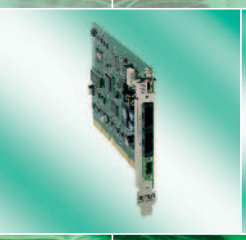
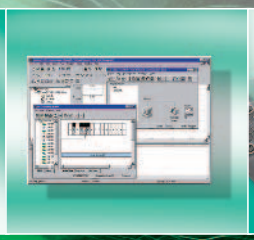
GENERAL CATALOGUE 2004

Automation Systems


- Programmable Controllers
- Wiring Systems
- Industrial Communication
- Remote I/O
- Industrial Information Technology
- Machine Management Tools
- HMI
- Software

Advanced Industrial Automation

Cat. No.Y201-EN2-02 AS

OMRON

Industrial Communication

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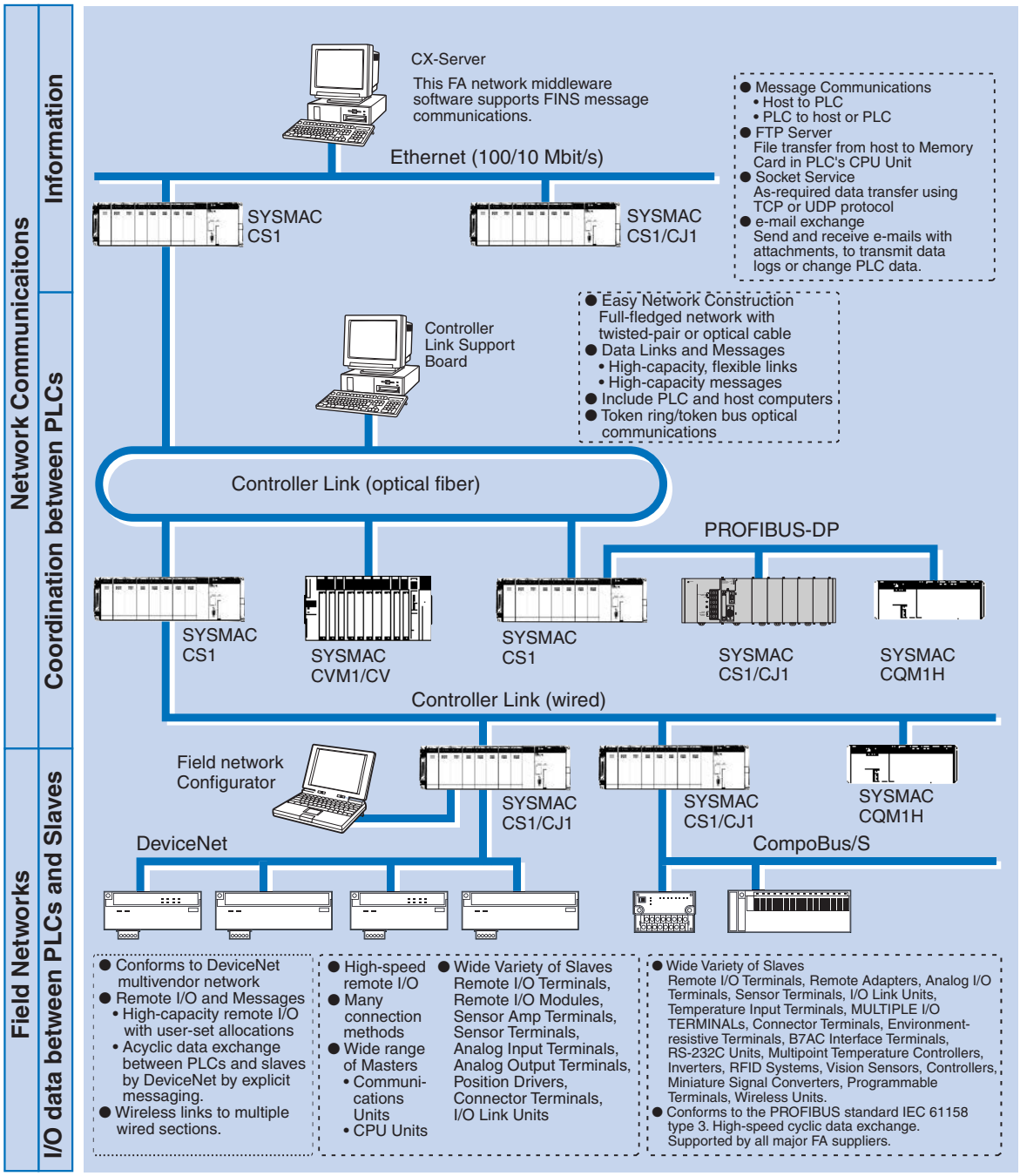
Industrial Communication

Overview

Seamlessly connect control networks to information

Omron has pioneered seamless communication through multiple network levels. The FINS (Factory Information Network System) protocol was designed to be used over open standard networks like Ethernet and DeviceNet, as well as proprietary networks like Controller Link.

On fieldbus level, multi-vendor field networks are supported with DeviceNet and PROFIBUS-DP, whereas Omron's fast CompoBus/S system offers a simple and cost-effective remote I/O solution.



Communications Network Overview

Network type		Network name	Connections	Communications	Applicable PLCs
Communi-cations networks	Information	Ethernet	Host to PLC	FINS message communications	CJ1, CS1: Ethernet Unit C200HX/HG/HE(-Z):PC Card Unit (Ethernet Card)
			PLC to PLC		
			Host to Memory Card in CPU Unit	FTP server	
			Unix computer or other node with socket service to PLC	Socket service	
			PLC to Host	Mail transmissions (CS1/CJ1 Ethernet Unit only)	
			Host to PLC		
	Port-to-port PLC control networks	Controller Link	Network-connected computer and PLC	FINS message communications	CJ1, CS1, C200HX/HG/HE(-Z), CQM1H: Controller Link Unit
				Data links (Offset designation and easy setting possible.)	
		Controller Link	PLC to PLC	FINS message communications	
				Data links (Offset designation and easy setting possible.)	
Field networks	PLC-to-slave control networks	DeviceNet	PLC to PLC	Explicit and FINS communications on open network. With the CS1W-DRM21, communications are possible with upper-level networks.	Master: CJ1, CS1, C200HX/HG/HE(-Z), Open Network Controller, VME Board Slaves:CJ1, CS1, C200HX/HG/HE(-Z), CQM1H, CPM, PC Board
		DeviceNet	PLC to slaves (components)	Large-volume remote I/O on open network (automatic or user-specified allocations)	
		PROFIBUS-DP			Master: CS1, C200H-series, CJ1 Slave: CS1, C200H-series, CJ1, CQM1H, CPM2A, CPM1A
		CompoBus/S		High-speed remote I/O (fixed allocations) on special OMRON network	Master:CJ1, CS1, C200HX/HG/HE(-Z), CQM1H, SRM1, CPM2C-S, SYSMAC Board Slaves:CPM1A, CPM2A, CPM2C
		B7A	B7A Link Terminal to B7A Link Terminal and B7A Interface Unit on PLC Rack to B7A Link Terminal	Wiring reduction with 1:1 transmissions without a communications master	CS1, C200HX/HG/HE(-Z), CQM1H, C1000H/C2000H
Motion Network	PLC to Servo control network	MechatroLink	CS1 PLC and Sigma II servo drives	Co-ordinating motion. Up to 30 axes.	CS1

Basic Specifications Communication Networks

Item		Ethernet	Controller Link
Communications	Messages	Supported	Supported
	Automatic Data links	Not supported	Supported
Other functions		• Socket service • FTP server • Mail notification	---
Maximum baud rate		100 Mbps (CS1, CJ1)	2 Mbps, Communications cycle time: approx 34 ms (for wired network with 32 nodes and data links of 2 Kbits + 2 kWords)
Maximum communications distance		2.5 km	Twisted-pair: 1 km* H-PCF optical fiber: 20 km GI optical fiber: 30 km *At 500 Kbps
Maximum number of nodes		254 nodes	Wired: 32 nodes, 64 with repeaters Optical: 62 nodes
Communications media		Coaxial cable (10Base-5) or twisted-pair cable (10Base-T, 100Base-Tx)	Twisted-pair or optical fiber cable
Data link capacity of network		---	32,000 words
Remote I/O		---	---
Applicable PLCs		CJ Series, CS Series, C200HX/HG/HE(-Z)	CJ Series, CS Series, C200HX/HG/HE(-Z)* *: Twisted-pair cable only

Field Networks

Field Network Specifications

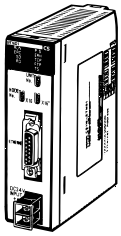
Item		PROFIBUS-DP	DeviceNet	CompoBus/S
Communi-cations supported	Remote I/O	Yes	Yes	Yes
	Messages	Limited (DPV1 specification)	Yes	---
Maximum baud rate		12 Mbps	500 kpbs Communications cycle time: Approx. 5 ms (with 128 inputs, 128 outputs)	750 kbps (in high-speed mode) Communications cycle time: 0.8 ms max. (with 128 inputs, 128 outputs in high-speed mode)
Maximum communications distance		1200 m up to 93.75 kbit/s to 100 m at 12 Mbps	500 m (at 125 kbps) This value is when Thick Cable is used for the trunk line. The value is 100 m for Thin Cable.	2-conductor cable Main line length:100 m max. in high-speed mode, 500 m in long-distance mode Special Flat Cable or 4-conductor cable: Total line length: 200 m max. total with no other specific restrictions for main or branch line lengths
Maximum number of slaves		125 slaves	63 slaves	32 slaves
Communications media		Special PROFIBUS cable	Special DeviceNet cable	2-conductor or 4-conductor cable, or special flat cable
Maximum number of remote I/O points		C200HW-PRM21: 300 words = 4800 points CJ1W-PRM21, CS1W-PRM21: 7000 words = 112000 points	• CS1: 2,048 points (Allocated using DM area settings: 16,000 points, allocated using Configurator: 32,000 points.) • C200HX/HG/HE(-Z): 1,600 points (allocated using Configurator: 4,800 points.) • C200HS: 1,024 points (allocated using Configurator: 1,280 points.) • CVM1/CV: 2,048 points (allocated using Configurator: 6,400 points.)	• CS1, C200HX/HG/HE(-Z), SYSMAC Board, C200HS, SRM1, CPM2C-S: 256 points • CQM1H: 128 points
Masters	PLCs	CJ series, CS series, C200H series (Master Unit is classified as a CPU Bus Unit.)	CJ Series, CS Series, CVM1/CV Series, C200HX/HG/HE(-Z), C200HS	CJ Series, CS Series, C200HX/HG/HE(-Z), C200HS, CQM1, SRM1, CPM2C-S
	Other	None	Open Network Controllers, VME Boards	SYSMAC Boards, VME Boards
Remote I/O slaves		GT1 I/O terminals, C200H I/O Link Unit, CJ1 I/O Link Unit, CQM1 I/O Link Unit, CPM I/O Link Unit, Inverter communication interface, F150 vision sytem	DRT1 and DRT2 sensor terminals, GT1 terminals, RS-232C Units, E5EK Digital Controller, 3G3MV Multifunction Miniature Inverters, 3G3FV Advanced General-purpose Inverters, V600 Intelligent Flags (ID system), F150 Vision Sensors, NT-DRT21 Programmable Terminal Interface Unit, WD30 Wireless Units, CS1 DeviceNet Unit, CJ1 DeviceNet Unit, C200H I/O Link Unit, CQM1 I/O Link Unit, CPM I/O Link	Remote I/O Terminals, Connector Terminals, Water-resistive Terminals, Sensor Terminals, Analog Analog Output Terminals, Remote I/O Modules, CPM2C I/O Link Unit, CPM1A/CPM2A I/O Link Unit

Note: The B7A transmission path that features reduced wiring without the need for a master is also available.

Ethernet

Unite Factory Controls and Office Information

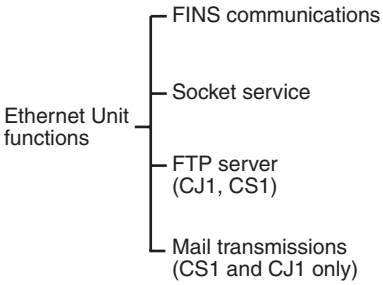
CJ1W-ETN11/21
for CJ1
Modular PLC



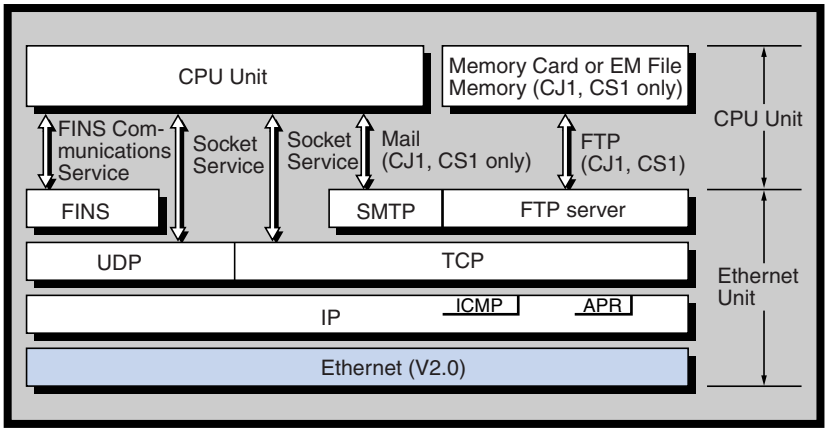
CS1W-ETN01/11/21
for CS1 Rack PLCs

Outline

- Use the socket service to send and receive the required data using TCP/IP or UDP/IP.
- Execute FINS commands using any of the standard protocols provided by OMRON.
- Send files via FTP.
- Send mail to provide information using SMTP, POP3.
- All of this is supported using Ethernet. Communications services can be selected based on the need at hand to flexibly merge PLCs into the Ethernet information network.



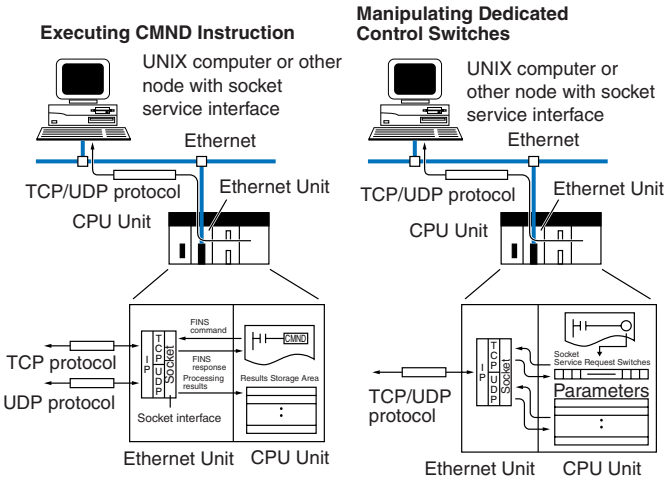
Software Configuration



Features

Socket Service Using UDP/IP or TCP/IP

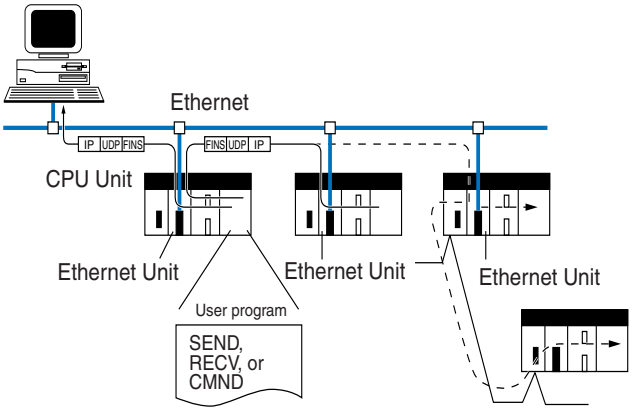
The socket service enables sending and receiving various data with UDP/IP or TCP/IP using standard protocols for Ethernet. This enables communications with a wide range of devices that support Ethernet communications, including control devices, workstations, personal computers, and Ethernet Units from other manufacturers.



FINS Message Communications

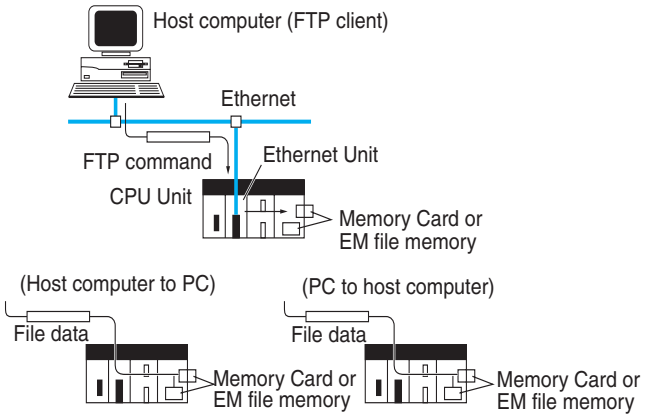
FINS commands, a special communications services from OMRON, can be sent to or received from other PLCs or computers on the same Ethernet network by executing SEND, RECV, or CMND instructions in the ladder-diagram program.

The FINS gateway function allows access not only to PLCs on the same Ethernet network, but also to PLCs on other networks such as SYSMAC LINK or Controller Link.



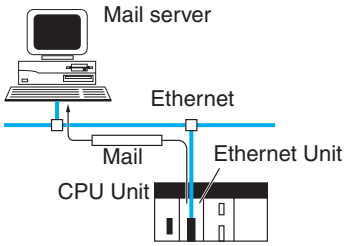
FTP Server (CS1, CJ1, and CVM1/CV Series Only)

The Ethernet Unit has a built-in FTP server function, so that workstations and other computers on the Ethernet with FTP client functions can read or write individual files with PLCs. This enables the client to download large quantities of data without any programming in the ladder program in the PLC.



Mail (CS1 and CJ1 Series Only)

Data such as user-created messages, Ethernet Unit error log information, data and status information can be sent as e-mail to a host computer. This enables on-site information to be sent from the PLC to the host computer in a single e-mail message. With the CS1W- and CJ1W-ETN21 Units, it is possible to send/receive e-mails with attachments, transfer programs and data to the PLC CPU by e-mail, and send FINS commands to the PLC CPU.



Connect Networks to the Controller Link Network

FINS message communications can be used to communicate between information networks and the Controller Link control network. A host computer can thus communicate through a PLC on Ethernet to monitor PLCs on the Controller Link FA network. Also, PLCs on the Controller Link Network can send and receive data with the host computer on Ethernet by communicating through a PLC on Ethernet.

Network Troubleshooting Functions

A wealth of RAS functions are provided for rapid troubleshooting.

- Self-diagnosis functions at startup
- PING command support to confirm connections to other nodes
- Internode echo tests to confirm connections to other nodes
- Error logs to record realtime error information
- Error notification via e-mail

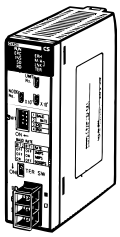
Ethernet Unit Comparison

Item		CJ1W-ETN11 CJ-series Ethernet Unit	CS1W-ETN01/ETN11 CS-series Ethernet Unit	CJ1W-ETN21, CS1W-ETN21 CJ-, CS1series PLCs
Applicable PLCs		CJ-series PLCs		
Transmission media (connections)		CS1W-ETN01:10Base-5 Others:10Base-T		100Base-Tx
FINS service	FINS commands	Implemented with CMND (COMMAND) instructions		
	Command reception	FINS commands can be received simultaneously from multiple nodes.		FINS commands can also be received by e-mail.
Socket service	Number of TCP/IP sockets	8 sockets		
	Number of UDP/IP sockets	8 sockets		
	Methods	Implemented with CMND (COMMAND) instructions		
		Implemented by manipulating specific bits.		
FTP server functions (file transfer)		Supported		
e-mail functions		Possible only when manipulating specific bits.	Transmit pre-defined e-mails by command bits.	Transmit and receive e-mail (SMTP, POP3) with attachments. Exchange data files and receive FINS commands.
Programming Device connections through gateway from serial to Ethernet communications		Supported		

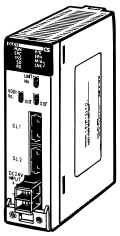
OMRON

Controller Link

A main FA network supporting data links and message communications.
Select from wired, optical, and optical ring models.

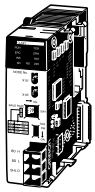


CS1W-CLK21-V1
(wired) for
CS1 PLCs



CS1W-CLK12-V1
CS1W-CLK52-V1
(optical ring) for
CS1 PLCs

3G8F7-CLK21
Controller Link support
board, PCI



CQM1H-CLK21
(wired) for CQM1-
Series PLCs

CJ1W-CLK21-V1
(wired) for CJ1-
Series PLCs

CS1W-RPT01
twisted-pair repeater

CS1W-RPT02
H-PCF repeater

CS1W-RPT03
GI fiber repeater

Outline

These Units connect to the Controller Link FA network to enable data links (shared memory areas) between PLCs and between PLCs and FA computers. They also enable message communications between PLCs and between PLCs and FA computers to enable sending required data only when needed.

What is Controller Link?

Controller Link is an FA network that can send and receive large data packets flexibly and easily among the OMRON C200HX/HG/HE Programmable Controllers (PLCs), CS-series PLCs, CVM1 PLCs, CV-series PLCs, and IBM PC/AT or compatible computers.

The Controller Link supports data links that enable data sharing and a message service that enables sending and receiving data when required. Data link areas can be freely set to create a flexible data link system and effectively use data areas.

A Controller Link Network can be connected by either shielded twisted-pair cable or optical fiber cable, including optical ring connections. Large quantities of data can be sent and received at high speeds to enable easy creation of a wide-range network encompassing both lower and higher network levels.

Repeaters can be used to extend a Controller Link network up to 62 nodes, to extend a wired network up to 3 km, and to bridge distances up to 2 km by an optical fiber link.

Controller Link Features

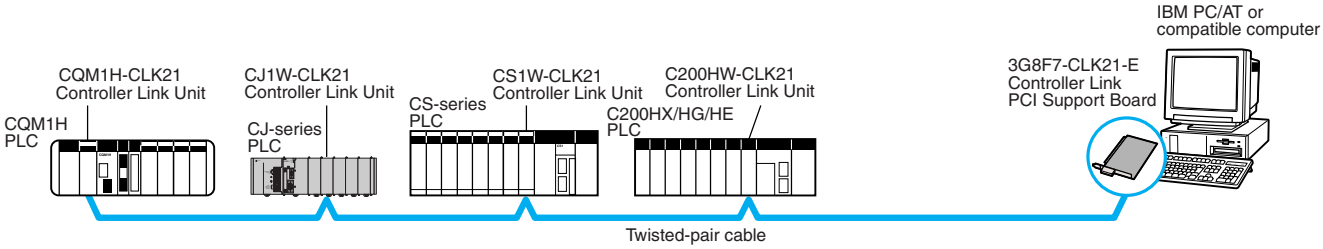
- Controller Link
  - Data links
    - Manual settings
    - Automatic settings
  - Message communications
    - SEND/RECV instructions
    - CMND instructions
  - RAS functions
    - Status area
    - Error log
    - Polling node backup
    - Node bypass
    - Transmission path duplication*
    - Disconnect detection and notification*
    - Node connection configuration readout*

*Only for Optical Ring models in token ring mode.

System Configuration

Wired System (Twisted-pair Cable)

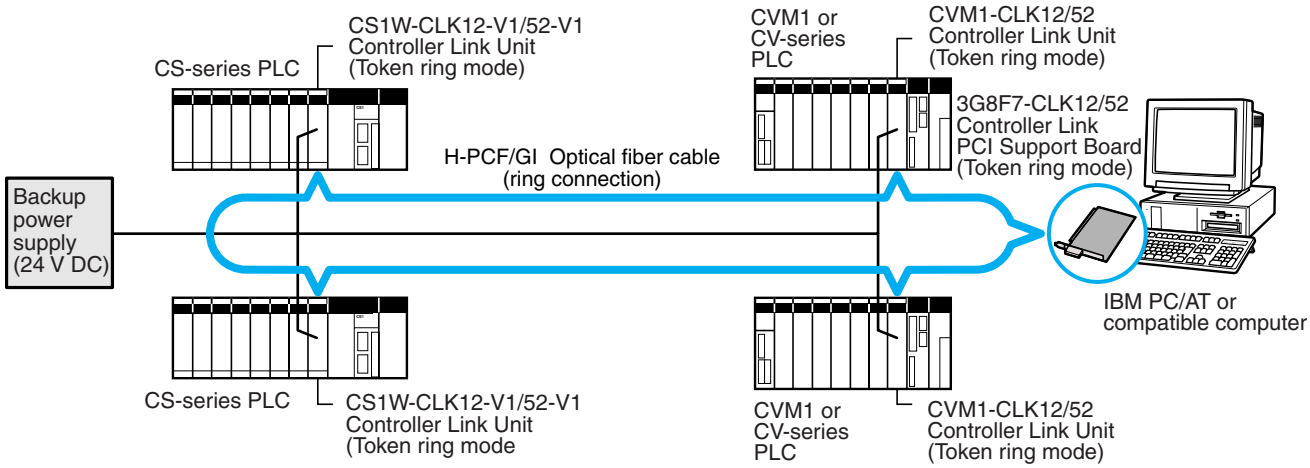
Wired Systems are supported by CJ-series, CS-series, C200HX/HG/HE(-Z), CQM1H, CVM1, and CV-series PLCs.



