

mitsubishi

MELSECNET/10

Network Module

User's Manual
(Hardware)

A1SJ71QLP21,A1SJ71QLP21S
A1SJ71QLR21,A1SJ71QBR11

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

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



● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

When using Mitsubishi equipment, thoroughly read this manual and the associated manuals introduced in this manual. Also pay careful attention to safety and handle the module properly.

These precautions apply only to Mitsubishi equipment. Refer to the CPU module user's manual for a description of the PC system safety precautions.

These ●SAFETY PRECAUTIONS● classify the safety precautions into two categories: "DANGER" and "CAUTION"



Procedures which may lead to a dangerous condition and cause death or serious injury if not carried out properly.



Procedures which may lead to a dangerous condition and cause superficial to medium injury, or physical damage only, if not carried out properly.

Depending on circumstances, procedures indicated by  CAUTION may also be linked to serious results.

In any case, it is important to follow the directions for usage.

Store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

[INSTALLATION PRECAUTIONS]

CAUTION

- Use the PC in an environment that meets the general specifications contained in this manual. Using this PC in an environment outside the range of the general specifications could result in electric shock, fire, erroneous operation, and damage to or deterioration of the product.
- Do not touch the printed circuit board of the module.
It may cause damage or erroneous operation.
- Install so that the pegs on the bottom of the module fit securely into the base unit peg holes.
The module fixing screws must be tightened by the specified torque.
Not installing the module correctly or tightening the screws to the terminal base could result in erroneous operation, damage, or pieces of the product falling.

[WIRING PRECAUTIONS]

⚠ DANGER

- Completely turn off the external power when installing or placing wiring. Not completely turning off all power could result in electric shock or damage to the product.

⚠ CAUTION

- When wiring in the PC, be sure that it is done correctly by checking the product's rated voltage and the terminal layout. Connecting a power supply that is different from the rating or incorrectly wiring the product could result in fire or damage.
- Be sure there are no foreign substances such as sawdust or wiring debris inside the module. Such debris could cause fires, damage, or erroneous operation.
- Solder the coaxial cable connector properly. Incomplete soldering may cause a malfunction.
- Tighten terminal screws to the specified torque.
If a terminal screw is not tightened to the specified torque, the module may fall out, short circuit, or malfunction.
If a terminal screw is tightened excessively, exceeding the specified torque, the module may fall out, short circuit, or malfunction due to breakage of the screw or the module.
- Be sure to fix communication cables or power 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 cables 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 terminal block.
Pulling the cable that is still connected to the module may cause malfunction or damage to the module or cable.

CONTENTS

1. Overview	..	1
2. Performance Specifications	2
3. Handling	..	4
3.1 Cable length restrictions between stations		4
4. The Name and Setting of Each Part		5
5. Wiring	..	10
5.1 Precautions for Laying Optical Fiber Cables	..	11
5.2 Precautions when Installing the Coaxial Cables		13
5.2.1 For the Coaxial Loop Type		13
5.2.2 For the Coaxial Bus Type	14
5.2.3 Connecting the Connector for the Coaxial Cables	..	16
6. External Dimensions		18
6.1 A1SJ71QLP21		18
6.2 A1SJ71QLP21S	..	18
6.3 A1SJ71QLR21	..	19
6.4 A1SJ71QBR11	..	19

About the Manuals

The following product manuals are available. Please use this table as a reference to request the appropriate manual as necessary.

Detailed Manual

Manual name	Manual No. (Model code)
For QnA/Q4AR MELSECNET/10 Network System Reference Manual	1B-66690 (13JF78)

1. Overview

This manual explains the specifications and names of each part, etc., of the A1SJ71QLP21(S), A1SJ71QLR21 and A1SJ71QBR11 model network module (abbreviated as Network Modules) which are used with MELSECNET/10 network system of the MELSEC-QnA series.

- 1) The use, cable used and installation position of the Network Modules are indicated on the following chart.

Type	Use	Cable used		Application
		Optical fiber cable	Coaxial cable	
A1SJ71QLP21(S)	The control station, normal station and master station of MELSECNET/10	○	-	Main base, Extension base I/O slot
A1SJ71QLR21		-	○	
A1SJ71QBR11				

- 2) Please verify the existence of the following parts after opening the package.

- a) In the case of A1SJ71QLP21

Product name	Quantity
A1SJ71QLP21 Network module	1

- b) In the case of A1SJ71QLP21S

Product name	Quantity
A1SJ71QLP21S Network module	1

- c) In the case of A1SJ71QLR21

Product name	Quantity
A1SJ71QLR21 Network module	1

- d) In the case of A1SJ71QBR11

Product name	Quantity
A1SJ71QBR11 Network module	1
F form connector (A6RCON-F)	1

- 3) When constructing a coaxial bus system, a terminal resistor (A6RCON-R75) or a BNC-TMP-05 (75) manufactured by Hirose Electric Corp. is required for both system terminals. It is not included with the module and must be purchased separately.

- 4) Application CPU
Q2ASCPU(S1), Q2ASHCPU (S1)

2. Performance Specifications

The performance specifications for Network Modules are indicated as follows.

