MITSUBISHI

CC-Link IE Controller Network Module

User's Manual
(Hardware)

QJ71GP21-SX
QJ71GP21S-SX

Thank you for purchasing the Mitsubishi programmable controller MELSEC-Q series.

Prior to use, please read this and relevant manuals thorougly to fully understand the product.

MELSEC-Q
Mitsubishi Programmable Controller

MODEL	QJ71GP21-SX-U-HW
MODEL CODE	13JY13
IB(NA)-0800364-D(0804)MEE	

● SAFETY PRECAUTIONS ●

(Be sure to read these instructions before use.)

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 the 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 minor or moderate injury or property 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 save this manual to make it accessible when required and always forward it to the end user.

[DESIGN PRECAUTIONS]

⚠ DANGER

- For each station's operating status in the case of a communication error in the network, refer to CC-Link IE Controller Network Reference Manual. A malfunction due to a communication error may result in an accident.
- To control a running programmable controller (data modification) by connecting GX Developer to a CPU module or connecting a personal computer to an intelligent function module, create an interlock circuit on the sequence program so that the entire system will function safely all the time. Also, before performing any other controls (e.g. program modification, operating status change (status control)) to the programmable controller, read the manual carefully and ensure the safety. Especially, in the case of controlling a remotely-located programmable controller from an external device, a programmable controller side problem could not be resolved immediately due to data communication failure. To prevent this, establish corrective procedures for communication failure between the external device and the programmable controller CPU, as well as creating an interlock circuit on the program.
- Laser diodes are used in the optical transceivers of the CC-Link IE controller network. The class of these laser diodes is Class 1.

⚠ CAUTION

- Do not install the control lines and/or communication cables together with the main circuit or power cables, and also do not bring them close to each other. Keep a distance of 100mm (3.94 inch) or more between them. Failure to do so may cause a malfunction due to noise.

[INSTALLATION PRECAUTIONS]

⚠CAUTION
● Use the programmable controller in the environment conditions given in the general specifications of the User's Manual for the CPU module used. Failure to do so may cause an electric shock, fire, malfunction, or damage to or deterioration of the product. ● While pressing the installation lever located at the bottom of the module, insert the module fixing projection into the fixing hole in the base unit to mount the module. Incorrect module mounting may cause a malfunction, failure, or drop of the module. In an environment of frequent vibrations, secure the module with the screw. The screw must be tightened within the specified torque range. If the screw is too loose, it may cause a drop, short circuit, or malfunction. Excessive tightening may damage the screw and/or the module, resulting in a drop, short circuit or malfunction. ● Be sure to shut off all phases of the external power supply used by the system before mounting or removing the module. Failure to do so may damage the module. ● Do not directly touch any conductive part or electronic component of the module. Doing so may cause a malfunction or failure of the module.

[WIRING PRECAUTIONS]

⚠DANGER
● Be sure to shut off all phases of the external power supply before installation or wiring. Failure to do so may result in an electric shock or damage to the product.

[WIRING PRECAUTIONS]

⚠CAUTION

- Always ground the FG terminal to the protective ground conductor. Failure to do so may cause a malfunction.
- Verify the rated voltage and pin-out, and connect the external power supply cable properly. Connecting a power supply with a different voltage rating or faulty wiring may cause a fire or failure.
- Terminal screws must be tightened with the specified torque. If a screw is loose, it may cause a short circuit, fire or malfunction.
- Be careful to prevent foreign matter such as dust or wire chips from entering the module. Failure to do so may cause a fire, failure or malfunction.
- Be sure to place the communication cables or power cables in a duct or clamp them. If not, dangling cables may swing or inadvertently be pulled, resulting in damage to the module or cables, or malfunctions due to poor cable connection.
- When disconnecting a communication cable or a power cable from the module, do not pull the cable part. For a cable with connectors, hold the connector by hand and disconnect it from the module. For a cable connected to a terminal block, loosen the terminal block screws and disconnect the cable from the module. Pulling a cable that is still connected to the module may cause a malfunction or damage the module and/or the cable.
- A protective film is attached to the module top to prevent foreign matter such as wire chips from entering the module during wiring. Do not remove the film during wiring. Be sure to remove it for heat dissipation before system operation.

