CJ-series Ethernet Unit

CJ1W-ETN21

CSM_CJ1W-ETN21_DS_E_4_1

Organically Connect the Production Site and Management

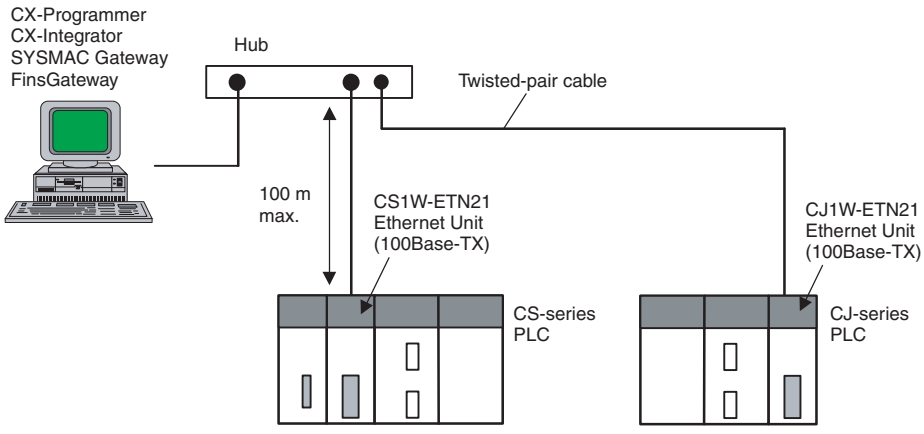
- Select the required communications services according to application needs to flexibly integrate PLCs with an Ethernet information network.

CJ1W-ETN21

Features

- Use Ethernet to implement various communications protocols.
- Implement FINS message communications using UDP/IP or TCP/IP with a user application on a host computer or with Support Software, such as the CX-Programmer.
- Use the clock on an SNTP server to automatically adjust the clocks in the PLCs connected to the Ethernet network. (An SNTP server is required separately.)
- An FTP server is built in, so files can be used to transfer PLC data between network PLCs and workstations or personal computers with an FTP client.
- Email can be used to send commands to the PLCs, or triggers can be set so that the PLCs will send PLC data or Ethernet Unit status to a host computer.
- The standard UDP/IP and TCP/IP protocols are supported to enable communications with a wide range of devices, workstations, personal computers, and Ethernet modules from other manufacturers.
- The SMTP/POP3/SNTP servers enable the use of host names instead of IP addresses. (A DNS server is required separately.)

System Configuration

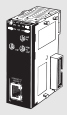


Ordering Information

International Standards

- The standards are abbreviated as follows: U: UL, U1: UL (Class I Division 2 Products for Hazardous Locations), C: CSA, UC: cULus, UC1: cULus (Class I Division 2 Products for Hazardous Locations), CU: cUL, N: NK, L: Lloyd, and CE: EC Directives.
- Contact your OMRON representative for further details and applicable conditions for these standards.

Ethernet Unit

Unit type	Product name	Specifications			No. of unit numbers allocated	Current consumption (A)		Model	Standards
		Communications cable	Communications functions	Units per CPU Unit		5 V	24 V		
CJ1 CPU Bus Unit	Ethernet Unit 	100Base-TX	FINS communications service (TCP/IP, UDP/IP), FTP server functions, socket services, mail transmission service, mail reception (remote command receive), automatic adjustment of PLC's built-in clock, server/host name specifications	4 *	1	0.37	–	CJ1W-ETN21	UC1, N, L, CE

Note: 1. There is no accessory for the CJ-series Ethernet Unit.
2. This unit cannot be used with the Machine Automation Controller NJ-series.

* Up to three Ethernet Units can be connected to a CJ1M-CPU1□-ETN CPU Unit.

Industrial Switching Hubs

Product name	Appearance	Specifications			Accessories	Current consumption (A)	Model	Standards
		Functions	No. of pors	Failure detection				
Industrial Switching Hubs		Quality of Service (QoS): EtherNet/IP control data priority Failure detection: Broadcast storm and LSI error detection 10/100BASE-TX, Auto-Negotiation	3	No	• Power supply connector	0.22	W4S1-03B	UC, CE
			5	No		0.22	W4S1-05B	
			5	Yes	• Power supply connector • Connector for informing error	0.22	W4S1-05C	CE

Recommended Network Devices

The following products are recommended for use with the Ethernet Unit.