Topic		A1SJ71QLP21(S)	A1SJ71QLR21	A1SJ71QBR11
Maximum link points per 1 network	X/Y	8192 points		
	B	8192 points		
	W	8192 points		
Maximum link points per 1 station	When constructing a PC network	$\left[\frac{B+Y}{8} + (2 \times W) \right] + (2 \times W) \leq 2000 \text{ bytes}$		
	When constructing a remote I/O network	<ul style="list-style-type: none"> • Remote master station → remote I/O station $\left[\frac{B+Y}{8} + (2 \times W) \right] + (2 \times W) \leq 2000 \text{ bytes}$ • Remote I/O station → remote master station $\left[\frac{B+X}{8} + (2 \times W) \right] + (2 \times W) \leq 2000 \text{ bytes}$ • Remote master station → remote sub master station Remote sub master station → remote master station $\left[\frac{Y+B}{8} + (2 \times W) \right] + (2 \times W) \leq 2000 \text{ bytes}$ 		
Communication speed	10Mbps (20Mbps: Multiplex transmission)			10Mbps
Communication method	Token ring mode			Token pass mode
Synchronous mode	Frame synchronous mode			
Transmission circuit format	Double loop (Optical fiber cable)	Double loop (Coaxial cable)	Single pass (Coaxial cable)	
General extension distance (inter station distance) *1	30km $\left[\begin{array}{l} \text{SI cable H type inter station 300m} \\ \text{SI cable L type inter station 500m} \\ \text{QSI cable inter station 1km} \end{array} \right]$	3C-2V	3C-2V	5C-2V
		19.2km (inter station 300m)	300m (inter station 300m)	500m (inter station 500m)
		5C-2V 30km (inter station 500m)	Repeater module (A6BR10, A6BR10-DC) Maximum expansion is 2.5km	
Maximum number of networks	239			
Maximum number of groups	9 (Only in a PC network)			
Number of connection	When constructing a PC network	64 stations (Control station: 1 Normal stations: 63)		32 stations (Control station: 1 Normal stations: 31)
Stations in 1 network	When constructing a remote I/O network	65 stations *2 Remote master station: 1 Remote I/O stations: 64		33 stations Remote master station: 1 Remote I/O stations: 32

Topic	A1SJ71QLP21(S)	A1SJ71QLR21	A1SJ71QBR11
Maximum number of installation modules per 1 CPU	Q2ASCPU(S1), Q2ASHCPU(S1): 4		
Coding mode	NRZ1 signal (Non Return to Zero Inverted)	Manchester signal	
Transmission format	HDLC performance (frame format)		
Error control format	Retry by CRC ($X^{10}+X^{14}+X^5+1$) and overtime		
RAS function	<ul style="list-style-type: none"> • Loop pack function due to abnormality detection and cable disconnection (A1SJ71QLP21(S), A1SJ71QLR21) • Diagnostic function for local link circuit check • Prevention of system down due to shifting to control station (Only for PC networks) • Abnormality detection by link special relay, resistor • Network monitor, each type of diagnostic function • Transient transmission possible even when there is PC CPU abnormality (cause of abnormality can be verified from other station) • Prevention of loopback due to supplying external power (A1SJ71QLP21S) 		
Transient transmission	• N:N intercommunication (Monitor, program upload/download, etc.)		
Connection cable	Optical fiber cable SI-200/220, SI-200/250 QSI-185/230 (Arranged by user *3)	3C-2V, 5C-2V Equivalent goods	
Integration cable	2-core optical connector plug DL-72ME (For SI-200/250) CA7003, CA7005 (For SI-200/220 and QSI-185/230)	BNC-P-3-NI-CAU BNC-P-5-NI-CAU Equivalent goods (manufactured by DDK Electronics., LTD.	
Cable transmission loss	12dB/km or less	5.6 dB/km or less	In accordance with JIS C 3501
Consumption current (5VDC)	0.40	1.14A	0.80A
External supply power (A1SJ71QLP21(S) only)	Voltage	20.4 to 31.2VDC	
	Current	0.2A	
	Applicable wire size	0.75 to 2mm ²	
	Tightening torque	98 to 137.2N(cm)	
Weight [kg (lb)]	0.3 (0.66) (A1SJ71QLP21(S)): 0.42 (0.92)		
Input occupancy points	32 points (A1SJ71QLP21(S)): 48 points, I/O slot: 2 slot occupy)		

*1: There are restrictions to the distance between stations, being determined according to the type of cable and number of stations. See sections 5.1, 5.2.1 and 5.2.2.

*2: Because A1SJ71QLR21 does not have Remote I/O module of double loop (coaxial cable), Remote I/O network cannot be constructed.

*3: Specialised training 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.

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

3. Handling

[INSTALLATION PRECAUTIONS]

CAUTION

- Use the PC in an environment that meets the general specifications contained in this manual. Using this PC in an environment outside the range of the general specifications could result in electric shock, fire, erroneous operation, and damage to or deterioration of the product.
- Do not touch the printed circuit board of the module.
It may cause damage or erroneous operation.
- Install so that the pegs on the bottom of the module fit securely into the base unit peg holes.
The module fixing screws must be tightened by the specified torque.
Not installing the module correctly or tightening the screws to the terminal base could result in erroneous operation, damage, or pieces of the product falling.

