Programmable Terminal NS-B series

Replace Guide
From NS-V2 to NS-B

NB5Q-TW01B-V1-S
NB7W-TW01B-V1-S
NB10W-TW01B-V1-S
NB15W-TW01B-V1-S



V474-E1-02

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■ Introduction

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 designing FA systems.
- Personnel in charge of installing and maintaining FA systems.
- Personnel in charge of managing FA systems and facilities.

This guide provides reference information for replacing the NS-V2 with the NS-B, its NS series successor model. Reading this guide will help you understand the considerations and procedures for replacing the NS-V2 with the NS successor model.
The replacement instructions are described based on the NS-V2. If replacing an NS model without a V suffix or with a V1 suffix with the NS-B, first convert the screen data to NS-V2 format before replacing it with the NS-B.

Note that this guide does not contain safety precautions or other safety-related information.
Be sure to read the safety points and other information required for use provided in the manuals for the NS-B Series Programmable Terminal, and thoroughly test the equipment before actual use.

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Related Manuals

The followings are the manuals and practice guides related to this document.

No.	Model	Title
V083	NS15-TX01□-V2 NS12-TS00□-V1/-V2	NS5, NS8, NS10, NS12, NS15 Programmable Terminals SETUP MANUAL
V073	NS12-TS01□-V1/-V2 NS10-TV00□-V1/-V2	NS5, NS8, NS10, NS12, NS15 Programmable Terminals PROGRAMMING MANUAL
V087	NS10-TV01□-V1/-V2 NS8-TV00□-V1/-V2 NS8-TV01□-V1/-V2 NS8-TV10□-V1 NS8-TV11□-V1 NS5-SQ00□-V1/-V2 NS5-SQ01□-V1/-V2 NS5-TQ00□-V2 NS5-TQ01□-V2 NS5-MQ00□-V2 NS5-MQ01□-V2 NS5-SQ10□-V2 NS5-SQ11□-V2 NS5-TQ10□-V2 NS5-TQ11□-V2 NS5-MQ10□-V2 NS5-MQ11□-V2	Smart Active Parts Library Reference Manual
V129	NB15W-TW01B-V1-S NB10W-TW01B-V1-S NB7W-TW01B-V1-S NB5Q-TW01B-V1-S	NS-B-series Programmable Terminal Hardware User's Manual
V130		NS-B-series Programmable Terminal Software User's Manual
V131		NS-B-series Programmable Terminal Host Connection User's Manual
V133	CXONE-AL□□C-V4 CXONE-AL□□D-V4	CX-Designer Version 4.□ Operation Manual
5483393-0	NB15W-ATT01 NB10W-ATT02 NB7W-ATT01 NB5Q-ATT01	NS-B-series Attachment INSTRUCTION SHEET

Terminology

Term	Description
NS-V2	NS□-□□□□-V2.
NS-B	NB□□W-TW01B-V1-S.
Memory card	Indicates external media. Use CompactFlash for the NS-V2 and USB memory for the NS-B.

1 Applicable Models

1 - 1 Applicable Models

Replacement Target Models Programmable Terminal	Recommended Replacement Models Programmable Terminal
NS5-SQ10-V2 NS5-SQ10B-V2 NS5-SQ11-V2 NS5-SQ11B-V2 NS5-TQ10-V2 NS5-TQ10B-V2 NS5-TQ11-V2 NS5-TQ11B-V2 NS8-TV00-V2 NS8-TV00B-V2 NS8-TV01-V2 NS8-TV01B-V2 NS10-TV00-V2 NS10-TV00B-V2 NS10-TV01-V2 NS10-TV01B-V2 NS12-TS00-V2 NS12-TS00B-V2 NS12-TS01-V2 NS12-TS01B-V2 NS15-TX01S-V2 NS15-TX01B-V2	NB5Q-TW01B-V1-S NB7W-TW01B-V1-S NB10W-TW01B-V1-S NB15W-TW01B-V1-S

1 - 2 Optional Items

The following products need to be replaced when the NS-V2 is replaced with the NS-B.

Product Name	**Replacement Target Models (For NS5-□□W□□□□-V2)**	**Recommended Replacement Models (For NS-B□□W□□□□)**	**Remarks**
Anti-reflection Sheets	NS15-KBA04	NB15W-KBA04	For 15-inch models
	NS12-KBA04	NB10W-KBA04	For 10-inch models
	NS7-KBA04	NB7W-KAB04	For 7-inch models
	NT30-KBA04	NB5Q-KAB04	For 5-inch models
Attachment	-	NB15W-ATT01	For 15-inch models
	-	NB10W-ATT02	For 12-inch/10-inch models
	-	NB7W-ATT01	For 7-inch models
	-	NB5Q-ATT01	For 5-inch models
Memory card	HMC-EF183 HMC-EF283 HMC-EF583	FZ-MEM16G	

The following products can be used with both NS-V2 and NS-B.

Product Name	**Model**	**Remarks**
Barcode reader	V520-RH21-6	
PT-PLC connection cable	XW2Z-200T	Cable to connect with PLC (for CP/CJ/CS-series), RS-232C, 2 m
	XW2Z-500T	Cable to connect with PLC (for CP/CJ/CS-series), RS-232C, 5 m
	NB-RSEXT-2M	Cable to connect with PLC, RS-422A/485, 2 m

The following products cannot be used with the NS-B.

Product Name	**Model**	**Remarks**
Video input unit	NS-CA001	
	NS-CA002	
ControllerLink I/F unit	NS-CLK21	
Battery	CJ1W-BAT01	This is not required because the NS-B is battery-free.
RS-422A conversion adapter	NS-AL002	Serial port B of the NS-B supports RS-422.
	CJ1W-CIF11	

1 - 3 List of Changes

1 - 3 - 1 Hardware Changes

Resolution has changed (3-1-1 General Specifications)
Effective display area has changed (3-1-1 General Specifications)
Unit weight has been reduced (3-1-1 General Specifications)
Dimensions have changed (3-1-1 General Specifications)
Panel cutout dimensions have changed (3-1-1 General Specifications)
Lighting pattern of the front indicator has changed (3-1-2 Performance Specifications)
Brightness has changed
Specifications of DIP switches have changed (4-1-5 Differences in DIP Switch)
Primary side and secondary side of the power supply were isolated but are now not isolated (5-2-1 Checking Whether or Not the Existing Equipment Is Grounded Positively)
Battery-free (3-1-2 General Specifications and 4-1-1 Battery-free)
Cable connection orientation has changed (4-1-2 Cable Connection Orientation)
Connectable devices have changed (3-1-4 Connectable Devices)
Pressing two points at the same time is no longer supported (3-1-2 Performance Specifications)
Applicable standards have changed (3-1-1 General Specifications)
Memory card has changed from CompactFlash to USB memory (3-1-2 Performance Specifications)
A 5 V power supply is now required when connecting a barcode reader to PORT2 (4-1-3 Bar Code Reader)
RS-422/485 communications are performed with PORT2 (4-1-4 RS-422/485 Communications)
There is no successor model for the handheld type (NSH5)
There is no successor model for the integrated controller type (NSJ)
Some standards are not supported (3-1-1 General Specifications)
Video boards and CLK boards cannot be used (1-2 Optional items)
There are PLCs that cannot be connected. (3-1-4 Connectable Devices)
SD card function for the NS-B 15-inch model (Coming soon)

1 - 3 - 2 Software Changes

There are differences in the appearance of parts (4-2-1 Object Appearance Discrepancies)
Timing to write to holding memory has changed (4-2-2 Differences in Timing for Saving to Holding Memory)
Specifications of system memory ($SB/$SW) have changed (4-2-3 Differences in System Memory)
Procedure for switching the screen to the system menu has changed (4-2-4 Procedure for Switching to System Menu)
Connectable devices have changed (3-1-4 Connectable Devices)
Some command button functions have been deleted (4-2-5 Command Button Functions Deleted)
Some functions of the Multifunction Object have been removed (4-2-6 Functions of Multifunction Object Deleted)
Display range for date and time has changed (4-2-7 Date and Time Display Range)
CX-Designer version has been updated (4-2-8 CX-Designer Versions)
Ladder monitor function (Coming soon)
Data trace function (Coming soon)
Device monitor function (Coming soon)
Memory transfer Tool (Coming soon)
Printer print function has been deleted
Screen data transfer via serial connection is not supported.
Programming console function has been deleted (support planned for a future release)
NJ troubleshooter function has been deleted (support planned for a future release)
The Switch Box function has been deleted (support planned for a future release)
SPMA function has been deleted (support planned for a future release)

2 Recommended Replacement Models

Replacement with the corresponding NS-B series model below is recommended depending on the panel size.
Furthermore, the panel cutout will differ when replacing the NS-V2 with the NS-B.
The NS-B can be installed without machining the control panel by using the compatible attachment.

Replacement source NS-V2 model	Recommended replacement NS-B model	Compatible attachment
NS15-TX01□-V2	NB15W-TW01B-V1-S	NB15W-ATT01
NS12-TS01□-V2	NB10W-TW01B-V1-S	NB10W-ATT02
NS10-TV01□-V2	NB10W-TW01B-V1-S	NB10W-ATT02
NS8-TV01□-V2	NB7W-TW01B-V1-S	NB7W-ATT01
NS5-TQ01□-V2	NB5Q-TW01B-V1-S	NB5Q-ATT01

3 Specifications

This chapter describes the hardware specifications and the changes from the NS-V2.

3 - 1 Ratings/Performance

3 - 1 - 1 General Specifications

Item		Specification	
		NS-V2	NS-B
Power supply	Rated supply voltage	24 VDC	
	Allowable power supply voltage Range	20.4 to 27.6 VDC	
Grounding method		Ground of 100 Ω or less	
Degree of protection		Front operation part IP65 oil-proof type, equivalent to NEMA4	Front operation part: IP65 (Dust proof and drip proof only from the front of the panel)
Operating environment	Ambient operating temperature	0 to 50°C Subject to restrictions depending on whether or not there is an expansion unit and the mounting angle	0 to 50°C
	Ambient operating humidity	35 to 85% RH (0 to 40°C) 35 to 60% RH (40 to 50°C) No condensation	10 to 90% RH No condensation
	Operating atmosphere	Must be free from corrosive gases	
	Ambient storage temperature	-20 to 60°C (with no condensation)	
	Noise immunity	Compliant with IEC61000-4-4, 2 kV (power cable)	
	Shock resistance	147 m/s^2 for 3 times each in X, Y, and Z directions	147 m/s^2 for 3 times each in X, Y, and Z directions With each time lasting for at least 11 ms
Battery	Life	5 years (at 25°C) Within 5 days after battery running low (indicator lights in orange)	None
	Model used	CJ1W-BAT01	Battery-free

Item		Specification	
		NS-V2	**NS-B**
International standards	EC Directive	Compliant with EN61131-2	
	UL Standards	UL508, ANSI/ISA12.12.01	UL61010-2-201 UL hazardous locations: None UL Type-4: None
	KC Standards	None	Available
	RCM Standards	Available	
	UKCA Standards	None	Available
	Shipping Standards	Available * Compliance with each of the following standards differs depending on the product model. (NK, LR, DNV, RINA, BV, GL, ABS, KR, CR)	None

Item		Specification	
		NS15-TX01□-V2	**NB15W-TW01B-V1-S**
Dimensions (W×H×D) mm		405 × 304 × 75.8	356 × 272 × 45.0
Panel cutout	Dimensions (W×H) mm	383.5 × 282.5	345.0 × 261.0
	Panel thickness	1.6 to 4.8 mm	
Weight		4.2 kg max.	2625 g
Current/power consumption		45 W max.	14 W
Operating environment	Vibration resistance	5 to 8.4 Hz with 3.5-mm half amplitude 8.4 to 150 Hz with 9.8 m/s^2 constant acceleration 10 times each in X, Y, and Z directions	10 to 57 Hz with 0.075-mm amplitude 57 to 150 Hz, 9.6 m/s^2 30 minutes each in X, Y, and Z directions

