OMRON

Programmable Controller CP1E-series

Replace Guide
From CP1E to CP2E

CP2E-E□□
CP2E-S□□
CP2E-N□□
CP1E-E□□/E□□S
CP1E-N□□/NA□□
CP1E-N□□S
CP1E-N□□S1

SYSMAC
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P150-E1-02

■ Introduction

This replacement guide assumes replacement of the CP1E with the CP2E and no changes to the operation or functions.

The contents include references for selection, configuration of settings, and wiring. No precautions for correct use are included. Be sure to obtain the user's manuals for both the source and target replacement models, and refer to these manuals for necessary usage information—including precautions for correct use—and for verifying operation is satisfactory.

■ Intended Audience

This guide is intended for the following personnel, who must also have knowledge of electrical systems (an electrical engineer or the equivalent).

- Personnel in charge of introducing FA devices.
- Personnel in charge of designing FA systems.
- Personnel in charge of managing FA facilities.

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■ Related Manuals

Man. No.	Model	Manual
W479 (CP1E)	CP1E-E□□SD□-□ CP1E-N□□S□D□-□ CP1E-E□□D□-□ CP1E-N□□D□-□ CP1E-NA□□D□-□	CP1E CPU Unit Hardware User's Manual
W480 (CP1E)	CP1E-E□□SD□-□ CP1E-N□□S□D□-□ CP1E-E□□D□-□ CP1E-N□□D□-□ CP1E-NA□□D□-□	CP1E CPU Unit Software User's Manual
W613 (CP2E)	CP2E-E□□D□-□ CP2E-S□□D□-□ CP2E-N□□D□-□	CP2E CPU Unit Hardware User's Manual
W614 (CP2E)	CP2E-E□□D□-□ CP2E-S□□D□-□ CP2E-N□□D□-□	CP2E CPU Unit Software User's Manual
W483 (For both CP1E and CP2E)	CP1E-E□□D□-□ CP1E-N□□D□-□ CP2E-E□□D□-□ CP2E-S□□D□-□ CP2E-N□□D□-□	CP1E/CP2E CPU Unit Instructions Reference Manual
W446	CXONE-AL□□D-V4	CX-ProgrammerVer.9.□ Operation Manual

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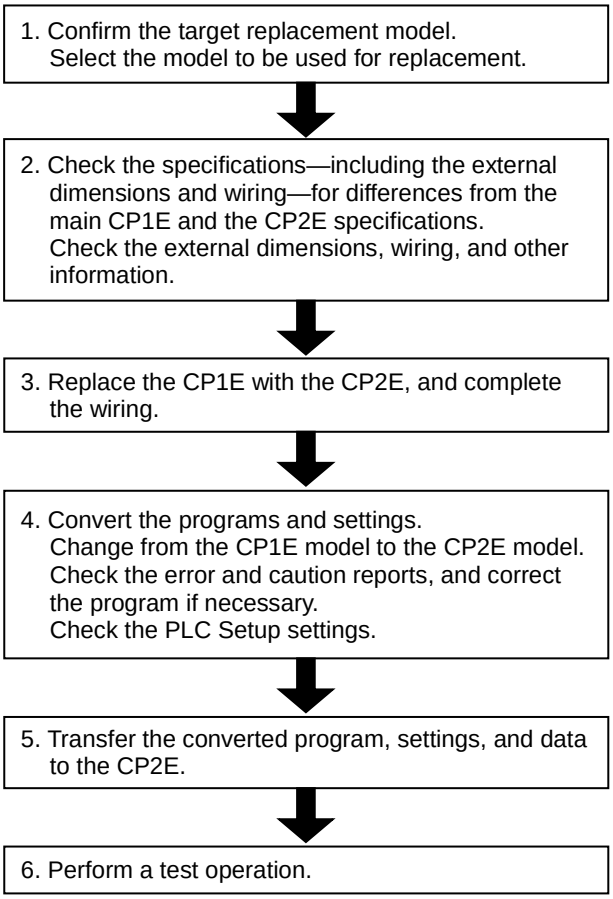
Replacement flow

The procedure to replace the CP1E with the CP2E is as follows. (Each number shows the number of the section)



Precautions for Correct Use

- **This guide provides the procedure to replace the CP1E with the CP2E. However, there are differences in functions and performance between these two models, and not all CP1E can be replaced with the CP2E. Please refer to this guide and the manuals to examine replacement carefully.**
- **After replacement, please perform trial operation before starting actual operation and check that the system operates correctly. This guide does not include sufficient specifications for replacement. Please refer to the manuals listed on the *Related Manuals* page and check the specifications before continuing.**

1. Replacement Model Confirmation

< Precaution for replacement >
Note that the dimensions, specifications, programs, settings, terminal arrangements, and other aspects may be changed by replacing the CP1E with the CP2E. Please refer to this replacement guide and the user's manuals of the CP1E and CP2E for details.

● Using CP1E-E□□(S)DR-A
Replace with CP2E-E□□DR-A.

Model being replaced: CP1E-E□□/E□□S	Model used for replacement: CP2E-E□□
CP1E-E10D□-□	CP2E-E14DR-A
CP1E-E14DR-A/E14SDR-A	CP2E-E14DR-A
CP1E-E20DR-A/E20SDR-A	CP2E-E20DR-A
CP1E-E30DR-A/E30SDR-A	CP2E-E30DR-A
CP1E-E40DR-A/E40SDR-A	CP2E-E40DR-A
CP1E-E60DR-A/E60SDR-A	CP2E-E60DR-A

*: No 10-point CPU Unit is available for the CP2E. Replace with a 14-point CPU Unit.

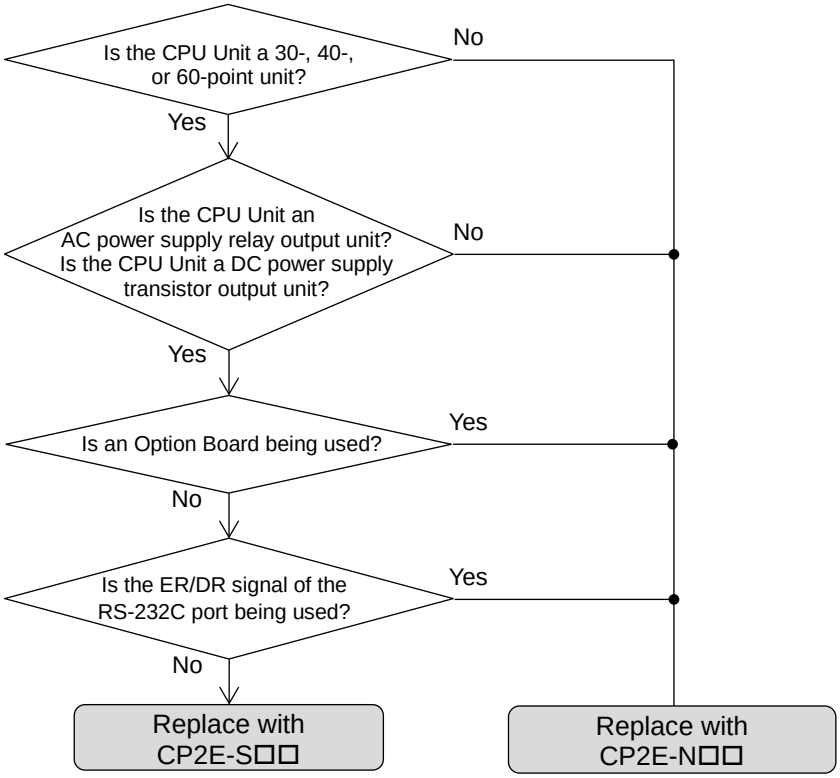
● Using CP1E-N□□SD□-□
Replace with CP2E-S□□D□-□.