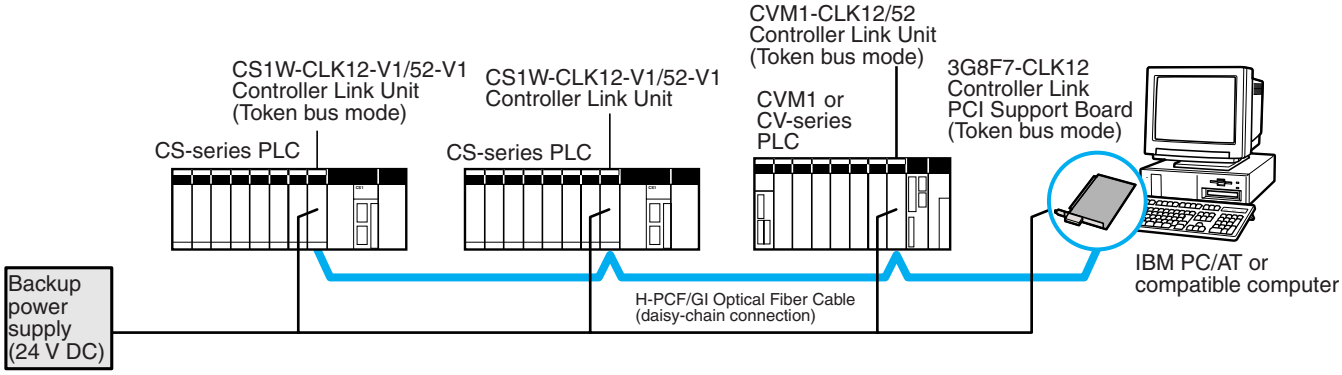
Optical Bus or Optical Ring System (H-PCF or GI Cable)

Optical Systems are supported by CS-series, CVM1, and CV-series PLCs.

Token Ring Mode



Token Bus Mode



Features

Data Links

Data links allow the constant sharing of data in predetermined data areas between nodes, between PLCs, or between a PLC and an IBM PC/AT or compatible computer on the network. Data links do not require the use of communications programs on the PLC (CPU Unit) or IBM PC/AT or compatible computer. Data written in the send area of the local node will be automatically sent to the receive area of other nodes.

The I/O area (CIO area), data link area (LR area), data memory area (DM area), and extended data memory area (EM area) can be freely set in the send or receive area.

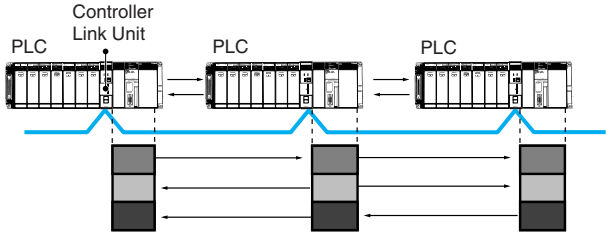
- Number of send words per node: 1,000 words max.
- Number of send and receive words per node:
  CS/CJ-series PLCs: 12,000 words max.
  C200HX/HG/HE(-Z)/CVM1/CV-series PLCs: 8,000 words max.
  Computer nodes: 32,000 words max.

The data link areas can be set automatically or manually.

Automatic Setting

Used for simple data link processing. Data link can be performed by simply setting parameters in the DM area of the PLC.

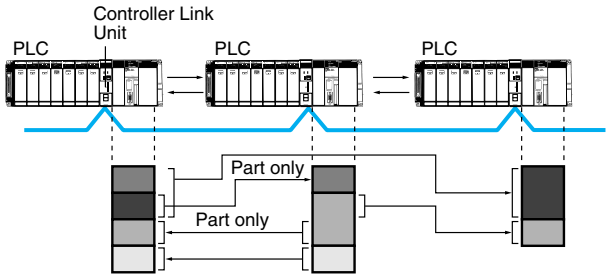
Various predefined communication modes can be selected (equal size areas, master-slave type, chain link type) using -V1 models.



Constant data exchange (sharing)
(IR/CIO area, Link/LR area, DM area, etc.)

Manual Setting
Used for flexible data link processing depending on each system.

Using the Controller Link Support Software, individual data link tables can be set for each node and the data link area can be freely allocated for each node. Send data size per node can be freely set. It is possible to set nodes for only send or receive data. With the Controller Link Unit, the data link can be set to receive only a part of the data link area of other nodes.



Message Service

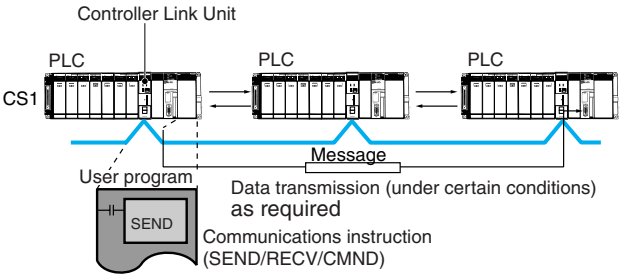
The message service can be used to control data transmission with particular nodes, reading or writing of status data, changing of operation modes, etc., by executing communications instructions in the user program. The communications instructions include SEND and RECV instructions for data transmission and CMND instructions for sending various commands.

SEND/RECV
The SEND and RECV instructions sends and receives data in an area of a particular node.

The SEND instruction sends data from an area of the local node and writes to an area in the designated node.

The RECV instruction requests the designated node to send area data and writes the data to the local node.

CMND
The CMND instruction sends commands such as those to read or write data at other nodes, perform control operations, or read error logs. With the Controller LInk Unit, OMRON's command protocol called FINS is used.



Twisted-pair Cable or Optical Fiber Cable Connections

The Controller Link Units can be connected to the network using either shielded twisted-pair cable, H-PCF fiber-optic cable, or GI fiber-optic cable. Select the system that suits your application.

Features of Twisted-pair Cable
Twisted-pair cable is easy to connect and maintain. The cable can be processed much more easily than coaxial or fiber-optic cable, thereby reducing the cost of tools and assembly time.

Connections are made to a terminal block on the Controller Link Unit and to a special connector on the Controller Link Support Board for easy system assembly and modification.

The network is equipped with the required terminating resistance built into the Units allowing the terminating resistance to be easily set at both ends of the network using a simple switch.

Features of Optical Fiber Cable
Optical Fiber Cable has superior noise resistance, so this system can provide highly reliable communications even in very noisy conditions. The fiber-optic cable allows long-distance and large-scale networks.

With H-PCF fiber-optic cable, the communications distance can be up to 20 km in total, enabling a wider range of system size and network scale.

Compatibility with Different Node Configurations

The following Controller Link Units and Controller Link Boards are available for communications between different models. Wired Units and Optical/Optical Ring Units, however, cannot be combined on the same network.

Wired System
- Units for CQM1H, CJ-series, CS-series, C200HX/HG/HE(-Z), and CVM1/CV-series PLCs and Support Board interfaces for computers with a PCI bus

Optical Ring System (H-PCF or GI Cable)
- Units for CS-series and CVM1/CV-series PLCs and Support Board interfaces for computers with a PCI bus

Flexible Inter-network Connections

The Controller Link Network can connect to other networks (Ethernet, SYSMAC NET, SYSMAC LINK, and another Controller Link network) via CVM1/CV-series or CS-series PLCs. By installing a Communications Unit for the Ethernet, SYSMAC NET or SYSMAC LINK on the same CS-series or CV series-PLC as a Controller Link Unit, a message service can be created with nodes in interconnected networks through the PLC. Communications are possible across up to three network levels.

The programming and monitoring of other PLCs on the network can be conducted from Programming Devices connected to the PLC's CPU Unit. Inter-network connections are possible in this case also and can cover up to three network levels.

RAS Functions

RAS performs real-time monitoring of the network status. If an error occurs in the network, RAS records and displays the time and contents of the error.

Status Area

Data Link Status Area
When the data link function is used, the data link status is reflected in the data link status area of the PLCs.

Network Status Area Other than the Data Link
The network status such as the state of node participation is reflected in the status area of the PLCs.

Error Log

The error log function records contents (codes) and times of errors that occur in the network into the RAM or EEPROM, up to the maximum of 39 errors.

The recorded errors can be read using the Controller Link Support Software or the message service function.

Node Bypass

Data communications can be continued by bypassing the node, even when a node in the communications line malfunctions or the PLC or IBM PC/AT or compatible computer power supply is turned OFF. This prevents the whole network system from being affected by a node malfunction or power interruption.

To use the bypass node function, a 24-V DC backup power must be supplied to the Controller Link Unit/Support Board.

Transmission Path Duplication

In the token-ring mode in an Optical Ring System (H-PCF cable), data transmission will be unaffected even by a cable or connector break at one location in the ring connection. With the fiber-optic cable wired in a ring shape, a break at one point will simply cause the transmission to be routed in the other path.

Disconnect Detection and Notification

Even with transmission path duplication, the network will be broken if disconnections occur in two or more places. In the token-ring mode in an Optical Ring System (H-PCF cable), the location of a disconnection can be detected and can be identified by means of the status display for all nodes. This function can be used to prevent system crashes in advance, by performing maintenance when a disconnection occurs at one place.

Node Connection Configuration Data Reading

In the token-ring mode in an Optical Ring System (H-PCF cable), connection data can be read for all of the nodes configured in the network. The information that can be read includes the order in which the nodes are connected and which of two optical connectors is connected to which node. Special support software (Controller Link Support Soft-

ware, Ver. 2.00 or later) is required in order to read the node connection configuration data.

Data Link Settings with CX-Programmer

With the CS-series Controller Link Unit, the CX-Programmer programming software can be used to set data links freely or monitor data link status. (The Controller Link Support Software cannot be used connected directly to the RS-232C port on a CS-series PLC.)

Communications Specifications

Items		Wired	Optical Ring, H-PCF cable (See note 1.)	Optical Ring, GI cable
Baud rate		2 Mbps, 1 Mbps, or 500 kbps	2 Mbps	2 Mbps
Data Link cycle time (2 kWords + 2 Kbits for 32 nodes)		35 ms (2 bps)	37 ms	37 ms
Maximum transmission distance		500 m, 800 m, 1 km	20 km	30 km
Maximum distance between nodes		500 m, 800 m, 1 km	Crimp cut: 800 m Adhesive: 1 km	62.5/124 μm: 2 km 50/125 μm: 1 km
Transmission medium (cable)		Shielded twisted-pair cable (special cable)	H-PCF cable (200/230 μm)	GI cable (62.5/125 μm or 50/125 μm)
Node connection method		Terminal block (M3 crimp terminals)	Connected via special 2-carrier optical cable (JIS-F07)	Connected via ST connectors (IEC-874-10)
Transmission path format		Multidrop connections (token-bus mode)	Ring method (token-ring mode) Daisy-chain method (token-bus mode)	Ring method (token-ring mode) Daisy-chain method (token-bus mode)
Maximum number of nodes		32 nodes	62 nodes (See note 2.)	62 nodes (See note 2.)
Number of network levels		3 (via FINS communications)	3 (via FINS communications)	3 (via FINS communications)
Number of data link words	Per network	32,000 words	64,000 words	64,000 words
	Per node	Send:1,000 words max. Receive: 12,000 (See note 3.) (Computer with Support Board: 32,000 words)	Send:1,000 words max. Receive: 12,000 (See note 3.) (Computer with Support Board: 62,000 words)	Send:1,000 words max. Receive: 12,000 (See note 3.) (Computer with Support Board: 62,000 words)
Message length		2,012 bytes max. (including the header)	2,012 bytes max. (including the header)	
International standards		EC, UL/CSA	EC, UL/CSA	EC, UL/CSA
RAS functions		Node bypass Error detection Polling node backup Self-diagnosis function (hardware checking at startup) Watchdog timer Broadcast test Error log function	Node bypass Error detection Polling node backup Self-diagnosis function (hardware checking at startup) Watchdog timer Broadcast test Error log function Loop bypass power supply Loopback functionality (token ring mode)	Node bypass Error detection Polling node backup Self-diagnosis function (hardware checking at startup) Watchdog timer Broadcast test Error log function Loop bypass power supply Loopback functionality (token ring mode)
Models	For PLCs	CS1W-CLK21-V1, CJ1W-CLK21-V1, CQM1H-CLK21	CS1W-CLK12-V1	CS1W-CLK52-V1
	For computers	3G8F7-CLK21 (PCI bus)	3G8F7-CLK12-V1 (PCI bus)	3G8F7-CLK52-V1 (PCI bus)

Note: 1. Optical Ring Units in token bus mode can be used on the same network as Optical Bus Units/Boards (CS1W-CLK11 and 3G8F5-CLK11).

2. With the token-bus method, the maximum number of nodes in an Optical Bus System with optical bus nodes (i.e., model numbers ending in CLK11) is 32 (node addresses 1 to 32). The total number of words that can be transmitted in a data link is 32,000 words max. CX-Net in CX-Programmer can be used in systems with up to 32 nodes (node addresses 1 to 32). Use Controller Link Support Software (Ver. 2.00 or later) for systems with up to 62 nodes (node addresses 1 to 62).

3. For CS1/CSJ. C200HX/HG/HE, CVM1/CV-series, and CQM1H PLCs: 8,000 words.

Data Link Specifications

Item		Automatically set links		User-set links	
Number of data link nodes		32 nodes max. (2 nodes min.)			
Number of data link words	Send/receive words per node (total of areas 1 and 2)	CS/CJ Series: 12,000 words max. CVM1/CV Series, C200HX/HG/HE, CQM1H: 8,000 words Personal computers: 32,000 words			
Data link areas	Area 1	CIO/IR area (I/O bits, works bits, etc., including data link bits)		CIO/IR area (I/O bits, works bits, etc., including data link bits), DM area, EM area	
	Area 2	DM area, EM area		CIO/IR area (I/O bits, works bits, etc., including data link bits), DM area, EM area	
Number of send words per node	Area 1	0 to 1,000 words (same number for each node)	Max. total for area 1 and area 2: 1,000 words	0 to 1,000 words (may be different for each node)	Max. total for area 1 and area 2: 1,000 words
	Area 2	0 to 1,000 words (same number for each node)		0 to 1,000 words (may be different for each node)	
Data reception	Area 1	All of the data sent by the other nodes is received. It is not possible to receive only part of the data.		Settings can be made to receive all, none, or part of the data from any specific node.	
	Area 2				
Offset setting	Area 1	Not supported		Supported (Settings can be made to receive a specified number of words from a specified word offset from the first word.)	
	Area 2				
Send node order	Area 1	The order is the same as the node addresses.		Any order	The same order must be used for areas 1 and 2.
	Area 2			Any order	

Message Communications Specifications

Item		SEND/RECV	CMND
Application		Sending and receiving data	Reading and writing data at other nodes (e.g., file memory), changing the operating mode and other control operations, reading error logs, etc.
Message contents		Sending commands to send or receive data	Sending any FINS command
Local node to remote node	PLC to PLC	Supported.	Supported.
	PLC to computer	Supported, but programming is required on the computer to return a response)	Supported, but programming is required on the computer to return a response)
	Computer to PLC	Supported, but programming is required on the computer to receive a response)	Supported, but programming is required on the computer to receive a response)
Local node: Remote nodes		SEND: 1:1 or 1:N (broadcasting) RECV: 1:1	1:1 or 1:N (broadcasting)
Data length		1,980 bytes (990 words) max.	1,990 bytes max.

Conversion guide from SYSMAC LINK to Controller Link

Item				SYSMAC LINK		Controller Link
Transmission path				Coaxial cable (5C-2V) or optical fiber cable (optical bus)		Twisted-pair cable or optical fiber cable (optical ring or optical bus)
Transmission distance				Coaxial cable: 1km max. Optical fiber cable: 10 km max		Twisted-pair cable: 1km max. at 500 kbps, 500 m max. at 2 Mbps Optical fiber cable: 20 km max
Baud rate				Coaxial: 2 Mbps (fixed) Optical fiber cable: 2 Mbps (fixed)		Twisted-pair cable: 2 Mbps, 1 Mbps, 500 kpbs Optical fiber cable: 2 Mbps (fixed)
Maximum number of nodes				62 nodes		Twisted-pair cable: 32 nodes Optical fiber cable: 62 nodes (See note.)
Data links	Automatically set	No. of send/receive data link words per node		CS Series: 2,966 words max.		CS Series: 12,000 words max. CVM1/CV Series, C200HX/HG/HE(-Z), CQM1H: 8,000 words max.
		Link areas	Area 1	Data Link Area in CIO Area, fixed first word: CIO 1000 (or LR 00)	Automatic setting in LR area only, DM area only, or both LR and DM areas.	CIO/IR area, user-specified first word
			Area 2	DM Area, fixed first word: DM 0000		DM or EM area, user-specified first word
		No. of send words per node (same for each node)		4, 8, 16, or 32 words		1 to 1,000 words, user specified
	User-set	Node order		User-set		
		Send size		Can be set		
		Receive-only nodes		Not supported (Send area size can be set to 0.)		Supported
		Send-only nodes		Supported		
		Data areas		Fixed (Area 1: CIO, Area 2: DM)		Can be set
		Receive size		All or nothing		Can be set
		Receive offset (from first word)		Cannot be set (must receive from beginning)		Can be set
Communications cycle time				Can be set		Cannot be set

Note: With the token-bus method, the maximum number of nodes in an Optical Bus System with optical bus nodes (i.e., model numbers ending in CLK11) is 32 (node addresses 1 to 32). The total number of words that can be transmitted in a data link is 32,000 words max. CX-Net in CX-Programmer can be used in systems with up to 32 nodes (node addresses 1 to 32). Use Controller Link Support Software (Ver. 2.00 or later) for systems with up to 62 nodes (node addresses 1 to 62).

Programming Devices for Controller Link and Ethernet communication

The CX-Net functionality in CX-Programmer supports various networks. Create data links or routing tables and manage network operation.

CX-Programmer Functions for Communications Networks

The CX-Net PLC Network Configuration Tool provided in the CX-Programmer supports the following functions.

- Setting data links, transferring data link tables, and starting data links
- Setting and transferring routing tables.
- Testing communications.
- Other network monitoring and setting functions.

Supported Networks

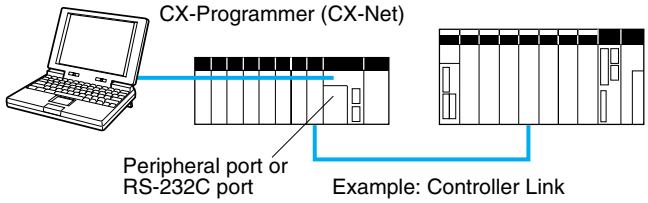
Data link and routing table settings are supported for the following networks.

- Controller Link/SYSMAC LINK
- Ethernet (routing tables only)

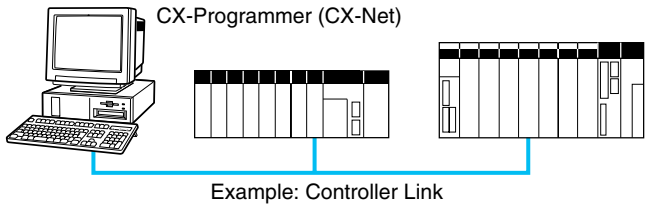
Use the CX-Programmer Either as a Peripheral Device or a Network Node

Operation is possible connected to a communications port using RS-232C or as a network node with the computer connected to the network through Support Board.

As a Peripheral Device



As a Network Node via a Network Support Board



CX-Programmer Communications Functions

Operation			Controller Link/ SYSMAC LINK	Ethernet
Connecting online to PLCs			Supported	Supported
Data links	Creating data link tables	Manually setting data links as required	Supported	---
		Automatically setting data links	Supported	---
	Checking data links		Supported	---
	Transferring data link tables to PLCs		Supported	---
	Starting data links		Supported	---
	Monitoring data link status		Supported	Supported
Routing tables (See note 1.)	Creating routing tables	Creating FINS local routing tables (only for the PLC to which the CX-Programmer is directly connected)	Supported	Supported
		Creating FINS network routing tables (for all PLCs on the same network as PLC to which the CX-Programmer is connected)	Supported	Supported (See note 3.)
		Creating routing tables for SYSMAC NET	---	---
	Checking routing tables		Supported	Supported
	Transferring routing tables to PLCs		Supported	Supported
Testing communications	Performing echo-back tests between nodes		Supported	Supported
	Performing broadcast tests		Supported	Supported (See note 3.)
	Performing PING tests.		---	Supported
Monitoring network	Confirming the nodes participating in the network		Supported	---
	Monitoring network error status		Supported (See note 2.)	---
Setting network parameters to refine communications.			Supported	---

Note: 1. Routing tables must be set in the PLCs to use network communications between nodes on different networks, to mount more than one Communications Unit to the same PLC, or to use the CX-Programmer's remote monitoring functions. Routing tables are not required if each PLC has only one Communications Unit and if they are all on only one network.

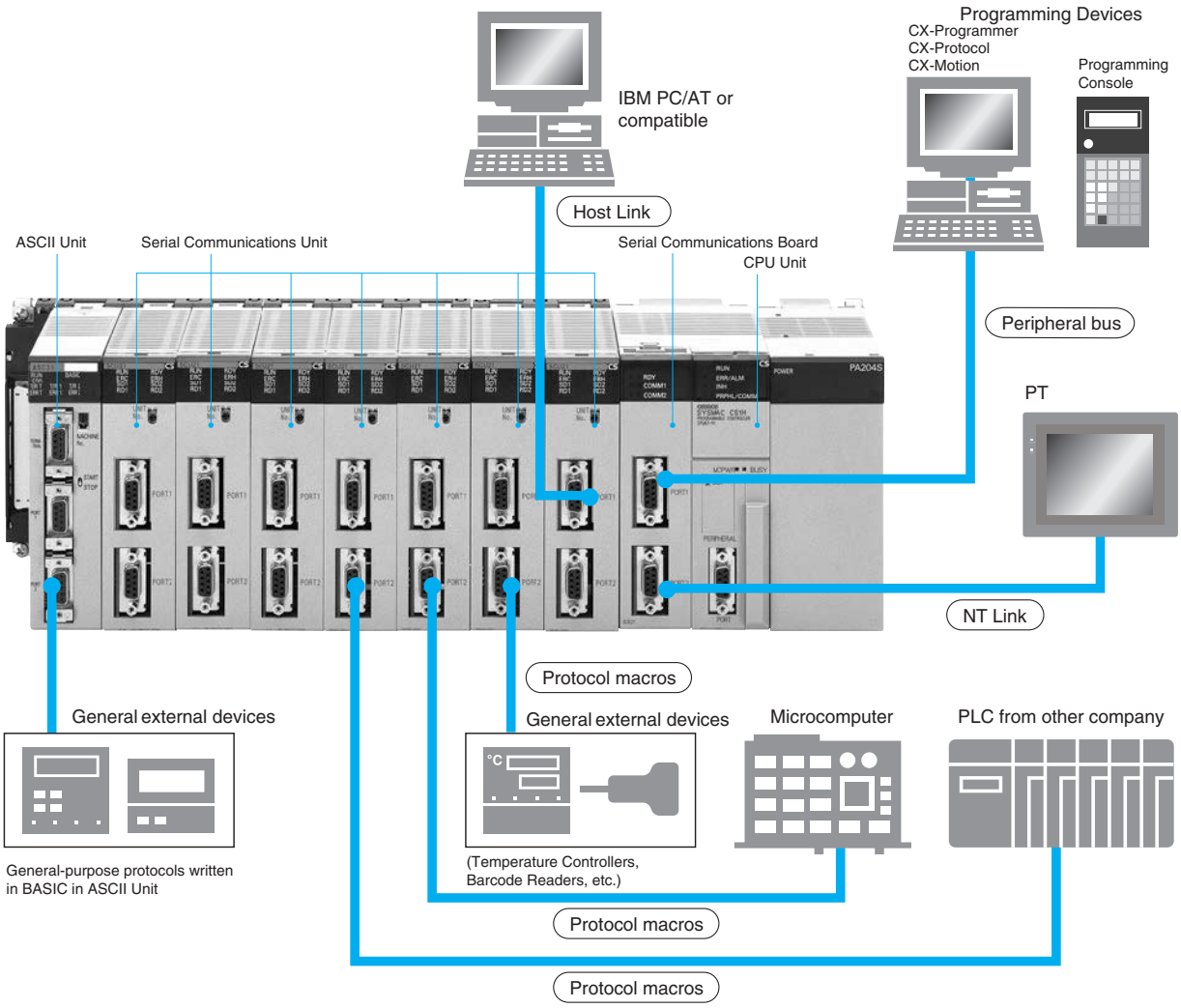
2. Not supported for C-series PLCs.