Item		Specification	
		NS12-TS01□-V2 **NS10-TV01□-V2**	**NB10W-TW01B-V1-S**
Dimensions (W×H×D) mm		315 × 241 × 48.5	268.8 × 210.8 × 54.0
Panel cutout	Dimensions (W×H) mm	302 × 228	258.0 × 200.0
	Panel thickness	1.6 to 4.8 mm	
Weight		2.5 kg max.	1465 g
Current/power consumption		25 W max.	8 W
Operating environment	Vibration resistance	10 to 57 Hz with 0.075-mm amplitude, 57 to 150 Hz 9.8 m/s^2 constant acceleration, each in X, Y, and Z directions	10 to 57 Hz with 0.075-mm amplitude 57 to 150 Hz, 9.6 m/s^2 30 minutes each in X, Y, and Z directions

Item		Specification	
		NS8-TV01□-V2	**NB7W-TW01B-V1-S**
Dimensions (W×H×D) mm		232 × 177 × 48.5	202.0 × 148.0 × 46.0
Panel cutout	Dimensions (W×H) mm	220.5 × 165.5	191.0 × 137.0
	Panel thickness	1.6 to 4.8 mm	
Weight		2.0 kg max.	705 g
Current/power consumption		25 W max.	7 W
Operating environment	Vibration resistance	10 to 57 Hz with 0.075-mm amplitude, 57 to 150 Hz 9.8 m/s^2 constant acceleration, each in X, Y, and Z directions	10 to 57 Hz with 0.075-mm amplitude 57 to 150 Hz, 9.6 m/s^2 30 minutes each in X, Y, and Z directions

Item		Specification	
		NS5-□Q11□-V2	**NB5Q-TW01B-V1-S**
Dimensions (W×H×D) mm		195 × 142 × 54	184.0 × 142.0 × 46.0
Panel cutout	Dimensions (W×H) mm	184 × 131	172.4 × 131.0
	Panel thickness	1.6 to 4.8 mm	
Weight		1.0 kg max.	660 g
Current/power consumption		15 W max.	7 W
Operating environment	Vibration resistance	10 to 57 Hz with 0.075-mm amplitude, 57 to 150 Hz 9.8 m/s^2 constant acceleration, each in X, Y, and Z directions	10 to 57 Hz with 0.075-mm amplitude 57 to 150 Hz, 9.6 m/s^2 30 minutes each in X, Y, and Z directions

3 - 1 - 2 Performance Specifications

・ Display

Item			Specifications (common for all models)	
			NS-V2	NS-B
Backlight	Life		50,000 hours min.	50,000 hours min. (normal temperature (25°C) with 40% brightness)
	Brightness adjustment		32 levels by touch panel operation	
Front panel indicator	RUN	Lit green	Normal operation	• When starting the NB Unit for the first time • When starting the NB Unit after downloading the screen data • When entering calibration mode
		Flashing green	Memory card transfer ended normally	Not supported
		Lit orange	Backlight abnormality detected immediately after the power is turned on	Not supported
		Flashing orange	Checking the file system immediately after the power is turned on	Not supported
		Lit red	Normal operation with battery running low or not connected	Not supported
		Flashing red	Memory card transfer in progress	Not supported
Rear panel indicator	MC PWR	Lit green	Supplying power to memory card	Not supported
		Green off	Power supply to memory card is stopped	Not supported

Item		Specification	
		NS15-TX01□-V2	**NB15W-TW01B-V1-S**
Display panel	Display device	Color high-brightness TFT LCD	TFT LCD
	Resolution	1024 × 768	
	Display color	256 colors (BMP/JPG image parts are 32,768 colors)	16.2 million colors
	Effective display area	304.1 × 228.1	304 × 228
	View angles	±85° left/right 70° upward 80° downward	±89° left/right 89° upward 89° downward

Item		Specification	
		NS12-TS01□-V2	**NB10W-TW01B-V1-S**
Display panel	Display device	Color high-brightness TFT LCD	TFT LCD
	Resolution	800 × 600	1024 × 600
	Display color	256 colors (BMP/JPG image parts are 32,768 colors)	65,536 colors
	Effective display area	246.0 × 184.5	211 × 133
	View angles	±60° left/right 45° upward 75° downward	±80° left/right 75° upward 80° downward

Item		Specification	
		NS10-TV01□-V2	**NB10W-TW01B-V1-S**
Display panel	Display device	Color high-brightness TFT LCD	TFT LCD
	Resolution	640 × 480	1024 × 768
	Display color	256 colors (BMP/JPG image parts are 32,768 colors)	65,536 colors
	Effective display area	215.2 × 162.4	211 × 133
	View angles	±60° left/right 35° upward 65° downward	±80° left/right 75° upward 80° downward

Item		Specification	
		NS8-TV01□-V2	**NB7W-TW01B-V1-S**
Display panel	Display device	Color high-brightness TFT LCD	TFT LCD
	Resolution	640 × 480	800 × 480
	Display color	256 colors (BMP/JPG image parts are 32,768 colors)	65,536 colors
	Effective display area	170.9 × 128.2	154 × 85
	View angles	±65° left/right 50° upward 60° downward	±80° left/right 60° upward 80° downward

Item		Specification	
		NS5-TQ11□-V2	**NB5Q-TW01B-V1-S**
Display panel	Display device	Color high-brightness TFT LCD	TFT LCD
	Resolution	320 × 240	
	Display color	256 colors (BMP/JPG image parts are 32,768 colors)	65,536 colors
	Effective display area	117.2 × 88.4	113 × 85
	View angles	±70° left/right 70° upward 50° downward	±80° left/right 70° upward 70° downward

・ Operation part

Item		Specifications (common for all models)	
		NS-V2	NS-B
Touch switches	Method	Matrix resistive film type	Analog resistive film type*1
	Pressing two points at the same time	Possible	Not possible
	Life	1,000,000 times min.	
Switch	Function key	NS15 only, 3 keys	None

*1 Due to the change in method, the touch position may become misaligned as the touch panel deteriorates over time. If the touch position deviation becomes significant, calibrate the touch panel periodically.
Refer to *NS-B-series Programmable Terminal Hardware User's Manual (Cat. No. V129)* for the procedure.

Item		Specification	
		NS15-TX01□-V2	NB15W-TW01B-V1-S
Switch	DIP switch	6-pole switch × 1: for transfer 6-pole switch × 1: for switching between RS-232C and RS-422A	4-pole switch × 1
	Reset switch	1	None
External dimmer		1, Lot No. 30114 or earlier only	None

Item		Specification	
		NS12-TS01□-V2 NS12-TS01□-V2	NB10W-TW01B-V1-S
Switch	DIP switch	6-pole switch × 1: for transfer	4-pole switch × 1
	Reset switch	1	

Item		Specification	
		NS8-TV01□-V2 NS5-TQ11□-V2	NB7W-TW01B-V1-S NB5Q-TW01B-V1-S
Switch	DIP switch	6-pole switch × 1: for transfer	2-pole switch × 1
	Reset switch	1	

・ External interfaces

Item		**Specifications (common for all models)**	
		NS-V2	**NS-B**
Memory card interface		1 slot	None
SDCard		None	Only the NB15 has 1 port (Coming soon)
USB Type A		1 port	
USB Type B		1 port	
Serial port	RS232C	Only the NS15 has 1 port Other models have 2 ports	2 ports (PORT1 and PORT2)
	RS422/485	Only the NS15 has 1 port	PORT2 can be used for RS-422/485
Ethernet port		Only models equipped with an Ethernet port 1 port	1 port
ControllerLink		Option board	None
Video output		1 port	None
Video input		Option board	None

3 - 1 - 3 Version Information

Item	Specifications (common for all models)	
	NS-V2	NS-B
Screen creation tool	CX-Designer Ver3	CX-Designer Ver4

3 - 1 - 4 Connectable Devices

Item		Specifications (common for all models)	
		NS-V2	NS-B
Serial port	SYSMAC-PLC ・ SYSMAC-CJ2/CS/CJ/CV/C	Possible * Supports NTLink (1: N), NTLink (1:1), and Host Link	
	MELSEC-A	Possible	Not possible
	MELSEC-F	Possible	Not possible
	MELSEC-A(PrgCon)	Possible	Not possible
	MELSEC-Q(PrgCon)	Possible	Not possible
	MELSEC-Q/QnA	Possible	Not possible
	SIMATIC S7-300	Possible	Not possible
	Temperature controller	Possible	
	Memeory Link	Possible	
	Barcode reader	Possible	
	Modem	Possible	Not possible
	YASKAWA MP	Possible	Not possible
	Varispeed / VS mini	Possible	Not possible
	Modbus Machine(Modicon Address Style)	Possible	

Item		Specifications (common for all models)	
		NS-V2	NS-B
Serial port	Modbus Machine(IEC61131 Address Style)	Possible	
	SLC500/MicroLogix	Possible	Not possible
	PLC-5	Possible	Not possible
	ComtrolLogix/CompactLogix	Possible	Not possible
	Yokogawa Electric (FA-M3)	Possible	Not possible
Ethernet	SYSMAC-CV/CS1/CJ1/CP1	Possible * Supports FINS and EtherNet/IP	
	SYSMAC-CJ2	Possible	
	SYSMAC-NJ(NJ,NX)	Possible	
	Trajexia	Possible	Not possible
	Modbus TCP	Possible	Not possible
Controller Link		Possible	Not possible
Printer		Possible	Not possible

4 Functional Changes

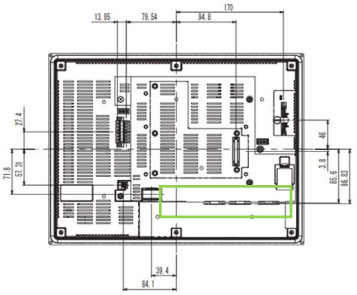
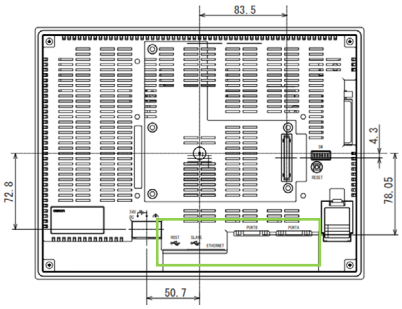
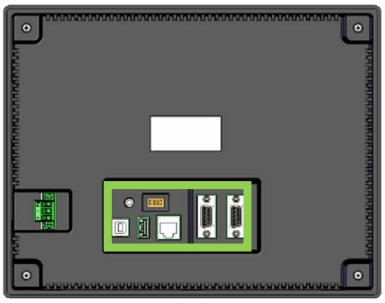
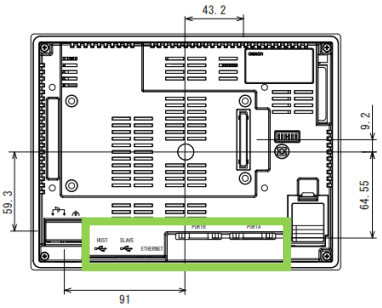
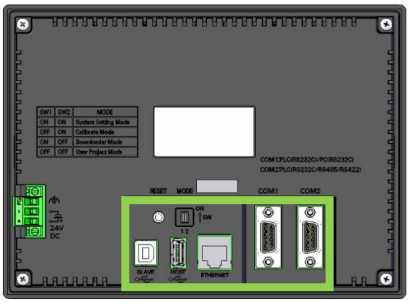
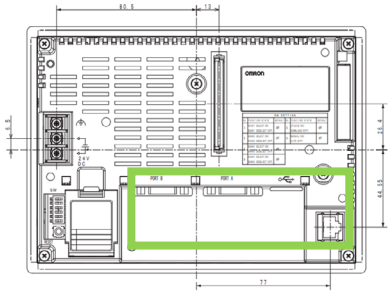
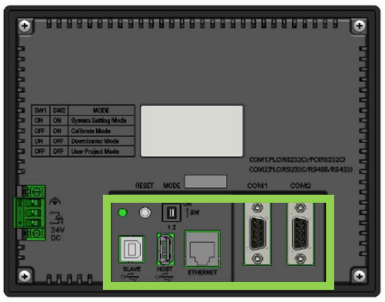
4 - 1 Hardware

4 - 1 - 1 Battery-free

Specification	NS-V2	NS-B
Battery-free	A battery needs to be installed. If a battery is not installed, the time data returns to the initial state in the event of a power interruption.	In an environment that is 40°C, the time data is stored for 10 days after a power interruption. Refer to *NS-B-series Programmable Terminal Hardware User's Manual (Cat. No. V129)* for details. Furthermore, when synchronizing the time of the PLC with the NS-B, use SAP [Settime PLC→NS]. Refer to *CX-Designer Version 4.□ Operation Manual (Cat. No. V133)* and *Smart Active Parts Library Reference Manual (Cat. No. V087)* for details.
Battery installation state at shipment	A battery is installed in the product.	A battery is not installed in the product.

