WARNING

THE INSTALLATION SHALL BE MADE BY QUALIFIED INSTALLATION PERSONNEL AND SHOULD CONFORM TO ALL NATIONAL AND LOCAL CODES

Hyundai Robot

Hi4aFF071001FMEN3

Hi4a Controller Function Manual

FIFO

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1 Overview

1.1. About the FIFO function

FIFO(First In First Out) function is to reserve the program to execute by external input signal and it's the function to execute the program followed by the reserved order.

Hyundai robot controller supports the two ways of FIFO function. Use followed by wanted work environment after knowing fully about the feature of each method.

Refer the 1.3 application example part about the environment to apply, and you can select the application method 『[PF2]: System』 → 『1: User parameter』 → 『14: FIFO function』 → 『(2) Program』 at the manual mode.

1.2. Applicable example

1.2.1. FIFO Function by external selection

In the case of different works penetrate continuously followed by conveyor, each work that selects the program by external program selection and it's the execution function of the reserved program by the order after registering this at the FIFO register.

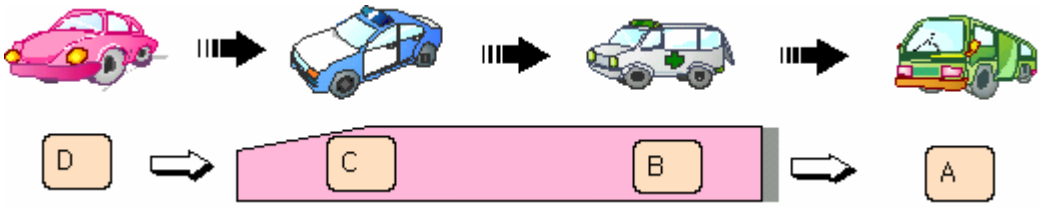


Fig. 1.1 FIFO function by external selection

Above diagram shows the executing condition of A program, B and C program show the registered condition at the FIFO register by the order, and D program shows the condition that is not registered yet.

1.2.2. FIFO function by internal selection

In the case of programming about the work of each work target, it executes the program followed by the order after registering this input corresponding program number at the FIFO register if the button above the work station is pressed.

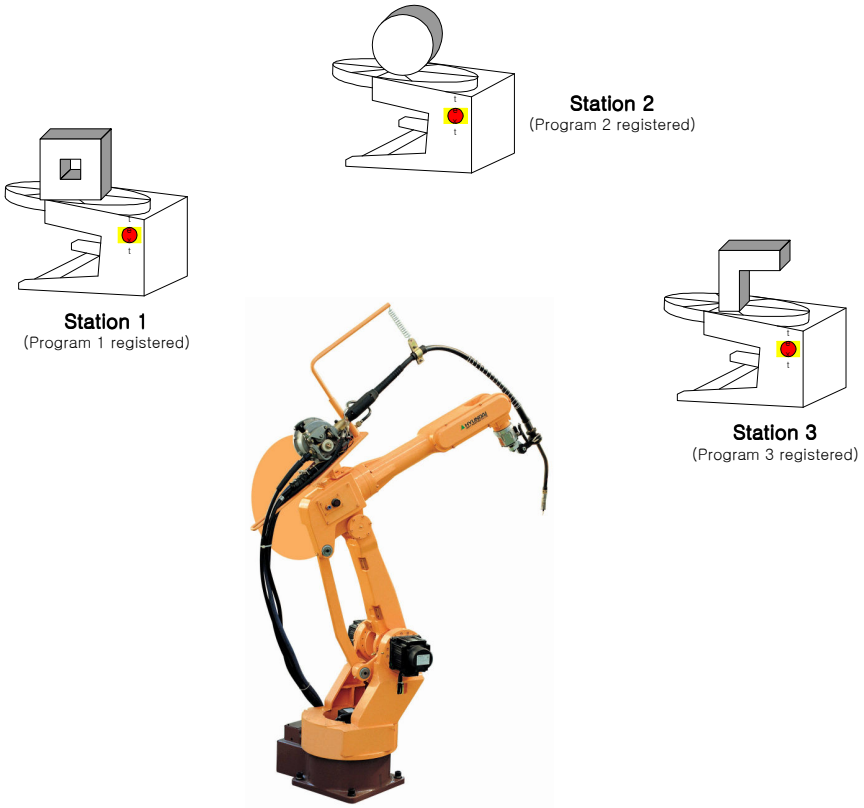


Fig. 1.2 FIFO function by internal selection

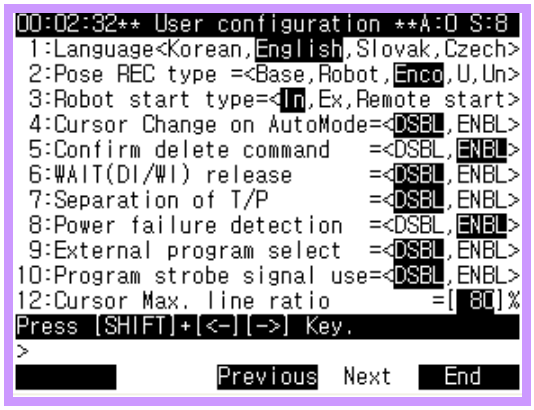
In the case of that different work is put on each of 3 work stations like the above diagram, corresponding number 1, 2 ,3 program is registered at the FIFO register when inputting the button above work station number 1, 2, and 3.