3. Supported only when the IP address conversion method for all Ethernet Units on the PLCs are set for automatic address generation.

See the software chapter on page 671 for more information

Serial Communication

Serial Communications Connections Examples



Serial Communications Support

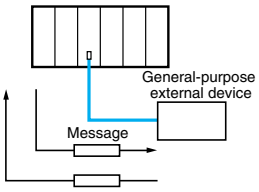
PLC	Unit name	Port	Serial communications mode							
			Protocol macro	Host Link	1:N NT Link	1:1 NT Link	No-protocol	1:1 link	Peripheral bus	Programming Console bus
			General purpose	Host computer	OMRON PTs	OMRON PTs	General purpose	C-series PLCs	Programming Devices	Programming Console
CS1/CJ1	CPU Unit	Peripheral	---	Supported	Supported	---	---	---	Supported	Supported
		RS-232C	---	Supported	Supported	---	Supported	---	Supported	---
C200HX/HG/HE(-Z)		Peripheral	---	Supported	---	---	Supported	---	Supported	Supported
		RS-232C	---	Supported	Supported	Supported	Supported	Supported	---	---
CVM1/CV		Peripheral	---	---	---	---	---	---	Supported	Supported
		RS-232C	---	Supported (DIP switch setting)	---	Supported (DIP switch setting)	---	---	---	---
CQM1H		Peripheral	---	Supported	---	---	Supported	---	Supported	Supported
		RS-232C	---	Supported	---	Supported	Supported	Supported	---	---
CPM2A/ CPM2C		Peripheral	---	Supported	---	---	Supported	---	Supported	Supported
		RS-232C	---	Supported	Supported (-V2 only)	Supported	Supported	Supported	---	---
SRM1(-V2)		Peripheral	---	Supported	---	---	Supported	---	Supported	Supported
		RS-232C	---	Supported	---	Supported	Supported	Supported	---	---
C200HX/HG/HE(-Z)	C200H Communications Board	RS232C, RS422A/485	Supported	Supported	Supported	Supported	Supported	Supported	---	---
CQM1H	CQM1H Serial Communications Board	RS232C, RS422A/485	Supported	Supported	Supported	Supported	Supported	Supported	---	---

PLC	Unit name	Port	Serial communications mode							
			Protocol macro	Host Link	1:N NT Link	1:1 NT Link	No-protocol	1:1 link	Peripheral bus	Programming Console bus
			General purpose	Host computer	OMRON PTs	OMRON PTs	General purpose	C-series PLCs	Programming Devices	Programming Console
C200H, C200HS, C200HX/HG/HE(-Z)	Host Link Unit	RS232C, RS422A/485	---	Supported	---	---	---	---	---	---
CS1	Serial Communications Board	RS232C, RS422A/485	Supported	Supported	Supported	---	---	---	---	---
	Serial Communications Unit	RS232C	Supported	Supported	Supported	---	---	---	---	---
CJ1	Serial Communications Unit	RS232C, RS422A/485	Supported	Supported	Supported	---	---	---	---	---

Protocol Macros

Data communications procedures called protocols can be created on the CX-Protocol to match the communications specifications of an external devices with an RS-232C or RS-422A/485 port. (Communications, however, must be half-duplex or full-duplex and use start-stop synchronization.) The protocols are transferred to Serial Communications Board or Units to then enable data communications with the external devices merely by executing the PMCR instruction in the CPU Unit.

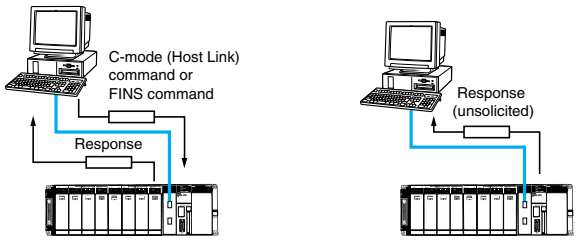
Standard protocols for OMRON components (Temperature Controllers, Panel Meters, Bar Code Readers, Modems, etc.) are provided as a standard feature. The standard protocols can be modified according to application needs and easily used.



Host Links

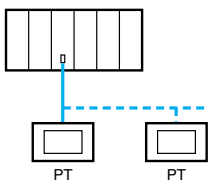
C-mode (Host Link) commands or FINS command wrapped in Host Link headers and terminators can be sent from a host computer (e.g., a personal computer or PT) to perform many operations, such as reading and writing I/O memory or controlling the operating mode of the PLC.

Unsolicited commands can be sent from the PLCs to the host computers. FINS commands are wrapped in Host Link headers and terminators automatically when SEND, RECV, or CMND instructions are executed.



1:N NT Links

A PLC can be linked to PTs (Programmable Terminals) from an RS-232C or RS-422A/485 port so that I/O memory in the PLC can be allocated for PT control areas, PT status areas, and objects, such as touch switches, lamps, and memory tables. One PLC can be linked to from 1 to 8 PTs.



Note: 1. There are two types of NT Links: 1:1 and 1:N. These are completely different communications modes and are not compatible with each other. Always set the PT for the 1:N mode. Communications will not be possible if it is set to 1:1.

2. The NT-AL001 Adapter Unit is required to connect the RS-232C port on the NT30/NT30C PTs in a 1:N NT Link.

3. The PT's Programming Console functionality is not supported with 1:N NT Links.

Protocol Macro Features

Support a Wide-range of Protocols

With both RS-232C and RS-422A/485 ports, essentially any device that supports full or half duplex communications and start-stop synchronization can be connected. Send and receive frames can be created as required to meet communications frame specifications, Essentially all send frames (e.g., command + data) and expected receive frames (e.g., responses) can be matched to the communications frames (messages) of the external device.

Use Processing Functions for Communications

Error check code calculations, send frame length calculations, and numeric conversions between ASCII and hexadecimal are all supported.

Monitor Communications Time

Response wait monitoring, response completion monitoring, and send completion monitoring are all supported, and ending or retrying communications can be set for when monitor times are exceeded.

Retry Processing

Just set the number of retries to execute retry processing when something happens to cause an error.

Include PLC Read/Write Variables in Send and Receive (Expected) Frames

Read/write variables for I/O memory in the PLC can be included in the send frames (messages). PLC data will be read when sending and used as the destination address or data. Read/write variables for I/O memory in the PLC can also be included in the receive frames. PLC data will be written as the source address or data when response is received.

Repeat Variables to Switch Write Destinations for 1:N Communications

Repeat counters for send/receive processing can be included in variables so that, for example, the same data can be sent to up to 32 different destinations by switching the destination address. (The limit of 32 is imposed by the physical layer.) When receiving data, the write address can be easily switched when receiving data for I/O memory in the PLC.

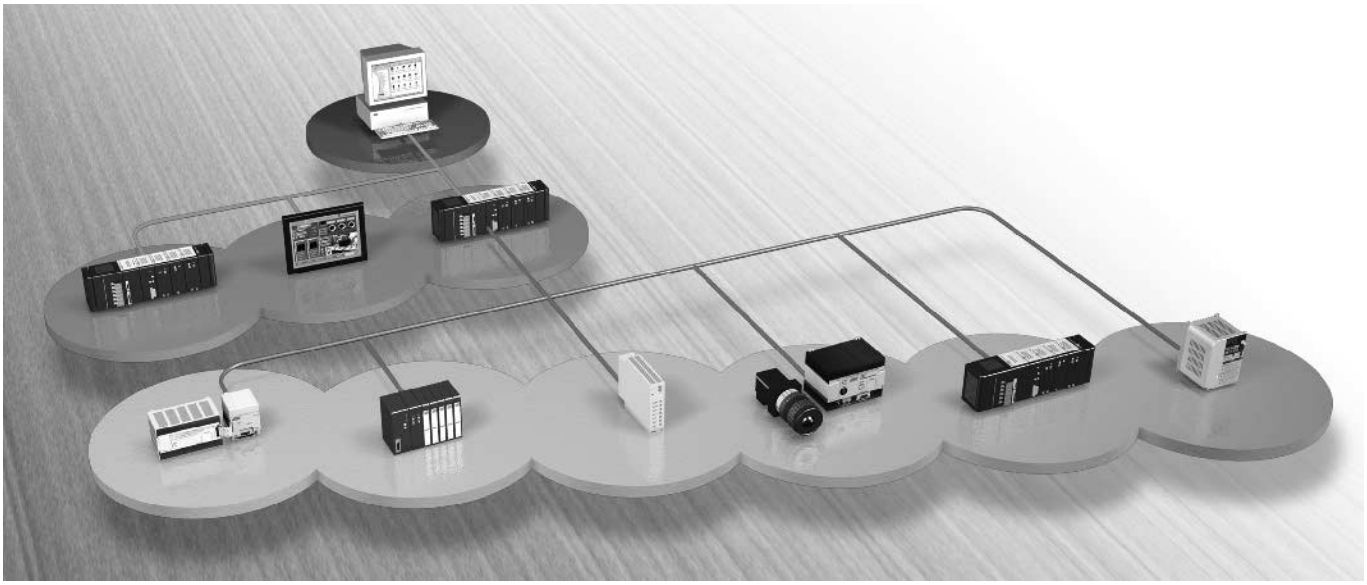
PLC Interrupt Processing at Data Reception

Interrupts to the PLC's CPU Unit can be generated when data is received to execute an interrupt program. (Interrupts are supported only by Serial Communications Boards, and not by Serial Communications Units.)

Next Processing Switches in Receive Data

The received data can be compared to up two 15 expected reception messages that have been registered in advance and the results of comparison can be used to switch the next process to be executed.

PROFIBUS-DP



PROFIBUS-DP introduction

PROFIBUS is a vendor-independent, open fieldbus standard for a wide range of applications in manufacturing-, process- and building automation. The PROFIBUS standards are set and maintained by the PROFIBUS Nutzer Organisation (PNO) since 1990. Over the years PROFIBUS has become one of the most favoured industry standards for accomplishing a wide variety of process automation tasks.

The importance of this common ground for engineers and process automation specialists was immediately recognised by the OMRON company. OMRON became a member of PNO in 1991. Vendor independence and openness are guaranteed by the PROFIBUS standard IEC 61158 Type 3. With PROFIBUS, devices of different manufacturers can communicate without special interface adjustments.

DP stands for Decentralised Peripherals. It is optimised for high speed and low-cost interfacing, especially designed for communication between automation control systems and distributed I/O at the device level.

Protocol architecture

The PROFIBUS protocol architecture is oriented on the Open System Interconnection (OSI) reference model in accordance with the international standard ISO 7498. PROFIBUS-DP uses layers 1 and 2, and the user interface. Layers 3 to 7 are not defined.

Layer 1 (physical layer) defines the physical transmission characteristics.

Layer 2 (data link layer) defines the bus access control.

This streamlined architecture ensures fast and efficient data transmission. The application functions which are availible to the user, as well as the system and device behaviour of the various PROFIBUS-DP device-types are specified in the user interface.

Transmission medium

RS-485 transmission technology or fibre optics are defined as transmission media. RS-485 transmission is the most frequently used transmission technology. Its application includes all areas in which high transmission speed and simple inexpensive installation are required. Twisted pair shielded copper cable with one conductor pair is used.

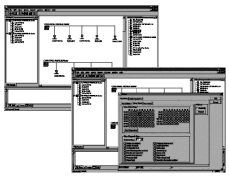
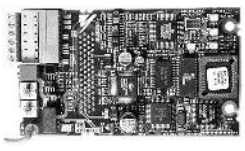
Easy installation

The RS-485 transmission technology is very easy to handle. Installation of the twisted pair cable does not require expert knowledge. The bus structure permits addition and removal of stations or step-by-step commissioning of the system without influencing the other stations. Later expansions have no effect on stations which are already in operation.

Various transmission speeds between 9.6 kbit/s and 12 Mbit/s can be selected. One unique transmission speed is selected for all devices on the bus when the system is commissioned.

Cable length

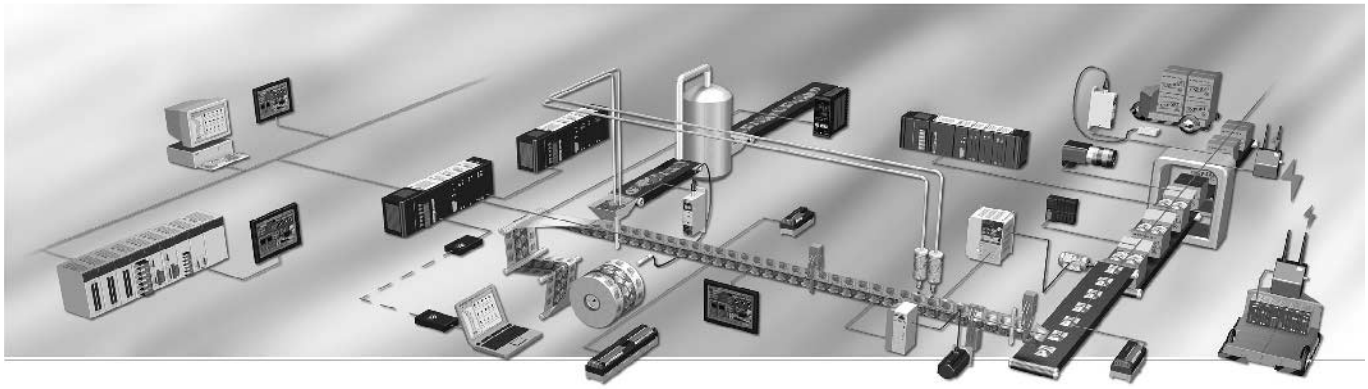
The maximum cable length depends on the transmission speed. The specified cable lengths are based on type-A cable. The length can be increased by the use of repeaters. The use of more than 3 repeaters in series is not recommended.

Product	Appearance	Model	Specifications	Page
PLC masters		CS1W-PRM21	- PROFIBUS-DP master class one with support of DP-V1 data types - 7k word I/O - Simple configuration - Handles data independently, thus reduces CPU load	335 see note
		CJ1W-PRM21	- PROFIBUS-DP master class one with support of DP-V1 data types - 7k word I/O - Simple configuration - Handles data independently, thus reduces CPU load	231 see note
Configurator		CX-Profi	Advanced configuration tool that uses FDT/DTM (Field Device Tool and Device Type Manager) Technology - The PROFIBUS-DP network topology and system characteristics are defined and then downloaded in the OMRON PROFIBUS Master Unit - Configuration can be done remotely, via other networks as Ethernet or ControllerLink	687 see note
PLC slave units		CJ1W-PRT21	PROFIBUS-DP I/O Link - Data link to any PLC data area - Simple configuration using - Max. data input 100 words - Max. data output 100 words	232
		C200HW-PRT21	Can be used on C200HS/HE/HG/HX and CS1G/H - Default 2 words in + 2 words out, maximum 100 words in and 100 words out - Simple PROFIBUS-DP node address setting by rotary switches - Supports SYNC/FREEZE and Fail/ Safe functions	338
		CQM1-PRT21	- Auto-detects all PROFIBUS-DP baudrates from 9.6 kbits/s to 12 Mbits/s - Support and indication of PROFIBUS-DP broadcast functions (Sync/Freeze/Clear) - Communication status available externally via relay output - Configurable for 2, 4, 6 or 8 words	155
		CPM1A-PRT21	PROFIBUS I/O link for CPM1A/CPM2A - LED status display - Max. data input 16 bits and 16 output bits	69
I/O slave unit		PRT1-COM	Connects up to eight GT1 I/O units to PROFIBUS. Input data 128 bytes max. Output data 128 bytes max.	519
Inverter PROFIBUS Option		SI-P1	PROFIBUS-DP slave for E7(PV), F7(RV), G5(FV) Inverters	For more information please contact your local OMRON representative
		SI-P1/V7	PROFIBUS-DP slave for 3G3MV Inverters	For more information please contact your local OMRON representative

Product	Appearance	Model	Specifications	Page
Servo Drive PROFIBUS Option		JUSP-NS500	PROFIBUS option unit for Sigma-II (W-Series) Servo Drives	For more information please contact your local OMRON representative
XtraDrive with PROFIBUS		XD-□□-□□DO	Intelligent Servo Drive with Embedded PROFIBUS	For more information please contact your local OMRON representative
F150 Vision system		F150-C15E-3-PRT	Number of connected camers: 1 unit / 2 units (using the F150-A20) Processing resolution: 512 (H) x 484 (V) Number of scenes: 16 scenes (can be saved to a computer through the RS-232C) Image memory function: Up to 23 scdreebs can be saved) Processing method: Dark-light/2-value method	For more information please contact your local OMRON representative
Temperature Controllers		E5ZN	A dedicated gateway is available.	For more information please contact your local OMRON representative

Note: Available in the beginning of 2004.

DeviceNet



DeviceNet: Optimising industrial networking

DeviceNet is an innovative industrial network system that enables a wide range of devices to be easily networked and managed remotely. Everything - from PLCs and remote I/O, to fibre optic sensors, vision systems controllers, servos and inverters - can be seamlessly integrated into DeviceNet, making it one of the best industrial field busses around. As a founding member of ODVA, Omron is one of the companies that integrates DeviceNet interfaces into its many core products.

All of Omron's products are optimised for seamless integration into a DeviceNet system. You can configure Omron's devices over the network on-the-fly, and add a device or machine to a production line without powering down. DeviceNet is a flexible network, designed to accommodate your growing needs.

Easy to use software

Omron's DeviceNet configuration software is specially developed to integrate products in a more user-friendly way than in other bus systems. Omron's DeviceNet units have a default mode that enables you to set the addresses, plug the products in and watch everything run. The configuration software allows you to monitor and fine-tune the DeviceNet products in your network for optimum operation. The products are literally plug-and-play, and the software is drag-and-drop. Nothing could be easier.

ODVA and Omron –setting the standards

DeviceNet is based on open standards and specifications defined by the Open DeviceNet Vendors Association (ODVA), a consortium whose main task is to promote DeviceNet

world-wide. Omron is a founding member of ODVA and a leading player in promoting DeviceNet, and is dedicated to producing and improving products that work with DeviceNet. All Omron products are ODVA certified, making them fully DeviceNet compatible. Thanks to ODVA's strong conformance testing policies, DeviceNet also ensures the interchangeability and interoperability of control devices from hundreds of manufacturers world-wide.

Overview of DeviceNet

Two types of communications are supported:
1) Remote I/O communications that automatically transfer I/O between slaves and the CPU Unit to which a DeviceNet Unit is mounted without any special programming in the CPU Unit.
2) Message communications that read/write messages, control operation, or perform other functions for other CPU Units to which a DeviceNet Unit is mounted and slaves. Message communications are achieved by executing specific instructions (CMND) from the program in the CPU Unit to which the DeviceNet Unit is mounted.

The following functions are supported by a CS/CJ-series DeviceNet Unit.

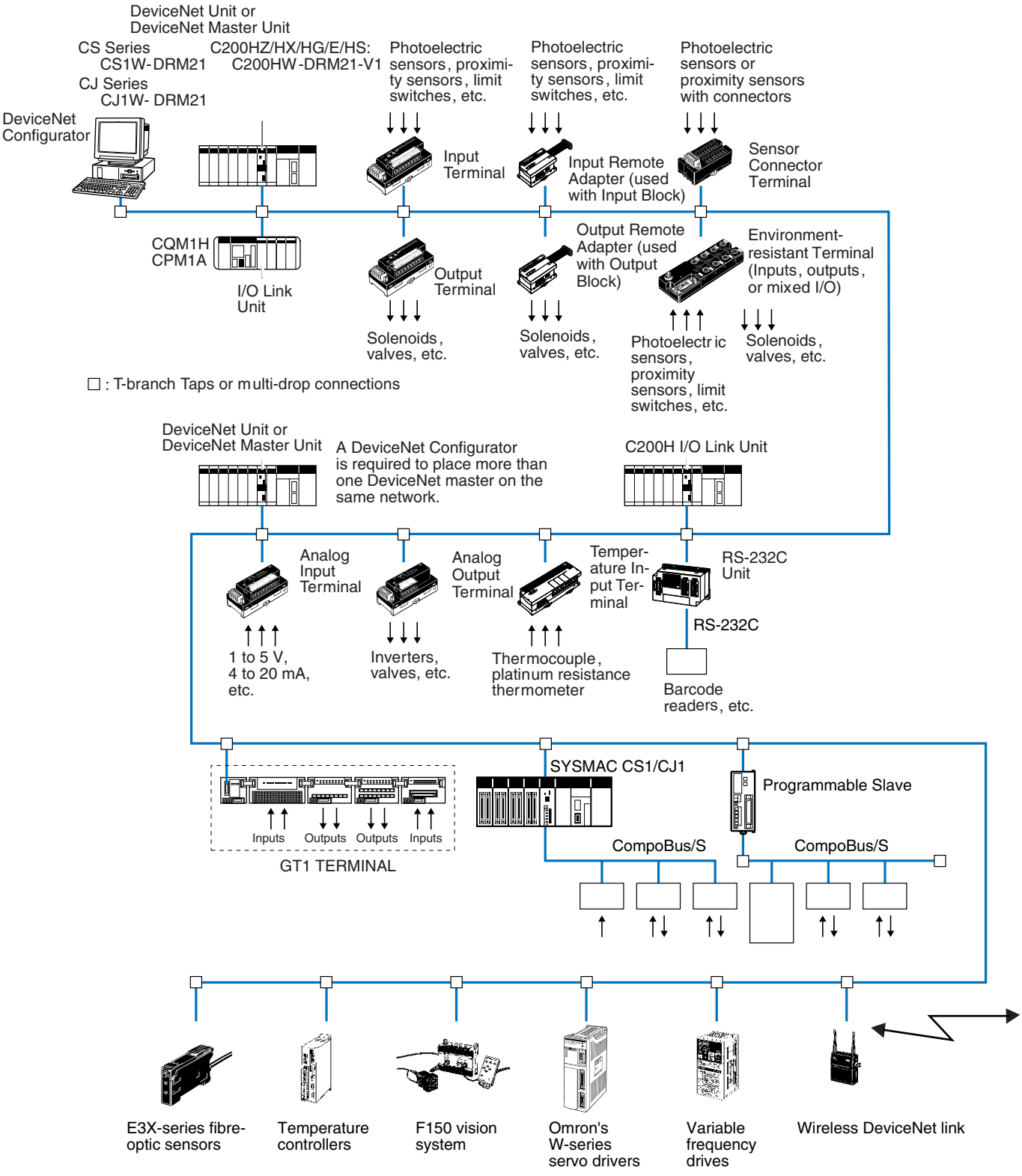
- I/O area words can be flexibly allocated for remote I/O Master and Slave communication.
- Multiple DeviceNet Units can be mounted on a single PLC. Fixed (automatic) allocations are possible for up to three DeviceNet Units.
- More than one DeviceNet master unit can be connected to a single network. With the DeviceNet Configurator, remote I/O can be allocated in any order, i.e., not necessarily in the order of node addresses.

Note: When the DeviceNet configurator is connected through a dedicated Board or Card it uses one node address in the DeviceNet network. It does not use a node address if it is connected throuogh the serial port of the PLC.

A CS/CJ-series DeviceNet Unit can function as either a master or slave in remote I/O communication. Both can be used simultaneously.

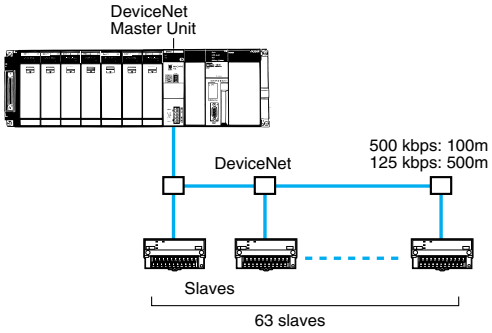
With a CS/CJ-series DeviceNet Unit, the DeviceNet network can be treated exactly like a Controller Link, Ethernet, or other network for message communications or remote programming and monitoring by a CX-Programmer.

