

Programmable Controller CJ-series

Replace Guide From CJ2M to CJ3M

CJ3M-CPU□□

CJ2M-CPU□□

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Replace
Guide

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Table of Contents

1	Replacement Flow	3
2	Main specification differences between CJ2M and CJ3M.....	4
2.1	Changes in Specifications Between CJ2M and CJ3M.....	4
2.1.1	Changes in CPU Function Specifications.....	4
2.1.2	Changes in EtherNet/IP Function Specifications.....	5
2.2	Comparison of External Interfaces.....	6
2.3	Details of Specification/Function Changes.....	8
2.3.1	Memory Card.....	8
2.3.2	Specifications for Battery Backup.....	8
2.3.3	CPU Unit Model Representation in FINS0501 Response Data	9
3	Selection of Replacement Models	10
3.1	Selection Flow for Replacement Models.....	10
3.2	Details of Replacement Model Selection.....	11
3.2.1	Selection of CPU Unit.....	11
3.2.2	Selection of Battery.....	11
3.2.3	Selection of Memory Card.....	11
3.2.4	Option Board Replacement.....	12
3.2.5	Review of Power Supply Unit.....	12
4	Hardware Settings, Installation, and Wiring.....	14
4.1	Hardware Setting.....	14
4.2	Installation.....	15
4.3	Wiring.....	15
5	Migration of User Programs/Settings	16
5.1	How to Migrate Programs and Settings	16
5.2	Migration by Project File	17
5.2.1	Prepare File for CJ2M CPU Unit.....	18
5.2.2	Read Data from CJ2M CPU Unit.....	18
5.2.3	Convert for CJ3M CPU Unit.....	20
5.2.4	Check Program.....	22
5.2.5	Transfer to CJ3M CPU Unit.....	23
5.3	Migration by Simple Backup/Restore	25
5.3.1	Read Data from CJ2M CPU Unit.....	25
5.3.2	Transfer Data to Memory Card for CJ3M CPU Unit.....	25
5.3.3	Writing Data to CJ3M CPU Unit.....	26
5.3.4	Limitations of Simple Backup/Restore	26
6	Operation Check and Trial Run.....	27
	Appendices.....	28
A-1	Comparison of CJ2M and CJ3M Specifications	28
A-1-1	General Specifications	28
A-1-2	Performance Specifications.....	28

Related Manuals

The manuals related to this document are as follows.

To ensure safe operation of the system, be sure to obtain and review the manuals and instruction sheets for all equipment and devices that make up the system, including the sections on "Safety Precautions" and "Precautions for Safe Use", before using the system.

Manual Name	Manual No.	Model
CJ Series CJ3 CPU Unit User's Manual (Hardware)	W664	CJ3M-CPU□□
CJ Series CJ2 CPU Unit User's Manual (Hardware)	W472	CJ2H-CPU6□-EIP CJ2H-CPU6□ CJ2M-CPU□□
CJ Series CJ2/CJ3 CPU Unit User's Manual (Software)	W473	CJ3M-CPU□□ CJ2H-CPU6□-EIP CJ2H-CPU6□ CJ2M-CPU□□
CS/CJ Series EtherNet/IP Units User's Manual	W465	CS1W-EIP21/EIP21S CJ1W-EIP21/SIP21S CJ3M-CPU□□ CJ2H-CPU6□-EIP CJ2M-CPU□□
CX-Programmer Operation Manual	W469	CXONE-AL□□D-V4

1 Replacement Flow

This procedure describes the replacement of CJ2M CPU Units with CJ3M CPU Units.

- ① This flow shows the preparation tasks required before replacement.

	Description	Reference
Pre-replacement		
Model selection	Select the required unit, tools, and tool connection cable for replacing the CJ2M you are using with a CJ3M. Refer to the applicable specifications and notes when selecting the models.	“2 Main Specification Differences Between CJ2M and CJ3M” “3. Selection of Replacement Models”
Unit procurement	Procure the selected units and peripheral devices.	
Data readout	Read out the program, I/O memory and setting data from the CJ2M CPU Unit using CX-Programmer.	“5. Migration of User Programs/Settings”
Data conversion and modification	Convert the readout data for using with the CJ3M CPU Unit. Most program data can be converted automatically; however, some setting and configurations require modification. Migration work may also be required because the specifications of the built-in EtherNet/IP function differ between the CJ2M and CJ3M CPU Units.	
To the actual		

- ② Replacement Flow: This section describes the procedure for replacing a CJ2M with a CJ3M.

	Description	Reference
Unit replacement and Wiring	Replace each unit and perform hardware configuration and wiring. No changes to settings or wiring other than the CPU unit are necessary.	“4. Hardware Settings, Installation, and Wiring” Related Manuals *
Data writing	Data converted from the CJ2M (programs, I/O memory, and various setting data) is written to the CJ3M.	“5. Migration of User Programs/Settings”
Operation check	Turn on the power and confirm that it operates normally.	
Replacement		

* For instructions on how to install CJ series units and wire the units, refer to the following manuals.

- CJ3 CPU Unit User's Manual (Hardware) No. W664
- CJ2 CPU Unit User's Manual (Hardware) No. W472
- Refer to the user manuals for each special-purpose unit.



Precautions for Safe Use

After carrying out the replacement work, be sure to confirm operational safety by trial operation or other means before starting system operation. If the wiring or settings are incorrect, the system may malfunction. Changing from CJ2M to CJ3M may change the cycle time. When creating a program that depends on cycle time, check its operation after conversion. To make it the same as the CJ2M CPU unit, use the “constant cycle time function” in the PLC system settings.

2 Main specification differences between CJ2M and CJ3M

2.1 Changes in Specifications Between CJ2M and CJ3M

2.1.1 Changes in CPU Function Specifications

The main specification changes between the CJ2M CPU Unit and the CJ3M CPU Unit are as follows.

(Only specifications with changes are shown. For a comparison of all performance specifications and functional specifications, see “A-1: Comparison of CJ2M and CJ3M Specifications”.)

Item	CJ2M-CPU□□	CJ3M-CPU□□
Maximum number of I/O points	2,560 points	5,120 points
Maximum number of expansion racks	3 racks	7 racks
Maximum number of units	40 units Basic I/O units: 40 units Special I/O units: 40 units CPU Bus unit: CPU1□ 16 units CPU3□ 15 units	80 units Basic I/O units: 80 units Special I/O units: 80 units CPU Bus unit: CPU1□ 16 units CPU3□: 15 units
Number of CJ1W-EIP21S/EIP21 mountable units	CPU1□: 2 units CPU3□: 2 units	CPU1□: 8 units CPU3□: 7 units
Program capacity	CPU□1: 5k steps CPU□2: 10k steps CPU□3: 20k steps CPU□4: 30k steps CPU□5: 60k steps	CPU□1: 5k steps CPU□2: 10k steps CPU□3: 20k steps CPU□4: 50k steps CPU□5: 100k steps
FB program area	20k steps	40k steps
Number of EM banks	CPU1□/2□/3□: 1 bank CPU4□/5□: 4 banks	CPU1□/2□/3□: 1 bank CPU4□/5□: 10 banks
Maximum number of FB definitions /Maximum number of instances	CPU1□/2□/3□: 256/256 CPU4□/5□: 2048/2048	2048/2048
Number of registrable network symbols (tags)	2,000 max.	10,000 max.
Data trace memory capacity	8,000 words	220,000 words
Batteryless I/O memory backup function (*2)	None When the power is turned off, the I/O memory is backed up by a battery	Available When the power is turned off, backup of I/O memory does not require a battery (backed up by non-volatile memory)
Battery (*1, *2)	Built in at shipment (CJ1W-BAT01)	Not built in at shipment Sold separately (CJ1W-BAT01)
Clock (*2)	Built in	Built in
Internal capacitor backup retention time (*2)	5 minutes (when no battery is installed) Backs up I/O memory and the clock	10 days (when no battery is installed) Backs up the clock only
Peripheral USB port (*1)	Type-B connector	Type-C connector
Serial port (*1)	CPU1□: RS-232C CPU3□: CP1W option board	RS-232C port
Memory card (*2)	HMC-EF□□□	HMC-SD□□□ (SD memory card)
Power-on time (CPU standalone startup time ^{<A04>})	Approx. 2 seconds	CPU1□: Approx. 2 seconds CPU3□: Approx. 6 seconds
Current consumption	CPU1□: 5 VDC 0.5 A CPU3□: 5 VDC 0.7 A	CPU1□: 5 VDC 0.26A, 24V DC 0.003A CPU3□: 5 VDC 0.91A, 24V DC 0.003A

*1: See “2.2 Comparison of External Interfaces”.

*2: See “2.3 Details of Specification/Function Changes”.

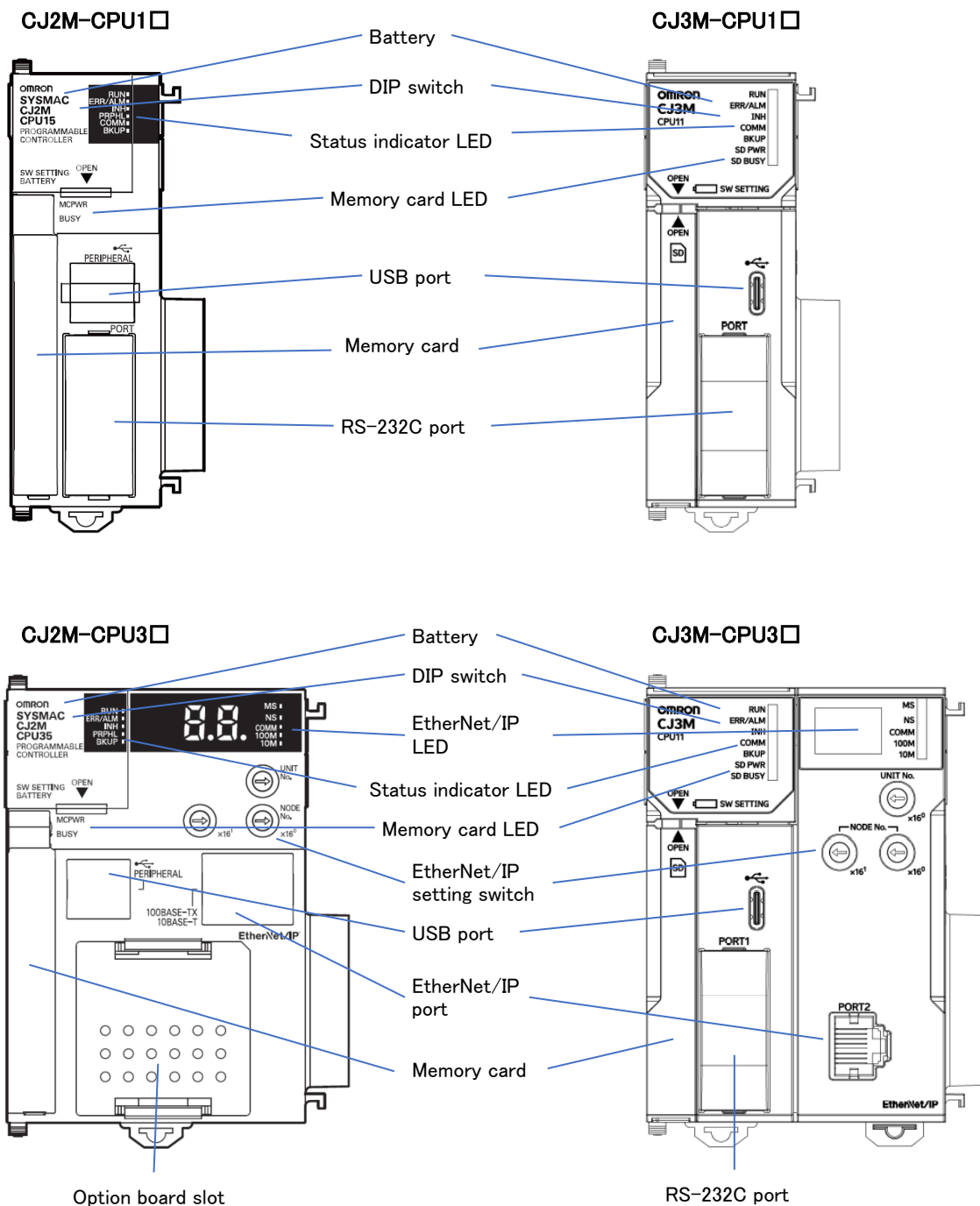
2.1.2 Changes in EtherNet/IP Function Specifications