Revisions

* The manual number is given on the bottom right of the cover.

Print Date	*Manual Number	Revision
Jan., 2007	IB(NA)-0800364-A	First edition
Apr. 2007	IB(NA)-0800364-B	Model added QJ71GP21S-SX Partially revised SAFETY PRECAUTIONS, Chapter 1 and 2, Section 3.1, Chapter 4, Section 5.1, Chapter 6 Added Section 6.2
Jan., 2008	IB(NA)-0800364-C	The entire manual was reviewed since the existing MELSECNET/G network module has been integrated into the CC-Link IE controller network module. Partially revised Section 5.1
Apr., 2008	IB(NA)-0800364-D	Partially revised Compliance with The EMC and Low Voltage Directives, Chapter 2

CONTENTS

Manuals

The following table lists the manual on this product.
You can order it as necessary.

Relevant Manual

Manual name	Manual No. (Model code)
CC-Link IE Controller Network Reference Manual	SH-080668ENG (13JV16)

Compliance with the EMC and Low Voltage Directives

(1) For programmable controller system
To configure a system meeting the requirements of the EMC and Low Voltage Directives when incorporating the Mitsubishi programmable controller (EMC and Low Voltage Directives compliant) into other machinery or equipment, refer to Chapter 9 "EMC AND LOW VOLTAGE DIRECTIVES" of the QCPU User's Manual (Hardware Design, Maintenance and Inspection).
The CE mark, indicating compliance with the EMC and Low Voltage Directives, is printed on the rating plate of the programmable controller.

(2) For the product
No additional measures are necessary for the compliance of this product with the EMC and Low Voltage Directives.

1. OVERVIEW

This manual explains how to install and connect the QJ71GP21-SX or QJ71GP21S-SX CC-Link IE controller network module (hereinafter referred to as CC-Link IE controller network module).

(Packing list)

Table 1.1 Packing list

Model	Product name	Quantity
QJ71GP21-SX	QJ71GP21-SX CC-Link IE controller network module	1
QJ71GP21S-SX	QJ71GP21S-SX CC-Link IE controller network module (with external power supply function)	1

2. PERFORAMNCE SPECIFICATIONS

The following describes the performance specifications of the CC-Link IE controller network module.
For general specifications of the CC-Link IE controller network module, refer to the following manual.
☞QCPU User's Manual (Hardware Design, Maintenance and Inspection)

Table 2.1 Performance specifications

Item		Specification	
		QJ71GP21-SX	QJ71GP21S-SX
Max. link points per network	LB	32K points (32768 points, 4KB) (Basic model QCPU or safety CPU: 16K points (16384 points, 2KB))	
	LW	128K points (131072 points, 256KB) (Basic model QCPU or safety CPU: 16K points (16384 points, 32KB))	
	LX	8K points (8192 points, 1KB)	
	LY	8K points (8192 points, 1KB)	
Max. link points per station	LB	16K points (16384 points, 2KB)	
	LW	16K points (16384 points, 32KB)	
	LX	8K points (8192 points, 1KB)	
	LY	8K points (8192 points, 1KB)	
Transient transmission capacity		Up to 1920 bytes	
Communication speed		1Gbps	

Table 2.1 Performance specifications (Continued)