Overall System Configuration

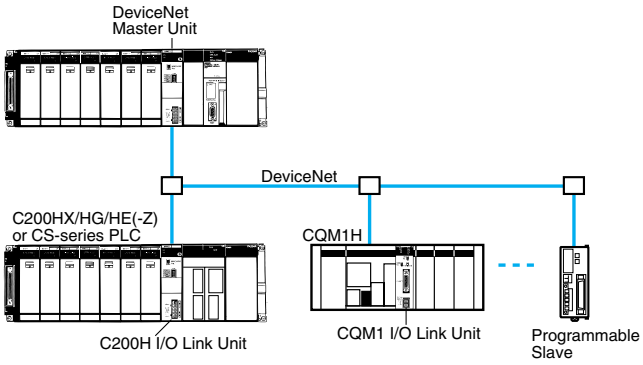


System Configuration Examples

I/O Terminals Connected as Slaves



Other PLCs Connected as Slaves



Masters

PLC	Model	Mountable position	Master/Slave function	Maximum number of mountable units	
				With Configurator	Without Configurator
CJ Series	CJ1W-DRM21 DeviceNet Unit	CPU or Expansion CPU Rack (Classified as CPU Bus Units)	Master and Slave	3	16
CS Series	CS1W-DRM21 DeviceNet Unit				
CS Series	C200HW-DRM21-V1 DeviceNet Master Unit	CPU Rack or Expansion I/O Rack (Classified as Special I/O Units)	Master only	16	1
C200HX/HG/HE				10 or 16	
C200HS				10	

Remote I/O Master Functions

Item	Master	Model	Without Configurator	With Configurator
Max. No. of Slave nodes per Master	CJ Series	CJ1W-DRM21	63 nodes	
	CS Series	CS1W-DRM21		
	CS Series, C200HX/HG/HE	C200HW-DRM21-V1	50 nodes	63 nodes
	C200HS		32 nodes	63 nodes
Max. No. of control points per Master	CJ Series	CJ1W-DRM21	2,048 pts (64 input /64 output words) or 16,000 pts (500 input/500 output words)	32,000 pts (500 words x 4 blocks)
	CS Series	CS1W-DRM21		
	CS Series, C200HX/HG/HE	C200HW-DRM21-V1	1,600 pts (50 input/50 output words)	Without messages: 4,800 pts With messages: 1,600 pts
	C200HS		1,024 pts (32 input/32 output words)	1,280
Max. No. of I/O points per Slave controllable by Master	CJ Series	CJ1W-DRM21	100 input/100 output words	
	CS Series	CS1W-DRM21		
	CS Series, C200HX/HG/HE	C200HW-DRM21-V1	32 input/32 output words	
	C200HS			
Remote I/O allocation areas	CJ Series	CJ1W-DRM21	DeviceNet Area in CIO Area, and user-allocated words in CIO Area, DM Area, and other areas.	User-allocated words in CIO Area, DM Area, and other areas.
	CS Series	CS1W-DRM21		
	CS Series, C200HX/HG/HE	C200HW-DRM21-V1	DeviceNet Area C200H DeviceNet words in CIO Area (including dedicated words/ bits)	User-allocated words in CIO Area, DM Area, and other areas.
	C200HS			

Remote I/O Slave (only Units Mounted in a PLC)

Item	CPU Unit to which a Slave is mounted	Unit Model	Without the Configurator	With the Configurator
Max. No. of I/O pts per Slave	CJ Series	CJ1W-DRM21	32 pts (1 input/ 1 output word) or 3,200 pts (100 input/100 output words)	4,800 pts (100 input words x 2/100 output words x 1)
	CS Series	CS1W-DRM21		
	CS Series, C200HX/HG/HE	C200HW-DRT21	1,024 pts (32 input/32 output words)	
	CQM1H, CQM1 Series	CQM1-DRT21	32 pts (1 input/1 output word)	
Allocation areas in the CPU Unit to which this Slave is mounted	CJ Series	CJ1W-DRM21	CIO, WR, DM, EM, HR	
	CS Series	CS1W-DRM21		
	CS Series, C200HX/HG/HE	C200HW-DRT21	CIO, DM, EM, AR, LR, T/C	
	CQM1H, CQM1 Series	CQM1-DRT21	CIO	

Message Communications

Master	Unit model	Send	Receive	FINS commands
CJ Series	CJ1W-DRM21	SEND	RECV	CMND
CS Series	CS1W-DRM21			
CS Series, C200HX/HG/HE	C200HW-DRM21-V1	None	None	IOWR
C200HS		Not supported		

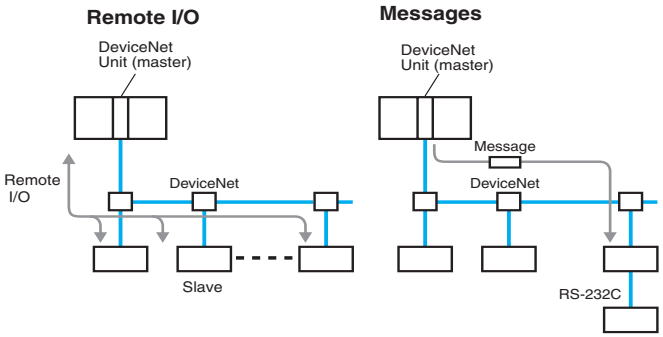
Item	Master model	Model	Capacity
Max. No. of nodes per Master for message communications using FINS commands	CJ Series	CJ1W-DRM21	63 nodes
	CS Series	CS1W-DRM21	
	CS Series, C200HX/HG/HE	C200HW-DRM21-V1	8 nodes
	C200HS		Not supported
Max. No. of nodes per Master for message communications using explicit messages	CJ Series	CJ1W-DRM21	63 nodes
	CS Series	CS1W-DRM21	
	CS Series, C200HX/HG/HE	C200HW-DRM21-V1	63 nodes
	C200HS		Not supported
Max. message length	CJ Series	CJ1W-DRM21	SEND:267 words RECV:269 words CMND:542 bytes (starting with command code)
	CS Series	CS1W-DRM21	
	CS Series, C200HX/HG/HE	C200HW-DRM21-V1	IOWR: 160 bytes (starting with command code)

Features of DeviceNet

Simultaneous Remote I/O Communications and Message Services

Remote I/O communications that constantly transfer I/O between a DeviceNet Unit and slaves as well as message communications where the DeviceNet Unit sends and receives data as needed can both be executed simultaneously. When a DeviceNet network is constructed, this feature ensures the network will be able to handle applications that require the free flow back and forth of bit data and message data. FINS commands can be executed along with DeviceNet explicit messages in message communications.

Remote I/O Communications



Various Connection Methods

Normal multi-drop, T-branch multi-drop, and daisy-chain line connections are available. These methods can be combined to construct a flexible system that suits the floor layout.

Maximum Network Length of 500 m

A maximum network length of 500 m is possible with a baud rate of 125 Kbps using thick cable.

Large Slave and I/O Capacities

A network can connect up to 63 Slaves and can handle remote I/O communications of up to 2,048 points (without a DeviceNet configurator) per Master Unit.

High-speed Communications

High-speed communications are possible at up to 500 Kbps for a trunk line length of 100 m.

Multiple PLCs in a Single Network

With the CS1W-DRM21 and CJ1W-DRM21, Multiple DeviceNet Units can be connected in a single network without using a DeviceNet configurator. With the C200HW-DRM21-V1, multiple PLCs are possible if a DeviceNet configurator (sold separately) is used. This enables message communications between PLCs as well as for remote I/O communications between PLCs and slaves in multiple groups. This feature allows a DeviceNet to be used as a common bus that can integrate all types of control with less wiring.

Multiple Master Units on a Single PLC

If a DeviceNet configurator (sold separately) is used, more than one Master Unit can be mounted to a single PLC. This feature enables greater DeviceNet remote I/O control capacity and ensures that DeviceNet can easily handle line expansion as well as other applications.

Application-specific Remote I/O Allocations

With the CS1W-DRM21 and CJ1W-DRM21, word allocations can be set for any area and in any node order without using a DeviceNet configurator. With the C200HW-DRM21-V1 user-specified allocations are possible if a DeviceNet configurator (sold separately) is used. By making allocations application-specific, programming can be structure more logically and coded much more efficiently.

Compatibility with Slow Slaves

With the CS1W-DRM21 and CJ1W-DRM21, the communications cycle time can be set even without a DeviceNet configurator so slaves with slow response times can be used. With the C200HW-DRM21-V1, I/O this same feature is supported by using a DeviceNet configurator (sold separately).

A Wide Variety of Slaves

A wide variety of I/O devices can be used as slaves, such as Remote I/O Terminals, Environment-resistant Terminals, Water-resistant Terminals, Remote Adapters, Sensor Terminals, Temperature Input Terminals, CQM1 I/O Link Units, Analog I/O Terminals, C200H I/O Link Units, RS-232C Units, GT1 I/O TERMINALs, Temperature Controllers, Inverters, and Intelligent Flags.

Constant Data Exchange with Slave CPU Units

With C200H I/O Link Units, Programmable Terminals, and other products, up to 32 input words and 32 output words can be constantly exchanged in the specified area of I/O memory in a slave CPU Unit. The CPU Unit where the Master Unit is mounted can thus control the Programmable Slave or the CPU Unit of the I/O Link Unit as a high-function slave.

Communications Specifications

Item	Specification			
Communications protocol	DeviceNet			
Connections	Multidrop or T-branch (See note 1.)			
Baud rate	125, 250, or 500 kbps (set via switch)			
Communications media	Special 5-conductor cable (2 signal lines, 2 power supply lines, 1 shield)			
Communications distance	**Baud rate**	**Overall network length (See note 2.)**	**Branch length**	**Total branch length**
	500 kbps	100 m max. (See note 3.)	6 m max.	39 m max.
	250 kbps	250 m max. (See note 3.)	6 m max.	78 m max.
	125 kbps	500 m max. (See note 3.)	6 m max.	156 m max.
Maximum number of nodes	64 nodes (Including master, maximum number of slaves: 63)			
Maximum number of slaves	CS1W-DRM21 and CJ1W-DRM21: 63 (even without a DeviceNet configurator) C200HW-DRM21-V1: without DeviceNet configurator: 1 with DeviceNet configurator: 63			
Error control checks	CRC errors, node address redundancy check, scan list verification			

Note: 1. Terminating resistance must be connected to both ends of the trunk line.
2. The distance between the two most separated nodes.
3. With Thin Cable, the overall network length must be 100 m or less at any baud rate.

DeviceNet Wireless Link

WD30

The DeviceNet wireless units, consisting of a DeviceNet wireless master station and a DeviceNet wireless slave station, allow wireless communication with DeviceNet slaves.

- Up to 3,200 I/O points can be communicated through a single Unit.
- Uses spread spectrum technology for superior noise resistance in manufacturing environments.
- Compact construction.
- Long-range communications have been achieved with a relay function (3 repeaters max.).
- Explicit message communication is supported.

Ordering Information

List of Models

Name	Number of I/O points (words used)	Model	Antenna style
DeviceNet Wireless Master	1,600 inputs max. (100 words) 1,600 outputs max. (100 words)	WD30-ME	Pencil antenna
		WD30-ME01	Magnetic base antenna
DeviceNet Wireless Slave	512 inputs max. (32 words) 512 outputs max. (32 words)	WD30-SE	Pencil antenna
		WD30-SE01	Magnetic base antenna
Magnetic Base Antenna (1)	---	WD30-AT001 (See note.)	---

Note: The WD30-AT001 Magnetic Base Antenna can be used with the WD30-ME, WD30-ME01, WD30-SE, and WD30-SE01.

Optional Accessories (Micro Connectors)

Name	Model	Specifications
Shielded T-branch Connector	DCN2-1	Connector with one branch
Cable with Shielded Connectors	DCA1-5CN□□W1	Cables with connectors on both ends
	DCA1-5CN□□F1	Cables with a connector socket on one end
Shielded Terminator	DRS2-1	Terminator with plug connector

Included Accessories

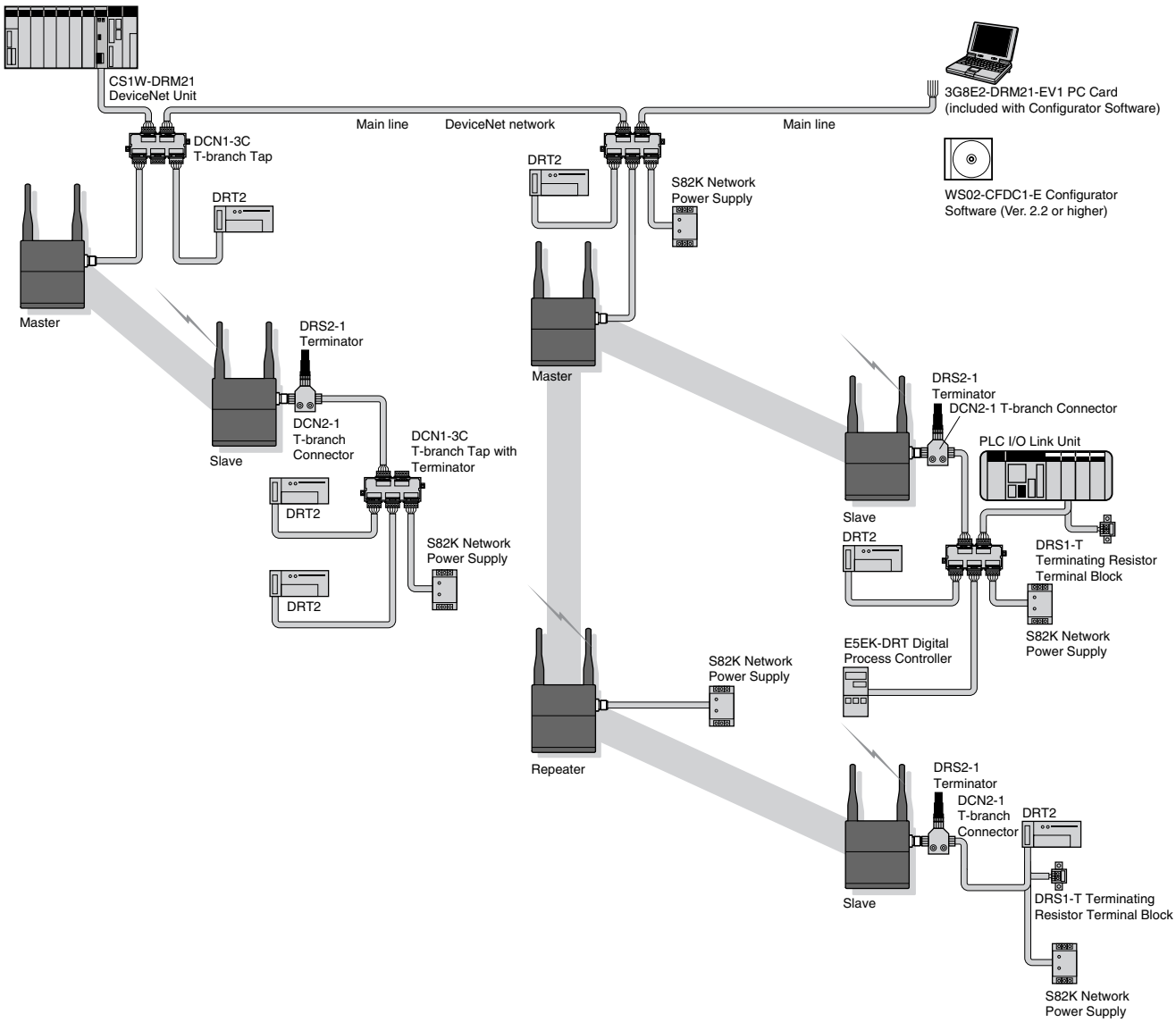
The following accessories are included with a DeviceNet Wireless Master or DeviceNet Wireless Slave.

- Two antennas
- DeviceNet Wireless Units Instruction Sheet
- Sticker
- Two M4 mounting bolts (with nuts, flat washers, and spring washers)

Optional Accessories (Configurator Software)

Name	Model
Configurator (PC Card)	3G8E2-DRM21-EV1
Configurator Software	WS02-CFDC1-E

System Configuration



Specifications

General Specifications

Item	Specifications
DeviceNet communications power supply voltage	11 to 25 V DC (Supplied from the DeviceNet network power supply.)
Current consumption (See note.)	350 mA max. (at startup), 120 mA average
Ambient temperature	Operating:−10° to 50°C Storage:−20° to 65°C
Ambient humidity	Operating:25% to 85% (with no condensation)
Weight	Approx. 200 g

Note: Select a power supply with excess capacity. (We recommend a minimum of 25 W.)

Wireless Interface Specifications

Item	Specifications
Wave type	Spread Spectrum (direct sequence; DS-SS)
Communication method	Simplex (half duplex)
Frequency band	2.4 GHz (2401 MHz to 2480.2 MHz)
Number of channels	34 channels (based on frequency division)
Antenna power	10 mW
Data transfer speed between wireless units	100 kbps
Transmission distance (See note 1.)	Indoors: 60 m (approx. 50 m with magnetic base antennas) Outdoors: 300 m (unobstructed)
Relay stations	3 repeaters max.
Max. number of sets in the same area (See note 1.)	10 sets max.
Max. number of wireless Slaves	64 max.

Note: 1. The actual transmission distance depends on many factors in the installation environment.
2. The wireless system is not suitable for applications requiring real-time control.

DeviceNet Interface Specifications (Summary)

Item	Specifications	
Communications functions (See note.)	Master/Slave connections	Remote I/O functions and Explicit message communications functions
Self-diagnostic functions	Unit	WDT error, hardware errors (such as memory and CAN errors), and setting errors
	DeviceNet communications	Duplicate node address errors, Bus OFF detection, and connection timeout
Device profiles	Communication control unit	Refer to Appendix A of the *WD30 DeviceNet Wireless Units Operation Manual* for various DeviceNet IDs (vendor, device type = communication adapter, product code, product revision, product name, serial number, status, and I/O unit IDs.)

Note: FINS message communications are not supported. Explicit messages must be handled in the ladder program. Refer to the *WD30 DeviceNet Wireless Units Operation Manual* for details.

I/O Points

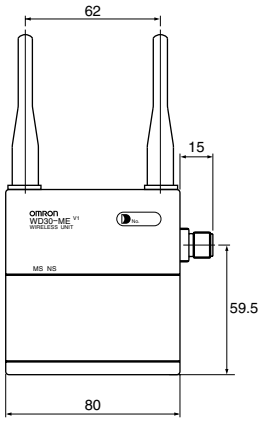
Name	Number of I/O points (words used)
DeviceNet Wireless Master	1,600 inputs max. (100 words) 1,600 outputs max. (100 words)
DeviceNet Wireless Slave	512 inputs max. (32 words) 512 outputs max. (32 words)

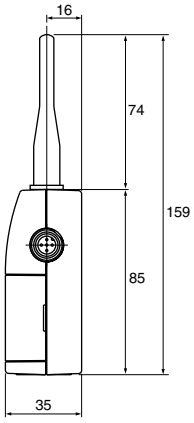
Note: Relay Stations can be used to create up to 3 levels and DeviceNet Slaves can be connected in each level. Terminators are required when Slaves are connected to a Relay Station or Slave Station. Refer to the *WD30 DeviceNet Wireless Units Operation Manual* for details on Terminator installation.

Dimensions

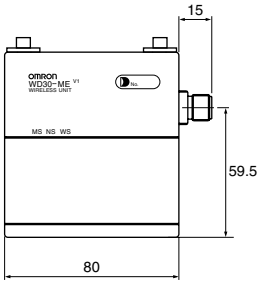
Note: All units are in millimeters unless otherwise indicated.

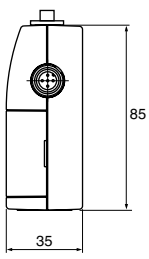
WD30-ME and WD30-SE DeviceNet Wireless Units



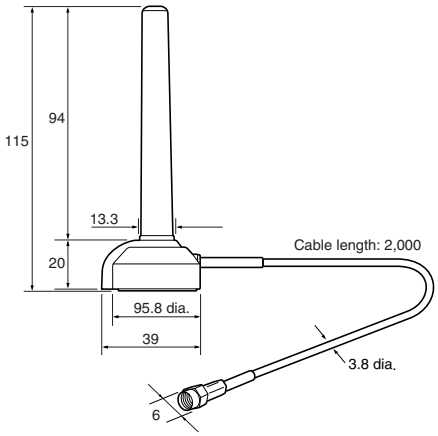


WD30-ME01 and WD30-SE01 DeviceNet Wireless Units





WD30-AT001 Magnetic Base Antenna (Included with the WD30-ME01 and WD30-SE01.)



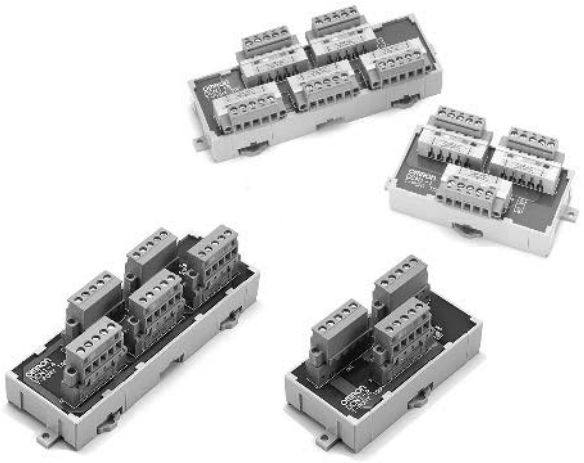
Precautions

Refer to the *WD30 DeviceNet Wireless Units Datasheet (*Catalog No. M502-E1-□, M503-E1-□) or *WD30 DeviceNet Wireless Units Operation Manual* (Catalog No. M071-E1-□) for more detailed specifications.

