CJ-series EtherCAT® Slave Unit

CJ1W-ECT21

CSM_CJ1W-ECT21_DS_E_2_1

Hi-speed I/O link based on EtherCAT

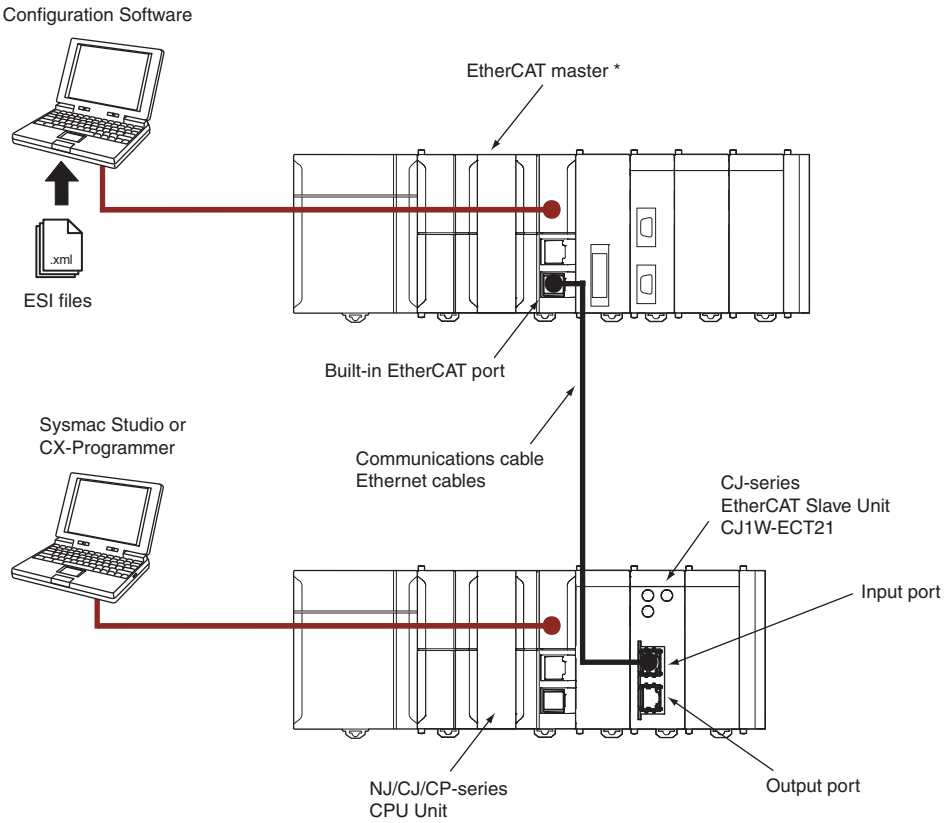
- NJ/CJ Series available as subsystem controller on EtherCAT.
- Interface with multiple networks such as EtherCAT and DeviceNet.

CJ1W-ECT21

Features

- Fast data exchange between EtherCAT master and CPU Unit.
- Adjustable data exchange sizes.
- Node address setting by rotary switches or software.
- Easy integration of networks used by CJ/NJ Series with EtherCAT.

System Configuration



* An EtherCAT Slave Unit cannot be connected to any of the OMRON CJ1W-NC□□81/□□82 Position Control Units even though they can operate as EtherCAT masters.

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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.

EtherCAT Slave Unit

Unit type	Product name	Specifications		No. of unit numbers allocated	Current consumption (A)		Model	Standards
		Communications cable	Communications functions		5 V system	24 V system		
CJ1 CPU Bus Unit	EtherCAT Slave Unit	STP (shielded twisted-pair) cable of category 5 or higher with double shielding	Refreshing methods: Free-Run Mode PDO data sizes: TxPDO 400byte max./ RxPDO: 400byte max.	1	0.34	---	**CJ1W-ECT21 ***	UC1, CE, KC

* When using with the Machine Automation Controller NJ /NXSeries, use CPU Units with unit version 1.10 or later and the Sysmac Studio version 1.13 or higher.

Recommended EtherCAT Communications Cables

Use Straight STP (shielded twisted-pair) cable of category 5 or higher with double shielding (braiding and aluminum foil tape) for EtherCAT.