The main specification changes in the built-in EtherNet/IP functions of the CJ2M-CPU3□ and CJ3M-CPU3□ are as follows. (Only specifications with changes are shown. For a comparison of all specifications, see “A-1 Comparison of CJ2M and CJ3M Specifications”.)

Item	CJ2M-CPU3□	CJ3M-CPU3□
CIP Service		
Tag Data Link		
Number of Connections	32	256
Unit Allowable Communication Bandwidth	1 to 10,000 ms (in 0.5 ms increments)	0.5 to 10,000 ms (in 0.5 ms increments)
Number of tags that can be registered	32	256
Maximum link data size per node	640CH	184,832CH
Maximum data size per connection	640CH	722CH
Number of tag sets that can be registered	32	256
Maximum size of one tag set	640CH	722CH
Maximum number of tags that can be refreshed per cycle	Output/Transmit: 32 Input/Receive: 32	Output/Transmit: 256 Input/Receive: 256
Data size refreshable per cycle	Output/Transmit: 640CH Input/Receive: 640CH	Output/Transmit: 6432CH Input/Reception: 6432CH
Explicit message		
UCMM (connectionless)	Maximum number of clients that can communicate simultaneously: 16 Maximum number of servers that can communicate simultaneously: 16	Maximum number of clients that can communicate simultaneously: 32 Maximum number of servers that can communicate simultaneously: 32
Socket service	Not possible	Possible
Modbus server	Not possible	Possible
Modbus client	Not possible	Possible
EtherNet/IP Conformance Test	CT17	CT21
Ethernet Interface	100BASE-TX/10BASE-T Auto Negotiation/Fixed Setting	100BASE-TX/10BASE-T Auto Negotiation/Fixed Setting Auto MDI/MDI-X

2.2 Comparison of External Interfaces

The differences in the interfaces between the CJ2M CPU Unit and the CJ3M CPU Unit are as follows.



Differences between parts

Item	CJ2M CPU Unit	CJ3M CPU Unit
Battery	Installed at shipment CJ1W-BAT01	Not installed at shipment Sold separately: CJ1W-BAT01
DIP switch	The arrangement and settings are the same.	
Status indicator LEDs	RUN, ERR/ALM, INH, PRPHL, COMM, BKUP	RUN, ERR/ALM, INH, COMM, BKUP *: The functions of each LED are the same, but there is no PRPHL LED.
Memory card LED	BUSY, MC PWR	SD BUSY, SD PWR Although the names are different, the functions are the same.
USB port	Type-B connector	Type-C connector A commercially available USB cable can be used.
Memory card	HMC-EF□□□	HMC-SD□□□ Refer to "2.3.1 Memory Card" .
RS-232C port (CPU1□)	The connector (D-sub 9-pin) and the pin assignment are the same. The wiring used with the CJ2M CPU Unit can be used as is.	
Option board slot (CPU3□)	RS-232C or RS-422A/485 option board (CP1W-CIF□□) can be mounted.	RS-232C port For CJ3M-CPU3□ replacement, refer to "3.2.4 Option Board Replacement" .
EtherNet/IP setting switch	Unit No., node address setting The setting functions are the same.	
LED for EtherNet/IP	7SEG, MS, NS, COMM, 100M, 10M The functions of each LED are the same.	
EtherNet/IP port	The connector (RJ45) is the same. The wiring used with the CJ2M CPU unit can be used as is.	

2.3 Details of Specification/Function Changes

This section explains the specification and functional differences that should be considered when replacing a CJ2M CPU Unit with a CJ3M CPU Unit in the same device. For functions enhanced in the CJ3M CPU Unit, refer to the User's Manual.

2.3.1 Memory Card

The available memory cards are different. If you are using a memory card, transfer the data on the memory card from the CJ2M CPU Unit to the CJ3M CPU Unit before use.

Although the memory cards are different, files used in the CJ2M CPU Unit can be used as is in the CJ3M CPU Unit.

■ Differences in memory cards

Memory card for CJ2M CPU Unit

Memory card models	Type	Capacity	Format	Number of rewrites	Write protect
HMC-EF183	Flash memory	128 MB	FAT16	100,000 times	None
HMC-EF283	Flash memory	256 MB			
HMC-EF582	Flash memory	512 MB			

Memory card for CJ3M CPU Unit

Memory card models	Type	Capacity	Format	Number of rewrites	Write protect
HMC-SD292	SD memory card	2 GB	FAT32	500,000 times	Possible using the hard switch on the memory card
HMC-SD492	SDHC memory card	4 GB		100,000 times	
HMC-SD1A2	SDHC memory card	16 GB			

2.3.2 Specifications for Battery Backup

The CJ3M CPU Unit is not equipped with a battery at shipment.

- (1) When using the clock function on a CJ3M CPU Unit, install a battery.
However, the clock is maintained by the built-in capacitor, so a battery is not necessary for short-term power interruptions.
- (2) Because the CJ3M CPU Unit uses nonvolatile RAM for I/O memory, battery backup is not required.
- (3) Since a battery is not installed at shipment, battery errors are set to "Do not detect" in the PLC system settings. When using the clock function, set battery error to "Detect".

Differences in specifications for the battery, I/O memory retention, and clock function between the CJ2M CPU Unit and the CJ3M CPU Unit

Item	CJ2M CPU Unit	CJ3M CPU Unit
Battery installed at shipment	Installed	Not installed
Battery error detection setting in PLC system settings	Detect (default)	Do not detect (default)
Battery-less I/O memory backup function	None When the power is turned off, the I/O memory is backed up by a battery.	Yes When the power is turned off, no battery is required to back up the I/O memory.
I/O memory	SRAM	Non-volatile RAM
Clock	Built-in	Built-in
Built-in capacitor backup time for clock function	5 minutes	10 days, ambient temperature 40° C
Battery used	CJ1W-BAT01	



Precautions for Safe Use

When using a battery, connect CX-Programmer and, in PLC System Settings under "Battery Error Detection", set the CPU unit battery error to "Detect". The CJ3M CPU Unit is set to "Do not detect" by default. If it is set to "Do not detect", no error will be detected when the battery is exhausted, and a program that uses time data may malfunction.

2.3.3 CPU Unit Model Representation in FINS0501 Response Data

In the response data of Read CPU Unit Information (FINS0501), the CPU unit model is indicated as "CJ2X-CPU□□".

It is not shown as "CJ3M-CPU□□".

If the CPU unit model in the FINS0501 response data is used in an application (e.g., for display purposes), interpret "CJ2X-CPU□□" as "CJ3M-CPU□□".



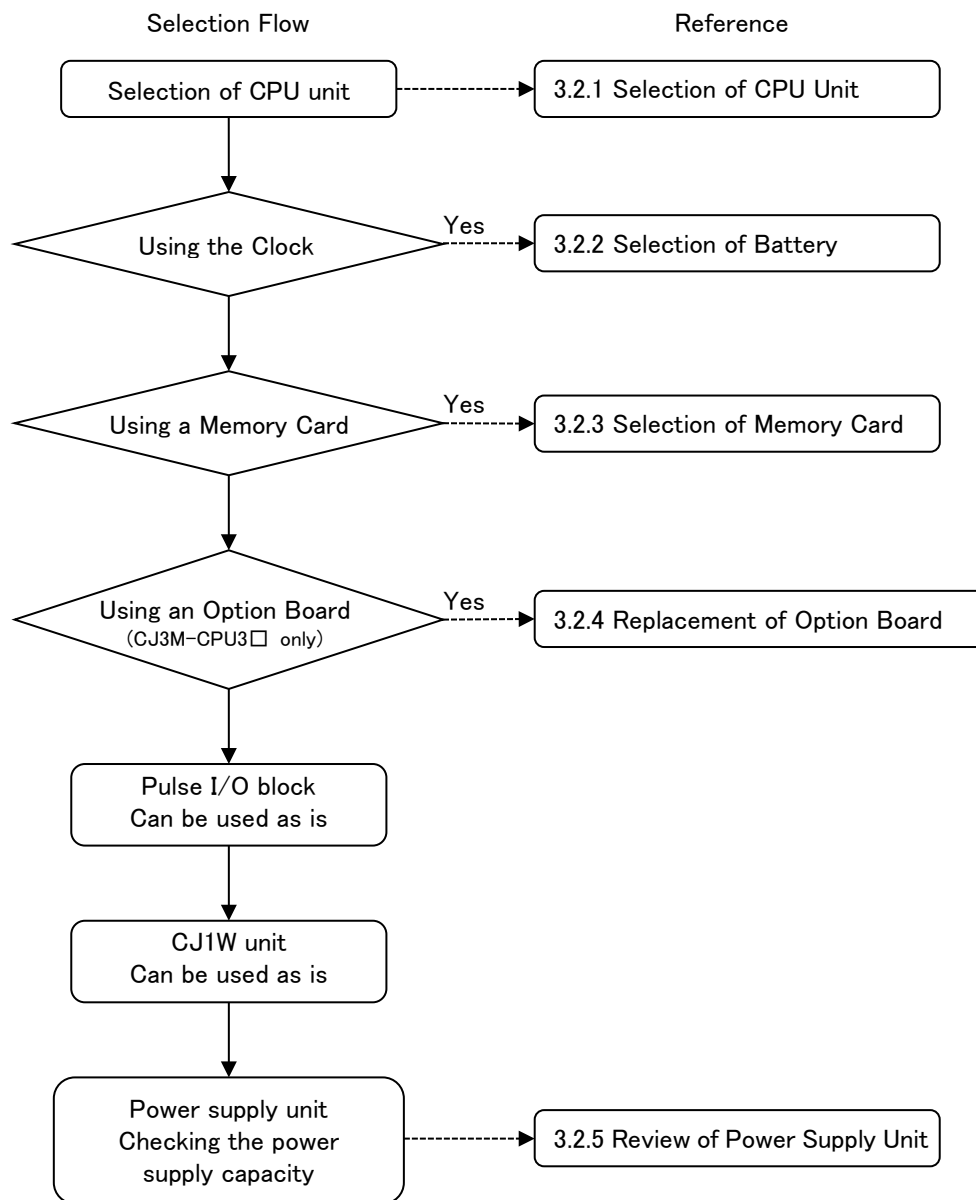
Additional Information

In CX-One tools such as CX-Programmer, the CPU unit model is displayed as "CJ3M-CPU□□".

