MITSUBISHI

Network Unit

User's Manual
(Hardware)

A7GT-J71LP23
A7GT-J71BR13

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

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

MODEL	A7GT-J71LP23-U-E
MODEL CODE	1DM026
IB(NA)-66558-B(0406)MEE	

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1. GENERAL DESCRIPTION

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The A7GT-J71LP23 Network Unit (hereinafter abbreviated to A7GT-J71LP23) and the A7GT-J71BR13 Network Unit (hereinafter abbreviated to A7GT-J71BR13) is a data link unit which is installed to the A77GOT-S3 Graphic Operation Terminal (hereinafter abbreviated to A77GOT-S3)when the A77GOT-S3 is used as a local station in the MELSECNET/10 network system.
This User's Manual gives the specifications, switch settings, and the method of installing to the A77GOT-S3.

A7GT-J71LP23	For connection in MELSECNET/10 optical loop networks, as normal station only.
A7GT-J71BR13	For connection in MELSECNET/10 coaxial bus networks, as normal station only.

The A7GT-J71BR13 comes packaged with an F type connector (A6RCON-F).

2. SPECIFICATIONS

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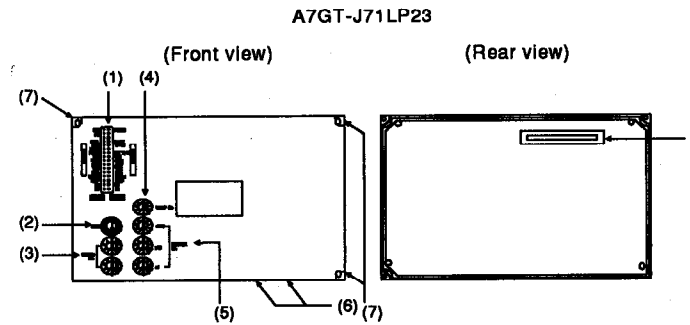The performance specifications of the A7GT-J71LP23/A7GT-J71BR13 are as given in the table below.

Item		A7GT-J71LP23	A7GT-J71BR13
Maximum number of link points per network	LX/LY	8192 points	
	LB	8192 points	
	LW	8192 points	
Maximum number of link points per station		$\frac{B+Y}{8} + 2 \times W \leq 2000$ bytes	
Communication speed		10 MBPS (20 MBPS: multiples transmission)	10 MBPS
Communication method		Token ring method	Token bus method
Synchronizing method		Frame synchronization	
Type of transmission channel		Duplex loop	Single bus
Overall distance of a network	Station-to-station: 500 m (0.31 mil.) when SI cable is used. Station-to-station: 1 km (0.62 mil.) when QSI cable is used.	30 km (18.6 mil.)	3C-2V: 300 m (0.19 mil.) (Station-to-station: 300 m(0.19 mil.)) 5C-2V: 500 m(0.31 mil.) (Station-to-station: 500 m(0.31 mil.))
Accessible network range		Same network only	
Maximum number of groups		9	
Number of stations connected to a network		63 stations	31 stations
RAS functions		• Loopback in case of error detection or cable disconnection. (available with A7GT-J71LP23 system only) • Link channel check for the host station. • System down protection by control station shift function. • Error detection by using special relays and registers. • Network monitor and diagnostic functions	
Transient transmission		• N: N communication • ZNRD/ZNWR instruction (N:N) *1	
Connection cable		SI-200/250 / QSI-185/230	3C-2V, 5C-2V or equivalent
Applicable connectors		2-core fiber-optic cable connector plug CA9003 / 2-core fiber-optic cable connector plug CA7003	BNC-P-3-Ni-CAU, BNC-P-5-Ni-CAU (DDK) or equivalent
Cable transmission loss		12 dBm/km or less / 5.5 dBm/km or less	Conforms to JIS C 3501
Weight		0.35 kg (0.77 lb)	

* When a coaxial bus system is built, the cable length between stations is restricted by the number of connected stations. See Section 4.3.2 (1).