Model being replaced: CP1E-N□□S	Model used for replacement: CP2E-S□□
CP1E-N30SD□-□	CP2E-S30D□-□
CP1E-N40SD□-□	CP2E-S40D□-□
CP1E-N60SD□-□	CP2E-S60D□-□

● Using CP1E-N□□S1D□-□
Replace with CP2E-S□□D□-□.

Model being replaced: CP1E-N□□S1	Model used for replacement: CP2E-S□□
CP1E-N30S1D□-□	CP2E-S30D□-□
CP2E-N40S1D□-□	CP2E-S40D□-□
CP2E-N60S1D□-□	CP2E-S60D□-□

● Using CP1E-N□□D□-□



Model being replaced: CP1E-N□□	Model used for replacement: CP2E-S□□	Model used for replacement: CP2E-N□□
CP1E-N14D□-□	-	CP2E-N14D□-□
CP1E-N20D□-□	-	CP2E-N20D□-□
CP1E-N30D□-□	CP2E-S30D□-□	CP2E-N30D□-□
CP1E-N40D□-□	CP2E-S40D□-□	CP2E-N40D□-□
CP1E-N60D□-□	CP2E-S60D□-□	CP2E-N60D□-□

*: Replacing the communication port with the Option Board

(1) The CP2E-N□□ does not have a built-in RS-232C port.
If an RS-232C communication port is necessary, mount the RS-232C Option Board CP1W-CIF01 on the CP2E-N□□.

(2) If using the CP1W-CIF41 Ethernet Option Board, replace the CP1W-CIF41 with the CP2E-N Built-In Ethernet Port. The CP1W-CIF41 cannot be mounted on the CP2E-N□□.
Refer to *Appendix 3. PC System Setting Examples for Transitioning from CP1W-CIF41 to CP2E-N□□* for replacing the settings when using the CP1W-CIF41.

(3) All other Option Boards that can be mounted to the CP1E-N can be used with the CP2E.
CP1W-CIF01/CP1W-CIF11/CP1W-CIF12-V1
CP1W-ADB21/CP1W-DAB21V/CP1W-MAB221

*: No CP2E-N□□ replacement models exist for transistor output/AC power supply CP1E-N□□ models (CP1E-N□□DT/DT1-A). Replace with a transistor output/DC power supply model (CP2E-S□□DT/DT1-D or CP2E-N□□DT/DT1-D).

● Using CP1E-NA20D□□-□
No direct replacement models are available.
Use the following combinations as equivalent configurations.

<table>
<tr><th>Model being replaced:
CP1E-NA20D□□-□</th><th>Model used for replacement: CP2E + Analog unit</th></tr>
<tr><td rowspan="3">CP1E-NA20D□-□
Inputs: 12, Outputs: 8
Analog inputs: 2 (isolated)
Input range: 0 to 5 V, 1 to 5 V, 0 to 10 V, -10 to +10 V, 0 to 20 mA, 4 to 20 mA
Resolution: 6,000
Analog outputs: 1 (isolated)
Output range: 0 to 5 V, 1 to 5 V, 0 to 10 V, -10 to +10 V, 0 to 20 mA, 4 to 20 mA
Resolution: 6,000</td><td>CP2E-S30D□-□ or CP2E-N30D□-□
Inputs: 18, Outputs: 12
CP1W-MAD11 (Analog Input/Output Expansion Unit)
Analog inputs: 2 (isolated)
Input range: 0 to 5 V, 1 to 5 V, 0 to 10 V, -10 to +10 V 0 to 20 mA, 4 to 20 mA
Resolution: 6,000
Analog outputs: 1 (isolated)
Input range: 0 to 5 V, 1 to 5 V, 0 to 10 V, -10 to +10 V 0 to 20 mA, 4 to 20 mA
Resolution: 6,000</td></tr>
<tr><td>Model used for replacement:
CP2E + Analog Option Board</td></tr>
<tr><td>CP2E-N30D□-□
Inputs: 18, Outputs: 12
CP1W-MAB221 (Analog Option Board)
Analog inputs: 2 (non-isolated)
Input range: 0 to 10 V, 0 to 20 mA
Resolution: 4,000 (0 to 10 V); 2,000 (0 to 20 mA)
Analog outputs: 1 (non-isolated)
Input range: 0 to 10 V
Resolution: 4,000</td></tr>
</table>

*: When using the CP1W-MAB221, the analog I/O range is limited, and the internal circuits of the analog I/O and the CPU Unit are not isolated.

2. Main Specifications and Differences Between CP1E and CP2E

2.1. Dimensions

Although the dimensions of the CP1E and the CP2E are different, the two models are almost identical.
*: No 10-point CPU Unit is available for the CP2E. Replace with a CPU Unit with 14 points or more.

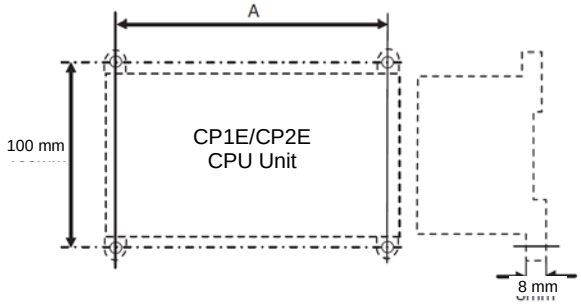
Dimension comparison table

I/O points	Dimensions (W x H x D)		
	CP1E-E□□ CP1E-N□□ Normal-type	CP1E-E□□S CP1E-N□□S(1) Renewal-type	CP2E
10 points	66×90×85	-	-
14 points	86×90×85	86×90×79	86×90×80
20 points	86×90×85	86×90×79	86×90×80
30 points	130×90×85	130×90×79	130×90×80
40 points	150×90×85	150×90×79	150×90×80
60 points	195×90×85	195×90×79	195×90×80

2.2. Mounting

The DIN track and screw hole dimensions are the same as for the CP1E.

I/O points	Mounting hole pitch A	
	CP1E	CP2E
10 points	56±0.5	-
14 points	76±0.5	76±0.5
20 points	76±0.5	76±0.5
30 points	120±0.5	120±0.5
40 points	140±0.5	140±0.5
60 points	185±0.5	185±0.5



2.3. Expansion (I/O) Units

All CP1W Expansion (I/O) Units connectable to the CP1E can be used with the CP2E.

2.4. Option Boards

The CP1W-CIF41 cannot be used with the CP2E. If using the CP1W-CIF41 with the CP1E, use the built-in Ethernet port of CP2E-N□□.

2.5. Supply Voltage

Although the power supply voltage and operating voltage range of the CP1E and CP2E are the same, the power consumption increases depending on the model.
Change to an appropriate power supply if power supply capacity is insufficient.

2.6. External Power Supply

The external power supply specifications of the CP1E and CP2E are the same.
Only 30/40/60-point AC power supply models include an external power supply function.