3 Selection of Replacement Models

3.1 Selection Flow for Replacement Models

The flow for selecting models is as follows.
For details, see each reference.



3.2 Details of Replacement Model Selection

3.2.1 Selection of CPU Unit

Select the CPU Unit according to the program capacity and the number of EM banks.

■ Replacement models for the CJ2M-CPU1□ (built-in RS-232C type)

CJ2M CPU Unit

Model	Specifications	
	Program capacity	Number of EM banks
CJ2M-CPU11	5k steps	1 bank
CJ2M-CPU12	10k steps	
CJ2M-CPU13	20k steps	
CJ2M-CPU14	30k steps	4 banks
CJ2M-CPU15	60k steps	

CJ3M CPU Unit

Model	Specifications	
	Program capacity	Number of EM banks
CJ3M-CPU11	5k steps	1 bank
CJ3M-CPU12	10k steps	
CJ3M-CPU13	20k steps	
CJ3M-CPU14	50k steps	10 banks
CJ3M-CPU15	100k steps	

■ Replacement for CJ2M-CPU3□ (built-in EtherNet/IP type)

CJ2M CPU Unit

Model	Specifications	
	Program capacity	Number of EM banks
CJ2M-CPU31	5k steps	1 bank
CJ2M-CPU32	10k steps	
CJ2M-CPU33	20k steps	
CJ2M-CPU34	30k steps	4 banks
CJ2M-CPU35	60k steps	

CJ3M CPU Unit

Model	Specifications	
	Program capacity	Number of EM banks
CJ3M-CPU31	5k steps	1 bank
CJ3M-CPU32	10k steps	
CJ3M-CPU33	20k steps	
CJ3M-CPU34	50k steps	10 banks
CJ3M-CPU35	100k steps	

3.2.2 Selection of Battery

The CJ3M CPU unit does not include a built-in battery when purchased. If you are using the clock, install a battery. The battery is the same as the one for the CJ2M CPU Unit.

Battery for CJ3M CPU Unit

Model	Lifetime (0 to 55° C)
CJ1W-BAT01	5 years



Precautions for Safe Use

When using a battery, connect CX-Programmer and, in the PLC system settings under "Battery Error Detection", set the CPU Unit battery error to "Detect". The CJ3M CPU Unit is set to "Do not detect" by default. If it is set to "Do not detect", no abnormality will be detected when the battery is exhausted, and programs that use time data may malfunction

3.2.3 Selection of Memory Card

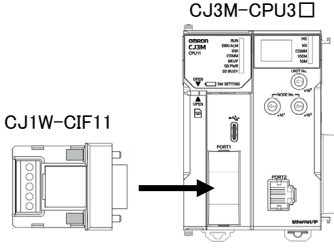
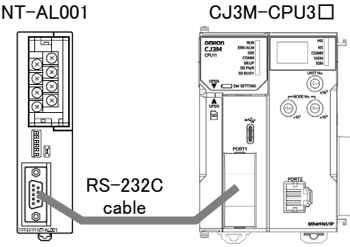
The memory cards used are different for CJ3M CPU Units and CJ2M CPU Units. Use a memory card for the CJ3M CPU Unit.

Memory Card for CJ3M CPU Unit

Memory card type	Type	Capacity	Model	Number of rewrites	Write protect
HMC-SD292	SD memory card	2 GB	FAT32	50,000 times	Possible with the memory card's hardware switch.
HMC-SD492	SDHC memory card	4 GB		100,000 times	
HMC-SD1A2	SDHC memory card	16 GB			

3.2.4 Option Board Replacement

If an option board is mounted on the CJ2M-CPU3□, replace it as follows using the RS-232C port of the CJ3M-CPU3□.

Replacement source: CJ2M-CPU3□		Replacement destination: CJ3M-CPU3□
Option board model	Specifications	
CP1W-CIF01	RS-232C	Use the built-in RS-232C port
CP1W-CIF11	RS-422A/485 (non-isolated type)	Attach the CJ1W-CIF11 (RS-232C/RS-422A conversion unit, non-isolated type) to the built-in RS-232C port 
CP1W-CIF12-V1	RS-422A/485 (Isolated type)	Attach the NT-AL001 (RS-232C/RS-422A conversion unit, isolated type) to the built-in RS-232C port 

3.2.5 Review of Power Supply Unit

■ When replacing the CJ2M-CPU1□ with the CJ3M-CPU1□

The CPU unit's current consumption is lower. There is no need to review the power supply unit.

■ When replacing CJ2M-CPU3□ with CJ3M-CPU3□

Calculate the current/power consumption of the CPU unit and check whether the power supply unit has sufficient capacity. If necessary, replace the power supply unit. For the method of calculating current/power consumption, refer to "CJ3 CPU Unit User's Manual (Hardware) (Cat. No. W664), 2-1-5 Calculating Unit Current Consumption".

Comparison of the current consumption of CPU units

Replacement source		Replacement destination	
Model	Current consumption	Model	Current consumption
CJ2M-CPU1□	5VDC 0.5 A	CJ3M-CPU1□	5VDC 0.26A, 24VDC 0.003A
CJ2M-CPU3□	5VDC 0.7 A	CJ3M-CPU3□	5VDC 0.91A, 24VDC 0.003A

CJ Series power supply unit

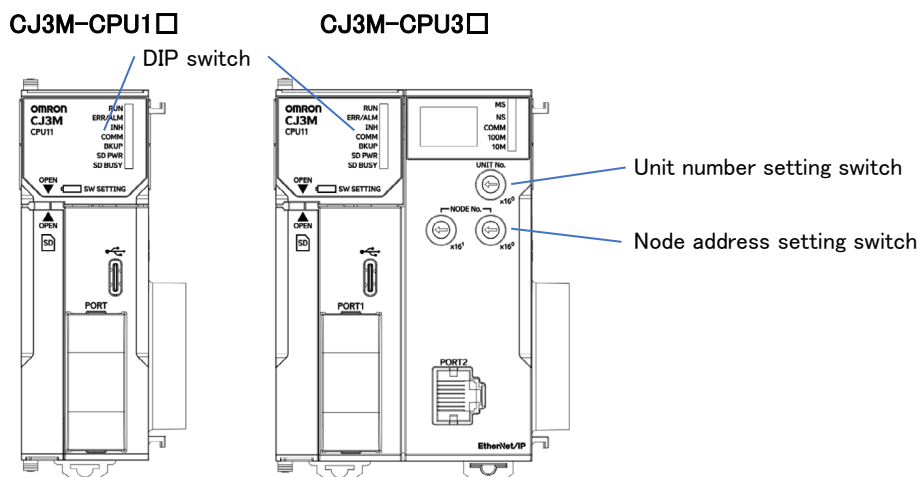
Model	Power supply voltage	Output current capacity		Total maximum power supply	Additional functions
		5 V	24 V		
CJ1W-PA205R	100-240 VAC	5.0 A	0.8 A	25 V	Output function during operation
CJ1W-PA205C	100 to 240 VAC	5.0 A	0.8 A	25 V	Replacement timing notification function

Model	Power supply voltage	Output current capacity		Total maximum power supply	Additional functions
		5 V	24 V		
CJ1W-PA202	100 to 240 VAC	2.8 A	0.4 A	14 W	
CJ1W-PD025	24 VDC (isolated type)	5.0 A	0.8 A	25 W	
CJ1W-PD022	24 VDC (non-isolated type)	2.0 A	0.4 A	19.6 W	

4 Hardware Settings, Installation, and Wiring

4.1 Hardware Setting

Configure the hardware settings for the CJ3M CPU Unit.



•CPU dip switch

The function is the same. Configure the DIP switch to the same ON/OFF setting as the CJ2M CPU Unit.

No.	Function	Remarks
SW1	User program protect	ON: Writing disabled for user program memory OFF: Writing enabled for user program memory
SW2	Automatic transfer from the memory card at power-on	ON: Execute automatic transfer from the memory card at power-on OFF: No transfer
SW3	Unused (*1)	Please set to OFF.
SW4	Unused (*1)	Please set to OFF.
SW5	Serial port communication settings	ON: Toolbus, automatic recognition of communication speed setting OFF: Follow the communication settings in the PLC system settings
SW6	Switch for user customization	ON: A395.12 ON OFF: A395.12 OFF
SW7	Set the simple backup type	Refer to the Hardware section of the User's Manual.
SW8	OFF fixed (*1)	Set to OFF.

*1: Although SW3/SW4/SW8 are assigned functions in the CJ3M CPU Unit, set all of them to OFF. For the functions of SW3/SW4/SW8, refer to **"CJ3 CPU Unit User's Manual (Hardware) (Cat. No. W664), 3-1-1 CPU Section"**.

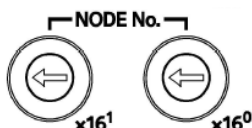
•EtherNet/IP unit number setting switch

The function is the same. Set it to the same unit number as the CJ2M CPU Unit.



•EtherNet/IP node address setting switch

The function is the same. Set the node address to be the same as the CJ2M CPU Unit.

