MITSUBISHI

CC-Link IE Controller Network Interface Board

User's Manual
(Hardware)

Q80BD-J71GP21-SX
Q80BD-J71GP21S-SX

Thank you for purchasing the Mitsubishi program logic controller MELSEC series.

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

MODEL	CCIECONTROL-B-SW1-H
MODEL CODE	13JY32
IB(NA)-0800386-F(1005)MEE	

● SAFETY PRECAUTIONS ●

(Be sure to read these instructions before using the product.)

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

In this manual, the safety precautions are classified into two levels: "⚠ WARNING" and "⚠ CAUTION".

⚠WARNING	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.

Under some circumstances, failure to observe the precautions given under "⚠ CAUTION" may lead to serious consequences.
Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Installation Precautions]

⚠WARNING

- Shut off the external power supply for the system in all phases before installing the board to or removing it from the personal computer. Failure to do so may result in electric shock or cause the board to fail or malfunction.
- Do not touch any connectors while power is on. Doing so may cause electric shock or malfunction.

⚠CAUTION

- Use the board in an environment that meets the general specifications in this manual. Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- Do not directly touch any conductive parts and electronic components of the board. Doing so may cause malfunction or failure of the board.
- When installing the board, take care not to get injured by an implemented component or a surrounding member.
- Fix the board by tighten the board-fixing screws within the specified torque range. Undertightening may cause drop of the component or wire, short circuit, or malfunction. Overtightening may damage the screw and/or module, resulting in drop, short circuit, or malfunction.
  For the tightening torque of the board-fixing screws, refer to the manual supplied with the personal computer.
- Before handling the board, touch a conducting object such as a grounded metal to discharge the static electricity from the human body. Failure to do so may cause the board to fail or malfunction.
- Securely insert the board into the PCI bus slot following the board installation instruction of the personal computer.Incorrect insertion of the board may lead to a malfunction, failure or drop of the board.
- When installing the board, take care not to get injured by an implemented component or a surrounding member.
- When installing the board, take care not to contact with other boards.
- Handle the board in a place where static electricity will not be generated. Failure to do so may cause a failure or malfunction.
- The board is included in an antistatic envelope.
  When storing or transporting it, be sure to put it in the antistatic envelope. Failure to do so may cause a failure or malfunction.
- Do not drop or apply a strong impact to the board.
  Doing so may cause a failure or malfunction.

[Wiring Precautions]

⚠WARNING

- Shut off the external power supply for the system in all phases before installing the board or starting wiring.Failure to do so may result in electric shock, damage to the product, or malfunction.
- After installation of the board and wiring, attach the cover on the module before turning it on for operation.Failure to do so may result in electric shock.

⚠CAUTION

- Check the rated voltage and pin-out before wiring to the external power supply cable, and connect the cables correctly. Connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure.
- Place the communication cable and the external power supply cable connected to the board in a duct or clamp them. If not, dangling cables may swing or inadvertently be pulled, resulting in damage to the board or cables or malfunctions due to poor contact.
- When disconnecting the cable from the board, do not pull the cable by the cable part. Pulling the cable connected to the board may result in malfunction or damage to the board or cable.
- Prevent foreign matter such as dust or wire chips from entering the personal computer. Such foreign matter may cause a fire, failure, or malfunction.
- Do not install the external power supply or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm (3.94 in.) or more between them. Failure to do so may result in malfunction due to noise.
- Special skills and tools are required to connect the communication cable to the connector plug, which is an exclusive product. When purchasing it, please consult your local Mitsubishi representative. Incomplete connection can result in a short, fire or malfunction.
- Securely plug the communication cable to the connector of the board. Then, check for any incomplete connection. Poor contact may cause an erroneous input or output.
- Use a specified tool for crimping of the cable and contacting pin. Imperfect crimping may cause a malfunction.
- Verify the pin-out and fully insert the crimped contacting pin into the connector. Imperfect insertion may cause a failure or malfunction.
- Insert the wired external power supply cable into the external power supply cable connector until a click is heard. Imperfect insertion may cause a failure or malfunction.

[Wiring Precautions]

⚠CAUTION
● Always ground the personal computer to the protective ground conductor. Failure to do so may cause a malfunction

[Disposal Precautions]

⚠CAUTION
● When disposing of this product, treat it as industrial waste.