Cable with Connectors

Item	Appearance	Recommended manufacturer	Cable length(m) *1	Model
Standard type Cable with Connectors on Both Ends (RJ45/RJ45) Wire Gauge and Number of Pairs: AWG27, 4-pair Cable Cable Sheath material: LSZH *2 Cable color: Yellow *3		OMRON	0.3	**XS6W-6LSZH8SS30CM-Y**
			0.5	**XS6W-6LSZH8SS50CM-Y**
			1	**XS6W-6LSZH8SS100CM-Y**
			2	**XS6W-6LSZH8SS200CM-Y**
			3	**XS6W-6LSZH8SS300CM-Y**
			5	**XS6W-6LSZH8SS500CM-Y**
Rugged type Cable with Connectors on Both Ends (RJ45/RJ45) Wire Gauge and Number of Pairs: AWG22, 2-pair Cable		OMRON	0.3	**XS5W-T421-AMD-K**
			0.5	**XS5W-T421-BMD-K**
			1	**XS5W-T421-CMD-K**
			2	**XS5W-T421-DMD-K**
			5	**XS5W-T421-GMD-K**
			10	**XS5W-T421-JMD-K**
Rugged type Cable with Connectors on Both Ends (M12 Straight/RJ45) Wire Gauge and Number of Pairs: AWG22, 2-pair Cable		OMRON	0.3	**XS5W-T421-AMC-K**
			0.5	**XS5W-T421-BMC-K**
			1	**XS5W-T421-CMC-K**
			2	**XS5W-T421-DMC-K**
			5	**XS5W-T421-GMC-K**
			10	**XS5W-T421-JMC-K**
Rugged type Cable with Connectors on Both Ends (M12 Right-angle/RJ45) Wire Gauge and Number of Pairs: AWG22, 2-pair Cable		OMRON	0.3	**XS5W-T422-AMC-K**
			0.5	**XS5W-T422-BMC-K**
			1	**XS5W-T422-CMC-K**
			2	**XS5W-T422-DMC-K**
			5	**XS5W-T422-GMC-K**
			10	**XS5W-T422-JMC-K**

*1. Standard type cables length 0.2, 0.3, 0.5, 1, 1.5, 2, 3, 5, 7.5, 10, 15 and 20m are available.
Rugged type cables length 0.3, 0.5, 1, 2, 3, 5, 10 and 15m are available.
*2. The lineup features Low Smoke Zero Halogen cables for in-cabinet use and PUR cables for out-of-cabinet use.
*3. Cables colors are available in blue, yellow, or Green
Note: For details, refer to Cat.No.G019.

Cables / Connectors

Wire Gauge and Number of Pairs: AWG24, 4-pair Cable

Item	Appearance	Recommended manufacturer	Model
Cables	----	Hitachi Metals, Ltd.	**NETSTAR-C5E SAB 0.5 × 4P***
	----	Kuramo Electric Co.	**KETH-SB***
	----	SWCC Showa Cable Systems Co.	**FAE-5004***
RJ45 Connectors	----	Panduit Corporation	**MPS588-C***

* We recommend you to use above cable and connector together.

Wire Gauge and Number of Pairs: AWG22, 2-pair Cable

Item	Appearance	Recommended manufacturer	Model
Cables	----	Kuramo Electric Co.	**KETH-PSB-OMR***
	----	Nihon Electric Wire&Cable Co.,Ltd.	**PNET/B***
RJ45 Assembly Connector		OMRON	**XS6G-T421-1***

* We recommend you to use above cable and connector together.
Note: Connect both ends of cable shielded wires to the connector hoods.

General Specification

The general specifications conform to those of the CJ-series PLCs, CP-series PLCs and NSJ-series PLCs.

Specifications

EtherCAT Slave Unit CJ1W-ECT21

Item		Specification
Model number		CJ1W-ECT21
Applicable PLCs		NJ-series, CJ-series, CP-series, NSJ-series
Unit classification		CPU Bus Unit
Applicable unit numbers		0 to F
Mounting position		CPU Rack or Expansion Rack
Number of Units that can be mounted		16 Units max. (you must allocate unique words)
CPU Unit words used	**Allocated CIO Area words (CPU Bus Unit words) *1**	25 words/Unit (one unit number's words)
		Unit Status 1, Unit Status 2, Slave Status 1, Slave Status 2
	Allocated DM Area words (CPU Bus Unit words) *2	100 words/Unit (one unit number's words)
		I/O Communication Area Setting Table, I/O Communication Area Reference Table
	Other I/O memory *3	I/O communication area in any area *4
	CPU Bus Unit setting area	Not used
Transmission specifications	**Communications protocol**	EtherCAT protocol
	Modulation	Baseband
	Baud rate	100 Mbps
	Physical layer	100BASE-TX (IEEE 802.3)
	Topology	Depends on the specifications of the EtherCAT master
	Transmission media	Category 5 or higher twisted-pair cable (Recommended cable: double-shielded cable with aluminum tape and braiding)
	Transmission distance	Distance between nodes: 100 m or less
	Send/receive PDO data sizes	Allocatable IN and OUT data area sizes of 0, 50, 100, 200 or 400 bytes
	Mailbox data size	Input: 512 bytes Output: 512 bytes
	Mailbox	Emergency messages and SDO requests
	Refreshing methods	Free-Run Mode
	Node address setting range	1 to 255 (hardware switch setting) 1 to 65535 (software switch setting)
Current consumption		340 mA max. at 5 V DC
Weight		97 g max.
Dimensions		31 × 90 × 65 mm (W × H × D)

*1. Access via the device variables for CJ-series Unit when using NJ-serires CPU Units.
*2. Using the user-defined variable for R/W to the allocation area when using NJ-serires CPU Units.
*3. The IN and OUT data exchanged with the EtherCAT master is designated to memory areas by configuring the I/O Communication Area Setting Table. Refer to *"CJ-series EtherCAT Slave Units Operation Manual"* for NJ-series CPU Unit (W542)
*4. Set with allocated DM area words (CPU Bus Unit words) or CX-Programmer when using CJ/CP/NSJ-series CPU Units.

