

# MITSUBISHI

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# CC-Link System Master/Local Interface Board

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User's Manual

## Q80BD-J61BT11N-H1

Thank you for buying the Mitsubishi general-purpose programmable logic controller MELSEC Series

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

MODEL	Q80BD-J61BT11N-H1-U
MODEL CODE	13JY04
IB(NA)-0800356-C(0801)MEE	

## ● SAFETY PRECAUTIONS ●

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

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


Note that these precautions apply only to this product. Refer to the user's manual of the CPU module for safety precautions on programmable controller systems. In this manual, the safety instructions are ranked as "DANGER" and "CAUTION".



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



Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Note that failure to observe the  CAUTION level instructions may also lead to serious results depending on the circumstances.

Be sure to observe the instructions of both levels to ensure personal safety.

Please keep this manual in accessible place and be sure to forward it to the end user.

## [DESIGN PRECAUTIONS]

### **DANGER**

- For details on the operating status of each station when a communication problem occurs in the data link, refer to user's manuals noted in the list of related manuals.
- If a cable dedicated to the CC-Link is disconnected, this may destabilize the line, and a data link communication error may occur in multiple stations. Make sure to create an interlock circuit in the sequence program so that the system will operate safely even if the above error occurs. Failure to do so may result in a serious accident due to faulty output or malfunctions.
- When performing the control of the personal computer in operation (changing data), configure an interlock circuit in a user program so the safety of the overall system is always maintained.  
When performing other controls of the personal computer in operation (changing program and operation status (status control)), read this manual carefully and confirm if the overall safety is maintained.  
Especially, when this control is performed to a remote personal computer from an external device, problems that have occurred on the personal computer side may not be able to immediately be handled if there is a data communication error.  
Define a troubleshooting agreement between external devices and the personal computer for data communication error occurrences, as well as construct an interlock circuit in the user program.
- A failure in the CC-Link Ver.2 board may cause remote I/O not to turn on or off correctly.  
For critical I/O signals that may cause a serious accident, establish a circuit to externally monitor them.

### **CAUTION**

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other.  
They should be installed 100mm (3.94 in.) or more from each other.  
Not doing so could result in noise that may cause malfunction.

## [INSTALLATION PRECAUTIONS]

### CAUTION

- Use the product in an environment that meets the general specifications contained in "Type Q80BD-J61BT11N CC-Link system Master/Local Interface Board User's Manual (For SW1DNC-CCBD2-B)".  
Using this product in an environment outside the range of the general specifications may cause electric shock, fire, malfunction, and damage to or deterioration of the product.
- Do not directly touch the conductive area or electronic components of the product.  
Doing so may cause malfunction or failure in the product.
- Fix the product securely with the installation screws and tighten the installation screws within the specified torque range.  
If the screws are loose, it may cause short circuits or malfunction.  
If the screws are tightened too much, it may cause damage to the screws resulting in short circuits or malfunction.
- Always make sure to touch the grounded metal to discharge the electricity charged in the body, etc., before touching the product.  
Failure to do so may cause a failure or malfunctions of the product.
- Be sure to shut off all phases of the external power supply used by the system before installing or removing the product. If all power is not turned off, not doing so may cause damage to the product.
- Securely mount the product to the PCI bus slot of the mounting device.  
If the product is not mounted correctly, this may lead to malfunctioning, failure or cause the board to fall.
- When mounting the product, take care not to become injured by the components that are installed or surrounding materials.
- While handling the product, be sure to keep it free of static electricity.  
Static electric charges may damage the product or result in malfunction.
- Be sure to turn off the power supply to the applicable station before installing or removing the terminal block.  
If the terminal block is installed or removed without turning off the power supply to the applicable station, correct data transmission cannot be guaranteed.
- Do not drop the product and the terminal block or subject it to any excessive shock.  
It may damage the product and the terminal block or result in malfunction.

## [WIRING PRECAUTIONS]

### CAUTION

- Be sure to shut off all phases of the external power supply used by the system before installing or removing the product and wiring.  
Not doing so may cause damage to the product.
- When turning on the power and operating the module after installation and wiring, always attach the computer's main cover.  
Failure to do so may cause an electric shock.
- When turning on the power and operating the module after wiring is completed, always attach the terminal cover that comes with the product.  
There is a risk of malfunction if the terminal cover is not attached.
- Always ground the SLD terminal of the product and the personal computer to the protective ground conductor.  
Not doing so can cause a malfunction.
- Tighten the terminal screws within the range of specified torque.  
If the terminal screws are loose, it may cause short circuits or malfunction.  
If the terminal screws are tightened too much, it may cause damage to the screw and/or the product, resulting in short circuits or malfunction.
- Prevent foreign matter such as swarf or wire chips from being attached onto the product.  
Failure to do so may cause fires, failure or malfunction.
- Be sure to fix the wires or cables connected to the product by placing them in a duct or clamping them.  
If not fixed, cables may be dangled and accidentally pulled, causing damage to the product and cables and malfunction due to bad cable contacts.
- Do not install the control lines together with the communication cables, or bring them close to each other. Doing so may cause malfunctions due to noise.
- When removing the communication cable or power supply cables from the product, do not pull the cable.  
First loosen the screws where the cable is connected to the product and then remove the cable.  
Pulling the cable that is connected to the product may cause damage to the product and cable or malfunction due to bad cable contacts.
- Solderless terminals with insulation sleeve cannot be used for the terminal block. It is recommended that the wiring connecting sections of the solderless terminals will be covered with a marking tube or an insulation tube.
- Be sure to turn off the power supply to the applicable station before installing or removing the terminal block.  
If the terminal block is installed or removed without turning off the power supply to the applicable station, correct data transmission cannot be guaranteed.

## [WIRING PRECAUTIONS]

### CAUTION

- Always make sure to power off the system in advance when removing the terminating resistor to charge the system. If the terminating resistor is removed and mounted while the system is energized, normal data transmission will not be guaranteed.
- Use applicable solderless terminals and tighten them with the specified torque.  
If any solderless spade terminal is used, it may be disconnected when the terminal screw comes loose, resulting in failure.
- Be sure to tighten any unused terminal screws within a tightening torque range (0.59 to 0.88N.m).  
Failure to do so may cause a short circuit due to contact with a solderless terminal.

## [START UP AND MAINTENANCE PRECAUTIONS]

### CAUTION

- Do not dismantle or rebuild the product.  
Doing so could cause failure, malfunction, injury or fire.
- Be sure to shut off all phases of the external power supply used by the system before installing or removing the product.  
Not doing so may cause failure or malfunction of the Product.
- Do not touch the terminal while the power is on.  
Doing so may cause malfunction.
- Be sure to shut off all phases of the external power supply used by the system before cleaning or retightening the terminal screws or module mounting screws.  
Not doing so may cause damage to the product.  
If the screws are loose, it may cause the short circuits or malfunction.  
If the screws are tightened too much, it may cause damages to the screws and/or the product, resulting in short circuits or malfunction.
- Always make sure to touch the grounded metal to discharge the electricity charged in the body, etc., before touching the product.  
Failure to do so may cause a failure or malfunctions of the product.