● CONDITIONS OF USE FOR THE PRODUCT ●

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

Revisions

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

Print Date	*Manual Number	Revision
Apr., 2007	IB(NA)-0800386-A	First edition
Oct., 2007	IB(NA)-0800386-B	Correction Chapter 5, Section 7.2, Chapter 8
Jan., 2008	IB (NA)-0800386-C	Correction SAFETY PRECAUTIONS, Manual, Chapter 1, Chapter 2, Chapter 3, Chapter 4, Chapter 5, Chapter 6, Chapter 7
Sep., 2008	IB (NA)-0800386-D	Correction Chapter 2
Jun., 2009	IB (NA)-0800386-E	Correction Chapter 1, Chapter 5
May, 2010	IB (NA)-0800386-F	Addition CONDITIONS OF USE FOR THE PRODUCT, Section 2.1, Section 2.2 Correction SAFETY PRECAUTIONS, Chapter 2, Section 3.1, Chapter 4, Section 5.1.2, Section 5.1.3, Chapter 6, Chapter 7, Section 7.1, Section 7.2

CONTENTS

Manual

The following is the manual relevant to this product.
Please purchase it if necessary.

Relevant Manuals

Manual Name	Manual Number (Model Code)
CC-Link IE Controller Network Reference Manual This manual explains the system configuration, performance specification, functions, handling and wiring instructions, and troubleshooting of the CC-Link IE Controller network system. (Sold separately)	SH-080668ENG (13JV16)
CC-Link IE Controller Network Interface Board User's Manual (For SW1DNC-MNETG-B) This manual explains the system configuration, software package installation and uninstallation, operating method for utilities, accessible ranges and devices, and troubleshooting of the CC-Link IE Controller Network board. (Sold separately)	SH-080691ENG (13JZ02)

Remarks

CC-Link IE Controller Network Interface Board User's Manual (For SW1DNC-MNETG-B) is stored on CD-ROM of the corresponding software package in PDF format.
A printed version of the manual is available as an option. Indicate the manual No. (Model code) when placing an order for a printed version of the manual.

1. OVERVIEW

This manual explains the handling of the Q80BD-J71GP21(S)-SX CC-Link IE Controller Network interface board (hereinafter referred to as CC-Link IE Controller Network board).
The CC-Link IE Controller Network board can be used as a control station or normal station in the CC-Link IE Controller network system.

The packing list of the CC-Link IE Controller Network board is given below.

Item	Quantity	
	Q80BD-J71GP21-SX	Q80BD-J71GP21S-SX
Q80BD-J71GP21-SX CC-Link IE Controller Network interface board	1	—
Q80BD-J71GP21S-SX CC-Link IE Controller Network interface board	—	1
Connector set (for external power supply cable)	—	1
CC-Link IE Controller Network Interface Board User's Manual (Hardware)	1	1
SW1DNC-MNETG-B CC-Link IE Controller Network software package (CD-ROM)*1	1	1
Software license agreement	1	1

*1 The CD-ROM contains the User's Manual in PDF format.

2. SPECIFICATIONS

General specifications and Performance specifications of the CC-Link IE Controller Network board are shown below.

2.1 General specifications

(1) General specifications of the CC-Link IE Controller Network board are shown below.

<table>
<tr><th>Item</th><th colspan="7">Specification</th></tr>
<tr><td>Operating ambient temperature</td><td colspan="7">0 to 55 °C</td></tr>
<tr><td>Storage ambient temperature</td><td colspan="7">-25 to 75 °C</td></tr>
<tr><td>Operating ambient humidity</td><td colspan="7">5 to 95 % RH, Condensation not allowed</td></tr>
<tr><td>Storage ambient humidity</td><td colspan="7">5 to 95 % RH, Condensation not allowed</td></tr>
<tr><td rowspan="5">Vibration resistance</td><td rowspan="5">Conforming to JIS B3502, IEC61132-2</td><td>—</td><td>Frequency</td><td>Acceleration</td><td>Amplitude</td><td>Sweep Count</td></tr>
<tr><td rowspan="2">Intermittent vibration</td><td>10 to 57 Hz</td><td>—</td><td>0.075 mm</td><td rowspan="4">10 times each in X, Y and Z axes</td></tr>
<tr><td>57 to 150 Hz</td><td>9.8 m/s^2</td><td>—</td></tr>
<tr><td rowspan="2">Continuous vibration</td><td>10 to 57 Hz</td><td>—</td><td>0.035 mm</td></tr>
<tr><td>57 to 150 Hz</td><td>4.9 m/s^2</td><td>—</td></tr>
<tr><td>Shock resistance</td><td colspan="7">Conforming to JIS B 3502, IEC 61131-2
(147 m/s^2, 3 times each in 3 directions)</td></tr>
<tr><td>Operating environment</td><td colspan="7">No corrosive gas present</td></tr>
<tr><td>Operating altitude*1</td><td colspan="7">2000 m (6562 ft) or less</td></tr>
<tr><td>Installation area</td><td colspan="7">In control panel</td></tr>
<tr><td>Overvoltage category *2</td><td colspan="7">II or lower</td></tr>
<tr><td>Pollution degree*3</td><td colspan="7">2 or lower</td></tr>
</table>

*1 The board cannot be used under the environment where the atmospheric pressure is higher than the one at the altitude of 0 m.

