOUT#626	SOUT#625

50807	50806	50805	50804	50803	50802	50801	50800
SOUT#640	SOUT#639	SOUT#638	SOUT#637	SOUT#636	SOUT#635	SOUT#634	SOUT#633

50817	50816	50815	50814	50813	50812	50811	50810
SOUT#648	SOUT#647	SOUT#646	SOUT#645	SOUT#644	SOUT#643	SOUT#642	SOUT#641
						SPHERE INTERFERENCE R1 - > R2	

50827	50826	50825	50824	50823	50822	50821	50820
SOUT#656	SOUT#655	SOUT#654	SOUT#653	SOUT#652	SOUT#651	SOUT#650	SOUT#649
							SPHERE INTERFERENCE R2 - > R1

50837	50836	50835	50834	50833	50832	50831	50830
SOUT#664	SOUT#663	SOUT#662	SOUT#661	SOUT#660	SOUT#659	SOUT#658	SOUT#657

50847	50846	50845	50844	50843	50842	50841	50840
SOUT#672	SOUT#671	SOUT#670	SOUT#669	SOUT#668	SOUT#667	SOUT#666	SOUT#665

50857	50856	50855	50854	50853	50852	50851	50850
SOUT#680	SOUT#679	SOUT#678	SOUT#677	SOUT#676	SOUT#675	SOUT#674	SOUT#673

50867	50866	50865	50864	50863	50862	50861	50860
SOUT#688	SOUT#687	SOUT#686	SOUT#685	SOUT#684	SOUT#683	SOUT#682	SOUT#681

50877	50876	50875	50874	50873	50872	50871	50870
SOUT#696	SOUT#695	SOUT#694	SOUT#693	SOUT#692	SOUT#691	SOUT#690	SOUT#689

50887	50886	50885	50884	50883	50882	50881	50880
SOUT#704	SOUT#703	SOUT#702	SOUT#701	SOUT#700	SOUT#699	SOUT#698	SOUT#697

50897	50896	50895	50894	50893	50892	50891	50890
SOUT#712	SOUT#711	SOUT#710	SOUT#709	SOUT#708	SOUT#707	SOUT#706	SOUT#705

50907	50906	50905	50904	50903	50902	50901	50900
SOUT#720	SOUT#719	SOUT#718	SOUT#717	SOUT#716	SOUT#715	SOUT#714	SOUT#713
							IN IO TRACE

50917	50916	50915	50914	50913	50912	50911	50910
SOUT#728	SOUT#727	SOUT#726	SOUT#725	SOUT#724	SOUT#723	SOUT#722	SOUT#721
SYSTEM BACKUP DATA TRANSMITTED	SYSTEM BACKUP DATA CREATED	ABORT STOPPING	PAUSE STOPPING	AXES DETACHMENT	BRAKE LINE GROUND CHECK	SYSRUN	

50927	50926	50925	50924	50923	50922	50921	50920
SOUT#736	SOUT#735	SOUT#734	SOUT#733	SOUT#732	SOUT#731	SOUT#730	SOUT#729

50937	50936	50935	50934	50933	50932	50931	50930
SOUT#744	SOUT#743	SOUT#742	SOUT#741	SOUT#740	SOUT#739	SOUT#738	SOUT#737

50947	50946	50945	50944	50943	50942	50941	50940
SOUT#752	SOUT#751	SOUT#750	SOUT#749	SOUT#748	SOUT#747	SOUT#746	SOUT#745

50957	50956	50955	50954	50953	50952	50951	50950
SOUT#760	SOUT#759	SOUT#758	SOUT#757	SOUT#756	SOUT#755	SOUT#754	SOUT#753

50967	50966	50965	50964	50963	50962	50961	50960
SOUT#768	SOUT#767	SOUT#766	SOUT#765	SOUT#764	SOUT#763	SOUT#762	SOUT#761

50977	50976	50975	50974	50973	50972	50971	50970
SOUT#776	SOUT#775	SOUT#774	SOUT#773	SOUT#772	SOUT#771	SOUT#770	SOUT#769

50987	50986	50985	50984	50983	50982	50981	50980
SOUT#784	SOUT#783	SOUT#782	SOUT#781	SOUT#780	SOUT#779	SOUT#778	SOUT#777

50997	50996	50995	50994	50993	50992	50991	50990
SOUT#792	SOUT#791	SOUT#790	SOUT#789	SOUT#788	SOUT#787	SOUT#786	SOUT#785

51007	51006	51005	51004	51003	51002	51001	51000
SOUT#800	SOUT#799	SOUT#798	SOUT#797	SOUT#796	SOUT#795	SOUT#794	SOUT#793

51017	51016	51015	51014	51013	51012	51011	51010
SOUT#808	SOUT#807	SOUT#806	SOUT#805	SOUT#804	SOUT#803	SOUT#802	SOUT#801
						SYNCRO MODE	SINGLE MODE

51027	51026	51025	51024	51023	51022	51021	51020
SOUT#816	SOUT#815	SOUT#814	SOUT#813	SOUT#812	SOUT#811	SOUT#810	SOUT#809

51037	51036	51035	51034	51033	51032	51031	51030
SOUT#824	SOUT#823	SOUT#822	SOUT#821	SOUT#820	SOUT#819	SOUT#818	SOUT#817

51047	51046	51045	51044	51043	51042	51041	51040
SOUT#832	SOUT#831	SOUT#830	SOUT#829	SOUT#828	SOUT#827	SOUT#826	SOUT#825

51057	51056	51055	51054	51053	51052	51051	51050
SOUT#840	SOUT#839	SOUT#838	SOUT#837	SOUT#836	SOUT#835	SOUT#834	SOUT#833

51067	51066	51065	51064	51063	51062	51061	51060
SOUT#848	SOUT#847	SOUT#846	SOUT#845	SOUT#844	SOUT#843	SOUT#842	SOUT#841

51077	51076	51075	51074	51073	51072	51071	51070
SOUT#856	SOUT#855	SOUT#854	SOUT#853	SOUT#852	SOUT#851	SOUT#850	SOUT#849

51087	51086	51085	51084	51083	51082	51081	51080
SOUT#864	SOUT#863	SOUT#862	SOUT#861	SOUT#860	SOUT#859	SOUT#858	SOUT#857

51097	51096	51095	51094	51093	51092	51091	51090
SOUT#872	SOUT#871	SOUT#870	SOUT#869	SOUT#868	SOUT#867	SOUT#866	SOUT#865

51107	51106	51105	51104	51103	51102	51101	51100
SOUT#880	SOUT#879	SOUT#878	SOUT#877	SOUT#876	SOUT#875	SOUT#874	SOUT#873

51117	51116	51115	51114	51113	51112	51111	51110
SOUT#888	SOUT#887	SOUT#886	SOUT#885	SOUT#884	SOUT#883	SOUT#882	SOUT#881

51127	51126	51125	51124	51123	51122	51121	51120
SOUT#896	SOUT#895	SOUT#894	SOUT#893	SOUT#892	SOUT#891	SOUT#890	SOUT#889

51137	51136	51135	51134	51133	51132	51131	51130
SOUT#904	SOUT#903	SOUT#902	SOUT#901	SOUT#900	SOUT#899	SOUT#898	SOUT#897

51147	51146	51145	51144	51143	51142	51141	51140
SOUT#912	SOUT#911	SOUT#910	SOUT#909	SOUT#908	SOUT#907	SOUT#906	SOUT#905

51157	51156	51155	51154	51153	51152	51151	51150
SOUT#920	SOUT#919	SOUT#918	SOUT#917	SOUT#916	SOUT#915	SOUT#914	SOUT#913

51167	51166	51165	51164	51163	51162	51161	51160
SOUT#928	SOUT#927	SOUT#926	SOUT#925	SOUT#924	SOUT#923	SOUT#922	SOUT#921

51177	51176	51175	51174	51173	51172	51171	51170
SOUT#936	SOUT#935	SOUT#934	SOUT#933	SOUT#932	SOUT#931	SOUT#930	SOUT#929

51187	51186	51185	51184	51183	51182	51181	51180
SOUT#944	SOUT#943	SOUT#942	SOUT#941	SOUT#940	SOUT#939	SOUT#938	SOUT#937

51197	51196	51195	51194	51193	51192	51191	51190
SOUT#952	SOUT#951	SOUT#950	SOUT#949	SOUT#948	SOUT#947	SOUT#946	SOUT#945

51207	51206	51205	51204	51203	51202	51201	51200
SOUT#960	SOUT#959	SOUT#958	SOUT#957	SOUT#956	SOUT#955	SOUT#954	SOUT#953

51217	51216	51215	51214	51213	51212	51211	51210
SOUT#968	SOUT#967	SOUT#966	SOUT#965	SOUT#964	SOUT#963	SOUT#962	SOUT#961

51227	51226	51225	51224	51223	51222	51221	51220
SOUT#976	SOUT#975	SOUT#974	SOUT#973	SOUT#972	SOUT#971	SOUT#970	SOUT#969

51237	51236	51235	51234	51233	51232	51231	51230
SOUT#984	SOUT#983	SOUT#982	SOUT#981	SOUT#980	SOUT#979	SOUT#978	SOUT#977

51247	51246	51245	51244	51243	51242	51241	51240
SOUT#992	SOUT#991	SOUT#990	SOUT#989	SOUT#988	SOUT#987	SOUT#986	SOUT#985
						DETECT OVERLOAD (R2)	DETECT OVERLOAD (R1)

51257	51256	51255	51254	51253	51252	51251	51250
SOUT#1000	SOUT#999	SOUT#998	SOUT#997	SOUT#996	SOUT#995	SOUT#994	SOUT#993

51267	51266	51265	51264	51263	51262	51261	51260
SOUT#1008	SOUT#1007	SOUT#1006	SOUT#1005	SOUT#1004	SOUT#1003	SOUT#1002	SOUT#1001

51277	51276	51275	51274	51273	51272	51271	51270
SOUT#1016	SOUT#1015	SOUT#1014	SOUT#1013	SOUT#1012	SOUT#1011	SOUT#1010	SOUT#1009

51287	51286	51285	51284	51283	51282	51281	51280
SOUT#1024	SOUT#1023	SOUT#1022	SOUT#1021	SOUT#1020	SOUT#1019	SOUT#1018	SOUT#1017

51297	51296	51295	51294	51293	51292	51291	51290
SOUT#1032	SOUT#1031	SOUT#1030	SOUT#1029	SOUT#1028	SOUT#1027	SOUT#1026	SOUT#1025

51307	51306	51305	51304	51303	51302	51301	51300
SOUT#1040	SOUT#1039	SOUT#1038	SOUT#1037	SOUT#1036	SOUT#1035	SOUT#1034	SOUT#1033

51317	51316	51315	51314	51313	51312	51311	51310
SOUT#1048	SOUT#1047	SOUT#1046	SOUT#1045	SOUT#1044	SOUT#1043	SOUT#1042	SOUT#1041

51327	51326	51325	51324	51323	51322	51321	51320
SOUT#1056	SOUT#1055	SOUT#1054	SOUT#1053	SOUT#1052	SOUT#1051	SOUT#1050	SOUT#1049

51337	51336	51335	51334	51333	51332	51331	51330
SOUT#1064	SOUT#1063	SOUT#1062	SOUT#1061	SOUT#1060	SOUT#1059	SOUT#1058	SOUT#1057

51347	51346	51345	51344	51343	51342	51341	51340
SOUT#1072	SOUT#1071	SOUT#1070	SOUT#1069	SOUT#1068	SOUT#1067	SOUT#1066	SOUT#1065

51357	51356	51355	51354	51353	51352	51351	51350
SOUT#1080	SOUT#1079	SOUT#1078	SOUT#1077	SOUT#1076	SOUT#1075	SOUT#1074	SOUT#1073

51367	51366	51365	51364	51363	51362	51361	51360
SOUT#1088	SOUT#1087	SOUT#1086	SOUT#1085	SOUT#1084	SOUT#1083	SOUT#1082	SOUT#1081

51377	51376	51375	51374	51373	51372	51371	51370
SOUT#1096	SOUT#1095	SOUT#1094	SOUT#1093	SOUT#1092	SOUT#1091	SOUT#1090	SOUT#1089

51387	51386	51385	51384	51383	51382	51381	51380
SOUT#1104	SOUT#1103	SOUT#1102	SOUT#1101	SOUT#1100	SOUT#1099	SOUT#1098	SOUT#1097

51397	51396	51395	51394	51393	51392	51391	51390
SOUT#1112	SOUT#1111	SOUT#1110	SOUT#1109	SOUT#1108	SOUT#1107	SOUT#1106	SOUT#1105

51407	51406	51405	51404	51403	51402	51401	51400
SOUT#1120	SOUT#1119	SOUT#1118	SOUT#1117	SOUT#1116	SOUT#1115	SOUT#1114	SOUT#1113
					ARITHMTC ERROR FLAG	ARITHMTC ZERO FLAG	ARITHMTC CARRY FLAG

51417	51416	51415	51414	51413	51412	51411	51410
SOUT#1128	SOUT#1127	SOUT#1126	SOUT#1125	SOUT#1124	SOUT#1123	SOUT#1122	SOUT#1121

51427	51426	51425	51424	51423	51422	51421	51420
SOUT#1136	SOUT#1135	SOUT#1134	SOUT#1133	SOUT#1132	SOUT#1131	SOUT#1130	SOUT#1129

51437	51436	51435	51434	51433	51432	51431	51430
SOUT#1144	SOUT#1143	SOUT#1142	SOUT#1141	SOUT#1140	SOUT#1139	SOUT#1138	SOUT#1137

51447	51446	51445	51444	51443	51442	51441	51440
SOUT#1152	SOUT#1151	SOUT#1150	SOUT#1149	SOUT#1148	SOUT#1147	SOUT#1146	SOUT#1145

51457	51456	51455	51454	51453	51452	51451	51450
SOUT#1160	SOUT#1159	SOUT#1158	SOUT#1157	SOUT#1156	SOUT#1155	SOUT#1154	SOUT#1153

51467	51466	51465	51464	51463	51462	51461	51460
SOUT#1168	SOUT#1167	SOUT#1166	SOUT#1165	SOUT#1164	SOUT#1163	SOUT#1162	SOUT#1161

51477	51476	51475	51474	51473	51472	51471	51470
SOUT#1176	SOUT#1175	SOUT#1174	SOUT#1173	SOUT#1172	SOUT#1171	SOUT#1170	SOUT#1169

51487	51486	51485	51484	51483	51482	51481	51480
SOUT#1184	SOUT#1183	SOUT#1182	SOUT#1181	SOUT#1180	SOUT#1179	SOUT#1178	SOUT#1177

51497	51496	51495	51494	51493	51492	51491	51490
SOUT#1192	SOUT#1191	SOUT#1190	SOUT#1189	SOUT#1188	SOUT#1187	SOUT#1186	SOUT#1185

51507	51506	51505	51504	51503	51502	51501	51500
SOUT#1200	SOUT#1199	SOUT#1198	SOUT#1197	SOUT#1196	SOUT#1195	SOUT#1194	SOUT#1193

51517	51516	51515	51514	51513	51512	51511	51510
SOUT#1208	SOUT#1207	SOUT#1206	SOUT#1205	SOUT#1204	SOUT#1203	SOUT#1202	SOUT#1201

51527	51526	51525	51524	51523	51522	51521	51520
SOUT#1216	SOUT#1215	SOUT#1214	SOUT#1213	SOUT#1212	SOUT#1211	SOUT#1210	SOUT#1209

4.5 Specific Output Signals for Material Handling, Press Tending, Cutting, and Other Applications

4.5.1 Device 1

51537	51536	51535	51534	51533	51532	51531	51530
SOUT#1224	SOUT#1223	SOUT#1222	SOUT#1221	SOUT#1220	SOUT#1219	SOUT#1218	SOUT#1217
					PROHIBIT WORK CONTINUE	END WORK	START WORK

51547	51546	51545	51544	51543	51542	51541	51540
SOUT#1232	SOUT#1231	SOUT#1230	SOUT#1229	SOUT#1228	SOUT#1227	SOUT#1226	SOUT#1225

51557	51556	51555	51554	51553	51552	51551	51550
SOUT#1240	SOUT#1239	SOUT#1238	SOUT#1237	SOUT#1236	SOUT#1235	SOUT#1234	SOUT#1233

51567	51566	51565	51564	51563	51562	51561	51560
SOUT#1248	SOUT#1247	SOUT#1246	SOUT#1245	SOUT#1244	SOUT#1243	SOUT#1242	SOUT#1241

51577	51576	51575	51574	51573	51572	51571	51570
SOUT#1256	SOUT#1255	SOUT#1254	SOUT#1253	SOUT#1252	SOUT#1251	SOUT#1250	SOUT#1249

51587	51586	51585	51584	51583	51582	51581	51580
SOUT#1264	SOUT#1263	SOUT#1262	SOUT#1261	SOUT#1260	SOUT#1259	SOUT#1258	SOUT#1257

4.5.2 Device 2

51597	51596	51595	51594	51593	51592	51591	51590
SOUT#1272	SOUT#1271	SOUT#1270	SOUT#1269	SOUT#1268	SOUT#1267	SOUT#1266	SOUT#1265
					PROHIBIT WORK CONTINUE	END WORK	START WORK

51607	51606	51605	51604	51603	51602	51601	51600
SOUT#1280	SOUT#1279	SOUT#1278	SOUT#1277	SOUT#1276	SOUT#1275	SOUT#1274	SOUT#1273

51617	51616	51615	51614	51613	51612	51611	51610
SOUT#1288	SOUT#1287	SOUT#1286	SOUT#1285	SOUT#1284	SOUT#1283	SOUT#1282	SOUT#1281

51627	51626	51625	51624	51623	51622	51621	51620
SOUT#1296	SOUT#1295	SOUT#1294	SOUT#1293	SOUT#1292	SOUT#1291	SOUT#1290	SOUT#1289

51637	51636	51635	51634	51633	51632	51631	51630
SOUT#1304	SOUT#1303	SOUT#1302	SOUT#1301	SOUT#1300	SOUT#1299	SOUT#1298	SOUT#1297

51647	51646	51645	51644	51643	51642	51641	51640
SOUT#1312	SOUT#1311	SOUT#1310	SOUT#1309	SOUT#1308	SOUT#1307	SOUT#1306	SOUT#1305

4.6 Specific Output Signals: Explanation

The following symbols are used in the explanation to represent the signal conditions.

The signal takes effect while it is in the ON state.

The rising edge is detected as the signal.

4.6.1 Alarms and Messages Display

■ **50010 to 50014: ALARM/ERROR OCCURRENCE**

These signals indicate the occurrence of alarms or errors. The “MAJOR ALM OCCUR” (50010) signal remains ON until power is turned OFF.

Register M640 Alarm Code (Binary/BCD)

If an alarm occurs in the system, the corresponding alarm code is output. If there are two or more alarms, the code of the first occurring alarm is output. To switch binary and BCD data type, use the parameter (S2C315). Factory setting is binary.

Register M641, 642 Alarm Data (Binary/BCD)

- This data is detailed information added to the alarm code.

■ **50015, 50016: BATTERY WEAK**

These signals are turned ON to indicate that batteries need replacement when voltage drops in the memory protection battery and the absolute encoder memory retention battery. Loss of data in memory due to a weak battery causes much damage.

Take the signals as a kind of alarm and take appropriate action.

■ **50017: COOLING FAN ERROR**

This signal is turned ON to inform that the cooling fan is required to be changed when the CPU rack cooling fan inside YRC1000micro or the cooling fan connected to the power ON unit is not operating normally. Such an error as non-operating cooling fan causes damages to YRC1000micro and robot components.

Take the signal as a kind of alarm and take appropriate action.

■ **50697: SHOCK DTCT ALM**

This signal indicates that the shock detection alarm “4315: SHOCK DETECTION” currently occurs.

■ **50726: MOTOR TEMPERATURE RAISED (85°C)**

This signal is turned ON when the encoder temperature is raised to 85°C or higher.

■ **51240, 51241: DETECT OVERLOAD**

These signals are turned ON when an excessive load for the payload is detected.

4.6.2 Setting of Mode / Cycle and Particular Play Operation

■ **50050 to 50052: CYCLE SETTING**

These signals indicate the status of specifications of current cycle setting. The signal corresponding to the selected cycle is turned ON.

■ **50053, 50054: MODE SETTING**

These signals indicate the status of specifications of current mode settings. The signals are synchronized with the mode select key lamps on the front door of the YRC1000micro. The signal corresponding to the selected mode is turned ON.

■ **50056: COMMAND REMOTE SETTING**

This signal indicates that the command remote function such as transmission is valid.

■ **50060: IN-GUARD SAFE OPERATION SETTING**

This signal indicates that the manipulator is in the in-guard safe operation status.

■ **50061: DRY-RUN SETTING**

This signal indicates that the dry-run is set.

■ **50062: MACHINE LOCK SETTING**

This signal indicates that the machine lock is set.

■ **50063: SOFT LIMIT RELEASE SETTING**

This signal indicates that the soft limit is released. Switching to the play mode releases the soft limit automatically and turns OFF this signal.

■ **50064: CHECK RUN SETTING**

This signal indicates the check run is set.

4.6.3 Start and Stop Signals

■ **50020: HEAD OF MASTER JOB**

This signal indicates that the execution position is at the head of the master job. The signal can be used as a check signal calling for master job.

■ **50066: POSITION CHECK COMPLETED**

This signal indicates that the position check operation has been completed after “Alarm 4107: OUT OF RANGE (ABSO DATA)” occurred. The signal stays ON if the alarm does not occur after power ON.

■ **50067: FULL SPEED RUNNING**

This signal indicates that the manipulator is running in the condition that the safe speed limit is released.

■ **50070: RUNNING (Start Lamp)**

This signal indicates that the manipulator is running. That is, the manipulator is either executing jobs, ready for reserved starting, ready for multi-series starting, or performing test run. This signal is synchronized with the state of the “START” button on the programming pendant.

■ **50071: HOLDING (Hold Lamp)**

This signal indicates that the manipulator is in the “HOLDING” status as “HOLD” being instructed. This signal is synchronized with the state of the “HOLD” button on the programming pendant.

■ **50073: SERVO ON**

This signal indicates that after the servo power is turned ON, internal processing such as current position setting has been completed and the system is ready to accept “START” instruction. This can be used for determining external starting conditions.

■ **50075: JOB EDITING OPERATION INDICATION**

This signal indicates that the job to be executed has just been edited, searched, or manipulated with the cursor ON. This can be used for determining starting conditions after editing.

■ **50076: JOG OPERATION INDICATION**

This signal indicates that the manipulator was made to move an axis or followed the FWD/BWD operation on the programming pendant. This signal goes OFF automatically when playback is started. This can be used for determining restarting condition.

■ **50077: OT RELEASE**

This signal indicates that the overrun status is released.

■ **50270, 50271, 50280, 50281, 50290 to 50292: OPERATION TARGET CONTROL GROUP**

These signals indicate the manipulator control group which was made to move an axis or followed the FWD/BWD operation on the programming pendant.

■ **50320, 50321, 50330 to 50332: SERVO ON STATUS**

These signals indicate that the servo power for each robot/station is ON. With the signal ON, the corresponding servo power for each robot/station is ON.

■ **50360, 50361, 50370 to 50372: SEQUENCE WAITING**

These signals indicate that the manipulator is stopped by the “SEQUENCE WAIT” (40130 to 40131) signal. After accepting the above signal and the manipulator has stopped, these signals go ON. When sequence wait is cleared, these signals go OFF before the manipulator starts operating.

■ **50400, 50401, 50410 to 50412: SEQUENCE CONTINUING**

These signals indicate that manipulator operation is in executing state in the sequence of instruction as taught. These signals go ON when the initial job is executed after the power is turned ON.

The same conditions as above are applied to the “FWD” and “TEST” operations on the programming pendant.

These signals go OFF in the following cases.

• When the cursor is moved by the operation such as change of the line No. with the programming pendant at the manipulator stop.

• When a different job is called up.

• When edit operation (insertion, modification, deletion) is executed from the programming pendant.

For a system with one manipulator, use signal No. 50400.

■ **50440, 50441, 50450 to 50452: CONTROL GROUP RUNNING**

This signal indicates that the manipulator is running (segment data is not equal to 0).

■ **50480, 50481: WORK RESTART PROHIBIT**

When an emergency stop is executed during running at high-speed, the job instruction stop position may advances from the actual manipulator position due to the servo delay. At restarting, the manipulator moves adjusting this delay, then the job is executed. When the stop position is within the work section, these signals remains ON to indicate that the work restart is prohibited until the manipulator moves for the delay and reaches the work start position.

For a system with one manipulator, use signal No. 50480 (R1).

■ **50490, 50491: PERMISSIBLE WORK RUNNING**

These signals indicate that the manipulator is running at the actual workable speed. These signals are turned ON being synchronized with “RUNNING” (50490) signal. The status of these signals during operations other than normal playback operation are shown below.

State 0 : OFF 1 : ON	Meaning
0	• Machine Lock Operation • Dry-Run Operation • Low-Speed Start-Up Operation
1	• During in-guard safety operation • During continuous operation with the programming pendant • When adjusting speed during operation • When speed is limited by the sensor

For a system with one manipulator, use R1J (50490)

■ **50500, 50501: SEARCH START**

These signals indicate that “SEARCH” instruction being executed. These signals can be used as effective sensing signals for external sensor.

For a system with one manipulator, use signal No. 50500.

■ **50520, 50527: LOCUS DEVIATION**

These signals indicate that the corresponding manipulators are deviating from the natural locus, as jog operation after the emergency stop or motion stop.

For a system with one manipulator, use signal No. 50520.

■ **50725: DIALOG DISPLAYED AT START**

This signal indicates that the following dialogs are displayed when a job start is operated:

①“Restart from edit cursor(black)?”

②“Restart the job from current position?”

③“Simulating I/O. Start?”

④“Over-riding speed. Start?”

This signal is turned ON until [Yes/No] is selected on the dialog.

4.6.4 Interference Signals

■ **50080 to 50157: IN-CUBE**

State

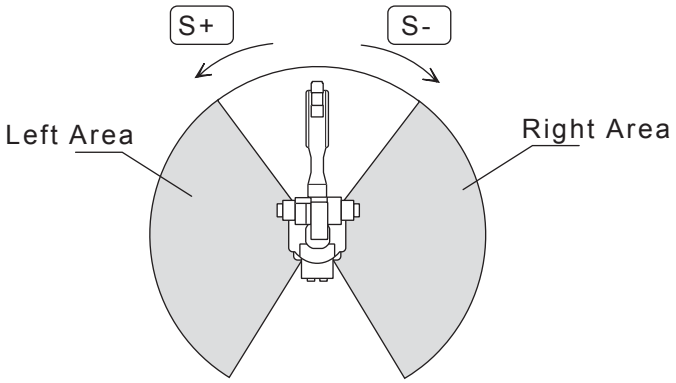
These signals indicate the area in which the current control point is positioned, or in which the axis is positioned in the initially set area. Set the area by parameters (S2C003 to S2C194, S3C064 to S2C1087). These can be used to prevent interference with other manipulators or jigs.

■ **50160 to 50177: S-AXIS INTERFERENCE AREA**

State

These signals indicate the area in which the current S-Axis is positioned in the initially set area. Set the area by parameters (S2C002, S3C048 to S3C063). These can be used to prevent interference with other manipulators or jigs.

Fig. 4-3: Relation Between the Area and the Signal



■ **50811: SPHERE INTERFERENCE**

State

These signals indicate an interference detected by the sphere interference check. These signals can be used in the dynamic interference check for two or more manipulators.

4.6.5 Arithmetic Instruction Signal

■ **51400, 51401, 51402: Arithmetic Flag**

These signals reflect the result of the arithmetic instruction in the following steps. There are three kinds of flag: Carry Flag(51400), Zero Flag(51401), and Error Flag(51402).

4.6.6 GP Signals

■ **50074: I/O SIMULATED**

This signal indicates any of the signals that are in the simulation mode in the IO windows.

■ **50560, 50561: SHOCK DETECTION VALID**

This signal indicates that the shock detection function is valid.

■ **50690 to 50693: SECURITY MODE**

These signals indicate the current setting of security mode.

50690: Operation mode

50691: Editing mode

50692: Management mode

50693: Safety mode

■ **50696: WRONG DATA**

This signal is turned ON when the wrong job data is operated.

■ **50727: IN ENERGY SAVER MODE**

This signal is turned ON when the energy saver mode is operated.

■ **50766: AUTO BACKUP DATA CREATED**

This signal indicates that auto backup is operated.
When the signal is ON, the servo cannot be turned ON.

■ **50767: AUTO BACKUP DATA TRANSMITTED**

This signal is turned ON until the backup request occurs and transmitting the storage device is completed.

■ **50770 : JOB STUCK**

These signals indicate that the master and sub task 1 to 5 are in job stuck process.

■ **50900: IN IO TRACE**

This signal indicates that the trace operation is proceeded.

■ **50911: SYSRUN**

This signal informs external devices whether the controller is in normal condition or not.

This signal is the pulse one and is turned ON/OFF every 100 msec when S3C1303 is 0 or every S3C1303 × 4 msec when S3C1303 is not 0.

(Example) This signal turns ON/OFF every 5 × 4 msec = 20 msec when S3C1303 is 5.

■ **50912: BRAKE LINE GROUND CHECK**

This signal is turned on when any of axes need to be checked if the break line is grounding.

■ **50913: AXES DETACHMENT**

This signal is turned ON when any of axes are being disconnected.

■ **50914: PAUSE STOPPING**

This signal is turned ON while the manipulator stops its motion by the PAUSE instruction.

■ **50915: ABORT STOPPING**

This signal is turned ON while the manipulator stops its motion by the ABORT instruction.

■ **50916: SYSTEM BACKUP DATA CREATED**

This signal indicates that the system backup (CMOS.BIN) data is in preparation.

When the signal is ON, the servo cannot be turned ON and the programming pendant operation is not available.

■ **50917: SYSTEM BACKUP DATA TRANSMITTED**

This signal indicates that the system backup (CMOS.BIN) data is being transmitted to the storage device.

4.6.7 Independent Control Signals (Optional)

■ **50021 to 50025: TOP SUB 1 to 5 MASTER**

These signals indicate that the execution position is at the head of the master job in sub task 1 to 5. Use as a checking signal of master job in each sub task call.

■ **50601 to 50605: SUB HELD**

These signals indicate sub task 1 to 5 stops the operation by alarm occurrence or the “PAUSE” instruction. Operation can be restarted by pressing the [START] key on the front door of the YRC1000micro or inputting external start (40044).

These signals are turned OFF when all tasks stop or the sub task is released.

■ **50621 to 50625: SUB ALARM OCCUR**

These signals indicate that the sub task is generating an alarm individually during the system section alarm occurrence (50012) or user section alarm occurrence (50013).

■ **50640 to 50645: CRD WORKING**

It notifies the operator that master and sub tasks No. 1 to 5 are in execution.

■ **50660 to 50665: SUB 1 to 5 MASTER OPERATING**

These signals indicate that the robot is operating by sub task 1 to 5 and the master job signals.

■ **50700 to 50705: SELECT JOB**

These signals are turned ON when there are any selected jobs.

■ **50771 to 50775: JOB STACK**

These signals indicate that the sub task 1 to 5 are in job stack process.

■ **51010: SINGLE MODE SELECTING**

It shows that the axis operation is in the single mode.

It is turned ON when the “SYNCRO MODE” in the status display area is not displayed.

■ **51011: SYNCRO MODE SELECTING**

It shows that the axis operation is in the syncro mode.

It is turned ON when the “SYNCRO MODE” in the status display area is displayed.

4.6.8 Signals for Servo Float Function (Optional)

■ **50510, 50511: SERVO FLOAT ON**

These signals indicate the servo float operating status.

In the system with one manipulator, use signal No. 50510 (R1).

4.6.9 Signals for Material Handling, Press Tending, Cutting, and Other Applications

Signals from 51530 to 51647 are classified into two blocks and allocated to output signals that have different meanings depending on the application. Most of these outputs are used by the system so they cannot be used from the outside of the YRC1000micro. This section explains exceptional signals that are available for external use.

■ **51530, 51590**
: WORK START Instructions

These signals indicate work starting and wait for inputting of the “WORK START RESPONSE” (41130, 41190) signal.

For a system with one application, use signal No. 51530.

■ **51531, 51591**
: WORK END Instructions

These signals indicate work ending and wait for inputting of the “WORK END RESPONSE” (41131, 41191) signal.

For a system with one application, use signal No. 51531.

■ **51532, 51592**
: WORK CONTINUING PROHIBIT Instructions

These signals indicate whether to continue the operation when resuming, after stopping while at the operation. When the signals are ON, the operation is not continued.

For a system with one application, use signal No. 51532.

5 Internal Signal Used in Standard Ladder

5.1 Signals for Material Handling, Press Tending, Cutting, and Other Applications

70017	70016	70015	70014	70013	70012	70011	70010
CONTROL POWER ON COMPLETED (NORMALITY ON)	SYSTEM RESERVE	SYSTEM RESERVE				EXT START RECEIVING READY	EXT START
70027	70026	70025	70024	70023	70022	70021	70020
		REMOTE SELECT	EXTERNAL HOLD AUXILIARY 1				ALARM OCCUR
70037	70036	70035	70034	70033	70032	70031	70030
70047	70046	70045	70044	70043	70042	70041	70040
70057	70056	70055	70054	70053	70052	70051	70050

:
:

79997	79996	79995	79994	79993	79992	79991	79990

6 Internal Control Status Signals

6.1 Internal Control Status Signals

* : NC contact

80017	80016	80015	80014	80013	80012	80011	80010
SVONRDY	START	*HOLD		TEACH	PLAY	REMOTE	

REMOTE	Remote Mode Select
PLAY	Play Mode Select
TEACH	Teach Mode Select
*HOLD	Hold (Programming Pendant)
START	Operation Start (Programming Pendant)
SVONRDY	Servo On (Programming Pendant)

80027	80026	80025	80024	80023	80022	80021	80020
*PBESP	*PPESP	*EXESP		*SAFF			

*SAFF	Safety Plug Input
*EXESP	External Emergency Stop
*PPESP	Programming Pendant Emergency Stop
*PBESP	YRC1000micro Door Emergency Stop

80037	80036	80035	80034	80033	80032	80031	80030
	EXESW		PPESW	SVONRDY1		SVONRDY0	

SVON RDY0	Servo ON Condition 1
SVON RDY1	Servo ON Condition 2
PPESW	Enable Switch Input
EXESW	External Enable Switch Input

80047	80046	80045	80044	80043	80042	80041	80040
FST	SSP					SAFSPD1	SAFSPD2

SAFSPD2	Safe Speed 2
SAFSPD1	Safe Speed 1
SSP	Safe Speed Mode Select
FST	Full-speed Test

80057	80056	80055	80054	80053	80052	80051	80050
			SF_SVON	SVONRDY0	SVKPEN	EX24VU_OK	24VU_OK

24VU_OK	24V OK
EX24VU_OK	External 24V OK
SVKPEN	SERVO STATUS KEEP ENABLE
SVONRDY0	SERVO ON READY
SF_SVON	SERVO ON STATUS

80067	80066	80065	80064	80063	80062	80061	80060
	*OT	*SHOCK1			*FUCUT	*PROTECTED_STOP	*SHOCK2

*SHOCK2	Shock Sensor Operation Hold
*PROTECTED_STOP	Protected Stop
*FUCUT	Blake Fuse Blown
*SHOCK1	Shock Sensor Operation Emergency Stop
*OT	Over Travel

80077	80076	80075	80074	80073	80072	80071	80070

80087	80086	80085	80084	80083	80082	80081	80080
				RIN4(SV#1)	RIN3(SV#1)	RIN2(SV#1)	RIN1(SV#1)

RIN1 (SV#1)	Direct In1 (Servo 1)
RIN2 (SV#1)	Direct In2 (Servo 1)
RIN3 (SV#1)	Direct In3 (Servo 1)
RIN4 (SV#1)	Direct In4 (Servo 1)

80097	80096	80095	80094	80093	80092	80091	80090
				RIN4(SV#2)	RIN3(SV#2)	RIN2(SV#2)	RIN1(SV#2)

RIN1 (SV#2)	Direct In1 (Servo 2)
RIN2 (SV#2)	Direct In2 (Servo 2)
RIN3 (SV#2)	Direct In3 (Servo 2)
RIN4 (SV#2)	Direct In4 (Servo 2)

80107	80106	80105	80104	80103	80102	80101	80100

80117	80116	80115	80114	80113	80112	80111	80110

80127	80126	80125	80124	80123	80122	80121	80120

80137	80136	80135	80134	80133	80132	80131	80130

80147	80146	80145	80144	80143	80142	80141	80140

80157	80156	80155	80154	80153	80152	80151	80150

80167	80166	80165	80164	80163	80162	80161	80160
						*FUCUT (SV#2)	*FUCUT (SV#1)

*FUCUT(SV#1) Blake Fuse Blown(SV#1)
*FUCUT(SV#2) Blake Fuse Blown(SV#2)

80177	80176	80175	80174	80173	80172	80171	80170
						*SHOCK1 (SV#2)	*SHOCK1 (SV#1)

*SHOCK1(SV#1) Shock Sensor Operation Emergency Stop(SV#1)

*SHOCK1(SV#2) Shock Sensor Operation Emergency Stop(SV#2)

80187	80186	80185	80184	80183	80182	80181	80180
						*OT2 (#1)	*OT1 (#1)

*OT1 (#1) Over Travel1 (#1)

*OT2 (#1) Over Travel2 (#1)

80197	80196	80195	80194	80193	80192	80191	80190

80207	80206	80205	80204	80203	80202	80201	80200

80217	80216	80215	80214	80213	80212	80211	80210

80227	80226	80225	80224	80223	80222	80221	80220

80237	80236	80235	80234	80233	80232	80231	80230
						*SHOCK2 (SV#2)	*SHOCK2 (SV#1)

*SHOCK2(SV#1) Shock Sensor Operation Hold(SV#1)
*SHOCK2(SV#2) Shock Sensor Operation Hold(SV#2)

80247	80246	80245	80244	80243	80242	80241	80240
						*PROTECTED _STOP1(#1)	*PROTECTED _STOP2(#1)

*PROTECTED_STOP1(#1) Protected Stop1(#1)
*PROTECTED_STOP2(#1) Protected Stop2(#1)

80257	80256	80255	80254	80253	80252	80251	80250

80267	80266	80265	80264	80263	80262	80261	80260

80277	80276	80275	80274	80273	80272	80271	80270

80287	80286	80285	80284	80283	80282	80281	80280
						*FANALM1 (#2)	*FANALM1 (#1)

*FANALM1(#1) Fan Alarm 1 (#1)
*FANALM1(#2) Fan Alarm 1 (#2)

80297	80296	80295	80294	80293	80292	80291	80290

80307	80306	80305	80304	80303	80302	80301	80300

80317	80316	80315	80314	80313	80312	80311	80310

80327	80326	80325	80324	80323	80322	80321	80320

80337	80336	80335	80334	80333	80332	80331	80330

80347	80346	80345	80344	80343	80342	80341	80340
				MSLGC_ SVOFF	FANALM_ST OP		LOOPBK_E RR

LOOPBK_ERR	SAFETY CIRCUIT BOARD COMMUNICATION ERROR
FANALM_STOP	FAN ALARM DETECTION STOP STATUS
MSLGC_SVOFF	SERVO OFF STATUS BY SAFETY LOGIC CIRCUIT

80357	80356	80355	80354	80353	80352	80351	80350

80367	80366	80365	80364	80363	80362	80361	80360

80377	80376	80375	80374	80373	80372	80371	80370

80387	80386	80385	80384	80383	80382	80381	80380
				24VU_OK #2	EX24VU_OK #2	24VU_OK #1	EX24VU_OK #1

EX24VU_OK(#1)	EXTERNAL 24V OK(#1)
24VU_OK (#1)	24V OK(#1)
EX24VU_OK(#2)	EXTERNAL 24V OK(#2)
24VU_OK (#2)	24V OK(#2)