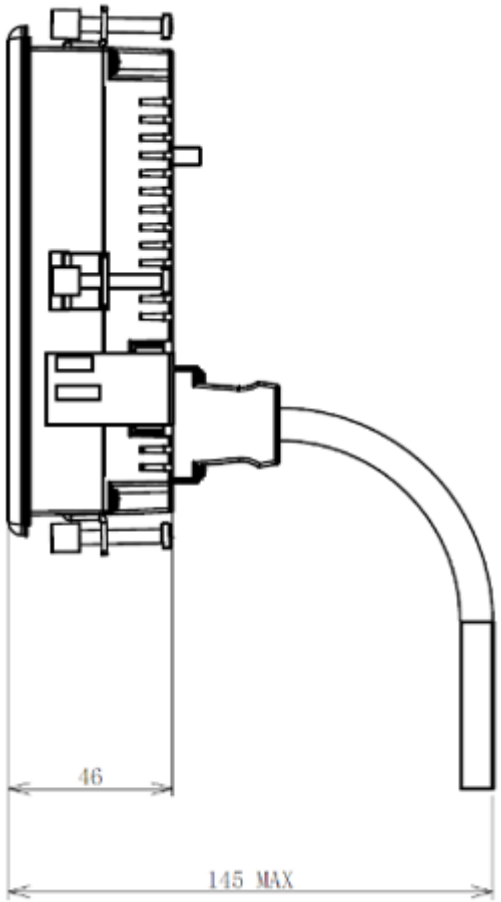
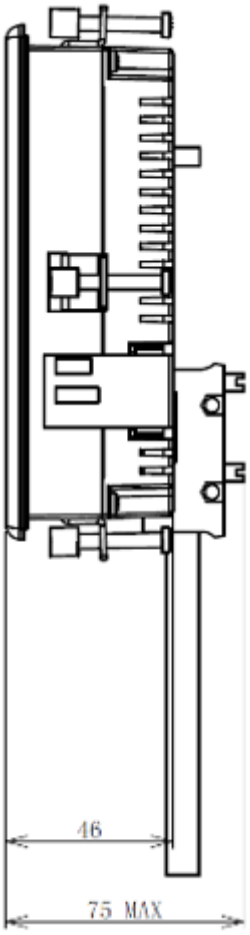
4 - 1 - 2 Cable Connection Orientation

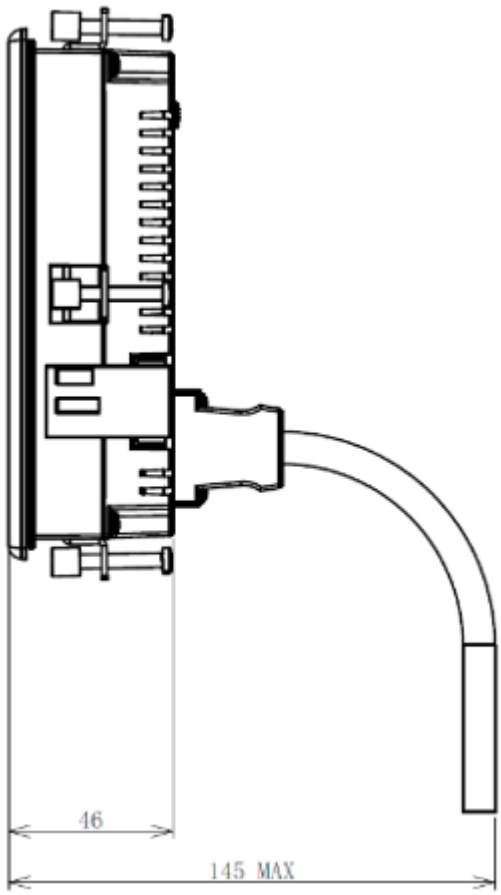
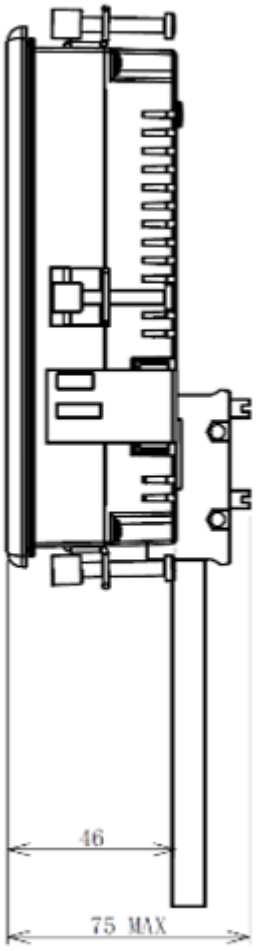
On the NS-V2, the cables exit downward. However, on the NS-B, except for the 15-inch model, the connection orientation of the serial ports, USB slave port, USB host port, and Ethernet port differ.
If space at the rear is limited, consider using right-angle connectors.
The serial ports, USB slave port, USB host port, and Ethernet port are shown in the green boxes in the figure below.

NS-V2	NS-B
NS15 	NB15 
NS10/12 	NB10 
NS8 	NB7 
NS5 	NB5 

The following table lists the hoods for right-angle connection of serial cables.
The height can be reduced by replacing the existing connector hood with a right-angle cable hood.
Use commercially available right-angle connectors for the USB and Ethernet cables, as OMRON does not recommend any specific type.

Size to use with NS-B Series (in inches)	D-sub right-angle hood model	Manufacturer
5 and 7 inches	XM2S-0921	OMRON

5.7 inch	
From	To
	

7 inch wide	
From	To
	

4 - 1 - 3 Barcode Reader

The PIN assignment differs between serial port B of the NS-V2 and that of the NS-B.
Since serial port B of the NS-B does not supply 5 V to the barcode reader, supply 5 V from an external source.

NS-V2

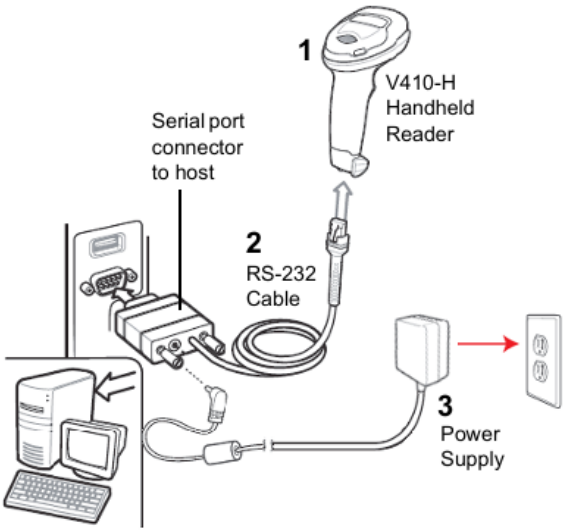
	Signal	Pin No.
RS-232C interface		1
	SD	2
	RD	3
	RS	4
	CS	5
	+5V	6
		7
		8
	SG	9

NS-B

Pins	Signals	I/O	Functions		
			RS-232C	RS-485	RS-422A
1	SDB+	I/O	-	-	Sending data(+)
2	SD	O	Sending data	-	-
3	RD	I	Receiving data	-	-
4	Terminal R1	-	-	Terminal resistor	
5	Terminal R2	-	-	Terminal resistor	
6	RDB+	I/O	-	Send/Receive data(+)	Receiving data(+)
7	SDA-	I/O	-	-	Sending data(-)
8	RDA-	I/O	-	Send/Receive data(-)	Receiving data(-)
9	SG	-	Signal ground		

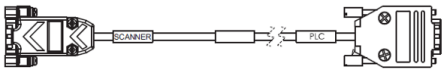
For the supported barcode reader “V410-HDS4608SR,” 5 V can be supplied using the “V410-AC0-1.”
To connect the NS-B to the barcode reader, “V430-WPLC-2M” is required.

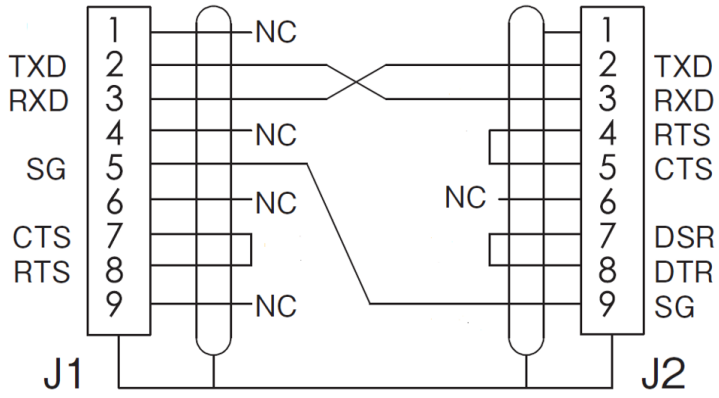
- **RS-232**



Part	Description	Part Number
1	V410-H XD Handheld Reader, Black Grey, Wired, with X-Mode	V410-HDS4608XD
	V410-H SR Handheld Reader, Black Grey, Wired	V410-HDS4608SR
	V410-H HC Handheld Reader, White, Wired	V410-HDS4608HC
2	Cable, RS-232, DB9F, TXD-2, 7 ft.	V410-WR-2M
3	Kit, V410-H AC Power Supply, 5.2 VDC, 1A	V410-AC0-1

The wiring of the V430-WPLC-2M is shown below.



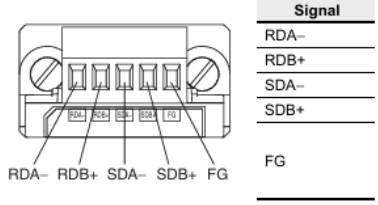


4 - 1 - 4 RS-422/485 Communications

When connecting the NS-V2 via RS-422/485, an RS-232C/RS-422A conversion unit was used. With the NS-B, the device can be connected directly to PORT2.
When connecting a cable with the RS-232C/RS-422A conversion unit, discrete wires were connected to the terminal block. Since the connection is now made directly to PORT2, reconnect using a D-sub 9-pin connector.
The pin assignment for each unit is shown below. Connect the pins to the corresponding signals.

