MITSUBISHI

MELSECNET/H Network Module

User's Manual

(Hardware)

QJ71LP21-25, QJ71LP21S-25 QJ71LP21G, QJ71BR11

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

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

MELSEC-Q
Mitsubishi
Programmable Controller

MODEL	NET/H-LP21S-U-H
MODEL CODE	13JT16
IB(NA)-0800144-J(0703)MEE	

● 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.
Precautionary notes in this manual cover only the installation of this product.
For precautions on designing and discarding this product, refer to "Safety Precautions" in the MELSECNET/H Reference Manual.
For safety precautions on the programmable controller system, refer to the CPU User's Manual.
In this manual, the safety instructions are ranked as "DANGER" and "CAUTION".

⚠DANGER	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.

Note that the **⚠CAUTION** level may lead to a serious consequence according to the circumstances.
Always follow the instructions of both levels because they are important to personal safety.
Please store this manual in a safe place and make it accessible when required.
Always forward it to the end user.

[INSTALLATION PRECAUTIONS]

⚠CAUTION

- Use the programmable controller in the operating environment that meets the general specifications given in the user's manual of the CPU module. Using the programmable controller in any other operating environment may cause an electric shock, fire or malfunction, or may damage or degrade the product.
- While holding the module mounting lever at the bottom of module, insert the module fixing tab into the fixing hole in the base unit. Then secure the module using the module fixing hole as a support point.
  Incorrect mounting may cause malfunctions, a failure or a drop of the module.
  In an environment of frequent vibrations, secure the module with the screw.
  Tighten the screw within the specified torque range.
  If the screw is too loose, it may cause a drop of the module, a short circuit or malfunctions.
  If too tight, it may damage the screw and/or the module, resulting in a drop of the module, a short circuit or malfunctions.
- Completely turn off the externally supplied power used in the system before mounting or removing the module. Failure to do so may damage the product.
- Do not directly touch the conducting parts and electronic parts of the module. This may cause the module to malfunction or fail.
- Before handling the module, touch a grounded metal object to discharge the static electricity from the human body. Failure to do so may cause malfunction or failure of the module.

[WIRING PRECAUTIONS]

⚠DANGER

- Completely turn off the externally supplied power used in the system when installing or placing wiring.
  Failure to do so may cause electric shocks or damage the product.

⚠CAUTION

- Always connect the FG terminals to the ground using class D (class 3) or higher grounding exclusively designed for programmable controller.
  Failure to do so may cause malfunctions.
- When connecting cables to the terminal block for external power supply, check the rated voltage and terminal layout of the product for correct wiring. Connecting a cable to power supply of different voltage or incorrect wiring may cause a fire or fault.
- Tighten the terminal screws with the specified torque.
  Loose tightening may lead to a short circuit, fire or malfunction.
- Solder coaxial cable connectors properly. Incomplete soldering may result in malfunction.
- Be careful not to let foreign objects such as dust and wire chips get inside the module. They may cause a fire, mechanical breakdown or malfunction.
- The top surface of the module is covered with a protective film to prevent foreign objects such as wire chips from entering the module during wiring work. Do not remove this film until all the wiring work is complete. Before operating the system, be sure to remove the film to release the heat.
- Make sure to place the communication and power cables into a duct or fasten them using a clamp. Failure to do so may damage the module or cables by pulling a dangling cable inadvertently or cause the module to malfunction due to bad connection.
- When disconnecting the communication and power cables from the module, do not pull a cable part by hand.
  When disconnecting a cable with a connector, hold the connector connected to the module by hand and pull it out to remove the cable. When disconnecting a cable connected to a terminal block, loosen the screws on the terminal block first before removing the cable. If a cable is pulled while being connected to the module, it may cause the module to malfunction or damage the module and cables.

Revisions

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

Print Date	*Manual Number	Revision
Sep., 2000	IB(NA)-0800144-A	First edition
Mar., 2001	IB(NA)-0800144-B	Model addition QJ71LP21G
Nov., 2001	IB(NA)-0800144-C	Partial correction Contact address (Back cover)
Aug., 2002	IB(NA)-0800144-D	Model addition QJ71LP21S-25
Mar., 2004	IB(NA)-0800144-E	Partial correction SAFETY PRECAUTIONS, Section 3.1, Compliance with the EMC Directive and the Low Voltage Directive, Chapter 4 (a), (b), (c), Section 5.3, Chapter 6
May, 2004	IB(NA)-0800144-F	Partial correction SAFETY PRECAUTIONS, Chapter 2, Section 5.2
Oct., 2004	IB(NA)-0800144-G	Mode addition MELSECNET/H Extended mode Partial correction SAFETY PRECAUTIONS, About Manuals, Chapter 1, 2, 3, 4, 5, Section 5.1, 5.2, Chapter 6
Nov., 2005	IB(NA)-0800144-H	Partial correction Compliance with the EMC Directive and the Low Voltage Directive, Chapter 4, 6
Mar., 2006	IB(NA)-0800144-I	Partial correction Chapter 2, 4

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

Print Date	*Manual Number	Revision
Mar., 2007	IB(NA)-0800144-J	Change of a term "PLC" was changed to "programmable controller" Partial correction SAFETY PRECAUTIONS, Chapter 4, Section 5.1, 5.2

CONTENTS

About the Manuals

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

Related Manuals

Manual name	Manual No. (Model code)
Q corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)	SH-080049 (13JF92)
Q corresponding MELSECNET/H Network System Reference Manual (Remote I/O network)	SH-080124 (13JF96)
For QnA/Q4AR MELSECNET/10 Network System Reference Manual	IB-66690 (13JF78)

Compliance with the EMC Directive and the Low Voltage Directive

When incorporating the Mitsubishi programmable controller into other industrial machinery or equipment and keeping compliance with the EMC and low voltage directives, refer to Chapter 3 "EMC Directive and Low Voltage Instruction" of the User's Manual (Hardware) for the CPU module used or the programmable controller CPU supplied with the base unit.
The CE logo is printed on the rating plate of the programmable controller, indicating compliance with the EMC and low voltage directives.
For making this product compliant with the EMC and low voltage directives, please refer to Section 3.1.3 "Cable" in Chapter 3 of the above-mentioned user's manual.