80397	80396	80395	80394	80393	80392	80391	80390

80407	80406	80405	80404	80403	80402	80401	80400

80417	80416	80415	80414	80413	80412	80411	80410

80427	80426	80425	804124	80423	80422	80421	80420

80437	80436	80435	80434	80433	80432	80431	80430

80447	80446	80445	80444	80443	80442	80441	80440

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81327	81326	81325	81324	81323	81322	81321	81320
MS-OUT08	MS-OUT07	MS-OUT06	MS-OUT05	MS-OUT04	MS-OUT03	MS-OUT02	MS-OUT01

MS-OUT01 Safety Logic Circuit MS-OUT01
MS-OUT02 Safety Logic Circuit MS-OUT02
MS-OUT03 Safety Logic Circuit MS-OUT03
MS-OUT04 Safety Logic Circuit MS-OUT04
MS-OUT05 Safety Logic Circuit MS-OUT05
MS-OUT06 Safety Logic Circuit MS-OUT06
MS-OUT07 Safety Logic Circuit MS-OUT07
MS-OUT08 Safety Logic Circuit MS-OUT08

81337	81336	81335	81334	81333	81332	81331	81330
MS-OUT16	MS-OUT15	MS-OUT14	MS-OUT13	MS-OUT12	MS-OUT11	MS-OUT10	MS-OUT09

MS-OUT09 Safety Logic Circuit MS-OUT09
MS-OUT10 Safety Logic Circuit MS-OUT10
MS-OUT11 Safety Logic Circuit MS-OUT11
MS-OUT12 Safety Logic Circuit MS-OUT12
MS-OUT13 Safety Logic Circuit MS-OUT13
MS-OUT14 Safety Logic Circuit MS-OUT14
MS-OUT15 Safety Logic Circuit MS-OUT15
MS-OUT16 Safety Logic Circuit MS-OUT16

81347	81346	81345	81344	81343	81342	81341	81340
MS-OUT24	MS-OUT23	MS-OUT22	MS-OUT21	MS-OUT20	MS-OUT19	MS-OUT18	MS-OUT17

MS-OUT17	Safety Logic Circuit	MS-OUT17
MS-OUT18	Safety Logic Circuit	MS-OUT18
MS-OUT19	Safety Logic Circuit	MS-OUT19
MS-OUT20	Safety Logic Circuit	MS-OUT20
MS-OUT21	Safety Logic Circuit	MS-OUT21
MS-OUT22	Safety Logic Circuit	MS-OUT22
MS-OUT23	Safety Logic Circuit	MS-OUT23
MS-OUT24	Safety Logic Circuit	MS-OUT24

81357	81356	81355	81354	81353	81352	81351	81350
MS-OUT32	MS-OUT31	MS-OUT30	MS-OUT29	MS-OUT28	MS-OUT27	MS-OUT26	MS-OUT25

MS-OUT25	Safety Logic Circuit	MS-OUT25
MS-OUT26	Safety Logic Circuit	MS-OUT26
MS-OUT27	Safety Logic Circuit	MS-OUT27
MS-OUT28	Safety Logic Circuit	MS-OUT28
MS-OUT29	Safety Logic Circuit	MS-OUT29
MS-OUT30	Safety Logic Circuit	MS-OUT30
MS-OUT31	Safety Logic Circuit	MS-OUT31
MS-OUT32	Safety Logic Circuit	MS-OUT32

81367	81366	81365	81364	81363	81362	81361	81360
MS-OUT40	MS-OUT39	MS-OUT38	MS-OUT37	MS-OUT36	MS-OUT35	MS-OUT34	MS-OUT33

MS-OUT33	Safety Logic Circuit	MS-OUT33
MS-OUT34	Safety Logic Circuit	MS-OUT34
MS-OUT35	Safety Logic Circuit	MS-OUT35
MS-OUT36	Safety Logic Circuit	MS-OUT36
MS-OUT37	Safety Logic Circuit	MS-OUT37
MS-OUT38	Safety Logic Circuit	MS-OUT38
MS-OUT39	Safety Logic Circuit	MS-OUT39
MS-OUT40	Safety Logic Circuit	MS-OUT40

81377	81376	81375	81374	81373	81372	81371	81370
MS-OUT48	MS-OUT47	MS-OUT46	MS-OUT45	MS-OUT44	MS-OUT43	MS-OUT42	MS-OUT41

MS-OUT41	Safety Logic Circuit MS-OUT41
MS-OUT42	Safety Logic Circuit MS-OUT42
MS-OUT43	Safety Logic Circuit MS-OUT43
MS-OUT44	Safety Logic Circuit MS-OUT44
MS-OUT45	Safety Logic Circuit MS-OUT45
MS-OUT46	Safety Logic Circuit MS-OUT46
MS-OUT47	Safety Logic Circuit MS-OUT47
MS-OUT48	Safety Logic Circuit MS-OUT48

81387	81386	81385	81384	81383	81382	81381	81380
MS-OUT56	MS-OUT55	MS-OUT54	MS-OUT53	MS-OUT52	MS-OUT51	MS-OUT50	MS-OUT49

MS-OUT49	Safety Logic Circuit MS-OUT49
MS-OUT50	Safety Logic Circuit MS-OUT50
MS-OUT51	Safety Logic Circuit MS-OUT51
MS-OUT52	Safety Logic Circuit MS-OUT52
MS-OUT53	Safety Logic Circuit MS-OUT53
MS-OUT54	Safety Logic Circuit MS-OUT54
MS-OUT55	Safety Logic Circuit MS-OUT55
MS-OUT56	Safety Logic Circuit MS-OUT56

81397	81396	81395	81394	81393	81392	81391	81390
MS-OUT64	MS-OUT63	MS-OUT62	MS-OUT61	MS-OUT60	MS-OUT59	MS-OUT58	MS-OUT57

MS-OUT57	Safety Logic Circuit MS-OUT57
MS-OUT58	Safety Logic Circuit MS-OUT58
MS-OUT59	Safety Logic Circuit MS-OUT59
MS-OUT60	Safety Logic Circuit MS-OUT60
MS-OUT61	Safety Logic Circuit MS-OUT61
MS-OUT62	Safety Logic Circuit MS-OUT62
MS-OUT63	Safety Logic Circuit MS-OUT63
MS-OUT64	Safety Logic Circuit MS-OUT64

81407	81406	81405	81404	81403	81402	81401	81400
FS-OUT08	FS-OUT07	FS-OUT06	FS-OUT05	FS-OUT04	FS-OUT03	FS-OUT02	FS-OUT01

FS-OUT01	Safety Logic Circuit	FS-OUT01
FS-OUT02	Safety Logic Circuit	FS-OUT02
FS-OUT03	Safety Logic Circuit	FS-OUT03
FS-OUT04	Safety Logic Circuit	FS-OUT04
FS-OUT05	Safety Logic Circuit	FS-OUT05
FS-OUT06	Safety Logic Circuit	FS-OUT06
FS-OUT07	Safety Logic Circuit	FS-OUT07
FS-OUT08	Safety Logic Circuit	FS-OUT08

81417	81416	81415	81414	81413	81412	81411	81410
FS-OUT16	FS-OUT15	FS-OUT14	FS-OUT13	FS-OUT12	FS-OUT11	FS-OUT10	FS-OUT09

FS-OUT09	Safety Logic Circuit	FS-OUT09
FS-OUT10	Safety Logic Circuit	FS-OUT10
FS-OUT11	Safety Logic Circuit	FS-OUT11
FS-OUT12	Safety Logic Circuit	FS-OUT12
FS-OUT13	Safety Logic Circuit	FS-OUT13
FS-OUT14	Safety Logic Circuit	FS-OUT14
FS-OUT15	Safety Logic Circuit	FS-OUT15
FS-OUT16	Safety Logic Circuit	FS-OUT16

81427	81426	81425	81424	81423	81422	81421	81420
FS-OUT24	FS-OUT23	FS-OUT22	FS-OUT21	FS-OUT20	FS-OUT19	FS-OUT18	FS-OUT17

FS-OUT17	Safety Logic Circuit	FS-OUT17
FS-OUT18	Safety Logic Circuit	FS-OUT18
FS-OUT19	Safety Logic Circuit	FS-OUT19
FS-OUT20	Safety Logic Circuit	FS-OUT20
FS-OUT21	Safety Logic Circuit	FS-OUT21
FS-OUT22	Safety Logic Circuit	FS-OUT22
FS-OUT23	Safety Logic Circuit	FS-OUT23
FS-OUT24	Safety Logic Circuit	FS-OUT24

81437	81436	81435	81434	81433	81432	81431	81430
FS-OUT32	FS-OUT31	FS-OUT30	FS-OUT29	FS-OUT28	FS-OUT27	FS-OUT26	FS-OUT25

FS-OUT25 Safety Logic Circuit FS-OUT25
FS-OUT26 Safety Logic Circuit FS-OUT26
FS-OUT27 Safety Logic Circuit FS-OUT27
FS-OUT28 Safety Logic Circuit FS-OUT28
FS-OUT29 Safety Logic Circuit FS-OUT29
FS-OUT30 Safety Logic Circuit FS-OUT30
FS-OUT31 Safety Logic Circuit FS-OUT31
FS-OUT32 Safety Logic Circuit FS-OUT32

81447	81446	81445	81444	81443	81442	81441	81440
FS-OUT40	FS-OUT39	FS-OUT38	FS-OUT37	FS-OUT36	FS-OUT35	FS-OUT34	FS-OUT33

FS-OUT33 Safety Logic Circuit FS-OUT33
FS-OUT34 Safety Logic Circuit FS-OUT34
FS-OUT35 Safety Logic Circuit FS-OUT35
FS-OUT36 Safety Logic Circuit FS-OUT36
FS-OUT37 Safety Logic Circuit FS-OUT37
FS-OUT38 Safety Logic Circuit FS-OUT38
FS-OUT39 Safety Logic Circuit FS-OUT39
FS-OUT40 Safety Logic Circuit FS-OUT40

81457	81456	81455	81454	81453	81452	81451	81450
FS-OUT48	FS-OUT47	FS-OUT46	FS-OUT45	FS-OUT44	FS-OUT43	FS-OUT42	FS-OUT41

FS-OUT41 Safety Logic Circuit FS-OUT41
FS-OUT42 Safety Logic Circuit FS-OUT42
FS-OUT43 Safety Logic Circuit FS-OUT43
FS-OUT44 Safety Logic Circuit FS-OUT44
FS-OUT45 Safety Logic Circuit FS-OUT45
FS-OUT46 Safety Logic Circuit FS-OUT46
FS-OUT47 Safety Logic Circuit FS-OUT47
FS-OUT48 Safety Logic Circuit FS-OUT48

81467	81466	81465	81464	81463	81462	81461	81460
FS-OUT56	FS-OUT55	FS-OUT54	FS-OUT53	FS-OUT52	FS-OUT51	FS-OUT50	FS-OUT49

FS-OUT49	Safety Logic Circuit	FS-OUT49
FS-OUT50	Safety Logic Circuit	FS-OUT50
FS-OUT51	Safety Logic Circuit	FS-OUT51
FS-OUT52	Safety Logic Circuit	FS-OUT52
FS-OUT53	Safety Logic Circuit	FS-OUT53
FS-OUT54	Safety Logic Circuit	FS-OUT54
FS-OUT55	Safety Logic Circuit	FS-OUT55
FS-OUT56	Safety Logic Circuit	FS-OUT56

81477	81476	81475	81474	81473	81472	81471	81470
FS-OUT64	FS-OUT63	FS-OUT62	FS-OUT61	FS-OUT60	FS-OUT59	FS-OUT58	FS-OUT57

FS-OUT57	Safety Logic Circuit	FS-OUT57
FS-OUT58	Safety Logic Circuit	FS-OUT58
FS-OUT59	Safety Logic Circuit	FS-OUT59
FS-OUT60	Safety Logic Circuit	FS-OUT60
FS-OUT61	Safety Logic Circuit	FS-OUT61
FS-OUT62	Safety Logic Circuit	FS-OUT62
FS-OUT63	Safety Logic Circuit	FS-OUT63
FS-OUT64	Safety Logic Circuit	FS-OUT64

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85127	85126	85125	85124	85123	85122	85121	85120

6.1.1 Internal Control Status Signal (Monitor)

The following symbols are used in the explanation to represent the signal conditions.

The signal takes effect while it is in the ON state.

The rising edge is detected as the signal.

■ **80011 to 80013: MODE SELECTION**

These signals indicate the status of the mode key of the programming pendant.

■ **80015: *PROGRAMMING PENDANT PANEL HOLD**

These signals indicate the status of the mode key of the programming pendant.

■ **80016: OPERATION START**

This signal indicates the operating status of the [START] key on the programming pendant.

■ **80017: SERVO POWER ON**

This signal indicates the operating status of the [SERVO POWER] key on the programming pendant.

■ **80023: *SAFETY PLUG INPUT**

This signal turns OFF while the safety guard input signal connected to the robot specific input connector is operating.

For the connection, refer to “YRC1000micro INSTRUCTIONS (RE-CTO-A221) 14.1.1 Connection of Robot Specific Input Signal”.

■ **80025: *EXTERNAL EMERGENCY STOP**

This signal is OFF while the safety guard input signal connected to the robot specific input connector is operating.

For the connection, refer to the “YRC1000micro INSTRUCTIONS (RE-CTO-A221) 14.1.1 Connection of Robot Specific Input Signal”.

■ **80026: *PROGRAMMING PENDANT EMERGENCY STOP**

This signal is OFF when the emergency stop on the programming pendant is operating.

■ **80027: * YRC1000micro DOOR EMERGENCY STOP**

State

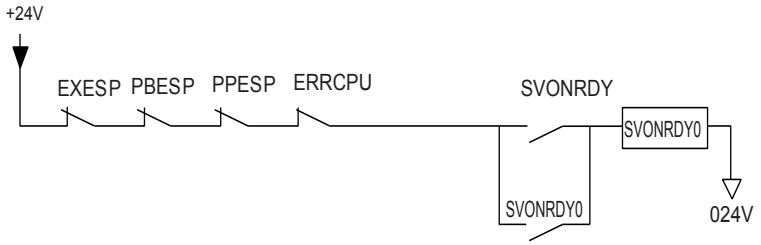
This signal is OFF when the emergency stop on the upper part of the YRC1000micro door is operating.

■ **80031, 80053: SERVO ON CONDITION 1**

State

This signal turns ON when the following signals satisfy the conditions for servo ON status.

When this signal turns OFF while the servo is ON, the servo power supply is shut down.

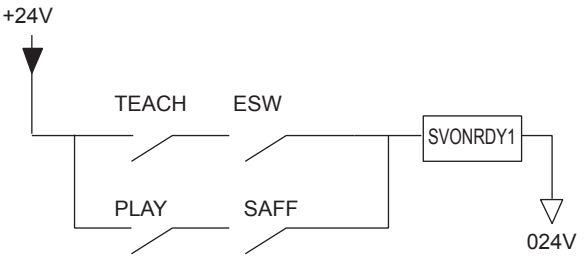


■ **80033: SERVO ON CONDITION 2**

State

This signal turns ON when the following signals satisfy the conditions for servo ON status.

When this signal turns OFF while the servo is ON, the servo power supply is shut down.



TEACH: Teach Mode
PLAY : Play Mode

■ **80034: ENABLE SWITCH INPUT**

State

This signal indicates the operating status of enable switch input signal.

This signal turns ON by holding the enable switch and turns OFF by holding longer until it clicks.

■ **80040: SAFE SPEED 2**

This signal turns ON in the safe speed 2 condition.

■ **80041: SAFE SPEED 1**

This signal turns ON in the safe speed 1 condition.

■ **80046: SAFE SPEED MODE SELECT**

This signal is ON either in the safe speed 1 or the safe speed 2 condition.

■ **80047: FULL-SPEED TEST**

This signal is ON when the safe speed limit is released.

■ **80050: 24V OK**

This signal is ON when 24V power for I/O is supplied normally.

For the connection of I/O power supply, refer to fig 14-11 “Connection Diagram of GPIO Connector” in “YRC1000micro INSTRUCTIONS (RE-CTO-A221) 14.1 Connection for Connector on Front Panel”.

■ **80051: EXTERNAL 24V OK**

This signal is ON when 24V external power for I/O is supplied normally.

For the connection of I/O power supply, refer to fig 14-11 “Connection Diagram of GPIO Connector” in “YRC1000micro INSTRUCTIONS (RE-CTO-A221) 14.1 Connection for Connector on Front Panel”.

■ **80052: SERVO ON STATUS KEEP ENABLE**

This signal indicates the status of servo ON status keep enabled.

■ **80054: SERVO ON STATUS**

This signal indicates the status of servo ON.

■ **80060: *SHOCK SENSOR OPERATION HOLD**

This signal indicates the status in which the shock sensor operation detecting-circuit is detected.
This signal is valid when “HOLD” is set for the shock sensor stop designation in the overrun and shock sensor release window.

■ **80061: *PROTECTED STOP**

This signal indicates the status in which the protected-stop is detected. This signal is input from the machine safety module.

■ **80062: *BRAKE FUSE BLOWN-OFF**

This signal turns OFF when the fuse of the brake excitation circuit is blown OFF.

■ **80065: *SHOCK SENSOR OPERATION EMERGENCY STOP**

This signal indicates the status in which the shock sensor operation detecting-circuit is detected.
This signal is valid when “EMERGENCY STOP” is set for the shock sensor stop designation in the overrun and shock sensor release window.

■ **80066: *OVERTRAVEL**

This signal turns OFF when the overrun LS operates.

■ **80080 to 80153: DIRECT IN (SERVO) 1 to 4**

These signals indicate the status of direct in (servo) input signals.

The signals are input from the specific input terminal block.

■ **80160, 80161, 80162, 80163, 80164, 80165, 80166, 80167**

This is an individual monitoring signal for the brake fuse blown signal (*FUCUT).

If any of 80160 through 80167 is 0 (brake fuse blown detected), 80062 becomes 0.

■ **80170, 80171**

This is an individual monitoring signal for the shock sensor operation emergency stop (*SHOCK1).

If either 80170 or 80171 is 0 (brake fuse blown detected), 80065 becomes 0.

■ **80180, 80181**

This is an individual monitoring signal for the Over Travel.

If either 80180 or 80181 is 0 (brake fuse blown detected), 80066 becomes 0.

■ **80230, 80231**

This is an individual monitoring signal for the shock sensor operation hold (*SHOCK2).

If either 80230 or 80231 is 0 (brake fuse blown detected), 80060 becomes 0.

■ **80240, 80241**

This is an individual monitoring signal for the servo ON enabled (*ON-EN).

If either 80240 or 80241 is 0 (brake fuse blown detected), 80061 becomes 0.

■ **80280, 80281**

This is an individual monitoring signal for the cooling fan error 1 (*FANALM1).

■ **80340: SAFETY CIRCUIT BOARD COMMUNICATION ERROR**

This signal indicates the communication status of the safety circuit board.

If an error occurs, it turns ON.

■ **80342: FAN STATUS ERROR**

This signal indicates the status that the fan alarm status cannot be obtained normally.
If the fan operation status cannot be obtained normally, it turns ON.

■ **80343: SERVO OFF BY SAFETY LOGIC CIRCUIT**

This signal indicates the servo OFF status by the operation of the safety logic circuit.

This signal turns ON when the servo is turned OFF.

■ **80380, 80382**

These are individual monitoring signals for the external 24V OK (EX24VU_OK).

If either 80380 or 80382 is 0, 80051 becomes 0.

■ **80381, 80383**

These are individual monitoring signals for 24V OK (24VU_OK).

If either 80381 or 80383 is 0, 80050 becomes 0.

■ **80400 to 80407**

These signals indicate the status of GP input/output of I/O board.

■ **81320 to 81397:**

These are individual monitoring signals for the machine safety output (MS-OUT) of the safety logic circuit.

■ **81400 to 81477:**

These are individual monitoring signals for the functional safety output (FS-OUT) of the safety logic circuit

7 Pseudo Input Signals

The following symbols are used in the explanation to represent the signal conditions.

The signal takes effect while it is in the ON state.

The rising edge is detected as the signal.

7.1 Pseudo Input Signals

■ 87013: ROBOT GPIO SIGNAL SETTING

Each signals of GPIO (20010 to 20017 and 30010 to 30017) can be set as below.
When this signal is OFF, specific functions are set for each signals of GPIO. For details of each functions, refer to “YRC1000micro INSTRUCTIONS Chapter 14.2 Specific I/O Signal List”.

When this signal is ON, each signals can be used as GPIO with no specific functions:

• The statuses which have been input to the signals 20010 to 20017 are output to the signals 00010 to 00017.

• The statuses which have been input to the signals 10010 to 10017 are output to the signals 30010 to 30017.

The initial status of this signal is ON.

■ 87014 to 87016: REMOTE FUNCTION SELECTION

The pseudo input signal window allows to set whether the I/O, commands, or programming pendant is used at the remote mode selection.

These signals indicate the status set in the pseudo input signal window as shown below.

(0:OFF 1:ON)

87014	IO	0:Used	1:Not Used
87015	Command	0:Not Used	1:Used
87016	Programming Pendant	0:Used	1:Not Used

■ 87017: EXTERNAL HOLD b CONTACT SETTING

As the factory setting, a ladder is set, which turns ON the external hold (40067) of the specific input signal by turning ON the external input signal 20011. However, by turning ON this signal (87017), the external hold can be turned ON when the external input signal 20011 is turned OFF.

8 Network I/O Signals

Network input signals are related to optional network functions. For the contents of signals, refer to “YRC1000micro OPTIONS INSTRUCTIONS FOR ETHERNET FUNCTION(HW1484452)”.

9 Interface Panel Signals

Interface panel signals are related to the optional interface panel functions. For details, refer to “YRC1000micro OPTIONS INSTRUCTIONS FOR INTERFACE PANEL FUNCTION (HW1484466)”.

10 I/O Except Concurrent I/O

The following signal is connected directly to the manipulator control section without passing through the concurrent I/O.

Adequate care should be taken for switch setting and method of connection when using this signal.

WARNING

- Before use, remove any jumper leads from the specific input signals.

Failure to observe this instruction may result in the malfunction leading to injury or damage to the equipment.

■ **EXESP: FOR EXTERNAL EMERGENCY STOP**

State

This signal allows to use the emergency stop switch of an external operation equipment.

When this signal is input, the servo power goes OFF, and the job execution is stopped.

The servo power cannot be turned ON while this signal is being input.

This function becomes invalid by connecting the jumper wire.

■ **SAFF: FOR SAFETY PLUG**

State

This signal turns OFF the servo power when the door of the safeguard is open.

Connect interlock signals such as a safety plug installed in the safeguard door. Install an interlock signal such as safety plugs in door of the safeguard.

When the interlock signal is input, the servo power goes OFF, and the servo power cannot be turned ON.

However, this signal is invalid in the teach mode.

■ **AXDIN1 to 4: FOR DIRECT IN (SERVO) INPUT SIGNAL 1 to 4**

State

This signal can be used in conjunction with the search function.

11 Register

11.1 Common Usage for All Applications

11.1.1 GP Register

M009	M008	M007	M006	M005	M004	M003	M002	M001	M000

M019	M018	M017	M016	M015	M014	M013	M012	M0011	M010

M029	M028	M027	M026	M025	M024	M023	M022	M021	M020

M039	M038	M037	M036	M035	M034	M033	M032	M031	M030

M049	M048	M047	M046	M045	M044	M043	M042	M041	M040

M059	M058	M057	M056	M055	M054	M053	M052	M051	M050

M069	M068	M067	M066	M065	M064	M063	M062	M061	M060

M079	M078	M077	M076	M075	M074	M073	M072	M071	M070

M089	M088	M087	M086	M085	M084	M083	M082	M081	M080

M099	M098	M097	M096	M095	M094	M093	M092	M091	M090

M109	M108	M107	M106	M105	M104	M103	M102	M101	M100

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⋮

M399	M398	M397	M396	M395	M394	M393	M392	M391	M390

M569	M568	M567	M566	M565	M564	M563	M562	M561	M560
ANALOG OUTPUT									
10	9	8	7	6	5	4	3	2	1

M579	M578	M577	M576	M575	M574	M573	M572	M571	M570
ANALOG OUTPUT									
20	19	18	17	16	15	14	13	12	11

M589	M588	M587	M586	M585	M584	M583	M582	M581	M580
ANALOG OUTPUT									
30	29	28	27	26	25	24	23	22	21

M599	M598	M597	M596	M595	M594	M593	M592	M591	M590
ANALOG OUTPUT									
40	39	38	37	36	35	34	33	32	31

11.1.2 System Register

M609	M608	M607	M606	M605	M604	M603	M602	M601	M600
ANALOG INPUT									
10	9	8	7	6	5	4	3	2	1

M619	M618	M617	M616	M615	M614	M613	M612	M611	M610
ANALOG INPUT									
20	19	18	17	16	15	14	13	12	11

M629	M629	M628	M627	M626	M625	M624	M623	M622	M620
ANALOG INPUT									
30	29	28	27	26	25	24	23	22	21

M639	M638	M637	M636	M635	M634	M633	M632	M631	M630
ANALOG INPUT									
40	39	38	37	36	35	34	33	32	31

M649	M648	M647	M646	M645	M644	M643	M642	M641	M640
			ERROR DATA H	ERROR DATA L	ERROR CODE		ALARM DATA H	ALARM DATA L	ALARM CODE

M659	M658	M657	M656	M655	M654	M653	M652	M651	M650
		SYSTEM RESERVE	SYSTEM RESERVE	SYSTEM RESERVE	SYSTEM RESERVE	IO ALARM (65 - 128)	IO ALARM (33 - 64)	IO ALARM (17 - 32)	IO ALARM (1 - 16)

M669	M668	M667	M666	M665	M664	M663	M662	M661	M660
		SYSTEM RESERVE	SYSTEM RESERVE	SYSTEM RESERVE	SYSTEM RESERVE	IO ALARM (65 - 128)	IO ALARM (33 - 64)	IO ALARM (17 - 32)	IO ALARM (1 - 16)

M679	M678	M677	M676	M675	M674	M673	M672	M671	M670

M689	M688	M687	M686	M685	M684	M683	M682	M681	M680

M699	M698	M697	M696	M695	M694	M693	M692	M691	M690

M709	M708	M707	M706	M705	M704	M703	M702	M701	M700

M719	M718	M717	M716	M715	M714	M713	M712	M711	M710

M729	M728	M727	M726	M725	M724	M723	M722	M721	M720

M739	M738	M737	M736	M735	M734	M733	M732	M731	M730

M749	M748	M747	M746	M745	M744	M743	M742	M741	M740

M759	M758	M757	M756	M755	M754	M753	M752	M751	M750
				ALARM 1 CONTROL GRP	ALARM 1 CONTROL GRP STATION 1-3	ALARM 1 CONTROL GRP ROBOT, BASE	ALARM 1 SUB CODE H	ALARM 1 SUB CODE L	ALARM 1 ALARM CODE

M769	M768	M767	M766	M765	M764	M763	M762	M761	M760
				ALARM 2 CONTROL GRP	ALARM 2 CONTROL GRP STATION 1-3	ALARM 2 CONTROL GRP ROBOT, BASE	ALARM 2 SUB CODE H	ALARM 2 SUB CODE L	ALARM 2 ALARM CODE

M779	M778	M777	M776	M775	M774	M773	M772	M771	M770
				ALARM 3 CONTROL GRP	ALARM 3 CONTROL GRP STATION 1-3	ALARM 3 CONTROL GRP ROBOT, BASE	ALARM 3 SUB CODE H	ALARM 3 SUB CODE L	ALARM 3 ALARM CODE

M789	M788	M787	M786	M785	M784	M783	M782	M781	M780
				ALARM 4 CONTROL GRP	ALARM 4 CONTROL GRP STATION 1-3	ALARM 4 CONTROL GRP ROBOT, BASE	ALARM 4 SUB CODE H	ALARM 4 SUB CODE L	ALARM 4 ALARM CODE

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M919	M918	M917	M916	M915	M914	M913	M912	M911	M910

11.2 Material Handling, Press Tending, Cutting, and Other Applications

Device 2

M469	M468	M467	M466	M465	M464	M463	M462	M461	M460

Device 1

M479	M478	M477	M476	M475	M474	M473	M472	M471	M470
SYSTEM RESERVE									

Device 2

M549	M548	M547	M546	M545	M544	M543	M542	M541	M540

Device 1

M559	M558	M557	M556	M555	M554	M553	M552	M551	M550

Device 1

M929	M928	M927	M926	M925	M924	M923	M922	M921	M920

Device 2

M939	M938	M937	M936	M935	M934	M933	M932	M931	M930

12 Standard Ladder Program

12.1 List of Usable Instructions

The following table shows a list of usable instructions in concurrent I/O.

SUPPLE -MENT

In the instruction, there are two kinds of instructions, the one which uses the memory of one step and the other which uses the memory of two steps.

Table 12-1: List of Usable Instructions in Concurrent I/O.

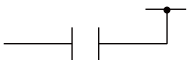
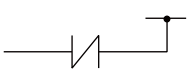
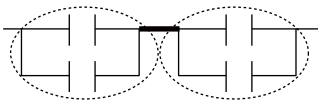
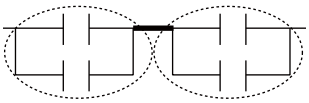
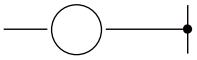
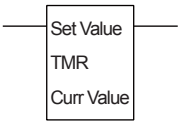
Instruction	Symbol	Function	Format	Remarks
STR		Logic line starting Temporary storing of intermediate result in logical operation Relay No. #XXXXX	STR #XXXXX	1 Step Instruction
STR-NOT		NC contact used to start the logic line Temporary storing of intermediate result in logical operation Relay No. #XXXXX	STR-NOT #XXXXX	1 Step Instruction
AND		Logical AND Relay No. #XXXXX	AND #XXXXX	1 Step Instruction
AND-NOT		Logical AND negation Relay No. #XXXXX	AND-NOT #XXXXX	1 Step Instruction
OR		Logical OR Relay No. #XXXXX	OR #XXXXX	1 Step Instruction
OR-NOT		Logical OR negation Relay No. #XXXXX	OR-NOT #XXXXX	1 Step Instruction
AND-STR		Logical AND for intermediate are result	AND-STR	1 Step Instruction
OR-STR		Logical OR for intermediate are result	OR-STR	1 Step Instruction
OUT		External or internal output Relay No. #XXXXX	OUT #XXXXX	1 Step Instruction
PART		User/System Identification (Not displayed on the programming pendant)	PART N	1 Step Instruction
END		Program end (Not displayed on the programming pendant)	END	1 Step Instruction
TMR		ON-delay time (100ms) Set Value (S) • Decimal (0-65535) • Register (M000-M999) Curr value (D) • Register (M000-M559)	TMR D,S	2 Steps Instruction

Table 12-1: List of Usable Instructions in Concurrent I/O.

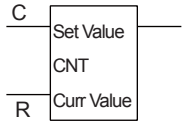
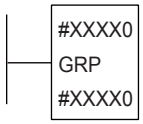
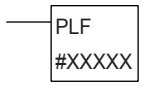
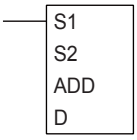
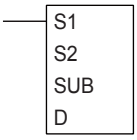
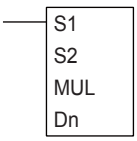
Instruction	Symbol	Function	Format	Remarks
CNT		Subtract counter Set value (S) • Decimal (0-65535) • Register (M000-M999) Curr value (D) • Register (M000-M559)	CNT D,S	2 Steps Instruction
GSTR		Transmission of batch contents of 1 group (8 bits) Relay No. #XXXX0	GSTR #XXXX0	1 Step Instruction
GOUT			GOUT #XXXX0	1 Step Instruction
PLS		Rising up pulse output Relay No. #XXXXX	PLS #XXXXX	1 Step Instruction Exe Condition 
PLF		Rising down pulse output Relay No. #XXXXX	PLF #XXXXX	1 Step Instruction Exe Condition 
ADD	 D←S1+S2 Arith Flag: Carry=0/1; Zero=0/1; (Error=0)	Add 16 bits unsigned binary data (0-65535) S1, S2: Source • Decimal (0-65535) • Register (M000-M999) D: Destination • Register (M000-M599)	ADD S1,S2,D	2 Steps Instruction Exe Condition 
SUB	 D←S1-S2 Arith Flag: Carry=0/1; Zero=0/1; (Error=0)	Subtract 16 bits unsigned binary data (0-65535) S1, S2: Source • Decimal (0-65535) • Register (M000-M999) D: Destination • Register (M000-M599)	SUB S1,S2,D	2 Steps Instruction Exe Condition 
MUL	 Dn+1,Dn←S1xS2 Arith Flag: (Carry=0); (Zero=0); (Error=0)	Multiply 16 bits unsigned binary data (0-65535) S1, S2: Source • Decimal (0-65535) • Register (M000-M999) D_n, D_{n+1}: Destination D_n: Low data storing register D_{n+1}: High data storing register • Register (M000-M599)	MUL S1,S2,D	2 Steps Instruction Exe Condition 

Table 12-1: List of Usable Instructions in Concurrent I/O.

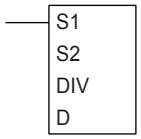
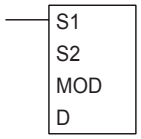
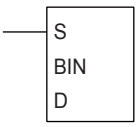
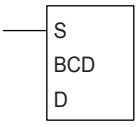
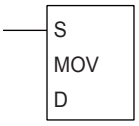
Instruction	Symbol	Function	Format	Remarks
DIV	 D(Quotient)←S1/S2 Arith Flag: (Carry=0); (Zero=0); Error=0/1	Divide 16 bits unsigned binary data (0-65535) S1, S2: Source • Decimal (0-65535) • Register (M000-M999) D: Destination • Register (M000-M599)	DIV S1,S2,D	2 Steps Instruction Exe Condition 
MOD	 D(Modulus)←S1/S2 Arith Flag: (Carry=0); (Zero=0); Error=0/1	Modules of 16 bits unsigned binary data (0-65535) S1, S2: Source • Decimal (0-65535) • Register (M000-M999) D: Destination • Register (M000-M599)	MOD S1,S2,D	2 Steps Instruction Exe Condition 
BIN	 D←S Arith Flag: Carry=0/1; (Zero=0); Error=0/1	Convert 8/16 bits data from BCD to BIN S: Source • Register (M000-M999) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0 D: Destination • Register (M000-M599)) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0	BIN S,D	2 Steps Instruction Exe Condition 
BCD	 D←S Arith Flag: Carry=0/1; (Zero=0); Error=0/1	Convert 8/16 bits data from BIN to BCD S: Source • Register (M000-M599) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0 D: Destination • Register (M000-M599) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0	BCD S,D	2 Steps Instruction Exe Condition 
MOV	 D←S	Transmit 8/16 bits data **S: Source** • Decimal (0-65535) • Register (M000-M999) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0 **D: Destination** • Register (M000-M599) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0	MOV S,D	2 Steps Instruction Exe Condition 

Table 12-1: List of Usable Instructions in Concurrent I/O.

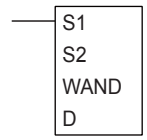
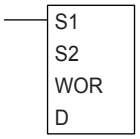
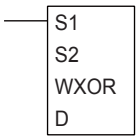
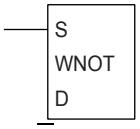
Instruction	Symbol	Function	Format	Remarks
WAND	 D←S1∩ S2	Logical AND of 8/16 bits data S1, S2: Source • Decimal (0-65535) • Register (M000-M999) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0 D: Destination • Register (M000-M599) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0	WAND S1,S2,D	2 Steps Instruction Exe Condition 
WOR	 D←S1∪ S2	Logical OR of 8/16 bits data S1, S2: Source • Decimal (0-65535) • Register (M000-M999) • Relay No. (byte) W#XXXX0 D: Destination • Register (M000-M599) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0	WOR S1,S2,D	2 Steps Instruction Exe Condition 
WXOR	 D←(S1∪ S2) ∪ $\overline{(S1\cap S2)}$	Exclusive OR of 8/16 bits data S1, S2: Source • Decimal (0-65535) • Register (M000-M999) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0 D: Destination • Register (M000-M599) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0	WXOR S1,S2,D	2 Steps Instruction Exe Condition 
WNOT	 D←$\overline{S}$	Logical NOT of 8/16 bits data S: Source • Decimal (0-65535) • Register (M000-M999) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0 D: Destination • Register (M000-M599) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0	WNOT S,D	2 Steps Instruction Exe Condition 

Table 12-1: List of Usable Instructions in Concurrent I/O.

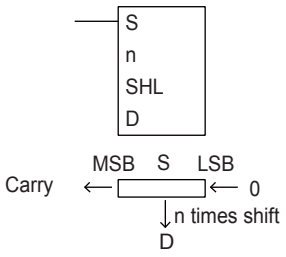
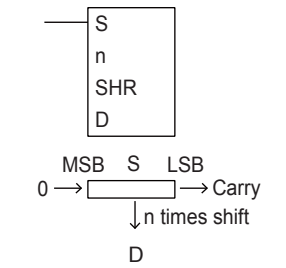
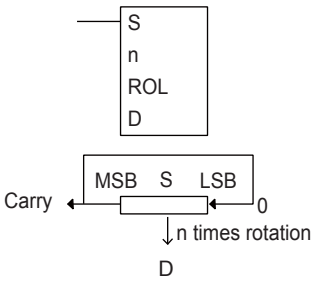
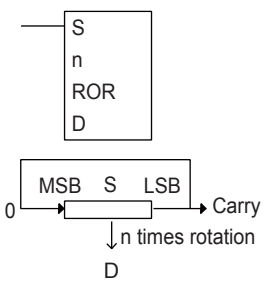
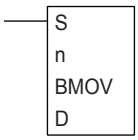
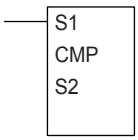
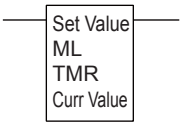
Instruction	Symbol	Function	Format	Remarks
SHL	 Arith Flag: Carry=0/1; (Zero=0); (Error=0)	Left shift of 8/16 bits data S: Source • Decimal (0-65535) • Register (M000-M999) • Relay No. (byte) #XXX0 • Relay No. (word) W#XXXX0 n: Shift count • Decimal (0-16) D: Destination • Register (M000-M599) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0	SHL S,n,D	2 Steps Instruction Exe Condition 
SHR	 Arith Flag: Carry=0/1; (Zero=0); (Error=0)	Right shift of 8/16 bits data S: Source • Decimal (0-65535) • Register (M000-M999) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0 n: Shift count • Decimal (0-16) D: Destination • Register (M000-M599) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0	SHR S,n,D	2 Steps Instruction Exe Condition 
ROL	 (Note) Carry flag is not included in rotation. Arith Flag: Carry=0/1; (Zero=0); (Error=0)	Left rotation of 8/16 bits data S: Source • Decimal (0-65535) • Register (M000-M999) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0 n: Rotation count • Decimal (0-16) D: Destination • Register (M000-M599) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0	ROL S,n,D	2 Steps Instruction Exe Condition 
ROR	 (Note) Carry flag is not included in rotation. Arith Flag: Carry=0/1; (Zero=0); (Error=0)	Right rotation of 8/16 bits data S: Source • Decimal (0-65535) • Register (M000-M999) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0 n: Rotation count • Decimal (0-16) D: Destination • Register (M000-M599) • Relay No. (byte) #XXXX0 • Relay No. (word) W#XXXX0	ROR S,n,D	2 Steps Instruction Exe Condition 

Table 12-1: List of Usable Instructions in Concurrent I/O.

Instruction	Symbol	Function	Format	Remarks
BMOV	 D ← S … D+n ← S+n	Block Transmission of 8/16 bits data S: Source • Register (M000-M999) • Relay No. (byte) #XXXX0 n: Transmission data count • Decimal (1-999) D: Destination • Register (M000-M599) • Relay No. (byte) #XXXX0	BMOV S, n, D	2 Steps Instruction Exe Condition 
CMP	 S1= S2: Carry =0 : Zero =1 : Error =0 S1> S2: Carry =0 : Zero =0 : Error =0 S1< S2: Carry =1 : Zero =0 : Error =0	Comparison of 8/16 bits data S1, S2: Source • Register (M000-M999) • Decimal (0-65535) • Relay No. (byte) #XXXX0 • Relay No. (word)	CMP S1, S2	2 Steps Instruction Exe Condition 
MLTMR		ON-delay time (1 ms) Set Value (S) • Decimal (0-65535) • Register (M000-M999) Curr value (D) • Register (M000-M559)	MLTMR D, S	2 Steps Instruction

#XXXXX: Relay No., MXXX: Register Number, YYYY: Numerical Value (0-65535), N: Numerical Value (1-2)

12.2 Instruction Description

NOTE

- Output to each single relay is only once. It is unable to use multiple times of output to the same relay.
- The numbers of the output relays are limited to 0XXXX, 3XXXX, 4XXXX, and 7XXXX.
- It is able to register up to 560 TMR/CNT/MLTMR instructions and operation instructions that can use registers.