Part		Maker	Model number	Contact phone
Sizes and conductor pairs: AWG 24 × 4 pairs	Cables	Tonichi Kyosan Cable, Ltd.	NETSTAR-C5E SAB 0.5 × 4P	Kanetsu Planning Department
		Kuramo Electric Co., Ltd.	KETH-SB	Kuramo Electric Co., Ltd.
		SWCC Showa Cable Systems Co. Ltd.	FAE-5004	SWCC Showa Cable Systems Co. Ltd.
	RJ45 Connectors	Panduit Corporation	MPS588	Panduit Corporation, Japan Branch, Osaka Sales Office
Sizes and conductor pairs: AWG 22 × 2 pairs	Cables	Kuramo Electric Co., Ltd.	KETH-PSB-OMR	Kuramo Electric Co., Ltd.
	RJ45 Assembly Connectors	OMRON	XS6G-T421-1	OMRON Corporation, Customer Support Center
Sizes and conductor pairs: 0.5 mm × 4 pairs	Cables	Fujikura Ltd.	F-LINK-E 0.5mm × 4P	Kanetsu Planning Department
	RJ45 Connectors	Panduit Corporation	MPS588	Panduit Corporation, Japan Branch, Osaka Sales Office
Boots		TSUKO	MK Boots (VI) LB	TSUKO

Mountable Racks

Model	NJ system		CJ system (CJ1, CJ2)		CP1H system	NSJ system	
	CPU Rack	Expansion Rack	CPU Rack	Expansion Backplane	CP1H PLC	NSJ Controller	Expansion Backplane
CJ1W-ETN21	Not Supported		4 Units (per CPU Unit) *1		2 Units *2	Not supported	4 Units *3

*1. Up to three Ethernet Units can be connected to a CJ1M-CPU1□-ETN CPU Unit.
*2. A CP1W-EXT01 CJ Unit Adaptor is required.
*3. If an Expansion Rack is used, the NSJW-CLK21-V1 or NSJW-ETN21 cannot be mounted to the NSJ Controller.

Ethernet Units Specifications

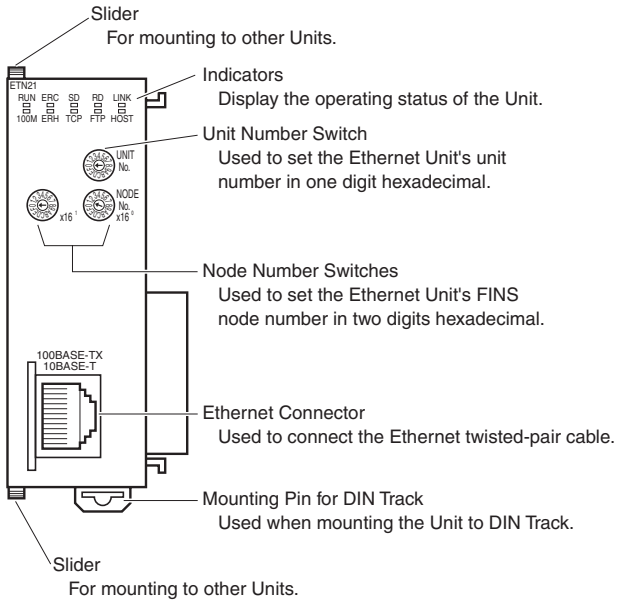
Item		Specifications	
Model number		CJ1W-ETN21	
Type		100Base-TX (Can be used as 10Base-T)	
Applicable PLCs		CJ-series PLCs	
Unit classification		CJ-series CPU Bus Unit	
Mounting location		CPU Rack or Expansion Rack	
Number of Units that can be mounted		4 max. (including Expansion Racks)	
Transfer specifications	Media access method	CSMA/CD	
	Modulation method	Baseband	
	Transmission paths	Star form	
	Baud rate	100 Mbit/s (100Base-TX)	10 Mbit/s (10Base-TX)
	Transmission media	Unshielded twisted-pair (UDP) cable Categories: 5, 5e Shielded twisted-pair (STP) cable Categories: 100 Ω at 5, 5e	Unshielded twisted-pair (UDP) cable Categories: 3, 4, 5, 5e Shielded twisted-pair (STP) cable Categories: 100 Ω at 3, 4, 5, 5e
	Transmission distance	100 m (distance between hub and node)	
	Number of cascade connections	No restrictions if switching hubs are used.	
Current consumption (Unit)		370 mA max. at 5 V DC	
Weight		100 g max.	
Dimensions		31 × 90 × 65 mm (W × H × D)	
Other general specifications		Other specifications conform to the general specifications of the CJ-series.	

