MITSUBISHI

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NEW PRODUCT RELEASE

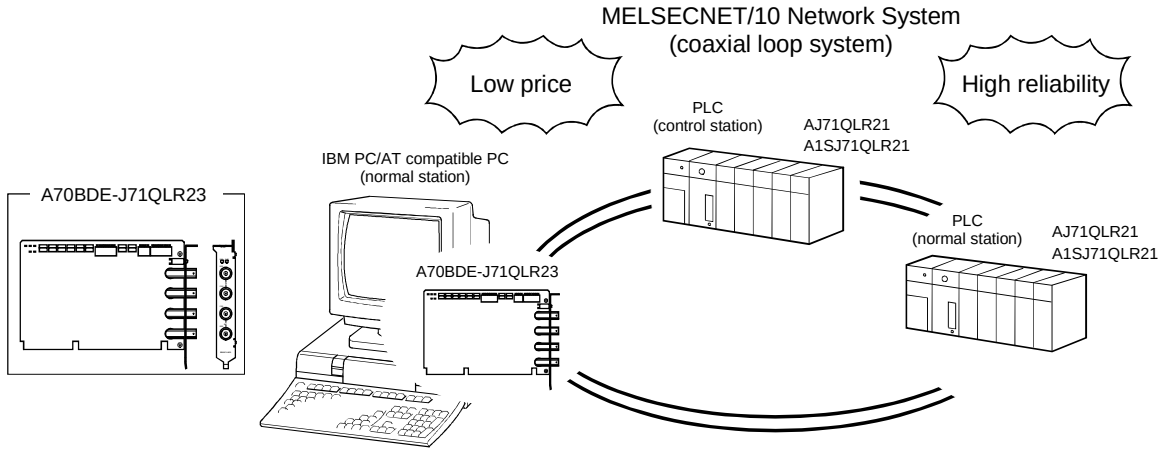
GENERAL-PURPOSE
PROGRAMMABLE LOGIC CONTROLLER

Type A1SJ71QLR21,AJ71QLR21* MELSECNET/10 Network Modules (For Coaxial loop system)
Type A70BDE-J71QLR23 MELSECNET/10 Interface Board (For Coaxial loop system)

*** AJ71QLR21 will be available soon.**

New!

A coaxial loop system, less expensive than the optical loop system and more reliable than the coaxial bus system, is possible using a network system with the PLC.



The coaxial loop system has the following features compared to the coaxial bus system and optical loop system.

System name	Reliability	System structure
Coaxial loop system	The faulty station is cut off when the cable is disconnected or when the normal station is disconnected, allowing normal operation with just the operable stations. (Loop back function)	As a coaxial cable is used, the system can cost less than the optical loop system. Maximum overall distance: 30km
Coaxial bus system	The system stops when the cable is disconnected or when the normal station is disconnected.	As a coaxial cable is used, the system can cost less than the optical loop system. Maximum overall distance: 500m (Can be extended up to 2.5km using the repeater module.)
Optical loop system	The faulty station is cut off when the cable is disconnected or when the normal station is disconnected, allowing normal operation with just the operable stations. (Loop back function)	The signal attenuation is less compared to the coaxial cable, and the cable is resistant to noise, so the maximum overall distance is long. Maximum overall distance: 30km

1. Type A1SJ71QLR21, AJ71QLR21 MELSECNET/10 Network Modules(For Coaxial loop system)

[Features]

1) An optimum network module, corresponding to the PLC CPU Series and module size being used, can be selected.
   • Control station/normal station/master station network module

Series	Module size	QnA Series
QnA series	Compact	A1SJ71QLR21
	Large	AJ71QLR21

2) The MELSECNET/10 network system (coaxial loop system) is structured by mounting the A1SJ71QLR21/AJ71QLR21 on the PLC's base unit connecting the PLC CPUs with a coaxial cable. Data can be shared between the PLC CPUs by creating a network using the MELSECNET/10 network system.
   The A1SJ71QLR21/AJ71QLR21 can set the PLC as the control station or normal station.
   There is only one control station per network system; all other stations are normal stations.

[Performance specifications]

The performance specifications of the network module are shown below.

