

QJ61BT11 Control & Communication Link System Master/Local Module

Thank you for purchasing the Mitsubishi general-purpose PLC MELSEC-Q Series.

Before starting use, please read through this manual and the details manual to ensure correct usage.

User's Manual (Hardware)

MELSEC-Q
Mitsubishi Programmable
Logic Controller

Type	QJ61BT11-U-H-JE
Type code	13JQ41
IB(NA)-0800026-C(0009)MEE	

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● SAFETY PRECAUTIONS ●

(Always read these instructions before using this equipment.)

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

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


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 medium or slight personal injury or physical damage.

Note that the  **CAUTION** level may lead to a serious consequence according to the circumstances.

Always follow the instructions of both levels because they are important to personal safety. Please save this manual to make it accessible when required and always forward it to the end user.

[DESIGN PRECAUTIONS]

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 (3.9inch) or more from each other.
Not doing so could result in noise that may cause malfunction.

[INSTALLATION PRECAUTIONS]

CAUTION

- Use the PLC in an environment that meets the general specifications contained in the CPU user's manual to use.
Using this PLC in an environment outside the range of the general specifications may cause electric shock, fire, malfunction, and damage to or deterioration of the product.
- When installing the module, securely insert the module fixing tabs into the mounting holes of the base unit while pressing the installation lever located at the bottom of the module downward. Improper installation may result in malfunction, breakdown or dropping out of the module.
Securely fix the module with screws if it is subject to vibration during use.
- Tighten the screws within the range of specified torque.
If the screws are loose, it may cause fallout, short circuits, or malfunction.
If the screws are tightened too much, it may cause damage to the screw and/or the module, resulting in fallout, short circuits or malfunction.
- Switch all phases of the external power supply off when mounting or removing the module. Not doing so may cause damage to the module.
- Do not directly touch the conductive area or electronic components of the module.
Doing so may cause malfunction or failure in the module.

[WIRING PRECAUTIONS]

CAUTION

- 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.
- Tighten the terminal screws within the range of specified torque.
If the terminal screws are loose, it may cause fallout, short circuits, or malfunction.
If the terminal screws are tightened too much, it may cause damage to the screw and/or the module, resulting in fallout, short circuits or malfunction.
- Be careful not to let foreign matters such as sawdust or wire chips get inside the module. These may cause fires, failure or malfunction.
- The top surface of the module is covered with protective film to prevent foreign objects such as cable offcuts from entering the module when wiring.
Do not remove this film until the wiring is complete. Before operating the system, be sure to remove the film to provide adequate heat ventilation.
- Be sure to fix communication cables or power supply cables leading from the module by placing them in the duct or clamping them.
Cables not placed in the duct or without clamping may hang or shift, allowing them to be accidentally pulled, which may cause a module malfunction and cable damage.
- When removing the communication cable or power supply cable from the module, do not pull the cable. When removing the cable with a connector, hold the connector on the side that is connected to the module.
When removing the cable connected to the terminal block, first loosen the screws on the part that is connected to the terminal block. Pulling the cable that is still connected to the module may cause malfunction or damage to the module or cable.

About the Manuals

The following manuals are also related to this product.
Order them if necessary.

Related Manuals

Manual name	Manual number (Model code)
QJ61BT11 Control & Communication Link System Master/Local Module User's Manual	SH-080016 (13JL91)

Conformation to the EMC Directive and Low Voltage Instruction

For details on making Mitsubishi PLC conform to the EMC directive and low voltage instruction when installing it in your product, please refer to Chapter 3, "EMC Directive and Low Voltage Instruction" of the PLC CPU User's Manual (Hardware). The CE logo is printed on the rating plate on the main body of the PLC that conforms to the EMC directive and low voltage instruction.

1. OVERVIEW

This manual explains the specifications, names of each part and the settings, etc., for the QJ61BT11 Control & Communication Link System (abbreviated as CC-Link from here on) Master/Local Module (hereinafter QJ61BT11) used in combination with the MELSEC-Q Series PLC CPU. After unpacking, confirm that the following products are enclosed.