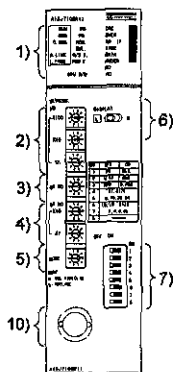
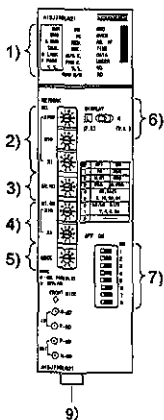
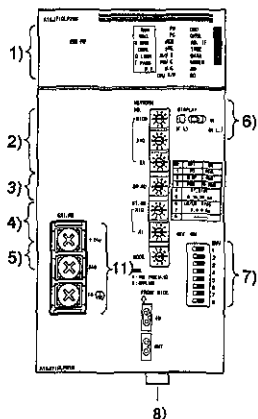
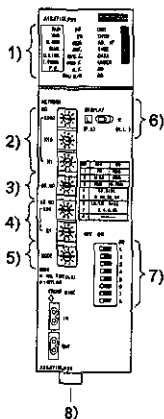
3.1 Cable length restrictions between stations.

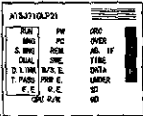
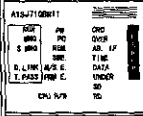
- 1) The main module case is made of plastic, so do not drop it or subject it to strong impacts.
- 2) Do not dismount the printed wiring board from the case. It may damage the module.
- 3) When wiring, be careful never to let foreign matter from the above module such as wiring scraps get inside the module. If something goes in, get rid of it.
- 4) The module installation screw should be kept within the following range.

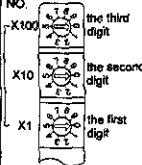

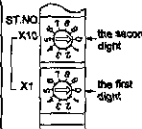
Screw Locations	Tightening Torque Range
Module installation screws (M4 screws)	78 to 117N•cm


4. The Name and Setting of Each Part

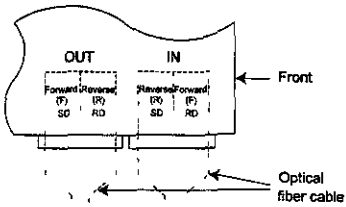
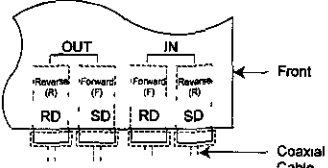
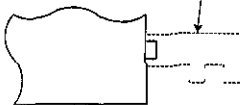
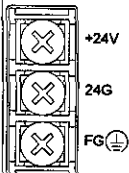
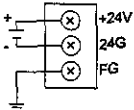
Indicates the name and setting of each part of Network Modules.



No.	Name	Contents		
1)	LED	RUN	Module at the normal time: lamp is lit When a WDT error is generated: lamp is not lit	
	A1SJ71QLP21	MNG	Control station, master station setting time: lamp is lit Normal station setting time: lamp is not lit	
		S.MNG	When it is sub-management station: lamp is lit	The position of the switch for the display switch over of 6 is valid when it is on the left side.
	A1SJ71QLP21's LED is the one that "EXP.PW" is added to the LED of A1SJ71QLP21. A1SJ71QLR21's LED is the same as the LED of A1SJ71QLP21.	DUAL	During execution of multiplex transmission: lamp is lit	
	A1SJ71QBR11	D.LINK	During data link: lamp is lit	The position of the switch for the display switch over of 6 is valid when it is on the right side.
		T.PASS	At the time of baton pass (transient transmission): lamp is lit	
		F.E.	If there is an error when the Plus (F. Loop) loop is abnormal: lamp is lit <Primary cause> The power supply of the adjacent station is off, the cable is cut or not connected, etc.	
		PW	When the power supply is supplied: lamp is lit	
		PC	When setting a PC network: the lamp is lit (SW1 is off)	
		REM.	When setting a remote I/O: lamp is lit (turns on the SW1)	
		SW.E.	When there is an abnormality with a switch between 2 and 6: lamp is lit	
		M/S.E.	On the same network, at the time of station or control station duplication: lamp is lit	
		PRM.E.	When there is a conformity error with a common parameter and station existent parameter and when the parameter received from a sub-management station and the focal station parameter received from the management station are different: lamp is lit	
		R.E.	If there is an error when the Sub (R. Loop) loop is abnormal: lamp is lit <Primary cause> The power supply of the adjacent station is off, the cable is cut or not connected, etc.	
		CPU R/W	During CPU communication exchange: lamp is lit	
		EXT.PW	When the external power supply (24VDC) is being supplied to A: lamp is lit	
		CRC	When there is a code check error of receiving data: lamp is lit <Primary cause> The timing of a station in parallel condition sending data to corresponding station, H/W abnormality, cable abnormality, noise, etc.	
		OVER	When there is an error due to delayed processing of receiving data: the lamp is lit <Primary cause> H/W abnormality, cable abnormality, noise, etc.	