Item		Specifications	
		A1SJ71QLR21	AJ71QLR21
Maximum number of link points per network	LX/LY	8192 points	
	LB	8192 points	
	LW	8192 points	
Maximum number of link points per link		LW×2+(LB+LY)/8≦2000 bytes	
Communication speed		10Mbps(equivalent to 20Mbps during multiplex transmission)	
Communication method		Token ring	
Synchronization method		Frame synchronization	
Encoding method		Manchester code	
Transmission path format		Duplex loop	
Transmission format		Conforms to HDLC (frame type)	
Maximum number of networks		239	
Maximum number of groups		9	
Number of stations connected in one network		64 stations (control station:1, normal station:63)	
Station type which can be set		Control station/Normal station	
Overall distance for one network	Cable type	3C-2V	5C-2V
	Maximum Transmission distance	19.2km(62995 ft.) (300m(984.3 ft.)between stations)	30km(98430 ft.) (500m(1640.5 ft.)between stations)
Error control system		Retries based on CRC($X^{16}+X^{12}+X^5+1$) and overtime	
Transient transmission function		• N:N communication (data transmission/reception, data read/write, etc.) • Transient instructions (ZNRD/ZNWR,SEND/RECV,READ/WRITE,REQ)	
RAS function		• Loopback function upon error detection and cable breakage • Diagnostic function for the host link line check system • Prevention of system down by transferring the control station • Error detection using link special relays and link special registers. • Network monitoring and various diagnostic function	
Connection cable		3C-2V, 5C-2V	
Applicable connector		BNC-P-3-Ni-CAU, BNC-P-5-Ni-CAU(DDK) or equivalent product	
Cable transmission loss		Conforms to JIS C 3501	
Adjustment standard		EMC standard, UL standard (To be complied with in near future.)	
Maximum number of installation modules		Maximum of 4	
CPU type		Q2ASCPU(S1) Q2ASHCPU(S1)	Q2ACPU(S1),Q3ACPU, Q4ACPU,Q4ARCPU
Input output occupancy points		Special 32 points	
5VDC internal voltage consumption		1.14A	- *1
Weight		0.30kg (0.65lb)	- *1

*1:In planning stages

[List of functions]

The list of network module functions is shown below.

Function	Description
Data communication functions	1) Input(X), output(Y), link relay(B), and link register(W) can be accessed via MELSECNET/10 using the cyclic transmission function. • The Network module support 8k points independently for each device. • 2,000/1600 bytes are supported for the number of link points per station. 2) N:N communication is possible using the transient transmission function. • Communication is possible even when cyclic transmission is not being performed. • The maximum number of transient transmissions during each link scan can be specified.
Loopback function	When there is a cable breakage or when a normal station is disconnected, the faulty station can be separated using duplex loop type coaxial cable, and normal operation is executed with only the stations that are operable.
Multiplex transmission function (PC to PC Network only)	When the coaxial cable is a duplex loop type, the transmission speed can be doubled by making each transmission path independent.
Automatic return function	A station disconnected due to an error occurrence can automatically return to the system when the faulty section returns to the normal status. this is executed according to the board information setting.
Test function	A test is performed according to the test mode setting. The hardware and loop circuit are checked.
Self diagnostic function	1) The error message associated with an error code is displayed. 2) Contents of the error detected in the link special relay or link special register are stored.

[Product configuration]

Product name	Type	Type code	Remarks
Type A1SJ71QLR21 MELSECNET/10 Network Module	A1SJ71QLR21	1W1204	-
Type AJ71QLR21 MELSECNET/10 Network Module *1	AJ71QLR21	13X212	-

*1:In planning stages

[Manuals]

Manual name	Manual shipment type	IB No.	Type code
MELSECNET/10 Network Module User's Manual(Hardware)	Enclosed with A1SJ71QLR21	IB-0800091	13JQ87

2. Type A70BDE-J71QLR23 MELSECNET/10 Interface Board (For Coaxial loop system)

[Features]

1) An available personal computer can be assembled with the lowcost and high-reliability MELSECNET/10 network system (coaxial loop system).
   The A70BDE-J71QLR23 can be mounted in a personal computer to use the personal computer as a normal station.

2) Test and monitor information related to data link are displayed on the CRT screen.
   Operation becomes easy since the data-link testing and monitoring statuses are displayed on the CRT for IBM PC/AT compatible PC.