NS-V2

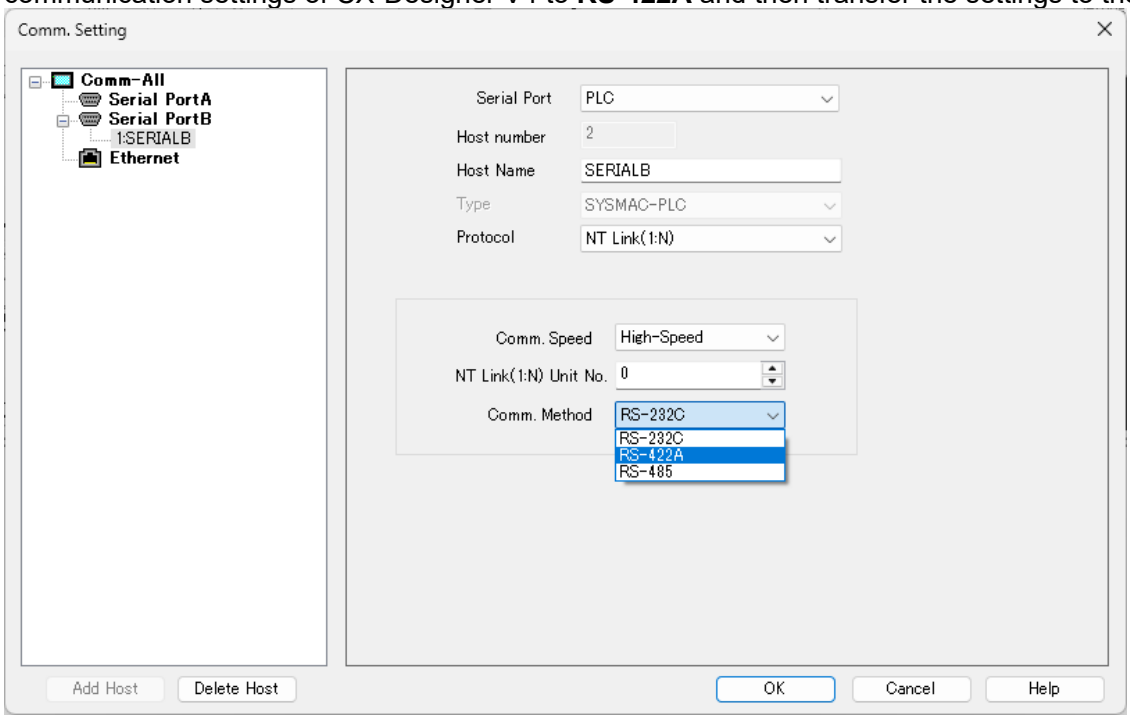
RS-422A/485 Terminal Block



NS-B

Pins	Signals	I/O	Functions		
			RS-232C	RS-485	RS-422A
1	SDB+	I/O	-	-	Sending data(+)
2	SD	O	Sending data	-	-
3	RD	I	Receiving data	-	-
4	Terminal R1	-	-	Terminal resistor	
5	Terminal R2	-	-	Terminal resistor	
6	RDB+	I/O	-	Send/Receive data(+)	Receiving data(+)
7	SDA-	I/O	-	-	Sending data(-)
8	RDA-	I/O	-	Send/Receive data(-)	Receiving data(-)
9	SG	-	Signal ground		

In addition, to perform RS-422 communication via PORT2, set the communication standard in the communication settings of CX-Designer V4 to **RS-422A** and then transfer the settings to the NS-B.



4 - 1 - 5 Differences in DIP Switch

The number of DIP switches differs between the NS-V2 and NS-B, resulting in the following functional differences.

1. Memory card transfer
2. Switching between RS-232C and RS-422A (supported only for the NS15-TX01□-V2)

・ Differences in memory data transfer setting

Banks 1 to 4 can be specified for the memory card transfer function.
Banks 1 to 4 can be specified by DIP switch for the NS-V2, but only bank 1 can be specified by DIP switch for the NS-B.
When using banks 2 to 4, use the manual transfer mode.

DIP switch settings of the NS-V2

Switch No.	**Function**
1	Specifies bank 1 when transferring data. ON: Specifies bank 1
2	Specifies bank 2 when transferring data. ON: Specifies bank 2
3	Specifies bank 3 when transferring data. ON: Specifies bank 3
4	Specifies bank 4 when transferring data. ON: Specifies bank 4
5	Specifies whether to upload or download. ON: Uploads. OFF: Downloads.
6	Specifies whether to transfer manually or automatically. ON: Transfers manually. OFF: Transfers automatically.

DIP switch settings of the NS-B

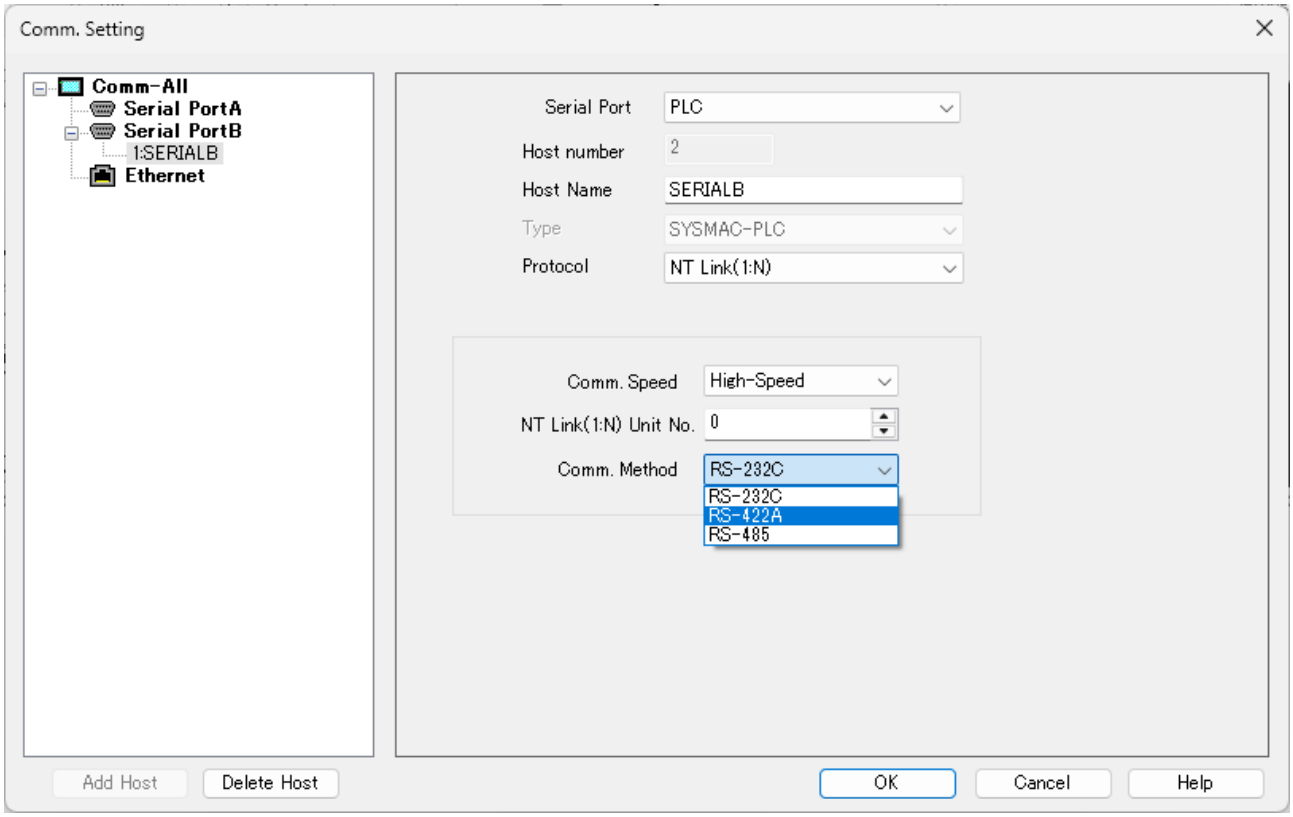
Switch 1	**Switch 2**	**Operation mode**	**Description**
ON	ON	Automatic Download Mode	Downloads the screen data automatically from external memory when the PT Unit starts up.
OFF	ON	Automatic Upload Mode	Uploads the screen data automatically from external memory when the PT Unit starts up.
ON	OFF	Manual Transfer Mode	Starts the memory card transfer function when the PT Unit starts up.
OFF	OFF	User Project Mode	Executes the project stored in the screen data area when the PT Unit starts up.

* The NB10W/NB15W-TW01B-V1-S has switches 3 and 4, but they have no functions.

・ RS-232C/RS-422A switching differences

This function is supported only by the NS15-TX01□-V2 and allows the communication method of serial port B to be switched between RS-232C and RS-422A using the DIP switch settings.

For the NS-B, set the communication standard in the communication settings of CX-Designer to **RS-422A**.



4 - 2 Software

4 - 2 - 1 Object Appearance Discrepancies

There are differences in how objects appear between the NS-V2 and NS-B.
The differences are shown below.

	NS-V2	NS-B
Graphic Objects - Colors Due to differences in the LCD, there may be variations in how colors appear. Example: The appearance of purple color No. 5 (R: 128, G: 0, and B: 128) differs.		

4 - 2 - 2 Differences in Timing for Saving to Holding Memory

The holding memory is used for user alarm history and data logs, operation logs, internal holding bit memory, and word memory ($SB and $SW).
On the NS-V2, data was saved continuously, whereas on the NS-B, data is saved at 30-second intervals.
To explicitly save the information of the holding memory, set system bit “$SB62 Internal Holding Memory” to 1.
When saving is complete, the value returns to 0.

4-2-3 Differences in System Memory

Some of the NS-B system memory has been changed compared with that of the NS-V2.
This section describes the changes to the system memory.

Changes to $SB

Address	Function (NS-V2)	Function (NS-B)	Remarks
$SB4	Battery Low	Reserved	The function has been deleted because the unit is battery-free.
$SB15	Notification/Control of Video	Reserved	The function has been deleted because the video function is not supported.
$SB20	Contrast Adjust (+10 levels)	Reserved	The function has been deleted.
$SB21	Contrast Adjust (+1 level)	Reserved	Same as above
$SB22	Contrast Adjust (-1 level)	Reserved	Same as above
$SB23	Contrast Adjust (-10 levels)	Reserved	Same as above
$SB24	Video Capture Trigger	Reserved	The function has been deleted because the video function is not supported.
$SB25	Start Printing/Capture Screen	Capture Screen	The corresponding functions have been deleted because the print function is not supported.
$SB26	Stop Printing	Reserved	Same as above
$SB27	Test Pattern Printing	Reserved	Same as above
$SB28	Printer Head Cleaning	Reserved	Same as above
$SB29	Update Printer Status	Reserved	Same as above
$SB30	Printer Busy Status / Capture Busy Status	Capture Busy Status	Same as above
$SB31	Notification of Printer Error / Capture Screen Error	Capture Screen Error	Same as above
$SB48	Memory Free Space Check	USB Memory Free Space Check Flag	
$SB49	Stop Memory Card	Remove USB Memory	
$SB50	Memory Card Removing Status (Power OFF)	USB Memory Removing Status	
$SB62	Reserved	Save Internal Holding Memory	A function to explicitly save has been added because the holding memory save timing has changed.

$SW

Address	Function (NS-V2)	Function (NS-B)	Remarks
$SW11	Destination (0:Printer/1:Memory Card)	Reserved	The corresponding functions have been deleted because the print function is not supported.

・ System memory compatible with the NT series

PT status control area

Address	Bit	Function (NS-V2)	Function (NS-B)	Remarks
3	7	Destination (0:Printer/1:Memory Card)	Capture Screen	The corresponding functions have been deleted because the print function is not supported.

PT status notification bits

Address	Bit	Function (NS-V2)	Function (NS-B)	Remarks
1	7	Printer Busy Status / Capture Busy Status	Reserved	The corresponding functions have been deleted because the print function is not supported.
1	13	Battery Low	Reserved	The function has been deleted because the unit is battery-free.

4-2-4 Procedure for Switching to System Menu

On the NS-V2, press two of the four corners of the screen simultaneously to switch to the system menu.

On the NS-B, you can switch to the system menu by double-tapping one of the four corners.

4 - 2 - 5 Command Button Functions Deleted

The following command button functions have been removed due to differences in functionality between the NS-V2 and NS-B.

Function Name	Remarks
Action (Display System Menu) Switch Box Function	Because the switch box function is not supported. (Support planned for a future release)
Action (Video Control - Video Capture)	Because the video input unit is not supported.
Action (Video - Contrast Adjustment)	Same as above
Action (Video Control - Vision Sensor Console Output)	Same as above

4 - 2 - 6 Functions of Multifunction Object Deleted

The following functions of the Multifunction Object have been removed due to differences in functionality between the NS-V2 and NS-B.

