

Procedure for setting up the simulated input skip function

For an input signal to be skipped if in a simulated status, enable the simulated input skip function.

- Step

- 1 Press [MENU] key.
- 2 Select the "5 I/O" item.
- 3 Press the F1, [TYPE] key.
- 4 Select the "Digital" or "Robot".
- 5 If output signals are displayed, press F3, "IN/OUT" to switch to the input signal list screen.
- 6 Position the cursor on the signal for which the simulated input skip function is to be enabled.
- 7 Press the [NEXT] key and then the F3, "DETAIL" key.
- 8 On the input signal detail screen, position the cursor on "Skip when simulated".
- 9 Press the F4, "TRUE" key.

3.8 SETTING AUTOMATIC OPERATION

Automatic operation is the function with which the remote controller starts a program, using the peripheral I/O. The automatic operation includes the following functions:

- The robot service request (RSR) function selects and starts a program according to the robot service request signals (RSR1 to RSR8 inputs). When another program is being executed or is temporarily stopped, the selected program enters the wait state and is started once the program currently being executed terminates.
- The program number selection (PNS) function selects or examines a program, using the program number selection signals (PNS1 to PNS8 PNSTROBF) and the START signal. While a program is temporarily stopped or being executed, these signals are ignored.
- The automatic operation start signal (PROD_START input) starts the currently selected program from line 1. When another program is temporarily stopped or is being executed, this signal is ignored.
- The cycle stop signal (CSTOPI input) is used to terminate the program currently being executed.
 - When "FALSE" is selected for "CSTOPI for ABORT" on the system configuration menu, this signal terminates the program currently being executed once the execution is complete. It also releases programs from the wait state by RSR. (Default)
 - When "TRUE" is selected for "CSTOPI for ABORT" on the system configuration menu, this signal forcibly terminates the program currently being executed immediately. It also releases (Clear) programs from the wait state by RSR.
- The external start signal (START input) is used to start a program that is temporarily stopped.
 - When "FALSE" is selected for "START for CONTINUE only" on the system configuration menu, this signal starts the currently selected program from the current line. This signal also starts a temporarily stopped program. (Default)
 - When "TRUE" is selected for "START for CONTINUE only" on the system configuration menu, this signal starts only a temporarily stopped program. When no program is temporarily stopped, this signal is ignored.

A program can be started by entering the peripheral I/O only when the robot is in the remote state. The remote state is established when the following remote conditions are satisfied:

- The teach pendant enable switch is off.
- The remote signal (SI[2]) is on. (For how to turn the remote signal (SI[2]) on and off, see the description of "Remote/Local setup" in Section 3.15, "SYSTEM CONFIG MENU".)
- The *SFSPD signal of the peripheral I/O is set on.
- The ENBL signal of the peripheral I/O is set on.
- System variable \$RMT_MASTER is set to 0 (peripheral equipment).

NOTE

The value of \$RMT_MASTER can be set to 0 (peripheral equipment), 1 (CRT/KB), 2 (host computer), or 3 (no remote equipment).

A program including a motion (group) can be started when the following ready conditions are satisfied:

- The ENBL input signal of the peripheral I/O is set on.
- The servo power is turned on (not in the alarm state).

The CMDENBL signal indicates whether the above conditions are satisfied. The CMDENBL signal is output when the following conditions are satisfied:

- The remote conditions are satisfied.
- The ready conditions are satisfied.
- The continuous operation mode is selected (the single step mode is disabled).

NOTE

If "TRUE" is specified at "START for CONTINUE only" on the system configuration screen, the START signal is effective for only a program on hold.

When the CMDENBL signal cannot be turned on, or the program cannot be started by peripheral I/O even if the CMDENBL signal is on, confirm the following items.

Item	Method to check
Check items when the CMDENBL cannot be turned on.	
- The remote conditions are satisfied.	SO[0:REMOTE] is on.
- The teach pendant enable switch is off.	SO[7:TPENBL] is off.
- The setting of Remote/Local is Remote.	SI[2:REMOTE] is on.
- The mode switch is set to AUTO mode.	SI[8] is on, and SI[9] is on.
- UI[3:SFSPD] is on.	UI[3:SFSPD] is on.
- UI[8:ENBL] is on.	UI[8:ENBL] is on.
- \$RMT_MASTER = 0 (Peripheral equipment)	Check in the system variables screen.
- The operation enable conditions are satisfied.	
- Any alarm does not occur.	SO[3:FAULT] is off, UO[6:FAULT] is off.
- The servo power is turned on.	UO[2:SYSRDY] is on.
- The continuous operation mode is selected (the single step mode is disabled).	The STEP LED on the teach pendant is off. In case that the integrated PMC is enabled, INFO[1:STEP] is 0.
Check items when the program cannot be started even if the CMDENBL signal is on.	When the program is started by the peripheral I/O, if the alarm "SYST-011 Failed to run task" occurs, confirm the alarm detail code in alarm history screen.
- UI signals are enabled.	Check the setting of the system variables in the system variable screen.
- The PNS/RSR, PNSTROBE, PROD_START, START signals are input correctly.	Check the status of the signals in UI screen. Check the configuration of UI. In case that UI signals are displayed as "*UI", because the UOP signals are assigned to PMC, check the PMC program.
- The condition for automatic operation in the program select screen in setup menu are satisfied.	Check the setting in the program select screen. Example) If HOME position check is enabled, check whether the robot is in the home position.

Sequence of program restart by peripheral I/O

After eliminating the cause of an alarm, the program is restarted by peripheral I/O as follows.

