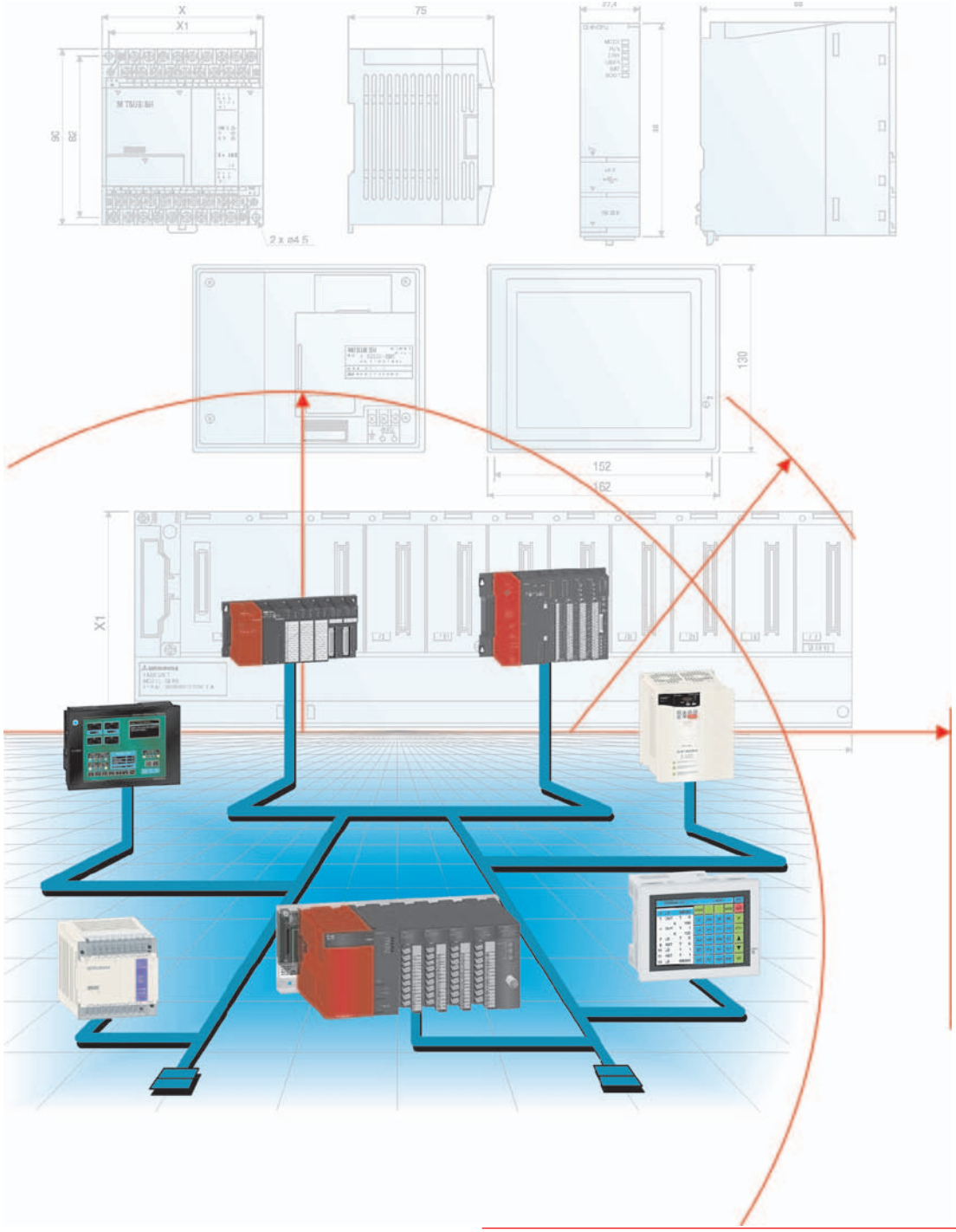
MITSUBISHI ELECTRIC

Programmable
Logic
Controllers



Networks

Technical Catalogue

2005

New Products in this Catalogue

New Products 08/2005

Communications modules

- MELSEC ST series temperature control modules for PROFIBUS/DP

Services

- EMC Competence Center supports any problems

Further Publications within the PLC Range

Technical Catalogues

MELSEC System Q, AnS/QnAS, FX Series Technical Catalogues

Product catalogues for programmable logic controllers and accessories for the further MELSEC PLC series

HMI Technical Catalogue

Product catalogue for operator terminals, visualisation software and accessories (art. no. 68542)

Frequency Inverters, MELSERVO and Motion Controllers Technical Catalogues

Product catalogues for frequency inverters, amplifiers, servo motors and motion controllers with SSCNET connection

Additional Services

You will find current information on updates, alterations, new items, and technical support on MITSUBISHI ELECTRIC's web pages (www.mitsubishi-automation.com).

The products section of the MITSUBISHI home site includes various documentations of the whole product range by MITSUBISHI ELECTRIC as well as the current version of this catalogue on hand. All manuals and catalogues can be downloaded. The content is updated daily and to date is provided in German and English.

About this product catalogue

Due to the constantly growing product range, technical alteration, and new or changed characteristical features, this catalogue is updated frequently.

Texts, figures and diagrams shown in this product catalogue are intended exclusively for explanation and assistance in planning and ordering the MELSEC Programmable Logic Controllers and the associated accessories. Only the manuals supplied with the units are relevant for installation, commissioning and handling of the units and the accessories. The information given in these documentations must be read before installation and commissioning of the units or software.

Should questions arise with regard to the planning of modules described in this product catalogue, do not hesitate to contact the german branch of the MITSUBISHI ELECTRIC EUROPE B.V. in Ratingen or one of its distributors (see cover page).

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NETWORKS

APPENDIX

MELSEC PLC Systems

Description

With the MELSEC PLC systems, MITSUBISHI ELECTRIC presents a variety of compact and modular PLC systems, permitting access to the world of network technology.

The compactness ensures that they occupy less space in the switchgear cabinet and their diverse communication facilities guarantee flexibility and openess.

The compact PLC series MELSEC FX1S/FX1N/FX2N/FX2NC features controllers for low and medium range application with 10 to 256 I/Os.

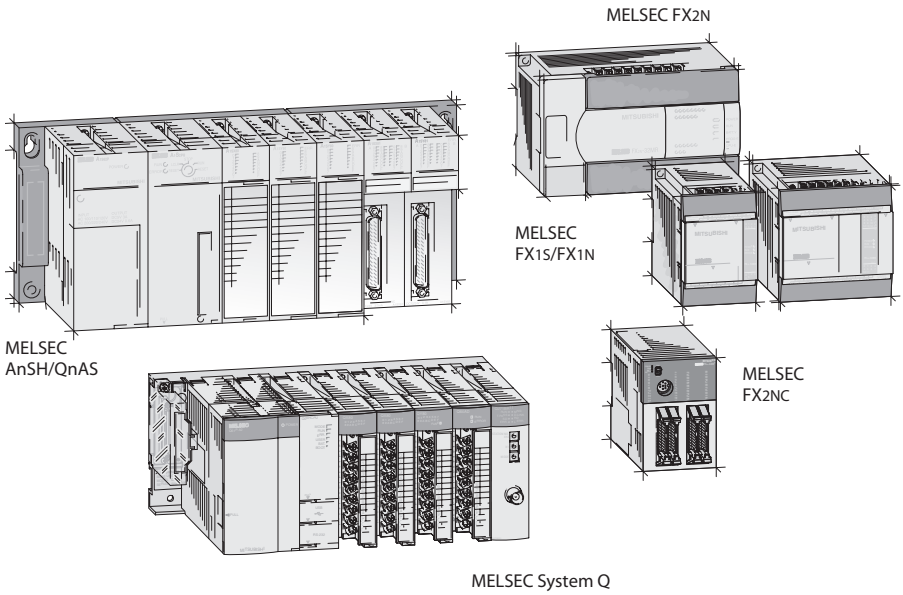
The modular PLC series MELSEC AnSH/QnAS features controllers for the medium range with up to 1,024 I/Os.

The top end of the modular PLC series is the MELSEC System Q, a high performance system featuring multi-processor platform for up to four PLCs, one PC and three motion controller CPUs in an ultra compact format with up to 8,192 I/Os.

The individual system can be installed in a local network or used in a fieldbus system as a master or slave depending on the series.

Special features

- expandable from 10 up to 8,192 I/Os
- selectable or interchangeable intelligence
- diverse communication facilities like the open network Ethernet, CC-Link, PROFIBUS/DP, AS-i, DeviceNet, CANopen and MITSUBISHI networks
- easy installation
- innovative technology for future application
- high program execution speed and fast network access are featured
- IEC 1131.3 standard programming



General specifications

General Specifications	Data
Ambient temperature	0 – +55 °C
Storage temperature	-20 – +75 °C
Ambient relative humidity	max. 90 % (non-condensing)
Protection	IP 20
Noise durability	1500 Vpp with noise generator; 1 µs at 25 – 60 Hz
Insulation withstand voltage	AC 1500 V, 1 min.
Shock resistance	10 G (3 times each in 3 directions)
Vibration resistance	2 G: resistant to vibrations from 10 – 55 Hz for 2 hours along all 3 axes; 0.5 G for DIN rail mounting
Insulation resistance	>5 MΩ (500 V DC)
Ground	Class 3
Environment	Avoid environments containing corrosive gases, install in a dust-free location.
Certifications ①	UL / CSA / CE / DNV / RINA / LR / GL / BV / ABS

① Depends on the series.

MELSEC Networks Systems

Overview

In production locations, the introduction of a network system suited to applications and objectives is significant to ensure efficient production and appropriate quality control and to achieve reductions in equipment sizes and costs by labour saving and wiring reduction.

Assuming a three-level network, Mitsubishi Electric offers network products optimum for respective applications.

Cyclic communication

The basis of MELSECNET/10/H or CC-Link communication having close relationships with machine control is cyclic communication. Since the data of the pre-specified region is transferred periodically (cyclically) and automatically, cyclic communication does not need a sequence program for data transfer.

The cyclic communication data of MELSECNET/10/H or CC-Link is sent by broadcast. Broadcasting is a method in which the data sent from a given station is received by all other stations. Broadcasting allows data to be transmitted to multiple stations at once and to be shared by all stations.

Information network/command level

We assume that an information network is on the highest network level in production fields. Designed to transfer production control information, quality control information, facility operating status and other information between the PLC or facility controller and the production control computer, the information network assumes the use of the most general-purpose Ethernet. Ethernet accepts not only a wide variety of computers such as Windows and UNIX type personal computers but also various Factory Automation equipment. The MELSEC System Q has functions which make the best use of the Ethernet features.

Control network/control level

We assume that a control network which links control devices, e.g. PLC and CNC, is on the middle network level in production sites. Designed to transfer data directly related to the operations and motions of machinery and equipment between the control devices, the control network is required to have excellent real-time capabilities. MELSECNET(10/H), MELSEC's control network, is highly regarded in the market for its excellent real-time capabilities, simple network settings, highly redundant reliability typified by duplex loop, and boasts the largest share in Japan and a great number of installations throughout the world.

Field network/production level

We assume that a field network which links control devices, such as PLC, with sensors and drive equipment is on the lowest network level in production locations.

While control devices were previously linked with sensors and drive equipment by wires on a point-by-point basis, the field network can connect multiple sensors and drive equipment with a single network cable, reducing the number of wires and wiring processes. When connected with intelligent equipment such as the ID system, bar-code reader, inverter and display, the field network allows production data control at network ends through transfer of various data, in addition to ON/OFF data, and serves for improved maintenance efficiency by centralized control of equipment operating statuses.

Ease of setting network parameters

For the Ethernet, MELSECNET/10/H and CC-Link networks, you can set the parameters and various functions required for network connection with the programming software GX (IEC) Developer, greatly reducing programs related to network setting. Also, you can easily confirm the settings on screen.

MELSEC Networks

TCP/IP ETHERNET

Ready for immediate operation with the worldwide standard TCP/IP protocol. A PC connected to the Ethernet has full access to all PLCs in the MELSECNET, all the way down to the I/Os on the production level.

MELSECNET/10/H

Low-cost cabling, brilliantly simple set-up and maximum availability thanks to redundancy and Floating Master. The maximum coverage is up to 30 km.

CC-Link

The network for the control and I/O level comprises capabilities like real-time processing and distributed intelligence. Modules of third-party manufacturers can be integrated.

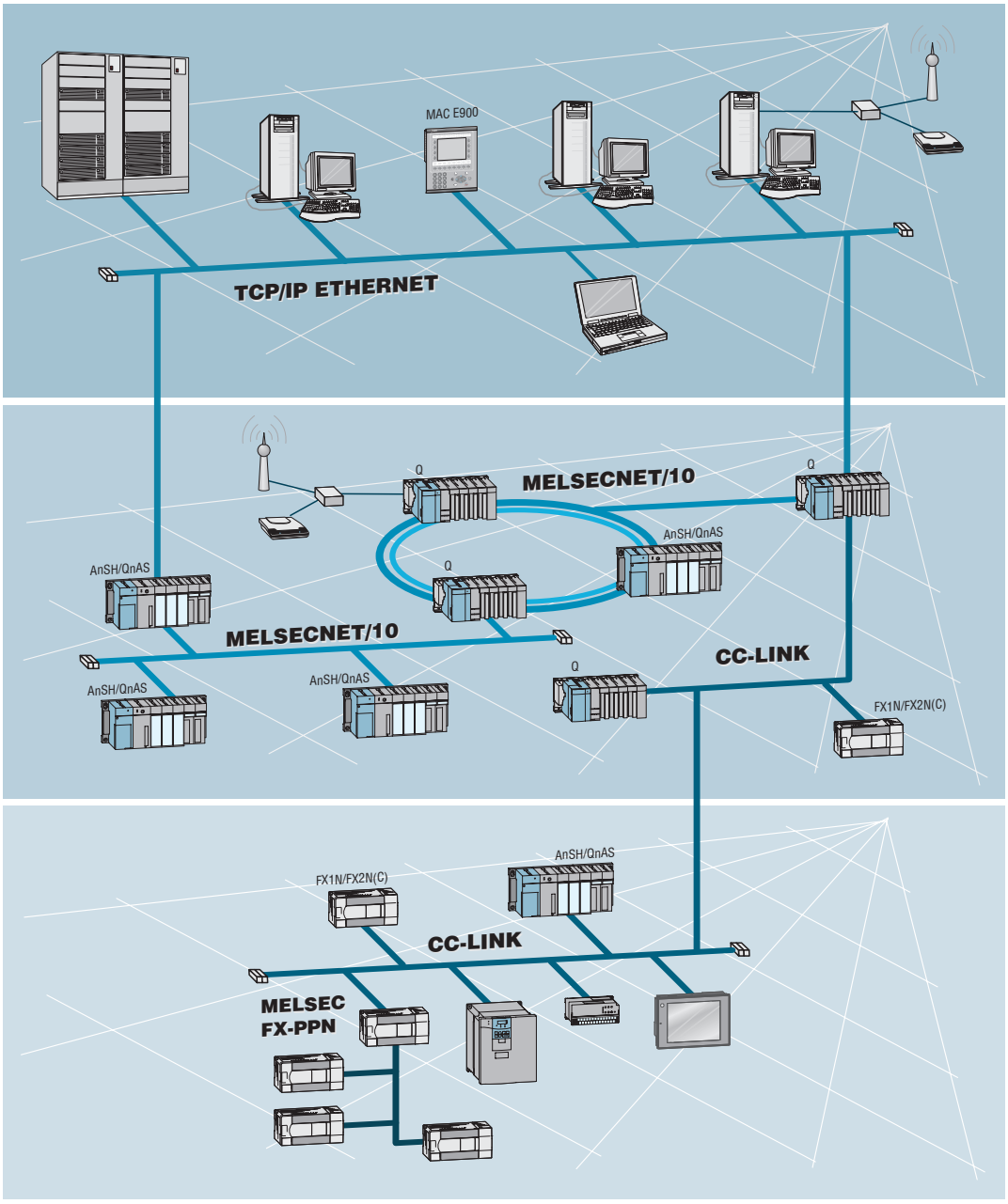
MELSEC FX Peer-to-Peer

The FX-PPN construction enables a network for up to 8 FX2N controllers as clients. A standard twisted-pair cable can be used as the communications media.

COMMAND LEVEL
TCP/IP ETHERNET

CONTROL LEVEL
CC-Link
MELSECNET/10
MELSECNET/H

PRODUCTION LEVEL
CC-Link
MELSEC FX-PPN



Open Networks

TCP/IP ETHERNET

Ready for immediate operation with the worldwide standard TCP/IP protocol. A PC connected to the Ethernet has full access to all PLCs in the MELSECNET, all the way down to the I/Os on the production level.

CC-Link

The new open network for the control and I/O level. Sensors and actuators from different manufacturers can be connected. Up to 64 stations can be integrated.

PROFIBUS/DP

Enables quick and simple connection of sensors and actuators from different manufacturers to MELSEC PLCs, with data transfer rates of up to 12 Mbaud.

DeviceNet

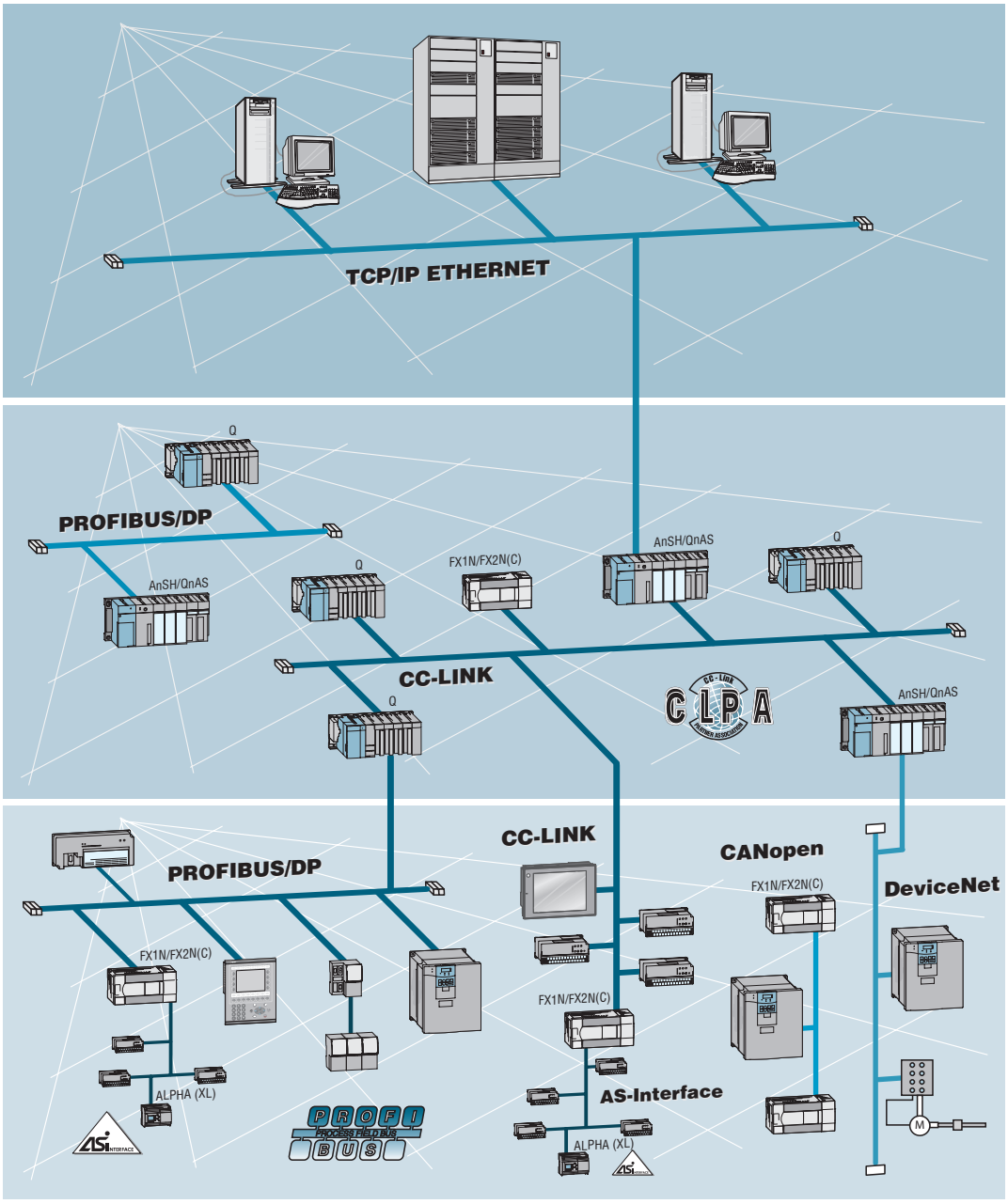
Cost-effective CAN-based network communications. Fault-resistant network structure where components of different manufacturers can be integrated quickly and easily.

AS-Interface

International standard for the lowest field bus level. Connection of conventional sensors and actuators with twisted-pair cable.

CANopen

Cost effective network communications with fault-resistant network structure where components of different manufacturers can be integrated quickly and easily.



COMMAND LEVEL
TCP/IP ETHERNET

CONTROL LEVEL
PROFIBUS/DP
CC-Link

PRODUCTION LEVEL
PROFIBUS/DP
DeviceNet
AS-Interface
CC-Link
CANopen

ETHERNET

Overview

ETHERNET is the most widespread network for connection of information processors such as personal computers and work stations. By loading an ETHERNET interface into the PLC, production-related management information can be transmitted rapidly to personal computers or work stations.

ETHERNET is a platform for a very wide range of data communications protocols. The combination of ETHERNET and the extremely widespread TCP/IP protocol enables high-speed data communications between process supervision systems and the MELSEC PLC series.

Structure

Up to 5 ETHERNET segments can be linked to one another per repeater. There are three standard network types : "Yellow" cable using the 10BASE5 interface, "Cheapernet" cable (Thin Ethernet) using the 10BASE2 interface and 10/100BASE-T for using with twisted pair cable.

Bus segments using Yellow cable can be up to 500 m long. Cheapernet configurations support bus segment cable lengths of up to 185 m.

Data exchange

TCP/IP provides logical point-to-point links between two ETHERNET stations. Using the TCP/IP protocol a process supervision system can request 256 data words per query, 480 words if a QnAS compatible ETHERNET card is used and 960 if the System Q module is used. The speed of the response to the query varies depending on the type of CPU used and the ETHERNET module.

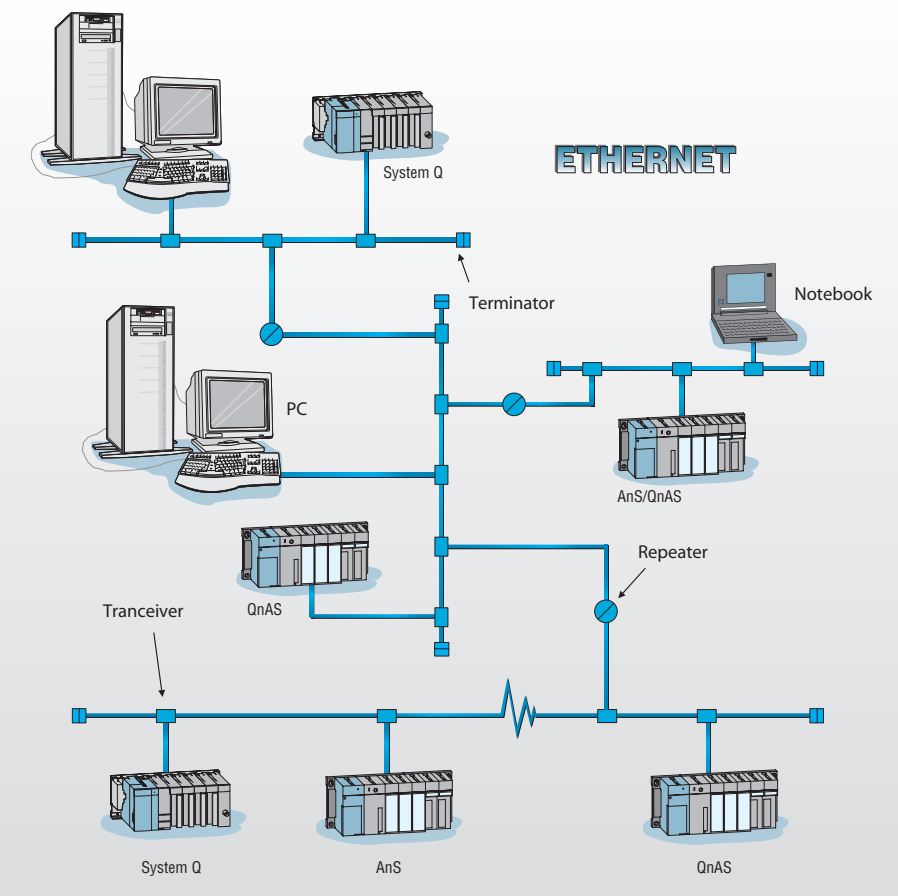
FTP server functionality

The MELSEC PLC compatible ETHERNET modules also provide FTP server functionality, in addition to the normal TCP/IP communications services. This means that a personal computer running standard communications software can read from and write to the PLC CPU sequence program via the Internet.

Administration

The programming software GX IEC Developer or GX Developer providing function blocks or setup routines for the PLCs, makes the configuration of one or more TCP/IP links a quick and easy process.

Cable and logic diagnostics are also simple because all MELSEC ETHERNET cards support the PING instruction.



Specifications	Yellow Cable	Thin Ethernet	Twisted Pair	
Cable type	10BASE5	10BASE2	10BASE-T	100BASE-TX
Max. distance between 2 stations	2500 m	925 m	depends on configuration	
Min. distance between 2 stations	2.5 m	0.5 m	—	—
Max. segment length	500 m	185 m	100 m	100 m
Max. permitted no. of repeaters	4	4	—	—
Max. stations per segment	100	30	1024 (12 per hub)	1024 (12 per hub)
Connector type	AUI	BNC	RJ45	RJ45

Recommended cable types by company Belden:

10BASE5

Belden number	Type	Specifications	Use as
9880	Thick yellow coax	IEC802.3 10BASE5 DEC approved 17-00451-00	Standard trunk
89880	Teflon yellow cable	DEC approval 17-00324-00	High temp or outside trunk

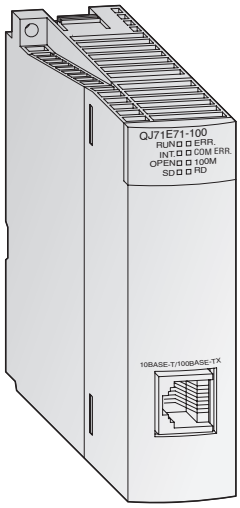
10BASE2

Belden number	Type	Specifications
9907	Trunk cable	DEC Part No. 17-01248-00
89907	Teflon coax cable: High temp or outside trunk	DEC Part no. 17-01246-00

10BASE-T

Belden number	Type	Specifications
7923A	Industrial Ethernet cable, 4 pair UTP, 350MHz, Enhanced category 5e, Vertical tray rated, #24 Solid bare copper, Polyolefin insulation, Bonded pairs, PVC jacket, Rip cord	NEC/(UL): UL Subject 444 IEC: IS11801 Category 5 TIA/EIA: ANSI/TIA/EIA 568B.2 Category 5e, Others: NEMA WC-63.1 Category 5e
7929A	Industrial Ethernet cable, 4 pai ScTP, 200 MHz category 5e, Riser rated, #24 Solid bare copper, Polyolefin insulation, Singles adjoined, Foil shield bonded to PVC jacket, Rip cord	NEC/(UL): UL Subject 444 IEC: IS11801 Category 5 TIA/EIA: ANSI/TIA/EIA 568B.2 Category 5e, Others: NEMA WC-63.1 Category 5e

■ MELSEC System Q Client/Server Modules



QJ71E71-B2, QJ71E71-B5, QJ71E71-100, QJ71MT91

These interface modules are used on the PLC side to connect a host system, e.g. personal computer or work station, and Q mode PLC via ETHERNET to collect or change PLC data, monitor CPU module operation, control status and transfer any data by TCP/IP or UDP/IP communication.

Special features:

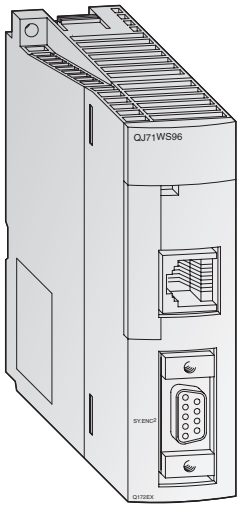
- Between four different network types of 10BASE5, 10BASE2, 10BASE-T and 100BASE-TX can be chosen
- The communications function using fixed buffers is available to transfer data between the PLC and Personal Computer or another PLC
- Up to 960 data words per query are available
- Integrated FTP protocol
- Sending and receiving data via e mail or SMS
- Up to 16 communications lines can be opened for concurrent data communications
- On-screen setting of the initial processing and logical link processing possible
- PLC programming and monitoring can be performed from GX Developer/GX IEC Developer on a personal computer via Ethernet
- PING diagnostic function support

Specifications			QJ71E71-100		QJ71E71-B5	QJ71E71-B2	QJ71MT91	
Module type			Client / server		Client / server	Client / server	Master / slave	
Communications method			ETHERNET: CSMA/CD		ETHERNET: CSMA/CD	ETHERNET: CSMA/CD	MODBUS®/TCP	
Interface		type	10BASE-T	100BASE-TX	10BASE5	10BASE2	10BASE-T	100BASE-TX
Communications data	transfer rate	Mbit/s	10 autodetect	100 autodetect	10	10	10	100
	transfer type		Base band	Base band	Base band	Base band	Base band	Base band
	max. network length	m	—	—	2500	925	—	—
	max. segment length	m	100 ①	100 ①	500	185	100 ①	100 ①
	no. of nodes		Cascade connection of up to four levels	Cascade connection of up to two levels	100 units/segment	30 units/segment	64 slaves	—
	min. distance between 2 nodes	m	—	—	2.5	0.5	—	—
Datasize	no. of simultaneous openable connections		16		16	16	64	64
	fixed send/receive buffer		1 k words x 8		1 k words x 16	1 k words x 8	4 k words x 2	64 k points x 2
	variable buffer		6 k words		6 k words	6 k words		
Simultaneous bidirectional connections			8 + 1 FTP connection		8 + 1 FTP connection	8 + 1 FTP connection	64	64
Transport protocol			TCP/IP with ARP, UDP/IP		TCP/IP with ARP, UDP/IP	TCP/IP with ARP, UDP/IP	MODBUS®/TCP	
No. of loadable modules per CPU			4		4	4	4	
No. or occupied I/O points			32		32	32	32	
Internal power consumption (5 V DC)		mA	500		430	700	520	
Weight		kg	0.11		0.12	0.14	0.11	
Dimensions (W x H x D)		mm	27.5 x 98 x 90		27.5 x 98 x 90	27.5 x 98 x 90	27.5 x 98 x 90	
Order information		Art. no.	138327		147287	129614	155603	
Accessories			—		—	—	GX Configurator MB contained in GX Configurator UT	

① Length between hub and node

■ MELSEC System Q Web Server Module

PLC ➠ System Q



QJ71WS96

The web server module QJ71WS96 enables the remote control monitoring of the System Q.

Special features:

- Access to the PLC via the internet
- Very easy setting functions integrated
- User needs only a Web browser for setting and monitoring.
- RS232 interface for modem connection
- Various connections for data exchange are possible: ADSL, modem, LAN, etc.
- Sending and receiving data via mail or FTP
- Integration of a self-designed web site and Java applets is possible
- Standard connection via ETHERNET to exchange data between other PLCs or PCs
- Events and CPU data protocol, storing functions

Specifications			QJ71WS96
Module type			Web server, FTP server/client
Communications method			ETHERNET: CSMA/CD
Interface		type	10BASE-T/100BASE-TX
Communications data	transfer rate	MBit/s	10/100 auto detect
	transfer type		Base band
	max. segment length	m	100 ①
	no. of nodes		Cascade connection of up to four levels for 10BASE-T, two levels for 100BASE-TX
	min. distance between 2 nodes	m	—
RS-232 communications data	interface		RS232, 9-poles D-SUB
	transfer type		Duplex
	synchronisations method		Start/stop synchronisation
	transfer speed	MBit/s	9.6 / 19.2 / 38.4 / 57.6 / 115.2
	transmission distance	m	Max. 15
	data format		1 start bit, 8 data bits, 1 stop bit
	parity check		—
	transfer control		floating control is possible (RS/CS)
Functions			Monitoring of devices, registers and tags (also via several networks) logging function in programmable intervalls Events and CPU data protocol monitor e-mail service and FTP server and client 16 access levels via password
Memory capacity		MB	5 (Standard-ROM); expandable with Compact Flash™ Card up to 512
I/O points			32
Internal power consumption (5 V DC)		mA	500
Weight		kg	0.11
Dimensions (W x H x D)		mm	27.5 x 98 x 90

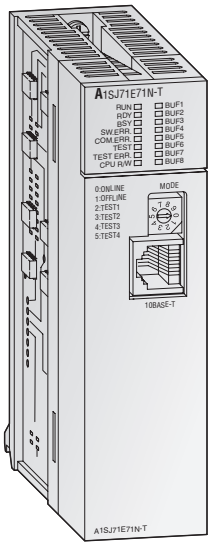
Order information	Art. no.	147115

Accessories	Compact Flash™ card, max. 512 MB, type 1

① Length between hub and node

■ MELSEC AnSH Client/Server Modules

PLC ➠ AnSH/QnAS series



A1SJ71E71N-B2, A1SJ71E71N-B5, A1SJ71E71N-T

These modules connect the MELSEC AnS system to the open, non-proprietary ETHERNET. This enables process supervision packages and other programs from a wide variety of vendors to access all devices of the controller at a rate of 10 Mbit/s.

Different models are available for each ETHERNET interface type, allowing you to select an appropiate model for each application.

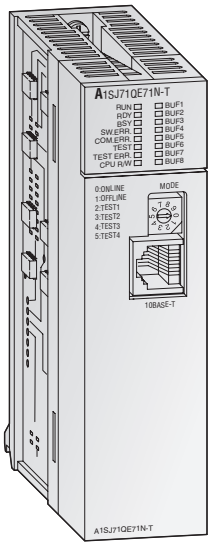
Special features:

- The modules support the following cable types:
  - A1SJ71E71N-B2: 10BASE2 (Cheapernet using RG58 coax cable)
  - A1SJ71E71N-B5: 10BASE5 (ETHERNET using Yellow cable)
  - A1SJ71E71N-T: 10BASE-T (ETHERNET using twisted pair cable)
- Communications protocol TCP/IP with ARP
- Module and communication status indicated by LEDs
- Full support for the GX IEC Developer programming software package (read and write programs, monitoring, remote PLC operating mode change (RUN/STOP))
- Ready-to-use GX IEC Developer function block available
- Integrated bus cable diagnostics
- PING diagnostics function support
- Automatically detects whether the communication partner is ready to communicate

Specifications			A1SJ71E71N-B2	A1SJ71E71N-B5	A1SJ71E71N-T
Module type			Client / server	Client / server	Client / server
Communications method			ETHERNET: CSMA/CD	ETHERNET: CSMA/CD	ETHERNET: CSMA/CD
Interface		type	10BASE2	10BASE5	10BASE-T
Communications data	transfer rate	Mbit/s	10	10	10
	transfer type		Base band	Base band	Base band
	max. network length	m	925	2500	2500
	max. segment length	m	185	500	500
	nodes		Max. 30/segment	Max. 100/segment	Max. 100/segment
	min. distance between 2 nodes	m	0.5	2.5	2.5
Data buffer	no. of simultaneous openable connections		8	8	8
	fixed buffer		1 k words x 8	1 k words x 8	1 k words x 8
	RAM buffer		6 k words	6 k words	6 k words
Simultaneous bidirectional connections			4	4	4
Transport protocol			TCP/IP with ARP, UDP/IP	TCP/IP with ARP, UDP/IP	TCP/IP with ARP, UDP/IP
I/O points			32	32	32
Internal power consumption (5 V DC)		mA	520	350	350
Weight		kg	0.27	0.27	0.27
Dimensions (W x H x D)		mm	34.5 x 130 x 93.6	34.5 x 130 x 93.6	34.5 x 130 x 93.6
Order information		Art. no.	142619	153012	153013
Accessories			—	—	—

■ MELSEC QnAS Client/Server Modules

PLC ➠ AnSH/QnAS series



A1SJ71QE71N-B2, A1SJ71QE71N-B5, A1SJ71QE71N-T

These modules connect the MELSEC QnAS system to the open, non-proprietary ETHERNET. This enables process supervision packages and other programs from a wide variety of vendors to access all devices of the QnAS controller at a rate of 10 Mbit/s.

Different models are available for each ETHERNET interface type, allowing you to select an appropiate model for each application.

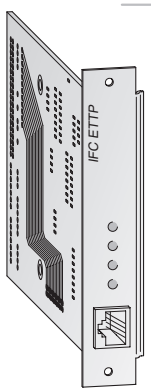
Special features:

- The modules support the following cable types:
  - A1SJ71QE71N-B2: 10BASE2 (Cheapernet using RG58 coax cable)
  - A1SJ71QE71N-B5: 10BASE5 (ETHERNET using Yellow cable)
  - A1SJ71QE71N-T: 10BASE-T (ETHERNET using twisted pair cable)
- Communications protocol TCP/IP with ARP
- PING diagnostics function support
- FTP-server function enabling program uploads and downloads via the Internet with standard communications software
- Fast response times – 480 words exchanged per protocol
- Integrated easy bus cable diagnostics
- A function block library for GX IEC Developer makes the configuration of TCP/IP links quick and easy.

Specifications			A1SJ71QE71N-B2	A1SJ71QE71N-B5	A1SJ71QE71N-T
Module type			Client / server	Client / server	Client / server
Communications method			ETHERNET: CSMA/CD	ETHERNET: CSMA/CD	ETHERNET: CSMA/CD
Interface		type	10BASE2	10BASE5	10BASE-T
Communications data	transfer rate	Mbit/s	10	10	10
	transfer type		Base band	Base band	Base band
	max. network length	m	925	2500	2500
	max. segment length	m	185	500	500
	nodes		30	100	100
	min. distance between 2 nodes	m	0.5	2.5	2.5
Data buffer	no. of simultaneous openable connections		8	8	8
	fixed send/receive buffer		1 k words x 8	1 k words x 8	1 k words x 8
	variable buffer		6 k words	6 k words	6 k words
Simultaneous bidirectional connections			4 + 1 FTP connection	4 + 1 FTP connection	4 + 1 FTP connection
Transport protocol			TCP/IP with ARP, UDP/IP	TCP/IP with ARP, UDP/IP	TCP/IP with ARP, UDP/IP
I/O points			32	32	32
Internal power consumption (5 V DC)		mA	800	600	600
Weight		kg	0.28	0.27	0.27
Dimensions (W x H x D)		mm	34.5 x 130 x 93.6	34.5 x 130 x 93.6	34.5 x 130 x 93.6
Order information		Art. no.	142621	153034	153035
Accessories			—	—	—

HMI Communications Adapter

HMI ➠ MAC E series



MAC-IFC-ETTP, MAC-IFC-ETCX

The communications adapters enable network communications with several HMI control units from Mitsubishi Electric.

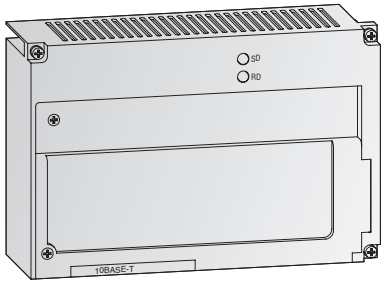
One master terminal serves up to 7 slave terminals.

The optional MAC-IFC-ETTP(-ETCX) interface cards are used for ETHERNET connection as twisted-pair (ETTP) or as coaxial cable (ETCX).

Specifications		MAC-IFC-ETTP	MAC-IFC-ETCX
Application for		MAC E300/E600/E610/E615/ E700/E710/E900T/ E900VT/E910T	MAC E300/E600/E610/E615/ E700/E710/E900T/ E900VT/E910T
Type		Plug-in board	Plug-in board
Use		Interface for Ethernet (twisted pair)	Interface for Ethernet (coaxial)
Order information	Art. no.	104727	104726

HMI Communications Adapter

HMI ➠ GOT series



A9GT-J71E71-T

The communications adapter A9GT-J71E71-T supports the controlling of PLCs within the ETHERNET. The module provides a RJ45 interface for connection.

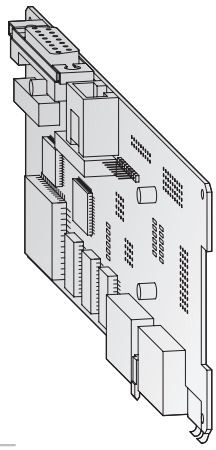
It supports various fuctions, e.g. e-mail sending, FTP server and client/ server functionality.

These modules are designed to fit on the back of A956/A970/A975/A985GOT operator panels.

Specifications		A9GT-J71E71-T
Use		Ethernet
Type		Remote control and monitoring of PLCs
Application for		A956/A970/A975/A985GOT
Order information	Art. no.	139395

Interface Card for Robots Controller HR533

ROB ➠ MELFA



HR533

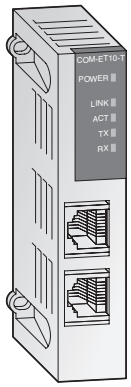
The interface card HR533 enables network communications with a CR□ controller for a MELFA robot and other units from MITSUBISHI ELECTRIC.

Specifications	HR533
Application for	CR1, CR2, CR2A
Card type	Plug-in board
Interface type	10BASE5, 10BASE-T (selectable)
Use	Interface for Ethernet

Order information	Art. no.	129809

Communications module COM-ET 10-T for Ethernet

PLC ➠ FX series



COM-ET 10-T

The COM-ET10-T communications module is a serial-to-Ethernet converter and enables connection of FX family PLCs to Ethernet networks. It is installed on the left side of the controller with an adapter module (FX1N-CNV-BD, FX2N-CNV-BD or FX2NC-CNV-IF).

With a the COM-ET10-T installed the PLC can exchange data quickly and easily with process visualisation systems, and it is also possible to perform diagnostics and programming from any location in the network. The module provides upload, download and debugging functionality via the Ethernet for the entire MELSEC FX family.

Specifications		COM-ET 10-T
General specifications		Conforms to FX1N/FX2N/FX2NC base units
Power supply (5 V DC)		Max. 100 mA (from base unit)
Interface		10BaseT
Connector		RJ45
Max. transfer rate		10 Mbit/s
Max. segment length	m	100
Related I/O points		—
Weight	kg	0,09
Dimensions (W x H x D)	mm	19 x 20 x 74

Order information	Art. no.	144679

MELSECNET/10/H

Overview

MELSECNET/10 and MELSECNET/H are token passing networks with a minimum communication speed of 10 Mbit/s. These networks have the performance capabilities to exercise centralized control of manufacturing lines by connection of multiple PLCs and a personal computer. Since the transmission right is always assigned cyclically in a token passing network, data transmission can always be made if the number of connections or communications increases with the network. Hence, this network is suitable for facility control requiring real-time capabilities.

Structure

The ring structure of MELSECNET/10 enables very large network coverage of up to 30 km.

Remote stations always need a separate network structure for the connection to the control networks.

Cable types

MELSECNET/10 gives you a wide choice of cable types and topologies:

- Coaxial bus (max. 500 m)
- Coaxial duplex loop (max. 2.5 km)
- Fibre-optics duplex loop (max. 30 km)

Data exchange

These networks have a cyclic communication system which is designed to transfer periodically or automatically the data pre-specified in the network parameters and does not need programming for data transfer.