1. Overview

This manual explains how to handle the MELSECNET/H network module, model numbers QJ71LP21-25, QJ71LP21S-25, QJ71LP21G and QJ71BR11 (hereinafter referred to as the network module).
The network module is used as a control/normal station in the PLC to PLC network and as a remote master station in the remote I/O network in the MELSECNET/H system.
After unpacking the network module, confirm that any of the following products is enclosed.

Model	Description	Quantity
QJ71LP21-25	Model QJ71LP21-25 MELSECNET/H network module (optical loop type)	1
QJ71LP21S-25	QJ71LP21S-25 MELSECNET/H network module (optical loop type, with external power supply function)	1
QJ71LP21G	Model QJ71LP21G MELSECNET/H network module (optical loop type)	1
QJ71BR11	Model QJ71BR11 MELSECNET/H network module (coaxial bus type)	1
	F-type connector (A6RCON-F)	1

Important

The coaxial bus-type network system requires terminal resistors at both terminal stations of the network. The user should arrange for terminal resistors, since the QJ71BR11 does not come with terminal resistors.

* Terminal resistor (75Ω)
  - A6RCON-R75

2. Performance Specifications

The following table shows the performance specifications for the network module:

<table>
<tr><th colspan="2" rowspan="2">Item</th><th colspan="3">Specifications</th></tr>
<tr><th>QJ71LP21-25</th><th>QJ71LP21S-25</th><th>QJ71LP21G</th></tr>
<tr><td colspan="2">Maximum number of link points per network</td><td colspan="3">(1) PLC to PLC network
<table>
<tr><td></td><td>MELSECNET/H mode, MELSECNET/H Extended mode *1</td><td>MELSECNET/10 mode *1</td></tr>
<tr><td>LX/LY</td><td>8192 points</td><td>8192 points</td></tr>
<tr><td>LB</td><td>16384 points</td><td>8192 points</td></tr>
<tr><td>LW</td><td>16384 points</td><td>8192 points</td></tr>
</table>
(2) Remote I/O network
<table>
<tr><td>LX/LY</td><td>8192 points</td></tr>
<tr><td>LB</td><td>16384 points
(Remote master station to Remote submaster station, Remote I/O station: 8192 points),
(Remote submaster station, Remote I/O station to Remote master station: 8192 points)</td></tr>
<tr><td>LW</td><td>16384 points
(Remote master station to Remote submaster station, Remote I/O station: 8192 points),
(Remote submaster station, Remote I/O station to Remote master station: 8192 points)</td></tr>
</table></td></tr>
<tr><td rowspan="2">Maximum number of link points per station</td><td>PLC to PLC network</td><td colspan="3">• MELSECNET/H mode, MELSECNET/10 mode
{(LY+ LB) /8 + (LW × 2)} ≦ 2000 bytes *2
• MELSECNET/H Extended mode
{(LY+ LB) /8 + (LW × 2)} ≦ 35840 bytes *2</td></tr>
<tr><td>Remote I/O network</td><td colspan="3">• Remote master station → Remote I/O station *3
{(LY + LB) /8 + (LW × 2)} ≦ 1600 bytes
• Remote I/O station → Remote master station *3
{(LX + LB) /8 + (LW × 2)} ≦ 1600 bytes
• Multiplexed remote master station
↔ Multiplexed remote sub-master station
{(LY + LB) /8 + (LW × 2)} ≦ 2000 bytes</td></tr>
<tr><td colspan="2">Communication speed</td><td colspan="2">10Mbps/25Mbps *4 (Selected with MODE switch)</td><td>10Mbps</td></tr>
<tr><td colspan="2">Communication method</td><td colspan="3">Token ring</td></tr>
<tr><td colspan="2">Synchronous method</td><td colspan="3">Frame synchronous method</td></tr>
<tr><td colspan="2">Transmission path format</td><td colspan="3">Duplex loop</td></tr>
<tr><td colspan="2">Maximum number of networks</td><td colspan="3">239</td></tr>
<tr><td colspan="2">Maximum number of groups</td><td colspan="3">32 (9 in MELSECNET/10 mode in PLC to PLC network)</td></tr>
</table>

*1: Mode selection is performed using network parameters.

*2: The number of LY points of the stations set in the I/O master station is the sum total of the LY points for output to all stations within the block.

*3: The remote master station includes the multiplexed remote master station and multiplexed remote sub-master station.

*4: 25Mbps is applied to the MELSECNET/H mode and MELSECNET/H Extended mode only.