It is unable to use the multiple times outputs of the registers that were used as current values of TMR/CNT/MLTMR instructions. However, it is able to use the multiple times outputs of the registers that were used as the destination registers of arithmetic instructions.

12.2.1 STR Instruction

1. Format
   STR #XXXXX
   #XXXXX: Relay No.
2. Function
   Operates as a Normal Open at the beginning of logical line.
   Stores temporarily the preliminary result of the logic operation.
3. Ladder Program Example

<Ladder Diagram>

< Program>
STR #70010
OUT #70100

12.2.2 STR-NOT Instruction

1. Format
   STR-NOT #XXXXX
   #XXXXX: Relay No.
2. Function
   Operates as a Normal Close at the beginning of logical line.
   Stores temporarily the preliminary result of the logic operation.
3. Ladder Program Example

<Ladder Diagram>

< Program>
STR-NOT #70010
OUT #70100

12.2.3 AND Instruction

1. Format
   AND #XXXXX
   #XXXXX: Relay No.
2. Function
   Performs logical AND operation.
3. Ladder Program Example

<Ladder Diagram>

< Program>
STR #70010
AND #70011
OUT #70100

12.2.4 AND-NOT Instruction

1. Format
   AND-NOT #XXXXX
   #XXXXX: Relay No.
2. Function
   Performs logical AND negation operation.
3. Ladder Program Example

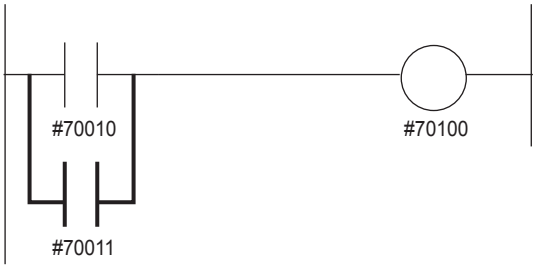
<Ladder Diagram>

< Program>
STR #70010
AND-NOT #70011
OUT #70100

12.2.5 OR Instruction

1. Format
   OR #XXXXX
   #XXXXX: Relay No.
2. Function
   Performs logical OR operation.
3. Ladder Program Example

<Ladder Diagram>

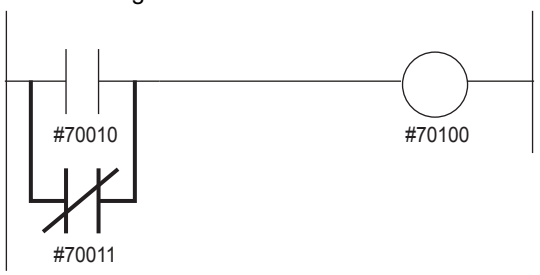


< Program>
STR #70010
OR #70011
OUT #70100

12.2.6 OR-NOT Instruction

1. Format
   OR-NOT #XXXXX
   #XXXXX: Relay No.
2. Function
   Performs logical OR negation operation.
3. Ladder Program Example

<Ladder Diagram>



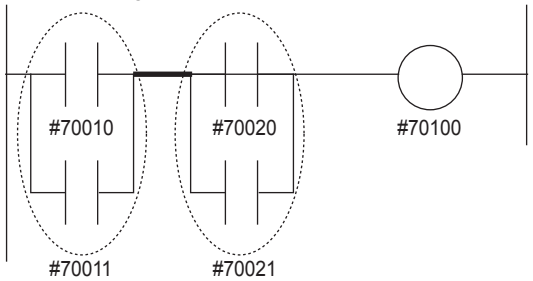
< Program>

```
STR       #70010
OR-NOT    #70011
OUT       #70100
```

12.2.7 AND-STR Instruction

1. Format
   AND-STR
2. Function
   Performs logical AND operation with the preliminary results.
3. Ladder Program Example

<Ladder Diagram>



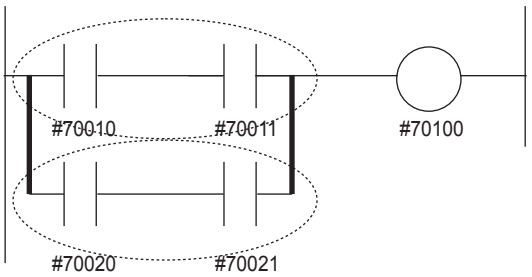
< Program>

```
STR       #70010
OR        #70011
STR       #70020
OR        #70021
AND-STR
OUT       #70100
```

12.2.8 OR-STR Instruction

1. Format
   OR-STR
2. Function
   Performs logical OR operation with the preliminary results.
3. Ladder Program Example

<Ladder Diagram>



< Program>

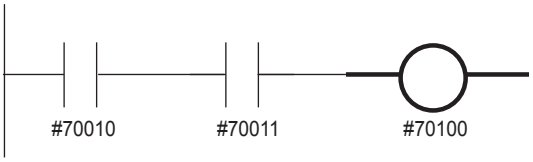
```
STR      #70010
AND      #70011
STR      #70020
AND      #70021
OR-STR
OUT      #70100
```

12.2.9 OUT Instruction

1. Format
   OUT #XXXXX
   #XXXXX: Relay No.
2. Function
   Outputs to the internal or the external.
3. Ladder Program Example

NOTE Two or more times output to the same relay cannot be used.

<Ladder Diagram>



< Program>

```
STR      #70010
AND      #70011
OUT      #70100
```

12.2.10 PART Instruction

1. Format
   PART N
   N: Ladder Identification Number (1: System Ladder, 2: User Ladder)
2. Function
   Identifies the system ladder from the user ladder.
3. Ladder Program Example

NOTE This instruction is not displayed in the programming pendant screen.

<Ladder Diagram>

There is no symbol.

System

User

< Program>

```
PART    1
STR     #70010
OUT     #70100
   :
PART    2
   :
END
```

12.2.11 END Instruction

1. Format
   END
2. Function
   Ends the ladder program.
3. Ladder Program Example

NOTE This instruction is not displayed in the programming pendant screen.

<Ladder Diagram>

There is no symbol.

< Program>

```
STR     #70010
OUT     #70100
END
```

12.2.12 TMR Instruction

1. Format
   TMR Curr Value, Set Value
   Set Value: Register (M000-M999), Decimal (0-65535)
   Curr Value: Register (M000-M559)

Set Value / Curr Value	Decimal	Register (M000 - M999)
Mxxx (M000 - M559)	0 - 65535 (0.0 - 6553.5 sec)	0 - 65535 (0.0 - 6553.5 sec)

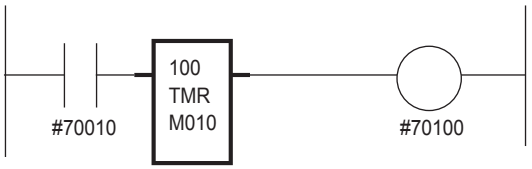
2. Function
   This instruction is an On Delay Timer to handle the subtraction formula and counter circuit by binary value. The internal clock is 0.1 second. While the start input is OFF, counting is not performed and Curr Value = Set value is maintained. Additionally, the TMR contact is turned OFF. Curr Value is decremented by 1 every 0.1 seconds as soon as the start input is turned ON. The TMR contact is turned ON when the Curr Value equals to 0. This state is maintained while the start input is at ON state.

Start Input	Curr Value	TMR Contact
OFF	Set Value	OFF
ON (Curr Value > 0)	Decremented by 1 every 0.1 seconds	OFF
ON (Curr Value = 0)	0	ON
ON→OFF (Curr Value > 0)	Return to Set Value	OFF
ON→OFF (Curr Value = 0)	Return to Set Value	ON→OFF

3. Ladder Program Example
   The timer is reset when the YRC1000micro power is turned ON. Therefore, Curr Value becomes Set Value by the reset function even if the YRC1000micro power is turned ON in the ON state of the timer start input.

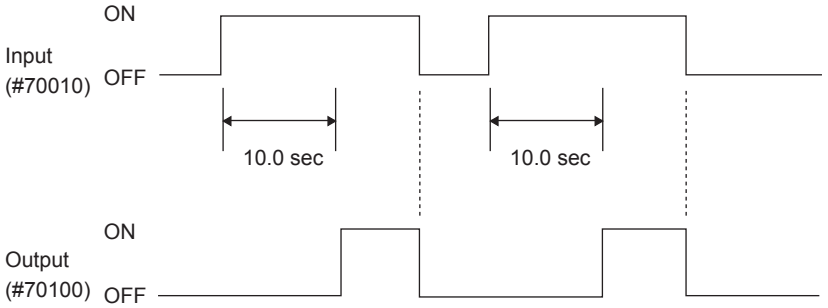
NOTE
Two or more times output to the same relay cannot be used.
It is unable to use the multiple times outputs of the register used as a current value of the TMR/CNT/MLTMR instruction

<Ladder Diagram>



< Program>

```
STR     #70010
TMR     M010,100
OUT     #70100
```



12.2.13 CNT Instruction

1. Format
   CNT Curr Value, Set Value
   Set Value: Register (M000-M999), Decimal (0-65535)
   Curr Value: Register (M000-M559)

Set Value / Curr Value	Decimal	Register (M000 - M999)
Mxxx (M000 - M559)	0 - 65535	0 - 65535

2. Function
   Even if the counter input is turned to ON from OFF, counting is not performed and Curr Value = Set Value is maintained while the reset input is ON. Additionally, the CNT contact is turned OFF.
   The Curr Value is decremented by 1 each time the counter input is turned to ON from OFF in OFF state of the reset input. The CNT contact is turned ON when the Curr Value becomes 0. This state is maintained in OFF state of the reset signals.
   Powering ON the YRC1000micro resets the counter. Consequently, the Curr Value remains as the Set Value by the reset function even if the counter input is in the ON state when the YRC1000micro power is ON.

Reset Input	Curr Value	CNT Contact
ON	Set Value	OFF
OFF (Curr Value > 0)	Decremented by 1 each time the counter input turns from OFF→ON	OFF
OFF (Curr Value = 0)	0	ON
OFF→ON (Curr Value > 0)	Return to Set Value	OFF
OFF→ON (Curr Value = 0)	Return to Set Value	ON→OFF

3. Ladder Program Example
   The counter input is ignored once the counter is counted up. Start counting after turning the counter input to OFF from ON.

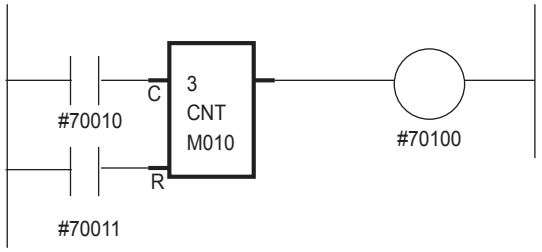
The reset input is given priority when the counter input and reset input are turned ON at the same time.

NOTE

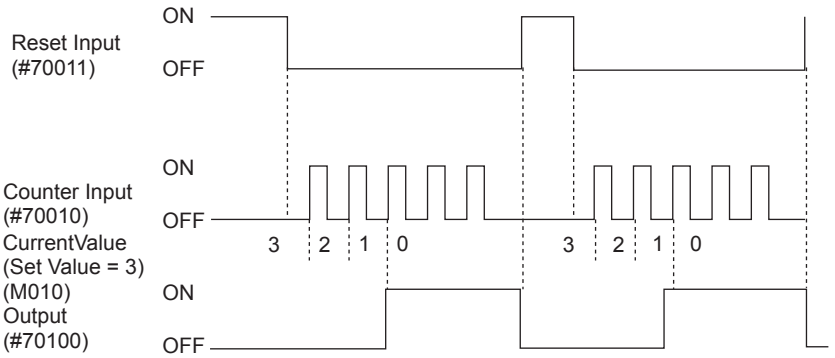
Two or more times output to the same relay cannot be used.

It is unable to use the multiple times outputs of the register used as a current value of the TMR/CNT/MLTMR instruction.

<Ladder Diagram>



< Program>
STR #70010
Counter Input
STR #7011
Reset Input
CNT M010, 3
CNT instruction
OUT #70100
Output



12.2.14 GSTR Instruction / GOUT Instruction

1. Format
   GSTR #XXXX0
   GOUT #XXXX0
   #XXXX0: Relay No. (byte)

2. Function
   The GSTR instruction stores the relay number (8 bits).
   The GOUT instruction outputs 8 bits data stored by the GSTR instruction to the relay number (8 bits).

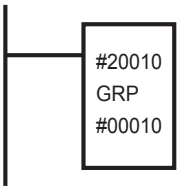
3. Ladder Program Example

NOTE

The GSTR instruction and the GOUT instruction should be pairs.

The output cannot be done to the same relay two or more times.

<Ladder Diagram>



< Program>

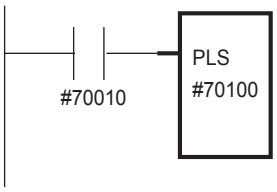
```
GSTR   #20010
GOUT   #00010
```

12.2.15 PLS Instruction

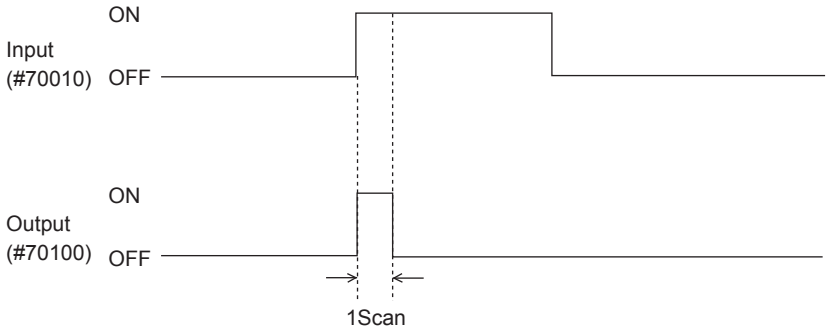
1. Format
   PLS #XXXXX
   #XXXXX: Relay No.
2. Function
   The PLS instruction outputs one scanning pulse signal when specified signal is turned to ON from OFF.
3. Ladder Program Example

NOTE The output cannot be done to the same relay two or more times.

<Ladder Diagram>



< Program>
STR #70010
PLS #70100

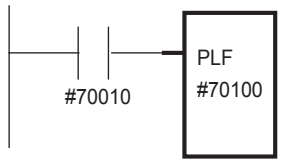


12.2.16 PLF Instruction

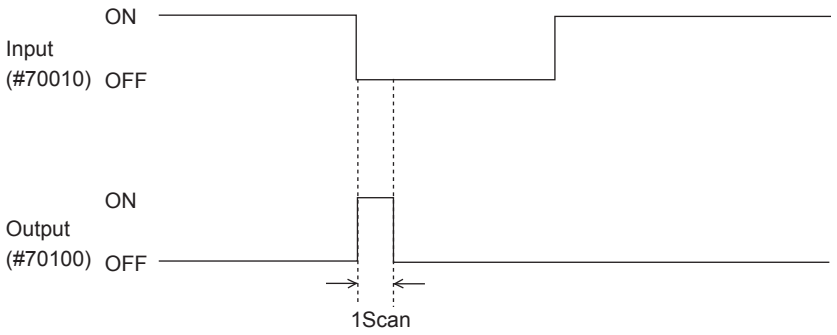
1. Format
   PLF #XXXXX
   #XXXXX: Relay No.
2. Function
   The PLF instruction outputs one scanning pulse signal when specified signal is turned to OFF from ON.
3. Ladder Program Example

NOTE The output cannot be done to the same relay two or more times.

<Ladder Diagram>



< Program>
STR #70010
PLF #70100



12.2.17 ADD Instruction

1. Format
   ADD S1, S2, D

S1: Source 1	Register (M000-M999) Decimal (0-65535)
S1: Source 2	Register (M000-M999) Decimal (0-65535)
D: Destination	Register (M000-M599)

2. Function
   S1 and S2 (16 bits unsigned binary data) are added and the addition result is output to D when the input signal is in ON state. As a result of calculation, the carry flag (#51400) and the zero flag (#51401) of a specific output are changed. The error flag (#51402) is not used.

Table 12-2: <Arithmetic Flag>

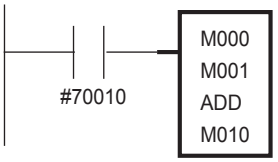
S1+S2	D	Carry Flag	Zero Flag	Error Flag
0	0	0	1	Not Used (0)
1-65535	1-65535	0	0	Not Used (0)
65536	0 (S1+S2-65536)	1	1	Not Used (0)
65536 or more	S1+S2-65536	1	0	Not Used (0)

Unused flag is cleared.

3. Ladder Program Example

NOTE It is unable to use the multiple times outputs of register used as a current value of the TMR/CNTMLTMR instruction.

<Ladder Diagram>



< Program>
STR #70010
ADD M000, M001, M010

12.2.18 SUB Instruction

1. Format
   SUB S1, S2, D

S1: Source 1	Register (M000-M999) Decimal (0-65535)
S1: Source 2	Register (M000-M999) Decimal (0-65535)
D: Destination	Register (M000-M599)

2. Function
   S1 and S2 (16 bits unsigned binary data) are subtracted and the subtraction result is output to D when input signal is in ON state. As a result of calculation, the carry flag (#51400) and the zero flag (#51401) of a specific output are changed. The error flag (#51402) is not used.

Table 12-3: <Arithmetic Flag>

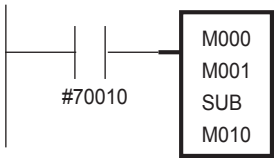
S1-S2	D	Carry Flag	Zero Flag	Error Flag
0	0	0	1	Not Used (0)
1-65535	1-65535	0	0	Not Used (0)
Negative Number	S1-S2+65536	1	0	Not Used (0)

Unused flag is cleared.

3. Ladder Program Example

NOTE It is unable to use the multiple times outputs of register used as a current value of the TMR/CNT/MLTMR instruction.

<Ladder Diagram>



< Program>
STR #70010
SUB M000, M001, M010

12.2.19 MUL Instruction

1. Format
   MUL S1, S2, Dn

S1: Source 1	Register (M000-M999) Decimal (0-65535)
S1: Source 2	Register (M000-M999) Decimal (0-65535)
Dn+1(High), Dn(Low): Destination	Register (M000-M599)

2. Function
   S1 and S2 (16 bits unsigned binary data) are multiplied and the multiplication result is output to D when the input signal is in ON state. The carry flag (#51400), the zero flag (#51401) , and the error flag (#51402) are not used.

Table 12-4: Arithmetic Flag

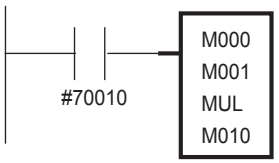
S1 x S2	Dn+1	Dn	Carry Flag	Zero Flag	Error Flag
0	0	0	Not Used (0)	Not Used (0)	Not Used (0)
1-65535	0	1-65535	Not Used (0)	Not Used (0)	Not Used (0)
65536 or more	High Word	Low Word	Not Used (0)	Not Used (0)	Not Used (0)

Unused flag is cleared.

3. Ladder Program Example

NOTE It is unable to use the multiple times outputs of the register used as a current value of the TMR/CNT/MLTMR instruction.

<Ladder Diagram>



< Program>
STR #70010
MUL M000,M001,M010
When results=65536:
M011=1(0000000000000001 Binary Data)
M010=0(0000000000000000 Binary Data)

12.2.20 DIV Instruction

1. Format
   DIV S1, S2, D

S1: Source 1	Register (M000-M999) Decimal (0-65535)
S1: Source 2	Register (M000-M999) Decimal (0-65535)
D: Destination (Quotient)	Register (M000-M599)

2. Function
   S1 and S2 (16 bits unsigned binary data) are divided and the division result (Quotient) is output to D when the input signal is in ON state. As a result of calculation, the error flag (#51402) of a specific output is changed. The carry flag (#51400) and the zero flag (#51401) are not used.

Table 12-5: <Arithmetic Flag>

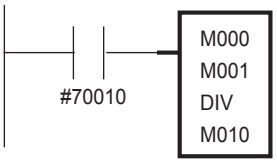
S1	S2	D	Carry Flag	Zero Flag	Error Flag
0-65535	Excepted for 0	Quotient	Not Used (0)	Not Used (0)	0
0-65535	0	No changes	Not Used (0)	Not Used (0)	1

Unused flag is cleared.

3. Ladder Program Example

NOTE It is unable to use the multiple times outputs of the register used as a current value of the TMR/CNT/MLTMR instruction.

<Ladder Diagram>



< Program>

```
STR   #70010
DIV   M000, M001, M010
```

12.2.21 MOD Instruction

1. Format
   MOD S1, S2, D

S1: Source 1	Register (M000-M999) Decimal (0-65535)
S1: Source 2	Register (M000-M999) Decimal (0-65535)
D: Destination (Residuum)	Register (M000-M599)

2. Function
   S1 and S2 (16 bits unsigned binary data) are divided and the division result (Residuum) is output to D when the input signal is in ON state. As a result of calculation, the error flag (#51402) of a specific output is changed. The carry flag (#51400) and the zero flag (#51401) are not used.

Table 12-6: <Arithmetic Flag>

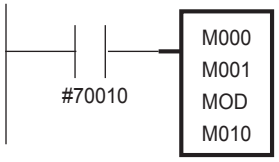
S1	S2	D	Carry Flag	Zero Flag	Error Flag
0-65535	Excepted for 0	Surplus	Not Used (0)	Not Used (0)	0
0-65535	0	No changes	Not Used (0)	Not Used (0)	1

Unused flag is cleared.

3. Ladder Program Example

NOTE It is unable to use the multiple times outputs of the register used as a current value of the TMR/CNT/MLTMR instruction.

<Ladder Diagram>



< Program>

```
STR   #70010
MOD   M000,M001,M010
```

12.2.22 BIN Instruction

1. Format
   BIN S, D

S: Source	Register (M000-M999) Relay (byte) #XXXX0 Relay (word) W#XXXX0
D: Destination	Register (M000-M599) Relay (byte) #XXXX0 Relay (word) W#XXXX0

2. Function
   S (BCD data) is converted to binary data and is output to D when the input signal is in ON state. As a result of calculation, the carry flag (#51400) and the error flag (#51402) of a specific output are changed. The zero flag (#50401) is not used.

Table 12-7: <Arithmetic Flag>

S	D	Carry Flag	Zero Flag	Error Flag
BCD	BIN	0/1	Not Used (0)	0
Excepted for BCD	No Changes	0	Not Used (0)	1

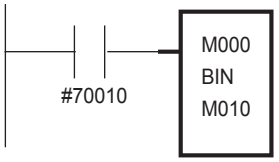
The carry flag is set when the conversion result is the relay (byte) and the conversion data is more than 256 (BCD). Unused flag is cleared.

3. Ladder Program Example

NOTE

The output cannot be done to the same relay two or more times.
It is unable to use the multiple times outputs of the register used as a current value of the TMR/CNT/MLTMR instruction.

<Ladder Diagram>



< Program>

```
STR   #70010
BIN   M000,M010
```

12.2.23 BCD Instruction

1. Format
   BCD S, D

S: Source	Register (M000-M999) Relay (byte) #XXXX0 Relay (word) W#XXXX0
D: Destination	Register (M000-M599) Relay (byte) #XXXX0 Relay (word) W#XXXX0

2. Function
   S (binary data) is converted to BCD data and is output to D when the input signal is in ON state. As a result of calculation, the carry flag (#51400) and the error flag (#51402) of a specific output are changed. The zero flag (#51401) is not used.

Table 12-8: <Arithmetic Flag>

S	D	Carry Flag	Zero Flag	Error Flag
9999 or less (binary data)	BCD	0/1	Not Used (0)	0
10000 or more (binary data)	No Changes	0	Not Used (0)	1

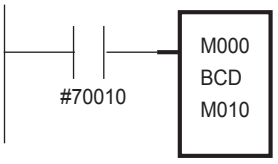
The carry flag is set when the conversion result is the relay (byte) and the conversion data is more than 256 (BCD). Unused flag is cleared.

3. Ladder Program Example

NOTE

The output cannot be done to the same relay two or more times.
It is unable to use the multiple times outputs of the register used as a current value of the TMR/CNT/MLTMR instruction.

<Ladder Diagram>



< Program>

```
STR   #70010
BCD   M000,M010
```

12.2.24 MOV Instruction

1. Format
   MOV S, D

S: Source	Register (M000-M999) Decimal (0-65535) Relay (byte) #XXXX0 Relay (word) W#XXXX0
D: Destination	Register (M000-M599) Relay (byte) #XXXX0 Relay (word) W#XXXX0

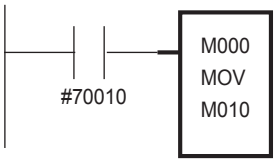
2. Function
   S is output to D in ON state of the input signal. As a result of calculation, the carry flag (#51400) of a specific output is changed. The zero flag (#51401) and the error flag (#51402) are not used. The carry flag is set when the transmission result is the relay (byte) and the transmission data is more than 256 (BCD).

3. Ladder Program Example

NOTE

The output cannot be done to the same relay two or more times.
It is unable to use the multiple outputs of the register used as a current position of the TMR/CNT/MLTMR instruction.

<Ladder Diagram>



< Program>

```
STR   #70010
MOV   M000, M010
```

12.2.25 WAND Instruction

1. Format
   WAND S1, S2, D

S1: Source	Register (M000-M999)
S2: Source	Decimal (0-65535) Relay (byte) #XXXX0 Relay (word) W#XXXX0
D: Destination	Register (M000-M599) Relay (byte) #XXXX0 Relay (word) W#XXXX0

2. Function
   Logical AND operation between S1 and S2 is performed and the result is output to D when the input signal is in ON state. The logic operation is performed in each correspondence bit of S1 and S2.

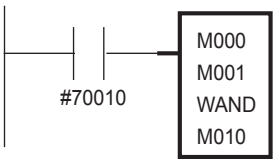
D←S1∩S2

S1	1100110011001100	Binary Data
S2	1010101010101010	Binary Data
	↓	
D	1000100010001000	Binary Data

3. Ladder Program Example

> NOTE
> The output cannot be done to the same relay two or more times.
> It is unable to use the multiple outputs of the register used as a current position of the TMR/CNT/MLTMR instruction.

<Ladder Diagram>



< Program>

```
STR     #70010
WAND    M000, M001, M010
```

12.2.26 WOR Instruction

1. Format
   WOR S1, S2, D

S1: Source	Register (M000-M999)
S2: Source	Decimal (0-65535) Relay (byte) #XXXX0 Relay (word) W#XXXX0
D: Destination	Register (M000-M599) Relay (byte) #XXXX0 Relay (word) W#XXXX0

2. Function
   Logical OR operation between S1 and S2 is performed and the result is output to D when the input signal is in ON state. The logic operation is performed in each correspondence bit of S1 and S2.

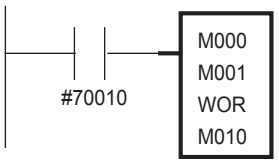
D←S1∪S2

S1	1100110011001100	Binary Data
S2	1010101010101010	Binary Data
	↓	
D	1110111011101110	Binary Data

3. Ladder Program Example

NOTE
The output cannot be done to the same relay two or more times.
It is unable to use the multiple outputs of the register used as a current position of the TMR/CNT/MLTMR instruction.

<Ladder Diagram>



< Program>
STR #70010
WOR M000, M001, M010

12.2.27 WXOR Instruction

1. Format
   WXOR S1, S2, D

S1: Source	Register (M000-M999)
S2: Source	Decimal (0-65535) Relay (byte) #XXXX0 Relay (word) W#XXXX0
D: Destination	Register (M000-M599) Relay (byte) #XXXX0 Relay (word) W#XXXX0

2. Function
   Exclusive OR operation between S1 and S2 is performed and the result is output to D when the input signal is in ON state. The logic operation is performed in each correspondence bit of S1 and S2.

D←(S1∪S2)∩(S1∩S2)

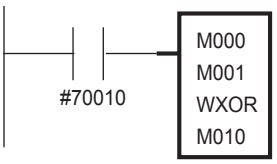
S1	1100110011001100	Binary Data
S2	1010101010101010	Binary Data
	↓	
D	0110011001100110	Binary Data

3. Ladder Program Example

NOTE

The output cannot be done to the same relay two or more times.
It is unable to use the multiple times outputs of the register used as a current position of the TMR/CNT/MLTMR instruction.

<Ladder Diagram>



< Program>

```
STR     #70010
WXOR    M000, M001, M010
```

12.2.28 WNOT Instruction

1. Format
   WNOT S, D

S: Source	Register (M000-M999) Decimal (0-65535) Relay (byte) #XXXX0 Relay (word) W#XXXX0
D: Destination	Register (M000-M599) Relay (byte) #XXXX0 Relay (word) W#XXXX0

2. Function
   Logical negation operation of S is performed and the result is output to D when the input signal is in ON state. The logic operation is performed in each correspondence bit of S1 and S2.

$D \leftarrow \overline{S}$

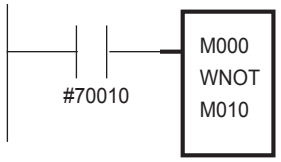
S1	1100110011001100	Binary Data
	↓	
D	0011001100110011	Binary Data

3. Ladder Program Example

NOTE

The output cannot be done to the same relay two or more times.
It is unable to use the multiple times outputs of the register used as a current position of the TMR/CNT/MLTMR instruction.

<Ladder Diagram>



< Program>

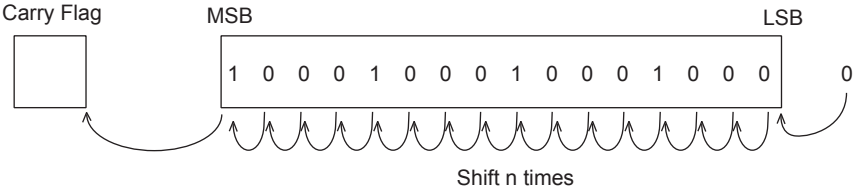
```
STR     #70010
WNOT    M000, M010
```

12.2.29 SHL Instruction

1. Format
   SHL S, n, D

S: Source	Register (M000-M999) Decimal (0-65535) Relay (byte) #XXXX0 Relay (word) W#XXXX0
n: Shift count	Decimal (0-16)
D: Destination	Register (M000-M599) Relay (byte) #XXXX0 Relay (word) W#XXXX0

2. Function
   16 bits data contents of S is shifted to the high bit direction (left) n times and the result is output to D when the input signal is in ON state. 0 is shifted to the lowest bit (LSB) and the highest bit (MSB) is shifted to the carry flag.

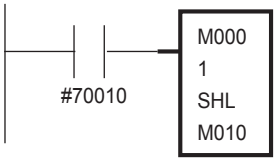


3. Ladder Program Example

NOTE

The output cannot be done to the same relay two or more times.
It is unable to use the multiple times outputs of the register used as a current position of the TMR/CNT/MLTMR instruction.
The operation is performed each scanning when the input signal is in ON state. For one time operation, use the pulse output instruction (PLS, PLF) in the input circuit.

<Ladder Diagram>



< Program>
STR #70010
SHL M000,1,M010

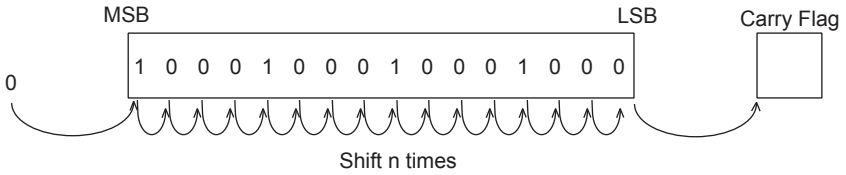
When M000 = 1000100010001000 (binary data), the result is as follows.
M010: 0001000100010000
Carry flag: 1

12.2.30 SHR Instruction

1. Format
   SHR S, n, D

S: Source	Register (M000-M999) Decimal (0-65535) Relay (byte) #XXXX0 Relay (word) W#XXXX0
n: Shift count	Decimal (0-16)
D: Destination	Register (M000-M599) Relay (byte) #XXXX0 Relay (word) W#XXXX0

2. Function
   16 bits data contents of S is shifted to the low bit direction (right) n times and the result is output to D when the input signal is in ON state. 0 is shifted to the highest bit (MSB) and the lowest bit (LSB) is shifted to the carry flag.

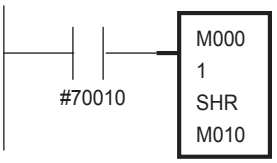


3. Ladder Program Example

NOTE

The output cannot be done to the same relay two or more times.
It is unable to use the multiple times outputs of the register used as a current position of the TMR/CNT/MLTMR instruction.
The operation is performed each scanning when the input signal is in ON state. For one time operation, use the pulse output instruction (PLS, PLF) in the input circuit.

<Ladder Diagram>



< Program>
STR #70010
SHR M000, 1, M010

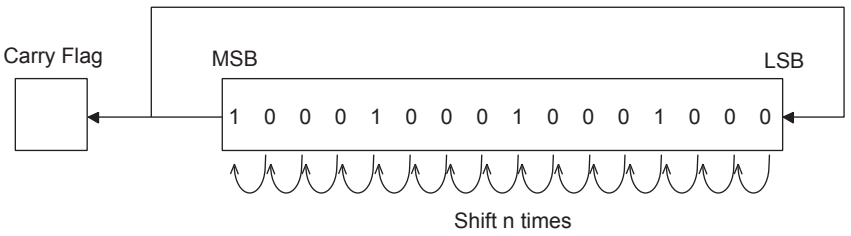
When M000 = 1000100010001000 (binary data), the result is as follows.
M010: 0100010001000100
Carry flag: 0

12.2.31 ROL Instruction

1. Format
   ROL S, n, D

S: Source	Register (M000-M999) Decimal (0-65535) Relay (byte) #XXXX0 Relay (word) W#XXXX0
n: Shift count	Decimal (0-16)
D: Destination	Register (M000-M599) Relay (byte) #XXXX0 Relay (word) W#XXXX0

2. Function
   16 bits data contents of S is shifted to the high bit direction (left) n times and the result is output to D when the input signal is in ON state. The highest bit (MSB) is shifted to the carry flag and the lowest bit (LSB).

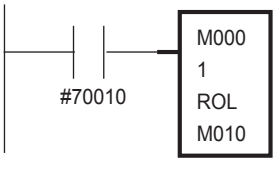


3. Ladder Program Example

NOTE

The output cannot be done to the same relay two or more times.
It is unable to use the multiple times outputs of the register used as a current position of the TMR/CNT/MLTMR instruction.
The operation is performed each scanning when the input signal is in ON state. For one time operation, use the pulse output instruction (PLS, PLF) in the input circuit.

<Ladder Diagram>



< Program>
STR #70010
ROL M000, 1, M010

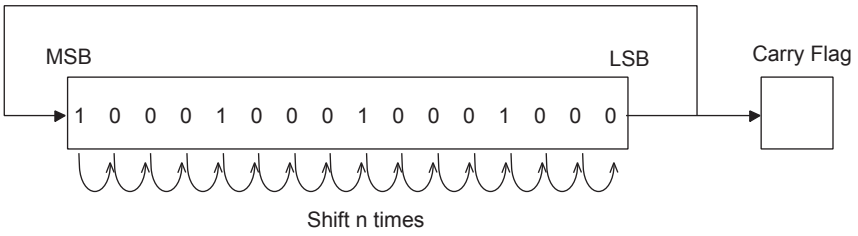
When M000 = 1000100010001000 (binary data), the result is as follows.
M010: 0001000100010001
Carry flag: 1

12.2.32 ROR Instruction

1. Format
   ROR S, n, D

S: Source	Register (M000-M999) Decimal (0-65535) Relay (byte) #XXXX0 Relay (word) W#XXXX0
n: Shift count	Decimal (0-16)
D: Destination	Register (M000-M599) Relay (byte) #XXXX0 Relay (word) W#XXXX0

2. Function
   16 bits data contents of S is shifted to the low bit direction (right) n times and the result is output to D when the input signal is in ON state. The lowest bit (LSB) is shifted to the carry flag and the highest bit (MSB).

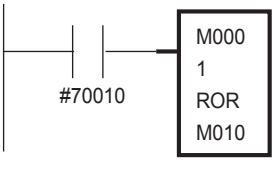


3. Ladder Program Example

NOTE

The output cannot be done to the same relay two or more times.
It is unable to use the multiple times outputs of the register used as a current position of the TMR/CNT/MLTMR instruction.
The operation is performed each scanning when the input signal is in ON state. For one time operation, use the pulse output instruction (PLS, PLF) in the input circuit.

<Ladder Diagram>



< Program>

```
STR  #70010
ROL  M000, 1, M010
```

When M000 = 1000100010001000 (binary data), the result is as follows.
M010: 0100010001000100
Carry flag: 0

12.2.33 BMOV Instruction

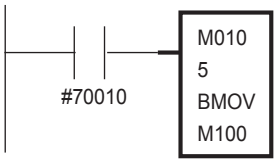
1. Format
   BMOV S, n, D

S: Source	Register (M000-M999) Relay (byte) #XXXX0
n: Transmission data count	Decimal (1-999)
D: Destination	Register (M000-M599) Relay (byte) #XXXX0

2. Function
   When the input is ON, the block transmission is performed from n bytes data of S to n bytes data of D.
   The carry flag (#51400), zero flag (#51401), and error flag (#51402) for output are not used.

3. Ladder Program Example
   Multiple output to the same relay is not available.
   The register which has been used as the current value for TMR/CNT/MLTMR instruction and the register which has been used as the calculation result cannot be used multiple times.

<Ladder Diagram>



< Program>
STR #70010
BMOV M010, 5, M100

Transmission result
M010→M100 (2 bytes)
M011→M101 (2 bytes)
M012→M102 Lower 1 byte is output.

12.2.34 CMP Instruction

1. Format
   CMP S1, S2

S1: Source	Register (M000-M999) Decimal (0-65535) Relay (byte) #XXXX0 Relay (word) W#XXXX0
S2: Source	Register (M000-M999) Decimal (0-65535) Relay (byte) #XXXX0 Relay (word) W#XXXX0

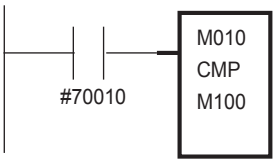
2. Function
   When the input is ON, S1 and S2 are compared in size.
   The carry flag (#51400) and zero flag (#51401) for output are changed according to the calculation result. The error flag (#51402) is not used.

Table 12-9: <Arithmetic Flag>

D	Carry Flag	Zero Flag	Error Flag
S1=S2	0	1	Not Used (0)
S1>S2	0	0	Not Used (0)
S1<S2	1	0	Not Used (0)

3. Ladder Program Example

<Ladder Diagram>



< Program>
STR #70010
CMP M010, M100

Calculation result
If the value of M100 is more than that of M010, the carry flag is output.

12.2.35 MLTMR Instruction

1. Format
   MLTMR Curr Value, Set Value
   Set Value: Register (M000-M999), Decimal (0-65535)
   Curr Value: Register (M000-M559)

Set Value / Curr Value	Decimal	Register (M000 - M999)
Mxxx (M000 - M559)	0 - 65535 (0.000 - 65.535 sec)	0 - 65535 (0.000 - 65.535 sec)

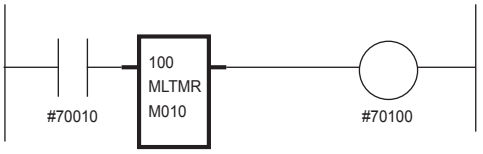
2. Function
   This instruction is an On Delay Timer to handle the subtraction formula and counter circuit by binary value. The internal clock is 0.001 second.
   While the start input is OFF, counting is not performed and Curr Value = Set value is maintained. Additionally, the MLTMR contact is turned off.
   Curr Value is decremented by 1 every 0.001 seconds as soon as the start input is turned on. The MLTMR contact is turned on when the Curr Value equals to 0. This state is maintained while the start input is at ON state.