3. NAMES OF PARTS AND SETTINGS

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The following gives the names of parts and settings of the A7GT-J71LP23/A7GT-J71BR13.

A7GT-J71LP23

(Front view)   (Rear view)

No.		Name		Description	
(1)	LED		Name	State	Description
		RUN	Lit	Normal state	
			Unlit	WDT error, SP. UNIT ERROR	
		PC	Lit	Setting for a PC-to-PC network is made. (Always lit)	
		DUAL		Executing multiplex transmission. (Unlit: Multiplex transmission not executed.)	
		SW.E	Lit	Switch settings with (2) to (5) have abnormality.	
		M/S.E	Lit (Unlit when normal)	Two same station numbers or two control stations are set in a network. *1	
		PRM.E		Matching error between common parameters and station-specific parameters. Parameters received from the sub-control station do not match the parameters in the host station (received from the control station).	
		POWER	Lit	Power is supplied. (Unlit: Power is not supplied.)	
		D.LINK		Data link is operative. (Unlit: Data link is inoperative.)	
		T.PASS		Joining baton passing.	
		GOT R/W		Communicating with the GOT.	
		CRC	Lit (Unlit when normal.)	Code check error in received data. <Causes> Timing when the station which is sending data to a specific station is set off-line, hardware fault, cable fault, noise, etc.	
		OVER		Processing of received data delayed. <Causes> Hardware fault, cable fault, noise, etc.	
		AB. IF		• *1's in the number larger than specified are received consecutively. • Received data length is shorter than specified. <Causes> Timing when the station which is sending data to a specific station is set off-line, WDT setting is too short, cable fault, noise, etc.	
		TIME		Data link WDT times out. <Causes> WDT setting is too short, cable fault, noise, etc.	
		DATA		Abnormal data larger than 2 kbytes are received. <Causes> Cable fault, noise, etc.	
		UNDER		Internal processing of send data is not at constant intervals. <Causes> Hardware fault	
		LOOP		The forward or reverse loop is faulty. <Causes> Power to the adjacent station is OFF. Cable breakage or not connected, etc.	
		SD	Dimly lit	Sending data.	
		RD		Receiving data.	

(Continued)

No.	Name	Description		
(2) *2	Mode select switch	Setting of mode (Factory setting: 0)		
		Mode	Name	Description
		0	On-line (Automatic on-line return is set.)	Automatic on-line return during data link is enabled.
		1	Unusable	
		2	Off-line	Host station is set off-line.
		3	Test mode 1	Loop test (Forward loop)
		4	Test mode 2	Loop test (Reverse loop)
		5	Test mode 3	Station-to-station test (Master station)
		6	Test mode 4	Station-to-station test (Slave station)
		7	Test mode 5	Self-loopback test
		8	Test mode 6	Internal self-loopback test
		9	Test mode 7	Hardware test
		A	—	Unusable
		B	—	Unusable
		C	—	Unusable
		D	Test mode 8	Network number confirmation (LED indication)
		E	Test mode 9	Group number confirmation (LED indication)
		F	Test mode 10	Station number confirmation (LED indication)
(3) *2	Station number setting switches	Setting of station number (Factory setting: 1) <Setting range> 1 to 64: Station number Other than 1 to 64: Setting error (SW.E LED is lit.)		
(4) *2	Group number setting switch	Setting of group number (Factory setting: 0) <Setting range> 0: No group setting 1 to 9: Group number		
(5) *2	Network number setting switches	Setting of network number (Factory setting: 1) <Setting range> 1 to 255: Network number Other than 1 to 255: Setting error (SW.E LED is lit.)		
(6)	Connector	Used to connect fiber-optic cables.		
(7)	Unit mounting screws	Screws for mounting to the A77GOT-S3		
(8)	Connector	Connector for connection to the A77GOT-S3		

*1: The M/S.E LED does not light in some cases due to the condition of channels and cable connections even in the situation when two same station numbers or two control stations exist in a network. Execute on-line diagnosis as well as visually check the system.