## [DISPOSAL PRECAUTIONS]

### CAUTION

- When disposing of this product, treat it as industrial waste.

## Revisions

\*The manual number is noted at the lower right of the top cover.

Print Date	*Manual Number	Revision
Aug., 2006	IB(NA)-0800356-A	First edition
Oct., 2007	IB(NA)-0800356-B	Correction Section 1.1, Chapter 4, Chapter 5, Chapter 7
Jan., 2008	IB(NA)-0800356-C	Correction SAFETY PRECAUTIONS, Chapter 2, Chapter 3, Chapter 5, Section 6.1

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## About the Manuals

The following manuals are also related to this product.  
In necessary, order them by quoting the details in the tables below.

### Related Manuals

Manual name	Manual No. (Model code)
CC-Link Ver.2 Q80BD-J61BT11N Driver Reference Manual This manual explains the driver development compatible with various OS, for interface board used in the CC-Link Ver.2 compatible PC. (Sold separately)	SH(NA)-080601ENG
CC-Link System Master/Local Module type QJ61BT11N User's Manual This Manual explains the system configuration, Performance specifications, functions, handling, wiring and troubleshooting for the QJ61BT11N. (Sold separately)	SH-080394 (13JR64)
Control & Communication Link System Master/ Local Module type AJ61BT11/A1SJ61BT11 User's Manual This Manual explains the system configuration, Performance specifications, functions, handling, wiring and troubleshooting for the AJ61BT11 and A1SJ61BT11. (Sold separately)	IB-66721 (13J872)
Control & Communication Link System Master/ Local Module type AJ61QBT11/ A1SJ61QBT11 User's Manual This Manual explains the system configuration, Performance specifications, functions, handling, wiring and troubleshooting for the AJ61QBT11 and A1SJ61QBT11. (Sold separately)	IB-66722 (13J873)

# 1. Outline

This manual explains the methods of handling the Q80BD-J61BT11N-H1 CC-Link System Master/Local interface Board.

The Q80D-J61BT11N-H1 CC-Link system Master/Local interface board can be used as a master or local station in the CC-Link system.

Unpack the product and confirm that the following products are enclosed.

Part name	Quantity
Type Q80BD-J61BT11N-H1 CC-Link System Master/Local Interface Board	1
Terminating resistor 110 $\Omega$ 1/2W (brown, brown, brown)	2
Terminating resistor 130 $\Omega$ 1/2W (brown, orange, brown)	2
CC-Link System Master/Local Interface Board User's Manual	1

## Important

In the CC-Link system, it is required to connect terminating resistors to both ends of the network.

Refer to section "6.1 Wiring by CC-Link dedicated cable" for details on the terminator.

## 1.1 CC-Link version

There are two types of CC-Link version, i.e., Ver.1 and Ver.2.

### (1) Definition of Ver.1.00 and Ver.1.10

A product with a cable length of 20cm or longer between stations, which has been achieved by improving the restriction on the conventional cable distance between the stations, is defined as Ver.1.10.

Where as, the conventional product is defined as Ver.1.00.

The conditions requiring the cable length to be 20cm or longer between stations are as follows:

- 1) All the stations comprising a CC-Link system must be of Ver.1.10.
- 2) All the data link cables must be Ver.1.10 compatible CC-Link dedicated cables.

### POINT

If stations of Ver.1.00 and Ver.1.10 are mixed in a system, the maximum total cable length and the cable length between stations will be as specified by Ver.1.00.

Refer to user's manuals noted in the list of related manuals for the maximum overall cable distance and station-to-station cable length of Version 1.00.

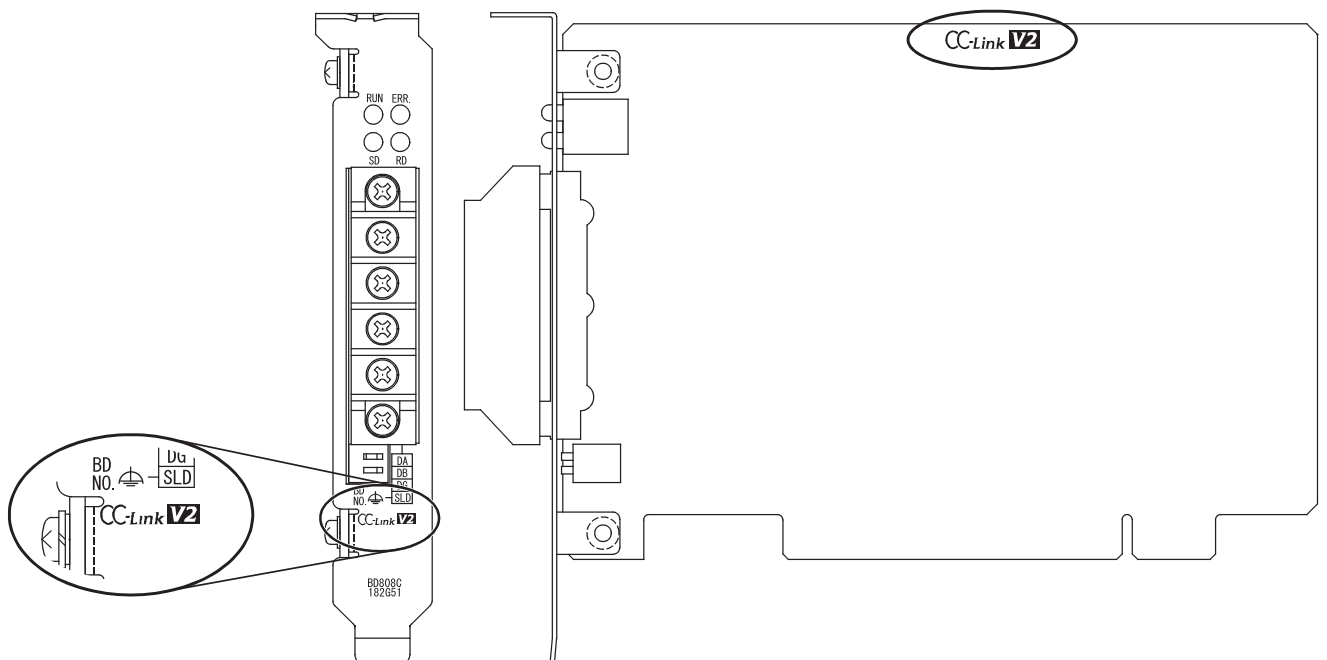
### (2) Definition of Ver.2

The CC-Link Ver.2 board is defined as the Q80BD-J61BT11N-H1 type CC-Link system master/local interface board supporting the extended cyclic points.