Administration

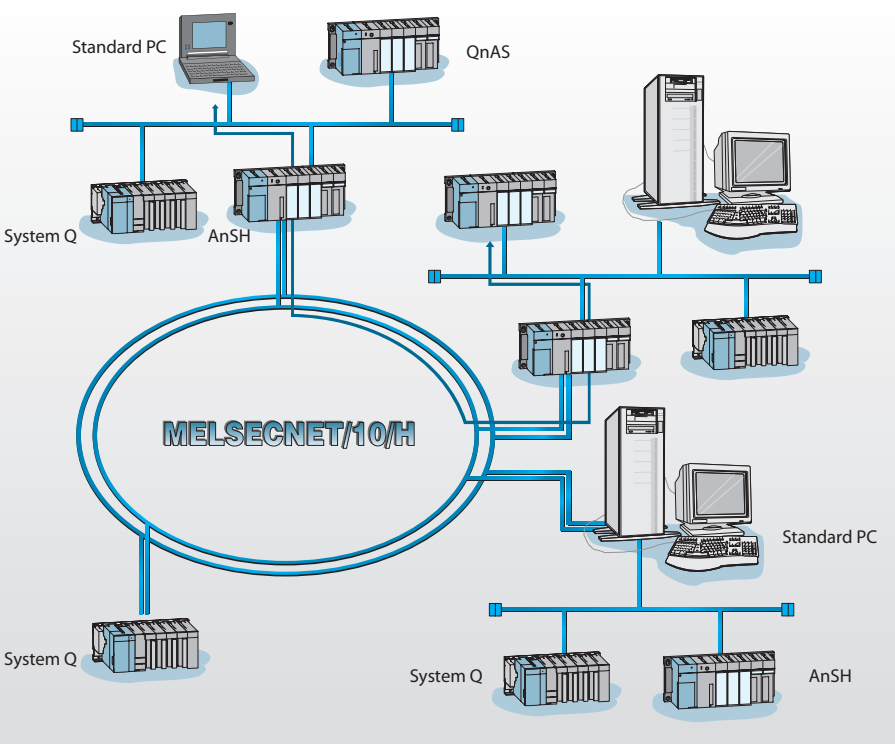
MELSECNET/10/H enables you to program and monitor every PLC in the system from any station.

The Floating Master architecture ensures reliable network operation even if the network manager fails.

Special features

In parallel to the cyclic data exchange it is also possible for any station to send data to and read data from any other station, even across several networks. The system also supports multitast and broadcast functions.

In MELSECNET/10/H systems you only have to set parameters for the network manager, making installation very quick and simple.



Specifications			Electrical		Optical		
Cable type			Coaxial bus	Coaxial duplex loop	Glass fibre SI 200/220 µm QSI 185/230 µm	Glass fibre GI50/125 µm	Glass fibre GI62.5/125 µm
Data transfer	rate	Mbit/s	10	10 (20)	10 (20) / 25	10 (20)	10 (20)
	distance between 2 stations	m		500	1,000	2,000	2,000
	total coverage	m	≤500 (2,500)	≤30,000	≤30,000	≤30,000	≤30,000
Media	impedance (100 kHz)	Ω	75	75	—	—	—
	transmission losses		—	—	≤5.5 dB / km	≤3 dB / km	≤3 dB / km
	transmission bandwidth		—	—	≥20 MHz / km	≥300 MHz / km	≥300 MHz / km
Connectors							
Connection system			RG59	RG59	CA7003	DL6-CP①	DL6-CP①
Order information		Art. no.	—	—	69365	144073	144073

① Simplex connector, for duplex connect 2× DL6-CP together

Cable type	Layout	Connector	Length	Order information
Duplex cable: SI/QSI 185/230 µm	Glass fibre cable for MELSECNET; Connection plugs at both ends; for installation inside the cabinet	CA7003	2 m, 5 m, 30 m, 50 m	AS-2P-☐M-A
	Simple cable protection; for installation outside the cabinet	CA7003	2 m, 5 m, 10 m, 20 m, 30 m, 50 m, 100 m	AS-2P-☐M-B
Duplex cable: GI 62,5/125 µm (for GE type modules)	Connection plugs at both ends; 2-conductor type for interior installation; simple cable protection	DL6-CP	2 m, 5 m, 10 m, 20 m, 30 m	AGS-2P-☐ M-625A
Duplex cable: GI 50/125 µm (for G type modules)	Connection plugs at both ends; 2-conductor type for interior installation; simple cable protection	DL6-CP	5 m, 30m	AG-2P-☐M-A
Simplex cable: Adapter cable GI 62,5/125 µm / GI 50/125 µm	Adapter cable Simplex DL6-CP – ST plug	DL6-CP, ST	3 m, 4 m	AGS-CS-☐M-☐A

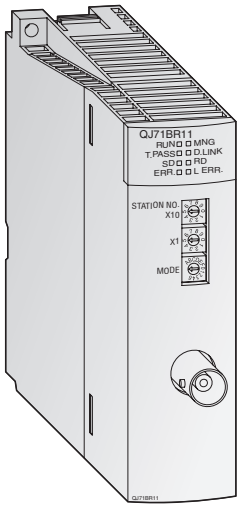
You will find a detailed overview for all optical cables in chapter "Accessories" on page 79.

Recommended cable types by company Belden (coax cable):

Belden number	Description
1505A	High precision data coax (high availability in many colours) (20 AWG), Attenuation 2.9dB/100m at 100MHz
1505F	Flexible version of 1505A
1506A	Teflon version of 1505A, suitable for outdoor and direct burial
8241	Standard commercial RG59, Attenuation 3.6dB/100m at 100MHz
8241F	Flexible version of 8241

■ MELSEC System Q Master Modules

PLC ➠ System Q



QJ71BR11, QJ72BR15

These interface modules are used to connect the MELSEC System Q as master or local station to the MELSECNET10/H network. This enables fast and effective connection between System Q systems.

QJ71BR11 and QJ72BR15 feature the coaxial bus topology.

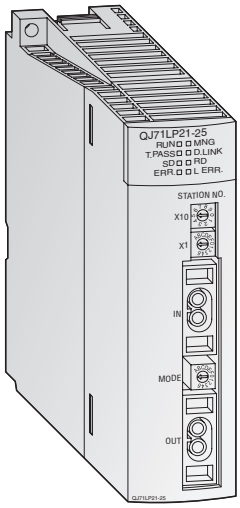
Special features:

- High data transfer rate (10 Mbit/s) with coaxial bus systems
- Increased link register (LB, LW) capacities to 16 k points
- The QJ71BR11 and QJ72BR15 can be used for:
  - PLC ↔ PLC, PC data communications
  - PLC ↔ remote I/O control
- Floating Master technology guarantees trouble-free operation, no matter which station in the system is powered down.
- Up to four MELSECNET/H modules can be installed in a single PLC, handling routing functions across up to as many as 239 networks.
- The network system supports data communications between any two stations, no matter how many networks lie between them.
- Station separating function in coaxial bus systems and loopback function in optical duplex loop systems when some station become faulty
- Control station shifting function and automatic return function

Specifications			QJ71BR11	QJ72BR15
Module type			Master / local stations	Remote I/O station
Communications method			Token bus	Token bus
Topology			Coaxial bus system	Coaxial bus system
Synchronisation			Frame synchronisation method	Frame synchronisation method
Transmission channel			Single bus	Single bus
Link registers per network	LX/LY		8192 (0 – 1FFF)	8192 (0 – 1FFF)
	LB		8192 (MELSECNET/10 mode), 16384 (MELSECNET/H mode)	8192 (MELSECNET/10 mode), 16384 (MELSECNET/H mode)
	LW		8192 (MELSECNET/10 mode), 16384 (MELSECNET/H mode)	8192 (MELSECNET/10 mode), 16384 (MELSECNET/H mode)
Transient transmission capacity			Max. 1920 bytes/frame	Max. 1920 bytes/frame
Modulation method			Manchester	Manchester
Transmission format			Conforms to HDLC	Conforms to HDLC
Terminating resistor		Ω	75	75
No. of networks in one system			Max. 239	Max. 239
Max. number of groups			32	32
Stations per network			32 (1 Master, 31 local stations)	32 (1 Master, 31 local stations)
Max. number of modules per CPU			4	4
Transmission	rate	Mbit/s	10	10
	distance		300 m / 500 m (depends on cable used)	300 m / 500 m (depends on cable used)
	distance with repeater		Up to 2.5 km by connection of max. 4 repeaters	Up to 2.5 km by connection of max. 4 repeaters
	cable		RG59 BU / RG6 AU	RG59 BU / RG6 AU
	connectors		BNC-P-3-Ni / BNC-P-5	BNC-P-3-Ni / BNC-P-5
Max. compensation time during power failure		ms	≤ 20	≤ 20
I/O points			32	32
Internal power consumption (5 V DC)		mA	750	1000
Weight		kg	0.11	0.16
Dimensions (W x H x D)		mm	27.5 x 98 x 90	27.5 x 98 x 90
Order information		Art. no.	127592	136393
Accessories			Terminating resistor: BNC-75 OHM, art. no. 53871	

■ MELSEC System Q Floating Master Modules and Remote I/O Stations

PLC ➠ System Q



QJ71LP21G, QJ71LP21GE, QJ71LP21-25, QJ71LP21S-25
QJ72LP25G, QJ72LP25GE, QJ72LP25-25

These interface modules are used to connect the MELSEC System Q as master or local station to the MELSECNET10/H network. This enables fast and effective connection between System Q systems.

All these interface modules feature the optical loop system.

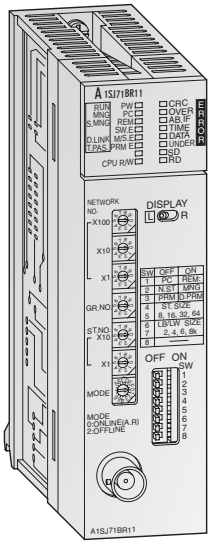
Special features:

- High data transfer rate (10/25 Mbit/s) with optical loop systems
- Increased link register (LB, LW) capacities to 16k points
- These interface modules can be used for:
  - PLC ↔ PLC, PC data communications
  - PLC ↔ remote I/O control (separate network) for Q02CPU up
- Floating Master technology guarantees trouble-free operation, no matter which station in the system is powered down.
- Up to four MELSECNET/H modules can be installed in a single PLC, handling routing functions across up to as many as 239 networks.
- Station separating function in coaxial bus systems and loopback function in optical duplex loop systems when some station become faulty
- Control station shifting function and automatic return function
- The QJ71LP21S-25 has the same function and performance as the QJ71LP21-25, additionally it features external power supply for more reliability. The QJ71LP21S-25 requires 2 I/O slots on the main base unit.

Specifications			QJ71LP21G	QJ71LP21GE	QJ71LP21-25	QJ71LP21S-25	QJ72LP25G	QJ72LP25GE	QJ72LP25-25
Module type			Floating Master	Floating Master	Floating Master	Floating Master	Remote I/O station	Remote I/O station	Remote I/O station
Communications method			Token ring	Token ring	Token ring	Token ring	Token ring	Token ring	Token ring
Topology			Redundant optical loop system				Redundant optical loop system		
Synchronisation			Frame synchronisation method				Frame synchronisation method		
Transmission channel			Redundant loop	Redundant loop	Redundant loop	Redundant loop	Redundant loop	Redundant loop	Redundant loop
Link registers per network	LX/LY		8192 (0 – 1FFF)	8192 (0 – 1FFF)	8192 (0 – 1FFF)	8192 (0 – 1FFF)	8192 (0 – 1FFF)	8192 (0 – 1FFF)	8192 (0 – 1FFF)
	LB		8192 (MELSECNET/10 mode), 16384 (MELSECNET/H mode)				8192 (MELSECNET/10 mode), 16384 (MELSECNET/H mode)		
	LW		8192 (MELSECNET/10 mode), 16384 (MELSECNET/H mode)				8192 (MELSECNET/10 mode), 16384 (MELSECNET/H mode)		
Transient transmission capacity		bytes/ frame	Max. 1920	Max. 1920	Max. 1920	Max. 1920	Max. 1920	Max. 1920	Max. 1920
Modulation method			NRZI	NRZI	NRZI	NRZI	NRZI	NRZI	NRZI
Transmission format			Conforms to HDLC	Conforms to HDLC	Conforms to HDLC	Conforms to HDLC	Conforms to HDLC	Conforms to HDLC	Conforms to HDLC
Terminating resistor		Ω	—	—	—	—	—	—	—
No. of networks in one system			Max. 239	Max. 239	Max. 239	Max. 239	Max. 239	Max. 239	Max. 239
Max. number of groups			32	32	32	32	32	32	32
Stations per network			64 (1 Master, 63 local stations)				64 (1 Master, 63 local stations)		
Max. number of modules per CPU			4	4	4	4	—	—	—
Transmission	rate	Mbit/s	10	10	10 / 25	10 / 25	10	10	10 / 25
	distance		2000 m	2000 m	SI 200/220: 500 m, QSI 185/230: 1000 m	SI 200/220: 500 m, QSI 185/230: 1000 m	2000 m	2000 m	SI 200/220: 500 m, QSI 185/230: 1000 m
	distance with repeater		—	—	—	—	—	—	—
	cable		GI50/125 µm	GI62,5/125 µm	SI/QSI	SI/QSI	GI50/125 µm	GI62,5/125 µm	SI/QSI
	connectors		DL6-CP	DL6-CP	CA7003	CA7003	DL6-CP	DL6-CP	CA7003
Max. compensation time during power failure		ms	≤ 20	≤ 20	≤ 20	≤ 20	≤ 20	≤ 20	≤ 20
I/O points			32	32	32	48	—	—	—
Internal power consumption (5 V DC)		mA	550	550	550	550	850	850	850
Weight		kg	0.11	0.11	0.11	0.20	0.15	0.15	0.15
Dimensions (W x H x D)		mm	27.5 x 98 x 90	27.5 x 98 x 90	27.5 x 98 x 90	55 x 98 x 90	27.5 x 98 x 90	27.5 x 98 x 90	27.5 x 98 x 90
Order information		Art. no.	138958	138959	136391	147632	138960	138961	136392
Accessories			Optical plugs and cables (refer to pages 15 and 79)						

■ MELSEC AnSH/AnAS Master Modules and Remote I/O Stations

PLC ➠ AnS/QnAS series



A1SJ71BR11, A1SJ71LP21, A1SJ71LP21GE

These interface modules are used to connect the MELSEC AnSH/AnAS as master (only with AnAS CPU) or local station to the MELSECNET/10 network. This enables fast and effective connection between System Q, QnA, QnAS and A systems.

Three different topologies are featured:
A1SJ71BR11 for coaxial bus, A1SJ71LP21 for optical loop system and A1SJ71LP21GE for redundant system.

The optical loop system is featured in SI, QSI and GI cable.

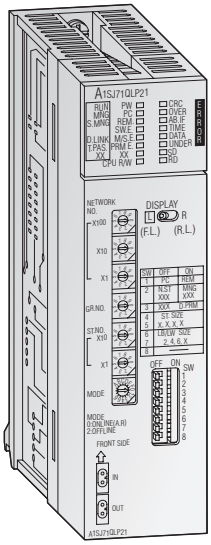
Special features:

- High data transfer rate (10 Mbit/s) with coaxial bus systems and optional 10/20 Mbit/s with optical loop systems
- The A1SJ71BR11 and A1SJ71LP21(GE) modules can be used for:
  - PLC ↔ PLC, PC data communications
  - PLC ↔ remote I/O control
- Floating Master technology guarantees trouble-free operation, no matter which station in the system is powered down.
- Up to 4MELSECNET/10 modules can be installed in a single PLC, handling routing functions across up to as many as 255 networks.
- The network system supports data communications between any two stations, no matter how many networks lie between them.
- Large data volumes via link devices for cyclic data communications

Specifications			A1SJ71BR11	A1SJ71LP21	A1SJ71LP21GE
Module type			Floating master (only AnAS) / local station	Floating master (only AnAS) / local station	Floating master (only AnAS) / local station
Communications method			Token bus	Token ring	Token ring
Topology			Coaxial bus system	Redundant optical loop system	Redundant optical loop system
Synchronisation			Frame synchronisation method	Frame synchronisation method	Frame synchronisation method
Transmission channel			Single bus	Redundant loop	Redundant loop
Link registers			8192 (0 – 1FFF)	8192 (0 – 1FFF)	8192 (0 – 1FFF)
Max. cyclic data for link in one station			≤ 2000 bytes	≤ 2000 bytes	≤ 2000 bytes
Modulation method			Manchester	NRZI	NRZI
Transmission format			Conforms to HDLC	Conforms to HDLC	Conforms to HDLC
Terminating resistor		Ω	75	—	—
No. of networks in one system			Max. 255	Max. 255	Max. 255
Stations per network			32 (1 master, 31 local stations)	64 (1 master, 63 local stations)	64 (1 master, 63 local stations)
Groups (multitast)			Max. 9	Max. 9	Max. 9
Transmission	rate	Mbit/s	10	10 (20)	10 (20)
	distance		300 m / 500 m (depends on cable used)	SI 200/220: 500 m, QSI 185/230: 1000 m	GI 62.5/125 : 2000 m
	cable		RG59 BU / RG6 AU	—	—
	connectors		BNC-P-3-Ni / BNC-P-5	CA7003	DL6-CP
Max. compensation time during power failure		ms	≤ 20	≤ 20	≤ 20
I/O points			32	32	32
Internal power consumption (5 V DC)		mA	800	650	650
Weight		kg	0.33	0.33	0.33
Dimensions (W x H x D)		mm	34.5 x 130 x 93.6	34.5 x 130 x 93.6	34.5 x 130 x 93.6
Order information		Art. no.	47869	47868	53457
Accessories			Terminating resistor: BNC-75 OHM, art. no. 53871	Optical plugs and cables (refer to pages 15 and 79)	

■ MELSEC QnAS Master Modules

PLC ➠ AnS/QnAS series



A1SJ71QBR11, A1SJ71QLR21, A1SJ71QLP21

These interface modules are used to connect the MELSEC QnAS as master or local station to the MELSECNET/10 network. This enables fast and effective connection between System Q, QnA, QnAS and A systems.

Three different topologies are featured:
A1SJ71QBR11 for coaxial bus, A1SJ71QLR21 for redundant coaxial bus system and A1SJ71QLP21 for redundant optical loop system.

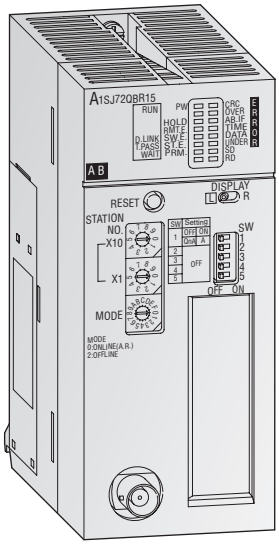
The optical loop systems are featured in SI, QSI and GI cable.

Special features:

- High data transfer rate (10 Mbit/s) with coaxial bus systems and optional 10/20 Mbit/s with optical loop systems
- The modules can be used for:
  - PLC ↔ PLC, PC data communications
  - PLC ↔ remote I/O control
- Floating Master technology guarantees trouble-free operation, no matter which station in the system is powered down.
- Up to 4MELSECNET/10 modules can be installed in a single PLC, handling routing functions across up to as many as 239 networks.
- The network system supports data communications between any two stations, no matter how many networks lie between them.
- Large data volumes via link devices for cyclic data communications
- The modules can also be used for the configuration of a redundant master system for remote I/Os in MELSECNET/10.

Specifications			A1SJ71QBR11	A1SJ71QLR21	A1SJ71QLP21
Module type			Floating master	Floating master	Floating master
Communications method			Token bus	Token ring	Token ring
Topology			Coaxial bus system	Redundant coaxial bus system	Redundant optical loop system
Synchronisation			Frame synchronisation method	Frame synchronisation method	Frame synchronisation method
Transmission channel			Single bus	Redundant loop	Redundant loop
Link register			8192 (0 – 1FFF)	8192 (0 – 1FFF)	8192 (0 – 1FFF)
Max. cyclic data for link in one station			≤ 2000 bytes	≤ 2000 bytes	≤ 2000 bytes
Modulation method			Manchester	Manchester	NRZI
Transmission format			Conforms to HDLC	Conforms to HDLC	Conforms to HDLC
Terminating resistor		Ω	75	75	—
No. of networks in one system			239	239	239
Stations per network			32 (1 master, 31 local stations)	64 (1 master, 63 local stations)	64 (1 master, 63 local stations)
Groups (multitast)			Max. 9	Max. 9	Max. 9
Transmission	rate	Mbit/s	10	10 (acc. to 20 multiplex)	10 (acc. to 20 multiplex)
	distance	m	300 m / 500 m (depends on cable used)	300 m / 500 m (depends on cable used)	SI 200/220: 500 m, QSI 185/230: 1000 m
	cable		RG59 BU / RG6 AU	RG59 BU / RG6 AU	—
	plug		BNC-P-3-Ni / BNC-P-5	BNC-P-3-Ni / BNC-P-5	CA7003
Max. compensation time during power failure		ms	≤ 20	≤ 20	≤ 20
I/O points			32	32	32
Internal power consumption (5 V DC)		mA	800	650	650
Weight		kg	0.3	0.3	0.3
Dimensions (W x H x D)		mm	34.5 x 130 x 93.6	34.5 x 130 x 93.6	34.5 x 130 x 93.6
Order information		Art. no.	66540	128797	66541
Accessories			Terminating resistor: BNC-75 OHM, art. no. 53871	Terminating resistor: BNC-75 OHM, art. no. 53871	Optical plugs and cables (refer to pages 15 and 79)

■ MELSEC QnAS Slave Modules



A1SJ72QBR15, A1SJ72QLP25

These modules are used for building remote stations in the MELSECNET/10 network. The modules are mounted instead of a QnAS CPU on the base unit. This enables fast and costeffective connection of extremely complex remote I/Os to a host PLC CPU in MELSECNET/10 networks.

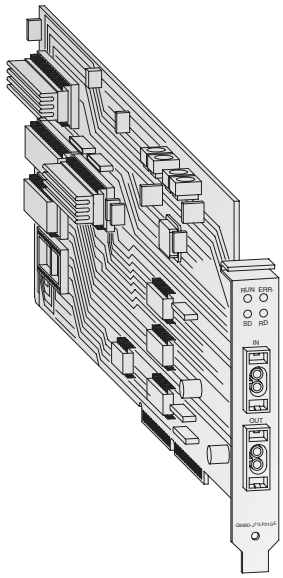
Special features:

- Enables configuration of very complex remote inputs and outputs with:
  - Digital I/Os
  - Analog I/Os
  - Positioning modules
  - Communications modules (ETHERNET/Computer Link)
  - Etc.
- Supports definition of a standby Master for remote I/Os in MELSECNET/10 networks (only with QnAS series CPUs).
- The Master CPU can be programmed and monitored from the remote module.
- Installation on the base unit instead of the PLC CPU

Specifications			A1SJ72QBR15	A1SJ72QLP25
Module type			Slave	Slave
Communications method			Token bus	Token ring
Topology			Coaxial bus system	Optical loop system
Synchronisation			Frame synchronisation method	Frame synchronisation method
Transmission channel			Single bus	Redundant loop
No. of I/Os in a network			Max. 8192	Max. 8192
No. of data per slave			Max. 1600 bytes	Max. 1600 bytes
Modulation method			Manchester	NRZI
Transmission format			Conforms to HDLC	Conforms to HDLC
Terminating resistor		Ω	75	—
No. of networks in one system			239	239
Stations per network			33 (1 master, 32 local stations)	64 (1 master, 63 local stations)
Transmission	rate	Mbit/s	10	10 (20)
	distance	m	300 m / 500 m (depends on cable used)	SI 200/220: 500 m, QSI 185/230: 1000 m
	cable		RG59 BU / RG6 AU	—
	plug		BNC-P-3-Ni / BNC-P-5	CA7003
Max. compensation time during power failure		ms	≤ 20	≤ 20
I/O points			—	—
Internal power consumption (5 V DC)		mA	700	520
Weight		kg	0.43	0.41
Dimensions (W x H x D)		mm	54.5 x 130 x 93.6	54.5 x 130 x 93.6
Order information		Art. no.	68450	68449
Accessories			Terminating resistor: BNC-75 OHM, art. no. 53871	Optical plugs and cables (refer to pages 15 and 79)

■ Interface Boards for Personal Computer

PLC ➠ All series



Interface boards for MELSECNET/10/H

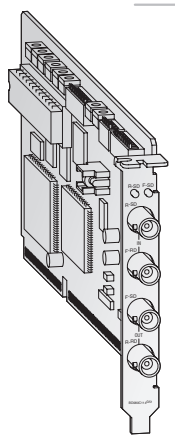
This range of boards are used to connect a PC to MELSECNET/10 or MELSECNET/H networks as a local station.

Special features:

- Compatibility with multiple PLC system of High Performance System Q CPU
- No Dip-switch settings needed
- User programming functions allowed
- Drivers for various operating systems
- Compatible with MELSECNET/10 board
- PCI bus compatible

Specifications			Q80BD-J71LP21-25	Q80BD-J71LP21G	Q80BD-J71LP21GE	Q80BD-J71BR11
Module type			Local station	Local station	Local station	Local station
Transmission method			Redundant optical loop system	Redundant optical loop system	Redundant optical loop system	Single coaxial bus
Transmission path			Token ring	Token ring	Token ring	Token bus
Synchronisation method			Frame synchronisation method	Frame synchronisation method	Frame synchronisation method	Frame synchronisation method
Modulation			NRZI (Non Return to Zero Inverted)	NRZI (Non Return to Zero Inverted)	NRZI (Non Return to Zero Inverted)	Manchester
Link points per connection			2 x W + (B+Y)/8 ≤ 2000 bytes	2 x W + (B+Y)/8 ≤ 2000 bytes	2 x W + (B+Y)/8 ≤ 2000 bytes	2 x W + (B+Y)/8 ≤ 2000 bytes
Link devices			8192 link relays / registers (16348)	8192 link relays / registers	8192 link relays / registers	8192 link relays / registers (16348)
Transmission format			Conforms to HDLC	Conforms to HDLC	Conforms to HDLC	Manchester
Max. link points in one system			Max. 239	Max. 239	Max. 239	Max. 239
Stations per network			Max. 64	Max. 64	Max. 64	Max. 32
Max. number of local station groups			9 (MELSECNET/10) / 32 (MELSECNET/H)	9	9	9 (MELSECNET/10) / 32 (MELSECNET/H)
Trans-mission	type/medium		Optical (SI 200/220, QSI 185/230)	Optical (GI 50/125 µm)	Optical (GI 62.5/125 µm)	Coaxial
	rate	Mbit/s	10 (MELSECNET/10) / 25 (MELSECNET/H)	10	10	10 (MELSECNET/10) / 25 (MELSECNET/H)
	distance between 2 stations	m	SI 200/220: 500 m, QSI 185/230: 1000 m	GI 62.5/125: 1000 m	GI 62.5/125: 1000 m	3C-2V: 300 m, 5C-2V: 500 m, 2500 m with Repeater
	cable		Fibre optic	Fibre optic	Fibre optic	Coaxial cable
	connectors		CA7003	DL6-CP	DL6-CP	BNC-P-5 / BNC-P-3-NI or equivalent
Error detection			CRC based and overflow	CRC based and overflow	CRC based and overflow	CRC based and overflow
Boards per PC			Max. 4	Max. 4	Max. 4	Max. 4
Internal current consumption (5 V DC)		A	0.46	0.45	0.45	0.67
Weight		kg	0.1	0.1	0.1	0.1
Dimensions		mm	PCI bus slot, half size	PCI	PCI	PCI
Order information		Art. no.	136367	138962	138963	136366
Accessories			Optical plugs and cables (refer to pages 15 and 79)			Terminating resistor: BNC-75 OHM, art. no. 53871

■ Interface Boards for Personal Computer



Interface boards for MELSECNET/10

This range of boards are used to connect a PC to MELSECNET/10 networks as a local station.

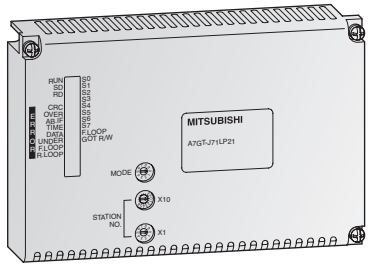
Special features:

- High data rates between the personal computer and the programmable logic controller
- The PC can access all other CPUs, even across multiple networks (integrated routing function)
- Perfect for PLC programming over MELSECNET/10
- Ideal for data and program archiving
- Up to 4 interface boards can be installed in each personal computer.
- ISA bus compatible

Specifications			A70BDE-J71QLP23	A70BDE-J71QLP23GE	A70BDE-J71QLR23	A70BDE-J71QBR13
Module type			Local station	Local station	Local station	Local station
Transmission method			Duplex loop	Duplex loop	Duplex loop	Single bus
Transmission path			Token ring	Token ring	Token ring	Token bus
Synchronisation method			Frame synchronisation method	Frame synchronisation method	Frame synchronisation method	Frame synchronisation method
Modulation			NRZI (Non Return to Zero Inverted)	NRZI (Non Return to Zero Inverted)	Manchester	Manchester
Link points per connection			2 x W + (B+Y)/8 ≤ 2000 bytes	2 x W + (B+Y)/8 ≤ 2000 bytes	2 x W + (B+Y)/8 ≤ 2000 bytes	2 x W + (B+Y)/8 ≤ 2000 bytes
Link devices			8192 link relays / registers	8192 link relays / registers	8192 link relays / registers	8192 link relays / registers
Transmission format			Conforms to HDLC	Conforms to HDLC	Conforms to HDLC	Conforms to HDLC
Max. link points in one system			Max. 239	Max. 239	Max. 239	Max. 239
Stations per network			Max. 64	Max. 64	Max. 64	Max. 32
Max. number of local station groups			9	9	9	9
Trans-mission	type/medium		Optical (SI 200/220, QSI 185/230)	Optical (GI 62.5/125)	Electrical	Electrical
	rate	Mbit/s	10 / acc. to 20 multiplex	10 / acc. to 20 multiplex	10 / acc. to 20 multiplex	100
	distance between 2 stations	m	SI 200/220: 500 m, QSI 185/230: 1000 m	GI 62.5/125: 1000 m	3C-2V: 300 m, 5C-2V: 500 m, 2500 m with Repeater	3C-2V: 300 m, 5C-2V: 500 m, 2500 m with Repeater
	cable		Fibre optic	Fibre optic	Coaxial cable	Coaxial cable
	connectors		CA7003	DL6-CP	BNC-P-5 / BNC-P-3-NI or equivalent	BNC-P-5 / BNC-P-3-NI or equivalent
Error detection			CRC based and overflow	CRC based and overflow	CRC based and overflow	CRC based and overflow
Boards per PC			Max. 4	Max. 4	Max. 4	Max. 4
Internal current consumption (5 V DC)		A	1.3	1.3	1.3	1.3
Weight		kg	0.5	0.5	0.5	0.5
Dimensions		mm	ISA bus board	ISA bus board	ISA bus board	ISA bus board
Order information		Art. no.	126888	126887	128856	126889

■ HMI Communications Adapters

HMI ➠ GOT series



A7GT-J71LP23, A7GT-J71BR13

This communications adapter A7GT-J71LP23 and A7GT-J71BR13 allow GOT connection to MELSECNET/10.

The GOT serves as local station and accesses all PLCs within the network.

These modules are designed to fit on the back of A900GOT series operator panels (not A950/A953GOT).

Specifications	A7GT-J71LP23	A7GT-J71BR13
Connection	MELSECNET/10 optical (SI cable)	MELSECNET/10 coaxial
Application	Only local station	Only local station
Applicable GOT	A900GOT series (not A950/A953GOT)	A900GOT series (not A950/A953GOT)
Remark	No CE	No CE
Order information Art. no.	56176	42934

CC-Link

Overview

The open fieldbus and control network CC-Link provides a fast data communications with different devices. The following components from MITSUBISHI ELECTRIC among others can be integrated:

- MELSEC PLC systems AnSH/QnAS and System Q (up to 24 CPUs)
- Remote digital inputs/outputs
- Remote analog inputs/outputs
- High-speed counters
- Positioning modules
- Modules for temperature measurement
- Distributed intelligence (e.g. FX2N)
- Frequency inverters (e.g. FR-A 540)
- Operator terminals (e.g. GOT series)
- Robots
- Third-party devices like gateways, solenoid valves, bar code readers, etc. (please refer to www.cc-link.org in the internet)

Structure

The maximum bus segment extension is 1,200 m (at 156 kbit/s max.). With a reduced extension, transfer rates of up to 10 Mbit/s can be achieved.

Cable types

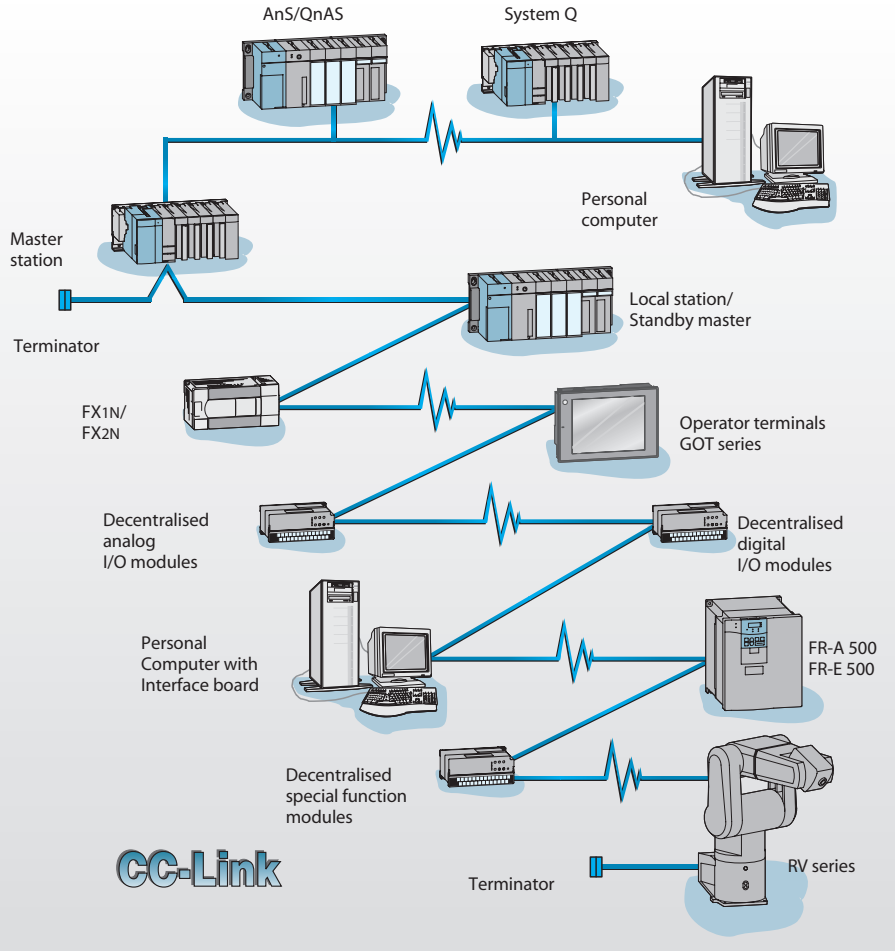
The data communications requires standardized shielded twisted-pair cable (3 wires bus, 2 wires power and shield), according to the CLPA specifications.

Data exchange

Various data like digital and analog data can be exchanged easily. In addition to the cyclic transmission of word data, CC-Link systems handle transient transmission (message transmission) as well. This enables data communications with intelligent devices such as display devices, bar code readers, measuring devices, personal computers and PLC systems (up to 24 CPUs) as well beside the analog and digital devices.

Administration

The programming software packages GX IEC Developer and GX Developer ensure an easy setup and commissioning.



Various special features provide a particular economic network administration:

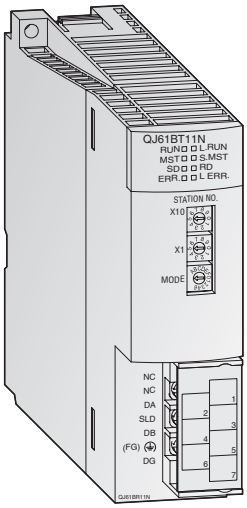
- Automatic online return function after the removal of a unit from the network.
- Stand-by master function for redundancy across the system.
- Automatic link cutoff function of a faulty slave station without interrupting network communications.
- Link status confirmation.
- Extensive test and diagnostics functions

Cable specifications	According to the CLPA specifications: 3 wires bus, 2 wires power and shield
Diameter	0.54 mm^2 (3 wires and shield)
Cable resistance (20 °C)	≤37.8 Ω / km
Electrostatic capacity (1kHz)	60 nF / km
Impedance (1 MHz)	100 Ω ±15 %
Insulation resistance	≥10,000 MΩ / km
Voltage withstand	500 V DC for 1 minute
Maximal distance	1200 m

Recommended cable types by company Belden:

Belden number	Specifications
YR47205	Three #20 (7x28) AWG bare copper conductors foam high density polyethylen insulated with overall beldfoil and 78% tinned copper braid shield, 22 AWG (19x34) Tinned copper drain wire. Red PVC jacket.
YR47198	Power limited tray cable, 3 conductor 20 AWG (7x28) bare copper, foamed PE insulation, overall beldfoil shield with a 22 AWG (19x34) tinned copper drain wire, 78% tinned copper braid, PVC inner jacket and 2 conductors 18 AWG (7x26) bare copper, PVC insulation cabled with polypropylene fillers, overall PVC jacket.

■ MELSEC System Q Master/Local Module



QJ61BT11N

The QJ61BT11N can be used as a master or local station in a CC-Link system and manages the connection of remote inputs and outputs. In addition to the features of the MELSEC AnU/QnA series modules, the QJ61BT11N provides new functions such as remote device station initial setting function.

Special features:

- The parameters of all modules across the network are set directly via the master module.
- The communication between the remote modules and the master module is performed automatically (refresh rate of up to 3.3 ms for 2048 I/O points).
- With one master module a system can be extended by up to 8192 remote I/O points.
- An additional stand-by master establishes a duplex system.
- Automatic link cutoff function of a faulty slave station without interrupting network communications.
- Automatic online return of a station after error corrective action without network reset.
- Automatic CC-Link start function without parameter setting
- Remote device station registration function without creating a sequence program
- Interrupt program start via network data command

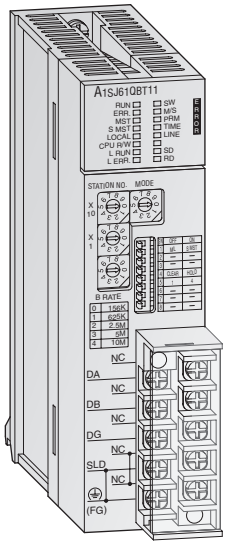
Specifications			QJ61BT11N
Module type			Master / local station
CPU series			MELSEC System Q
Link points per station	remote I/O points		32
	remote registers		4 (read), 4 (write)
Max. number of link points	remote I/O points		8192
	remote registers		2048 (read), 2048 (write)
Number of stations occupied			Max. 4 (64) (max. number of I/O points 128 points, link register 32 points) (Q02(H), Q06H, Q12H, Q25H) / max. 2 using (Q00J, Q00, Q01)
Transient transmission			Max. 1024 bytes/station
Number of connectable modules			Max. 64 (Remote I/O modules: max. 64; Remote special function modules: max. 42; local stations: max. 24)
I/O refresh time		ms	3.3 – 4.4
Transmission	speed	Mbit/s	10; 5; 2.5; 0.62; 0.15
	type		Bus (RS485)
	distance		100 m at 10 Mbit/s; 150 m at 5 Mbit/s; 200 m at 2.5 Mbit/s; 600 m at 0.62 Mbit/s; 1200 m at 0.15 Mbit/s
	total distance		Max. 1200 m
Communication system			Polling
Synchronizations method			Frame synchronisation system
Modulation			NRZI
Transmission format			Conforms to HDLC
Transmission cable type			CC-Link dedicated cable (see page 23 for details)
Occupied I/O points			32
Internal power consumption (5 V DC)		mA	460
Weight		kg	0.12
Dimensions (W x H x D)		mm	27.4 x 98 x 90

Order information	Art. no.	154748

Accessories	Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80

■ MELSEC AnSH/QnAS Master/Local Modules

PLC ➠ AnS/QnAS series



A1SJ61BT11, A1SJ61QBT11

The CC-Link modules A1SJ61BT11 and A1SJ61QBT11enable the control and monitoring of I/O modules on a remote system for the MELSEC AnS/QnAS series.

The data is transferred to the central controllers via the master module.

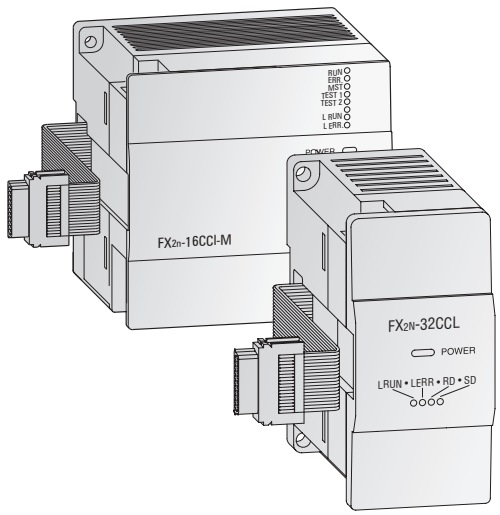
Special features:

- The parameters of all modules across the network are set directly via the master module.
- The communication between the remote modules and the master module is performed automatically (refresh rate of up to 3.9 ms for 2048 I/O points).
- With one master module a system can be extended by up to 2048 remote I/O points.
- An additional stand-by master establishes a duplex system.
- Automatic link cutoff function of a faulty slave station without interrupting network communications.
- Automatic online return of a station after error corrective action without network reset.

Specifications			A1SJ61BT11	A1SJ61QBT11
Module type			Master / local Station	Master / local station
CPU series			MELSEC AnS series	MELSEC QnAS series
Link points per station	I/O points		32	
	register		8	
Decentral I/O points			2048	
Number of connectable modules			Max. 64 (Remote I/O modules: max. 64; Remote special function modules: max. 42; local stations: max. 24)	
I/O refresh time		ms	3.9 – 6.7	
Transmission	speed	Mbit/s	10; 5; 2.5; 0.62; 0.15	
	type		Bus	
	distance		100 m at 10 Mbit/s; 150 m at 5 Mbit/s; 200 m at 2.5 Mbit/s; 600 m at 0,.62 Mbit/s; 1200 m at 0.15 Mbit/s	
	total distance		Max. 1200 m	
Synchronizations method			Frame synchronisation	
Modulation			NRZI	
Tramsmission route type			Bus (RS485)	
Transmission format			Conforms to HDLC	
Transmission cable	type		CC-Link dedicated cable (see page 23 for details)	
	no. of cores		2	
	cable resistance (20 °C)		Max. 37.8 Ω/km	
	insulation resistance (1 kHz)		Max. 60 nF/km	
	characteristic impedance (100 kHz)		100 ±15Ω	
	cable resistance (20 °C)		10000 MΩ/km	
	diameter		0.5 mm^2	
I/O points			32	
Internal power consumption (5 V DC)		mA	400	
Weight		kg	0.25	
Dimensions (W x H x D)		mm	37.5 x 130 x 93.6	
Order information		Art. no.	75497	126738
Accessories			Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80	

■ MELSEC FX1N/FX2N(C)Master/Local Modules

SPS ➠ FX1N/FX2N(C) series



FX2N-16CCL-M, FX2N-32CCL

The communications module FX2N-16CCL-M enables the control and monitoring of I/O modules on a remote system for the MELSEC FX1N/FX2N series. The data is transferred to the central controller via the master controller.

The communications modules FX2N-16CCL-M/FX2N-32CCL enable the user to connect the CC-Link network with a Q/A/QnAS/AnS system as master CPU. The user can access the network of all MELSEC PLC systems and frequency inverters and additional products from other suppliers.

Thus the network is expandable via the digital inputs/outputs of the FX modules to a maximum of 256 I/Os.

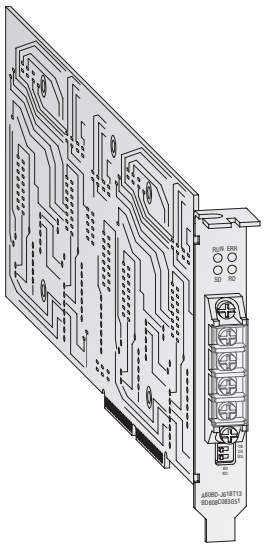
The buffer memory of the FX2N-16CCL-M/FX2N-32CCL is read and written by FROM/TO instructions. The connection is made at the extension bus on the right side of the controller.