*2: After changing settings, reset the A77GOT-S3. Resetting of the A77GOT-S3 is not necessary for mode settings D, E, and F.

A7GT-J71BR13

(Front view)   (Rear view)

(7) (1) (4)

(7)

(8)

(2)
(3)

(6) (5)

(7)

No.	Name	Description		
		Name	State	Description
(1)	LED	RUN	Lit	Normal state
			Unlit	WDT error, SP. UNIT ERROR
		PC	Lit	Setting for a PC-to-PC network is made. (Always lit)
		DUAL		Executing multiples transmission. (Unlit: Multiples transmission not executed)
		SW. E	Lit	Switch settings with (2) to (5) have abnormality.
		M/S. E	(Unlit when normal)	Two same station numbers or two control stations are set in a network. *1
		PRM. E		Matching error between common parameters and station-specific parameters. Parameters received from the sub-control station do not match with the parameters in the host station (received from the control station).
		POWER	Lit	Power is supplied. (Unlit: Power is not supplied.)
		D. LINK		Data link is operative. (Unlit: Data link is inoperative.)
		T. PASS		Joining baton passing.
		GOT R/W		Communicating with the GOT.
		CRC	Lit (Unlit when normal.)	Code check error in received data. <Causes> Timing when the station which is sending data to a specific station is set off-line, hardware fault, cable fault, noise, etc.
		OVER		Processing of received data delayed. <Causes> Hardware fault, cable fault, noise, etc.
		AB. IF		• *1's in the number larger than specified are received consecutively. • Received data length is shorter than specified. <Causes> Timing when the station which is sending data to a specific station is set off-line, WDT setting is too short, cable fault, noise, etc.
		TIME		Data link WDT times out. <Causes> WDT setting is too short, cable fault, noise, etc.
		DATA		Abnormal data larger than 2 kbytes are received. <Causes> Cable fault, noise, etc.
		UNDER		Internal processing of send data is not at constant intervals. <Causes> Hardware fault
		SD	Dimly lit	Sending data.
		RD		Receiving data.
(2) (5)	Refer to A7GT-J71LP23 (2) to (5)			
(6)	Connector	Used to connect F type connector		
(7) (8)	Refer to A7GT-J71LP23 (7) and (8)			

LED labels: RUN PC DUAL SW.E M/S.E PRM.E CRC OVER AB.IF TIME DATA UNDER SD RD / POWER D.LINK T.PASS GOT R/W

*1: The M/S.E LED does not light in some cases due to the condition of channels and cable connections even in the situation when two same station numbers or two control stations exist in a network. Execute on-line diagnosis as well as visually check the system.

*2: If there are no terminal resistors, this LED may continuously on even when data link is not being executed (this does not indicate a network module error).

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4. WIRING

4. WIRING

4.1 Handling Precautions

(1) The unit has a resin case: be careful not to drop it or subject it to strong impact.

(2) Do not remove the printed circuit boards from the unit since this will cause faults.

(3) During wiring work, take care to ensure that no off-cuts fall into the unit.

(4) Tighten the unit mounting screws and terminal screws with the torque indicated below.

| Screw Location	Tghtening Torque Range N/cm (kg/cm) [lb/in.]
Unit mounting screw	36 to 48 (3.7 to 4.9) [3.20 to 4.24]

4.2 Installation

Follow the procedures given below when installing or removing the A7GT-J71AT23B to and from the A77GOT-S3.

Always turn off the power to the A77GOT-S3 before installing or removing the A7GT-J71LP23/the A7GT-J71BR13.

(Installation)

(1) Fit the A7GT-J71LP23/A7GT-J71BR13 to its installation position on the back side of the A77GOT-S3 by sliding it along the guides provided for the mounting screws.

(2) Insert and tighten three unit mounting screws and secure the unit.

A77GOT-S3

A7GT-J71LP23
A7GT-J71BR13
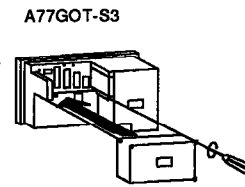
(Removal)

(1) Remove three unit mounting screws, and pull out the A7GT-J71LP23/A7GT-J71BR13 along the guides.