2.7. I/O Function Assignment

All CP1E functions have been covered with the CP2E, with some functions including enhancements. This eliminates the need to implement changes when replacing the models.

(1) Input interrupt, quick-response input function

Function assignments have not been changed. The CP2E-N□□ includes an increased number of interrupt inputs and quick-response inputs.

Contact function assignments

Input contact	CP1E	CP2E	
		CP2E-S/E□□, CP2E-N14	CP2E-N20/30/40/60
0.02	Interrupt input 2/ Quick-response input 2	Interrupt input 2/ Quick-response input 2	Interrupt input 2/ Quick-response input 2
0.03	Interrupt input 3/ Quick-response input 3	Interrupt input 3/ Quick-response input 3	Interrupt input 3/ Quick-response input 3
0.04	Interrupt input 4/ Quick-response input 4	Interrupt input 4/ Quick-response input 4	Interrupt input 4/ Quick-response input 4
0.05	Interrupt input 5/ Quick-response input 5	Interrupt input 5/ Quick-response input 5	Interrupt input 5/ Quick-response input 5
0.06	Interrupt input 6/ Quick-response input 6	Interrupt input 6/ Quick-response input 6	Interrupt input 6/ Quick-response input 6
0.07	Interrupt input 7/ Quick-response input 7	Interrupt input 7/ Quick-response input 7	Interrupt input 7/ Quick-response input 7
0.08	—	—	Interrupt input 8/ Quick-response input 8
0.09	—	—	Interrupt input 9/ Quick-response input 9

(2) High-speed counter input function changes

Although the max. input frequency has been increased, function assignments have not been changed.

Max. input frequency

High-speed counter	CP1E-E□□(S)	CP1E-N□□(S)	CP2E-S/E□□	CP2E-N□□
High-speed counter 0	Increment pulse: 10 kHz Increment/decrement pulse: 10 kHz Pulse + direction: 10 kHz Phase difference: 5 kHz	Increment pulse: 100 kHz Increment/decrement pulse: 100 kHz Pulse + direction: 100 kHz Phase difference: 50 kHz	Increment pulse: 100 kHz Increment/decrement pulse: 100 kHz Pulse + direction: 100 kHz Phase difference: 50 kHz	Increment pulse: 100 kHz Increment/decrement pulse: 100 kHz Pulse + direction: 100 kHz Phase difference: 50 kHz
High-speed counter 1	Increment pulse: 10 kHz Increment/decrement pulse: 10 kHz Pulse + direction: 10 kHz Phase difference: 5 kHz	Increment pulse: 100 kHz Increment/decrement pulse: 10 kHz Pulse + direction: 100 kHz Phase difference: 5 kHz	Increment pulse: 100 kHz Increment/decrement pulse: 10 kHz Pulse + direction: 100 kHz Phase difference: 5 kHz	N30/40/60 Increment pulse: 100 kHz Increment/decrement pulse: 100 kHz Pulse + direction: 100 kHz Phase difference: 50 kHz N14/20 Increment pulse: 100 kHz Increment/decrement pulse: 10 kHz Pulse + direction: 100 kHz Phase difference: 5 kHz
High-speed counter 2	Increment pulse: 10 kHz	Increment pulse: 10 kHz	Increment pulse: 10 kHz	Increment pulse: 100 kHz
High-speed counter 3	Increment pulse: 10 kHz	Increment pulse: 10 kHz	Increment pulse: 10 kHz	Increment pulse: 10 kHz
High-speed counter 4	Increment pulse: 10 kHz	Increment pulse: 10 kHz	Increment pulse: 10 kHz	Increment pulse: 10 kHz
High-speed counter 5	Increment pulse: 10 kHz	Increment pulse: 10 kHz	Increment pulse: 10 kHz	Increment pulse: 10 kHz

Contact function assignments

Input contact	For both CP1E and CP2E		
	Increment pulse	Differential phase or up/down	Pulse + direction
0.00	High-speed counter 0	High-speed counter 0 (phase A/increment)	High-speed counter 0 (pulse)
0.01	High-speed counter 1	High-speed counter 0 (phase B/decrement)	High-speed counter 1 (pulse)
0.02	High-speed counter 2	High-speed counter 1 (phase A/increment)	High-speed counter 0 (direction)
0.03	—	High-speed counter 1 (phase B/decrement)	High-speed counter 1 (direction)
0.04	High-speed counter 3	High-speed counter 0 (phase Z/reset)	High-speed counter 0 (reset)
0.05	High-speed counter 4	High-speed counter 1 (phase Z/reset)	High-speed counter 1 (reset)
0.06	High-speed counter 5	—	—

(3) Using pulse outputs
Although the number of pulse output points has been increased, function assignments have not been changed.

Contact function assignments

Output

Output contact	CP1E-N□□(S)	CP2E	
		CP2E-S□□	CP2E-N□□
100.00	Pulse output 0 (pulse)	Pulse output 0 (pulse)	Pulse output 0 (pulse)
100.01	Pulse output 1 (pulse)	Pulse output 1 (pulse)	Pulse output 1 (pulse)
100.02	Pulse output 0 (direction)	Pulse output 0 (direction)	Pulse output 0 (direction)
100.03	Pulse output 1 (direction)	Pulse output 1 (direction)	Pulse output 1 (direction)
100.04	Pulse output 0 Error counter reset output	Pulse output 0 Error counter reset output	Pulse output 0 Error counter reset output
100.05	Pulse output 1 Error counter reset output	Pulse output 1 Error counter reset output	Pulse output 1 Error counter reset output
100.06	-	-	Pulse output 2 Error counter reset output
100.07	-	-	Pulse output 3 Error counter reset output
101.00	-	-	Pulse output 2 (pulse)
101.01	-	-	Pulse output 3 (pulse)
101.02	-	-	Pulse output 2 (direction)
101.03	-	-	Pulse output 3 (direction)

Input (N20/30/40/60, S20/30/40/60 CPU Unit: With origin searching)

Input contact	CP1E-N□□(S)	CP2E	
		CP2E-S□□	CP2E-N□□
0.06	Pulse output 0 origin input	Pulse output 0 origin input	Pulse output 0 origin input
0.07	Pulse output 1 origin input	Pulse output 1 origin input	Pulse output 1 origin input
0.08	-	-	Pulse output 2 origin input
0.09	-	-	Pulse output 3 origin input
0.10	Pulse output 0 origin proximity input	Pulse output 0 origin proximity input	Pulse output 0 origin proximity input
0.11	Pulse output 1 origin proximity input	Pulse output 1 origin proximity input	Pulse output 1 origin proximity input
1.00	-	-	Pulse output 2 origin proximity input
1.01	-	-	Pulse output 3 origin proximity input

*1: The pulse output function cannot be used with relay output models.
*2: Pulse outputs 2 and 3 can be used with N30/40/60 CPU Units.

Input (N14 CPU Unit: With origin searching)

Input contact	CP1E-N14	CP2E	
		-	CP2E-N14
0.03	Pulse output 0 origin proximity input	-	Pulse output 0 origin proximity input
0.04	-	-	-
0.05	Pulse output 1 origin proximity input	-	Pulse output 1 origin proximity input
0.06	Pulse output 0 origin input	-	Pulse output 0 origin input
0.07	Pulse output 1 origin input	-	Pulse output 1 origin input

*1: The pulse output function cannot be used with relay output models.