No.	Name	Contents			
1)	LED	AB,IF	Errors when successively receiving communication which is "1" above the regulations and or when the length of the receiving data is short: lamp is lit <Primary causes> The timing of a station in parallel condition sending data to the corresponding station, monitoring time is short, cable is abnormal, noise, etc.		
		TIME	An error at the time that the data link timer is working: lamp is lit <Primary causes> Monitoring time is short, cable abnormality, noise, etc.		
		DATA	Error when receiving abnormal data which is 2K bytes or over: lamp is lit. <Primary causes> Cable abnormality, noise, etc.		
		UNDER	An error when the internal processing of the sending transmission data is not in constant intervals: lamp is lit <Primary causes> H/W abnormality		
		SD	During data sending: lamp is lit		
		RD	During data receiving: lamp is lit		
2) *2	Network number setting switch NETWORK NO. 	Network number setting (factory setting at time of shipping: 1) <Setting range> 1 to 239 :Network number Other than 1 to 239 :Setting error (SW.E LED lamp is lit) Becomes off-line condition			
3) *2	Group number setting Switch 	Network number setting (factory setting at time of shipping: 1) <Setting range> 1 to 239 :Network number Other than 1 to 239 :Setting error (SW.E LED lamp is lit) Becomes off-line condition			
4) *2	Station number setting switch 	Station number setting (factory setting at time of shipping: 1)			
		Type	Setting		
	PC network	1 to 64 Other than 1 to 64	:station number :setting error (SW.E led light is lit)		
	Remote network	I/O 0 1 to 64 Other than 1 to 64	:remote master station :remote sub master station :setting error (SW.E LED light is lit)		