Start Input	Curr Value	TMR Contact
OFF	Set Value	OFF
ON (Curr Value > 0)	Decremented by 1 every 0.001 seconds	OFF
ON (Curr Value = 0)	0	ON
ON→OFF (Curr Value > 0)	Return to Set Value	OFF
ON→OFF (Curr Value = 0)	Return to Set Value	ON→OFF

3. Ladder Program Example
   The timer is reset when the YRC1000micro power is turned on. Therefore, Curr Value becomes Set Value by the reset function even if the YRC1000micro power is turned on in the ON state of the timer start input.

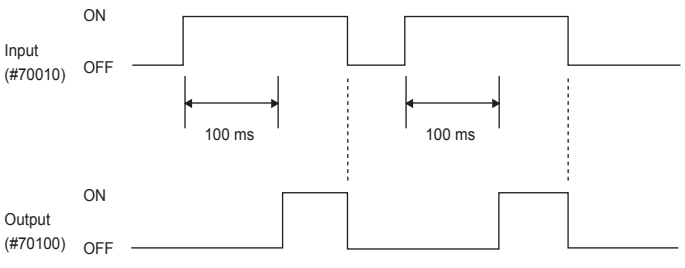
NOTE
This instruction cannot be output multiple times to one relay.
The register used as the current value of TMR/CNT/MLTMR instruction cannot be output multiple times.

<Ladder Diagram>



< Program>

```
STR      #70010
MLTMR    M010,100
OUT      #70100
```



12.3 Arithmetic Flag

12.3.1 Flag Type

The arithmetic flag is a signal to reflect calculation result in the operation of the following steps. There are three types of flags. These flags are allocated to the following specific outputs.

- #51400: Carry Flag
- #51401: Zero Flag
- #51402: Error Flag

Refer to *chapter 12.1 "List of Usable Instructions"* for the instructions which influence the flag.

(1) Carry Flag

- Case of ADD Instruction:
  This flag is set when the place of digit is moved to the left as a result of the operation.
- Case of SUB Instruction:
  This flag is set when the result is negative.

(2) Zero Flag

- Case of ADD or SUB Instruction:
  This flag is set when the result is 0.

(3) Error Flag

- This flag is set when the error occurs. The instruction is not executed.

12.3.2 Flag Transition Under Scanning

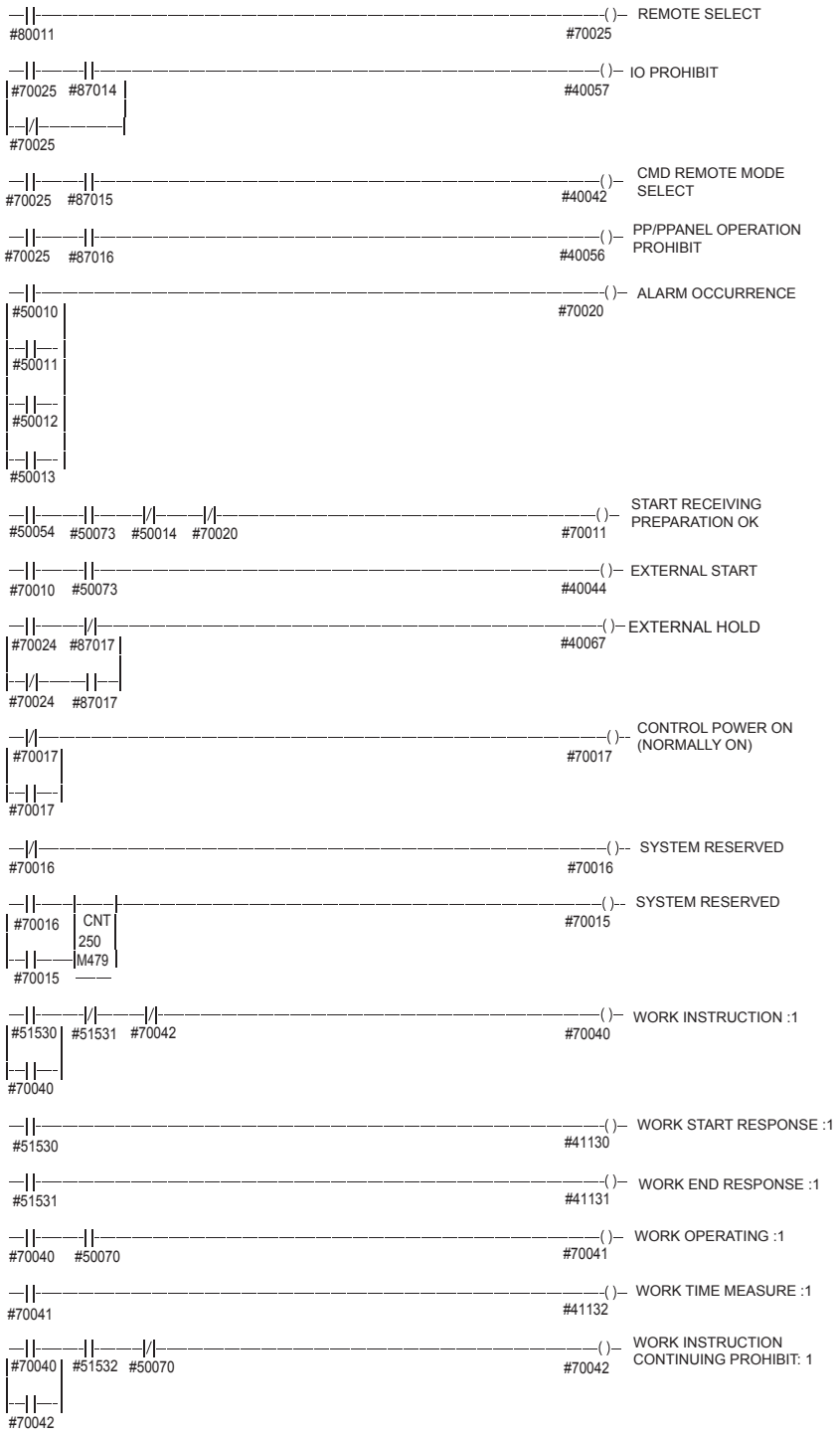
- The flag is cleared before ladder program processing of every scanning.
- When the processing of the instruction which influences the flag starts, the flag is set by the operation result when the execution condition of the instruction consists. The flag is cleared when the execution condition of the instruction is a failure.
- The state of the flag does not change regardless of execution or non-execution in the processing of the instruction which does not influence the flag.

12.4 Material Handling, Press Tending, Cutting, and Other Applications

12.4.1 LADDER PROGRAM LIST

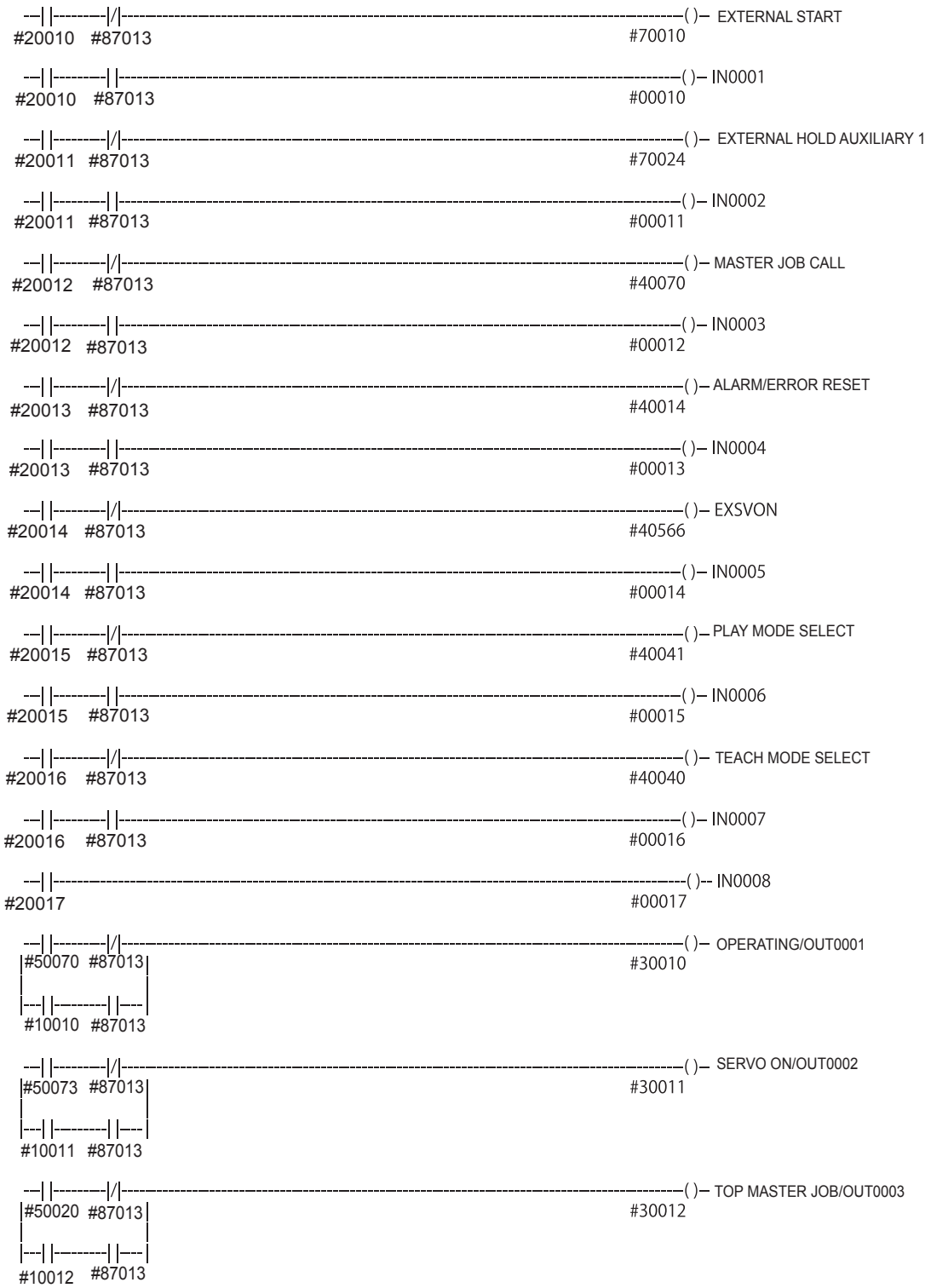
NOTE System ladder section differs according to the version. Check the version of the software used for the YRC1000micro.

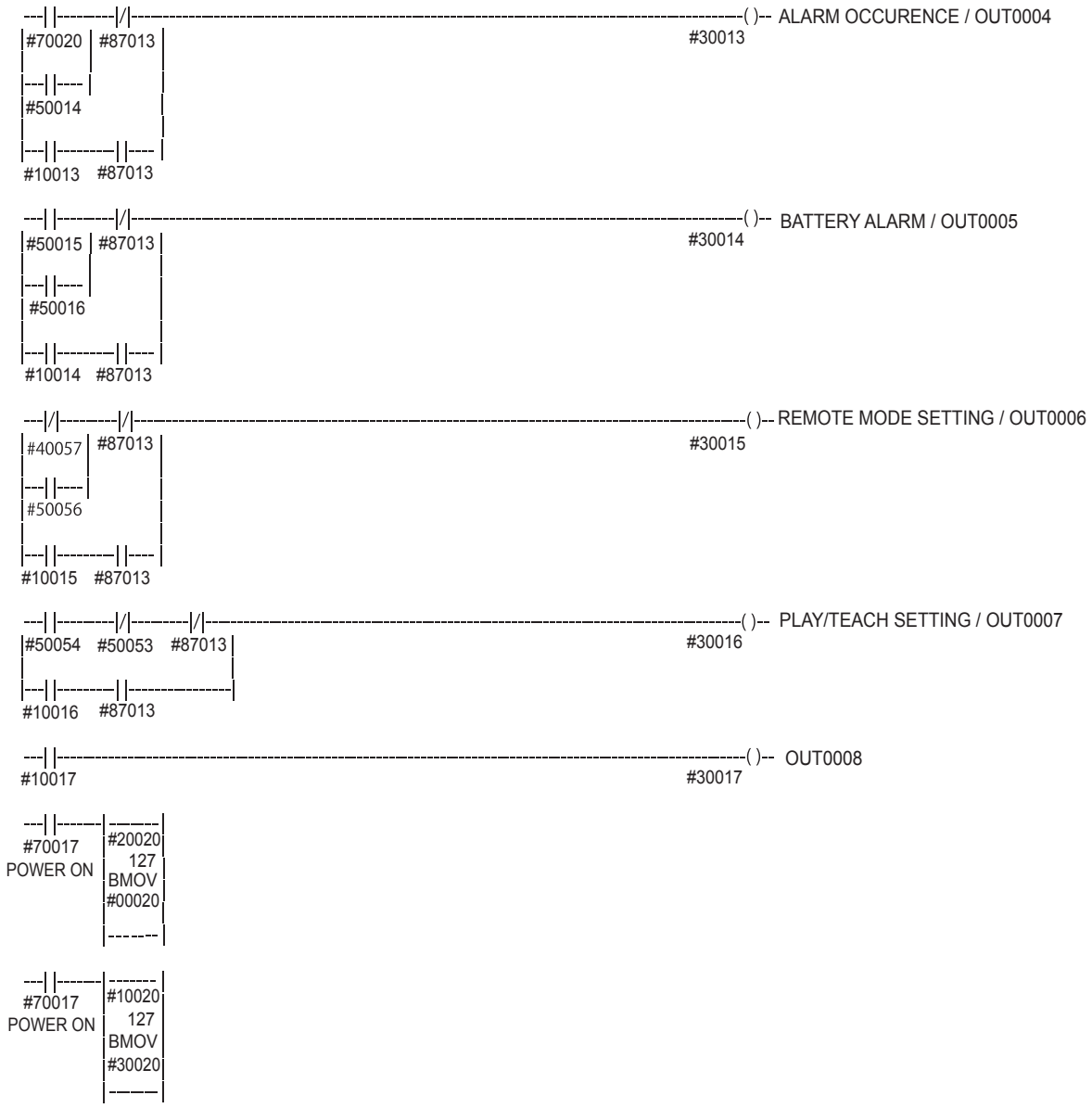
■ **System Ladder Section**
Standard ladders are prepared for each application prior to shipment. Ladder programs cannot be edited.


#80011
#70025
REMOTE SELECT
#70025
#87014
#70025
#40057
IO PROHIBIT
#70025
#70025
#87015
#40042
CMD REMOTE MODE SELECT
#70025
#87016
#40056
PP/PPANEL OPERATION PROHIBIT
#50010
#50011
#50012
#50013
#70020
ALARM OCCURRENCE
#50054
#50073
#50014
#70020
#70011
START RECEIVING PREPARATION OK
#70010
#50073
#40044
EXTERNAL START
#70024
#87017
#70024
#87017
#40067
EXTERNAL HOLD
#70017
#70017
#70017
CONTROL POWER ON (NORMALLY ON)
#70016
#70016
SYSTEM RESERVED
#70016
CNT
250
M479
#70015
#70015
SYSTEM RESERVED
#51530
#51531
#70042
#70040
#70040
WORK INSTRUCTION :1
#51530
#41130
WORK START RESPONSE :1
#51531
#41131
WORK END RESPONSE :1
#70040
#50070
#70041
WORK OPERATING :1
#70041
#41132
WORK TIME MEASURE :1
#70040
#51532
#50070
#70042
#70042
WORK INSTRUCTION CONTINUING PROHIBIT: 1

■ **User Ladder Section**

Signal connection specification and interface signals with system ladder are prepared prior to shipment. Including these signals, ladder programs can be edited.




#70020
#87013
#50014
#10013
#87013
#30013
ALARM OCCURENCE / OUT0004
#50015
#87013
#50016
#10014
#87013
#30014
BATTERY ALARM / OUT0005
#40057
#87013
#50056
#10015
#87013
#30015
REMOTE MODE SETTING / OUT0006
#50054
#50053
#87013
#10016
#87013
#30016
PLAY/TEACH SETTING / OUT0007
#10017
#30017
OUT0008
#70017
POWER ON
#20020
127
BMOV
#00020
#70017
POWER ON
#10020
127
BMOV
#30020

12.4.2 I/O ALARM

	Alarm No.	I/O Alarm Message
System Section		
	9000	
	9001	
	9002	
	9003	
	9004	
	9005	
	9006	
	9007	
	9008	
	9009	
	9010	
	9011	
	9012	
	9013	
	9014	
	9015	
	9016	
	9017	
	9018	
	9019	
	9020	
	9021	
	:	
	9063	
User Section		
	9064	
	9065	
	9066	
	9067	
	9068	
	9069	
	:	
	9127	

12.4.3 I/O MESSAGE

	No.	I/O Message
System Section		
	0001	
	0002	
	0003	
	0004	
	0005	
	0006	
	0007	
	0008	
	0009	
	0010	
	0011	
	0012	
	0013	
	0014	
	0015	
	0016	
	0017	
	0018	
	0019	
	0020	
	0021	
	:	
	0064	
User Section		
	0001	
	0002	
	0003	
	0004	
	0005	
	0006	
	:	
	0064	

12.5 Prevent Robot Interference

The ladder circuit is available in the concurrent I/O program to prevent robots from entering specified interference areas.

12.5.1 Single Robot System

The ladder circuit is available in the concurrent I/O program to prevent robots from entering interference areas.

Four interference areas are assigned to each robot to prevent interference.

R1
Interference 1 (#50080)
Interference 2 (#50081)
Interference 3 (#50082)
Interference 4 (#50083)

The entrance prohibit signal is available for each interference area in the concurrent I/O program.

R1
Entrance Prohibit 1 (#70030)
Entrance Prohibit 2 (#70031)
Entrance Prohibit 3 (#70032)
Entrance Prohibit 4 (#70033)

The robot is stopped from attempting to enter an interference area by the sequence wait signal when the entrance prohibit signal is ON.

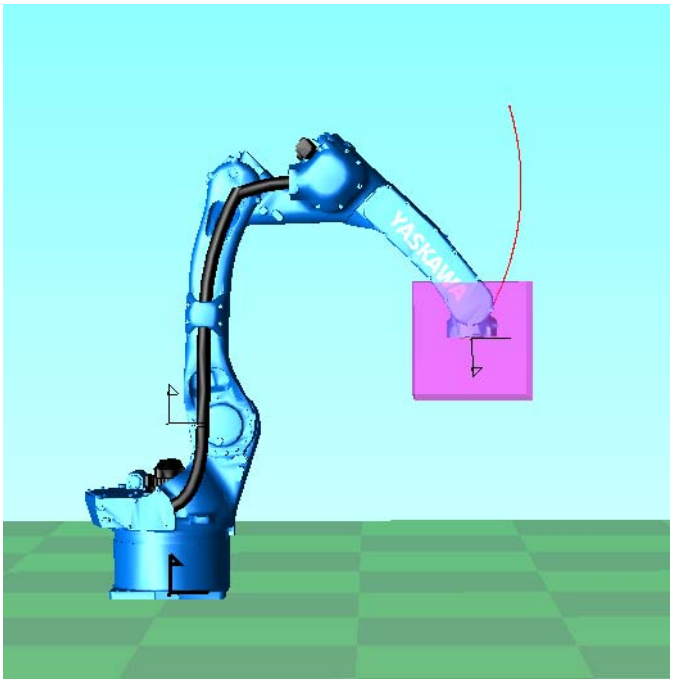
The entrance prohibit signal for the single robot system is contingent upon the following signals.

Entrance Prohibit Signal	Condition	Remarks
Entrance Prohibit 1 (#70030)	AIO board CN308 B5 interference 1 entrance prohibit (#20020)	Can be changed in control mode
Entrance Prohibit 2 (#70031)	AIO board CN308 A5 interference 2 entrance prohibit (#20021)	Can be changed in control mode
Entrance Prohibit 3 (#70032)	(Not used)	Can be changed in control mode
Entrance Prohibit 4 (#70033)	(Not used)	Can be changed in control mode

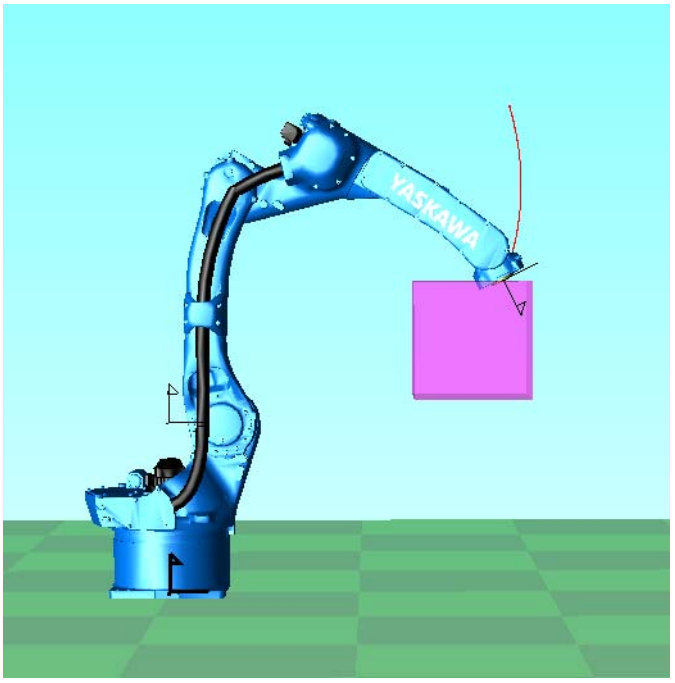
When using interference areas 1 and 2 for different purposes, do not perform wiring for CN308 B5 or A5 on the AIO board, or make sure that entrance prohibit signals 1 and 2 are always OFF.

(Example) When the interference 1 entrance prohibited signal (#20020) = ON is input as an external input signal, the entrance prohibited 1 signal turns ON (#70030 = ON).
If robot 1 enters interference area 1 (#50080 = ON) when the entrance prohibit 1 signal is ON (#70030 = ON), the sequence wait signal turns ON (#40130 = ON) and the robot will stop.

1. Interference 1 entrance prohibit signal (#20020) = OFF
   Robot 1 can enter interference area 1.



2. Interference 1 entrance prohibit signal (#20020) = ON
   When robot 1 enters interference area 1, the sequence wait signal will stop the robot.



12.5.2 Dual Robot Signal

Four interference areas are assigned to each robot to prevent interference.

R1	R2
Interference 1 (#50080) Interference 2 (#50081) Interference 3 (#50082) Interference 4 (#50083)	Interference 9 (#50090) Interference 10 (#50091) Interference 11 (#50092) Interference 12 (#50093)

The entrance prohibit signal is available for each interference area in the concurrent I/O program.

R1	R2
Entrance Prohibit 1 (#70030) Entrance Prohibit 2 (#70031) Entrance Prohibit 3 (#70032) Entrance Prohibit 4 (#70033)	Entrance Prohibit 9 (#70230) Entrance Prohibit 10 (#70231) Entrance Prohibit 11 (#70232) Entrance Prohibit 12 (#70233)

The entrance prohibit signal for the dual robot system, such as ARC welding combinations, is contingent upon the following signals.

Entrance Prohibit Signal	Condition	Remarks
Entrance Prohibit 1 (#70030)	(Not used)	Can be changed in control mode
Entrance Prohibit 2 (#70031)	AIO board CN308 B5 interference 2 entrance prohibit (#20020)	Can be changed in control mode
Entrance Prohibit 3 (#70032)	Interfierence11 (#50092)	Can be changed in manufacturer mode
Entrance Prohibit 4 (#70033)	(Not used)	Can be changed in control mode
Entrance Prohibit 9 (#70230)	(Not used)	Can be changed in control mode
Entrance Prohibit 10 (#70231)	AIO board CN308 A5 interference 10 entrance prohibit (#20021)	Can be changed in control mode
Entrance Prohibit 11 (#70232)	Interference 3 (#50082)	Can be changed in manufacturer mode
Entrance Prohibit 12 (#70233)	(Not used)	Can be changed in control mode

NOTE

When using interference areas 2 and 10 for different purposes, do not perform wiring for CN308 B5 or A5 on the AIO board, or make sure that entrance prohibit signals 2 and 10 are always OFF.

Set interference areas 3 and 11 only for the purpose of preventing interference between robots 1 and 2 in the same area. If interference areas 3 and 11 are set for different purposes, the sequence wait signal may stop the robot in unexpected situations.

(Example) When robot 2 enters interference area 11 (#50092 = ON), the entrance prohibit 3 signal turns ON (#70032 = ON). If robot 1 enters interference area 3 (#50082 = ON) when the entrance prohibit 3 signal is ON, the sequence wait signal turns ON (#40130 = ON) and robot 1 will stop.

When robot 1 enters interference area 3 (#50082 = ON), the entrance prohibit 11 signal turns ON (#70232 = ON). If robot 2 enters interference area 11 (#50092 = ON) when the entrance prohibit 11 signal is ON, the sequence wait signal turns ON (#40131 = ON) and robot 2 will stop.

13 How to Monitor Signals

Signal status can be monitored in the windows described in the following sections.

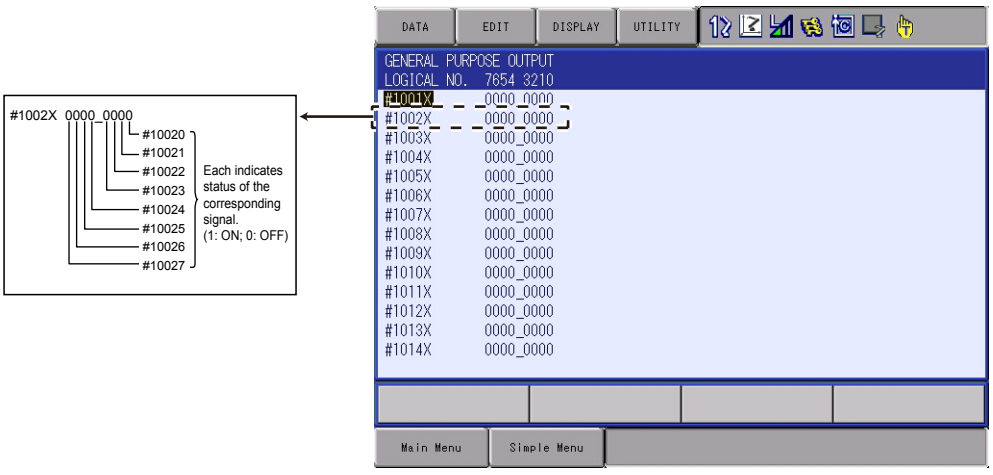
13.1 Monitoring I/O Signals

The following example shows one of the I/O monitor windows.

13.1.1 I/O Windows

1. Select {IN/OUT} under the main menu.
2. Select an I/O window to be monitored.
   – The following I/O windows can be selected.
   - {GENERAL PURPOSE INPUT}: Signals referred with instructions in JOBs (#0xxxx)
   - {GENERAL PURPOSE OUTPUT}: Signals output from JOBs (#1xxxx)
   - {EXTERNAL INPUT}: Signals input from external devices (#2xxxx)
   - {EXTERNAL OUTPUT}: Signals output to external devices (#3xxxx)
   - {SPECIFIED INPUT}: Signals change manipulator operation mode (#4xxxx)
   - {SPECIFIED OUTPUT}: Signals inform manipulator operation mode and status (#5xxxx)
   - {AUX. RELAY}: Signals used in concurrent I/O (#7xxxx)
   - {CONTROL INPUT}: Signals refer to hardware status controller (#80xxx to #85xxx)
   - {NETWORK INPUT}: Signals input from network devices (#27xxx~#29xxx)
   - {NETWORK OUTPUT}: Signals output to network devices (#37xxx~#39xxx)

The same applies to the signals ON other windows.

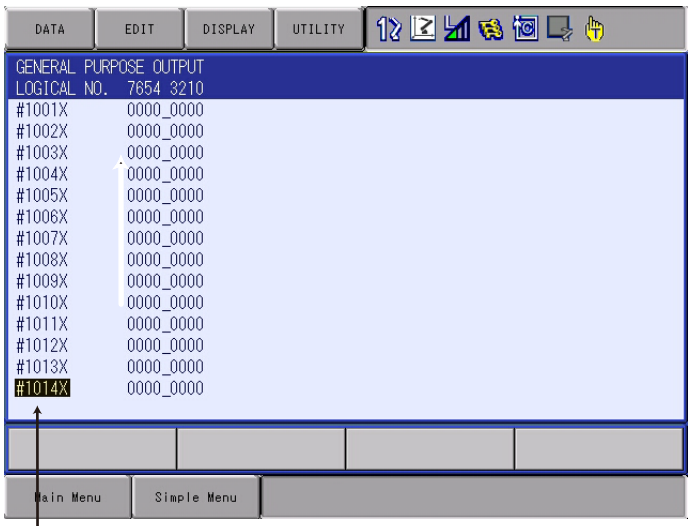


If the desired relay number is not displayed on the screen, perform the following operation to point the cursor to the desired relay number.

1. Point the cursor to the desired relay number.

   (1) Move the cursor to a relay number, and press [SELECT].

   (2) Input the desired relay number with the [Numeric Key] , then press [ENTER] to point the cursor to the specified number.



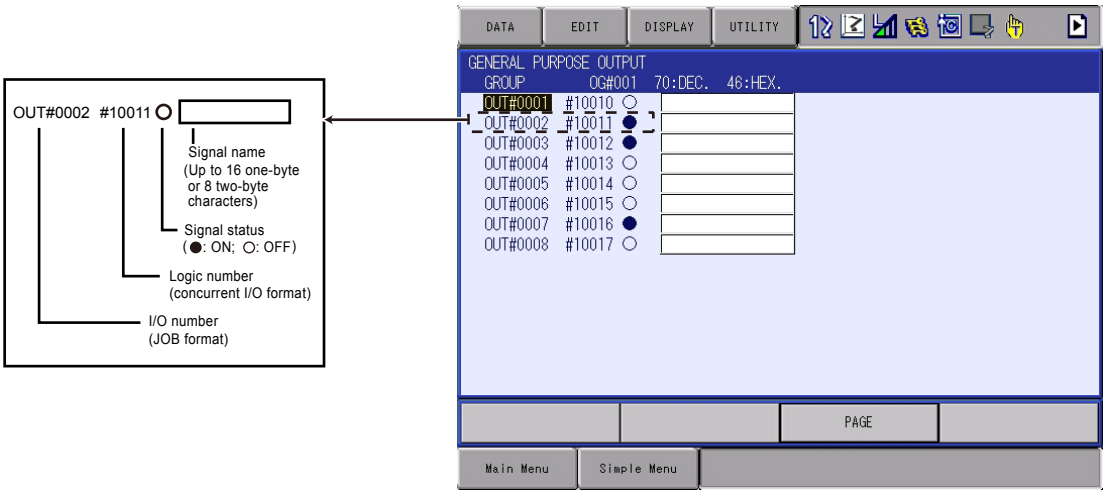
13.2 I/O Status Window

The signal status can be monitored by switching the GP INPUT/OUTPUT, EXTERNAL INPUT/OUTPUT, SPECIFIED INPUT/OUTPUT windows to the I/O status window.

In the I/O status window, each signal name can be monitored as well.

In the GP INPUT, GP OUTPUT, EXTERNAL INPUT, and EXTERNAL OUTPUT status windows, the signal status can be changed.

1. Select {DISPLAY} under the menu.
2. Select {DETAIL}.
   – The I/O window is switched to the I/O status window.
3. Select {SIMPLE}.
   – The I/O status window is switched to the I/O window.
4. Press [PAGE].
   – Pressing the [PAGE] changes the relay number displayed on the screen.
     • The relay numbers are displayed in the following order each time the [PAGE] is pressed:
     #1001X → #1102X →⋯→ #1511X →#1512X (the last page) → #1001X →⋯
     • The relay numbers change in the following reverse order each time the [SHIFT] + [PAGE] are pressed:
     #1001X → #1512X (the last page) → #1511X →⋯→ #1002X → #1001X →⋯
   – <Example> GP Output window



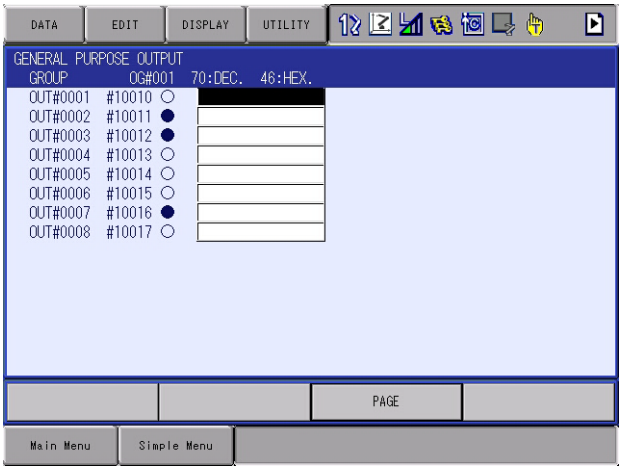
• In the GP Output status window, the output signal ON/OFF status can be changed.
Once the status is changed, the status is maintained unless the next output instruction of JOB (DOUT) is executed.

• In the status windows “GP Input”, “External Input” and “External Output”, the signal ON/OFF status can be forcibly changed.
Once the status is changed, the status is maintained unless the forced change status is canceled.

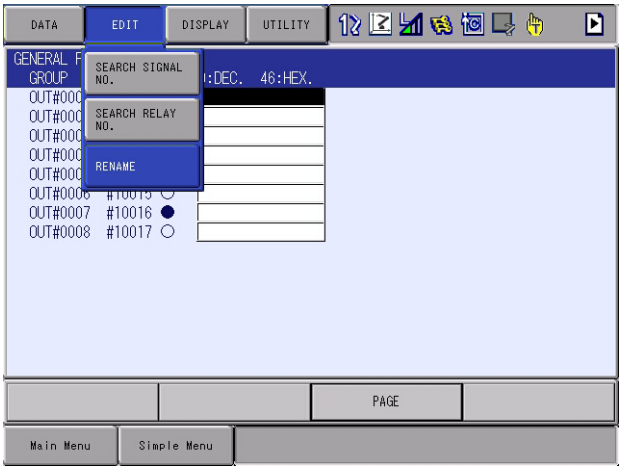
13.2.1 Signal Name Registration

1. Select the signal name to be registered.

(1) Move the cursor to the desired signal name to be registered, and press [SELECT].

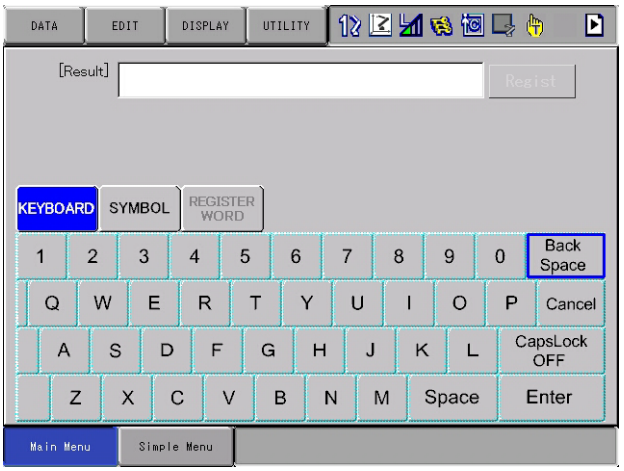


Or, move the cursor to the line of the signal whose name to be registered. Select {EDIT}, then {RENAME} from the menu.



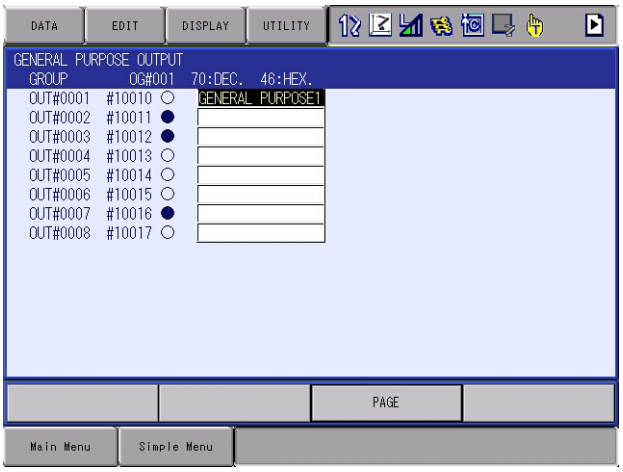
(2) Characters can be entered.

– Enter up to 16 one-byte (or 8 two-byte) characters.



2. Enter the signal name.

3. Press [ENTER].
   – The name is registered.

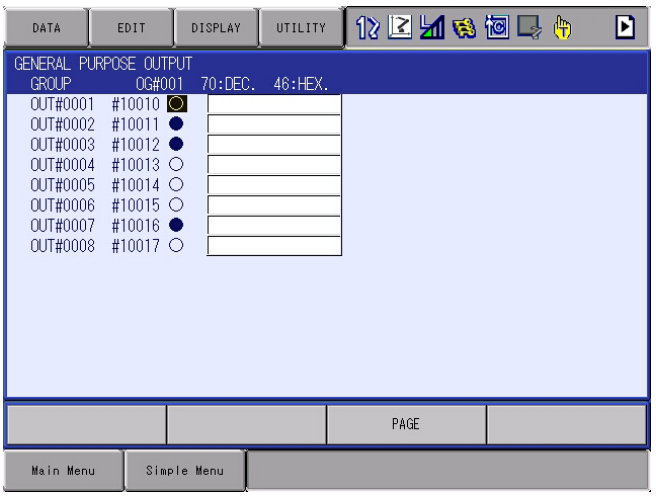


NOTE Do not use “/” for the top of the signal name.

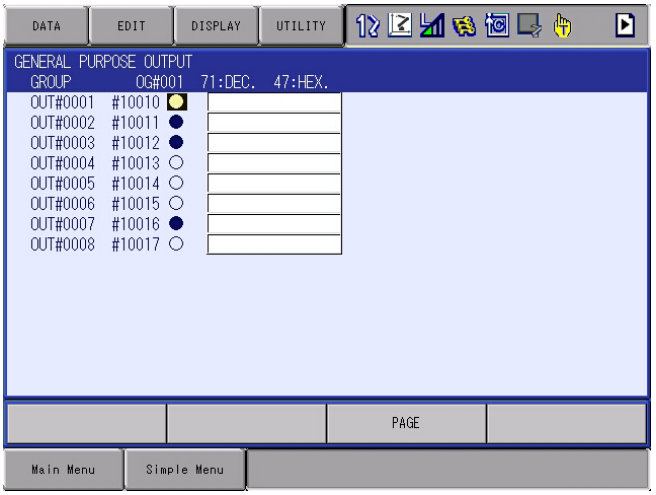
13.2.2 Changing Signal Status from GP Output Status Window

The ON-OFF status of the GP output signals can be changed by performing the following procedure.

1. Select the signal status desired to be changed.
   – Move the cursor to the status (“●” or “○”) of desired signal in the GP OUTPUT window.



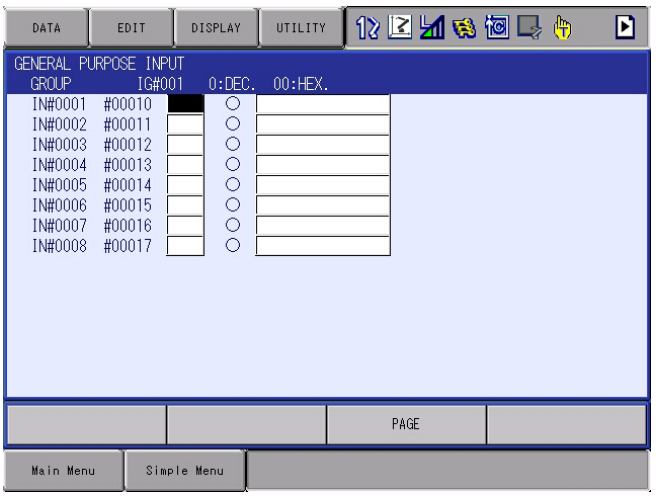
2. Select the signal status.
   – The signal status changes each time the [INTERLOCK] +[SELECT] keys are pressed.



