

How to Switch from NT to NS

April, 2005

Revision History

Revision Code	Revision Date	Revised Page, Description
-1A	December 10, 2004	Newly created.
-1B	April 15,2005	Translate in English and updated

Intended Reader

This document is intended for NT series users who are planning to replace NT series by NS series. Recommended NT models, connection topology, and the method to switch display shall be provided in this document.

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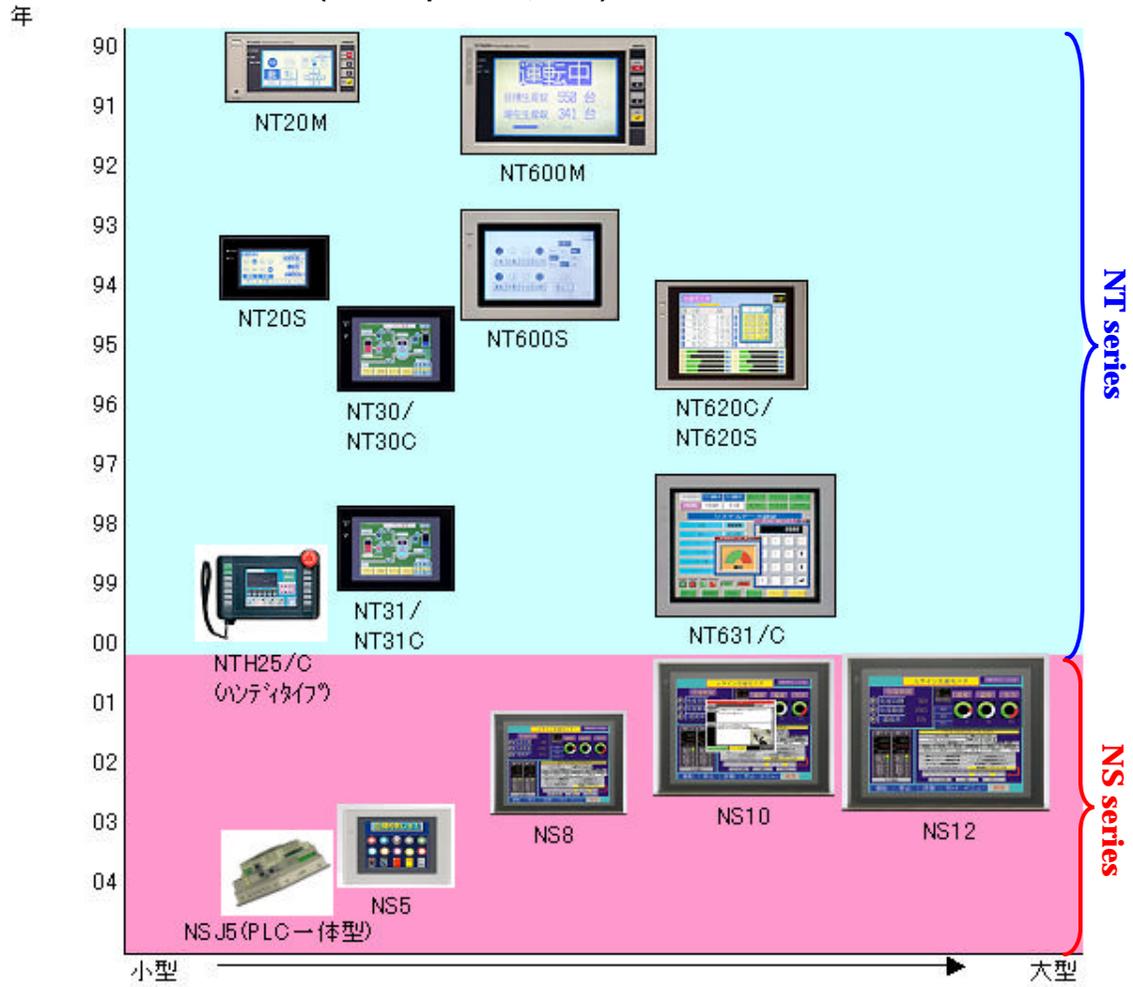
APPENDIX 2: Panel attachments for NT to NS conversion.

APPENDIX 3: NT-series Screen Data Conversion to NS.