Cables and Connectors

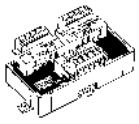
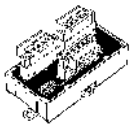
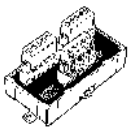
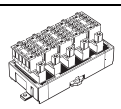
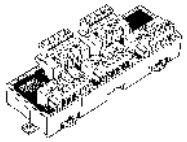
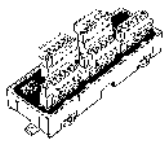
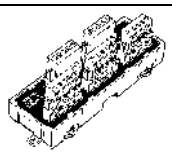
Peripherals for DeviceNet

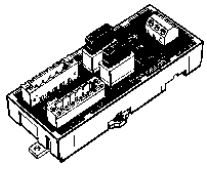
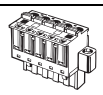
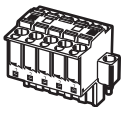
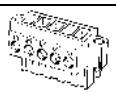
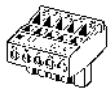
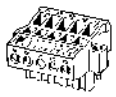
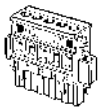
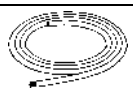
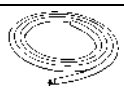
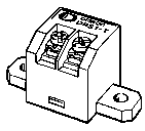
- T-branch tabs
- Network terminators
- Network connectors
- DeviceNet cable



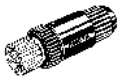
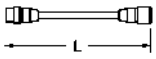
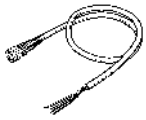
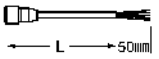
Ordering Information

General-purpose Models

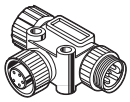
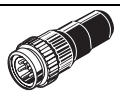
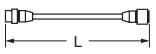
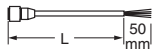
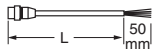
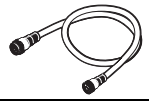
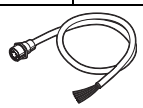
Product	Appearance	Model	Specification	
T-branch Tap for 1 branch line		DCN1-1NC	Cable wiring direction: Toward top Cable lock direction: From top Connector screw direction: From top	Provided with 3 parallel connectors with clamps (XW4G-05C1-H1-D), standard terminating resistor
		DCN1-1C	Cable wiring direction: Toward side Cable screw direction: From top Connector screw direction: From side	Provided with 3 parallel connectors with screws (XW4B-05C1-H1-D), standard terminating resistor
		DCN1-2C	Cable wiring direction: Toward top Cable screw direction: From side Connector screw direction: From top	
		DCN1-2R	Cable wiring direction: From side Cable screw direction: From top Connector screw direction: From top	Provided with 3 orthogonal connectors with screws (XW4B-05C1-VIR-D), standard terminating resistor
T-branch Tap for 3 branch lines		DCN1-3NC	Cable wiring direction: Toward top Cable lock direction: From top Connector screw direction: From top	Provided with 5 parallel clamp connectors with screws (XW4G-05C1-H1-D), standard terminating resistor
		DCN1-3C	Cable wiring direction: Toward side Cable screw direction: From top Connector screw direction: From side	Provided with 5 parallel connectors with screws (XW4B-05C1-H1-D), standard terminating resistor
		DCN1-4C	Cable wiring direction: Toward top Cable screw direction: From side Connector screw direction: From top	
		DCN1-4R	Cable wiring direction: Toward side Cable screw direction: From top Connector screw direction: From top	Provided with 5 orthogonal clamp connectors with screws (XW4B-05C1-VIR-D), standard terminating resistor

Product		Appearance	Model	Specification
Power Supply Tap			DCN1-1P	One-branch tap provided with 2 connectors, standard terminating resistor, and fuse
Connectors			XW4G-05C1-H1-D	Parallel clamp connector with screws Connector insertion and wiring both performed horizontally.
			XW4G-05C4-HF-D	Parallel multi-branching clamp connector with screws Connector insertion and wiring performed in same direction.
			XW4B-05C1-H1-D	Parallel connector with screws Connector insertion and wiring performed in same direction.
			XW4B-05C4-T-D	Parallel, screwless, multi-branching connector Connector insertion and wiring performed in same direction.
			XW4B-05C4-TF-D	Parallel, multi-branching connector with screws Connector insertion and wiring performed in same direction.
			XW4B-05C1-VIR-D	Orthogonal connector with screws Connector insertion and wiring performed at a right angle.
Omron supplied DeviceNet Cables	Thin Cables		DCA1-5C10	Outer diameter: 7.00 mm Length: 100 m
	Thick Cables		DCA2-5C10	Outer diameter: 11.6 mm Length: 100 m
Terminal-block Terminator			DRS1-T	Resistance of 121 Ω

Environment-resistive Models for Thin Wires

Product	Appearance		Model	Specifications	
Sealed Assembling-type Connector (male)			XS2G-D5S7	For communications (plug)	
Sealed Assembling-type Connector (female)			XS2C-D5S7	For communications (socket)	
Sealed T-branch Connector			DCN2-1	For 1 branch line	
Sealed Connector with Terminating Resistor			DRS2-1	Plug	
			DRS2-2	Socket	
Cables with Sealed Connectors			DCA1-5CNC5W1	Length (L): 0.5 m	Cable with connectors on both ends
			DCA1-5CN01W1	Length (L): 1 m	
			DCA1-5CN02W1	Length (L): 2 m	
			DCA1-5CN03W1	Length (L): 3 m	
			DCA1-5CN05W1	Length (L): 5 m	
			DCA1-5CN10W1	Length (L): 10 m	
			DCA1-5CNC5F1	Length (L): 0.5 m	Cable with connector socket on one end
			DCA1-5CN01F1	Length (L): 1 m	
			DCA1-5CN02F1	Length (L): 2 m	
			DCA1-5CN03F1	Length (L): 3 m	
			DCA1-5CN05F1	Length (L): 5 m	
			DCA1-5CN10F1	Length (L): 10 m	
			DCA1-5CNC5H1	Length (L): 0.5 m	Cable with connector plug on one end
			DCA1-5CN01H1	Length (L): 1 m	
			DCA1-5CN02H1	Length (L): 2 m	
			DCA1-5CN03H1	Length (L): 3 m	
			DCA1-5CN05H1	Length (L): 5 m	
			DCA1-5CN10H1	Length (L): 10 m	

Environment-resistive Models for Thick Wires

Product	Appearance		Model	Specifications	
Sealed T-branch Connector			DCN3-11	T-branch Connector	
			DCN3-12	T-branch Connector (Branch connector is M12.)	
Sealed Connector with Terminating Resistor			CRS3-1	Plug	
Cables with Sealed Connectors			DCA2-5CN01W1	Length (L): 1 m	Cable with connectors on both ends
			DCA2-5CN02W1	Length (L): 2 m	
			DCA2-5CN05W1	Length (L): 5 m	
			DCA2-5CN10W1	Length (L): 10 m	
			DCA2-5CN01F1	Length (L): 1 m	Cable with connector socket on one end
			DCA2-5CN02F1	Length (L): 2 m	
			DCA2-5CN05F1	Length (L): 5 m	
			DCA2-5CN10F1	Length (L): 10 m	
			DCA2-5CN01H1	Length (L): 1 m	Cable with connector plug on one end
			DCA2-5CN02H1	Length (L): 2 m	
			DCA2-5CN05H1	Length (L): 5 m	
			DCA2-5CN10H1	Length (L): 10 m	
			DCA1-5CN01W5	Length (L): 1 m	Cable with connectors on both ends Thin cable M12 socket
			DCA1-5CN02W5	Length (L): 2 m	
			DCA1-5CN05W5	Length (L): 5 m	
			DCA1-5CN10W5	Length (L): 10 m	
Panel-mounting Connector (female)			DCA2-5CNC5P1	Connector socket for panel mounting Cable: 0.5 m	
Panel-mounting Connector (male)			XS4M-D521-1	Connector plug for panel mounting DIP terminals	

Recommended cable types, non-Omron

Network	Reference	Description
DeviceNet	Belden 46012 or compatible	DeviceNet thick cable (trunk). For use in Europe only. 18AWG/1PR 15AWG/1PR STR TC IND.
Device Net	Belden 3082A or compatible	DeviceNet thick cable (trunk). For global use. 18AWG/1PR 15AWG/1PR STR TC IND.
DeviceNet	Belden 3084A or compatible	DeviceNet thin cable (drop). 22AWG/1PR 24AWG/1PR STR TC IND.
PROFIBUS-DP	Belden 3079A or compatible	PROFIBUS cable. Type A (EN50170 vol. 2) Multi conductor, twisted, 22AWG

Specifications

General-purpose Models (T-branch Taps)

Ratings/Characteristics

Rated current	Between main lines:8 A (power supply line) and 2 A (signal line) Between main and branch lines:3 A (power supply line) and 1 A (signal line)
Insulation resistance	100 MΩ min. (at 500 V DC)
Dielectric strength	500 V AC for 1 min, leakage current: 1 mA max.
Ambient temperature	Operating: 0°C to 55°C

Materials

Item	Component	Materials
Unit	Main and Expansion Units	PBT resin with glass (UL14V-0)/gray
	DIN rail lock	POM resin/yellow
Terminal block connector (See note.)	Housing	PA66 resin (UL94V-0)
	Contact	Phosphor bronze coated with gold
PCB		Glass epoxy resin

Environment-resistive Models (Thin Wire Communications Connectors)

Ratings/Characteristics

Item	DCA1-5CN□□□1 Connectors with Cables	DCN2-1 T-branch Connector	XS2□-D5S7 Assembling-type Connector	DRS2-□ Connectors with Terminating Resistor
Rated current	3 A			
Rated voltage	125 V DC			
Contact resistance (connector)	40 mΩ max. (at 20 m V DC max. and 100 mA max.)			
Insulation resistance	1,000 MΩ min. (at 500 V DC)			
Dielectric strength (connector)	1,500 V AC for 60 seconds (leakage current: 1 mA max.)			
Ambient temperature range	–20 to 65°C			
Storage temperature range	–25 to 70°C			
Enclosure rating	IEC IP67			
Insertion durability	200 times			
Cable strength	98 N for 15 s	---		
Vibration resistance	No current interruptions of more than 1 μm while performing simple vibrations at either 10 to 500 Hz with 1.52-mm full amplitude or at acceleration 100 m/s^2, whichever is smaller			

Environment-resistive Models (Thick Wire Communications Connectors)

Ratings/Characteristics

Item	DCA2-5CN□□□1 Connectors with Thick Wires	DCA1-5CN□□W5 Connectors with Thick Wires	DCN3-11 T-branch Connector	DCN3-12 T-branch Connector	DRS3-1 Connectors with Terminating Resistor	DCA2-5CNC5P1 Panel Mounting Connector	XS4M-D521-1 Panel Mounting Connector
Rated current	8 A	3 A	8 A	3 A (See note.)	8 A		
Rated voltage	125 V DC						
Contact resistance (connector)	30 mΩ max. (at 20 m V DC max. and 100 mA max.)						
Insulation resistance	1,000 MΩ min. (at 500 V DC)						
Dielectric strength (connector)	1,500 V AC for 60 seconds (leakage current: 1 mA max.)						
Ambient temperature range	–20 to 65°C						
Storage temperature range	–25 to 70°C						
Enclosure rating	IEC IP67						
Insertion durability	200 times						
Cable strength	98 N for 15 s		---			98 N for 15 s	---
Vibration resistance	No current interruptions of more than 1 μm while performing simple vibrations at either 10 to 500 Hz with 1.52-mm full amplitude or at acceleration 100 m/s^2, whichever is smaller						

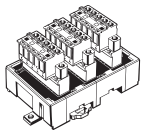
Note: The rated current between thick wires is 8 A.

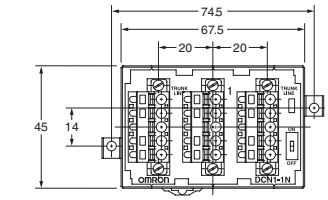
Dimensions

Note: All units are in millimeters unless otherwise indicated.

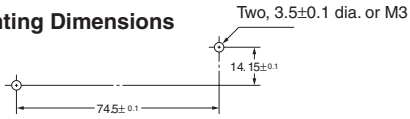
General-purpose Models

DCN1-1NC
T-branch Tap for 1 Branch Line
(With Three Branching Connectors)

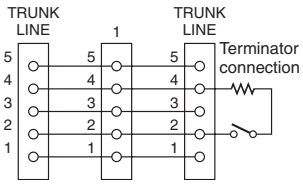




Mounting Dimensions

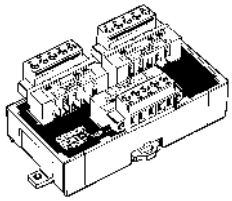


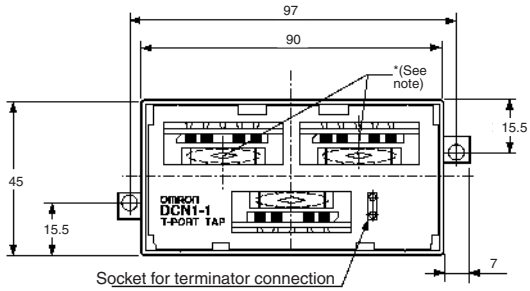
Internal Circuit



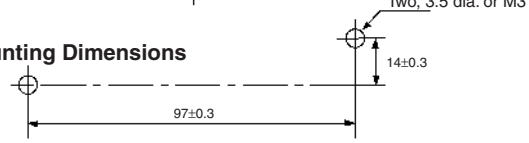
Terminal No.	Name
1	V–
2	CAN-L
3	DRAIN
4	CAN-H
5	V+

DCN1-1C
T-branch Tap for 1 Branch Line
(With Three Branching Connectors)

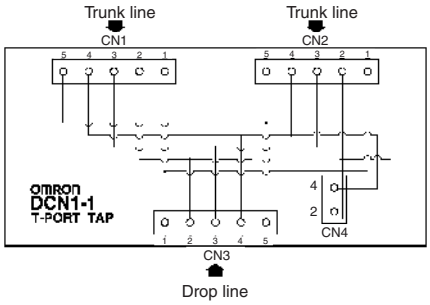




Mounting Dimensions



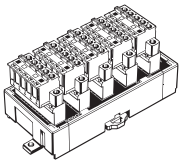
Internal Circuit

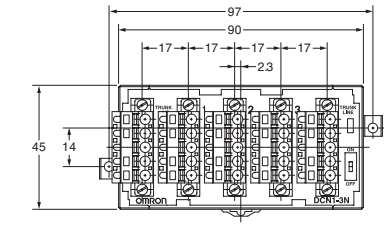


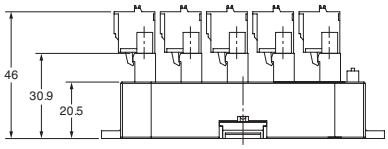
Terminal No.	Name
1	V–
2	CAN-L
3	DRAIN
4	CAN-H
5	V+

Note: When connecting a branch line to the main line, connect the trunk line to the connector marked with an asterisk because the resistance between the trunk line is minimal.

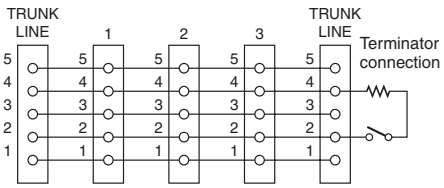
DCN1-3NC
T-branch Tap for 3 Branch Lines
(With Five Branching Connectors)





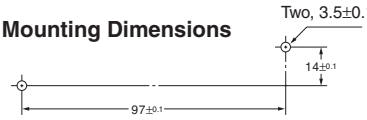


Internal Circuit

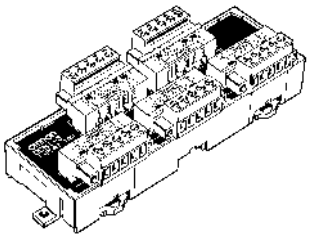


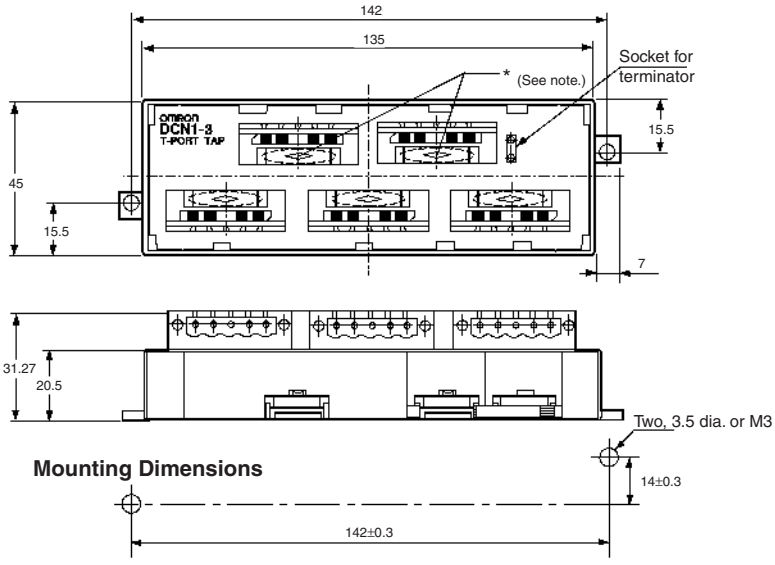
Terminal No.	Name
1	V–
2	CAN-L
3	DRAIN
4	CAN-H
5	V+

Mounting Dimensions



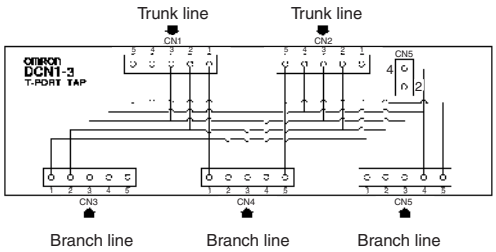
DCN1-3C
T-branch Tap for 3 drop Lines
(With Five Branching Connectors)





Mounting Dimensions

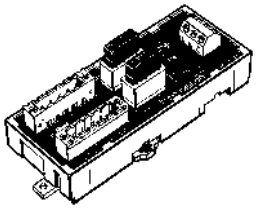
Internal Circuit

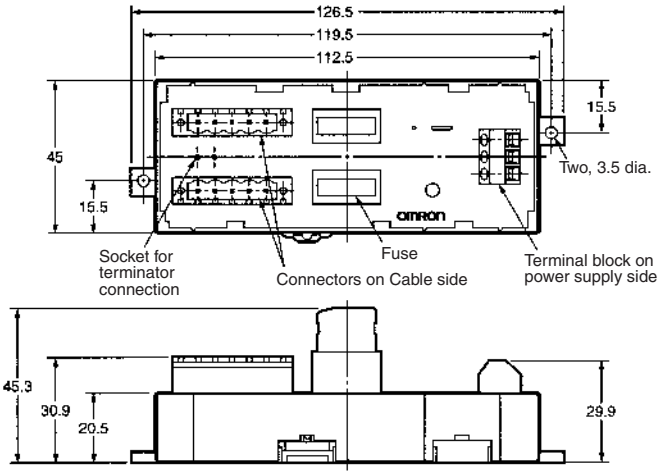


Terminal No.	Name
1	V–
2	CAN-L
3	DRAIN
4	CAN-H
5	V+

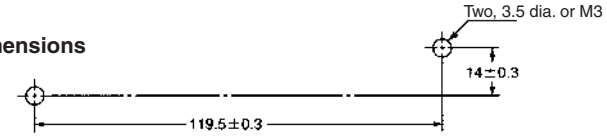
Note: When connecting a drop line to the trunk line, connect the trunk line to the connector marked with an asterisk because the resist ance between the trunk line connectors portion is minimal.

DCN1-1P
Power Supply Tap
(With Two Branching Connectors)

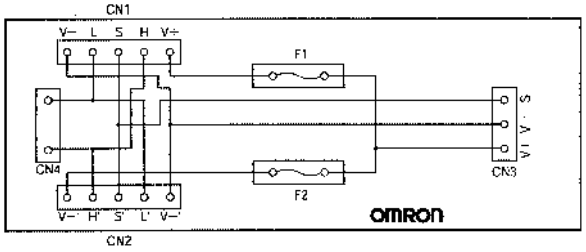




Mounting Dimensions

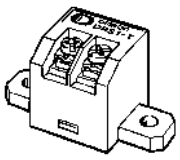


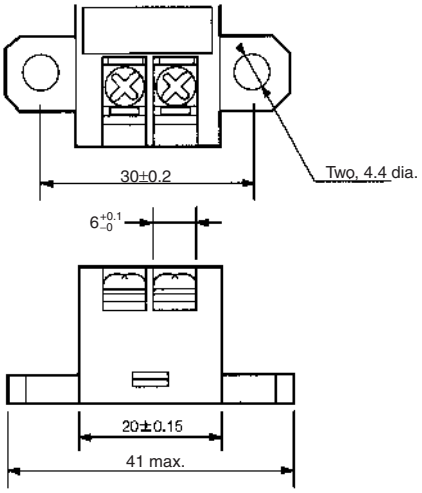
Internal Circuit



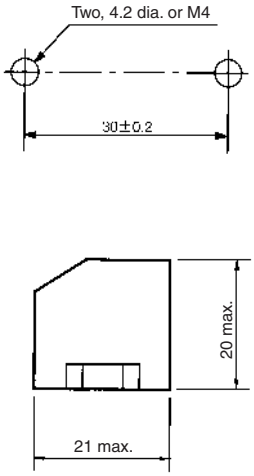
Terminal No.	Name
V–	V–
L	CAN-L
S	DRAIN
H	CAN-H
V+	V+

DRS1-T Terminal-block Terminator



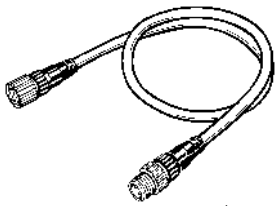


Mounting Holes

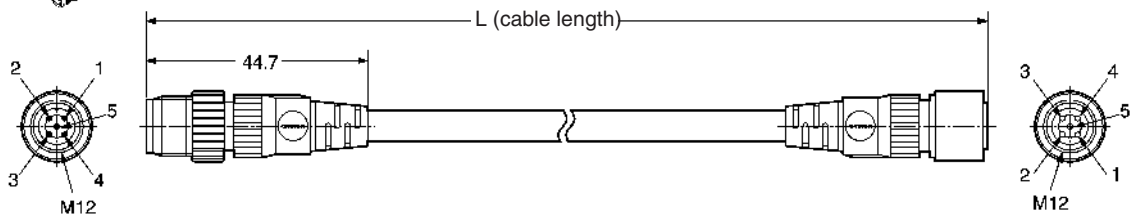


Environment-resistive Models for thin cable

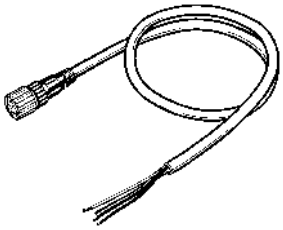
DCA1-5CN□□W1
Cables with Connectors on Both Ends



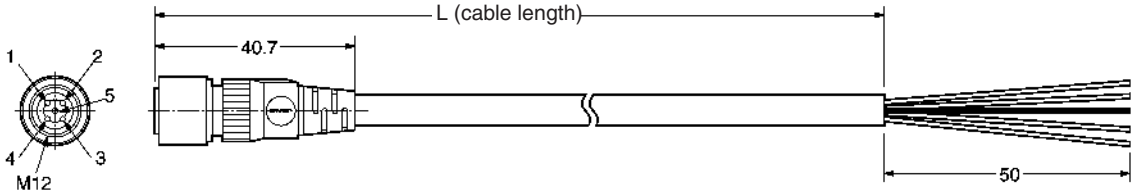
Terminal No.	Color	Name
1	---	DRAIN
2	Red	V+
3	Black	V–
4	White	CAN-H
5	Blue	CAN L



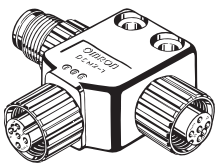
DCA1-5CN□□F1
Cables with Connector (Socket) on Single End



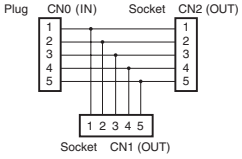
Terminal No.	Color	Name
1	---	DRAIN
2	Red	V+
3	Black	V–
4	White	CAN-H
5	Blue	CAN L



DCN2-1
T-branch Connector

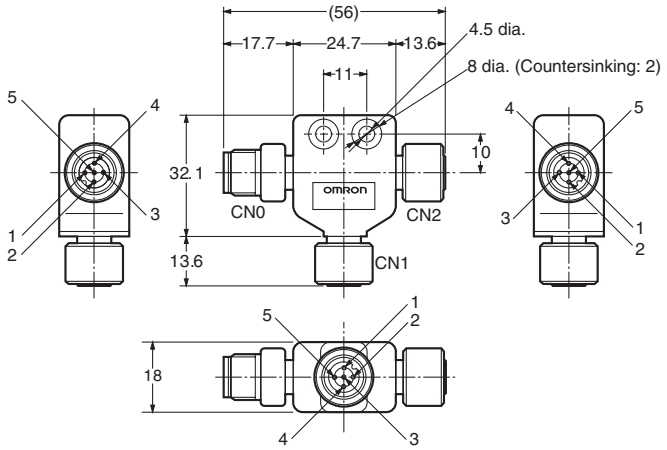


Connections Diagram

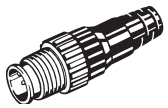


Wiring

Terminal No.	Name
1	SHIELD
2	V+
3	V–
4	CAN-H
5	CAN-L



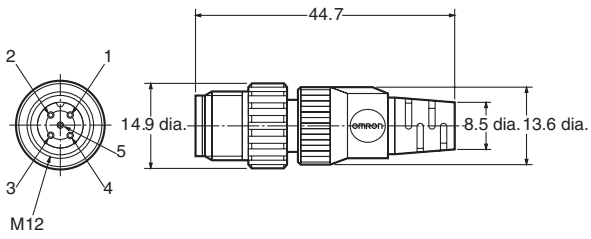
DRS2-1 (Plug)
DRS2-2 (Socket)
Connectors with Terminating Resistance



Wiring

Terminal No.	Name
1	DRAIN: NC
2	V+: NC
3	V–: NC
4	CAN-H: 121 Ω
5	CAN-L:

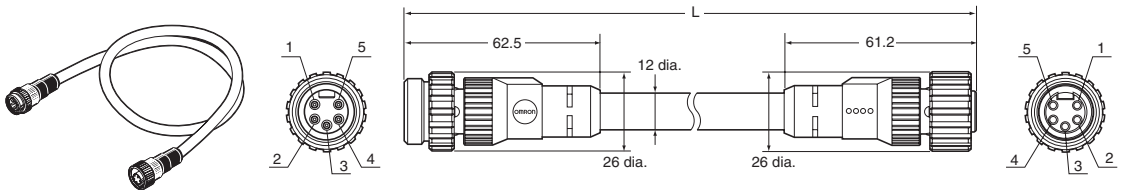
Note: Terminating resistance (121 Ω) is connected between terminals 4 and 5.



Note: The diagram shows the DRS2-1 (plug).