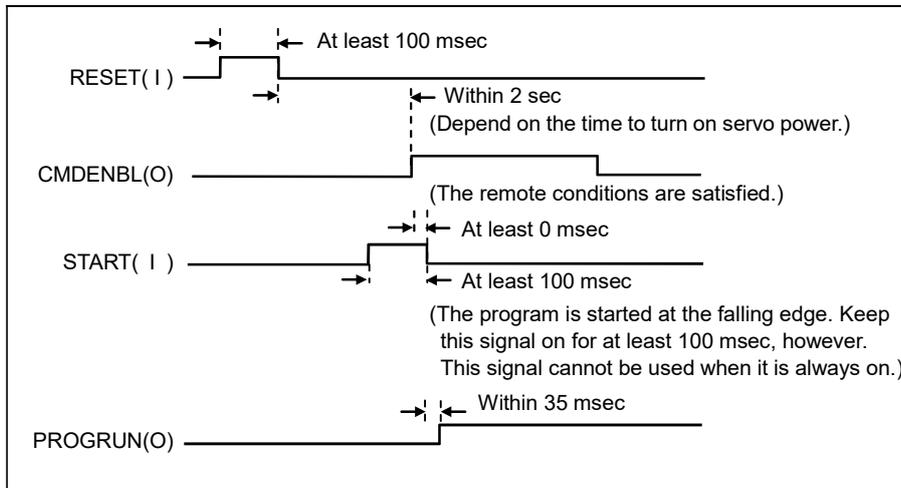


Fig. 3.8 Sequence of program restart by peripheral I/O

3.8.1 Robot Service Request (RSR)

The robot service request (RSR) starts a program from an external device. The eight robot service request signals (RSR1 to RSR8) are used for this function.

- The controller uses the RSR1 to RSR8 inputs to determine whether the input RSR signal is enabled. When the signal is disabled, it is ignored.
Whether to enable or disable RSR1 to RSR8 is set in system variables \$RSR1 to \$RSR8 and can be changed on the RSR setting screen or by using the program RSR instruction.

NOTE

If the peripheral device input signal (UI) is disabled, select TRUE for "Enable UI signals" on the system configuration screen.

- Eight RSR registration numbers can be registered for RSR. The value obtained by adding a base number to an RSR registration number is used as the program number (four digits). For example, when RSR2 is input, the following value is used as the program number:

$$\text{(Program number)} = \text{(RSR2 registration number)} + \text{(base number)}$$

The selected program is named as follows:

$$\text{RSR} + \text{(program number)}$$

NOTE

Specify the name of a program for automatic operation in "RSR" + (program number) format. Enter a 4-digit number such as RSR0121, not RSR121. If not, the robot will not operate.

The base number is set in \$SHELL_CFG.\$JOB_BASE and can be changed using "Base number" on the RSR setting screen or a program parameter instruction.

- A pulse of the RSR acknowledgment output (ACK1 to ACK8) corresponding to the RSR1 to RSR8 input is output. When the ACK1 to ACK8 signal is output, the controller accepts another RSR input.
- When a program is in the terminated state, the selected program is started. When another program is being executed or is temporarily stopped, the request (job) is entered the queue and the selected program is started when the program being executed terminates.
Jobs (RSR programs) are executed in the order in which they are entered the queue.

- 5 Waiting programs are canceled (cleared) by the cycle stop signal (CSTOPI input) or upon forced program termination.

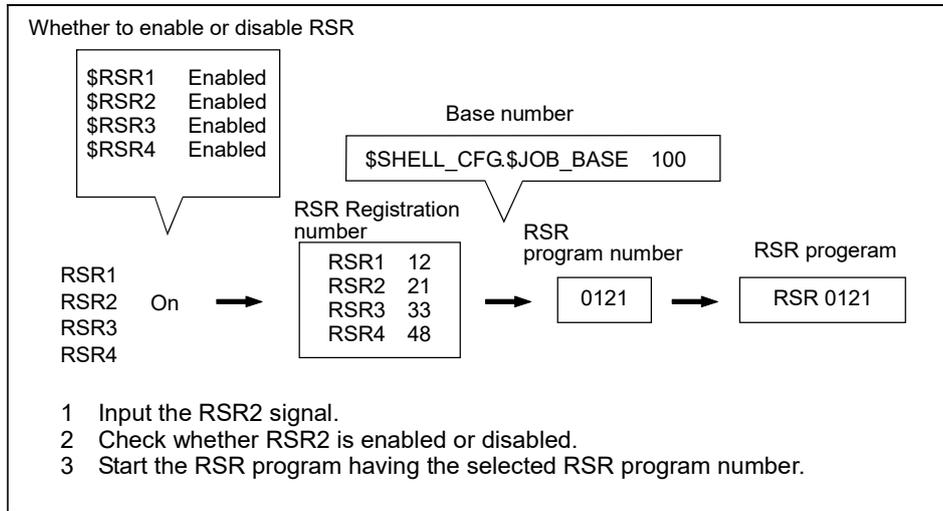


Fig. 3.8.1 (a) Robot service request

Starting a program by RSR is enabled in the remote state.

Starting a program involving operation (group) by RSR is enabled when the operation enable conditions as well as the remote conditions are satisfied.

The CMDENBL output is provided to indicate whether the above conditions are satisfied.