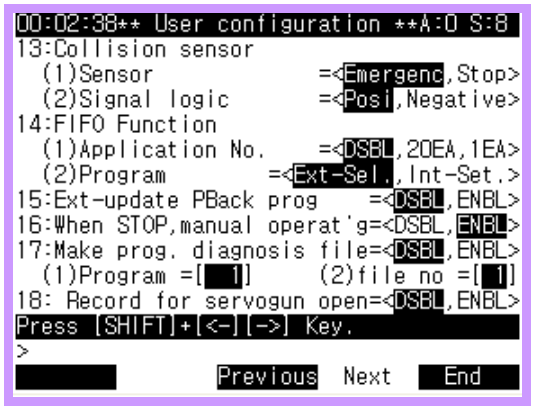
If work number 1 is ready, program number 1 executes by pressing the starting button of operation panel after pressing the button. Also, program number 2 executes when work number 2 is ready and press the button after completing the execution of program number.

2 Preparatory Items

2.1. Common factors

The environment for using FIFO function is setup at『[PF2]: System』 → 『1: User parameter』 → 『14: FIFO function』.





- Application No.

  ① <DSBL> - It doesn't use the FIFO function.

  ② <20 EA>
  Register the FIFO register as preparing 20 each. If you register over 20 each, the error "E1-47 FIFO register exceeds 20 each" occurs.

  ③ <1 EA>
  Prepare 1 each of FIFO register and register only 1 each of the program. So, the register changes the new program when registering other programs follwed by executing registered program at the register.

- Program

  ① Ext-Sel
  It registers at the FIFO register selecting the program by allocated input signal to the external program selection Bit.: FIFO function by the external selection

  ② Int-Set
  It registers at the FIFO register that is corresponding to the program when input signal is ON as input signal and corresponding program that user has been set up already. : FIFO function by internal setup

2.2. FIFO function by external selection

2.2.1. Setup for Application

Application program sets up at 『[PF2]: System』 → 『1: User parameter』.

- Select 『9: External program select』 as <ENBL>.
- Select 『10: Program strobe signal use』 as <ENBL>.
- Select 『14: FIFO function』 → 『(1) Application No.』 as <20 EA> or <1EA>.
- Select 『14: FIFO function』 → 『(2) Program』as <Ext-Sel>.

2.2.2. Alposition of input signal

Input signal executes at 『[PF2]: System』 → 『2: Controller parameter』 → 『7: Assign input signals』.

(1) Prog. selection bit
It decides the program number by input condition of signal.

(2) Program strobe
When inputting the signal, it registers the selected program number at the FIFO register.

(3) Binary/Discrete(OFF→Binary)
When deciding the program number to the program selection Bit, it selects whether it decides the Binary or Discrete.

2.2.3. Alposition of output signal

(1) Program echo bit
After registering the program at FIFO register, you can confirm the selected program by outputting the signal using allocated number.

(2) Program acknowledgement
After registering the program at FIFO register, it outpus the reserved condition to the puls signal of 200ms.

2.3. FIFO function by internal setup

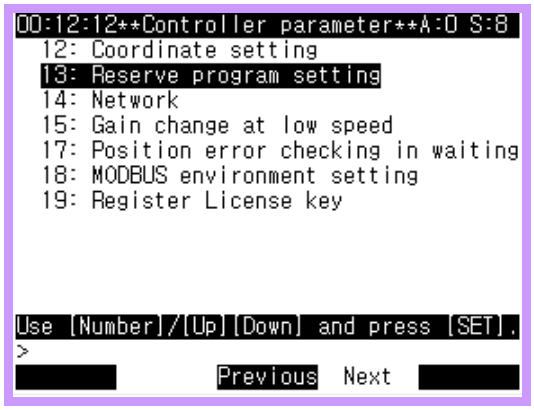
2.3.1. Setup for application

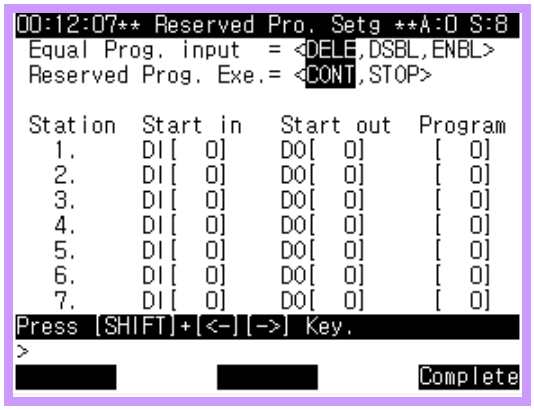
Set the application environment at『[PF2]: System』 → 『1: User parameter』.