Item		Specifications		
		QJ71LP21-25	QJ71LP21S-25	QJ71LP21G
Number of stations per network	PLC to PLC network	64 stations (control station: 1, normal station: 63)		
	Remote I/O network	65 stations (Remote master station: 1, Remote I/O station: 64) *5		
Overall distance		30 km (98430 ft.)		
Distance between stations *6	10Mbps	SI optical cable: 500 m (1640.5 ft.) H-PCF optical cable :1 km (3281 ft.) Broad-band H-PCF optical cable :1 km (3281 ft.) QSI optical cable:1 km (3281 ft.)		GI optical cable: 2 km (36562 ft.)
	25Mbps	SI optical cable:200 m (656.2 ft.) H-PCF optical cable :400m (1312.4 ft.) Broad-band H-PCF optical cable :1 km (3281 ft.) QSI optical cable:1 km (3281 ft.)		-
Connection cable		Optical fiber cable (Arranged by user *7)		
Applicable connector		2-core optical connector plug (Arranged by user *7)		
No. of occupied I/O points		32 points (I/O assignment: 32 points as intelligent)	48 points (I/O assignment: first 16 points as empty, last 32 points as intelligent) *8	32 points (I/O assignment: 32 points as intelligent)
External supply power	Voltage	-	20.4 to 31.2 V DC	-
	Current	-	0.20A	-
	Terminal screw size	-	M3 screw	-
	Applicable solderless terminal	-	R1. 25-3	-
	Applicable wire size	-	0.3 to 1.25 mm^2	-
	Tightening torque	-	0.42 to 0.58N•m	-
	Allowable momentary power failure period	-	1ms (Level PS1)	-
	Noise durability	-	By noise simulator of 500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency	-
5 VDC current consumption		0.55A		
External dimensions		98 (3.86 in.) (H) × 27.4 (1.08 in.) (W) × 90 (3.54 in.) (D) [mm]	98 (3.86 in.) (H) × 55.2 (2.17 in.) (W) × 90 (3.54 in.) (D) [mm]	98 (3.86 in.) (H) × 27.4 (1.08 in.) (W) × 90 (3.54 in.) (D) [mm]
Weight		0.11kg	0.20kg	0.11kg

*5: On a multiplexed remote I/O network, one of 64 remote I/O stations works as a multiplexed remote sub-master station.

*6: There are restrictions to the distance between stations, being determined according to the type of cable and number of stations. See sections 5.1 .

*7: Specialized skill and specific tools are required to connect the connector to the optical fiber cable; the connector itself is a custom product. Please contact your nearest Mitsubishi Electric System Service Corporation when purchasing these items.

*8: Two slots are occupied.
Set the numeric value resulted from adding 10H to the I/O No. of the slot where a module mounted as the "Starting I/O No." of the "Network parameter". The first empty 16 points can be set to "0" on the "I/O assignment" tab screen within the "Qn(H) Parameter" screen.
Example: Set 10H as the "Starting I/O No." when the module is mounted on slot 0.
(Set 0H as the "Starting I/O No." when 0 has been set to slot 0 on the "I/O assignment" tab screen.)

<table>
<tr><th colspan="2" rowspan="2">Item</th><th>Specifications</th></tr>
<tr><th>QJ71BR11</th></tr>
<tr><td colspan="2">Maximum number of link points per network</td><td>(1) PLC to PLC network
<table>
<tr><th></th><th>MELSECNET/H mode,
MELSECNET/H Extended *1</th><th>MELSECNET/10 mode *1</th></tr>
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<tr><td colspan="2">Communication method</td><td>Token bus</td></tr>
<tr><td colspan="2">Synchronous method</td><td>Frame synchronous method</td></tr>
<tr><td colspan="2">Transmission path format</td><td>Single bus</td></tr>
<tr><td colspan="2">Maximum number of networks</td><td>239</td></tr>
<tr><td colspan="2">Maximum number of groups</td><td>32 (9 in MELSECNET/10 mode in PLC to PLC network)</td></tr>
<tr><td rowspan="2">Number of stations per network</td><td>PLC to PLC network</td><td>32 stations (control station: 1, normal station: 31)</td></tr>
<tr><td>Remote I/O network</td><td>33 stations (Remote master station: 1, Remote I/O station: 32) *4</td></tr>
</table>

*1: Mode selection is performed using network parameters.

*2: The number of LY points of the stations set in the I/O master station is the sum total of the LY points for output to all stations within the block.

*3: The remote master station includes the multiplexed remote master station and multiplexed remote sub-master station.

*4: On a multiplexed remote I/O network, one of 32 remote I/O stations works as a multiplexed remote sub-master station.

Item	Specifications
	QJ71BR11
Overall distance	500 m (1640.5 ft.) (5C-2V) 300 m (984.3 ft.) (3C-2V) Can be extended to a maximum of 2.5 km (8202.5 ft.) using up to 4 repeater modules (A6BR10, A6BR10-DC).
Distance between stations *5	500 m (1640.5 ft.) (5C-2V) 300 m (984.3 ft.) (3C-2V)
Connection cable	Coaxial cable Equivalent to 3C-2V, 5C-2V *6 (Arranged by user)
Applicable connector	BNC-P-3-NiCAu (For 3C-2V), BNC-P-5- NiCAu (For 5C-2V) Equivalent to (DDK) (Arranged by user)
Number of I/O occupied points	32 points (I/O assignment: intelligent 32 points)
5VDC current consumption	0.75A
External dimensions	98 (3.86 in.) (H) × 27.4 (1.08 in.) (W) × 90 (3.54 in.) (D) [mm]
Weight	0.11kg

*5: There are restrictions to the distance between stations, being determined according to the type of cable and number of stations. See sections 5.2.

*6: When creating the multiplexed remote I/O network for the redundant system, use double-shielded coaxial cables. See sections 5.2.

For general specifications of the network module, refer to the user's manual for the CPU that is to be used.

3. Handling

⚠CAUTION
● Use the programmable controller in the operating environment that meets the general specifications given in the user's manual of the CPU module. Using the programmable controller in any other operating environment may cause an electric shock, fire or malfunction, or may damage or degrade the product. ● While holding the module mounting lever at the bottom of module, insert the module fixing tab into the fixing hole in the base unit. Then secure the module using the module fixing hole as a support point. Incorrect mounting may cause malfunctions, a failure or a drop of the module. In an environment of frequent vibrations, secure the module with the screw. Tighten the screw within the specified torque range. If the screw is too loose, it may cause a drop of the module, a short circuit or malfunctions. If too tight, it may damage the screw and/or the module, resulting in a drop of the module, a short circuit or malfunctions. ● Completely turn off the externally supplied power used in the system before mounting or removing the module. Failure to do so may damage the product. ● Do not directly touch the conducting parts and electronic parts of the module. This may cause the module to malfunction or fail.