3) Various functions are available to accommodat user programming.
   Various functions that can be used with Visual C++ and Visual Basic are provided, making it possible to easily create user program remote control for the PLC CPU as well as reading from and writing to devices.

4) N:N communication is possible with the transient transmission function.
   Normal station PCscan communicate with the PLC on a control station and normal station via data communication (Q/QnA dedicated instruction), device reading and writing, and so on.

5) Drivers for various operating systems are available.
   A variety of drivers are provided to make it easier to construct a system that is compatible with the user's environment.

   Compatible operating systems: Windows 95(English Version)
   Windows 98(English Version)
   Windows NT Workstation 4.0(English Version)
   MS-DOS Ver6.2(English Version)

[Performance specifications]

The performance specifications of the A70BDE-J71QLR23 are shown below.

Item		Specifications	
Maximum number of link points per network	LX/LY	8192 points	
	LB	8192 points	
	LW	8192 points	
Maximum number of link points per link		LW×2+(LB+LY)/8≦2000 bytes	
Communication speed		10Mbps(equivalent to 20Mbps during multiplex transmission)	
Communication method		Token ring	
Synchronization method		Frame synchronization	
Encoding method		Manchester code	
Transmission path format		Duplex loop	
Transmission format		Conforms to HDLC (frame type)	
Maximum number of networks		239	
Maximum number of groups		9	
Number of stations connected in one network		64 stations (control station:1, normal station:63)	
Overall distance for one network	Cable type	3C-2V	5C-2V
	Maximum Transmission distance	19.2km(62995 ft.) (300m(984.3 ft.)between stations)	30km(98430 ft.) (500m(1640.5 ft.)between stations)
Error control system		Retries based on CRC($X^{16}+X^{12}+X^5+1$) and overtime	
transient transmission function		• N:N communication (data transmission/reception, data read/write, etc.)	
RAS function		• Loopback function upon error detection and cable breakage • Diagnostic function for the host link line check system • Prevention of system down by transferring the control station • Error detection using link special relays and link special registers. • Network monitoring and various diagnostic function	
Connection cable		3C-2V, 5C-2V	
Applicable connector		BNC-P-3-Ni-CAU, BNC-P-5-Ni-CAU(DDK) or equivalent product	
Cable transmission loss		Conforms to JIS C 3501	
Applicable standards		EMC standard, UL standard (To be complied with in near future.)	
Number of boards that can be used		Maximum of 4 *1,*2	
Loading slot		IBM PC/AT compatible PC ISA bus slot	
Number of slots occupied		1 slot	
5VDC internal voltage consumption		1.3A	
Weight		0.17kg (0.37lb)	

*1: The No. of mountable boards is the combination of the A70BDE-J71QLP23, A70BDE-J71QLP23GE, A70BDE-J71QBR13 and A70BDE-J71QLR23.

*2: When mounting two or more A70BDE-J71QLR23 Board onto the personal computer, do not mount in the adjacent ISA bus slot. If this is not observed, the coaxial cable cannot be connected.

[List of functions]

The list of network module functions is shown below.

Function	Description
Data communication functions	1) Input(X), output(Y), link relay(B), and link register(W) can be accessed via MELSECNET/10 using the cyclic transmission function. • The A70BDE-J71QLR23 and unit support 8k points independently for each device. • 2,000 bytes are supported for the number of link points per station. 2) N:N communication is possible using the transient transmission function. • Communication is possible even when cyclic transmission is not being performed. • The maximum number of transient transmissions during each link scan can be specified.
Loopback function	When there is a cable breakage or when a normal station is disconnected, the faulty station can be separated using duplex loop type coaxial cable, and normal operation is executed with only the stations that are operable.
Multiplex transmission function	When the coaxial cable is a duplex loop type, the transmission speed can be doubled by making each transmission path independent.
Automatic return function	A station disconnected due to an error occurrence can automatically return to the system when the faulty section returns to the normal status. this is executed according to the board information setting.
Test function	A test is performed according to the test mode setting. The hardware and loop circuit are checked.
Loop monitor function	By the loop monitor setting, the host and other stations can be monitored and a check of the operating status performed.
Self diagnostic function	1) The error message associated with an error code is displayed. 2) Contents of the error detected in the link special relay or link special register are stored.

[Data link functions]

The following functions can be used from the application software to access the data in the PLC.

