



WARNING



**INSTALLATION SHOULD ONLY BE
PERFORMED BY QUALIFIED INSTALLATION
PERSONNEL AND MUST CONFORM TO ALL
NATIONAL AND LOCAL CODES**





Hi5a Controller Function Manual

Program Reservation Execution





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Introduction



1. Introduction

Program Reservation Execution

1.1. About Program Reservation Execution Function

Program Reservation Execution function is the function to reserve the program to execute by external input signal and to execute the program by reserved order.

Hyundai robot controller supports two methods of Program Reservation Execution function. Learn the characteristics of each method and use the type depending on the working environment.

1.2. Application Example

1.2.1. Method by External Selection

When different types of workpieces continuously move through the conveyor, this function selects the program by the external program selection method, registers the information to the Program Reservation Execution registry and executes the reserved program in order.

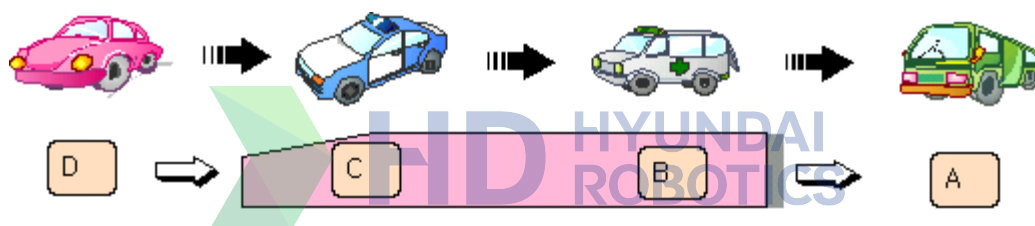


Figure 1.1 Method by external selection

The above picture shows the condition of executing program A and then program B and C registered in Program Reservation Execution register in order, and the condition of program D not registered yet.

1.2.2. Method of Internal Setting

If the button on the workstation is pressed when the target workpiece is programmed, the program number applicable to this input is registered to reserve execution register and the program will be executed in this order.

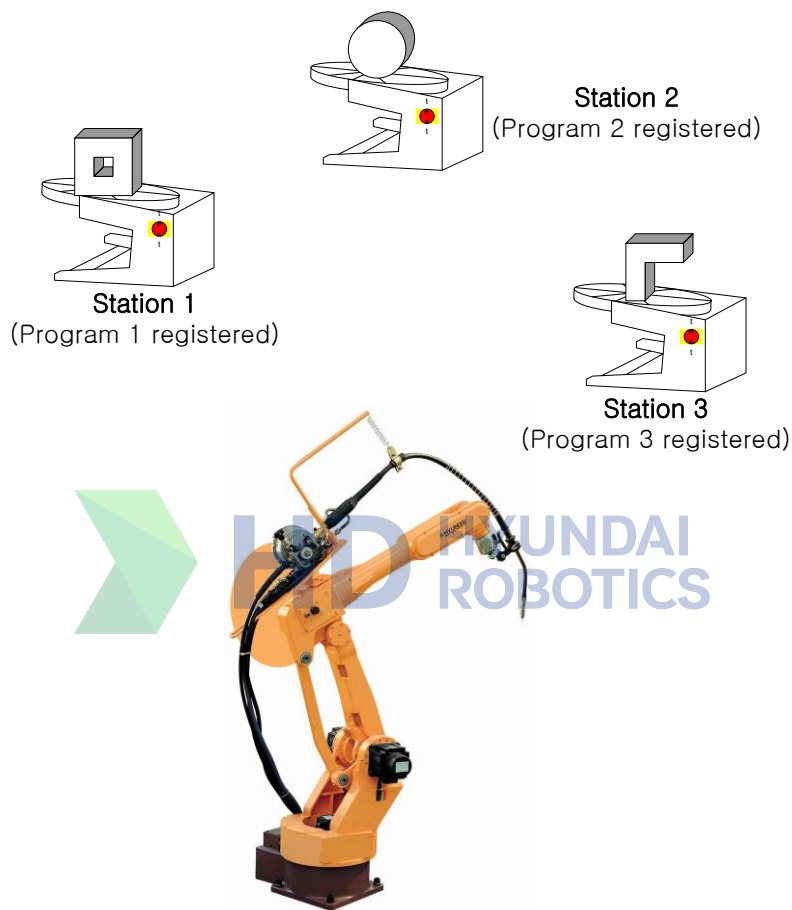


Figure 1.2 Method by internal setting

When each workpiece is set on 3 workstations as shown in the above figure, and the buttons on workstations 1, 2 and 3 are pressed, the programs 1, 2 and 3 are registered to the Program Reservation Execution Register.