3.1 Handling Precautions

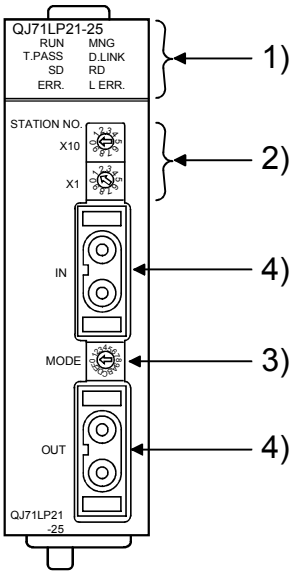
(1) Since the module case is made of resin, do not drop it or subject it to strong impact.

(2) The module can easily be secured to the base unit using the hooks located at the top of the module. In places where there are frequent vibrations, however, it is recommended to fix the module with the module fixing screws. In that case, tighten the module fixing screws within the following range.
Module fixing screws (M3): Tightening torque range is 0.36 to 0.48 N·m.

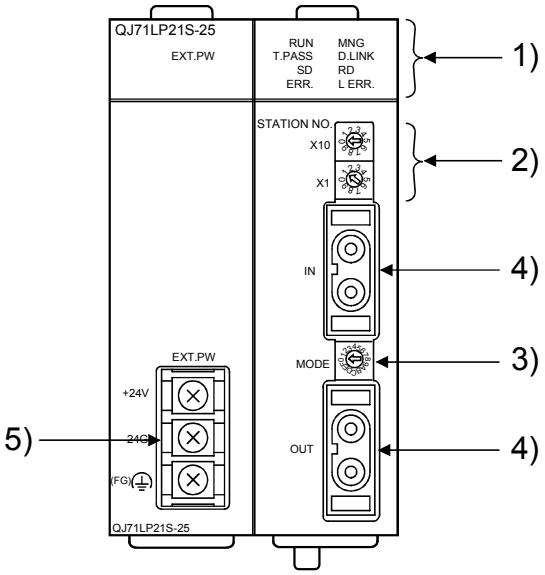
(3) The following range must be applied when tightening the external supply power terminal screws for the QJ71LP21S-25. For specifications of the external supply power terminal screws, refer to chapter 2.
External supply power terminal screws (M3): Tightening torque range is 0.42 to 0.58 N·m.

4. Part Identification Names

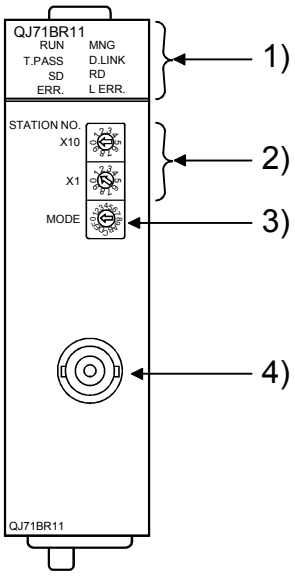
QJ71LP21-25, QJ71LP21G



QJ71LP21S-25



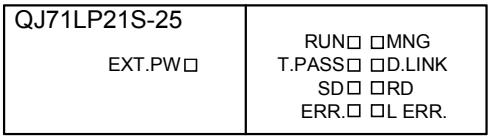
QJ71BR11



Number	Name	Reference Section	Number	Name	Reference Section
1)	Display LED	(1) in this chapter	4)	Connector	(3) in this chapter
2)	Station number setting switches	(2)(a) in this chapter	5)	External power supply terminal block	—
3)	Mode setting switch	(2)(b) in this chapter	—	—	—

(1) LED indication

<QJ71LP21S-25>



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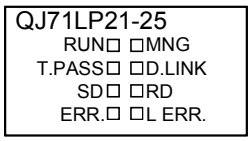


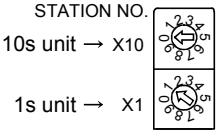
LED name	Indication
RUN	On : Operating normally Off : Watchdog timer error occurred (hardware error)
T. PASS	On : Executing baton pass Flicker : Executing test Off : Baton pass not yet executed (host is disconnecting)
SD	On : Data being transmitted Of f : Data not yet transmitting
ERR.	On : Setting error occurred Flicker : • Error detected by a test • The mode setting switch or the station number setting switch was changed during operation *1 Off : No setting error
MNG	On : Operating as a control station, sub-control station, remote master station or remote sub-master station Off : Operating as a normal station
D. LINK	On : Data link being executed Off : Data link not yet executed
RD	On : Data being received Off : Data not yet received
L ERR.	On : Communication error occurred Off : No communication error
EXT.PW	On : Power being supplied externally Off : Power not yet supplied externally

*1: The ERR. LED flashes on the QJ71LP21-25 and QJ71BR11 whose first five digits of the serial number is “02112” or later.

(2) Setting of each switch

(a) Station number setting switches

Set a station number. (Factory default: 1)



Type	Setting range
PLC to PLC network	1 to 64: Station number *2 Other than 1 to 64: Setting error (The ERR. LED turns ON.)
Remote I/O network	0: Remote master station 1 to 64: Remote sub-master station *2 Other than 1 to 64: Setting error (The ERR. LED turns ON.)

*2: When using the QJ71BR11, setting any of 33 to 64 will result in a setting error. However, the ERR. LED will not turn ON.