Item		Specification	
		QJ71GP21-SX	QJ71GP21S-SX
Number of stations per network		When Universal model QCPU is used for control station: 120 (Control station: 1, Normal station: 119) *1 When any other than Universal model QCPU is used for control station: 64 (Control station: 1, Normal station: 63) *2	
Connection cable		Optical fiber cable (Multi-mode fiber) (☞ CC-Link IE Controller Network Reference Manual)	
Overall cable distance		66000m (When 120 stations are connected)	
Station-to-station distance (Max.)		550m (Core/Clad = 50/125 (μm))	
Max. number of networks		239	
Max. number of groups		32	
Transmission path		Duplex loop	
Optical fiber specifications		1000BASE-SX(MMF) optical fiber cable	
	Standard	IEC60793-2-10 Types A1a.1 (50/125 μm multimode)	
	Transmission loss (max.)	3.5 (dB/km) or less (λ = 850nm)	
	Transmission band (min.)	500 (MHz•km) or more (λ = 850nm)	
Connector specifications		Duplex LC connector	
	Standard	IEC61754-20: Type LC connector	
	Connection loss	0.3 (dB) or less	
	Polished surface	PC (Physical Contact) polishing	
Number of occupied I/O points		32 (Intelli.: 32 points) *3	48 (I/O assignment: Empty first half: 16 points, Latter half: 32 points for intelli.) *3 *4
External power supply	Voltage	No external power supply function	20.4V to 31.2V DC
	Current		0.28A
	Terminal screw size		M3
	Applicable solderless terminal		R1.25-3
	Applicable wire size		0.3 to 1.25mm^2
	Tightening torque		0.42 to 0.58N•m
	Allowable momentary power failure time		1ms (Level PS1)
	Noise immunity		By noise simulator of 500Vp-p noise voltage, 1 μs noise width, and 25 to 60Hz noise frequency

Table 2.1 Performance specifications (Continued)

Item	Specification	
	QJ71GP21-SX	QJ71GP21S-SX
Internal current consumption (5V DC)	0.85A	0.90A
External dimensions	98 (H) x 27.4 (W) x 90 (D) [mm]	98 (H) x 55.2 (W) x 90 (D) [mm]
Weight	0.18kg	0.28kg

*1 A Universal model QCPU can be set to a station No. within the range of No.1 to No.120.
For a module other than Universal model QCPUs, station No.1 to No.64 can be set.

*2 A station with a Basic model QCPU or safety CPU operates as a normal station. (It cannot be set to a control station.)

*3 All I/O signals of the CC-Link IE controller network module are used by the system. (Use prohibited)

*4 Two I/O slots are occupied.
In the Start I/O No. field of Network parameters, set a value obtained by adding 10_H to the I/O No. of the module-installed slot. Note that 0 point can be set instead of 16 points for the first half in I/O assignment of Network parameters.
(Example) When the module is installed to slot 0, set 10_H to Start I/O No.
(When 0 point is set to slot 0 in I/O assignment, set 0_H to Start I/O No.)

3. MOUNTING AND INSTALLATION

3.1 Handling Precautions

This section describes precautions for handling the CC-Link IE controller network module itself.

(1) Since the module case is made of resin, do not drop the module or apply a strong impact to it.

(2) Do not remove the printed-circuit board of the module from the case.
Doing so will cause failure.

(3) Be careful to prevent foreign matter such as dust or wire chips from entering the module. Failure to do so may cause a fire, failure or malfunction.

(4) A protective film is attached to the module top to prevent foreign matter such as wire chips from entering the module during wiring. Do not remove the film during wiring.
Be sure to remove it for heat dissipation before system operation.

(5) Before handling the module, touch a grounded metal object to discharge the static electricity from the human body.
Not doing so may cause a failure or malfunction of the module.

(6) Tighten the module fixing screws or terminal screws within the following torque range.

Table 3.1 Screw tightening torque

Screw	Tightening torque range
Module fixing screw (M3 screw)*1	0.36 to 0.48N•m
Terminal screw on external power supply terminal block (M3 screw)	0.42 to 0.58N•m

*1 The module can be easily fixed onto the base unit using the hook at the top of the module.
However, it is recommended to secure the module with the module fixing screw if the module is subject to significant vibration or shock.

3.2 Installation Environment

For details, refer to the user's manual for the CPU module used.

4. PART NAMES

This section explains the names of each part of the CC-Link IE controller network module.