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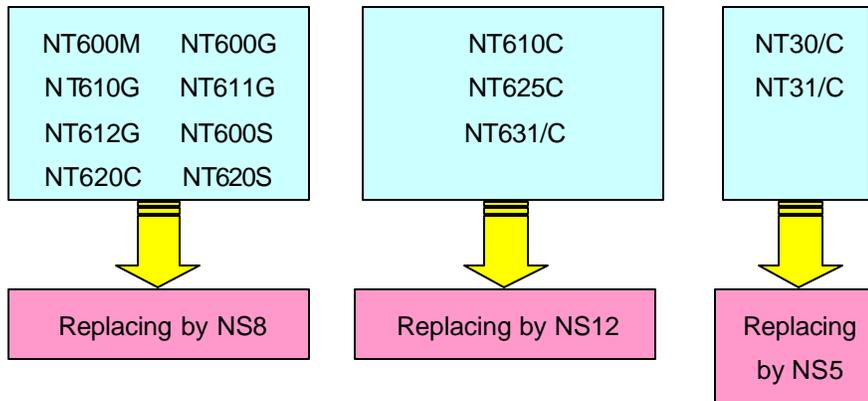
1. Differences between NT series and NS series (from the viewpoint of hardware)

1.1 Line of Omron indicators (as of September, 2004)



Note) Please see NS-series catalogue for more information.

1.2 Recommended NS models for NT users



*For NT600M, NT600G, NT610G, NT611G, and NT612G users

Recommended NS model: NS8

Panel cut: NS8 is smaller than the above NT series. A special attachment (NS8-ATT02) is available to adjust the size.

Others: Since the power supply for NS8 supports AC100V, please prepare DC24V power supply.

*For NT600S, NT620C, and NT620S users

Recommended NS model: NS8

Panel cut: NS8 is smaller than the above NT series. A special attachment (NS8-ATT02) is available to adjust the size.

*For NT610C, NT625C, and NT631/C users

Recommended NS model: NS10, NS12

Panel cut: NS10 and NS12 are smaller than the above NT series. A special attachment (NS12-ATT01) is available to adjust the size.