(b) Mode setting switch

Set the operating mode. (Factory default: 0)

1) QJ71LP21-25, QJ71LP21S-25 *1

Type	Setting range	
PLC to PLC network, Remote I/O network	0: On-line 1: Self-loopback test 2: Internal self-loopback test 3: Hardware test	10Mbps used
	4: On-line 5: Self-loopback test 6: Internal self-loopback test 7: Hardware test	25Mbps used
	8 to F: Use prohibited	

2) QJ71LP21G, QJ71BR11

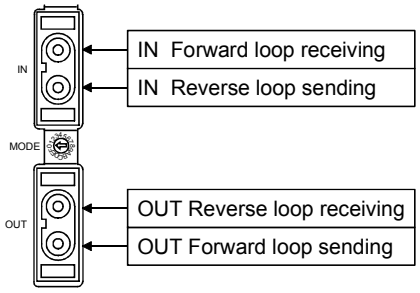
Type	Setting range
PLC to PLC network, Remote I/O network	0: On-line 1: Self-loopback test 2: Internal self-loopback test 3: Hardware test 4 to F: Use prohibited

*1: When setting it to online with the Mode setting switch, the same setting must be made for control station and normal stations of PLC to PLC network, or remote master station and remote I/O stations of remote I/O network.

(3) Connector

(a) IN/OUT connectors

Connected with an optical fiber connector.



(b) Coaxial connector

Connect an F-type connector for a coaxial cable.

5. Wiring

⚠DANGER

- Completely turn off the externally supplied power used in the system when installing or placing wiring.
  Failure to do so may cause electric shocks or damage the product.

⚠CAUTION

- Always connect the FG terminals to the ground using class D (class 3) or higher grounding exclusively designed for programmable controller.
  Failure to do so may cause malfunctions.
- When connecting cables to the terminal block for external power supply, check the rated voltage and terminal layout of the product for correct wiring. Connecting a cable to power supply of different voltage or incorrect wiring may cause a fire or fault.
- Tighten the terminal screws with the specified torque.
  Loose tightening may lead to a short circuit, fire or malfunction.
- Solder coaxial cable connectors properly. Incomplete soldering may result in malfunction.
- Be careful not to let foreign objects such as dust and wire chips get inside the module. They may cause a fire, mechanical breakdown or malfunction.
- The top surface of the module is covered with a protective film to prevent foreign objects such as wire chips from entering the module during wiring work. Do not remove this film until all the wiring work is complete. Before operating the system, be sure to remove the film to release the heat.
- Make sure to place the communication and power cables into a duct or fasten them using a clamp. Failure to do so may damage the module or cables by pulling a dangling cable inadvertently or cause the module to malfunction due to bad connection.
- When disconnecting the communication and power cables from the module, do not pull a cable part by hand.
  When disconnecting a cable with a connector, hold the connector connected to the module by hand and pull it out to remove the cable. When disconnecting a cable connected to a terminal block, loosen the screws on the terminal block first before removing the cable. If a cable is pulled while being connected to the module, it may cause the module to malfunction or damage the module and cables.

5.1 Precautions for Laying Optical Fiber Cables

(1) The distance between stations varies depending on the type of optical fiber cable used.

(a) QJ71LP21-25, QJ71LP21S-25

Type		Distance between stations (m)	
		10Mbps	25Mbps
SI optical fiber cable (Old type: A-2P-□)	L type	500 (1640.5 ft.)	200 (656.2 ft.)
	H type	300 (984.3 ft.)	100(328.1 ft.)
SI optical fiber cable		500 (1640.5 ft.)	200 (656.2 ft.)
H-PCF optical fiber cable		1000 (3281 ft.)	400 (1312.4 ft.)
Broad-band H-PCF optical fiber cable		1000 (3281 ft.)	1000 (3281 ft.)
QSI optical fiber cable		1000 (3281 ft.)	1000 (3281 ft.)

(b) QJ71LP21G

Type	Distance between stations (m)
GI optical fiber cable	2000 (6562 ft.)

(2) When optical fiber cable is connected, there are restrictions for the bending radius of the cable.
For details, check the specifications of the cable to be used.

(3) Please maintain the optical fiber cable permissible bending radius with a checking tool.
Enquiries for the checking tool for optical fiber cable bending radius maintenance are handled by Mitsubishi Electric System Service Corporation. Please contact your nearest Mitsubishi Electric System Service Corporation for detail.

(4) When laying the optical fiber cable, do not touch the fiber core of the cable connector or module connector, or let dirt or dust collect on it.
If oil from the hands, dirt or dust should adhere to the core, the transmission loss will increase, causing a malfunction in the data link.
Also, do not remove the cover from the module connector until an optical fiber cable is connected.

(5) When attaching or detaching the optical fiber cable to/from the module, hold the cable connector securely with the hands.

(6) Connect the cable connector and module connector securely until you hear a "click" sound.

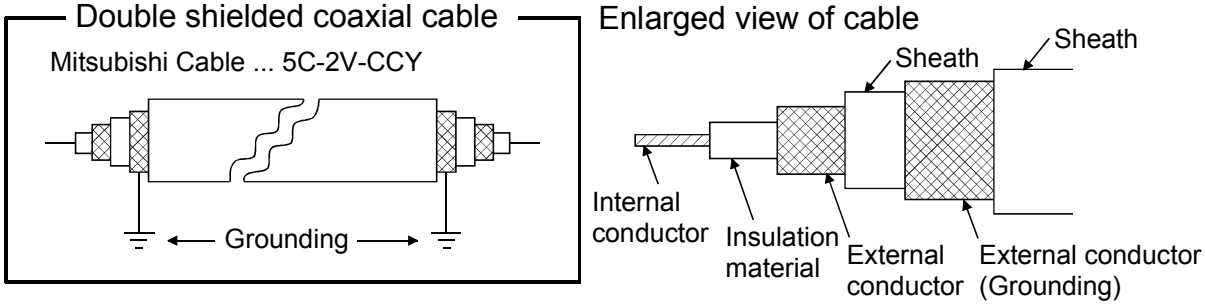
(7) Completely turn off the externally supplied power used in the system when connecting or disconnecting the cable.