Special features:

- The parameters of all modules accross the network are set directly via the master module.
- Automatic online return after error corrective action
- Data transfer via shielded cable with a different Power supply core

Specifications		FX2N-16CCL-M	FX2N-32CCL
Modul type		Master station	Local station
Station numbers	no.	—	1 – 64 points
	stations	—	1 – 4 stations
Link points per station	remote I/O points	—	32
	remote register	—	8 (4 IN/ 4 OUT)
Max. number of link points		≤ 256 for FX2N/FX2NC, ≤ 128 for FX1N	—
Number of controllable devices		Max. 15 (max. 7 I/O modules and max. 8 intelligent modules)	—
Link scan time		3.9 – 6.7	Dependant on master module
Synchronous system		Frame synchronisation system	Frame synchronisation system
Encryption system		NRZI	NRZI
Transmission route type		Bus (RS485)	Bus (RS485)
Transmission format		Conforms to HDLC	Conforms to HDLC
Communication speed	Mbit/s	10 / 5 / 2.5 / 0.625 / 0.156	10 / 5 / 2.5 / 0.625 / 0.156
Communication distance		100 m at 10 Mbit/s, 150 m at 5 Mbit/s, 200 m at 2.5 Mbit/s, 600 m at 0.62 Mbit/s, 1200 m at 0.15 Mbit/s	100 m at 10 Mbit/s, 150 m at 5 Mbit/s, 200 m at 2.5 Mbit/s, 600 m at 0.62 Mbit/s, 1200 m at 0.15 Mbit/s
Communication cable		CC-Link dedicated cable (see page 23 for details)	CC-Link dedicated cable (see page 23 for details)
General specifications		Conforms to FX2N(C) base units	Conforms to FX2N(C) base units
Status display		5 LEDs (Power, L RUN, L ERR, RD, SD)	5 LEDs (Power, L RUN, L ERR, RD, SD)
Related I/O points on PC		8	8
Power supply		5 V DC / max. 130 mA (via base unit), 24 V DC / 50 mA	5 V DC / max. 130 mA (via base unit), 24 V DC / 50 mA
Weight	kg	0.4	0.2
Dimensions (W x H x D)	mm	85 x 90 x 87	43 x 90 x 87
Order information	Art. no.	133596	102961
Accessories		Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80	

Interface Boards for CC-Link



A80BDE-J61BT11, A80BDE-J61BT13

The interface boards A80BDE-J61BT11 and A80BDE-J61BT13 allow integration of a personal computer as local station into the CC-Link network.

The A80BDE-J61BT11 can also serve as a master station.

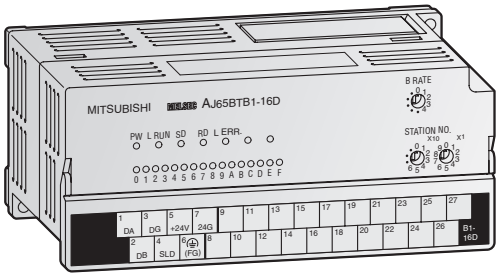
Special features:

- PCI board for plug-and-play without DIP switch configuration
- Monitor and test function of data available within the network supported
- Ideal for user-defined programming

Specifications			A80BDE-J61BT11	A80BDE-J61BT13
Module type			Master	Slave
Transmission speed		Mbit/s	10; 5; 2.5; 0.625; 0.156 (selectable)	10; 5; 2.5; 0.625; 0.156 (selectable)
Max. transmission distance			Dependant on the transmission speed	Dependant on the transmission speed (see master module)
Link devices	per system		2048 link relays , 256 registers	2048 link relays , 256 registers
	per station		30 link relays , 256 registers	30 link relays , 256 registers
Communications method			Polling	Polling
Synchronisation method			Frame synchronisation method	Frame synchronisation method
Modulation			NRZI	NRZI
Transmission method			Bus (RS485)	Bus (RS485)
Transmission format			Conforms to HDLC	Conforms to HDLC
Boards per network			Max. 4	Max. 4
System requirements (PC)			Windows NT Workstation 4.0 or higher, with Pentium processor ≥133 MHz, 1 free PCI slot, min. 32 MB RAM, min. 20 MB ROM (hard disk)	
Internal power consumption (5 V DC)		mA	400	400
Weight		kg	0.16	0.16
Dimensions (W x H x D)		mm	8.8 x 107 x 192	8.8 x 107 x 192
Order information		Art. no.	131441	102866
Accessories			Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80	

■ Remote Digital Input and Combination Modules

PLC ➠ All series



Remote inputs AJ65BT□□-□□

These remote input modules are intended to be installed near the control target. The advantages are reduced cabling and the capability of aquiring data and operation results of individual machine modules autonomously, electrically, and mechanically.

Three different input modules with up to 32 inputs and three combined modules with eight inputs and eight outputs are available.

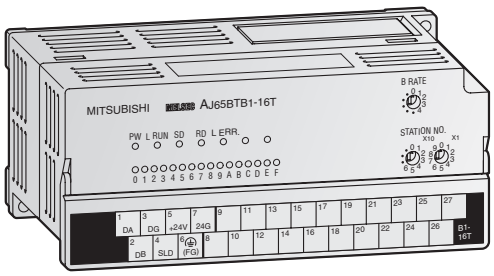
Special features:

- Up to 64 I/O modules with a maximum of 32 inputs each can be connected.
- All modules are very compact.
- Tough, highly shock-resistant design
- Status indicator LEDs for the inputs
- Standard electrical isolation between process and control via optocouplers
- Mounting with DIN rail adapters or screws
- Modules can be mounted in horizontal arrangement or in one of 4 orientations on a flat surface.

Specifications			AJ65BTB1-16D	AJ65BTB2-16D	AJ65BTC1-32D	AJ65BTB1-16DT	AJ65BTB2-16DT	AJ65BTB2-16DR
Module type			Input modules			Combination modules		
Inputs			16	16	32	8	8	8
Outputs			—	—	—	8	8	8
Input type			DC input (sink / source type)	DC input with 8 potential terminals (sink / source type)	DC input (sink / source type)	DC input (sink type)	DC input with 16 potential terminals (sink type)	DC input (source type)
No. of points per module			16	16	32	8	8	8
Output type			—	—	—	Transistor (sink type)	Transistor (sink type)	Relay
No. of points per module			—	—	—	8	8	8
Insulation type			All modules feature photocoupler insulation.					
Input voltage			24 V DC	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
Input current		mA	7	7	7	7	7	7
Max. output current	per output		—	—	—	0.5	0.5	2
	per group		—	—	—	4	4	8
Minimum signal voltage	ON voltage	V	≥ 14	≥ 14	≥ 14	≥ 14	≥ 14	≥ 14
	OFF voltage	V	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
Response time	OFF ⟶ ON	ms	≤ 2	≤ 2	≤ 2	≤ 10	≤ 10	≤ 10
	ON ⟶ OFF	ms	≤ 2	≤ 2	≤ 2	≤ 12	≤ 12	≤ 10
Status display of inputs			All modules provide LEDs for each input.					
Error (RUN) display of stations			LED	LED	LED	LED	LED	LED
I/O points			16	16	32	16	16	16
Connection terminals			Terminal block	Terminal block	Connector	Terminal block	Terminal block	Terminal block
Applicable wire size		mm^2	0.75 – 2.0	0.75 – 2.0	0.75 – 2.0	0.75 – 2.0	0.75 – 2.0	0.75 – 2.0
Internal power consumption		mA	60	60	70	70	70	70
Weight (without terminal block)		kg	0.32	0.4	0.27	0.33	0.33	0.43
Dimensions (W x H x D)		mm	151.9 x 65 x 46	197.4 x 65 x 46	165 x 65 x 46	151.9 x 65 x 46	151.9 x 65 x 46	197.4 x 65 x 46
Order information		Art. no.	75447	75450	75455	75448	75452	75451
Accessories			Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80					

■ Remote Digital Output Modules

PLC ➠ All series



Remote outputs AJ65BT□□-□□

These remote output modules are intended to be installed near the control target. The advantages are reduced cabling and the capability of aquiring data and operation results of individual machine modules autonomously, electrically, and mechanically.

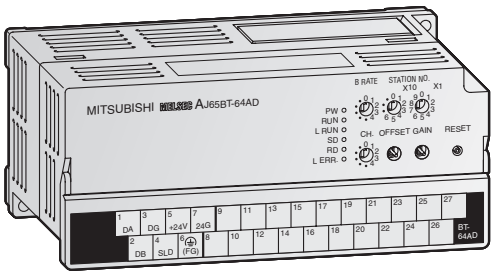
Special features:

- Up to 64 I/O modules with a maximum of 32 outputs each can be connected.
- All modules are very compact.
- Tough, highly shock-resistant design
- Status indicator LEDs for the outputs
- Standard electrical isolation between process and control via optocouplers
- Mounting with DIN rail adapters or screws
- Modules can be mounted in horizontal arrangement or in one of 4 orientations on a flat surface.

Specifications			AJ65BTB1-16T	AJ65BTC1-32T	AJ65BTB2-16R
Module type			Output modules		
Outputs			16	32	16
Output type			Transistor (sink type)	Transistor (sink type)	Relay
No. of points per module			8	32	8
Insulation type			All modules feature photocoupler insulation.		
Output rated voltage			12/24 V DC	12 /24 V DC	24 V DC 240 V AC
Max. output current	per output	A	0.5	0.1	2
	per group	A	4	2	8
Response time	OFF ⟶ ON	ms	≤ 2	≤ 2	≤ 10
	ON ⟶ OFF	ms	≤ 2	≤ 2	≤ 12
Overvoltage protection			Zener diode	Clamp diode	—
Status display of outputs			All modules provide LEDs for each output.		
Error (RUN) display of stations			LED	LED	LED
I/O points			16	32	16
Connection terminals			Terminal block	Connector	Terminal block
Applicable wire size		mm^2	0.75 – 2.0	0.75 – 2.0	0.75 – 2.0
Internal power consumption		mA	80	115	85
Weight (without terminal block)		kg	0.34	0.28	0.47
Dimensions (W x H x D)		mm	151.9 x 65 x 46	165 x 65 x 46	197.4 x 65 x 46
Order information		Art. no.	75449	75456	75453
Accessories			Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80		

■ Remote Analog Input Modules

PLC ➠ All series



Analog/Digital Converter

The analog input module AJ65BT-64AD converts analog process signals into digital values that can be processed by the CPU.

Special features:

- 4 analog input channels per module.
- Selectable current or voltage input.
- Resolution 5 mV and 20 mA.
- Converting time 1 ms per channel.
- Converts analog values in the range of -10 to 10 V or -20 to +20 mA into digital values from -2,048 to +2,047.
- Status indicator LEDs.
- Standard electrical isolation between process and control via optocouplers.
- Input characteristics can be user-modified via offset/gain settings.
- Ready for use with all CC-Link master modules.

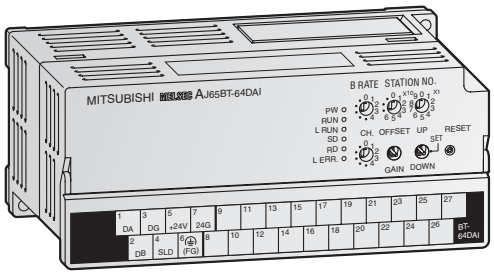
Specifications			AJ65BT-64AD			
Analog inputs			4			
Resolution			12 bit, -2048 / +2047			
I/O characteristics			**Analog input**		**Digital output**	
			Voltage	Current	Voltage	Current
			-10 V – 10 V 0 – 10 V 0 – 5 V 1 – 5 V	-20 – 20 mA 0 – 20 mA 0 – 20 mA 4 – 20 mA	0 – 4000 0 – 4000 0 – 4000 0 – 4000	-2048 – 2047 -2048 – 2047 -2048 – 2047 -2048 – 2047
Max. resolution			-10 V – 10 V 0 – 10 V 0 – 5 V 1 – 5 V	-20 – 20 mA 0 – 20 mA 0 – 20 mA 4 – 20 mA	5 mV 2.5 mV 1.25 mV 1 mV	20 µA 10 µA 5 µA 4 µA
Overall accuracy			±1.0 % (for the whole measurement range)			
Max. conversion time			1 ms/channel			
Max. input	voltage	V	±15			
	current	mA	±30			
Isolation			Photocoupler isolation between output terminals and PC power for all modules.			
I/O points			2 stations (each 32 devices)			
External power consumption		V DC	24			
Applicable wire size		mm^2	0.75 – 2.00			
Internal power consumption (24 V DC)		mA	120			
Weight		kg	0.35			
Dimensions (W x H x D)		mm	152 x 65 x 63			

Order information	Art. no.	75444

Accessories	Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80

■ Remote Analog Output Modules

PLC ➠ All series



Digital to analog converter modules

These modules serve as remote 4-channels digital to analog converter modules with 12-bit or 13-bit binary resolution and output an analog current or voltage signal. This type of module is typically used with frequency inverters, valves or sliders.

Special features:

- 4 channels per module.
- Resolution of the digital input signals selectable in 3 steps: 1/4000, 1/8000, 1/12000.
- Gain and offset setting provided for each channel.
- Converting time of 1 ms per channel and 4 ms for 4 channels.
- Status indicator LEDs.
- Standard electrical isolation between process and control via optocouplers.
- Ready for use with all CC-Link master modules.

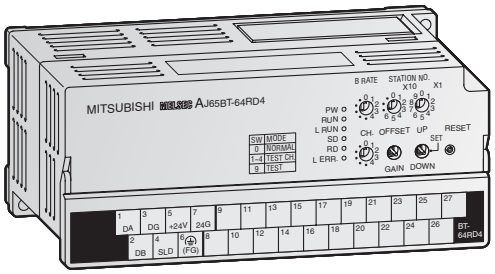
Specifications		AJ65BT-64DAV		AJ65BT-64DAI	
Analog outputs		4		4	
Resolution		12 bit, -2048 to +2.047		12 bit, 0 – 4095	
Analog output		-10 V – 0 V – +10 V DC (external input resistance 2 kΩ – 1 MΩ)		4 – 20 mA DC (external input resistance 0 – 600 Ω)	
I/O characteristics		**Digital input**	**Analog output**	**Digital input**	**Analog output**
		Resolution	Voltage	Resolution	Current
		2000 1000 0 -1000 -2000	+10 V +5 V 0 V -5 V -10 V	4000 2000 0	+20 mA +12 mA +4 mA
Offset/Gain setting		Yes (users or factory setting)		Yes (users or factory setting)	
Overall accuracy		±1.0 % (for the whole measurement range)		±1.0 % (for the whole measurement range)	
Max. conversion time		Max. 1 ms/1 channel, 4 ms/4 channels		Max. 1 ms/1 channel, 4 ms/4 channels	
Isolation method		All modules fitted with photocoupler isolation between input terminals and internal circuit.			
I/O points		2 stations (32 devices)		2 stations (32 devices)	
Applicable wire size	mm^2	0.75 – 2.0		0.75 – 2.0	
Internal power consumption (24 V DC)	mA	180		270	
Weight	kg	0.4		0.4	
Dimensions (W x H x D)	mm	152 x 65 x 63		152 x 65 x 63	

Order information	Art. no.	75446	75445

Accessories	Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80

■ Remote Analog Input Modules for Pt100-Temperature Sensors

PLC ➠ All series



Connection of Pt100-Temperature sensors

The analog modules AJ65BT-64RD3 and AJ65BT-64RD4 provide analog inputs for measuring values of 3- and 4-wire-type Pt100-Temperature sensors.

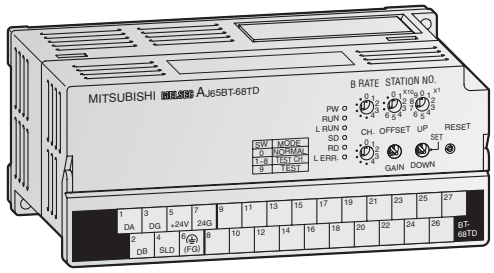
Special features:

- Linear measuring range without adjustment of the measuring values.
- Direct output of the measuring values in °C.
- Temperature measuring range of -180°C to +600°C in combination with a Pt100-element according to DIN IEC 751.
- Platinum sensors can be connected directly.
- A line break is indicated to the PLC by the module.
- The conversion can be enabled or disabled for each channel individually.
- Averaging on time or measuring cycles can be parametrized.
- Status indicator LEDs.
- Standard electrical isolation between process and control via optocouplers.
- Ready for use with all CC-Link master modules.

Specifications			AJ65BT-64RD3	AJ65BT-64RD4
Pt100-input points			4	4
Method of measurement			3-wire type	4-wire type
Connectable temperature measuring resistants			Pt100 (conforms to JIS C 1604-1989 and DIN IEC 751), JPt100 (conforms to JIS C 1604-1981)	
Temperature	Measurement range	°C	-180 – +600	-180 – +600
	Detected value		16 bits signed binary: -1800 – +6000 32 bits signed binary: -180000 – +600000	16 bits signed binary: -1800 – +6000 32 bits signed binary: -180000 – +600000
Overall accuracy	at 25 °C (±5%)		±0.1 % (for the whole measurement range)	±0.1 % (for the whole measurement range)
	at <20 °C or > 30 °C		±0.25 % (for the whole measurement range)	±0.25 % (for the whole measurement range)
Resolution		°C	0.025	0.025
Max. conversion time			40 ms / Pt100 input	40 ms / Pt100 input
Isolation			Photocoupler isolation between output terminals and PC power for all modules.	
Modules per network			Max. 16 Pt100 analog input modules in one network	Max. 16 Pt100 analog input modules in one network
I/O points			4 stations (128 devices)	4 stations (128 devices)
Applicable wire size		mm²	0.75 – 2.0	0.75 – 2.0
External voltage supply		V DC	24	24
Internal power consumption (24 V DC)		mA	170	170
Weight		kg	0.38	0.38
Dimensions (W x H x D)		mm	152 x 65 x 63	152 x 65 x 63
Order information		Art. no.	88026	88027
Accessories			Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80	

■ Remote Input Module for Temperature Measurement

PLC ➠ All series



Temperature measuring via thermocouple

This module allows direct input of temperature measurements via thermocouples.

Special features:

- The module provides 8 thermocouples inputs that can be addressed independently.
- Linearized measuring range up to 1700 °C (depending on thermocouple)
- Support for thermocouple types B, R, S, K, E, J, T with characteristics of thermoelectric voltages according to DIN IEC 584-1
- Line break detection for each input channel
- Cold junction compensation is possible.
- Standard electrical isolation between process and control via optocoupler

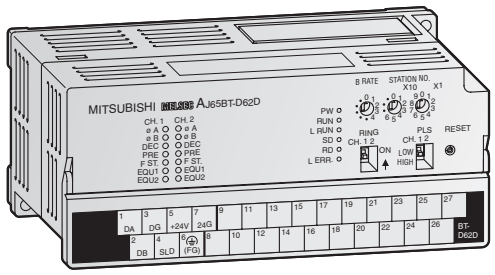
Specifications		AJ65BT-68TD			
Input points		8			
Temperature input range	°C	–200 – 1700			
Detected temperature value		16 bits signed binary: 0 – 17000 (value to the first decimal place x 10)			
Scaling value	°C	16 bits signed: 0 – +2000			
Thermocouple		**Type**	**Temperature measurement range**	**Conversion accuracy** (at operating ambient temperature is Ta = 25 ± 5°C)	**Temperature characteristic** (when operating ambient temperature varies by ΔT = 1 °C)
		B	600 – 1700 °C	±2.5 °C	±0.4 °C
		R	200 – 1600 °C	±2 °C	±0.3 °C
		S	200 – 1600 °C	±2 °C	±0.3 °C
		K	0 – 1200 °C	±0.5 °C or 0.25 % of the measured temperature which ever is larger	±0.07 °C or 0.02 % of the measured temperature which ever is larger
		E	0 – 800 °C		
		J	0 – 750 °C		
		T	0 – 350 °C		
Cold junction compensation accuracy		±1 °C			
Overall accuracy		(Conversion accuracy Ta) + (temperature characteristic) x (operating ambient temperature variation) ± 1 °C			
Max. conversion time		45 ms / channel, without respect to the number of used channels			
Absolute max. input voltage	V	± 5			
Isolation method		Transformer			
I/O points		4 stations (128 devices)			
Applicable wire size	mm²	0.75 – 2.0			
Internal power consumption (5 V DC)	mA	81			
Weight	kg	0.40			
Dimensions (W x H x D)	mm	152 x 65 x 63			

Order information	Art. no.	88025

Accessories	Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80

■ Remote High-Speed Counter Modules

PLC ➠ All series



High-Speed Counter

The high-speed counter modules acquire signals at frequencies beyond the range of normal digital input modules. Positioning tasks or frequency measurements for example can be performed.

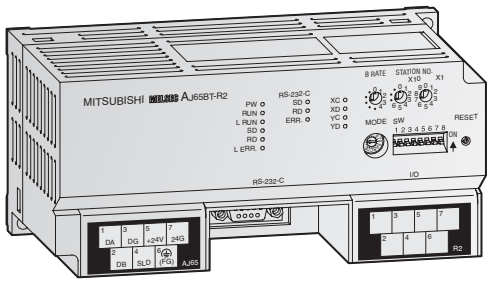
Special features:

- Input for incremental shaft encoder with automatic forward and reverse detection
- Count preset via external signals or via the PLC program by the PRESET function
- Ring counter for counting up to a predefined value with automatic reset to the initial value
- Functions such as velocity measurement, determining switching points or periodical counting are provided.
- Automatic multiplication of the counted values
- Status indicator LEDs
- Ready for use with all CC-Link master modules

Specifications			AJ65BT-D62	AJ65BT-D62D / 62D-S1
Counter inputs			2 (1 or 2 phases)	2 (1 or 2 phases)
Signal levels			5 / 12 / 24 V DC (2 – 5 mA)	EIA Standard, RS-422-A differential driver
Max. counting frequency		pulse/s	200 000	400 000
Counting range			23 bits + sign (binary), 0 – 16777215	23 bits + sign (binary), 0 – 16777215
Comparison range			24 bits + sign (binary)	24 bits + sign (binary)
Counter type			Both modules are equipped with UP/DOWN preset counter and ring counter function.	
External digital input points			Preset, count disable function	Preset, count disable function
Min. input pulse width			1 / 2 phase: 5 µs 1 phase: 100 µs; 2 phase: 142 µs	1 phase: 2.5 µs; 2 phase: 3.3 µs; 1 phase: 100 µs; 2 phase: 142 µs
External	inputs		5 / 12 / 24 V DC (2 – 5 mA)	5 / 12 / 24 V DC (2 – 5 mA)
	response time	OFF ⟶ ON	< 0.5 ms	< 0.5 ms
		ON ⟶ OFF	< 3 ms	< 3 ms
External	outputs		2 A	2 A
	response time		< 0.1 ms	< 0.1 ms
I/O points			4 stations (128 devices)	4 stations (128 devices)
Applicable wire size		mm^2	0.75 – 2.0	0.75 – 2.0
Internal power consumption (24 V DC)		mA	70	D62D: 100; D62D-S1: 120
Weight		kg	0.41	0.42
Dimensions (W x H x D)		mm	152 x 65 x 63	152 x 65 x 63
Order information		Art. no.	88028	88029 / 88030
Accessories			Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80	

■ Remote Interface Modules

PLC ➠ All series



Data exchange with peripherals

These modules allow communication with peripheral devices through a standard RS232C (AJ65BT-R2) or RS422 (AJ65BT-G4-S3) interface. The peripherals are connected point to point (1:1).

Special features:

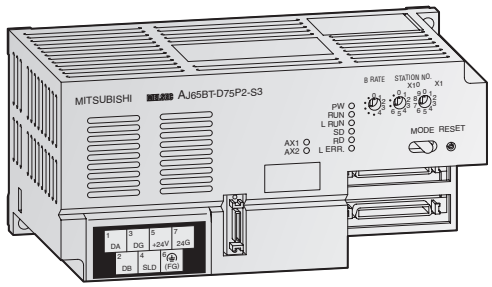
- Access capabilities of host PCs with visualization, programming or monitor software to the complete data set of the MELSEC AnAS CPU
- AJ65BT-R2 supportes ASCII data exchange with connected devices such as bar code readers, scaling or identification systems
- AJ65BT-R2 has two universal digital inputs and outputs each
- AJ65BT-R2 features printer control options
- LED indicators for the module and communications status
- AJ65BT-G4-S3 enables connection of a programming unit

4 CC-LINK

Specifications			AJ65BT-R2	AJ65BT-G4-S3
Interface		type	RS232C (D-Sub, 9 pole), 1 channel	RS422, 1 channel
Communications mode			Full duplex (without protocol)	Full duplex (without protocol)
Synchronisation			Start/stop synchronisation	—
Data transfer	speed	bit/s	300, 600, 1200, 2400, 4800, 9600, 19200 (selectable)	19200, 38400 (selectable)
	channel		Bus (RS485)	—
	distance	m	15	15
Data format			1 start bit, 7 or 8 data bits, 1 or 0 parity bits, 1 or 2 stop bits	Depends on the used programming software
Error correction			Parity check, checksum	Depends on the used programming software
DTR/DSR control			YES / NO selectable	Depends on the used programming software
X ON / X OFF (DC1 / DC3)			YES / NO selectable	Depends on the used programming software
Universal I/Os	input data		2 inputs 24 V DC (sink / source type)	Depends on the used programming software
	output data		2 transistor outputs 12/24 V DC	Depends on the used programming software
I/O points			1 station (32 addresses)	1 station (32 addresses)
External power supply		V DC	24	24
Power consumption (24 V DC)		mA	110	190
Weight		kg	0.4	0.4
Dimensions (W x H x D)		mm	170 x 80 x 63,5	170 x 80 x 63,5
Order information		Art. no.	88003	134950
Accessories			Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80	

■ Remote Positioning Modules

PLC ➠ All series



Open Control Loop Positioning

Locating the positioning unit near the servo/mechanical system not only reduces cable costs but also eliminates problems arising from noise and cable losses.

Special features:

- Control up to two axes, linear interpolation or circular interpolation
- Storage of up to 600 items of positioning data
- Travel unit can be specified pulse, mm, inch or degree.
- In connection with the MELSERVO MR-J2 servo amplifier an absolute position detection system can be configured.
- 7 types of home position return functions are available.
- Parameterization and specification of positioning data can be done entirely by the PLC program or by GX Configurator AP

4 CC-LINK

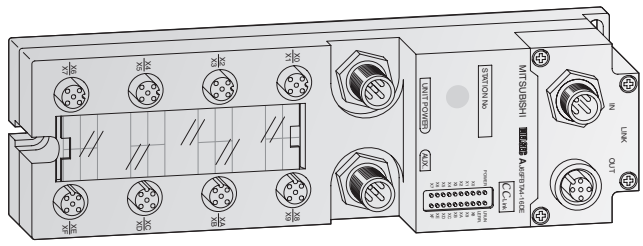
Specifications		AJ65BT-D75P2-S3
Control axes		2
Interpolation		Linear interpolation (2 axes), circular interpolation (2 axes)
Points per axis		600
Positioning	method	Pulse control "Point to Point" (absolute data and/or incremental); speed/position swiching control (incremental); locus control (absolute data and/or incremental)
	positioning units	absolute data: -2147483648 – 2147483647 pulse; -214748364.8 – 214748364.7 µm; -21474.83648 – 21474.83647 inch; 0 – 359.99999 degree incremental: -2147483648 – 2147483647 pulse; -214748364.8 – 214748364.7 µm; -21474.83648 – 21474.83647 degree; -21474.83648 – 21474.83647 inch Speed/position switching control: 0 – 2147483647 pulse; 0 – 214748364.7 µm; 0 – 21474.83647 degree; 0 – 21474.83647 inch
	positioning speed	1 – 1000000 pulse/min; 0.01 – 6000000.00 mm/min; 0.001 – 600000.000 degree/min; 0.001 – 600000.000 inch/min
	acceleration/ deceleration processing	Automatic trapezoidal or S-pattern acceleration and deceleration
	acceleration and deceleration time	1 – 65535 ms (4 patterns each can be set)
Offset		Electronic gear and backlash compensation
I/O points		4 stations with each 128 devices
Internal power consumption (5 V DC)	mA	300
Weight	kg	0.5
Dimensions (W x H x D)	mm	170 x 80 x 63,5

Order information	Art. no.	88002

Accessories	Software for all MELSEC positioning modules: GX Configurator AP; adapter cable: A1SD75-C01H, art. no. 54943 Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80

■ Waterproof Type Remote Digital Input, Output and Combination Modules

PLC ➠ All series



IP67 Waterproof Type Remote Digital I/Os AJ65FBTA□□-□□

Six types of low profile waterproof remote I/O modules with IP67 protection are now available with the CC-Link system featuring Input, Output and Combination modules.

Special features:

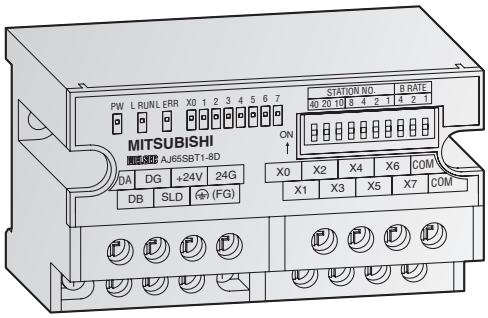
- Protection to IP67 (water proof)
- Simple connection without tool saves installation time
- Simple switch setting under the front cover of the modules
- Slim design saves installation space
- High ambient temperature resistance of up to 55 °C
- The modules feature M12 connection technology

Specifications			AJ65FBTA4-16D	AJ65FBTA4-16DE	AJ65FBTA2-16T	AJ65FBTA2-16TE	AJ65FBTA42-16DT	AJ65FBTA42-16DTE
Module type			Input modules		Output modules		Combination modules	
Inputs			16	16	—	—	8	8
Outputs			—	—	16	16	8	8
Input type			DC input (sink type)	DC input (source type)	—	—	DC input (sink type)	DC input (source type)
No. of points per module			16	16	—	—	8	8
Output type			—	—	DC output (sink type)	DC output (source type)	DC output (sink type)	DC output (source type)
No. of points per module			—	—	16	16	8	8
Insulation type			All modules feature photocoupler insulation.					
Input voltage			24 V DC	24 V DC	12 / 24 V DC	12 / 24 V DC	24 V DC	24 V DC
Input current		mA	7	7	4	4	7	7
Max. output current	per output	A	—	—	1	1	1	1
	per group	A	—	—	4	4	4	4
Minimum signal voltage	ON voltage	V	≥ 14	≥ 14	—	—	≥ 14	≥ 14
	OFF voltage	V	≤ 6	≤ 6	—	—	≤ 6	≤ 6
Response time	OFF ⟶ ON	ms	≤ 1.5	≤ 1.5	≤ 0.5	≤ 0.5	≤ 1.5	≤ 1.5
	ON ⟶ OFF	ms	≤ 1.5	≤ 1.5	≤ 1.5	≤ 1.5	≤ 1.5	≤ 1.5
Status display of I/Os			All modules provide LEDs for each I/O.					
Error (RUN) display of stations			LED	LED	LED	LED	LED	LED
I/O points			16	16	16	16	16	16
Connection terminals			M12	M12	M12	M12	M12	M12
Applicable wire size		mm^2	0.75 – 2.0	0.75 – 2.0	0.75 – 2.0	0.75 – 2.0	0.75 – 2.0	0.75 – 2.0
Internal power consumption		mA	65	65	75	75	70	70
Weight (without terminal block)		kg	0.40	0.40	0.40	0.40	0.40	0.40
Dimensions (W x H x D)		mm	60 x 200 x 48	60 x 200 x 48	60 x 200 x 48	60 x 200 x 48	60 x 200 x 48	60 x 200 x 48
Order information		Art. no.	137587	137588	150380	150381	137589	137590

Accessories	
	Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80 M12 connection cables: refer to page 78

■ Compact Remote Digital Input Modules

PLC ➠ All series



Remote inputs AJ65SBTB1-□□

The remote input modules are intended to be installed near the control target. The advantages are reduced cabling and the capability of aquiring data and operation results of individual machine modules autonomously, electrically, and mechanically.

Three different input modules with up to 32 inputs and two combined modules with eight inputs and eight outputs are available.

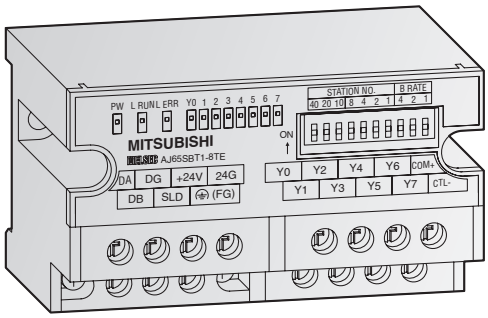
Special features:

- Up to 64 I/O modules with a maximum of 32 inputs each can be connected.
- All modules are very compact.
- Tough, highly shock-resistant design
- Status indicator LEDs for the inputs are integrated.
- Standard electrical isolation between process and control via optocouplers
- Mounting with DIN rail adapters or screws
- Modules can be mounted in horizontal arrangement or in one of 4 orientations on a flat surface.

Specifications			AJ65SBTB1-8D	AJ65SBTB1-16D	AJ65SBTB1-16D1	AJ65SBTB1-32D1	AJ65SBTC1-32D
Module type			Compact input modules				
Inputs			8	16	16	32	32
Input type			DC input (sink / source type)	DC input (sink / source type)	DC input (sink / source type)	DC input (sink / source type)	DC input (sink / source type)
No. of points per module			8	16	16	32	32
Insulation type			All modules feature photocoupler insulation.				
Input voltage			24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
Input current		mA	7	7	5	5	5
Minimum signal voltage	ON voltage	V	≥ 14	≥ 14	≥ 15	≥ 15	≥ 14
	OFF voltage	V	≤ 6	≤ 6	≤ 3	≤ 3	≤ 6
Response time	OFF ⟶ ON	ms	≤ 1.5	≤ 1.5	0.2	≤ 0.2	1.5
	ON ⟶ OFF	ms	≤ 1.5	≤ 1.5	0.2	≤ 0.2	1.5
Status display of inputs			All modules provide LEDs for each input.				
Error (RUN) display of stations			LED	LED	LED	LED	LED
I/O points			8	16	16	32	32
Connection terminals			Terminal block	Terminal block	Terminal block	Terminal block	Connector
Applicable wire size		mm^2	0.75 – 2.0	0.75 – 2.0	0.75 – 2.0	0.75 – 2.0	0.75 – 2.0
Internal power consumption		mA	30	35	40	45	45
Weight (without terminal block)		kg	0.14	0.18	0.18	0.16	0.16
Dimensions (W x H x D)		mm	87 x 50 x 40	118 x 50 x 40	118 x 50 x 40	118 x 50 x 40	118 x 50 x 40
Order information		Art. no.	104422	136026	140144	140145	127118
Accessories			Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80				

■ Compact Remote Digital Output Modules

PLC ➠ All series



Remote outputs AJ65BT□□-□□

The remote output modules are intended to be installed near the control target. The advantages are reduced cabling and the capability of aquiring data and operation results of individual machine modules autonomously, electrically, and mechanically.

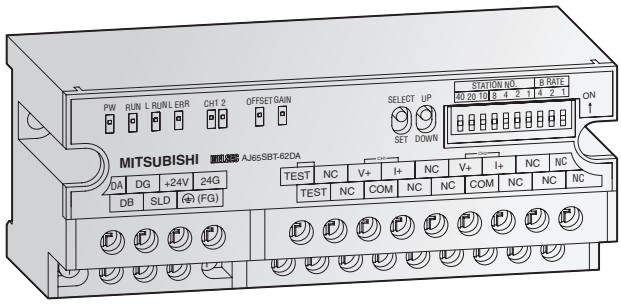
Special features:

- Up to 64 I/O modules with a maximum of 32 outputs each can be connected.
- All modules are very compact.
- Tough, highly shock-resistant design.
- Status indicator LEDs for the outputs.
- Standard electrical isolation between process and control via optocouplers
- Mounting with DIN rail adapters or screws
- Modules can be mounted in horizontal arrangement or in one of four orientations on a flat surface.

Specifications			AJ65SBTB1-8TE	AJ65SBTB2-8T1	AJ65SBTB1-16TE	AJ65SBTB1-32T	AJ65SBTB2N-8R	AJ65SBTB2N-16R
Module type			Compact output modules					
Outputs			8	8	16	32	8	16
Output type			Transistor (source type)	Transistor (source type)	Transistor (source type)	Transistor (sink type)	Relay	Relay
No. of points per module			8	8	16	32	8	16
Insulation type			All modules feature photocoupler insulation.					
Output voltage			24 V DC	24 V DC	24 V DC	24 V DC	24 V DC / 240 V AC	24 V DC / 240 V AC
Output current per point/module		A	0.1/0.8	0.1/0.8	0.1/1.6	0.5/4.8		
Max. output current	per output		0.1	0.1	0.1	0.5	2	2
	per group		0.8	0.8	1.6	4.8	4	8
Response time	OFF ⟶ ON	ms	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	10	10
	ON ⟶ OFF	ms	≤ 1.5	≤ 1.5	≤ 1.5	≤ 1.5	12	12
Status display of inputs			All modules provide LEDs for each input.					
Error (RUN) display of stations			LED	LED	LED	LED	LED	LED
I/O points			8	8	16	32	8	16
Connection terminals			Terminal block	Terminal block	Terminal block	Terminal block	Terminal block	Terminal block
Applicable wire size		mm^2	0.75 – 2.0	0.75 – 2.0	0.75 – 2.0	0.75 – 2.0	0.75 – 2.0	0.75 – 2.0
Internal power consumption		mA	35	35	50	65	85	120
Weight (without terminal block)		kg	0.14	0.14	0.18	0.25	0.25	0.35
Dimensions (W x H x D)		mm	87 x 50 x 40	87 x 50 x 40	118 x 50 x 40	179 x 50 x 40	118 x 50 x 40	179 x 50 x 40
Order information		Art. no.	129574	On request	129575	138957	140148	140149
Accessories			Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80					

■ Compact Remote Analog Modules

PLC ➠ All series



Analog input and output modules

The analog input module AJ65SBT-64AD converts analog process signals into digital values that can be processed by the CPU.

The analog output module AJ65SBT-64DA serves as remote 4-channels digital to analog converter modules with 12-bit or 13-bit binary resolution and output an analog current or voltage signal. This type of module is typically used with frequency inverters, valves or sliders.

Special features:

- 4 analog channels per module
- Selectable current or voltage input
- Resolution 5 mV and 20 mA for the input module and 1/4000, 1/8000, 1/12000 selectable for each channel for the output module.
- Converting time of 1 ms per channel and 4 ms for 4 channels
- Status indicator LEDs
- Standard electrical isolation between process and control via optocouplers
- Input characteristics can be user-modified via offset/gain settings.
- These analog I/O modules are ready for use with all CC-Link master modules.

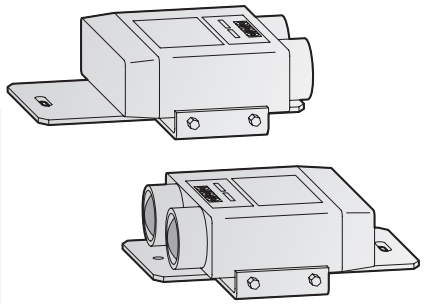
Specifications			AJ65SBT-64AD				AJ65SBT-62DA			
Modul type			Compact analog input module				Compact analog output module			
Analog inputs			4				—			
Analog outputs			—				2			
Resolution			-4096 / +4095				-4096 / +4095 voltage, 0 – 4095 output			
Analog output			—				-10 V – 0 V – +10 V DC / 0 – 20 mA (external input resistance 2 kΩ – 1 MΩ) / 0 – 60 MΩ			
I/O characteristics			**Analog input**		**Digital output**		**Digital input**	**Analog output**		
			Voltage	Current	Resolution	Current resolution	Resolution voltage	Voltage	Current	Input resolution
			-10 V – 10 V 0 – 10 V 0 – 5 V 1 – 5 V	-20 – 20 mA 0 – 20 mA 0 – 20 mA 4 – 20 mA	-4000 – 4000 0 – 4000 0 – 2000 0 – 4000	0 – 4000 0 – 4000 0 – 4000 0 – 4000	4000 2000 0 -2000 -4000	+10 V +5 V 0 V -5 V -10 V	0 mA 20 mA	0 4000
Max. resolution			-10 V – 10 V 0 – 10 V 0 – 5 V 1 – 5 V	-20 – 20 mA 0 – 20 mA 0 – 20 mA 4 – 20 mA	2.5 mV 2.5 mV 1.25 mV 1 mV	20 µA 10 µA 5 µA 4 µA	2.5 mV 0.625 mV 0.5 mV		5 µA 4 µA	
Offset/Gain setting			Yes (users or factory setting)				Yes (users or factory setting)			
Overall accuracy			±0.2 % (25 ± 5°C) , 0.4 % (0 – 55°C)				±0.2 % (25 ± 5°C) , 0.4 % (0 – 55°C)			
Max. conversion time			1 ms/channel				1 ms/channel			
Max. input	voltage	V	±15				—			
	current	mA	±30				—			
Isolation			Photocoupler isolation between output terminals and PC power for all modules.				—			
I/O points			32				32			
External power consumption		V DC	24				—			
Applicable wire size		mm^2	0.75 – 2.00				0.75 – 2.00			
Internal power consumption (24 V DC)		mA	120				180			
Weight		kg	0.35				0.4			
Dimensions (W x H x D)		mm	118 x 50 x 40				118 x 50 x 40			

Order information	Art. no.	140146	140147

Accessories	Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80

■ Compact Remote Digital Input Modules

PLC ➠ All series



Repeater modules for infrared transmission

By using AJ65BT-RPI-10A and AJ65BT-RPI-10B modules combined, it becomes possible to perform wireless data transmission using infrared light.
This is the smart solution in places where wiring is difficult.

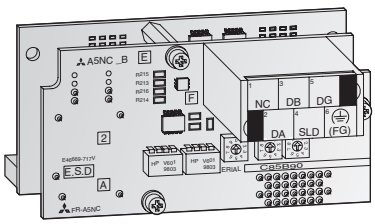
Special features:

- The optical transmission modules AJ65BT-RPI-10A and AJ65BT-RPI-10B feature infrared data transmission up to 100 m.
- For optical data transfer an A-type and a B-type is needed.

Specifications			AJ65BT-RPI-10A	AJ65BT-RPI-10B
Module type			Optical infrared transmission module	Optical infrared transmission module
Network data transfer	transmission speed	Mbit/s	2.5 / 0.625 / 0.156	2.5 / 0.625 / 0.156
	max. number of connectable segments		2	2
	I/O points		1 (remote I/O station when monitoring function is used)	
	max. transmission distance/segment		Differs according to transmission speed; same as normal CC-Link system (system with only one segment)	
Optical data transfer	transmission distance	m	max. 100	
	angle of beam spread	°	0–50 m: ±2 / 50–100 m: ±1	
	modulation frequency	MHz	Module A→B: 36±3 / module B→A: 44±2.5	
	modulation method		FSK	
Ambient illumination		lx	max. 10000, avoid direct sunlight	
Power supply		V	20.4–26.4	
Internal power consumption (24 V DC)		mA	137	137
Weight		kg	0.5	0.5
Dimensions (W x H x D)		mm	100 x 57.5 x 161	100 x 57.5 x 161
Order information		Art. no.	137585	137586

■ Communications Boards for Inverters

INV ➠ FR-A 500/FR-E 500 series



FR-A5NC, FR-E5NC

These inverter inboard options connect Mitsubishi Electric frequency inverters to a CC-Link network with a System Q, AnS/QnAS or AnU/QnA series as master CPU. This enables access to frequency inverters via CC-Link.

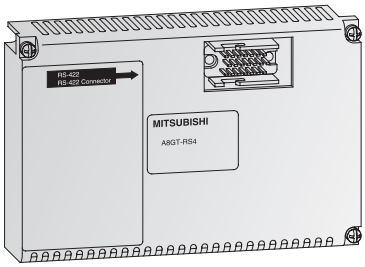
The option boards can be mounted directly in a mounting area within the inverter front face.

The FR-A5NC is used for the FR-A 500 type and the FR-E5NC is used for the FR-E 500 type.

Specifications			FR-A5NC	FR-E5NC
Applicable inverters			FR-A 500	FR-E 500
Power supply			5 V DC supplied from the inverter	
Communications system			Broadcast polling system	Broadcast polling system
Transmission path form			RS485	RS485
Station type			Remote device station	Remote device station
Communications speed	1200/600/200/150(110)/100 m	MBit/s	0.156/0.625/2.5/5/12	0.156/0.625/2.5/5/12
Communications distance		m	Max. 1200 (depends on communications speed)	
Connector			8 pin terminal block (M3 x 8 screws)	
Communications cable		mm²	0.75 – 2.00	0.75 – 2.00
Order information		Art. no.	68042	104558

■ HMI Communications Adapters

HMI ➠ GOT series



A8GT-J61BT13, A8GT-J61BT15

These modules allow GOT connection to a CC-Link network.