### (3) How to check the version

The following logo is not shown on the Ver.1.00 compatible CC-Link board. On the side of the Ver.1.10 compatible CC-Link board, the "CC-Link" logo is marked.

The Ver.2 compatible CC-Link board has "CC-Link **V2**" logos in the positions shown below.



## 2. Specifications

### 2.1 General Specifications

(1) The following table shows the general specifications of the CC-Link Ver.2 board.

Item	Specifications					
Operating ambient temperature	0 to 55 °C					
Storage ambient temperature	-25 to 75 °C					
Operating ambient humidity	5 to 95 % RH, No condensation					
Storage ambient humidity	5 to 95 % RH, No condensation					
Vibration resistance	Conforming to JIS B 3502, IEC 61131-2		Frequency	Acceleration	Amplitude	Sweep Count
		When there is intermittent vibration	10 to 57 Hz	—	0.075 mm	10 times each in X, Y and Z axis (80 minutes)
			57 to 150 Hz	9.8 m/s <sup>2</sup>	—	
		When there is continuous vibration	10 to 57 Hz	—	0.035 mm	
	57 to 150 Hz	4.9 m/s <sup>2</sup>	—			
Shock resistance	Conforming to JIS B3502, IEC 61131-2 (147 m/s <sup>2</sup> , 3 times each in 3 directions XYZ)					
Operating environment	No corrosive gas present					
Operating height	2000 m (6562 ft) or less					
Installation area	On the control board					
Over-voltage category *1	II or less					
Pollution rate *2	2 or less					

\*1: Indicates the distribution area where the device is assumed to be connected, from the public power distribution network to the local machine device.

Category II is applied to the devices to which the power is supplied from a fixed equipment. The surge resistance voltage of a rated 300 V device is 2500 V.

\*2: This is an index which indicates the occurrence rate of the conductive object in the environment where the device is used.

Pollution rate II indicates that only non-conductive pollution may occur with a possibility of generating temporary conductivity due to accidental condensation.

(2) General specifications of the CC-Link Ver.2 board or the personal computer, whichever is lower, must be satisfied after installation.

## 2.2 Performance specifications

The performance specifications of the CC-Link Ver.2 board are given below.

Table 2.1 Performance Specifications

Item	Specification
Transmission rate	Can select from 156 kbps / 625 kbps / 2.5 Mbps / 5 Mbps / 10 Mbps
Overall cable distance (maximum transmission distance)	Varies according to the transmission rate (Refer to Section 2.2)
Maximum number of connected stations (master station)	64
Number of occupied stations (when mounted to local station)	In remote net ver.1 mode: 1 or 4 station(s) (Can be changed by the utility parameter setting.) In remote net ver.2 mode, remote net additional mode: 1 to 4 station(s) (Can be changed by the utility parameter setting.)
Maximum number of link points per system *1	Remote I/O (RX, RY): 2048 points Remote register (RWw): 256 points (master station → remote station/ local station/intelligent device station/standby master station) Remote register (RWr): 256 points (remote station/local station/ intelligent device station/standby master station → master station)
Remote station/local station/ intelligent device station/ standby master station Number of link points per link *1	Remote I/O (RX, RY): 32 points (local station is 30 points) Remote register (RWw): 4 points (master station → remote station/ local station/intelligent device station/standby master station) Remote register (RWr): 4 points (remote station/local station/ intelligent device station/standby master station → master station)
Communication method	Broadcast polling method
Synchronous method	Frame synchronous method
Encoding method	NRZI method
Transmission path	Bus (RS-485)
Transmission format	Conforms to HDLC
Error control system	CRC ( $X^{16} + X^{12} + X^5 + 1$ )
Connection cable	CC-Link dedicated cable/ CC-Link dedicated high performance cable/Ver.1.10-compatible CC-Link dedicated cable *2
RAS function	<ul style="list-style-type: none"> <li>• Auto return function</li> <li>• Slave station disconnect function</li> <li>• Error detection by the link special relay/register</li> </ul>
Number of boards that may be used in one system	Maximum 4
Loading slot	PC PCI bus slot (half size)
PCI bus specifications	32-bit bus Basic clock: 33MHz 5V DC $\pm 5\%$ PCI standard Rev.2.2
Occupied slot	1 slot
5 V DC internal current consumption	0.56 A
Weight	0.11 kg

\*1: The link points shown above apply to the use in the remote net ver.1 mode.

Refer to Table 3.2 for those in the remote net ver.2 mode, remote additional mode.

\*2: Ver.1.10-compatible CC-Link dedicated cables, CC-Link dedicated cables (Ver.1.00) and CC-Link dedicated high-performance cables cannot be used together. If used together, correct data transmission will not be guaranteed. Also attach the terminating resistor which matches the kind of the cable. (Refer to section 6.1)

Table 2.2 Number of link points for remote net Ver.2 mode/remote net additional mode

Item		Specifications				
Maximum No. of link points per system		Remote I/O (RX, RY): 8192 points Remote register (RWw): 2048 points (master station → remote device station/local station/intelligent device station/standby master station) Remote register (RWr): 2048 points (remote device station/local station/intelligent device station/standby master station → master station)				
No. of link points per station	Expanded cyclic setting	Single	Double	Quadruple	Octuple	
	Remote I/O (RX, RY)	32 points (30 points for local station)	32 points (30 points for local station)	64 points (62 points for local station)	128 points (126 points for local station)	
	Remote register (RWw)	4 points	8 points	16 points	32 points	
	Remote register (RWr)	4 points	8 points	16 points	32 points	
Number of link points per number of occupied stations	Occupies 1 station	Remote I/O (RX, RY)	32 points	32 points	64 points	128 points
		Remote register (RWw)	4 points	8 points	16 points	32 points
		Remote register (RWr)	4 points	8 points	16 points	32 points
	Occupies 2 stations	Remote I/O (RX, RY)	64 points	96 points	192 points	384 points
		Remote register (RWw)	8 points	16 points	32 points	64 points
		Remote register (RWr)	8 points	16 points	32 points	64 points
	Occupies 3 stations	Remote I/O (RX, RY)	96 points	160 points	320 points	640 points
		Remote register (RWw)	12 points	24 points	48 points	96 points
		Remote register (RWr)	12 points	24 points	48 points	96 points
	Occupies 4 stations	Remote I/O (RX, RY)	128 points	224 points	448 points	896 points
		Remote register (RWw)	16 points	32 points	64 points	128 points
		Remote register (RWr)	16 points	32 points	64 points	128 points

### **2.3 Maximum overall cable distance**

The maximum overall cable distance differs according to the transmission rate. For the relationship between transmission rate and maximum overall cable distance, refer to the CC-Link Partner Association homepage <http://www.cc-link.org/>.