5.2 Precautions when Installing the Coaxial Cables

(1) Between stations, use the cable length indicated in the table below according to the number of stations connected.
There is the possibility of communication errors if the cable length other than the table listed below is used.

Number of stations connected	Cable length between stations	Total extension distance
2 to 9 stations	1 to 300 m (3C-2V) (3.28 to 984.3 ft.) 1 to 500 m (5C-2V) (3.28 to 1640.5 ft.)	300 m (984.3 ft.) (3C-2V) 500 m (1640.5 ft.) (5C-2V)
10 to 33 stations	1 to 5 m (3C-2V, 5C-2V) (3.28 to 16.41 ft.) 13 to 17 m (3C-2V, 5C-2V) (42.65 to 55.78 ft.) 25 to 300 m (3C-2V, 5C-2V) (82.03 to 984.3 ft.) 25 to 500 m (5C-2V) (82.03 to 1640.5 ft.)	

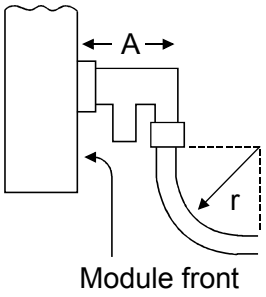
(2) If the number of stations could be increased due to system expansion, consider the restrictions shown in above (1) in advance before cabling.
(3) When using a repeater module (models A6BR10 or A6BR10-DC), use the station-to-station cable length indicated by "10 to 33" stations, regardless of the number of stations connected or the number of repeater modules.
(4) Install the coaxial cables at least 100 mm (3.94 in.) away from other power cables and control cables.
(5) Consider wiring using double-shielded coaxial cable in places that are subject to large amounts of noise.
(6) When creating the multiplexed remote I/O network for the redundant system, use double-shielded coaxial cables.



The 5C-2V connector plug is applicable to double-shielded coaxial cable. Connect the 5C-2V connector plug to the coaxial cable inside a double-shielded coaxial cable. Ground the shielded part outside a double-shielded coaxial cable as shown in the above figure.

(7) When connecting a coaxial cable, the following restrictions on the bending radius must be observed.

Cable type	Allowable bending radius r [mm (in.)]	Connector A [mm (in.)]
3C-2V	23 (0.91)	55 (2.17)
5C-2V	30 (1.18)	



(8) Do not pull any of the connected coaxial cables.
This will cause a faulty contact, cable disconnection, or damage to the module.

(9) Make sure to connect a terminal resistor to both terminal stations of the coaxial bus type network system.

(10) Depending on the usage environment, some white oxidation deposits may be seen on the F type connector. However, oxidation will not occur on the connection area, so there will be no problems with the function of the unit.

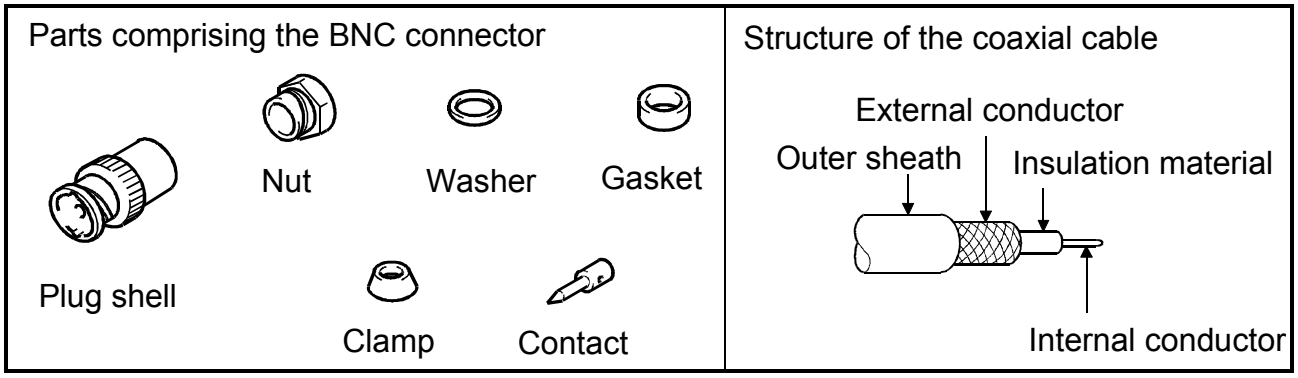
(11) Completely turn off the externally supplied power used in the system when connecting or disconnecting the cable.

5.3 Connecting the Connector for the Coaxial Cable

The following section explains how to connect the BNC connector (connector plug for the coaxial cable) to the cable.

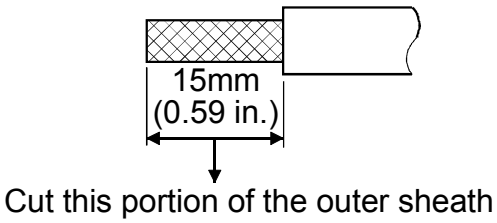
(1) Structure of the BNC connector and coaxial cable

The structure of the BNC connector and coaxial cable are shown in the figure below.