No.	Name	Contents																																																																																										
5) *2	Mode setting switch  MODE 0: FOML TIME(A,R) 2: OFFLINE	Mode setting (factory setting at time of shipping: 0) <table border="1"> <thead> <tr> <th>Mode</th> <th>Name</th> <th>Contents</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>On-line (automatic double line existent)</td> <td>Data link (automatic double line existent)</td> </tr> <tr> <td>1</td> <td>Use not possible</td> <td>-</td> </tr> <tr> <td>2</td> <td>Off-line</td> <td>Placing local station in parallel condition</td> </tr> <tr> <td>3</td> <td>Forward loop</td> <td>Data link system Check of all forward loop side circuits is executed.</td> </tr> <tr> <td>4</td> <td>Reverse loop</td> <td>Data link system Check of all reverse loop side circuits is executed.</td> </tr> <tr> <td>5</td> <td rowspan="2">Test between stations (master stations)</td> <td rowspan="2">By the mode which checks circuits between 2 stations, execute the check of the one which has a smaller number as the master station and the other as the sub master station.</td> </tr> <tr> <td>6</td> <td>Test between stations (sub master stations)</td> </tr> <tr> <td>7</td> <td>Self back to back test</td> <td>By the module simplex, check the hardware including the sending and receiving communication circuit of the transmission system and the cable.</td> </tr> <tr> <td>8</td> <td>Internal self back to back test</td> <td>By the unit simplex, check the hardware including the sending and receiving communication circuit of the transmission system.</td> </tr> <tr> <td>9</td> <td>Hardware test</td> <td>Check the internal hardware of the network module.</td> </tr> <tr> <td>A to F</td> <td>Use prohibited</td> <td>(Do not set the mode.)</td> </tr> </tbody> </table>	Mode	Name	Contents	0	On-line (automatic double line existent)	Data link (automatic double line existent)	1	Use not possible	-	2	Off-line	Placing local station in parallel condition	3	Forward loop	Data link system Check of all forward loop side circuits is executed.	4	Reverse loop	Data link system Check of all reverse loop side circuits is executed.	5	Test between stations (master stations)	By the mode which checks circuits between 2 stations, execute the check of the one which has a smaller number as the master station and the other as the sub master station.	6	Test between stations (sub master stations)	7	Self back to back test	By the module simplex, check the hardware including the sending and receiving communication circuit of the transmission system and the cable.	8	Internal self back to back test	By the unit simplex, check the hardware including the sending and receiving communication circuit of the transmission system.	9	Hardware test	Check the internal hardware of the network module.	A to F	Use prohibited	(Do not set the mode.)																																																							
Mode	Name	Contents																																																																																										
0	On-line (automatic double line existent)	Data link (automatic double line existent)																																																																																										
1	Use not possible	-																																																																																										
2	Off-line	Placing local station in parallel condition																																																																																										
3	Forward loop	Data link system Check of all forward loop side circuits is executed.																																																																																										
4	Reverse loop	Data link system Check of all reverse loop side circuits is executed.																																																																																										
5	Test between stations (master stations)	By the mode which checks circuits between 2 stations, execute the check of the one which has a smaller number as the master station and the other as the sub master station.																																																																																										
6			Test between stations (sub master stations)																																																																																									
7	Self back to back test	By the module simplex, check the hardware including the sending and receiving communication circuit of the transmission system and the cable.																																																																																										
8	Internal self back to back test	By the unit simplex, check the hardware including the sending and receiving communication circuit of the transmission system.																																																																																										
9	Hardware test	Check the internal hardware of the network module.																																																																																										
A to F	Use prohibited	(Do not set the mode.)																																																																																										
6) *2	Switch for mode switch over	Switch over of forward/reverse loop of the error display of CRC-Under and the display switch over of Run-F.E./PW-R.E. (factory setting at the time of shipping: left side) <table border="1"> <thead> <tr> <th>Switch position</th> <th>Contents</th> </tr> </thead> <tbody> <tr> <td>L(F.L.)</td> <td>The CRC-Under error display is set to the forward loop side and the RUN to R.E. display is set to valid.</td> </tr> <tr> <td>R(R.L.)</td> <td>(PW to R.E. display is invalid) The CRC-Under error display is set to the reverse loop side and the PW to R.E. display is set to valid. (RUN to R.E. display is invalid)</td> </tr> </tbody> </table>	Switch position	Contents	L(F.L.)	The CRC-Under error display is set to the forward loop side and the RUN to R.E. display is set to valid.	R(R.L.)	(PW to R.E. display is invalid) The CRC-Under error display is set to the reverse loop side and the PW to R.E. display is set to valid. (RUN to R.E. display is invalid)																																																																																				
Switch position	Contents																																																																																											
L(F.L.)	The CRC-Under error display is set to the forward loop side and the RUN to R.E. display is set to valid.																																																																																											
R(R.L.)	(PW to R.E. display is invalid) The CRC-Under error display is set to the reverse loop side and the PW to R.E. display is set to valid. (RUN to R.E. display is invalid)																																																																																											
7) *2	Conditions setting switch <table border="1"> <thead> <tr> <th>SW</th> <th>OFF</th> <th>ON</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>PC</td> <td>REM.</td> </tr> <tr> <td>2</td> <td>N.SF</td> <td>MING</td> </tr> <tr> <td>3</td> <td>PRM</td> <td>D.PRM</td> </tr> <tr> <td>4</td> <td>ST SIZE</td> <td></td> </tr> <tr> <td>5</td> <td>8, 16, 32, 64</td> <td></td> </tr> <tr> <td>6</td> <td>LBLW SIZE</td> <td></td> </tr> <tr> <td>7</td> <td>2, 4, 8, 16</td> <td></td> </tr> <tr> <td>8</td> <td></td> <td></td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>OFF</th> <th>ON</th> <th>SW</th> </tr> </thead> <tbody> <tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>1</td></tr> <tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>2</td></tr> <tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>3</td></tr> <tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>4</td></tr> <tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>5</td></tr> <tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>6</td></tr> <tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>7</td></tr> <tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>8</td></tr> </tbody> </table>	SW	OFF	ON	1	PC	REM.	2	N.SF	MING	3	PRM	D.PRM	4	ST SIZE		5	8, 16, 32, 64		6	LBLW SIZE		7	2, 4, 8, 16		8			OFF	ON	SW	<input type="checkbox"/>	<input type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	3	<input type="checkbox"/>	<input type="checkbox"/>	4	<input type="checkbox"/>	<input type="checkbox"/>	5	<input type="checkbox"/>	<input type="checkbox"/>	6	<input type="checkbox"/>	<input type="checkbox"/>	7	<input type="checkbox"/>	<input type="checkbox"/>	8	Operation condition setting (factory setting at the time of shipping: all off) <table border="1"> <thead> <tr> <th>SW</th> <th>Contents</th> <th>OFF</th> <th>ON</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Network type</td> <td>PC Network</td> <td>Remote I/O network</td> </tr> <tr> <td>2</td> <td>Station type</td> <td>Normal station/ Multiple sub master</td> <td>Control station/ parallel sub masters</td> </tr> <tr> <td>3</td> <td>Use parameters</td> <td>Parameters in common</td> <td>Default Parameters</td> </tr> <tr> <td>4</td> <td>Number of stations</td> <td>OFF 8 stations</td> <td>ON 16 stations</td> </tr> <tr> <td>5</td> <td>[Valid when SW3 is ON]</td> <td>OFF 32 stations</td> <td>ON 64 stations</td> </tr> <tr> <td>6</td> <td>B/W number of general point</td> <td>OFF 2k points</td> <td>ON 4k points</td> </tr> <tr> <td>7</td> <td>[Valid when SW3 is ON]</td> <td>OFF 8k points</td> <td>ON 16k points</td> </tr> <tr> <td>8</td> <td>Use prohibited (always off)</td> <td></td> <td></td> </tr> </tbody> </table>	SW	Contents	OFF	ON	1	Network type	PC Network	Remote I/O network	2	Station type	Normal station/ Multiple sub master	Control station/ parallel sub masters	3	Use parameters	Parameters in common	Default Parameters	4	Number of stations	OFF 8 stations	ON 16 stations	5	[Valid when SW3 is ON]	OFF 32 stations	ON 64 stations	6	B/W number of general point	OFF 2k points	ON 4k points	7	[Valid when SW3 is ON]	OFF 8k points	ON 16k points	8	Use prohibited (always off)		
SW	OFF	ON																																																																																										
1	PC	REM.																																																																																										
2	N.SF	MING																																																																																										
3	PRM	D.PRM																																																																																										
4	ST SIZE																																																																																											
5	8, 16, 32, 64																																																																																											
6	LBLW SIZE																																																																																											
7	2, 4, 8, 16																																																																																											
8																																																																																												
OFF	ON	SW																																																																																										
<input type="checkbox"/>	<input type="checkbox"/>	1																																																																																										
<input type="checkbox"/>	<input type="checkbox"/>	2																																																																																										
<input type="checkbox"/>	<input type="checkbox"/>	3																																																																																										
<input type="checkbox"/>	<input type="checkbox"/>	4																																																																																										
<input type="checkbox"/>	<input type="checkbox"/>	5																																																																																										
<input type="checkbox"/>	<input type="checkbox"/>	6																																																																																										
<input type="checkbox"/>	<input type="checkbox"/>	7																																																																																										
<input type="checkbox"/>	<input type="checkbox"/>	8																																																																																										
SW	Contents	OFF	ON																																																																																									
1	Network type	PC Network	Remote I/O network																																																																																									
2	Station type	Normal station/ Multiple sub master	Control station/ parallel sub masters																																																																																									
3	Use parameters	Parameters in common	Default Parameters																																																																																									
4	Number of stations	OFF 8 stations	ON 16 stations																																																																																									
5	[Valid when SW3 is ON]	OFF 32 stations	ON 64 stations																																																																																									
6	B/W number of general point	OFF 2k points	ON 4k points																																																																																									
7	[Valid when SW3 is ON]	OFF 8k points	ON 16k points																																																																																									
8	Use prohibited (always off)																																																																																											