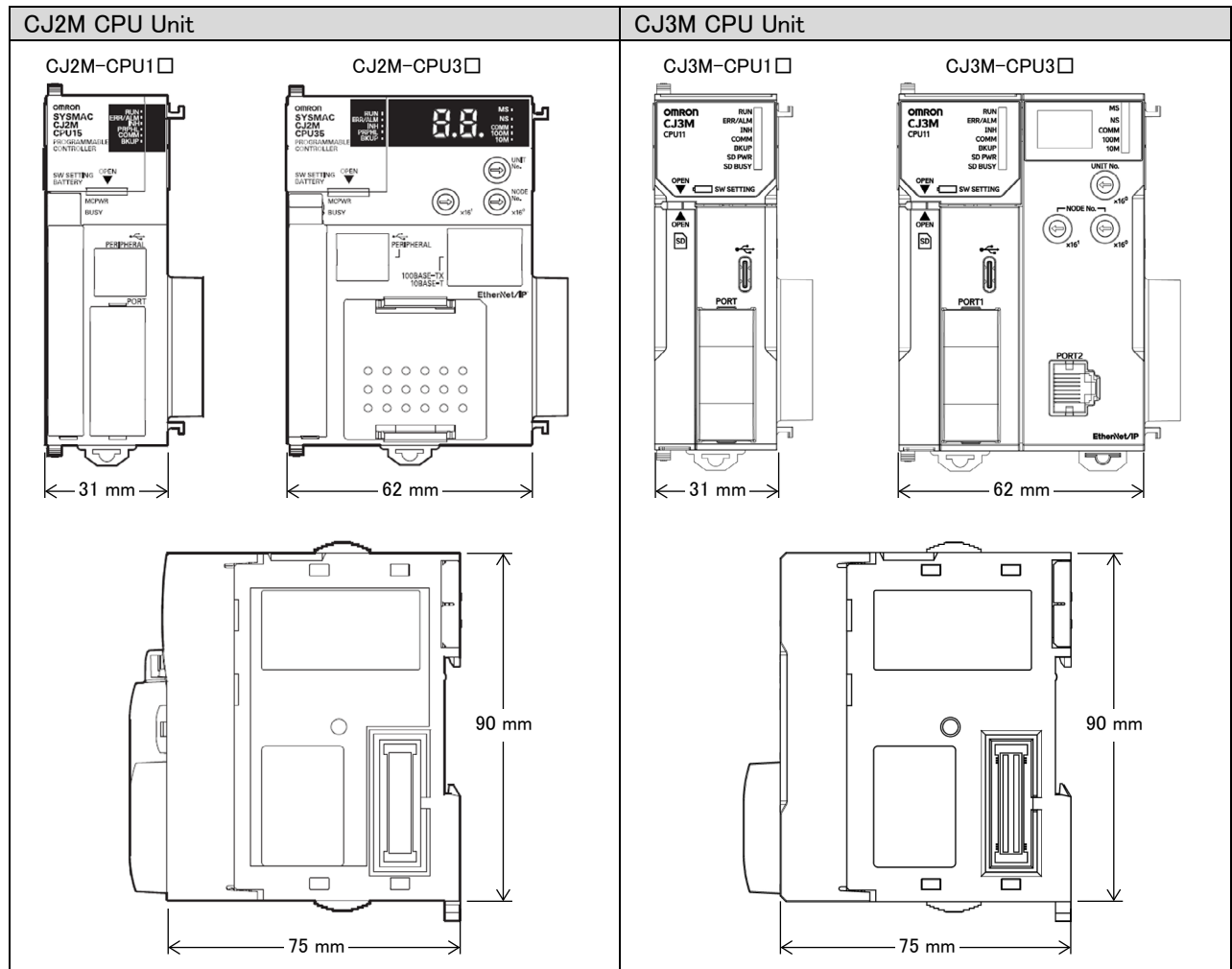


4.2 Installation

The method for mounting the CJ3M CPU Unit in the control panel is the same as for the CJ2M CPU Unit.

Since the external dimensions are also the same, the CPU Unit can be replaced without changing the control panel layout. However, if the power supply unit is changed, the width of the CPU unit may change.

External dimensions



4.3 Wiring

The wiring for the CJ2M CPU Unit can be reused, except for the wiring of the RS-422A/485 option board mounted on the CJ2M-CPU3□. The wiring for CJ1W units and CJ2M pulse I/O blocks can also be reused.

Wiring of the CPU Unit

CPU Unit	Communication Port	Actions Required for Replacement
CJ2M-CPU1□	RS-232C Port	The RS-232C cable can be reused.
CJ3M-CPU3□	Option Board	
	CP1W-CIF01	The RS-232C cable can be reused.
	CP1W-CIF11	Rewire to CJ1W-CIF11. (*1)
	CP1W-CIF12-V1	Rewire to NT-AL001. (*1)
	EtherNet/IP port	The Ethernet cable can be reused.

*1: See "3.2.4 Replacement of Option Board".

5 Migration of User Programs/Settings

This section explains how to migrate the CPU unit's program/settings.

5.1 How to Migrate Programs and Settings

There are the following methods for migrating programs and settings.

Refer to each section.

- ① When migrating from the master program/settings file

Method 1

Migrate by converting the project file of an existing CJ2M CPU Unit.

Refer to **"5.2. Migration by Project File"**.

- ② When migrating programs and settings from equipment using a CJ2M CPU Unit

Method 2

Read out the program from the CJ2M CPU Unit, convert it for use with the CJ3M CPU Unit, and migrate it.

Refer to **"5.2. Migration by Project File"**.

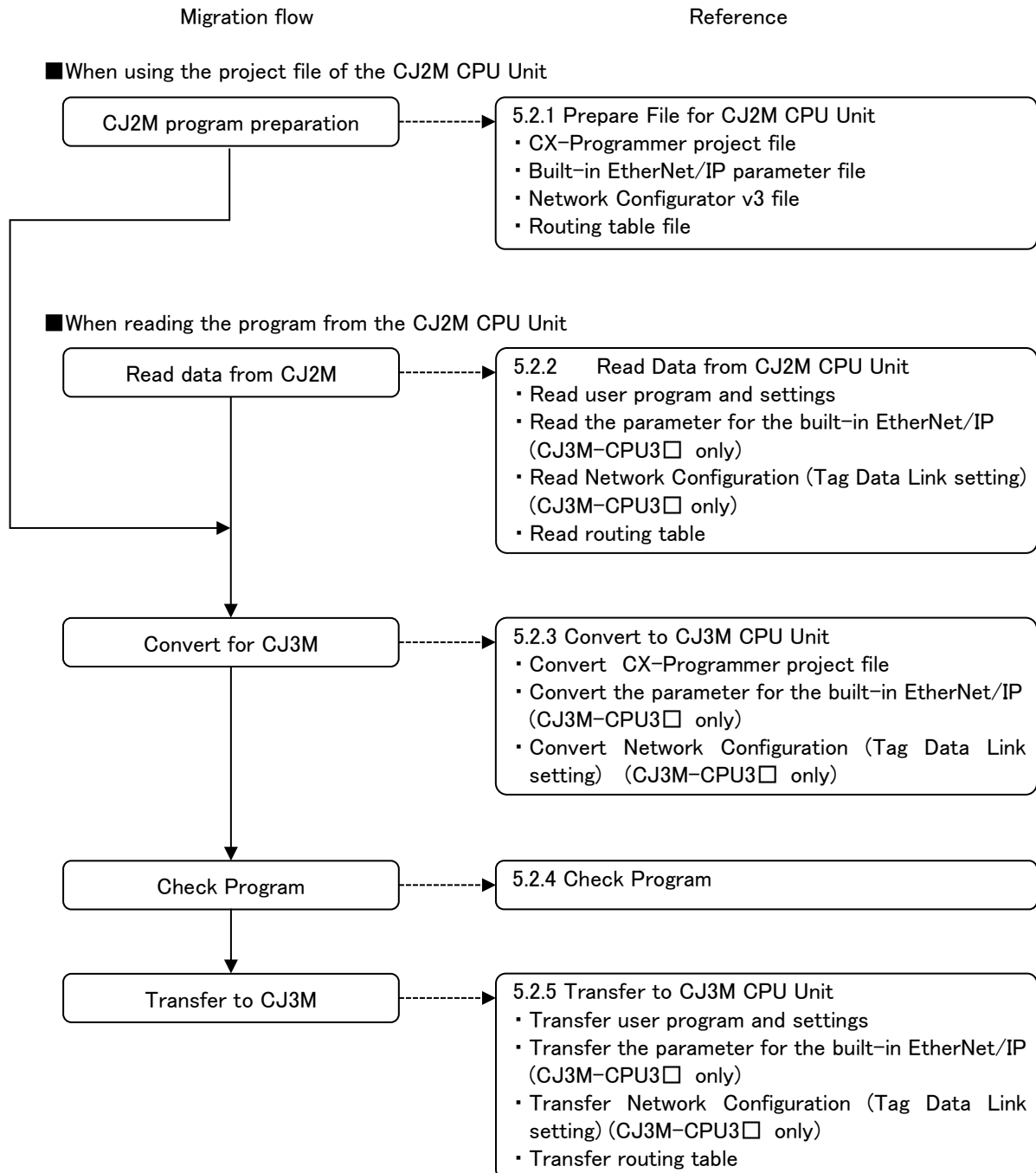
Method 3

Migrate using Simple Backup/Restore.

Refer to **"5.3 Migration by Simple Backup/Restore"**.

5.2 Migration by Project File

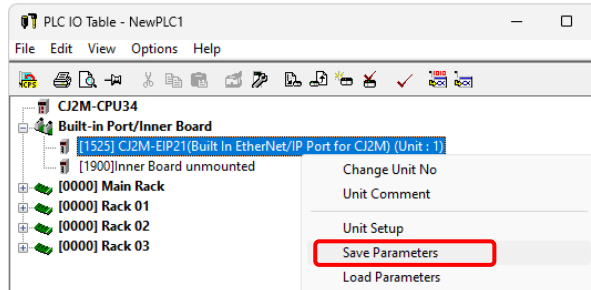
The model selection flow is as follows.



5.2.1 Prepare File for CJ2M CPU Unit

Prepare the project file for the CJ2M CPU Unit.

- (1) CX-Programmer project file (file name xxxx.cxp)
- (2) CJ3M-CPU3□ built-in EtherNet/IP parameter file (File name xxxx.xml)
- (3) Because the built-in EtherNet/IP parameters are not carried over, open and save the CX-Programmer project file.
 - Open the I/O table from CX-Programmer's "I/O Table and Unit Setup".
 - Right-click the CJ2M-EIP21, select "Save Parameters", and save the settings.