(2) After removal, keep the A7GT-J71LP23/A7GT-J71BR13 in safe storage.
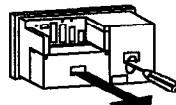
4.3 Precautions for Cable Connections

4.3.1 Precautions for cable connections (A7GT-J71LP23)

(1) When building an optical loop system with the A7GT-J71LP23, several types of fiber-optic cables must be used according to the cable length between stations.

Cable Type		Length between Stations
Type SI	Type L	500 m (1640 ft)
	Type H	300 m (984 ft)
Type QSI		1 km (3280 ft)

(2) Fiber-optic cables have the following limitations on the bending radius:

Cable Type		Allowable Bending Radius r [mm] (in)	Connector A [mm] (in)	
			CA9003	CA7003
SI	Standard cable for indoor cabling	50 (1.97)	45 (1.77)	
	Reinforced cable for indoor cabling	85 (3.35)		
	Standard cable for outdoor cabling	85 (3.35)		
	Reinforced cable for outdoor cabling	140 (5.51)		

A7GT-AJ71LP23
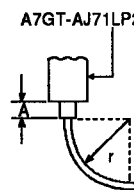
(Continued)

Cable Type		Allowable Bending Radius r [mm] (in)	Connector A [mm] (in)	
			CA9003	CA7003
QSI	Cable for indoor cabling	50 (1.97)		30 (1.18)
	Reinforced cable for indoor cabling	60 (2.36)		
	Reinforced cable for outdoor cabling	60 (2.36)		
	Concentric cable for outdoor cabling	140 (5.51)		

(3) When connecting the fiber-optic cables, use caution not to touch the fiber-optic core in the cable or module connector and use caution so that the cables are not contaminated with dirt and dust. If the cable is contaminated with finger grease, dirt, and dust, transmission loss will increase and data link transmission faults will occur.

(4) When engaging and disengaging the cable connector, hold the cable connector by hand. Do not grab and pull the cable line.

#### 4.3.2 Precautions for cable connections (A7GT-J71BR13)

(1) Restrictions of cable length between stations

(a) When building a coaxial bus system, cables of different lengths must be used according to the total number of stations. If cables other than those specified below are used, communication errors may occur.

Total Number of Stations	Cable Length Between Stations [m] (ft)	Overall Distance
1 to 9 stations	1 to 300 (3.3 to 984) (3C-2V) 1 to 500 (3.3 to 1640) (5C-2V)	
10 to 32 stations	1 to 5 (3.3 to 16.4) (3C-2V, 5C-2V)	300 (984) (3C-2V) 500 (1640) (5C-2V)
	13 to 17 (42.7 to 55.8) (3C-2V, 5C-2V)	
	25 to 300 (82.0 to 984) (3C-2V) 25 to 500 (2.0 to 1640) (5C-2V)	

(b) If the number of stations is likely to increase, for example due to system expansion, bear the applicable cable restrictions in mind when carrying out wiring work.

(2) Cautions on cabling

(a) Coaxial cable must be laid providing a 100 mm (3.94 in) or more clearance to power cables or control cables.

(b) Where intensive influence by noise is expected, use of double-shielded coaxial cables is recommended.

Double-shielded coaxial

Mitsubishi cable: 5C-2V-CCY

Grounding
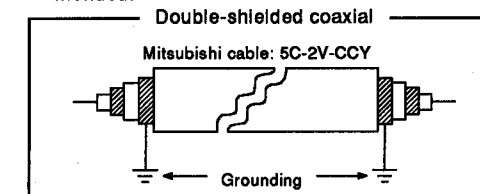
(3) Coaxial cables have the following limitations on the bending radius:

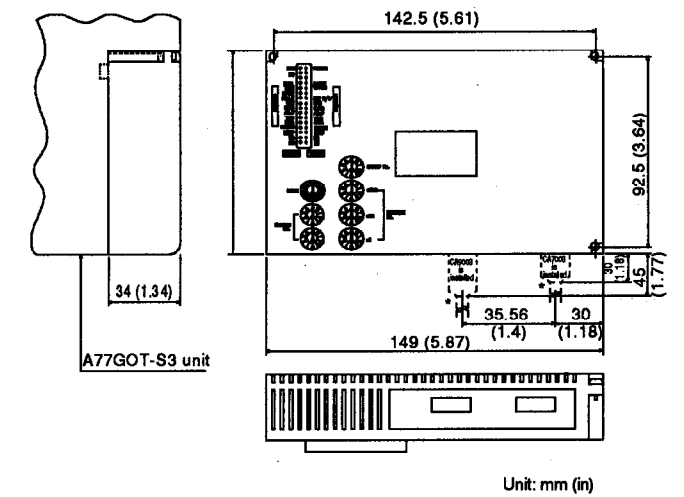| Cable Type	Allowable Bending Radius r [mm] (in)	Connector A [mm] (in)
3C-2V	23 (0.91)	50 (1.97)
5C-2V	30 (1.18)	
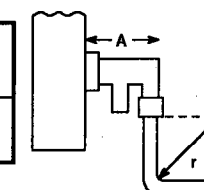
(4) Do not pull connected coaxial cable. Contact failure and cable disconnection may occur.

(5) Terminal resistances are not included in the product package. Please procure A6RCON-R75 or 75-ohm resistances.
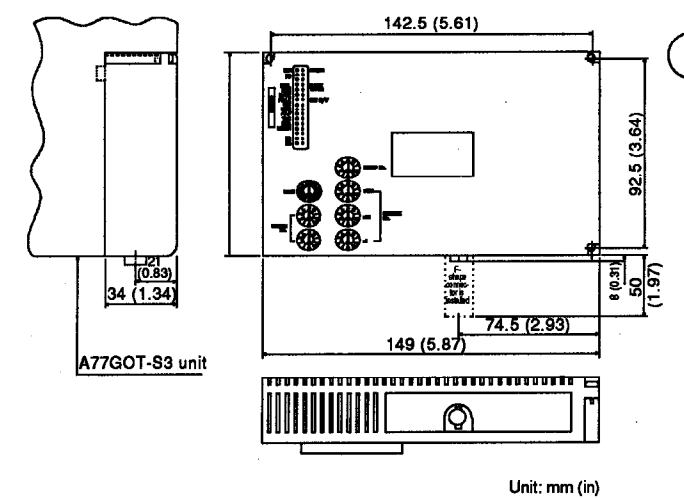
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5. OUTSIDE DIMENSIONS

5. OUTSIDE DIMENSIONS

5.1 A7GT-J71LP23

142.5 (5.61)

92.5 (3.64)

34 (1.34)

35.56 (1.4)   30 (1.18)

149 (5.87)

A77GOT-S3 unit

Unit: mm (in)

5.2 A7GT-J71BR13

142.5 (5.61)

92.5 (3.64)

34 (1.34)

74.5 (2.93)

149 (5.87)

A77GOT-S3 unit

Unit: mm (in)

REVISIONS

A	B	
Feb., 1995	Jun., 2004	

IMPORTANT

IMPORTANT

(1) Design the configuration of a system to provide an external protective or safety interlocking circuit for the CPs.

(2) The components on the printed circuit boards will be damaged by static electricity, so avoid handling them directly. If it is necessary to handle them take the following precautions.

(a) Ground human body and work bench.

(b) Do not touch the conductive areas of the printed circuit board and its electrical parts with and non-grounded tools etc.

Under no circumstances will Mitsubishi Electric be liable or responsible for any consequential damage that may arise as a result of the installation or use of this equipment.

All examples and diagrams shown in this manual are intended only as an aid to understanding the text, not to guarantee operation. Mitsubishi Electric will accept no responsibility for actual use of the product based on these illustrative examples.

Owing to the very great variety in possible applications of this equipment, you must satisfy yourself as to its suitability for your specific application.