*2 It indicates that the device is to be connected to which power distribution part, within the area from the public electricity network to machinery in the premise.
Category II applies to the devices to which power is supplied from fixed installations.
The surge voltage withstand for devices rated up to 300 V is 2500 V.

*3 This is an index showing the degree of the conductive pollution that can occur in the environment where the device is used.
In Pollution degree 2, only nonconductive pollution occurs. Occasionally, however, temporary conductivity caused by condensation can be expected.

(2) General specifications of the CC-Link IE Controller Network board or the personal computer, whichever are lower, must be satisfied after installation.

2.2 Performance Specifications

Performance specifications of the CC-Link IE Controller Network board are shown below.

Item		Specification	
		Q80BD-J71GP21-SX	Q80BD-J71GP21S-SX
Max. link points per network	LB	32K points (32768 points, 4K bytes)	
	LW	128K points (131072 points, 256K bytes)	
	LX	8K points (8192 points, 1K byte)	
	LY	8K points (8192 points, 1K byte)	
Max. link points per station	LB	Normal:16K points (16384 points, 2K bytes) Extended mode:32K points (32768 points, 4K bytes)	
	LW	Normal:16K points (16384 points, 32K bytes) Extended mode:128K points (131072 points, 256K bytes)	
	LX	8K points (8192 points, 1K byte)	
	LY	8K points (8192 points, 1K byte)	
Transient transmission capacity		Up to 1920 bytes	
Communications speed		1G bps	
Number of stations per network		120 stations (Control station: 1; Normal station: 119)	
Connection cable		Optical fiber cable (Multi-mode fiber)	
Overall cable distance		66000 m (When 120 stations are connected)	
Station-to-station distance	Min.	2 m	
	Max.	550 m (Core/clad = 50/125 (μm))	
Max. number of networks		239	
Max. number of groups		32	
Transmission path		Duplex loop	
Communication method		Token ring method	
Synchronization method		Flag synchronization (Frame synchronization)	
Encoding method		8B10B	
Transfer format		Ethernet II	
Error control system		FCS (Frame Check Sequence, CRC32 of the frame, Ethernet-compliant)	
RAS functions		Loop back function by error detection and cable disconnection, System-down prevention by control station switching, Error detection by link special relays and link special registers, etc.	
Transient transmission		N: N communications	

Item		Specification	
		Q80BD-J71GP21-SX	Q80BD-J71GP21S-SX
Number of boards that can be installed		Up to 4*1	
Installation slot		PCI bus slot (Half size) or PCI-X bus slot (Half size)	
Occupied slots		1 slot	
PCI bus performance		Bus width: 32 bit Bus frequency: 33MHz Bus voltage: 5V or 3.3 V DC (Universal PCI compliance)	
External power supply*2	Voltage	(No external power supply)	20.4 V to 31.2 V DC
	Current		0.27 A
	Connector		Connector set (Accessory)
	Applicable cable size		0.50 to 1.25 mm^2 [AWG#20-16]
	Allowable momentary power failure time		1ms (level PS1)
	Noise durability		Noise voltage: 500vp-p Noise width: 1μs (By the noise simulator with noise frequency 25 to 60Hz)
5 V DC Internal current consumption		0.88 A	0.88 A
Weight		0.12 kg	0.14 kg

*1 This indicates the number of CC-Link IE Controller Network boards that can be installed to a personal computer, not including any other boards such as MELSECNET/H boards.
Note that it cannot exceed the number of physical PCI slots of the personal computer.

*2 Use the power complies with CLASS2.

3. HANDLING

This section explains precautions for handling and installation environment of the CC-Link IE Controller Network board.

3.1 Handling precautions

The following explains precautions for handling the CC-Link IE Controller Network board.

⚠ **WARNING**	● Shut off the external power supply for the system in all phases before installing the board to or removing it from the personal computer. Failure to do so may result in electric shock or cause the board to fail or malfunction. ● Do not touch any connectors while power is on. Doing so may cause electric shock or malfunction.

⚠ **CAUTION**	● Do not directly touch any conductive parts and electronic components of the board. Doing so may cause malfunction or failure of the board. ● When installing the board, take care not to get injured by an implemented component or a surrounding member. ● Fix the board by tighten the board-fixing screws within the specified torque range. Undertightening may cause drop of the component or wire, short circuit, or malfunction. Overtightening may damage the screw and/or module, resulting in drop, short circuit, or malfunction. For the tightening torque of the board-fixing screws, refer to the manual supplied with the personal computer. ● Before handling the board, touch a conducting object such as a grounded metal to discharge the static electricity from the human body. Failure to do so may cause the board to fail or malfunction. ● Securely insert the board into the PCI bus slot following the board installation instruction of the personal computer.Incorrect insertion of the board may lead to a malfunction, failure or drop of the board. ● When installing the board, take care not to get injured by an implemented component or a surrounding member. ● When installing the board, take care not to contact with other boards. ● Handle the board in a place where static electricity will not be generated. Failure to do so may cause a failure or malfunction.