Part name	Qty.
QJ61BT11 body	1
Terminal resister 110 Ω 1/2W (brown, brown, brown)	2
Terminal resister 130 Ω 1/2W (brown, orange, brown)	2

1.1 Definition of Ver.1.10

The module of which the cable length between station and station is uniformly 20cm or more by improving the conventional limit of the cable length between station and station is defined as Ver.1.10. The conventional modules are defined as Ver.1.00.

The conditions for setting the cable length between station and station uniformly to 20cm or more are indicated below.

- 1) All modules configuring the CC-Link system must use Version 1.10.
- 2) All data link cables must be Version 1.10 compatible CC-Link dedicated cable.

Point

The Ver.1.00 specifications are applied for the maximum overall cable distance and the cable length between station and station, when the CC-Link system is configured with the modules and cables of Ver.1.00 and Ver.1.10.

(1) Checking Version 1.10

The "CC-Link" logo is stamped on the "plate" for the Version 1.10 modules.

CC-Link

2. Performance specifications

2.1 Performance specifications

The performance specifications of the QJ61BT11 are shown below.

Refer to the User's Manual of the CPU in use for the general specifications of the QJ61BT11.

Item	Specifications
Transmission rate	Select from 156kbps/625kbps/2.5Mbps/5Mbps/10Mbps
Maximum overall cable distance (Maximum transmission distance)	Differs according to transmission rate (Refer to section 2.2.)
Maximum No. of connected modules (for master station)	64 modules
No. of occupied stations (for local station)	One station or four
Maximum No. of link points per system	Remote input/output (RX, RY) : 2048 points Remote register (RWw) : 256 points (Master station → remote device station/local station/intelligent device station/standby master station) Remote register (RWr) : 256 points (Remote device station/local station/intelligent device station/standby master station → master station)
No. of link points per remote station/local station/intelligent device station/standby master station	Remote input/output (RX, RY) : 32 points (30 points for local station) Remote register (RWw) : 4 points (Master station → remote device station/local station/intelligent device station/standby master station) Remote register (RWr) : 4 points (Remote device station/local station/intelligent device station/standby master station → master station)
Communication method	Polling method
Synchronization method	Flag synchronous system
Coding method	NRZI method
Transmission path	Bus (RS-485)
Transmission format	HDLC compliant
Error control system	CRC ($X^{16}+X^{12}+X^5+1$)
Connection cable	CC-Link dedicated cable/CC-Link dedicated high-performance cable*
RAS functions	<ul style="list-style-type: none"> • Automatic return function • Slave station cutoff function • Error detection with link special relay/register
No. of I/O occupied points	32 points (I/O assignment: 32 intelligent points)
5VDC internal current consumption (A)	0.46
Weight (kg)	0.12

* The CC-Link dedicated cable and CC-Link dedicated high-performance cable cannot be used together. Also attach the terminal resistor which matches the kind of the cable.

2.2 Maximum overall cable distance

The maximum overall cable distance differs according to the transmission rate. For the relationship between transmission rate and max. total cable length, refer to CC-Link Catalog, L(NA)-74108143E.

2.3 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 CC-Link catalog L (NA) 74108143E.

3. Mounting and installation

3.1 Precautions for handling

The precautions for handling the module are given below.

- 1) The module case is made of resin, so do not drop it or apply strong impacts on it.
- 2) Crimp terminals with insulated sleeves cannot be used with the terminal block. Covering the wire connection section of the crimp terminals with mark tubes or insulated tubes is recommended.

3) Tighten the module installation screws within the following ranges.