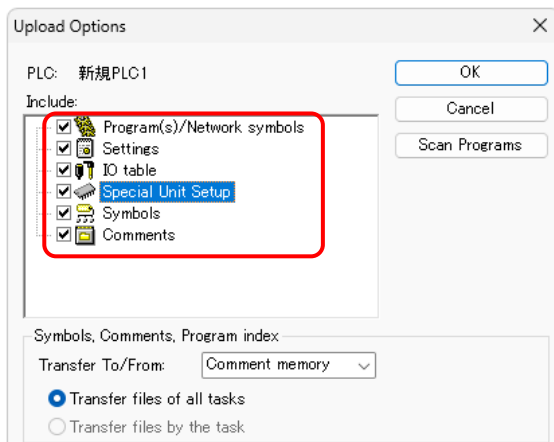
- (4) Routing table file (file name: xxxx.rtg)
- (5) Network Configurator v3 file (file name: xxxx.nvf)

5.2.2 Read Data from CJ2M CPU Unit

Read data from the CJ2M CPU Unit to be replaced.

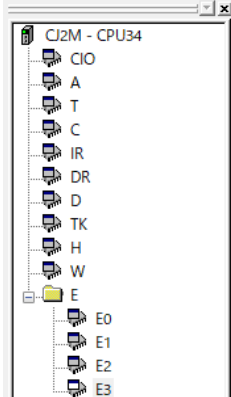
● Use CX-Programmer to read the user program and settings.

- (1) Connect CX-Programmer online to the CJ2M CPU Unit to be replaced.
- (2) From [PLC] > [Transfer] > [From PLC], check all items and read the data from the PLC.



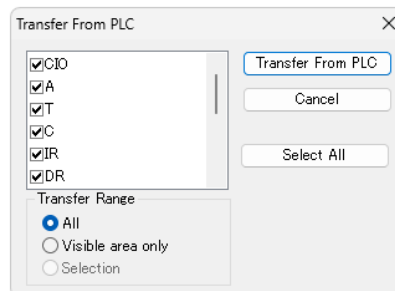
- (3) Read the I/O memory from PLC memory.

Open the Memory window



Select [Online] > [Transfer From PLC].

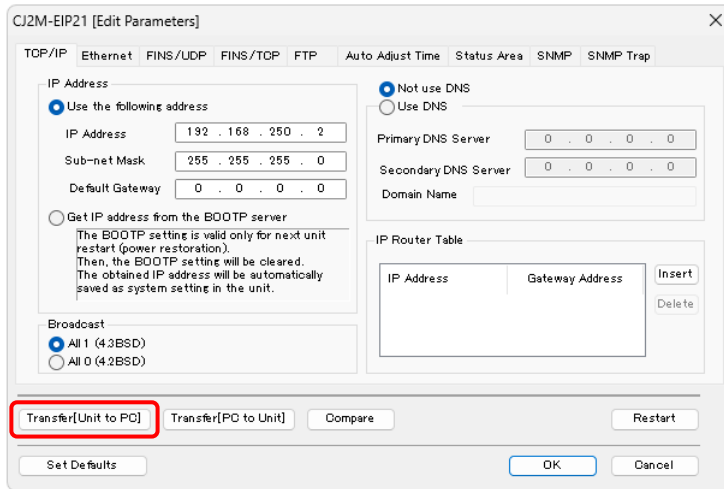
Check all areas and click [Transfer From PLC] to transfer.



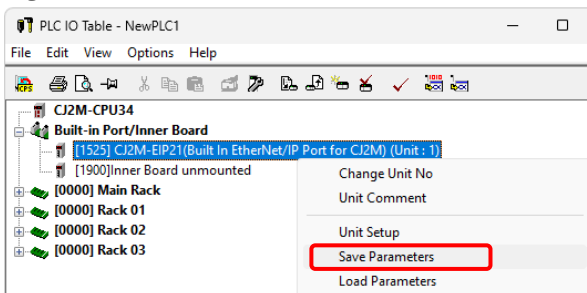
- (4) Save the file with [File] > [Save As]. (File name xxxx.cxp)

●Read out and save the built-in EtherNet/IP parameters (CJ2M-CPU3□ only)

- (1) Open the I/O table from CX-Programmer's "I/O Table and Unit Setup".
- (2) Open the settings for the CJ2M-EIP21 and confirm that the settings have been uploaded.
If the settings have not been read out, read them out using "Transfer [Unit to PC]".



- (3) Right-click the CJ2M-EIP21, select "Save Parameters", and save the settings. (File name xxxx.xml)

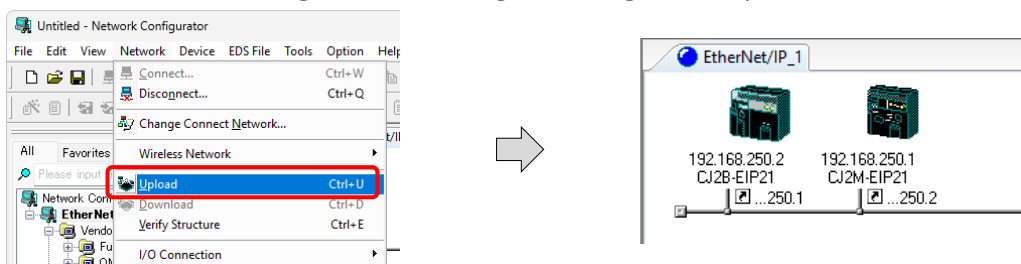


●Use Network Configurator to read the network configuration (Tag Data Link settings). (CJ2M-CPU3□ only)

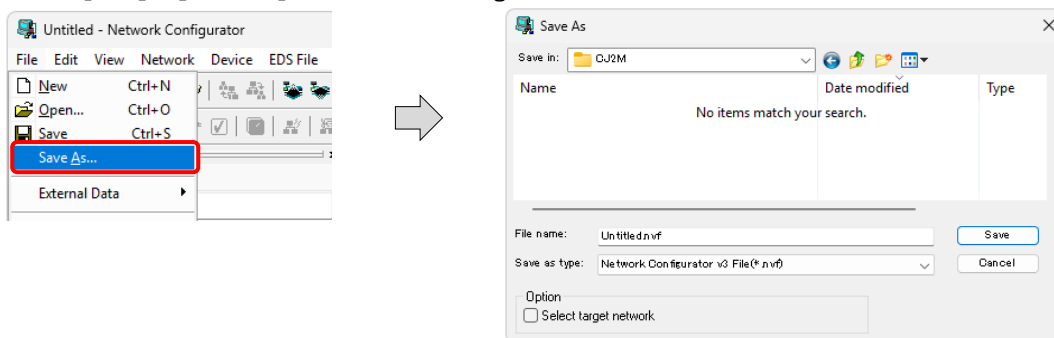
- (1) Connect Network Configurator to the CJ2M CPU unit, select [Network] > [Upload], and perform a network setting upload.

Read the settings for the entire network, not only the settings for the CJ2M CPU Unit.

* This is because, after migration, the settings of the tag data link partner PLC also need to be transferred.

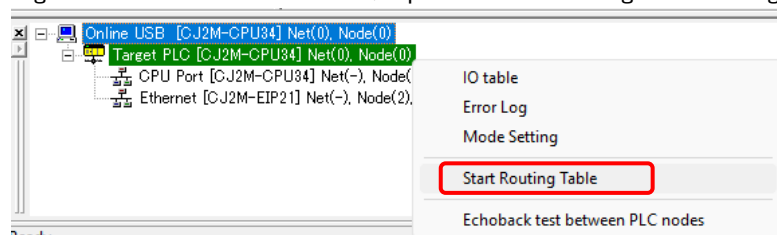


- (2) Select [File] > [Save As] to save the settings. (file name xxxx.nsf)

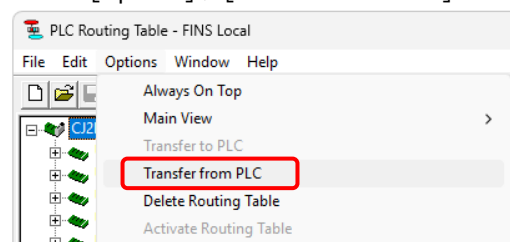


●Read the routing table using CX-Integrator. (Only if a routing table has been configured)

- (1) Connect CX-Integrator online to the CJ2M CPU Unit to be replaced.
- (2) Right-click the CJ2M-CPU unit > open the PLC routing table setting tool from "Start Routing Table".



- (3) Select [Options] > [Transfer from PLC] to read out the routing table from the CJ2M CPU unit.



- (4) Save the routing table with [File] > [Save Local Routing Table File]. (File name: xxxx.rtg)

●Use CJ1W-CLK□□ or CJ1W-FLN22

When these unit are used, use the support software to read out and save the following data.

Model	Data	Support Software
CJ1W-CLK□□	Data link tables	Data link tables in the CX-Integrator
CJ1W-FLN22	FL-net Unit settings。	CX-Flnet support software

Refet to Users Manual for each unit.

5.2.3 Convert for CJ3M CPU Unit

Convert the project file of the CJ2M CPU unit for the CJ3M CPU unit.

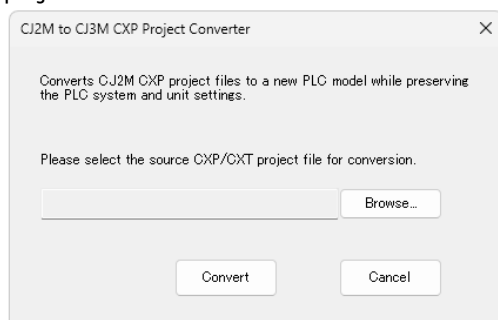
●Conversion of CX-Programmer project file

For conversion from CJ2M to CJ3M, use the model conversion tool [CJ2M to CJ3M CXP Project Converter].

Download [CJ2M to CJ3M CXP Project Converter] from the Sysmac Studio/CX-One Utility download page.

URL: <https://www.fa.omron.co.jp/product/tool/26/cxone-utility/index.html>

- (1) Start [CJ2M to CJ3M CXP Project Converter].
- (2) Conversion is not possible if multiple PLCs exist in the project file. Prepare a file containing only one CJ2M project and then convert it.



- (3) Click the "Convert" button to convert it into a CX-Programmer project file for the CJ3M CPU unit. The files after conversion are as follows.

Example

Before conversion: CJ2M_Prog1.cxp

After conversion: CJ2M_Prog1_converted.cxp

The data that can be migrated using the conversion tool is as follows.

- Program data (including function blocks)
- Data types
- Variable table
- PLC memory
- PLC system settings
- I/O Table
- Special I/O Units and CPU Bus Units Settings (Except for built-in EtherNet/IP setting)

The settings of the built-in EtherNet/IP port of the CJ2M-CPU3□ are not converted by this converter. Migrate the settings of the built-in EtherNet/IP port using the method described in this chapter.

