

MITSUBISHI

Positioning Module

User's Manual
(Hardware)

QD75M1

QD75M2

QD75M4

Thank you for buying the Positioning Module.

Prior to use, please read both this manual and detailed manual thoroughly and familiarize yourself with the product.

MELSEC-Q

Mitsubishi Programmable
Logic Controller

• SAFETY INSTRUCTIONS •

(Always read these instructions before using this equipment.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.

The instructions given in this manual are concerned with this product. For the safety instructions of the programmable controller system, please read CPU module User's Manual.

In this manual, the safety instructions are ranked as "DANGER" and "CAUTION".




DANGER

Indicates that incorrect handling may cause hazardous conditions resulting in death or severe injury.



CAUTION

Indicates that incorrect handling may cause hazardous conditions resulting in medium or slight personal injury or physical damage.

Note that the CAUTION level may lead to a serious consequence according to the circumstances. Always follow the instructions of both levels because they are important to personal safety.

Please store this manual in a safe place and make it accessible when required. Always forward it to the end user.

[INSTALLATION PRECAUTION]

CAUTION

- Use the PLC within the general specifications environment given in the CPU module User's Manual to use.
Using this PLC in an environment outside the range of the general specifications may cause electric shock, fire, malfunction, and damage to or deterioration of the product.
- While pressing the installation lever located at the bottom of module, insert the module fixing tab into the fixing hole in the base unit until it stops. Then, securely mount the module with the fixing hole as a supporting point.
Incorrect loading of the module can cause a malfunction, failure or drop.
When using the module in the environment of much vibration, tighten the module with a screw. Tighten the screws within the specified torque range.
Undertightening can cause a drop, short circuit or malfunction.
Overtightening can cause a drop, short circuit or malfunction due to damage to the screws or module.
- Completely turn off the externally supplied power used in the system before installing or removing the module. Not doing so may damage the product.
- Do not directly touch the module's conductive parts and electronic components of the module.
Touching the conductive parts and electronic components of the module could cause an operation failure or give damage to the module.

[WIRING PRECAUTION]

DANGER

- Completely turn off the externally supplied power used in the system before installing or placing wiring.
Not doing so may cause electric shock or damage to the product.

CAUTION

- Check the layout of the terminals and then properly route the wires to the module.
- Solder connectors for external input signal cable and SSCNET cable properly.
Insufficient soldering may cause malfunction.
- Be careful not to let foreign matter such as sawdust or wire chips get inside the module.
These may cause fires, failure or malfunction.
- The top surface of the module is covered with protective film to prevent foreign objects such as cable offcuts from entering the module when wiring.
Do not remove this film until the wiring is complete.
Before operating the system, be sure to remove the film to provide adequate ventilation.
- Securely connect the connector for the SSCNET cable to the bottom connector on the module.
- When removing the cable or power supply cable from the module, do not pull the cable. When removing the cable with a connector, hold the connector on the side that is connected to the module.
Pulling the cable that is still connected to the module may cause malfunction or damage to the module or cable.
- The cable used for connecting the QD75 external input signal and SSCNET cable should not be routed near or bundled with the main circuit cable, power cable and/or other such load-carrying cables other than those for the PLC. These cables should be separated by at least 100 mm (3.94 in.). They can cause electrical interference, surges and inductance that can lead to misoperation.

REVISIONS

Print Date	* Manual Number	Revision
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Apr., 2004	IB (NA) 0300031-B	Partial corrections and additions Chapter 1, Chapter 2, Chapter 4, Chapter 5
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About Manuals

There are following manuals for this product.

If it is required, please make this table reference and request it.

Relevant Manuals

Manual Name	Manual Number (Model Code)
Type QD75M Positioning Module User's Manual(Details)	IB-030062 (1XB752)
GX Configurator-QP Version2 Operating Manual	SH-080172 (13JU19)

Conformation to the EMC Directive and Low Voltage Instruction

For details on making Mitsubishi PLC conform to the EMC directive instruction when installing it in your product, please refer to Chapter 3, "EMC Directive and Low Voltage Instruction" of the using PLC CPU module User's Manual(Hardware).

The CE logo is printed on the rating plate on the main body of the PLC that conforms to the EMC directive instruction.

For the other EMC Directive guidelines on the servo amplifier and the servo motor, refer to the "EMC INSTALLATION GUIDELINES" (IB(NA)-67303).

1. Overview

This manual explains how to handle the Positioning Module, model numbers QD75M1, QD75M2, QD75M4 (hereinafter collectively referred to as the QD75).