No.	Name	Contents
8)	Connector (A1SJ71QLP21(S))	Connect the optical fiber cable. 
9)	Connector (A1SJ71QLR21)	Connect the coaxial type cable. 
10)	Connector (A1SJ71QBR11)	Connect the F type connector. 
11)	External power source supply terminal EXT.PW 	When preventing loop pack by turning OFF the power source of the sequencer CPU, supply an external power source. 

*1: EXT.PW LED light by the power supply for the network generated with an external power supply(24VDC). Therefore, please note that an external power supply might be input when LED is turned off.

*2: When it is desired to change the setting while the Q2ASCPU's power supply is ON, reset the Q2ASCPU (move the RUN/STOP key switch away from RESET to a position other than RESET).

*3: When using by the remote I/O network, it becomes valid for station numbers 1 to 64.

*4: Valid in the case of PC network management station.

5. Wired

DANGER

- Completely turn off the external power when installing or placing wiring. Not completely turning off all power could result in electric shock or damage to the product.

CAUTION

- When wiring in the PC, be sure that it is done correctly by checking the product's rated voltage and the terminal layout. Connecting a power supply that is different from the rating or incorrectly wiring the product could result in fire or damage.
- Be sure there are no foreign substances such as sawdust or wiring debris inside the module. Such debris could cause fires, damage, or erroneous operation.
- Solder the coaxial cable connector properly. Incomplete soldering may cause a malfunction.
- Tighten terminal screws to the specified torque.
If a terminal screw is not tightened to the specified torque, the module may fall out, short circuit, or malfunction.
If a terminal screw is tightened excessively, exceeding the specified torque, the module may fall out, short circuit, or malfunction due to breakage of the screw or the module.
- Be sure to fix communication cables or power 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 cables 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 terminal block.
Pulling the cable that is still connected to the module may cause malfunction or damage to the module or cable.

5.1 Precautions for Laying Optical Fiber Cables

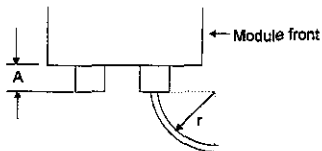
- 1) The distance between stations varies depending on the type of optical fiber cable used.

Type	Distance between stations (m)
SI type optical fiber cable (Old type: A-2P-□)	500 (1640.5 ft.)
L type	300 (984.3 ft.)
H type	500 (1640.5 ft.)
SI (H-PGF) type optical fiber cable	1000 (3281 ft.)
QSI type optical fiber cable	1000 (3281 ft.)

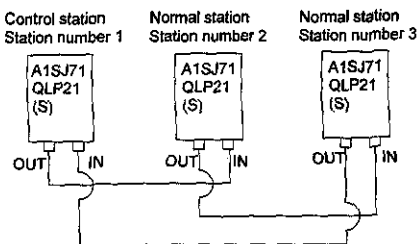
- 2) When connecting an optical fiber cable, the following restrictions on the bending radius must be observed.

Cable type	Type	Allowable bending radius		Connector A (mm (in.))			
		± 2.8mm area	(mm (in.))	CA9003	CA7003	CA7005	DL-72ME
SI (old)	A	—	50 (1.97)	45 (1.77)	—	—	—
	B	50	85 (3.35)				
	C		85 (3.35)				
	D		140 (5.51)				
SI	A		—	50 (1.97)	—	30 (1.18)	—
	B	50	60 (2.36)				
	C		60 (2.36)				
	D		110 (4.33)				
SI (H-PCF)	A		—	45 (1.77)	—	—	—
	B	45	100 (3.94)				
	D	50	100 (3.94)				
QSI	A	—	50 (1.97)	—	30 (1.18)	30 (1.18)	—
	B	50	60 (2.36)				
	C		60 (2.36)				
	D		140 (5.51)				

- (Type) A: Indoor use standard B: Indoor use reinforced
C: Outdoor use standard D: Outdoor use reinforced



- 3) The optical fiber cable is wired in the following manner.
There is no problem even if not wiring in order of the station number.
There is no problem even if station how many become control station.



- 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.
- 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.

5.2 Precautions when Installing the Coaxial Cables

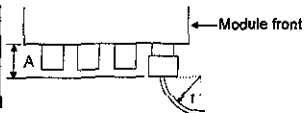
5.2.1 For the Coaxial Loop Type

- 1) The distance between station is different depending on the kind of the coaxial cable used.