### **2.4 CC-Link dedicated cable specifications**

Use the CC-Link dedicated cable with the CC-Link system. The performance of the CC-Link system cannot be guaranteed with cables other than the CC-Link dedicated cables. For the specifications of CC-Link dedicated cable and the reference office, refer to the CC-Link Partner Association homepage <http://www.cc-link.org/>.

Remark
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For details, refer to the CC-Link Installation Guide issued by CC-Link Partner Association.

## 3. Handling

This section explains the handling precautions and installation environment of the CC-Link Ver.2 board.

### 3.1 Precautions when handling

The following explains the handling precautions of the CC-Link Ver.2 board:



#### CAUTION

- Do not directly touch the conductive area or electronic components of the CC-Link Ver.2 board.  
Doing so may cause malfunction or failure in the CC-Link Ver.2 board.
- Always make sure to touch the grounded metal to discharge the electricity charged in the body, etc., before touching the CC-Link Ver.2 board.  
Failure to do so may cause a failure or malfunctions of the CC-Link Ver.2 board.
- While handling the CC-Link Ver.2 board, be sure to keep it free of static electricity.  
Static electric charges may damage the CC-Link Ver.2 board or result in malfunction.
- Be careful not to let foreign objects such as swarf or wire chips get inside the personal computer.  
They may cause fires, failure or malfunction.
- Be sure to turn off the power supply to the applicable station before installing or removing the terminal block.  
If the terminal block is installed or removed without turning off the power supply to the applicable station, correct data transmission cannot be guaranteed.
- Do not drop the CC-Link Ver.2 board and the terminal block or subject it to any excessive shock.  
It may damage the CC-Link Ver.2 board and the terminal block or result in malfunction.
- Be sure to shut off all phases of the external power supply used by the system before performing work such as installing the CC-Link Ver.2 board and wiring.  
If all power is not turned off, there is a risk of electric shock or damage to the product.
- Solderless terminals with insulation sleeve cannot be used for the terminal block. It is recommended that the wiring connecting sections of the solderless terminals will be covered with a marking tube or an insulation tube.
- Use applicable solderless terminals and tighten them with the specified torque.  
If any solderless spade terminal is used, it may be disconnected when the terminal screw comes loose, resulting in failure.
- Be sure to tighten any unused terminal screws within a tightening torque range (0.59 to 0.88N·m).  
Failure to do so may cause a short circuit due to contact with a solderless Terminal.
- Always make sure to power off the system in advance when removing the terminating resistor to charge the system. If the terminating resistor is removed and mounted while the system is energized, normal data transmission will not be guaranteed.
- Do not disassemble or modify CC-Link Ver.2 board.  
Doing so could cause failure, malfunction, injury or fire.
- When disposing of this product, treat it as industrial waste.

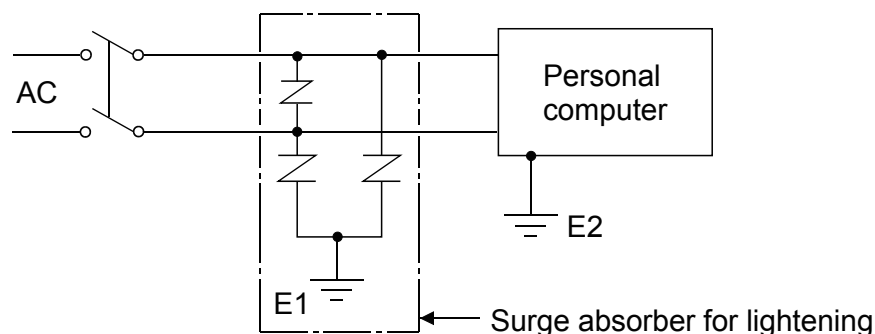


- (1) Tighten the terminal block mounting screws and terminal block terminal screws of the CC-Link Ver.2 board using a torque within the following ranges.

Screw location	Clamping torque range
Terminal block terminal screws (M3.5 screws)	0.59 to 0.88 N·m
Terminal block mounting screws (M3.5 screws)	0.59 to 0.88 N·m

- (2) Refer to the instruction manual provided with the personal computer for the clamping torque of the CC-Link Ver.2 board mounting screws.

- (3) As a countermeasure to power surge due to lightning, connect a surge absorber for lightning as shown below.



#### POINT

- (1) Separate the ground of the surge absorber for lightning (E1) from that of the personal computer (E2).
- (2) Select a surge absorber for lightning whose power supply voltage does not exceed the maximum allowable circuit voltage even at the time of maximum power supply voltage elevation.

### 3.2 Installation environment

Refer to the instruction manual provided with the personal computer for information on how to install the personal computer in which the CC-Link Ver.2 board has been mounted.



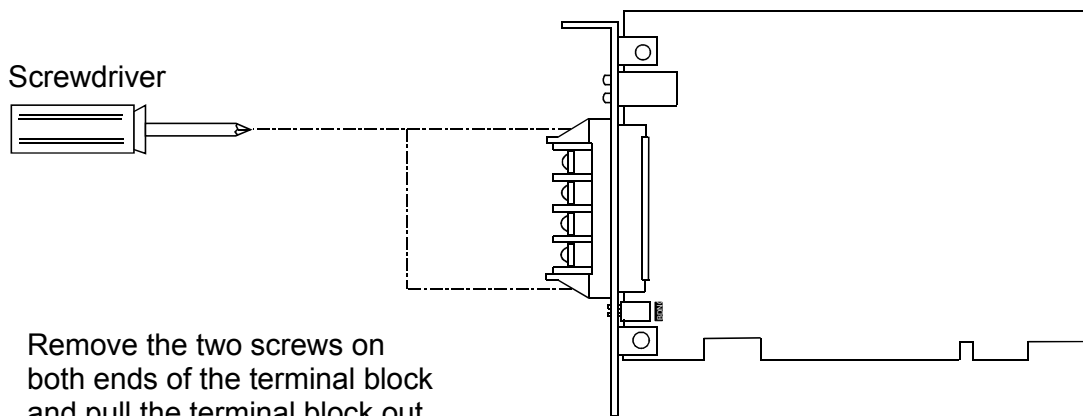
#### CAUTION

- Always ground the SLD terminal of the CC-Link Ver.2 board and the personal computer to the protective ground conductor.  
Not doing so can cause a malfunction.

