OMRON

Programmable Controller CS/CJ-series

Practices Guide
System Expansion and Interconnection

CJ3M-CPU□□
CJ2M-CPU□□
CJ2H-CPU6□
CJ2H-CPU6□-EIP
CS1G/H-CPU□□H

Practices Guide

P172-E1-02

Terms and Conditions Agreement

Thank you for your usage of products of Omron Corporation (“Omron”). Without any special agreements, these terms and conditions shall apply to all transactions regardless of who sells.

● Definitions of Terms

Omron product(s): Omron’s factory automation system devices, general control devices, sensing devices, and electronic/mechanical components.

- Catalogs: Any and all catalogs (including “Best Components” and other catalogs), specifications, instructions and manuals relating to Omron products, including electronically provided data.
- Conditions: Use conditions, rating, performance, operating environment, handling procedure, precautions and/or prohibited use of Omron products described in the catalogs.
- User application(s): Application of Omron products by a customer, including but not limited to embedding/using Omron products into customer’s components, electronic circuit boards, devices, equipment or systems.
- Conformity: (a) conformity, (b)performance, (c) no infringement of intellectual property of third party, (d) compliance with laws and regulations, and (e) conformity to various standards of Omron products in user applications.

● Note about Descriptions

- Rating and performance is tested separately. Combined conditions are not warranted.
- Reference data is intended to be used just for reference. Omron does NOT guarantee that the Omron Product can work properly in the range of reference data.
- Examples are intended for reference. Omron does not warrant the conformity in usage of the examples.
- Omron may discontinue Omron products or change specifications of them because of improvements or other reasons.

● Note about Use

Adopt and use Omron products considering the following cautions.

- Use the product in conformance to the conditions, including rating and performance.
- Check the conformity and decide whether or not Omron products are able to be adopted. Omron makes no guarantees about the conformity.
- Make sure in advance that electricity is properly supplied to Omron products and they are set up rightly in your system for intended use.
- When you use Omron products, ensure the followings: (i) allowance in aspect of rating and performance, (ii) safety design which can minimize danger of the application when the product does not work properly, (iii) systematic safety measures to notify danger to users, and (iv) periodical maintenance of Omron products and the user application.

- Omron assumes no responsibility for any direct or indirect loss, damage and expense resulting from infection of our products, installed software, any computer devices, computer programs, network, and databases with the followings: DDoS attack (distributed DoS attack); computer virus and other technically harmful program; and unauthorized access.
  Please conduct the followings by yourself: (i) antivirus software, (ii) data input/output, (iii) lost data recovery, (iv) protections against computer virus that contaminate Omron products or the installed software, and (v) measures to protect Omron products from unauthorized access.
- Omron products are designed and manufactured as commodity for general industrial products. For this reason, the usages (a) to (d) are to be unintended. Omron makes no guarantees on Omron products, if you use Omron products for those purposes. However, special applications that Omron expects or usages with especial agreement are excluded.
  (a) Applications requiring high-level safety (e.g. nuclear control facilities, combustion facilities, aerospace and aviation facilities, railroad facilities, elevating facilities, amusement facilities, medical facilities, safety devices or other applications which has possibility to influence lives or bodies)
  (b) Applications requiring high reliability (e.g. gas/water/electricity supply system, 24-hour operating system, applications handling with rights/property, such as payment system)
  (c) Applications in a harsh condition or environment (e.g. outdoor facilities, facilities with potential of chemical contamination or electromagnetic interference, facilities with vibration or impact, facilities on continual operation for a long period).
  (d) Applications under conditions or environment which are not described in the catalogs
- Omron products in the catalogs are not intended to be used in automotive applications (including two-wheel vehicles). Please DO NOT use Omron products in automotive applications. Contact our sales personnel for automotive products.

● Warranty

Warranty of Omron products is subject to followings.

- Warranty Period: One year after your purchase.
  However, except when there is a separate statement in the catalogs.
- Coverage: Omron will provide one of the services listed below, on the basis of Omron's decision.
  (a) Free repairing of the malfunctioning Omron products (except electronic/mechanical components) at Omron maintenance service sites.
  (b) Free replacement of the malfunctioning Omron products with the same number of substitutes.
- Exceptions: This warranty does not cover malfunctions caused by any of the followings.
  (a) Usage in the manner other than its original purpose
  (b) Usage out of the conditions
  (c) Usage out of Note about Use in these conditions
  (d) Remodeling/repairing by anyone except Omron
  (e) Software program by anyone except Omron
  (f) Causes which could not be foreseen by the level of science and technology at the time of shipment of the products.
  (g) Causes outside Omron or Omron products, including force majeure such as disasters

- Limitation of Liability

  The warranty described in this Terms and Conditions Agreements is a whole and sole liability for Omron products. There are no other warranties, expressed or implied.
  Omron and its distributors are not liable for any damages arisen from or relating to Omron products.

- Export Control

  Customers of Omron products shall comply with all applicable laws and regulations of other relevant countries regarding security export control, in exporting Omron products and/or technical documents or in providing such products and/or documents to a non-resident.
  Omron products and/or technical documents may not be provided to customers if they violate the laws and regulations.

EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.
EtherNet/IP™, DeviceNet™ and CompoNet™ are trademarks of ODVA.
Other company names and product names in this document are the trademarks or registered trademarks of their respective companies.

TABLE OF CONTENTS

1 Overview ... 4
1.1 CS/CJ Series Expansion Interconnection Overview ... 4
1.2 Notes Before Use ... 5
1.3 System Specifications ... 5
2 System configuration and devices ... 6
2.1 CS-series System Configuration ... 6
2.1.1 Connecting a CJ-series Expansion Rack to the CS Series ... 6
2.1.2 Restrictions on System Configuration ... 6
2.2 CJ-series System Configuration ... 7
2.2.1 Connecting a CS-series Expansion Rack to the CJ Series ... 7
2.2.2 Restrictions on System Configuration ... 7
2.3 List of Units Compatible with CS/CJ Series Expansion Interconnection ... 8
2.3.1 CJ1W Units Usable with the CS-series System ... 8
2.3.2 CS1W Units Usable with the CJ-series System ... 12
2.3.3 Expansion Cables (Common to CS and CJ) ... 18
2.4 Restrictions ... 19
2.4.1 Restrictions on System Configuration ... 19
2.4.2 Restrictions on Backup and Restoration ... 19
2.4.3 Other Restrictions ... 20
3 Expansion Interconnection Functions Available with Tools ... 21
3.1 Expansion Interconnection Functions ... 21
3.2 Details on the Functions to Be Activated in the I/O Table Window ... 21
3.2.1 Seven Expansion Racks Can Be Displayed for the CJ2 CPU Unit ... 21
3.2.2 CS1W Units Can Be Selected for the CJ2 CPU Unit and CJ1W Units for the CS1 CPU Unit ... 22
3.2.3 A Mix of CS1W and CJ1W Units Can Be Detected ... 22
3.2.4 A CJ1W Power Supply and a C200HW Power Supply for CS1 Can Be Selected ... 23
3.3 Restrictions on Data Created with CS/CJ Series Expansion Interconnection Enabled ... 24
4 Enabling CS/CJ Series Expansion Interconnection ... 25
5 Migration: Connecting a CJ-series Expansion Rack to the CS System ... 26
5.1 Migration Workflow ... 26
5.2 Migration Procedure ... 27
5.2.1 Designing the System Configuration ... 27
5.2.2 Reading the Data from the Existing System ... 28
5.2.3 Modifying the System Configuration ... 29
5.2.4 Migrating the Special Unit Setup ... 30
5.2.5 Modifying the Basic I/O Words (Modifying the First Word of the Rack) ... 30
5.2.6 Modifying the Programs/PLC System Settings ... 31
5.2.7 Modifying the System Configuration ... 31
5.2.8 Configuring and Wiring the Hardware ... 31
5.2.9 Transferring the Data ... 31
5.2.10 Checking the Operation ... 31
6 Migration: Connecting a CS-series Expansion Rack to the CJ System ... 32
6.1 Migration Workflow ... 32
6.2 Migration Procedure ... 33
6.2.1 Designing the System Configuration ... 33
6.2.2 Reading the Data from the Existing System ... 33
6.2.3 Creating the System Configuration ... 34
6.2.4 Migrating the Special Unit Setup ... 35
6.2.5 Modifying the Basic I/O Words (Modifying the First Word of the Rack) ... 35
6.2.6 Migrating the Programs and PLC System Settings ... 35
6.2.7 Modifying the System Configuration ... 35
6.2.8 Modifying the Hardware Settings ... 35
6.2.9 Transferring the Data ... 36
6.2.10 Checking the Operation ... 36
7 Related Settings and CIO Areas ... 37
7.1 CS1 CPU Unit ... 37
7.1.1 PLC System Settings ... 37
7.1.2 I/O Memory ... 37

7.2 CJ3/CJ2 CPU Unit 37
7.2.1 PLC System Settings 37
7.2.2 I/O Memory 37
Appendix 40
Appendix 1 Checking the Version and Lot Number 40

Related Manuals

The following table shows the manuals that are related to this document.
Before using this system, be sure to have the related manuals and instruction documents available and review their contents, including *Safety Precautions*, *Precautions for Safe Use*, and other safety-related information, to ensure safe usage of the system.

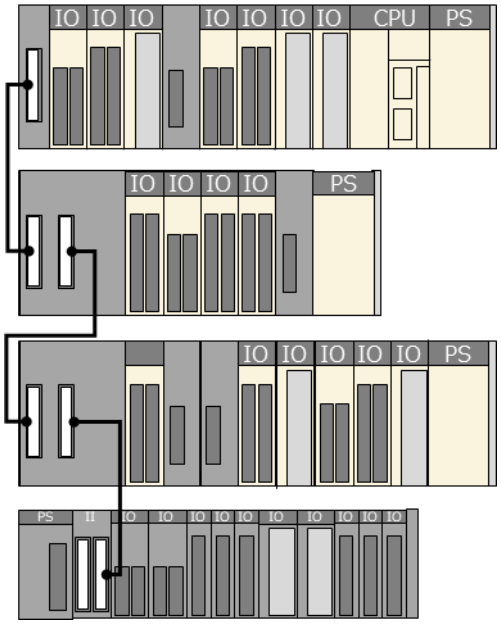
Manual name	Manual No.	Model numbers
CS-series Programmable Controllers Operation Manual	W339	CS1G/H-CPU□□H
CS/CJ/NSJ-series Programmable Controllers Programming Manual	W394	CS1G/H-CPU□□H CS1G/H-CPU□□H
CJ-Series CJ3 CPU Unit Hardware User's Manual	W664	CJ3M-CPU□□
CJ-Series CJ2 CPU Unit Hardware User's Manual	W472	CJ2H-CPU6□-EIP CJ2H-CPU6□ CJ2M-CPU□□
CJ-series CJ2/CJ3 CPU Unit Software User's Manual	W473	CJ3M-CPU□□ CJ2H-CPU6□-EIP CJ2H-CPU6□ CJ2M-CPU□□
CX-Programmer Operation Manual	W446	CXONE-AL□□D-V4

1 Overview

1.1 CS/CJ Series Expansion Interconnection Overview

CS/CJ Series Expansion Interconnection enables connecting a CJ-series Expansion Rack to the CS-series system configuration, or a CS-series Expansion Rack to the CJ-series system configuration.
This function allows phased replacement of the CS-series system configuration with the CJ Series.

Connecting a CJ-series Expansion Rack to the CS1-series system configuration



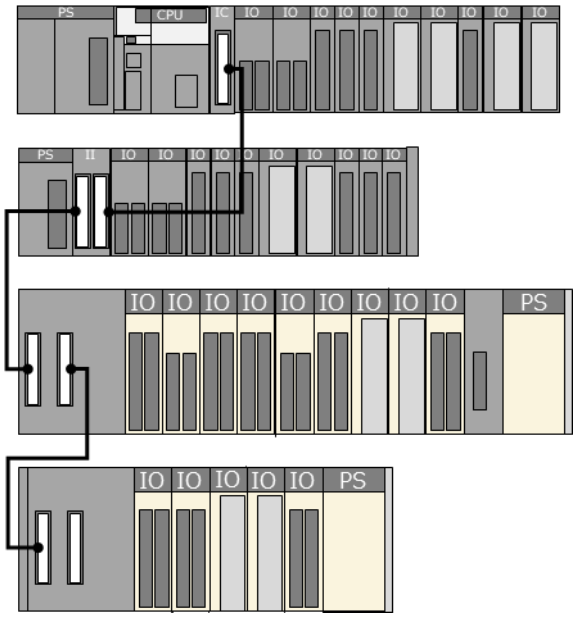
CS-series CPU Unit

CS-series Expansion Rack

CS-series Expansion Rack

CJ-series Expansion Rack

Connecting a CS-series Expansion Rack to the CJ-series system configuration



CJ-series CPU Unit

CJ-series Expansion Rack

CS-series Expansion Rack

CS-series Expansion Rack

1.2 Notes Before Use

CS/CJ-Series Expansion Interconnection cannot be used with CX-One remaining in the default state.

- Enable CS/CJ-Series Expansion Interconnection to use it.
- For how to enable the function, refer to *4. Enabling CS/CJ Series Expansion Interconnection*.
- For how to migrate the system configuration using the function, refer to *5. Migration: Connecting a CJ-series Expansion Rack to the CS System* and *6. Migration: Connecting a CS-series Expansion Rack to the CJ System*.

1.3 System Specifications

Below are the CPU Units compatible with CS/CJ Series Expansion Interconnection, and the specifications when it is enabled.