Function Name	Remarks
Action (Display System Menu) Switch Box Function	Because the switch box function is not supported. (Support planned for a future release)
Action (Display System Menu) Ladder Monitor	Because the ladder monitor function is not supported. (Coming soon)
Action (Display System Menu) PLC Data Trace	Because the PLC data trace function is not supported. (Coming soon)
Action (Display System Menu) Programming Console (C Series)	Because the programming console function is not supported. (Support planned for a future release)
Action (Display System Menu) Programming Console (CS Series)	Because the programming console function is not supported. (Support planned for a future release)
Action (Display System Menu) Troubleshooter (NJ-series)	Because the troubleshooter (NJ-series) function is not supported. (Support planned for a future release)
Action (Video Control - Video Capture)	Because the video input unit is not supported.
Action (Video - Contrast Adjustment)	Same as above
Action (Video Control - Vision Sensor Console Output)	Same as above

4 - 2 - 7 Date and Time Display Range

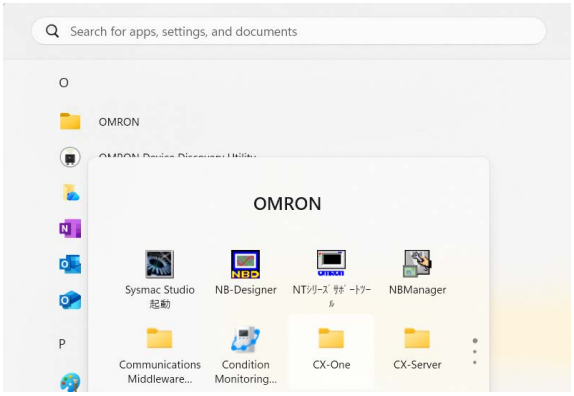
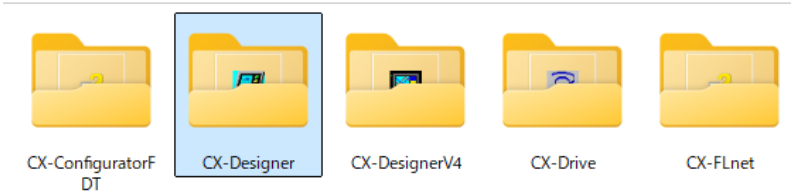
The dates and times that can be displayed by the NS-V2 and NS-B are shown below.

Models	Lower limit	Upper limit
NS-V2	1970-01-01 00:00:00	2106-02-07 06:28:15
NS-B	2024-01-01 00:00:00	2062-01-09 03:14:07

4 - 2 - 8　CX-Designer Versions

The version of CX-Designer to use when handling screen data on the NS-V2 and on the NS-B differs.
Use Ver. 3 for the NS-V2 and Ver. 4 for the NS-B.
If CX-One Ver. 4.70 or later is installed, both versions of CX-Designer can be used.
If the IPP file is selected when existing screen data is opened, the appropriate CX-Designer opens automatically to enable the editing of the screen data.

When creating new screen data, select the CX-Designer to use as described in the procedure below.

1. Select **CX-One** in the **OMRON** folder from the Start menu.	
2. When File Explorer starts, check that the folder contains the **CX-Designer** and **CX-DesignerV4** folders. Select **CX-Designer** when using the NS-V2, and **CX-DesignerV4** when using the NS-B.	
3. Start CX-Designer in the folder.	

4 - 2 - 9　Auto-Update for CX-ONE

If you wish to auto-update from CX-One 4.70 or earlier, please meet the following two conditions.
(1) Set your PC's OS (operating system) to Windows 11 or higher.
(2) Please set the CX-Designer installed on your PC to V3.77 or higher.
　Please run the auto-update with CX-Designer V3.77 or higher installed.

If you are installing CX-One 4.70 or higher, please use Windows 11 or later as the OS.

5 Work Procedure

5 - 1 Workflow

Replace the unit with the NS-B as described in the procedures below. For details on the procedures, refer to the subsequent pages.

5-2 Preparations

5-2-1 Checking Whether or Not the Existing Equipment Is Grounde

5-2-2 Uploading the Screen Data from the NS-V2

5-2-3 Converting the Screen Data for NS-B

5-3 Removing the NS-V2

5-3-1 Turning OFF the NS-V2 Power

5-3-2 Removing All Cables

5-3-3 Removing the Memory Card (Only When Used)

5-4-4 Removing the NS-V2 from the Control Panel

5-4 Installing the NS-B

5-4-1 Mounting the Attachment to the Control Panel

5-4-2 Installing the NS-B in the Control Panel

5-4-3 Connecting the Cables

5-4-4 Installing the Memory Card (Only When Used)

5-5 Starting Up

5-5-1 Turning ON the NS-B Power

5-5-2 Downloading the Screen Data to the NS-B

5-5-3 Checking the Settings and Communication

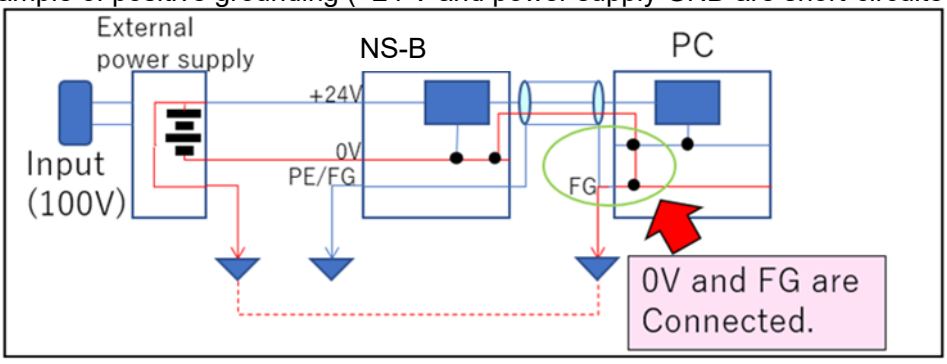
5-5-4 Starting Operation

5 - 2 Preparations

5 - 2 - 1 Checking Whether or Not the Existing Equipment Is Grounded Positively

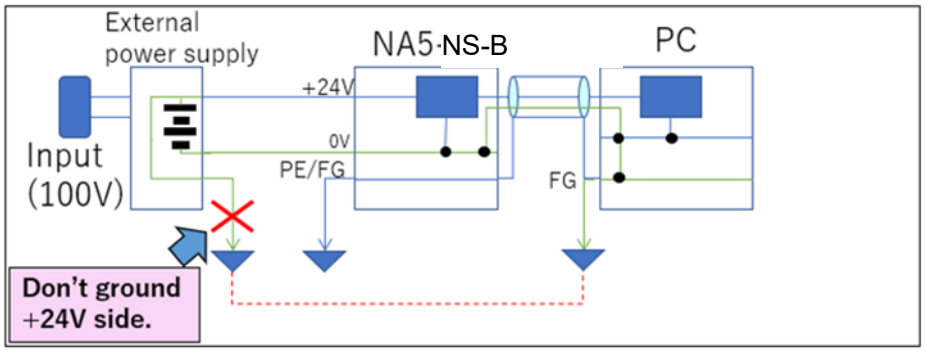
1) Check for positive grounding in the wiring diagram
Check the wiring diagrams in advance to make sure that the 24 V side and ground side of the NS-B Unit are not short-circuited (i.e., the 24 V side is not grounded). If they are short-circuited and the NS-V2 is replaced with the NS-B, the internal power supply of the NS-B will be a non-isolated DC power supply, resulting in a short circuit such as the **positively grounded example** below, which may lead to equipment damage.

Example of positive grounding (+24 V and power supply GND are short-circuited)

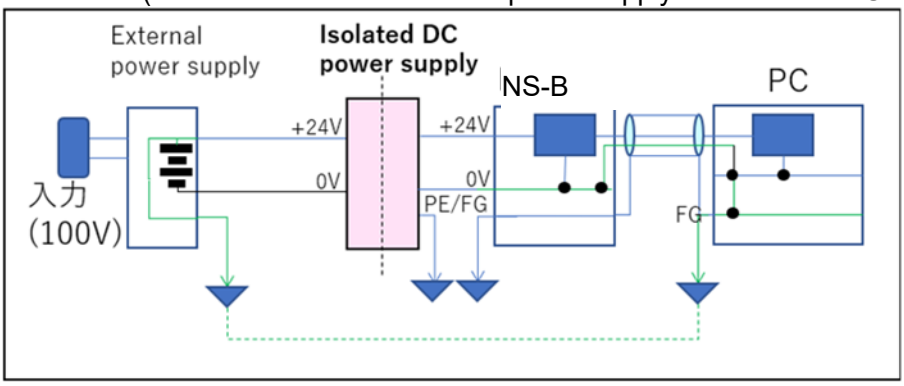


* If the check shows that the 24 V side and ground side of the NS-B Unit are short-circuited (i.e., the 24 V side is grounded), change the wiring so that the 24 V side is not grounded as shown in the figure below (Measure 1), or isolate the external power supply unit from the NS-B Unit (Measure 2).

Measure 1 (rewire so that the 24 V side is not grounded)



Measure 2 (isolate between the external power supply unit and NS-B Unit)

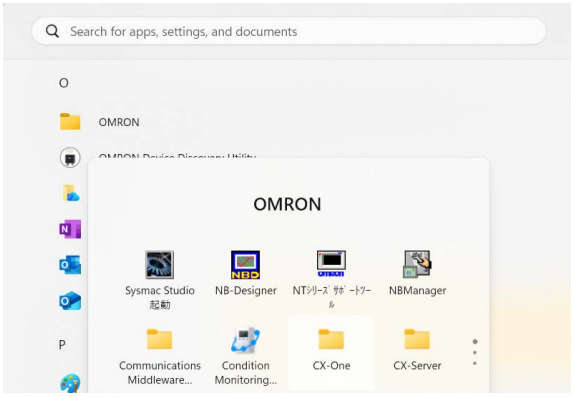
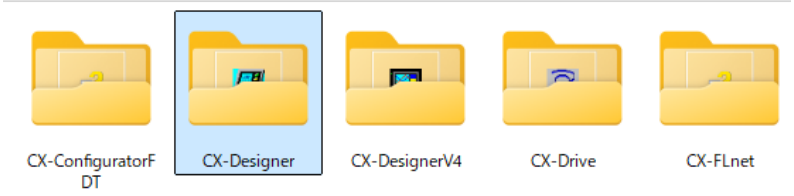
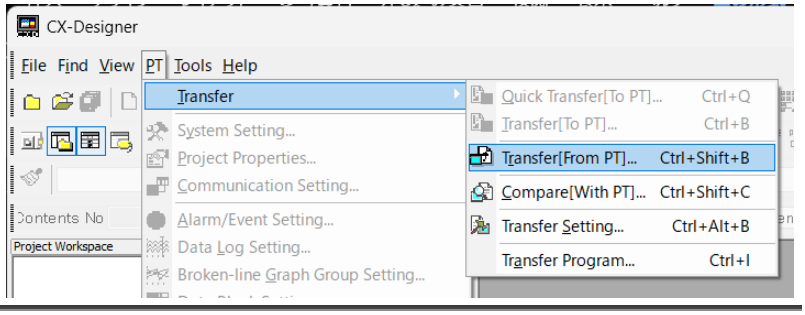