Type	Distance between stations (m)	Total extension distance (km)
3C-2V	300	19.2
5C-2V	500	30

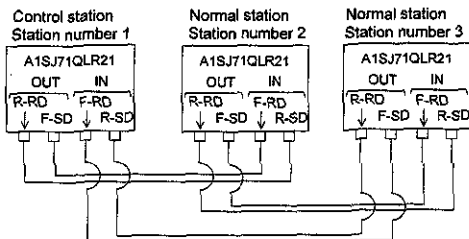
- 2) When connecting a coaxial cable, the following restrictions on the bending radius must be observed.

Cable type	Allowable bending radius r[mm]	Connector A[mm]
3C-2V	23	35
5C-2V	30	

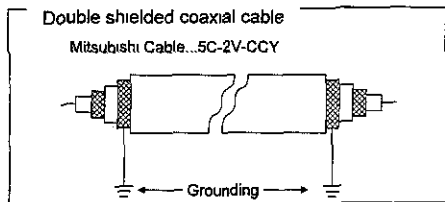


- 3) The Coaxial cable is wired in the following manner.

There is no problem even if not wiring in order of the station number.
There is no problem even if station how many become control station.



- 4) Install the coaxial cables at least 100 mm (3.94 ft.) 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) Do not pull any of the connected cables.

This will cause a faulty contact, cable disconnection, or damage to the module.

5.2.2 For the Coaxial Bus Type

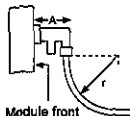
- 1) Between stations, use the cable length indicated in the table below according to the number of stations connected.

There is the possibility of communication errors if the cable length other than the table listed below is used.

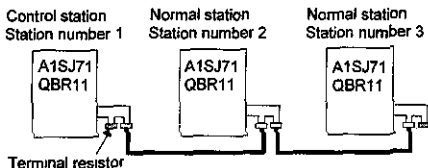
Number of stations connected	Cable length between stations	Total extension distance
2 to 9 stations	1 to 300 m (3C-2V) (3.28 to 984.3 ft.)	300 m (984.3 ft.) (3C-2V)
	1 to 500 m (5C-2V) (3.28 to 1640.5 ft.)	
10 to 33 stations	1 to 5 m (3C-2V, 5C-2V) (3.28 to 16.41 ft.)	500 m (1640.5 ft.) (5C-2V)
	13 to 17 m (3C-2V, 5C-2V) (42.65 to 55.78 ft.)	
	25 to 300 m (3C-2V) (82.03 to 984.3 ft.) 25 to 500 m (5C-2V) (82.03 to 164.5 ft.)	

- 2) If there is the possibility of an increase in the number of stations due to system expansion, install the cables with advance consideration of the restrictions.
- 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) When connecting a coaxial cable, the following restrictions on the bending radius must be observed.

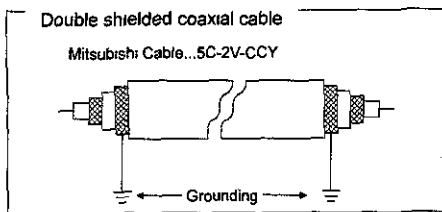
Cable type	Allowable bending radius r [mm (in.)]	Connector A [mm (in.)]
3C-2V	23 (0.91)	50 (1.97)
5C-2V	30 (1.18)	



- 5) The coaxial cable is wired in the following manner.
 There is no program even if not wiring in order of the station number.
 There is no program even if station how many become control station.



- 6) Install the coaxial cables at least 100 mm (3.94 ft.) away from other power cables and control cables.
- 7) Consider wiring using double-shielded coaxial cable in places that are subject to large amounts of noise.



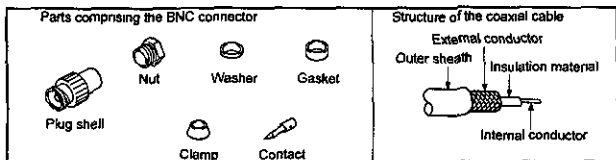
- 8) Do not pull any of the connected coaxial cables.
 This will cause a faulty contact, cable disconnection, or damage to the module.
- 9) Make sure to connect a terminal resistor to both terminal stations of the coaxial bus type network system.
- 10) The F type connector has the possibility to extract a white oxide according to the use environment.
 However, there is no problem on the function because the oxide is not generated in connected part.

5.2.3 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.

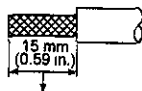
1) Structure of the BNC connector and coaxial cable

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



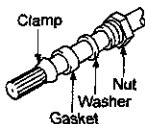
2) How to connect the BNC connector and the coaxial cable

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

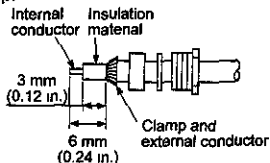


Cut this portion of the outer sheath

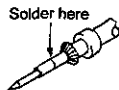
- b) Feed the nut, washer, gasket and clamp on the coaxial cable through, as shown below, then unfasten the external conductor.



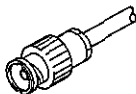
- c) Cut the external conductor, insulation material and internal conductor to the dimensions shown below. However, cut the external conductor to the same dimension as the tapered section of the clamp and smooth it down to the clamp.



- 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.