Item	CS Series Same as the standard specifications	CJ Series with CS/CJ-Series Expansion Interconnection enabled. The specifications within parentheses apply when the function is disabled.
Compatible CPU Units	CS1G-CPU4□H CS1H-CPU6□H Unit version Ver. 4.0 or later **(CS1D Series is incompatible.)**	CJ3M-CPU□□ All version CJ2M-CPU□□ Unit version Ver. 2.2 or later CJ2H-CPU6□(-EIP) Unit version Ver. 1.6 or later **Lot number 260105 or later only***1
Compatible CS-series Backplanes	CPU Backplanes CS1W-BC□□2 *CS1W-BC□□3 is incompatible. Expansion Backplanes CS1W-BI□□2/BI□□3 *I/O Expansion Backplanes for C200H Series cannot be connected.	Expansion Backplanes CS1W-BI□□2/BI□□3 *I/O Expansion Backplanes for C200H Series cannot be connected.
Compatible units	CS1W/CJ1W Basic I/O Units, Special I/O Units, and CPU Bus Units*2 *C200H-series Units cannot be used.*3	
Number of I/O points	5,120 max.	5,120 max.
Connectable number of units	10 per rack (CPU or expansion) 80 in the entire system	10 per rack (CPU or expansion) 80 in the entire system (10 per rack, 40 in the entire system)
Basic I/O Units	80 max. with 5,120 I/O points max. in total	80 max. with 5,120 I/O points max. in total (40 max., with 2,560 I/O points max. in total)
Special I/O Units	80 max. For up to 96 unit numbers	80 max. For up to 96 unit numbers (40 max. *5)
CPU Bus Units	16 max.	CJ3M/CJ2M-CPU1□ and CJ2H-CPU6□ 16 max. CJ3M/CJ2M-CPU3□ and CJ2H-CPU6□-EIP 15 max.
Number of Expansion Racks	7 max.	7 max. (3 max. *5)
Total length of I/O connecting cables	12 m max.	12 m max. (12 m max.)

*1 For how to check the version and lot number, refer to *Appendix 1 Checking the Version and Lot Number*.
*2 For details on the CS1 CPU Unit, CJ3/CJ2 CPU Unit, CS1W Unit, and CJ1W Unit, refer to the operation manual of each unit.
*3 C200H-series Units do not work even if they are installed.
*4 For operation with tools, refer to *3. Expansion Interconnection Functions Available with Tools*.
*5 For only CJ2 CPU unit. CJ3 CPU unit can be used 80 units max. and 7 racks max..

2 System configuration and devices

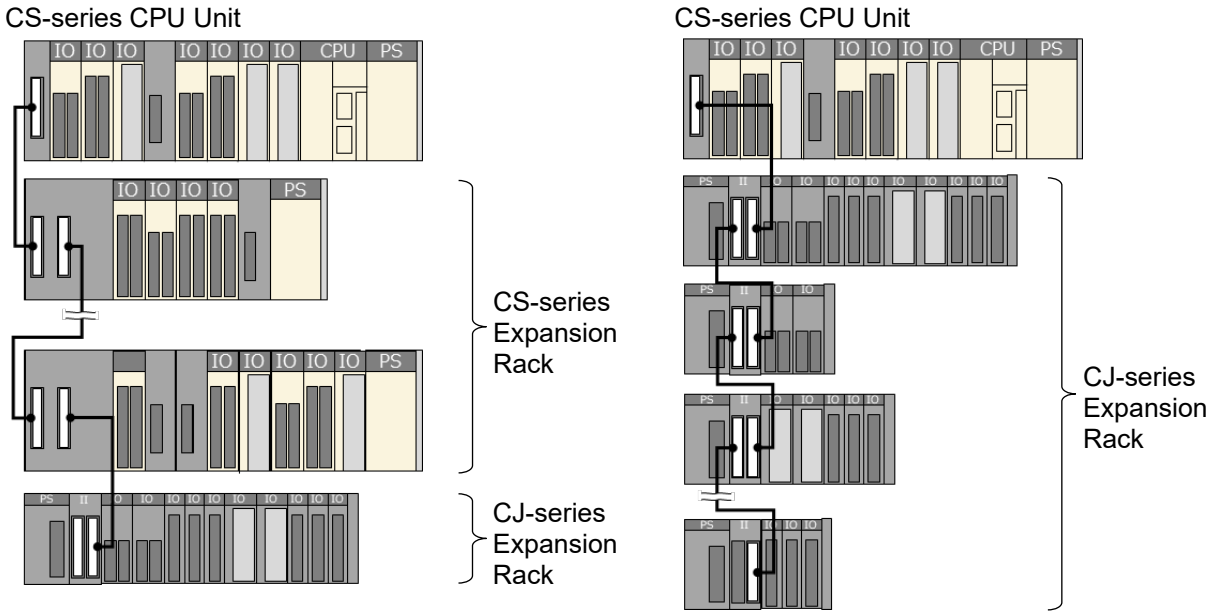
2.1 CS-series System Configuration

Below are the system configuration examples.

2.1.1 Connecting a CJ-series Expansion Rack to the CS Series

Enable CS/CJ Series Expansion Interconnect before connecting a CJ-series Expansion Rack downstream of the CS-series system (a CS-series CPU Unit or Expansion Rack).

System configuration with a CJ-series Expansion Rack connected to the CS Series

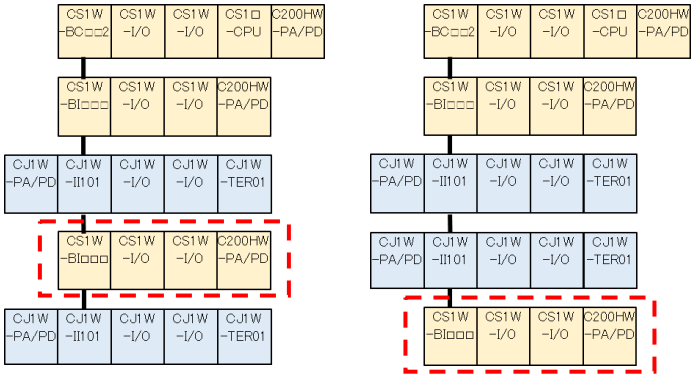


*For a CS-series CPU Backplane, use CS1W-BC□□2.
Using CS1W-BC□□3 will cause an I/O bus error.
*For CS-series and CJ-series Expansion Racks, up to seven racks in total can be connected.
*The total length of I/O connecting cables must not exceed 12 m.

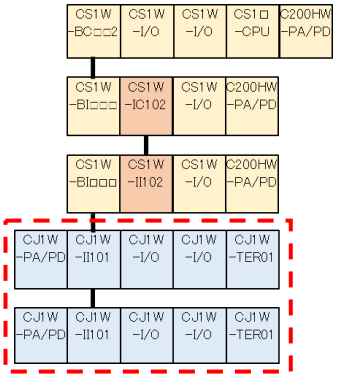
2.1.2 Restrictions on System Configuration

A CJ-series Expansion Rack can be connected only downstream of the CS-series CPU Unit or CS-series Expansion Rack.
The following configurations may also work without errors, but they are not guaranteed.

(1) Do not connect a CS-series Expansion Rack downstream of the CJ-series Expansion Rack.



(2) Do not connect it to a CS-series Long-distance Expansion Rack.



Precautions for Correct Use

Connect a CJ-series Expansion Rack downstream of the CS-series device.

2.2 CJ-series System Configuration

Below are the system configuration examples.

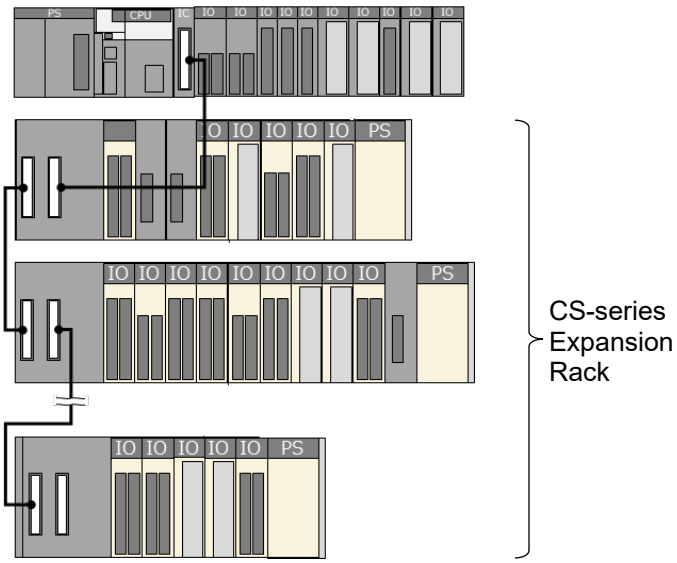
2.2.1 Connecting a CS-series Expansion Rack to the CJ Series

Enable CS/CJ Series Expansion Interconnection before connecting a CS-series Expansion Rack downstream of the CJ-series system (a CJ-series CPU Unit or Expansion Rack).

System configuration with a CS-series Expansion Rack connected to the CJ Series

CJ-series CPU Unit

CJ-series CPU Unit

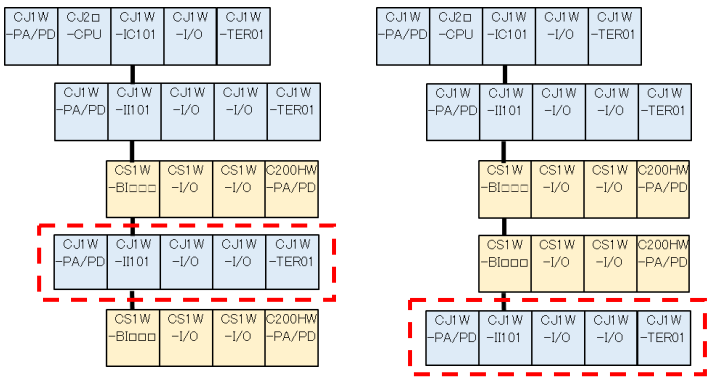


*For CS-series and CJ-series Expansion Racks, up to seven racks in total can be connected.
*It is possible to use CJ-series Expansion Racks only.
*The total length of I/O connecting cables must not exceed 12 m.

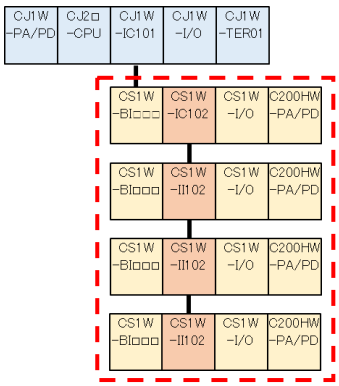
2.2.2 Restrictions on System Configuration

A CJ-series Expansion Rack can be connected only downstream of the CS-series CPU Unit or CS-series Expansion Rack.
The following configurations may also work without errors, but they are not guaranteed.

(1) Do not connect a CJ-series Expansion Rack downstream of the CS-series Expansion Rack.



(2) Do not connect it to a CS-series Long-distance Expansion Rack.



Precautions for Correct Use

Connect a CS-series Expansion Rack downstream of the CJ-series device.

2.3 List of Units Compatible with CS/CJ Series Expansion Interconnection

2.3.1 CJ1W Units Usable with the CS-series System

CJ1W Units usable with the CS-series system will be displayed after CS/CJ Series Expansion Interconnect is enabled.

Grayed units are not supported.

• Basic I/O Unit

Input Unit

Unit name	Specification	Model	Compatibility with CS system
DC Input Unit	Terminal block, 12 to 24 VDC, 8 points	CJ1W-ID201	Yes
	Terminal block, 24 VDC, 16 points	CJ1W-ID211	Yes
		CJ1W-ID212	Yes
	Fujitsu/OTAX connector 24 VDC, 32 points	CJ1W-ID231	Yes
	MIL connector, 24 VDC, 32 points	CJ1W-ID232	Yes
		CJ1W-ID233	Yes
	Fujitsu/OTAX connector 24 VDC, 64 points	CJ1W-ID261	Yes
	MIL connector, 24 VDC, 64 points	CJ1W-ID262	Yes
AC Input Unit	Terminal block, 200 to 240 VAC, 8 points	CJ1W-IA201	Yes
	Terminal block, 100 to 120 VAC, 16 points	CJ1W-IA111	Yes
Interrupt Input Unit	Terminal block, 24 VDC, 16 points	CJ1W-INT01	**No**
Quick-response Input Unit	Terminal block, 24 VDC, 16 points	CJ1W-IDP01	Yes

Output Unit

Unit name		Specification	Model	Compatibility with CS system
Relay Contact Output Unit		Terminal block, 250 VAC/24 VDC, 2 A 8 points, independent contact	CJ1W-OC201	Yes
		Terminal block, 250 VAC/24 VDC, 2 A, 16 points	CJ1W-OC211	Yes
Triac Output Unit		Terminal block, 250 VAC, 0.6 A, 8 points	CJ1W-OA201	Yes
			CJ1W-OA201-1	Yes
Transistor Output Unit	Sinking	Terminal block, 12 to 24 VDC, 2 A, 8 points	CJ1W-OD201	Yes
		Terminal block, 12 to 24 VDC, 0.5 A, 8 points	CJ1W-OD203	Yes
		Terminal block, 12 to 24 VDC, 0.5 A, 16 points	CJ1W-OD211	Yes
		Terminal block, 24 VDC, 0.5 A, 16 points	CJ1W-OD213	Yes
		Fujitsu/OTAX connector 12 to 24 VDC, 0.5 A, 32 points	CJ1W-OD231	Yes
		MIL connector, 12 to 24 VDC, 0.5 A	CJ1W-OD233	Yes

Unit name		Specification	Model	Compatibility with CS system
		32 points		
		MIL connector, 24 VDC, 0.5 A, 32 points	CJ1W-OD234	Yes
		Fujitsu/OTAX connector 12 to 24 VDC, 0.3 A, 64 points	CJ1W-OD261	Yes
		MIL connector, 12 to 24 VDC, 0.3 A 64 points	CJ1W-OD263	Yes
	Sourcing	Terminal block, 24 VDC, 2 A, 8 points	CJ1W-OD202	Yes
		Terminal block, 24 VDC, 0.5 A, 8 points	CJ1W-OD204	Yes
		Terminal block, 24 VDC, 0.5 A, 16 points	CJ1W-OD212	Yes
		Terminal block, 24 VDC, 0.5 A, 32 points	CJ1W-OD232	Yes
		Terminal block, 12 to 24 VDC, 0.3 A, 64 points	CJ1W-OD262	Yes