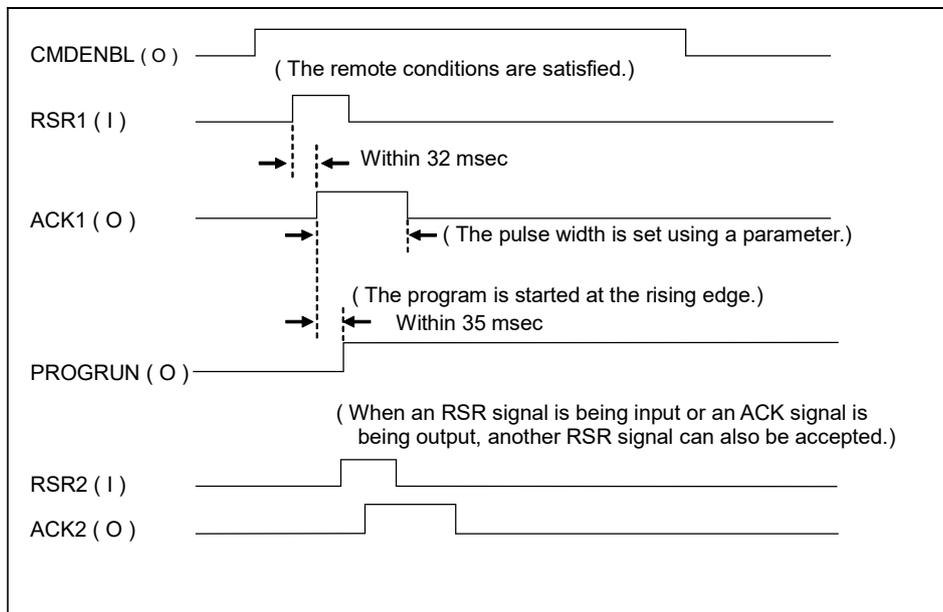


Fig. 3.8.1 (b) Sequence of automatic operation by RSR

Set RSR for SETUP RSR/PNS on the RSR setting screen.

Table 3.8.1 RSR setting items

Item	Description
RSR1 to 8 program number	Specifies whether to enable or disable RSR1 to RSR8 and the RSR registration numbers. When an RSR signal is disabled and the specified signal is input, the program is not started. Setting whether to enable or disable each RSR is stored in system variable \$RSR1 to \$RSR8.
Job prefix	Top character string of the name of the program to be started. By default, it is set to "RSR".
Base number	Added to the RSR registration number to obtain the RSR program number.
Acknowledge function	Sets whether to output RSR acknowledgment signals (ACK1 to ACK8).
Acknowledge pulse width	Sets the pulse output period (unit: msec) when the output of each RSR acknowledgment signal (ACK1 to ACK8) is enabled. (unit msec)

Procedure 3-8 Setting RSR

Step

- 1 Press [MENU] key to display the screen menu.
- 2 Select "6 SETUP".
- 3 Press F1, [TYPE] to display the screen switching menu.
- 4 Select Prog Select. The Prog Select screen appears.
- 5 Position the cursor to "Program select mode". Press F4, [CHOICE] and select "RSR", then press F3, "DETAIL".(Prog Select Screen →3.8.4)

RSR setting screen

Prog Select				1/12	
RSR Setup					
1	RSR1 program number	[ENABLE]]	[0]
2	RSR2 program number	[ENABLE]]	[0]
3	RSR3 program number	[ENABLE]]	[0]
4	RSR4 program number	[ENABLE]]	[0]
5	RSR5 program number	[ENABLE]]	[0]
6	RSR6 program number	[ENABLE]]	[0]
7	RSR7 program number	[ENABLE]]	[0]
8	RSR8 program number	[ENABLE]]	[0]
9	Job prefix				[RSR]
10	Base number				[0]
11	Acknowledge function				[FALSE]
12	Acknowledge pulse width(msec)				[400]
	[TYPE]			ENABLE	DISABLE

- 6 Position the cursor to the target item and enter a value.
- 7 After changing Program select mode, to enable the change, cycle power.



WARNING

After the type of automatic operation function is changed, cycling power of the controller is required to enable the change. If not, the setting is not accepted.

3.8.2 Program Number Selection (PNS)

The remote controller uses the program number selection (PNS) function to select or collate a program. Specify a desired PNS program number with the input signals, PNS1 to PNS8.

Step

- 1 The controller reads the PNS1 to PNS8 input signals as a binary number by the PNSTROBE pulse input. When a program is being executed or is temporarily stopped, these signals are ignored. When the PNSTROBE pulse input is on, the selection of a program from the teach pendant is disabled.

NOTE

If the peripheral device input signal (UI) is disabled, select TRUE for "Enable UI signals" on the system configuration screen.

- 2 The data of signals PNS1 to PNS8 is converted into a decimal PNS number. The sum of the PNS number and the reference number is a PNS program number (four digits).

$$(\text{Program number}) = (\text{PNS number}) + (\text{Base number})$$

The specified PNS+(Program number) program number is named as follows.

NOTE

Specify the name of a program for automatic operation in "PNS" + (program number) format. Enter a 4-digit number such as PNS0138, not PNS138. If not, the robot will not operate.

The base number is set in \$SHELL_CFG.\$JOB_BASE and can be changed using "Base number" on the PNS setting screen or a program parameter instruction.

When a zero is input by the PNS1 to PNS8 inputs, the following process is done depending on the UOP allocation type.

UOP allocation type is "Full":

When a zero is input by the PNS1 to PNS8 inputs, the system enters the status in which no program is selected on the teach pendant.

UOP allocation type is "Simple":

When a zero is input by the PNS1 to PNS8 inputs, or the nonexistent program number is set and PNSTROBE signal is input, nothing is done.

When START is input in this state, if no program is selected, nothing is done. If a program is selected when START signal is input, the selected program is started.

(In case that the nonexistent program number is set and PNSTROBE signal is input, or START signal is input when no program is selected, the warning is displayed.)

- 3 SNO1 to SNO8 are output to indicate a PNS number as a binary code as confirmation. An SNACK pulse is output simultaneously. If the PNS number cannot be represented as an 8-bit numeric value, SNO1 to SNO8 output a zero.
- 4 The remote controller checks that the SNO1 to SNO8 output value is the same as the PNS1 to PNS8 input value when SNACK is output, and sends the automatic operation start input (PROD_START).
- 5 The controller receives the PROD_START input and starts the program.

Starting a program by PNS is enabled in the remote state.

Starting a program involving an operation (group) is enabled when the operation enable conditions as well as the remote conditions are satisfied.