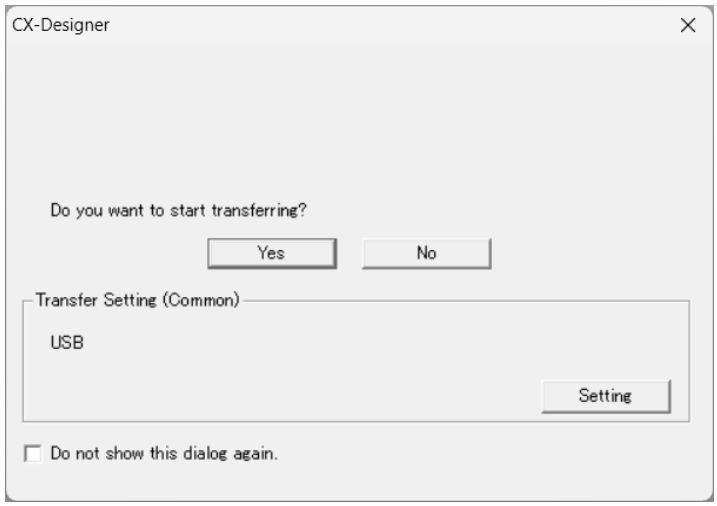
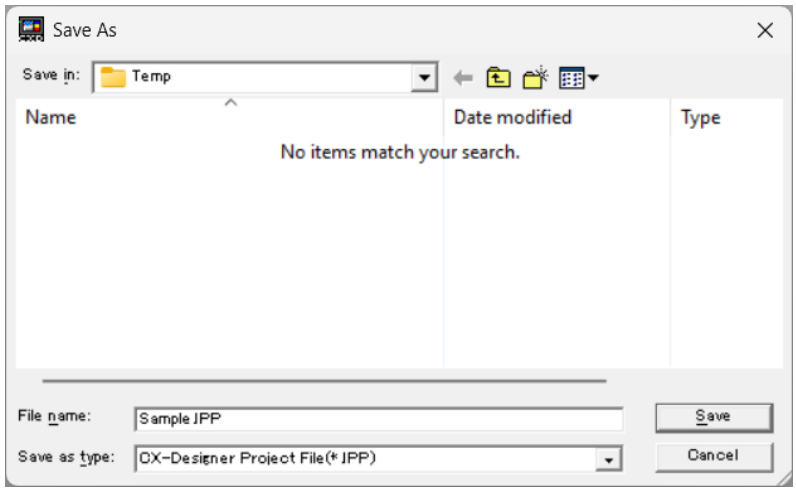
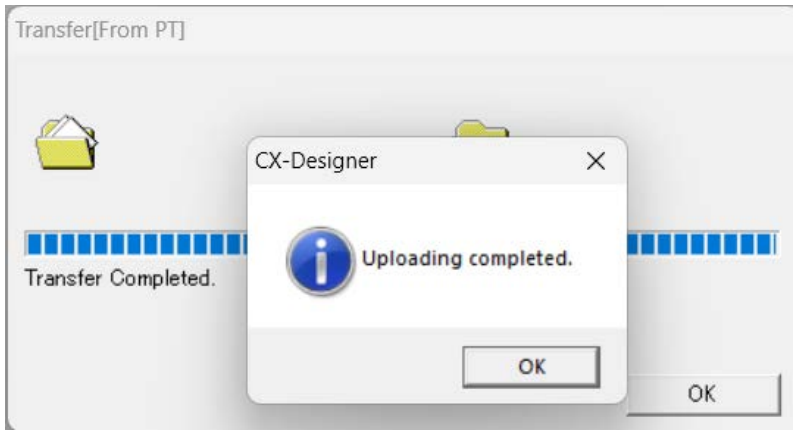
2) Check for positive grounding in the control panel

Using a tester or similar wiring inspection device, check that the 24 V side and ground side are not short-circuited.

5 - 2 - 2　Uploading the Screen Data from the NS-V2

Perform this procedure while Ver. 4.70 or later of CX-One is installed.
Furthermore, the upload will be performed using a USB cable, so prepare one in advance.

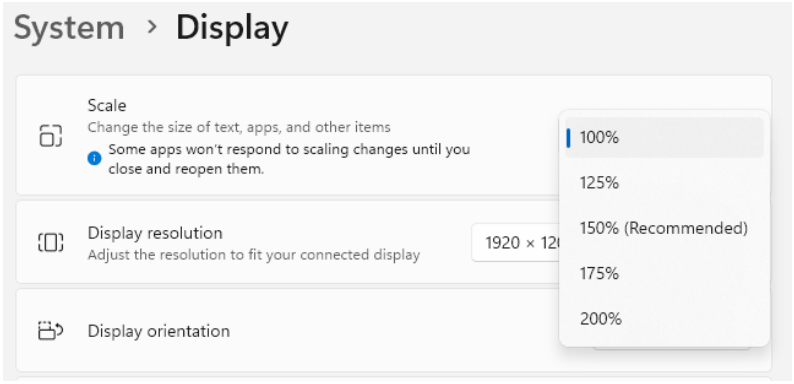
1. Connect the PC and NS-V2 with a USB cable.	
2. Select **CX-One** in the **OMRON** folder from the Start menu.	
3. When File Explorer starts, select the **CX-Designer** folder. * Do not open the **CX-DesignerV4** folder now because it is for the CX-Designer used with the NS-B.	
4. Start CX-Designer.	
5. Once CX-Designer has started, select **PT - Transfer - Transfer[From PT]** from the menu bar.	

5. When the Transfer screen is displayed, check that the transfer setting is set to **USB** and then select **Yes**.	
6. When the dialog box to set the save destination for the screen data to be uploaded is displayed, set the desired location and select **Save**.	
7. Uploading starts. Wait until it completes. After the upload is complete, select **OK**.	
8. Close CX-Designer because file uploading is completed.	
Proceed to “5-2-3 Converting the Screen Data for NS-B.”	

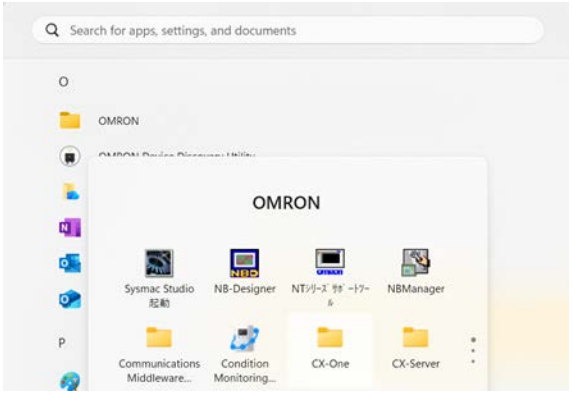
5 - 2 - 3 Converting the Screen Data for NS-B

1. Set the display scale of the PC to 100%.
Right-click the desktop screen, select **Display settings** to display the settings screen, and then set Scale to 100%.

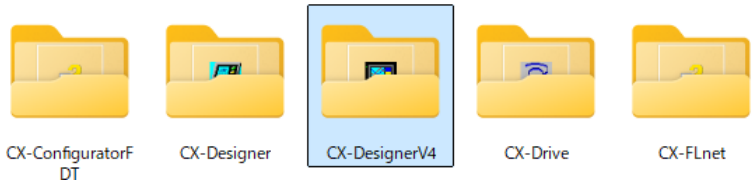
* The font size of CX-Designer may be affected by the scale of the display, so set the scale to 100%.



2. Select **CX-One** in the **OMRON** folder from the Start menu.



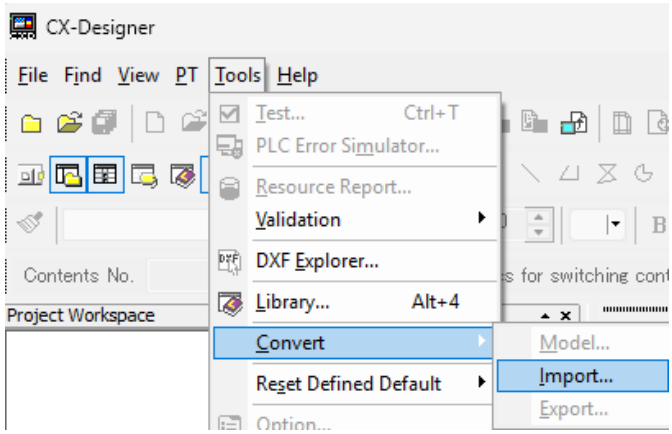
3. When File Explorer starts, select the **CX-DesignerV4** folder.



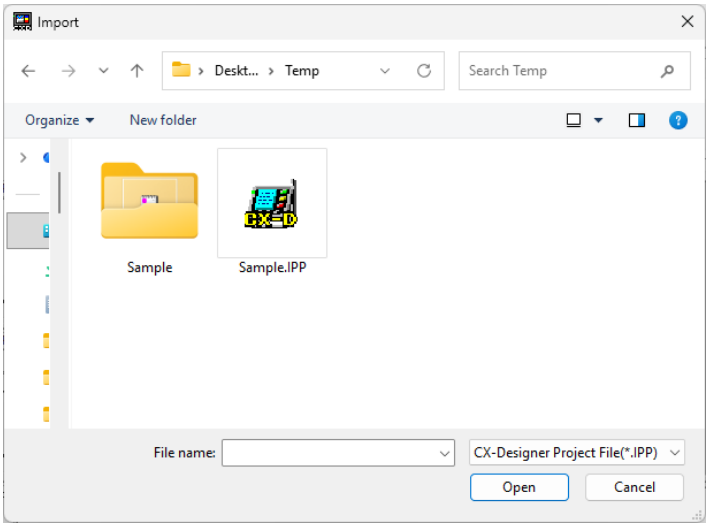
4. Start CX-Designer V4.



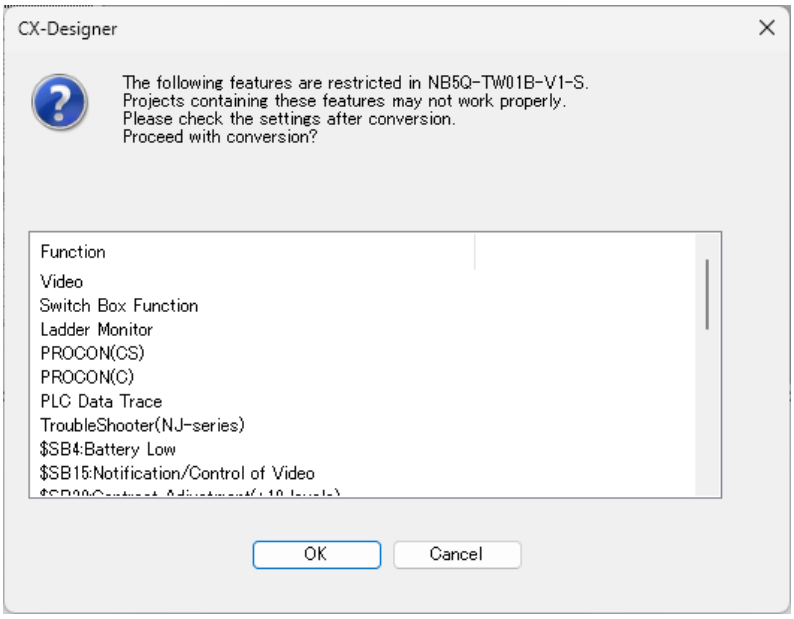
5. Once CX-Designer V4 has started, select **Tools - Convert - Import** from the menu bar.



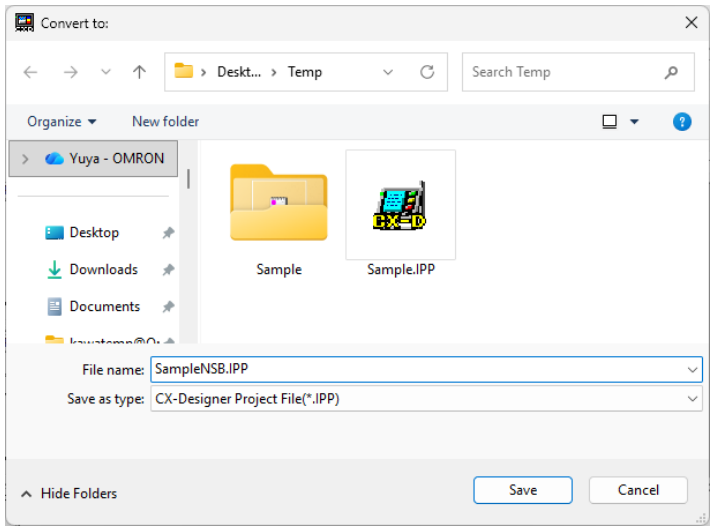
6. When the dialog box to select the file to convert is displayed, select the file uploaded in " 5 - 2 - 2 Uploading the Screen Data from the NS-V2".