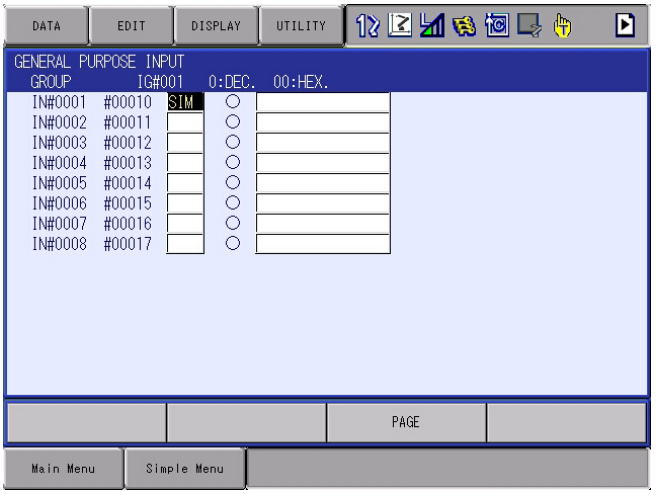
13.2.3 Changing Signal Status from GP Input Status Window

The status of the GP input signals can be changed by performing the following procedure.

1. Select the signal desired to be changed.
   – Move the cursor to the small box on the row of the signal to be changed in the GP INPUT window.

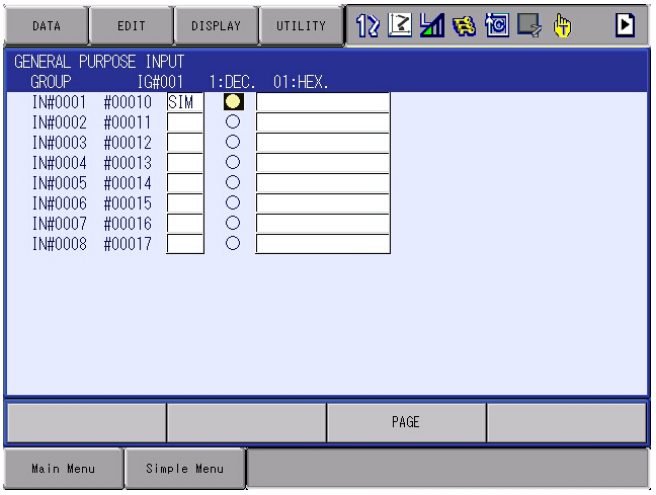


2. Select the “SIM” status.
   – The signal status changes each time the [SELECT] key is pressed.
   • [SIM] : status of forced signal
   • [Blank] : standard status



3. Select the signal status.

   – Only for the signal specified as “SIM”, each time the cursor is moved to the signal status and [INTERLOCK] + [SELECT] keys are pressed, the signal status changes (“●” or “○”).



NOTE

If “SIM” (forced signal) is selected, the user parameter S4C488 enables the continuous operation of the next instruction even if the signal status does not correspond to the condition when executing the WAIT instruction that specifies the infinite wait status for the GP input signal.

(Example) When the following instruction is given in a JOB with “SIM” specified for the IN#0001.

WAIT IN#0001=ON

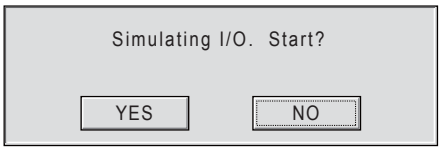
1. S4C488=0: infinite wait status until the signal status corresponds to the condition.
2. S4C488=non-0: executes the next instruction after a time specified in S2C488 (in units of 0.01 msec) has passed even if the signal status does not correspond to the condition.

For example, when the parameter is set to “S4C488=100”, the above WAIT instruction executes the next instruction a second later if IN#0001 is set to “OFF” enabled by selecting “SIM”.

NOTE

• Perform the following check operation for safety when operating the manipulator with “SIM” (forced signal) is remained selected for the GP input signal.

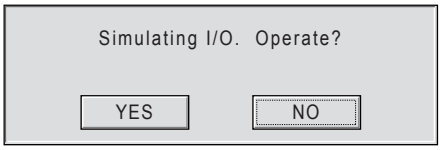
1. If any of the GP input signal is set to “SIM”, the confirmation dialog box appears when starting a job.



Select “YES” when executing the job with the “SIM” status.
The job starts running by performing the start operation again after the dialog box disappears.

Select “NO” when not executing the job with the “SIM” status.
Cancel the “SIM” status after the dialog box disappears.

2. If any of the GP input signal is set to “SIM”, the confirmation dialog box appears when operating the manipulator (JOG, FWD/BWD operations) with the programming pendant.



Select “YES” when operating the manipulator with the “SIM” status.
The manipulator can be operated after the dialog box disappears.

Select “NO” when not operating the manipulator with the “SIM” status.
Cancel the “SIM” status after the dialog box disappears.

• Concurrent I/O program reflects the actual signal status regardless of the “SIM” status of the GP input signal.

For example, even if building a circuit in the ladder program as follows, #30010 is not ON when “SIM” is selected and the signal status set to “ON” (“●”) for #00010. (The ON-OFF status of normal signal is referred in the ladder program.)

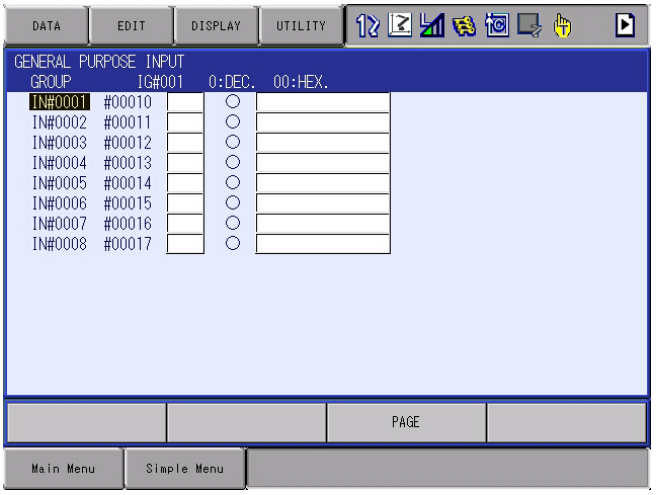
STR #00010

OUT #30010

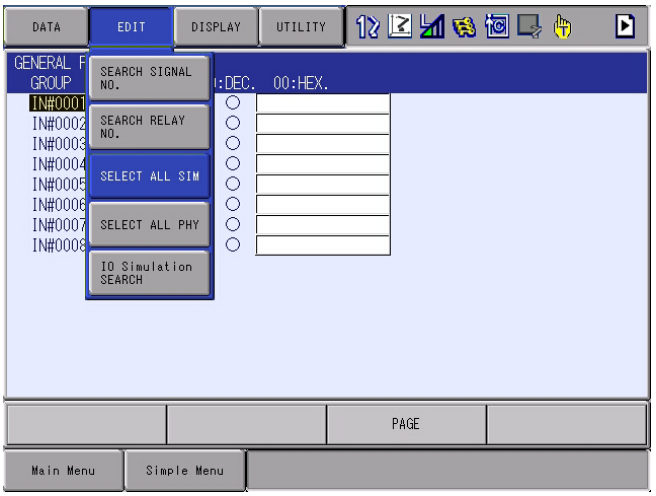
13.2.3.1 Batch Selection of SIM

Follow the procedure below to set all the GP input signals to “SIM”.

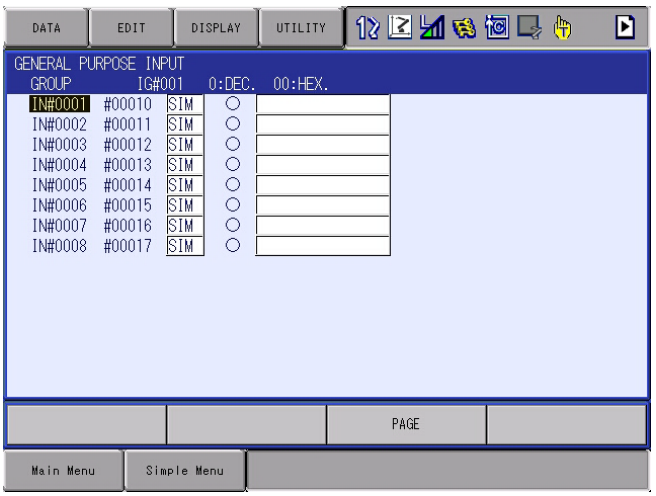
1. Display the GP INPUT window.



2. Select {EDIT} from the menu.



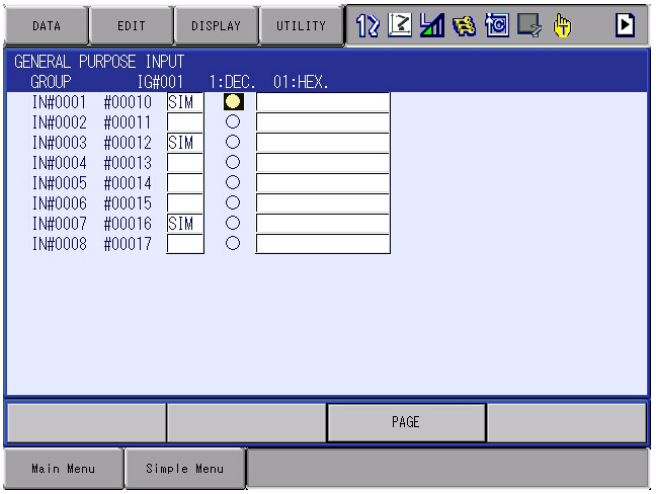
3. Select {SELECT ALL SIM}.
   – Set all the GP input signals to “SIM”.



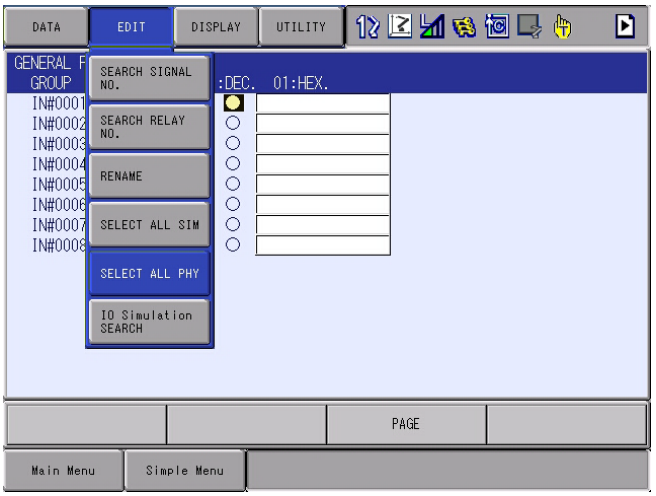
13.2.3.2 Batch Cancellation of SIM

Follow the procedure below to cancel the “SIM” status of all the GP input signals.

1. Display the GP INPUT window.

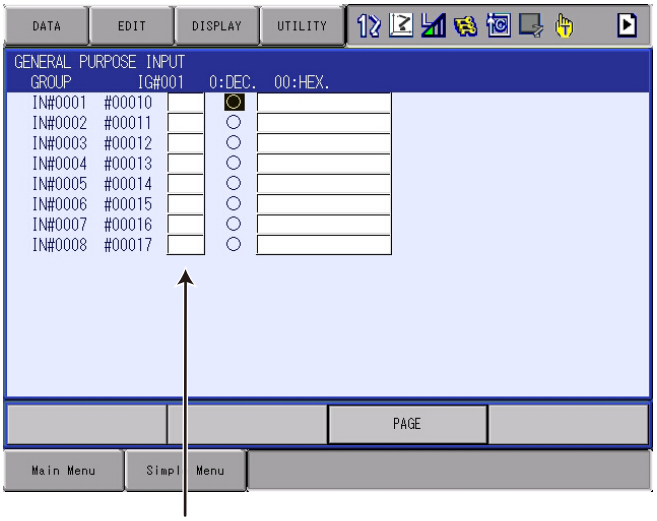


2. Select {EDIT} from the menu.



3. Select {SELECT ALL PHY}.

– Cancels the “SIM” status of all the GP input signals.

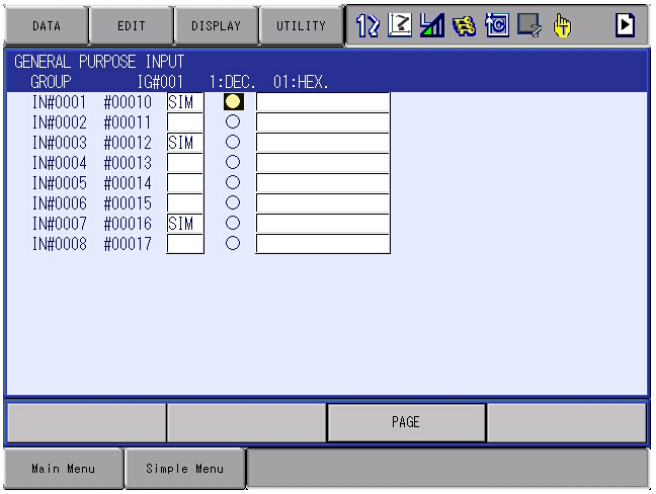


Cancels the "SIM" status of all the GP input signals.
(IN#0001 to IN#4096)

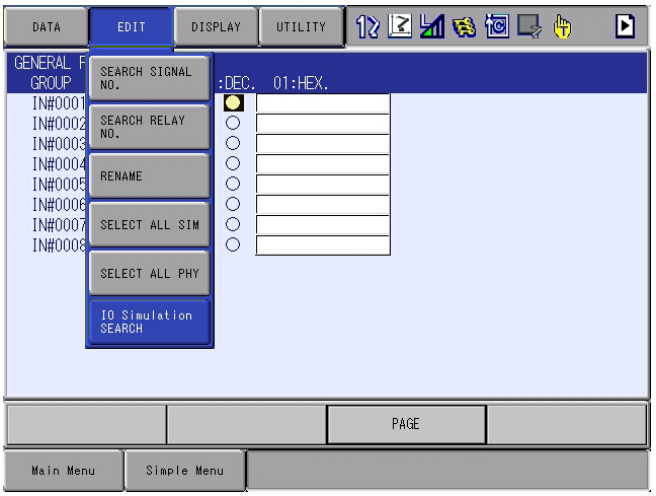
13.2.3.3 IO Simulation Search

Follow the procedure below to search the GP input signals with “SIM” status.

1. Display the GP INPUT window.



2. Select {EDIT} from the menu.

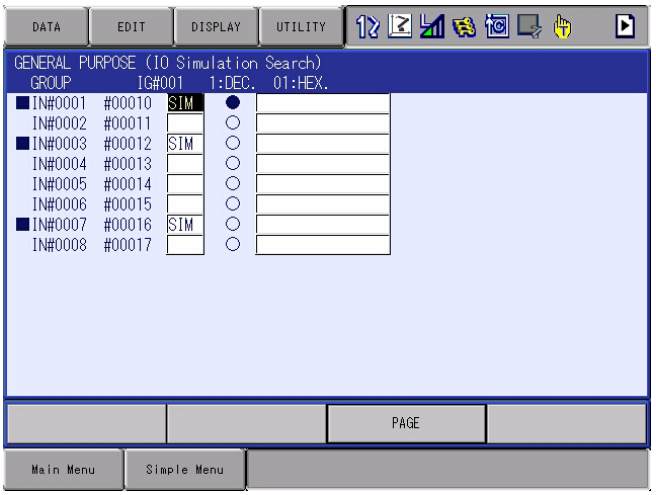


3. Select {IO Simulation SEARCH}.

– When there is a GP input signal with “SIM” status, the following is shown:

• “■” are added on the left of the signals with the “SIM” status.

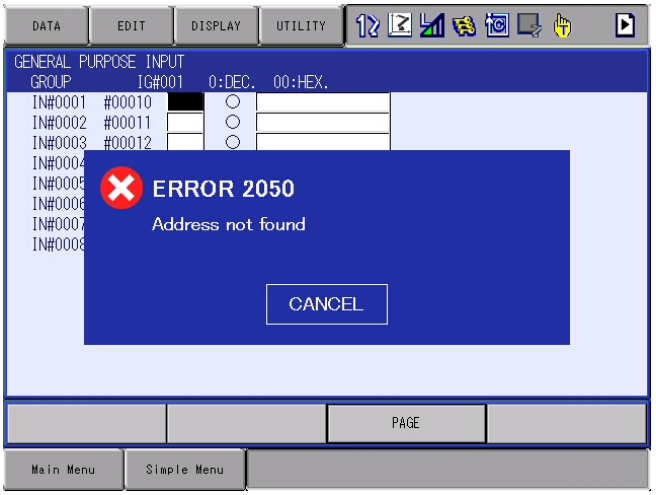
• “(IO Simulation Search)” is shown in the title.



– When there is no GP input signal with “SIM” status, the following is shown:

• “ERROR 2050: Address not found” is shown.

• Does not move on to the IO simulation search.



SUPPLE-MENT

During the IO simulation search, the search status does not change even if the signal’s “SIM” status changes. “■” is added to the signal which was “SIM” status when the search started.

Follow the procedure below to jump to the GP input signal with “SIM” status during the IO simulation search.

1. Press the cursor key [↓].
   – The cursor moves to the next signal with “SIM” status.
2. Press the cursor key [↑].
   – The cursor moves to the previous signal with “SIM” status.

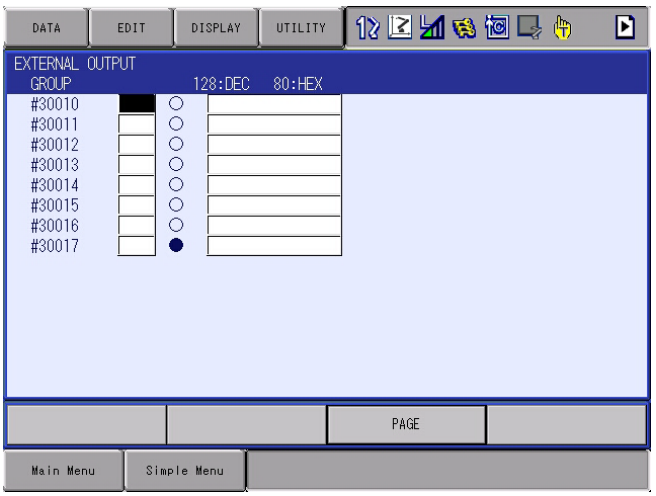
The IO simulation search is canceled in the following cases:

- when [CANCEL] is pressed during the IO simulation search
- when the menu {EDIT}, then {SELECT ALL SIM} are selected during the IO simulation search
- when the menu {EDIT}, then {SELECT ALL PHY} are selected during the IO simulation search
- when the menu {EDIT}, then {SEARCH SIGNAL NO.} or {SEARCH RELAY NO.} are selected during the IO simulation search
- when the display is changed from the I/O status window (DETAIL) to the I/O window (SIMPLE)
- when the window is closed
- when the page is switched

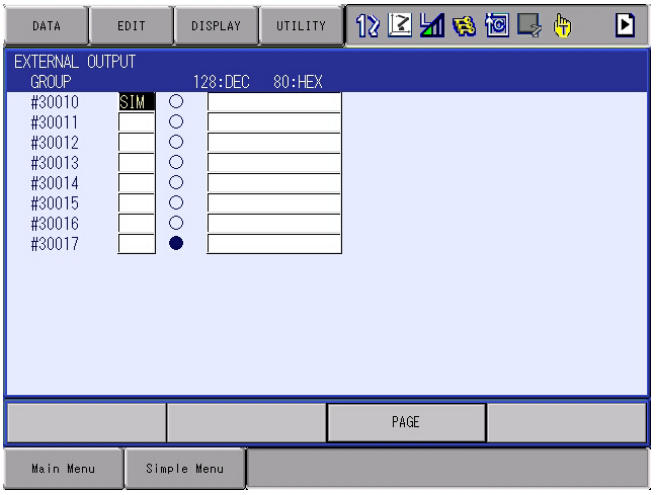
13.2.4 Changing Signal Status from External Output Status Window

Follow the procedure below to change the status of the external output signals.

1. Select the signal to be changed.
   – Move the cursor to the small box on the row of the signal to be changed in the EXTERNAL OUTPUT window.

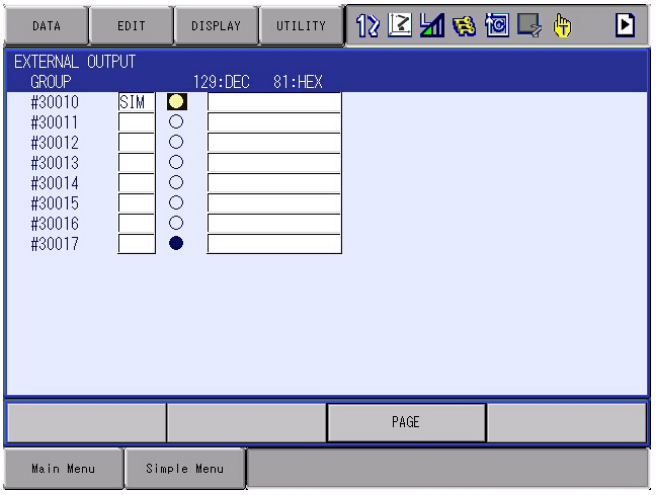


2. Select the “SIM” status.
   – The signal status changes each time the [SELECT] key is pressed.
   • [SIM] : status of forced signal
   • [Blank] : standard status



3. Select the signal status.

   – Only for the signal specified as “SIM”, each time the cursor is moved to the signal status and [INTERLOCK] + [SELECT] keys are pressed, the signal status changes (“●” or “○”).



WARNING

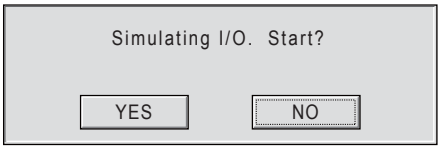
- Changing the status of external output signal by specifying “SIM” also changes the signals output to the actual external devices. Before forcibly changing the signal status, verify the destination device of each signal, and check ON how the change effects on the device.

Failure to observe this caution may result in injury or damage to equipment.

NOTE

• Perform the following check operation for safety when operating the manipulator with “SIM” (forced signal) is remained selected for the external output signal.

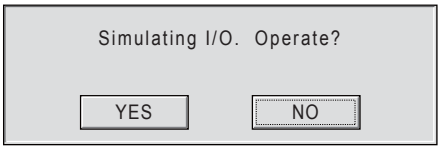
1. If any of the external output signal is set to “SIM”, the confirmation dialog box appears when starting a job.



Select “YES” when executing the job with the “SIM” status.
The job starts running by performing the start operation again after the dialog box disappears.

Select “NO” when not executing the job with the “SIM” status.
Cancel the “SIM” status after the dialog box disappears.

2. If any of the external output signal is set to “SIM”, the confirmation dialog box appears when operating the manipulator (JOG, FWD/BWD operations) with the programming pendant.



Select “YES” when operating the manipulator with the “SIM” status.
The manipulator can be operated after the dialog box disappears.

Select “NO” when not operating the manipulator with the “SIM” status.
Cancel the “SIM” status after the dialog box disappears.

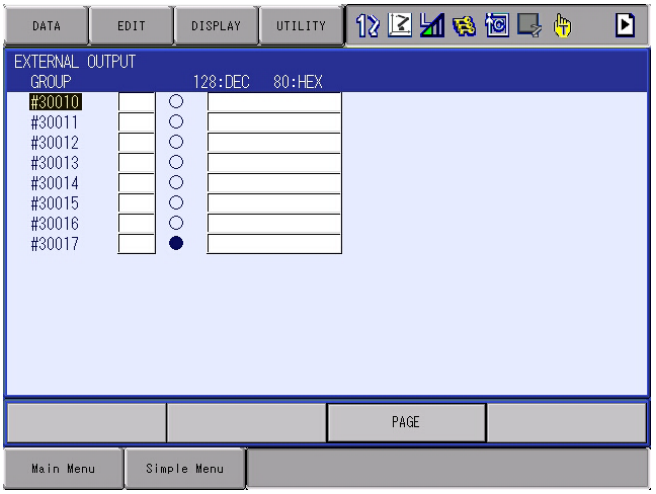
• Concurrent I/O program reflects the actual signal status regardless of the “SIM” status of the external output signal.

For example, even if building a circuit in the ladder program as follows, #30011 is not ON when “SIM” is selected and the signal status set to “ON” (“●”) for #30010.
(The ON-OFF status of normal signal is referred in the ladder program.)
STR #30010
OUT #30011

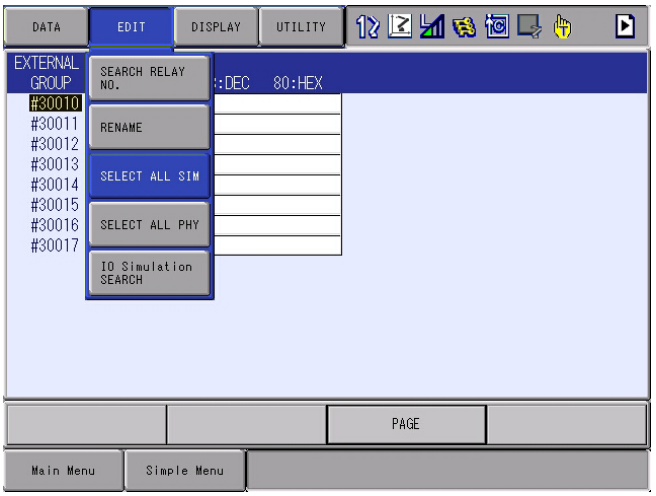
13.2.4.1 Batch Selection of SIM

Follow the procedure below to set all the external output signals to “SIM”.

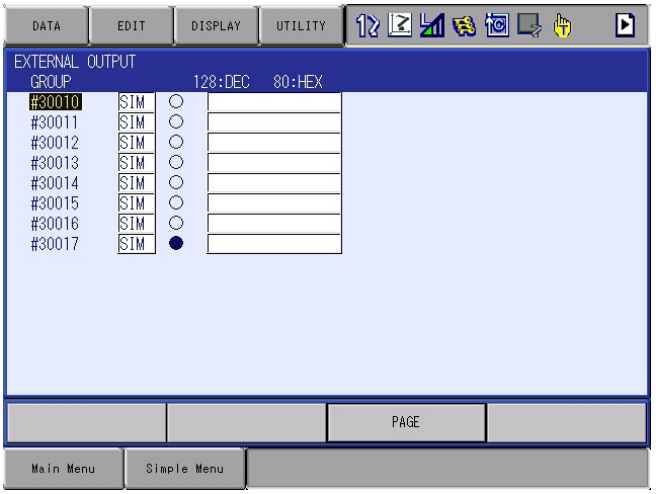
1. Display the EXTERNAL OUTPUT window.



2. Select {EDIT} from the menu.



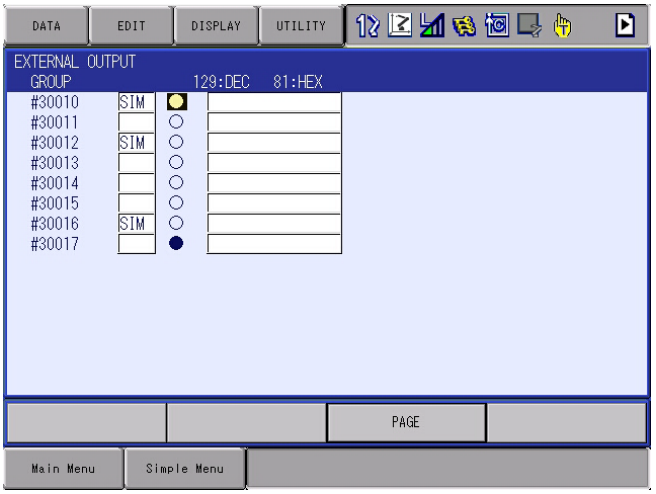
3. Select {SELECT ALL SIM}.
   – Set all the external output signals to “SIM”.



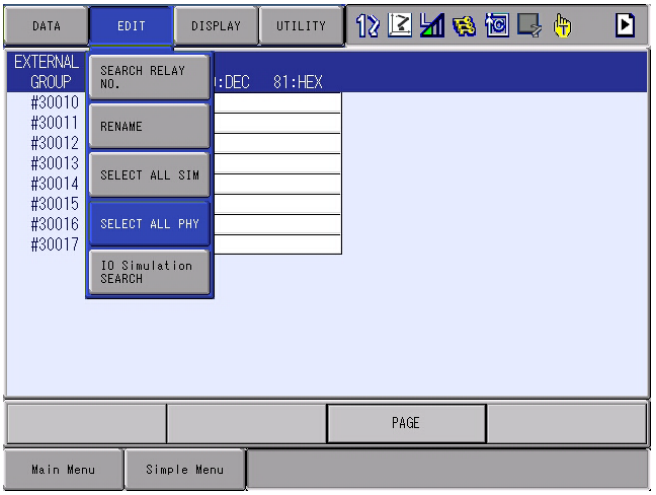
13.2.4.2 Batch Cancellation of SIM

Follow the procedure below to cancel the “SIM” status of all the external output signals.

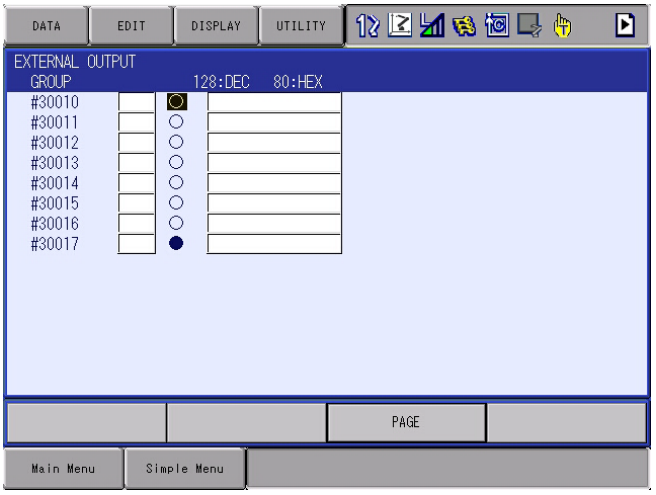
1. Display the EXTERNAL OUTPUT window.



2. Select {EDIT} from the menu.



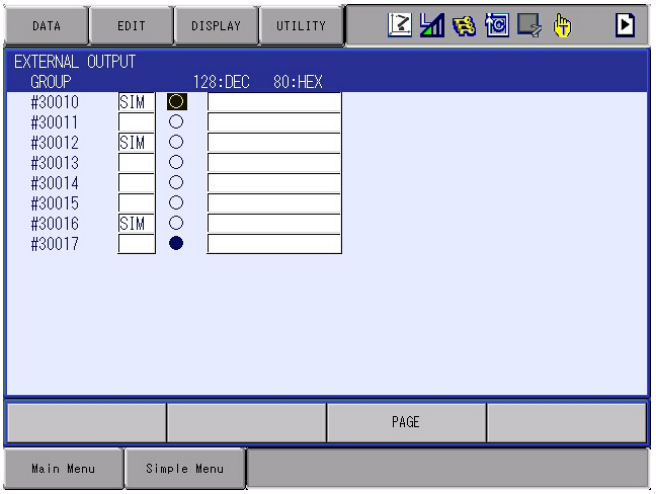
3. Select {SELECT ALL PHY}.
   – Cancels the “SIM” status of all the external output signals.



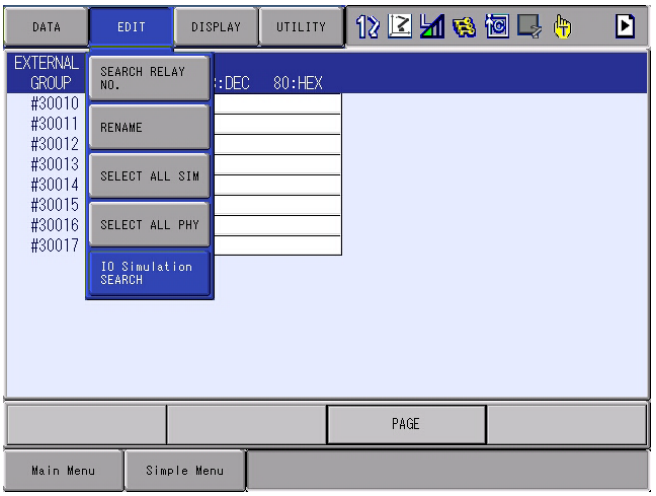
13.2.4.3 IO Simulation Search

Follow the procedure below to search the external output signals with “SIM” status.

1. Display the EXTERNAL OUTPUT window.



2. Select {EDIT} from the menu.

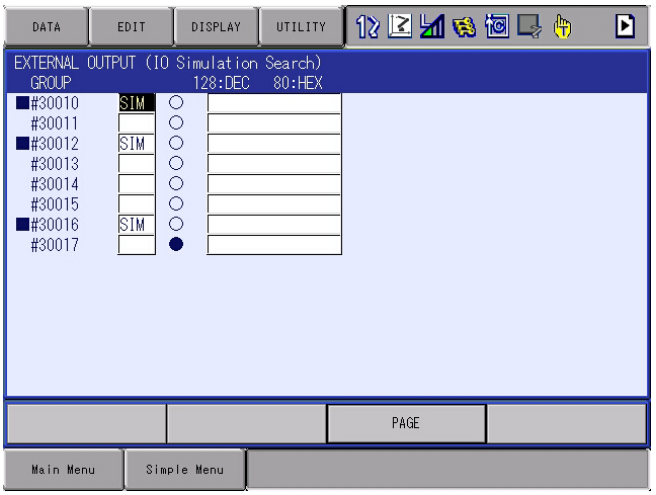


3. Select {IO Simulation SEARCH}.

– When there is an external output signal with “SIM” status, the following is shown:

• “■” are added on the left of the signals with the “SIM” status.

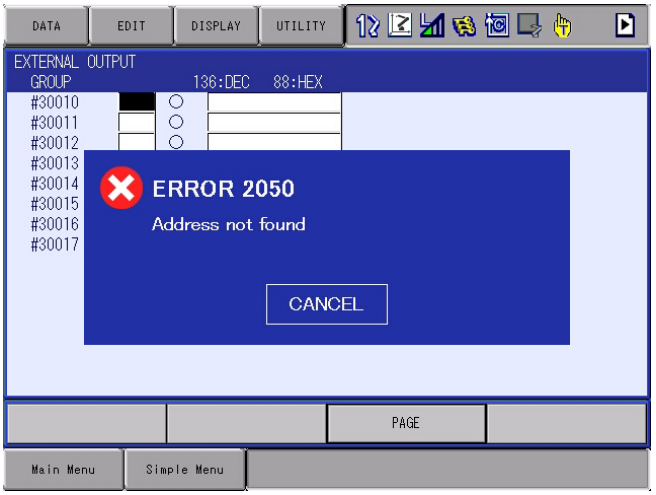
• “(IO Simulation Search)” is shown in the title.



– When there is no external output signal with “SIM” status, the following is shown:

• “ERROR 2050: Address not found” is shown.

• Does not move on to the IO simulation search.



SUPPLE-MENT

During the IO simulation search, the search status does not change even if the signal’s “SIM” status changes. “■” is added to the signal which was “SIM” status when the search started.

Follow the procedure below to jump to the external output signal with “SIM” status during the IO simulation search.

1. Press the cursor key [↓].
   – The cursor moves to the next signal with “SIM” status.
2. Press the cursor key [↑].
   – The cursor moves to the previous signal with “SIM” status.

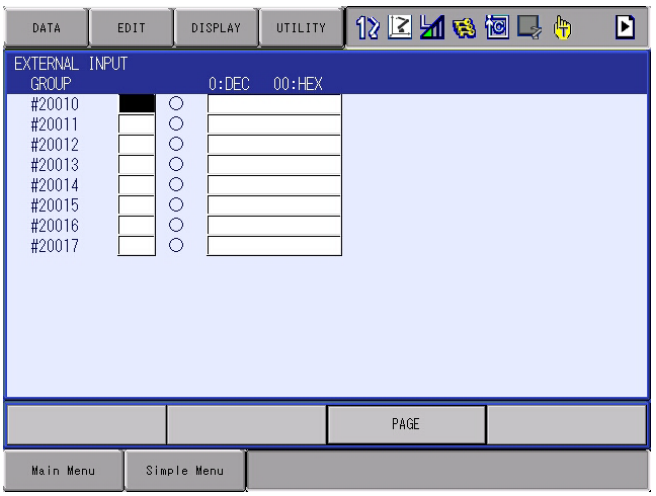
The IO simulation search is canceled in the following cases:

- when [CANCEL] is pressed during the IO simulation search
- when the menu {EDIT}, then {SELECT ALL SIM} are selected during the IO simulation search
- when the menu {EDIT}, then {SELECT ALL PHY} are selected during the IO simulation search
- when the menu {EDIT}, then {SEARCH RELAY NO.} is selected during the IO simulation search
- when the display is changed from the I/O status window (DETAIL) to the I/O window (SIMPLE)
- when the window is closed
- when the page is switched

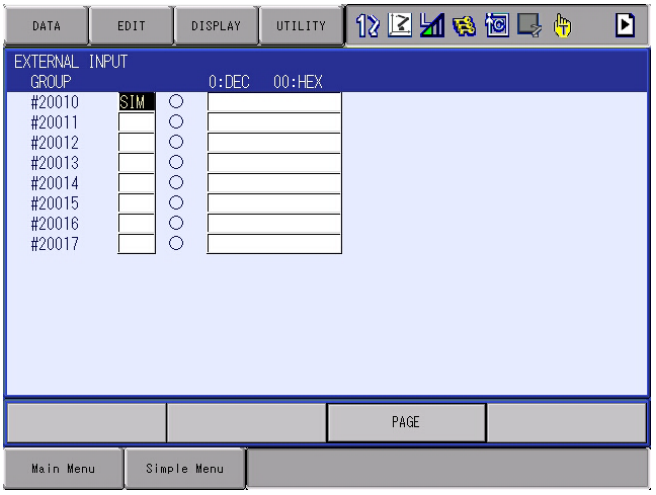
13.2.5 Changing Signal Status from External Input Status Window

The status of the external input signals can be changed by performing the following procedure.

1. Select the signal desired to be changed.
   – Move the cursor to the small box on the row of the signal to be changed in the GP Input window.

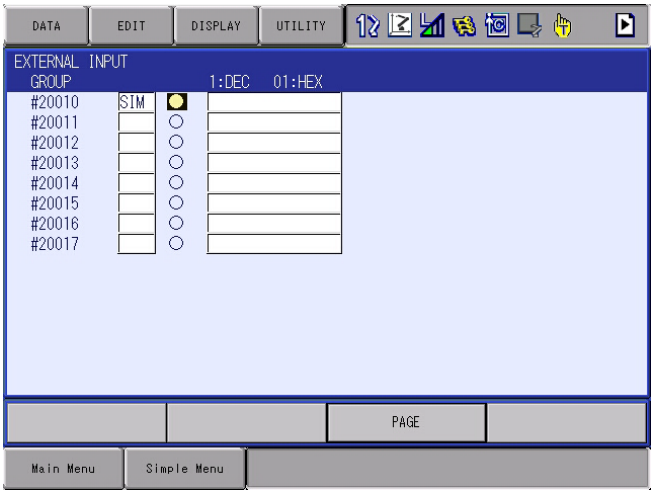


2. Select the forced status.
   – The signal status changes each time the [SELECT] key is pressed.
   • [SIM] : status of forced signal
   • [Blank] : standard status



3. Select the signal status.

   – Only for the signal specified as “SIM”, each time the cursor is moved to the signal status and [INTERLOCK] + [SELECT] keys are pressed, the signal status changes (“●” or “○”).



WARNING

- When changing the status of external input signal by specifying “SIM”, parameters can be set as follows:

  S2C394=0
  Changes only the internal status (signal indication) if the output status of signals to the external device has been changed with the concurrent I/O program due to the change of external input signals. The output status for external device remains the same condition when the “SIM” mode is selected in the external input signal screen. Restores the original status by cancelling the “SIM” mode for all the external input signals.