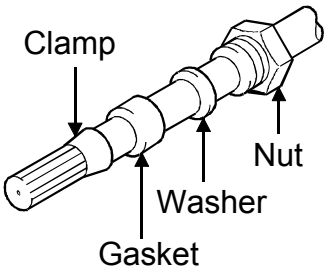


(2) How to connect the BNC connector and the coaxial cable

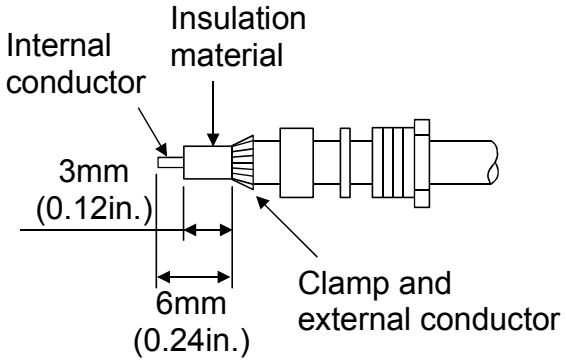
(a) Cut off the outer sheath of the coaxial cable to the length shown in the diagram below.



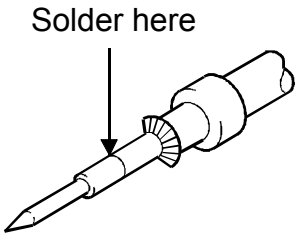
(b) Feed the nut, washer, gasket and clamp on the coaxial cable through, as shown below, then unfasten the external conductor.



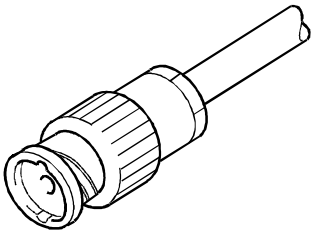
(c) Cut the external conductor, insulation material and internal conductor to the dimensions shown below. However, cut the external conductor to the same dimension as the tapered section of the clamp and smooth it down to the clamp.



(d) Solder the contact to the internal conductor.



(e) Insert the connector assembly in (d) into the plug shell and screw the nut into the plug shell.



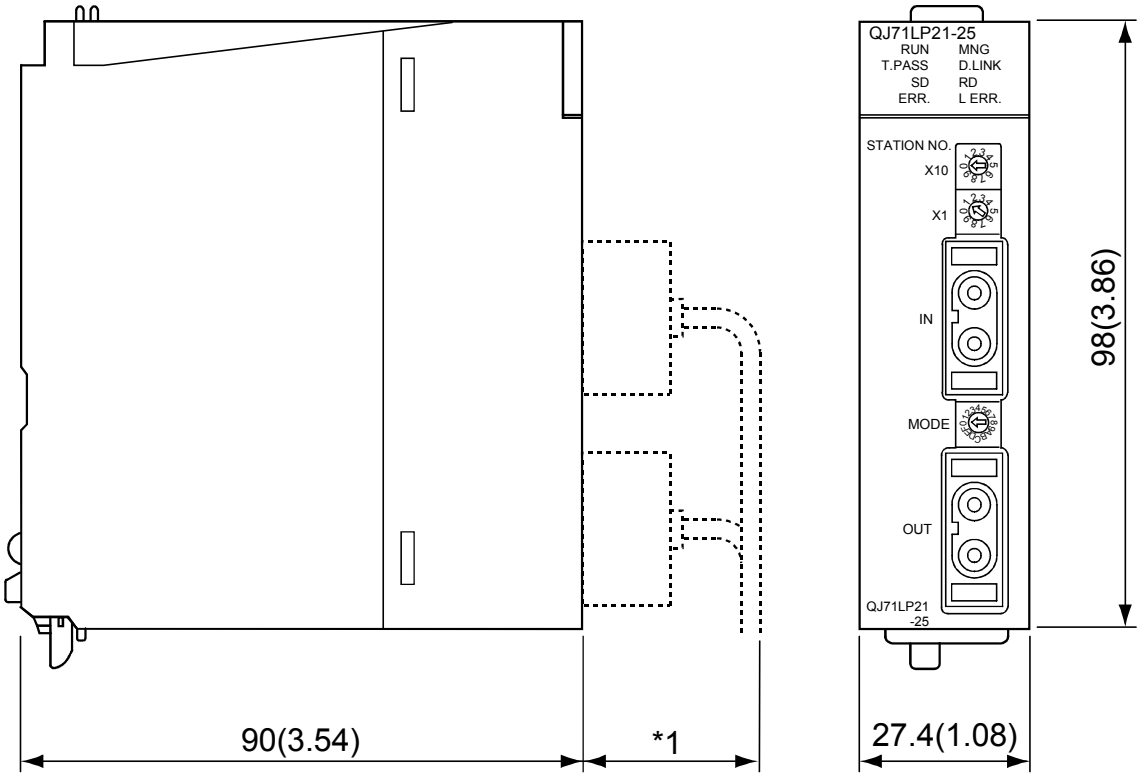
Important

(1) Note the following precautions when soldering the internal conductor and contact.
- Make sure that the solder does not bead up at the soldered section.
- Make sure there are no gaps between the connector and cable insulator or they do not cut into each other.
- Perform soldering quickly so the insulation material does not become deformed.

(2) Before connecting or disconnecting the coaxial connector, touch a grounded metal object to discharge the static electricity from the human body. Failure to do so may result in a module malfunction.