Precautions for Safe Use

1. The model conversion tool supports conversion only from the PLC model “CJ2M” to “CJ3M”. If you need to change the CPU type (CPU□□), open the converted file in CX-Programmer and modify it there after model conversion.
2. The PLC system setting “Do not detect battery error” on the CJ2M CPU Unit is carried over to the CJ3M CPU Unit. If a battery is installed in the CJ3M CPU Unit, change the setting to “Detect Low Battery”.

CJ2M CPU Unit (Backup Source)	CJ3M CPU Unit (Restore Destination)
Setting: “Do not detect Low Battery”	Setting: “Detect Low Battery”
OFF: Detect battery error	OFF: Do not detect battery error
ON: Do not detect battery error	ON: Detect battery error

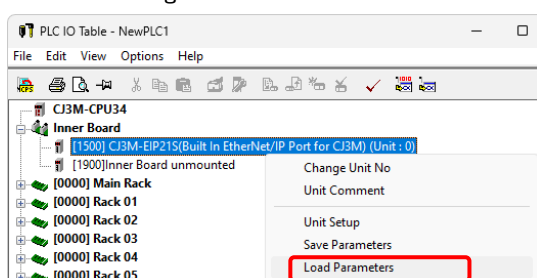
Additional Information

When changing the PLC model using CX-Programmer, the following setting data will not be initialized.
PLC system settings, I/O tables, high-function unit settings

● Set Built-in EtherNet/IP Parameters (CJ3M-CPU3□ Only)

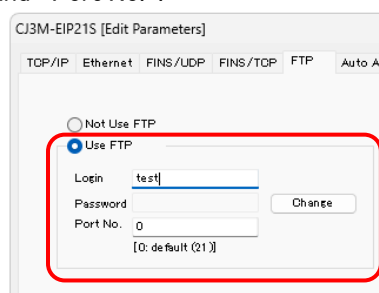
Set the parameters for the CJ3M-EIP21S (built-in EtherNet/IP on the CJ3M-CPU3□).

- (1) Open the I/O table from CX-Programmer's “I/O Table and Unit Setup”.
- (2) Right-click CJ3M-EIP21S, select “Load Parameters” to read the settings saved file in 5.2.1 or 5.2.2, and confirm that the settings have been carried over correctly.



Precautions for Safe Use

- FTP settings are not carried over. If you are using FTP, set it to use FTP, and configure the “Password” and “Port No.”.



- When obtaining an IP address from a BOOTP server

To replace it with a different unit, the MAC address of the EtherNet/IP port will change. Therefore, you need to change the settings on the BOOTP server side.

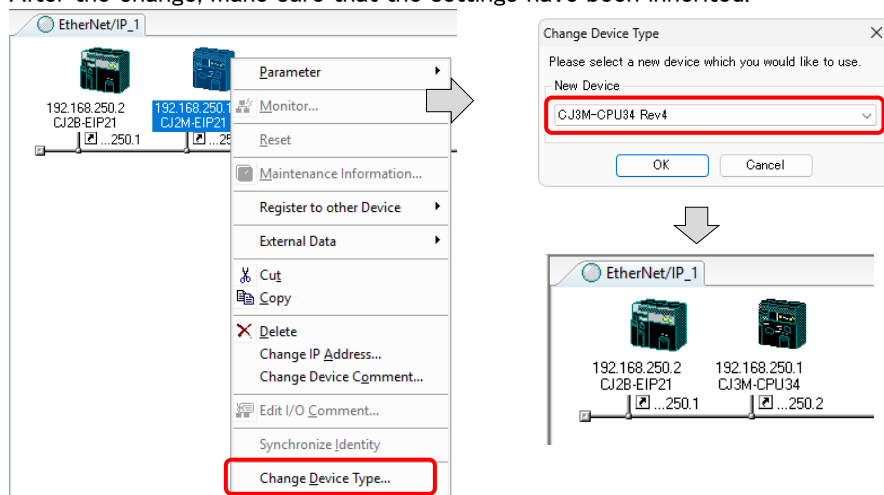
If CJ2M-EIP21 was set to "Obtain IP address from BOOTP server", CJ3M-EIP21S will be set to "Obtain IP address from BOOTP server (one time only)", but there is no need to change the settings. The behavior when obtaining an IP address from a BOOTP server is the same before and after replacement.

● Network Configuration Conversion (CJ3M-CPU3□ Only)

Convert the network configuration for CJ3M-CPU3□ from CJ2M-EIP21.

- (1) Right-click CJ2M-EIP21 > from "Change Device Type", change the device to CJ3M-CPU3□.

After the change, make sure that the settings have been inherited.



● Conversion of the routing table file for CX-Integrator

Refer to "5.2.5 Transfer to CJ3M CPU Unit".

5.2.4 Check Program

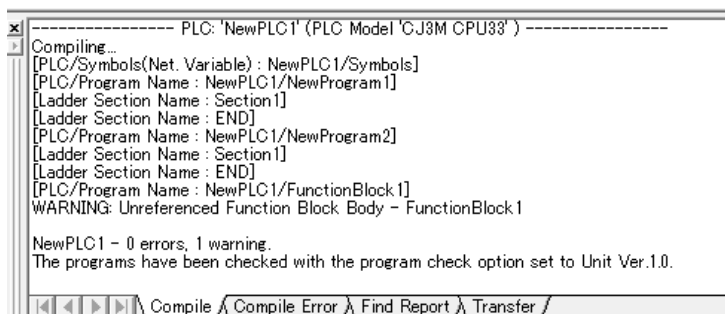
Check that the file converted for the CJ3M CPU Unit has been converted correctly.

Make sure that the user program and other settings are reflected.

● How to check a program in CX-Programmer

[PLC] > Execute [All Program Compile (Check)].

The compilation results are displayed in the "Compile" window.



The items checked during "Compile" are as follows:

- Data undecided check (whether it is established as a valid circuit)
- Instruction existence check (whether the instruction and operand exist in the PLC)
- Operand check (whether the operand is within the operable range)
- Program capacity check (whether it is within the UM capacity of the target PLC model)

- Syntax check (whether the ladder syntax is correct)
- Circuit shape check (whether the circuit shape is appropriate)
- Duplicate use check (coil duplicate use check)
- Task-related check (check regarding tasks)



Additional Information

When a program is converted with the [CJ2M to CJ3M CXP Project Converter], compile errors may occur. Check the error locations and resolve the errors.

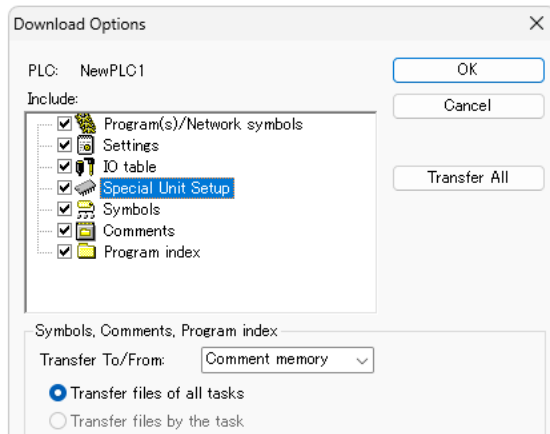
5.2.5 Transfer to CJ3M CPU Unit

Transfer the converted data to the CJ3M CPU Unit.

● Transfer the user program and settings using CX-Programmer.

- (1) Open the CX-Programmer project file for the CJ3M CPU Unit and connect online.
- (2) From [PLC] > [Transfer] > [Transfer from PLC], check all items and transfer the data to the PLC.

The built-in EtherNet/IP parameters are transferred at the same time.



Additional Information

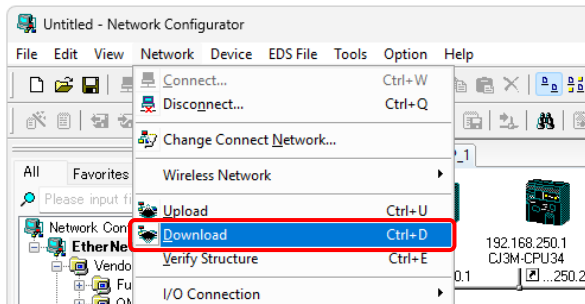
When a CJ1W-ETN21 Unit is used and a memory all clear operation is performed, cycle the power or restart the CJ1W-ETN21 Unit. If these operations are not performed, the settings of CJ1W-ETN21 cannot be transferred.

● Transfer the network configuration (Tag Data Link setting) using Network Configurator (CJ3M-CPU3□ only)

- (1) Connect Network Configurator to the CJ3M CPU unit.
- (2) Select [Network] > [Download], and download the settings to the CJ3M CPU unit.

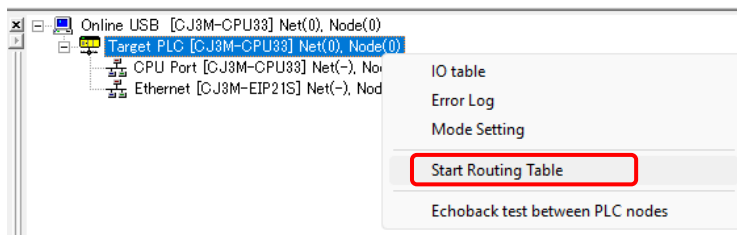
Transfer the settings for the entire network, not only the settings for the CJ3M CPU Unit.

* When transferring, the CJ3M CPU Unit must be connected to the network.

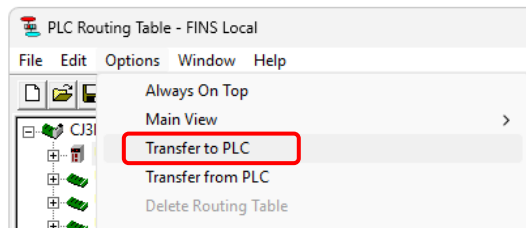


● Transfer the routing table using CX-Integrator. (Only when using a routing table)

- (1) Launch CX-Integrator and connect to the CJ3M CPU unit.
- (2) Right-click the CJ3M CPU unit > open the PLC routing table setting tool from "Start Routing Table".



- (3) From [File] > [Open Local Routing Table File], select and open the routing table file of the CJ2M CPU unit.
 At this time, please confirm that the routing table settings are correct.
 Select [Options] > [Transfer to PLC] to transfer the routing table to the CJ3M CPU Unit.



●Use CJ1W-CLK□□ or CJ1W-FLN22

When these unit are used, use the support software to transfer these following data on “5.2.2 Read Data from CJ2M CPU Unit”.

Model	Data	Support Software
CJ1W-CLK□□	Data link tables	Data link tables in the CX-Integrator
CJ1W-FLN22	FL-net Unit settings。	CX-Flnet support software

Refet to Users Manual for each unit.