### 3.3 Mounting and removing the terminal block

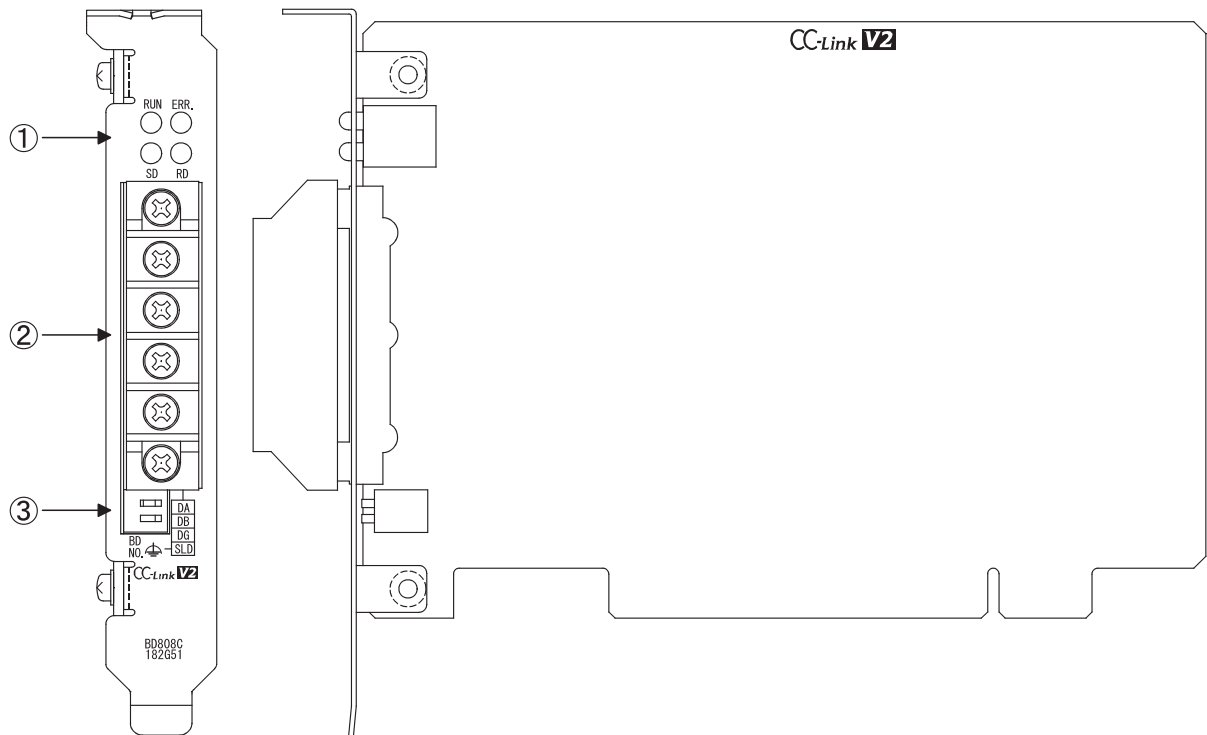
Since a 2-piece type terminal block is used, the CC-Link Ver.2 board can be replaced without disconnecting the signal line to the terminal block.

The following shows how to mount and remove the terminal block:

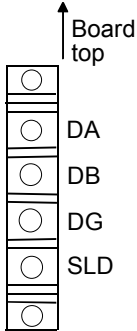
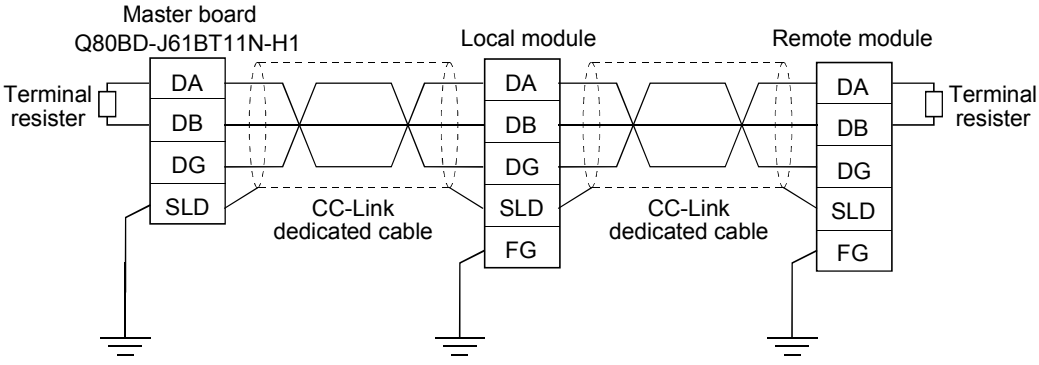
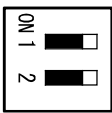


## 4. Names of Each Part

The names of each CC-Link Ver.2 board part are explained in this section.