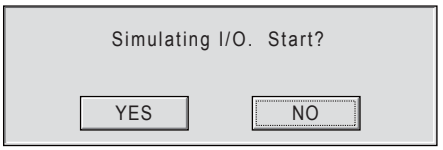
  S2C394=1 (Default)
  Changes the signals output to the actual external devices if the output status of signals to the external device has been changed with the concurrent I/O program due to the change of external input signals.
  Before forcibly changing the signal status, verify the destination device of each signal, and check ON how the change effects on the device.

Failure to observe this caution may result in injury or damage to equipment.

NOTE

- Perform the following check operation for safety when operating the manipulator with “SIM” (forced signal) is remained selected for the external input signal.

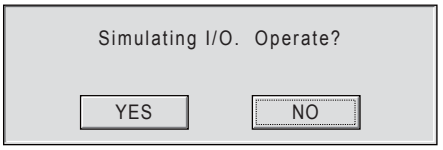
1. If any of the external input signal is set to “SIM”, the confirmation dialog box appears when starting a job.



Select “YES” when executing the job with the “SIM” status.
The job starts running by performing the start operation again after the dialog box disappears.

Select “NO” when not executing the job with the “SIM” status.
Cancel the “SIM” status after the dialog box disappears.

2. If any of the external input signal is set to “SIM”, the confirmation dialog box appears when operating the manipulator (JOG, FWD/BWD operations) with the programming pendant.

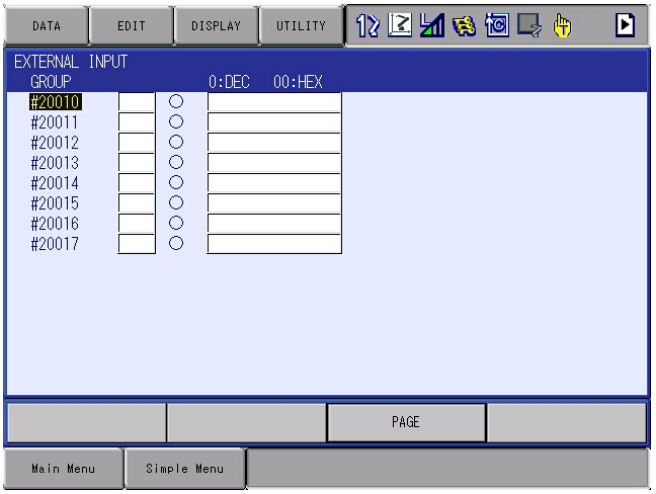


Select “YES” when operating the manipulator with the “SIM” status.
The manipulator can be operated after the dialog box disappears.
Select “NO” when not operating the manipulator with the “SIM” status.
Cancel the “SIM” status after the dialog box disappears.

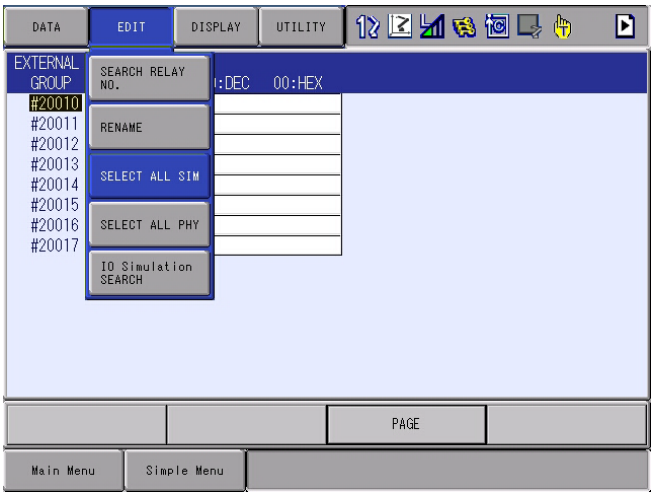
13.2.5.1 Batch Selection of SIM

Follow the procedure below to set all the external input signals to “SIM”.

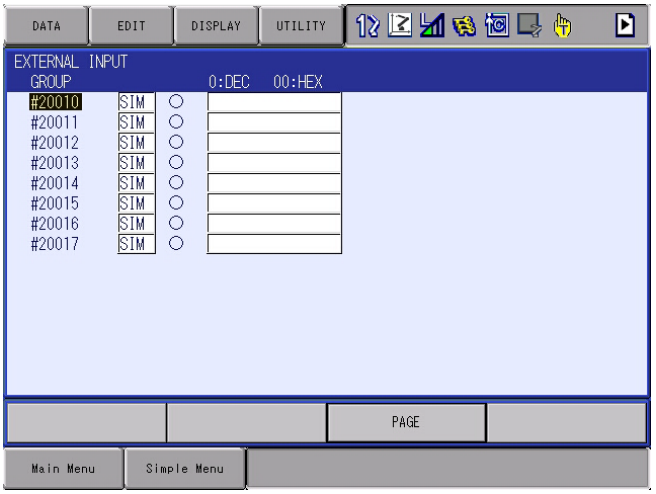
1. Display the EXTERNAL INPUT window.



2. Select {EDIT} from the menu.



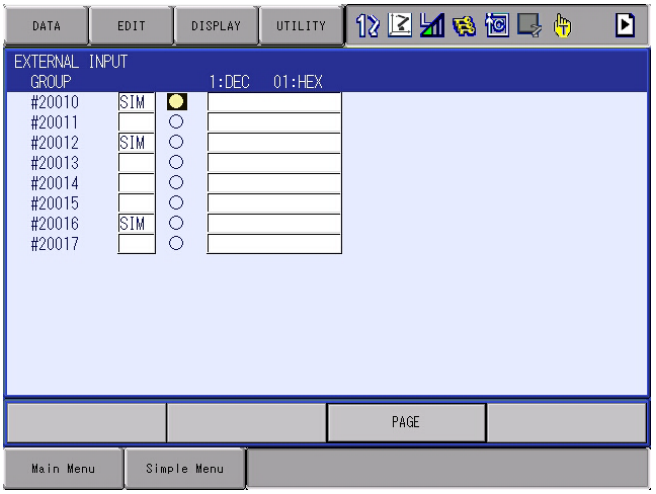
3. Select {SELECT ALL SIM}.
   – Set all the external input signals to “SIM”.



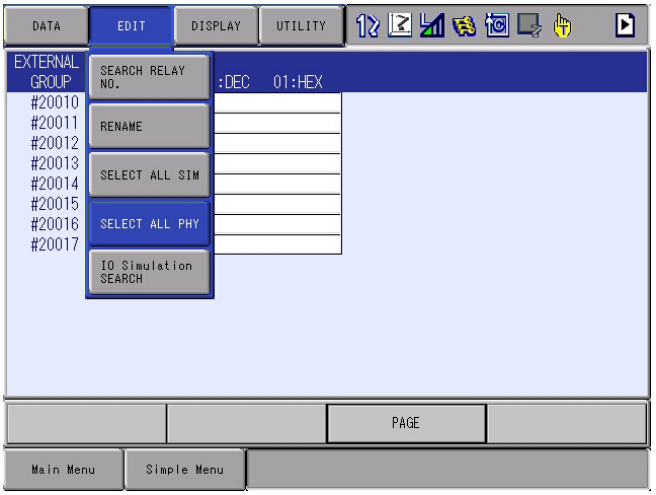
13.2.5.2 Batch Cancellation of SIM

Follow the procedure below to cancel the “SIM” status of all the external input signals.

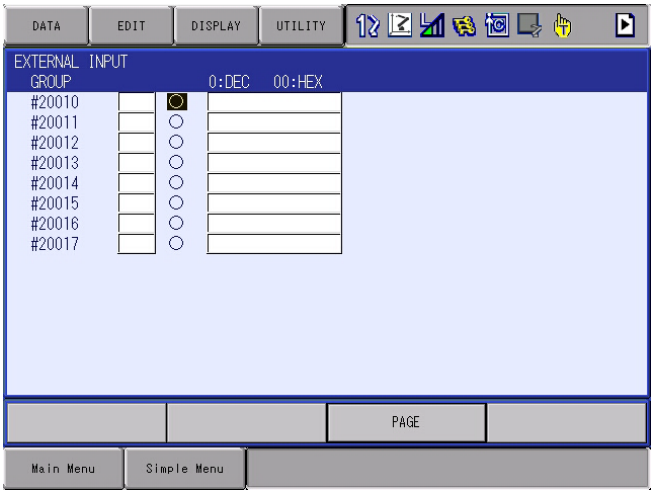
1. Display the EXTERNAL INPUT window.



2. Select {EDIT} from the menu.



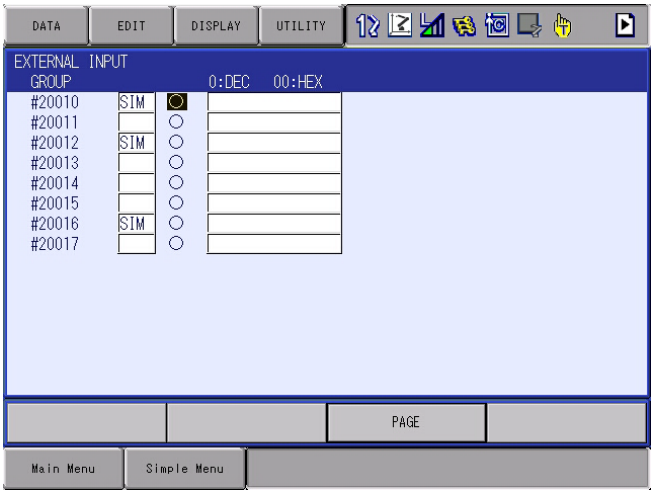
3. Select {SELECT ALL PHY}.
   – Cancels the “SIM” status of all the external input signals.



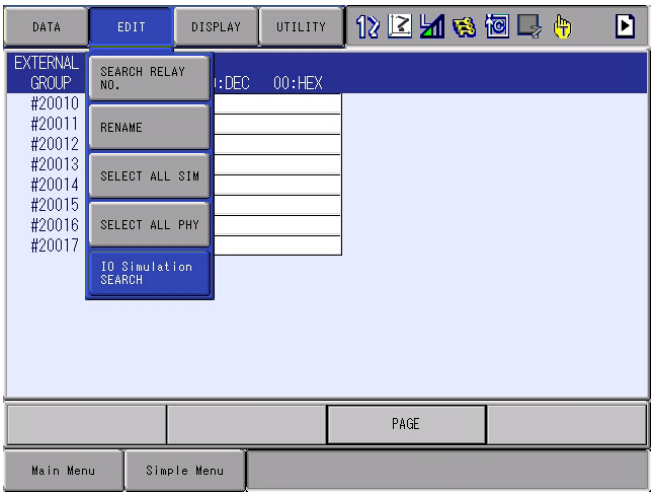
13.2.5.3 IO Simulation Search

Follow the procedure below to search the external input signals with “SIM” status.

1. Display the EXTERNAL INPUT window.



2. Select {EDIT} from the menu.

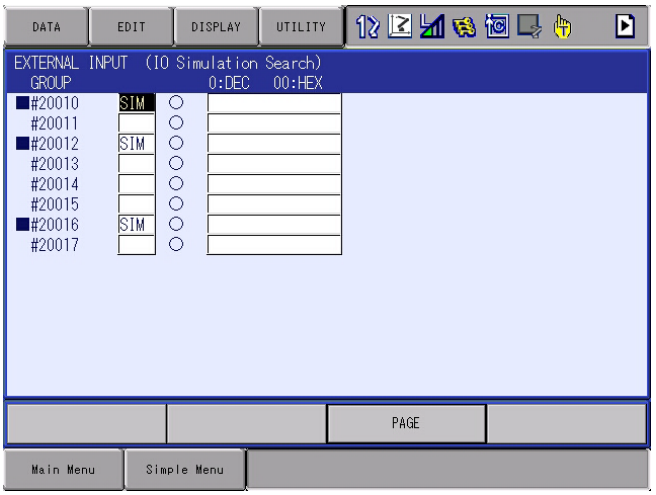


3. Select {IO Simulation SEARCH}.

– When there is an external input signal with “SIM” status, the following is shown:

• “■” are added on the left of the signals with the “SIM” status.

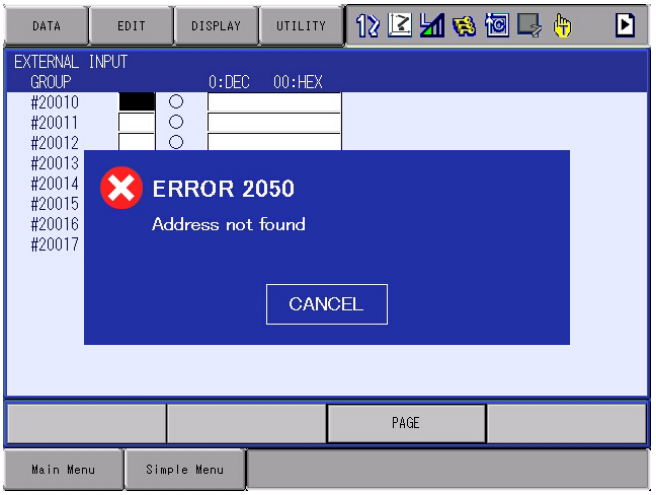
• “(IO Simulation Search)” is shown in the title.



– When there is no external input signal with “SIM” status, the following is shown:

• “ERROR 2050: Address not found” is shown.

• Does not move on to the IO simulation search.



SUPPLE-MENT

During the IO simulation search, the search status does not change even if the signal’s “SIM” status changes. “■” is added to the signal which was “SIM” status when the search started.

Follow the procedure below to jump to the external input signal with “SIM” status during the IO simulation search.

1. Press the cursor key [↓].
   – The cursor moves to the next signal with “SIM” status.
2. Press the cursor key [↑].
   – The cursor moves to the previous signal with “SIM” status.

The IO simulation search is canceled in the following cases:

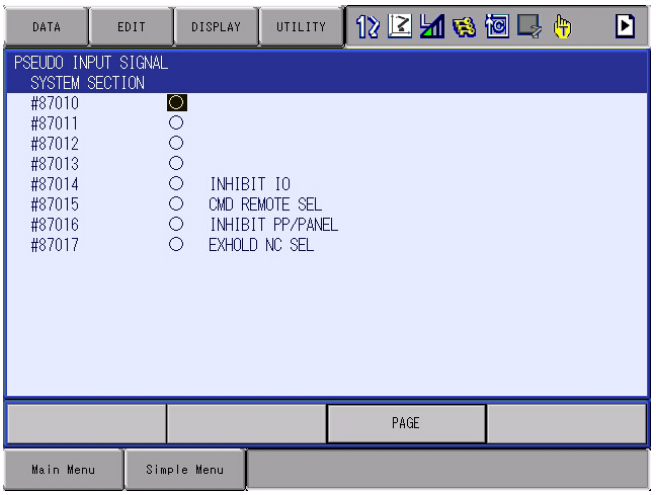
- when [CANCEL] is pressed during the IO simulation search
- when the menu {EDIT}, then {SELECT ALL SIM} are selected during the IO simulation search
- when the menu {EDIT}, then {SELECT ALL PHY} are selected during the IO simulation search
- when the menu {EDIT}, then {SEARCH RELAY NO.} is selected during the IO simulation search
- when the display is changed from the I/O status window (DETAIL) to the I/O window (SIMPLE)
- when the window is closed
- when the page is switched

13.3 Pseudo Input Signal Window

13.3.1 Check of Pseudo Input Signal State

The status and name of the pseudo input signals can be checked with this window.

1. Select {IN/OUT} under the main menu
2. Select {PSEUDO INPUT SIG}
   – The pseudo input signal window appears.



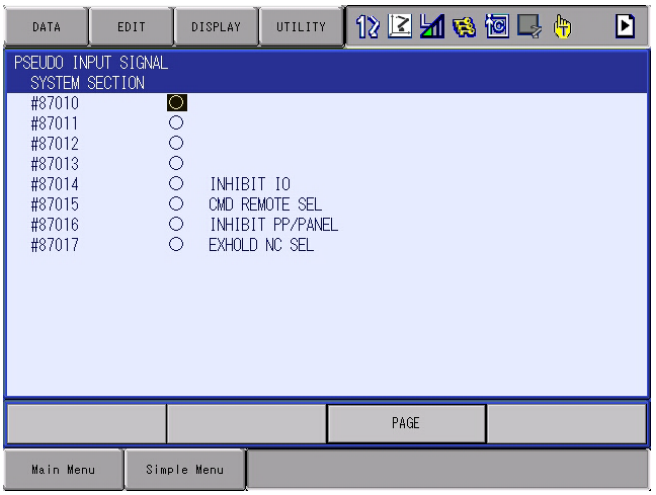
3. Press the [PAGE].
   – The system section (#87010-#87167) and the user section (#87170-#87207) are changed alternately with the [PAGE].

13.3.2 Change of Pseudo Input Signal State

The signals can be turned ON/OFF in the pseudo input signal window in the management mode.

The status of the pseudo input signals can be changed by performing the following procedure.

1. Select the signal to be changed.
   – Move the cursor to the signal status to be changed. The signal status is indicated as either "○" or "●".



2. Select the signal status.
   – The signal status changes each time the [INTERLOCK] +[SELECT] keys are pressed. (●: ON; ○: OFF)

13.3.3 Signal Name Registration

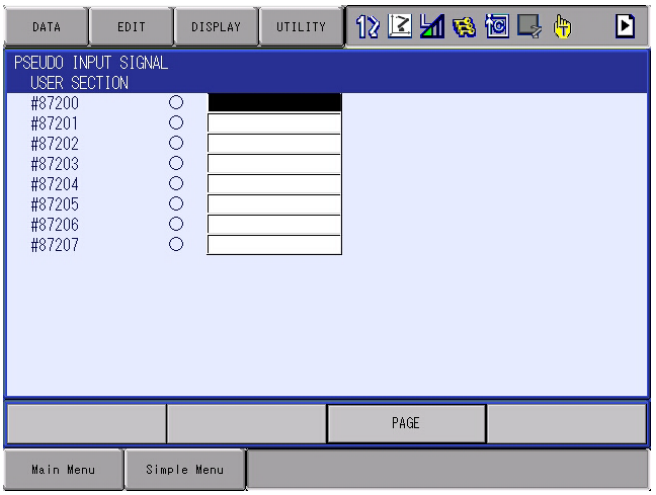
Signal name can be registered in the user section of the pseudo input signal window in the management mode.

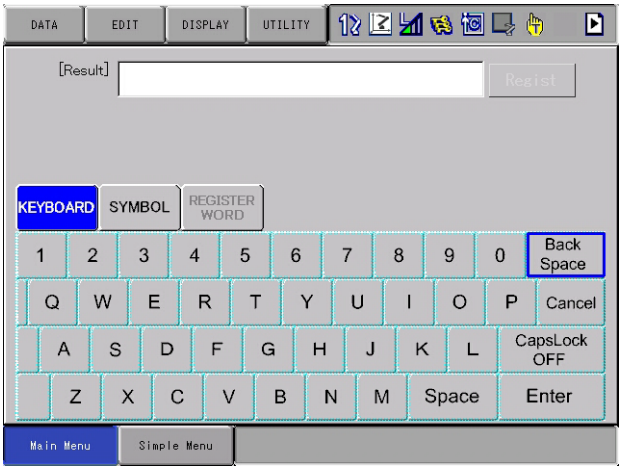
The signal name can be registered by performing the following procedure.

1. Select the signal name to be changed.

   (1) Move the cursor to the desired signal name to be registered, and press [SELECT] to enable character entry.

   – Enter up to 16 one-byte characters.



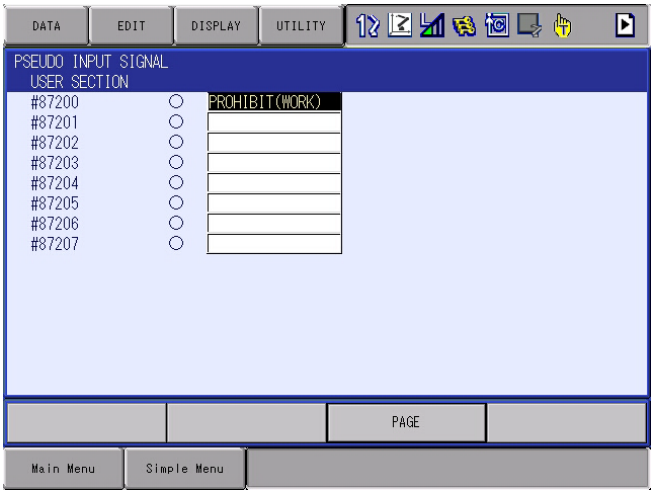


2. Input the signal name.

3. Press [ENTER].

(1) Input the signal name and press [ENTER].

– The name is registered.

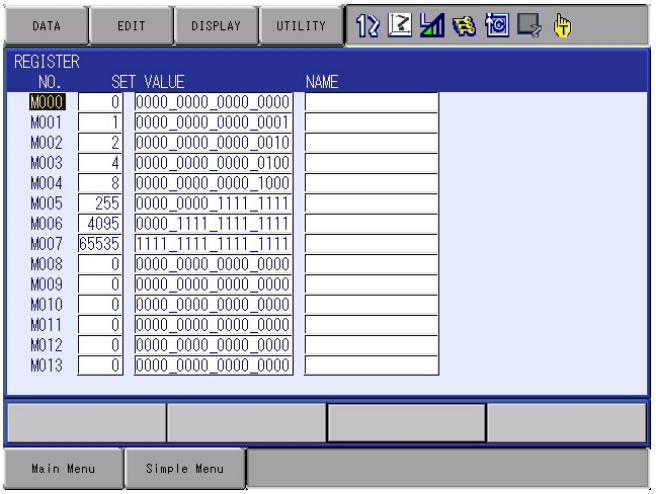


13.4 Register Window

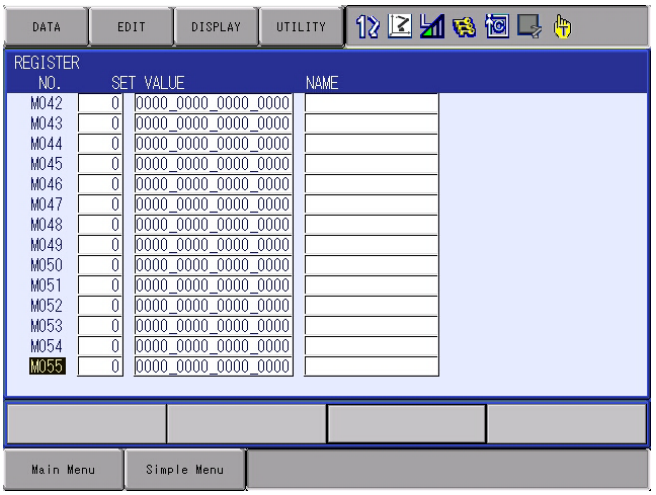
13.4.1 Check Registers

The register can be checked in the register window.

1. Select {IN/OUT} under the main menu.
2. Select {REGISTER}.
   – The register window appears.



3. Move the cursor to the desired register number.
   – When the desired register number is not displayed, move the cursor in the following manner: move the cursor to “NO.” and press [SELECT]; enter the desired register number using the [Numeric Key] , then press [ENTER].
   The cursor moves to the specified register number.



13.4.2 Register Setting

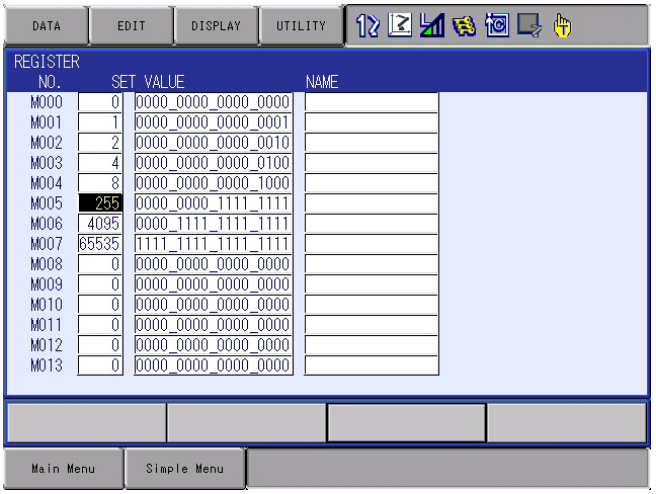
A register can be set in the management mode.

1. Select the register data to be set.

   (1) Move the cursor to the data (decimal or binary) of the register number to be set in the register window, and press [SELECT].

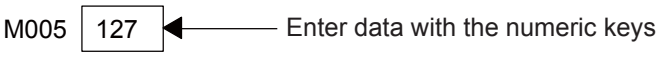
   – When the decimal data is selected, enter a decimal value.

   – When the binary data is selected, enter a binary value.

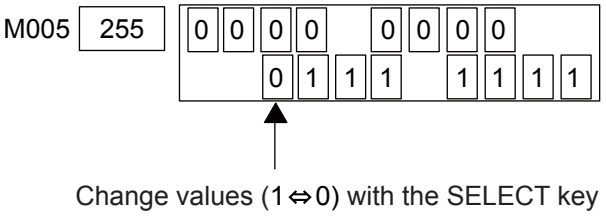


2. Enter a desired numerical value.

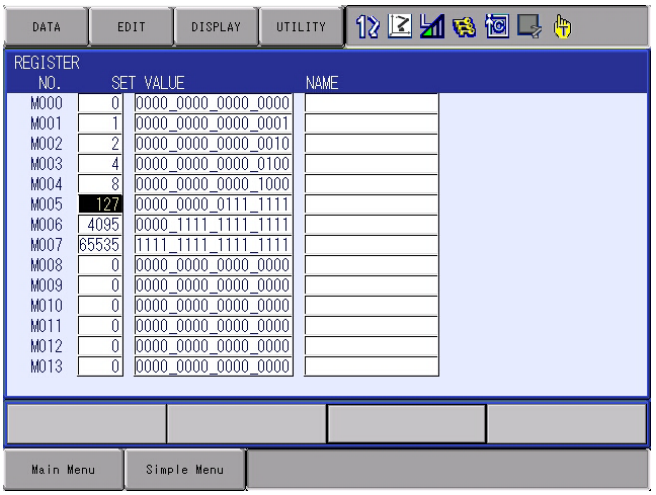
   – When a decimal value is selected, enter decimal value data using the [Numeric Key] .



   – When a binary value is selected, move the cursor to a binary data to be set in the input line, and press [SELECT]. Each time [SELECT] is pressed, “0” and “1” are displayed alternately.
   Also, “0” and “1” can be entered using the NUMBERKEYS.



3. Press [ENTER].
   – The entered numerical value is set at the cursor position.



NOTE

The registers used as current value of TMR/CNT/MLTMR instruction in the ladder program cannot be set.

<Example of Ladder Program>

```
STR #70010
TMR M010, M011
OUT #70011M011
```
⟵ M010 (current value) cannot be set in the register window; (set value) can be set in the register window.

```
STR #70020
STR #70021
CNT #M020, M021
OUT #70021M021
```
⟵ M020 (current value) cannot be set in the register window; (set value) can be set in the register window.

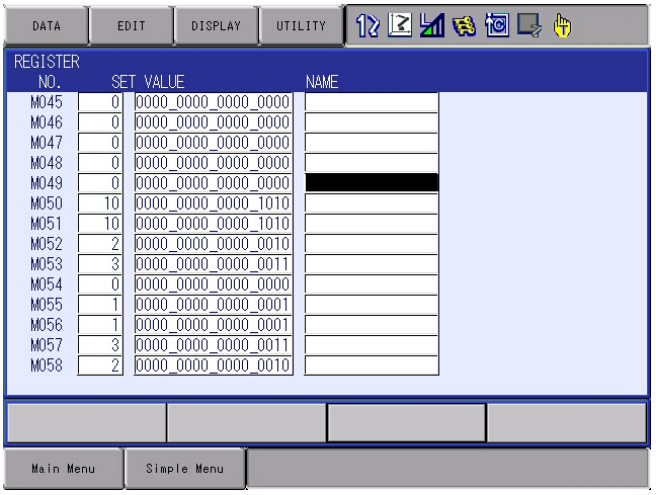
13.4.3 Signal Name Registration

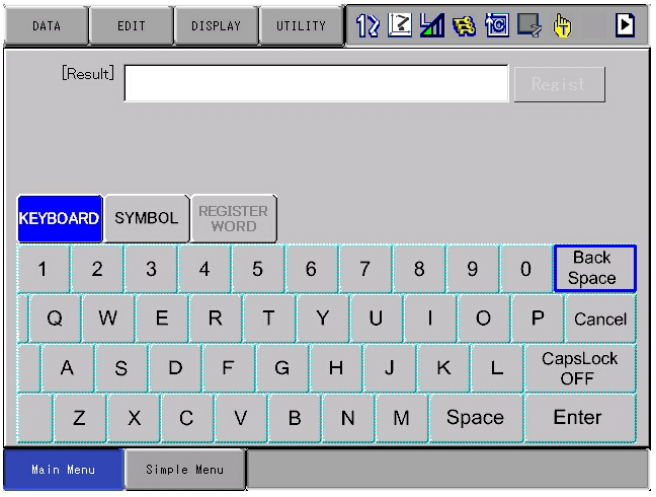
The signal name can be registered by performing the following procedure.

1. Select the signal name to be registered.

   (1) Move the cursor to the desired signal name to be registered, and press [SELECT] to enable character entry.

   – Enter up to 16 one-byte (or 8 two-byte) characters.



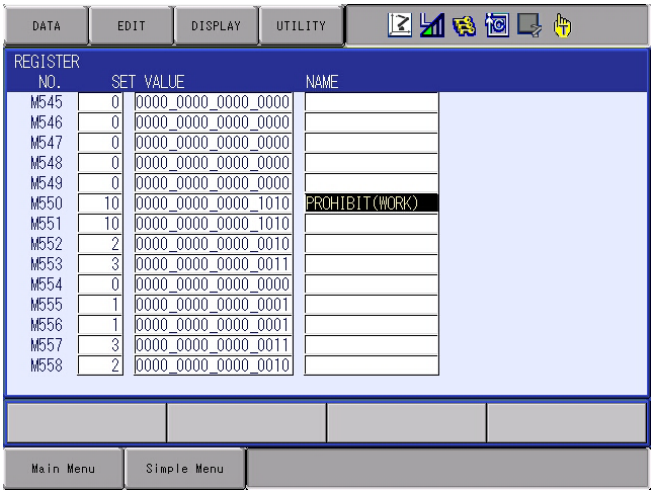


2. Enter the signal name.

3. Press [ENTER].

(1) Input the signal name and press [ENTER].

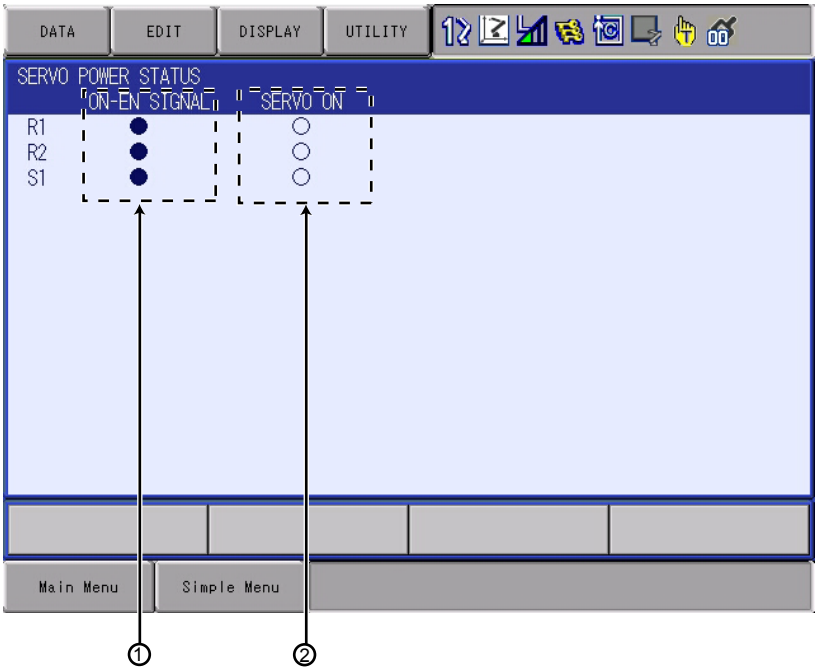
– The name is registered.



13.5 Servo Power Status Window

The status of “ON_EN” signals connected to each control group and servo power supply of each control group can be checked in the Servo Power Status window.

1. Select {IN/OUT} under the main menu.
2. Select {SERVO POWER STATUS}.
   – The servo power status window appears.



① ON_EN SIGNAL

Displays the status of “ON_EN” signal that each control group is connected.

◯: Open (OFF) status
The servo power supply is shut down.

●: Close (ON) status
When the servo ON lamp is lit, the servo power supply is turned ON.

② SERVO ON

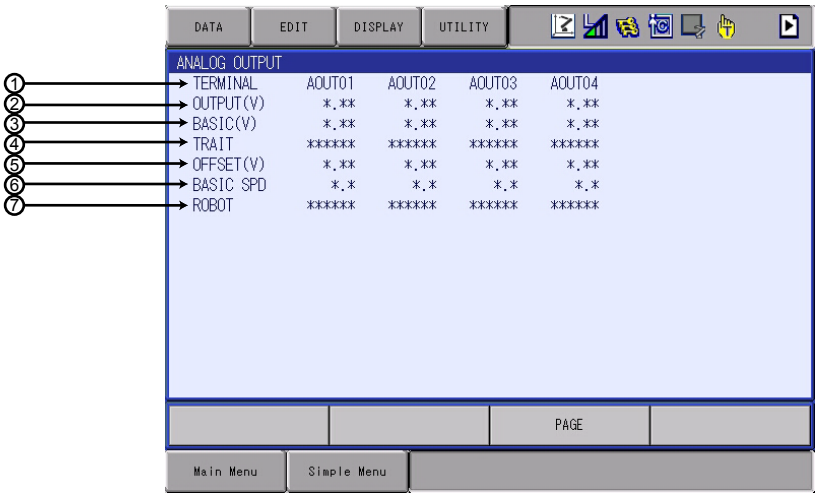
Displays the status (specific output 50320 to 50357) of servo power supply of each control group.

◯: Servo power supply shut down

●: Servo power ON completed

13.6 Analog Output Window

The current settings can be checked in the Analog Output window.



①TERMINAL

The general-purpose analog output ports are displayed.

②OUTPUT (V)

The current output voltage is displayed.

③BASIC (V)

The basic voltage used for executing the analog output corresponding to speed is displayed.

The value can be overwritten by setting a new value using ARATION instruction.

④TRAIT

The current output characteristic of output port is displayed.

SP RAT: Executing analog output corresponding to speed.

STATIC: The output is fixed.

⑤OFFSET (V)

The offset voltage used for executing the analog output corresponding to speed is displayed.

The value can be overwritten by setting a new value using ARATION instruction.

⑥BASIC SPD

The basic speed used for executing the analog output corresponding to speed is displayed.

The value can be overwritten by setting a new value using ARATION instruction.

⑦ROBOT

The manipulator No. for the analog output corresponding to speed is displayed.

13.6.1 OPERATION

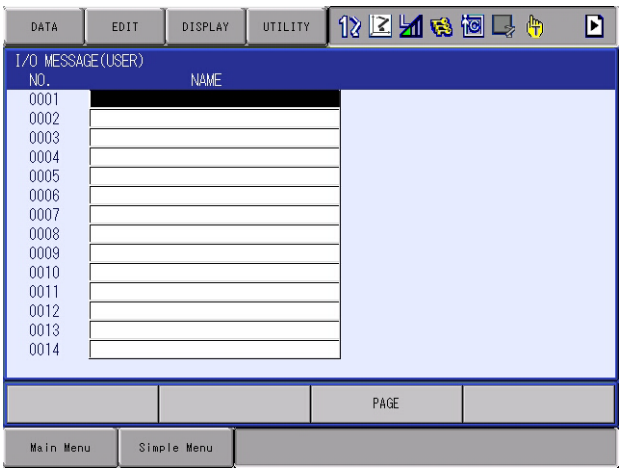
1. Select {IN/OUT} under the main menu.
2. Select {ANALOG OUTPUT}.
   – The analog output window appears.
   – The window for the output terminal AOUT1 to 4, AOUT 5 to 8, and AOUT 9 to 12 can be switched by pressing the [PAGE].

13.7 I/O Messages and I/O Alarms

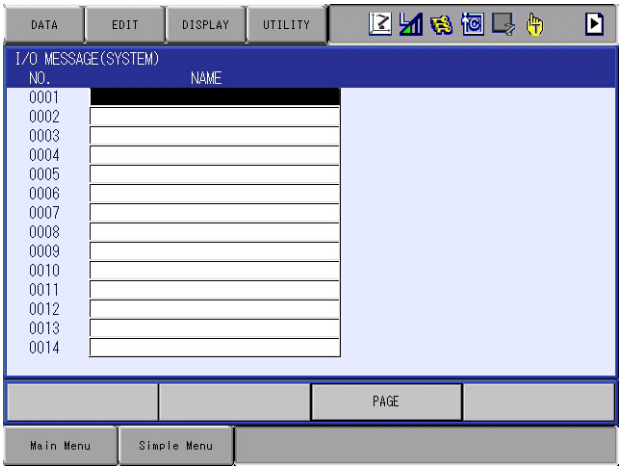
13.7.1 Displayed for User Section

User section I/O alarms and I/O messages can be displayed or registered in the management mode by the following procedures:

1. Select {IN/OUT} under the main menu.
2. Select {IO ALARM} or {IO MESSAGE}.
   – The user section or the system section under the selected sub menu (I/O Alarm or I/O Message) is displayed.



3. Press the [PAGE].
   – To change between the user section and the system section, use the [PAGE].



13.7.2 Registered User Section

User section I/O alarms and I/O messages can be displayed or registered by the following procedures.

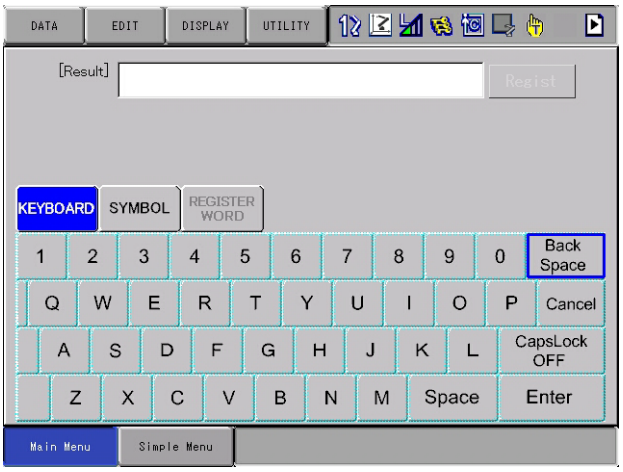
However, the system I/O alarms and I/O messages cannot be edited.

1. Select the name to be changed.

   (1) Move the cursor to the name to be changed in either the I/O Alarm (User Section) window or the I/O Message (User Section) window, and press [SELECT].

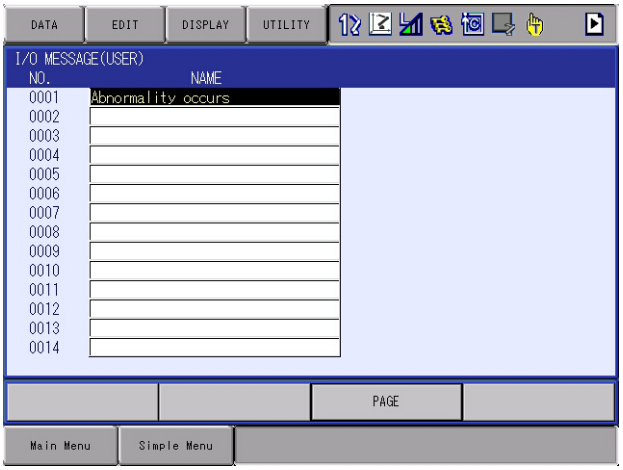
   (2) The character input status window appears.

   – Enter up to 32 one-byte characters for the Alarm and Message windows respectively.
   Up to 64 messages can be registered for each window.



2. Input the I/O Alarm Name or the I/O Message Name.
3. Press [ENTER].

   – The name is displayed.



NOTE Do not use “/” for each top of the I/O Alarm Name and the I/O Message Name.

13.8 Ladder Program Window

This window allows operators to check the ON-OFF status of signals and register values included in the ladder program.