EtherCAT Communications Specifications

Item	Specification
Communications standard	IEC 61158 Type 12
Physical layer	100BASE-TX (IEEE 802.3)
Modulation	Baseband
Baud rate	100 Mbps
Topology	Depends on the specifications of the EtherCAT master.
Transmission media	Category 5 or higher twisted-pair cable (Recommended cable: double-shielded cable with aluminum tape and braiding)
Transmission distance	Distance between nodes: 100 m or less

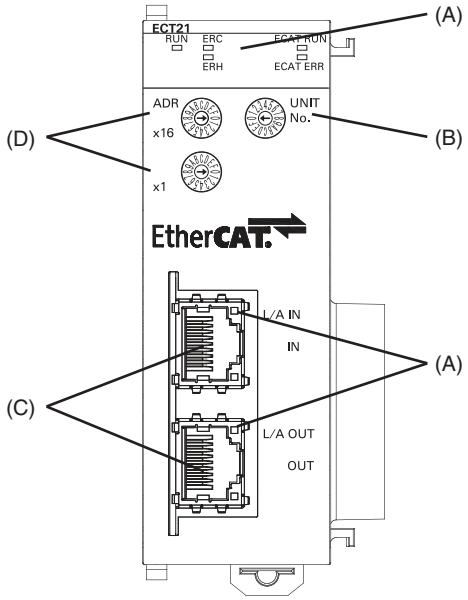
Unit Versions and Software Versions

Model number of EtherCAT Slave Unit	Unit version	Corresponding unit version/version *			
		Using NJ CPU Unit		Using CJ/CP/NSJ-series CPU Unit	
		Unit version of CPU Units	Sysmac Studio Version	Unit version of CPU Unit	CX-Programmer version
CJ1W-ECT21	Ver.1.0	Ver.1.10 or later	Ver.1.13 or higher	The oldest available version or later	Ver.9.54 or higher

* Some Units do not have all of the versions given in the above table. If a Unit does not have the specified version, support is provided by the oldest available version after the specified version. Refer to the user'fs manuals for the specific Units for the relation between models and versions.

External Interface

CJ1W-ECT21

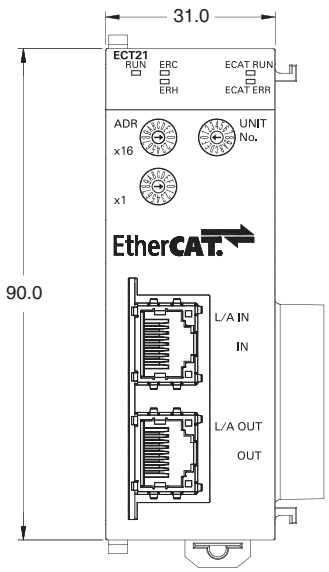


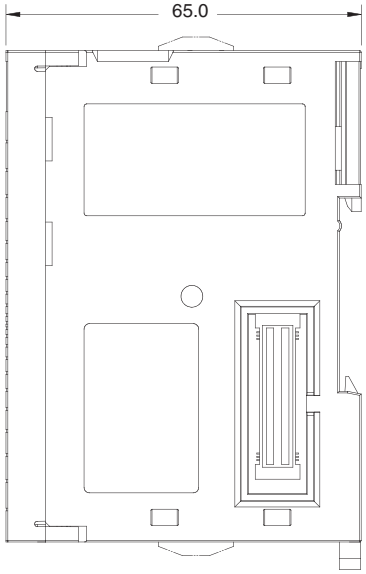
Letter	Name	Function
(A)	Indicators	The indicators show the current operating status of the Unit and the connection status of the IN and OUT EtherCAT ports.
(B)	Unit number switch	This switch sets the unit number of the EtherCAT Slave Unit as a one-digit hexadecimal value.
(C)	Communication connectors	These connectors are connected to the communications cables of the EtherCAT network. There are two connectors: one for the input port and one for the output port.
(D)	Node address switches	These switches set the node address as a two-digit hexadecimal value.

Dimensions

(Unit: mm)

CJ1W-ECT21





Related Manuals

Manual name	Cat No.	Model numbers	Applications	Descrioption
CJ-series EtherCAT® Slave Units Operation Manual	W541	CJ1W-ECT21	Learning how to use an EtherCAT Slave Unit.	The following items are described: the overall system and configuration methods of an EtherCAT Slave Unit, information on hardware and functions to set up, control and monitor the EtherCAT Slave Unit.
CJ-series EtherCAT® Slave Units Operation Manual for NJ-series CPU Unit	W542	CJ1W-ECT21	Learning about the functions and operating procedures when the CJ-series EtherCAT Slave Unit is used in an NJ-series system configuration.	The functions and operating procedures when the CJ-series EtherCAT Slave Unit is used in an NJ-series system configuration are described.

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