- Select 『9: External program select』 as <ENBL>.
- Select 『14: FIFO function』 → 『(1) Application No.』 as <20 EA> or<1 EA>.
- Select 『14: FIFO function』 → 『(2) Program』 as <Int-Set>.

2.3.2. Program reservation setup

It's the allocated function of environmental setup, input signal, output signal and program that is needed for the application of FIFO function.
Select 『[PF2]: System』 → 『2: Controller parameter』 → 『13: Reserve program setting』 from the manual mode.





- Equal Prog. Input

  Decide management when registering the program at FIFO register and when the program already exists at the register.

  ① <DELE> - It deletes the program that is already registered.
  ② <DSBL> - It doesn't register.
  ③ <ENBL> - It registers.

- Reserved prog. Exe.

  The execution method is decided when executing the program that is registered at the register.

  ① <CONT> - Execute the registered program continuously.
  ② <STOP> - Stop after executing one of the registered program.

- Start in

  It sets up the signal about the each port of input connector that is affixed on I/O board.

- Start out

  The signal about the each port of output connector that is affixed on I/O board sets up.

- Program

  It sets the work program of corresponging work station.

3
Program Reservation

3.1. FIFO function by external selection

3.1.1. Confirmation of program registration

From the『Output signal assigning』menu, output the selected program number as the allocated port to the program eco bit and output the signal for 200ms as allocated port of program ACK.

3.1.2. Timing diagram

It shows the timing diagram until following program number that is decided by the selection signal and program strobe signal reserves at the FIFO register. When you apply the FIFO function by external selection, you must keep the following timing diagram.

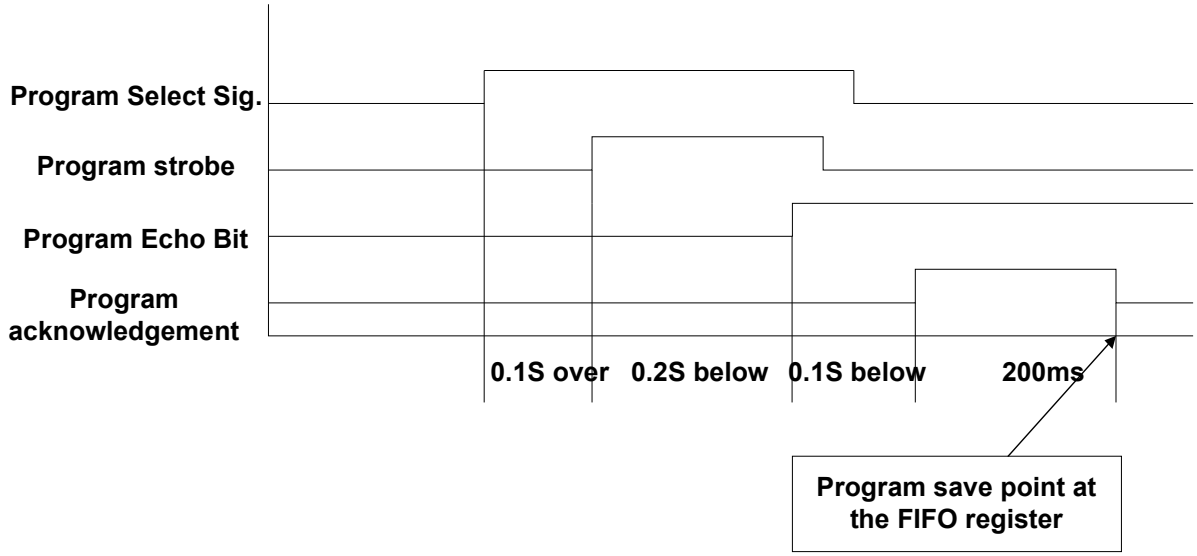


Fig. 3.1 Timing Diagram

3.2. FIFO function by internal setup

3.2.1. Confirmation of program registration

Blinking signal will output as allocated output signal from 『[PF2]: System』 → 『2: Controller parameter』 → 『13: Reserve program setting』.