No.	Name	Description																																																
1)	Operation indicator LED RUN ERR. ○ ○ SD RD ○ ○	<p>With the RUN LED indication (ON/OFF/flashing), the CC-Link Ver.2 board status or communication status is expressed.</p> <p>(1) When RUN LED is ON/OFF</p> <table border="1"> <thead> <tr> <th>LED name</th> <th>Status</th> <th>Details</th> </tr> </thead> <tbody> <tr> <td rowspan="2">RUN</td> <td>OFF</td> <td>A WDT error has occurred, or the board is being reset.</td> </tr> <tr> <td>ON</td> <td>Operating normally.</td> </tr> <tr> <td rowspan="3">ERR.</td> <td>OFF</td> <td>No communication error has occurred, or the board is being reset.</td> </tr> <tr> <td>ON</td> <td>All stations are faulty.</td> </tr> <tr> <td>flashing</td> <td>There is a faulty station or station No. is duplicated.</td> </tr> <tr> <td rowspan="2">SD</td> <td>OFF</td> <td>No data have been transmitted, or the board is being reset.</td> </tr> <tr> <td>ON</td> <td>Data are being transmitted.</td> </tr> <tr> <td rowspan="2">RD</td> <td>OFF</td> <td>No data have been received, or the board is being reset.</td> </tr> <tr> <td>ON</td> <td>Data are being received.</td> </tr> </tbody> </table> <p>(2) When RUN LED is flashing</p> <table border="1"> <thead> <tr> <th>LED name</th> <th>Status</th> <th>Details</th> </tr> </thead> <tbody> <tr> <td rowspan="2">RUN</td> <td>flashing</td> <td>Indicates the board is in the error mode.</td> </tr> <tr> <td>ON OFF</td> <td>No error</td> </tr> <tr> <td rowspan="2">ERR.</td> <td>OFF</td> <td>No OS start error has occurred.</td> </tr> <tr> <td>ON</td> <td>An OS start error has occurred.</td> </tr> <tr> <td rowspan="2">SD</td> <td>OFF</td> <td>No driver response error has occurred.</td> </tr> <tr> <td>ON</td> <td>A driver response error has occurred.</td> </tr> <tr> <td rowspan="2">RD</td> <td>OFF</td> <td>No PCI bus error has occurred.</td> </tr> <tr> <td>ON</td> <td>A PCI bus error has occurred.</td> </tr> </tbody> </table>	LED name	Status	Details	RUN	OFF	A WDT error has occurred, or the board is being reset.	ON	Operating normally.	ERR.	OFF	No communication error has occurred, or the board is being reset.	ON	All stations are faulty.	flashing	There is a faulty station or station No. is duplicated.	SD	OFF	No data have been transmitted, or the board is being reset.	ON	Data are being transmitted.	RD	OFF	No data have been received, or the board is being reset.	ON	Data are being received.	LED name	Status	Details	RUN	flashing	Indicates the board is in the error mode.	ON OFF	No error	ERR.	OFF	No OS start error has occurred.	ON	An OS start error has occurred.	SD	OFF	No driver response error has occurred.	ON	A driver response error has occurred.	RD	OFF	No PCI bus error has occurred.	ON	A PCI bus error has occurred.
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3)	<p>Channel No. setting switch</p>  <p>BD NO.</p>	<p>Sets the board No. corresponding to the channel No. used for accessing the CC-Link Ver.2 board from the user program. Set unique board Nos. when installing more than one CC-Link Ver.2 board.</p> <table border="1" data-bbox="376 770 1362 1010"> <thead> <tr> <th colspan="2">Switch</th> <th rowspan="2">Channel No.</th> <th rowspan="2">Board No.</th> <th rowspan="2">Remarks</th> </tr> <tr> <th>1</th> <th>2</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>OFF</td> <td>81</td> <td>0</td> <td>Default setting</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>82</td> <td>1</td> <td>—</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>83</td> <td>2</td> <td>—</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>84</td> <td>3</td> <td>—</td> </tr> </tbody> </table>	Switch		Channel No.	Board No.	Remarks	1	2	OFF	OFF	81	0	Default setting	ON	OFF	82	1	—	OFF	ON	83	2	—	ON	ON	84	3	—
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## 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.

### 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 5.1.4 summarize the precautions on conformance to the EMC Directive of the machinery constructed using the CC-Link Ver.2 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
EN50081-2: 1995	EN55011 Radiated noise	Electromagnetic emissions from the product are measured.	30M-230MHz QP: 30dB $\mu$ V/m (30 m in measurement range) *1 230M-1000MHz QP: 37 dB $\mu$ V/m (30 m in measurement range)
	EN55011 Conducted noise	Electromagnetic emissions from the product to the power line is measured.	150k-500kHz QP: 79 dB, Mean: 66 dB *1 500k-30MHz QP: 73 dB, Mean: 60 dB
EN61131-2: 1996	EN61000-4-2 Electrostatic immunity	Immunity test in which static electricity is applied to the cabinet of the equipment.	15kV Aerial discharge
	EN61000-4-4 Fast transient burst noise	Immunity test in which burst noise is applied to the power line and signal lines.	Power line: 2kV Digital I/O (24V or higher): 1kV (Digital I/O (24V or less)) > 250V (Analog I/O, signal lines) > 250V
	EN61000-4-3 Radiated field AM modulation	Immunity test in which field is irradiated to the product.	10V/m, 26-1000MHz, 80%AM modulation@1kHz
	EN61000-4-12 Damped oscillatory wave immunity	Immunity test in which a damped oscillatory wave is superimposed on the power line.	Power line: 1kV Digital I/O (24V or higher): 1kV

\*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. \*

\*: Also, each network remote station needs to be installed inside the control panel.

However, the waterproof type remote station can be installed outside 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 Ver.2 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 Cables

The cables extracted from the control panel contain a high frequency noise component. On the outside of the control panel, therefore, they serve as antennas to emit noise. Use shielded cable for the to be extracted to the outside of the control panel.

The use of a shielded cable also increases noise resistance.

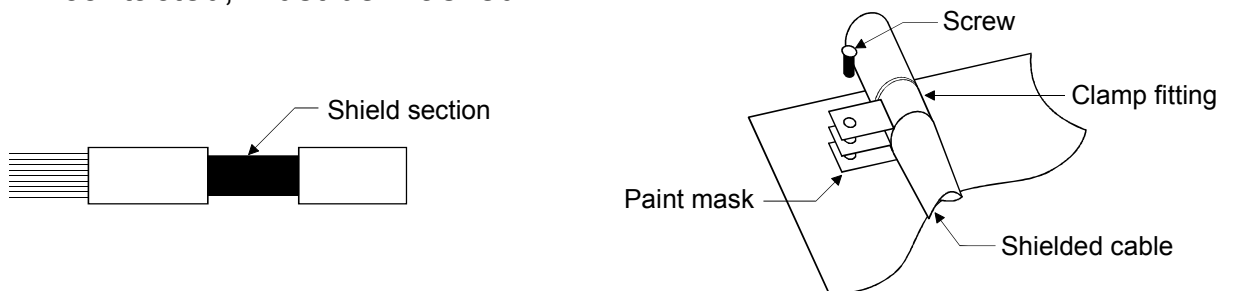
#### (1) Grounding of shielded of shield cable

- (a) Ground the shield of the shield cable as near the exit as possible from the control panel.

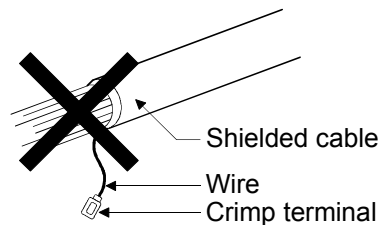
If the ground point is not near the outlet, the cables after the ground point will cause electromagnetic induction, and will generate a higher harmonic noise.

- (b) Peel part of the shielded cable's sheath, and ground a wide section of the exposed shielded section against the control panel.

Clamp fittings can be used as shown below. Note that the painting on the inner side of the control panel, against which the clamp fitting is contacted, must be masked.