Environment-resistive Models for Thick Wires

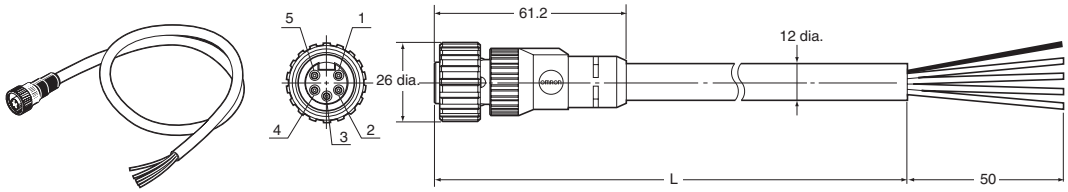
DCA2-5CN□□W1
Thick Cable with Connectors on Both Ends (5 Conductors for Communications)



Wiring

Terminal No.	Color	Name
1	---	DRAIN
2	Red	V+
3	Black	V–
4	White	CAN-H
5	Blue	CAN-L

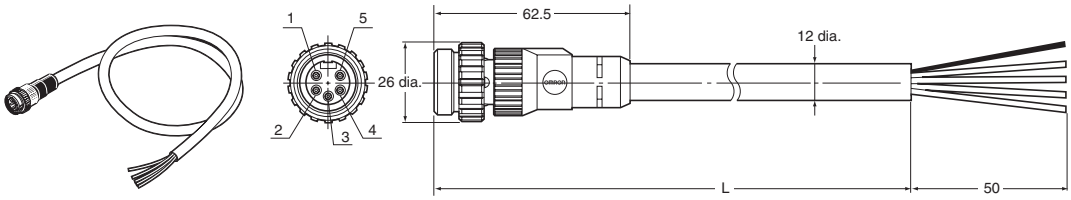
DCA2-5CN□□F1
Thick Cable with Connector Socket on One End (5 Conductors for Communications)



Wiring

Terminal No.	Color	Name
1	---	DRAIN
2	Red	V+
3	Black	V–
4	White	CAN-H
5	Blue	CAN-L

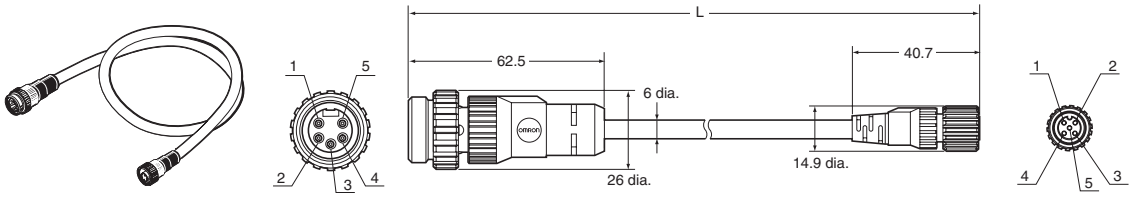
DCA2-5CN□□H1
Thick Cable with Connector Plug on One End (5 Conductors for Communications)



Wiring

Terminal No.	Color	Name
1	---	DRAIN
2	Red	V+
3	Black	V–
4	White	CAN-H
5	Blue	CAN-L

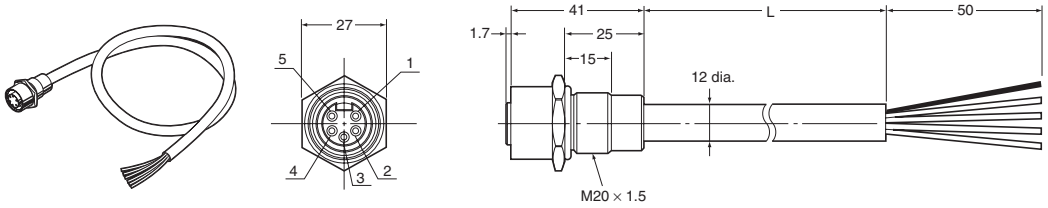
DCA1-5CN□□W5
Thin Cable with Connectors on Both Ends (5 Conductors for Communications)



Wiring

Terminal No.	Color	Name
1	---	DRAIN
2	Red	V+
3	Black	V–
4	White	CAN-H
5	Blue	CAN-L

DCA2-5CNC5P1
Thin Cable with Panel-mounting Connector Socket on One End (5 Conductors for Communications)

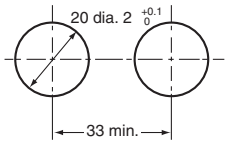


Wiring

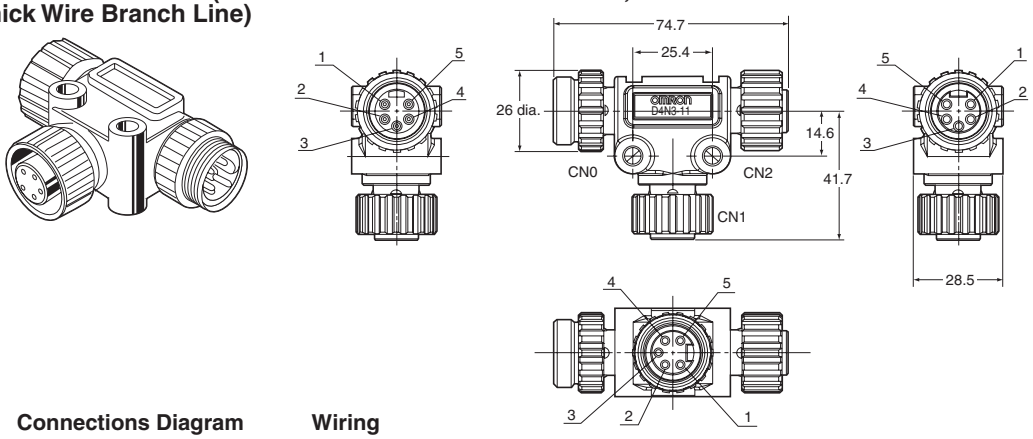
Terminal No.	Color	Name
1	---	DRAIN
2	Red	V+
3	Black	V–
4	White	CAN-H
5	Blue	CAN-L

Note: A rubber seal and nut for panel mounting are included.

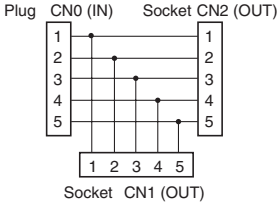
Panel Cutout Dimensions



DCN3-11
T-branch Connector (5 Conductors for Communications, Thick Wire Branch Line)



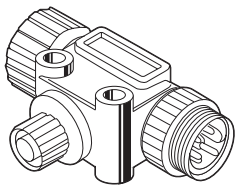
Connections Diagram

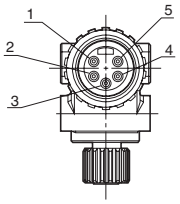


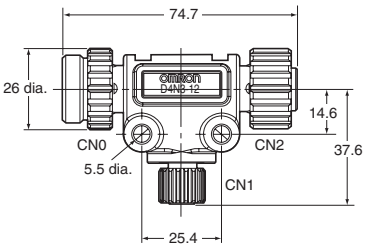
Wiring

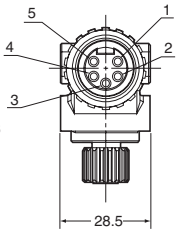
Terminal No.	Name
1	DRAIN
2	V+
3	V–
4	CAN-H
5	CAN-L

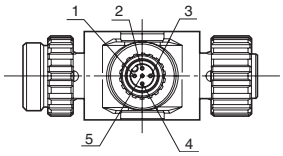
DCN3-11
T-branch Connector (5 Conductors for Communications, Thin Wire Branch Line)



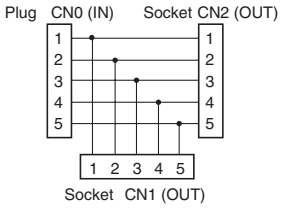








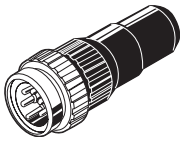
Connections Diagram



Wiring

Terminal No.	Name
1	DRAIN
2	V+
3	V–
4	CAN-H
5	CAN-L

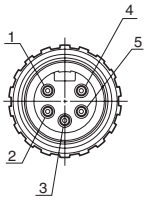
DRS3-1
Connector Plug with Terminating Resistance

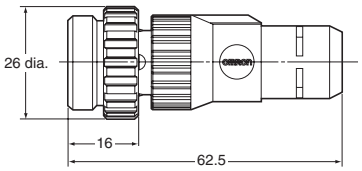


Wiring

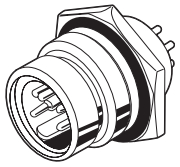
Terminal No.	Name
1	DRAIN: NC
2	V+: NC
3	V–: NC
4	CAN-H: 121 Ω
5	CAN-L: 121 Ω

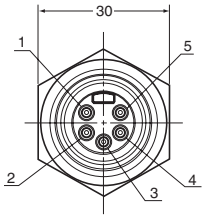
Note: Terminating resistance (121 Ω) is connected between terminals 4 and 5.

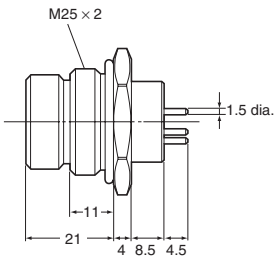




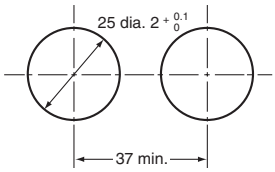
XS4M-D521-1
Panel-mounting Connector Plug (5 Pins for Communications)



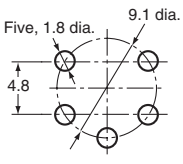




Panel Cutout Dimensions



PCB Processing Dimensions



Note: A rubber seal and nut for panel mounting are included.

Environment-resistive Peripheral Devices

Applicable Connectors

Power Supply Connectors (M12 Microconnectors)

Model number	Specifications
XS2C-D4□□	Connector assembly with socket (press-fit, solder, and screw types)
XS2W-D42□-□□□-□	Cable with connectors on both ends
XS2F-D42□-□80-□	Cable with connector socket on one end
XS2R-D427-5	T-branch connector

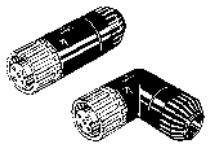
Power Supply Connectors (7/8-16UN Miniconnectors)

Model number	Specifications
XS4W-D421-1□□-A	Cable with connectors on both ends
XS4F-D421-1□□-A	Cable with connector socket on one end
XS4H-D421-1□□-A	Cable with connector plug on one end
XS4R-D424-5	T-branch connector

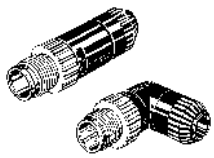
I/O Connectors (M12 Microconnectors)

Model number	Specifications
XS2G-D4□□	Connector assembly (crimp, solder, and screw types)
XS2H-D421-□□□-□	Cable with connector plug on one end
XS2W-D42□-□□□-□	Cable with connectors on both ends
XS2R-D426-□11F	Y-shaped joint with plug/socket at both ends of cable (Can be used with DRT1-□D08C/□D16C(-1) only.)
XS2R-D426-□10F	Y-shaped joint with sockets on one end of cable (Can be used with DRT1-□D08C/□D16C(-1) only.)
XS2R-D426-1	Y-shaped joint with plug/socket (no cable) (Can be used with DRT1-□D08C/□D16C(-1) only.)
XS2Z-12	Waterproof cover
XS2Z-15	Dust cover

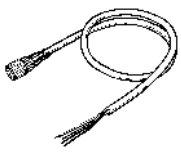
Connector Assemblies with Socket (M12 Microconnectors for Power Supply)

Appearance	Dimensions of applicable cable (mm)	Cable direction	Number of pins	Connection method		
				Crimp	Solder	Screw
	6 dia. (5 to 6 dia.)	Straight	4	XS2C-D4C1	XS2C-D421	XS2C-D4S1
		L-shaped		XS2C-D4C2	XS2C-D422	XS2C-D4S2
	5 dia. (4 to 5 dia.)	Straight		XS2C-D4C3	XS2C-D423	XS2C-D4S3
		L-shaped		XS2C-D4C4	XS2C-D424	XS2C-D4S4
	3 dia. (3 to 4 dia.)	Straight		XS2C-D4C5	XS2C-D425	XS2C-D4S5
		L-shaped		XS2C-D4C6	XS2C-D426	XS2C-D4S6
	7 dia. (6 to 7 dia.)	Straight		---	---	XS2C-D4S9
	8 dia. (7 to 8 dia.)					XS2C-D4S7

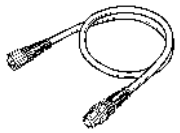
Connector Assemblies with Plug (M12 Microconnectors for Power Supply)

Appearance	Dimensions of applicable cable (mm)	Cable direction	Number of pins	Connection method		
				Crimp	Solder	Screw
	6 dia. (5 to 6 dia.)	Straight	4	XS2G-D4C1	XS2G-D421	XS2G-D4S1
		L-shaped		---	XS2G-D422	XS2G-D4S2
	5 dia. (4 to 5 dia.)	Straight		XS2G-D4C3	XS2G-D423	XS2G-D4S3
		L-shaped		---	XS2G-D424	XS2G-D4S4
	3 dia. (3 to 4 dia.)	Straight		XS2G-D4C5	XS2G-D425	XS2G-D4S5
		L-shaped		---	XS2G-D426	XS2G-D4S6
	7 dia. (6 to 7 dia.)	Straight		---	---	XS2G-D4S9
	8 dia. (7 to 8 dia.)					XS2G-D4S7

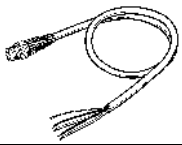
Cables with Connector Socket on One End (M12 Microconnectors for Power Supply)

Appearance	Cable direction	Number of core wires	Cable length (m)	Standard cable	Earthquake-resistant cable
	Straight 	4	1	XS2F-D421-C80-A	XS2F-D421-C80-R
			2	XS2F-D421-D80-A	XS2F-D421-D80-R
			5	XS2F-D421-G80-A	XS2F-D421-G80-R
			10	XS2F-D421-J80-A	XS2F-D421-J80-R
	L-shaped 		1	XS2F-D422-C80-A	XS2F-D422-C80-R
			2	XS2F-D422-D80-A	XS2F-D422-D80-R
			5	XS2F-D422-G80-A	XS2F-D422-G80-R
			10	XS2F-D422-J80-A	XS2F-D422-J80-R

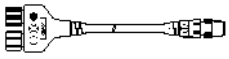
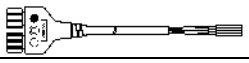
Cables with Connector (Socket/Plug) on Both Ends (M12 Microconnectors for Power Supply and I/O)

Appearance	Cable direction	Number of core wires	Cable length (m)	Standard cable	Earthquake-resistant cable
	Straight/straight	4	1	XS2W-D421-C81-A	XS2W-D421-C81-R
			2	XS2W-D421-D81-A	XS2W-D421-D81-R
			5	XS2W-D421-G81-A	XS2W-D421-G81-R
	L-shaped/L-shaped		2	XS2W-D422-D81-A	---
			5	XS2W-D422-G81-A	
	Straight/L-shaped		2	XS2W-D423-D81-A	
			5	XS2W-D423-G81-A	
	L-shaped/straight		2	XS2W-D424-D81-A	
			5	XS2W-D424-G81-A	

Cables with connector plug on One End (M12 Microconnectors for I/O)

Appearance	Cable direction	Number of core wires	Cable length (m)	Standard cable
	Straight	3	0.3	XS2H-D421-AC0-A
		4		XS2H-D421-A80-A
		3	1	XS2H-D421-CC0-A
		4		XS2H-D421-C80-A

Plugs and Sockets on Y-shaped Joints (M12 Microconnectors for I/O)

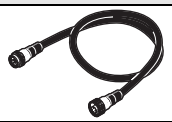
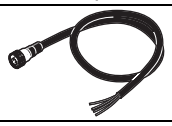
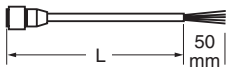
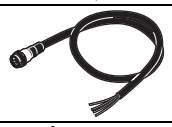
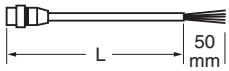
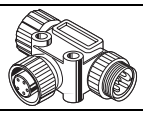
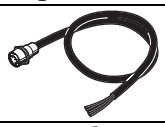
Appearance	With/without cable	Connector	DC models	
			Cable length (m)	Model number
	With cable	Connectors on both ends	0.5	XS2R-D426-B11-F
			1	XS2R-D426-C11-F
			2	XS2R-D426-D11-F
			3	XS2R-D426-E11-F
		Connector on one end	2	XS2R-D426-D10-F
			5	XS2R-D426-G10-F
	Without cable	Connectors on both ends	---	XS2R-D426-1

Note: These Plugs and Sockets can be used with Environment-resistive Terminals (DRT□-□16C(-1)) only.

T-branch Connectors and Connector Covers (M12 Microconnectors)

Appearance	Type	Model number	Application
	T-branch connector	XS2R-D427-5	For branching power lines
	Waterproof cover	XS2Z-12	For covering unused I/O connectors
	Dust cover	XS2Z-15	

Power Supply Connectors (7/8-16UN Miniconnectors)

Appearance		Cable length	Model
		1 m	XS4W-D421-101-A
		2 m	XS4W-D421-102-A
		5 m	XS4W-D421-105-A
		10 m	XS4W-D421-110-A
		1 m	XS4F-D421-101-A
		2 m	XS4F-D421-102-A
		5 m	XS4F-D421-105-A
		10 m	XS4F-D421-110-A
		1 m	XS4H-D421-101-A
		2 m	XS4H-D421-102-A
		5 m	XS4H-D421-105-A
		10 m	XS4H-D421-110-A
	T-branch Connector	---	XS4R-D424-5
	Panel mounting connector socket Cable: 50 cm	---	XS4P-D421-1C5-A
	Panel mounting connector plug DIP terminals	---	CS4M-D421-1

Accessory: Waterproof Caps (for 7/8-16UN Miniconnectors)

Type	Model
Waterproof Cap for Plug	XS4Z-11
Waterproof Cap for Socket	XS4Z-12

Recommended cable types, non-Omron

Network	Reference	Description
DeviceNet	Belden 46012 or compatible	DeviceNet thick cable (trunk). For use in Europe only. 18AWG/1PR 15AWG/1PR STR TC IND.
DeviceNet	Belden 3082A or compatible	DeviceNet thick cable (trunk). For global use. 18AWG/1PR 15AWG/1PR STR TC IND.
DeviceNet	Belden 3084A or compatible	DeviceNet thin cable (drop). 22AWG/1PR 24AWG/1PR STR TC IND
PROFIBUS-DP	Belden 3079A or compatible	Profibus cable. Type A (EN50170 vol.2) Multi conductor. twisted. 22 AWG

Note: Please contact either your local Omron or Belden distributor for the availability of these cables

DeviceNet product overview

Masters 496
Configurator 497
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- Smart Slaves 497
- General-purpose Slaves 498
- Intelligent Slaves Operating as PLC Units 498
- Other Intelligent Slaves 499
- GT1 I/O TERMINAL Units 500

Peripheral Devices 501
- General-purpose Peripheral Devices 501
- Environment-resistive Peripheral Devices (for Thin Cable) 502
- Environment-resistive Peripheral Devices (for Thick Cable) 503
- Cables with Connectors Compatible with GT1 I/O TERMINAL Connectors 504

International Standards and EC Directives

- The abbreviations used in the “Standards” column in the following tables indicate the following international standards.
  U: UL, C:CSA, UC: cULus, CU: cUL, N: NK, L: Lloyd, CE: EC Directives
  See OMRON sales representatives for conditions under which UL, CSA, cULus, cUL, NK, LLOYD, and CE standards were met. The information on standards is current as of August 2002.

EC Directives

The EC Directives applicable to PLCs include the EMC Directives and the Low Voltage Directive. OMRON complies with these directives as described below.

EMC Directives

Applicable Standards

EMI:EN50081-2

EMS:EN61131-2 and EN61000-6-2 (See note.)

PLCs are electrical devices that are incorporated in machines and manufacturing installations. OMRON PLCs conform to the related EMC standards so that the devices and machines into which they are built can more easily conform to EMC standards. The actual PLCs have been checked for conformity to EMC standards. Whether these standards are satisfied for the actual system, however, must be checked by the customer.

EMC-related performance will vary depending on the configuration, wiring, and other conditions of the equipment or control panel in which the PLC is installed. The customer must, therefore, perform final checks to confirm that the overall machine or device conforms to EMC standards.

Note: The applicable EMI standard depends on the product.

Low Voltage Directive

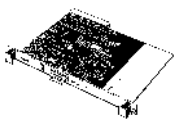
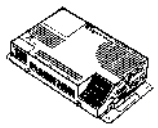
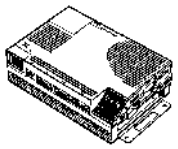
Applicable Standard

EN61131-2

Devices that operate at voltages from 50 to 1,000 V AC or 75 to 150 V DC must satisfy the appropriate safety requirements. With PLCs, this applies to Power Supply Units and I/O Units that operate in these voltage ranges.

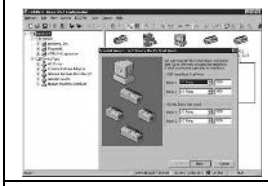
These Units have been designed to conform to EN61131-2, which is the applicable standard for PLCs.

Masters

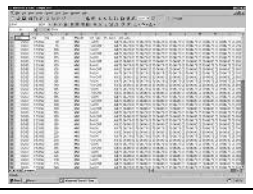
Product	Appearance	Model	Specifications	Standards	Page
DeviceNet Unit		CJ1W-DRM21	For CJ Series Functions as either a master or a slave. 2,048 I/O points	U, C, N, CE	229
		CS1W-DRM21	For CS1 Series • Unit can be used either as master, or as slave. Master and slave functionality can be used simultaneously. • Up to 2,048 I/O points • By means of a pre-set allocations, the need for configuration software is optional * Supports the same seamless transparency as Controller Link and Ethernet, by using FINS message communications		339
Master Units		C200HW-DRM21-V1	For CS1H/G, C200HS, C200HX/HG/HE • Incorporating a remote I/O and message communications functions. • With CS1H/G, C200HX/HG/HE: 800 input points, 800 output points • With C200HS: 512 input points, 512 output points	U, C, N, L, CE	341
Master Board		3G8B3-DRM21-E	VME Bus Interface Board • I/O allocation: 12,288 bytes • Double-height (6U-size), single slot • I/O allocation space of 12 Kbytes.	Please contact your local OMRON representative.	
Open Network Controllers with DeviceNet Interface		ITNC-EIS01-DRM	• Enables access via the www • Supports TCP/IP, Telnet, FTP, Active X packages, HTML, and other standard protocols • No expansion slot on the EIS models, • Besides the DeviceNet interface, also two COM ports	U, C, E	628
		ITNC-EIX01-DRM	• Enables access via the www • Supports TCP/IP, Telnet, FTP, Active X packages, HTML, and other standard protocols • Includes expansion slot • Besides the DeviceNet interface, also three COM ports		
Optional software	---	ITNC-NSIQ-EF	NX-Server for DeviceNet ONC Edition Ver. 1.00 Reads data from the network without adding a node to it, thus not creating any additional traffic or load on the network.	---	694

Note: Refer to the CS1 catalog (Cat. No. P047) for details on SYSMAC CS1-series PLCs and to the C200HX/HG/HE catalog (Cat. No. P036) for details on SYSMAC C200HX/HG/HE PLCs.