The CMDENBL output is provided to indicate whether the above conditions are satisfied.

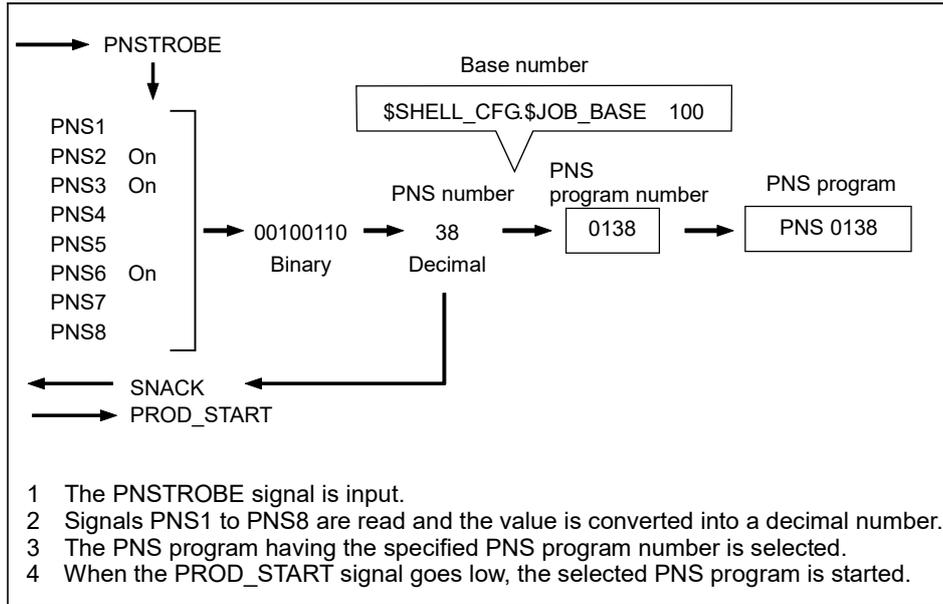


Fig. 3.8.2 (a) Program number selection

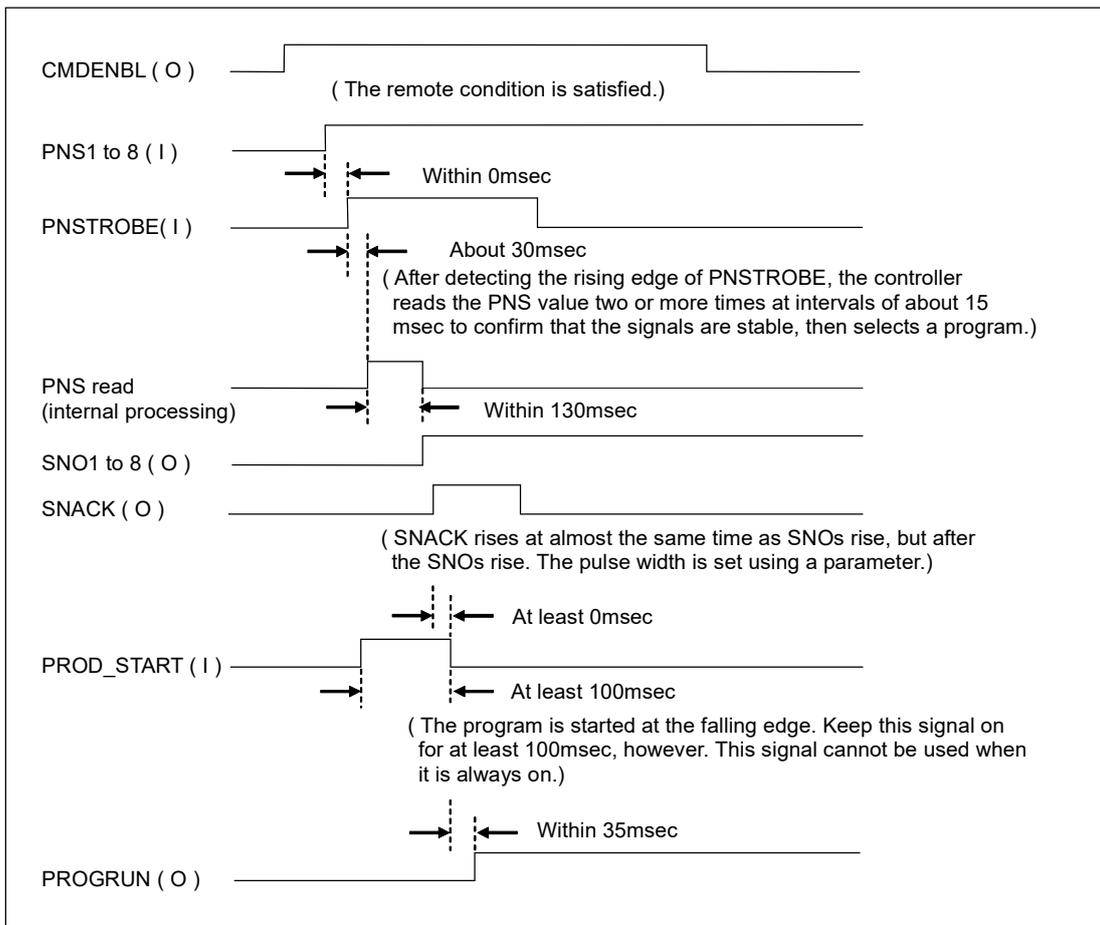


Fig. 3.8.2 (b) Sequence of automatic operation by PNS

Set the PNS function on the PNS setting screen [6 (SETUP). RSR/PNS]. Refer to Table 3.8.2.