Set the security mode to the management mode.
(The {LADDER PROGRAM} menu is not displayed in the operation/edit mode.)

1. Select {IN/OUT} from the main menu.
2. Select {LADDER PROGRAM}.
   – The ladder program window appears.

NOTE

The programming pendant will not display the monitor indication while the ladder program is edited.

The monitor indication restarts if compiling the edited ladder program succeeds and ends with a normal termination.

The monitor indication may be displayed differently depending on the instruction types of ladder program.

Instruction	Description
STR OR AND OUT PLS PLF	"●" signifies the ON status of operand relay number signal. "○" signifies the OFF status of operand relay number signal. <Example> STR #20010 ●: #20010=ON-status
STR-NOT OR-NOT AND-NOT	"●" signifies the OFF status of operand relay number signal. "○" signifies the ON status of operand relay number signal. <Example> STR-NOT #20010 ●: #20010=OFF-status
GSTR GOUT	Indicates the 8 bit data value from the operand relay number in the decimal/ hexadecimal number. (The value in parentheses indicates the hexadecimal number.) <Example> GOUT #00010 128 (80H) Hexadecimal Decimal In this case, #00010 to #00016=OFF-status, and #00017=ON-status.
CNT TMR MLTMR	Indicates the register value (16 bits) of the current value operand (the 1st operand) in the decimal/hexadecimal number. (The value in parentheses indicates the hexadecimal number.) <Example> TMR M010, M011 10 (000aH) Hexadecimal Decimal In this case, setting is M010=10.
ADD SUB DIV MOD	Indicates the register value (16 bits) of the calculation result operand (the 3rd operand) in the decimal/hexadecimal number. (The value in parentheses indicates the hexadecimal number.) <Example> ADD M020, M021, M022 100 (0064H) Hexadecimal Decimal In this case, setting is M022=100.
MUL	Indicates the register value (16 bits) of the calculation result operand (the 3rd operand) in the decimal/hexadecimal number. (The value in parentheses indicates the hexadecimal number.) However, if the calculation result exceeds 16 bits, the register value will be indicated in 32-bit value in the decimal/hexadecimal number. <Example> MUL M030, M031, M032 65536 (00010000H) Hexadecimal Decimal In this case, setting is M032=65536.

Instruction	Description
WAND WOR WXOR SHL SHR ROL ROR	Indicates the value of the register/word-type relay/byte type relay of the calculation result operand (the 3rd operand) in the decimal/hexadecimal number. (The value in parentheses indicates the hexadecimal number.) Register, word-type relay: 16 bits Byte-type relay: 8 bits <Example> SHL M040, 4, M041 4096 (1000H) Hexadecimal Decimal In this case, setting is M041=4096.
WNOT MOV BIN BCD CMP	Indicates the value of the register/word-type relay/byte type relay of the calculation result operand (the 2nd operand) in the decimal/hexadecimal number. (The value in parentheses indicates the hexadecimal number.) Register, word-type relay: 16 bits Byte-type relay: 8 bits <Example> MOV 255, #70010 255 (ffH) Hexadecimal Decimal In this case, #70010 to #70017=ON-status.
BMOV	Indicates the value of the register/byte type relay of the calculation result operand (the 3rd operand) in the decimal/hexadecimal number. (The value in parentheses indicates the hexadecimal number.) Register: 16 bits Byte-type relay: 8 bits <Example> BMOV M010 5 M100 255 (00ffH) Hexadecimal Decimal
AND-STR OR-STR END (PART) (NOP)	The monitor indication will not be displayed.

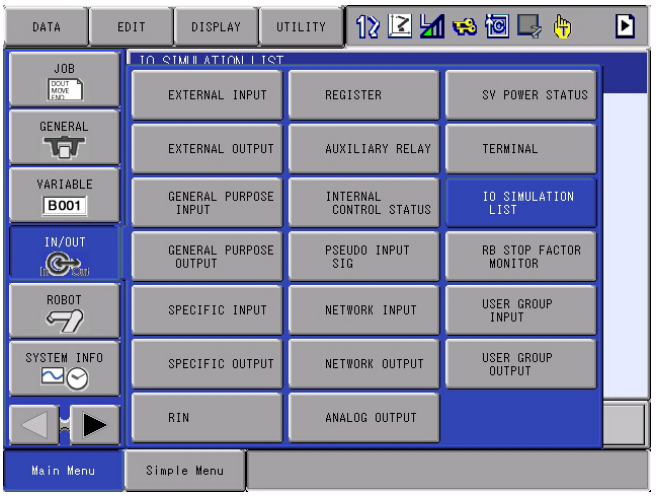
13.9 IO Simulation List Window

In the IO simulation list window, the list of the signals with “SIM” status can be displayed. The following three signals, which “SIM” status can be set, are displayed in the IO simulation list window:

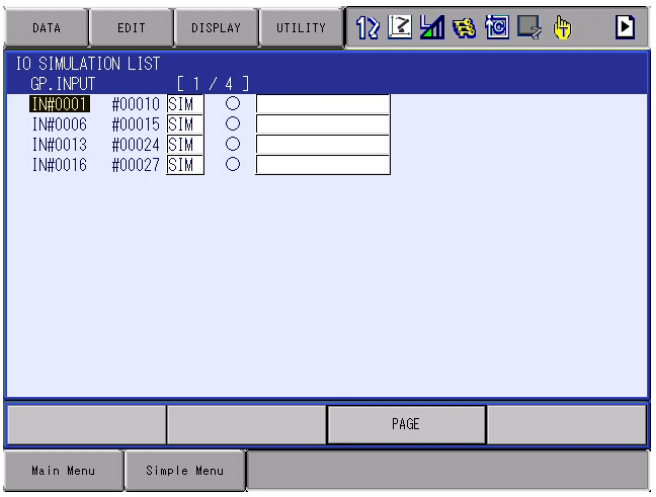
- GP input
- External output
- External input

Follow the procedure below to display the IO simulation list window.

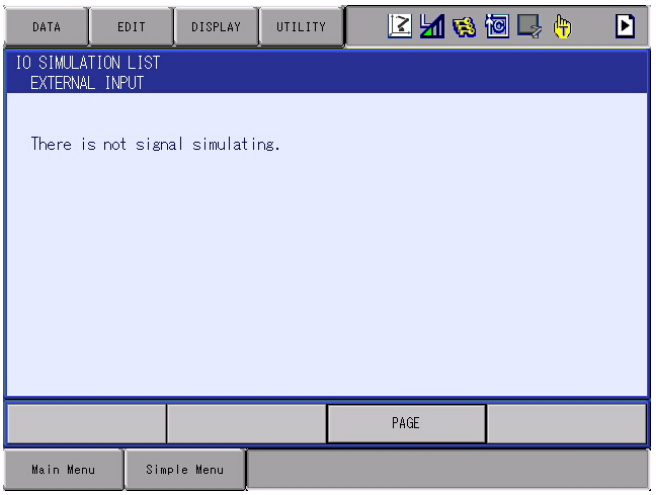
1. Select {IN/OUT} under the main menu.



2. Select {IO SIMULATION LIST}.
   – The IO simulation list window of the GP input is displayed.



3. Press the [PAGE] .
   – The IO simulation list window is displayed in the order of “EXTERNAL INPUT -> EXTERNAL OUTPUT -> GP INPUT-> EXTERNAL INPUT -> ...”.
   – If there is no signal with “SIM” status, the following window is displayed.



SUPPLE -MENT

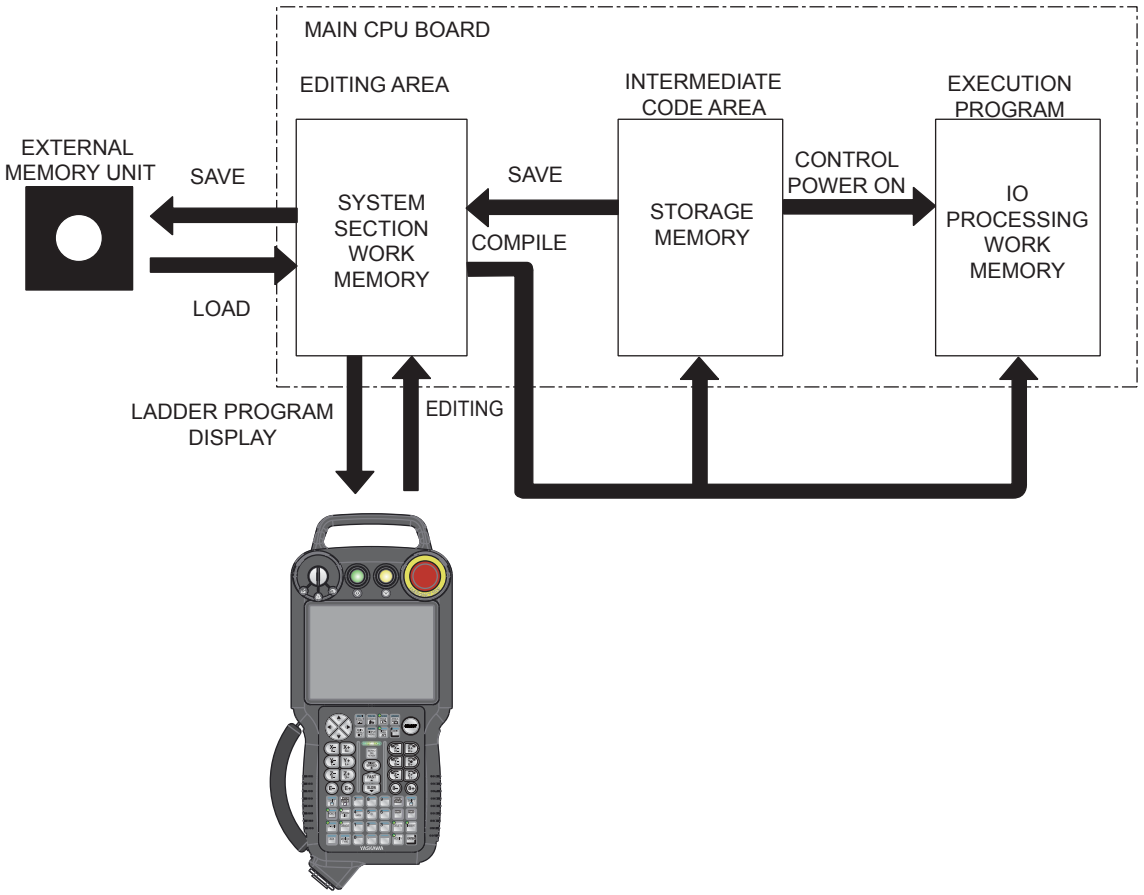
In the IO simulation list window, only the signals with “SIM” status are displayed.

If the “SIM” status of a signal is canceled while the IO simulation list window is displayed, the signal disappears from the window.

14 Editing Ladder Programs

14.1 Flow of Data by Ladder Programs

Flow of data in editing, storage, and execution areas by operation of ladder program is shown below.



NOTE

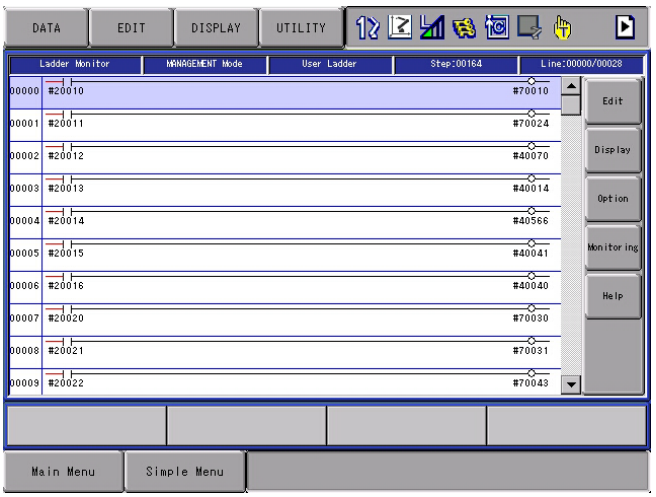
- Only the user ladder program can be edited. The system ladder program cannot be edited.
- When the system ladder program is changed, the ladder program from the external memory unit cannot be loaded.
- If control power is shut down while the ladder program is being edited, the edited ladder program is lost. The intact program remains in the execution area.
- During editing of ladder programs, “EDITING” is displayed on the upper right of the user section window. This indication appears only when the program in the editing area and that in the execution area do not match. Nothing is displayed after compilation of cancellation of editing when the programs in the two areas match.
- When the ladder program used in DX100/DX200/ YRC1000 is tried to be loaded, the confirmation dialog “Load the CIOPRG of past product?” is displayed. Select “YES” to load the ladder program of DX100/DX200/YRC1000. If the [CANCEL] key is pressed or “NO” is selected while this dialog is displayed, the ladder program is not loaded.
- Before loading the ladder program of DX100/DX200/ YRC1000 into the YRC1000micro, make sure to confirm that the application(s) of DX100/DX200/YRC1000 and the application(s) of YRC1000micro are the same. Do not load the ladder program when the used application(s) is different and/or the number of used applications is different (For example, “Material handling, press tending, cutting, and other applications” and “Material handling, press tending, cutting, and other applications + Material handling, press tending, cutting, and other applications” are recognized as different applications.)

14.2 Editing by Mnemonic and Ladder Editor Program

The editing operations for ladder programs are two ways as follows.

1. Editing by Mnemonic Codes
   – Ladder programs can be edited in mnemonic codes as shown below.

2. Ladder Editor Program (Optional Function)
   – Ladder programs can be edited with the image of ladders as shown in the window below.



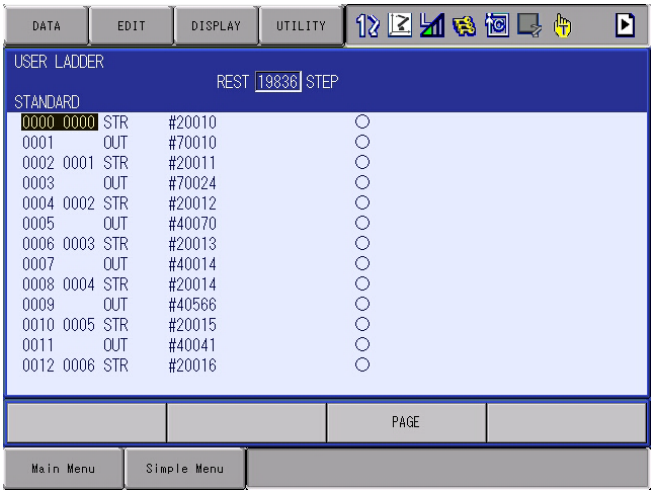
14.3 Mnemonic Editing Window

14.3.1 Basic Operation

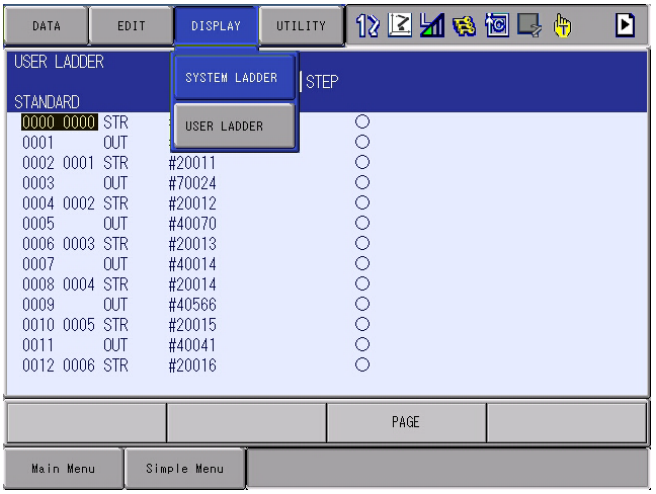
Ladder program is protected so that it cannot be easily changed.

The following operations are authorized only to those who can input a user ID No. (security: management mode).

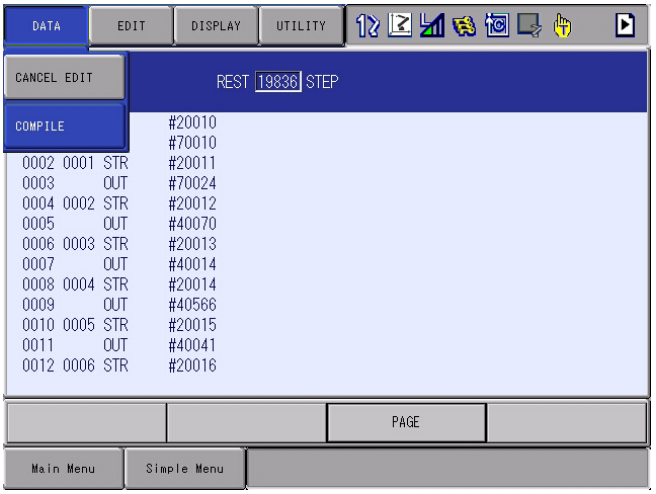
1. Select {IN/OUT} under the main menu
2. Select {LADDER PROGRAM}
   – The C.I/O user section is displayed.



   – To confirm the system ladder program, press the [PAGE], or select [DISP]→[SYSTEM LADDER] under the menu.



3. Edit Operation
   – For each editing operations, see *chapter 14.3.2 "Editing Operation"* on the following pages.
   – The system ladder program cannot be edited.
4. Select {DATA} under the menu
5. Select {COMPILE}



6. Select “YES”
   - The edited ladder program is checked for syntax error. If no error is found, the new program is written into the execution area to run.
   - If any error is found in the edited ladder program, the erroneous step is identified. In this case, the program stored in the execution area remains unchanged.

NOTE

The cursor moves up/down by line each time the up/down cursor key is pressed.

Pressing [SHIFT] + up/down cursor key moves the cursor up/down by five lines at a time.

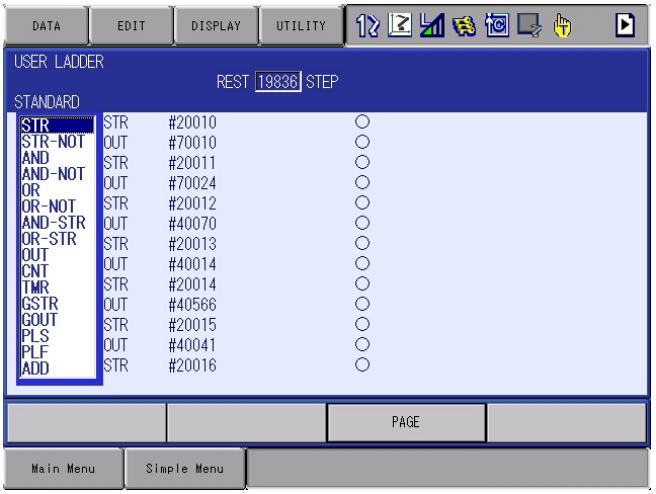
14.3.2 Editing Operation

The editing operation is divided into the instruction registration operation (adding, changing, and deleting) and the operand edit operation.

14.3.2.1 Inserting Instruction

1. Move the cursor to the address area

2. Select the line before the line you wish to add
   (1) The instruction list dialog box is displayed.
   (2) Move the cursor to the instruction list dialog, and the cursor in the address area becomes underlined.



3. Select the instruction to be inserted
   – Move the cursor to the input buffer line instruction.

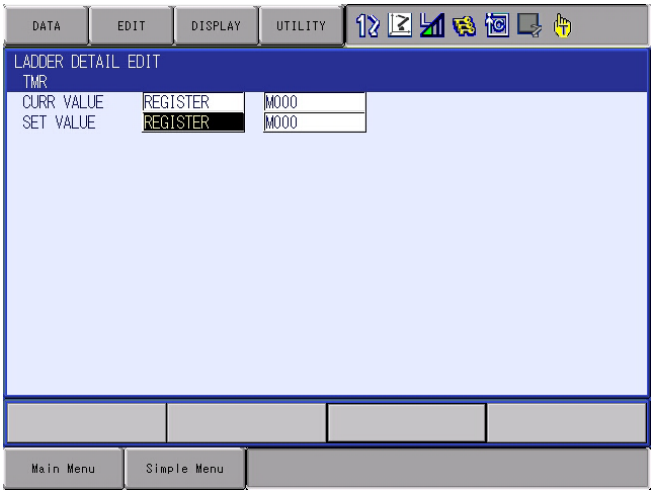
   – When there are more than two kinds of operand instructions, move the cursor to the instruction and press [SELECT]. A detailed screen is displayed.
   – When changing numeric data, move the cursor to the data to be corrected and press the [SHIFT] + [CURSOR KEY] simultaneously. The numeric data then increases and decreases.

   – To directly input the numeric value, press [SELECT]. The input line is displayed, then input the data using the [NUMBER KEY] and press [ENTER].

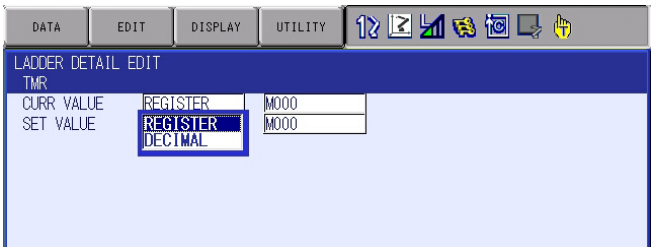
• Instructions with Two or More Kinds of Operands
The input line is displayed. Input the data using the [NUMBER KEY] and press [ENTER].

• Instructions with Two or More Kinds of Operands

(1) When changing the type of operand, move the cursor to the operand and press [SELECT] to select the operand type.



(2) Move the cursor to the operand data and press [SELECT] to change the operand.

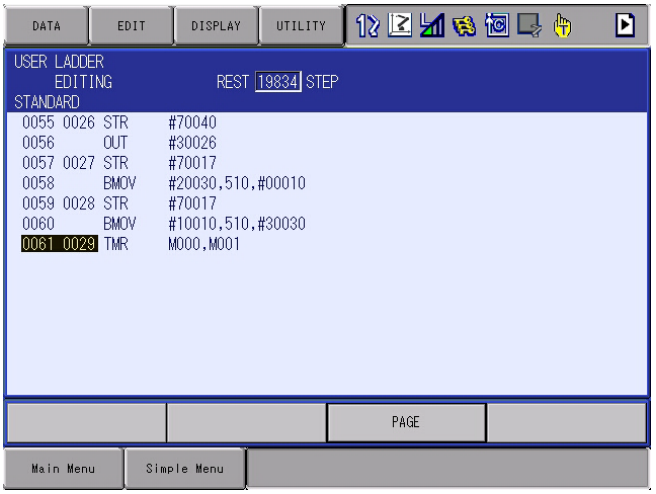


(3) If the type of operand and data are changed, press [ENTER].

(4) The ladder detail edit window closes, and the ladder program window is displayed.

4. Press [ADD]

5. Press [ENTER]
   - The instruction shown in the input buffer line is added.
   - When an instruction is added to the last line, do not press [ADD].
   - If there is a change, press [SELECT] in the instruction area, and perform numeric input operation again.



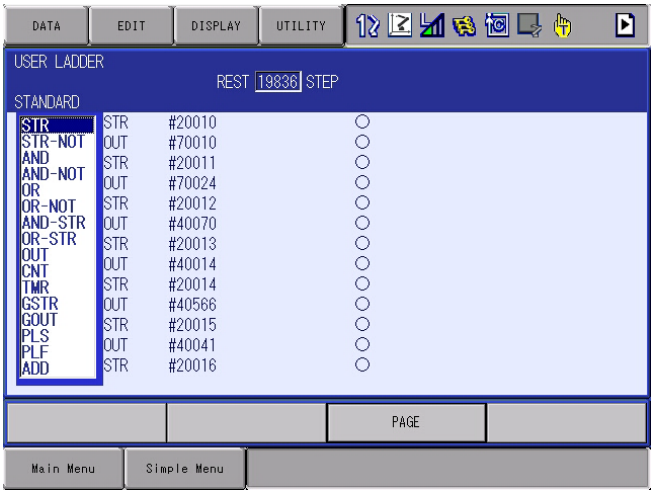
14.3.2.2 Changing Instructions

1. Move the cursor to the address area

2. Select the line to be changed

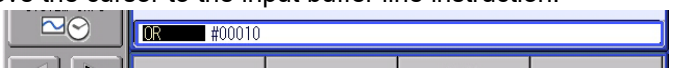
   – The instruction select dialog box is displayed.

   – The cursor moves to the instruction list, and the cursor in the address area is underlined.



3. Select the instruction to be changed

   – Move the cursor to the input buffer line instruction.



   – When there are more than two kinds of operand instructions, move the cursor to the instruction and press [SELECT]. A detailed screen is displayed.

   – When changing numeric data, move the cursor to the data to be corrected and press the [SHIFT] + CURSOR simultaneously. The numeric data then increases and decreases.

   (1) To directly input the numeric value, press [SELECT].

   (2) The input line appears. Input the data using the NUMBER KEY and press [ENTER].

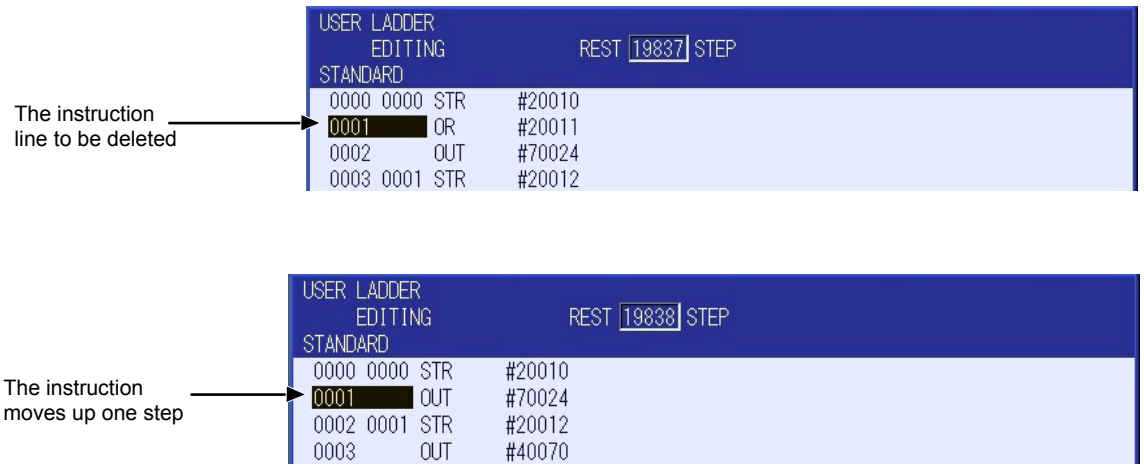
4. Press [MODIFY]

5. Press [ENTER]

– The instruction displayed in the input buffer line is changed.

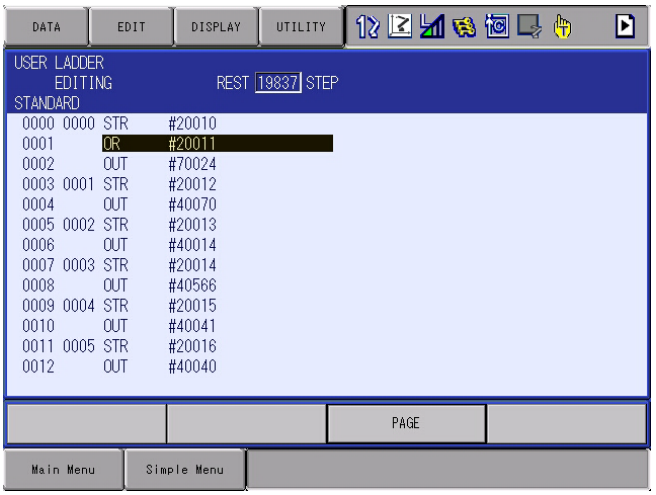
14.3.2.3 Delete Instructions

1. Move the cursor to the address area
2. Move the cursor to the line to be deleted
3. Press [DELETE]
4. Press [ENTER]
   – The cursor line instruction is deleted.



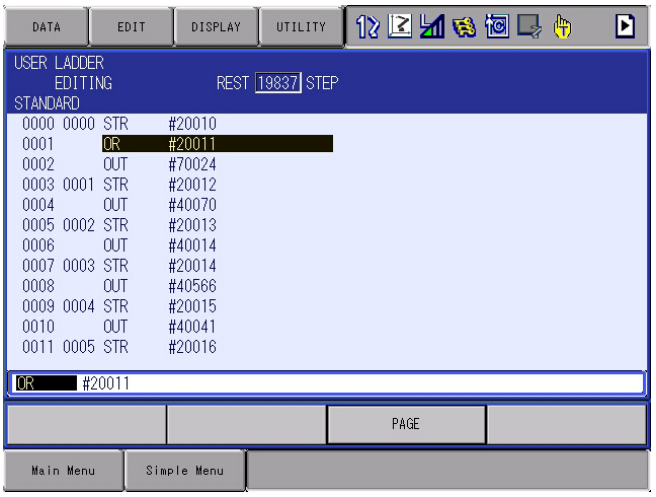
14.3.2.4 Editing Operands

1. Move the cursor to the instruction area



2. Select the line of the operand to be edited

   – Move the cursor to the input buffer line instruction.



3. Edit Operation

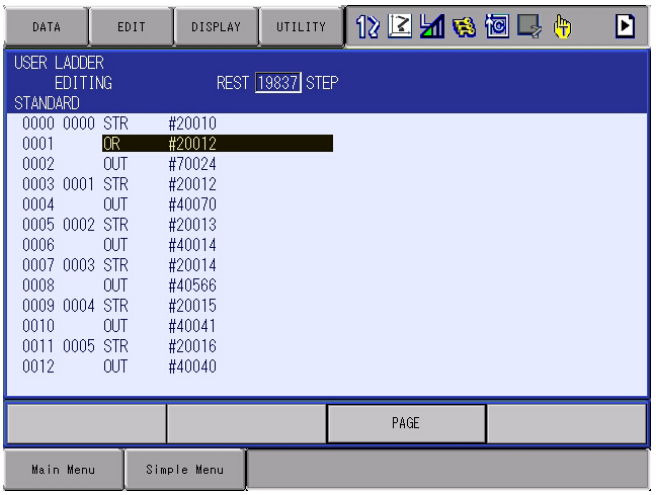
   – When there are more than two kinds of operand instructions, move the cursor in the instruction to and press [SELECT]. A detailed screen is displayed.

   – When changing numeric data, move the cursor to the data to be corrected and press the [SHIFT] + CURSOR simultaneously. The numeric data then increases and decreases.

   – To directly input the numeric value, press [SELECT]. The input line appears. Input the data using the NUMBER KEY and press [ENTER].

4. Press [ENTER]

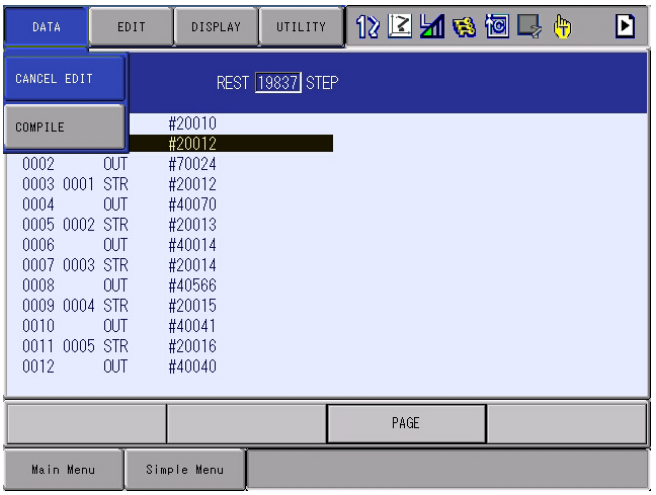
   – The cursor line operand is changed.



14.3.2.5 Canceling Editing

Use the following steps to cancel editing during the ladder program editing and to return to the preceding program.

1. Select {DATA} under the menu
2. Select {CANCEL EDIT}

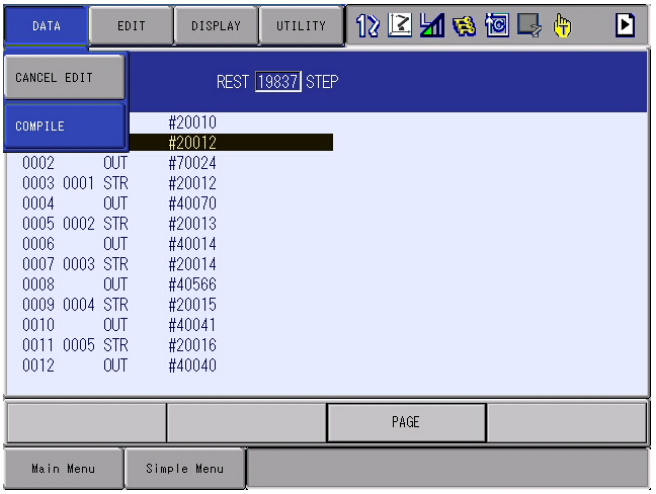


3. Select “YES”
   - The confirmation dialog box is displayed.
   - When “YES” is selected, the program returns to the ladder program (executing program) before editing.
   - When “NO” is selected, the cancel edit operation is cancelled, and the ladder program on the edit is displayed.

14.3.3 Compile

Use the following steps to compile the ladder program after editing.

1. Select {DATA} under the menu
2. Select {COMPILE}
   - The ladder program starts compiling.
   - The edited ladder program is checked for syntax error. If no error is found, the new program is written into the execution area to run.
   - If any error is found in the edited ladder program, the erroneous step is identified. In this case, the program stored in the execution area remains unchanged.



NOTE After completing the compilation, the current values of the TMR/CNT/MLTMR instructions in the register are restored to the set values.

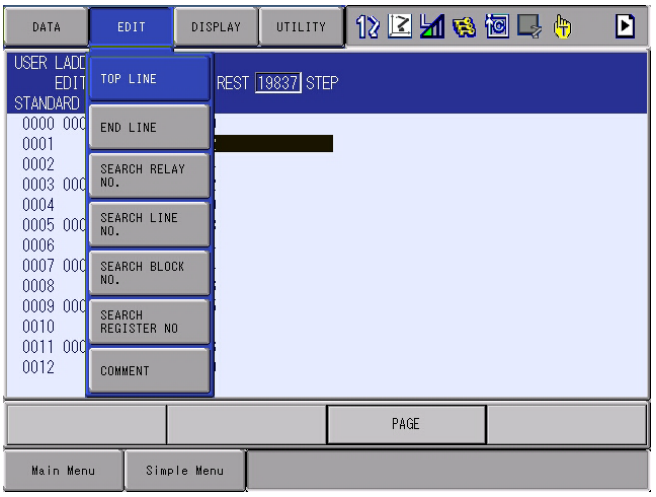
14.3.4 Search

The search function can be used for the edit and confirmation.

Search can be executed when the cursor is either in the address area, or the instruction area of the user ladder window or the system ladder window.

The search is an operation to move the cursor to a specified line or relay No. line in the ladder window. This allows to find out a target position at once without using the cursor.

1. Select {IN/OUT} under the main menu
2. Select {LADDER PROGRAM}
   – The user ladder window or the system ladder window appears.
   – Press the [PAGE] to switch the window.
3. Select {EDIT} under the menu
   – The pull down menu appears.



4. Select a desired search from the pull down menu

14.3.4.1 Top Line, End Line

This is the operation to move the cursor to the first line or the last line in the current window.

1. Select “TOP LINE” or “END LINE” under the pull down menu
   – The cursor moves to “TOP LINE” or “END LINE” of the window, then the selected line is displayed.

14.3.4.2 Search for Line No. and Block No.

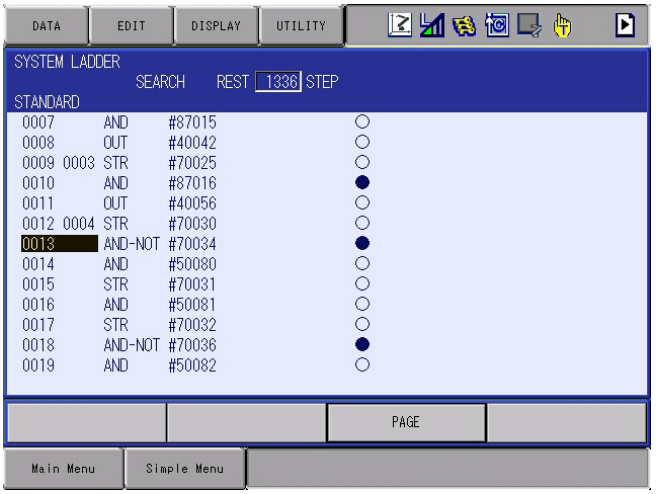
This is the operation to move the cursor to a line or a block in the current window.

1. Select “SEARCH LINE NO.” or “SEARCH BLOCK NO.” under the pull down menu
   – Numbers can be input.
2. Input a line No. or block No. using the NUMBER KEYS
3. Press [ENTER]
   – The cursor moves to the entered line No. or block No., then the selected line or block is displayed.

14.3.4.3 Search for Relay No. and Register No.

This is the operation to move the cursor to a relay No. or register line in the current window.

1. Select “SEARCH RELAY NO.” or “SEARCH REGISTER NO.” under the pull down menu
   – Numbers can be input.
2. Input a desired relay No. or register No. using the NUMBER KEYS
3. Press [ENTER]
   – The cursor moves to the entered relay No. or register No. and the selected relay or register is displayed.



   – While searching, “SEARCH” is displayed in the screen.
4. Continues searching with the cursor
   – In search status, forward and backward searching can be executed by [↓] and [↑] cursors.
   – Press the [PAGE] to switch the window between the user ladder and the system ladder to continue searching.
   – To end the search, press [Cancel] or move the cursor to the address area or the instruction area by using [→] and [←] cursors. The search status is canceled and the indication of “SEARCH” disappears.

14.4 Loading a Ladder Program with Different System Section

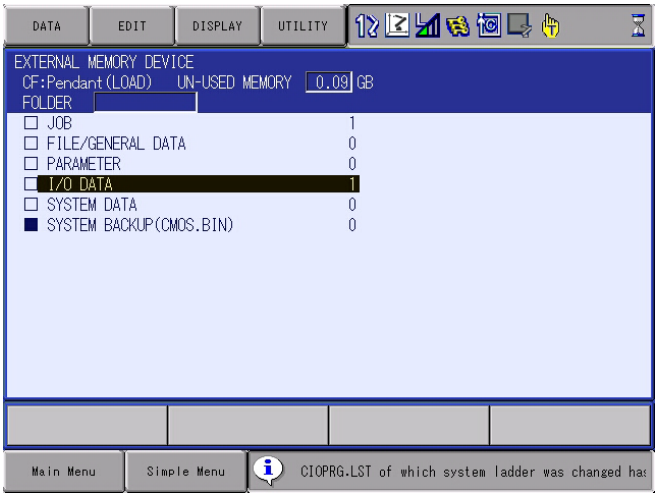
NOTE

When the board with the software version changed the initial ladder program of the system section is newly delivered for function addition or improvement, in order to use the ladder program as is of the previous version being used, the ladder program which has the different system section can be loaded just for one time with the following operation:

1. Select { EX.MEMORY } under the main menu
2. Select { LOAD }
3. Select [I/O DATA]
4. Select { UTILITY } under the menu
5. Select { LOAD SYSTEM CIO }
   - A check mark is added to the left of “LOAD SYSTEM CIO.”
   - The message indicating “Save current CIOPRG.LST. The CIOPRG.LST of which system ladder was changed can be loaded.” appears.

6. Select {EX.MEMORY} under the main menu
7. Select {SAVE}
8. Select [I/O DATA]
9. Select [C.IO PRGM]
10. Press [ENTER]
11. Select “YES “
    - The current concurrent IO program is saved.
12. Select {EX.MEMORY} under the main menu
13. Select {LOAD}
14. Select [I/O DATA]

15. Select [○ C.IO PRGM]
16. Press [ENTER]
17. Select “ YES “
    - A concurrent IO program with different system section is loaded.
    - The message indicating “The CIOPRG.LST of which system ladder was changed has been loaded.” appears.



NOTE If you turn ON the power supply again or change the security level while loading the ladder program with different system section, redo the above load operation from the beginning.

15 Clearing Signals

By setting parameters, the signal status can be automatically cleared when the power is turned ON or the mode is changed.