When work no. 1 is ready, the operator presses the button (Input), and then presses the start button of the control panel to run program no. 1. With program no. 1 running, prepare work no. 2 and press the button (Input) to put program no. 2 in the program reservation register. Program no. 2 starts after the completion of program no. 1. If the button (Input) is pressed for program no. 2 after program no. 1 has completed execution, the start button must be pressed again





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User
Interface



2. User Interface

Program Reservation Execution

2.1. Program Reservation Execution Environment Setting

Set the reserved execution of programs in [/System/Control Parameters/Program Reserved Execution]

Record cond. 2009.12.01 [thu] MANUAL 08:17:34 AM

Reserved program execution

Apply register number = ☒ Disable ☐ 20EA ☐ 1EA

Program input type = ☐ Ext. sel ☒ Int. set

Equal program input = ☒ Delete ☐ Disable ☐ Enable

Station		Start in	Start out	Program
1.	=	0	0	0
2.	=	0	0	0
3.	=	0	0	0
4.	=	0	0	0
5.	=	0	0	0
6.	=	0	0	0
7.	=	0	0	0

Select the number of registers.

Complete

- Apply register number

① Disable – Program Reservation Execution function is not used.

② 20EA

Prepare 20 program reserved execution registers. Error code “E1047” is displayed if more than 20 programs are reserved

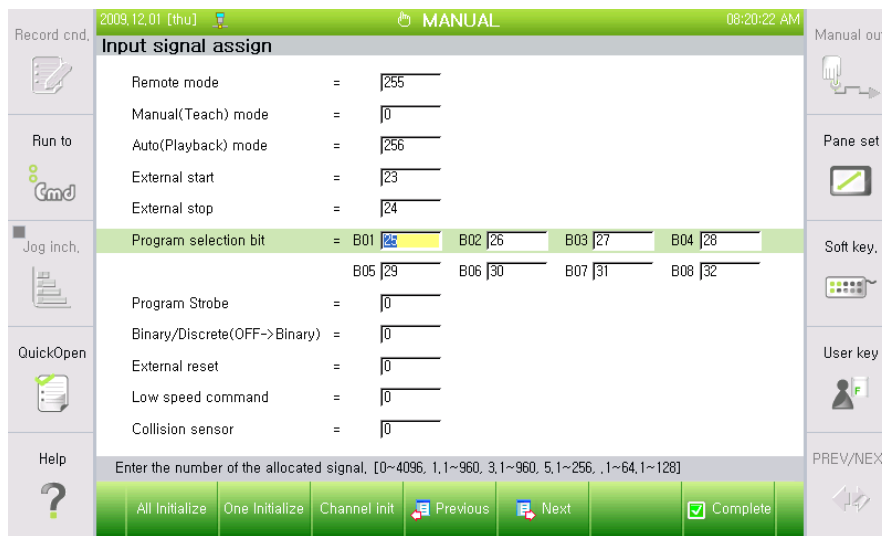
③ 1EA

Prepare 1 program reserved execution register. Only 1 program can be reserved. Thus, it cannot be used to make program reservations in situations requiring 2 or more works to be fed consecutively

- Program input type

① External selection

In External Selection - [/System/Control Parameters/Input & Output Signal Setting/Input Signal Assignment], register the inputted program in the program reserved execution register by using the “Program Selection Bit.”



- Assign the program strobe input signal in the picture above
- Assign the Binary/Discrete(OFF->Binary) input signal to select Binary or Discrete reception of an externally inputted program selection signal and use it according to the reception method
- In the reception method, the desired program number is generated after the program selection bit is read according to the Binary/Discrete(OFF->Binary) when the strobe signal is changed from Low to High. The program selection bit input signal must be activated 200 msec before the program strobe input signal
- To use the external selection mode, select "Yes" for "4. Use Program Strobe Signal" in [/System/1. User Environment]

- ① Internal setting – When the input signal and the applicable program are pre-designated by the user, and the input signal is turned on, the applicable program will be registered to the Program Reservation Execution Register
 - A total of 7 different work units are provided
 - "Process when Entering Same Program" menu is used only for internal settings
 - The input signal of the workbench can be used with the external start and stop buttons. It will be explained in detail in the input signal below

- Equal program input

When scheduling a program number in the program reserved execution register in the "Internal Settings" for the program input method, this function handles the reservation decision if the same program already exists in the register

- ① Delete - Condition for deleting the program number reserved in the register. It finds and deletes the first number among the identical reserved program numbers in the register. If deletion is executed, "Reserved program (No:xxx) will be deleted." is displayed on the screen
- ② Prohibit - Does not register the program if the same program is already reserved in the register. If deletion is executed, "Reserved program (No: xxx) will be deleted." is displayed on the screen
- ③ Allow - Puts a program in the register if it is empty