After unpacking the QD75, please verify that the corresponding product as listed below is enclosed in the package.

Model name	Description	Quantity
QD75M1	QD75M1 Positioning Module (Single-axis SSCNET type)	1
QD75M2	QD75M2 Positioning Module (Dual-axis SSCNET type)	1
QD75M4	QD75M4 Positioning Module (Four-axis SSCNET type)	1

Important

The user should arrange for a connector for external input signal cable and SSCNET cable since it is not provided in the package.

* Connector type

- A6CON1 (Soldering type)
- A6CON2 (Crimp-contact type)
- A6CON3 (Pressure-displacement type)
- A6CON4 (Soldering type, useable for straight out and diagonal out)

* A6CON2 Crimp-contact tool

- Model name: FCN-363T- Supplier's offices :
- Model name: FCN-363T-T005/H

* A6CON3 Pressure-displacement tool

- Model name: FCN-367T-T012/H (Locator Plate)
: FCN-707T-T001/H (Cable Cutter)
: FCN-707T-T101/H (Hand Press)

• Supplier's offices :

- FUJITSU COMPONENTS AMERICA, INC 250E Caribbean Drive Sunnyvale, CA 94089
U. S. A
Tel: (1-408) 745-4900
- FUJITSU COMPONENTS EUROPE B.V. Diamantlaan 25, 2132 WV Hoofddorp, The Netherlands
Tel : (31) 23-5560910
- FUJITSU COMPONENTS ASIA PTE LTD 102E Pasir Panjang Road, # 04-01 Citilink Warehouse Complex, Singapore
118529
Tel: (1-408) 745-4900
- FUJITSU COMPONENTS HONG KONG CO., LTD. Suite 913 Ocean Centre, 5 Canton Road. TST,
Kowloon, Hong Kong
Tel: (852) 2881-8495
- FUJITSU ELECTRONIC COMPONENTS (SHANGHAI) CO., LTD. Rm 3105, Bund Center, 222 Yan An Rd(E), Shanghai, 200002
Tel: (86) 21-6335-2560

* SSCNET Connector type

- MR-J2CN1 (Soldering type)

2. Specifications

(1) The specifications for the QD75M1, QD75M2 and QD75M4

Item	Specification		
	QD75M1	QD75M2	QD75M4
Number of axes (axis)	1	2	4
SSCNET cable	MR-J2HBUS□M (Note-1)	<ul style="list-style-type: none"> For connection of QD75M and MR-J2-B/MR-J2S-B/ MR-J2-Jr/MR-J2M-B. For connection of MR-J2-B/MR-J2S-B/MR-J2- Jr/ MR-J2M-B and MR-J2-B/MR-J2S-B/MR-J2- Jr/ MR-J2M-B. (0.5m (1.64ft.), 1m (3.28ft.), 5m (16.4ft.)) MR-J2CN1 : connector set (sold separately) 	
	MR-J2HBUS□M-A (Note-1)	<ul style="list-style-type: none"> For connection of QD75M/MR-J2-B/MR-J2S-B/ MR-J2-Jr/MR-J2M-B and MR-H-BN/MR-H-BN4. (0.5m (1.64ft.), 1m (3.28ft.), 5m (16.4ft.)) MR-J2CN1-A : connector set (sold separately) 	
	MR-HBUS□M (Note-1)	<ul style="list-style-type: none"> For connection of MR-H-BN/MR-H-BN4 and MR-H-BN/MR-H-BN4. (0.5m (1.64ft.), 1m (3.28ft.), 5m (16.4ft.)) MR-HBCNS : connector set (sold separately) 	
SSCNET cable over all length (m (ft.))	30 (98.43)		
Applicable wire size	0.3 mm ² (when A6CON1/A6CON4 is used), AWG#24 to 28 (when A6CON2 is used), AWG#28 (twisted) or AWG#30 (single wire) (when A6CON3 is used)		
Applicable connector	A6CON1, A6CON2, A6CON3, A6CON4 (sold separately)		
No. of I/O occupied points (points)	32 (I/O assignment: Intelligent function module 32 points)		
Internal current consumption (5VDC) (A)	0.40	0.40	0.40
External dimensions (mm (inch))	98 (3.86) (H) × 27.4 (1.08) (W) × 90 (3.54) (D)		
Weight (kg (lb.))	0.15 (0.33)	0.15 (0.33)	0.16 (0.35)

(Note-1) : □ = Cable length

(05: 0.5m (1.64ft.), 1: 1m (3.28ft.), 5: 5m (16.40ft.))