The intelligent module (A8GT-J61BT13) enables access to all PLCs within the network as local station.

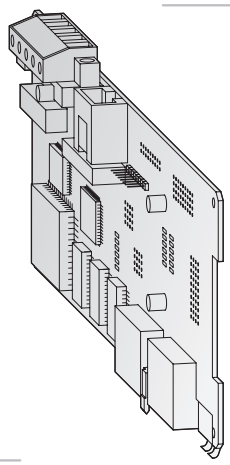
The remote module (A8GT-J61BT15) supportes data transfer with the Master PLC within a specific address area.

These modules are designed to fit on the back of A956/A970/A975/A985GOT operator terminals.

Specifications	A8GT-J61BT13	A8GT-J61BT15
Connection GOT to	CC-Link	CC-Link
Application	Intelligent station	Remote station
Application for GOT	A956/A970/A975/A985GOT	A956/A970/A975/A985GOT
Remark	No CE	No CE
Order information Art. no.	126726	76646
Accessories	Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80	

■ Interface Card 2A-HR 575 E for Robots Controller

ROB ➠ MELFA



2A-HR 575 E

This interface card 2A-HR 575 E allows CR□ robot controller connection to a CC-Link network.

Specifications	2A-HR 575 E
Application for	CR robot controller
Card type	Plug-in board
Use	Robot CC-Link interface
Order information Art. no.	129808
Accessories	Programming software: GX IEC Developer, refer to page 98, or GX Developer, refer to page 99 Repeater modules for all CC-Link modules: refer to page 80

PROFIBUS/DP Network

Overview

The open PROFIBUS/DP network enables extremely fast data exchange with a very wide variety of slave devices, including:

- Remote digital I/Os
- Remote analog I/Os
- Remote intelligence PLC (FX1N, FX2N)
- Frequency inverters (FR-A 240, FR-A 540 (L), FR-E 500)
- Operator terminals (MAC E series)
- A range of other devices from third-party manufacturers

Structure

The maximum coverage of a bus segment is 1200 m (at a maximum of 93.75 kbit/s). Up to 3 repeaters are allowed. Thus the maximum distance between 2 stations is calculated with 4800 m.

Cable types

To help reduce costs PROFIBUS/DP uses RS 485 technology with shielded 2-wire cabling.

Suitable cables include the UNITRONIC BUSLD from Lappkabel and the DUE 4451 from Alcatel.

Cable check

An adapter from Bihl + Wiedemann is available for the quick check of the cable connection and performance.

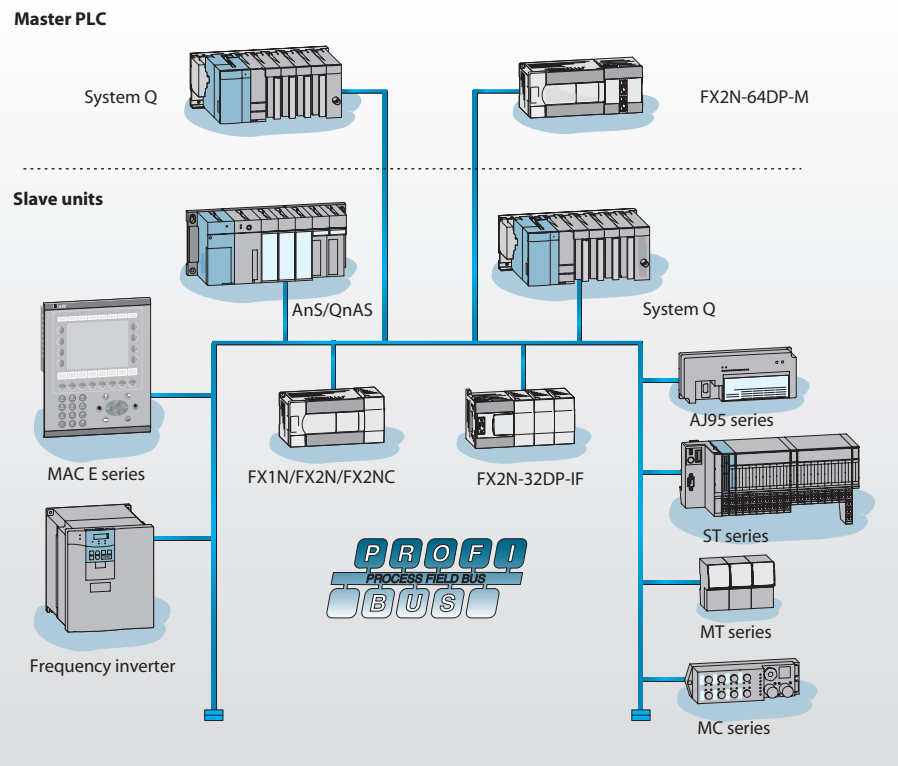
Data exchange

The PROFIBUS FX2N-64DP-M, AJ71PB92, A1SJ71PB92D and QJ71PB92D master modules support slave device data exchange with up to 244 send bytes and 244 receive bytes. This means you can exchange a total of up to 128 bytes with a slave unit per network cycle. The processing time depends on the CPU of the PLC series.

Administration

In combination with the software GX Configurator DP the FX2N-64DP-M, A1SJ71PB92D and QJ71PB92D PROFIBUS/DP master units give you user-friendly plug-and-play technology. The configuration software is self-explanatory, using a graphical model for setting up the network. You simply select the slave unit (e.g. FX2N), assign the station numbers and specify where the information is stored in the master CPU.

Of course, PROFIBUS/DP slaves from MITSUBISHI ELECTRIC can also be connected to master devices from other manufacturers.



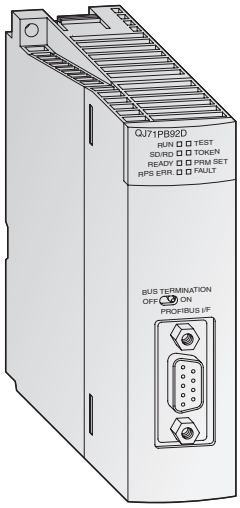
Specifications			FX2N-64DP-M	A1SJ71PB92D	QJ71PB92D
Application range			MELSEC FX2N(C)	MELSEC AnS/QnAS	System Q
Communications protocol			EN 50170 / DIN 19245-T3		
Cabling			Shielded 2-wire with 24 AWG = 0.22 mm², impedance: 100 – 130 Ω; Shielded 2-wire with 22 AWG = 0.34 mm², impedance: 135 – 165 Ω;		
Interface			RS485		
Data transfer rate	distance				
	1 200 m	kBit/s	9.6 / 19.2 / 93.75		
	1 000 m	kBit/s	187.5		
	400 m	kBit/s	500		
	200 m	kBit/s	1 500	12000 / 6000 / 3000 (100 m) 1500 (200 m)	
Processing time			Depends on the CPU of the PLC series		
Max total distance		m	4800 (3 repeaters)		
Slave units per master			60		
Stations per segment			32		
Repeaters per network			3		
Accessories			PROFIBUS plug connector for up to 12 Mbaud: PROFICON-PLUS, art. no. 140008 or PROFICON-PLUS-PG, art. no. 140009 (refer to page 76)		

Recommended cable types by company Belden:

Belden number	Type	Specifications	Use as
3079A	Installation cable		EN50170 cable
3079ANH	Installation cable	IEC60332-part 3 cat. C	Halogen free cable
3079E*	Installation cable		Standard Trunk cable with stranded conductors

* Belden Europe advises to use 3079E with stranded conductors since conductors tend to brake with vibration or if put under constant strain.

■ MELSEC System Q Master and Slave Modules



QJ71PB92D / QJ71PB93D

The QJ71PB92D PROFIBUS/DP master module and the QJ71PB93D PROFIBUS/DP slave module enable MELSEC programmable logic controllers to communicate with other PROFIBUS devices.

Special features:

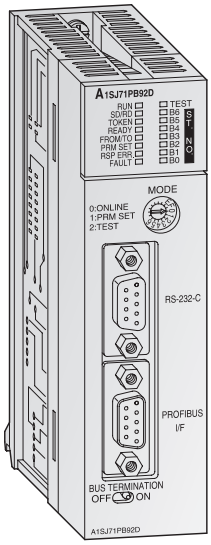
- The QJ71PB92D PROFIBUS/DP master can communicate with up to 60 slave units.
- Up to 244 input bytes and 244 output bytes can be processed at a time per slave station.
- Supported functions include Sync, Freeze and specialised diagnostics messages for the specific slave types used.
- Data exchange with automatic refresh is possible.
- Data exchange with batch transfer is possible as an option.
- The QJ71PB93D PROFIBUS/DP slave module the enables data exchange with all PROFIBUS master modules.

Specifications			QJ71PB92D	QJ71PB93D
Module type			Master	Slave
Network type			PROFIBUS/DP	PROFIBUS/DP
Communications protocol			EN50170, DIN19245T3	EN50170, DIN19245T3
Interface		type	RS485	RS485
Communications mode			Logical token ring with subordinate Master/Slave procedure	Logical token ring with subordinate Master/Slave procedure
Topology			Bus	Bus
Modulation			NRZ	NRZ
Cabling			Shielded 2-wire	Shielded 2-wire
Communications distance	9.6 kbps 19.2 kbps 93.75 kbps	m	1200, 4800 (3 repeaters)	1200, 4800 (3 repeaters)
	187 kbps	m	1000, 4000 (3 repeaters)	1000, 4000 (3 repeaters)
	500 kbps	m	400, 1600 (3 repeaters)	400, 1600 (3 repeaters)
	1500 kbps	m	200, 800 (3 repeaters)	200, 800 (3 repeaters)
	3 Mbps 6 Mbps 12 Mbps	m	100, 400 (3 repeaters)	100, 400 (3 repeaters)
Max. nodes			32, 62 (1 repeater), 92 (2 repeaters), 126 (3 repeaters)	32, 62 (1 repeater), 92 (2 repeaters), 126 (3 repeaters)
Max. transmission distance		m	4800 (3 repeaters)	4800 (3 repeaters)
Repeaters per network			Max. 3	Max. 3
I/O points			32	32
Internal power consumption (5 V DC)		mA	570	360
Weight		kg	0.15	0.15
Dimensions (W x H x D)		mm	27.4 x 105 x 97.5	27.4 x 105 x 97.5

Order information	Art. no.	134931	143545

Accessories	Configuration software incl. configuration cable for GX Configurator DP, art. no. 136579 (refer to page 100) PROFIBUS plug connector for up to 12 Mbaud: PROFICON-PLUS, art. no. 140008 or PROFICON-PLUS-PG, art. no. 140009 (refer to page 76)

■ MELSEC AnSH/QnAS Master and Slave Modules



A1SJ71PB92D, A1SJ71PB93D

The A1SJ71PB92D and A1SJ71PB93D PROFIBUS/DP modules enable MELSEC PLCs to communicate with other PROFIBUS devices.

Special features:

- The A1SJ71PB92D PROFIBUS/DP master can communicate with up to 60 slave units. Up to 32 input bytes and 32 output bytes can be processed at a time per slave station. Supported functions include Sync, Freeze and specialised diagnostics messages for the specific slave types used.
- The A1SJ71PB93D PROFIBUS/DP slave enables the data exchange with MELSEC AnS series PLCs in the PROFIBUS/DP network.

Specifications			A1SJ71PB92D	A1SJ71PB93D
Module type			Master (Class 1)	Slave
Network type			PROFIBUS/DP	PROFIBUS/DP
Communications protocol			EN50170, DIN19245T3	EN50170, DIN19245T3
Interface		type	RS485	RS485
Communications mode			Token passing between Master and Slave and polling between Master and Slave	Token passing between Master and Slave and polling between Master and Slave
Topology			Bus	Bus
Modulation			NRZ	NRZ
Cabling			Shielded 2-wire	Shielded 2-wire
Communications distance	9.6 kbps 19.2 kbps 93.75 kbps	m	1200, 4800 (3 repeaters)	1200, 4800 (3 repeaters)
	187 kbps	m	1000, 4000 (3 repeaters)	1000, 4000 (3 repeaters)
	500 kbps	m	400, 1600 (3 repeaters)	400, 1600 (3 repeaters)
	1500 kbps	m	200, 800 (3 repeaters)	200, 800 (3 repeaters)
	3 Mbps 6 Mbps 12 Mbps	m	100, 400 (3 repeaters)	100, 400 (3 repeaters)
Max. nodes			32, 62 (1 repeater), 92 (2 repeaters), 126 (3 repeaters)	32, 62 (1 repeater), 92 (2 repeaters), 126 (3 repeaters)
Max. transmission distance		m	4800 (3 repeaters)	4800 (3 repeaters)
Repeaters per network			Max. 3	Max. 3
I/O points			32	32
Internal power consumption (5 V DC)		mA	560	360
Weight		kg	0.27	0.18
Dimensions (W x H x D)		mm	34.5 x 130 x 93.6	34.5 x 130 x 93.6

Order information	Art. no.	63393	140673

Accessories	Configuration software for A1SJ71PB92D: GX Configurator DP, art. no. 136579 (refer to page 100) PROFIBUS plug connector for up to 12 Mbaud: PROFICON-PLUS, art. no. 140008 or PROFICON-PLUS-PG, art. no. 140009 (refer to page 76)

■ The New MELSEC ST Series

System description

The new ST series is designed as a modular input/output system for connection to PROFIBUS/DP and comprises:

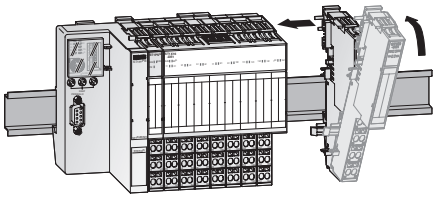
- basic module (head station and bus node for PROFIBUS/DP)
- power supply modules
- digital and analog I/O modules

They can be combined freely to provide an efficient system configuration depending to your demands.

The name "ST" means "Slice-type Terminal" and comes from the physical appearance of the very slim modules (12.6mm) , similar to slices. As well as slice type modules, cost saving block modules with 16 inputs or outputs are available.

The extension modules are designed as a 2-component system, that means they consist of electronic modules for the function and base modules as modular backplane bus with two types of terminals: spring clamp or screw clamp terminals.

The electronic modules can be clipped easily in the base modules without any tool and can be mounted on a DIN rail. Exchange of the electronic modules can be made on-line, so the system keeps running. Re-wiring is not needed.

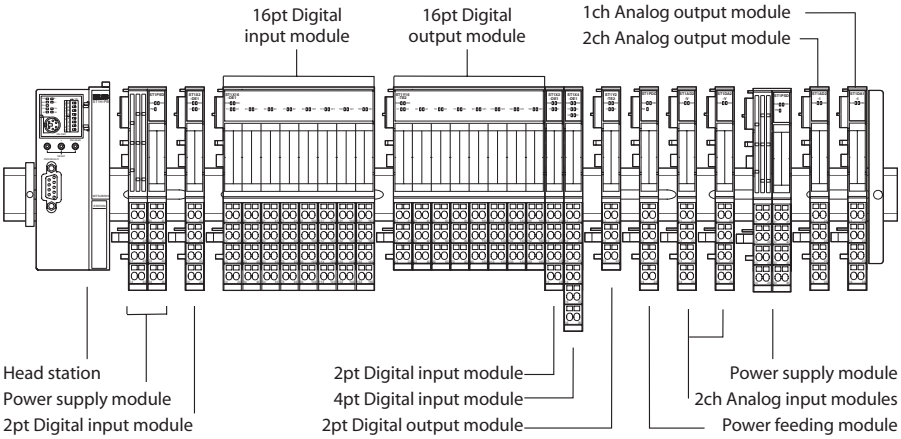


Every electronic module provides LEDs for quick and easy diagnostics and also additional information. Error and status messages are also shown on the basic module.

Special features:

- ST = Slice terminals, only 12.6mm wide
- Modular structure with no restriction on installation position
- Easy and complete handling via 3 push buttons
- Connection diagram on every module
- Applicable wire size for all base modules 0.5–2.5mm², flexible wire with ferrule or solid core wire without ferrule
- Expandable in two-point increments
- Mounting on DIN rail
- Replaceable electronic modules
- Hot swap function without re-wiring
- Standing wiring
- Quick diagnostics via LED´s
- Distributed 24V DC for actors/sensors
- Gold contacts for all bus and signal connections
- Electronic elements are coded to prevent an incorrect unit being inserted
- Easy parameter setting with GX Configurator DP

Product range



Reference Tables for Model Designation Code

Electronic modules

ST1	Y	16	–	TPE3
a	b	c		d

The code in detail:

a Designation of the series
b Designation of I/O type module
H = head station
P = power module
Y = output module
X = input module
AD = analog input module
DA = analog output module
c Number of I/Os, e.g. 2, 4 or 16 I/Os
d Model variation

Base modules

ST1	B	S3	–	Y	16
f	g	h		i	k

The code in detail:

f Designation of the series
g "B" = base module, "A" = accessory
h Terminal type and number of wires
S = Spring clamp type
E = Screw clamp type
i Applicable electronic module
Y = output module
X = input module
IR = analog/relay modules
k number of I/Os

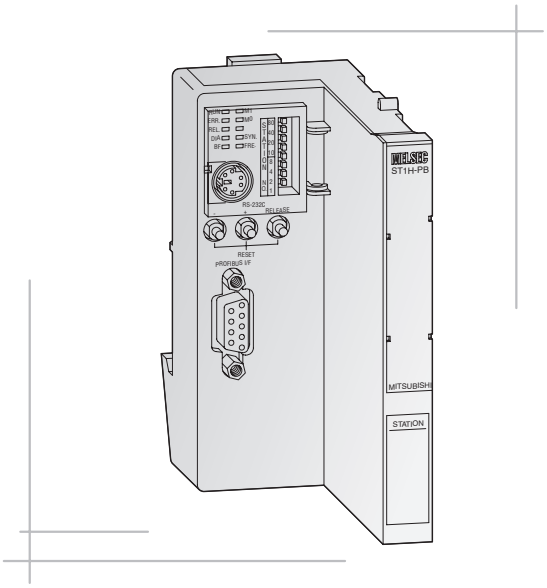
Product range and Selection guide

The following table shows the possible combinations between electronic modules and the applicable base modules. However, two types of base modules featuring spring clamp terminals or screw clamp terminals are available. Choose the best solution for your special application.

Electronic modules	Base modules Spring clamp terminals	Screw clamp terminals
Head station		
ST1H-PB	no need	no need
Power supply modules		
ST1PSD (first one)	ST1B-S4P2-H-SET	ST1B-E4P2-H-SET
ST1PSD (second and more)	ST1B-S4P2-R-SET	ST1B-E4P2-R-SET
ST1PDD	ST1B-S4P2-D	ST1B-E4P2-D
Digital input modules		
ST1X2-DE1	ST1B-S4X2	ST1B-E4X2
ST1X4-DE1	ST1B-S6X4	ST1B-E6X4
ST1X16-DE1	ST1B-S4X16	ST1B-E4X16
Digital output modules		
ST1Y2-TE2	ST1B-S3Y2	ST1B-E3Y2
ST1Y16-TE2	ST1B-S3Y16	ST1B-E3Y16
ST1Y2-TPE3	ST1B-S3Y2	ST1B-E3Y2
ST1Y16-TPE3	ST1B-S3Y16	ST1B-E3Y16
ST1Y2-R2	ST1B-S4IR2	ST1B-E4IR2
Analog input modules		
ST1AD2-V	ST1B-S4IR2	ST1B-E4IR2
ST1AD2-I	ST1B-S4IR2	ST1B-E4IR2
Analog output modules		
ST1DA2-V	ST1B-S4IR2	ST1B-E4IR2
ST1DA1-I	ST1B-S4IR2	ST1B-E4IR2
Temperature modules		
ST1TD2	ST1B-S4TD2	ST1B-E4TD2

■ ST Series Basic Module

PLC ➠ All series



Basic module (head station) of the ST series

The basic module ST1H-PB connects the remote I/O modules of the ST series to PROFIBUS/DP. The basic module and all ST devices are mounted on a DIN rail.

The ST1H-PB provides a Mini-DIN socket for diagnostics and parameter setting using the QC30R2 cable. The station number can be set via DIP switches on the basic module. LEDs show the status of the connected systems.

Special features:

- DIN rail mounting
- LEDs for RUN, ERROR, MODE and status massages
- Connection to the PROFIBUS via RS 485 Sub-D interface
- Connection to the I/O modules via integrated backplane bus
- Easy maintenance, Hot swap with switches, no PC, software or special tools needed
- End plate and bracket for fixing the ST series modules on the DIN rail are included.

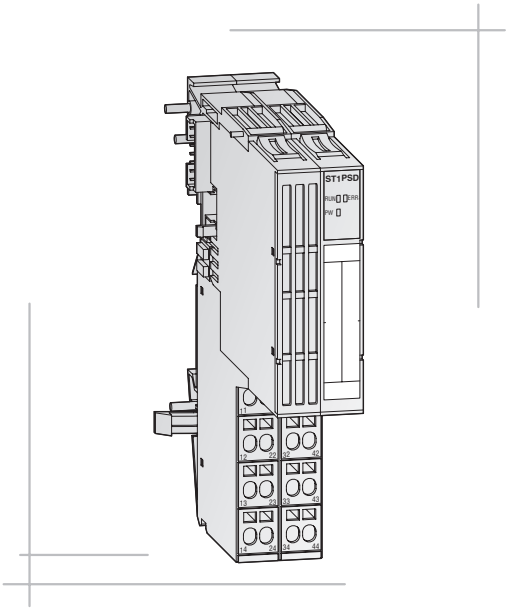
Specifications			ST1H-PB
Module type			Head station of the MELSEC ST series for PROFIBUS/DP
Occupied I/O points			4 / 4
Communications	protocol		IEC 61158/EN50170
	medium		Shielded 2-wire
Interface		type	RS485
Supported operation modes			Sync mode, freeze mode
Max. transmission distance		m	4800 (3 repeaters)
Programming interface			RS232 Mini-DIN socket for diagnostics and programming
Diagnostics LEDs			RUN, ERR, REL, DIA, BF, SYN, FRE, M0, M1
Data exchange with master			304 total / 32 / 64 / 128 / 256, selectable mode
Number of addressable slices			max. 63
Addressable I/O points	digital	bit	256
	analog	word	32
Internal power consumption (5 V DC)		mA	530
External power supply			Via ST1PSD
Dimensions (W x H x D)		mm	114.5 x 50.5 x 74.5
Weight		kg	0.1

Order information	Art. no.	152951

Accessories	End plate and bracket for fixing on the DIN rail included in package Configuration software: GX Configurator DP V6.00 or higher, art. no. 136579 (refer to page 100) PROFIBUS plug connector for up to 12 Mbaud: PROFICON-PLUS, art. no. 140008 or PROFICON-PLUS-PG, art. no. 140009 (refer to page 76) Programming cable QC30R2 (for connection of PC–ST series), art. no. 128424

■ ST Series Bus Power Supply and Refreshing Module

PLC ➠ All series



Bus power supply and refreshing module

The Bus power supply and refresh module ST1PSD can serve in two ways: distribute 24 V DC power supply for the basic module and I/Os field supply and 5 V DC for the internal backplane bus (H mode) or distribute 24 V DC power supply for I/Os field supply and refresh the internal backplane bus with 5 V DC (R mode). Each mode (H or R) is indicated by the use of a different base module, marked with "H" or "R".

You need 1 ST1PSD with H-type base module beside the basic module to operate the ST station, a second or more (using the R-type base module) is only needed depending of the power consumption of the connected consumers (see bottom of this page).

LEDs on the module show the status for RUN and ERROR. Diagnosis can be made via the head module.

Special features:

- DIN rail mounting
- LEDs for RUN and ERROR on the modules and also on the basic module
- Connection to the basic module (head station) via integrated backplane bus in the base modules
- Four selectable types of base modules (double function):
  - spring clamp type terminals for power supply (H)
  - spring clamp type terminals for bus refresh (R)
  - screw clamp type terminals for power supply (H)
  - screw clamp type terminals for bus refresh (R)

Specifications		ST1PSD
Module type		Power supply for head station, internal 5V DC backplane bus and 24V DC for I/Os (double function)
Occupied I/O points		2 / 2
Occupied Slice number		2
Nominal voltage	V DC	24.0
System supply	V DC	24.0 for basic module and I/O´s, field supply / 5.0 for internal backplane bus
Permissible range for operating	V DC	24.0 (19.2 – 28.8 (±20%))
Ripple		< 5%
Output current (5 V DC)	A	2.0
Output current (24 V DC)	A	8 / 10 with fuse
Dimensions (W x H x D)	mm	25.2 x 55.4 x 74.1
Weight	kg	0.05
Connection cable type		24 V DC (with shield) + 24 V DC for field supply

Order information	Art. no.	152952
Applicable base module for **basic module supply**	Spring clamp type	ST1B-S4P2-H-SET, art. no. 152908
	Screw clamp type	ST1B-E4P2-H-SET, art. no. 152918
Applicable base module for **bus refreshing** within the station	Spring clamp type	ST1B-S4P2-R-SET, art. no. 152909
	Screw clamp type	ST1B-E4P2-R-SET, art. no. 152919
Accessories		Wiring markers in different colours: ST1A-WMK-□□□ (refer to p. 77); Base module labels: ST1A-BMK- □□□ (refer to p. 77); Ext. power supply modules for mounting on DIN rail: DLP□□□-24-1/E (refer to p. 77)

Note: For connection diagram refer to page 90.

Note: Calculation of the power consumtion

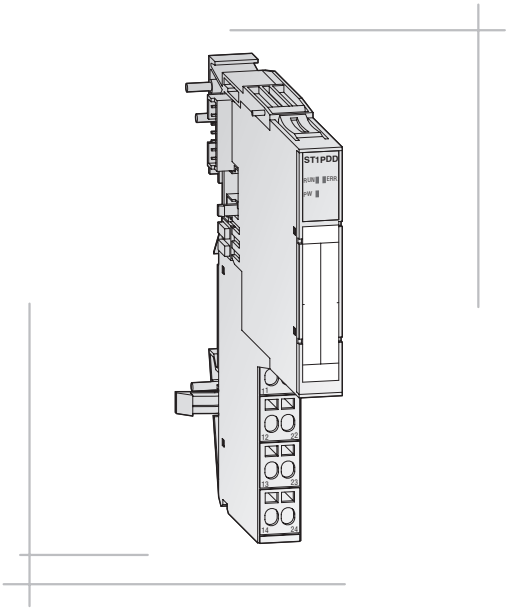
The power consumtion and the need of a power refresh module will be calculated exactly in the GX Configurator DP during your configuration of the System.

For a rough calculation of the internal 5V DC power consumtion and a rough calculation for the number of needed PSD refresh modules, please refer to the attached table.

Module type	Power supply/consumtion	Description
ST1PSD	2.0A	Power supply infeed
ST1H-PB	0.53A	Power consumption
Slicemodule	0.1A	Power consumption
Blockmodule	0.15A	Power consumption

■ ST Series Power Feeding Module

PLC ➠ All series



Power feeding module

The power feeding module ST1PDD distributes 24V DC only for the I/Os of the actuators and sensors.

The number of ST1PDD modules needed can be calculated individually by addition of the current consumption of all connected devices.

The electronic module is fitted in a base module, which can be installed on a standard DIN rail.

Special features:

- DIN rail mounting
- LEDs for RUN and ERROR on the modules and also on the basic module
- ST1PDD can be placed anywhere on the DIN rail, the only restriction is the power consumption of the connected consumers.
- Two selectable types of base modules:
  - spring clamp type terminals
  - screw clamp type terminals

Specifications		ST1PDD
Module type		Power feeding module
Occupied I/O points		2 / 2
Occupied Slice number		1
Nominal voltage	V DC	24.0
Permissible range	V DC	24.0 (19.2 – 28.8 (±20%))
Ripple		< 5%
Internal power consumption (5 V DC)	mA	60
Maximum operating current	A	8 (24V DC) / 10 (24V DC) with fuse
Dimensions (W x H x D)	mm	12.6 x 55.4 x 74.1
Weight	kg	0.03
Base module for power feeding	Spring clamp type	ST1B-S4P2-D, art. no. 152910
	Screw clamp type	ST1B-E4P2-D, art. no. 152920
Connection cable type		24 V DC with shield

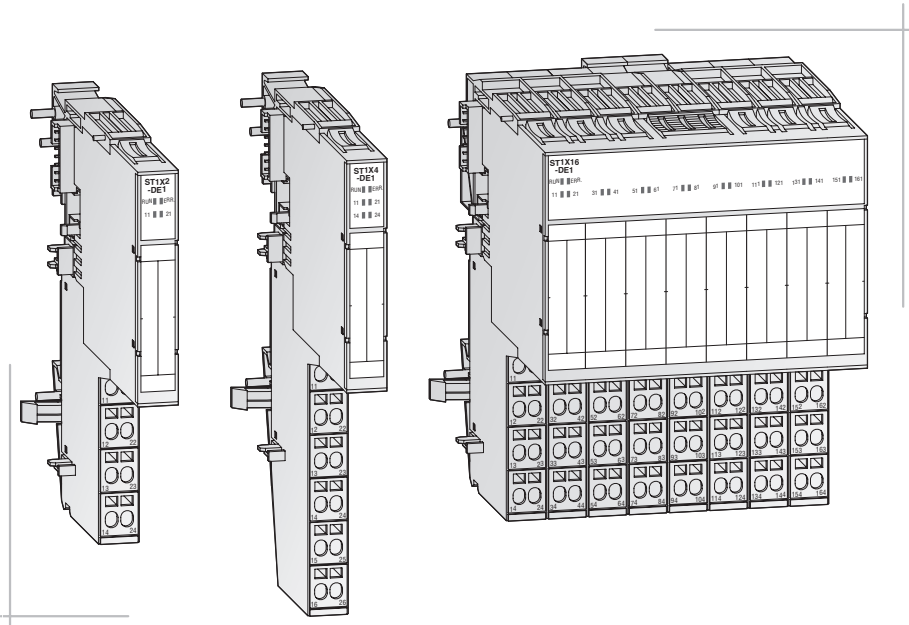
Order information	Art. no.	152953

Accessories	Wiring markers in different colours: ST1A-WMK-□□□ (refer to p. 77); Base module labels: ST1A-BMK- □□□ (refer to p. 77); Ext. power supply modules for mounting on DIN rail: DLP□□□-24-1/E (refer to p. 77)

Note: For connection diagram refer to page 90.

■ ST Series Digital Input Modules

PLC ➠ All series



Digital input modules

The digital input modules of the ST series connect directly to field devices (contacts, limit switches, sensors, etc.) and PROFIBUS/DP master module.

Two slim slice modules with 2 or 4 inputs are available. Also a cost saving block type module with 16 inputs is available.

Special features:

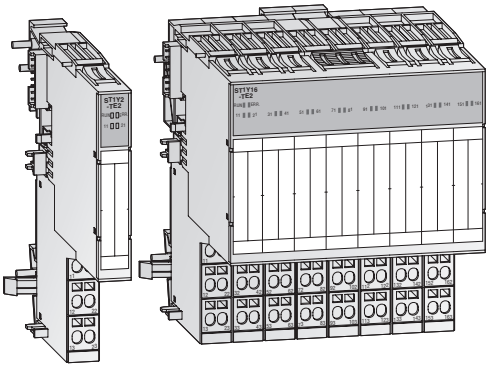
- Modules with 2, 4 or 16 inputs available
- DIN rail mounting
- LEDs for RUN and ERROR on the modules and also on the basic module
- Connection to the basic module (head station) via integrated backplane bus in the base modules
- Two selectable types of connecting terminals base modules:
  - spring clamp type terminals
  - screw clamp type terminals

Specifications			ST1X2-DE1	ST1X4-DE1	ST1X16-DE1
Module type			DC input module, 2 inputs	DC input module, 4 inputs	DC input module, 16 inputs
Occupied I/O points			2 / 2	4 / 4	16 / 16
Occupied Slice number			1	1	8
Isolation method			Photo coupler	Photo coupler	Photo coupler
Rated input voltage		V DC	24 (+20/-15%, ripple ratio within 5%)	24 (+20/-15%, ripple ratio within 5%)	24 (+20/-15%, ripple ratio within 5%)
Rated input current		mA	4	4	4
Inputs simultaneous ON			100%	100%	100%
Switch ON	voltage	V	min. 19	min. 19	min. 19
	current	mA	min. 3	min. 3	min. 3
Switch OFF	voltage	V	max. 11	max. 11	max. 11
	current	mA	max. 1.7	max. 1.7	max. 1.7
Input resistance		kΩ	5.6	5.6	5.6
Response time	OFF ⟶ ON	ms	0.5 / 1.5 or less (default: 1.5)		
	ON ⟶ OFF	ms	0.5 / 1.5 or less (default: 1.5)		
Dielectric withstand voltage			500 V AC for 1 minute between all DC external terminals and ground		
Insulation resistance			10 MΩ or more by insulation resistance tester		
Noise immunity			By noise simulator of 500 V p-p noise voltage; 1 s noise width and 25 to 60 Hz noise frequency; Fast transient noise IEC61000-4-4: 1 kV		
Internal current consumption (5V DC)		mA	85	95	120
Dimensions (W x H x D)		mm	12.6 x 55.4 x 74.1	12.6 x 55.4 x 74.1	100.8 x 55.4 x 74.1
Weight		kg	0.03	0.03	0.1
Applicable base module	Spring clamp type		ST1B-S4X2, art. no. 152911	ST1B-S6X4, art. no. 152912	ST1B-S4X16, art. no. 152913
	Screw clamp type		ST1B-E4X2, art. no. 152921	ST1B-E6X4, art. no. 152922	ST1B-E4X16, art. no. 152923
Connection cable type			3-wire 24 V DC (with shield)	3-wire 24 V DC	3-wire 24 V DC (with shield)
Order information		Art. no.	152964	152965	152966
Accessories			Wiring markers in different colours: ST1A-WMK-□□□ (refer to p. 77); Base module labels: ST1A-BMK- □□□ (refer to p. 77)		

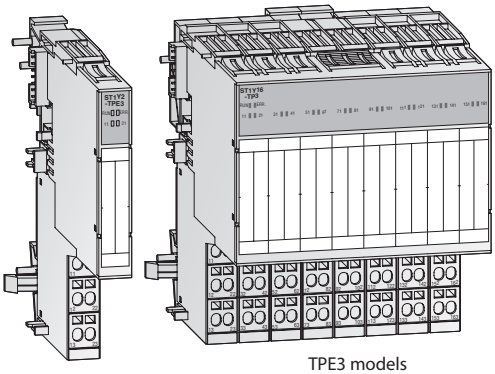
Note: For connection diagram refer to page 90.

■ ST Series Digital Output Modules

PLC ➠ All series



TE2 models



TPE3 models

Digital output modules

The digital output modules of the ST series connect directly to field devices (e.g. contactors, valves, lights) and PROFIBUS/DP master module.

The TPE3 models provide advanced protection functions e.g. for thermal and short circuit failures.

Two slim slice modules with 2 or 4 outputs are available. Beside this, two cost saving block type modules with 16 outputs each are available.

Special features:

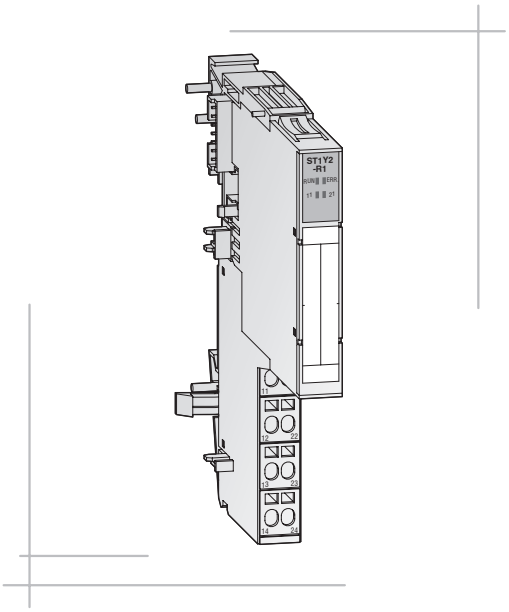
- Modules with 2 or 16 outputs available
- DIN rail mounting
- LEDs for RUN and ERROR on the modules and also on the basic module
- Connection to the basic module (head station) via integrated backplane bus in the base modules
- Two selectable types of connecting terminals base modules:
  - spring clamp type terminals
  - screw clamp type terminals

Specifications			ST1Y2-TE2	ST1Y16-TE2	ST1Y2-TPE3	ST1Y16-TPE3
Module type			Transistor output, 2 outputs	Transistor output, 16 outputs	Transistor output, 2 outputs	Transistor output, 16 outputs
Occupied I/O points			2 / 2	16 / 16	2 / 2	16 / 16
Occupied Slice number			1	8	1	8
Isolation method			Photo coupler	Photo coupler	Photo coupler	Photo coupler
Rated load voltage		V DC	24 (+20/-15%)	24 (+20/-15%)	24 (+20/-15%)	24 (+20/-15%)
Max. load current		A	0.5/point; 1.0/common	0.5/point; 4.0/common	1.0/point; 2.0/common	1.0/point; 4.0/common
Max. inrush current		A	4.0 (10 ms or less)	4.0 (10 ms or less)	2.0 (10 ms or less)	4.0 (10 ms or less)
Leakage current OFF		mA	0.1 or less	0.1 or less	0.3 or less	0.3 or less
Max. voltage drop at ON			0.2 V DC (TYP) 0.5 A, 0.3 V DC (max.) 0.5 A	0.2 V DC (TYP) 0.5 A, 0.3 V DC (max.) 0.5 A	0.15 V DC (TYP) 1.0 A, 0.2 V DC (max.) 1.0 A	0.15 V DC (TYP) 1.0 A, 0.2 V DC (max.) 1.0 A
Response time	OFF ⟶ ON	ms	max. 1.0	max. 1.0	max. 0.5	max. 0.5
	ON ⟶ OFF	ms	max. 1.0 (rated load, resistive load)	max. 1.0 (rated load, resistive load)	max. 1.5 (rated load, resistive load)	max. 1.5 (rated load, resistive load)
Surge compressor			Zener diode	Zener diode	Zener diode	Zener diode
Fuse		A	6.7 (fuse blow capacity: 50 A)		—	—
Fuse blown indicator			Yes (when fuse blows, LED indicates it and signal is output to head module)		—	—
Protection functions			—		Thermal protection, short circuit protection (Thermal and short circuit protection are activated in increments of 1 points. When the output section protection function is working, LED indicates it and signal is output to Head module. Automatic reset.)	
Dielectric withstand voltage			500 V AC for 1 minute between all DC external terminals and ground			
Insulation resistance			10 MΩ or more by insulation resistance tester			
Noise immunity			By noise simulator of 500 V p-p noise voltage; 1 s noise width and 25 to 60 Hz noise frequency; Fast transient noise IEC61000-4-4: 1kV			
Internal current consumption (5V DC)		mA	90	150	95	160
Dimensions (W x H x D)		mm	12.6 x 55.4 x 74.1	100.8 x 55.4 x 74.1	12.6 x 55.4 x 74.1	
Weight		kg	0.03	0.1	0.03	0.1
Applicable base module	Spring clamp type		ST1B-S3Y2, art. no. 152914	ST1B-S3Y16, art. no. 152915	ST1B-S3Y2, art. no. 152914	ST1B-S3Y16, art. no. 152915
	Screw clamp type		ST1B-E3Y2, art. no. 152924	ST1B-E3Y16, art. no. 152925	ST1B-E3Y2, art. no. 152924	ST1B-E3Y16, art. no. 152925
Connection cable type			2-wire 24 V DC with shield	2-wire 24 V DC with shield	2-wire 24 V DC with shield	2-wire 24 V DC with shield
Order information		Art. no.	152967	152968	152969	152970
Accessories			Wiring markers in different colours: ST1A-WMK-□□□ (refer to p. 77); Base module labels: ST1A-BMK- □□□ (refer to p. 77)			

Note: For connection diagram refer to page 90.

■ ST Series Relay Output Module

PLC ➠ All series



Relay output module

The digital relay output module of the ST series connect directly to field devices (e.g. contactors, valves, lights) and PROFIBUS/DP master module.

The electronic module is fitted in a base module, which can be installed on a standard DIN rail. The electronic module can be replaced without having to turn OFF the power ("Hot Swap"), without rewiring and without using any tool.

Special features:

- DIN rail mounting
- LEDs for RUN and ERROR on the modules and also on the basic module
- Connection to the basic module (head station) via integrated backplane bus in the base modules
- Two selectable types of connecting terminals base modules:
  - spring clamp type terminals
  - screw clamp type terminals

Specifications			ST1Y2-R2
Module type			Relay output module
Occupied I/O points			2 / 2
Occupied Slice number			1
Isolation method			Relay
Rated load voltage			24 V DC (+20/-15%); 240 V AC
Max. load current		A	2.0 (cos ϕ=1)/point; 4.0/common
Max. switching load			264 V AC/125 V DC
Response time	OFF ⟶ ON	ms	max. 10
	ON ⟶ OFF	ms	max. 12
Life	Mechanical		20 million times or more
	Electrical		200 V AC 1.5 A, 240 V AC 1.0 A (cosϕ=0.7) 0.1 million times or more 24 V DC 1.0 A, 100 V DC 0.1 A (L/R=7ms) 0.1 million times or more
Max. switching frequency			3600/h
Dielectric withstand voltage			2830 VAC; rms/3 cycles (altitude 200m)
Insulation resistance			10 MΩ or more by insulation resistance tester
Noise immunity			By noise simulator of 500 V p-p noise voltage; 1 s noise width and 25 to 60 Hz noise frequency; Fast transient noise IEC61000-4-4: 1 kV
Internal current consumption (V DC)		mA	90
Dimensions (W x H x D)		mm	12.6 x 55.4 x 74.1
Weight		kg	0.04
Applicable base module	Spring clamp type		ST1B-S4IR2, art. no. 152916
	Screw clamp type		ST1B-E4IR2, art. no. 152927
Connection cable type			2 wires (internal connected)

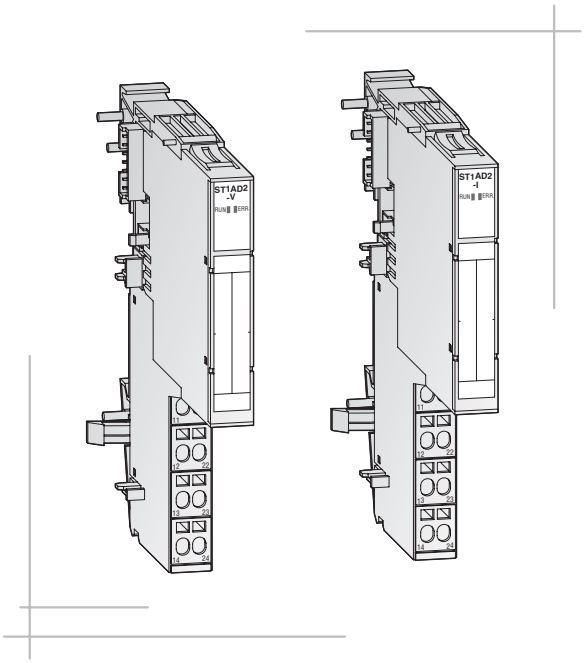
Order information	Art. no.	152971

Accessories	Wiring markers in different colours: ST1A-WMK-□□□ (refer to p. 77); Base module labels: ST1A-BMK- □□□ (refer to p. 77)

Note: For connection diagram refer to page 90.

■ ST Series Analog Input Module

PLC ➠ All series



Analog input modules

The analog input modules of the ST series convert analog process data like pressure, temperature, etc. into digital values that are sent to the PROFIBUS/DP master.

The electronic modules are fitted in a base module, which can be installed on a standard DIN rail. The electronic modules can be replaced without having to turn OFF the power ("Hot Swap"), without rewiring and without using any tools.