Communications Specifications

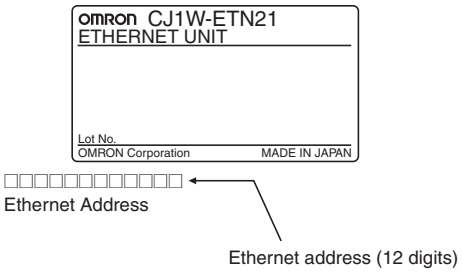
Item		Ethernet Unit
Model number		CJ1W-ETN21
Physical layer		100BASE-TX, 10BASE-T
Number of nodes on FINS network		254
Server specification		Specification by IP address or host name specifications (DNS client function)
Communications service	**FINS communications service**	FINS/UDP FINS/TCP
	FTP server function	The CPU Unit's file memory (Memory Card or EM file memory) can be read/written.
	Automatic clock information adjustment	The CPU Unit's internal clock data can be automatically adjusted to the clock data received from the SNTP server
	Web functions	The Unit settings can be made and status can be read from the Web browser using the Web server.
	Mail functions	Mail send functions Mail receive functions
	Socket service function	TCP socket services UDP socket services
	FINS commands	RESET
		CONTROLLER DATA READ
		CONTROLLER STATUS READ
		ECHOBACK TEST
		BROADCAST TEST (READ RESULTS)
		BROADCAST TEST (SEND TEST DATA)
		ERROR LOG READ
		ERROR LOG CLEAR
		REQUEST TO OPEN UDP SOCKET
		REQUEST TO RECEIVE UDP SOCKET
		REQUEST TO SEND UDP SOCKET
		REQUEST TO CLOSE UDP SOCKET
		REQUEST TO OPEN TCP SOCKET (PASSIVE)
		REQUEST TO OPEN TCP SOCKET (ACTIVE)
		REQUEST TO RECEIVE TCP SOCKET
		REQUEST TO SEND TCP SOCKET
		REQUEST TO CLOSE TCP SOCKET
		EXECUTE PING COMMAND
		REQUEST TO CHANGE REMOTE NODE FOR FINS/TCP CONNECTION
		REQUEST TO READ STATUS FOR FINS/TCP CONNECTION
		IP ADDRESS TABLE WRITE
		IP ADDRESS WRITE
		IP ADDRESS TABLE READ
		IP ROUTING TABLE READ
		PROTOCOL STATUS READ
		MEMORY STATUS READ
		SOCKET STATUS READ
		ADDRESS DATA READ
		IP ADDRESS READ

External Interface

CJ1W-ETN21



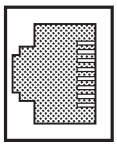
Each communications device connected to the Ethernet network is allocated a unique Ethernet address. For the Ethernet Unit, this Ethernet address is shown on the right side of the Unit as a 12-digit hexadecimal number.



Ethernet Connectors

The following standards and specifications apply to the connectors for the Ethernet twisted-pair cable.

- Electrical specifications: Conforming to IEEE802.3 standards.
- Connector structure: RJ45 8-pin Modular Connector (conforming to ISO 8877)



Connector pin	Signal name	Abbr.	Signal direction
1	Transmission data +	TD+	Output
2	Transmission data –	TD–	Output
3	Reception data +	RD+	Input
4	Not used.	–	–
5	Not used.	–	–
6	Reception data –	RD–	Input
7	Not used.	–	–
8	Not used.	–	–
Hood	Frame ground	FG	–

Unit Version Upgrade Information

Unit Version 1.3

Upgrade	Details
Web function added	The unit settings and status monitoring for the Ethernet Unit can be easily performed from a Web browser.
Function prohibiting access using FINS/UDP from nodes with dynamically changed IP addresses	Access to change the remote IP address from a node using FINS/UDP can be prohibited (IP address protection).