Mixed I/O Unit

Unit name		Specification	Model	Compatibility with CS system
24 VDC Input Unit/ Transistor Output Unit	Sinking	Fujitsu/OTAX connector Input: 24 VDC, 16 points Output: 12 to 24 VDC, 0.5 A, 16 points	CJ1W-MD231	Yes
		Fujitsu/OTAX connector Input: 24 VDC, 32 points Output: 12 to 24 VDC, 0.5 A, 32 points	CJ1W-MD261	Yes
		MIL connector Input: 24 VDC, 16 points Output: 12 to 24 VDC, 0.5 A, 16 points	CJ1W-MD233	Yes
		MIL connector Input: 24 VDC, 32 points Output: 12 to 24 VDC, 0.3 A, 32 points	CJ1W-MD263	Yes
	Sourcing	MIL connector Input: 24 VDC, 16 points Output: 24 VDC, 0.5 A, 16 points	CJ1W-MD232	Yes
TTL I/O Unit		MIL connector Input: TTL (5 VDC), 16 points Output: TTL (5 VDC, 35 mA), 16 points	CJ1W-MD563	Yes

B7A Interface Unit

Unit name	Specification	Model	Compatibility with CS system
B7A Interface Unit	64 inputs	CJ1W-B7A14	**No (not supported)**
	64 outputs	CJ1W-B7A04	**No (not supported)**
	32 inputs 32 outputs	CJ1W-B7A22	**No (not supported)**

• Special I/O Unit

Unit name	Specification	Model	Compatibility with CS system
General-purpose Universal Input Unit	4 inputs, universal	CJ1W-AD04U	Yes
Analog Input Unit	8 inputs	CJ1W-AD081-V1	Yes
	4 inputs	CJ1W-AD041-V1	Yes
	4 inputs, high-speed	CJ1W-AD042	Yes*
Analog Output Unit	4 outputs	CJ1W-DA041	Yes
	2 outputs	CJ1W-DA021	Yes
	8 outputs, current output	CJ1W-DA08C	Yes
	8 outputs, voltage output	CJ1W-DA08V	Yes
	4 outputs, high-speed	CJ1W-DA042V	Yes*
Analog I/O Unit	4 inputs, 2 outputs	CJ1W-MAD42	Yes
Isolated-type High-resolution Universal Input Unit	4 inputs, universal Resolution: 1/256,000, 1/64,000, 1/16,000	CJ1W-PH41U	Yes
Isolated-type Thermocouple Input Unit	4 thermocouple inputs	CJ1W-PTS51	Yes
	2 thermocouple inputs	CJ1W-PTS15	Yes
Isolated-type Resistance Thermometer Input Unit	4 isolated resistance thermometer inputs	CJ1W-PTS52	Yes
	2 isolated resistance thermometer inputs	CJ1W-PTS16	Yes
Isolated-type DC Input Unit	2 direct voltage or direct current inputs	CJ1W-PDC15	Yes
Temperature Control Unit	4 loops, thermocouple input/NPN output	CJ1W-TC001	Yes
	4 loops, thermocouple input/PNP output	CJ1W-TC002	Yes
	2 loops, thermocouple input/NPN output, with heater burnout detection	CJ1W-TC003	Yes
	2 loops, thermocouple input/PNP output, with heater burnout detection	CJ1W-TC004	Yes
	4 loops, platinum resistance thermometer input/NPN output	CJ1W-TC101	Yes
	4 loops, platinum resistance thermometer input/PNP output	CJ1W-TC102	Yes
	2 loops, platinum resistance thermometer input/NPN output, with heater burnout detection	CJ1W-TC103	Yes
	2 loops, platinum resistance thermometer input/PNP output, with heater burnout detection	CJ1W-TC104	Yes
Position Control Unit	Pulse output, 1 axis Open collector output	CJ1W-NC113	Yes
	Pulse output, 2 axes Open collector output	CJ1W-NC213	Yes
	Pulse output, 4 axes Open collector output	CJ1W-NC413	Yes
	Pulse output, 1 axis Line driver output	CJ1W-NC133	Yes

Unit name	Specification	Model	Compatibility with CS system
	Pulse output, 2 axes Line driver output	CJ1W-NC233	Yes
	Pulse output, 4 axes Line driver output	CJ1W-NC433	Yes
High-speed Position Control Unit	Pulse output, 2 axes Open collector output	CJ1W-NC214	Yes*
	Pulse output, 4 axes Open collector output	CJ1W-NC414	Yes*
	Pulse output, 2 axes Line driver output	CJ1W-NC234	Yes*
	Pulse output, 4 axes Line driver output	CJ1W-NC434	Yes*
High-speed Counter Unit	Number of count channels: 2	CJ1W-CT021	Yes
CompoBus/S Master Unit	CompoBus/S remote I/O	CJ1W-SRM21	**No (not supported)**
CompoNet Master Unit	CompoNet remote I/O	CJ1W-CRM21	Yes
ID Sensor Unit	V600 Series, 1 head	CJ1W-V600C11	Yes
	V600 Series, 2 heads	CJ1W-V600C12	Yes
	V680 Series, 1 head	CJ1W-V680C11	Yes
	V680 Series, 2 heads	CJ1W-V680C12	Yes

*Commands specific to the units cannot be used on CS1 CPU Units. For details, refer to *2.4.3 Other Restrictions*.

• CPU Bus Unit

Unit name	Specification	Model	Compatibility with CS system
High-speed Analog Input Unit	4 inputs	CJ1W-ADG41	No (not supported)
Controller Link Unit	Wired	CJ1W-CLK23	Yes
Serial Communications Unit	RS-232C, 1 port RS-422A/485, 1 port	CJ1W-SCU41-V1	No (not supported)
	RS-232C, 2 ports	CJ1W-SCU21-V1	No (not supported)
	RS-422A/485, 2 ports	CJ1W-SCU31-V1	No (not supported)
High-speed Serial Communications Unit	RS-232C, 1 port RS-422A/485, 1 port	CJ1W-SCU42	Yes*
	RS-232C, 2 ports	CJ1W-SCU22	Yes*
	RS-422A/485, 2 ports	CJ1W-SCU32	Yes*
Ethernet Unit	100BASE-TX type	CJ1W-ETN21	No (not supported)
EtherNet/IP Unit	Tag data link, message communications, security	CJ1W-EIP21S	Yes
	Tag data link, message communications	CJ1W-EIP21	No (not supported)
FL-net Unit	100BASE-TX type	CJ1W-FLN22	Yes
EtherCAT Slave Unit	Refreshing: Free-Run Mode	CJ1W-ECT21	Yes
DeviceNet Unit	DeviceNet remote I/O	CJ1W-DRM21	Yes
Position Control Units with EtherCAT	Servo, 2 axes	CJ1W-NC281	Yes*
	Servo, 2 axes	CJ1W-NC281	Yes*
	Servo, 4 axes	CJ1W-NC481	Yes*
	Servo, 8 axes	CJ1W-NC781	Yes*
	Servo, 16 axes	CJ1W-NCF81	Yes*

Unit name	Specification	Model	Compatibility with CS system
	Servo, 4 axes	CJ1W-NC482	Yes*
	Servo, 8 axes	CJ1W-NC882	Yes*
	Servo, 16 axes	CJ1W-NCF82	Yes*
MECHATROLINK-II-supported Position Control Unit	MECHATROLINK-II, 2 axes	CJ1W-NC271	Yes
	MECHATROLINK-II, 4 axes	CJ1W-NC471	Yes
	MECHATROLINK-II, 16 axes	CJ1W-NCF71(-MA)	Yes
MECHATROLINK-II-supported Motion Control Unit	MECHATROLINK-II Real axis: 16 max. Virtual axis: 2 max.	CJ1W-MCH71	Yes
SYSMAC SPU High-speed Data Storage Unit	1 Ethernet port	CJ1W-SPU01-V2	Yes

*Commands specific to the units cannot be used on CS1 CPU Units. For details, refer to *2.4.3 Other Restrictions*.

• Other units

Unit name	Specification	Model	Compatibility with CS system
Power Supply Unit	Input: 100 to 240 VAC Output: 5V, 5.0 A; 24V, 0.8A	CJ1W-PA205R	Yes
	Input: 100 to 240 VAC Output: 5V, 5.0 A; 24V, 0.8A	CJ1W-PA205C	Yes
	Input: 100 to 240 VAC Output: 5V, 5.0 A; 24V, 0.8A	CJ1W-PA202	Yes
	Input: 24 VDC Output: 5V, 5.0 A; 24V, 0.8A	CJ1W-PD025	Yes
	Input: 24 VDC Output: 5V, 5.0 A; 24V, 0.8A	CJ1W-PD022	Yes
I/O Control Unit	-	CJ1W-IC101	**No (not supported)**
I/O Interface Unit	-	CJ1W-II101	Yes
Spacer Unit	-	CJ1W-SP001	Yes

Precautions for Correct Use

Do not install an incompatible unit in the CJ-series Expansion Rack connected to the CS-series system. Installing it does not cause an error. Check its compatibility in this manual.

2.3.2 CS1W Units Usable with the CJ-series System

CS1W Units usable with the CJ-series system will be displayed after CS/CJ Series Expansion Interconnection is enabled.
Inner boards and C200H-series Units cannot be used.
Grayed units are not supported.

• Basic I/O Unit
Input Unit

Unit name	Specification	Model	Compatibility with CJ system
DC Input Unit	Terminal block, 12 to 24 VDC, 8 points	CS1W-ID211	Yes
	Terminal block, 24 VDC, 16 points	CS1W-ID231	Yes
	Fujitsu/OTAX connector 24 VDC, 64 points	CS1W-ID261	Yes
	Fujitsu/OTAX connector	CS1W-ID291	Yes

Unit name	Specification	Model	Compatibility with CJ system
	24 VDC, 96 points		
AC Input Unit	Terminal block, 200 to 240 VAC, 8 points	CS1W-IA211	Yes
	Terminal block, 100 to 120 VAC, 16 points	CS1W-IA111	Yes
Interrupt Input Unit	Terminal block, 24 VDC, 16 points	CS1W-INT01	**No**
Quick-response Input Unit	Terminal block, 24 VDC, 16 points	CS1W-IDP01	Yes

Output Unit

Unit name		Specification	Model	Compatibility with CJ system
Relay Contact Output Unit		Terminal block, 250 VAC/24 VDC, 2 A 120 VDC, 0.1 A, 8 points, independent contact	CS1W-OC201	Yes
		Terminal block, 250 VAC/24 VDC, 2 A 120 VDC, 0.1 A, 16 points	CS1W-OC211	Yes
Triac Output Unit		Terminal block, 250 VAC, 1.2 A, 8 points	CS1W-OA201	Yes
		Terminal block, 250 VAC, 0.5 A, 16 points	CS1W-OA211	Yes
Transistor Output Unit	Sinking	Terminal block, 12 to 24 VDC, 0.5 A, 16 points	CS1W-OD211	Yes
		Fujitsu/OTAX connector 12 to 24 VDC, 0.5 A, 32 points	CS1W-OD231	Yes
		Fujitsu/OTAX connector 12 to 24 VDC, 0.3 A, 64 points	CS1W-OD261	Yes
		Fujitsu/OTAX connector 12 to 24 VDC, 0.1 A, 96 points	CS1W-OD291	Yes
	Sourcing	Terminal block, 24 VDC, 0.5 A, 16 points	CS1W-OD202	Yes
		Terminal block, 24 VDC, 0.5 A, 32 points	CS1W-OD232	Yes
		Terminal block, 24 VDC, 0.3 A, 64 points	CS1W-OD262	Yes
		Terminal block, 24 VDC, 0.1 A, 64 points	CS1W-OD292	Yes

Mixed I/O Unit

Unit name		Specification	Model	Compatibility with CJ system
24 VDC Input Unit/ Transistor Output Unit	Sinking	Fujitsu/OTAX connector Input: 24 VDC, 16 points Output: 24 VDC, 0.3 A, 16 points	CS1W-MD262	Yes
		Fujitsu/OTAX connector Input: 24 VDC, 16 points Output: 24 VDC, 0.1 A, 16 points	CJ1W-MD292	Yes
	Sourcing	Fujitsu/OTAX connector Input: 24 VDC, 16 points Output: 24 VDC, 0.3 A, 16 points	CS1W-MD262	Yes

Unit name		Specification	Model	Compatibility with CJ system
		Fujitsu/OTAX connector Input: 24 VDC, 48 points Output: 24 VDC, 0.1 A, 48 points	CS1W-MD292	Yes
TTL I/O Unit		Fujitsu/OTAX connector Input: TTL (5 VDC), 32 points Output: TTL (5 VDC, 35 mA), 32 points	CS1W-MD561	Yes

B7A Interface Unit

Unit name	Specification	Model	Compatibility with CJ system
B7A Interface Unit	32 inputs	CS1W-B7A12	Yes
	32 outputs	CS1W-B7A02	Yes
	16 inputs 16 outputs	CS1W-B7A21	Yes
	32 inputs 32 outputs	CS1W-B7A22	Yes

• Special I/O Unit

Unit name	Specification	Model	Compatibility with CJ system
Analog Input Unit	4 inputs	CS1W-AD041-V1	Yes
	8 inputs	CS1W-AD081-V1	Yes
	16 inputs	CS1W-AD161	Yes
Analog Output Unit	4 outputs	CS1W-DA041	Yes
	8 outputs, current output	CS1W-DA08C	Yes
	8 outputs, voltage output	CS1W-DA08V	Yes
Analog I/O Unit	4 inputs, 4 outputs	CS1W-MAD44	Yes
Isolated-type Thermocouple Input Unit	4 thermocouple inputs	CS1W-PTS01-V1	Yes
	4 thermocouple inputs	CS1W-PTS11	Yes
	4 thermocouple inputs	CS1W-PTS51	Yes
	8 thermocouple inputs	CS1W-PTS55	Yes
Isolated-type Resistance Thermometer Input Unit	4 isolated resistance thermometer inputs	CS1W-PTS02	Yes
	4 isolated resistance thermometer inputs	CS1W-PTS03	Yes
Isolated-type Resistance Thermometer Input Unit	4 isolated resistance thermometer inputs	CS1W-PTS12	Yes
	4 isolated resistance thermometer inputs	CS1W-PTS52	Yes
	8 isolated resistance thermometer inputs	CS1W-PTS56	Yes
Isolated-type 2-wire Transmission Device Input Unit	4 inputs	CS1W-PTW01	Yes
Isolated-type DC Input Unit	4 inputs	CS1W-PDC01	Yes
	4 inputs	CS1W-PDC11	Yes
	8 inputs	CS1W-PDC55	Yes
Isolated-type Control Output Unit	4 outputs	CS1W-PWM01	Yes
	4 outputs	CS1W-PWM02	Yes