Table 3.8.2 Setting the PNS function

Items	Descriptions
Job prefix	Top character string of the name of the program selected. By default, it is set to "PNS".
Base number	The reference number is added to the PNS number to obtain a PNS program number.
Acknowledge pulse width (msec)	Sets the pulse output period (unit: msec) of the PNS acknowledgment signal (SNACK).

Procedure 3-9 Setting the PNS function

Step

- 1 Press [MENU] key. The screen menu will be displayed.
- 2 Select "6 SETUP".
- 3 Press the F1, [TYPE]. The screen change menu will be displayed.
- 4 Select Prog Select. Prog Select screen will be displayed.
- 5 Position the cursor to "Program select mode". Press F4, [CHOICE] and select "PNS", then press F3, "DETAIL".(Prog Select Screen →3.8.4)

PNS setting screen

Prog Select		1/3
PNS Setup		
1 Job prefix		[PNS]
2 Base number		[100]
3 Acknowledge pulse width(msec)		[200]
[TYPE]		

- 6 Place the cursor on a desired field and enter a value.
- 7 After changing RSR to PNS, to enable the change, cycle power of the controller.

⚠ WARNING

After the type of automatic operation function is changed, cycling power is required to enable the change. If not, the setting is not accepted.

3.8.3 STYLE

The remote controller uses STYLE function to select or collate a program. Specify a desired STYLE program number with the input signals, STYLE1 to STYLE8.

Step

- 1 STYLE function needs programs to be set to each STYLE number in advance. Then program name is not restricted as PNS and RSR. (Refer to "Procedure 3-10 Setting" the style function about setting of the program.)
- 2 The controller reads the STYLE1 to STYLE8 input signals as a binary number. And the data of signals STYLE1 to STYLE8 is converted into a decimal STYLE number.
- 3 From the remote controller, the start input (START or PROD_START) is sent. Then program is selected by STYLE number, and selected program is started.
- 4 SNO1 to SNO8 are output to indicate a STYLE number as a binary code as confirmation. An SNACK pulse is output simultaneously.

- 5 If the program is pausing, and the start input (Only START. PROD_START is unusable.) is sent, no program selection is made and execution is resumed.

NOTE
 If the peripheral device input signal (UI) is disabled, select TRUE for "Enable UI signals" on the system configuration screen.

Starting a program by STYLE is enabled in the remote state.
 Starting a program involving an operation (group) is enabled when the operation enable conditions as well as the remote conditions are satisfied.
 The CMDENBL output is provided to indicate whether the above conditions are satisfied.