(Note-2) : For the general specifications of the QD75MH, see the "User's Manual for the CPU module used".

3. Handling

CAUTION

- Use the PLC within the general specifications environment given in the CPU module User's Manual to use.

Using the PLC outside the general specification range environment could lead to electric shocks, fires, malfunctioning, product damage or deterioration.

- While pressing the installation lever located at the bottom of module, insert the module fixing tab into the fixing hole in the base unit until it stops. Then, securely mount the module with the fixing hole as a supporting point.

Incorrect loading of the module can cause a malfunction, failure or drop.

When using the module in the environment of much vibration, tighten the module with a screw.

Tighten the screws within the specified torque range.

Undertightening can cause a drop, short circuit or malfunction.

Overtightening can cause a drop, short circuit or malfunction due to damage to the screws or module.

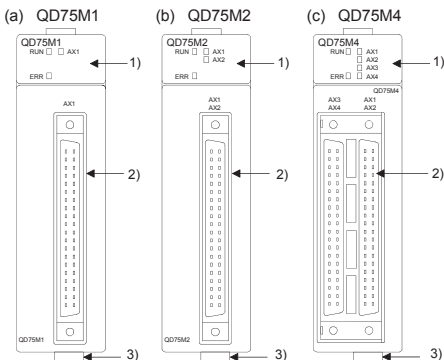
- Completely turn off the externally supplied power used in the system before installing or removing the module. Not doing so may damage the product.
- Do not directly touch the module's conductive parts and electronic components of the module. Touching the conductive parts and electronic components of the module could cause an operation failure or give damage to the module.

3.1 Handling Precautions

- (1) Since the module case is made of resin, do not drop it or subject it to strong impact.
- (2) The module can easily be secured to the base unit using the hooks located at the top of the module. However, if the module is to be placed in an area that is subject to strong vibration or impact, we recommend that it is secured with module mounting screws (to be provided by the user). In this case, tighten the module mounting screws within the following torque range.
Module mounting screws (M3 × 12): Tightening torque range is from 0.36 to 0.48 (N·m).

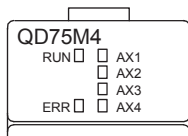
4. Names of Each Part

(1) Names of each part



No.	Name	No.	Name
1)	LED display	3)	SSCNET cable connector
2)	External input signal cable connector		

(2) Contents of LED display



LED name	Contents of display
RUN	On: Operating normally Off: Hardware error/watch dog error occurrence
AX1	On: Axis 1 is operating Flashing: Axis 1 error Off: Axis 1 is stopped
AX2	On: Axis 2 is operating Flashing: Axis 2 error Off: Axis 2 is stopped
AX3	On: Axis 3 is operating Flashing: Axis 3 error Off: Axis 3 is stopped
AX4	On: Axis 4 is operating Flashing: Axis 4 error Off: Axis 4 is stopped
ERR	On: System error occurrence Flashing: Axis error Off: Normal

All LED on the QD75 may be ON when there is an error in the QD75 hardware.

(3) Signal layout for external device connection connector

Pin layout	Axis 4 (AX4)		Axis 3 (AX3)		Axis 2 (AX2)		Axis 1 (AX1)		
	Pin No.	Signal name	Pin No.	Signal name	Pin No.	Signal name	Pin No.	Signal name	
	A20	2B20	No connect	2A20	No connect	1B20	PULSER B-	1A20	PULSER B+
	A19	2B19	No connect	2A19	No connect	1B19	PULSER A-	1A19	PULSER A+
	A18	2B18	No connect	2A18	No connect	1B18	No connect	1A18	No connect
	A17	2B17	No connect	2A17	No connect	1B17	No connect	1A17	No connect
	A16	2B16	No connect	2A16	No connect	1B16	No connect	1A16	No connect
	A15	2B15	No connect	2A15	No connect	1B15	No connect	1A15	No connect
	A14	2B14	No connect	2A14	No connect	1B14	No connect	1A14	No connect
	A13	2B13	No connect	2A13	No connect	1B13	No connect	1A13	No connect
	A12	2B12	No connect	2A12	No connect	1B12	No connect	1A12	No connect
	A11	2B11	No connect	2A11	No connect	1B11	No connect	1A11	No connect
	A10	2B10	No connect	2A10	No connect	1B10	No connect	1A10	No connect
	A9	2B9	No connect	2A9	No connect	1B9	No connect	1A9	No connect
	A8	2B8	No connect	2A8	No connect	1B8	No connect	1A8	No connect
	A7	2B7	COM	2A7	COM	1B7	COM	1A7	COM
	A6	2B6	COM	2A6	COM	1B6	COM	1A6	COM
	A5	2B5	CHG	2A5	CHG	1B5	CHG	1A5	CHG
	A4	2B4	STOP	2A4	STOP	1B4	STOP	1A4	STOP
	A3	2B3	DOG	2A3	DOG	1B3	DOG	1A3	DOG
A2	2B2	RLS	2A2	RLS	1B2	RLS	1A2	RLS	
A1	2B1	FLS	2A1	FLS	1B1	FLS	1A1	FLS	