Unit name	Specification	Model	Compatibility with CJ system
Voltage Transducer Input Unit	8 inputs	CS1W-PTR01	Yes
DC Input Unit	8 inputs	CS1W-PTR02	Yes
Isolated-type Pulse Input Unit	4 pulse inputs	CS1W-PPS01	Yes
Position Control Unit	Pulse output, 1 axis Open collector output	CS1W-NC113	Yes
	Pulse output, 2 axes Open collector output	CS1W-NC213	Yes
	Pulse output, 4 axes Open collector output	CS1W-NC413	Yes
	Pulse output, 1 axis Line driver output	CS1W-NC133	Yes
	Pulse output, 2 axes Line driver output	CS1W-NC233	Yes
	Pulse output, 4 axes Line driver output	CS1W-NC433	Yes
Motion Control Unit	Analog output, 2 axes	CS1W-MC221-V1	**No (not supported)**
	Analog output, 2 axes	CS1W-MC421-V1	**No (not supported)**
Customizable Counter Unit	Pulse input, 2 axes Pulse output, 2 axes	CS1W-HCP22-V1	**No (not supported)**
	Pulse input, 1 axis 1 analog input 2 analog outputs	CS1W-HCA12-V1	**No (not supported)**
	Pulse input, 2 axes 2 analog outputs	CS1W-HCA22-V1	**No (not supported)**
	12 DC inputs 8 transistor outputs	CS1W-HIO01-V1	**No (not supported)**
High-speed Counter Unit	2 pulse inputs	CS1W-CT021	Yes
	4 pulse inputs	CS1W-CT041	Yes
GP-IB Interface Unit	IEEE-488-1978 (GP-IB)	CS1W-GPI01	**No (not supported)**
CompoBus/S Master Unit	CompoBus/S remote I/O	CS1W-SRM21	Yes
CompoNet Master Unit	CompoNet remote I/O	CS1W-CRM21	Yes
ID Sensor Unit	V600 Series, 1 head	CS1W-V600C11	Yes
	V600 Series, 2 heads	CS1W-V600C12	Yes
	V680 Series, 1 head	CS1W-V680C11	Yes
	V680 Series, 2 heads	CS1W-V680C12	Yes

• CPU Bus Unit

Unit name	Specification	Model	Compatibility with CJ system
Controller Link Unit	Wired	CS1W-CLK23	Yes
		CS1W-CLK21-V1	**No (not supported)**
	Optical ring (H-PLCF cable)	CS1W-CLK13	Yes
		CS1W-CLK12-V1	**No (not supported)**
	Optical ring (GI cable)	CS1W-CLK53	Yes
		CS1W-CLK52-V1	**No (not supported)**
SYSMAC LINK Unit	Coaxial	CS1W-SLK21	Yes
	Optical	CS1W-SLK11	Yes

Unit name	Specification	Model	Compatibility with CJ system
Serial Communications Unit	RS-232C, 2 ports	CS1W-SCU21-V1	Yes
	RS-422A/485, 2 ports	CS1W-SCU31-V1	Yes
Ethernet Unit	100BASE-TX type	CS1W-ETN21	Yes
	10BASE-5 type	CS1W-ETN01	**No (not supported)**
EtherNet/IP Unit	Tag data link, message communications, security	CS1W-EIP21S	Yes
	Tag data link, message communications	CS1W-EIP21	Yes
FL-net Unit	100BASE-TX type	CS1W-FLN22	Yes
	10BASE-5 type	CS1W-FLN02	**No (not supported)**
DeviceNet Unit	DeviceNet remote I/O	CS1W-DRM21-V1	Yes
Loop Control Unit	PID operation with up to 32 loops	CS1W-LC001	**No (not supported)**
MECHATROLINK-II-supported Position Control Unit	MECHATROLINK-II, 2 axes	CS1W-NC271	Yes
	MECHATROLINK-II, 4 axes	CS1W-NC471	Yes
	MECHATROLINK-II, 16 axes	CS1W-NCF71(-MA)	Yes
MECHATROLINK-II-supported Motion Control Unit	MECHATROLINK-II Real axis: 16 max. Virtual axis: 2 max.	CS1W-MCH71	Yes
SYSMAC SPU High-speed Data Storage Unit	1 Ethernet port	CS1W-SPU01-V2	Yes
	1 Ethernet port	CS1W-SPU02-V2	Yes

• Backplane

Unit name	Specification	Model	Compatibility with CJ system
CS-series Expansion Backplane	3 slots	CS1W-BI033	Yes
	5 slots	CS1W-BI053	Yes
	8 slots	CS1W-BI083	Yes
	10 slots	CS1W-BI103	Yes
CS-series Expansion Backplane (for CS-series Units)	3 slots	CS1W-BI032	Yes
	5 slots	CS1W-BI052	Yes
	8 slots	CS1W-BI082	Yes
	10 slots	CS1W-BI102	Yes
I/O Expansion Backplane for C200H Series	3 slots	C200HW-BI032	**No (not supported)**
	5 slots	C200HW-BI051	**No (not supported)**
	8 slots	C200HW-BI081-V1	**No (not supported)**
	10 slots	C200HW-BI101-V1	**No (not supported)**

• Other units

Unit name	Specification	Model	Compatibility with CJ system
Power Supply Unit	Input: 100 to 240 VAC Output: 5 V, 4.6 A; 24 V, 0.625 A	C200HW-PA204	Yes
	Input: 100 to 240 VAC Output: 5 V, 4.6 A; 24 V, 0.625 A	C200HW-PA204C	Yes
	Input: 100 to 240 VAC Output: 5 V, 4.6 A; 24 V, 0.625 A	C200HW-PA204R	Yes
	Input: 100 to 120/200 to 240 VAC Output: 5 V, 4.6 A; 24 V, 0.625 A	C200HW-PA204S	Yes

Unit name	Specification	Model	Compatibility with CJ system
	Input: 100 to 120/200 to 240 VAC Output: 5 V, 9.0 A; 24 V, 1.3 A	C200HW-PA209R	Yes
	Input: 24 VDC Output: 5 V, 4.6 A; 24 V, 0.625 A	C200HW-PD024	Yes
	Input: 24 VDC Output: 5 V, 5.3 A; 24 V, 1.3 A	C200HW-PD025	Yes
I/O Control Unit	For Long-distance Expansion Rack	CS1W-IC102	**No (not supported)**
I/O Interface Unit	For Long-distance Expansion Rack	CS1W-II102	**No (not supported)**

Precautions for Correct Use

Do not install an incompatible unit in the CS-series Expansion Rack connected to the CJ-series system. Installing it does not cause an error. Check its compatibility in this manual.

2.3.3 Expansion Cables (Common to CS and CJ)

Unit name	Specification	Model	CS and CJ mixed system
Expansion cable	0.3 m	CS1W-CN313	Yes
	0.7 m	CS1W-CN713	
	2 m	CS1W-CN223	
	3 m	CS1W-CN323	
	5 m	CS1W-CN523	
	10 m	CS1W-CN131	
	12 m	CS1W-CN131B2	
CS-series long-distance expansion cable	0.3 m	CV500-CN312	**No (not supported)** *Because Long-distance Expansion Racks are not supported.
	0.6 m	CV500-CN612	
	1 m	CV500-CN122	
	2 m	CV500-CN222	
	3 m	CV500-CN322	
	5 m	CV500-CN522	
	10 m	CV500-CN132	
	20 m	CV500-CN232	
	30 m	CV500-CN332	
	40 m	CV500-CN432	
	50 m	CV500-CN532	

2.4 Restrictions

2.4.1 Restrictions on System Configuration

The following are not in the scope of the specifications.
Avoid them since the operation is not guaranteed although devices may work.

	Restriction	Description
1	Do not use an incompatible unit.	Installing an incompatible unit does not cause an error. • Do not use an incompatible unit although it can be added to the I/O Table window. • For incompatible units, refer to *2.3 List of Units Compatible with CS/CJ Series Expansion Interconnection*.
2	Do not insert a CJ-series Expansion Rack between the CS-series CPU Unit and Expansion Rack. Do not insert a CS-series Expansion Rack between the CJ-series CPU Unit and Expansion Rack.	The configuration on the left does not cause an error. • Avoid the configuration on the left although it can be set in the I/O Table window. • For configurations that should be avoided, refer to *2.1.2 and 2.2.2 Restrictions on System Configuration*.
3	CS1W-SPU01-V1/SPU02-V1 cannot be used in the conditions on the right when installed in the CS-series Expansion Rack connected to the CJ-series CPU Unit.	An I/O setting error will occur in the following conditions, preventing the operation. • Only CS1W-SPU Units are installed in the CS-series Expansion Rack and Slot 0 is blank; and also *Start running program before initializing Unit/Inner board recognition* is enabled in the PLC system settings.
4	The system does not start if a CJ-series Expansion Rack without an End Cover is connected to the CS-series CPU Unit.	The behavior differs between the CJ-series CPU Unit and the CS-series CPU Unit when a CJ-series Expansion Rack without an End Cover is connected. • On the CJ-series CPU Unit, an I/O bus error (no End Cover) will occur. • On the CS-series CPU Unit, no I/O bus error will occur, but the system will not start. Also, tools including CX-Programmer cannot be connected.
5	Do not connect more than seven Expansion Racks.	The configuration on the left does not cause an error.

2.4.2 Restrictions on Backup and Restoration

The following are not in the scope of the specifications.

	Restriction	Description
1	Do not restore the simple backup data for the configuration consisting of a CJ2 CPU Unit and four or more Expansion Racks to a CJ2 CPU Unit (**lot number 260104 or earlier**) that is incompatible with Expansion Interconnect.	An I/O setting error will occur, preventing the operation. (CJ3M has no restrictions.)
2	Do not restore the PLC backup tool data for the configuration consisting of a CJ2 CPU Unit and four or more Expansion Racks to a CJ2 CPU Unit (**lot number 260104 or earlier**) that is incompatible with Expansion Interconnect.	The restoration is not possible because building the configuration with four or more Expansion Racks is not available for a CJ2 CPU Unit that is incompatible with Expansion Interconnect. (CJ3M has no restrictions.)

2.4.3 Other Restrictions

	Restriction	Description
1	Commands specific to CJ1W Units cannot be used on CS1 CPU Units.	The following commands specific to CJ1W Units cannot be used on CS1 CPU Units. • CJ1W-AD042 Analog input direct conversion command (AIDC) • CJ1W-DA042V Analog output direct conversion command (AODC) • CJ1W-SCU□2 Serial port direct transmission command (DTXDU) Serial port direct transmission command (DRXDU) • CJ1W-NC□□4 Positioning quick start command (NCDMV) • CJ1W-NC□81/□82 Positioning quick start command (NCDMV) Positioning start trigger command (NCDTR)
2	Create an I/O table when using a CS1W Unit with the CJ3/CJ2 CPU Unit.	Without an I/O table, an I/O setting error will occur.

3 Expansion Interconnection Functions Available with Tools

3.1 Expansion Interconnection Functions

Enable CS/CJ Series Expansion Interconnection to use the following functions in CX-One.

■ Functions to be activated in the I/O Table window

(1) For the CJ2 CPU Unit, seven Expansion Racks can be displayed.
(2) For the CJ3/CJ2 CPU Unit, CS1W Units can be displayed and selected in an Expansion Rack.
For the CS1 CPU Unit, CJ1W Units can be displayed and selected in an Expansion Rack.
(3) I/O Table Checking allows detecting a mix of CS1W and CJ1W Units.
(4) A CJ1W power supply and a C200HW power supply for CS1 can be selected in the Consumption window.

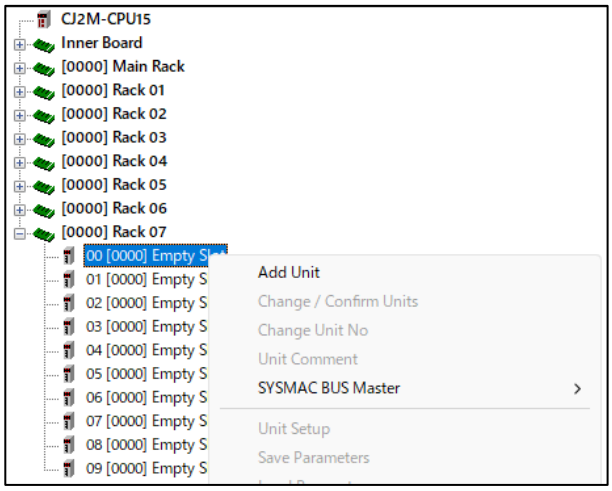
■ Compatible CX-One versions

CX-One Ver.4.☐ with auto-updates from January 2026 and later applied.

3.2 Details on the Functions to Be Activated in the I/O Table Window

3.2.1 Seven Expansion Racks Can Be Displayed for the CJ2 CPU Unit

When a CJ2 CPU Unit is configured in the I/O table, up to seven Expansion Racks are displayed, allowing addition of units.