(4) Using the PWM output function
The specifications are the same for both the CP1E and the CP2E. No changes have been implemented.

Output contact	CP1E	CP2E
100.01	PWM output 0	PWM output 0

*: The PWM output function cannot be used with relay output models.

2.8. Battery

The CP1E and the CP2E use different batteries.

CP1E: CP1W-BAT01 (sold separately)

CP2E: CP2W-BAT02 (sold separately)

The battery/capacitor backup areas are different between the CP1E and the CP2E.

When using the CP1E I/O memory backup battery, installation of a separate battery is not required.

Battery/capacitor backup area

	CP1E	CP2E
I/O memory • DM Area (D) • Holding Area (H) • Current counter value/counter flag (C) • Auxiliary Area	Battery/capacitor backup	- (Battery-less backup is performed even when the power is OFF, so no battery is required.)
Clock	Battery/capacitor backup (For CP1E-N□□(S))	Battery/capacitor backup (For CP2E-S□□/CP2E-N□□)

2.9. Analog Adjusters

The CP2E does not have an analog adjuster function.

Change how the function is implemented, such as by creating programmable terminal screens.

3. Wiring

3.1. Terminal Arrangement

The terminal block is fixed for both the CP1E and the CP2E.

● Input wiring

Same for both the CP1E and the CP2E.

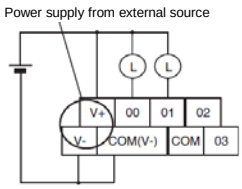
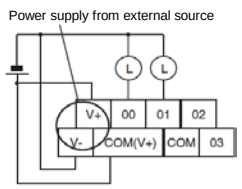
● Output wiring

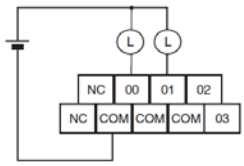
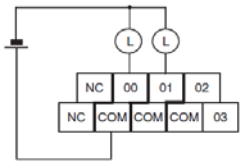
Relay output model

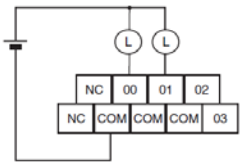
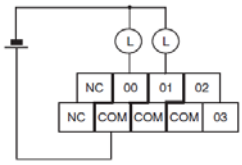
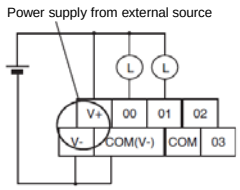
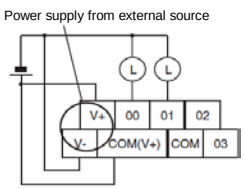
Same for both the CP1E and the CP2E.

Transistor output

Depending on the model used for replacement, some wiring may need to be changed.

<table>
<tr><th>Model being replaced: CP1E-N□□S</th><th>Model used for replacement: CP2E-S□□</th></tr>
<tr><td rowspan="2"><table><tr><th>Sinking</th><th>Sourcing</th></tr><tr><td> 
</td><td> 
</td></tr></table></td><td>No change

Model used for replacement: CP2E-N□□
Supplying 24 VDC power to the 100CH00 bit/01 bit is not necessary.<table><tr><th>Sinking</th><th>Sourcing</th></tr><tr><td> 
</td><td> 
</td></tr></table></td></tr>
</table>

<table>
<tr><th>Model being replaced: CP1E-N□□</th><th>Model used for replacement: CP2E-S□□</th></tr>
<tr><td rowspan="2"><table><tr><th>Sinking</th><th>Sourcing</th></tr><tr><td> 
</td><td> 
</td></tr></table></td><td>An external supply of 24 VDC power is required when using the 100CH00 bit/01 bit.<table><tr><th>Sinking</th><th>Sourcing</th></tr><tr><td> 
</td><td> 
</td></tr></table>
Model used for replacement: CP2E-N□□
No change</td></tr>
</table>

3.2. Communication Port Wiring

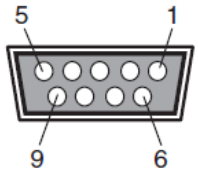
● Built-in RS-232C port

The interface of the built-in RS-232C port on the CP1E is different from the built-in RS-232C port on the CP2E-S/E□□.

Change the wiring.

Model being replaced: CP1E-N□□(S)

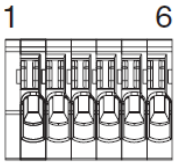
D-sub connector



Pin No.	Signal name	
	CP1E N□□S	CP1E N□□
1	FG	FG
2	SD(TXD)	SD(TXD)
3	RD(RXD)	RD(RXD)
4	RS(RTS)	RS(RTS)
5	CS(CTS)	CS(CTS)
6	5V	5V
7	-	DR(DSR)
8	-	ER(DTR)
9	SG(0V)	SG(0V)
Shell	FG	FG

Model used for replacement: CP2E-S/E□□

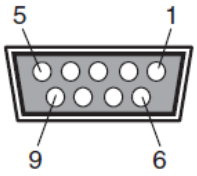
Terminal block



Pin No.	Signal name CP2E-S/E□□
1	SD(TXD)
2	RD(RXD)
3	RS(RTS)
4	CS(CTS)
5	SG(0V)
6	FG

Model used for replacement: CP2E-N□□ + Option Board CP1W-CIF01

D-sub connector



Pin No.	Signal name CP1E-N□□
1	FG
2	SD(TXD)
3	RD(RXD)
4	RS(RTS)
5	CS(CTS)
6	5V
7	DR(DSR)
8	ER(DTR)
9	SG(0V)
Shell	FG

● Built-in RS-485 port

The wiring for the built-in RS-485 port of the CP1E-N□□S1 and the built-in RS-485 port of the CP2E-S□□ is the same.

3.3. Expansion Unit and Option Board Wiring

Expansion Units and Option Boards can be replaced as they are.

4. Changing Programs and Settings Using CX-Programmer

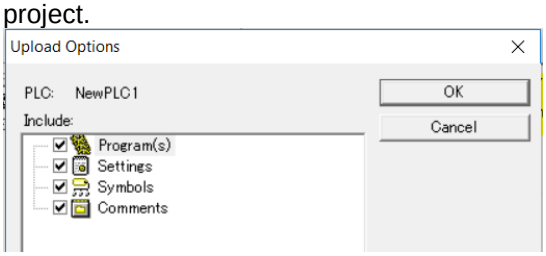
Use CX-Programmer to change programs and settings from the CP1E to the CP2E.
Use CX-Programmer version 9.72 or later.

4.1. Saving CP1E Programs and Settings

If programs must be transferred from the CP1E being replaced, use CX-Programmer to save the necessary CP1E programs.

4.1.1. Saving User Programs

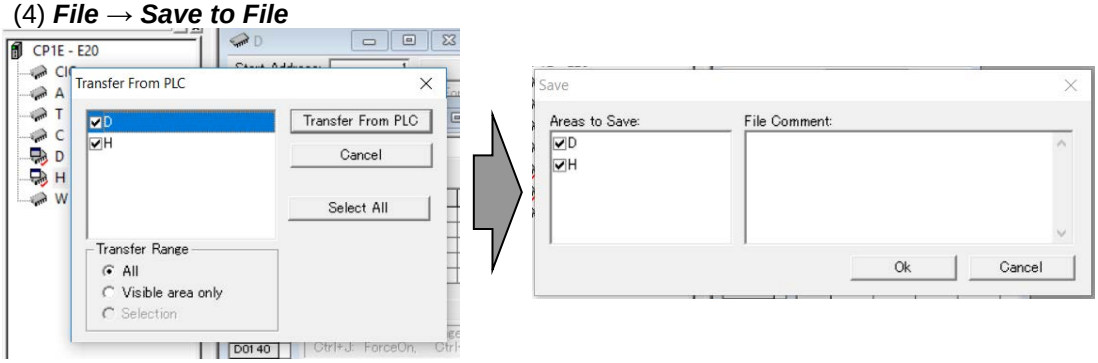
From the menu, click ***PLC*** → ***Transfer*** → ***Transfer From PLC***, and check all of the boxes as in the following diagram. After the user programs or PLC Setup settings are transferred to the project, save the project.