Special features:

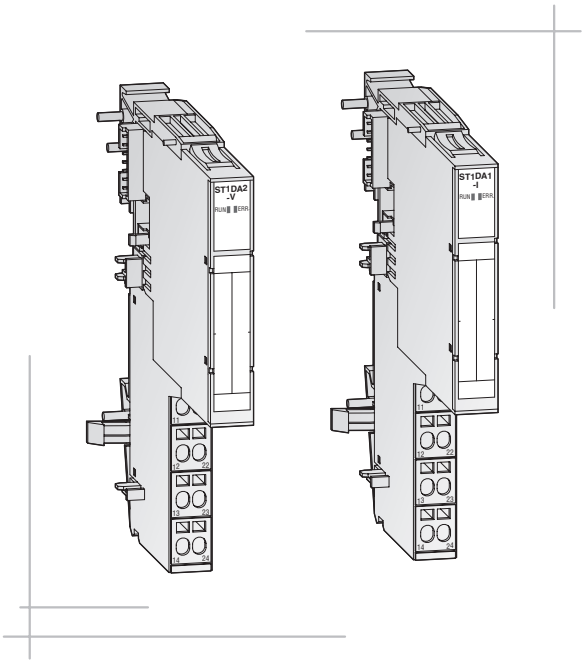
- DIN rail mounting
- LEDs for RUN and ERROR on the modules and also on the basic module
- Connection to the basic module (head station) via integrated backplane bus in the base modules
- Two selectable types of connecting terminals base modules:
  - spring clamp type terminals
  - screw clamp type terminals

Specifications			ST1AD2-V	ST1AD2-I
Module type			Analog input module	Analog input module
Occupied I/O points			4 / 4	4 / 4
Occupied Slice number			1	1
Number of input channels			2	2
Signal input range			-10 – +10 V 0 – +10 V 0 – 5 V 1 – 5 V	0–20 mA 4–20 mA
Resolution			12 bit + sign	12 bit + sign
Conversion time			0.1 ms per channel	0.1 ms per channel
Maximum input voltage			±15 V	—
Maximum input current			—	±30 mA
Total error			±0.8 % (0–55 °C)	±0.8 % (0–55 °C)
Data length			16 bit	
Input resistance	at Single-End		1.0 MΩ	250 Ω
Isolation	between the channels and backplane bus		Photo coupler	Photo coupler
	between the channels		—	—
Noise immunity			By noise simulator of 500 V p-p noise voltage; 1 s noise width and 25 to 60 Hz noise frequency; Fast transient noise IEC61000-4-4: 1 kV	
Dielectric withstand voltage			500 V AC for 1 minute between all DC external terminals and ground	
Internal current consumption (5V DC)		mA	110	110
Dimensions (W x H x D)		mm	12.6 x 55.4 x 74.1	12.6 x 55.4 x 74.1
Weight		kg	0.04	0.04
Applicable base module	Spring clamp type		ST1B-S4IR2, art. no. 152916	ST1B-S4IR2, art. no. 152916
	Screw clamp type		ST1B-E4IR2, art. no. 152927	ST1B-E4IR2, art. no. 152927
Connection cable type			2-wire 24 V DC with shield	2-wire 24 V DC with shield
Order information		Art. no.	152972	152973
Accessories			Wiring markers in different colours: ST1A-WMK-□□□ (refer to p. 77); Base module labels: ST1A-BMK- □□□ (refer to p. 77) Connectors for shielded analog cable: ST1A-SLD-□ (refer to p. 77)	

Note: For connection diagram refer to page 90.

■ ST Series Analog Output Module

PLC ➠ All series



Analog output modules

The analog output modules of the ST series convert the digital values sent from the PROFIBUS/DP master into an analog voltage signal. This signal can be used to control valves, inverters, servo-motors, etc.

The electronic modules are fitted in a base module, which can be installed on a standard DIN rail. The electronic modules can be replaced without having to turn OFF the power ("Hot Swap"), without rewiring and without using any tools.

Special features:

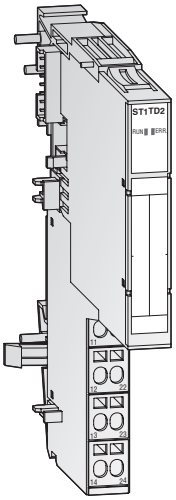
- DIN rail mounting
- LEDs for RUN and ERROR on the modules and also on the basic module
- Connection to the basic module (head station) via integrated backplane bus in the base modules
- Hot swap function for the electronic module
- Two selectable types of connecting terminals base modules:
  - spring clamp type terminals
  - screw clamp type terminals

Specifications			ST1DA2-V	ST1DA1-I
Module type			Analog output module	Analog output module
Occupied I/O points			4 / 4	4 / 4
Occupied Slice number			1	1
Number of output channels			2	1
Signal output range			-10 – +10 V 0 – +10 V 0 – 5 V 1 – 5 V	0–20 mA 4–20 mA
Resolution			12 bit + sign	12 bit + sign
Conversion time			0.1 ms per channel	0.1 ms per channel
Maximum input voltage			±15 V	—
Maximum input current			—	±30 mA
Total error			±0.8 % (0–55 °C)	±0.8 % (0–55 °C)
Data length			16 bit	
External load resistance value			1.0 kΩ–1.0 MΩ	0–500 Ω
Isolation	between the channels and backplane bus		Photo coupler	Photo coupler
	between the channels		—	—
Noise immunity			By noise simulator of 500 V p-p noise voltage; 1 s noise width and 25 to 60 Hz noise frequency; Fast transient noise IEC61000-4-4: 1 kV	
Dielectric withstand voltage			500 V AC for 1 minute between all DC external terminals and ground	
Internal current consumption (5V DC)		mA	95	95
Dimensions (W x H x D)		mm	12.6 x 55.4 x 74.1	
Weight		kg	0.04	0.04
Applicable base module	Spring clamp type		ST1B-S4IR2, art. no. 152916	ST1B-S4IR2, art. no. 152916
	Screw clamp type		ST1B-E4IR2, art. no. 152927	ST1B-E4IR2, art. no. 152927
Connection cable type			2-wire 24 V DC with shield	2-wire 24 V DC with shield
Order information		Art. no.	152975	152976
Accessories			Wiring markers in different colours: ST1A-WMK-☐☐☐ (refer to p. 77); Base module labels: ST1A-BMK- ☐☐☐ (refer to p. 77) Connectors for shielded analog cable: ST1A-SLD-☐ (refer to p. 77)	

Note: For connection diagram refer to page 90.

■ ST Series Analog Temperature Input Module

PLC ➠ All series



Analog Temperature Input Module

The analog temperature input modules of the ST series convert analog temperature data into digital values that are sent to the PROFIBUS/DP master.

The electronic modules are fitted in a base module, which can be installed on a standard DIN rail. The electronic modules can be replaced without having to turn OFF the power ("Hot Swap"), without rewiring and without using any tools.

Special features:

- DIN rail mounting
- LEDs for RUN and ERROR on the modules and also on the basic module
- Connection to the basic module (head station) via integrated backplane bus in the base modules
- Hot swap function for the electronic module
- Two selectable types of connecting terminals base modules:
  - spring clamp type terminals
  - screw clamp type terminals

Specifications			ST1TD2
Module type			Analog input module
Occupied I/O points			4 / 4
Occupied Slice number			2
Number of input channels			2
Output	Temperature conversion		1-bit signed binary (-2,700–18,200: value to the first decimal place × 10 times)
	Micro conversion		16-bit signed binary (-20,000–20,000)
Standard with thermocouple conforms			IEC584-1 (1997), IEC854-2 (1982), JIS C1602-1995
Cold junction temperature compensation accuracy			Ambient air temperature 25±5 °C: 1.5 °C; ambient air temperature 0–55 °C: ±2.5 °C
Thermocouple input accuracy			Depends on the used model of thermocouple
Micro voltage input range		mV	-80 – +80 (input resistance 1 MΩ or more)
Micro voltage input accuracy			Ambient air temperature 25±5 °C: ±0.16 mV; ambient air temperature 0–55 °C: ±0.32 mV
Resolution	Thermocouple input		K,T: 0.3 °C; E: 0.2 °C; J: 0.1 °C; B: 0.7 °C; R, S: 0.8 °C; N: 0.4 °C
	Micro voltage input	µV	4
Conversion speed			Cold junction temperature compensation setting: Not set: 30 ms/channel; Set: 60 ms/channel
Wire break detection			Yes (channel independent)
Absolute maximum input			±4 V
ROM write count			ROM write count by user range write or parameter setting: up to 10,000 times
Isolation	between the channels and backplane bus		Photo coupler
	between the channels		—
Noise immunity			By noise simulator of 500 V p-p noise voltage; 1 s noise width and 25 to 60 Hz noise frequency; Fast transient noise IEC61000-4-4: 1 kV
Dielectric withstand voltage			500 V AC for 1 minute between all DC external terminals and ground
Internal current consumption (5V DC)		mA	95
Dimensions (W x H x D)		mm	12.6 x 55.4 x 77.6
Weight		kg	0.04
Applicable base module	Spring clamp type		ST1B-S4TD2, art. no. 161736
	Screw clamp type		ST1B-E4TD2, art. no. 161737
Connection cable type			2-wire 24 V DC with shield

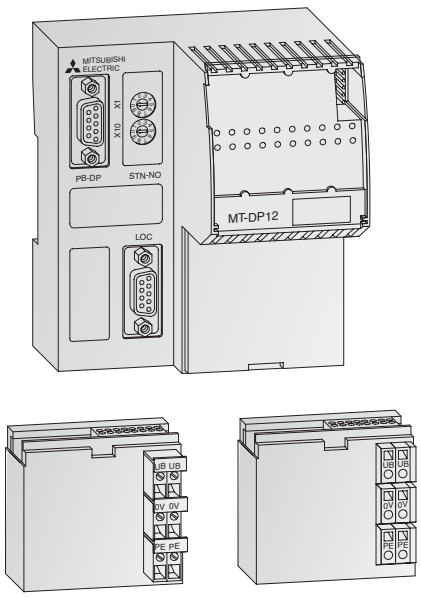
Order information	Art. no.	152972

Accessories	Wiring markers in different colours: ST1A-WMK-☐☐☐ (refer to p. 77); Base module labels: ST1A-BMK- ☐☐☐ (refer to p. 77) Connectors for shielded analog cable: ST1A-SLD-☐ (refer to p. 77)

Note: For connection diagram refer to page 90.

■ MT Series Basic Modules

PLC ➠ All series



Basic module (head station) of the MT series

The basic modules connect the extension modules of the MT series (MT = Modular Type) to PROFIBUS/DP. Due to the additional second interface on the basic module the extension modules can be installed in two rows.

The modules on the separate DIN rail are supplied with data and the system voltage via an extension cable and the local system extension module.

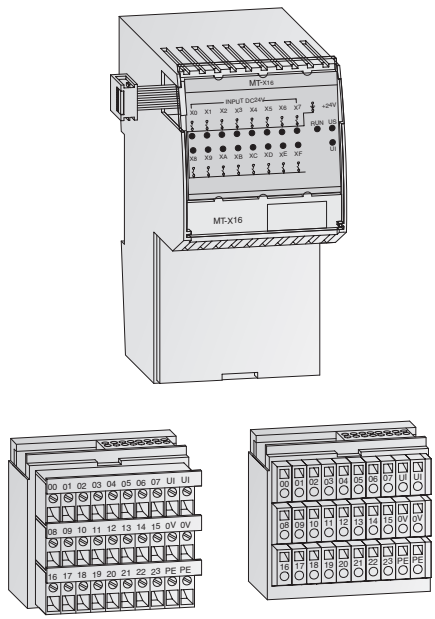
Special features:

- Up to 16 digital and 8 analog extension modules can be connected.
- Automatic detection of the data transfer rate
- Optocouplers between interface and system
- Two selectable types of connecting terminals:
  - screw clamp type terminals
  - spring clamp type terminals
- Supported installation in two rows through the local extension MT-LE-SET to be connected to the basic module.
- Up to 256 digital inputs/outputs per basic module
- DIN rail mounting

Specifications			MT-DP12	MT-DP12E
Module type			Basic module of the MT series, PROFIBUS/DP slave	Basic module of the MT series, PROFIBUS/DP slave
Communications	protocol		DIN 19245-T3	EN50170, DIN 19245-T3
	medium		Shielded pair with 24AWG = 0.22 mm², impedance: 100 – 130 Ω; Shielded pair with 22AWG = 0.34 mm², impedance: 135 – 165 Ω	Shielded pair with 24AWG = 0.22 mm², impedance: 100 – 130 Ω; Shielded pair with 22AWG = 0.34 mm², impedance: 135 – 165 Ω
Interface			RS485	RS485
Operation modes			Sync mode and freeze mode are supported	Sync mode and freeze mode are supported
Communications rate			9.6; 19.2; 93.75; 187.5; 500 kBit/S, 1.5; 3; 6; 12 Mbit/s	9.6; 19.2; 93.75; 187.5; 500 kBit/S, 1.5; 3; 6; 12 Mbit/s
Max. total distance		m	4800 (3 repeater)	4800 (3 repeater)
No. of connectable extension modules			Max. 16 extension modules (digital and analog I/O modules)	Max. 4 extension modules (digital and analog I/O modules)
Adressable digital I/Os			256	72
I/O points			—	—
Integrated inputs				
Digital inputs			—	8
Isolation			—	Optocoupler isolation between input terminals and internal power.
Rated input current		V DC	—	24 (18 – 30)
Response time	OFF ⟶ ON	ms	—	1
	ON ⟶ OFF	ms	—	1
Short circuit protection			—	Electronic
Status display for inputs			—	The module has status LEDs for all inputs.
Common data				
Applicable wire size		mm²	0.75 – 2.5	0.75 – 2.5
Power supply		V DC	24	24
Internal power consumption (24 V DC)		A	Max. 0.8 (with maximum configuration)	Max. 0.5 (with maximum configuration)
Weight		kg	0.28	0.35
Dimensions (W x H x D)		mm	96 x 114 x 60	96 x 114 x 60
Order information		Art. no.	130070	124622
Accessories			Local system adapter MT-LE with extension cable MT-LE-CBL50 (length 0.5 m) = MT-LE-SET, art. no. 69759 Screw type terminal block MT-DP12-TBS, art. no. 68888 Spring clamp terminal block MT-DP12-TBC, art. no. 68889 PROFIBUS plug connector for up to 12 Mbaud: PROFICON-PLUS, art. no. 140008 or PROFICON-PLUS-PG, art. no. 140009 (refer to page 76)	Screw type terminal block MT-DP12E-TBS, art. no. 124624 Spring clamp terminal block MT-DP12E-TBC, art. no. 124623 PROFIBUS plug connector for up to 12 Mbaud: PROFICON-PLUS, art. no. 140008 or PROFICON-PLUS-PG, art. no. 140009 (refer to page 76)

■ MT Series Digital Input/Combination Modules

PLC ➠ All series



Digital input/combination modules

The digital input modules of the MT series connect directly with field devices (contacts, limit switches, etc.) and PROFIBUS/DP master module.

Modules with 4, 8 and 16 inputs are available.

Beside the 4 inputs the combination module MT-X4Y4T consists of 4 transistor outputs. It additionally controls devices (e.g. contactors, valves, lights) via a PROFIBUS/DP master module.

Special features:

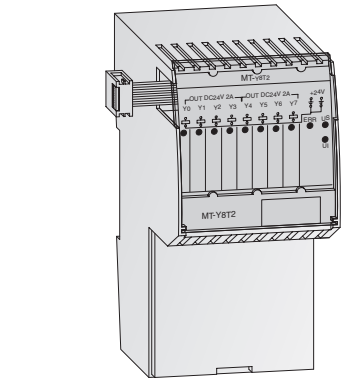
- For the 16-type modules potential terminal blocks in three-wire technology are available.
- The power supplying the sensors and outputs (except relay output) is directly fed into the module.
- Standard potential isolation between process and module
- Two selectable types of connecting terminals:
  - screw clamp type terminals
  - spring clamp type terminals
- Also supports 3-wire sensors

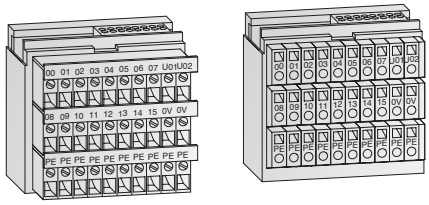
Specifications			MT-X8	MT-X16	MT-X4Y4T
Inputs			8	16	4
Simultaneously ON inputs			70 %	70 %	100 %
Outputs			—	—	4
Output type			—	—	Transistor
Common terminal arrangement			—	—	4
Isolation			Optocoupler isolation between input terminals and internal power for all modules.		
Input voltage (sensor supply)		V DC	24 (±25 %)	24 (±25 %)	24 (±25 %)
Output voltage range		V DC	—	—	24 (-1 %)
Output voltage (actuator supply)		V DC	—	—	24 (±25 %)
Max. switching voltage		V DC	—	—	—
Rated input current		A	0.7	0.7	0.7
Max. current	per output	A	—	—	0.5
	per group	A	—	—	4
Inrush current			—	—	—
Leakage current at OFF			—	—	< 50 µA
Response time	OFF ⟶ ON	ms	≤ 1	≤ 1	≤ 14
	ON ⟶ OFF	ms	≤ 1	≤ 1	≤ 0.05
Short circuit protection			Electronic	Electronic	Electronic
Status display for inputs			All modules have one or two status LEDs per input.		
Error indicator			LED	LED	LED
I/O points			8	16	8
Connection terminal			All modules can be fitted with screw type or spring clamp terminal blocks (see accessories).		
Applicable wire size		mm^2	0.75 – 2.5	0.75 – 2.5	0.75 – 2.5
External sensor/actor supply			24 V DC (≤30 mA)	24 V DC (≤30 mA)	24 V DC (≤20 mA)
Internal power consumption (8 V DC)		mA	25	30	35
Weight (without terminal block)		kg	0.16	0.17	0.22
Dimensions (W x H x D)		mm	56 x 114 x 60	56 x 114 x 60	56 x 114 x 60
Order information		Art. no.	68893	68896	124625
Accessories*		Terminal blocks	MT-X8-TBS, art. no. 68894 MT-X8-TBC, art. no. 68895	MT-X16-TBS, art. no. 68897 MT-X16-TBC, art. no. 68898 MT-X16-PTBS, art. no. 69400 MT-X16-PTBC, art. no. 69397	MT-X4Y4T-TBS, art. no. 124626 MT-X4Y4T-TBC, art. no. 124627

* Description of the terminal blocks: TBS=screw type terminal block, TBC=spring clamp terminal block, PTBS=screw type terminals with potential terminal, PTBC=spring clamp terminals with potential terminal

■ MT Series Digital Output Modules

PLC ➠ All series





Digital output modules

The digital output modules of the MT series connect directly with field devices (e.g. contactors, valves, lights) and PROFIBUS/DP master module.

Modules with 4, 8 and 16 outputs and a wide selection of output types are available to suit all applications.

Special features:

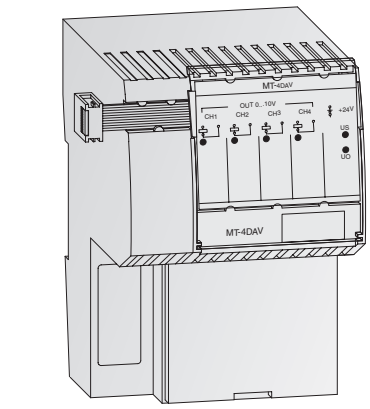
- The output modules provide transistor outputs rated at 0.5 A and 2 A, and relay outputs with up to 3 A (AC).
- The power supplying the sensors and outputs (except relay output) is directly fed into the module.
- Standard potential isolation between process and module
- Two selectable types of connecting terminals:
  - screw clamp type terminals
  - spring clamp type terminals
- Also support 3-wire devices

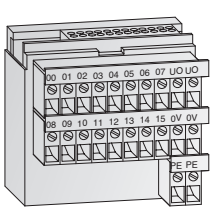
Specifications			MT-Y8T	MT-Y16T	MT-Y8T2	MT-Y4R	MT-Y8R5
Outputs			8	16	8	4	8
Output type			Transistor	Transistor	Transistor	Relay	Relay
Common terminal arrangement			8	8	4	1	1
Isolation			Optocoupler isolation between input and output terminals and internal power for all modules.				
Output voltage range			24 V DC (-1 %)	24 V DC (-1 %)	24 V DC (-0.5 %)	24 / 110 / 230 V DC, AC	24 / 110 / 230 V DC, AC
Output voltage (actuator supply)			24 V DC (±25 %)	24 V DC (±25 %)	24 V DC(±25 %)		
Max. switching voltage			—	—	—	250 V AC	250 V AC
Switching capacity conf. EN60947/5/1		at 24 V	—	—	—	2 A (AC15) / 1.3 A (DC 13)	5 A (AC12) / 3 A (AC15) / 1.0 A (DC 13)
		at 110 V	—	—	—	2 A (AC15) / 0.25 A (DC 13)	5 A (AC12) / 3 A (AC15) / 0.2 A (DC 13)
		at 220 V	—	—	—	2 A (AC15) / 0.1 A (DC 13)	5 A (AC12) / 3 A (AC15) / 0.1 A (DC 13)
Max. current	per output	A	0,5	0,5	2	—	—
	per group	A	4	4	10	—	—
Leakage current at OFF			<50 µA	<50 µA	<50 µA	—	—
Response time	OFF ⟶ ON	ms	≤ 0.14	≤ 0.14	≤ 0.3	10 ms	10 ms
	ON ⟶ OFF	ms	≤ 0.05	≤ 0.05	≤ 0.08	5 ms	5 ms
Short circuit protection			Electronic	Electronic	Electronic	—	—
Status display for outputs			All modules have one or two status LEDs per output.				
Error indicator			LED	LED	—	—	—
I/O points			8	16	8	8	8
Connection terminal			All modules can be fitted with screw type or spring clamp terminal blocks (see accessories).				
Applicable wire size		mm^2	0.75 – 2.5	0.75 – 2.5	0.75 – 2.5	0.75 – 2.5	0.75 – 2.5
External sensor/actor supply			24 V DC (≤20 mA)	24 V DC (≤20 mA)	24 V DC (≤20 mA)	24 V DC (≤20 mA)	24 V DC (≤20 mA)
Internal power consumption (8 V DC)		mA	35	60	35	Max. 45	Max. 120
Weight (without terminal block)		kg	0.16	0.16	0.18	0.175	0.325
Dimensions (W x H x D)		mm	56 x 114 x 60	56 x 114 x 60	56 x 114 x 60	56 x 114 x 60	112 x 114 x 60
Order information		Art. no.	68899	68902	68905	68908	124628
Accessories*		Terminal blocks	MT-Y8T-TBS, art. no. 68900 MT-Y8T-TBC, art. no. 68901	MT-Y16T-TBS, art. no. 68903 MT-Y16T-TBC, art. no. 68904 MT-Y16T-PTBS, art. no. 69399 MT-Y16T-PTBC, art. no. 69398	MT-Y8T2-TBS, art. no. 68906 MT-Y8T2-TBC, art. no. 68907	MT-Y4R-TBS, art. no 69401 MT-Y4R-TBC, art. no. 69402	MT-Y8R5-TBSLR, art. no. 125534 MT-Y8R5-TBCLR, art. no. 125533

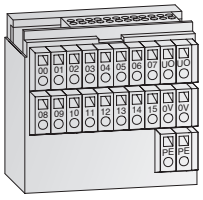
* Description of the terminal blocks: TBS=screw type terminal block, TBC=spring clamp terminal block, PTBS=screw type terminals with potential terminal, PTBC=spring clamp terminals with potential terminal

■ MT Series Analog Input/Output Modules

PLC ➠ All series







Analog input/output modules

Analog input modules of the MT series convert analog process data like pressure, temperature, etc. into digital values that are sent to the PROFIBUS/DP master.

The analog output modules convert the digital values sent from the PROFIBUS/DP master into an analog voltage signal. This signal can be used to control valves, inverters, servomotors, etc.

Special features:

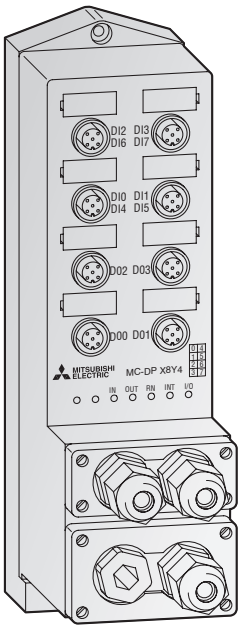
- 4 separately parameterisable channels per module
- Voltage, current, and temperature evaluation (MT-4AD-N) can be set via parameter.
- The power supplying the sensors and outputs is directly fed into the module.
- With the analog input module current, voltage, and 4-wire PT100 inputs can be operated in parallel
- Two selectable types of connecting terminals:
  - screw clamp type terminals
  - spring clamp type terminals
- Standard potential isolation between process and module

Specifications			MT-4AD-N		MT-4DA		MT-4DAV	
Module type			Analog input module		Analog output module		Analog output module	
No. of channels			4		4		4	
Analog input			-10 V – +10 V, -20 mA – +20 mA, 4 – 20 mA, -180 – +600 °C (PT100)		—		—	
Resolution of digital output			16 bits binary (incl. sign)		—		—	
Resolution of digital input			—		16 bits binary (incl. sign)		16 bits binary (incl. sign)	
Analog output			—		-10 – +10 V, 0 – +20 mA		0 – 10 V DC	
Input resistance	voltage	kΩ	200		—		—	
	current	Ω	50		—		—	
Max. input	voltage	V	±15		—		—	
	current	mA	±30		—		—	
Max. output load			—		≥750 Ω		≥750 Ω	
I/O characteristics			**Analog input**	**Digital output**	**Digital input**	**Analog output**	**Digital input**	**Analog output**
			-10 – +10 V -20 – +20 mA 4 – 20 mA -180 – +600 °C	-2048 – +2048 -2048 – +2048 0 – +2048 -1800 – +6000	- 2000 – +2000 0 – 2000	-10 – +10 V 0 – +20 mA	0 – 4000	0 – 10 V
Max. resolution			2.5 mV 5 µA 4 µA 0.125 °C		5 µV 10 µA		—	2.5 mV
Overall accuracy in % of the measurement range			± 50 mV (-10 – +10 V) ± 80 µA (-20 – +20 mA) ± 76 µA (4 – 20 mA) ± 4.2 °C (-180 – +600 °C)		—		—	± 30 mV (0 – +10 V)
Max. conversion time			50 ms/channel		1 ms/4 channels		1 ms/channel	
Isolation			Optocoupler isolation between input terminals and internal power					
Connection terminal			All modules can be fitted with screw type or spring clamp terminal blocks (see accessories).					
External sensor/actor supply			24 V DC (≤50 mA)		24 V DC (≤50 mA)		24 V DC (≤120 mA)	
Applicable wire size		mm^2	0.75 – 1.5		0.75 – 1.5		0.75 – 1.5	
Internal power consumption (8 V DC)		mA	80		60		60	
Weight		kg	0.225		0.225		0.22	
Dimensions (W x H x D)		mm	76 x 114 x 60		56 x 114 x 60		76 x 114 x 60	
Order information		Art. no.	133769		124643		68912	
Accessories		Terminal blocks	Screw type terminal block MT-4AD-TBS-N, art. no. 133770 Spring clamp terminal block MT-4AD-TBC-N, art. no. 133771		Screw type terminal block MT-4DA-TBS, art. no. 124645 Spring clamp terminal block MT-4DA-TBC, art. no. 124644		Screw type terminal block MT-4DAV-TBS, art. no. 68913 Spring clamp terminal block MT-4DAV-TBC, art. no. 68914	

*Description of the terminal blocks: TBS=screw type terminal block, TBC=spring clamp terminal block

■ MC Series Digital Input/Output Modules

PLC ➠ All series



Digital input, output, and combined modules acc. to IP67

The digital I/O modules of the MC series connect directly with field devices (contacts, limit switches, etc.) on the machine and PROFIBUS/DP master. The sensors and actuators are connected via plug-type/screw terminals.

Different modules with 16 inputs max. and 16 outputs max. as well as a combined I/O module with 8 inputs and 4 outputs are available.

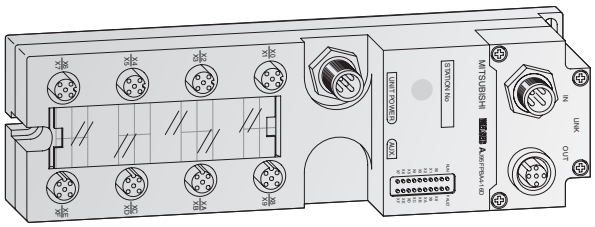
Special features:

- The power for the sensors and actuators is supplied directly on the module.
- Standard electrical isolation between process and control via optocoupler.
- Overload and short-circuit protection.
- Supports 3-wire connection

Specifications			MC-DPX8	MC-DPX16	MC-DPY8	MC-DPX8Y4	MC-DPY16
Inputs			8	16	—	8	—
Outputs			—	—	8	4	16
Output type			—	—	Transistor	Transistor	Transistor
Isolation			Optocoupler isolation between input terminals and internal power				
Input voltage (sensor supply)			24 V DC (±25 %)	24 V DC (±25 %)	24 V DC (±25 %)	24 V DC (±25 %)	
Rated output voltage			—	—	24 V DC (-1 %)	24 V DC (-1 %)	
Output voltage (actuator supply)			—	—	24 V DC (±25 %)	24 V DC (±25 %)	
Max. switching voltage		A	—	—	1.6	1.6	1.0
Max. input current		A	< 0.1	< 0.1	—	< 0.1	—
Max. current	per output	A	—	—	2	2	1
	per group	A	—	—	10 at 0–55 °C, 16 at 0–40 °C	10 at 0–55 °C, 16 at 0–40 °C	10 at 0–55 °C, 16 at 0–40 °C
Leakage current at OFF			—	—	<10 µA	<10 µA	<10 µA
Response time	OFF ⟶ ON	ms	1	1	0.5	0.5	0.5
	ON ⟶ OFF	ms	1	1	0.5	0.5	0.5
Short circuit protection			Electronic	Electronic	Electronic	Electronic	Electronic
Status display for outputs			All modules have one status LED per output.				
Error indicator			LED	LED	LED	LED	LED
I/O points			8	16	8	12	16
Sensor/actor connection			M12	M12	M12	M12	M12
Applicable wire size		mm^2	0.75 – 2.5	0.75 – 2.5	0.75 – 2.5	0.75 – 2.5	0.75 – 2.5
External sensor/actor supply			24 V DC (≤100 mA)	24 V DC (≤100 mA)	24 V DC (≤100 mA)	24 V DC (≤100 mA)	24 V DC (≤100 mA)
Internal power consumption (8 V DC)		mA	80	80	80	80	80
Weight (without termninal block)		kg	0.47	0.47	0.47	0.47	0.47
Dimensions (W x H x D)		mm	62 x 217.5 x 70.5	62 x 217.5 x 70.5	62 x 217.5 x 70.5	62 x 217.5 x 70.5	62 x 217.5 x 70.5
Order information		Art. no.	127208	127211	127209	127210	130649
Accessories			Special connection accessories on request; M12 connection cables (refer to page 78)				

■ Waterproof Type Input, Output and Combination Modules

PLC ➠ All series



IP67 Waterproof type input, output and combination modules

The waterproof modules of the AJ95FPBA□□-□□□ series connect directly to field devices (contacts, limit switches, etc.) on the machine and PROFIBUS/DP master module. The sensors and actuators are connected via plug-type/screw terminals.

Different modules with 16 inputs max. and 16 outputs max. as well as a combined I/O module with 8 inputs and 8 outputs are available.

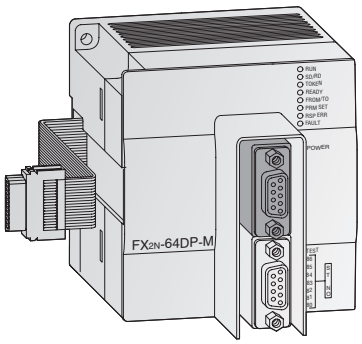
Special features:

- The driving power for the sensors and actuators is supplied directly on the module.
- Electrical isolation between process and control via optocoupler as standard.
- Overload and short-circuit protection
- IP67 protection (water proof)
- Simple connection without tools saves installation time
- Switch setting is available even after the module has been mounted.
- The built-in terminal resistor makes no need for the installation of an external terminal resistor.
- The slim design saves installation space.
- Supports 3-wire connection

Specifications			AJ95FPBA4-16DE	AJ95FPBA2-16TE	AJ95FPBA42-16DTE
Module type			Input module	Output module	Combination module
Level of protection			IP67	IP67	IP67
Inputs			16	—	8
Outputs			—	16	8
Input type			DC input	—	DC input
No. of points per module			16	—	8
Output type			—	DC output	DC output
No. of points per module			—	16	8
Insulation type			All modules feature photocoupler insulation.		
Input voltage		V DC	24	12 / 24	24
Input current		mA	7	—	7
Max. output current	per output	A	—	1	1
	per group	A	—	4	4
Minimum signal voltage	ON voltage	V	≥ 14	—	≥ 14
	OFF voltage	V	≤ 6	—	≤ 6
Response time	OFF ⟶ ON	ms	≤ 1.5	≤ 0.5	≤ 1.5 / ≤ 0.5
	ON ⟶ OFF	ms	≤ 1.5	≤ 1.5	≤ 1.5
Status display of I/Os			All modules provide LEDs for each I/O.		
Error (RUN) display of stations			LED	LED	LED
I/O points			16	16	16
Connection terminals			M12	M12	M12
Internal power consumption		mA	65	75	75
Weight (without terminal block)		kg	0.40	0.40	0.40
Dimensions (W x H x D)		mm	60 x 200 x 48	60 x 200 x 48	60 x 200 x 48
Order information		Art. no.	142200	142201	142202
Accessories			M12 connection cables (refer to page 78)		

■ MELSEC FX PROFIBUS/DP Master Module FX2N-64DP-M

PLC ➠ FX2N(C) series



FX2N-64DP-M

The Profibus/DP master module FX2N-64DP-M enables communication between PLCs of the MELSEC FX family and other Profibus devices.

The FX2N-64DP-M can control up to 60 slave units. In Extended Service mode it can process up to 244 input bytes and 244 output bytes.

Setup and parameter adjustment are performed with the user-friendly GX Configurator DP configuration software package. The FX2N-64DP-M supports Sync global control, Unsync global control, Freeze global control and Unfreeze global control.

Profibus parameters such as cycle periods and I/O data can be set and displayed directly using the programming software or the FX-20 PE hand-held programming unit.

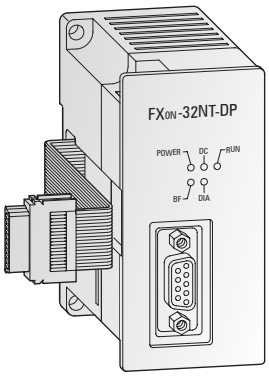
Specifications		FX2N-64DP-M
Module type		Master
General specifications		Conforms to FX1N/FX2N/FX2NC base units
Power supply		5 V DC / max. 30 mA (from base unit), 24 V DC / 250 mA
Communications protocol		EN50170, DIN19245T3
Interface		PROFIBUS/DP (with 9 pole D-SUB)
Communications speed		PROFIBUS standard (see table on page 43)
PROFIBUS specifications		PROFIBUS standard (see table on page 43)
Max. number of nodes		32, 62 (1 Repeater), 92 (2 Repeater), 126 (3 Repeater)
Communications distance	m	Max. 1,200 (depends on communication speed)
Related I/O points		8
Weight	kg	0.4
Dimensions (W x H x D)	mm	85 x 90 x 87

Order information	Art. no.	on request

Accessories	Configuration software: GX Configurator DP (Vers. 4.0), Art. no. 136578; PROFIBUS connector up to 12 Mbaud: PROFICON-PLUS, art. no. 140008 or PROFICON-PLUS-PG, art. no. 140009

■ MELSEC FX PROFIBUS/DP Slave Module FX0N-32NT-DP

PLC ➠ FX1N/FX2N(C) series



FX0N-32NT-DP

The FX0N-32NT-DP PROFIBUS/DP module enables you to integrate a MELSEC FX1N/FX2N(C) system in an existing PROFIBUS/DP network.

This interface module provides your FX1N, FX2N or FX2NC CPU with an intelligent PROFIBUS/DP link for the implementation of decentralised control tasks.

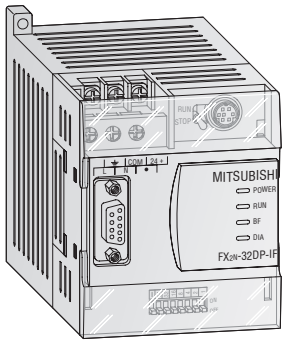
It links the system to the master PLC in the PROFIBUS/DP network for efficient and trouble-free data exchange.

Specifications			FX0N-32NT-DP
General specifications			Conforms to FX1N/FX2N(C) base units
Power supply			5 V DC / max. 170 mA (from base unit), 24 V DC / 60 mA
Interface			PROFIBUS/DP (with 9 pole D-SUB connector)
Communication speed	distance		
	1,200 m	kbit/s	9.6 / 19.2 / 93.75
	1,000 m	kbit/s	187.5
	200 m	kbit/s	1500
	100 m	kbit/s	3,000 / 6,000 / 12,000
Communication distance		m	Max. 1,200 (depends on communication speed)
Communication cable			PROFIBUS cable with 9-pin D-SUB connector
Related I/O points			8
Weight		kg	0.3
Dimensions (W x H x D)		mm	43 x 90 x 87

Order information	Art. no.	62125

■ MELSEC FX PROFIBUS/DP Decentralised I/O Stations

PLC ➠ FX1N/FX2N(C) series



FX2N-32DP-IF / FX2N-32DP-IF-D

The remote I/O station FX2N-32DP-IF(-D) forms an extremely compact communication unit and provides a connection of I/O modules with up to 256 I/O points or up to 8 special function modules as an alternative.

It features an entire electrical isolation of the PROFIBUS/DP connector and of the sensor/actuator circuits.

The module FX2N-32DP-IF includes a 230 V AC power supply unit and a 24 V DC service voltage terminal e.g. for analog modules. The FX2N-32DP-IF-D includes a 24 V DC power supply unit.

Profibus data such as the cycle time or I/O data can be monitored by using the programming software or directly on the hand-held programming unit FX-20PE. This allows easy error diagnosis directly on the module.

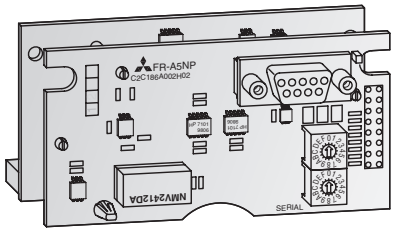
For detailled information on compatible I/O modules please refer to the Technical Catalogue FX series.

Specifications			FX2N-32DP-IF	FX2N-32DP-IF-D
General specifications			Conforms to FX1N/FX2N(C) base units	
Power supply			100–240 V AC (±10 %) 50/60 Hz	24 V DC (+20 % -30 %)
Power consumption			35 VA	14 W
Internal current supply			5 V DC / max. 200 mA (from base unit), 24 V DC / 500 mA	5 V DC / max. 220 mA, 24 V DC / max. 190 mA
Interface (connectors)			9-pin D-SUB for PROFIBUS/DP, 8-pin Mini-DIN for PC or programming unit FX-20PE	
Communication speed	distance			
	1,200 m	kBit/s	9.6 / 19.2 / 45.45 / 93.75	9.6 / 19.2 / 45.45 / 93.75
	1,000 m	kBit/s	187.5	187.5
	400 m	kBit/s	500	500
	200 m	kBit/s	1,500	1,500
	100 m	kBit/s	3,000 / 6,000 / 12,000	3,000 / 6,000 / 12,000
Communication distance		m	Max. 1,200 (depends on communication speed)	
Communication cable			PROFIBUS cable with 9-pin D-SUB connector	
Max. number of controllable I/O points			Max. 256	Max. 256
Weight		kg	0.4	0.4
Dimensions (W x H x D)		mm	75 x 98 x 87	75 x 98 x 87

Order information	Art. no.	103705	142763

■ Communications Boards for Inverters

INV ➠ FR-A 500/FR-E 500 series



FR-A5NP, FR-E5NP

These inverter options allow Mitsubishi Electric frequency inverters to be connected to a PROFIBUS/DP network. This enables remote control of the frequency inverters via PROFIBUS.

The option boards are mounted directly in the inverter front face.

The FR-A5NP is used for the FR-A 500 type and the FR-E5NP is used for the FR-E 500 type.

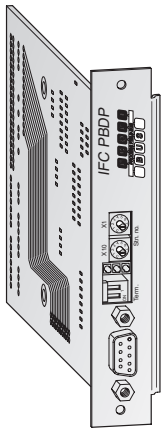
Special features:

- Data rates up to 12 Mbit/s
- Up to 126 stations are supported in a single network
- Network access to all inverter parameters is possible.
- LED status light for status information on the communication link

Specifications			FR-A5NP	FR-E5NP
Applicable inverters			FR-A 540 (L) EC, FR-A 520	FR-E 500 EC
General specifications			Conforms to Mitsubishi frequency inverters	
Power supply			5 V DC / max. 300 mA (from inverter), 24 V DC / 130 mA	
Backplane isolation		V DC	Min. 500	
Interface			PROFIBUS/DP	
Communication speed	distance			
	1200 m	kbit/s	9.6 / 19.2 / 93.75	
	1000 m	kbit/s	187.5	
	200 m	kbit/s	1500	
	100 m	kbit/s	3000 / 6000 / 12000	
Communication distance		m	Max. 1200 (depends on communication speed)	
Communication cable			PROFIBUS cable with 9-pin D-SUB plug	
Related I/O points			8	
Dimensions (W x H x D)		mm	96 x 49 x 33	
Order information		Art. no.	132707	104556

■ HMI Communications Adapter

HMI ➠ MAC E series



MAC-IFC-PBDP/E

The PROFIBUS/DP interface board supports the connection of the MAC E series HMIs to a PROFIBUS/DP network.

The board is easily inserted into the according slot of the control unit.

Specifications		MAC-IFC-PBDP/E
Application for		MAC E300/E600/E610/E615/E700/E710/E900T/E900VT/E910T
Type		Plug-in board
Use		PROFIBUS/DP slave
Order information	Art. no.	56166

DeviceNet

Overview

DeviceNet represents a cost-effective solution for the network integration of low-level terminal equipment.
Up to 64 devices including a master can be integrated in one network.

Structure

Due to the supported tree structure of the data line, a T-junction can be installed in any place. It has to be considered that the overall extension must not exceed 500 m, unless repeaters are used.

When using repeaters the maximum length is 3 km.

Cable types

For the data exchange a cable with two shielded twisted-pair cables is used.

Parameterization

Parameterization is done with the configuration software SyCon from Ver. 2.0.6.2 by the Hilscher company.

Communications

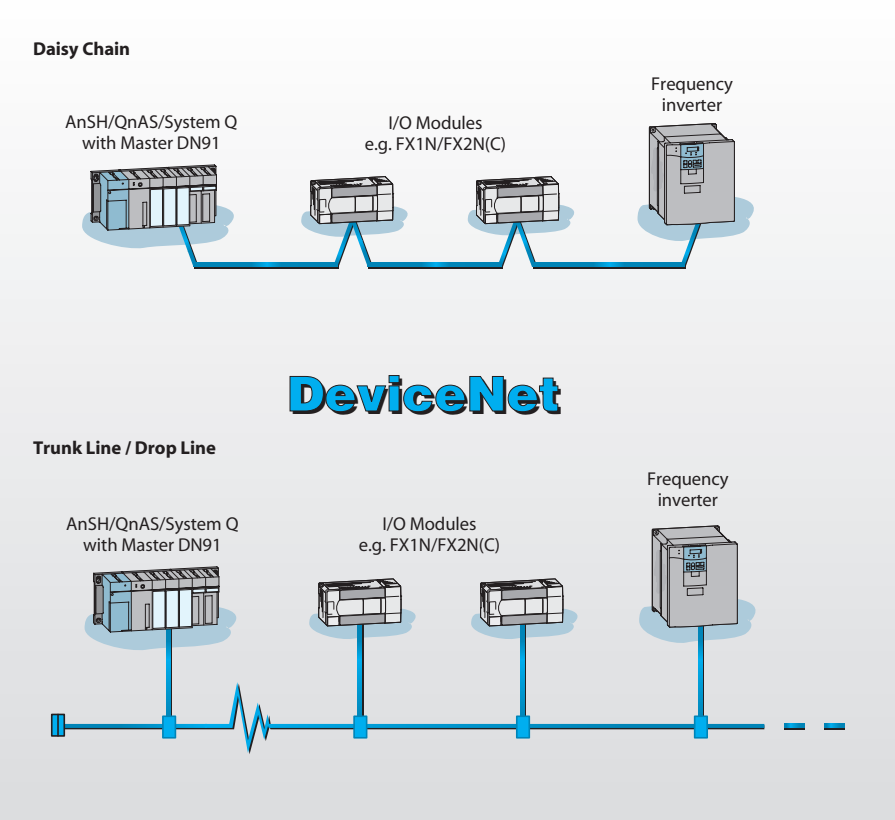
The bus accessing method CSMA/NDA ensures an extremely fast and efficient access of the link devices to the bus.