⚠ CAUTION	● The board is included in an antistatic envelope. When storing or transporting it, be sure to put it in the antistatic envelope. Failure to do so may cause a failure or malfunction. ● Do not drop or apply a strong impact to the board. Doing so may cause a failure or malfunction. ● When disposing of this product, treat it as industrial waste.

3.2 Installation environment

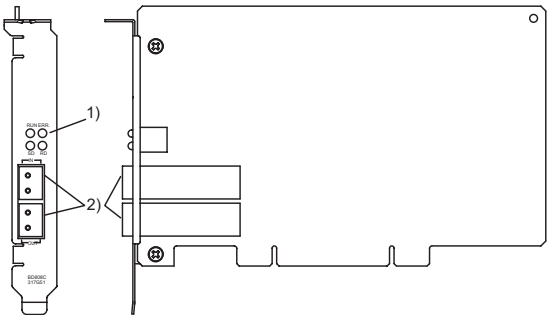
For installation of the personal computer in which the CC-Link IE Controller Network board is installed, refer to the manual for the personal computer.

⚠ CAUTION	● Use the board in an environment that meets the general specifications in this manual. Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product. ● Always ground the personal computer to the protective ground conductor. Failure to do so may cause a malfunction.

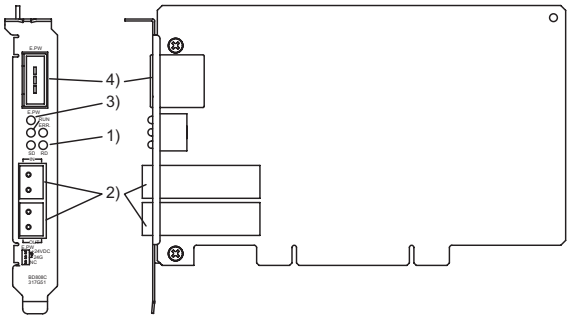
4. PART NAMES

This section explains each part name and setting of the CC-Link IE Controller Network board.

(1) Q80BD-J71GP21-SX

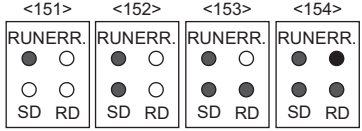
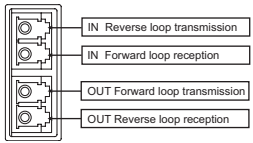


(2) Q80BD-J71GP21S-SX

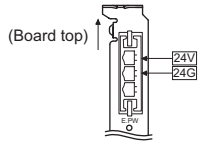


<table>
<tr><th>No.</th><th>Name</th><th>Description</th></tr>
<tr><td>1)</td><td>Indicator LED

RUN ERR.
○ ○
○ ○
SD RD</td><td>
Indicates the operating status of the CC-Link IE Controller Network board.
The display format has three types: normal , error and channel number confirmation.
(1) Normal status
When the RUN LED is OFF or ON, the LED display becomes normal status.
If a communication error occurs in the status, determine the error in Select station network device status display on the "CC-Link IE Controller Network diagnostics result" screen of the CC IE Control utility.
For the Select station network device status display, refer to "CC-Link IE Controller Network Interface Board User's Manual (For SW1DNC-MNETG-B)".
<table>
<tr><th>LED name</th><th>Status</th><th>Description</th></tr>
<tr><td rowspan="2">RUN</td><td>OFF</td><td>A WDT error occurred or the board is being reset.</td></tr>
<tr><td>ON</td><td>In normal operation</td></tr>
<tr><td rowspan="2">SD</td><td>OFF</td><td>Data has not been sent.</td></tr>
<tr><td>ON</td><td>During data transmission</td></tr>
<tr><td rowspan="2">RD</td><td>OFF</td><td>Data has not been received.</td></tr>
<tr><td>ON</td><td>During data reception</td></tr>
<tr><td rowspan="2">ERR.</td><td>OFF</td><td>No error</td></tr>
<tr><td>ON</td><td>Error</td></tr>
</table>
(2) Error status
When the RUN LED is flashing, the LED display becomes error status
If an error occurs in the status, check the error description on the Event Viewer screen.
<table>
<tr><th>LED name</th><th>Status</th><th>Description</th></tr>
<tr><td rowspan="2">RUN</td><td>Flashing</td><td>Indicates the display format is in error status.</td></tr>
<tr><td>ON
OFF</td><td>Indicates the display format is in nomal status.
Refer to (1) in this table.</td></tr>
<tr><td rowspan="2">SD</td><td>OFF</td><td>—</td></tr>
<tr><td>ON</td><td>—</td></tr>
<tr><td rowspan="2">RD</td><td>OFF</td><td>No driver response error</td></tr>
<tr><td>ON</td><td>A driver response error occurred.</td></tr>
<tr><td rowspan="2">ERR.</td><td>OFF</td><td>No PCI bus error</td></tr>
<tr><td>ON</td><td>A PCI bus error occurred.</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>No.</th><th>Name</th><th>Description</th></tr>
<tr><td>1)</td><td></td><td>(3) Channel number confirmation status
This status is for checking the channel No. of each board.
The LED displays the channel No. assigned to each board.
 