4.1.2. Saving I/O Memory

When the data for the ladder program is set in the I/O memory (DM Area and Holding Area) of the CP1E, it is necessary to copy it to the I/O memory area of the CP1E. Follow the procedure below to save a .mem file.

(1) ***Memory***
(2) Open ***D/H***
(3) ***Online*** → ***Transfer From PLC***
(4) ***File*** → ***Save to File***

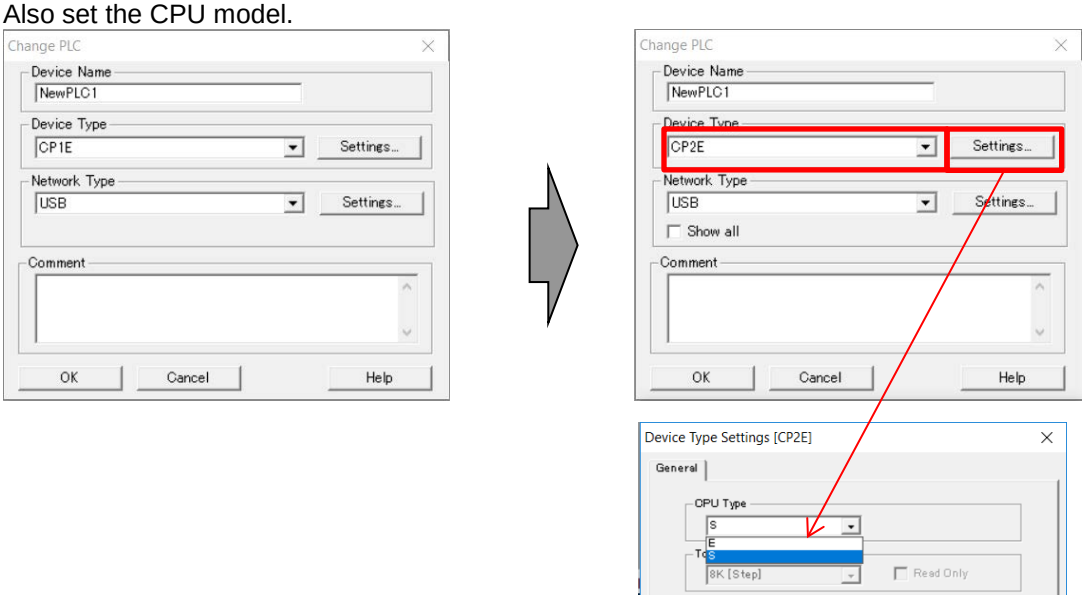


4.2. Converting program

Changing the PLC

Change the PLC model in the CP1E user program from “CP1E” to “CP2E” or “CP2E-N” with the CX-Programmer.

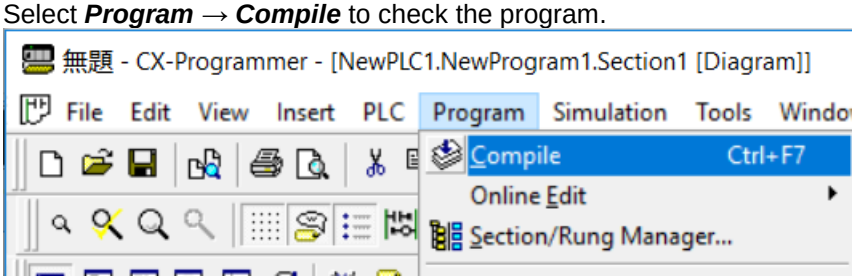
Also set the CPU model.



4.3. Checking error and warning report

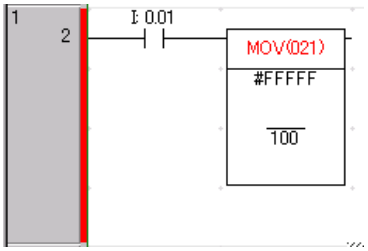
Check for errors after converting to the CP2E.

Select ***Program*** → ***Compile*** to check the program.



If the Output window shows errors or warnings, check the details for each.

If a ladder rung contains an error, a red line appears down the left-hand side of the rung.



Compile can check the following contents.

- Illegal data
- Instruction support by PLC
- Operand ranges
- Program capacity for PLC
- Syntax
- Ladder diagram structure
- Output duplication
- Tasks

4.4. Modifying Program

If an error occurs, correct the error while referring to the *CP2E CPU Unit User's Manual*, the *CP1E CPU Unit User's Manual*, and the *CP1E/CP2E Instructions Reference Manual*.

Precautions for Correct Use

Some errors may not be detected by the above-mentioned check with *Compile*.
Check the entire program to ensure there are no problems with the system, and modify as necessary.

4.5. PLC Setup Changes

Depending on the CP2E model being used for replacement, the CP1E PLC Setup settings may not be transferred. Open the PLC Setup settings for the CP2E, and configure the settings manually. Make sure that the PLC Setup settings have been changed correctly.

When changing models as follows, the PLC Setup settings will be transferred when the PLC model is changed.

Model being replaced: CP1E	Model used for replacement: CP2E	Transferring PLC Setup settings
CP1E-E	CP2E-E	Carried over
	CP2E-S, CP2E-N	**Cannot be carried over**
CP1E-N	CP2E-E	**Cannot be carried over**
	CP2E-S, CP2E-N	Carried over
Models other than CP1E CS/CJ/CP1H/CP1L	CP2E-E, CP2E-S, CP2E-N	**Cannot be carried over**

*: The PLC Setup settings are not transferred even when changing from the CP2E to a different model.

5. Transferring Data

Transfer the programs, settings, and data that have been converted or modified to the CP2E CPU Unit via USB port or Ethernet port.
Set the clock if the timer function will be used.

6. Test Operation

Turn on the power and confirm operation is correct before starting actual operation.

Precautions for Correct Use

After replacement, please perform trial operation before starting actual operation and check that the system operates correctly. If the wiring or settings are not configured correctly, the system may malfunction.