Function name	Description
mdOpen	Opens a communication line.
mdClose	Closes a communication line.
mdSend	Performs batch write of devices.
mdReceive	Performs batch read of devices.
mdRandW	Writes devices randomly.
mdRandR	Reads devices randomly.
mdDevSet	Sets a bit device.
mdDevRst	Resets a bit devices.
mdTypeRead	Reads the type of PLC CPU.
mdControl	Remote RUN/STOP/PAUSE.
mdInit	Refreshes the PLC device address.

Function name	Description
mdBdRst	Resets the board itself.
mdBdModSet	Sets the board itself.
mdBdModRead	Reads the board itself.
mdBdLedRead	Reads the LED information of the board itself.
mdBdSwRead	Reads the switch status of the board itself.
mdBdVerRead	Reads the version information of the board itself.
mdSend *1	Sends data (SEND function).
mdReceive *1	Receives data (RECV function).

*1:Q/QnA dedicated instruction

[Utility]

Various MELSECNET/10 utilities for monitoring are provided when the A70BDE-J71QLR23 is connected to the MELSECNET/10 network system.

1) MELSECNET/10 utility for Windows 95/98/NT Workstation 4.0

Menu	Description
Card list	Displays information on the hardware connected to the A70BDE-J71QLR23.
Card information	Displays and sets various information regarding the mounted A70BDE-J71QLR23.
Loop monitor	Monitors the line status of the local station.
Each station status	Displays the communication status and loop status of each station.
Error history monitor	Displays the history of the loop errors, communication errors and transient transmission errors.
Version	Displays the MELSECNET/10 utility version.
Device monitor utility	1) Monitors the local station and remote station devices. 2) Writes the local station and remote station devices.
Error viewer *1	Displays the date of error occurrence, error No. and message details.

*1:This can be used only with the Windows 95/98 OS.
When using the Windows NT Workstation 4.0 OS, the data is registered in the event viewer.

2) MELSECNET/10 utility for DOS

Menu	Description
Board information	1) Indicates status of A70BDE-J71QLR23. 2) Performs mode setting and board reset.
Network setting	Sets the routing parameter.
Network monitor	1) Displays host's communication status, link scan time, setting, and error information. 2) Displays information of each station.
Network diagnosis	Performs loop test, setting verification test, station order verification test, and communication test.
Device monitor	1) Performs device monitor for host and other stations. 2) Writes to device in the host and other stations.
Information	Displays setting status of A70BDE-J71QLR23.

[Operating environment]

The operating environment for A70BDE-J71QLR23 is shown below.

Item		Description
IBM PC/AT compatible PC		IBM PC/AT compatible PC with Pentium 133MHz or higher, one or more ISA bus slots (half size), and running Windows 95 (English version), Windows 98 (English version), Windows NT Workstation 4.0 (English version), or MS-DOS Ver6.2 (English version) *1
Operating system		Any one of the following: Windows 95(English version), Windows 98(English version), Windows NT Workstation 4.0(English version), MS-DOS Ver6.2(English version)
Programming language	MS-DOS Ver6.2	Visual C++ Ver1.5(English version)
	Windows 95 Windows 98 Windows NT 4.0	Visual Basic Ver4.0(English version), Visual C++ Ver4.2(English version), Visual Basic Ver5.0(English version), Visual C++ Ver5.0(English version), Visual Basic Ver6.0(English version), Visual C++ Ver6.0(English version)
Required memory size		32MB or more
Hard disk space		9MB or more
Disk drive (required when installing the driver)		3.5 inch (1.44MB) floppy disk drive

*1: A multiprocessor PC cannot be used since the drivers are not compatible.

[Product configuration]

Product name	Type	Type code	Remarks
Type A70BDE-J71QLR23 MELSECNET/10 Interface Board	A70BDE-J71QLR23	1W6009	A70BDE-J71QLR23 × 1 set FD(SW3DNF-MNET10) × 1 set Manual × 1 set Software use agreement × 1 Software entry form × 1

[Manuals]

Manual name	Manual shipment type	IB No.	Type code
Type A70BDE-J71QLP23/A70BDE-J71QLP23GE/ A70BDE-J71QBR13/A70BDE-J71QLR23 MELSECNET/10 Interface Board User's Manual	Enclosed with product	IB-0800035	13JL93

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