</td></tr>
<tr><td>2)</td><td>Optical fiber cable connector</td><td>Connector for connecting optical fiber cable
(1) The cable terminal is as shown below.
 

(2) For wiring of an optical fiber cable, refer to "CC-Link IE Controller Network Interface Board User's Manual (For SW1DNC-MNETG-B)".</td></tr>
<tr><td>3)</td><td>External power supply LED

E.PW</td><td>Indicates the status of external power supply.
<table>
<tr><th>LED name</th><th>Status</th><th>Description</th></tr>
<tr><td rowspan="2">E.PW</td><td>OFF</td><td>External power supply is not supplied.</td></tr>
<tr><td>ON</td><td>External power supply is being supplied.</td></tr>
</table></td></tr>
<tr><td>4)</td><td>External power supply cable connector</td><td>Connector for connecting external power supply cable
The cable terminal is as shown below.
 
</td></tr>
</table>

5. EMC AND LOW VOLTAGE DIRECTIVE

For the products sold in European countries, the conformance to the EMC Directive, which is one of the European Directives, has been a legal obligation since 1996. Also, conformance to the Low Voltage Directive, another European Directive, has been a legal obligation since 1997.
Manufacturers who recognize their products must conform to the EMC and Low Voltage Directives are required to declare that their products conform to these Directives and put a "CE mark" on their products.

(1) Authorized representative in Europe
Authorized representative in Europe is shown below.
Name : Mitsubishi Electric Europe BV
Address: Gothaer strase 8, 40880 Ratingen, Germany

5.1 Requirements for conformance to EMC Directive

The EMC Directive specifies that products placed on the market must "be so constructed that they do not cause excessive electromagnetic interference (emissions) and are not unduly affected by electromagnetic interference (immunity) ". The applicable products are requested to meet these requirements.
The sections 5.1.1 through 5.1.3 summarize the precautions on conformance to the EMC Directive of the machinery constructed using the CC-Link IE Controller Network board.
The details of these precautions has been prepared based on the control requirements and the applicable standards. However, we will not assure that the overall machinery manufactured according to these details conforms to the above-mentioned directives.
The final decision on the method for the EMC Directive conformance and the application must be made by the manufacturer of the machinery.

5.1.1 Standards applicable to the EMC Directive

The standards applicable to the EMC Directive are listed below. All test items were tested by installing each device on a personal computer bearing a CE certification logo.

Specification	Test item	Test details	Standard value
EN61131-2: 2003	EN61000-6-4 Radiated noise	Measures electromagnetic emissions from the product.	30M-230MHz QP: 30 dB μ V/m (30 m in measurement range)*1 230M-1000MHz QP: 37 dB μ V/m (30 m in measurement range)*1
	EN61000-6-4 Conducted noise	Measures electromagnetic emissions from the product to the power line.	150k-500kHz QP: 79 dB, Mean: 66 dB*1 500k-30MHz QP: 73 dB, Mean: 60 dB*1
	EN61000-4-2 Electrostatic immunity	Immunity test in which static electricity is applied to the cabinet of the equipment.	4 kV Contact discharge 8 kV Aerial discharge
	EN61000-4-4 Electrical fast transient/ burst immunity	Immunity test in which a burst noise is applied to a power line and signal line.	Power line: 2 kV Data communication: 1 kV Digital/Analog I/O (shielded): 1 kV
	EN61000-4-3 Radiated electromagnetic field immunity (AM modulation)	Immunity test in which a field is irradiated to the product.	10 V/m, 26-1000 MHz, 80%AM modulation@1 kHz
	EN61000-4-6 Conducted disturbances immunity	Immunity test in which a high frequency noise is applied to a power line and signal line.	3 V
	EN61000-4-5 Surge immunity	Immunity test in which a lightning surge is applied to a power line and signal line.	Power line: 2 kV (CM), 1 kV (DM) Data communication (shielded): 1 kV (CM) Digital/Analog I/O (shielded): 1 kV (CM)

*1 QP: Quasi-peak value, Mean: Mean value

5.1.2 Installing devices in the control panel

Installing devices in the control panel has a considerable effect, not only securing safety but also shielding the noise generated from the personal computer in the control panel.

(1) Control panel

(a) Use a conductive control panel.

(b) When attaching the control panel's top plate or base plate, mask painting and weld so that good surface contact can be made between the panel and plate.