- Start In
 - ① Set the signal for each port of the I/O connector installed on the I/O board
 - ② If the external start and stop signals are not assigned in the Input Signal Assignment, press this input button to use the external start or stop command
 - External start : Execute external start simultaneously with program number reservation
 - External stop : Execute external stop if currently executing program is reserved
- Start out
 - ① Set the signal for each port of the output connector installed on the I/O board.
 - ② If a lamp is connected to the output signal, the light of the lamp changes as below until the program number is reserved in the register and executed
 - If the program number is not reserved, → Lamp is turned off
 - If the program number is reserved, → Lamp blinks
 - If the reserved program number is executing, → Lamp is turned on
 - If the reserved program number has completed execution, → Lamp is turned off
- Program

Set the work program of the applicable workstation.
“Reserved program number is not assigned.” is displayed on the screen when a program number has not been assigned



2.2. Program Reservation Execution Register

The program reserved execution register is used to check, modify, insert, or delete a reserved program, and can be found in [/Service/Register/Program Reservation Execution]. There is no special SAVE button for this register. Press ENTER key to save this register



- **Changing the program number**
To change the reserved program at the current position, enter a program number in the reservation register number field
- **Insert (F1)**
Press F1 and enter a program number to reserve a new program in the next position
- **Delete (F2)**
Position the cursor on the reserved program number to delete; press F2 to display Yes/No message box; and select Yes to delete the program number from the register

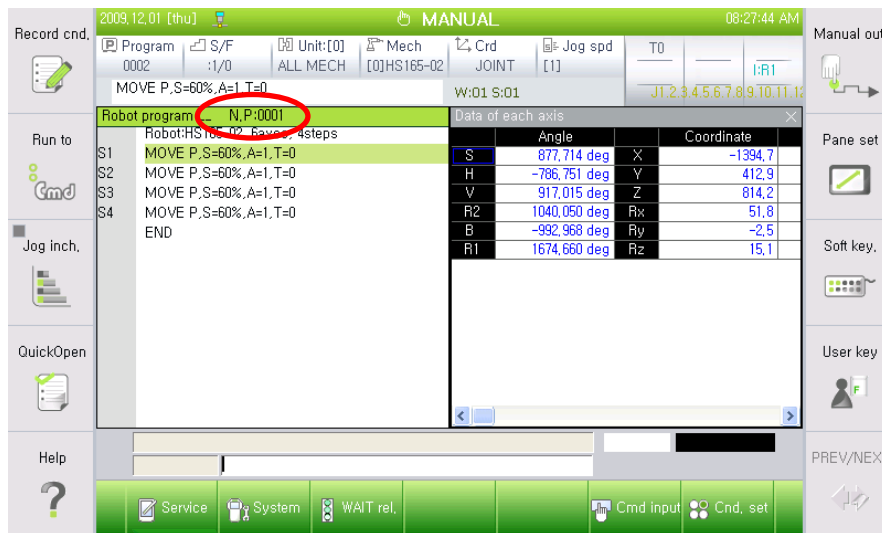


Reference

- It cannot be executed in remote mode.

2.3. Next program display

The next program to execute is displayed as “N.P:0001” in the Robot Program window in the following screen.



- ① N.P stands for Next Program, and it is displayed if the program reservation function is ON regardless of the operation mode
- ② This is the reserved program number to be executed next
- ③ If there is no reserved program number, “N.P:XXXX” is displayed

2.4. Program Reservation Condition External Check

2.4.1. External selection method

The following signal is output from [/System/Control Parameters/Input & Output Signal Setting/Output Signal Assignment]

- Display program number selected from program echo bit
 - Display program ACK for 200ms
- ① External reserved program number is synchronized with the “Program ACK” signal to send the Program Echo bit signal

2.4.2. Internal setting method

A blink signal is output according to the output signal set in [/System/Control Parameters/Program Reserved Execution]

- ① Refer to “Output Signal” of section 2.1 for an explanation on the method of checking the output signal







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Play



3. Play

Program Reservation Execution

3.1. Playback

3.1.1. Execution from step 0

When run button is pressed, the robot controller will execute the first program of the Program Reservation Execution Register. When the program is executed until the end and the end relay output time is set, it will stand by for the applicable time and then execute the next program registered to the Program Reservation Execution Register.

3.1.2. Execution from mid step

When the run button is pressed, the selected program is executed from the selected command. After the program is executed, the program registered in the Program Reservation Execution Register is executed.

3.1.3. Execution with no reserved program

When there is no registered program in the register and the run button is pressed, it will continue to be in standby mode until the program is registered in the Program Reservation Execution Register as shown in the following screen. When the program is registered in this condition, the program will be executed immediately.





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Error/Warning



4. Error/Warning

Program Reservation Execution

4.1. Error/Warning Message

- **Code** : E1047 Register exceeded 20
 - **Description** : You are trying to exceed the limit of 20 reservations that is set in [System/Control Parameters/Program Reserved Execution]
 - **Action** : Check the allowed number of reserved programs in [Service/Register/Program Reserved Execution]
-
-

- **Code** : W28302 program reservation can be registered only in remote mode
- **Description** : The program reservation registration mode is not in remote mode
- **Action** : Check the operation mode





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