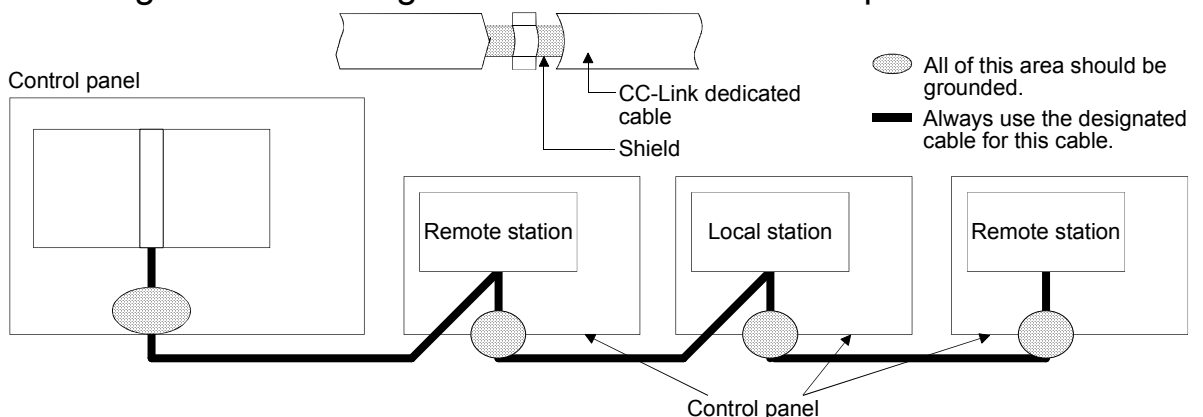
Note) The method of grounding by soldering a wire onto the shield section of the shielded cable as shown below is not recommended. The high frequency impedance will increase and the shield will be ineffective.



#### (2) Grounding procedure for the CC-Link dedicated cable

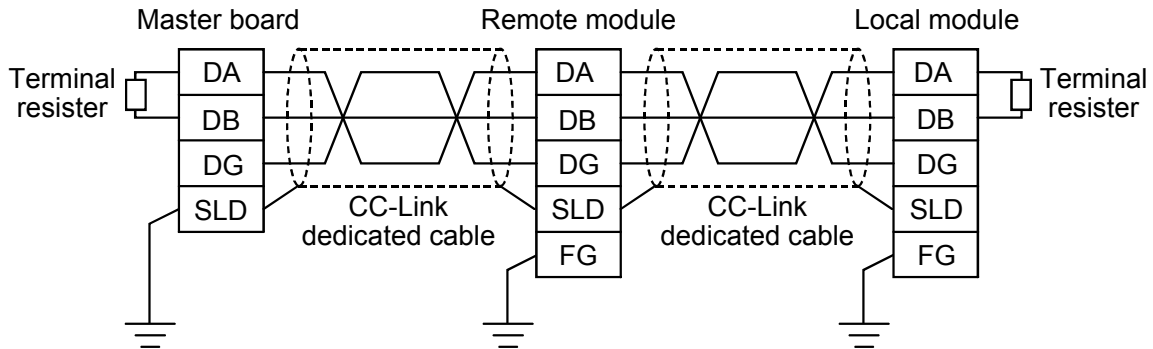
- (a) Always ground the CC-Link dedicated cable connected to the CC-Link system master station, local station and remote station.

Since the CC-Link dedicated cable is a shielded cable, remove a part of the outer sheath. Then ground the exposed part of the shield indicated in the figure below using as wide a surface area as possible.



Furthermore, the grounding should be made within 30 cm (11.81 in.) of the CC-Link Ver.2 board terminal area and at the position closest to the exit of the control panel.

- (b) Always use the specified CC-Link dedicated cable.
- (c) Do not use a ferrite core for the CC-Link dedicated cable coming from each module and the CC-Link Ver.2 board.
- (d) Ground the SLD terminal of the CC-Link Ver.2 board.  
Ground the FG terminal of each module.

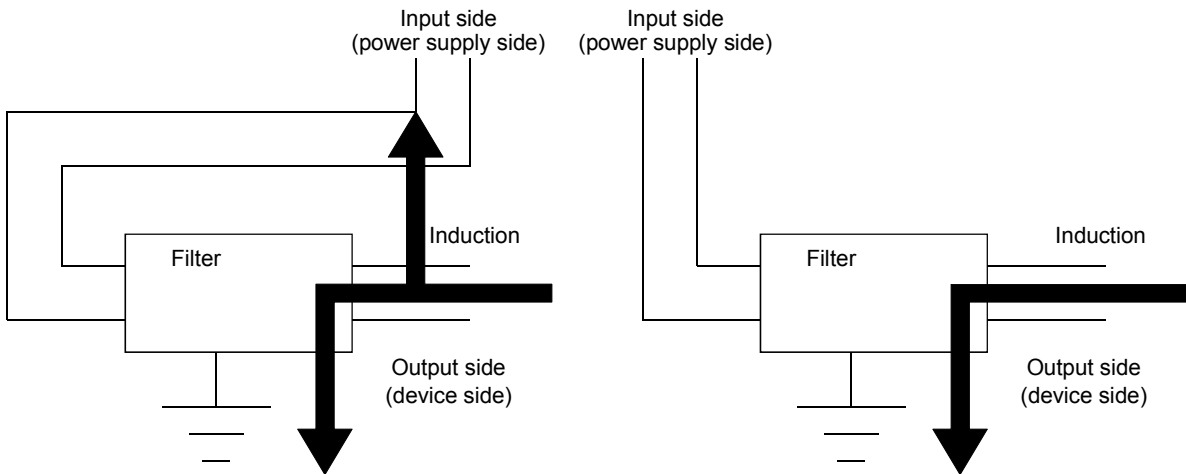


### 5.1.4 Noise filter (power supply line filter)

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.)).

#### Remark

Reference noise filters are shown below.

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



## 5.2 Requirements for conformance to Low Voltage Directive

The CC-Link Ver.2 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

The precautions for connecting the cable to the CC-Link Ver.2 board are given below.

### Remark

Refer to the user's manuals noted in the list of related manuals for details on the wiring method.

### 6.1 Wiring by CC-Link dedicated cable

This section explains the cable connection in the CC-Link system.