Reference

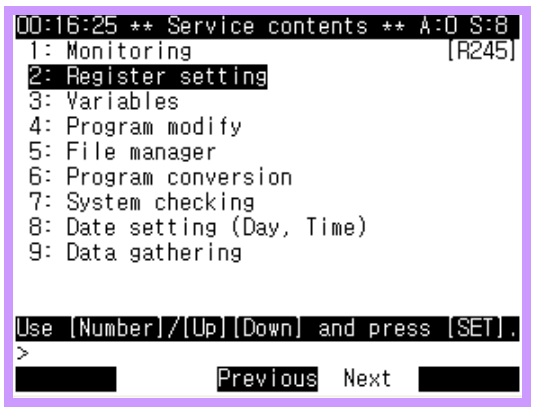
When the program registration button and output signal ramp are connected to the input signal, next change occurs on ramp until it executes after registering at the FIFO register.

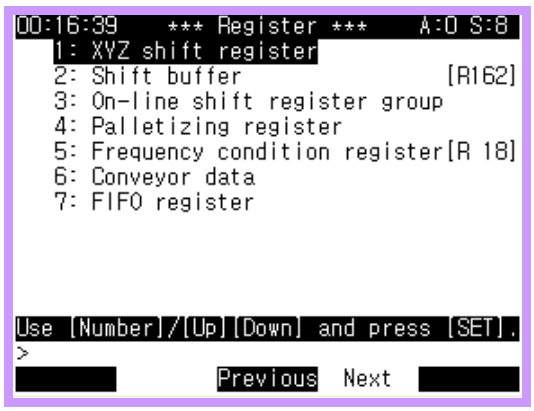
① Program is not registered → Ramp blackout
② Program registration by program registration button → Ramp blinking
③ While registered program executes → Ramp lighting
④ Execution of registered program completed → Ramp blackout

4

FIFO Registration

FIFO register is the function to confirm, change, insert or delete the registered program and it's prepared at『[PF1]: Service』 → 『2: Register』.





4.1. Change of registered program

(1) In order to change the registered program, the cursor moves to the position you want to change using [Direction] key.

(2) Press the [SET] key after inputting the number of program.

4.2. Manual registration of program

(1) Move the cursor to the place you want using the [Direction] key.

(2) After pressing the『[PF1]: Insert』key, press the [SET] key after inputting the program number according to the guidance message.

(3) If the guidance message『Insert next of the current position [Y/N]』shows up, register the program at the place you want by [YES] or [NO] key.

4.3. Deletion of registered program

(1) Move the cursor to the position of program to be deleted.

(2) If you press the『[PF2]: Delete』key, the guidance message 『Delete selected register?[YES(ALL=1)/NO]』 indicates.

(3) If you press the [YES] key, the program that has current cursor will be deleted but it won't be deleted if you press the [NO] key. Also, registered entire program can delete at once if you press the [1] key.

5 Program Execution

5.1. Execute at step 0

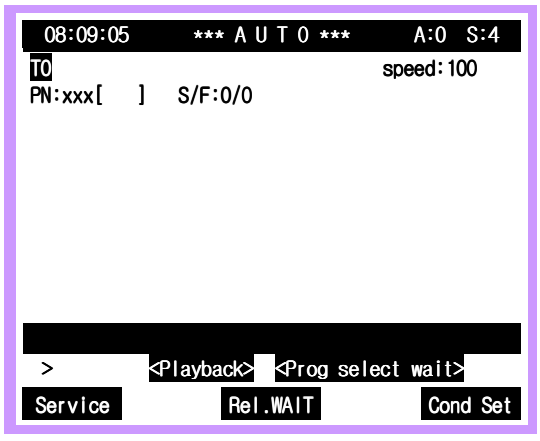
When inputting the starting button, the robot controller execute the first program of FIFO register. After executing until the program END, the next program that is registered at the FIFO register executes fter wating of corresponding time if the END relay output time is set up.

5.2. Execute at mid-step

When inputting the starting button , it executes from the selected instruction of selected program. After finishing the execution of this program, program that is registered at the FIFO register executes.

5.3. Execute when there is no registered program at the register

When the program that is registered at the register doesn't exist, it waits until the program registers at the FIFO register like the next screen if you input the starting button. If the program registers in here, the program executes at the same time.



While waiting until reserving the program, moving ramp of controller manufacture panel blinks and moving ramp lights when executing the program by registering the program.

6
Error

E1331 : Confirm external program select
『14: FIFO function』 → 『(1) Application No.』sets up as enable but『9: External program select』 occurs if the program executes in the <DSBL> condition.

E1332 : Confirm program strobe signal use
『14: FIFO function』 → 『(1) Application No.』 is enable, 『(2) Program』 is setup as <Ext-Sel>. It occurs if you execute the program in the condition of <DSBL> as the 『Program strobe signal use』.

E1335 : Cannot use continue play at FIFO
It occurs when executing the program during the set up condition of 『[PF5]: Cond Set』 → 『1: Cycle type』as <Continuous>

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