Screw position	Tightening torque range
Module installation screw (M3 screw)	36 to 48N • cm
Terminal block terminal screw (M3 screw)	42 to 58N • cm
Terminal block installation screw (M3.5 screw)	66 to 89N • cm

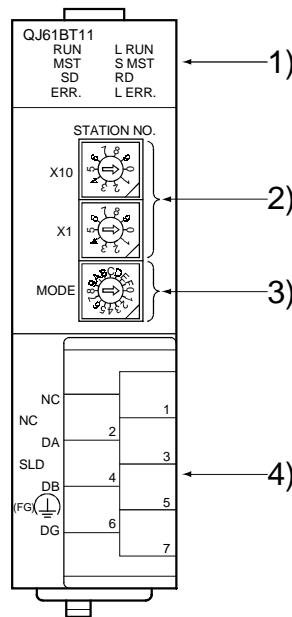
POINT

Always turn the power of the corresponding station OFF before mounting or removing the terminal block. If the terminal block is mounted or removed without turning the corresponding station's power OFF, correct data transmission by the mounted or removed station will not be guaranteed.

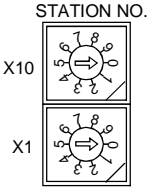

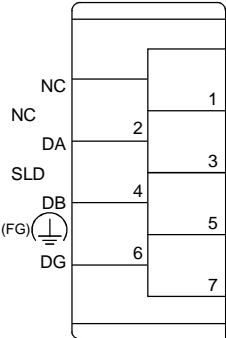
3.2 Installation environment

Refer to the User's Manual of the CPU module in use.

4. Names and settings of each part



No.	Name	Details	
1)	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> QJ61BT11 RUN L RUN MST S MST SD RD ERR. L ERR. </div>	Confirms the data link state by turning the LEDs ON and OFF.	
		LED name	Details
		RUN	ON: Module is normal OFF: Watch dog timer error
		ERR.	ON: Communication error in all stations Turns ON when the following type of error occurs. <ul style="list-style-type: none"> • When switch settings are incorrect • When master station is duplicated on same line • When there is an error in the parameter details • When the data link monitor timer functioned • When the cable is disconnected, or the transmission route is being affected by noise, etc. Flicker: Station with communication error found
		MST	ON: Operating as master station
		S MST	ON: Operating as standby master station
		L RUN	ON: Executing data link
		L ERR.	ON: Communication error (host) Flicker: Setting of switch 2) or 3) was changed while power was ON
		SD	ON: Sending data
		RD	ON: Receiving data

No.	Name	Details																																									
2)	Station No. setting switch 	Set the module's station No. (Default setting: 0) <Setting range> Master station : 0 Local station : 1 to 64 Standby master station : 1 to 64 The "ERR." LED will turn ON if a value other than 0 to 64 is set.																																									
3)	Transmission rate/ mode setting switch 	Set the module's transmission rate and operation state. (Default setting: 0) <table border="1"> <thead> <tr> <th>No.</th> <th>Transmission rate setting</th> <th>Mode</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Transmission rate 156kbps</td> <td rowspan="5">On-line</td> </tr> <tr> <td>1</td> <td>Transmission rate 625kbps</td> </tr> <tr> <td>2</td> <td>Transmission rate 2.5Mbps</td> </tr> <tr> <td>3</td> <td>Transmission rate 5Mbps</td> </tr> <tr> <td>4</td> <td>Transmission rate 10Mbps</td> </tr> <tr> <td>5</td> <td>Transmission rate 156kbps</td> <td rowspan="4">Line test</td> </tr> <tr> <td>6</td> <td>Transmission rate 625kbps</td> <td rowspan="2">When station NO. setting switch is 0: Line test 1</td> </tr> <tr> <td>7</td> <td>Transmission rate 2.5Mbps</td> </tr> <tr> <td>8</td> <td>Transmission rate 5Mbps</td> <td rowspan="2">When station NO. setting switch is 1 to 64: Line test 2</td> </tr> <tr> <td>9</td> <td>Transmission rate 10Mbps</td> </tr> <tr> <td>A</td> <td>Transmission rate 156kbps</td> <td rowspan="5">Hardware test</td> </tr> <tr> <td>B</td> <td>Transmission rate 625kbps</td> </tr> <tr> <td>C</td> <td>Transmission rate 2.5Mbps</td> </tr> <tr> <td>D</td> <td>Transmission rate 5Mbps</td> </tr> <tr> <td>E</td> <td>Transmission rate 10Mbps</td> </tr> <tr> <td>F</td> <td>Setting is inhibited.</td> <td></td> </tr> </tbody> </table>	No.	Transmission rate setting	Mode	0	Transmission rate 156kbps	On-line	1	Transmission rate 625kbps	2	Transmission rate 2.5Mbps	3	Transmission rate 5Mbps	4	Transmission rate 10Mbps	5	Transmission rate 156kbps	Line test	6	Transmission rate 625kbps	When station NO. setting switch is 0: Line test 1	7	Transmission rate 2.5Mbps	8	Transmission rate 5Mbps	When station NO. setting switch is 1 to 64: Line test 2	9	Transmission rate 10Mbps	A	Transmission rate 156kbps	Hardware test	B	Transmission rate 625kbps	C	Transmission rate 2.5Mbps	D	Transmission rate 5Mbps	E	Transmission rate 10Mbps	F	Setting is inhibited.	
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4)	Terminal block 	Connect the CC-Link dedicated cable for the data link. Refer to section 5.1 for details on the connection methods. The terminals SLD and FG are connected inside the module. This is a 2-piece method terminal block, and the module can be exchanged without disconnecting the signal wires connected to the terminal block.																																									