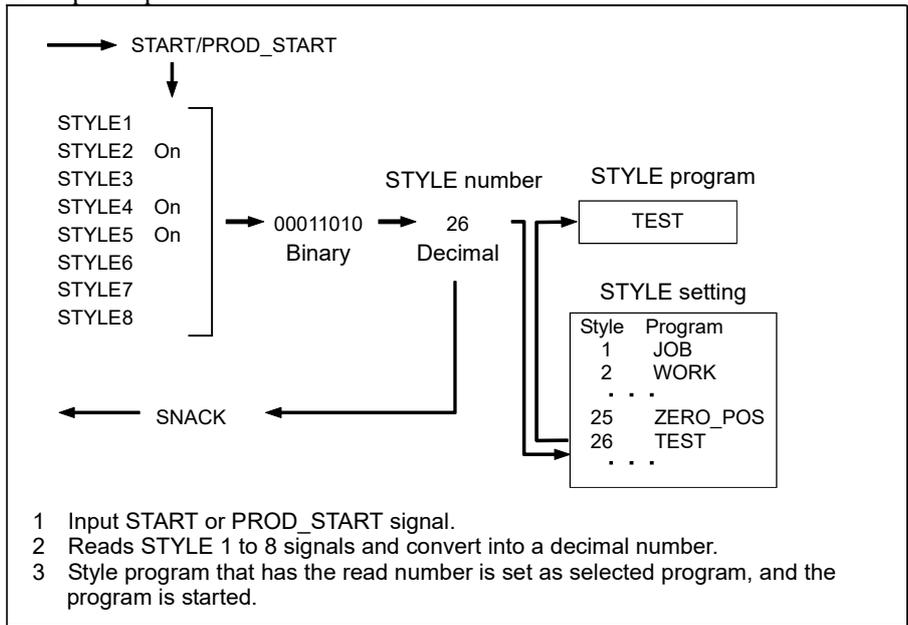


Fig. 3.8.3 (a) STYLE

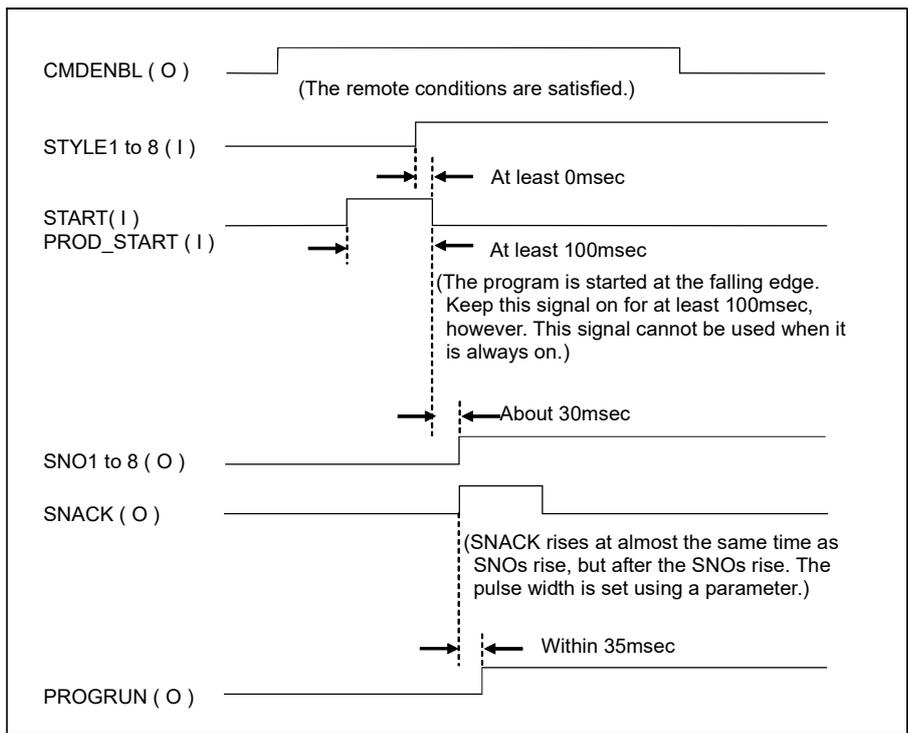


Fig. 3.8.3 (b) Sequence of automatic operation by STYLE

Set the STYLE function on the Prog Select screen [6 (SETUP). Prog Select]. Refer to Table 3.8.3.

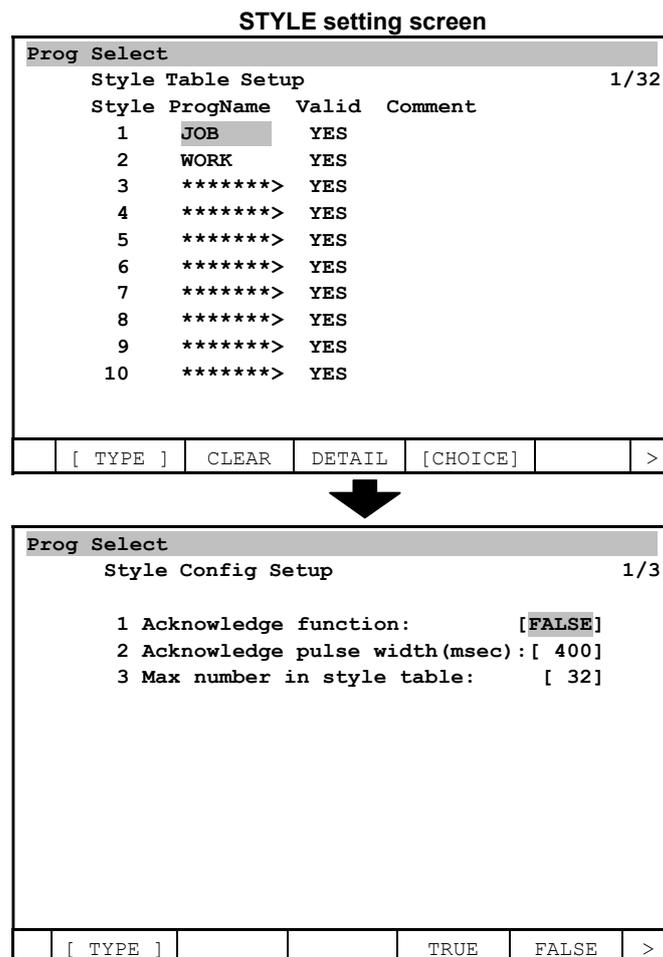
Table 3.8.3 Setting the STYLE function

Items	Descriptions
Acknowledge function	Sets whether to output STYLE acknowledgment signals (SNO1 to SNO8 and SNACK). This is disabled as initial setting.
Acknowledge pulse width (msec)	Sets the pulse output period (unit: msec) of the PNS acknowledgment signal (SNACK).
Max number in style table	Sets the max number which is used for STYLE.

Procedure 3-10 Setting the STYLE function

Step

- 1 Press [MENU] key. The screen menu will be displayed.
- 2 Select "6 SETUP".
- 3 Press the F1, [TYPE]. The screen change menu will be displayed.
- 4 Select "Prog Select". Prog Select screen will be displayed.
- 5 Position the cursor to "Program select mode". Press F4, [CHOICE] and select "STYLE", then press F3, "DETAIL". (Prog Select Screen →3.8.4)



- 6 By placing the cursor on a desired field, pressing F4, [CHOICE] and selecting program, set STYLE program.
- 7 By pressing F3. "DETAIL" additionally, acknowledge signal can be set. (This is disabled as initial setting.)

- 8 After changing setting from RSR/PNS/OTHER to STYLE, to enable the change, cycle power of the controller.

**WARNING**

After the type of automatic operation function is changed, cycling power of the controller to enable the change. If not, the setting is not accepted.

3.8.4 Prog Select Screen

Overview

On the "Prog Select" screen, the following can be performed:

- As program selection methods, it is now possible to select, PNS, RSR, STYLE, and OTHER.
- As program start methods, it is now possible to select UOP and OTHER.
- Various checks are performed at a program start or resumption.

Prog select screen

Prog Select		1/13
1	Program select mode:	STYLE
2	Production start method:	UOP
Production checks:		
3	At home check:	ENABLE
4	Resume position tolerance:	ENABLE
5	Simulated I/O:	DISABLE
6	General override < 100%:	DISABLE
7	Prog override < 100%:	DISABLE
8	Machine lock:	DISABLE
9	Single step:	DISABLE
10	Process ready:	DISABLE
General controls:		
11	Heartbeat timing:	1000 MS
12	Low TEMP DRAM memory:	100 KB
13	Low PERM CMOS memory:	50 KB
[TYPE]		DETAIL [CHOICE] HELP

Program selection methods

It is now possible to select PNS, RSR, STYLE, and OTHER.

- RSR
See Subsection 3.8.1, "Robot Service Request (RSR)".
- PNS
See Subsection 3.8.2, "Program Number Selection (PNS)".
- STYLE
See Subsection 3.8.3, "STYLE".
- OTHER
The program specified for the system variable \$SHELL_WRK. \$CUST_NAME is selected.
A program selection is made when a program is started with the method specified by following "Automatic operation start methods", described later.
If the program is pausing, no program selection is made and execution is restarted.
Usually, do not use this function because it is for special purposes.
(The setting of the system variable \$SHELL_WRK. \$CUST_NAME is not saved in system file as backup.)