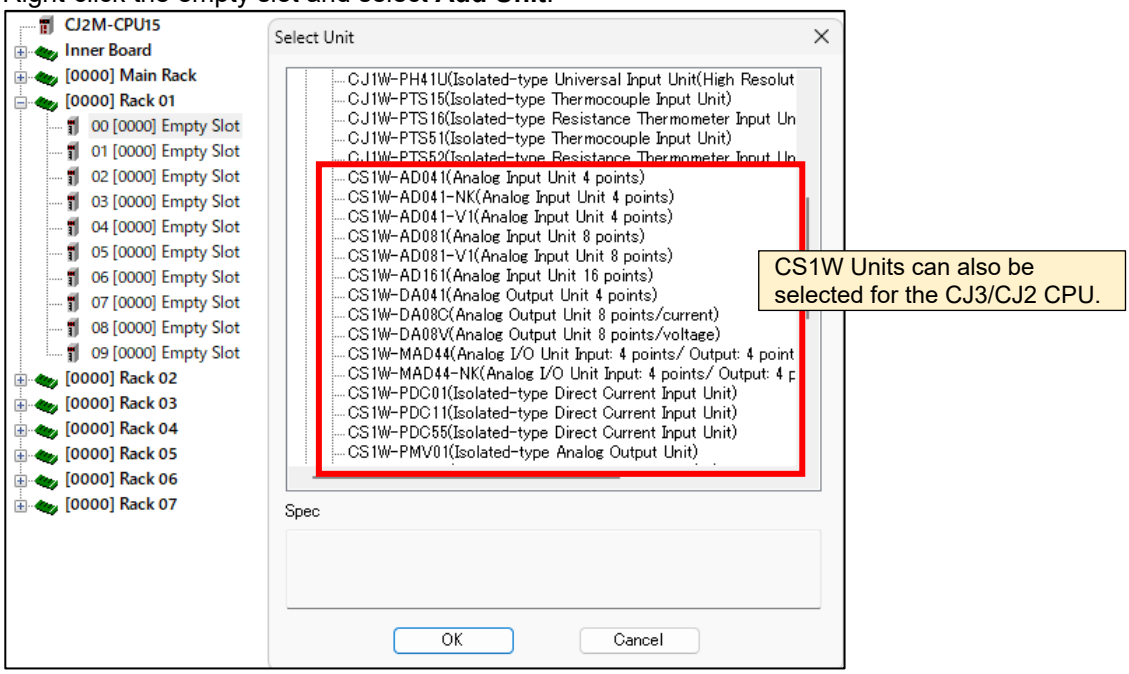
3.2.2 CS1W Units Can Be Selected for the CJ2 CPU Unit and CJ1W Units for the CS1 CPU Unit

When adding units to the slots of the Expansion Rack,

- For the CJ3/CJ2 CPU Unit, CS1W Units can be displayed and selected in addition to CJ1W Units.
- For the CS1 CPU Unit, CJ1W Units can be displayed and selected in addition to CS1W Units.

Example: Selecting units for Rack 01 under the CJ2 CPU Unit

Right-click the empty slot and select **Add Unit**.

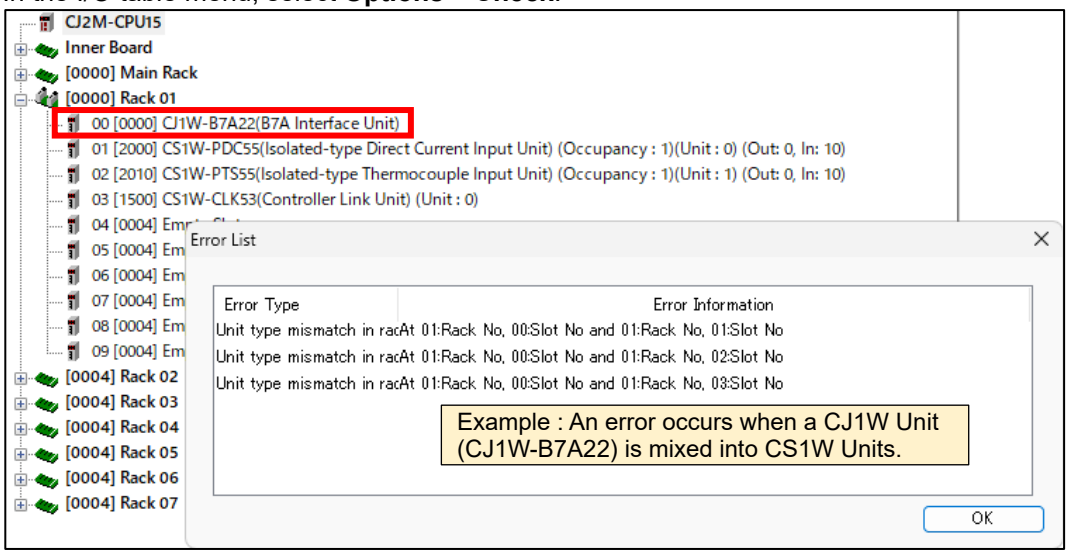


3.2.3 A Mix of CS1W and CJ1W Units Can Be Detected

I/O Table Checking allows detecting a mix of CS1W and CJ1W Units.

Example: Check result when a CJ1W Unit (CJ1W-B7A22) is mixed into CS1W Units

In the I/O table menu, select **Options** – **Check**.

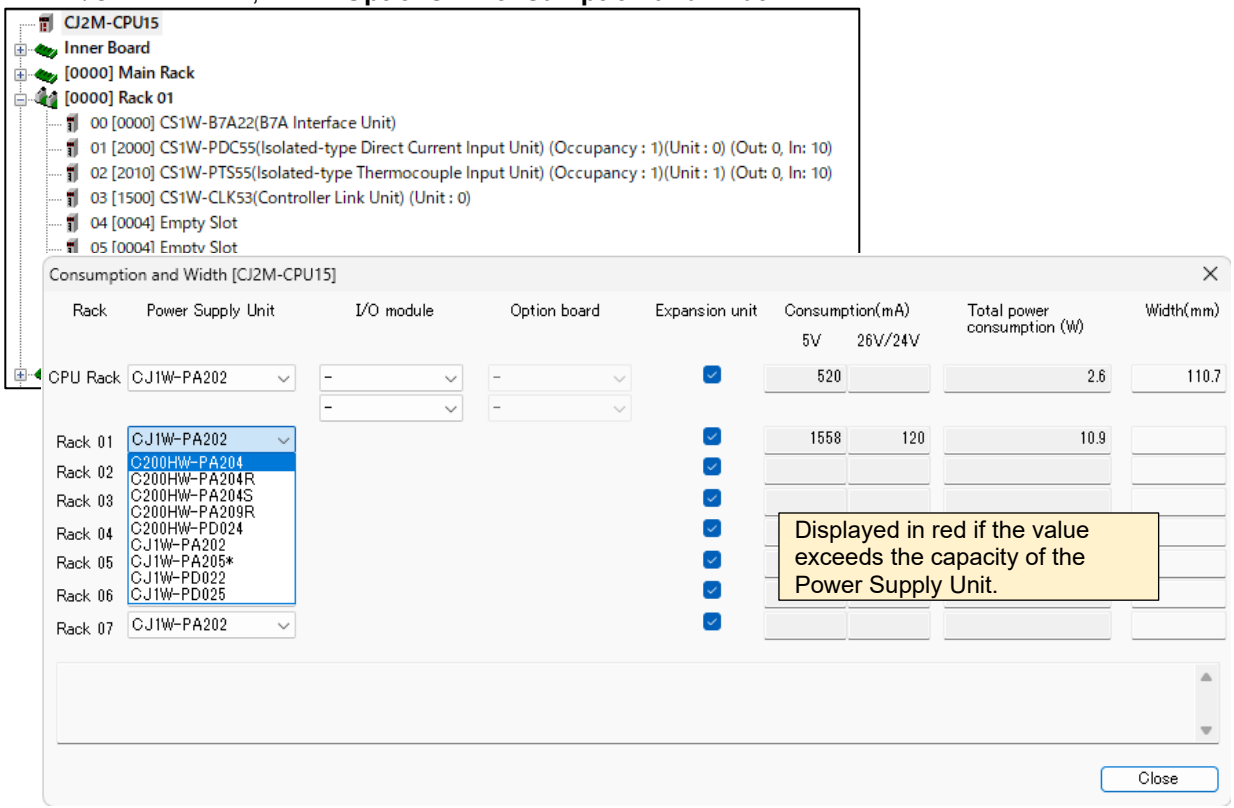


3.2.4 A CJ1W Power Supply and a C200HW Power Supply for CS1 Can Be Selected

In the Consumption and Width window, it is possible to select a CJ1W power supply and a C200HW power supply for CS1 to check if the total power consumption exceeds the capacity of the Power Supply Unit.

Example: The window allowing checking the current consumption for the CJ CPU Unit configuration

In the I/O table menu, select **Options** – **Consumption and Width**.



3.3 Restrictions on Data Created with CS/CJ Series Expansion Interconnection Enabled

For the data created in CX-One with CS/CJ Series Expansion Interconnection enabled, there are some restrictions when using it in an environment with CS/CJ Series Expansion Interconnection disabled.

■ Previous CX-One incompatible with CS/CJ Series Expansion Interconnection
Below are the restrictions. Update CX-One and then enable CS/CJ-Series Expansion Interconnection before use.

(1) CS/CJ-Series Expansion Interconnection cannot be enabled.
CS/CJ-Series Expansion Interconnection cannot be used although the Support Software may show it enabled.

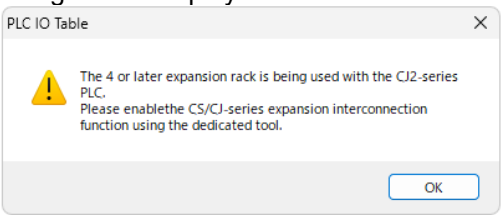
(2) For the system with more than four Expansion Racks connected with CJ2 CPU Unit, when the I/O table is downloaded from the PLC to a computer, Rack 5 and subsequent Expansion Racks will not be displayed in the I/O Table window.
- They are invisible but their data are maintained. Therefore, when the data is transferred from a computer back to the PLC, the data of Rack 5 and subsequent Expansion Racks will be transferred to the CJ2 CPU Unit.
- Rack 5 and subsequent Expansion Racks are invisible, so it is not possible to add, modify, or delete them or view or edit the Special Unit Setup.

■ CS/CJ Series Expansion Interconnection supported but not enabled in CX-One

Below are the restrictions. Enable CS/CJ-Series Expansion Interconnection before use.

(1) For the system with more than four Expansion Racks connected with CJ2 CPU Unit, when the I/O table is downloaded from the PLC to a computer, the message below will appear and Rack 5 and subsequent Expansion Racks will not be displayed in the I/O Table window.
- They are invisible but their data are maintained. Therefore, when the data is transferred from a computer back to the PLC, the data of Rack 5 and subsequent Expansion Racks will be transferred to the CJ2 CPU Unit.
- Rack 5 and subsequent Expansion Racks are invisible, so it is not possible to add, modify, or delete them or view or edit the Special Unit Setup.

Message to be displayed



The message above will appear at the time of the following.
- When the data including the I/O table is retrieved from the PLC while CX-programmer is connected with the Auto Online function.
- When a project file, etc., containing the relevant I/O table information is opened in applications such as CX-Programmer
- When the I/O Table window is opened in any application
- When the relevant I/O table information is retrieved from the PLC

4 Enabling CS/CJ Series Expansion Interconnection

CS/CJ-Series Expansion Interconnection cannot be used with CX-One remaining in the default state. Enable it with the Support Software before use.

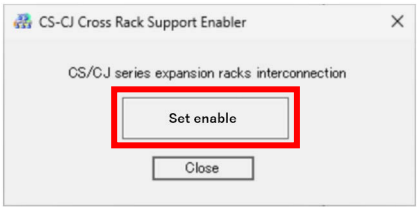
How to enable

(1) Download [CsCJCrossRackSupportEnable.exe] from the Sysmac Studio/CX-One Utility download page. (URL : https://www.fa.omron.co.jp/product/tool/26/cxone-utility/index.html)

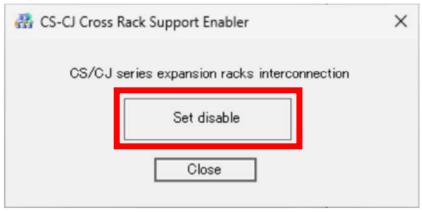
(2) Double-click *CsCJCrossRackSupportEnable.exe* to start it.

(3) Click **Set enable** to enable CS/CJ Series Expansion Interconnection.

Before enabling
Press **Set enable** to enable the function.

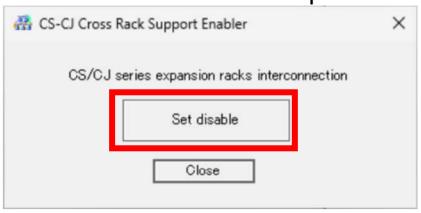


After enabling
(The button changes to **Set disable**.)



Reference

- Once the function is enabled, the status will be retained after CX-One is upgraded.
- To disable CS/CJ-Series Expansion Interconnection, click **Set disable**.



5 Migration: Connecting a CJ-series Expansion Rack to the CS System

5.1 Migration Workflow

Replace CS1W Special I/O Units and a CS1W CPU Bus Unit constituting the CS-series system with CJ1W Units as shown in the workflow below.
Enable CS/CJ-Series Expansion Interconnection before the work.

Before migration

Designing the System Configuration	Decide which existing CS-series Units should be replaced with CJ1W, and design the configuration.
Reading the Data from the Existing System	Read the programs, I/O table, and Special Unit Setup/data from the existing CS-series Units.

Migration of the system configuration and settings (offline)

Modifying the System Configuration	Modify the I/O table of the read project data and replace the CS1W Units with CJ1W Units.
Migrating the Special Unit Setup	Configure the Special Unit Setup of the replacement CJ1W Units.
Modifying the Basic I/O Words	To change the order of the Basic I/O Units, modify the word of each rack in Rack Start Addresses Settings.
Modifying the Programs/ PLC System Settings	Modify the programs as necessary.