6. External Dimensions

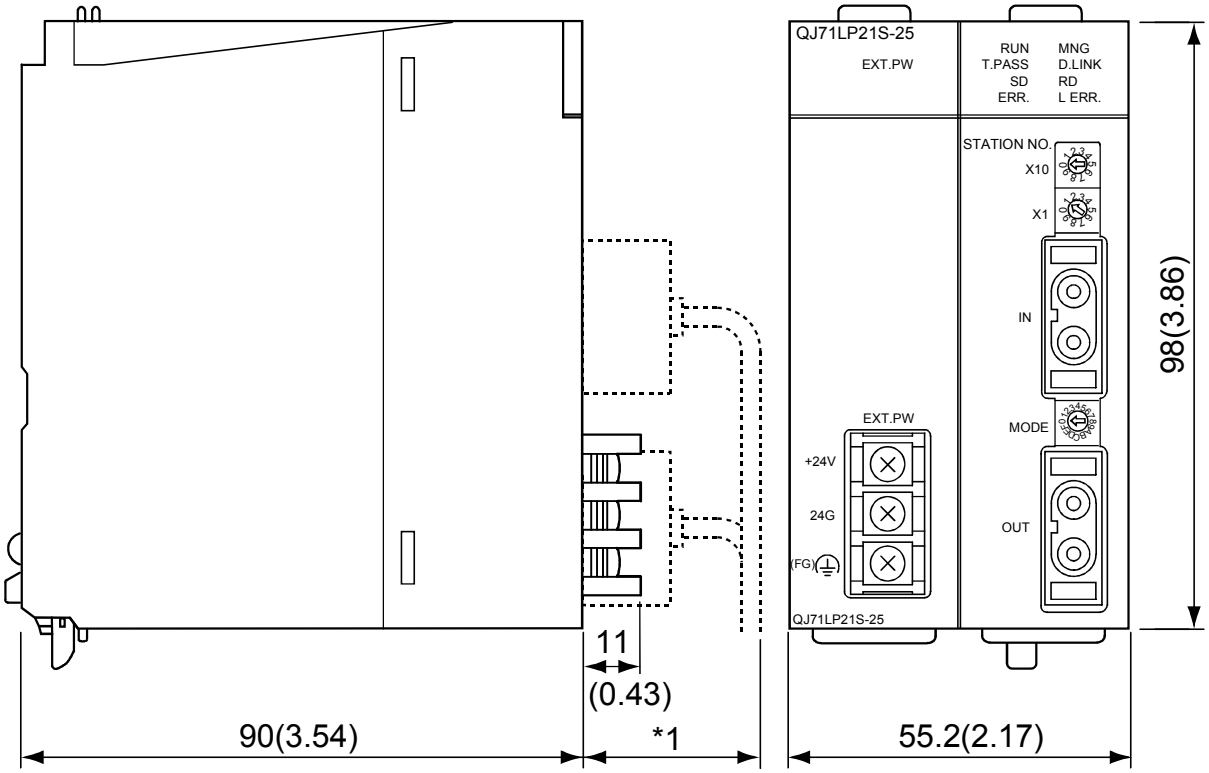
(1) QJ71LP21-25, QJ71LP21G



Unit: mm (in.)

*1: Please contact your nearest Mitsubishi Electric System Service Corporation for detail.

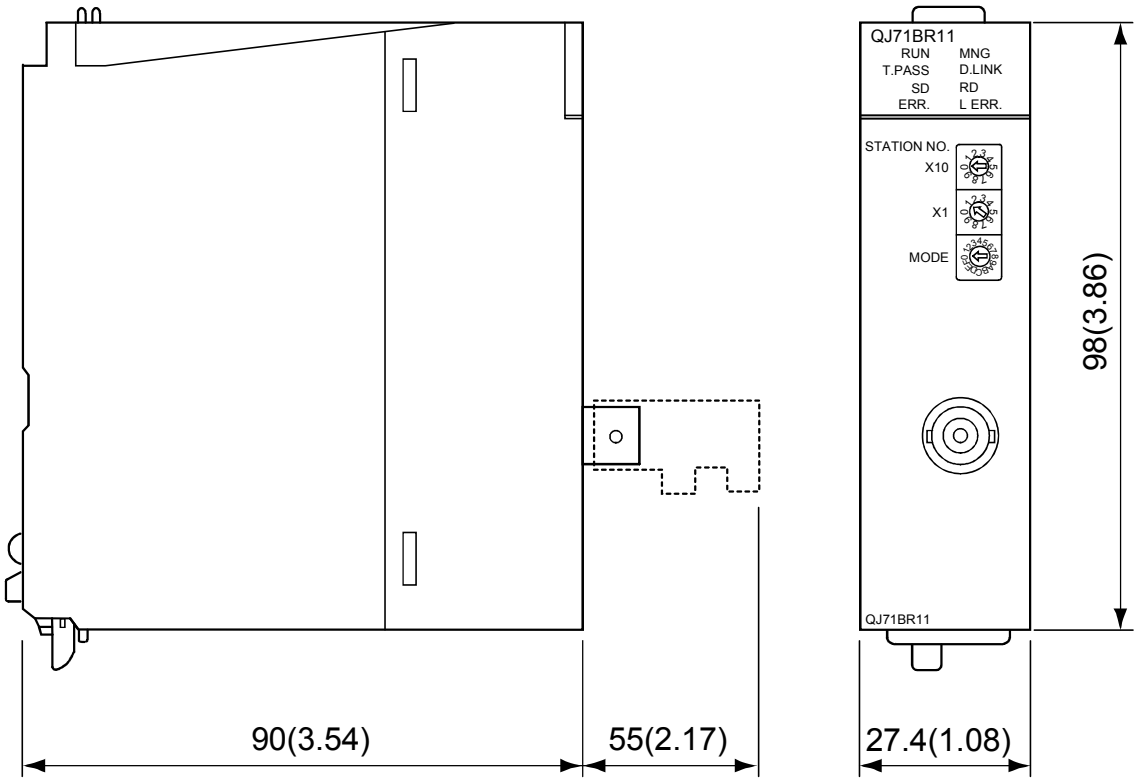
(2) QJ71LP21S-25



Unit: mm (in.)

*1: Please contact your nearest Mitsubishi Electric System Service Corporation for detail.

(3) QJ71BR11



Unit: mm (in.)

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- 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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