(c) To ensure good electrical contact with the control panel, mask the paint on the installation bolts of the inner plate in the control panel so that contact between surfaces can be ensured over the widest possible area.

(d) Ground the control panel with a thick wire so that a low impedance connection to ground can be ensured even at high frequencies.

(e) Holes made in the control panel must be 10 cm (3.94 in.) diameter or less. If the holes are 10 cm (3.94 in.) or larger, radio frequency noise may be emitted.
In addition, because radio waves leak through a clearance between the control panel door and the main unit, reduce the clearance as much as practicable. The leakage of radio waves can be suppressed by the direct application of an EMI gasket on the paint surface.

Maker name	Series type
KITAGAWA INDUSTRIES CO., LTD.	US series
ZIPPERTUBING (JAPAN) LTD.	71TS series
SEIWA ELECTRIC MFG CO., LTD.	E02S□□□A

Our tests have been carried out on a panel having the damping characteristics of 37 dB max. and 30 dB mean (measured by 3 m method with 30 to 300MHz).

(2) Connection of power and ground cable
The power supply cable and ground cable for a personal computer should be laid out as follows:

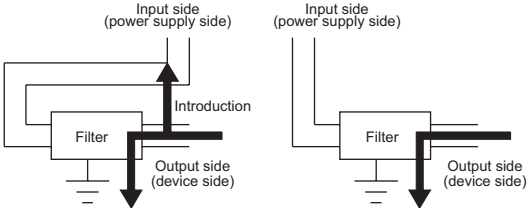
(a) Provide a grounding point near the power supply of personal computer. Ground the FG (frame ground) terminal of the personal computer and the SLD (shield) terminal of the CC-Link IE Controller Network board with the thickest and shortest grounding wire (wire for grounding) possible (about 30 cm (11.81 in.) or less in length). Since the FG and SLD terminals function to ground the noise generated in the personal computer, it is necessary to ensure the lowest possible impedance.
As the wires are used to relieve the noise, the wire itself contains a large amount of noise and thus short wiring prevents from functioning as an antenna.

(b) Twist the ground cable leading to the ground point with the power supply cable. By twisting it with the ground cable, the noise leaking from the power supply cable may be grounded at a higher rate. However, twisting the power supply cable with the ground cable may not be necessary if a noise filter is installed on the power supply cable.

5.1.3 Noise filter (power supply line filter)

A noise filter is a component which has an effect on conducted noise. It is not required to fit the noise filter to the power supply line, but fitting it can further suppress noise. (The noise filter has the effect of reducing conducted noise of 10MHz or less.)
The precautions required when installing a noise filter are described below.

(1) Do not bundle the wires on the input side and output side of the noise filter.
When they are bundled, the output side noise will induct into the input side wires.



(a) The noise will induct into input side when the input and output wires are bundled.

(b) Separate the input and output wires.

(2) Ground the ground terminal of the noise filter to the control panel using as short wiring as possible (about 10 cm (3.94 in.)).

Remarks

Reference noise filters are shown below.

Noise filter type	Maker name	Rated current(A)	Rated voltage(V)
FN343-3/01	SCHAFFNER	3	250
FN660-6/06		6	
ZHC2203-11	TDK	3	

5.2 Requirements for conformance to Low Voltage Directive

The CC-Link IE Controller Network board is out of the requirement for conformance to the Low Voltage Directive, since it does not use the power supply in the range of 50 to 1000V AC and 75 to 1500V DC.

6. WIRING

This section explains precautions for connecting cables to the CC-Link IE Controller Network board.

(1) Precautions for general wiring

⚠ **WARNING**	● Shut off the external power supply for the system in all phases before installing the board or starting wiring.Failure to do so may result in electric shock, damage to the product, or malfunction. ● After installation of the board and wiring, attach the cover on the module before turning it on for operation.Failure to do so may result in electric shock.

⚠ **CAUTION**	● When disconnecting the cable from the board, do not pull the cable by the cable part. Pulling the cable connected to the board may result in malfunction or damage to the board or cable. ● Prevent foreign matter such as dust or wire chips from entering the personal computer. Such foreign matter may cause a fire, failure, or malfunction. ● Always ground the personal computer to the protective ground conductor. Failure to do so may cause a malfunction.

(2) Precautions for communication cable wiring

⚠ **CAUTION**	● Place the communication cable and the external power supply cable connected to the board in a duct or clamp them. If not, dangling cables may swing or inadvertently be pulled, resulting in damage to the board or cables or malfunctions due to poor contact. ● Special skills and tools are required to connect the communication cable to the connector plug, which is an exclusive product. When purchasing it, please consult your local Mitsubishi representative. Incomplete connection can result in a short, fire or malfunction. ● Securely plug the communication cable to the connector of the board. Then, check for any incomplete connection. Poor contact may cause an erroneous input or output.