Migration of the actual configuration and test run

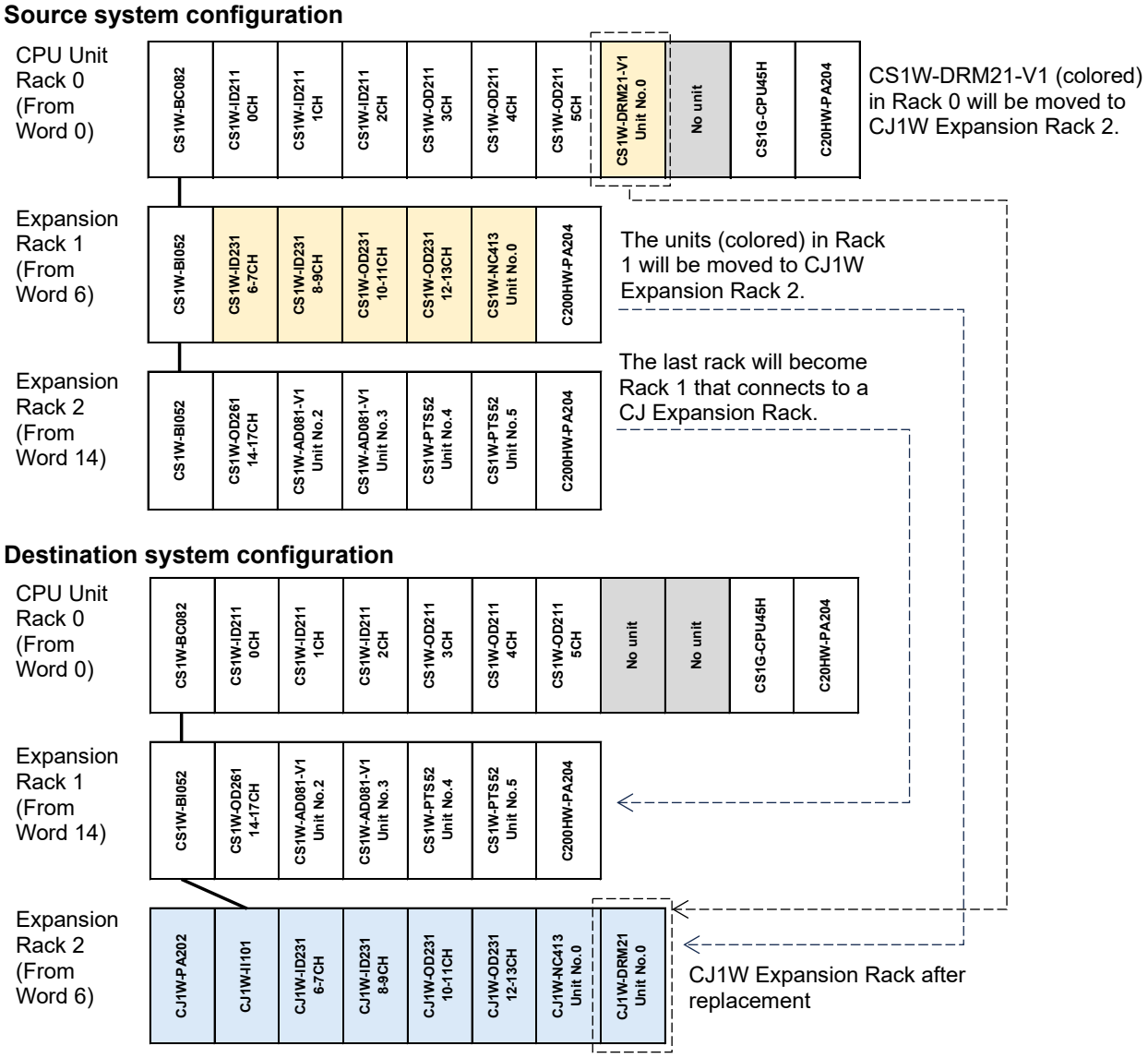
Modifying the System Configuration	Change the units according to the set I/O table.
Configuring and Wiring the Hardware	Configure and wire the DIP switches, etc. of the replacement CJ1W Units.
Transferring the Data	Transfer the modified project data. Transfer the data configured using the Special Unit Support Software, if any, at the same time.
Checking the Operation	Check the operation of the modified system.

5.2 Migration Procedure

The procedure assumes that in the CS system environment, CS1W Units discontinued earlier than planned are replaced with CJ1W Units to continue to use the CS system.

5.2.1 Designing the System Configuration

CS1W-DRM21-V1 (unit number 0) and CS1W-NC413 (unit number 0) are replaced with CJ1W Units. At the same time, the Basic I/O Units in Rack 1 are replaced with CJ1W Units.
Program modification can be minimized by using Rack Start Addresses Settings.



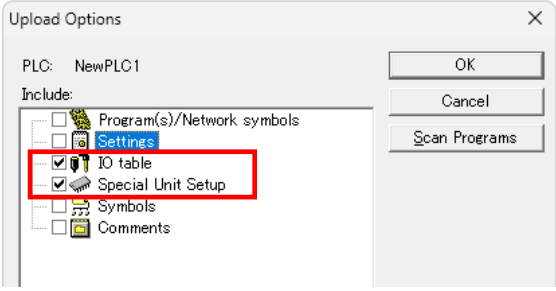
(1) Relocate the Expansion Racks.
From CS1W Rack 1 to CJ1W Rack 2
From CS1W Rack 2 to CS1W Rack 1

(2) Change the first word of the rack.
Expansion Rack 1: From Word 6 to Word 14
Expansion Rack 2: From Word 14 to Word 6

5.2.2 Reading the Data from the Existing System

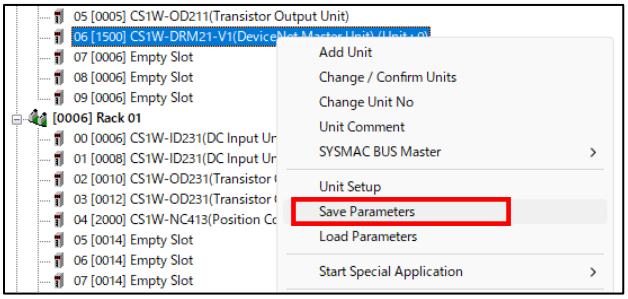
Read the programs, I/O table, and Special Unit Setup/data from the source CS-series Units.

(1) Connect CX-Programmer and select *PLC – Transfer –From PLC* to read the I/O table and Special Unit Setup.



Check *IO table* and *Special Unit Setup*.

(2) In the I/O Table window, save the settings of the Special Units (CS1W-NC413 and -DRM21-V1) to be replaced with CJ1W.
Right-click and select *Save Parameters*.



(3) If using the Special Unit Support Software to make the settings, read the data with the Support Software and save it as necessary.

- When using CX-Position to make the settings, use CX-Position to read the data from CS1W-NC413.
- When using CX-Integrator to make the settings, use CX-Integrator to read the data from CS1W-DRM21-V1.

5.2.3 Modifying the System Configuration

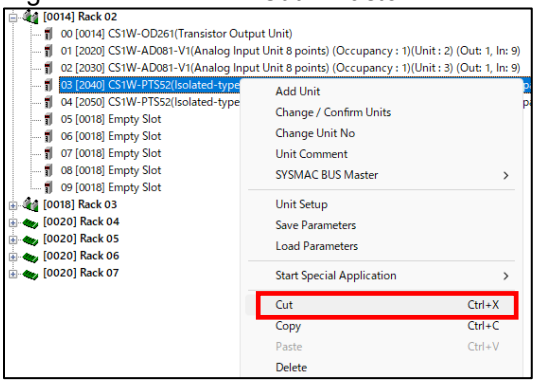
Modify the I/O table according to the destination system configuration.

Procedure

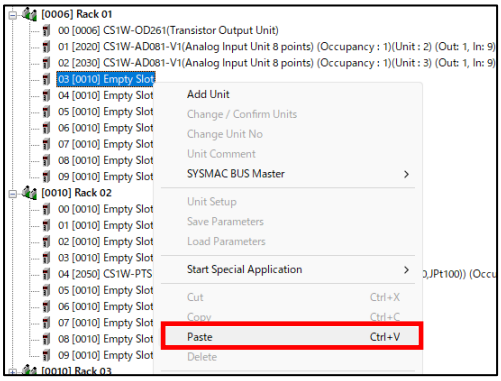
(1) From Rack 0, remove CS1W-DRM21-V1 to be replaced with CJ1W.

(2) From Rack 1, remove all units since they are to be replaced with CJ1W.

(3) Move the units in Rack 2 to Rack 1.
Right-click and select *Cut* – *Paste* to move them.



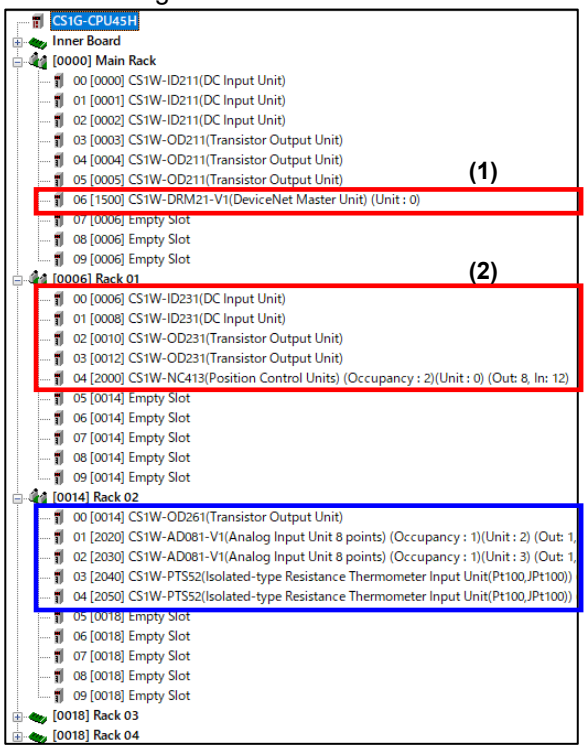
>



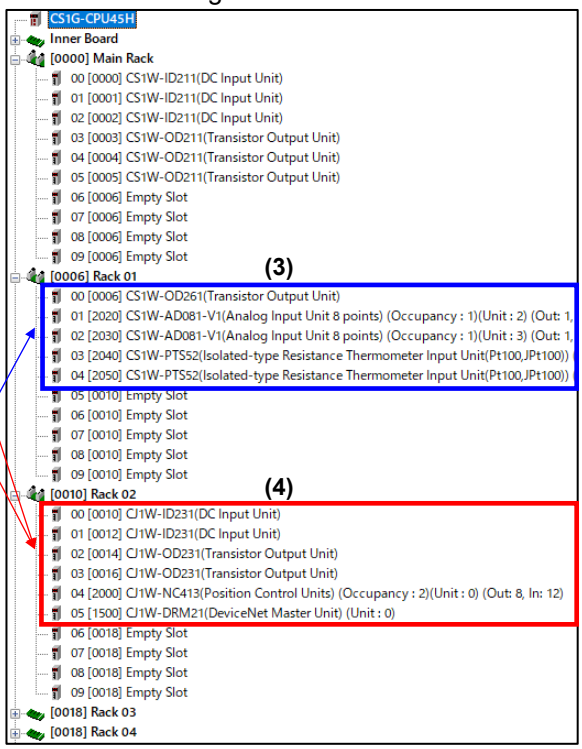
*Use the same unit numbers of the Special Units as the original ones.

(4) Add CJ1W Units to Rack 3.

Source configuration



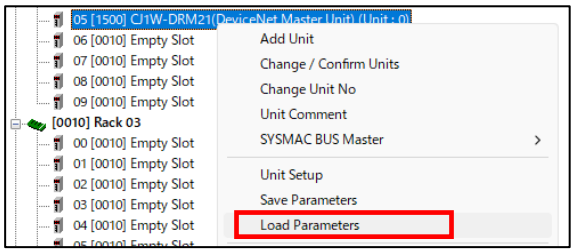
Destination configuration



5.2.4 Migrating the Special Unit Setup

Migrate the Special Unit Setup and the setting data of the Special Unit Support Software.

■ Migrate the Special Unit Setup.
In the I/O Table window, read the CS1W Special Unit Setup of CS1W-NC413 and CS1W-DRM21-V1 saved in 5.2.2 (2) to CJ1W.
Right-click and select *Load Parameters*.

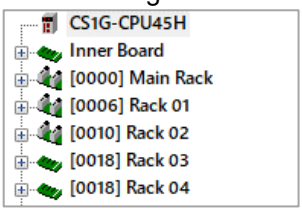


■ Modify the setting data configured using the Special Unit Support Software, if any, to adjust it to the CJ1W Units.

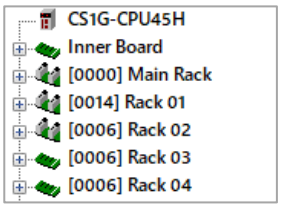
5.2.5 Modifying the Basic I/O Words (Modifying the First Word of the Rack)

The words of the Basic I/O Units change when the units are replaced. Therefore, use Rack Start Addresses Settings to set the first word of each rack. Setting the Rack Start Addresses Settings eliminates the need for program modification (basic I/O words modification).

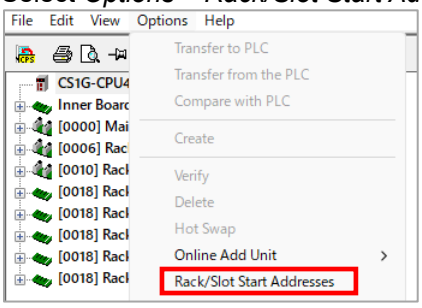
Source configuration



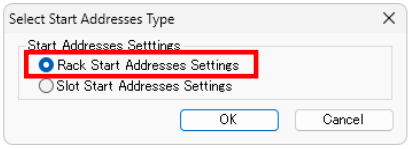
Destination configuration



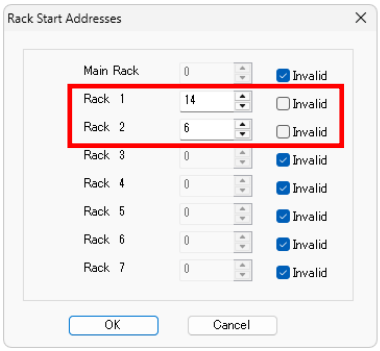
(1) Select *Options – Rack/Slot Start Addresses*.



>



(2) Uncheck *Invalid* for Racks 1 and 2 and set the first word.



5.2.6 Modifying the Programs/PLC System Settings

In this example, this step is skipped because the following items are unchanged.
Make sure that the unit settings and word numbers are correct in the destination configuration.

- Unit numbers of the Special I/O Units
- Unit numbers of the CPU Bus Units
- Word numbers of the Basic I/O Units

5.2.7 Modifying the System Configuration

Update the actual system configuration according to the set I/O table.

5.2.8 Configuring and Wiring the Hardware

Update the settings and wiring of the actual system configuration.

(1) CJ1W-DRM21
Set the same unit number and DIP switch setting as those of CS1W-DRM21-V1.
The original DeviceNet connector can be used.

(2) CJ1W-NC413
Set the same unit number as that of CS1W-NC413.
The connector differs between CJ1W-NC413 and CS1W-NC413. Use CJ1W-CM213-NC, a terminal block conversion cable.