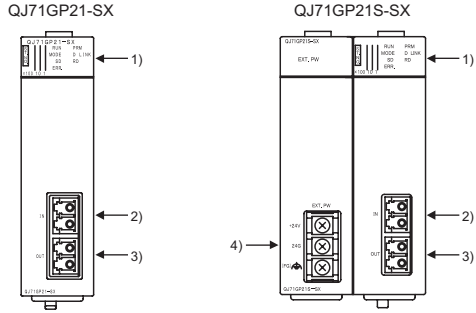


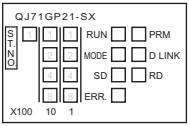
Figure 4.1 CC-Link IE controller network module appearance

Table 4.1 Names of parts

No.	Name	Description
1)	Indicator LED	Indicates the operating status of the CC-Link IE controller network module. ((1) in this section)
2)	IN connector	Used to connect an optical fiber cable to the CC-Link IE controller network module. (The cable is connected to OUT connector of another station) ((3) in this section)
3)	OUT connector	Used to connect an optical fiber cable to the CC-Link IE controller network module. (The cable is connected to IN connector of another station) ((3) in this section)
4)	External power supply terminal block	Connects a cable for supplying external power to the CC-Link IE controller network module.

(1) Indicator LEDs

QJ71GP21-SX



QJ71GP21S-SX

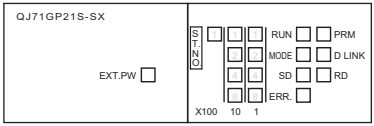


Figure 4.2 Indicator LEDs

Table 4.2 LED indication

Name	LED status *1	Description
RUN	ON, green	Operating normally
	OFF	Hardware fault or watchdog timer error
MODE	ON, green	Online mode
	Flashing, green	Test mode
	OFF	Offline mode
PRM	ON, green	Operating as a Control station
	OFF	Operating as a Normal station
D LINK	ON, green	Data link in operation (Cyclic transmission operated)
	Flashing, green	Data link in operation (Cyclic transmission stopped)
	OFF	Data link not in operation (Disconnected from network)
ERR.	ON, red	• Received data are erroneous.(Receive frame error) • A frame error above a certain level has occurred between stations. • The Control station or a station number is duplicated. • Cable disconnection, or incorrect cable connection between OUT and IN • Network parameters are corrupted, or some settings (Reserved station specification, Total number of stations, Network No, etc.) are inconsistent between the Control and Normal stations.
	OFF	Normal status
SD	N, green	Sending data
	OFF	Not sending data
RD	ON, green	Receiving data
	OFF	Not receiving data
1× 100 1,2,4,8× 10 1,2,4,8× 1	ON, green (Numeric display)	The station No. is set. ((2) in this section)
	OFF	No station No. is set.
EXT.PW	ON, green	External power supplied (Own station power status (SB0042) is ON.)
	OFF	External power not supplied (Own station power status (SB0042) is OFF.)

*1 When the CPU module is reset, the LEDs other than the EXT.PW LED turn OFF.

(2) Station No. setting
Station No. of the CC-Link IE controller network module is indicated.
(Example) When indicating station No.15

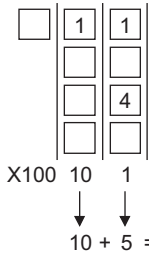


Figure 4.3 Example of station No. setting indication

(3) IN and OUT connectors

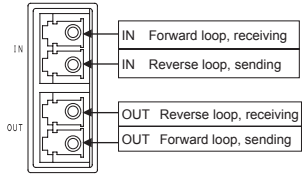


Figure 4.4 IN and OUT connectors

5.1 Connecting Optical Fiber Cables

(1) Connection method

Connect an optical fiber cable between OUT and IN as shown below.

Note that there is no need to connect the cables in the order of station numbers.