Automatic operation start methods

If the program selection method is "STYLE" or "OTHER", it is possible to select a program start method from UOP, and OTHER.

- UOP
A program is started with UI[6:START] or UI[18:PROD_START].
- OTHER
A program is started by changing the system variable \$SHELL_WRK.\$CUST_START from FALSE to TRUE.
This method cannot be selected if the program selection method is either RSR or PNS.

Usually, do not use this function because it is for special purposes.

- * If the program selection method is either STYLE or OTHER and the automatic operation start method is UOP, it is possible to select and start a program with either UI[6:START] or UI[18:PROD_START], provided that a program is terminated. In this case, the program is started at the first line.
If a program is pausing, the program can be resumed with either UI[6:START] or UI[18:PROD_START]. In this case, no program selection is made.
Note that if the program selection method is either RSR or PNS, the effects of UI[6:START] and UI[18:PROD_START] are the same as those in the past.

List of program selection methods and automatic operation start methods

		Automatic operation start method	
		UOP	Other
Program selection method	RSR	Program selection/start : RSR1 to 8	Not available.
	PNS	Program selection : PNS1 to 8, PNSTROBE Program start : UI[18:PROD_START] or UI[6:START]	Not available.
	Style	Program selection:STYLE1 to 8 Program start : UI[18:PROD_START] or UI[6:START]	Program selection:STYLE1 to 8 Program start :\$SHELL_WRK.\$CUST_START
	Other	Program selection: \$SHELL_WRK.\$CUST_NAME Program start : UI[18:PROD_START] or UI[6:START]	Program selection: \$SHELL_WRK.\$CUST_NAME Program start :\$SHELL_WRK.\$CUST_START

Automatic operation check

It is possible to specify whether to enable or disable each of the automatic operation check items on the Prog Select screen.

Check item	Explanation
At home check	<p>Checks to see if the robot is in its home position. Home position refers to the reference position for which "Is a valid HOME" is set to ENABLE on the Reference Position Set up screen (MENU → "SETUP" → F1 [TYPE] → "Ref. Position").</p> <p>If At home check is enabled, "Is a valid HOME" must be set to ENABLE for at least one reference position of group 1.</p> <div data-bbox="635 600 1299 846" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <pre> REF POSN Reference Position 1/13 Ref.Position Number: 1 1 Comment [*****] 2 Enable/Disable: DISABLE 3 Is a valid HOME: ENABLE 4 Signal definition: DO [0] 5 J1: 0.000 +/- 0.000 </pre> </div> <p>If "Is a valid HOME" is set to ENABLE on the Reference Position Set up screen, the "HOME_IO" program will be started when the robot reaches that position. If not using "HOME_IO", delete all contents of the "HOME_IO" program.</p> <p>NOTE The "HOME_IO" program is configured not to accept a forced termination request so that it can always be executed to the end.</p>
Resume position toler.	Checks to see if the robot is near the position at which the program paused.
Simulated I/O	Suppresses a program start/resumption if I/O is simulated.
General override < 100%	Suppresses a program start/resumption if the general override is less than 100%.
Prog override < 100%	Suppresses a program start/resumption if \$MCR_GRP[.].\$PRGOVERRIDE is less than 100.
Machine lock	Suppresses a program start/resumption if robot operation is disabled.
Single step	Suppresses a program start/resumption in case of a single step.
Process ready	Enables the user to check whether to make a program start/resumption depending on the status of the cooling machine, cooling water, welding transformer, etc. (The process ready conditions differ from one application to another). Selections are displayed allowing the user to continue the program, recheck the I/O status, and stop the program.

By positioning the cursor on each item and pressing F3, "DETAIL", it is possible to make detailed settings for that check item.

For some check items, it is not possible to make some of the settings on the Detailed Setup screen.

- * It is not possible to specify whether to enable or disable the Resume position toler. check item on the Prog Select screen. Specify this on the Resume tolerance check screen (MENU → "SETUP" → F1 [TYPE] → "Resume Tol.").

Automatic operation check detailed setting screen (At home check as an example)

Prog Select DETAIL	
	1/3
Check:	At home check
1 Check when run:	ENABLE
Check when resume:	DISABLE
2 Prompt if failure:	DISABLE
Post error if failure:	ENABLE
3 Post warning if forced:	DISABLE
Force condition:	DISABLE
[TYPE]	ENABLE DISABLE

Detailed setting	Explanation
Check when run	Checks specified items at a program start. For the Resume position toler. check, this item cannot be enabled.
Check when resume	Checks specified items at a program resumption. For the At home check, this item cannot be enabled.
Prompt if failure	Displays a prompt message on the screen if Check when run or Check when resume is set to ENABLED and the check causes a program start or resumption to be interrupted. At this time, it is possible to select whether to continue or stop the program. The text of the prompt message differs depending on the check item.
Post error if failure	Generates the alarms below if Check when run or Check when resume is set to ENABLED and the check causes a program start or restart to be interrupted. "SYST-011 Failed to run task" "SYST-079 Startup check failed"
Post warning if forced	Effective only if Force condition is enabled. If enabled, this item displays a warning in the event of Force condition. The text of the warning differs depending on the check item.
Force condition	If Check when run or Check when resume is set to ENABLED, this item causes that check item to be forcibly satisfied. This item takes precedence over all other detailed settings. For the check items of At home check, Resume position toler., and Machine lock, it is not possible to set Force condition to ENABLED. The action performed with Force condition differs depending on the check item.