5.3 Migration by Simple Backup/Restore

Using the simple backup function, read out the data from the CJ2M CPU Unit to be replaced and transfer it to the replacement CJ3M CPU Unit.

The data that can be migrated using simple backup are as follows.

- User programs / network variables
- Variable table / comments / program index
- PLC memory
- PLC Setup
- I/O Memory Data
- I/O Table
- Special I/O and CPU Bus Unit Settings (excluding built-in EtherNet/IP settings)
- Routing Table

Precautions for Safe Use

When migrating from a CJ2M-CPU3□ to a CJ3M-CPU3□ using the Simple Backup/Restore function, the built-in EtherNet/IP settings are not transferred.

The MS LED of the built-in EtherNet/IP will flash red, and “Er” and “H8” (restore failure) will be displayed on the 7-segment display.

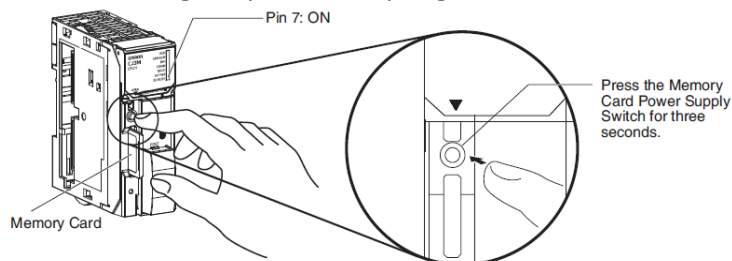
To migrate the built-in EtherNet/IP function, follow the procedure in “5.2 Migration by Project File”.

5.3.1 Read Data from CJ2M CPU Unit

Using the simple backup operation, read data from the CJ2M CPU Unit.

Attach the memory card (HMC-EF□□□) to the CJ2M CPU Unit. The MCPWR LED is responsible.

- (1) Turn ON DIP switch SW7 on the CJ2M CPU Unit.
- (2) Press and hold the Memory Card Power Supply Switch for at least 3 seconds.
The BUSY LED lights up, and backup begins.



- (3) When the MCPWR LED and BUSY LED turn off, the backup is complete.
- (4) Remove the memory card from the CJ2M CPU Unit.

5.3.2 Transfer Data to Memory Card for CJ3M CPU Unit

The memory cards for the CJ2M CPU Unit and CJ3M CPU Unit are different.

Copy data to the memory card for the CJ3M CPU Unit (HMC-SD□□□) using a personal computer.

The files to be backed up and restored are listed below.

Contents	File name	Extention
User program/ Network symbols	BACKUP	.OBJ
Symbol table files	BKUPSYM	.SYM
Comment files	BKUPCMT	.CMT
Program index files	BKUPPRG	.IDX
Parameter files	BACKUP	.STD
CIO/WR/HR/AR/T/C Area data	BKUPIOR	.IOR
DM Area data : D0 to D19999	BACKUPDM	.IOM

Contents	File name	Extension
DM Area data : D2000 to D32767	BACKUP	.IOM
EM Area data	BKUPEM□□	.IOM
EM forced status	BKUPEF□□	.IOM
Data in Special I/O Units and CPU Bus Units with unit address □□	BACKUP□□	.PRM

* : If no data or settings exist in the CPU Unit, a file is not created during backup.

5.3.3 Writing Data to CJ3M CPU Unit

Replace the CJ2M CPU Unit with the CJ3M CPU Unit, and then perform the restore operation to write the data to the CJ3M CPU Unit.

- (1) Turn OFF the power to the CJ3M CPU Unit, and insert the memory card to which the data was copied in 5.3.2.
- (2) Set dip switch SW7 to ON.
- (3) Turn on the power. The SD PWR LED flashes once and then lights up. At the same time, the SD BUSY LED blinks and restoration begins.
- (4) When restoration is complete, the SD PWR LED and SD BUSY LED turn off.
- (5) Turn the power OFF and set dip switch SW7 to OFF.

Precautions for Use

The PLC system setting “Do not detect battery error” on the CJ2M CPU Unit is carried over as-is to the CJ3M CPU Unit.

If a battery is installed on the CJ3M CPU Unit, change the setting to “Detect Low Battery”.

CJ2M CPU Unit (Backup Source)	CJ3M CPU Unit (Restore Destination)
Setting: “Do not detect Low Battery” OFF: Detect battery error ON: Do not detect battery error	Setting: “Detect Low Battery” OFF: Do not detect battery error ON: Detect battery error

5.3.4 Limitations of Simple Backup/Restore

The following restrictions apply:

- When migrating from a CJ2M-CPU3□ to a CJ3M-CPU3□ using the Simple Backup/Restore function, built-in EtherNet/IP settings are not transferred.
The MS LED will flash red, and “Er” and “H8” will be displayed on the 7-segment display.
To migrate EtherNet/IP functions, follow the procedure in “5.2 Migration by Project File”.
- If the backed-up program capacity exceeds the capacity of the destination CPU unit, the data cannot be restored.
- If the number of EM banks in the backup file is smaller than that of the destination CPU unit, only the EM bank range contained in the backup file is restored. Forced set/reset data is not restored.
EM bank areas not included in the backup file retain their pre-restore values.
Example: When restoring from a CJ2M-CPU13 (1 EM bank) to a CJ3M-CPU15 (10 EM banks).
- If the number of EM banks in the backup file exceeds that of the destination CPU unit, restoration is not possible.
Example: When restoring from a CJ2M-CPU15 (4 EM banks) to a CJ3M-CPU13 (1 EM bank).
- The unit number settings for Special I/O Units or CPU Bus Units are not correct.

Additional Information

For details of the Simple Backup/Restore function and information on errors that occur when an abnormal termination happens, refer to “CJ3 CPU Unit User’s Manual (Hardware) (Cat. No. W664), Section 8-3 Simple Backup”.

6 Operation Check and Trial Run

Verify that the programs and settings have been transferred to the CJ3M CPU Unit and configured correctly, and then perform an operation check and trial run.



Precautions for Safe Use

After completing the replacement work, be sure to verify operational safety by performing a trial run before starting system operation.

Changing from CJ2M to CJ3M may change the cycle time. If you create a program that depends on cycle time, check its operation after conversion. To make it the same as the CJ2M CPU unit, use the "Constant Cycle Time Function" in the PLC system settings.

In addition, the results of floating-point operations on real numbers may differ. Be sure to verify the results of computations using real-number types.

Appendices

A-1 Comparison of CJ2M and CJ3M Specifications

A-1-1 General Specifications

Blue text indicates specification differences

Item			CJ2M-CPU□□	CJ3M-CPU□□
Construction			Built into the panel	
Grounding method			Class D grounding (Class 3 grounding)	
Dimensions: height × depth × width			CPU1□: 90 mm × 75 mm × 31 mm CPU3□: 90 mm × 75 mm × 62 mm	
Mass			CPU1□: 130 g or less CPU3□: 190 g or less	CPU1: 140 g or less CPU3: 240 g or less
Current consumption			CPU1□: 5 VDC 0.5 A CPU3: 5 VDC 0.7 A	CPU1□: 5 VDC 0.26 A, 24VDC 0.003A CPU3: 5 VDC 0.91 A, 24VDC 0.003A
Operating environment	Operating ambient temperature		0 to 55° C	
	Operating ambient humidity		10 to 90% RH	
	Operating ambient atmosphere		No corrosive gases	
	Storage ambient temperature		-20 to 70° C	
	Operating altitude		2000 m or less	
	Pollution degree		Pollution degree 2 or less: Complies with IEC 61010-2-201	
	Noise immunity		Complies with IEC 61000-4-4, 2 kV (power supply line)	
	Overvoltage category		Category II: Complies with IEC 61010-2-201	
	EMC immunity level		Zone B	
	Vibration resistance		Complies with IEC 60068-2-6 Amplitude 3.5 mm at 5 to 8.4 Hz, 8.4 to 150 Hz Acceleration 10 m/s ² , 100 minutes in each of the X, Y, and Z directions (Sweep time 10 minutes × number of sweeps 10 = total 100 minutes)	
Battery	Shock resistance		Compliant with IEC 60068-2-27 150 m/s ² , 3 times each in the X, Y, and Z directions (relay output unit: 100 m/s ²)	
	At shipment		Built into the CPU unit	Sold separately
	Service life		5 years at 25° C (unpowered)	
Battery type			CJ1W-BAT01	

A-1-2 Performance Specifications

Item			CJ2M-CPU□□	CJ3M-CPU□□
Program capacity			60k steps max.	100k steps max.
Number of I/O points			2,560 points	5,120 points
Processing speed	Common processing time (overhead)		CPU1□: 160 μs CPU3□: 270 μs	CPU1□: 160 μs CPU3□: 260 μs
	Command execution time		Basic instructions: 0.04 μs, advanced instructions: 0.06 μs	
	Interrupt	I/O interrupt / external interrupt	Interrupt task startup time: 31 μs Return time to cycle execution task: 10 μs	
		Periodic interrupt	Minimum interval: 0.4 ms (set in 0.1 ms increments) Interrupt task start-up time: 30 μs Return time to cyclic execution task: 11 μs	
Maximum Number of Connectable Units			10 units per rack (CPU or expansion racks) 40 units max.	10 units per rack (CPU or expansion racks) 80 units max.
Basic I/O Units			No limit However, the interrupt input unit is limited to a maximum of 2 units	
Special I/O Units			96 units max.	
CPU Bus Units			CPU3□: 15 units max. CPU1□: 16 units max.	
Pulse I/O block			2 units max.	
Positions where interrupt units can be used			Slots 0 to 4 of the CPU unit	
Number of expansion racks			3 max.	7 max.