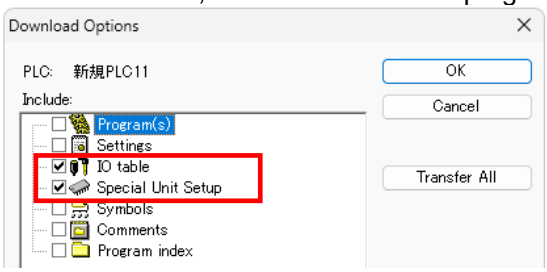
(3) CJ1W-ID231 and CJ1W-OD231
The connector is common to CS1W and CJ1W, so the original one can be used.

Terminal block conversion adapters and conversion cables are available for other models.
Refer to the *Replace Guide From CS1G/H to CJ3/CJ2* (Cat No. P164).

5.2.9 Transferring the Data

Transfer the modified I/O table to the CPU Unit, and the modified Special Unit Setup to the Special Unit.
Transfer the modified setting data of the Special Unit Support Software to the CJ1W Units as necessary.

(1) Transfer the I/O table and Special Unit Setup to the CPU Unit.
At the same time, transfer the modified programs and the PLC system settings, if any.



(2) Transfer the data of the Special Unit Support Software to the CJ1W Units.

5.2.10 Checking the Operation

After completing the migration, turn the power on to check the operation and perform a test run.

Precautions for Safe Use

After replacement, make sure that the set user programs and the unit parameters have been transferred and set successfully. With wrong wiring or settings, the system may malfunction.
Check the operation thoroughly before proceeding to full operation.

6 Migration: Connecting a CS-series Expansion Rack to the CJ System

6.1 Migration Workflow

Replace the CS-series system with the CJ-series system while continuing to use some CS1W Special I/O Units and a CS1W CPU Bus Unit as shown in the workflow below.
Enable CS/CJ-Series Expansion Interconnection before the work.

Before migration

Designing the System Configuration	Decide which existing CS-series Units should be replaced with CJ-series Units, and design the configuration.
Reading the Data from the Existing System	Read the programs, I/O table, and Special Unit Setup/Special Unit Support Software data from the existing CS-series Units.

Migration of the system configuration and settings (offline)

Creating the System Configuration	Create a new system configuration containing a CJ3/CJ2 CPU Unit.
Migrating the Special Unit Setup	Configure the Special Unit Setup of the replacement CJ1W Units.
Modifying the Basic I/O Words	To change the order of the Basic I/O Units, modify the word of each rack in Rack Start Addresses Settings.
Modifying the Programs/ PLC System Settings	Modify the programs as necessary.

Migration of the actual configuration and test run

Building the System Configuration	Build the system according to the set I/O table.
Configuring and Wiring the Hardware	Configure and wire the DIP switches, etc. of the replacement CJ1W Units.
Transferring the Data	Transfer the modified project data. Transfer the data configured using the Special Unit Support Software, if any, at the same time.
Checking the Operation	Check the operation of the modified system.

6.2 Migration Procedure

The procedure assumes Phase 1 of the phased replacement of the system configuration as shown below.

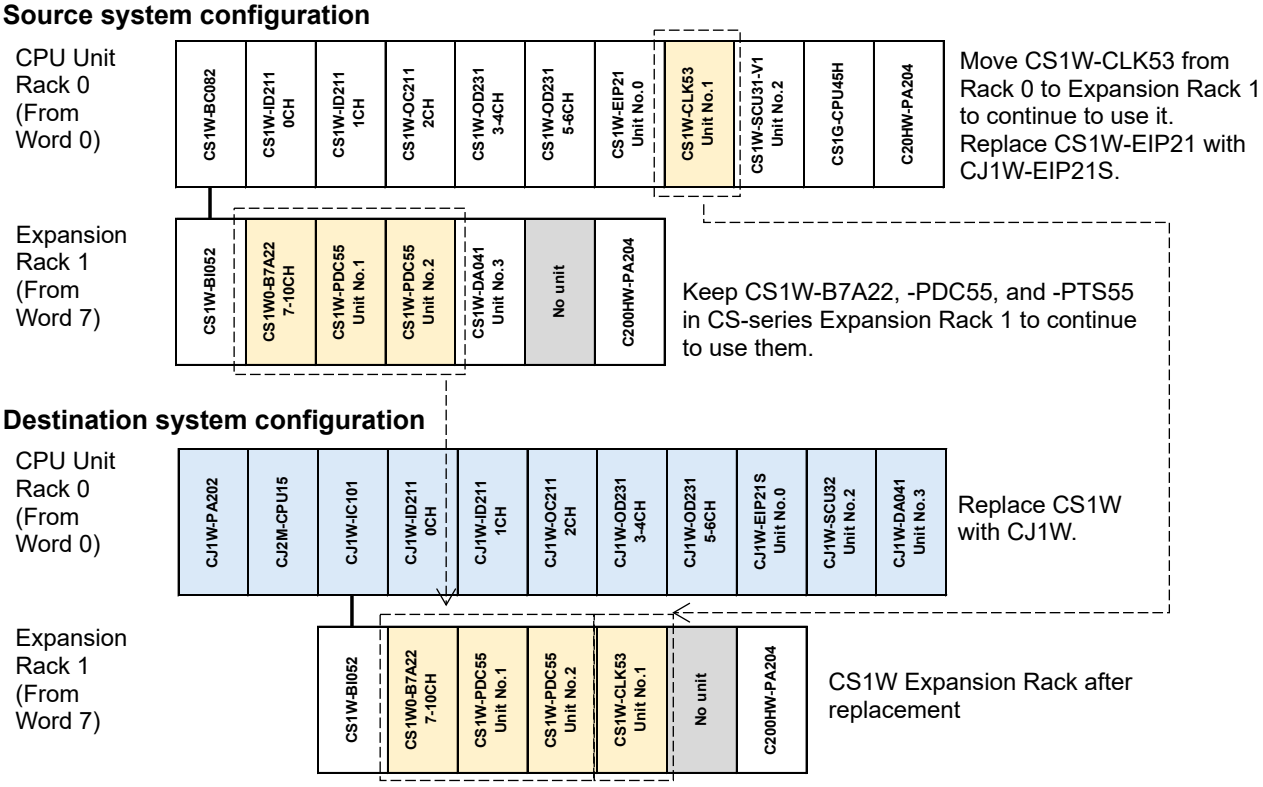
Phase 1: Replace the base system with CJ1W. Continue to use the CS1W Units that require a design change for replacement.

Phase 2: Replace the remaining CS1W Units with the CJ1W Units.

6.2.1 Designing the System Configuration

Replace the units with CJ1W Units, except CS1W-CLK53, CS1W-B7A22, CS1W-PDC55, and CS1W-PTS55.

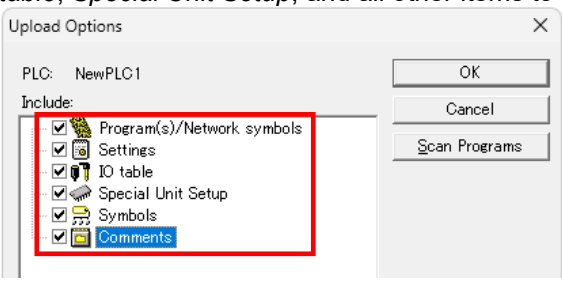
Source system configuration



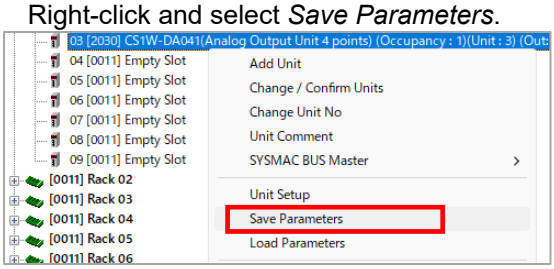
6.2.2 Reading the Data from the Existing System

Read the programs, I/O table, and Special Unit Setup/data from the source CS-series Units.

(1) Connect CX-Programmer and select *PLC – Transfer –From PLC*. Check *Program(s)*, *Settings*, *IO table*, *Special Unit Setup*, and all other items to read them.



(2) In the I/O Table window, save the settings of all the CS1W Special Units.
Right-click and select *Save Parameters*.



(3) If using the Special Unit Support Software to make the settings, read the data with the Support Software and save it as necessary.

■ Special Units to be replaced with CJ1W

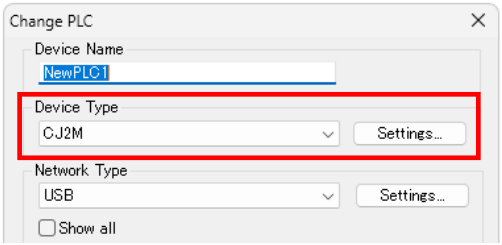
- CS1W-EIP21
  For how to replace CS1W-EIP21 with CJ1W-EIP21S, refer to the *Replacement Guide From EtherNet/IP and Ethernet Units to Enhanced Security Units* (Cat No. P152).

- When using CX-Protocol to make the settings, use CX-Protocol to read the settings from CS1W-SCU31-V1.

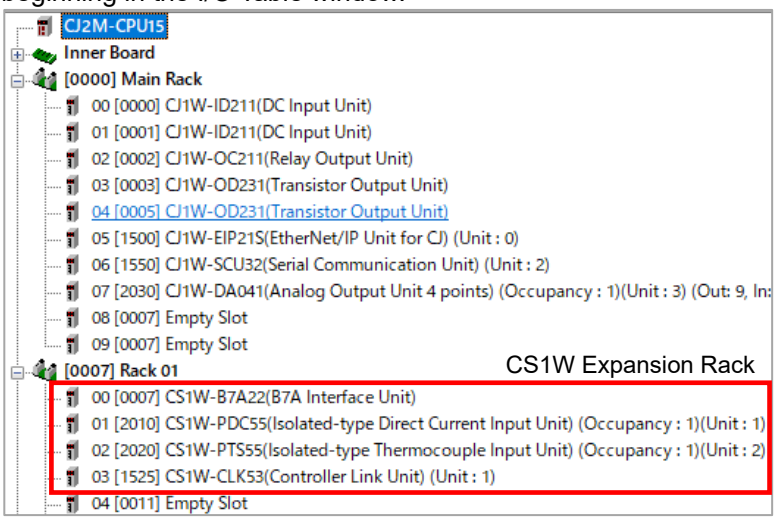
■ CS1W Special Units that continue to be used
Reading the data is not necessary since they are not replaced.

6.2.3 Creating the System Configuration

In the read project, change the CPU Unit from CS1G-CPU45H to CJ2M-CPU15.
Right-click *PLC* and select *Change*.



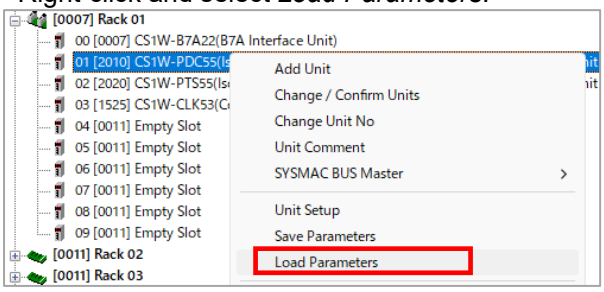
Changing the CPU Unit clears the I/O table completely. Register all the CJ1W and CS1W Units from the beginning in the I/O Table window.



6.2.4 Migrating the Special Unit Setup

Migrate the Special Unit Setup and the setting data of the Special Unit Support Software.

■ Migrate the Special Unit Setup.
In the I/O Table window, read all the Special Unit Setup saved in 6.2.2 (2).
Right-click and select *Load Parameters*.



■ Modify the setting data configured using the Special Unit Support Software, if any, to adjust it to the CJ1W Units.

6.2.5 Modifying the Basic I/O Words (Modifying the First Word of the Rack)

In this example, this step is skipped because the word numbers of the Basic I/O Units are unchanged.
Make sure that the word numbers of the Basic I/O Units are unchanged.

6.2.6 Migrating the Programs and PLC System Settings

- Modifying the programs
  Change the programs of CS1 CPU Unit by changing the model to CJ2 CPU Unit.
  Correct the programs if an error occurs in changing CS1 CPU Unit to CJ2 CPU Unit. Make sure that the unit numbers of the Special I/O Units, the unit number of the CPU Bus Unit, and the word numbers of the Basic I/O Units are unchanged to ensure that the word allocation remains the same.

- Modifying the PLC system settings
  The PLC system settings are cleared when the CPU Unit is changed. Set the PLC system settings on CJ2M-CPU15 based on those of CS1H-CPU45H.

For how to migrate the programs and PLC system settings, refer to the *Replace Guide From CS1G/H to CJ2* (Cat No. P164).

6.2.7 Modifying the System Configuration

Update the actual system configuration according to the set I/O table.
*The I/O table must be transferred since it is required to connect CS1W Units to the CJ3/CJ2 CPU Unit.

6.2.8 Modifying the Hardware Settings

Update the settings and wiring of the actual system configuration.

(1) CJ1W-EIP21S
Set the same unit number and node address as those of CS1W-EIP21.
The same Ethernet RJ45 connector can be used.

(2) CJ1W-SCU32
Set the same unit number and terminating resistance switch setting as those of CS1W-SCU31-V1.
Change the wiring since the interface connector is changed when CS1W-SCU31-V1 is replaced with CJ1W-SCU32.

(3) CJ1W-DA041
CS1W-DA041 and CJ1W-DA041 differ in the terminal block. Use CJ1W-AT641, a terminal block conversion adapter.

(4) CJ1W-ID211/OD211
CS1W-ID211/OD211 and CJ1W-ID211/OD211 differ in the terminal block.
Use CJ1W-AT611/AT612, a terminal block conversion adapter.

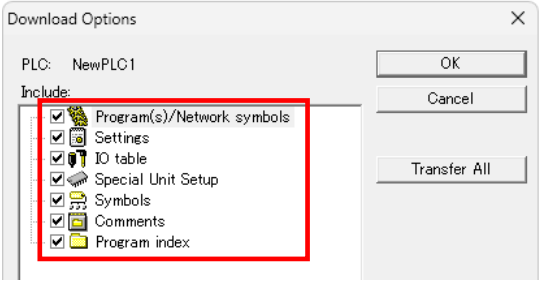
(5) CJ1W-OD231
The connector is common to CS1W and CJ1W, so the original one can be used.