15.1 Clearing the GP Output Signals

15.1.1 Clearing Signals When Powering ON

Set the parameter S2C235 to specify whether to collectively clear the GP output signals (4096 points) when powering ON, or to hold the signals in the statuses when powering OFF.

Parameter	Signal	Setting Value
S2C235	#10010 - #15127 (Collective setting)	0: Hold; 1: Clear If S2C235 is set to “1“, all the statuses of the GP output signals become OFF when the power is turned ON.

15.1.2 Clearing Signals When Changing the Teach/Play Mode

Set the parameters S4C064 to S4C079, S4C1164 to S4C1179 to specify whether to clear the GP output signals when changing modes, or to hold the signal statuses.
(Every 8 points; 0: hold; 1: clear)

Parameter	Signal		Setting Value
S4C064	d00: #10010 - #10017	d01: #10020 - #10027	Bit specified in every 8 points 0: Hold; 1: Clear The GP output signals whose specified bit is set to “1“ will be in the “OFF“ status when the mode is changed.
	d02: #10030 - #10037	d03: #10040 - #10047	
	d04: #10050 - #10057	d05: #10060 - #10067	
	d06: #10070 - #10077	d07: #10080 - #10087	
	d08: #10090 - #10097	d09: #10100 - #10107	
	d10: #10110 - #10117	d11: #10120 - #10127	
	d12: #10130 - #10137	d13: #10140 - #10147	
	d14: #10150 - #10157	d15: #10160 - #10167	
S4C065	d00: #10170 - #10177	d01: #10180 - #10187	
	d02: #10190 - #10197	d03: #10200 - #10207	
	d04: #10210 - #10217	d05: #10220 - #10227	
	d06: #10230 - #10237	d07: #10240 - #10247	
	d08: #10250 - #10257	d09: #10260 - #10267	
	d10: #10270 - #10277	d11: #10280 - #10287	
	d12: #10290 - #10297	d13: #10300 - #10307	
	d14: #10310 - #10317	d15: #10320 - #10327	
S4C066	d00: #10330 - #10337	d01: #10340 - #10347	
	d02: #10350 - #10357	d03: #10360 - #10367	
	d04: #10370 - #10377	d05: #10380 - #10387	
	d06: #10390 - #10397	d07: #10400 - #10407	
	d08: #10410 - #10417	d09: #10420 - #10427	
	d10: #10430 - #10437	d11: #10440 - #10447	
	d12: #10450 - #10457	d13: #10460 - #10467	
	d14: #10470 - #10477	d15: #10480 - #10487	
S4C067	d00: #10490 - #10497	d01: #10500 - #10507	
	d02: #10510 - #10517	d03: #10520 - #10527	
	d04: #10530 - #10537	d05: #10540 - #10547	
	d06: #10550 - #10557	d07: #10560 - #10567	
	d08: #10570 - #10577	d09: #10580 - #10587	
	d10: #10590 - #10597	d11: #10600 - #10607	
	d12: #10610 - #10617	d13: #10620 - #10627	
	d14: #10630 - #10637	d15: #10640 - #10647	

S4C068	d00: #10650 - #10657	d01: #10660 - #10667	Bit specified in every 8 points 0: Hold; 1: Clear The GP output signals whose specified bit is set to “1“ will be in the “OFF“ status when the mode is changed.
	d02: #10670 - #10677	d03: #10680 - #10687	
	d04: #10690 - #10697	d05: #10700 - #10707	
	d06: #10710 - #10717	d07: #10720 - #10727	
	d08: #10730 - #10737	d09: #10740 - #10747	
	d10: #10750 - #10757	d11: #10760 - #10767	
	d12: #10770 - #10777	d13: #10780 - #10787	
	d14: #10790 - #10797	d15: #10800 - #10807	
S4C069	d00: #10810 - #10817	d01: #10820 - #10827	
	d02: #10830 - #10837	d03: #10840 - #10847	
	d04: #10850 - #10857	d05: #10860 - #10867	
	d06: #10870 - #10877	d07: #10880 - #10887	
	d08: #10890 - #10897	d09: #10900 - #10907	
	d10: #10910 - #10917	d11: #10920 - #10927	
	d12: #10930 - #10937	d13: #10940 - #10947	
	d14: #10950 - #10957	d15: #10960 - #10967	
S4C070	d00: #10970 - #10977	d01: #10980 - #10987	
	d02: #10990 - #10997	d03: #11000 - #11007	
	d04: #11010 - #11017	d05: #11020 - #11027	
	d06: #11030 - #11037	d07: #11040 - #11047	
	d08: #11050 - #11057	d09: #11060 - #11067	
	d10: #11070 - #11077	d11: #11080 - #11087	
	d12: #11090 - #11097	d13: #11100 - #11107	
	d14: #11110 - #11117	d15: #11120 - #11127	
S4C071	d00: #11130 - #11137	d01: #11140 - #11147	
	d02: #11150 - #11157	d03: #11160 - #11167	
	d04: #11170 - #11177	d05: #11180 - #11187	
	d06: #11190 - #11197	d07: #11200 - #11207	
	d08: #11210 - #11217	d09: #11220 - #11227	
	d10: #11230 - #11237	d11: #11240 - #11247	
	d12: #11250 - #11257	d13: #11260 - #11267	
	d14: #11270 - #11277	d15: #11280 - #11287	
S4C072	d00: #11290 - #11297	d01: #11300 - #11307	
	d02: #11310 - #11317	d03: #11320 - #11327	
	d04: #11330 - #11337	d05: #11340 - #11347	
	d06: #11350 - #11357	d07: #11360 - #11367	
	d08: #11370 - #11377	d09: #11380 - #11387	
	d10: #11390 - #11397	d11: #11400 - #11407	
	d12: #11410 - #11417	d13: #11420 - #11427	
	d14: #11430 - #11437	d15: #11440 - #11447	

S4C073	d00: #11450 - #11457	d01: #11460 - #11467	Bit specified in every 8 points 0: Hold; 1: Clear The GP output signals whose specified bit is set to “1“ will be in the “OFF“ status when the mode is changed.
	d02: #11470 - #11477	d03: #11480 - #11487	
	d04: #11490 - #11497	d05: #11500 - #11507	
	d06: #11510 - #11517	d07: #11520 - #11527	
	d08: #11530 - #11537	d09: #11540 - #11547	
	d10: #11550 - #11557	d11: #11560 - #11567	
	d12: #11570 - #11577	d13: #11580 - #11587	
	d14: #11590 - #11597	d15: #11600 - #11607	
S4C074	d00: #11610 - #11617	d01: #11620 - #11627	
	d02: #11630 - #11637	d03: #11640 - #11647	
	d04: #11650 - #11657	d05: #11660 - #11667	
	d06: #11670 - #11677	d07: #11680 - #11687	
	d08: #11690 - #11697	d09: #11700 - #11707	
	d10: #11710 - #11717	d11: #11720 - #11727	
	d12: #11730 - #11737	d13: #11740 - #11747	
	d14: #11750 - #11757	d15: #11760 - #11767	
S4C075	d00: #11770 - #11777	d01: #11780 - #11787	
	d02: #11790 - #11797	d03: #11800 - #11807	
	d04: #11810 - #11817	d05: #11820 - #11827	
	d06: #11830 - #11837	d07: #11840 - #11847	
	d08: #11850 - #11857	d09: #11860 - #11867	
	d10: #11870 - #11877	d11: #11880 - #11887	
	d12: #11890 - #11897	d13: #11900 - #11907	
	d14: #11910 - #11917	d15: #11920 - #11927	
S4C076	d00: #11930 - #11937	d01: #11940 - #11947	
	d02: #11950 - #11957	d03: #11960 - #11967	
	d04: #11970 - #11977	d05: #11980 - #11987	
	d06: #11990 - #11997	d07: #12000 - #12007	
	d08: #12010 - #12017	d09: #12020 - #12027	
	d10: #12030 - #12037	d11: #12040 - #12047	
	d12: #12050 - #12057	d13: #12060 - #12067	
	d14: #12070 - #12077	d15: #12080 - #12087	
S4C077	d00: #12090 - #12097	d01: #12100 - #12107	
	d02: #12110 - #12117	d03: #12120 - #12127	
	d04: #12130 - #12137	d05: #12140 - #12147	
	d06: #12150 - #12157	d07: #12160 - #12167	
	d08: #12170 - #12177	d09: #12180 - #12187	
	d10: #12190 - #12197	d11: #12200 - #12207	
	d12: #12210 - #12217	d13: #12220 - #12227	
	d14: #12230 - #12237	d15: #12240 - #12247	

S4C078	d00: #12250 - #12257	d01: #12260 - #12267	Bit specified in every 8 points 0: Hold; 1: Clear The GP output signals whose specified bit is set to “1“ will be in the “OFF“ status when the mode is changed.
	d02: #12270 - #12277	d03: #12280 - #12287	
	d04: #12290 - #12297	d05: #12300 - #12307	
	d06: #12310 - #12317	d07: #12320 - #12327	
	d08: #12330 - #12337	d09: #12340 - #12347	
	d10: #12350 - #12357	d11: #12360 - #12367	
	d12: #12370 - #12377	d13: #12380 - #12387	
	d14: #12390 - #12397	d15: #12400 - #12407	
S4C079	d00: #12410 - #12417	d01: #12420 - #12427	
	d02: #12430 - #12437	d03: #12440 - #12447	
	d04: #12450 - #12457	d05: #12460 - #12467	
	d06: #12470 - #12477	d07: #12480 - #12487	
	d08: #12490 - #12497	d09: #12500 - #12507	
	d10: #12510 - #12517	d11: #12520 - #12527	
	d12: #12530 - #12537	d13: #12540 - #12547	
	d14: #12550 - #12557	d15: #12560 - #12567	
S4C1164	d00: #12570 - #12577	d01: #12580 - #12587	
	d02: #12590 - #12597	d03: #12600 - #12607	
	d04: #12610 - #12617	d05: #12620 - #12627	
	d06: #12630 - #12637	d07: #12640 - #12647	
	d08: #12650 - #12657	d09: #12660 - #12667	
	d10: #12670 - #12677	d11: #12680 - #12687	
	d12: #12690 - #12697	d13: #12700 - #12707	
	d14: #12710 - #12717	d15: #12720 - #12727	
S4C1165	d00: #12730 - #12737	d01: #12740 - #12747	
	d02: #12750 - #12757	d03: #12760 - #12767	
	d04: #12770 - #12777	d05: #12780 - #12787	
	d06: #12790 - #12797	d07: #12800 - #12807	
	d08: #12810 - #12817	d09: #12820 - #12827	
	d10: #12830 - #12837	d11: #12840 - #12847	
	d12: #12850 - #12857	d13: #12860 - #12867	
	d14: #12870 - #12877	d15: #12880 - #12887	
S4C1166	d00: #12890 - #12897	d01: #12900 - #12907	
	d02: #12910 - #12917	d03: #12920 - #12927	
	d04: #12930 - #12937	d05: #12940 - #12947	
	d06: #12950 - #12957	d07: #12960 - #12967	
	d08: #12970 - #12977	d09: #12980 - #12987	
	d10: #12990 - #12997	d11: #13000 - #13007	
	d12: #13010 - #13017	d13: #13020 - #13027	
	d14: #13030 - #13037	d15: #13040 - #13047	

S4C1167	d00: #13050 - #13057	d01: #13060 - #13067	Bit specified in every 8 points 0: Hold; 1: Clear The GP output signals whose specified bit is set to “1“ will be in the “OFF“ status when the mode is changed.
	d02: #13070 - #13077	d03: #13080 - #13087	
	d04: #13090 - #13097	d05: #13100 - #13107	
	d06: #13110 - #13117	d07: #13120 - #13127	
	d08: #13130 - #13137	d09: #13140 - #13147	
	d10: #13150 - #13157	d11: #13160 - #13167	
	d12: #13170 - #13177	d13: #13180 - #13187	
	d14: #13190 - #13197	d15: #13200 - #13207	
S4C1168	d00: #13210 - #13217	d01: #13220 - #13227	
	d02: #13230 - #13237	d03: #13240 - #13247	
	d04: #13250 - #13257	d05: #13260 - #13267	
	d06: #13270 - #13277	d07: #13280 - #13287	
	d08: #13290 - #13297	d09: #13300 - #13307	
	d10: #13310 - #13317	d11: #13320 - #13327	
	d12: #13330 - #13337	d13: #13340 - #13347	
	d14: #13350 - #13357	d15: #13360 - #13367	
S4C1169	d00: #13370 - #13377	d01: #13380 - #13387	
	d02: #13390 - #13397	d03: #13400 - #13407	
	d04: #13410 - #13417	d05: #13420 - #13427	
	d06: #13430 - #13437	d07: #13440 - #13447	
	d08: #13450 - #13457	d09: #13460 - #13467	
	d10: #13470 - #13477	d11: #13480 - #13487	
	d12: #13490 - #13497	d13: #13500 - #13507	
	d14: #13510 - #13517	d15: #13520 - #13527	
S4C1170	d00: #13530 - #13537	d01: #13540 - #13547	
	d02: #13550 - #13557	d03: #13560 - #13567	
	d04: #13570 - #13577	d05: #13580 - #13587	
	d06: #13590 - #13597	d07: #13600 - #13607	
	d08: #13610 - #13617	d09: #13620 - #13627	
	d10: #13630 - #13637	d11: #13640 - #13647	
	d12: #13650 - #13657	d13: #13660 - #13667	
	d14: #13670 - #13677	d15: #13680 - #13687	
S4C1171	d00: #13690 - #13697	d01: #13700 - #13707	
	d02: #13710 - #13717	d03: #13720 - #13727	
	d04: #13730 - #13737	d05: #13740 - #13747	
	d06: #13750 - #13757	d07: #13760 - #13767	
	d08: #13770 - #13777	d09: #13780 - #13787	
	d10: #13790 - #13797	d11: #13800 - #13807	
	d12: #13810 - #13817	d13: #13820 - #13827	
	d14: #13830 - #13837	d15: #13840 - #13847	

S4C1172	d00: #13850 - #13857	d01: #13860 - #13867	Bit specified in every 8 points 0: Hold; 1: Clear The GP output signals whose specified bit is set to “1“ will be in the “OFF“ status when the mode is changed.
	d02: #13870 - #13877	d03: #13880 - #13887	
	d04: #13890 - #13897	d05: #13900 - #13907	
	d06: #13910 - #13917	d07: #13920 - #13927	
	d08: #13930 - #13937	d09: #13940 - #13947	
	d10: #13950 - #13957	d11: #13960 - #13967	
	d12: #13970 - #13977	d13: #13980 - #13987	
	d14: #13990 - #13997	d15: #14000 - #14007	
S4C1173	d00: #14010 - #14017	d01: #14020 - #14027	
	d02: #14030 - #14037	d03: #14040 - #14047	
	d04: #14050 - #14057	d05: #14060 - #14067	
	d06: #14070 - #14077	d07: #14080 - #14087	
	d08: #14090 - #14097	d09: #14100 - #14107	
	d10: #14110 - #14117	d11: #14120 - #14127	
	d12: #14130 - #14137	d13: #14140 - #14147	
	d14: #14150 - #14157	d15: #14160 - #14167	
S4C1174	d00: #14170 - #14177	d01: #14180 - #14187	
	d02: #14190 - #14197	d03: #14200 - #14207	
	d04: #14210 - #14217	d05: #14220 - #14227	
	d06: #14230 - #14237	d07: #14240 - #14247	
	d08: #14250 - #14257	d09: #14260 - #14267	
	d10: #14270 - #14277	d11: #14280 - #14287	
	d12: #14290 - #14297	d13: #14300 - #14307	
	d14: #14310 - #14317	d15: #14320 - #14327	
S4C1175	d00: #14330 - #14337	d01: #14340 - #14347	
	d02: #14350 - #14357	d03: #14360 - #14367	
	d04: #14370 - #14377	d05: #14380 - #14387	
	d06: #14390 - #14397	d07: #14400 - #14407	
	d08: #14410 - #14417	d09: #14420 - #14427	
	d10: #14430 - #14437	d11: #14440 - #14447	
	d12: #14450 - #14457	d13: #14460 - #14467	
	d14: #14470 - #14477	d15: #14480 - #14487	
S4C1176	d00: #14490 - #14497	d01: #14500 - #14507	
	d02: #14510 - #14517	d03: #14520 - #14527	
	d04: #14530 - #14537	d05: #14540 - #14547	
	d06: #14550 - #14557	d07: #14560 - #14567	
	d08: #14570 - #14577	d09: #14580 - #14587	
	d10: #14590 - #14597	d11: #14600 - #14607	
	d12: #14610 - #14617	d13: #14620 - #14627	
	d14: #14630 - #14637	d15: #14640 - #14647	

S4C1177	d00: #14650 - #14657	d01: #14660 - #14667	Bit specified in every 8 points 0: Hold; 1: Clear The GP output signals whose specified bit is set to “1“ will be in the “OFF“ status when the mode is changed.
	d02: #14670 - #14677	d03: #14680 - #14687	
	d04: #14690 - #14697	d05: #14700 - #14707	
	d06: #14710 - #14717	d07: #14720 - #14727	
	d08: #14730 - #14737	d09: #14740 - #14747	
	d10: #14750 - #14757	d11: #14760 - #14767	
	d12: #14770 - #14777	d13: #14780 - #14787	
	d14: #14790 - #14797	d15: #14800 - #14807	
S4C1178	d00: #14810 - #14817	d01: #14820 - #14827	
	d02: #14830 - #14837	d03: #14840 - #14847	
	d04: #14850 - #14857	d05: #14860 - #14867	
	d06: #14870 - #14877	d07: #14880 - #14887	
	d08: #14890 - #14897	d09: #14900 - #14907	
	d10: #14910 - #14917	d11: #14920 - #14927	
	d12: #14930 - #14937	d13: #14940 - #14947	
	d14: #14950 - #14957	d15: #14960 - #14967	
S4C1179	d00: #14970 - #14977	d01: #14980 - #14987	
	d02: #14990 - #14997	d03: #15000 - #15007	
	d04: #15010 - #15017	d05: #15020 - #15027	
	d06: #15030 - #15037	d07: #15040 - #15047	
	d08: #15050 - #15057	d09: #15060 - #15067	
	d10: #15070 - #15077	d11: #15080 - #15087	
	d12: #15090 - #15097	d13: #15100 - #15107	
	d14: #15110 - #15117	d15: #15120 - #15127	

15.2 Clearing the Interface Panel Signals

15.2.1 Clearing Signals When Powering ON

Set the parameters S4C569 - S4C572 to specify whether to clear the interface panel signals when powering ON, or to hold the signals in the statuses when powering OFF.
(Every 8 points; 0: hold; 1: clear)

Parameter	Signal		Setting Value
S4C569	d00: #60010 - #60017	d01: #60020 - #60027	Bit specified in every 8 points 0: Hold; 1: Clear The interface panel signals whose specified bit is set to “1“ will be in the “OFF“ status when the power is ON.
	d02: #60030 - #60037	d03: #60040 - #60047	
	d04: #60050 - #60057	d05: #60060 - #60067	
	d06: #60070 - #60077	d07: #60080 - #60087	
	d08: #60090 - #60097	d09: #60100 - #60107	
	d10: #60110 - #60117	d11: #60120 - #60127	
	d12: #60130 - #60137	d13: #60140 - #60147	
	d14: #60150 - #60157	d15: #60160 - #60167	
S4C570	d00: #60170 - #60177	d01: #60180 - #60187	
	d02: #60190 - #60197	d03: #60200 - #60207	
	d04: #60210 - #60217	d05: #60220 - #60227	
	d06: #60230 - #60237	d07: #60240 - #60247	
	d08: #60250 - #60257	d09: #60260 - #60267	
	d10: #60270 - #60277	d11: #60280 - #60287	
	d12: #60290 - #60297	d13: #60300 - #60307	
	d14: #60310 - #60317	d15: #60320 - #60327	
S4C571	d00: #60330 - #60337	d01: #60340 - #60347	
	d02: #60350 - #60357	d03: #60360 - #60367	
	d04: #60370 - #60377	d05: #60380 - #60387	
	d06: #60390 - #60397	d07: #60400 - #60407	
	d08: #60410 - #60417	d09: #60420 - #60427	
	d10: #60430 - #60437	d11: #60440 - #60447	
	d12: #60450 - #60457	d13: #60460 - #60467	
	d14: #60470 - #60477	d15: #60480 - #60487	
S4C572	d00: #60490 - #60497	d01: #60500 - #60507	
	d02: #60510 - #60517	d03: #60520 - #60527	
	d04: #60530 - #60537	d05: #60540 - #60547	
	d06: #60550 - #60557	d07: #60560 - #60567	
	d08: #60570 - #60577	d09: #60580 - #60587	
	d10: #60590 - #60597	d11: #60600 - #60607	
	d12: #60610 - #60617	d13: #60620 - #60627	
	d14: #60630 - #60637	d15: #60640 - #60647	

15.3 Clearing the Auxiliary Relay Signals

15.3.1 Clearing Signals When Powering ON

Set the parameters S4C080 - S4C095 to specify whether to clear the auxiliary relay signals when powering ON, or to hold the signals in the statuses when powering OFF.
(Every 32 points; 0: clear; 1: hold)

Parameter	Signal		Setting Value
S4C080	d00: #70010 - #70047	d01: #70050 - #70087	Bit specified in every 32 points 0: Clear; 1: Hold The auxiliary relay signals whose specified bit is set to “1“ will be in the “OFF“ status when the power is ON.
	d02: #70090 - #70127	d03: #70130 - #70167	
	d04: #70170 - #70207	d05: #70210 - #70247	
	d06: #70250 - #70287	d07: #70290 - #70327	
	d08: #70330 - #70367	d09: #70370 - #70407	
	d10: #70410 - #70447	d11: #70450 - #70487	
	d12: #70490 - #70527	d13: #70530 - #70567	
	d14: #70570 - #70607	d15: #70610 - #70647	
S4C081	d00: #70650 - #70687	d01: #70690 - #70727	
	d02: #70730 - #70767	d03: #70770 - #70807	
	d04: #70810 - #70847	d05: #70850 - #70887	
	d06: #70890 - #70927	d07: #70930 - #70967	
	d08: #70970 - #71007	d09: #71010 - #71047	
	d10: #71050 - #71087	d11: #71090 - #71127	
	d12: #71130 - #71167	d13: #71170 - #71207	
	d14: #71210 - #71247	d15: #71250 - #71287	
S4C082	d00: #71290 - #71327	d01: #71330 - #71367	
	d02: #71370 - #71407	d03: #71410 - #71447	
	d04: #71450 - #71487	d05: #71490 - #71527	
	d06: #71530 - #71567	d07: #71570 - #71607	
	d08: #71610 - #71647	d09: #71650 - #71687	
	d10: #71690 - #71727	d11: #71730 - #71767	
	d12: #71770 - #71807	d13: #71810 - #71847	
	d14: #71850 - #71887	d15: #71890 - #71927	
S4C083	d00: #71930 - #71967	d01: #71970 - #72007	
	d02: #72010 - #72047	d03: #72050 - #72087	
	d04: #72090 - #72127	d05: #72130 - #72167	
	d06: #72170 - #72207	d07: #72210 - #72247	
	d08: #72250 - #72287	d09: #72290 - #72327	
	d10: #72330 - #72367	d11: #72370 - #72407	
	d12: #72410 - #72447	d13: #72450 - #72487	
	d14: #72490 - #72527	d15: #72530 - #72567	

S4C084	d00: #72570 - #72607	d01: #72610 - #72647	Bit specified in every 32 points 0: Clear; 1: Hold The auxiliary relay signals whose specified bit is set to “1“ will be in the “OFF“ status when the power is ON.
	d02: #72650 - #72687	d03: #72690 - #72727	
	d04: #72730 - #72767	d05: #72770 - #72807	
	d06: #72810 - #72847	d07: #72850 - #72887	
	d08: #72890 - #72927	d09: #72930 - #72967	
	d10: #72970 - #73007	d11: #73010 - #73047	
	d12: #73050 - #73087	d13: #73090 - #73127	
	d14: #73130 - #73167	d15: #73170 - #73207	
S4C085	d00: #73210 - #73247	d01: #73250 - #73287	
	d02: #73290 - #73327	d03: #73330 - #73367	
	d04: #73370 - #73407	d05: #73410 - #73447	
	d06: #78450 - #73487	d07: #73490 - #73527	
	d08: #73530 - #73567	d09: #73570 - #73607	
	d10: #73610 - #73647	d11: #73650 - #73687	
	d12: #73690 - #73727	d13: #73730 - #73767	
	d14: #73770 - #73807	d15: #73810 - #73847	
S4C086	d00: #73850 - #73887	d01: #73890 - #73927	
	d02: #73930 - #73967	d03: #73970 - #74007	
	d04: #74010 - #74047	d05: #74050 - #74087	
	d06: #74090 - #74127	d07: #74130 - #74167	
	d08: #74170 - #74207	d09: #74210 - #74247	
	d10: #74250 - #74287	d11: #74290 - #74327	
	d12: #74330 - #74367	d13: #74370 - #74407	
	d14: #74410 - #74447	d15: #74450 - #74487	
S4C087	d00: #74490 - #74527	d01: #74530 - #74567	
	d02: #74570 - #74607	d03: #74610 - #74647	
	d04: #74650 - #74687	d05: #74690 - #74727	
	d06: #74730 - #74767	d07: #74770 - #74807	
	d08: #74810 - #74847	d09: #74850 - #74887	
	d10: #74890 - #74927	d11: #74930 - #74967	
	d12: #74970 - #75007	d13: #75010 - #75047	
	d14: #75050 - #75087	d15: #75090 - #75127	
S4C088	d00: #75130 - #75167	d01: #75170 - #75207	
	d02: #75210 - #75247	d03: #75250 - #75287	
	d04: #75290 - #75327	d05: #75330 - #75367	
	d06: #75370 - #75407	d07: #75410 - #75447	
	d08: #75450 - #75487	d09: #75490 - #75527	
	d10: #75530 - #75567	d11: #75570 - #75607	
	d12: #75610 - #75647	d13: #75650 - #75687	
	d14: #75690 - #75727	d15: #75730 - #75767	

S4C089	d00: #75770 - #75807	d01: #75810 - #75847	Bit specified in every 32 points 0: Clear; 1: Hold The auxiliary relay signals whose specified bit is set to “1“ will be in the “OFF“ status when the power is ON.
	d02: #75850 - #75887	d03: #75890 - #75927	
	d04: #75930 - #75967	d05: #75970 - #76007	
	d06: #76010 - #76047	d07: #76050 - #76087	
	d08: #76090 - #76127	d09: #76130 - #76167	
	d10: #76170 - #76207	d11: #76210 - #76247	
	d12: #76250 - #76287	d13: #76290 - #76327	
	d14: #76330 - #76367	d15: #76370 - #76407	
S4C090	d00: #76410 - #76447	d01: #76450 - #76487	
	d02: #76490 - #76527	d03: #76530 - #76567	
	d04: #76570 - #76607	d05: #76610 - #76647	
	d06: #76650 - #76687	d07: #76690 - #76727	
	d08: #76730 - #76767	d09: #76770 - #76807	
	d10: #76810 - #76847	d11: #76850 - #76887	
	d12: #76890 - #76927	d13: #76930 - #76967	
	d14: #76970 - #77007	d15: #77010 - #77047	
S4C091	d00: #77050 - #77087	d01: #77090 - #77127	
	d02: #77130 - #77167	d03: #77170 - #77207	
	d04: #77210 - #77247	d05: #77250 - #77287	
	d06: #77290 - #77327	d07: #77330 - #77367	
	d08: #77370 - #77407	d09: #77410 - #77447	
	d10: #77450 - #77487	d11: #77490 - #77527	
	d12: #77530 - #77567	d13: #77570 - #77607	
	d14: #77610 - #77647	d15: #77650 - #77687	
S4C092	d00: #77690 - #77727	d01: #77730 - #77767	
	d02: #77770 - #77807	d03: #77810 - #77847	
	d04: #77850 - #77887	d05: #77890 - #77927	
	d06: #77930 - #77967	d07: #77970 - #78007	
	d08: #78010 - #78047	d09: #78050 - #78087	
	d10: #78090 - #78127	d11: #78130 - #78167	
	d12: #78170 - #78207	d13: #78210 - #78247	
	d14: #78250 - #78287	d15: #78290 - #78327	
S4C093	d00: #78330 - #78367	d01: #78370 - #78407	
	d02: #78410 - #78447	d03: #78450 - #78487	
	d04: #78490 - #78527	d05: #78530 - #78567	
	d06: #78570 - #78607	d07: #78610 - #78647	
	d08: #78650 - #78687	d09: #78690 - #78727	
	d10: #78730 - #78767	d11: #78770 - #78807	
	d12: #78810 - #78847	d13: #78850 - #78887	
	d14: #78890 - #78927	d15: #78930 - #78967	

S4C094	d00: #78970 - #79007 d02: #79050 - #79087 d04: #79130 - #79167 d06: #79210 - #79247 d08: #79290 - #79327 d10: #79370 - #79407 d12: #79450 - #79487 d14: #79530 - #79567	d01: #79010 - #79047 d03: #79090 - #79127 d05: #79170 - #79207 d07: #79250 - #79287 d09: #79330 - #79367 d11: #79410 - #79447 d13: #79490 - #79527 d15: #79570 - #79607	Bit specified in every 32 points 0: Clear; 1: Hold The auxiliary relay signals whose specified bit is set to “1“ will be in the “OFF“ status when the power is ON.
S4C095	d00: #79610 - #79647 d02: #79690 - #79727 d04: #79770 - #79807 d06: #79850 - #79887 d08: #79930 - #79967	d01: #79650 - #79687 d03: #79730 - #79767 d05: #79810 - #79847 d07: #79890 - #79927 d09: #79970 - #79997	

15.4 Clearing the GP Register

15.4.1 Clearing Registers When Powering ON

Set the parameters S4C835 - 869 to specify whether to clear the GP registers when powering ON, or to hold the signals in the statuses when powering OFF.
(Every 1 point; 0: hold; 1: clear)

Parameter	Signal				Setting Value
S4C835	d00: M000	d01: M001	d02: M002	d03: M003	Bit specified in every 1 points 0: Hold; 1: Clear The values of the GP registers whose specified bit is set to 1 will be "0" when the power is ON.
	d04: M004	d05: M005	d06: M006	d07: M007	
	d08: M008	d09: M009	d10: M010	d11: M011	
	d12: M012	d13: M013	d14: M014	d15: M015	
S4C836	d00: M016	d01: M017	d02: M018	d03: M019	
	d04: M020	d05: M021	d06: M022	d07: M023	
	d08: M024	d09: M025	d10: M026	d11: M027	
	d12: M028	d13: M029	d14: M030	d15: M031	
S4C837	d00: M032	d01: M033	d02: M034	d03: M035	
	d04: M036	d05: M037	d06: M038	d07: M039	
	d08: M040	d09: M041	d10: M042	d11: M043	
	d12: M044	d13: M045	d14: M046	d15: M047	
S4C838	d00: M048	d01: M049	d02: M050	d03: M051	
	d04: M052	d05: M053	d06: M054	d07: M055	
	d08: M056	d09: M057	d10: M058	d11: M059	
	d12: M060	d13: M061	d14: M062	d15: M063	
S4C839	d00: M064	d01: M065	d02: M066	d03: M067	
	d04: M068	d05: M069	d06: M070	d07: M071	
	d08: M072	d09: M073	d10: M074	d11: M075	
	d12: M076	d13: M077	d14: M078	d15: M079	
S4C840	d00: M080	d01: M081	d02: M082	d03: M083	
	d04: M084	d05: M085	d06: M086	d07: M087	
	d08: M088	d09: M089	d10: M090	d11: M091	
	d12: M092	d13: M093	d14: M094	d15: M095	
S4C841	d00: M096	d01: M097	d02: M098	d03: M099	
	d04: M100	d05: M101	d06: M102	d07: M103	
	d08: M104	d09: M105	d10: M106	d11: M107	
	d12: M108	d13: M109	d14: M110	d15: M111	
S4C842	d00: M112	d01: M113	d02: M114	d03: M115	
	d04: M116	d05: M117	d06: M118	d07: M119	
	d08: M120	d09: M121	d10: M122	d11: M123	
	d12: M124	d13: M125	d14: M126	d15: M127	
S4C843	d00: M128	d01: M129	d02: M130	d03: M131	
	d04: M132	d05: M133	d06: M134	d07: M135	
	d08: M136	d09: M137	d10: M138	d11: M139	
	d12: M140	d13: M141	d14: M142	d15: M143	

S4C844	d00: M144	d01: M145	d02: M146	d03: M147	Bit specified in every 1 points 0: Hold; 1: Clear
	d04: M148	d05: M149	d06: M150	d07: M151	
	d08: M152	d09: M153	d10: M154	d11: M155	The values of the GP registers whose specified bit is set to 1 will be "0" when the power is ON.
	d12: M156	d13: M157	d14: M158	d15: M159	
S4C845	d00: M160	d01: M161	d02: M162	d03: M163	
	d04: M164	d05: M165	d06: M166	d07: M167	
	d08: M168	d09: M169	d10: M170	d11: M171	
	d12: M172	d13: M173	d14: M174	d15: M175	
S4C846	d00: M176	d01: M177	d02: M178	d03: M179	
	d04: M180	d05: M181	d06: M182	d07: M183	
	d08: M184	d09: M185	d10: M186	d11: M187	
	d12: M188	d13: M189	d14: M190	d15: M191	
S4C847	d00: M192	d01: M193	d02: M194	d03: M195	
	d04: M196	d05: M197	d06: M198	d07: M199	
	d08: M200	d09: M201	d10: M202	d11: M203	
	d12: M204	d13: M205	d14: M206	d15: M207	
S4C848	d00: M208	d01: M209	d02: M210	d03: M211	
	d04: M212	d05: M213	d06: M214	d07: M215	
	d08: M216	d09: M217	d10: M218	d11: M219	
	d12: M220	d13: M221	d14: M222	d15: M223	
S4C849	d00: M224	d01: M225	d02: M226	d03: M227	
	d04: M228	d05: M229	d06: M230	d07: M231	
	d08: M232	d09: M233	d10: M234	d11: M235	
	d12: M236	d13: M237	d14: M238	d15: M239	
S4C850	d00: M240	d01: M241	d02: M242	d03: M243	
	d04: M244	d05: M245	d06: M246	d07: M247	
	d08: M248	d09: M249	d10: M250	d11: M251	
	d12: M252	d13: M253	d14: M254	d15: M255	
S4C851	d00: M256	d01: M257	d02: M258	d03: M259	
	d04: M260	d05: M261	d06: M262	d07: M263	
	d08: M264	d09: M265	d10: M266	d11: M267	
	d12: M268	d13: M269	d14: M270	d15: M271	
S4C852	d00: M272	d01: M273	d02: M274	d03: M275	
	d04: M276	d05: M277	d06: M278	d07: M279	
	d08: M280	d09: M281	d10: M282	d11: M283	
	d12: M284	d13: M285	d14: M286	d15: M287	
S4C853	d00: M288	d01: M289	d02: M290	d03: M291	
	d04: M292	d05: M293	d06: M294	d07: M295	
	d08: M296	d09: M297	d10: M298	d11: M299	
	d12: M300	d13: M301	d14: M302	d15: M303	

S4C854	d00: M304	d01: M305	d02: M306	d03: M307
	d04: M308	d05: M309	d06: M310	d07: M311
	d08: M312	d09: M313	d10: M314	d11: M315
	d12: M316	d13: M317	d14: M318	d15: M319
S4C855	d00: M320	d01: M321	d02: M322	d03: M323
	d04: M324	d05: M325	d06: M326	d07: M327
	d08: M328	d09: M329	d10: M330	d11: M331
	d12: M332	d13: M333	d14: M334	d15: M335
S4C856	d00: M336	d01: M337	d02: M338	d03: M339
	d04: M340	d05: M341	d06: M342	d07: M343
	d08: M344	d09: M345	d10: M346	d11: M347
	d12: M348	d13: M349	d14: M350	d15: M351
S4C857	d00: M352	d01: M353	d02: M354	d03: M355
	d04: M356	d05: M357	d06: M358	d07: M359
	d08: M360	d09: M361	d10: M362	d11: M363
	d12: M364	d13: M365	d14: M366	d15: M367
S4C858	d00: M368	d01: M369	d02: M370	d03: M371
	d04: M372	d05: M373	d06: M374	d07: M375
	d08: M376	d09: M377	d10: M378	d11: M379
	d12: M380	d13: M381	d14: M382	d15: M383
S4C859	d00: M384	d01: M385	d02: M386	d03: M387
	d04: M388	d05: M389	d06: M390	d07: M391
	d08: M392	d09: M393	d10: M394	d11: M395
	d12: M396	d13: M397	d14: M398	d15: M399
S4C860	d00: M400	d01: M401	d02: M402	d03: M403
	d04: M404	d05: M405	d06: M406	d07: M407
	d08: M408	d09: M409	d10: M410	d11: M411
	d12: M412	d13: M413	d14: M414	d15: M415
S4C861	d00: M416	d01: M417	d02: M418	d03: M419
	d04: M420	d05: M421	d06: M422	d07: M423
	d08: M424	d09: M425	d10: M426	d11: M427
	d12: M428	d13: M429	d14: M430	d15: M431
S4C862	d00: M432	d01: M433	d02: M434	d03: M435
	d04: M436	d05: M437	d06: M438	d07: M439
	d08: M440	d09: M441	d10: M442	d11: M443
	d12: M444	d13: M445	d14: M446	d15: M447
S4C863	d00: M448	d01: M449	d02: M450	d03: M451
	d04: M452	d05: M453	d06: M454	d07: M455
	d08: M456	d09: M457	d10: M458	d11: M459
	d12: M460	d13: M461	d14: M462	d15: M463

Bit specified in every 1 points
0: Hold; 1: Clear

The values of the GP registers whose specified bit is set to 1 will be “0“ when the power is ON.

S4C864	d00: M464	d01: M465	d02: M466	d03: M467	Bit specified in every 1 points 0: Hold; 1: Clear The values of the GP registers whose specified bit is set to 1 will be "0" when the power is ON.
	d04: M468	d05: M469	d06: M470	d07: M471	
	d08: M472	d09: M473	d10: M474	d11: M475	
	d12: M476	d13: M477	d14: M478	d15: M479	
S4C865	d00: M480	d01: M481	d02: M482	d03: M483	
	d04: M484	d05: M485	d06: M486	d07: M487	
	d08: M488	d09: M489	d10: M490	d11: M491	
	d12: M492	d13: M493	d14: M494	d15: M495	
S4C866	d00: M496	d01: M497	d02: M498	d03: M499	
	d04: M500	d05: M501	d06: M502	d07: M503	
	d08: M504	d09: M505	d10: M506	d11: M507	
	d12: M508	d13: M509	d14: M510	d15: M511	
S4C867	d00: M512	d01: M513	d02: M514	d03: M515	
	d04: M516	d05: M517	d06: M518	d07: M519	
	d08: M520	d09: M521	d10: M522	d11: M523	
	d12: M524	d13: M525	d14: M526	d15: M527	
S4C868	d00: M528	d01: M529	d02: M530	d03: M531	
	d04: M532	d05: M533	d06: M534	d07: M535	
	d08: M536	d09: M537	d10: M538	d11: M539	
	d12: M540	d13: M541	d14: M542	d15: M543	
S4C869	d00: M544	d01: M545	d02: M546	d03: M547	
	d04: M548	d05: M549	d06: M550	d07: M551	
	d08: M552	d09: M553	d10: M554	d11: M555	
	d12: M556	d13: M557	d14: M558	d15: M559	

NOTE

It is configurable if the register values allocated to the current TMR/CNT/MLTMR command values should be retained in the parameters below or cleared when the power is turned ON.

S2C488=0:

– The current register values for TMR/CNT/MLTMR commands will be configured in the register's setting values.

S2C488=1:

– The current register value for CNT command shall be retained.

– The current register values for TMR/MLTMR command will be configured in the register's setting values.

S2C488=2:

– The current register values for CNT command will be configured in the register's setting values.

– The current register value for TMR/MLTMR command shall be retained.

S2C488=3:

– The current register value for TMR/CNT/MLTMR commands shall be retained.

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