Configurator

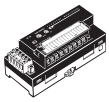
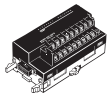
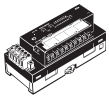
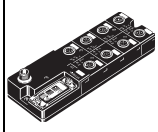
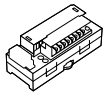
Product	Appearance	Model	Specifications	Standards	Page
DeviceNet Configurator		WS02-CFDC1-E	DeviceNet Configurator Software (Windows 95, 98, NT4.0, or 2000) For use with CJ1 or CS1 master Used to shorten network setup and troubleshooting time, and optimize performance by setting I/O allocation. The software uses drag-and-drop commands as well as pull down menus, for a familiar and effective Windows®, work environment.	---	688
		3G8E2-DRM21-EV1	PC Card (provided with software running on Windows 95, 98, Me, 2000, or XP)		

Monitor Software

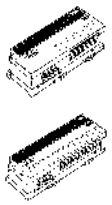
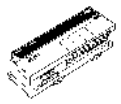
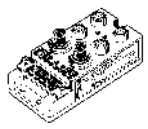
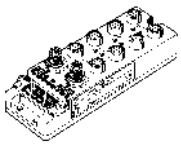
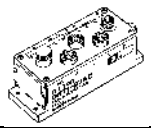
Product	Appearance	Model	Specifications	Standards	Page
NX-Server		WS02-NXD1-E	NX-Server for Windows, DDE edition Reads data from the network without adding a node to it, thus not creating any additional traffic or load on the network.	---	694

Slaves

Smart Slaves

Product	Appearance	Model	Specifications	Standards	
Remote I/O Terminals Basic Units		DRT2-ID16	16 inputs for terminals with NPN, ⊕ common	UC, CE	548
		DRT2-ID16-1	16 inputs for terminals with PNP, ⊖ common		
		DRT2-OD16	16 outputs for terminals with NPN, ⊖ common		
		DRT2-OD16-1	16 outputs for terminals with PNP, ⊕ common		
Remote I/O Terminals Expansion Units		XWT-ID08	8 inputs for terminals with NPN, ⊕ common	UC, CE	548
		XWT-ID08-1	8 inputs for terminals with PNP, ⊖ common		
		XWT-OD08	8 outputs for terminals with NPN, ⊖ common		
		XWT-OD08-1	8 outputs for terminals with PNP, ⊕ common		
		XWT-ID16	16 inputs for terminals with NPN, ⊕ common		
		XWT-ID16-1	16 inputs for terminals with PNP, ⊖ common		
		XWT-OD16	16 outputs for terminals with NPN, ⊖ common		
		XWT-OD16-1	16 outputs for terminals with PNP, ⊕ common		
Sensor Connector Terminals		DRT2-ID16S	16 inputs for terminals with NPN, ⊕ common	CE	565
		DRT2-ID16S-1	16 inputs for terminals with PNP, ⊖ common		
Analog Input Terminals		DRT2-AD04	4 inputs	U, CE	561
Analog Output Terminal		DRT2-DA02	2 outputs		
Environment-resistive Terminals		DRT2-ID08C	8 inputs for terminals with NPN, ⊕ common	CE	554
		DRT2-ID08C-1	8 inputs for terminals with PNP, ⊖ common		
		DRT2-OD08C	8 outputs for terminals with NPN, ⊖ common		
		DRT2-OD08C-1	8 outputs for terminals with PNP, ⊕ common		
		DRT2-HD16C	16 inputs for terminals with NPN, ⊕ common		
		DRT2-HD16C-1	16 inputs for terminals with PNP, ⊖ common		
Remote I/O Terminal with Relay Outputs		DRT2-ROS	16 output points		568

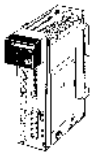
General-purpose Slaves

Product		Appearance	Model	Specifications		Standards	Page
Transistor Remote I/O Terminals			DRT1-ID08	8 inputs for terminals with NPN, ⊕ common		U, C, CE	571
			DRT1-ID08-1	8 inputs for terminals with PNP, ⊖ common			
			DRT1-ID16	16 inputs for terminals with NPN, ⊕ common			
			DRT1-OD08	8 outputs for terminals with PNP, ⊖ common			
			DRT1-OD08-1	8 outputs for terminals with NPN, ⊕ common			
			DRT1-MD16	8 inputs/8 outputs for terminals with NPN, ⊕ common for inputs, ⊖ common for outputs		---	
Transistor Remote I/O Terminals with 3-tier I/O Terminal Blocks	Common power supply for communications and internal circuit		DRT1-ID16TA	16 inputs, NPN (⊕ common)			576
			DRT1-ID16TA-1	16 inputs, PNP (⊖ common)			
			DRT1-MD16TA	8 inputs, NPN (⊕ common) 8 outputs, NPN (⊖ common)			
			DRT1-MD16TA-1	8 inputs, PNP (⊖ common) 8 outputs, PNP (⊕ common)			
			DRT1-OD16TA	16 outputs, NPN (⊖ common)			
			DRT1-OD16TA-1	16 outputs, PNP (⊕ common)			
	Separate power supplies for communications and internal circuit		DRT1-ID16T	16 inputs, NPN (⊕ common)		U, C, CE	
			DRT1-ID16T-1	16 inputs, PNP (⊖ common)			
			DRT1-MD16T	8 inputs/8 outputs, NPN (Input: ⊕ common; Output: ⊖ common)			
			DRT1-MD16T-1	8 inputs/8 outputs, PNP (Input: ⊖ common: Output: ⊕ common)			
			DRT1-OD16T	16 outputs, NPN (⊖ common)			
			DRT1-OD16T-1	16 outputs, PNP (⊕ common)			
Temperature Input Terminals			DRT1-TS04T	4 input points (Allocated 4 input words at the master)	Input types: R, S, K1, K2, J1, J2, T, E, B, N, L1, L2, U, W, PLII	U, CE	582
			DRT1-TS04P		Input types: Pt100, JPt100		
Waterproof Terminals			DRT1-ID04CL	4 transistor inputs, NPN (⊕ common)		UC, CE, L	584
			DRT1-ID04CL-1	4 transistor inputs, PNP (⊖ common)			
			DRT1-OD04CL	4 transistor outputs, NPN (⊖ common)			
			DRT1-OD04CL-1	4 transistor outputs, PNP (⊕ common)			
			DRT1-ID08CL	8 transistor inputs, NPN (⊕ common)			
			DRT1-ID08CL-1	8 transistor inputs, PNP (⊖ common)			
			DRT1-OD08CL	8 transistor outputs, NPN (⊖ common)			
			DRT1-OD08CL-1	8 transistor outputs, PNP (⊕ common)			
B7AC Interface Unit			DRT1-B7AC	10 inputs x 3 Units (i.e., branching for 3 B7AC Units)		U, C, CE	589

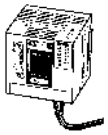
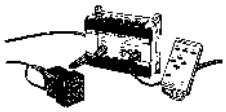
Note: Orders are accepted in units of 10 Connectors.

Intelligent Slaves Operating as PLC Units

Product	Appearance	Model	Specifications		Standards	Page
Small PLC's		CPM2C-S100C-DRT	Multi-functional slave for high-speed local control in a distributed architecture • CPM2C PLC with build-in Compobus/S master and DeviceNet interfaces • Up to 362 total I/O - 106 Local I/O with 3 expansion modules and up to 256 Remote I/O, mounted up to 500 meters from the CPU • Real-time clock function • 50 µs pulse inputs and interrupt outputs • Built-in high-speed counter with a maximum 20 kHz pulse speed	4 transistor outputs (sinking)	U, C, CE	89
		CPM2C-S110C-DRT		4 transistor outputs (sourcing)		

Product	Appearance	Model	Specifications	Standards	Page
I/O Link Units		C200HW-DRT21	For CS1H, CS1G, C200HX/HG/HE • I/O Link Unit is ideal for distributed control. • Supports I/O and message communications. Maximum I/O area size: 512 input points (32 words) 512 output points (32 words)	U, C, N, CE	342
		CQM1-DRT21	• Connects CQM1/CQM1H PLC • A maximum of 32 I/O points (16 inputs and 16 outputs).	U, C, CE	157
		CPM1A-DRT21	• I/O Link Unit for CPM2A/CPM1A PLCs • An I/O exchange of 32 input points and 32 output points		68

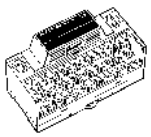
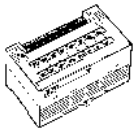
Other Intelligent Slaves

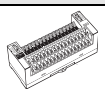
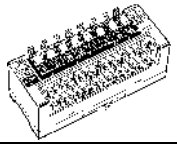
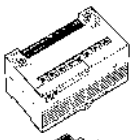
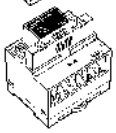
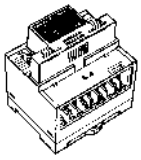
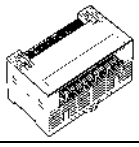
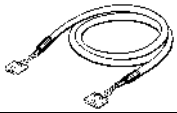
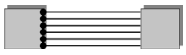
Product	Appearance	Model	Specifications		Standards	
RS-232C Unit		DRT1-232C2	2 RS-232C ports 16 input points (communications status)		U, C, CE	
Fiber Amplifier DeviceNet Communications Unit		E3X-DRT21	Up to 16 E3X-DA-N Fiber Amplifiers can be connected.		---	Please refer to OMRON's Sensor & Safety Catalog for more information
	---	E3X-DA6-P (See note.)	Fiber Amplifier			
		E3X-CN02 (See note.)	Reduced-wiring Connector			
		E39-TM1	Terminal Block Unit			
Intelligent Flag III		V600-HAM42-DRT	ID system for DeviceNet		CE	
Vision Sensor Controller		F150-C10V3-DRT	Vision Sensor for DeviceNet		CE	
Digital Controller		E5EK-AA2-DRT-500	Digital Controller for DeviceNet		---	Please refer to OMRON's Industrial Components Catalog for more information
Modular Temperature Controller		E5ZN-DRT	E5ZN DeviceNet Communications Unit		---	
		E5ZN-SCT24S-500	Terminal Unit			
	---	E3ZN-SDL	Setting/Display Device			
High-density Temperature Controllers		E5ZE-8AQHD1-TCB-V2	Thermocouple	Heating control, voltage output	---	
		E5ZE-8ACAD1-TCB-V2		Heating control, current output		
		E5ZE-8VQHD1-TCB-V2		Heating/cooling control, voltage output		
		E5ZE-8VCAD1-TCB-V2		Heating/cooling control, current output		
		E5ZE-8AQHD1-TPB-V2	Platinum-resistance thermometer	Heating control, voltage output		
		E5ZE-8ACAD1-TPB-V2		Heating control, current output		
		E5ZE-8VQHD1-TPB-V2		Heating/cooling control, voltage output		
		E5ZE-8VCAD1-TPB-V2		Heating/cooling control, current output		

Product	Appearance	Model	Specifications		Standards	
AC Servo Drivers		R88A-NCW152-DRT	DeviceNet Option Unit for OMNUC W-series AC Servo Drivers		CE, UC	Please contact your local OMRON representative for more information
	---	R88A-CNU01R	External I/O Connector		---	
		R88A-CCW002P4	Cable for Setup Tool (IBM PC/AT or compatible, 2 m)			
Servo Drive DeviceNet Option		JUSP-NS300	DeviceNet option unit for Sigma-II (W-Series) Servo Drives		---	
Motion Controller Option with DeviceNet		R88A-MCW151-DRT-E	1.5 axis Advanced Motion Controller with Embedded DeviceNet interface		---	
Multi-function Compact Inverter		3G3MV-PDRT2	DeviceNet Communications Unit for 3G3MV		---	
High-function General-purpose Inverter		3G3RV-PDRT2	DeviceNet Communications Card for 3G3RV/ 3G3FV Inverters		---	
Programmable Terminals		NT-DRT21	DeviceNet Interface Unit for NT31/NT631 Programmable Terminals		U, CE	
DeviceNet Wireless Unit		WD30-ME	DeviceNet Wireless Master Station	Pencil antenna	---	
		WD30-ME01		Magnetic Base Antenna		
		WD-30-SE	DeviceNet Wireless Slave Station	Pencil antenna		
		WD30-SE01		Magnetic Base Antenna		
	---	WD30-AT001	Magnetic Base Antenna			

Note: Order the Fiber Amplifier and Reduced-wiring Connector together.

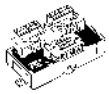
GT1 I/O TERMINAL Units

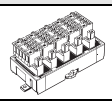
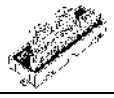
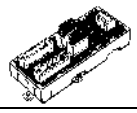
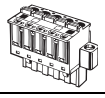
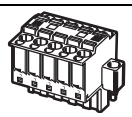
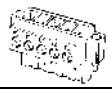
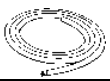
Product		Appearance	Model	I/O points	Specifications	Standards
Communications Unit			DRT1-COM	---	Connects to a maximum of eight GT1 I/O units to DeviceNet • Allows flexible combinations of I/O points. • 1024 I/O point maximum See chapter xxx for detail of the GT1 I/O modules • DIN rail mounting.	U, C, CE
			PRT1-COM	---	Input data 128 bytes max. Output data 128 bytes max.	
Digital I/O Units	Terminal block models		GT1-ID16	16 inputs	NPN, ⊕ common	
			GT1-ID16-1	16 inputs	PNP, ⊖ common	
			GT1-OD16	16 outputs	NPN, ⊖ common	
			GT1-OD16-1	16 outputs	PNP, ⊕ common	
	Molex connector models		GT1-ID16MX	16 inputs	NPN, ⊕ common	
			GT1-ID16MX-1	16 inputs	PNP, ⊖ common	
			GT1-OD16MX	16 outputs	NPN, ⊖ common	
			GT1-OD16MX-1	16 outputs	PNP, ⊕ common	

Product	Appearance	Model	I/O points	Specifications	Standards
Relay Output Unit		GT1-ROS16	16 outputs	Relay Output Unit with 16 points, 2 A, SPST-NO terminal block	U, C, CE
		GT1-ROP08	8 outputs	Relay Output Unit with 8 points, 5 A, SPST-NO terminal block	
		GT1-FOP08	8 outputs	SSR Output Unit with 8 points, 1.5 A, SPST-NO terminal block	---
Analog Input Units		GT1-AD08MX	8 inputs	Molex connector	U, C, CE
		GT1-AD04	4 inputs	Terminal block	
Analog Output Units		GT1-DA04MX	4 outputs	Molex connector	
		GT1-DA04	4 outputs	Terminal block	
Temperature Input Units		GT1-TS04T	4 inputs	Thermocouple input	U, C, CE
		GT1-TS04P	4 inputs	Platinum-resistance thermometer input	
Counter Unit		GT1-CT01	1 input 2 outputs	Counter Unit for encoder input with 1 input and 2 outputs	U, CE
I/O Unit Connecting Cable		GCN1-100	---	I/O Unit Cable Length: 1 m	---
		GCN1-004A	---	Package of ten pieces of GCN1-004.	---

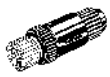
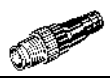
Peripheral Devices

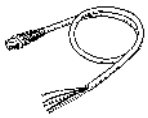
General-purpose Peripheral Devices

Product	Appearance	Model	Specifications	
T-branch Tap for 1 branch line		DCN1-1NC	Cable wiring direction: Toward top Cable lock direction: From top Connector screw direction: From top	Provided with 3 parallel clamp connectors with screws (XW4G-05C1-H1-D), standard terminating resistor
		DCN1-1C	Cable wiring direction: Toward side Cable screw direction: From top Connector screw direction: From side	3 parallel connectors with screws (XW4B-05C1-H1-D), standard terminating resistor
		DCN1-2C	Cable wiring direction: Toward top Cable screw direction: From side Connector screw direction: From top	
		DCN1-2R	Cable wiring direction: From side Cable screw direction: From top Connector screw direction: From top	3 vertical-type connectors with screws (XW4B-05C1-VIR-D), standard terminating resistor

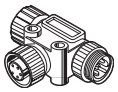
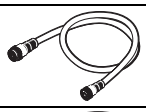
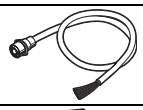
Product	Appearance	Model	Specifications	
T-branch Tap for 3 branch lines		DCN1-3NC	Cable wiring direction: Toward top Cable lock direction: From top Connector screw direction: From top	Provided with 5 parallel clamp connectors with screws (XW4G-05C1-H1-D), standard terminating resistor
		DCN1-3C	Cable wiring direction: Toward side Cable screw direction: From top Connector screw direction: From side	5 parallel connectors with screws (XW4B-05C1-H1-D), standard terminating resistor
		DCN1-4C	Cable wiring direction: Toward top Cable screw direction: From side Connector screw direction: From top	
		DCN1-4R	Cable wiring direction: Toward side Cable screw direction: From top Connector screw direction: From top	5 vertical-type connectors with screws (XW4B-05C1-VIR-D), standard terminating resistor
Power Supply Tap		DCN1-1P	2 connectors, standard terminating resistor, fuse	
Connector		XW4G-05C1-H1-D	Parallel clamp connector with screws (Connector insertion and wiring performed in the same direction.)	
		XW4G-05C4-HF-D	Parallel multi-branching clamp connector with screws Connector insertion and wiring performed in same direction.	
		XW4B-05C1-H1-D	Parallel connector with screws (Connector insertion and wiring performed in the same direction.)	
		XW4B-05C4-T-D	Parallel, screwless, multi-branching connector (Connector insertion and wiring performed in the same direction.)	
		XW4B-05C4-TF-D	Parallel, multi-branching connector with screws (Connector insertion and wiring performed in the same direction.)	
		XW4B-05C1-VIR-D	Orthogonal connector with screws (Connector insertion and wiring performed at a right angle.)	
DeviceNet cables Omron		DCA1-5C10	Thin cable Length: 100 m	
		DCA2-5C10	Thick cable Length: 100 m	
Terminal-block Terminator		DRS1-T	Resistance of 121 Ω	

Environment-resistive Peripheral Devices (for Thin Cable)

Product	Appearance	Model	Specifications
Sealed Assembling-type Connector (male)		XS2G-D5S7	For communications (plug)
Sealed Assembling-type Connector (female)		XS2C-D5S7	For communications (socket)
Sealed T-branch Connector		DCN2-1	For 1 branch line
Sealed Connector with Terminating Resistor		DRS2-1	Plug
		DRS2-2	Socket

Product	Appearance	Model	Specifications	
Cables with Sealed Connectors pre-attached		DCA1-5CNC5W1	Cable with connectors on both ends	Length: 0.5 m
		DCA1-5CN01W1		Length: 1 m
		DCA1-5CN02W1		Length: 2 m
		DCA1-5CN03W1		Length: 3 m
		DCA1-5CN05W1		Length: 5 m
		DCA1-5CN10W1		Length: 10 m
		DCA1-5CNC5F1	Cable with connector socket on one end	Length: 0.5 m
		DCA1-5CN01F1		Length: 1 m
		DCA1-5CN02F1		Length: 2 m
		DCA1-5CN03F1		Length: 3 m
		DCA1-5CN05F1		Length: 5 m
		DCA1-5CN10F1		Length: 10 m
		DCA1-5CNC5H1	Cable with connector plug on one end	Length: 0.5 m
		DCA1-5CN01H1		Length: 1 m
		DCA1-5CN02H1		Length: 2 m
		DCA1-5CN03H1		Length: 3 m
		DCA1-5CN05H1		Length: 5 m
		DCA1-5CN10H1		Length: 10 m

Environment-resistive Peripheral Devices (for Thick Cable)

Product	Appearance	Model	Specifications	
Sealed T-branch Connector		DCN3-11	T-branch Connector	
		DCN3-12	T-branch Connector (Branch connector is M12.)	
Sealed Connector with Terminating Resistor		DRS3-1	Plug	
Cables with Sealed Connectors		DCA2-5CN01W1	Cable with connectors on both ends	Length: 1 m
		DCA2-5CN02W1		Length: 2 m
		DCA2-5CN05W1		Length: 5 m
		DCA2-5CN10W1		Length: 10 m
		DCA2-5CN01F1	Cable with connector socket on one end	Length: 1 m
		DCA2-5CN02F1		Length: 2 m
		DCA2-5CN05F1		Length: 5 m
		DCA2-5CN10F1		Length: 10 m
		DCA2-5CN01H1	Cable with connector plug on one end	Length: 1 m
		DCA2-5CN02H1		Length: 2 m
		DCA2-5CN05H1		Length: 5 m
		DCA2-5CN10H1		Length: 10 m
		DCA1-5CN01W5	Cable with connectors on both ends Thin cable M12 socket	Length: 1 m
		DCA1-5CN02W5		Length: 2 m
		DCA1-5CN05W5		Length: 5 m
		DCA1-5CN10W5		Length: 10 m
Panel-mounting Connector (female)		DCA2-5CNC5P1	Connector socket for panel mounting Cable: 0.5 m	
Panel-mounting Connector (male)		XS4M-D521-1	Connector plug for panel mounting DIP terminals	

Recommended cable types, non-Omron

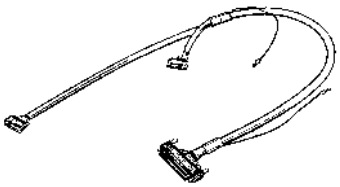
Network	Reference	Description
DeviceNet	Belden 46012 or compatible	DeviceNet thick cable (trunk). For use in Europe only. 18AWG/1PR 15AWG/1PR STR TC IND.
Device Net	Belden 3082A or compatible	DeviceNet thick cable (trunk). For global use. 18AWG/1PR 15AWG/1PR STR TC IND.
DeviceNet	Belden 3084A or compatible	DeviceNet thin cable (drop). 22AWG/1PR 24AWG/1PR STR TC IND.
PROFIBUS-DP	Belden 3079A or compatible	PROFIBUS cable. Type A (EN50170 vol. 2) Multi conductor, twisted, 22AWG

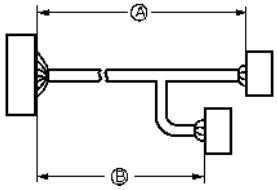
Cables with Connectors Compatible with GT1 I/O TERMINAL Connectors

G79-□C Cables with Fujitsu Connectors

Cables with 32-point Connectors

Size (mm)		Input (32 points)	Output (32 points)
A	B	Model	
1,000	750	G79-I100C-75	G79-O100C-75
1,500	1,250	G79-I150C-125	G79-O150C-125
2,000	1,750	G79-I200C-175	G79-O200C-175
3,000	2,750	G79-I300C-275	G79-O300C-275
5,000	4,750	G79-I500C-475	G79-O500C-475

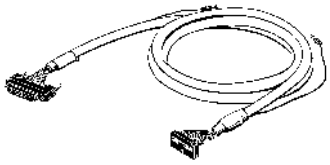


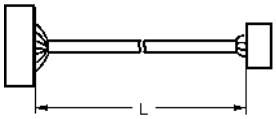


Length (without any bending)

Cables with 16-point Connectors

Cable length L (mm)	Model (16 I/O points)
1,000	G79-100C
1,500	G79-150C
2,000	G79-200C
3,000	G79-300C
5,000	G79-500C

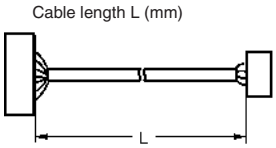




XW2Z Cables with Fujitsu Connectors

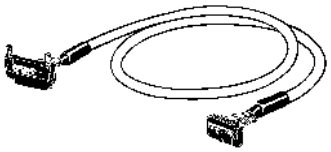
Cables with 16-point Connectors

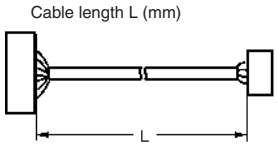
Cable length L (mm)	Model (16 I/O points)
500	XW2Z-050A
1,000	XW2Z-100A
1,500	XW2Z-150A
2,000	XW2Z-200A
3,000	XW2Z-300A
5,000	XW2Z-500A



Cable with 32-point Connectors

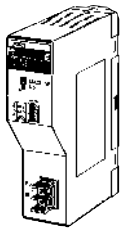
Cable length L (mm)	Model (32 I/O points)
500	XW2Z-050B
1,000	XW2Z-100B
1,500	XW2Z-150B
2,000	XW2Z-200B
3,000	XW2Z-300B
5,000	XW2Z-500B



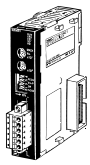


CompoBus/S

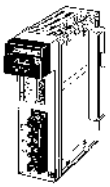
A High-speed I/O Bus Ideal for Distributed Machine Control and Reducing Wiring



C200HW-SRM21-V1
for C200HX/HG/HE(-Z)
Medium-size PLCs

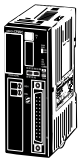


CJ1W-SRM21 for
CJ1 Small PLCs

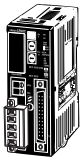


CQM1-SRM21-V1
for CQM1H/CQM1
Small PLCs

SRM1-C□-V2
Master Control Unit



CPM2C-S1□C
Master Unit



CPM2C-S1□C-DRT
Programmable Slave

Outline

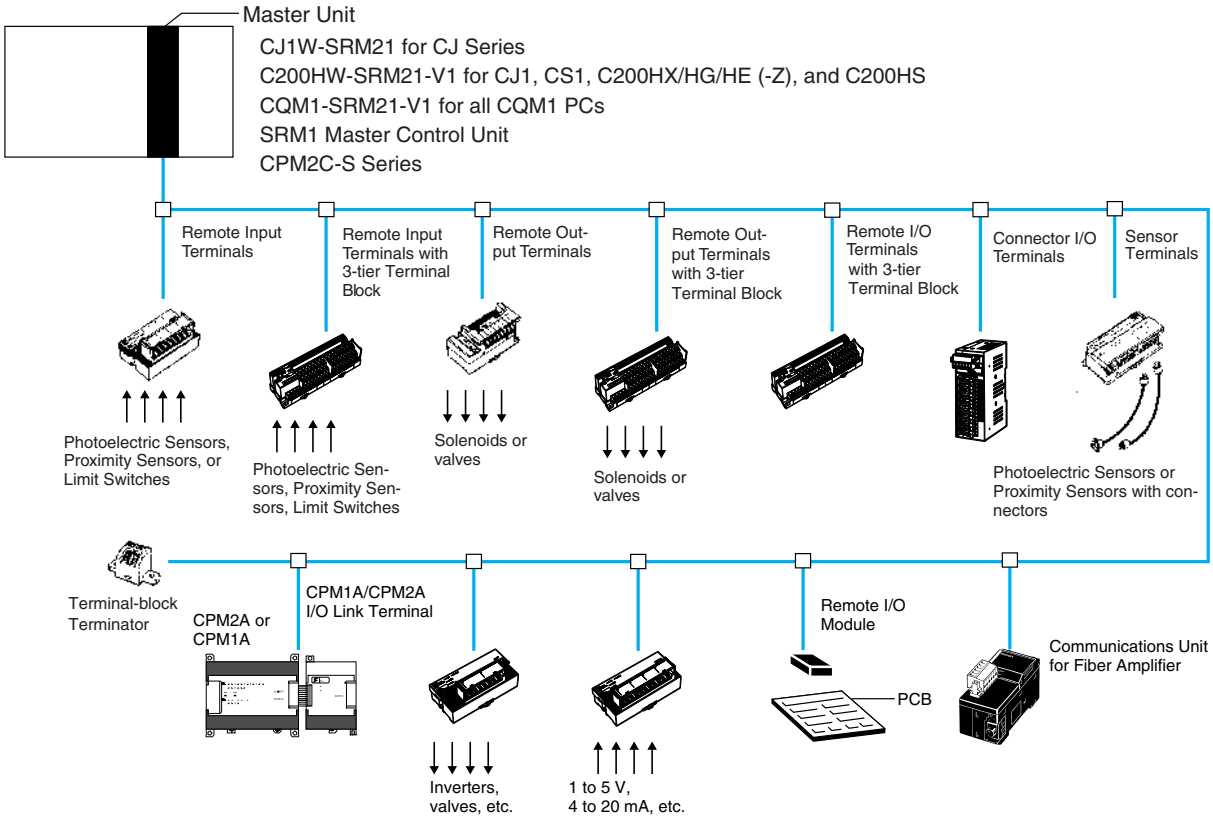
The CompoBus/S high-speed, wire-reduction bus is ideal for machine control. Reduce wiring both within devices and within the overall machine system. I/O data is transferred between the slaves and the CPU Unit of the PLC without any special programming.