Remarks

For optical fiber cables, refer to the "CC-Link IE Controller Network Reference Manual".

(3) Precautions for external power supply cable wiring

⚠ **CAUTION**	● Check the rated voltage and pin-out before wiring to the external power supply cable, and connect the cables correctly. Connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure. ● Place the communication cable and the external power supply cable connected to the board in a duct or clamp them. If not, dangling cables may swing or inadvertently be pulled, resulting in damage to the board or cables or malfunctions due to poor contact. ● Do not install the external power supply or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm (3.94 in.) or more between them. Failure to do so may result in malfunction due to noise. ● Use a specified tool for crimping of the cable and contacting pin. Imperfect crimping may cause a malfunction. ● Verify the pin-out and fully insert the crimped contacting pin into the connector. Imperfect insertion may cause a failure or malfunction. ● Insert the wired external power supply cable into the external power supply cable connector until a click is heard. Imperfect insertion may cause a failure or malfunction.

Remarks

For details of the wiring method, refer to "CC-Link IE Controller Network Interface Board User's Manual (For SW1DNC-MNETG-B)".

6.1 Optical fiber cable

The following explains precautions for connecting the optical fiber cables with the Q80BD-J71GP21-SX and Q80BD-J71GP21S-SX.

(1) Precautions for connection

(a) Use the dedicated optical fiber cable shown below for the controller network system.

Type	Model name (maker)
Multi-mode fiber (GI)	QG series (Mitsubishi electric system & service Co., Ltd.)

(b) When connecting an optical fiber cable to the Q80BD-J71GP21-SX and Q80BD-J71GP21S-SX, the cable bend radius is restricted.
For details, check the specifications of the cable used.

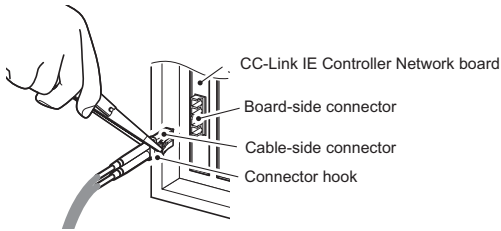
(c) When laying the optical fiber cables, do not touch the fiber cores of the cable-side and board-side connectors, and protect them from dirt and dust.
If oil from the hand, dirt or dust is attached to the core, it can increase transmission loss, causing a problem in data link.

(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 board-side connectors until a "click" can be heard.

(f) When installing the Q80BD-J71GP21-SX or Q80BD-J71GP21S-SX to the personal computer, secure a space of around 10 mm (0.39 in.) to the right and left of the optical connector. Depending on the adjacent boards and installing slot position, connecting/disconnecting the optical cable may be difficult. In this case, use the following dedicated tool.

Model name	Maker
SCT-SLM	Mitsubishi electric system & service Co., Ltd.



6.2 External power supply cable

This section explains the method for connecting external power supply cable to the Q80BD-J71GP21S-SX.

(1) Parts and tools required for external power supply cable
The following parts and tools are required for making external power supply cable.

(a) Connector set (accessories)
Check that the following parts are included with the attached connector set.

Type	Model name	Applicable wire size	Quantity
Connector	1-178288-3	—	1
Contact	175218-2	AWG#20-16	3 (Spare 1)

(b) Cable
Use an external power supply cable with heat-resistant vinyl sheath of 0.5 to 1.25 mm^2 [AWG#20 to 16].

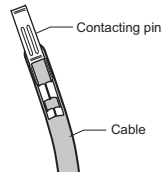
(c) Tool
Use the following specified crimp tools.

Model	Applicable wire size	Inquiry
91558-1	AWG#20-16	Tyco Electronics
1762956-1		

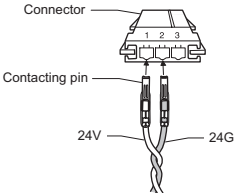
(2) Making external power supply cable

(a) Crimping a contacting pin
Using a crimp tool, crimp the cable and contacting pin.
Set the contacting pin and cable in the grooves of the crimp tool, squeeze the handle, and make them stick together tightly.
For details of the crimp, refer to the instruction of the tool.
A strip length of the cable should be 5 to 7 mm (1/5 to 2/7 in.)

(b) Check for a crimp
Check if the cable (including a part of the sheath) is evenly crimped to the contacting pin.
If the cable part is crimped but not the sheath part or the cable is stuck out, the cable cut or a malfunction may result.



(c) Connecting to the connector
According to the following pin-out, fully insert the crimped cable to the connector until a click is heard.