Appendix 1. Specification and Performance Comparison Between CP1E and CP2E

● Functional Specifications

Item		CP1E E/N□□S-type CPU Units	CP2E E/S□□-type CPU Units	CP1E N□□-type CPU Units	CP2E N□□-type CPU Units
Power supply		AC power supply 100 to 240 VAC DC power supply 24 VDC			
Operation temperature		0°C~55°C	-20°C~60°C	0°C~55°C	-20°C~60°C
Power supply to external devices (service power)		Only AC power supply E/N30/40/60S CPU Unit: 300 mA	Only AC power supply E/S30/40/60 CPU Unit: 300 mA E14/20 CPU Unit: None	Only AC power supply N30/40/60 CPU Unit: 300 mA N14/20 CPU Unit: None	Only AC power supply N30/40/60 CPU Unit: 300 mA N14/20 CPU Unit: None
High-speed counter inputs		E□□S-type: Up/down or pulse plus direction inputs: 10 kHz × 2 counters Or Differential phases (4x): 5 kHz × 2 counters Or Increment inputs: 10 kHz × 6 counters 10 kHz × 5 counters (Only for 10 I/O Points) N□□S-type: Up/down inputs: 100 kHz × 1 counter 10 kHz × 1 counter Or Pulse plus direction inputs: 100 kHz × 2 counters Or Differential phase inputs (4x) 50 kHz × 1 counter 5 kHz × 1 counter Or Incremental pulse inputs 100 kHz × 2 counters 10 kHz × 4 counters	Up/down inputs: 100 kHz × 1 counter 10 kHz × 1 counter Or Pulse plus direction inputs: 100 kHz × 2 counters Or Differential phase inputs (4x) 50 kHz × 1 counter 5 kHz × 1 counter Or Incremental pulse inputs 100 kHz × 2 counters 10 kHz × 4 counters	Up/down inputs: 100 kHz × 1 counter 10 kHz × 1 counter Or Pulse plus direction inputs: 100 kHz × 2 counters Or Differential phase inputs (4x) 50 kHz × 1 counter 5 kHz × 1 counter Or Incremental pulse inputs 100 kHz × 2 counters 10 kHz × 4 counters	N14/20 CPU Unit: Up/down inputs: 100 kHz × 1 counter 10 kHz × 1 counter Or Pulse plus direction inputs: 100 kHz × 2 counters Or Differential phase inputs(4×) 50 kHz × 1 counter 5 kHz × 1 counter Or Incremental pulse inputs 100 kHz × 2 counters 10 kHz × 4 counters N30/40/60 CPU Unit: Up/down or pulse plus direction inputs: 100 kHz × 2 counters, Or Differential phase inputs(4×) 50 kHz × 2 counters Or Incremental pulse inputs 100 kHz × 3 counters 10 kHz × 3 counters
Quick-response / Interrupt inputs		6 inputs	6 inputs	6 inputs	8 inputs (6 inputs only for 14 I/O points)
Pulse outputs (Models with transistor outputs only)	Pulse output method	E□□S-type: Not supported N□□S-type: Pulse plus direction only	E□□-type: Not supported S□□-type: Pulse plus direction only, 2 axes max.	Pulse plus direction only 2 axes max.	Pulse plus direction only 4 axes max.
	Speed control	E□□S-type: Not supported N□□S-type: Supported	E□□-type: Not supported S□□-type: Supported	Supported	Supported
	Positioning	E□□S-type: Not supported N□□S-type: Supported	E□□-type: Not supported S□□-type: Supported	Supported	Supported
	Origin searches	E□□S-type: Not supported N□□S-type: Supported	E□□-type: Not supported S□□-type: Supported	Supported	Supported
PWM outputs (Models with transistor outputs only)		E□□S-type: Not supported N□□S-type: 1 output	E□□-type: Not supported S□□-type: 1 output	1 output	1 output
Analog I/O		Not supported	Not supported	Supported (Only for NA20)	Not supported
Analog volume		Not supported	Not supported	Supported	Not supported
USB port		Provided. USB2.0 Full-speed (12M)			Not provided
Ethernet port		Not provided			Provided With switch function* * N14/20 is not supported.
Built-in serial communication port		E□□S-type: Not provided N□□S-type: RS-232C N□□S1-type: RS-232C and RS-485	Provided. E□□-type: RS-232C S□□-type: RS-232C and RS-485	Provided. N□□-type: RS-232C	Not provided Provided by installing Option Board.
Serial option board		Not provided		N14/20 CPU Unit: None N30/40/60 CPU Unit: 1 slot	N14/20 CPU Unit: 1 slot N30/40/60 CPU Unit: 2 slots
Serial communi-cation protocols	Baud rate	1200/2400/4800/9600/19.2k/38.4k/57.6k/115.2k			
	Supported protocol	• Host Link • 1:N NT Link • No-protocol mode • Serial PLC Links (master, slave) • Modbus-RTU easy master	• Host Link • 1:N NT Link • No-protocol mode • Serial PLC Links (master, slave) • Modbus-RTU Easy Master • Modbus-RTU Slave	• Host Link • 1:N NT Link • No-protocol mode • Serial PLC Links (master, slave) • Modbus-RTU easy master	• Host Link* • 1:N NT Link* • No-protocol mode • Serial PLC Links (master, slave) • Modbus-RTU Easy Master • Modbus-RTU Slave * PORT1 (EX) is not supported.

Item	CP1E E/N□□S-type CPU Units	CP2E E/S□□-type CPU Units	CP1E N□□-type CPU Units	CP2E N□□-type CPU Units
Option Boards that can be mounted	Cannot be mounted.		• RS232C Option Board CP1W-CIF01 • RS422A/485 Option Board CP1W-CIF11/CIF12-V1 • Ethernet Option Board CP1W-CIF41 • Analog Option Board CP1W-MAB221/ADB21/ DAB21V	Serial Communication Option Board with one port • RS232C Option Board CP1W-CIF01 • RS-422A/485 Option Board CP1W-CIF11/CIF12-V1 Serial Communication Option Board with two ports*1 • RS232C Option Board CP2W-CIFD1 • RS232C & RS-485 Option Board CP2W-CIFD2 • RS-485 Option Board CP2W-CIFD3 Analog Option Board*2 CP1W-MAB221/ ADB21/ DAB21V *1 CP2W-CIFD□ can only be mounted on option slot 1. *2 Maximum one Analog Option Board can be mounted on an N□□-type CPU Unit.
Memory backup	Built-in EEPROM: Contains the user programs, parameters, DM Area initial values and comment files Built-in SRAM (Battery backup): DM/HR/CNT/AR Data memory area	Built-in Flash Memory: Contains the user programs, parameters, DM Area initial values and comment files Built-in non-volatile memory (Batteryless backup): DM/HR/CNT/AR Data memory area	Built-in EEPROM: Contains the user programs, parameters, DM Area initial values and comment files Built-in SRAM (Battery backup): DM/HR/CNT/AR Data memory area	Built-in Flash Memory: Contains the user programs, parameters, DM Area initial values and comment files Built-in non-volatile memory (Batteryless backup): DM/HR/CNT/AR Data memory area
Clock	E□□S-type: Not supported N□□S-type: Supported	E□□-type: Not supported S□□-type: Supported	Supported	Supported

