

TECHNICAL BULLETIN

[Issue No.] T40-0005

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[Title] Guidelines for online module change (hot swapping)

[Date of Issue] July, '04

[Relevant Models] MELSEC-Q series (Process CPU, Redundant CPU)

Thank you for your continued support of Mitsubishi programmable logic controllers, MELSEC-Q series.

This technical bulletin provides guidelines for connecting to external devices and handling the external power supply during online module change, i.e., replacing a module online (while the CPU is running).

Replace a module online by following these guidelines in order to prevent an electric shock and malfunctions of running modules.

1. CPU modules that support online module change

Online module change can be carried out on the system that includes CPU modules or MELSECNET/H remote I/O modules listed in Table 1.1.

(For details, refer to the manual of the corresponding CPU module or MELSECNET/H remote I/O network.)

Table 1.1 CPU modules that support online module change

Type	Product	Model
MELSEC-Q series	Process CPU	Q12PHCPU, Q25PHCPU
	Redundant CPU	Q12PRHCPU, Q25PRHCPU
	MELSECNET/H remote I/O module	QJ72LP25, QJ72BR15 and other models (Function version D or later)

2. Target modules of online module change

The following modules can be replaced online.

Table 2.1 Target modules of online module change

Module type	Remarks	
Input module	No restrictions	
Output module		
I/O mixed module		
Intelligent function module	Analog-Digital converter module	Limited to function version C
	Digital-Analog converter module	
	Temperature input module	
	Temperature control module	
	Pulse input module	

For details including replacement procedure, refer to the manual of the corresponding intelligent function module.

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3. Precautions for online module change

- (1) Provide a separate switch or alternative means that cuts off the external power supply of the target module, in order to prevent an electric shock or malfunctions of running modules.
- (2) Perform online module change on the actual system during test run, in order to confirm that it will not affect the modules other than the replacement target by checking the following points in advance.
 - The means (including structure) for cutting off the connection with external devices is correctly provided.
 - Modules other than replacement target are not affected by the switch operation of ON/OFF.
- (3) Confirm that online module change will not cause the system connected to the PLC to malfunction.

For details of online module change, refer to the manual of the corresponding CPU module or MELSECNET/H remote I/O network.

4. Online module change procedure

Online module change procedure for I/O module is provided here.

For intelligent function module, refer to the corresponding intelligent function module manual.

START

GX Developer Settings 1

- 1) Go to [Diagnostics] → [Online module change].
- 2) "System Monitor" screen appears.
- 3) Select "Online module change" at the "Mode" section.
- 4) Double-click the module to be replaced online.

The screenshot shows the 'System Monitor' window in GX Developer. It contains two tables: 'Installed status' and 'Parameter status'. The 'Installed status' table has columns for modules 0-4, with 'Q288CPU' installed in slot 0. The 'Parameter status' table has columns for I/O addresses 0-50, with 'Q288CPU' parameters listed. On the right, the 'Mode' section has radio buttons for 'System monitor' and 'Online module change', with the latter selected. A black arrow points to the 'Online module change' option. Below the tables is a 'Status' legend with color-coded boxes for 'Module system error', 'Module error', 'Module warning', and 'Module change'. Buttons for 'Start monitor', 'Stop monitor', 'Start control', and 'Stop control' are at the bottom.

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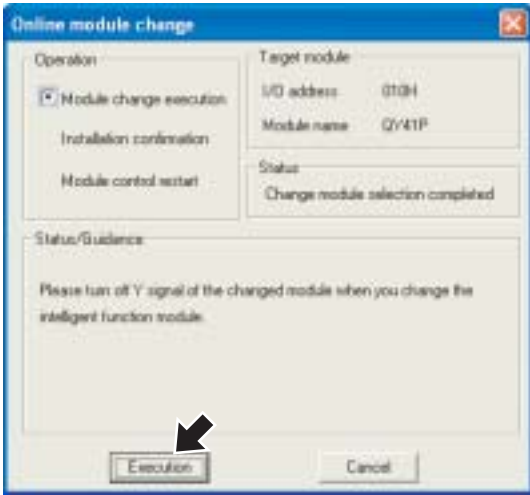
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GX Developer Settings 2

- 1) "Online module change" screen appears.
- 2) Click "Execution" button to enable online module change.



Cutting off the connection with external devices and external power supply

- 1) Cut off the connection with external devices (module I/O signals) using the switch or other means.
- 2) Turn off the switch of external power supply for the module to cut off the power supply.

Mounting and removing the module

- 1) Disconnect the terminal block or connector from the module.
- 2) Remove the module.
- 3) Mount a new module on the same slot.
- 4) Connect the terminal block or connector to the new module.

Re-connecting to external devices and resuming the external power supply

- 1) Turn on the switch of external power supply for the module to resume the power supply.
- 2) Make a connection with external devices (module I/O signals) using the switch or other means.

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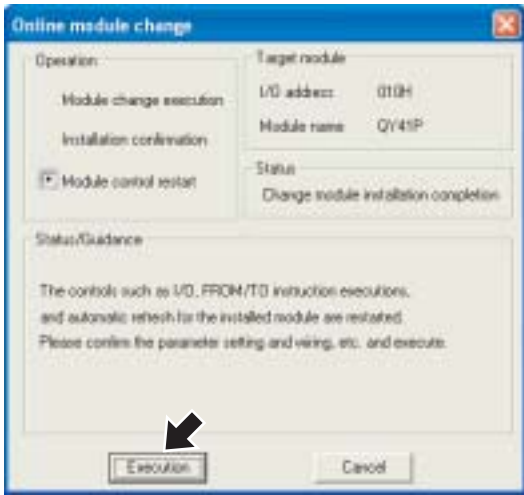
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GX Developer Settings 3

1) Mount the module, and click “Execution” button to resume the control.



2) A screen appears that shows the online module change completed.



Completed