Based on the Producer/Consumer network model this method allows flexible and efficient data transfer.

The slave modules communicate via the following methods:

- Polling
- Bit strobe
- Change of state
- Cyclic

Information is transmitted in packets of 8 bytes. Packets exceeding these 8 bytes are fragmented automatically.



Cable		Thick Cable	Thin Cable
Outline diameter	mm	12.2	6.9
Inside wire for data (blue / white)		18AWG19x30 zinc plated	24AWG19x36 zinc plated
Inside wire for power supply (red / black)		15AWG19x28 zinc plated	22AWG19x34 zinc plated
Trunkline		Yes	Yes
Dropline		Yes	Yes
Max. distance	m	500	500
Max. distance incl. repeater	m	3000	3000

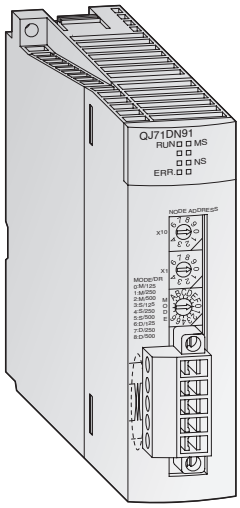
Recommended cable types by company Belden:

Belden number	Type	Specifications
3082A	Trunk cable	Thick cable, PVC jacket
3082F	Flexible trunk cable	Thick cable, PVC jacket
3084A	Drop cable	Thin cable, PVC jacket

All cables comply with **O**pen **D**evice **N**et **V**endor (ODVA) specifications.

■ MELSEC System Q Master Module

PLC ➠ System Q



CAN based network for low level terminals

DeviceNet represents a cost-effective solution for the network integration of low-level terminal equipment.

Up to 64 devices including a master can be integrated in one network.

Special features:

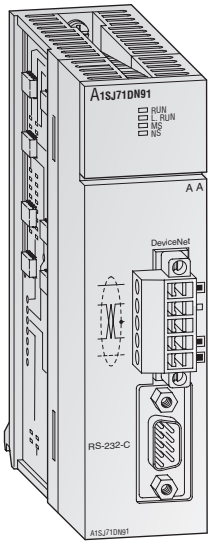
- The positions of master and slave stations are user-selectable.
- Transfer rates of 125, 250 and 500 kBaud
- Transmission distances of up to 500 m
- Communication methods
  - Polling
  - Bit strobe
  - Change of state
  - Cyclic

Specifications			QJ71DN91
Module type			Master (Group 2 only client)
Applicable PLC series			MELSEC System Q
Nodes per network			Group 2 Client
Stations per network			0 up to 63
Max. number of slave stations			63
Communi-cations volume	I/O communication		4096 addresses (256 bytes)
	Message communication		240 bytes
Communica-tion speed	Cable length	500 m	125 kBaud
		250 m	250 kBaud
		100 m	500 kBaud
Network power consumption		mA	30
I/O points			32
Internal power consumption (5 V DC)		mA	170
Weight		kg	0.11
Dimensions (W x H x D)		mm	27.5 x 98 x 90

Order information	Art.-No.	136390

Accessories	Configuration software SyCon from Fa. Hilscher

■ MELSEC AnSH/QnAS Master Module



CAN based network for low level terminals

DeviceNet represents a cost-effective solution for the network integration of low-level terminal equipment.

Up to 64 devices including a master can be integrated in one network.

Special features:

- The positions of master and slave stations are user-selectable.
- Transfer rates of 125, 250 and 500 kBaud
- Transmission distances of up to 500 m
- Communication methods
  - Polling
  - Bit strobe
  - Change of state
  - Cyclic

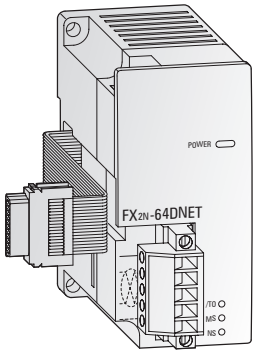
Specifications			A1SJ71DN91
Module type			Master (Group 2 only client)
Applicable PLC series			MELSEC AnS/QnAS series
Nodes per network			Group 2 Client
Stations per network			0 up to 63
Max. number of slave stations			63
Communi-cations volume	I/O communication		2048 addresses (256 bytes)
	Message communication		240 bytes
Communica-tion speed	Cable length	500 m	125 kBaud
		250 m	250 kBaud
		100 m	500 kBaud
Network power consumption		mA	26.5
I/O points			32
Internal power consumption (5 V DC)		mA	240
Weight		kg	0.23
Dimensions (W x H x D)		mm	34.5 x 130 x 93.6

Order information	Art.-No.	124373

Accessories	Configuration software SyCon from Fa. Hilscher

■ MELSEC FX Slave Module

PLC ➠ FX1N/FX2N(C) series



FX2N-64DNET

The DeviceNet slave module FX2N-64DNET can be used to connect FX1N and FX2N(C) programmable controller to a DeviceNet network. The FX2N-64DNET is a slave (group 2) on DeviceNet.

The FX2N-64DNET can communicate to the master by the master/slave communication (using the master/slave I/O connection), and to other nodes supporting the UCMM connection by client/ server communication (using the UCMM connection).

The communication method for I/ O connection supports "polling", "cyclic" and "change of state".

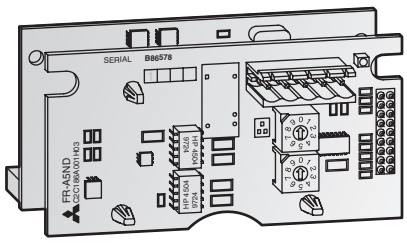
The communication between the programmable controller and the internal buffer memory of the FX2N-64DNET is handled by FROM/ TO instructions.

Specifications			FX2N-64DNET
Node type			G2 Server
Station numbers			0 – 63 points
Supported communication speeds		kBaud	125, 250, 500
Communication cable			DeviceNet standard (refer to page 65)
Communication data (open connection)	Master/ slave	no. of connections	1 connection (group 2)
		transfer time-out	2,000 ms (ACK time-out)
	UCMM client/server	no. of connections	63/63 (group 1, 3)
		data length	Max. 64 byte per connection
Communication data (I/O connection)		type	Polling, cyclic, change of state
		data length	Max. 64 bytes (fragmentation is possible)
Module ID code			K 7090
Status displays			Power, module status, network status
Related I/O points			8
External	power supply	V DC	24
	current consumption	mA	50
Internal power consumption (5 V DC)		mA	120
Weight		kg	0.2
Dimensions (W x H x D)		mm	43 x 90 x 87

Order information	Art. no.	131708

■ Communications Boards for Inverters

INV ➠ FR-A 500/FR-E 500 series



FR-A5ND, FR-E5ND

These inverter options allow Mitsubishi Electric frequency inverters to be connected to DeviceNet. This enables remote control of the frequency inverters via a DeviceNet network.

The option boards are mounted directly in the inverter front face.

The FR-A5ND is used for the FR-A 500 type and the FR-E5ND is used for the FR-E 500 type.

Specifications			FR-A5ND	FR-E5ND
Module type			Slave	Slave
Applicable inverters			FR-A 500	FR-E 500
Power supply	Control power		5 V DC supplied by the inverter	
	Communications power		11 – 28 V DC DeviceNet power supply	
Interface			DeviceNet (conform ODVA spec. release 2.0)	
Number of units			Max. 63	
Station type			Remote device station	
Communications speed (100 m)		kBit/s	Max. 500	
Communications distance		m	Max. 500 (depends on communications speed)	
Connector			5 pin terminal block	
Communications cable			DeviceNet standard thick or thin cable	

Order information	Art. no.	68043	104557

Actuator Sensor Interface (ASi)

Overview

The AS interface is an international standard for the lowest field bus level.

The network suits versatile demands, is very flexible and particularly easy to install.

Suitable for controlling:

- Sensors
- Actuators
- I/O units
- Gateways

Structure

ASI networks can be configured in any random tree structure.

Up to 2 repeaters are supported providing a maximum communication distance of 300 m. Terminating resistors are not needed.

Cable types

A special coded 2-wire cable is required.

When using a flat cable the modules are connected to the cable via push-through connections while the coding prevents incorrect connection.

Data exchange

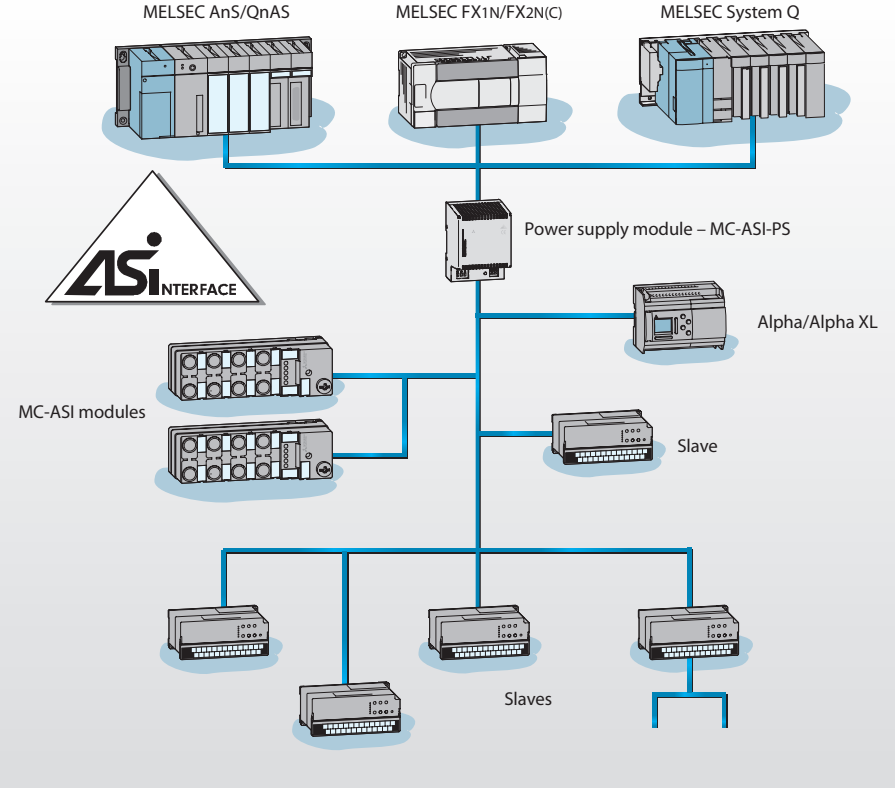
The AS interface supports the connection of conventional sensors and actuators following the master-slave principle.

Administration

The I/O points are assigned electronically through the bus connection or through the PLC program of the AnS/QnAS/System Q controller.

External power supply

The power supply module MC-ASI-PS is available for the AS-i network. It supplys the actuators and sensors units with the AS-i power.



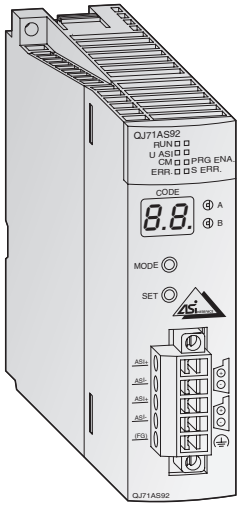
Specifications		AS interface
Network management		Master/Slave
Cabling		Special coded 2-wire cable (unshielded)
Data transfer rate	kBit/s	167
Bus cycle time	ms	≤5
Max. overall distance	m	100 (300 with repeater)
Slave units per master		31
Repeaters per network		2

Recommended cable type by company Belden:

Belden number	Type	Specifications
3999A	Installation cable	Yellow trunk

■ MELSEC Master Modules

PLC ➠ System Q / AnS/QnAS series



AS-interface master for System Q and AnSH/QnAS CPUs

The QJ71AS92 is a master module for connecting System Q to the AS-interface system.

The A1SJ71AS92 is a master module for connecting AnS/QnAS series to the AS-interface system.

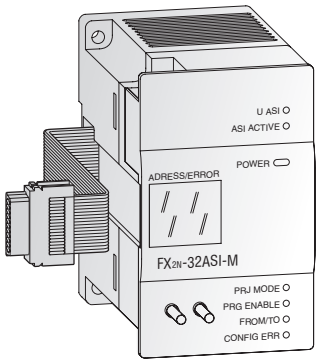
The QJ71AS92 and A1SJ71AS92 can control up to 62 slave units (group A: 31 / group B: 31) with up to 4 inputs and 4 outputs each per address. The addresses of the slave devices across the AS-interface are assigned automatically by the master.

Special features:

- Up to 62 slave units (group A: 31 / group B: 31) can be configured across two networks.
- Up to 496 digital inputs/outputs can be driven via the master.
- Communications via AS-i coded flat or round cable
- Highly efficient error securing system
- Automatic data exchange with the PLC

Specifications		QJ71AS92	A1SJ71AS92
Module type		Master	Master
Application range		MELSEC System Q	MELSEC AnS/QnAS series
AS-i standard		V2.11	AS-i standard
Max. number of slave stations to be controlled		62 x 1	31 x 2
Assignable I/O points		248 digital I/Os, 124 analog I/Os	Max. 2 x124 inputs, 2 x 124 outputs
Data transfer rate		167 kBaud	167 kBaud
I/O refresh time		Max. 5 ms (digital I/Os) / 35 ms (analog I/O slaves)	Max. 5 ms
Communications method		APM modulation	APM modulation
Error handling		Parity check	Parity check
Transmission	method	Bus	Bus
	distance	100 m (300 m with repeater)	100 m (300 m with repeater)
ASI network cable		AS-i standard cable	AS-i standard cable
I/O points assigned		32	32
External power supply		AS-i power supply (30.5 V DC)	AS-i power supply (30.5 V DC)
Power consumption	mA	40	100
Weight	kg	0.12	0.3
Dimensions (W x H x D)	mm	27.9 x 98 x 90	34.5 x 130 x 93.6
Order information	Art. no.	143531	129936
Accessories		External AS-i power supply: MC-ASI-PS, art. no. 130259 (refer to page 80) Configuration software: GX Configurator AS	

■ MELSEC FX2N Master Module



FX2N-32ASI-M

The FX2N-32ASI-M is a master module for connecting FX1N and FX2N(C) series PLC to the AS-interface system.

The FX2N-32ASI-M controls up to 31 slave units with up to 4 inputs and 4 outputs per I/O point. The I/O assignment in the AS-interface for the slave devices is performed automatically by the master.

The maximum communication distance is 100 m without repeaters. Using 2 repeaters the maximum communication distance is extended to 300 m.

The refresh time for the maximum allowed number of 256 I/O points (base unit and slaves) is 5 ms.

Special features:

- Up to 31 slaves
- Communications via AS-i coded flat or round cable
- Highly efficient error securing system
- Automatic data exchange with the PLC

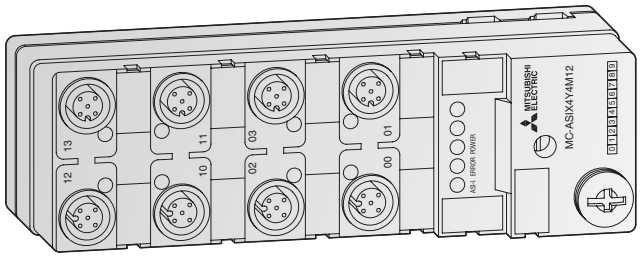
Specifications		FX2N-32ASI-M
Module type		Master module
Application range		MELSEC FX1N/FX2N(C) series
General specifications		Conforms to FX1N/FX2N(C) base units
Power supply		5 V DC / 150 mA (from base unit), 24 V DC / 70 mA
Assignable I/O points		Max. 124 inputs/124 outputs (max. 256 I/Os total)
Communications protocol		ASI standard
Communications speed	bit/s	167,000
Method		APM method (Alternating Pulse Modulation)
Communications path format		Bus network type
Communications cable		AS-i standard cable
Total extension distance	m	100 (300 with repeater)
Max. number of controllable units		Up to 31 slave modules (up to 4 inputs / 4 outputs per slave)
I/O refresh time		Max. 5 ms
Network setup		2 key network setup
Display		2 x 7 segment display for status and diagnosis messages
No. of occupied I/O points		8
Weight	kg	0.2
Dimensions (W x H x D)	mm	50 x 90 x 87

Order information	Art. no.	103314

Accessories	External AS-i power supply: MC-ASI-PS, art. no. 130259 (refer to page 80)

■ IP67 MC AS-i Modules

PLC ➠ All series



Digital input, output, and combination IP67modules with M12 connection technology

The MC series digital I/O modules connect with field devices (contacts, limit switches, etc.) directly on the machine and an AS-interface master. The sensors and actuators are connected via plug-type/screw terminals.

Different modules with 8 inputs max. and 8 outputs max. as well as a combined I/O module with 4 inputs and 4 outputs are available.

Special features:

- Simple start with AS-i technology via parallel cabling
- The modules can be mounted and dismounted by a central screw. The connection cables stay fixed on the mounting plate.
- Visual diagnostic display via LEDs on the module front
- Overload and short-circuit protection
- Adapters for M12 to M8 available

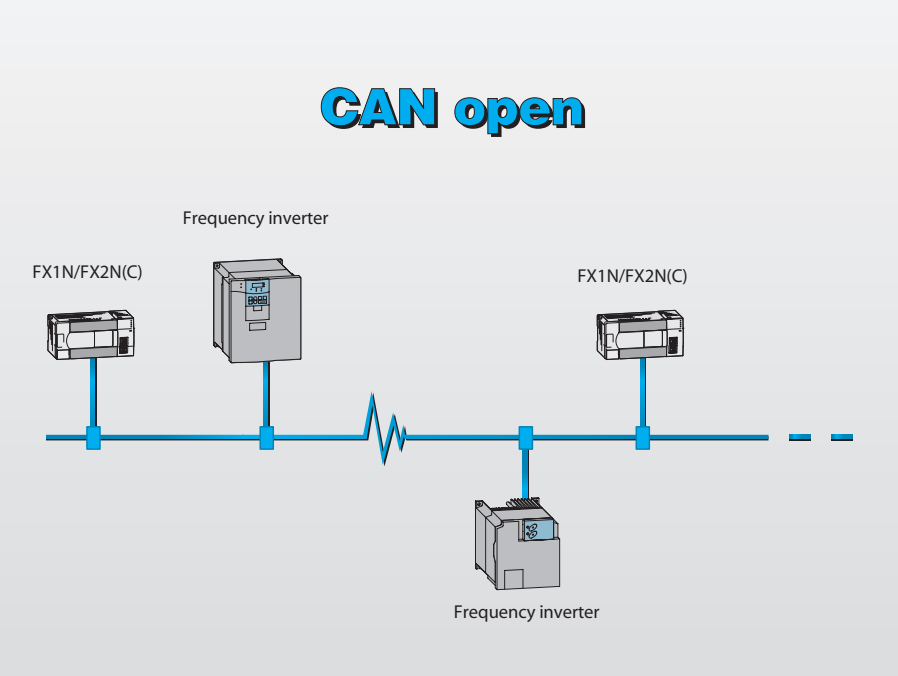
Specifications			MC-ASI X4M12	MC-ASI X8M12	MC-ASI Y4M12-05	MC-ASI Y4M12-2	MC-ASI Y8M12	MC-ASI X2Y2M12	MC-ASI X4Y4M12
Inputs			4	8	—	—	—	2	4
Outputs			—	—	4	4	8	2	4
Output type			—	—	Transistor	Transistor	Transistor	Transistor	Transistor
Inputs									
Voltage range		V DC	0–30	0–30	—	—	—	0–30	0–30
Max. switching current	Signal 0		$I_{in} \leq 2$ mA / $U_{in} \leq 5$ V	$I_{in} \leq 2$ mA / $U_{in} \leq 5$ V	—	—	—	$I_{in} \leq 2$ mA / $U_{in} \leq 5$ V	$I_{in} \leq 2$ mA / $U_{in} \leq 5$ V
	Signal 1		$I_{in} \geq 6$ mA / $U_{in} \geq 11$ V	$I_{in} \geq 6$ mA / $U_{in} \geq 11$ V	—	—	—	$I_{in} \geq 6$ mA / $U_{in} \geq 11$ V	$I_{in} \geq 6$ mA / $U_{in} \geq 11$ V
Input current		mA	≤ 11	≤ 11	—	—	—	≤ 11	≤ 11
Max. input current		mA	Max. 200	Max. 400	—	—	—	Max. 200	Max. 200
Short circuit and overload protection			Electronic	Electronic	—	—	—	Electronic	Electronic
Outputs									
Max. output current			—	—	IL 0.5 A 100 % ED	IL 2 A 50 % ED	IL 0,5 A 100 % ED	IL 2 A 100 % ED	IL 0,5 A 100 % ED
Max. output total current			—	—	2 A	4 A	4 A	4 A	2 A
Output voltage			—	—	Ub – 0.8 V typ.	Ub – 0.8 V typ.	Ub – 0.8 V typ.	Ub – 0.8 V typ.	Ub – 0.8 V typ.
Switching frequency	resitive load	Hz	—	—	100	100	100	100	100
	inductive load	Hz	—	—	0.2	0.2	0.2	0.2	0.2
Short circuit protection			—	—	Electronic	Electronic	Electronic	Electronic	Electronic
Overload protection		A	—	—	1	2	1	2	1
General									
Status display for outputs			All modules have status LEDs for the outputs.						
Error indicator			LED	LED	LED	LED	LED	LED	LED
Cabling			All modules can be connected with screw-tyre or clamp-type connectors acc. to PG9 and 3-pole M8-plug-in connectors.						
Flat cable connection			AS-i standard cable 2 x 1.5 mm² 24 V, 0 V						
Interface bus voltage		V DC	26.5 – 31.6	26.5 – 31.6	26.5 – 31.6	26.5 – 31.6	26.5 – 31.6	26.5 – 31.6	26.5 – 31.6
Profile (IO/ID Code)			0/0	2 x 0/0	8/0		2 x 8/0	3/0	7/0
Module power consumption		V DC	20 – 30	20 – 30	20 – 30	20 – 30	20 – 30	20 – 30	20 – 30
AS-Interface power consumption		mA	Max. 250	Max. 450	Max. 50	Max. 50	Max. 50	Max. 250	Max. 250
Weight (without mounting plate)		kg	0.10	0.14	0.10	0.10	0.14	0.10	0.10
Dimensions (W x H x D)		mm	50 x 105 x 38	50 x 154 x 38	50 x 105 x 38	50 x 105 x 38	50 x 154 x 38	50 x 105 x 38	50 x 105 x 38
Order information		Art. no.	130257	130253	130241	130240	130238	130258	130255
Accessories			External AS-i power supply: MC-ASI-PS, art. no. 130259 (refer to page 80) Connection cables (refer to page 78)						

CANopen Network

Network Description

CANopen is an "open" implementation of the Controller Area Network (CAN), which is defined in the EN50325-4 standard. It was developed by members of the CAN in Automation international users and manufacturers group. The CANopen application layer defines a range of communications services and protocols (e.g. process and service data) and a network management system.

CANopen networks are used for connecting sensors, actuators and controllers in industrial control systems, medical equipment, maritime electronics, railways, trams and commercial vehicles.



Structure

A CANopen bus system has a linear structure to which up to 127 bus stations can be connected. Multiple master stations can be connected to a single bus. The ends of the linear bus are terminated with resistors. Total network length can be up to 40m at a data transfer rate of 1Mbit/s. Lowering the data rate makes it possible to increase the length of the bus. For example, a transfer rate of 125kBit/s allows a bus length of 500 m. This can be increased to a maximum of 5,000 m with the help of repeaters (at 10 kBit/s).

Cabling

The bus uses inexpensive twisted-pair cabling.

Data Transfer

The protocol used in CANopen is extremely reliable. A variety of methods, including 15-bit CRC (cyclic redundancy check), are implemented to identify corrupt data and malfunctioning bus stations.

Data can be transmitted cyclically in broadcast mode, or in event-controlled mode.

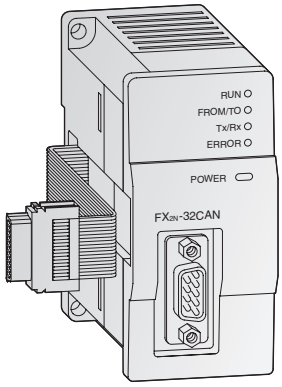
Cable	Shielded twisted pair cable
Diameter	0,5 mm^2 (1 pair)
Cable resistance (20 °C)	≤37,8 Ω / km
Electrostatic capacity (1kHz)	60 nF / km
Impedance (1 MHz)	100 Ω ±15 %
Insulation resistance	≥10.000 MΩ / km
Voltage withstand	500 V DC for 1 minute
Maximum distance	1.200 m

Recommended Belden cable type:

Belden number	Description	Use as
9841	1 pair 24AWG RS485 cable	Up to 800 meter point to point at 1 Mbit
89841	Teflon version of 9841	Up to 200°C
9842	2 pairs 24AWG RS485 cable	Up to 800 meter point to point at 1 Mbit
3107A	1 pair 22AWG RS485 cable	Up to 800 meter point to point at 1 Mbit

■ Communications Module for CANopen FX2N-32CAN

PLC ➠ FX1N/FX2N(C) series



FX2N-32CAN

The FX2N-32CAN communications module makes it possible to connect an FX1N/FX2N or FX2NC PLC to an existing CANopen network.

In addition to real-time capabilities and high-speed data transfer at rates of up to 1Mbit/s the CANopen module also shines with high transfer reliability and simple network configuration.

Up to 120 data words can be sent and received as process data objects (PDO). The number of words that can be transmitted in each direction can be set between 1 and 120.

Communication with the module's memory buffer is performed with simple FROM/TO instructions.

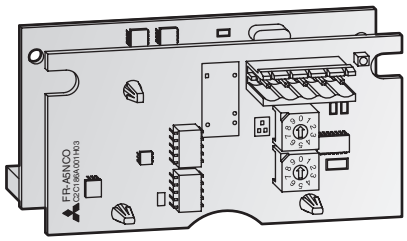
The network node address (station number) can be set to any value between 1 and 127. Up to 30 nodes can be connected to the bus per segment. If bridge or repeater devices are used the number of nodes can be increased to 127.

Specifications		FX2N-32CAN
Module type		CANopen interface
General specifications		Conforms to FX1S/FX1N/FX2N base units
Power supply		5 V DC (via base unit)
CAN standard		ISO 11898/1993
CANopen standard by CiA		DS-301 version 3.0
Additional CANopen features		NMT, Guarding, and Guarding request based on DS-302 V2.0. network variables based on DS-405 V1.0
Max. number of modules that can be connected to the network		30 without repeater; 127 with repeater
Station numbers		1 – 127
Supported baud rate	kBaud	10, 20, 50, 125, 250, 500, 800, 1000
Transmission cable		CANopen standard (see table on page before)
Status displays		RUN, Error, Power, Network status
Number of occupied I/O points		8
Internal power consumption (5 V DC)	mA	290
External power supply		Not necessary
Weight	kg	0.2
Dimensions (W x H x D)	mm	43 x 90 x 88.7

Order information	Art. no.	141179

■ Communications Boards for Inverters

INV ➠ FR-A 500/FR-E 500 series



OI-FR-A5NCO / OI-FR-E5NCO

These inverter inboard options integrate Mitsubishi Electric frequency inverters to the CANopen network. This enables access to operations, display functions and parameter settings of the frequency inverter via Personal Computer or PLC.

Special features:

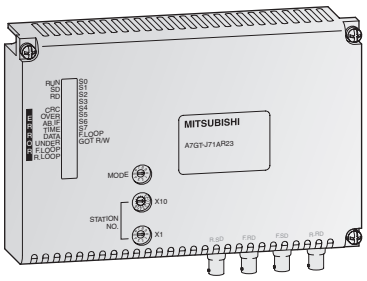
- Communication speed up to 1 MBaud
- Indicator-LED for communication state

Specifications		OI-FR-A5NCO	OI-FR-E5NCO
Module type		Slave	Slave
Applicable inverters		FR-A 500	FR-E 500
General specifications		Conforms to Mitsubishi frequency inverters	
Numbers of stations		1 – 127	
Supported communications speed	kBaud	10, 20, 50, 125, 250, 500, 800, 1000	
Communications cable		CANopen standard cable (refer to previous page)	
Max. number of units (network nodes)		30 without repeater; 127 with repeater	

Order information	Art. no.	139377	139378

HMI Data Link Module

HMI ➠ GOT series



A7GT-J71AR23

This communications adapter A7GT-J71AR23 allow GOT connection to MELSECNET(II).

The GOT serves as local station and accesses all PLCs within the network.

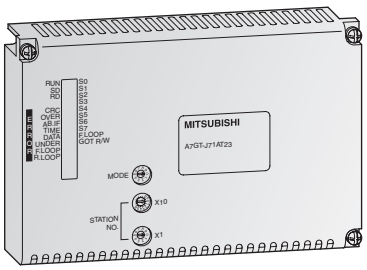
This module is designed to fit on the back of A900GOT series operator panels (not for A950/A953GOT).

Specifications	A7GT-J71AR23
Connection	MELSECNET(II)
Application	Only local station
Applicable GOT	A900GOT series (not A950/953GOT)
Remark	No CE

Order information	Art. no.	41475

HMI Data Link Module

HMI ➠ GOT series



A7GT-J71AT23B

This communications adapter A7GT-J71AT23B allows GOT connection to MELSECNET/B.

The GOT serves as local station and accesses all PLCs within the network.

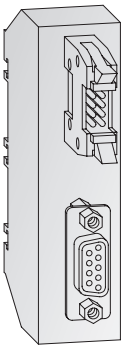
This module is designed to fit on the back of a A956/A970/A975/A985GOT operator panels.

Specifications	A7GT-J71AT23B
Connection	MELSECNET/B
Application	Only local station
Applicable GOT	A956/A970/A975/A985GOT
Remark	No CE

Order information	Art. no.	41476

Local System Extension Set for the MT Series

PROFIBUS/DP



MT-LE-SET

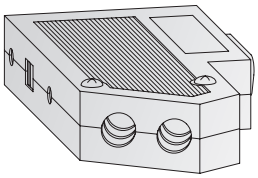
For the extension of the MT series to a second connecting level the local system extension MT-LE and the connecting cable MT-LE-CBL50 are required.

The extension and the cable are available only as complete set, which is called MT-LE-SET.

Specifications		MT-LE-SET
Application		MT series
Cable length	m	0.5
Dimensions (W x H x D)	mm	22.5 x 97 x 36
Order information	Art. no.	69759

PROFICON-PLUS PROFIBUS Connectors

PROFIBUS/DP



PROFICON-PLUS / PROFICON-PLUS-PG

The PROFICON-PLUS bus connectors plugs PROFICON-PLUS and PROFICON-PLUS-PG are designed for connecting DIN 19245 standard PROFIBUS components with data transfer rates of up to 12 Mbaud.

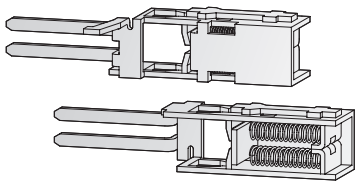
The PROFICON-PLUS-PG provides an additional port as SAP (Service Access Point).

Both connectors feature a metallic housing and are available with a selectable termination resistor each.

Specifications		PROFICON-PLUS	PROFICON-PLUS-PG
Data rate 12 Mbit/s		Supported	Supported
Terminator		Yes (selectable)	Yes (selectable)
2. Plug for connection		Not provided	Provided
Order information	Art. no.	140008	140009

ST Series Shielded Connectors

PROFIBUS/DP



Connectors for shielded analog cable

For the connection of the analog cables of the ST series special shielded connectors should be used for noise reduction in the cables and meet EMC directive-relevant standards.

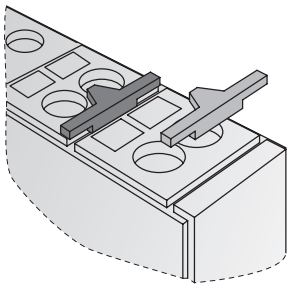
Two different types for the different base units are available:

- ST1A-SLD-S: for base modules with spring clamp type terminals
- ST1A-SLD-E: for base modules with screw clamp type terminals

Specifications		ST1A-SLD-S	ST1A-SLD-E
Applicable base units		Spring clamp type terminals	Screw clamp type terminals
Set of		10 pcs	10 pcs
Order information	Art. no.	152947	152948

Potential Markers for ST Series Base Modules

PROFIBUS/DP



Markers for labeling ST base modules

Coloured markers for different potentials, compliant to all user requirements are available.

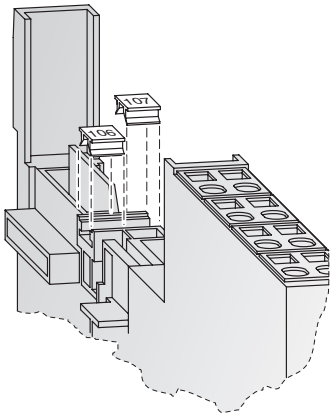
They can be clipped easily on the base module terminals.

Each package contains 10 strips with 6 markers with the same colour.

Specifications	Colour	Used for	Order information
ST1A-WMK-BL	blue	0V, N	152928
ST1A-WMK-RD	red	+24VDC, +5VDC	152929
ST1A-WMK-GN	green	shield	152930
ST1A-WMK-BK	black	signals	152931
ST1A-WMK-BR	brown	L1	152932
ST1A-WMK-RD/BL	red/blue	internal voltage	152933
ST1A-WMK-GN/YL	green/yellow	PE, Earthing	152934
ST1A-WMK-WH	white	other purposes	152935

ST Series Marker for Base Modules

PROFIBUS/DP



Markers for the ST series base modules

White markers for different potentials, compliant to all user requirements are available.

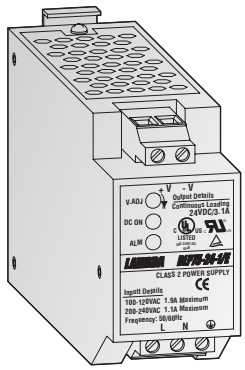
They can be clipped easily inside the base module connections for the electronic modules.

Each package contains 500 labels.

Specifications	Description	Order information
ST1A-BMK-50	10 pieces á 50 labels, white, numbers printed 01 to 50	152936
ST1A-BMK-100	10 pieces á 50 labels, white, numbers printed 51 to 100	152937
ST1A-BMK-150	10 pieces á 50 labels, white, numbers printed 101 to 150	153177
ST1A-BMK-200	10 pieces á 50 labels, white, numbers printed 151 to 200	152938

External Power Supply Units for ST Modules

PROFIBUS/DP



Power supply units for ST modules

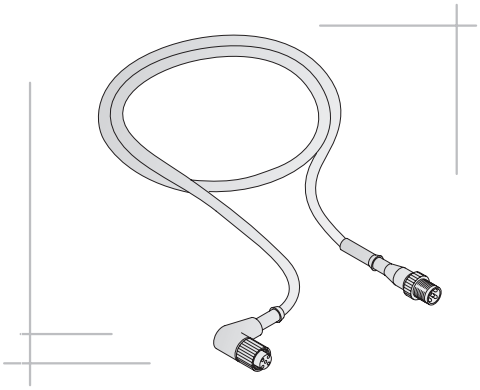
The power supply units are used for the DC 24 V power supply for the ST series modules, actuators and sensors and other external devices.

It comes with a DIN rail mounting system and can be installed near by the ST series station.

Specifications	DLP75-24-1/E	DLP120-24-1/E	DLP240-24-1/E
Application	24V DC power supply	24V DC power supply	24V DC power supply
Installation	DIN rail mounting	DIN rail mounting	DIN rail mounting
Power input	100–120 V ~/N, 230V AC, 50/60Hz	100–120 V ~/N, 230V AC, 50/60Hz	100–120 V ~/N, 230V AC, 50/60Hz
Power output	24V DC, 3.1A, 75W	24V DC, 5.0A, 120W	24V DC, 10.0A, 240W
Dimensions (W x H x D) mm	50 x 113 x 110	60 x 113 x 110	120 x 113 x 110
Order information Art. no.	153192	153193	153204

Connection Cables

PROFIBUS/DP



IP67 connection cables for slave modules

For all IP67 type slave modules a wide variety of different cables are available. All cables and connectors provide class IP67 and CE conformity.

All cables have to be ordered separately due to the specific application.

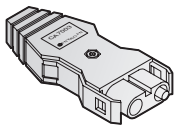
Type	Description	Length	CE conformity	Art. no.
Sensor / actuator cables for IP67 I/O modules				
IP67-CON1	M12, male connector, straight – M12, female connector, straight, 3 poles (pin 2-4 internal conneted), PUR	0.6 m	Yes	133640
IP67-CON2	M12, male connector, straight – M12, female connector, straight, 3 poles (pin 2-4 internal conneted), PUR	1.0 m	Yes	133641
IP67-CON3	M12, male connector, straight – M12, female connector, straight, 3 poles (pin 2-4 internal conneted), PUR	2.0 m	Yes	133642
IP67-CON4	M12, male connector, straight – M12, female connector, cranked, 3 poles (pin 2-4 internal conneted), PUR	0.6 m	Yes	133643
IP67-CON5	M12, male connector, straight – M12, female connector, cranked, 3 poles (pin 2-4 internal conneted), PUR	1.0 m	Yes	133644
IP67-CON6	M12, male connector, straight – M12, female connector, cranked, 3 poles (pin 2-4 internal conneted), PUR	2.0 m	Yes	133645
IP67-CON7	M12, male connector, straight – M8, female connector, straight, 3 poles, PUR	0.6 m	Yes	133646
IP67-CON8	M12, male connector, straight – M8, female connector, straight, 3 poles, PUR	1.0 m	Yes	133647
IP67-CON9	M12, male connector, straight – M8, female connector, straight, 3 poles, PUR	2.0 m	Yes	133649
IP67-CON10	M12, male connector, straight – M8, female connector, cranked, 3 poles, PUR	0.6 m	Yes	133650
IP67-CON11	M12, male connector, straight – M8, female connector, cranked, 3 poles, PUR	1.0 m	Yes	133651
IP67-CON12	M12, male connector, straight – M8, female connector, cranked, 3 poles, PUR	2.0 m	Yes	133652
IP67-CON13	M8, male connector, straight – M8, female connector, straight, 3 poles, PUR	0.6 m	Yes	133653
IP67-CON14	M8, male connector, straight – M8, female connector, straight, 3 poles, PUR	1.0 m	Yes	133656
IP67-CON15	M8, male connector, straight – M8, female connector, straight, 3 poles, PUR	2.0 m	Yes	133657
IP67-CON16	M8, male connector, straight – M8, female connector, cranked, 3 poles, PUR	0.6 m	Yes	133658
IP67-CON17	M8, male connector, straight – M8, female connector, cranked, 3 poles, PUR	1.0 m	Yes	133659
IP67-CON18	M8, male connector, straight – M8, female connector, cranked, 3 poles, PUR	2.0 m	Yes	133661
IP67-CON19	M12, female connector, straight, 3 poles (pin 2-4 internal connected), PUR – with untied wires	5.0 m	Yes	133662
IP67-CON20	M12, female connector, straight, 3 poles (pin 2-4 internal connected), PUR – with untied wires	10.0 m	Yes	133663
IP67-CON21	M12, female connector, cranked, 3 poles (pin 2-4 internal connected), PUR – with untied wires	5.0 m	Yes	133664
IP67-CON22	M12, female connector, cranked, 3 poles (pin 2-4 internal connected), PUR – with untied wires	10.0 m	Yes	133665
IP67-CON23	M8, female connector, straight, 3 poles, PUR – with untied wires	5.0 m	Yes	133666
IP67-CON24	M8, female connector, straight, 3 poles, PUR – with untied wires	10.0 m	Yes	133667
IP67-CON25	M8, female connector, cranked, 3 poles, PUR – with untied wires	5.0 m	Yes	133668
IP67-CON26	M8, female connector, cranked, 3 poles, PUR – with untied wires	10.0 m	Yes	133669
IP67-CON27	M12, male connector, 4 poles, in quick connection technology	—	Yes	133670
IP67-CON28	M8, male connector, 3 poles, in quick connection technology	—	Yes	133671
IP67-CON41	M12, T-branch connector with distributor (required for MC-DP-X16)	—	Yes	133683
IP67-M12-cap	M12, Closing cap to prevent non-used M12 I/O connectors	—	Yes	133638
Valve control wires / IP67 connectors				
IP67-CON29	M12, male connector, straight, PUR cable – valve connector type A, 18 mm	0.6 m	Yes	133672
IP67-CON30	M12, male connector, straight, PUR cable – valve connector type A, 18 mm	1.0 m	Yes	133673
IP67-CON31	M12, male connector, straight, PUR cable – valve connector type A, 18 mm	2.0 m	Yes	133674
IP67-CON32	M12, male connector, straight, PUR cable – valve connector type B, 10 mm	0.6 m	Yes	133675
IP67-CON33	M12, male connector, straight, PUR cable – valve connector type B, 10 mm	1.0 m	Yes	133676
IP67-CON34	M12, male connector, straight, PUR cable – valve connector type B, 10 mm	2.0 m	Yes	133677
IP67-CON35	M12, male connector, straight, PUR cable – valve connector type B, 11 mm	0.6 m	Yes	133678
IP67-CON36	M12, male connector, straight, PUR cable – valve connector type B, 11 mm	1.0 m	Yes	133679
IP67-CON37	M12, male connector, straight, PUR cable – valve connector type B, 11 mm	2.0 m	Yes	133703
IP67-CON38	Valve connector combination, 2 valve connectors type A, 18 mm	3.0 m	Yes	133680
IP67-CON39	Valve connector combination, 2 valve connectors type A, 18 mm	5.0 m	Yes	133681
IP67-CON40	M12, 5 poles, male connector, for self assembly	—	Yes	133682
IP67-CON42	M12, 5 poles, shielded male connector, for self assembly	—	Yes	150021
IP67-CON43	M12, 5 poles, shielded female connector, for self assembly	—	Yes	150022

■ Optical Cables

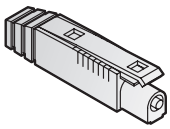
MELSECNET

Optical cables

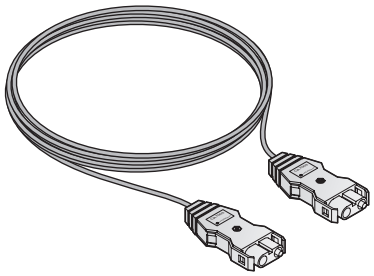
For MELSECNET/10/H and MELSECNET(II) networks a wide range of optical cables with different lengths and several connector types are available.