POINT

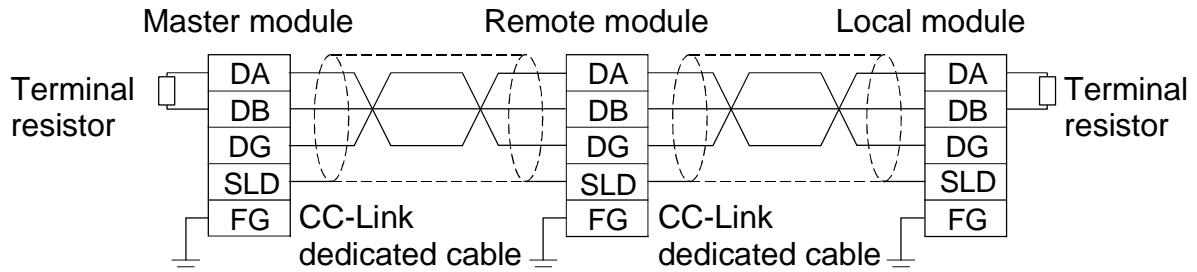
The station No. setting switch and transmission rate/mode setting switch details are validated when the module power is turned OFF to ON or when the PLC CPU is reset. If the setting details are changed while the module's power is ON, turn the module's power OFF and ON, or reset the PLC CPU.

5. External wiring

5.1 CC-Link dedicated cable wiring

The methods for connecting the CC-Link dedicated cable for the master module, local module, standby master module, remote module and intelligent module.

- 1) The cable connecting sequence is not related with the station No.
- 2) Be sure to connect "terminal resistor" of the unit accessory to the units on both ends CC-Link system. Connect the terminal resistor between "DA" and "DB".
- 3) In CC-Link system, the terminal resistor is different depending on the applied cable.
 - CC-Link dedicated cable : 110Ω 1/2W (brown, brown, brown)
 - CC-Link dedicated high-performance cable : 130Ω 1/2W (brown, orange, brown)
- 4) The master module can be connected to a place other than both ends.
- 5) A star connection cannot be used.
- 6) The connection method is shown below.