The details of Prompt if failure, Force condition, and Post warning if forced for each check item are as follows:

- At home check

Condition	Action in the event of an error
Prompt if failure	The prompt below appears. <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p>Robot arm is not at home.</p> <p>Jog or move robot to a home position.</p> <p style="text-align: center;">[OK]</p> </div>
Force condition	
Post warning if forced	

- **Resume position toler.**

Condition	Action in the event of an error
Prompt if failure	<p>The prompt below appears.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p>Robot arm moved too far. ANSWERING CONTINUE WILL INITIATE MOTION.</p> <p style="text-align: center;">CONTINUE [STOP]</p> </div> <p>When "CONTINUE" is selected, the program is executed with the warning "SYST-104 Resume tolerance ignored".</p>
Force condition	
Post warning if forced	

- **Simulated I/O**

Condition	Action in the event of an error
Prompt if failure	<p>The prompt below appears.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p>Simulated I/O ports exist (set from the I/O screens)</p> <p style="text-align: center;">CONTINUE FORCE [CANCEL]</p> </div> <ul style="list-style-type: none"> • When "CONTINUE" is selected, the program continues to run. • If "FORCE" is selected, simulated I/O is forcibly canceled and the program is executed. • When "CANCEL" is selected, the program does not start but stops.
Force condition	Simulated I/O is automatically forcibly canceled and the program runs.
Post warning if forced	<p>Simulated I/O is automatically forcibly canceled and the program runs, and the message below appears.</p> <p>"SYST-084 I/O forced unsimulated"</p>

- **General override < 100%**

Condition	Action in the event of an error
Prompt if failure	<p>The prompt below appears.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p>General override (set from teach pendant hardkeys) is less than 100%</p> <p style="text-align: center;">CONTINUE FORCE [STOP]</p> </div> <ul style="list-style-type: none"> • When "CONTINUE" is selected, the program continues to run. • When "FORCE" is selected, the program runs at an override of 100%. • When "STOP" is selected, the program does not start but stops.
Force condition	The program automatically runs at an override of 100%.

- Prog override < 100%

Condition	Action in the event of an error
Prompt if failure	<p>The prompt below appears.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p>Program override is less than 100%</p> <p>CONTINUE FORCE [STOP]</p> </div> <ul style="list-style-type: none"> • When "CONTINUE" is selected, the program continues to run. • When "FORCE" is selected, the program runs by setting \$MCR_GRP[].\$PRGOVERRIDE to 100. • When "STOP" is selected, the program does not start but stops.
Force condition	The program automatically runs by setting \$MCR_GRP[].\$PRGOVERRIDE to 100.
Post warning if forced	The program automatically runs by setting \$MCR_GRP[].\$PRGOVERRIDE to 100, and the message below appears. "SYST-088 Prog override forced to 100%"

- Machine lock

Condition	Action in the event of an error
Prompt if failure	<p>The prompt below appears.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p>Motion is disabled</p> <p>CONTINUE [STOP]</p> </div> <ul style="list-style-type: none"> • When "CONTINUE" is selected, the program starts with the warning below. "SYST-108 Machine lock ignored" • When "STOP" is selected, the program does not start but stops.
Force condition	
Post warning if forced	

- Single step

Condition	Action in the event of an error
Prompt if failure	<p>The prompt below appears.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p>Single step is enabled (set from STEP TP key)</p> <p>CONTINUE RECHECK [STOP]</p> </div> <ul style="list-style-type: none"> • When "CONTINUE" is selected, the program starts with the warning "SYST-109 Single step ignored". • When "RECHECK" is selected, the single step check is performed again, and in case of other than a single step, the program is started. • When "STOP" is selected, the program does not start but stops.
Force condition	A program start is made in the same way as when "CONTINUE" is selected and, at the same time, the single step is automatically canceled.
Post warning if forced	Single step is automatically canceled with the warning below, and the program start. "SYST-092 Single step forced off"

- Process ready

Condition	Action in the event of an error
Prompt if failure	<p>The prompt below appears.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p>Application process error. Please check process peripheral equipment.</p> <p style="text-align: center;">CONTINUE RECHECK [STOP]</p> </div> <ul style="list-style-type: none"> • When "CONTINUE" is selected, the program starts with the warning "SYST-110 Process ready ignored". • When "RECHECK" is selected, the process ready check is performed again, and if the conditions are met, the program is started. • When "STOP" is selected, the program does not start but stops.
Force condition	
Post warning if forced	

General settings

It is possible to make general settings for program selections and starts.

- Heartbeat timing :
Enables the user to specify the output cycle of the heartbeat signal for cell output. The heartbeat signal is an output signal that switches between ON and OFF at "n" millisecond intervals. PLC uses this signal to check that the robot is operating normally. This item specifies a heartbeat signal ON/OFF switching interval. An output signal can be allocated using the I/O cell output menu. If the timing is zero or if no input is allocated, the heartbeat signal is disabled.
- Low TEMP DRAM memory :
Enables the user to check the minimum temporary DRAM memory. If the memory is less than the minimum memory, a warning appears.
- Low PERM CMOS memory :
Enables the user to check the minimum permanent CMOS memory. If the memory is less than the minimum memory, a warning appears.

3.8.5 Cell Interface I/O

Cell interface I/O

Cell interface I/O signals are used for communication between the robot and the cell controller (PLC).

Cell interface input signals

Cell interface input signals are explained in Table 3.8.5 (a).

To configure cell interface I/O, use Procedure 3-11.

Table 3.8.5 (a) Cell interface input signals

input signal	Explanation
Tryout Mode (Effective to the material handling/gripper option only)	<p>This signal is to be allocated if tryout mode is used.</p> <p>The robot enters tryout mode under the conditions below.</p> <p>Signal = ON TP disabled \$shell_wrk.\$isol_mode = FALSE SI[REMOTE]=ON</p> <p>If the signal is allocated and TP is disabled, it is possible to change tryout mode from the soft panel.</p>