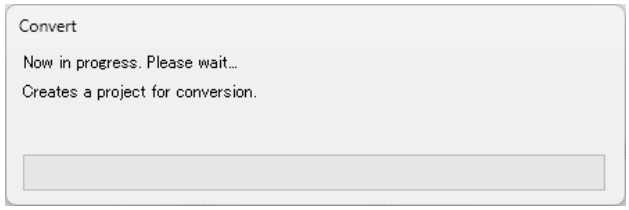
7. When the dialog box to execute conversion is displayed, select **OK**.



8. When the dialog box to set the location to save the converted file and the file name is displayed, set the desired location and select **Save**.



9. Conversion starts. Wait until it completes.



10. When conversion is completed, check whether or not there are any parts affected by the functional changes, and make modifications if necessary.
Refer to “8 Appendix-2 Model Conversion Rules” for the rules on the converted models, part positions, and sizes.

* If any parts were placed outside the screen on the NS-V2, they may become visible on the NS-B due to differences in resolution. Check the screen to ensure that no unintended parts are displayed.

Proceed to “5 - 3 Removing the NS-V2.”

5 - 3 Removing the NS-V2

5 - 3 - 1 Turning OFF the NS-V2 Power

Turn OFF the 24 VDC power supply of the NS-V2 Unit.

5 - 3 - 2 Removing All Cables

Remove all cables from the NS-V2 Unit.

5 - 3 - 3 Removing the Memory Card (Only When Used)

Remove the memory card.

5 - 3 - 4 Removing the NS-V2 from the Control Panel

Remove the NS-V2 Unit from the control panel.

5 - 4 Installing the NS-B

5 - 4 - 1 Mounting the Attachment to the Control Panel

Mount the attachment corresponding to the screen size of the model to be used on the control panel using the panel mounting brackets and a Phillips screwdriver.
Refer to *NS-B-series Attachment INSTRUCTION SHEET (3160273-9)* for the mounting procedure.

5 - 4 - 2 Installing the NS-B in the Control Panel

Install the NS-B Unit in the control panel using the panel mounting brackets and a Phillips screwdriver.

5 - 4 - 3 Connecting the Cables

Connect all cables to the NS-B Unit.

*1 Modification is necessary for the power supply and ground wires.
They are connected with a Y-shaped terminal in the case of the NS-V2, but the power wire is directly fixed to the terminal block in the case of the NS-B.
Cut the Y-shaped terminal, strip 6.5 mm of the insulation, and tighten the terminal screw to a torque of 0.3 to 0.5 N·m.
Furthermore, make sure the screws of the terminal block are firmly tightened.

*2 If RS-422A or RS-485 communication was performed with a serial port, modification is necessary.
Perform the modification in reference to "4 - 1 - 4 RS-422/485 Communications."

5 - 4 - 4 Installing the Memory Card (Only When Used)

Install the memory card if necessary.

* Support is not provided for compatibility with the data used on the NS-V2.

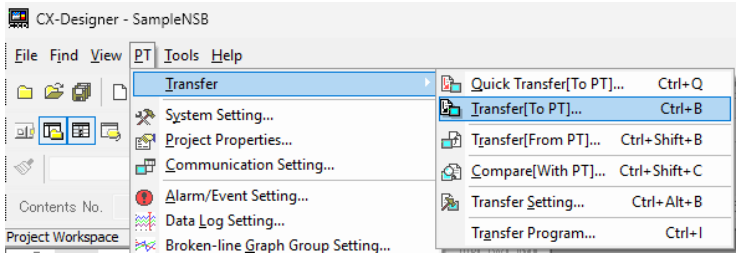
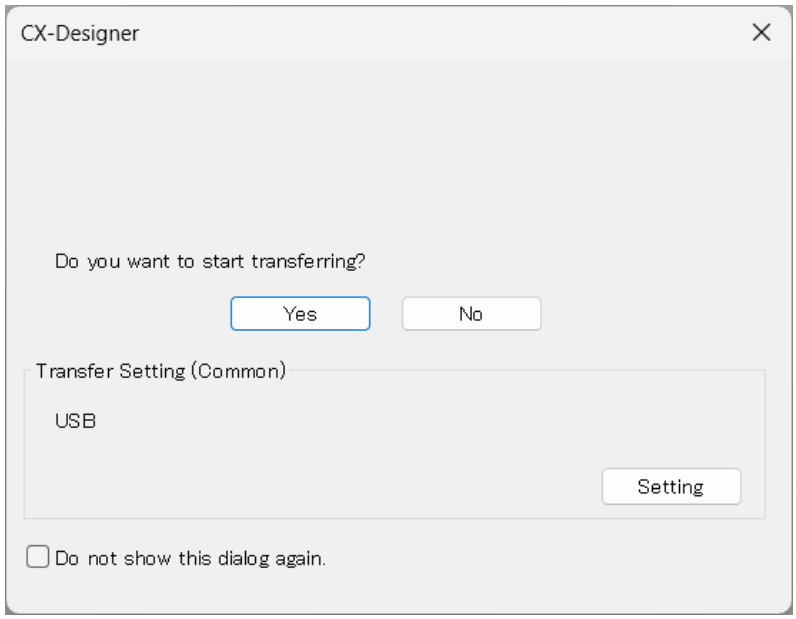
5 - 5 Starting Up

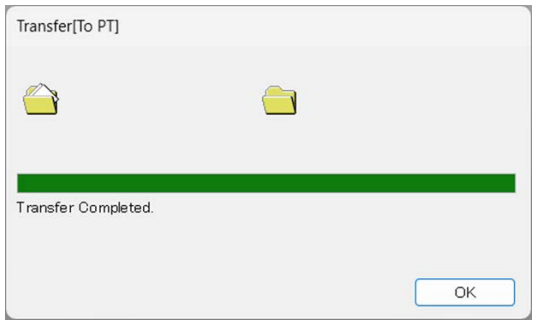
When a unit is replaced, the performance may differ.
When downloading screen data, thoroughly check the operation before you start actual system operation.

5 - 5 - 1 Turning ON the NS-B Power

Turn ON the 24 VDC power supply of the NS-B.

5 - 5 - 2 Downloading the Screen Data to the NS-B

1. Connect the PC and NS-B with a USB cable.	
2. Open the screen data created in “5 - 2 - 3 Converting the Screen Data for NS-B.”	
3. When the screen data is open, select **PT - Transfer - Transfer[To PT]** from the menu bar.	
4. When the Transfer screen is displayed, check that the transfer setting is set to **USB** and then select **Yes**.	

5. Transferring starts. Wait until it completes.	
After the transfer completes, proceed to “ 5 - 5 - 3 Checking the Settings and Communication.”	

5 - 5 - 3 Checking the Settings and Communication

Operate the screen on the actual system and check that the correct values are written to the connected device, the pages change correctly, and that the values set on the connected device are updated correctly.

5 - 5 - 4 Starting Operation.

Start actual operation.

6 Warranty and Repair Periods

The repair and warranty periods of the NS series and NS-B series are as follows.

Item	NS-Series	NS-B Series
Warranty Period	One year from the date of sale by OMRON	One year from the date of sale by OMRON
Repair Period	Requests for repair and diagnosis will be accepted for 7 years after discontinuation of production.	Requests for repair and diagnosis will be accepted for 5 years after the date of manufacture (5 years after discontinuation of production) * A unit requiring repair will be exchanged for a new product. * OMRON performs diagnosis to identify a faulty module.

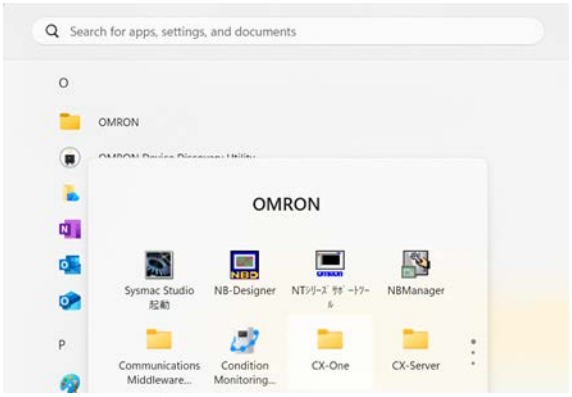
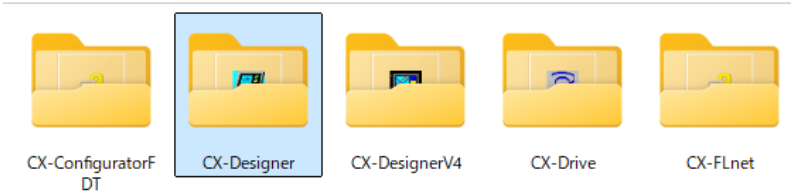
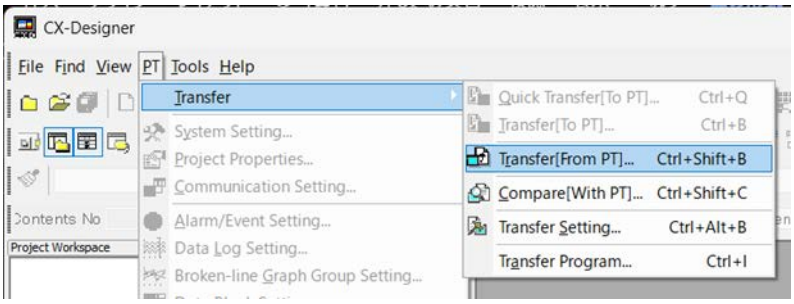
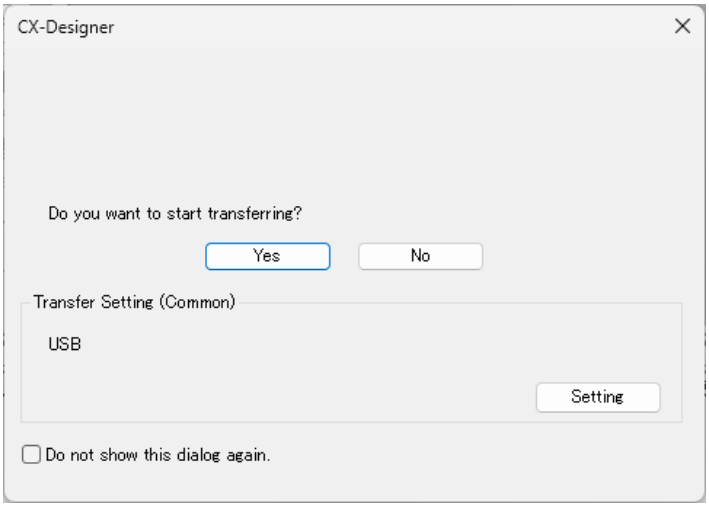
7 Appendix-1 Transfer Using a Memory Card

Even if CX-Designer is not available at the site, the screen data can be uploaded using a memory card.
* CX-Designer is required to perform the process to convert the data for NS-B.

7 - 1 Using a Memory Card to Upload Screen Data from the NS-V2

This section describes the procedure to upload the screen data of the NS-V2 to Bank 1. Refer to the *NS5, NS8, NS10, NS12, NS15 Programmable Terminals SETUP MANUAL (Cat. No. V083)* for details.