#### IMPORTANT

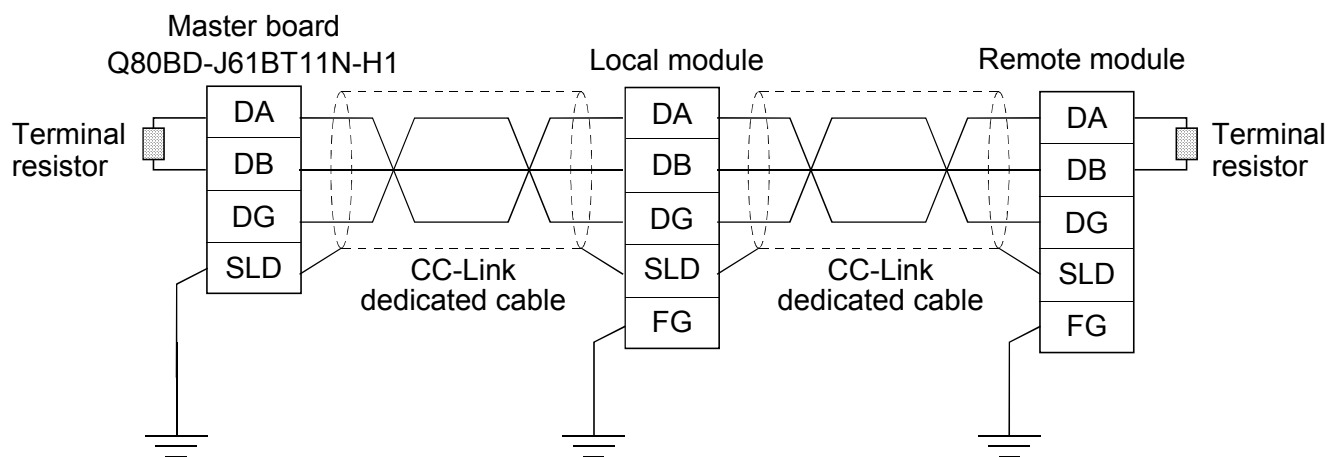
- (1) Be sure to turn off the power to the corresponding station before attaching and removing a terminal block. If the terminal block is attached or removed without turning off the power to the corresponding station, normal data transfer will not be guaranteed.
- (2) The CC-Link dedicated cables, the high-performance CC-Link dedicated cables and Ver.1.10-compatible CC-Link dedicated cables cannot be used together. If they are used together, normal data transfer will not be guaranteed.
- (3) Always ground the SLD terminal of the CC-Link Ver.2 board and the personal computer to the protective ground conductor. Not doing so can cause a malfunction.

- (1) CC-Link cables can be connected from any station number.
- (2) Be sure to connect the terminal resistors supplied with the board/module between the "DA" and "DB" terminals of both end stations in the CC-Link system.
- (3) Terminal resistors to be connected are different depending on the cable used by the CC-Link system:

Cable type	Terminal resistor
CC-Link dedicated cable	110Ω 1/2 W (brown - brown – brown)
Version 1.10-compatible CC-Link dedicated cable	
CC-Link dedicated high-performance cable	130Ω 1/2 W (brown - orange – brown)

- (4) The master station can be connected at points other than both ends.
- (5) A star connection is not allowed.  
For the T-branch connection, refer to user's manuals noted in the list of related manuals.

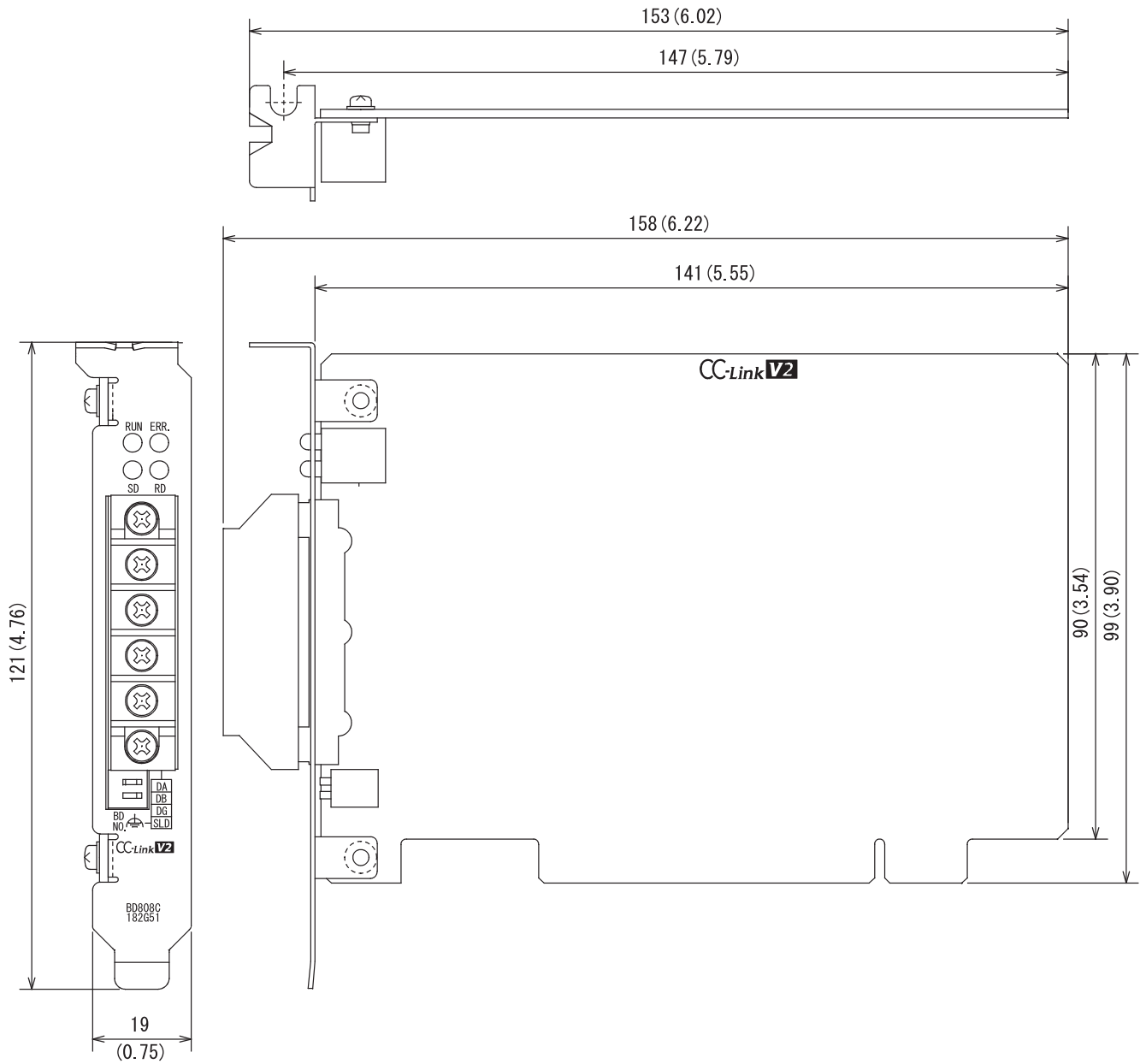
(6) The connection method is shown below.



**POINT**

Each module has a different terminal block layout.  
Exercise caution when wiring the system.

## 7. External Dimensions



Unit: mm (inch)

Other company names and product names used in this document are trademarks or registered trademarks of respective companies.

## 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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Brazil	MELCO-TEC Rep. Com.e Assessoria Tecnica Ltda. Rua Correia Dias, 184, Edificio Paraiso Trade Center-8 andar Paraiso, Sao Paulo, SP Brazil Tel : +55-11-5908-8331	China	Mitsubishi Electric Automation (Shanghai) Ltd. 4/F Zhi Fu Plazz, No.80 Xin Chang Road, Shanghai 200003, China Tel : +86-21-6120-0808
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