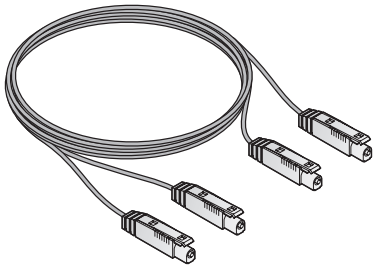
Duplex connector CA7003



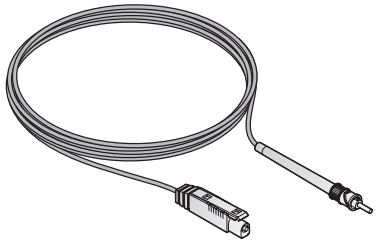
Simplex connector DL6-CP



Duplex cable
AS-2P-□M-A
with 2 x CA7003



Duplex cable
AGS-2P-□M-A
with 4 x DL6-CP

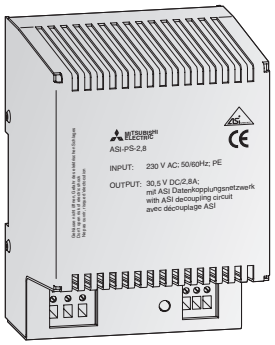


AGS-CS-□M-625A
Smplex adapter cable
DL6-CP – ST

Type	Description	Length	Art. no.
Glass fibre cable SI/QSI 185/230 µm			
AS-2P-2M-A	Glass fibre cable for MELSECNET; SI/QSI 185/230 µm; with connection plugs CA7003 at both ends	2 m	126228
AS-2P-5M-A	Glass fibre cable for MELSECNET; SI/QSI 185/230 µm; with connection plugs CA7003 at both ends	5 m	62430
AS-2P-30M-A	Glass fibre cable for MELSECNET; SI/QSI 185/230 µm; with connection plugs CA7003 at both ends	30 m	52353
AS-2P-50M-A	Glass fibre cable for MELSECNET; SI/QSI 185/230 µm; with connection plugs CA7003 at both ends	50 m	62457
AS-2P-02M-B	Glass fibre cable for MELSECNET; SI/QSI 185/230 µm; with connection plugs CA7003 at both ends; reinforced	2 m	130922
AS-2P-05M-B	Glass fibre cable for MELSECNET; SI/QSI 185/230 µm; with connection plugs CA7003 at both ends; reinforced	5 m	102952
AS-2P-10M-B	Glass fibre cable for MELSECNET; SI/QSI 185/230 µm; with connection plugs CA7003 at both ends; reinforced	10 m	130920
AS-2P-20M-B	Glass fibre cable for MELSECNET; SI/QSI 185/230 µm; with connection plugs CA7003 at both ends; reinforced	20 m	130919
AS-2P-30M-B	Glass fibre cable for MELSECNET; SI/QSI 185/230 µm; with connection plugs CA7003 at both ends; reinforced	30 m	130918
AS-2P-50M-B	Glass fibre cable for MELSECNET; SI/QSI 185/230 µm; with connection plugs CA7003 at both ends; reinforced	50 m	130917
AS-2P-100M-B	Glass fibre cable for MELSECNET; SI/QSI 185/230 µm; with connection plugs CA7003 at both ends; reinforced	100 m	131318
AS-2P-150M-B	Glass fibre cable for MELSECNET; SI/QSI 185/230 µm; with connection plugs CA7003 at both ends; reinforced	150 m	144484
AS-2P-200M-B	Glass fibre cable for MELSECNET; SI/QSI 185/230 µm; with connection plugs CA7003 at both ends; reinforced	200 m	151891
AS-2P-150M-B	Glass fibre cable for MELSECNET; SI/QSI 185/230 µm; with connection plugs CA7003 at both ends; reinforced	250 m	151892
AS-2P-300M-B	Glass fibre cable for MELSECNET; SI/QSI 185/230 µm; with connection plugs CA7003 at both ends; reinforced	300 m	152043
Glass fibre cable GI 62,5/125 µm – für GE-Typ-Module			
AGS-2P-2M-625A	Glass fibre cable for MELSECNET; GI 62,5/125 µm; with connection plugs DL6-CP at both ends	2 m	104332
AGS-2P-5M-625A	Glass fibre cable for MELSECNET; GI 62,5/125 µm; with connection plugs DL6-CP at both ends	5 m	104330
AGS-2P-10M-625A	Glass fibre cable for MELSECNET; GI 62,5/125 µm; with connection plugs DL6-CP at both ends	10 m	104331
AGS-2P-20M-625A	Glass fibre cable for MELSECNET; GI 62,5/125 µm; with connection plugs DL6-CP at both ends	20 m	145838
AGS-2P-30M-625A	Glass fibre cable for MELSECNET; GI 62,5/125 µm; with connection plugs DL6-CP at both ends	30 m	145840
AGS-2P-35M-625A	Glass fibre cable for MELSECNET; GI 62,5/125 µm; with connection plugs DL6-CP at both ends	35 m	150379
Glass fibre cable GI 50/125 µm – für G-Typ-Module			
AG-2P-5M-A	Glass fibre cable for MELSECNET; GI 50/125 µm; with connection plugs DL6-CP at both ends	5 m	38784
AG-2P-30M-A	Glass fibre cable for MELSECNET; GI 50/125 µm; with connection plugs DL6-CP at both ends	30 m	104729
Adapter for glass fibre cables			
AGS-CS-3M-625A	Adapter cable; GI 62,5/125 µm; Simplex DL6-CP – ST connector	3 m	58632
AGS-CS-4M-625A	Adapter cable; GI 62,5/125 µm; Simplex DL6-CP – ST connector	4 m	58631
AGS-CS-4M-50A	Adapter cable; GI 50/125 µm; Simplex DL6-CP – ST connector	4 m	58630

Power Supply Module

AS-i



MC-ASI-PS

The power supply module MC-ASI-PS is used for the AS-i network. It supplies the actuators and sensors units with the power, in compliance with the AS-i specification.

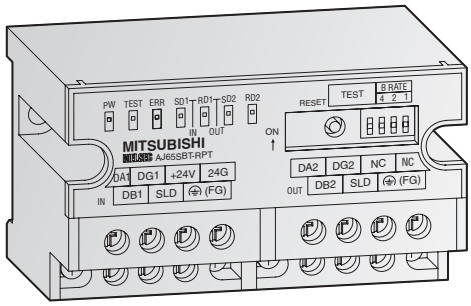
Special features:

- Short circuit protected
- Pulsed AS-i voltage

Specifications			MC-ASI-PS
Application			AS-i power supply
Input	voltage		230 V AC
	frequency		50/60 Hz
Output	voltage		30.5 V DC
	current		2.8 A
Weight		kg	1.3
Dimensions (W x H x D)		mm	103 x 153 x 70
Order information		Art. no.	130259

Repeater Modules for CC-Link

CC-Link



Repeater modules

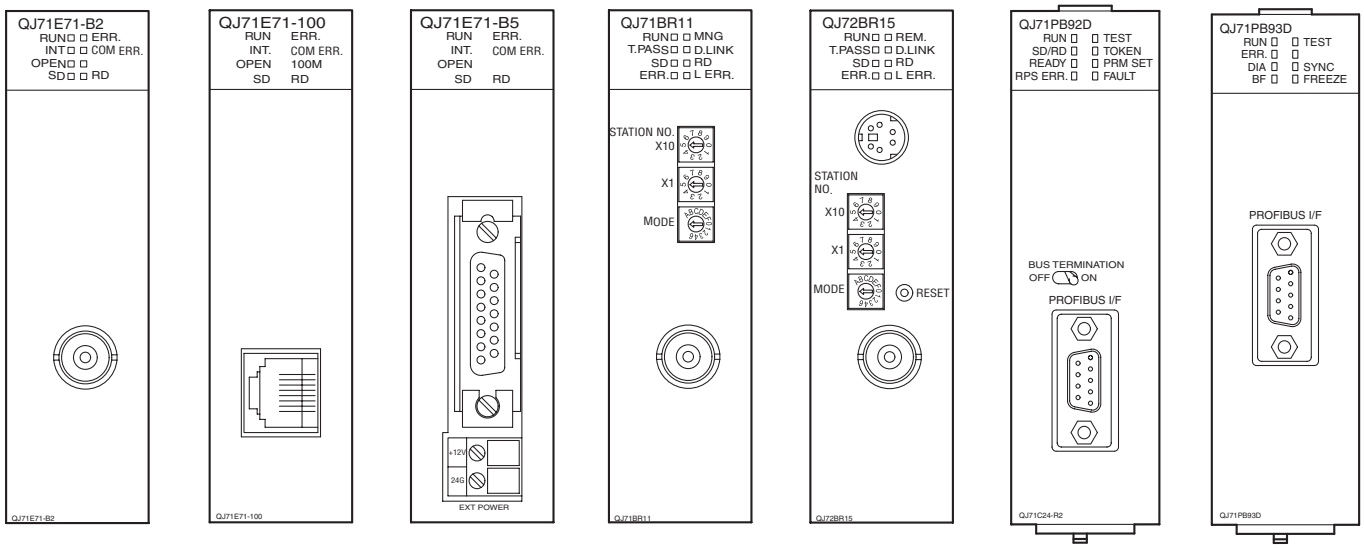
The repeater modules for CC-Link AJ65SBT-RPT, -RPS and -RPG are used to extend the transmission distance.
By using AJ65BT-RPI-10A and AJ65BT-RPI-10B modules combined, it becomes possible to perform wireless data transmission using infrared light.

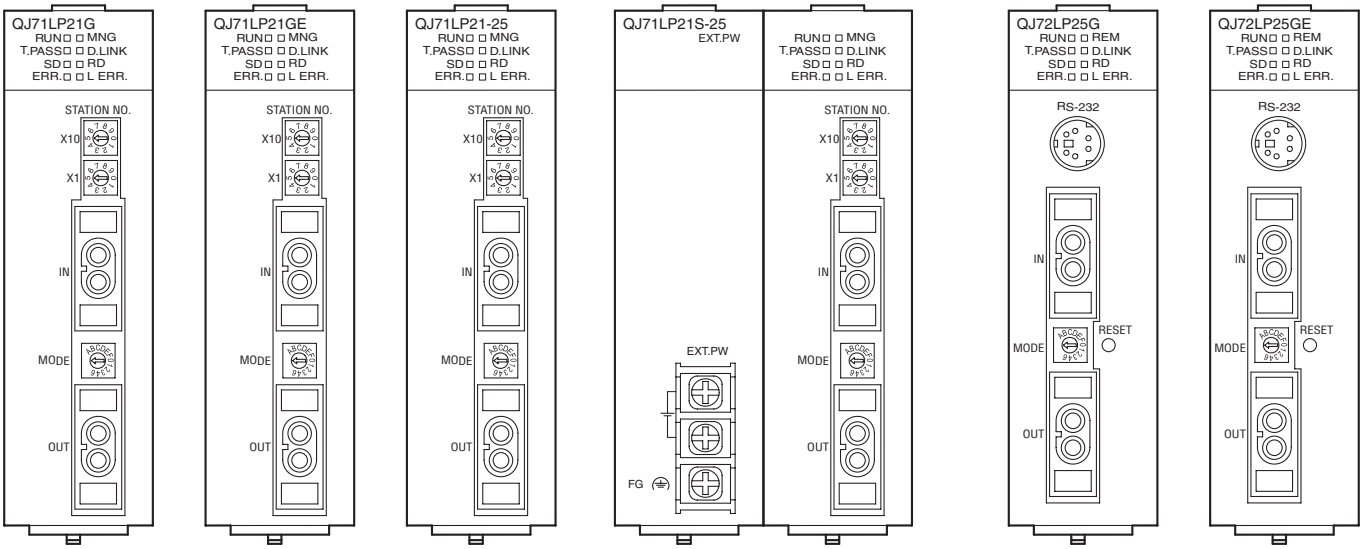
Special features:

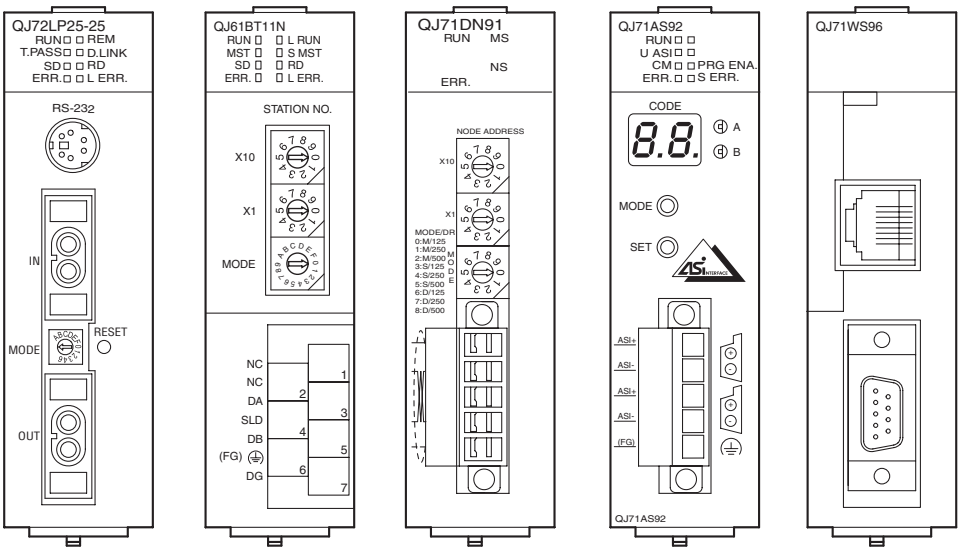
- The compact repeater module AJ65SBT-RPT can be connected to the CC-Link network via T-branch wiring and allows extension of the transmission distance up to ten stages.
- The compact optical repeater modules AJ65SBT-RPS and AJ65SBT-RPG allows extension of the transmission distance up to three stages using fibre optical cables.
- The optical transmission modules AJ65BT-RPI-10A and AJ65BT-RPI-10B feature an infrared transmission up to 100 m (see also page 41).

Specifications		AJ65SBT-RPT	AJ65SBT-RPS	AJ65SBT-RPG	AJ65BT-RPI-10A	AJ65BT-RPI-10B
Module type		T-branch repeater	Optical repeater module	Optical repeater module	Optical transmission module	Optical transmission module
Transmission speed	Mbit/s	10 / 5 / 2.5 / 0.625 / 0.156	10 / 5 / 2.5 / 0.625 / 0.156	10 / 5 / 2.5 / 0.625 / 0.156	10 / 5 / 2.5 / 0.625 / 0.156	2.5 / 0.625 / 0.156
Max. transmission distance	m	1200	1000	2000	100	100
Max. number of connectable segments		10	3	2	2	2
Max. transmission distance/segment		Differs according to transmission speed; same as normal CC-Link system (system with only one segment)				
Internal power consumption (24 V DC)	mA	60	60	60	137	137
Weight	kg	0.2	0.2	0.2	0.5	0.5
Dimensions (W x H x D)	mm	87.3 x 50 x 40	118 x 50 x 40	118 x 50 x 40	100 x 57.5 x 161	100 x 57.5 x 161
Order information	Art. no.	130353	137584	137859	137585	137586

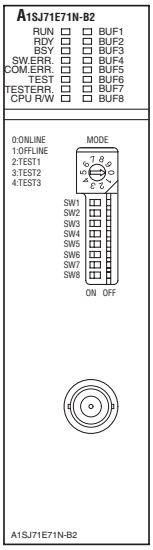
■ MELSEC System Q Communications Modules

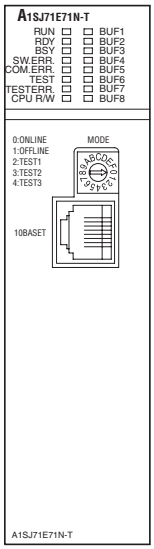


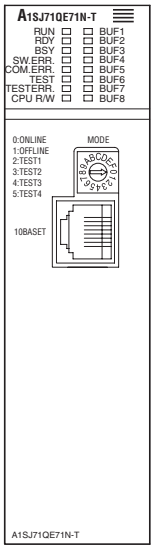


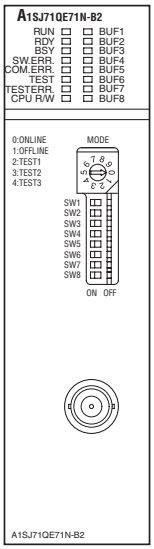


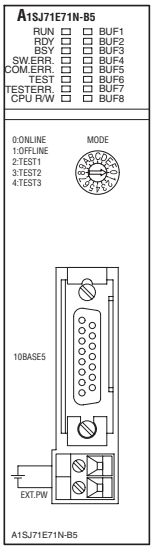
■ MELSEC AnSH/QnAS Series Communications Modules

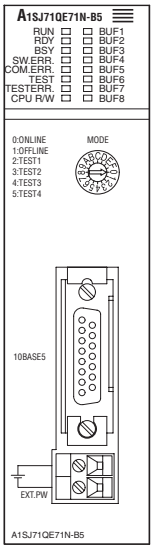


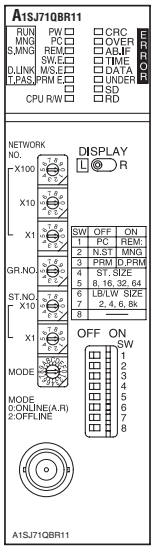


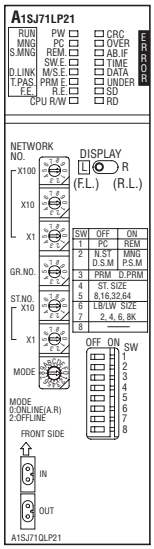


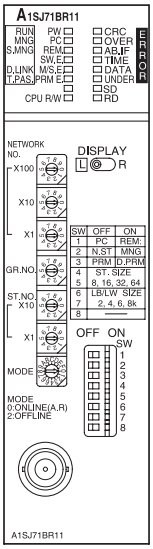


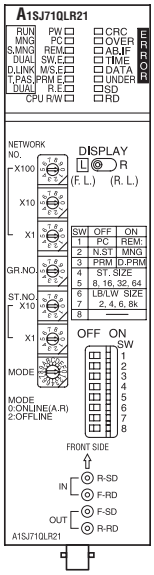


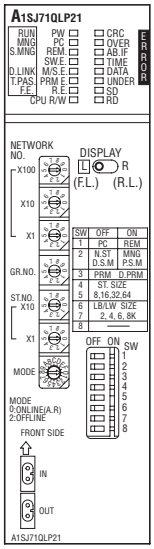


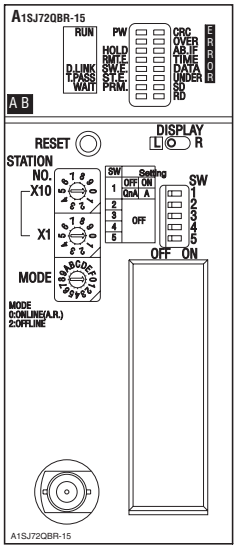


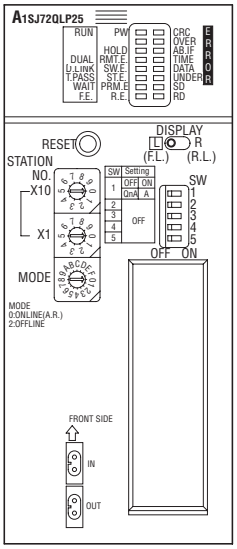


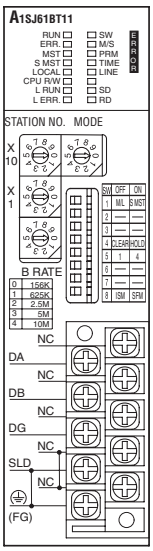


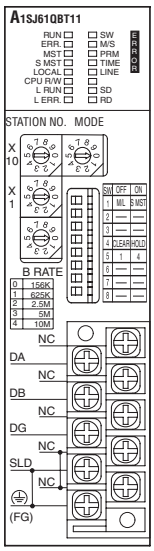


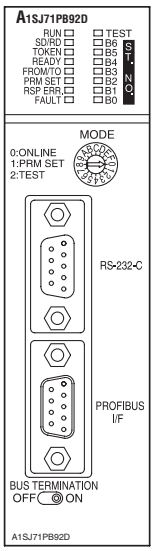


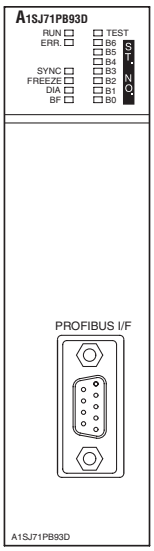


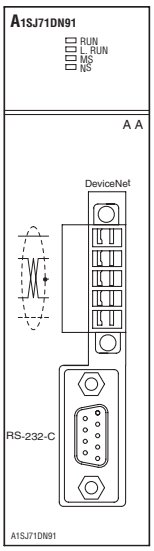






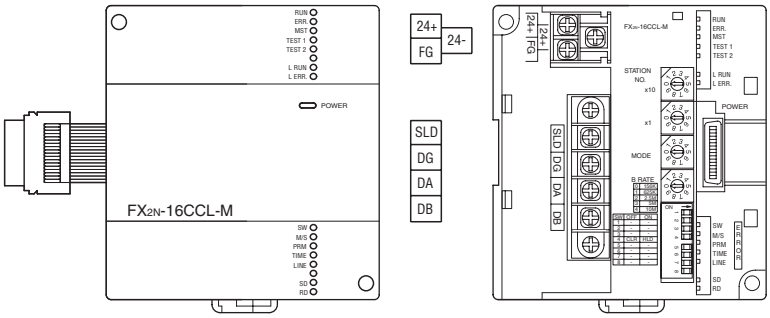




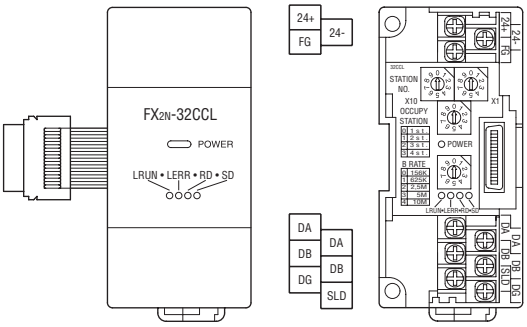


■ MELSEC FX Series Communications Modules

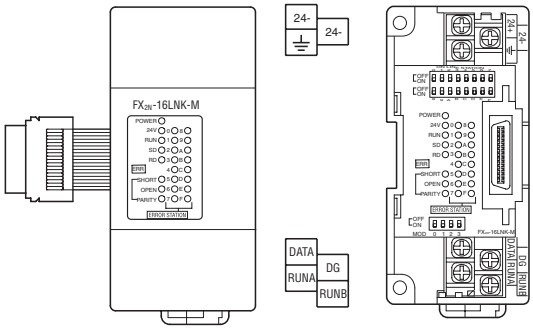
FX2N-16CCL-M



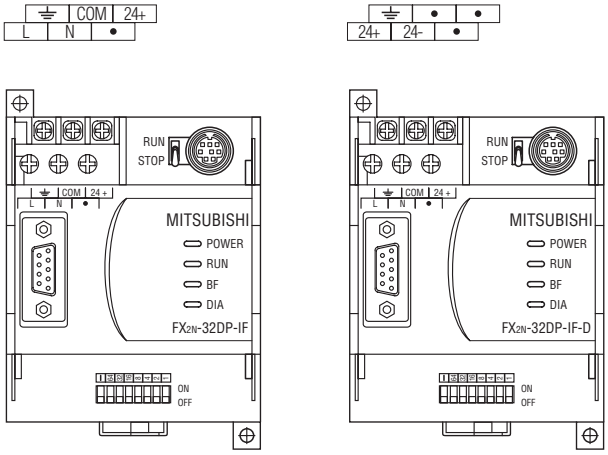
FX2N-32CCL



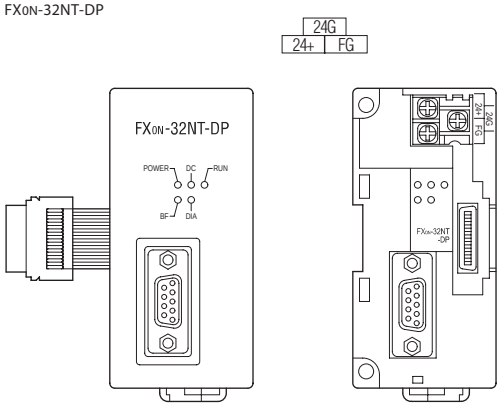
FX2N-16LNK-M



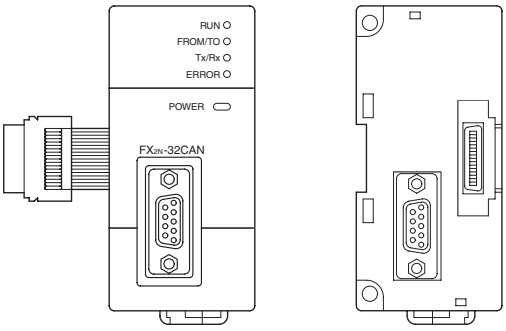
FX2N-32DP-IF



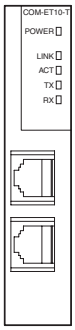
FX0N-32NT-DP



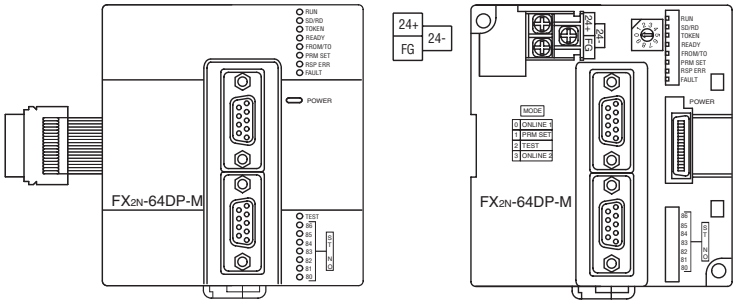
FX2N-32CAN



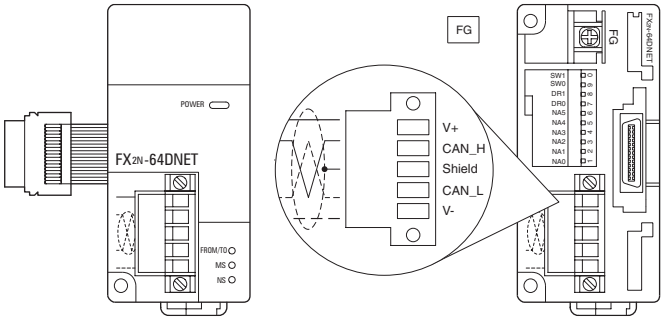
COM-ET10-T



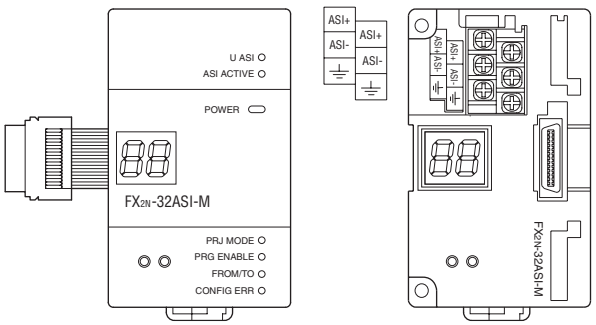
FX2N-64DP-M



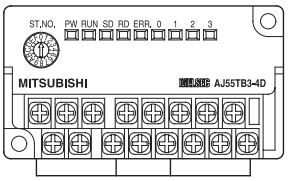
FX2N-64DNET



FX2N-32ASI-M



■ MELSEC I/O Link Decentralised Digital Input/Output Modules



AJ55TB3-4D

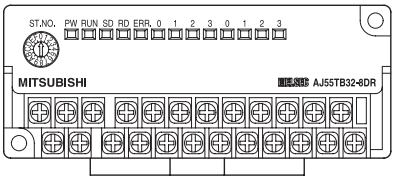
1 DATA	3 FG	5 +24V	7 I/O24A	9 X0	11 X1	13 X2	15 X3		
2 DG	4 24G	6 I/O24B	8 COMB	10 COMA	12 COMB	14 COMA	16 COMB		

AJ55TB32-4DR

1 DATA	3 FG	5 +24V	7 I/O24A	9 X0	11 X1	13 Y0	15 Y1		
2 DG	4 24G	6 I/O24B	8 COMB	10 COMA	12 COM1	14 COM1	16 COM2		

AJ55TB2-4R

1 DATA	3 FG	5 +24V	7 I/O24V	9 Y0	11 Y1	13 Y2	15 Y3		
2 DG	4 24G	6 I/O24G	8 COM1	10 COM1	12 COM1	14 COM1	16 COM2		



AJ55TB3-8D

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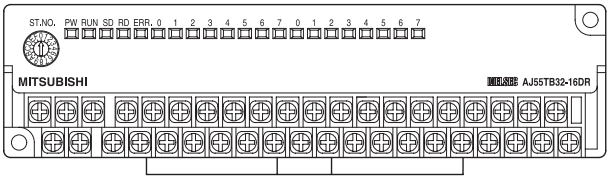
2 DG	4 24G	6 I/O24B	8 COMB	10 COMA	12 COMB	14 COMA	16 COMB	18 COMA	20 COMB	22 COMA	24 COMB								

AJ55TB32-8DR

1 DATA	3 FG	5 +24V	7 I/O24A	9 X0	11 X1	13 X2	15 X3	17 Y0	19 Y1	21 Y2	23 Y3								
2 DG	4 24G	6 I/O24B	8 COMB	10 COMA	12 COMB	14 COMA	16 COMB	18 COM1	20 COM1	22 COM1	24 COM2								

AJ55TB2-8R

1 DATA	3 FG	5 +24V	7 I/O24V	9 Y0	11 Y1	13 Y2	15 Y3	17 Y4	19 Y5	21 Y6	23 Y7								
2 DG	4 24G	6 I/O24G	8 COM1	10 COM1	12 COM1	14 COM1	16 COM1	18 COM1	20 COM1	22 COM1	24 COM2								



AJ55TB3-16D

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2 DG	4 24G	6 I/O24B	8 COMB	10 COMA	12 COMB	14 COMA	16 COMB	18 COMA	20 COMB	22 COMA	24 COMB	26 COMA	28 COMB	30 COMA	32 COMB	34 COMA	36 COMB	38 COMA	40 COMB

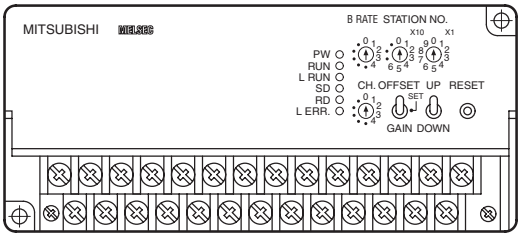
AJ55TB32-16DR

1 DATA	3 FG	5 +24V	7 I/O24A	9 X0	11 X1	13 X2	15 X3	17 X4	19 X5	21 X6	23 X7	25 Y0	27 Y1	29 Y2	31 Y3	33 Y4	35 Y5	37 Y6	39 Y7
2 DG	4 24G	6 I/O24B	8 COMB	10 COMA	12 COMB	14 COMA	16 COMB	18 COMA	20 COMB	22 COMA	24 COMB	26 COM1	28 COM1	30 COM1	32 COM1	34 COM1	36 COM1	38 COM1	40 COM2

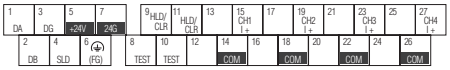
AJ55TB2-16R

1 DATA	3 FG	5 +24V	7 I/O24V	9 Y0	11 Y1	13 Y2	15 Y3	17 Y4	19 Y5	21 Y6	23 Y7	25 Y8	27 Y9	29 YA	31 YB	33 YC	35 YD	37 YE	39 YF
2 DG	4 24G	6 I/O24G	8 COM1	10 COM1	12 COM1	14 COM1	16 COM1	18 COM1	20 COM1	22 COM1	24 COM2	26 COM3	28 COM3	30 COM3	32 COM3	34 COM3	36 COM3	38 COM3	40 COM4

CC-Link Decentralised Analog Input/Output Modules



AJ65BT-64DAI



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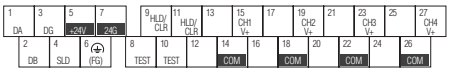

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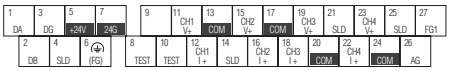

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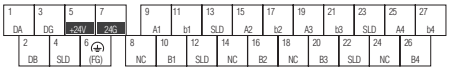

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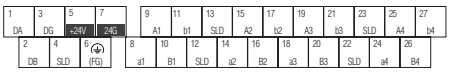

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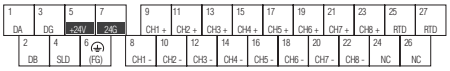

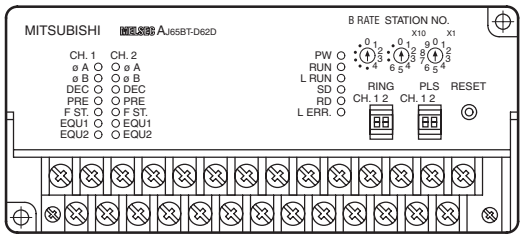

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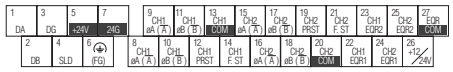

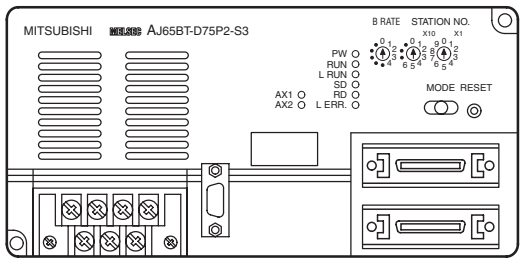

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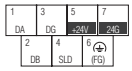
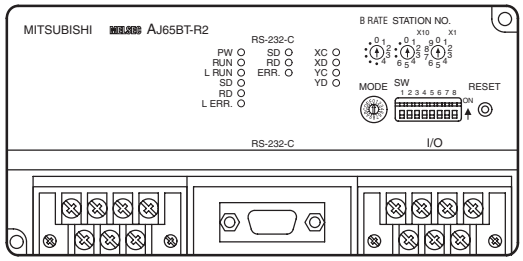
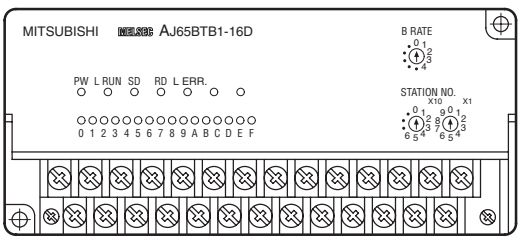


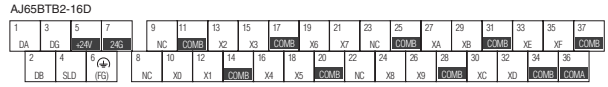


AJ65BT-R2

CC-Link Decentralised Digital Input/Output Modules

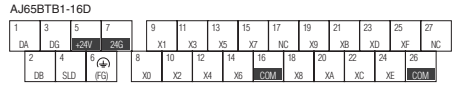


AJ65BTB2-16D



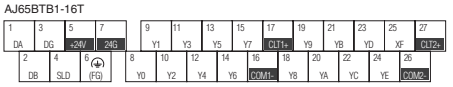
AJ65BTB2-16R

AJ65BTB1-16D



AJ65BTB1-16DT

AJ65BTB1-16T



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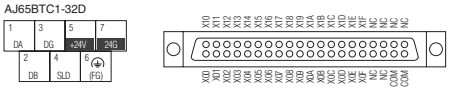

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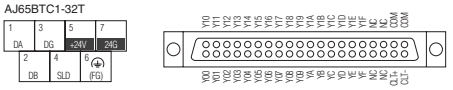
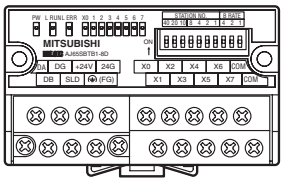


■ CC-Link Compact Decentralised Digital Input/Output Modules

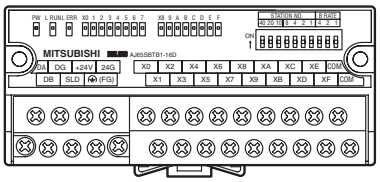


AJ65SBTB1-8D

DA	DG	+24V	24G		X0	X2	X4	X6	COM
DB	SLD	(FG)			X1	X3	X5	X7	COM

AJ65SBTB1-8TE

DA	DG	+24V	24G		Y0	Y2	Y4	Y6	COM+
DB	SLD	(FG)			Y1	Y3	Y5	Y7	CTL-



AJ65SBTB2N-8R

DA	DG	+24V	24G		Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	COM A				
DB	SLD	(FG)			COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B				

AJ65SBTB1-16D

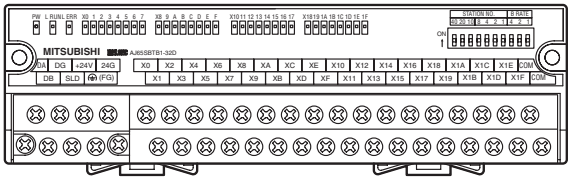
DA	DG	+24V	24G		X0	X2	X4	X6	X8	XA	XC	XE	COM				
DB	SLD	(FG)			X1	X3	X5	X7	X9	XB	XD	XF	COM				

AJ65SBTB1-16D1

DA	DG	+24V	24G		X0	X2	X4	X6	X8	XA	XC	XE	COM				
DB	SLD	(FG)			X1	X3	X5	X7	X9	XB	XD	XF	COM				

AJ65SBTB1-16TE

DA	DG	+24V	24G		Y0	Y2	Y4	Y6	Y8	YA	YC	YE	COM+				
DB	SLD	(FG)			Y1	Y3	Y5	Y7	Y9	YB	YD	YF	CTL-				



AJ65SBTB2N-16R

DA	DG	+24V	24G		Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	YA	YB	YC	YD	YE	YF	COM A								
DB	SLD	(FG)			COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B	COM B								

AJ65SBTB1-32D

DA	DG	+24V	24G		X0	X2	X4	X6	X8	XA	XC	XE	X10	X12	X14	X16	X18	X1A	X1C	X1E	COM								
DB	SLD	(FG)			X1	X3	X5	X7	X9	XB	XD	XF	X11	X13	X15	X17	X19	X1B	X1D	X1F	COM								

AJ65SBTB1-32D1

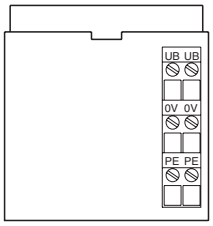
DA	DG	+24V	24G		X0	X2	X4	X6	X8	XA	XC	XE	X10	X12	X14	X16	X18	X1A	X1C	X1E	COM								
DB	SLD	(FG)			X1	X3	X5	X7	X9	XB	XD	XF	X11	X13	X15	X17	X19	X1B	X1D	X1F	COM								

AJ65SBTB1-32T

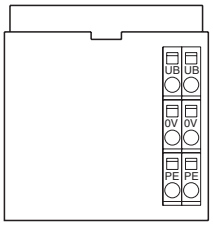
DA	DG	+24V	24G		Y0	Y2	Y4	Y6	Y8	YA	YC	YE	Y10	Y12	Y14	Y16	Y18	Y1A	Y1C	Y1E	CTL+								
DB	SLD	(FG)			Y1	Y3	Y5	Y7	Y9	YB	YD	YF	Y11	Y13	Y15	Y17	Y19	Y1B	Y1D	Y1F	COM-								

■ Terminal Blocks for MT Modules

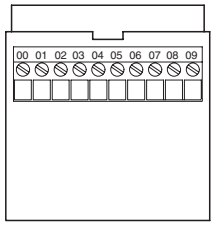
MT-DP12-TBS



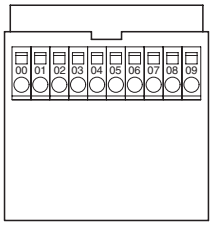
MT-DP12-TBC



MT-Y8R5-TBSL



MT-Y8R5-TBCL



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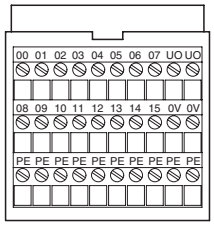
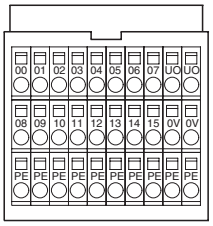
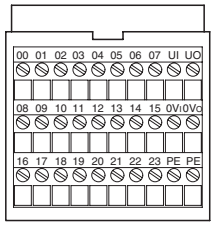


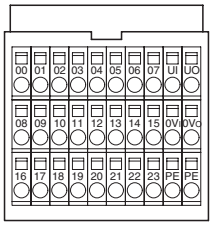
MT-Y8T-TBC



MT-X4Y4T-TBS



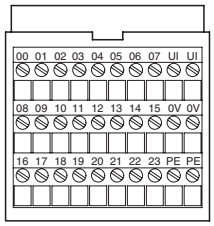
MT-X4Y4T-TBC



MT-4AD-TBS-N

MT-X8-TBS

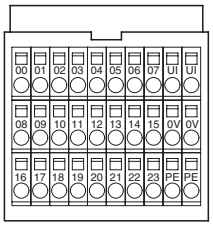
MT-X16-TBS



MT-4AD-TBC-N

MT-X8-TBC

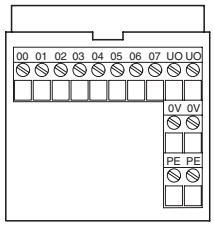
MT-X16-TBC



MT-4DA-TBS

MT-4DAV-TBS

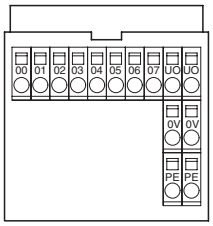
MT-Y4R-TBS



MT-4DA-TBC

MT-4DAV-TBC

MT-Y4R-TBC



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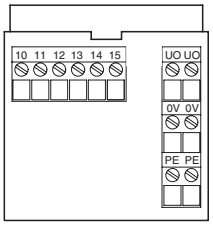

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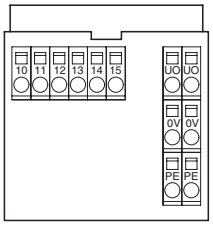
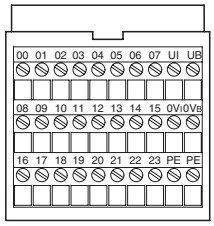


MT-DP12E-TBS



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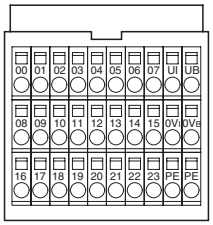

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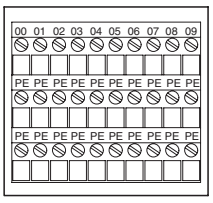

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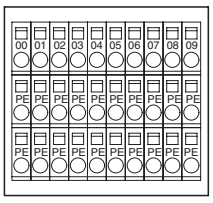

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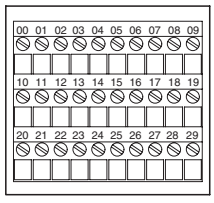

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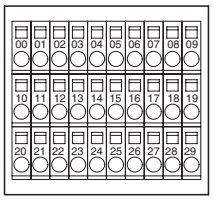
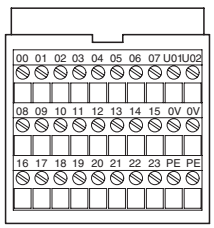