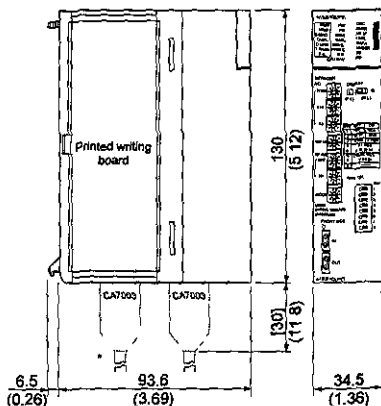
Important

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.

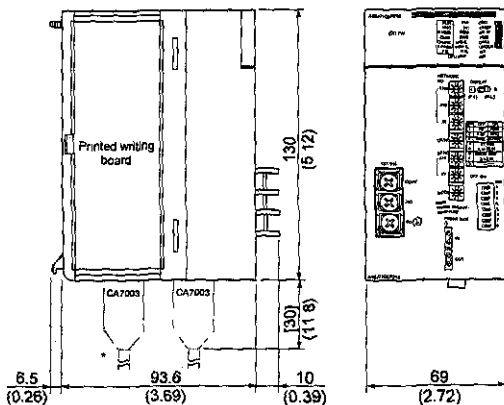
6. External Dimensions

6.1 A1SJ71QLP21



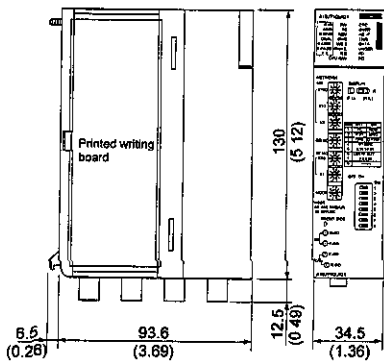
* Consider the radius of the bend in the cable.

6.2 A1SJ71QLP21S

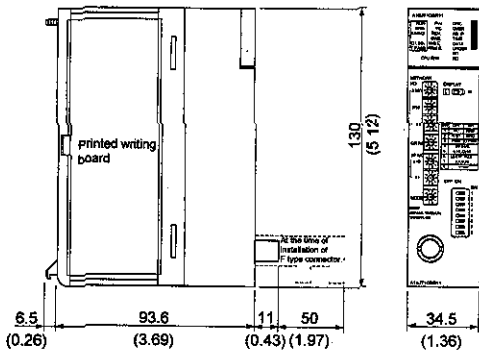


* Consider the radius of the bend in the cable.

6.3 A1SJ71QLR21



6.4 A1SJ71QBR11



Unit: mm (in.)

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.

Country/Region	Sales office/Tel	Country/Region	Sales office/Tel
U.S.A	Mitsubishi Electric Automation Inc. 500 Corporate Woods Parkway Vernon Hills, IL 60061 Tel : 1-847-478-2100	Indonesia	P.T. Autoteknikindo 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
Brazil	MELCO-TÉC Rep. Com.e Assessoria Técnica Ltda. Av. Rio Branco, 123-15, and S/1507, Rio de Janeiro, RJ CEP 20040-005, Brazil Tel : 55-21-221-8343	Thailand	F. A. Tech Co.,Ltd. 1138/33-34 Rama 3 Road, Yannawa, Bangkok 10120, Thailand Tel : 66-2-296-2861
U.K	Mitsubishi Electric Europe B.V. UK Branch Travellers Lane, Hatfield, Herts., AL10 8XB,UK Tel : 44-1707-276100	Hong Kong	Ryoden International Ltd. 10th Floor, Manulife Tower, 169 Electric Road, North Point, HongKong Tel : 852-2887-8870
Germany	Mitsubishi Electric Europe B.V. German Branch Gothaer Strasse 8 D-40880 Ratingen, GERMANY Tel : 49-2102-486-0	China	Ryoden International Shanghai Ltd. 3F Block5 Building Automation Instrumentation Plaza 103 Cao Bao Rd. Shanghai 200233 China Tel : 86-21-6475-3228
South Africa	MSA Manufacturing (Pty) Ltd. P O Box 36733 Bramley 201 8 Johannesburg, South Africa Tel : 27-11-444-8080	Taiwan	Setsuyo Enterprise Co. . Ltd. 8F., No.105 Wu-Kung 3rd.RD., Wu-Ku Hsiang, Taipei Hsiang, Taiwan R.O.C. Tel : 886-2-2289-2489
India	Messung Systems Pvt.Ltd. Electronic Sadan NO.111 Unit No15, M.I.D.C BHOSARI,PUNE-411028 Tel : 91-212-793130	Australia	Mitsubishi Electric Australia Pty. Ltd. 348 Victoria Road, PostalBag, No 2, Rydalmere, N.S.W 2116, Australia Tel : 61-2-9664-7777
Singapore	Mitsubishi Electric Asia Pte, Ltd. 307 ALEXANDRA ROAD #05-01/02, MITSUBISHI ELECTRIC BUILDING SINGAPORE 159943 Tel : 65-470-2480		

 **MITSUBISHI ELECTRIC CORPORATION**
HEAD OFFICE MITSUBISHI DENKI BLDG MARUOUCHI TOKYO 100-8710 TELEBUSINESS CABLE MELCO TOKYO
NAKOTOYAMA 2-14, YAMAGUCHI 750-8592, HIGASHI-KU, NAGOYA, JAPAN

When exported from Japan, this manual does not require application to the Ministry of International Trade and Industry for service transaction permission.

Specifications subject to change without notice.
Printed in Japan on recycled paper.