Item	CP1E CPU Units	CP2E CPU Units
Program capacity	E□□-type: 2K steps N□□-type: 8K steps	E□□-type: 4K steps S□□-type: 8K steps N□□-type: 10K steps
FB capacity	Not provided	E□□-type: 4K steps S□□-type: 8K steps N□□-type: 10K steps
Program language	Ladder diagram	Ladder diagram
Function blocks	Not provided	Maximum number of function block definitions: 64 Maximum number of instances: 128 Languages usable in function block definitions: Ladder diagrams, structured text (ST)
Instructions	Approximately 200	Approximately 220
Instruction execution times	LD: 1.19 μs MOV: 7.9 μs	LD: 0.23 μs MOV: 1.76 μs
Number of tasks	17 • 1 cyclic task • 16 interrupt tasks	17 • 1 cyclic task • 16 interrupt tasks
Maximum subroutine number	128	128
Maximum jump number	128	128
Scheduled interrupt tasks	1	1
CIO Area	4,640 bits (290 words) CIO 0.00 to CIO 289.15 (CIO 0 to CIO 289)	4,640 bits (290 words) CIO 0.00 to CIO 289.15 (CIO 0 to CIO 289)
Work Area (W)	1,600 bits (100 words) W0.00 to W99.15 (W0 to W99)	2,048 bits (128 words) W0.00 to W127.15 (W0 to W127)
Holding Area (H)	800 bits (50 words) H0.00 to H49.15 (H0 to H49)	2048 bits (128 words) H0.00 to H127.15 (H0 to H127)
Auxiliary Area (A)	Read-only: 7,168 bits (448 words) A0.00 to A447.15 (A0 to A447) Read/write: 4,896 bits (306 words) A448.00 to A753.15 (A448 to A753)	Read-only: 7,168 bits (448 words) A0.00 to A447.15 (A0 to A447) Read/write: 8,192 bits (512 words) A448.00 to A959.15 (A448 to A959)
Temporary Area (TR)	16 bits: TR0 to TR15	16 bits: TR0 to TR15
Counter Area (C)	256 timer numbers: T0 to T255	256 timer numbers: T0 to T255
Timer Area (T)	256 counter numbers: C0 to C255	256 counter numbers: C0 to C255
Data Memory Area (D)	E□□-type: 2K words D0 to D2047 N□□-type: 8K words D0 to D8191	E□□-type: 4K words D0 to D4095 S□□-type: 8K words D0 to D8191 N□□-type: 16K words D0 to D16383
Data Registers (DR)	Not provided	16 registers: DR0 to DR15
Index Registers (IR)	Not provided	16 registers: IR0 to IR15

Appendix 2. Expansion Units, Option Boards, Cables, Batteries

● CP1W Expansion Unit

The CP1W Expansion Unit can be used with the CP2E.

Product	CP1W Expansion Unit	Remarks
I/O Unit with 40 I/O points	CP1W-40EDR1	
	CP1W-40EDT	
	CP1W-40EDT1	
I/O Unit with 20 I/O points	CP1W-20EDR1	
	CP1W-20EDT	
	CP1W-20EDT1	
Input Unit with 8 inputs	CP1W-8ED	
Output Unit with 8 outputs	CP1W-8ER	
	CP1W-8ET	
	CP1W-8ET1	
Output Unit with 16 outputs	CP1W-16ER	
	CP1W-16ET	
	CP1W-16ET1	
Output Unit with 32 outputs	CP1W-32ER	
	CP1W-32ET	
	CP1W-32ET1	
Analog Input Unit	CP1W-AD041	
	CP1W-AD042	
	CP1W-DA021	
Analog Output Unit	CP1W-DA041	
	CP1W-DA042	
Analog I/O Unit	CP1W-MAD11	
	CP1W-MAD42	
	CP1W-MAD44	
Temperature Sensor Unit	CP1W-TS001	
	CP1W-TS002	
	CP1W-TS003	
	CP1W-TS004	
	CP1W-TS101	
	CP1W-TS102	

● Option Boards

All CP1W Option Boards except the CP1W-CIF41/DAM01 can be used with the CP2E.

Product	CP1W Expansion Unit	Remarks
Option Boards	CP1W-CIF01	
	CP1W-CIF11	
	CP1W-CIF12-V1	
	CP2W-CIFD1	For CP2E
	CP2W-CIFD2	For CP2E
	CP2W-CIFD3	For CP2E
	CP1W-ADB221	
	CP1W-DAB21V	
	CP1W-MAD221	
	CP1W-CIF41	Cannot be used
	CP1W-DAM01	Cannot be used

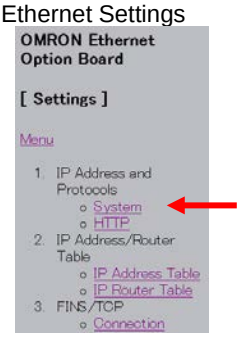
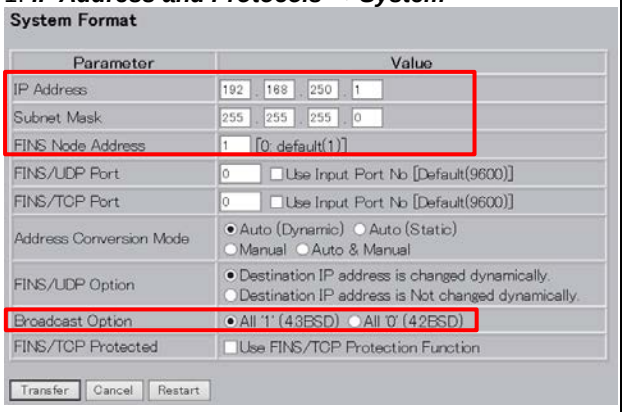
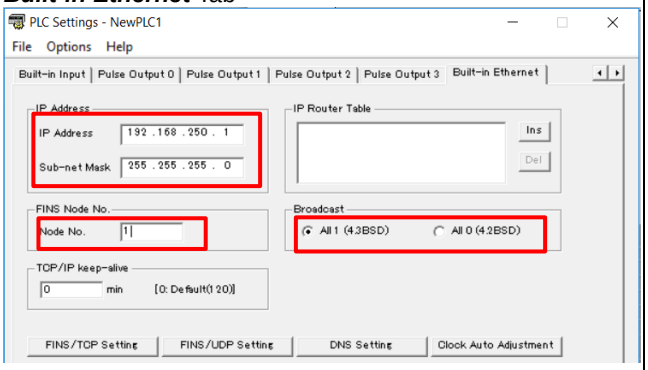
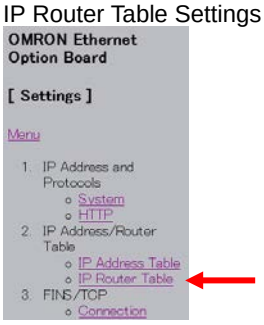
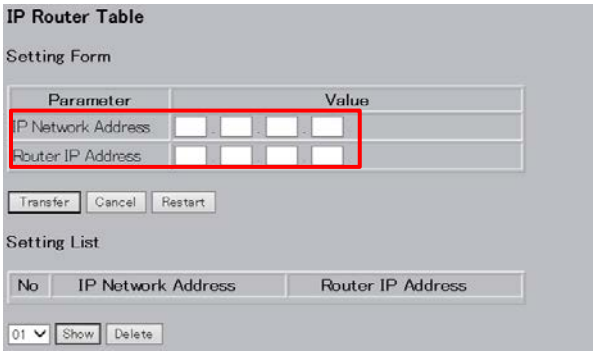
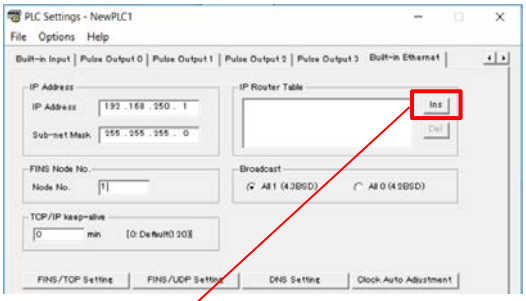
● Others