Pin No.	Description
1	24V
2	24G
3	Open

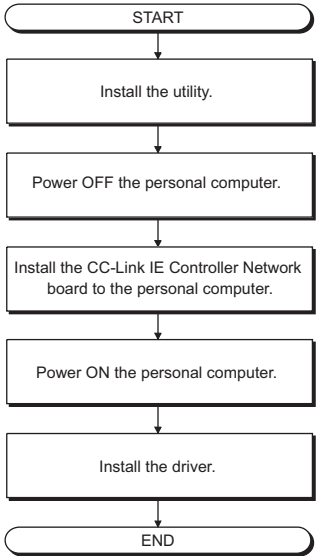
(3) Connecting external power supply cable to the board
Properly insert the wired external power supply cable to the external power supply cable connector of the Q80BD-J71GP21S-SX until a click is heard.
Keep the cable away from the main circuit cable, power cables and/or the load cables for any other than programmable controllers. Ensure a distance of 100 mm (3.94 in.) between them.

POINT
Be sure to twist the external power supply cable.

7. INSTALLING SOFTWARE PACKAGES

This chapter explains about installing the software packages and icons to be registered.
For details of the installation procedure and the uninstallation method, refer to "CC-Link IE Controller Network Interface Board User's Manual (For SW1DNC-MNETG-B)".

7.1 Installation procedures



7.2 Icons to be Registered

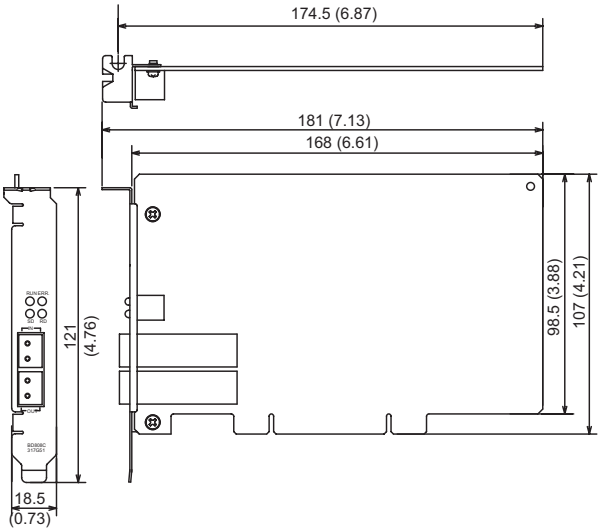
After installing the software packages, the icons shown below are registered in Start menu on the Windows©.
Click the each icon and start the utility.

[Start] - [Program] - [MELSEC] or
[Start] - [All Programs] - [MELSEC]

Icon	Utility name	Description
	CC IE Control utility	Starts CC IE Control utility.
	Device Monitor Utility	Starts Device monitor utility.
	MELSEC Data Link Function HELP	Starts HELP for the data link function.

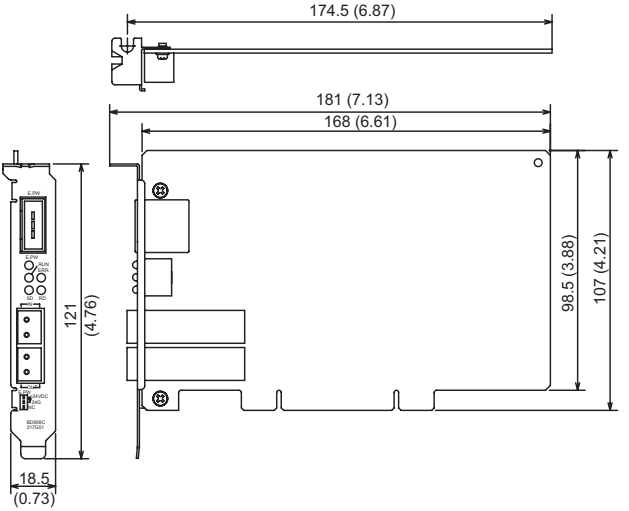
8. EXTERNAL DIMENSIONS

(1) Q80BD-J71GP21-SX



(Unit: mm (inch))

(2) Q80BD-J71GP21S-SX



(Unit: mm (inch))

Warranty

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.
However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.
[Gratis Warranty Term]
The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.
Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.
[Gratis Warranty Range]
(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
(2)Even within the gratis warranty term, repairs shall be charged for in the following cases.
1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued.
Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not , compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

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U.S.A	Mitsubishi Electric Automation Inc. 500 Corporate Woods Parkway Vernon Hills, IL 60061, U.S.A. Tel : +1-847-478-2100
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Germany	Mitsubishi Electric Europe B.V. German Branch Gothaer Strasse 8 D-40880 Ratingen, GERMANY Tel : +49-2102-486-0
U.K	Mitsubishi Electric Europe B.V. UK Branch Travellers Lane, Hatfield, Hertfordshire., AL10 8XB, U.K. Tel : +44-1707-276100
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Korea	Mitsubishi Electric Automation Korea Co., Ltd. 1480-6, Gayang-dong, Gangseo-ku Seoul 157-200, Korea Tel : +82-2-3660-9552
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