CS I/O terminal block conversion adapters and conversion cables are available for other models.
For details, refer to the *Replace Guide From CS1G/H to CJ2* (Cat No. P164).

6.2.9 Transferring the Data

Transfer the modified programs, PLC system settings, I/O table, and Special Unit Setup to the CJ2 CPU Unit. Transfer the modified setting data of the Special Unit Support Software to the CJ1W Units as necessary.

(1) Check all the items to transfer them to the CJ2 CPU Unit.



(2) Transfer the data of the Special Unit Support Software to the CJ1W Units as necessary.
Do not change the data of CS1W Units. Just make sure that their settings are retained correctly.

6.2.10 Checking the Operation

After completing the migration, turn the power on to check the operation and perform a test run.

Precautions for Safe Use

After replacement, make sure that the set user programs and the unit parameters have been transferred and set successfully. With wrong wiring or settings, the system may malfunction.
Check the operation thoroughly before proceeding to full operation.

7 Related Settings and CIO Areas

7.1 CS1 CPU Unit

7.1.1 PLC System Settings

No change in the PLC system settings of the CS1 CPU Unit.

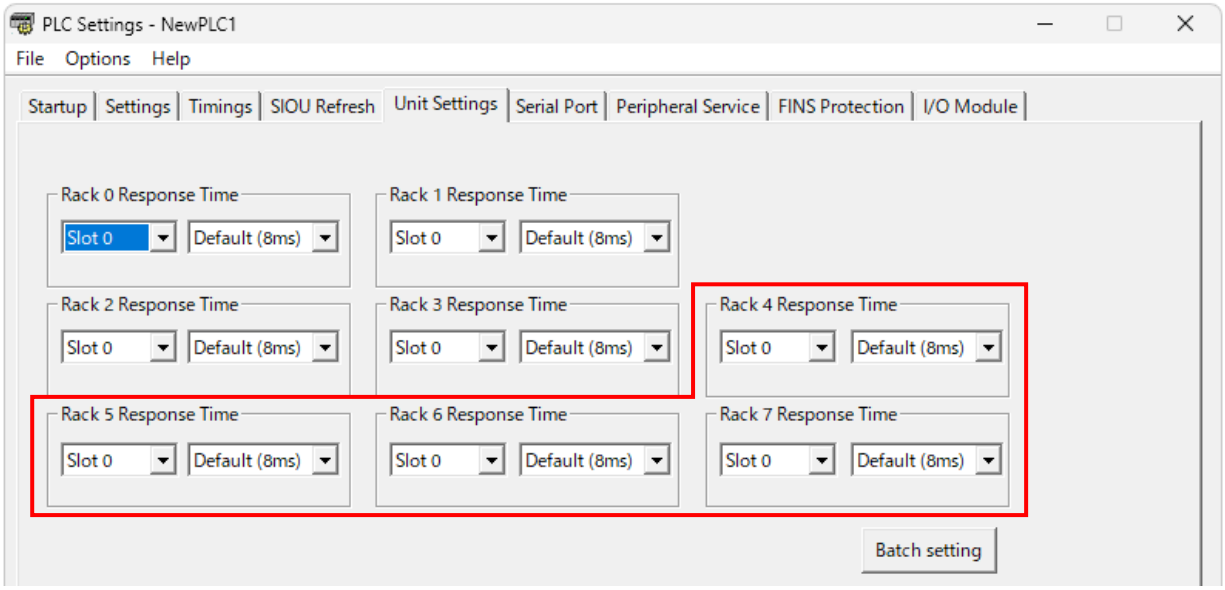
7.1.2 I/O Memory

No change in the I/O memory of the CS1 CPU Unit.

7.2 CJ3/CJ2 CPU Unit

7.2.1 PLC System Settings

■ Input response time of Basic I/O Units
As the Expansion Racks increase with CJ2 CPU Unit, the setting is activated for Racks 4 to 7.



7.2.2 I/O Memory

As the Expansion Racks increase, the ranges of some auxiliary areas are changed.

■ Auxiliary area **bold blue text** shows the differences from CJ2 CPU Unit when the setting is activated)

Address	Name	Description	When the operation mode is changed	When powered on	Timing of change/ Related area
A50 to **A89**	Basic I/O Unit information (Rack 0, Slot 0 to **Rack 7, Slot 9**)	These show the alarm output of Basic I/O Units (with load short-circuit protection). For CJ1W-OD202, the least four significant bits are used (2 points per bit). For CJ1W-OD212, -OD204, and -MD232, the least significant bit, and for CJ1W-OD232, the least two significant bits are used (per common). 1: With load short-circuit 0: Without load short-circuit	-	-	Every cycle

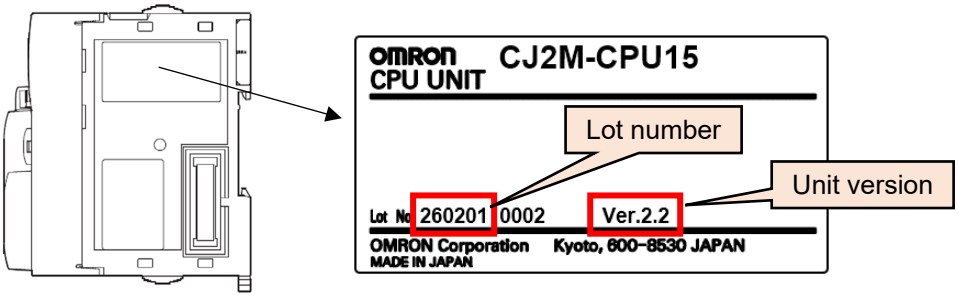
Address		Name	Description	When the operation mode is changed	When powered on	Timing of change/ Related area
A220 to **A259**		I/O response time of Basic I/O Unit	The actual I/O response time of the Basic I/O Units at the time is read and stored here. Below are the A220 to **259** values and the corresponding input response time of Basic I/O Units. 00 hex: 8 ms (Default) 10 hex: 0 ms (No filter) 11 hex: 0.5 ms 12 hex: 1 ms 13 hex: 2 ms 14 hex: 4 ms 15 hex: 8 ms 16 hex: 16 ms 17 hex: 32 ms Below is the correspondence between Words A220 to **259** and the rack and slot numbers. A220.00 to A220.07: Rack 0, Slot 0 A220.08 to A220.15: Rack 0, Slot 1 A221.00 to A221.07: Rack 0, Slot 2 ... A224.00 to A224.07: Rack 0, Slot 8 A224.08 to A224.15: Rack 0, Slot 9 In the same way, the following words correspond to Racks 1 to **7**, Slots 0 to 9. A225 to A229: Rack 1, Slots 0 to 9 A230 to A234: Rack 2, Slots 0 to 9 A235 to A239: Rack 3, Slots 0 to 9 **A240 to A244: Rack 4, Slots 0 to 9** **A245 to A249: Rack 5, Slots 0 to 9** **A250 to A254: Rack 6, Slots 0 to 9** **A255 to A259: Rack 7, Slots 0 to 9**	Retained	See the descripti on field.	PLC system settings, “I/O response time of Basic I/O Unit”
A336 to **A337**		Number of units recognized when powered on **(Racks 0 to 7)**	The number of Units detected on each Rack is stored in 1-digit hexadecimal (0 to A hex).Rack 0: A336.00 to A336.03 Rack 1: A336.04 to A336.07 Rack 2: A336.08 to A336.11 Rack 3: A336.12 to A336.15 **Rack 4: A337.00 to A337.03** **Rack 5: A337.04 to A337.07** **Rack 6: A337.08 to A337.11** **Rack 7: A337.12 to A337.15**	Retained	Cleared	-
A404	A404.00 to A404.07	Slot number with I/O bus error	Slot numbers (00 to 09) with an I/O bus error are stored in binary. 00 to 09 hex (Slots 0 to 9)			
	A404.08 to A404.15	Rack number with I/O bus error	Rack numbers (00 to **07**) with an I/O bus error are stored in binary.	Cleared	Cleared	A401.14
A407	A407.00 to A407.12	Detailed information on Too Many I/O Points 1	If any of the following values causes an excessive or duplicated value error, the value is stored in binary. For error causes, refer to *Detailed information on Too Many I/O Points 2* (A407, Bits 13 to 15). 1. The number of the I/O points when the total number of I/O points (excluding polled remote I/O nodes) set in the registered I/O table exceeds the maximum number (**5120**) specified for the CPU Unit 2. The number of interrupt input points when it exceeds 32 points 3. The number of connected Expansion Racks when it exceeds the limit (**8 or more**)	Cleared	Cleared	A401.11 A407.13 to A407.15

Address		Name	Description	When the operation mode is changed	When powered on	Timing of change/ Related area
A407	A407.13 to A407.15	Detailed information on Too Many I/O Points 2	The cause of the Too Many I/O Points error is stored in three bits. Below are the meanings of the data stored in Bits 0 to 12 of A407. 000: Total number of I/O points exceeded 001: Number of interrupt input points exceeded 100: Number of connected Pulse I/O Blocks exceeded 101: Number of connectable Expansion Racks exceeded 111: Number of units in a rack exceeded	Cleared	Cleared	A407.13 to A407.15
A408	A408.00 to A408.07	Slot number with Basic I/O Unit error	If a Basic I/O Unit error has occurred (A402.12 has become ON), the slot number with the error is stored in binary. 00 to 09 hex (Slots 0 to 9)	Cleared	Cleared	A402.12
	A408.08 to A408.15	Rack number with Basic I/O Unit error	If a Basic I/O Unit error has occurred (A402.12 has become ON), the rack number containing the error unit is stored in binary. **00 to 07 hex (Racks 0 to 7)**	Cleared	Cleared	A402.12
A409	A409.00 to A409.03	Flag of conflicting Expansion Rack number	When setting the first words of Expansion Racks with CX-Programmer, if word allocations conflict or the first word of each rack is set to 0901 or larger, the rack number becomes 1 (ON). **Bits 00 to 03: corresponding to Racks 0 to 7** 1: Conflicting word allocations between racks, or a too large first word of the rack 0: Normal	Cleared	Cleared	-

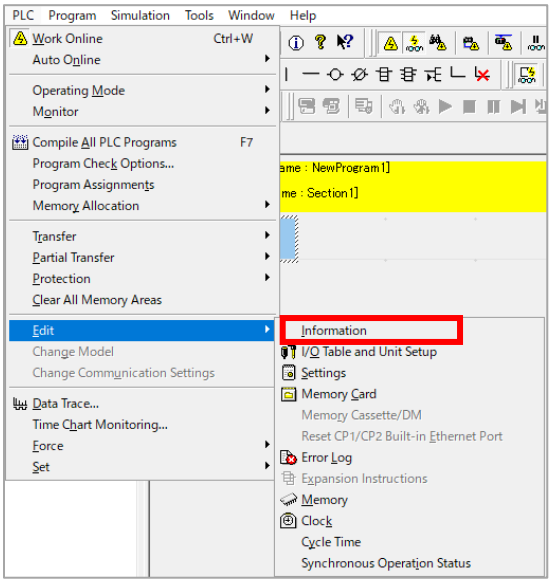
Appendix

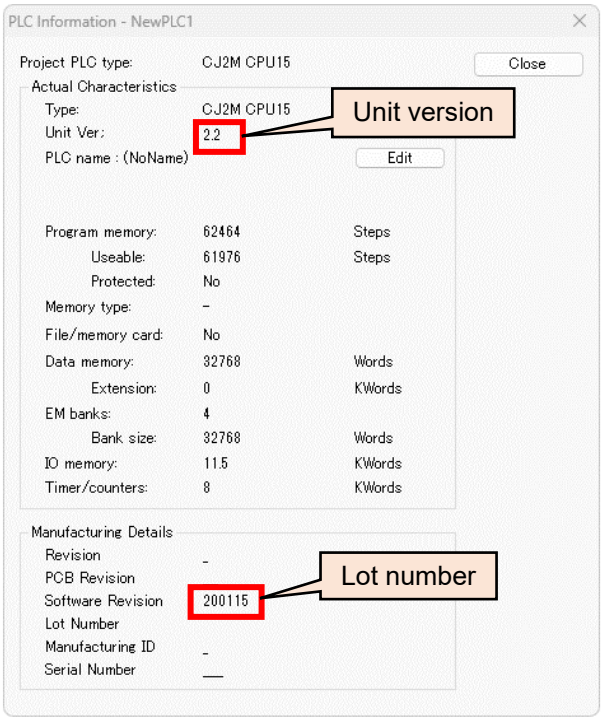
Appendix 1 Checking the Version and Lot Number

(1) Checking with the product label
Check the information with the nameplate on the side of the product.
The lot number is in the format of “YYMMDD” (e.g., “260201” means February 1, 2026).



(2) Checking with the CX-Programmer
Connect CX-Programmer and the CPU Unit to the network and select **Edit** – **Information** from the **PLC** menu.





Note: Do not use this document to operate the Unit.

OMRON Corporation **Industrial Automation Company**

Kyoto, JAPAN **Contact : www.ia.omron.com**

Regional Headquarters

OMRON EUROPE B.V.
Wegalaan 67-69, 2132 JD Hoofddorp
The Netherlands
Tel: (31) 2356-81-300 Fax: (31) 2356-81-388

OMRON ELECTRONICS LLC
2895 Greenspoint Parkway, Suite 200 Hoffman Estates,
IL 60169 U.S.A.
Tel: (1) 847-843-7900 Fax: (1) 847-843-7787

OMRON ASIA PACIFIC PTE. LTD.
438B Alexandra Road, #08-01/02 Alexandra
Technopark, Singapore 119968
Tel: (65) 6835-3011 Fax: (65) 6835-3011

OMRON INDUSTRIAL AUTOMATION (CHINA) CO., LTD.
19th Floor, Tower 2, Shanghai Landmark Center,
No. 88 North Sichuan Road,
Hongkou District, Shanghai, 200085, China
Tel: (86) 21-6023-0333

Authorized Distributor:

©OMRON Corporation 2025-2026 All Rights Reserved.
In the interest of product improvement,
specifications are subject to change without notice.

Cat. No. P172-E1-02 0926 (1225)