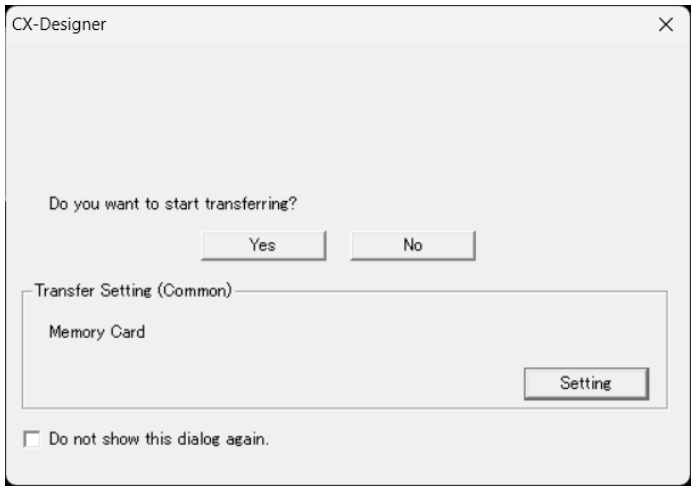
1. Turn OFF the power supply of the NS-V2 Unit.	
2. Insert the memory card to use for uploading into the NS-V2 Unit.	
3. Turn ON pins 1 and 5 of the DIP switch at the back of the Unit.	
4. Turn ON the power of the NS-V2 Unit.	
5. Uploading starts automatically. Wait until it completes. Indicator display of the NS-V2 is as follows during uploading. Transferring: Flashing in orange Transfer complete: Flashing in green Error occurring: Flashing in red * Do not remove the memory card during uploading.	
6. Turn OFF the power supply of the NS-V2 Unit and then remove the memory card from the NS-V2 Unit.	
7. Connect the memory card to the PC.	

8. Select **CX-One** in the **OMRON** folder from the Start menu.	
9. When File Explorer starts, select the **CX-Designer** folder.	
10. Start CX-Designer.	
11. Once CX-Designer has started, select **PT - Transfer - Transfer[From PT]** from the menu bar.	
12. When the Transfer screen is displayed, select **Setting**.	

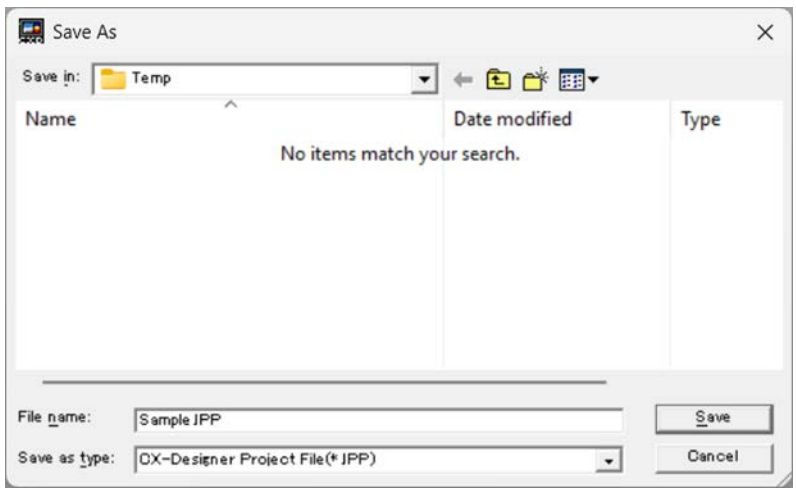
13. When the Communications Setup screen is displayed, select **OK**.
Comms. method: Memory Card
Drive: Drive with memory card assigned.
Bank: Bank 1

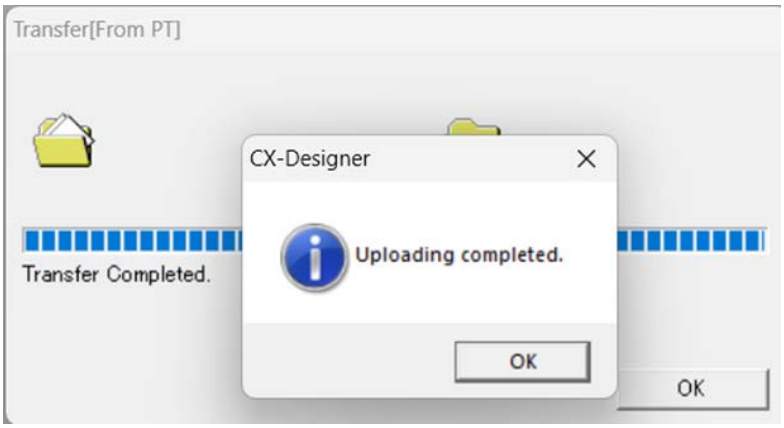


14. When the Transfer screen is displayed, check that the transfer setting is set to **Memory Card** and then select **Yes**.



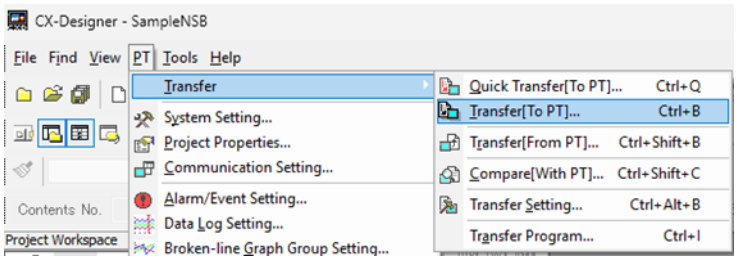
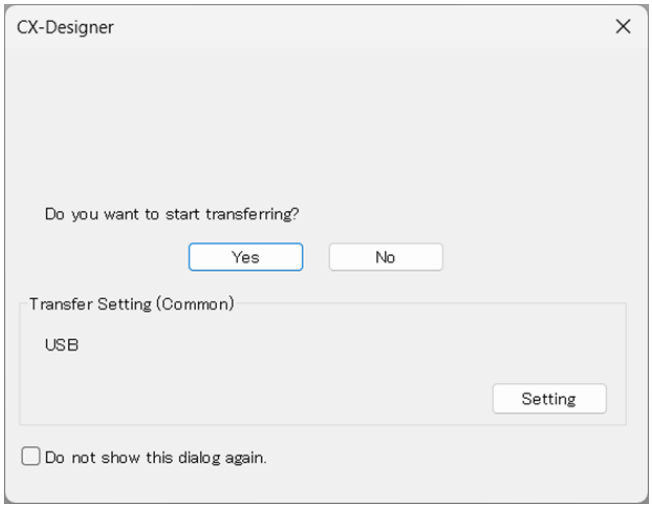
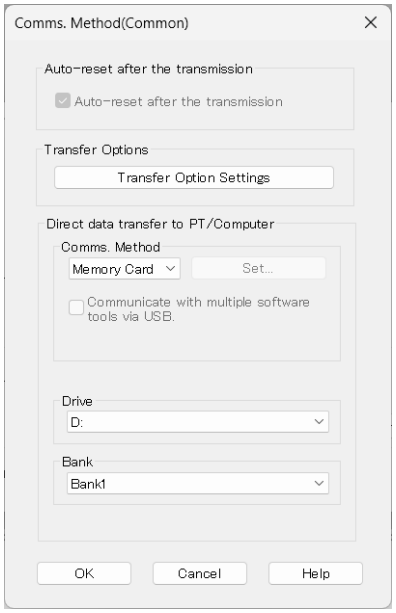
15. When the dialog box to set the save destination for the screen data is displayed, set the desired location and select **Save**.

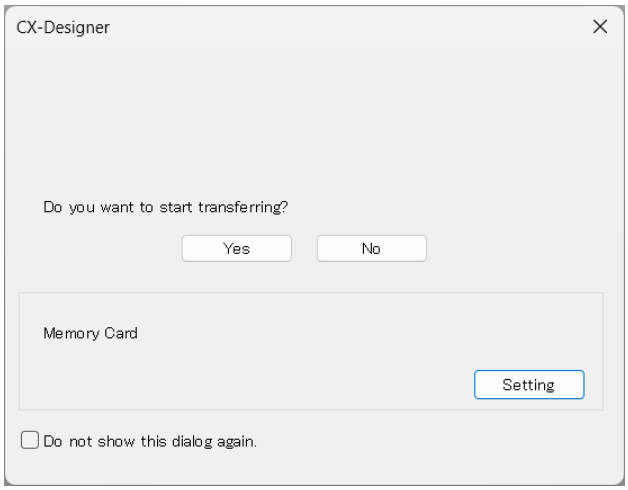
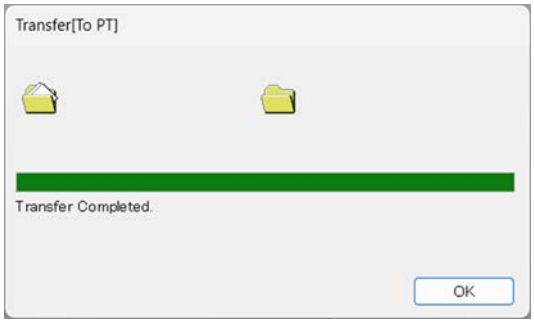
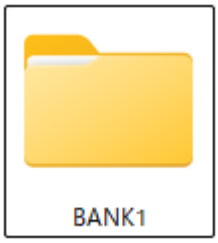


16. Wait until the upload is complete, and then select **OK**.	
The upload procedure is now complete. When converting the uploaded screen data for the NS-B, perform the procedure described in “ 5 - 2 - 3 Converting the Screen Data for NS-B.”	

7 - 2 Using a Memory Card to Download

This section describes the procedure to download the data of Bank 1 to the NS-B.
Refer to *NS-B-series Programmable Terminal Hardware User's Manual (Cat. No. V129)* for details.

1. Insert the memory card to use for downloading into the PC.	
2. Open the screen data you want to transfer to the NS-B.	
3. When the screen data is open, select **PT - Transfer - Transfer[To PT]** from the menu bar.	
4. When the Transfer screen is displayed, select **Setting**.	
5. When the Communications Setup screen is displayed, select **OK**. Comms. method: Memory Card Drive: Drive with memory card assigned. Bank: Bank 1	

6. When the Transfer screen is displayed, check that the transfer setting is set to **Memory Card** and then select **Yes**.	
7. Transferring starts. Wait until it completes.	
8. Open the memory card, and check that the **BANK1** folder has been created.	
9. Remove the memory card from the PC, and install it in the NS-B.	
10. Turn ON pins 1 and 2 of the DIP switch at the back of the NS-B.	
11. Turn ON the power of the NS-B Unit.	
12. Downloading starts automatically. Wait until it completes. The status of downloading is notified by the buzzer. The statuses are shown below. Transferring: Short buzzing sound at 1-second intervals Transferring complete: Short buzzing sound at 3-second intervals Error occurring: Long buzzing	

sound at 3-second intervals * Do not remove the memory card during downloading.	
13. Turn OFF the power supply of the NS-B Unit and then remove the memory card from the NS-B Unit.	
14. Turn OFF pins 1 and 2 of the DIP switch at the back of the NS-B Unit.	
15. Turn ON the power of the NS-B Unit.	
16. After the unit starts up, check that the screen is displayed correctly.	
The download procedure is now complete.	

8 Appendix-2 Model Conversion Rules

When the screen data of the NS-V2 is converted to the screen data for the NS-B, the part display positions and part sizes are offset according to the rules in the table below due to differences in resolution.

Model before conversion	**Model after conversion**	**Display position offset (X coordinate) * Y coordinate is not offset.**	**Part size magnification**
NS15-TX0☐-V2	NB15W-TW01B-V1-S	0	1
NS12-TS0☐ NS12-TS0☐-V1 NS12-TS0☐-V2	NB10W-TW01B-V1-S	112	1
NS10-TV0☐ NS10-TV0☐-V1 NS10-TV0☐-V2			1.25
NS8-TV0☐-V1 NS8-TV1☐-V1 NS8-TV0☐-V2 NS7-SV0☐	NB7W-TW01B-V1-S	80	1
NS5-SQ0☐-V1 NS5-SQ0☐-V2 NS5-SQ1☐-V2 NS5-TQ0☐-V2 NS5-MQ0☐-V2 NS5-TQ1☐-V2 NS5-MQ1☐-V2	NB5Q-TW01B-V1-S	0	1
NSJ12-TS0☐ NSJ10-TV0☐ NSJ8-TV0☐ NSJ5-SQ0☐ NSJ5-TQ0☐ NSJ5-SQ1☐ NSJ5-TQ1☐ NSH5-SQ0☐-V2 NSH5-SQ1☐-V2 NSA12-TX01B NS-Runtime	Conversion is not possible. Perform conversion after converting the model to V2.		

Revision History

Revision History	Date	Revised Content
01	September 2026	First edition
02	October 2026	Typo corrections; added 4-2-9.

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

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