(Note-1): Pin No. "1□□□" indicates the pin No. "2□□□" indicates the pin No. for the left connector.

(Note-2): When a 1-axis module is used, pin Nos. 1B1 to 1B18 are "No connect".

(Note-3): For 1-axis module and 2-axis module do not have AX3 and AX4 connector of the left side.

5. Wiring

DANGER

- Completely turn off the externally supplied power used in the system before installing or placing wiring.
Not doing so may cause electric shock or damage to the product.

CAUTION

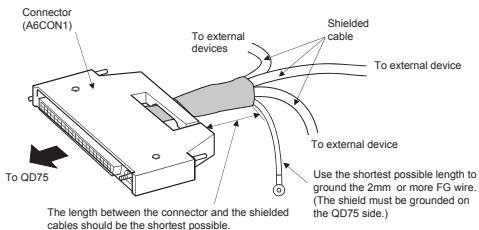
- Check the layout of the terminals and then properly route the wires to the module.
- Solder connectors for external input signal cable and SSCNET cable device properly.
Insufficient soldering may cause malfunction.
- Be careful not to let foreign matter such as sawdust or wire chips get inside the module.
These may cause fires, failure or malfunction.
- The top surface of the module is covered with protective film to prevent foreign objects such as cable off cuts from entering the module when wiring.
Do not remove this film until the wiring is complete.
Before operating the system, be sure to remove the film to provide adequate ventilation.
- Securely connect the connector for the SSCNET cable to the bottom connector on the module.
- When removing the cable or power supply cable from the module, do not pull the cable. When removing the cable with a connector, hold the connector on the side that is connected to the module.
Pulling the cable that is still connected to the module may cause malfunction or damage to the module or cable.
- The cable used for connecting the QD75 external input signal cable and SSCNET cable should not be routed near or bundled with the main circuit cable, power cable and/or other such load-carrying cables other than those for the PLC. These cables should be separated by at least 100 mm (3.94 in.). They can cause electrical interference, surges and inductance that can lead to mis-operation.

5.1 Wiring Precautions

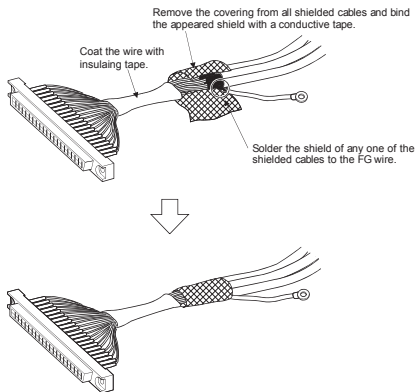
- (1) Use separate cables for connecting to the QD75 and for the power cable that create surge and inductance.
- (2) The cable for connecting QD75 can be placed in the duct or secured in place by clamps. If the cable is not placed in the duct or secured by clamps, unevenness or movement of the cable or careless pulling on it could result in damage to the unit or cable or defective cable connections could cause mis-operation of the unit.
- (3) If a duct is being used and cables to connect to QD75 are separated from the power line duct, use metal piping. Ground the pipes securely after metal piping.
- (4) The cable is to use the twisted pair shielded cable (wire size 0.3 mm^2). The shielded must be grounded on the QD75 side. (The following figure shows a wiring example.)

[Wiring example of shielded cable]

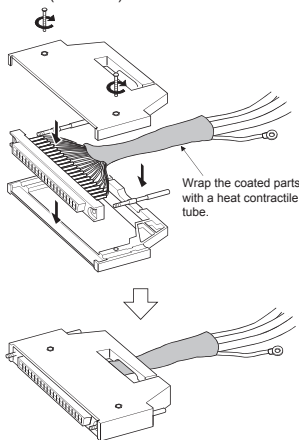
The following shows a wiring example for noise reduction in the case where the connector (A6CON1) is used.