Unit Version 1.4

Upgrade	Details
ETN11-compatible mode added to the ETN21 settings for FINS/UDP.	A mode compatible with the CS1W-ETN11/CJ1W-ETN11 was added in the operating specifications for FINS/UDP messages sent from a different UDP port number than the FINS/UDP port number set in the Ethernet Unit.

Unit Version 1.5

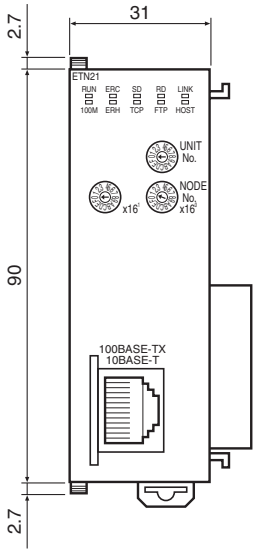
Upgrade	Details
CIDR function added to subnet mask settings	An option setting was added to the subnet mask settings to enable CIDR. Enabling CIDR allows you to use classless IP addresses in the subnet mask setting.
High-speed option added for socket service	This option can be set to improve communications performance for the socket service that is implemented by manipulating dedicated control bits. The performance is the same as the previous version if this option is not set.
Linger option added to socket options for TCP open requests.	A linger option can now be set in the options for passive or active TCP open requests.
Location of node address switches changed on CJ1W-ETN21	The location of the node address switches was changed. The setting method and setting range remain the same.

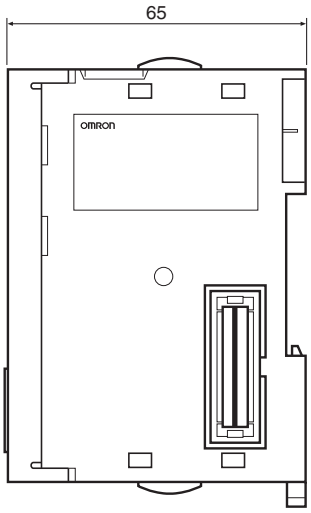
Note: CX-Programmer version 8.2 or higher is required for unit version 1.5 functions.

Dimensions

(Unit: mm)

CJ1W-ETN21





Related Manuals

Man.No.	Model	Name	Contents
W420	CS1W-ETN21 CJ1W-ETN21	Ethernet Units Operation Manual Construction of Networks	Provides information on operating and installing 100Base-TX Ethernet Units, including details on basic settings and FINS communications. Refer to the Communications Commands Reference Manual (W342) for details on FINS commands that can be sent to CS-series and CJ-series CPU Units when using the FINS communications service.
W421	CS1W-ETN21 CJ1W-ETN21	Ethernet Units Operation Manual Construction of Applications	Provides information on constructing host applications for 100Base-TX Ethernet Units, including functions for sending/receiving mail, socket service, automatic clock adjustment, FTP server functions, and FINS communications.
W342	CS1G/H-CPU□□H CS1G/H-CPU-□□EV1 CS1D-CPU□□H CS1D-CPU□□S CJ1M-CPU□□ CS1W-SCU21-V1 CS1W-SCB21-V1/41-V1 CJ1G/H-CPU□□H CJ1G-CPU□□P CJ1G-CPU□□ CJ1W-SCU21-V1/41-V1	Communications Commands Reference Manual	Describes the C-series (Host Link) and FINS communications commands used when sending communications commands to CS-series and CJ-series CPU Units.
W463	CXONE-AL□□C-V□/ AL□□D-V□	CX-One Setup Manual	Describes operating procedures for the CX-One FA Integrated Tool Package. Refer to this manual for operating procedures for the CX-One FA Integrated Tool Package.
W464	CXONE-AL□□C-V□/ CXONE-AL□□D-V□	CS/CJ/CP/NSJ-series CX-Integrator Network Configuration Software Operation Manual	Describes the operating procedures for the CX-Integrator.

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