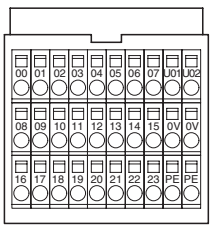
MT-Y8T2-TBS

MT-Y16T-TBS

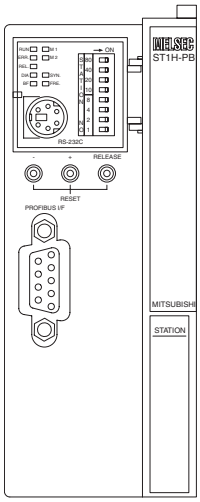


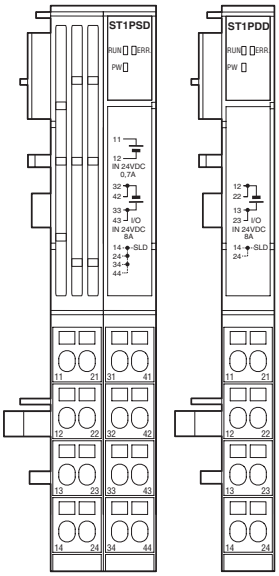
MT-Y8T2-TBC

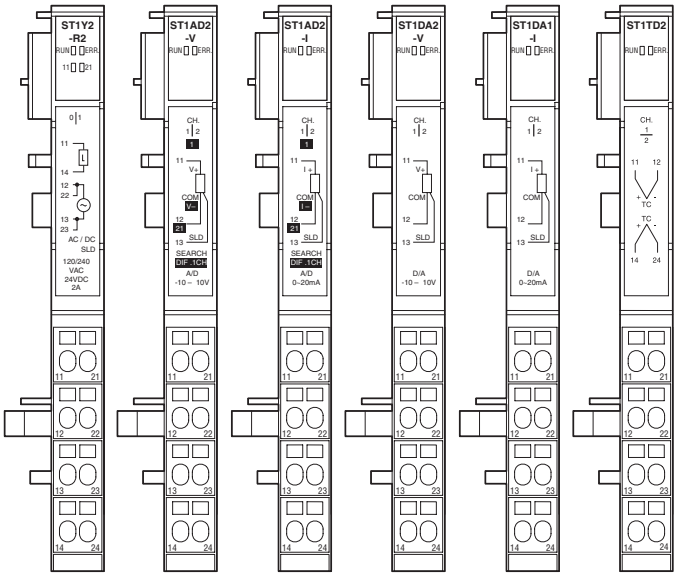
MT-Y16T-TBC

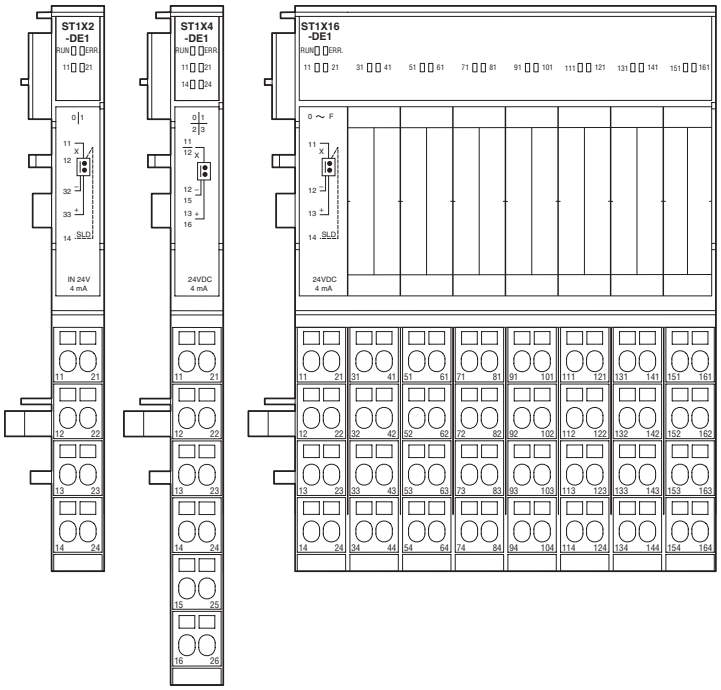


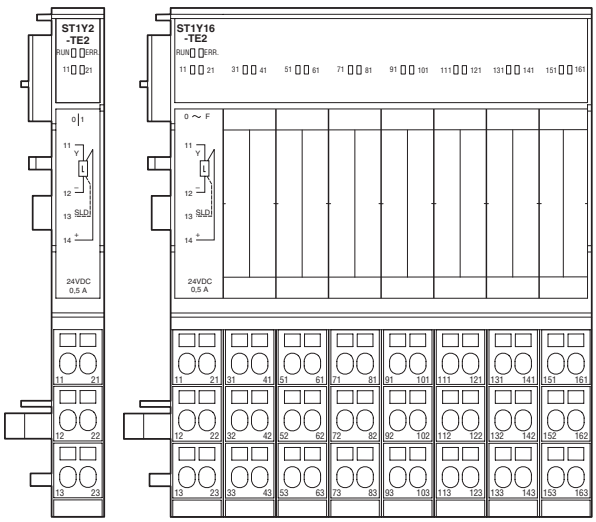
■ Profibus/DP MELSEC ST Modules

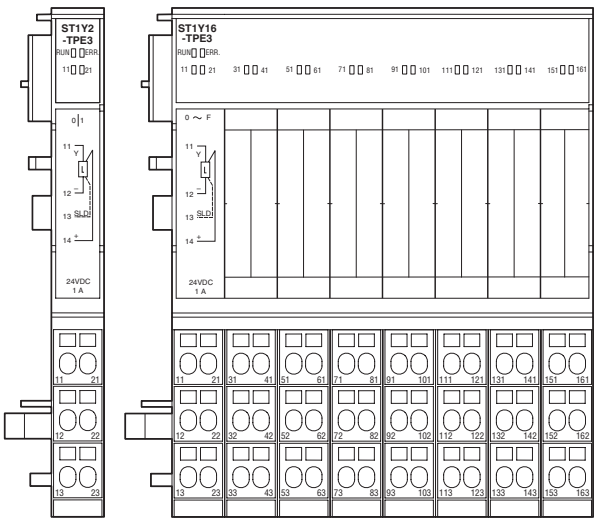








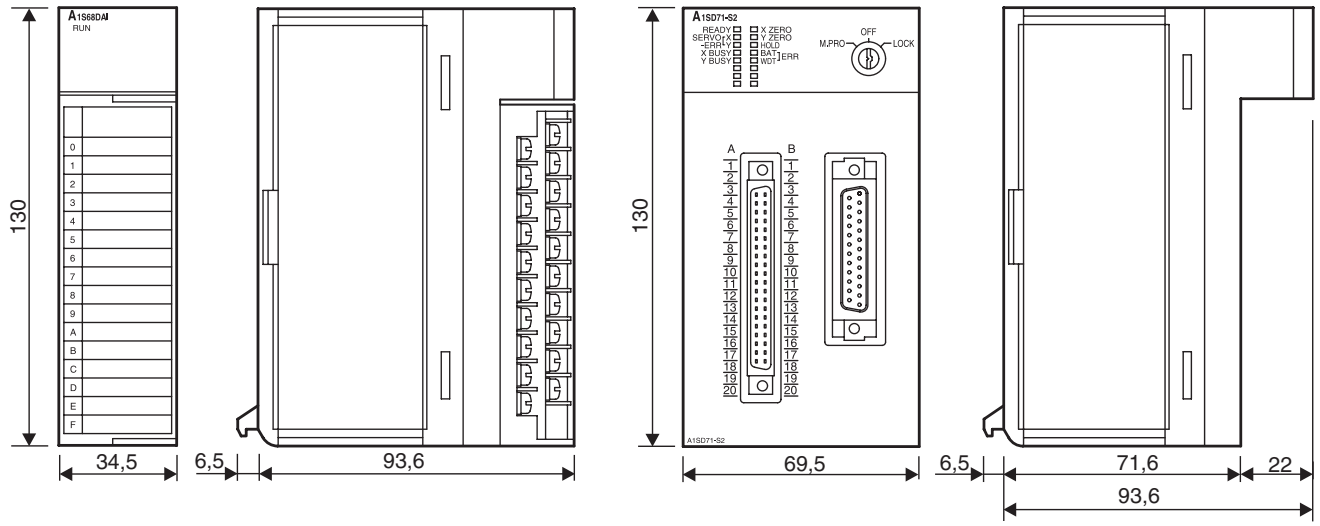




10

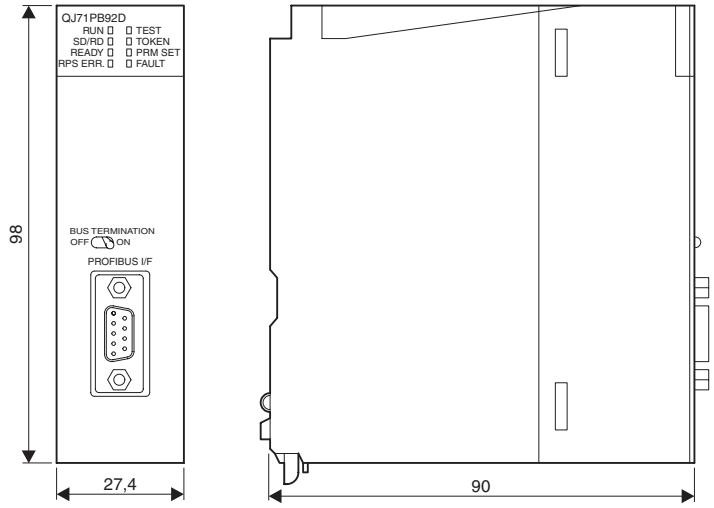
TERMINALS

MELSEC AnSH/QnAS Series Communication Modules



[mm]

MELSEC System Q Communication Modules



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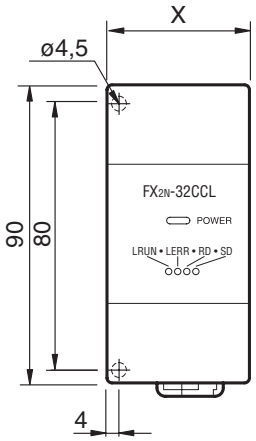
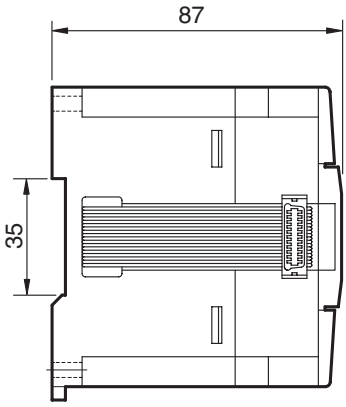
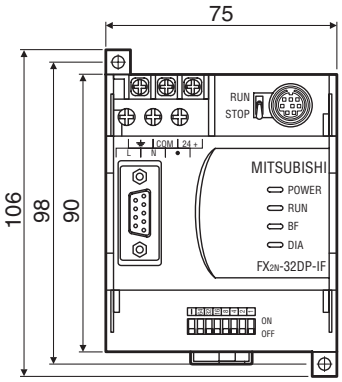
■ MELSEC FX2N Series Communication Modules

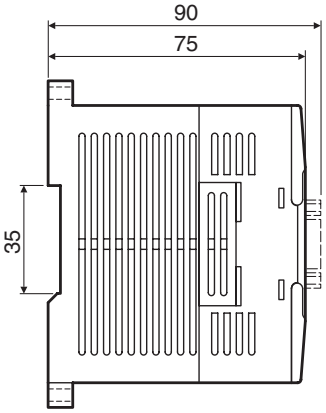




Communication Modules FX2N

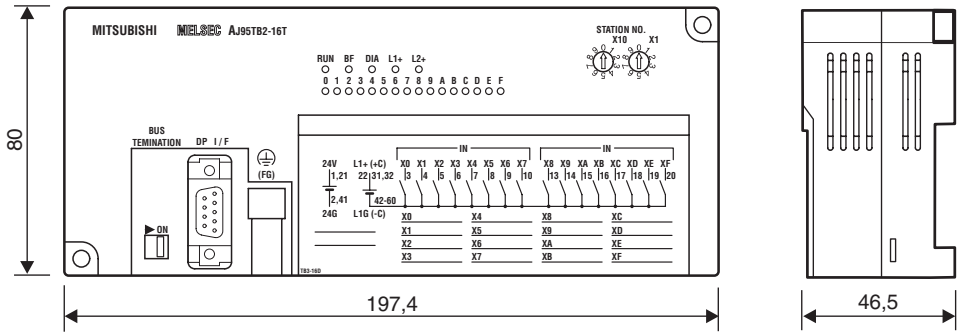
Type	X (in mm)
FX2N-16CCL-M	85
FX2N-32CCL	43
FX2N-32NT-DP	43
FX2N-32DP-IF(-D)	75
FX2N-64DNET	43
FX2N-32ASI-M	50
FX2N-16LNK-M	43
FX2N-64DP-M	85
FX2N-32CAN	43





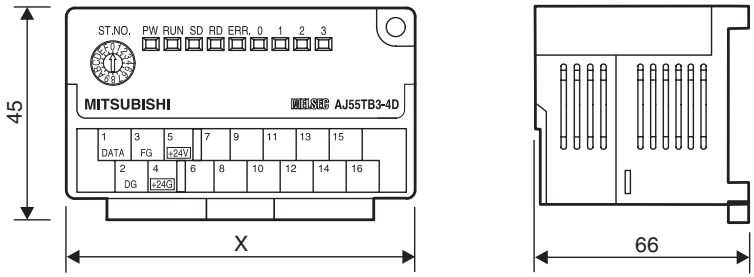
[mm]

■ Profibus/DP Compact I/O Modules



[mm]

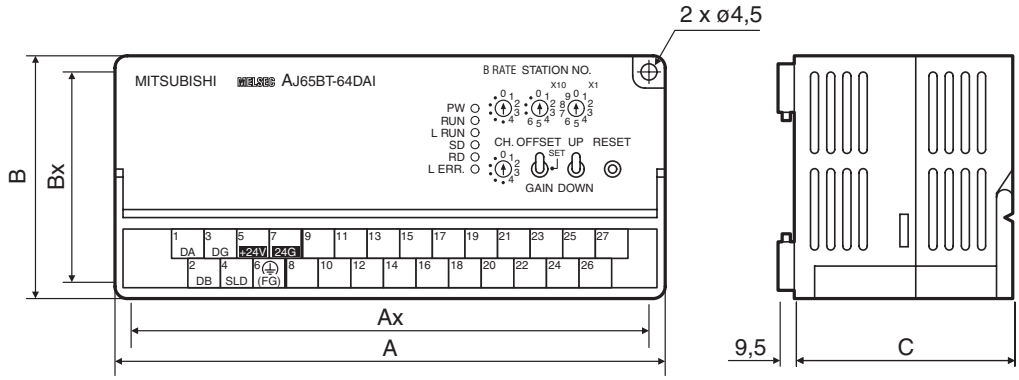
■ MELSEC Decentralised Input/Output Modules for I/O-Link



Typ	X (in mm)
AJ55TB3-4D	82
AJ55TB3-8D	114
AJ55TB3-16D	177
AJ55TB32-4DR	82
AJ55TB32-8DR	114
AJ55TB32-16DR	177
AJ55TB2-4R	82
AJ55TB2-8R	114
AJ55TB2-16R	177

[mm]

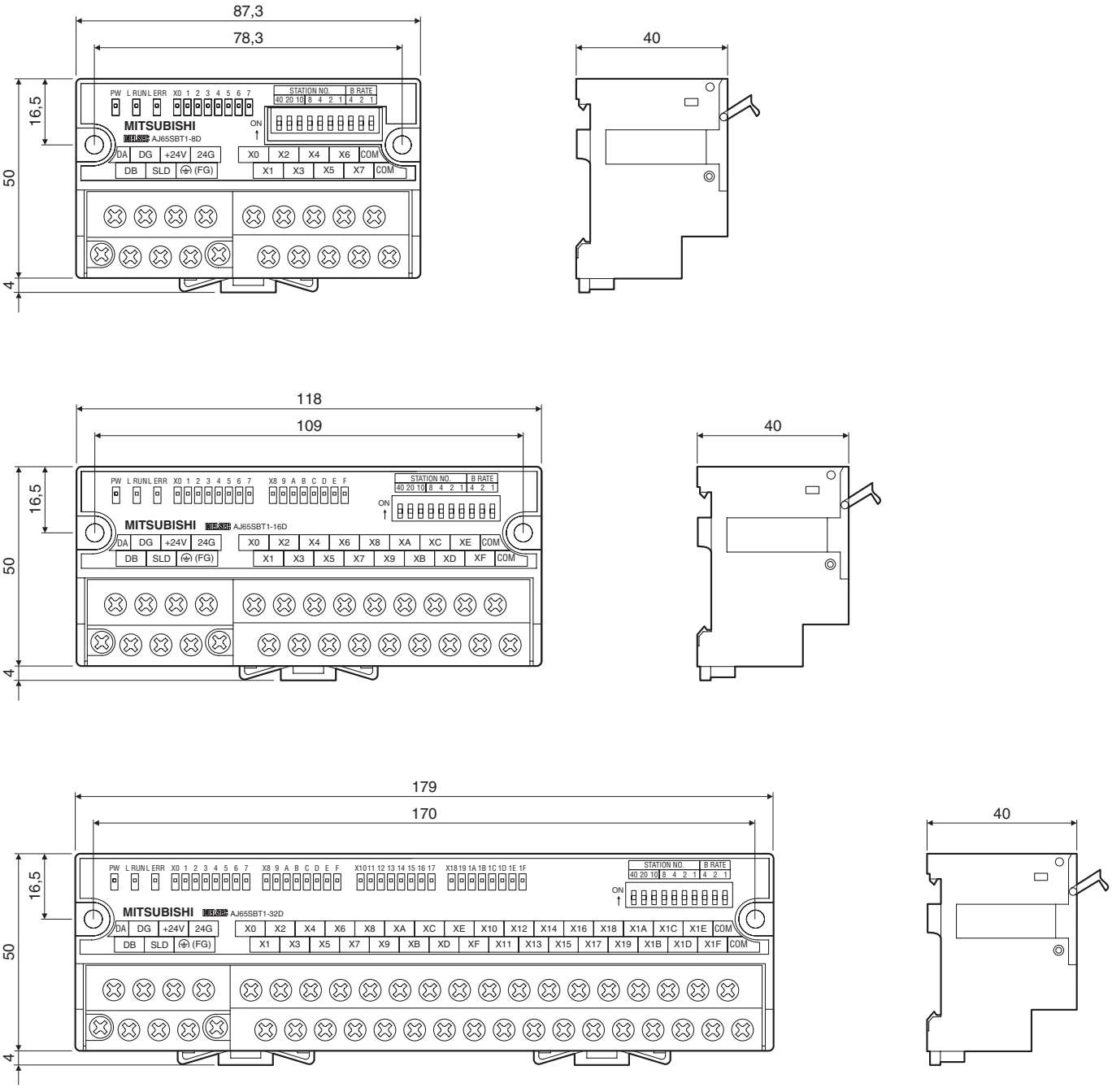
■ CC-Link Decentralised Input/Output Modules and Special Function Modules



[mm]

Type	I/O Modules							Analog modules				Special Function Modules		
	AJ65BTB1-16D	AJ65BTB2-16D	AJ65BTC1-32D	AJ65BTB1-16DT	AJ65BTB1-16T	AJ65BTC1-32T	AJ65BTB2-16R	AJ65BT-64AD	AJ65BT-64DAV/DAI	AJ65BT-68TD	AJ65BT-64RD3/4	AJ65BT-D62	AJ65BT-D75P2-S3	AJ65BT-R2
A	151.9	197.4	165	151.9	151.9	165	197.4	151.9	151.9	151.9	151.9	151.9	170	170
Ax	142.9	188.4	156	142.9	142.9	156	188.4	142.9	142.9	142.9	142.9	142.9	161	161
B	65	65	65	65	65	65	65	65	65	65	65	65	80	80
Bx	56	56	56	56	56	56	56	56	56	56	56	56	71	71
C	46	46	46	46	46	46	46	63	63	63	63	63	63.5	63.5

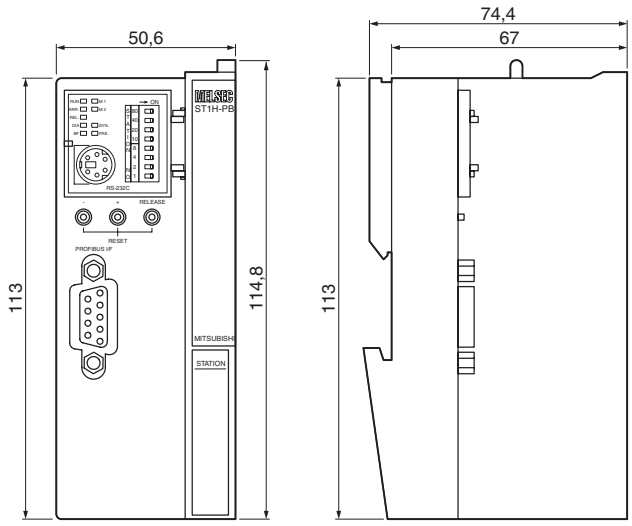
■ CC-Link Compact Decentralised Input/Output Modules



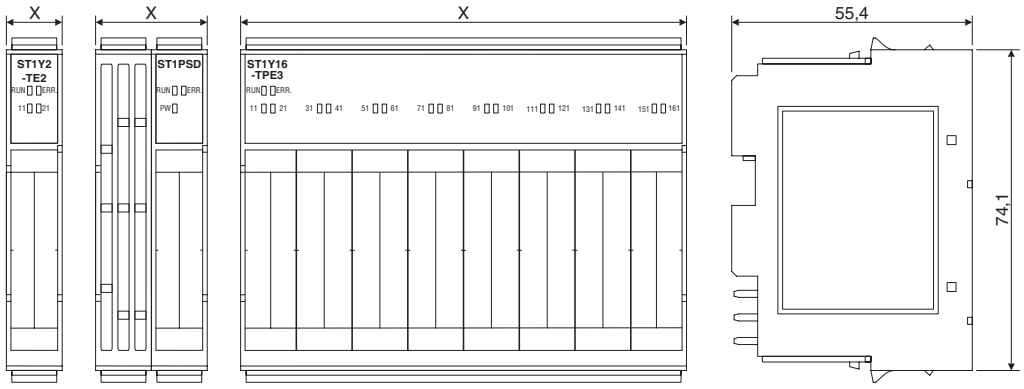
[mm]

Profibus/DP MELSEC ST Modules

ST1H-PB



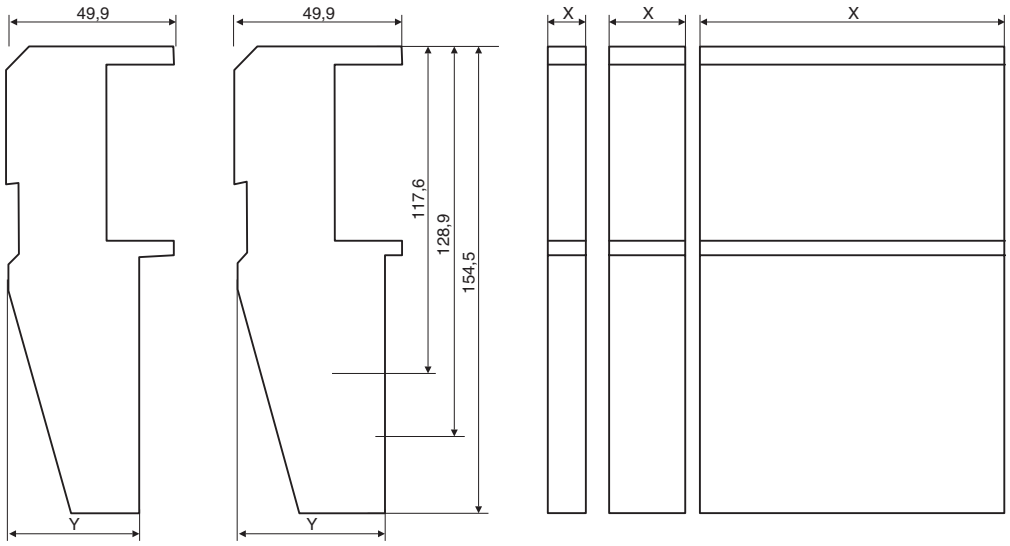
Electronic modules



Type	X
ST1PSD	12.6
ST1PPD	25.2
ST1X2-DE1	12.6
ST1X4-DE1	12.6
ST1X16-DE1	100.8
ST1Y2-TE2	12.6
ST1Y16-TE2	100.8
ST1Y2-TP3	12.6
ST1Y16-TP3	100.8
ST1Y2-R2	12.6
ST1AD2-V	12.6
ST1AD2-I	12.6
ST1DA2-V	12.6
ST1DA2-I	12.6
ST1TD2	12.6

Base modules

S-type E-type

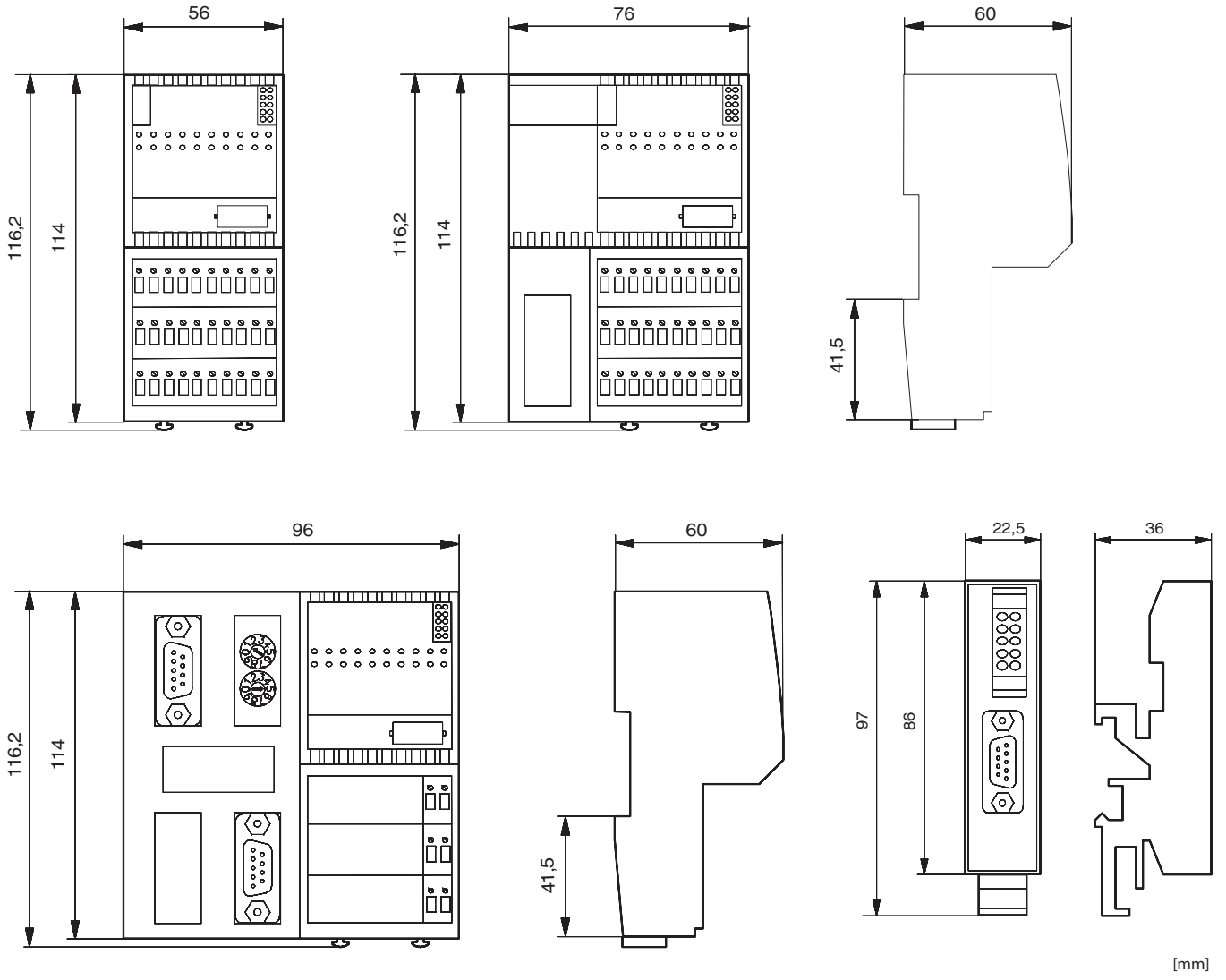


S-type	X	Y
ST1B-S4P2-H-SET	12.6	41.6
ST1B-S4P2-R-SET	25.2	41.6
ST1B-S4X2	12.6	41.6
ST1B-S6X4	12.6	41.6
ST1B-S4X16	100.8	41.6
ST1B-S3Y2	12.6	41.6
ST1B-S3Y16	100.8	41.6
ST1B-S4IR2	12.6	41.6
ST1B-S4TD2	12.6	41.6

E-type	X	Y
ST1B-E4P2-H-SET	12.6	48.3
ST1B-E4P2-R-SET	25.2	48.3
ST1B-E4X2	12.6	48.3
ST1B-E6X4	12.6	48.3
ST1B-E4X16	100.8	48.3
ST1B-E3Y2	12.6	48.3
ST1B-E3Y16	100.8	48.3
ST1B-E4IR2	12.6	48.3
ST1B-E4TD2	12.6	48.3

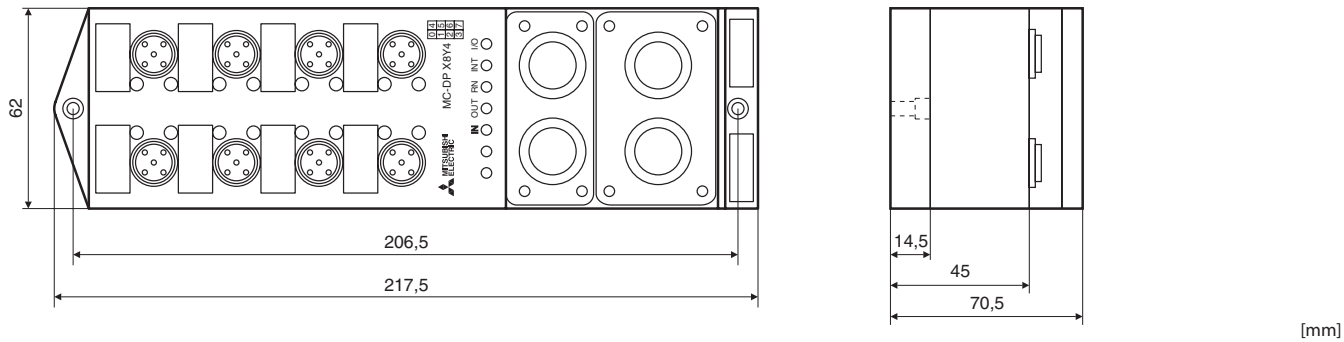
All dimensions in mm

■ Profibus/DP MT Modules



[mm]

■ Profibus/DP MC Modules



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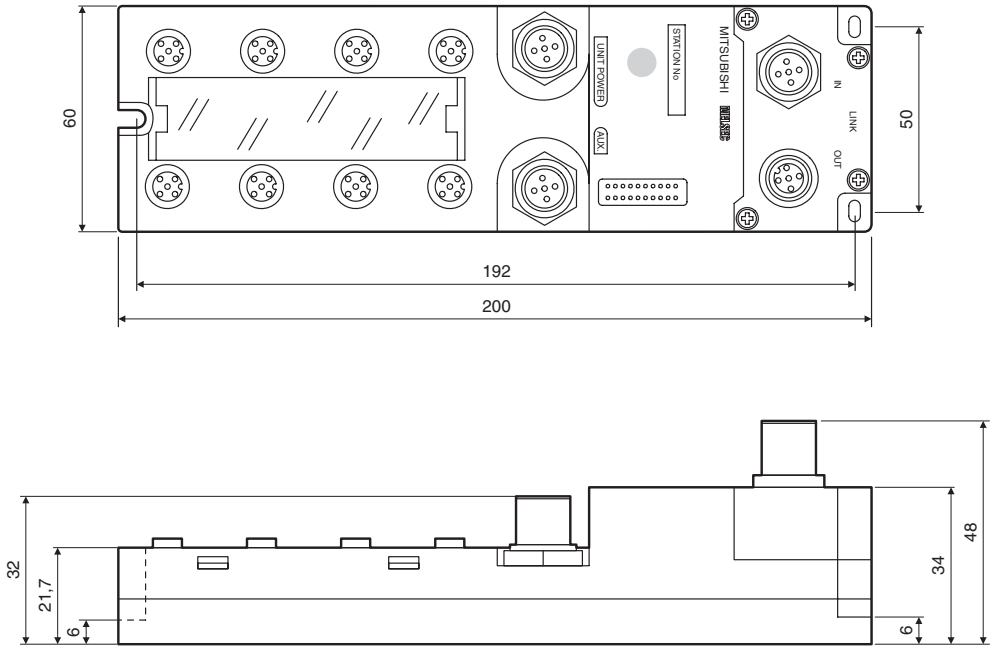
IP67 Profibus/DP I/O Modules



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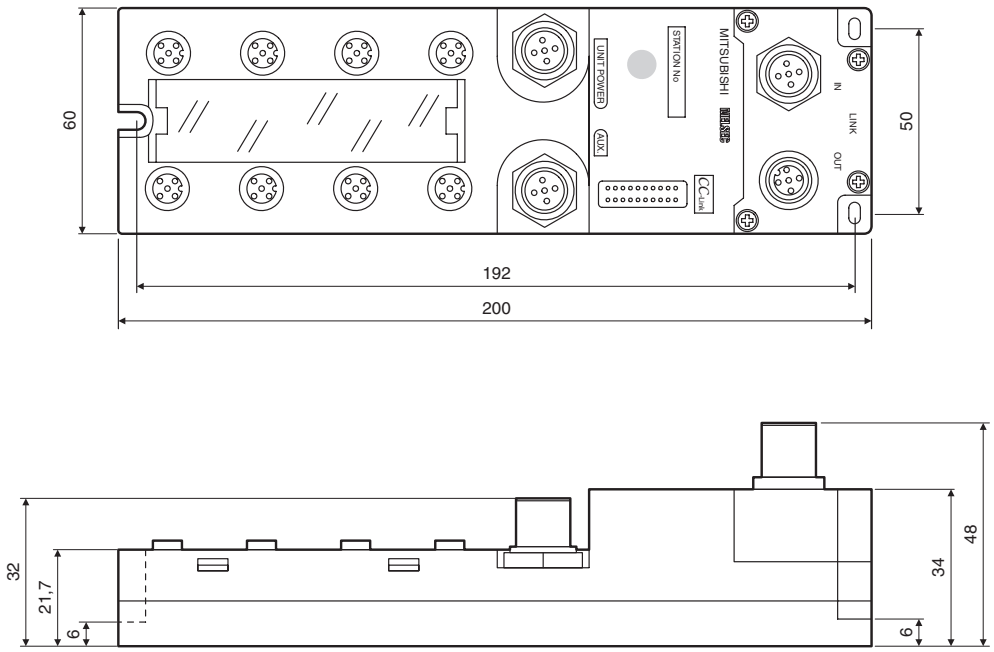
IP67 CC-Link I/O Modules



[mm]

MELSOFT – Programming and Documentation Software for Standard Personal Computers

With the MELSOFT software family Mitsubishi Electric offers efficient software packages helping to reduce programming and setup times to a high degree.

The MELSOFT software family provides instant access, direct communications, compatibility, and open exchange of variables.

The MELSOFT family comprises:

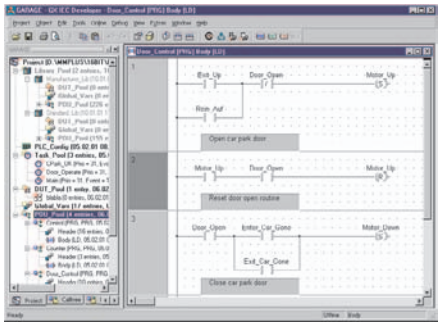
- Programming packages GX Developer and GX IEC Developer
- Network configuration software GX Configurator DP
- Visualization software MX4 SCADA
- MX Change software for a dynamic data exchange
- Various development software for operator terminals (please refer to the HMI Technical Catalogue)

GX Developer FX is the right decision for a universal programming package. If additionally to the FX family the programming of the AnS/QnAS and AnU/QnA series should be included, the GX Developer is the right choice.

For structured programming the IEC1131.3 (EN 61131-3) conforming programming software GX IEC Developer is recommended.

For detailed information please order our separate MELSOFT brochure and the Technical Cataloques for PLCs.

■ GX IEC Developer



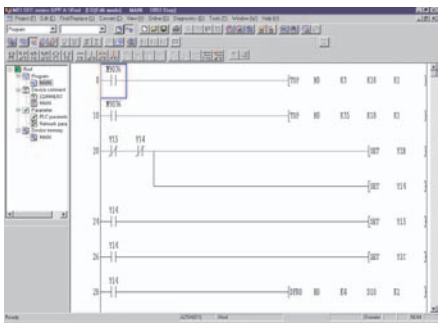
GX IEC Developer provides all functions of the pre-mentioned programs and in addition meets the programming standard for the future: IEC 1131.3 (EN 61131). This software supports stuctured, multi language programming and offers both the FX version and a full version for the programming of MELSEC AnS/QnAS and AnU/QnA series and MELSEC System Q.

The software is supplied without an programming cable as standard, which is required for the connection between the PLC and a serial interface of a personal computer.

GX IEC Developer can be run under MS Windows® 95/98/NT4/2000 and XP.

Software		GX IEC Developer FX V0600-1LOC-G	GX IEC Developer FX V0600-1LOC-E	GX IEC Developer V0600-1LOC-G	GX IEC Developer V0600-1LOC-E
Applicable PLC series		FX1S, FX1N, FX2N, FX2NC	FX1S, FX1N, FX2N, FX2NC	All MELSEC PLCs	All MELSEC PLCs
Software language		German	English	German	English
Disk type		CD-ROM	CD-ROM	CD-ROM	CD-ROM
Order information	Art. no.	152551	152562	152783	152536
Accessories		Programming cable: SC-09, art. no. 43393		Programming cable: SC-09, art. no. 43393 Programming cable for System Q: QC30R2, art. no. 128424	

GX Developer



GX Developer is the standard programming software for all MELSEC PLC series and combines all functions of MELSEC MEDOC with the user guidance of Microsoft Windows.

With this software you can comfortably create PLC programs alternatively in the form of Ladder Diagrams or Instruction Lists. Both forms of representation can be toggled easily during operation.

Besides efficient monitoring and diagnostics functions GX Developer features an offline simulation of any PLC type.

With GX Developer all MELSEC PLCs from the FX1S to the Q25PH (MELSEC System Q) are supported.

GX Developer FX is limited to programming of the FX series.

This software provides all the Windows-specific advantages and is especially suited to all MELSEC PLCs.

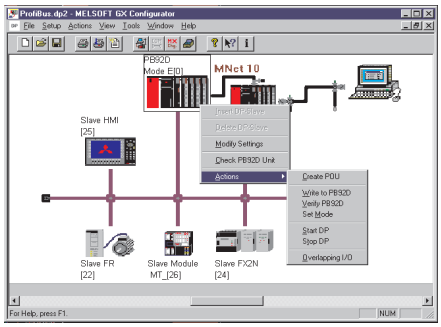
The software is supplied without an programming cable as standard, which is required for the connection between the PLC and a serial interface of a personal computer.

GX Developer can be run under MS Windows® 95/98/NT4/2000 and XP.

Software	GX Developer FX V0800-1L0C-G	GX Developer FX V0800-1L0C-E	GX Developer V0800-1L0C-G	GX Developer V0800-1L0C-E
Applicable PLC series	FX1S, FX1N, FX2N	FX1S, FX1N, FX2N	All MELSEC PLCs	All MELSEC PLCs
Software language	German	English	German	English
Disk type	CD-ROM	CD-ROM	CD-ROM	CD-ROM
Order information Art. no.	152848	152863	152816	150420
Accessories	Programming cable: SC-09, art. no. 43393		Programming cable: SC-09, art. no. 43393 Programming cable for System Q: QC30R2, art. no. 128424	

Software for PROFIBUS Networks

GX Configurator DP



The Software GX Configurator DP is a user friendly configurations software for the open network PROFIBUS/DP.

The software package is a 32 bit application and runs under MS Windows® 95/98/NT4/2000 and XP. Configuration of all PROFIBUS modules for the MELSEC Ans/QnAS series, System Q and also the FX family is possible.

Due to the supported extended user parameters of a GSD file, easy parameter setting of PROFIBUS/DP slave devices is possible even for third party devices.

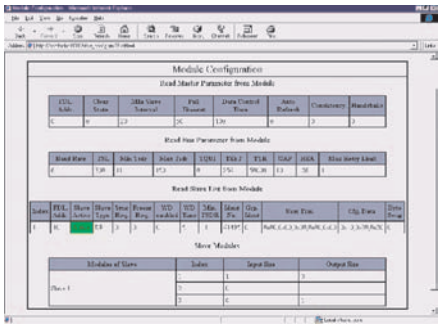
The GX Configurator DP enables the download of all configuration data via network.

Software	GX Configurator DP V0600-1L0C-E
Supported PROFIBUS/DP master modules for the Mitsubishi MELSEC series	A1SJ71PB92D, QJ71PB92D
Software language	English / German
Disk type	CD-ROM

Order information	Art. no.	155928

Accessories	Programming cable: SC-09, art. no. 43393 Programming cable for System Q: QC30R2, art. no. 128424

GX Monitor DP



With the new GX Monitor DP Software it is possible to make Diagnostics in graphical or text for PROFIBUS/DP networks and PLC via Internet.

By using the standard Internet Explorer® it is simple to use and easy to run on different PC platforms.

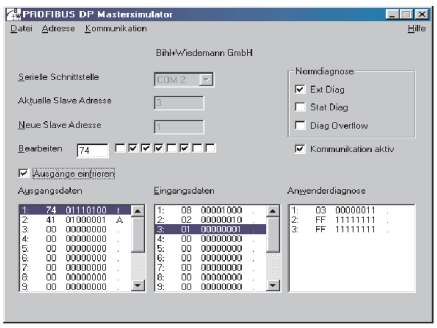
This software can be used independently or in combination with GX Configurator DP.

Software	GX Monitor DP V0100-1L0C-E
Supported PROFIBUS/DP master modules for the Mitsubishi MELSEC series	A1SJ71PB92D, QJ71PB92D, QJ71PB93D
Software language	English
Disk type	CD-ROM

Order information	Art. no.	143971

Accessories	Programming cable: SC-09, art. no. 43393 Programming cable for System Q: QC30R2, art. no. 128424

PROFIBUS Master Simulator



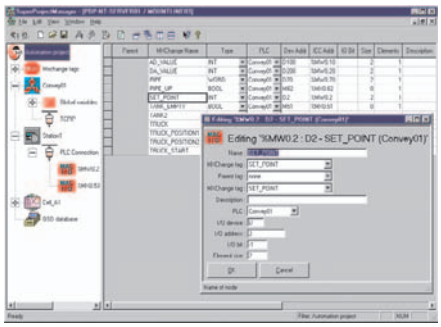
The PROFIBUS Master Simulator is an easy to use and versatile utility for the specifications exchange with PROFIBUS slaves. For this purpose the PROFIBUS Master Simulator is capable of exchanging the specifications with many slaves even without a GSD file, a type file, and a PROFIBUS master. Without further input or additional files PROFIBUS slaves can be started using their base I/O range.

Input specifications can be read and output specifications can be written. Furthermore, the PROFIBUS DP Master Simulator obviously supports GSD files as well as entering particular configurations for starting the specifications exchange with PROFIBUS slaves. Addressing is also supported. The PROFIBUS Master Simulator provides an option to scan the entire PROFIBUS for connected participants and display them graphically.

The PROFIBUS Master Simulator is a development of the company Bihl & Wiedemann GmbH (www.bihl-wiedemann.de) and is not distributed by Mitsubishi Electric.

Visualization Software and Software for Dynamic Data Exchange

■ MX Change



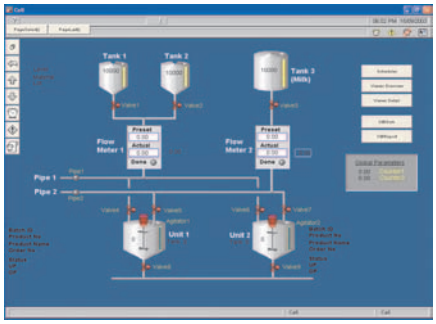
MX Change is integrated in the MELSOFT family as the "heart of automation". The software package consists of a Server and a Super Projekt Manager, other automation programs can be connected to. Since MX Change operates across a network, any variable once declared can be used by all other systems connected to the database.

Through this method following the principle "define once and use anywhere" the development time can even be decreased drastically.

The software runs under MS Windows® 95/98/NT/2000.

Software		MX Change V0220-1LOC-E	MX Change 2000T V0220-1LOC-E	MX Change 200T V0220-1LOC-E-DEMO
Software language		English	English	English
Executable tags		No limit	2,000	200/Demo version
Disk type		CD ROM	CD ROM	CD ROM
Order information	Art. no.	141997	141996	141995

■ MX4 SCADA and MX4 HMI



MX4 SCADA is a process visualisation system that can handle everything from simple installations to complex production control systems. The software package can administer an almost unlimited objects.

MX4 HMI is designed for small applications where there is no need for an extensive networked solution. However, if the application expands then it is easy to upgrade to MX4 SCADA.

Also included with MX4 SCADA/MX4 HMI is FastLinx, a communication and data exchange tool that make set-up simple and directly links MX4 to GX IEC Developer to ensure consistent use of PLC devices.

The software runs under MS Windows® 95/98/NT4/2000 and XP and is available in a variety of different versions geared to the objects to be handled.

Software		Demo & Development version	Run-time version
Applicable PLC series		All MELSEC PLCs	All MELSEC PLCs
Software language		English, German, French	English, German, French
Disk type		CD ROM	CD ROM
Order information	Art. no.	153421	On request

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Industrial Automation / German Branch
Gothaer Str. 8
D-40880 Ratingen

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Department: . . . . . .
Street: . . . . . .
Address: . . . . . .
Phone: . . . . . .
Fax: . . . . . .

Order declaration

Pos.	Number	Item (type)	Article number	Description	Remarks

Notes when ordering:
When ordering, please use only the type designations and order numbers shown in this catalogue.

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