In high-speed mode, a communications cycle time of 1 ms max. for 256 I/O points enables fast processing of remote I/O. In long-distance mode, communicate over a 500-m main line.

Within a total length of 200 m, you can also branch freely to connect slaves wherever needed using a special flat cable or 4-conductor cable.

All of this means easier designing of plant-floor layout.

Basic System Configuration



Features

CompoBus/S - a high-speed fieldbus for 128 inputs and 128 outputs

CompoBus/S is a very fast, and easy to install high-speed bus for use with sensors and actuators. The amount of wiring that is required is minimal, making CompoBus/S ideal for machine control.

A complete line-up of master units and slaves

Compobus/S allows digital and anlogue I/O signals to be exchanged between a master and the distributed I/O slaves over a flat cable or standard twisted cable over max. 500 meters. It requires no special software tools making it an real I/O bus that puts the PLC I/O on a remote location, without any additional programming effort.

Communication distances up to 500 m

In Long-distance Communications Mode, communications over the main line of up to 500 m are possible to control I/O devices in a wide area using standard cable and up to 200 m if flat cable is used. In the high-speed communications mode, the main line is limited to 100 m for standard cable, and 30 m for flat cable.

High-speed Communications

In High-speed Communications Mode, up to 16 Slaves with 128 I/O. In the 100 meter high-speed mode there is a fixed communication cycle time of 0.8 msec for 256 remote I/O, providing CompoBus/S with an unprecedented performance.

Backwards compatible

Remote I/O communications are also possible in high-speed communications mode by combining these Master Units and slaves with previously released master units and slaves.

Free topology

Within a total lenght of 200 meters, you can also branch freely to connect slaves wherever needed.
Only one cable is required to connect a master to a slave or a slave to another slave.
If a special flat cable with 4 conductors is used, the communications power supply can also be drawn from the same cable to greatly reduce the amount of floor wiring.
Branching from the main line to branch lines is also greatly simplified with a special connector.
Both the T-branch and multidrop methods can be combined flexibly when wiring. This wiring feature allows a very flexible system configuration that can be adjusted to the floor layout.
There are two types of cables (VCTF cable and Special Flat Cable), and when the Special Flat Cable is used, T-branch Connectors can be installed by simply snapping the connector on.

Easy startup and maintenance

The CompoBus/S System can be started just by wiring the cables and making some simple settings, and the power up the system!
Troubleshooting is easy because the Slave's node number is shown on the master's indicators if an error occurs with a Slave. Error information is also stored in PLC memory.

Wide variety of masters

Seperate PLC master units are available, or you can use a SRM or CPM2C with an integrated Compobus/S master function in the CPU. The variety of Masters provides flexibility in configuring a system to match your application needs.

Wide variety of slaves

Units in a wide range are available as I/O Slaves for a variety of applications. The variety of Slaves provides flexibility in configuring a system to match the required application.

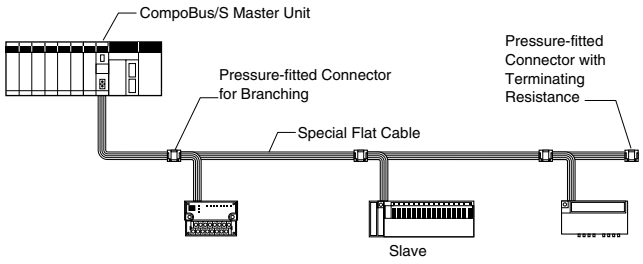
Connectability for Upgraded Terminals

Slave series	**Previous Master Units** C200HW-SRM21 CQM1-SRM21 SRM1-C01(-V1) SRM1-C02(-V1) 3G8B3-SRM00/01 C200PC-ISA02/12-SRM	**Master Units manufactured April 1999 or later** CJ1W-SRM21 C200HW-SRM21-V1 CQM1-SRM21-V1 SRM1-C01-V2 SRM1-C02-V2 TP1000-A-SRM C200PC-ISA03/13-SRM CPM2C-S100C/S110C CPM2C-S100C/S110C-DRT	
		Communications mode setting	
		High-speed	**Long-distance**
SRT1 Series FND-X□-SRT	Connectable	Connectable	---
SRT2 Series (See note 1.) CPM2C-SRT21 CPM1A-SRT21	Connectable	Connectable	Connectable
SRT2-AD04 SRT2-DA02	---	Connectable	Connectable

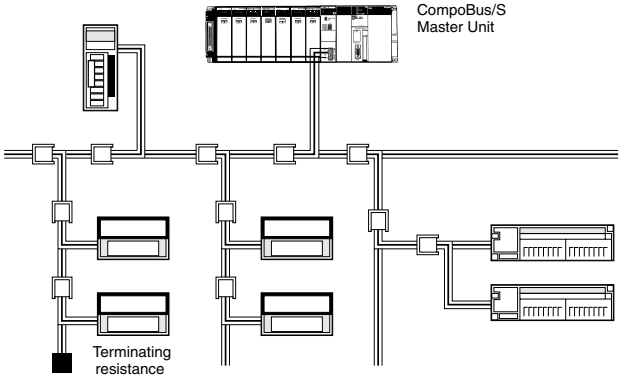
Note: 1. All of the SRT2 Series except for the SRT2-AD04 and SRT2-DA02.

CompoBus/S Network Configuration Examples

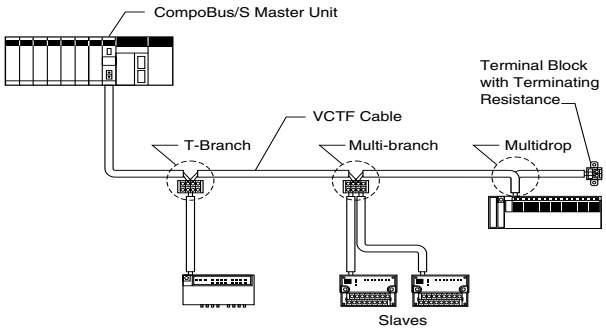
Special Flat Cable



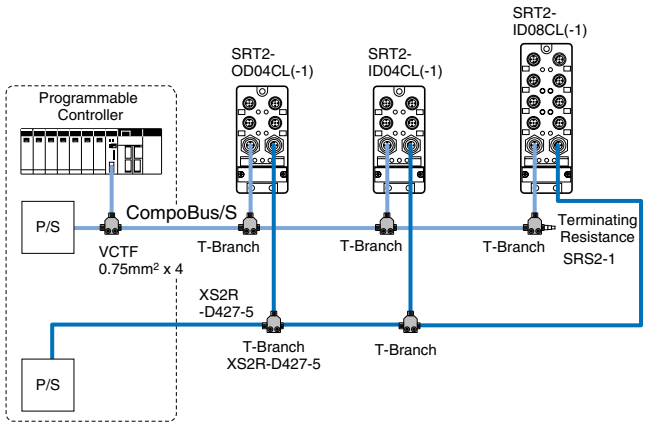
Special Flat Cable in Long-distance Mode



Standard Cable



4-Conductor Cable



Communications Specifications

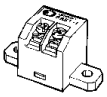
Item		Specification
Communications method		Special CompoBus/S protocol
Communications baud rate		High-speed Communications Mode: 750 kbps Long-distance Communications Mode: 93.75 kbps
Modulation method		Baseband method
Coding method		Manchester coding method
Error control checks		Manchester code check, frame length check, and parity check
Cable	VCTF cable (JIS C 3306)	Two 0.75 mm^2 conductors (2 signal wires) Four 0.75 mm^2 conductors (2 signal wires and 2 power supply wires)
	Special Flat Cable	Four 0.75 mm^2 conductors (2 signal wires and 2 power supply wires)
Communications distance	2-conductor VCTF cable	High-speed Communications ModeMain line length: 100 m max. Branch line length: 3 m max. Total branch line length: 50 m max.
		Long-distance Communications ModeMain line length: 500 m max. Branch line length: 6 m max. Total branch line length: 120 m max.
	4-conductor VCTF cable	High-speed Communications ModeMain line length: 30 m max. Branch line length: 3 m max. Total branch line length: 30 m max.
		Long-distance Communications Mode: Flexibly branched, provided that the total length of cable is a maximum of 200 m.
	Special Flat Cable	High-speed Communications ModeMain line length: 30 m max. Branch line length: 3 m max. Total branch line length: 30 m max.
		Long-distance Communications Mode: Flexibly branched, provided that the total length of cable is a maximum of 200 m.
I/O points, Slaves, usable node numbers, and communications cycle time	C200HW-SRM21-V1 Master Unit (used for CS-series, C200HX/C200HG/C200HE-(Z)E, and C200HS PLCs), CJ1W-SRM21 Master Unit (used for CJ-series PLCs), SRM1 Master Control Unit, and CPM2C-S PLC	
		Max. number of I/O points: 64 inputs/64 outputs Usable node numbers:IN0 to IN7 and OUT0 to OUT7 Communications cycle time: High-speed Communications Mode: 0.5 ms Long-distance Communications Mode:4.0 ms
		Max. number of I/O points: 128 inputs/128 outputs Usable node numbers:IN0 to IN15 and OUT0 to OUT15 Communications cycle time: High-speed Communications Mode: 0.8 ms Long-distance Communications Mode: 6.0 ms
	CQM1-SRM21-V1 Master Unit (CQM1/CQM1H PLCs)	
		Max. number of I/O points: 64 inputs/64 outputs Usable node numbers:IN0 to IN7 and OUT0 to OUT7 (8-point mode) Communications cycle time: High-speed Communications Mode: 0.5 ms Long-distance Communications Mode: 4.0 ms Usable node numbers:IN0 to IN15 and OUT0 to OUT15 (4-point mode) Communications cycle time: High-speed Communications Mode: 0.8 ms Long-distance Communications Mode: 6.0 ms
		Max. number of I/O points: 32 inputs/32 outputs Usable node numbers:IN0 to IN3 and OUT0 to OUT3 (8-point mode) IN0 to IN7 and OUT0 to OUT7 (4-point mode) Communications cycle time: High-speed Communications Mode: 0.5 ms Long-distance Communications Mode: 4.0 ms
		Max. number of I/O points: 16 inputs/16 outputs Usable node numbers:IN0 to IN1 and OUT0 to OUT1 (8-point mode) IN0 to IN3 and OUT0 to OUT3 (4-point mode) Communications cycle time: High-speed Communications Mode: 0.5 ms Long-distance Communications Mode: 4.0 ms

Cable, connectors and T-branches

Peripherals

Ordering Information

VCTF Cable Products

Product	Appearance	Model	Specification
Terminal-block Terminator		SRS1-T	Resistance: 100 Ω
T-branch Connector		XS2R-D427-5	Used to branch communications lines and power lines. (Waterproof specifications)
Connector Terminator (plug)		SRS2-1	Waterproof terminating resistance

Special Flat Cable Products

Product	Appearance	Model	Specification
Branch Connector		SCN1-TH4	Used with Special Flat Cable.
Extension Connector		SCN1-TH4E	Used with Special Flat Cable.
Connector Terminator		SCN1-TH4T	Used with Special Flat Cable.
Special Flat Cable		SCA1-4F10	100 m

Note: Branch Connectors and Extension Connectors are sold in blocks of 10 Units.

Four-core VCTF Cable Products

Product	Appearance	Model	Specification
Assembling Connector		XS2C-D4S7	Communications connector plug for 4-conductor VCTF cable
		XS2G-D4S7	Communications connector socket for 4-conductor VCTF cable

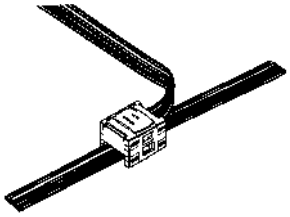
Recommended cable types, non-Omron

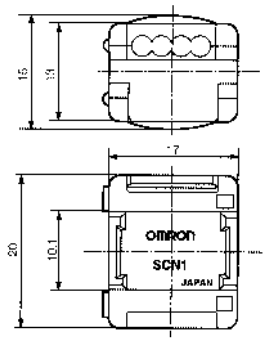
Belden 9409 or compatible	Non shielded two conductor VCTF communication cable
Belden 5341 UE or compatible	Non shielded four conductor VCTF communication cable

Dimensions

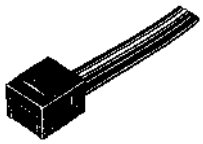
Note: All units are in millimeters unless otherwise indicated.

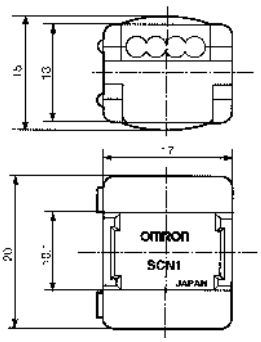
SCN1-TH4 Branch Connector
SCN1-TH4E Extension Connector



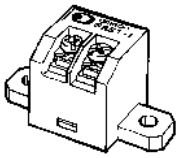


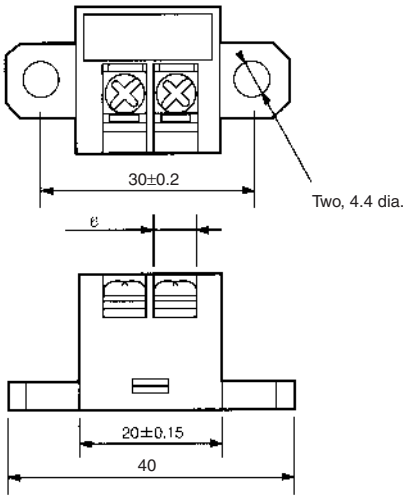
SCN1-TH4T Connector Terminator



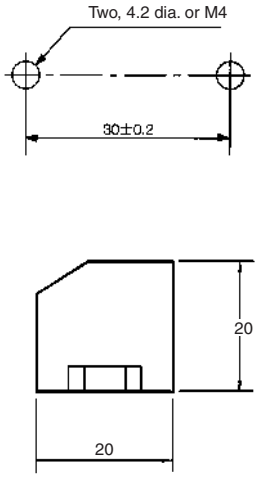


SRS1-T Terminal-block Terminator





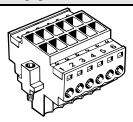
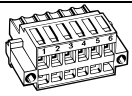
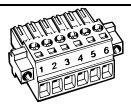
Mounting Holes



Weidmuller Communications Connectors for CompoBus/S Connector Terminals

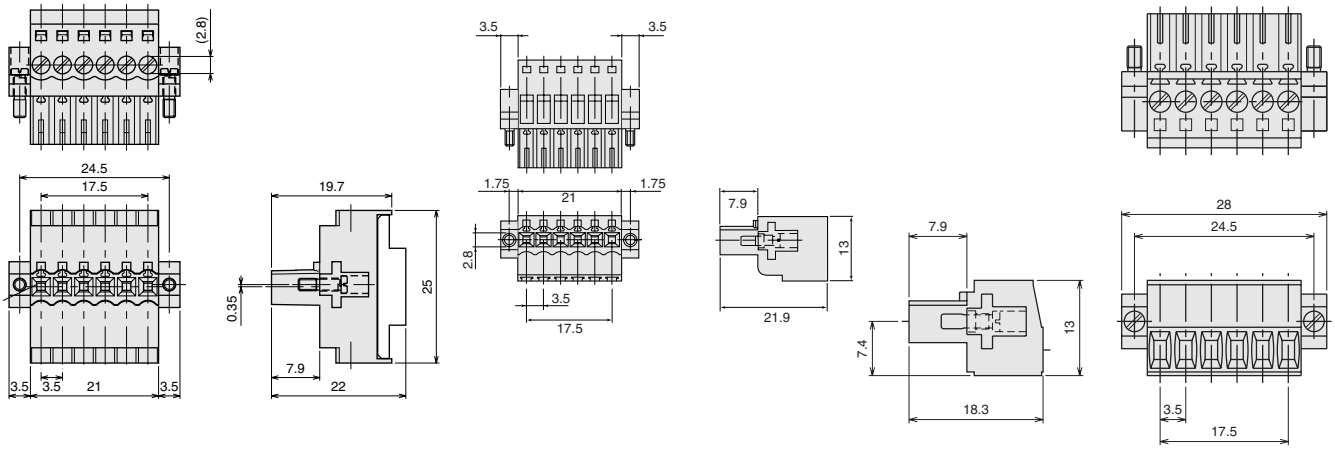
- The communications connectors provided with the SRT2-VID/VOD Connector Terminals are Weidmuller BL3.5/6F (part number 160668) PCB Plugs. These connectors do not require any special tools; the cables can be connected with just a standard flat-blade screwdriver. Two kinds of connectors are available to suit different applications.

Ordering Information

Connector type	Appearance	Model	Application
Branching connector		BLDZ3.5/6F	Ideal for multi-drop wiring
Tension Clamp Connectors		BLZF3.5/6F	Ideal for "one touch" connections
Communications Connectors for Connector Terminals		BL3.5/6F	Connector for the SRT2-□D32ML and SRT2-VID/VOD

Dimensions

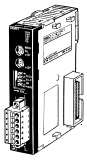
Note: All units are in millimeters unless otherwise indicated.



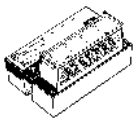
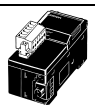
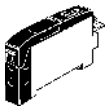
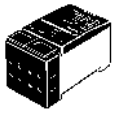
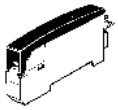
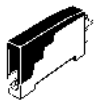
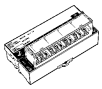
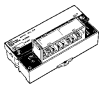
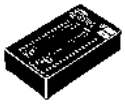
OMRON

CompoBus/S product overview

Masters

Product	Appearance	Model	Specifications	Standards	Page
CPM2C CPU Units with build-in CompoBus/S Master		CPM2C-S100C	CPM2C PLC 6 inputs and 4 outputs (sinking) build-in Three local expension units	U C CE	86
		CPM2C-S110C	CPM2C PLC 6 inputs and 4 outputs (sourcing) build-in Three local expension units		
CPM2C PLC with build-in Compobus/S master, and DeviceNet slave functionality		CPM2C-S100C-DRT	CPM2C PLC 6 inputs and 4 outputs (sinking) build-in Three local expension units	U C CE	89
		CPM2C-S110C-DRT	CPM2C PLC 6 inputs and 4 outputs (sourcing) build-in Three local expension units		
Master Units		CJ1W-SRM21	For the SYSMAC CJ Series 128 inputs and 128 outputs (256 points total)	U C CE	233
		C200HW-SRM21-V1	For CS1, C200HX/HG/HE (-ZE), and C200HS 128 inputs and 128 outputs (256 points in total) Program capacity of 4,096 word	U C CE	345
		CQM1-SRM21-V1	For CQM1 and CQM1H 64 inputs and 64 outputs (128 points in total)		158

Slaves

Product	Appearance	Model	Specifications	Standards	Page
I/O Link Units		CPM2C-SRT21	I/O Link Unit for CPM2C • Exchanges eight inputs and eight outputs with the master.	CE	100
		CPM1A-SRT21	I/O Link Unit for CPM2A/CPM1A • Exchanges eight inputs and eight outputs with the master.	U C CE	70
Transistor Remote I/O Terminals		SRT2-ID04 SRT2-ID04-1 SRT2-OD04 SRT2-OD04-1	4 NPN inputs (+ common) 4 PNP inputs (– common) 4 NPN outputs (– common) 4 PNP outputs (+ common)	U C CE	596
		SRT2-ID08 SRT2-ID08-1 SRT2-OD08 SRT2-OD08-1	8 NPN inputs (+ common) 8 PNP inputs (– common) 8 NPN outputs (– common) 8 PNP outputs (+ common)		
		SRT2-ID16 SRT2-ID16-1 SRT2-OD16 SRT2-OD16-1	16 NPN inputs (+ common) 16 PNP inputs (– common) 16 NPN outputs (– common) 16 PNP outputs (+ common)		
CompoBus/S Communications Unit for Optical Fiber Amplifiers		E3X-SRT21	Up to 14 Optical Fiber Amplifiers can be connected.	---	---
Photoelectric Sensors		E3X-NT16 E3X-NT26 E3X-NH16 E3X-DA16	1-channel general-purpose teaching 1-channel multi-functional, general-purpose teaching 1-channel long-distance, high-precision bar-display teaching 1-channel digital model	U C CE	Please refer to OMRON's Sensor & Safety Catalog for more information
		E3X-NM16	4-channel multi-functional, general-purpose teaching		
Proximity Sensors		E2CY-T16 E2C-T16	Aluminum detection Compact model with teaching function	U C	
Terminal Block Unit		E39-JID01	One input point	---	
Analog Input Terminal		SRT2-AD04	1 to 4 inputs (set with DIP switch)	U C CE	619
Analog Output Terminal		SRT2-DA02	1 or 2 outputs (set with DIP switch)		621
Remote I/O Modules		SRT2-ID16P SRT2-OD16P	16 NPN inputs (+ common) 16 NPN outputs (– common)	---	623

Peripheral Devices

VCTF Cable Products

Product	Appearance	Model	Specifications	Standards
Terminal-block Terminator		SRS1-T	100 Ω	---
T-branch Connector		XS2R-D427-5	Waterproof	
Connector Terminator (plug)		SRS2-1	Waterproof terminator	

Special Flat Cable Products

Product	Appearance	Model	Specifications	Standards
Branch Connector		SCN1-TH4	Connector for Special Flat Cable	---
Extension Connector		SCN1-TH4E		
Connector Terminator		SCN1-TH4T		
Special Flat Cable		SCA1-4F10	100 m	

Four-conductor VCTF Cable Products

Product	Appearance	Model	Specifications	Standards
Assembling Connector		XS2C-D4S7	Connector plug for 4-conductor VCTF cable communications	---
		XS2G-D4S7	Connector socket for 4-conductor VCTF cable communications	

Recommended cable types, non-Omron

Product	Specifications
Belden 9409 or compatible	Non shielded two conductor VCTF communication cable
Belden 5341UE or compatible	Non shielded four conductor VCTF communication cable

MechatroLink II

The MechatroLink II is the perfect solution for satisfying all your complex motion application requirements, including packaging, electronics, converting, food processing, textiles – in fact any multi-axes application is solved and integrated perfectly in a complete factory line.

MechatroLink-II high-speed motion link

This high-speed interface replaces the costly discrete wiring required with traditional systems. Just one MechatroLink-II cable eliminates the need for about 15 for each axis, which simplifies wiring, and reduces the cost and time needed for installation. It also means that maintenance and troubleshooting are minimised. With a frequency of 10 Mbps, the MechatroLink-II link provides communication cycle times of 0.5 ms for 4 axes, to 4 ms for 30 axes, ensuring fast, precise motion control.

MechatroLink-II Communications cycle

Number of axes	Communications cycle (ms)
1 – 4	0.5
5 – 9	1.0
10 – 21	2.0
22 – 30	4.0

MechatroLink-II Network

Product	Appearance	Model	Specifications	Page
Motion controller over MechatroLink		CS1W-MCH71	Advanced Multi-axes Controller over MechatroLink-II	317
Servo Drive MechatroLink Option		JUSP-NS115	MechatroLink-II option unit for Sigma-II (W-Series) Servo Drives	317
MechatroLink-II related accessories		JEPMC-W6022	MechatroLink-II Terminator	317
		JEPMC-W6003-A5	MechatroLink-II Cables	
		JEPMC-W6003-01		
		JEPMC-W6003-03		
		JEPMC-W6003-05		
		JEPMC-W6003-10		
		JEPMC-W6003-20		
		JEPMC-W6003-30		
		JEPMC-IO2310	24V DC I/O Module	
		JEPMC-PL2900	Counter Module	
		JEPMC-PL2910	Pulse Output Module	