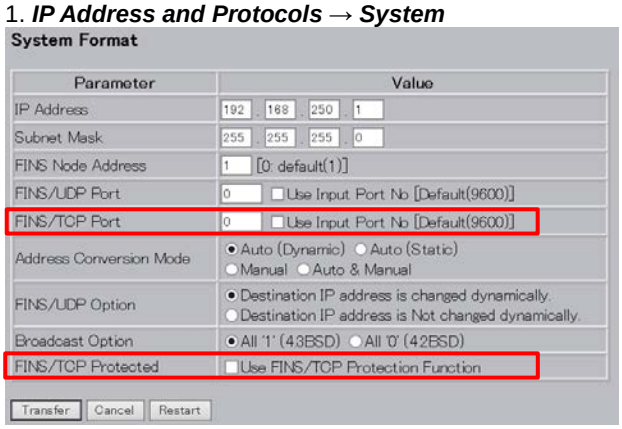
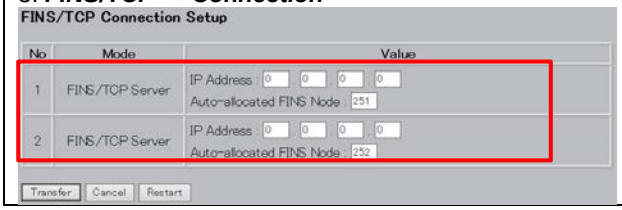
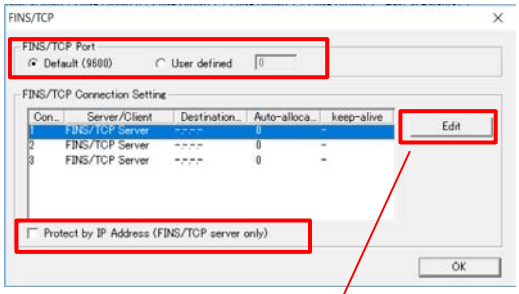
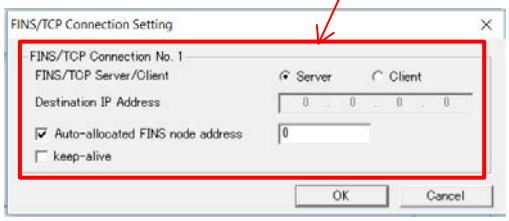
Compatible batteries have changed from the CP1E.

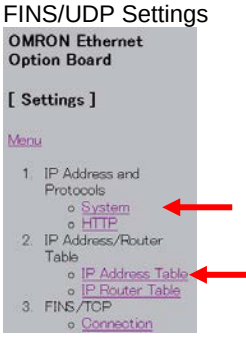
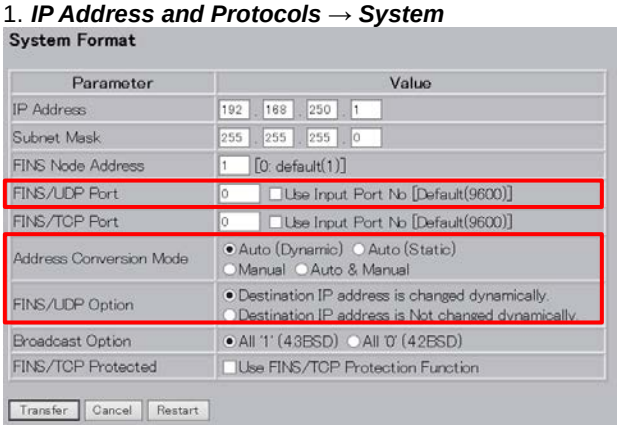
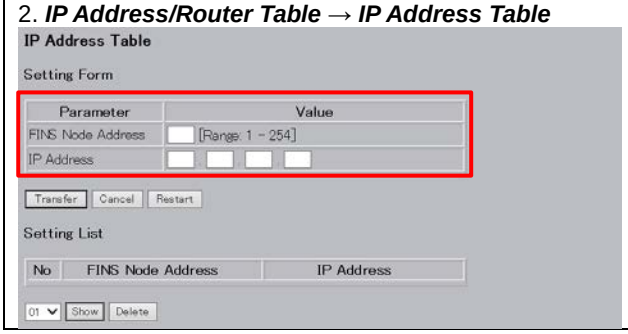
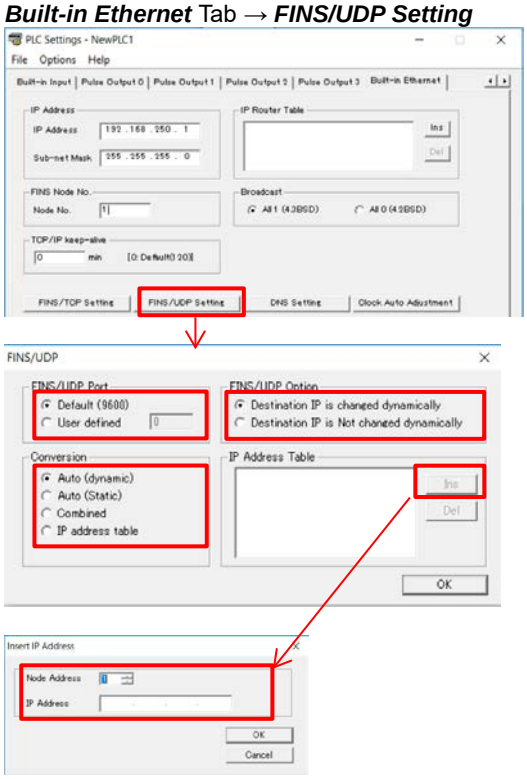
Product	CP1W Expansion Unit	Remarks
Battery	CP2W-BAT02	The CP1W-BAT01 cannot be used.
Extension cable	CP1W-CN811	

Appendix 3. PC System Setting Examples for Transitioning from CP1W-CIF41 to CP2E-N□□

The CP1W-CIF41 cannot be used with the CP2E. Use the built-in Ethernet function of the CP2E-N□□.

Model being replaced: CP1W-CIF41 Web browser settings screen	Model used for replacement: CP2E-N□□ PLC Setup settings screen
Ethernet Settings  1. ***IP Address and Protocols → System*** 	Ethernet Settings ***Built-in Ethernet*** Tab 
IP Router Table Settings  2. ***IP Address/Router Table → IP Router Table*** 	IP Router Table Settings ***Built-in Ethernet*** Tab → ***Ins*** under ***IP Router Table*** 

Model being replaced: CP1W-CIF41 Web browser settings screen	Model used for replacement: CP2E-N□□ PLC Setup settings screen
FINS/TCP Settings  1. ***IP Address and Protocols → System***  3. ***FINS/TCP → Connection***  	FINS/TCP Settings ***Built-in Ethernet*** Tab → ***FINS/TCP Setting***   • The CP1W-CIF41 supports FINS/TCP servers only, so make sure to check ***Server***. • The CP1W-CIF41 does not support the keep-alive function. Check this option if the function is required.

Model being replaced: CP1W-CIF41 Web browser settings screen	Model used for replacement: CP2E-N□□ PLC Setup settings screen
FINS/UDP Settings  1. ***IP Address and Protocols → System***  2. ***IP Address/Router Table → IP Address Table***  	FINS/UDP Settings ***Built-in Ethernet*** Tab → ***FINS/UDP Setting*** 

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