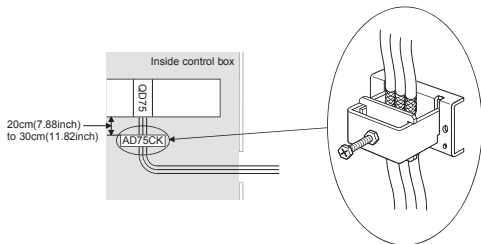
[Processing example of shielded cables]
Connections of FG wire and each shielded cable



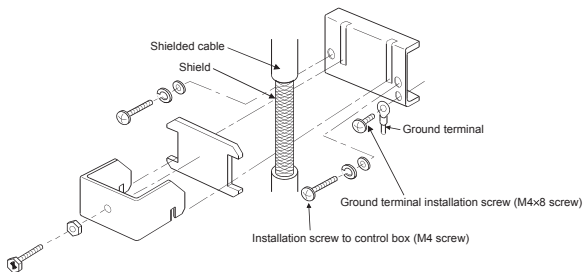
Assembling of connector (A6CON1)



- (5) To make this product conform to the EMC directive and low voltage instruction, be sure to use of a AD75CK type cable clamp (manufactured by Mitsubishi Electric) for grounding connected to the control box and the shielded cable/ the SSCNET cable.



[How to ground shielded cable using AD75CK]



Using the AD75CK, you can tie four cables of about 7mm outside diameter together for grounding.

5.2 SSCNET Cable Precautions

If the duct is below the bottom of the module, leave sufficient clearance to eliminate effects on the SSCNET cable, limit the space height to 70 mm (28.6 inch) MIN.

5.3 External Interface

The outline diagrams of the internal circuits for the QD75M1 external device connection interface are shown below.

(1) Input

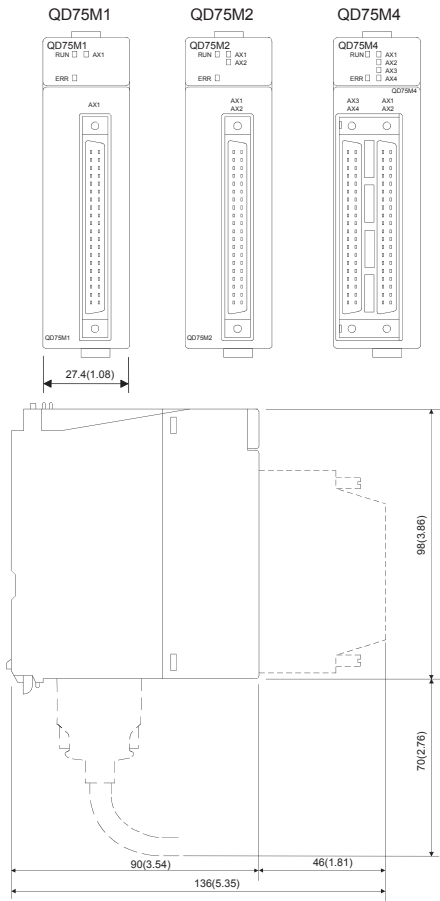
External wiring	Pin No.	Internal circuit	Signal name		Need for wiring (Note-1)	
	1A1		Upper-limit LS signal	FLS	○	
	1A2		Lower-limit LS signal	RLS	○	
	1A3		Near-point dog signal	DOG	△	
	1A4		Stop signal	STOP	△	
	1A5		External command signal/switching signal	CHG	△	
	1A6		Common	COM	○	
	1A7					
	1A19		Manual pulse generator A phase	PULSER A+	△	
	1B19			PULSER A-		
	1A20		Manual pulse generator B phase	PULSER B+	△	
	1B20			PULSER B-		
	1A11			—	—	—
	1A12			—	—	—
	1A8 1A9			—	—	—
1A10			—	—	—	

(Note-1): The symbols in Need for wiring column indicate the following meanings:

○ : Wiring is necessary for positioning. • △ : Wiring is necessary depending on the situation.

(Note-2): Either polarity can be connected to the common (COM).

6. External Dimensions



Unit : mm (inch)

Warranty

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

For safe use of the product

- This products have been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
 - Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
 - This product has been manufactured under strict quality control. However, when installing appropriate backup or failsafe functions in the system.
-



HEAD OFFICE : 1-8-12, OFFICE TOWER Z 14F HARUMI CHUO-KU 104-6212, JAPAN
NAGOYA WORKS : 1-14, YADA-MINAMI5, HIGASHI-KU, NAGOYA, JAPAN

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Specifications subject to change without notice.
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