Item		CJ2M-CPU□□	CJ3M-CPU□□
CIO Area	I/O Area	2,560 points (160 CH) 0000 to 159 CH	5,120 points (320 CH) 0000 to 319 CH
	Link Area	3,200 points (200 CH) 1000 to 1199 CH	
	~~Synchronous Data Refresh Area~~	None (CJ2H CPU Unit only)	
	CPU Bus Unit Area	6400 points (400 CH) 1500 to 1899 CH	
	Special I/O Unit Area	15360 points (960 CH) 2000 to 2959 CH	
	Pulse I/O Area	20 input points, 12 output points (2960 to 2963 CH)	
	Serial PLC Link Area	1440 points (90 CH) 3100–3189 CH	
	DeviceNet Area	9600 points (600 CH) 3200–3799 CH	
	EtherCAT remote I/O Area	1034 points (64 CH) 3900–3963 CH 320 points (20 CH) 3980–3999 CH	
	Internal I/O Area	3200 points (200 CH) 1300–1499 CH 34304 points (2144 CH) 4000–6143 CH	
Work Area		8192 points (512 CH) W000–W512 CH	
Holding Area		8192 points (512 CH) H000–H512 CH	
Auxiliary Area		Read-only / not writable: 31,744 points (1,984 CH) 7,168 points (448 CH) A000 to A447CH 21,576 points (1,536 CH) A10000 to A11535CH Read/write: 16,384 points (1,024 CH) A448 to A1471CH	
Temporary Area		16 points TR0 to 5	
Timer Area		4,096 points T0000 to T4095	
Counter Area		4096 points C0000 to C4095	
DM Area		32K words	
EM Area		32K words / 1 bank CPU□1/□2/□3: 1 bank CPU□4/□5: 4 banks	32k words / 1 bank CPU□1/□2/□3: 1 bank CPU□4/□5: 10 banks
Index Register		IR0 to IR15	
Data Register		DR0 to DR15	
Cycle Task Flag Area		128 flags	
Memory card		HMC-EF□□□□ (128 MB, 256 MB, 512 MB)	HMC-SD□□□□ (2 GB, 4 GB, 16 GB)
Operating mode		Program / Monitor / Run	
Execution mode		Normal mode	
Programming language		Ladder logic Structured text Instruction list Sequential function chart	
Function block	Maximum number of definitions	CPU 1/2/3: 256 CPU 4/5: 2048	2048
	Maximum number of instances	CPU 1/2/3: 256 CPU 4/5: 2048	2048
FB program area		20K steps	40K steps
Task	Task type	Cyclic task Interrupt task (Power OFF interrupt tasks, scheduled interrupt tasks, I/O interrupt task, external interrupt task, and input interrupt task)	
	Number of tasks	Cyclic tasks: 128 Interrupt tasks: 256	
Variables	Type of Symbols	Local symbols: Can be used only within a single task in the PLC. Global symbols: Can be used in all tasks in the PLC. Network symbols (tags): I/O memory in the CPU Unit can be externally accessed using symbols, depending on parameter settings.	
	Types of variables	BOOL (bit) UINT (unsigned 1-channel BIN) UDINT (unsigned 2-channel BIN) ULINT (unsigned 4-channel BIN) INT (signed 1-channel BIN) DINT (signed 2-channel BIN) LINT (signed 4-channel BIN) UINTBCD (unsigned 1-channel BCD) UDINTBCD (unsigned 2-channel BCD) ULINTBCD (unsigned 4-channel BCD) REAL (floating-point 2-channel) LREAL (floating-point 4-channel) CHANNEL (channel) NUMBER (constant or number) WORD (16-bit hexadecimal, 1-channel) DWORD (16-bit 2-channel)	

Item		CJ2M-CPU□□	CJ3M-CPU□□
		LWORD (16-bit 4-channel) STRING (ASCII code, 1 to 255 characters) TIMER (timer) COUNTER (counter)	
	Maximum size of Symbols	32kCH	
	Array Symbols	1-dimensional arrays	
	Number of Array Elements	32,000 elements max.	
	Number of registered network variables (tags)	2,000 items max.	10,000 items max.
	Length of Registrable network Symbols (tags)	255 bytes max.	
Data trace	Encoding of network Symbols (tags)	UTF-8	
	Memory capacity	8,000 words	220,000 words
	Number of samplings	Contacts = 31, channels: 1CH unit = 16 / 2CH unit = 8 / 4CH unit = 4	Contact = 31, Channels: 1CH unit = 32 / 2CH unit = 16 / 4CH unit = 8
	Sampling cycle	1 to 2550 ms (in 1 ms increments) or each cycle	
File memory	Trigger conditions	Rising/falling edge of specified contact Data comparison of specified channel Data size: 1CH, 2CH, 4CH Comparison methods: =, >, ≥, <, ≤, ≠	• Contacts Rising edge/Falling edge/ON/OFF AND/OR combinations of up to 4 contacts • Channels Data size: 1CH, 2CH, 4CH Comparison methods: =, >, ≥, <, ≤, ≠ AND/OR combinations of up to 2 channels • AND/OR combinations of contacts and channels
		Use memory card HMC-EF□□□	Use memory card HMC-SD□□□
		EM file memory	EM file memory
Source/comment memory	Program source, comments, program index, variable table	Capacity: 1 MB	Capacity: 2 MB
Communication	Communication logical port	Number of logical ports	8 ports (used in SEND/RECV/CMND/PMCR/TXDU/RXD instructions)
		Number of extended logical ports	64 ports (used with SEND2/RECV2/CMND2/PMCR2 commands)
	CIP communications	Class 3 (number of connections)	Number of connections: 128
		UCMM (non-connection)	Maximum number of clients that can communicate simultaneously: 16 Maximum number of servers that can communicate simultaneously: 16 Maximum number of clients that can communicate simultaneously: 32 Maximum number of servers that can communicate simultaneously: 32
	Peripheral (USB) port	USB 2.0-compliant Type B connector	USB 2.0-compliant Type C connector
		Transmission speed	12 Mbit/s
	Serial port	CPU1□	Interface: Conforms to EIA RS-232C
		Interface: Conforms to EIA RS-232C	
		CPU3□	
		Serial option board can be added	
		Communication method	
		Synchronization method	
	EtherNet/IP port	Transmission speed	0.3/0.6/1.2/2.4/4.8/9.6/19.2/38.4/57.6/115.2(kビット/s)
		Transmission distance	15 m max.
	Transmission specifications	Media access method	CSMA/CD
		Modulation method	Baseband
		Transmission line format	Star topology
		Transmission speed	100BASE-TX
		Transmission medium	Twisted pair cable (shielded: STP): Category 5, 5e
		Transmission distance	100 m (distance between the switching hub and the node)
	Co	Number of cascade connections	No limit when using a switching hub
		CIP service: tag data link (cyclic communication)	

Item		CJ2M-CPU□□	CJ3M-CPU□□	
		Number of connections	32	256
		Packet interval (update cycle)	1 to 10000 msec (in 0.5 msec increments)	0.5 to 10000 msec (in 0.5 msec increments)
		Permissible communication bandwidth per unit	3000pps	12000pps
		Number of registerable tags	32	256
		Tag type	CIO/DM/EM/HR/WR/network variables	
		Number of tags per connection (=1 tag set)	8	
		Maximum linked data size per node	640CH	184,832CH
		Maximum data size per connection	640CH	722CH
		Number of tag sets that can be registered	32	256
		Maximum size of one tag set	640CH	722CH
		Maximum number of tags that can be refreshed per CPU unit cycle	When output/transmitting (CPU → EtherNet/IP): 32 When input/receiving (EtherNet/IP → CPU): 32	When output/transmitting (CPU → EtherNet/IP): 256 When input/receiving (EtherNet/IP → CPU): 256
		Data size that can be refreshed per CPU unit cycle	When outputting/transmitting (CPU → EtherNet/IP): 640 CH When inputting/receiving (EtherNet/IP → CPU): 640 CH	When outputting/transmitting (CPU → EtherNet/IP): 6432 CH When inputting/receiving (EtherNet/IP → CPU): 6432 CH
		Changing tag data link parameter settings while running	Available	
		Multicast packet filter	Acceptable	
	CIP Service: Explicit Message			
	Class 3 (connection count)		Connection count: 128	
	UCMM (non-connection-oriented)		Maximum number of clients that can communicate simultaneously: 16 Maximum number of servers that can communicate simultaneously: 16	Maximum number of clients that can communicate simultaneously: 32 Maximum number of servers for simultaneous communication: 32
	CIP Routing		Available	
	FINS Service			
	FINS/UDP		Available	
	FINS/TCP		16 connections max.	
	Socket service			
	UDP		Not possible	8 sockets max.
	TCP		Not possible	8 sockets max.
	Modbus server			
	TCP		Not allowed	8 connections max.
	UDP		Not allowed	Allowed
	Modbus client			
	TCP		Not available	Available via a function block using socket services 8 connections max.
	UDP		Not available	Available via a function block using socket services 8 connections max.
	EtherNet/IP conformance test		Compliant with A5	Compliant with CT21
	EtherNet/IP interface		10BASE-T/100BASE-TX Auto Negotiation / fixed setting	
Pulse I/O	External interface		Pulse I/O block with CJ2M-MD211 or MD212 mounted (MIL 40-pin connector)	
	Built-in input		Can be used as a general-purpose input, interrupt input, pulse catch input, or high-speed counter input (terminal functions can be switched in the PLC system settings) Input method: line driver input or 24 VDC input (switched by wiring)	
	General-purpose input		20 points max. (10 points per pulse I/O block unit)	

Item		CJ2M-CPU□□	CJ3M-CPU□□
			Input time constant: selectable in PLC system settings (0, 0.5, 1, 2, 4, 8, 16, 32 ms) Default: 8 ms
	Interrupt input, pulse catch input		8 points max. (4 points per pulse I/O block unit) Minimum ON pulse width of input signal: 30 μ s or more
	High-speed counter input		4 points max. (2 points per pulse I/O block unit) Input method: phase difference (4x) pulse, pulse + direction, up/down pulse, additive pulse Maximum response frequency: 50 kHz in phase difference mode or 100 kHz in single-phase mode Numeric range mode: linear mode, ring mode Count value: 32 bits Counter reset: Z-phase signal + soft reset, soft reset Control method: target value match comparison, band comparison Gate function: available
	Built-in output		Can be used as a general-purpose output, pulse output, or PWM output (switch terminal functions in PLC system settings) Output type: Transistor sink output or source output (selectable depending on the I/O block model)
	General-purpose output		12 points max. (6 points per pulse I/O block)
	Pulse output		4 points max. (2 points per pulse I/O block) Output type: CW/CCW, pulse plus direction (selectable by wiring and ladder instructions) Output frequency: 1 pps to 100 kpps (specified in 1 pps increments) Output mode: continuous mode (for speed control), single mode (for position control) Output pulse count: relative coordinate specification 00000000 to 7FFFFFFF Hex (0 to +2147483647) Absolute coordinate specification 80000000 to 7FFFFFFF Hex (-2147483648 to +2147483647) Acceleration/deceleration curve: trapezoidal, S-curve Home search function: available
	PWM output		4 points max. (2 points per pulse I/O block unit) Output frequency: 0.1 to 6553.5 Hz (in 0.1 Hz increments), 1 to 32,800 Hz (in 1 Hz increments) Duty cycle: 0.0 to 100.0% (specified in 0.1% increments)
Built-in clock	Accuracy		Ambient temperature 55° C: monthly difference -3.5 to +0.5 minutes Ambient temperature 25° C: monthly difference -1.5 to +1.5 minutes Ambient temperature 0° C: monthly difference -3 to +1 minute
	Built-in capacitor backup time	5 minutes	Ambient temperature 40° C: 10 days

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

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