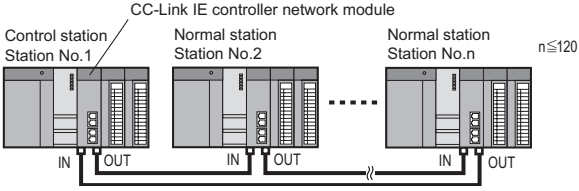


Figure 5.1 Connection method

(2) Connecting the optical fiber cable

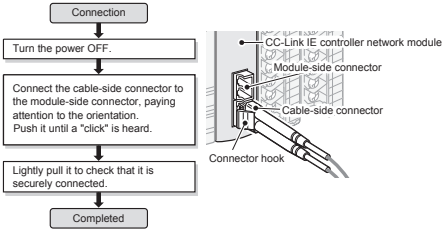


Figure 5.2 Connecting the optical fiber cable

(3) Disconnecting the optical fiber cable

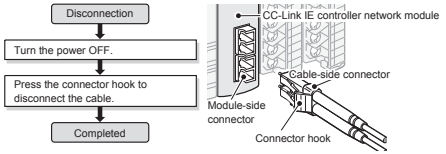


Figure 5.3 Disconnecting the optical fiber cable

5.2 Wiring Precautions

(a) Use the optical fiber cable described in the following manual.
☞ CC-Link IE Controller Network Reference Manual

(b) There are restrictions on the bending radius of the optical fiber cable.
For details, check the specifications of the cable to be used.

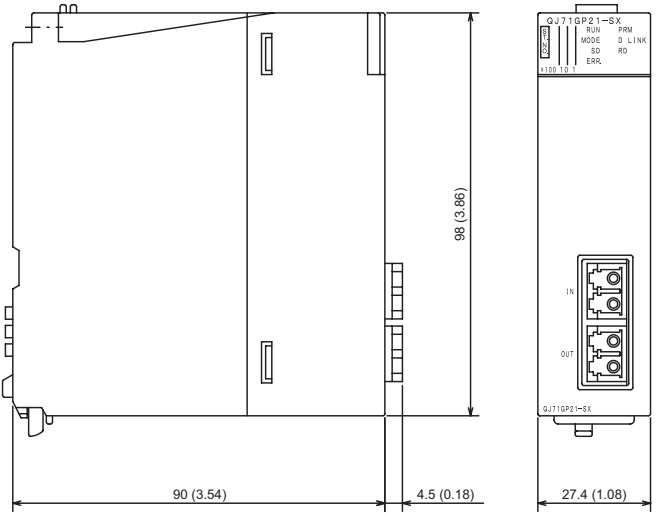
(c) When handling an optical fiber cable, do not touch the optical fiber core of the cable-side or module-side connector, and protect it from dirt or dust.
If oil from your hand, dirt or dust is attached to the core, it can increase transmission loss, arising a problem in data link.

(d) When connecting or disconnecting an optical fiber cable, hold the connector part of the cable.

(e) Make a full connection between the cable-side and module-side connectors until a "click" can be heard.

6. EXTERNAL DIMENSIONS

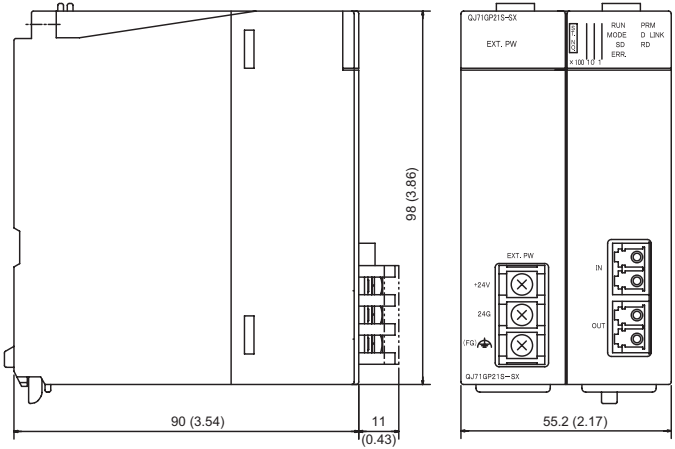
6.1 QJ71GP21-SX



(Unit: mm (inch))

Figure 6.1 External dimensions

6.2 QJ71GP21S-SX



(Unit: mm (inch))

Figure 6.2 External dimensions

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

- This product has 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 the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

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