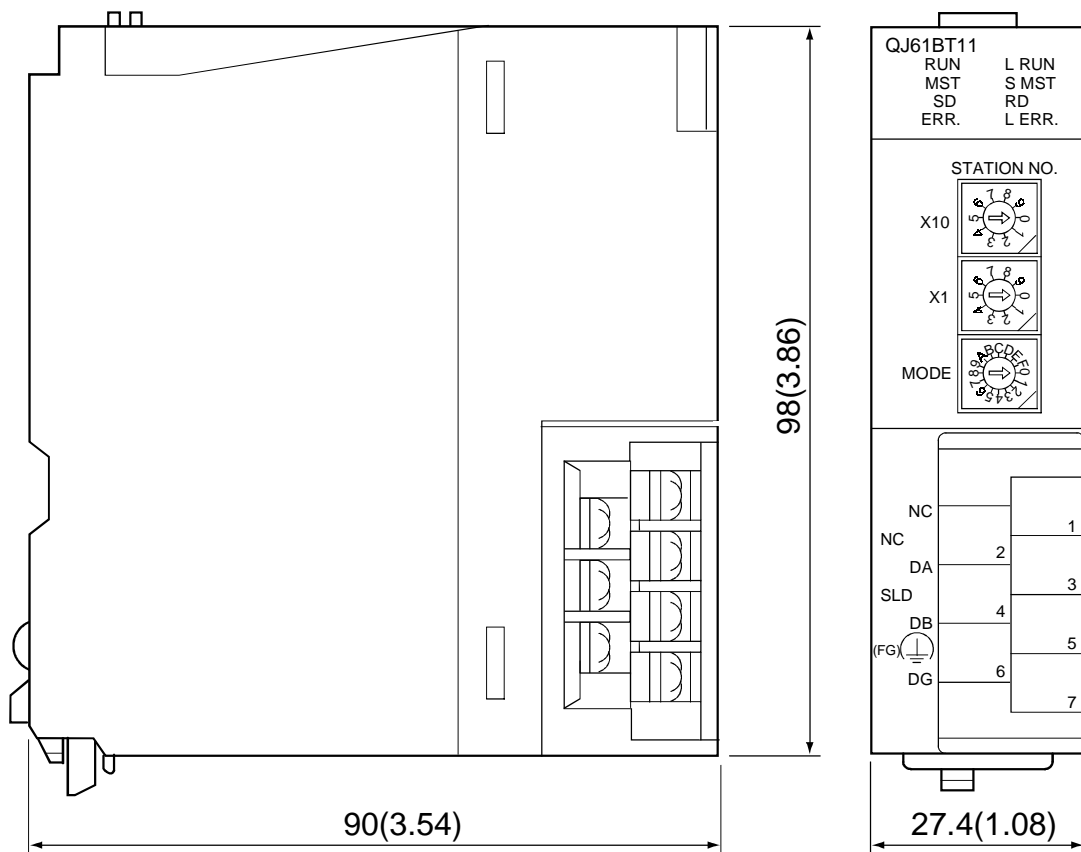
IMPORTANT

The CC-Link dedicated cable and CC-Link dedicated high-performance cable cannot be used together. If used together, correct data transmission will not be guaranteed.

POINT

Connect the shielded wire of the CC-Link dedicated cable to "SLD" of each module, and ground both ends of the shielded wire using D type grounding via "FG". The SLD and FG are connected into the module.

6. Outline dimensions



Unit: mm(inch)

Warranty

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

For safe use

- 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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U.K	Mitsubishi Electric Europe B.V. UK Branch Travellers Lane, Hatfield, Herts., AL10 8XB,UK Tel : 44-1707-276100	Thailand	F. A. Tech Co.,Ltd. 1138/33-34 Rama 3 Road, Yannawa, Bangkok 10120, Thailand Tel : 66-2-295-2861
South Africa	MSA Manufacturing (Pty) Ltd. P O Box 39733 Bramley 201 8 Johannesburg, South Africa Tel : 27-11-444-8080	Indonesia	P.T. Autoteknindo SUMBER MAKMUR Kompleks Agung Sedayu Propertindo (Harco Mangga Dua) Blok H No.4 Jl Mangga Dua Raya Jakarta Pusat 10730-Indonesia. Tel : 62-21-336292
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MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE:MITSUBISHI DENKI BLDG MARUNOUCHI TOKYO 100-8310 TELEX:J24532 CABLE MELCO TOKYO
NAGOYA WORKS:1-14, YADA-MINAMI 5, HIGASHI-KU, NAGOYA, JAPAN

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