

# CJ-series EtherCAT® Slave Unit

# CJ1W-ECT21

CSM\_CJ1W-ECT21\_DS\_E\_5\_2

## 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.

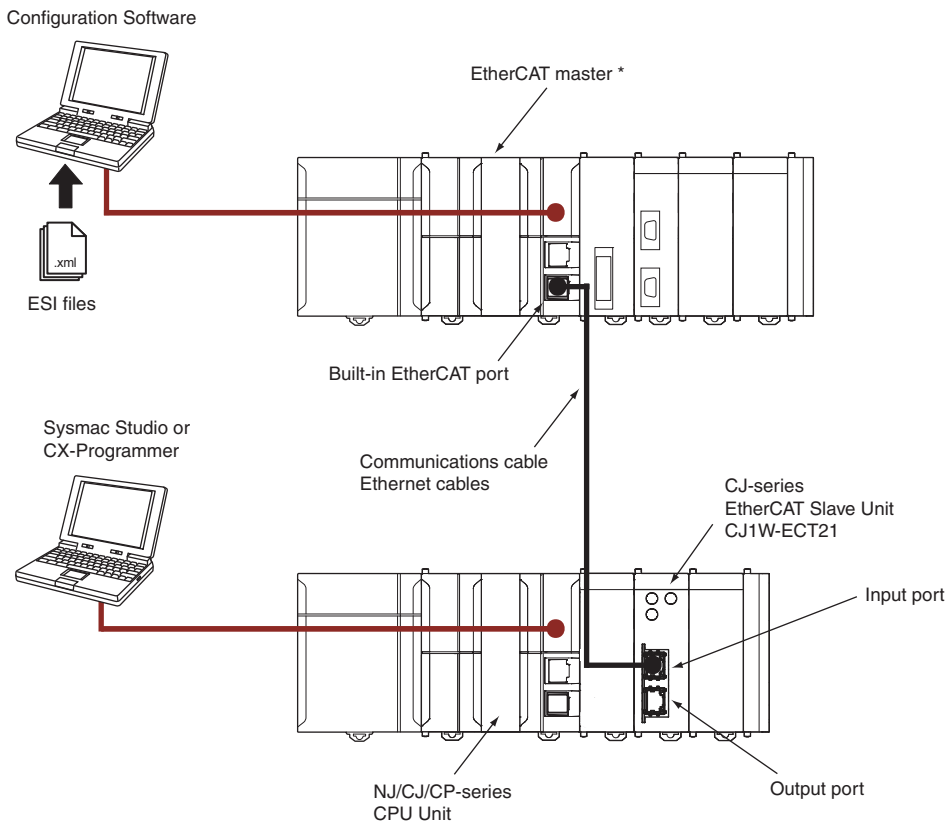


CJ1W-ECT21

## 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 Cable

Use a 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
Cable with Connectors on Both Ends (RJ45/RJ45) Standard RJ45 plugs type *1 Wire gauge and number of pairs: AWG26, 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
Cable with Connectors on Both Ends (RJ45/RJ45) Rugged RJ45 plugs type *1 Wire gauge and number of pairs: AWG22, 2-pair cable Cable color: Light blue		OMRON	5	XS6W-6LSZH8SS500CM-Y
			0.3	XS5W-T421-AMD-K
			0.5	XS5W-T421-BMD-K
			1	XS5W-T421-CMD-K
			2	XS5W-T421-DMD-K
Cable with Connectors on Both Ends (M12 Straight/M12 Straight) Shield Strengthening Connector cable *4 M12/Smartclick Connectors Wire Gauge and Number of Pairs: AWG22, 2-pair Cable Cable color: Black		OMRON	5	XS5W-T421-GMD-K
			10	XS5W-T421-JMD-K
			0.5	XS5W-T421-BM2-SS
			1	XS5W-T421-CM2-SS
			2	XS5W-T421-DM2-SS
Cable with Connectors on Both Ends (M12 Straight/RJ45) Shield Strengthening Connector cable *4 M12/Smartclick Connectors Rugged RJ45 plugs type Wire Gauge and Number of Pairs: AWG22, 2-pair Cable Cable color: Black		OMRON	3	XS5W-T421-EM2-SS
			5	XS5W-T421-GM2-SS
			10	XS5W-T421-JM2-SS
			0.5	XS5W-T421-BMC-SS
			1	XS5W-T421-CMC-SS
2	XS5W-T421-DMC-SS			
3	XS5W-T421-EMC-SS			
5	XS5W-T421-GMC-SS			
10	XS5W-T421-JMC-SS			

\*1. Standard type cables length 0.2, 0.3, 0.5, 1, 1.5, 2, 3, 5, 7.5, 10, 15 and 20 m are available.

Rugged type cables length 0.3, 0.5, 1, 2, 3, 5, 10 and 15 m are available.

For details, refer to Cat.No.G019.

\*2. The lineup features Low Smoke Zero Halogen cables for in-cabinet use and PUR cables for out-of-cabinet use. Although the LSZH cable is single shielded, its communications and noise characteristics meet the standards.

\*3. Cables colors are available in blue, yellow, or Green.

\*4. For details, contact your OMRON representative.

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

\*1. Access via the device variables for CJ-series Unit when using NJ-series CPU Units.

\*2. Using the user-defined variable for R/W to the allocation area when using NJ-series 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
<b>Communications standard</b>	IEC 61158 Type 12
<b>Physical layer</b>	100BASE-TX (IEEE 802.3)
<b>Modulation</b>	Baseband
<b>Baud rate</b>	100 Mbps
<b>Topology</b>	Depends on the specifications of the EtherCAT master.
<b>Transmission media</b>	Category 5 or higher twisted-pair cable (Recommended cable: double-shielded cable with aluminum tape and braiding)
<b>Transmission distance</b>	Distance between nodes: 100 m or less

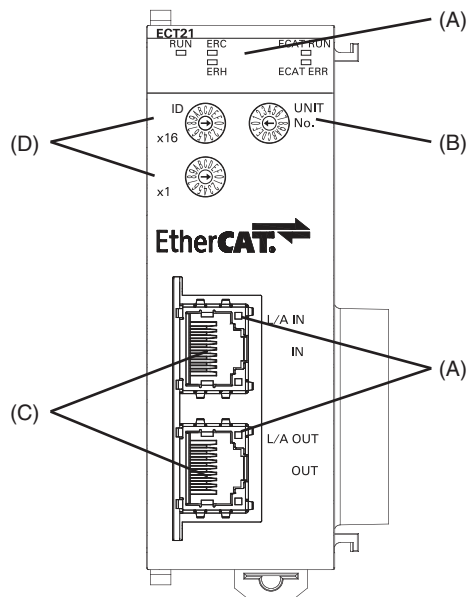
## Unit Versions and Software Versions

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's manuals for the specific Units for the relation between models and versions.

## External Interface

### CJ1W-ECT21

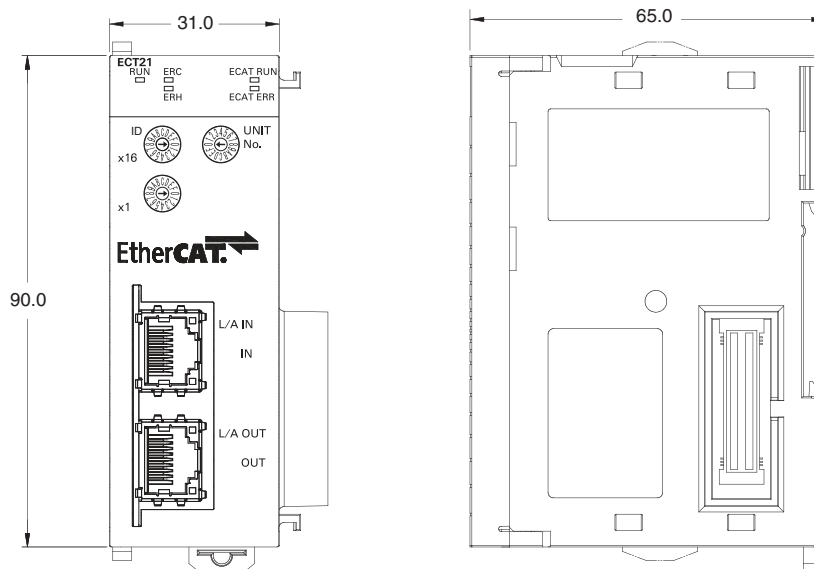


Letter	Name	Function
(A)	Indicators	The indicators show the current operating status of the Unit and the connection status of the IN and OUT EtherCAT ports.
(B)	Unit number switch	This switch sets the unit number of the EtherCAT Slave Unit as a one-digit hexadecimal value.
(C)	Communication connectors	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	Description
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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