*For NT30/C and NT31/C users

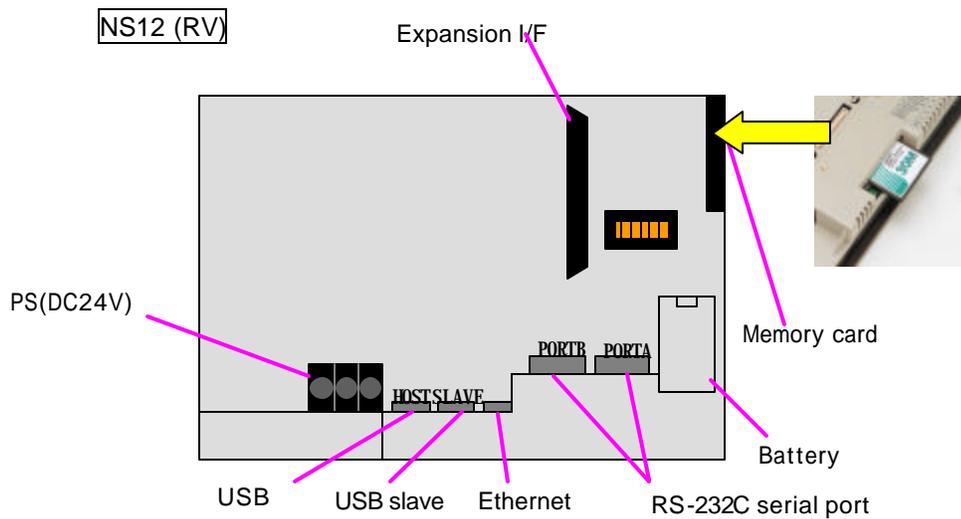
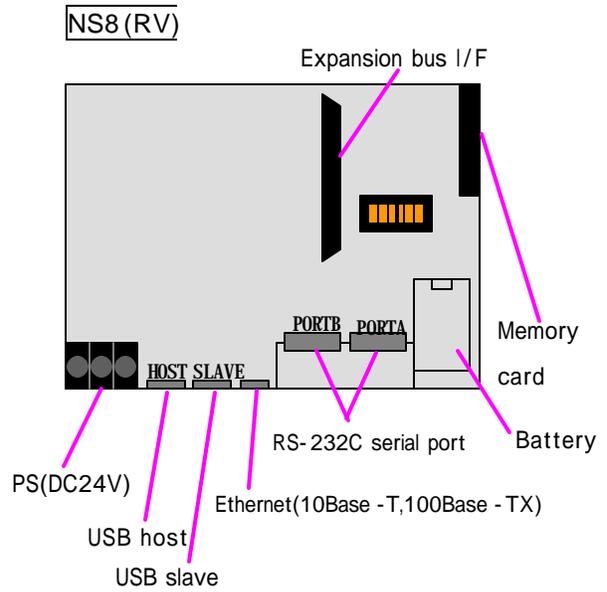
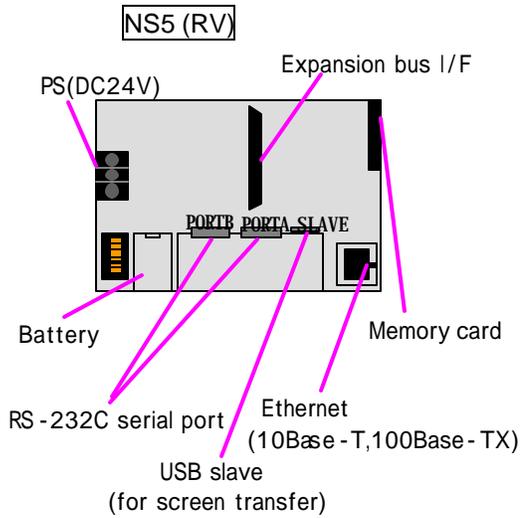
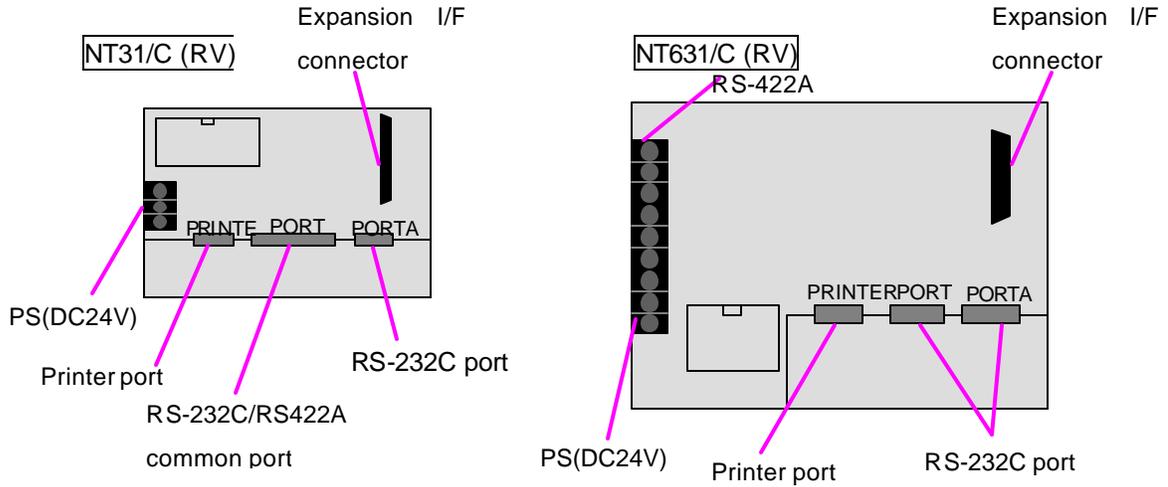
Recommended NS model: NS5

Panel cut: The existing panel is available.

See APPENDIX 1: Flow chart for conversion from NT- to NS-series.

See APPENDIX 2: Panel attachments for NT to NS conversion.

1.3 External Views of NT and NS (Rear View)



This section describes each port mounted on NT or (and) NS.

***RS-232C serial port**

Both NT and NS are equipped with one or two RS-232C serial port(s). A bar-code reader can be connected via this port. Bar-code reader V520-RH21-6 is recommended.

Although the command configuration of NT is different from that of NS, the memory link is also available via this port.

The Omron temperature controller that has an RS-485 communication port and supports CompoWay/F can be connected to an NS via the RS-232C port. In this case, an RS-422A adapter is required.

***Printer port/USB host port**

All NT series can be connected to a printer via the printer port. This port is compliant with Sentronics interface.

All NS series except NS5 can be connected to a printer via the USB host port.

***Expansion bus I/F**

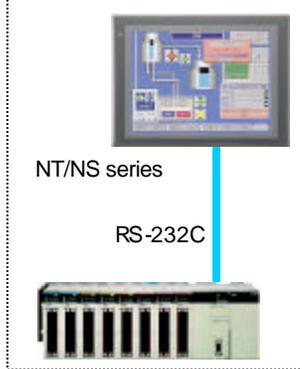
NS12, 10, and 8 are equipped with an expansion bus I/F.

A video input unit (NS-CA001) can be connected via this interface. Moving images of a camcorder or picture images of a visual sensor can be output via this interface. Furthermore, the screen display of a personal computer can be also output to an NS via this interface.

The Controller Link I/F unit(NS-CLK21) can be connected to NS 12 or 10. It cannot be connected to NS8.

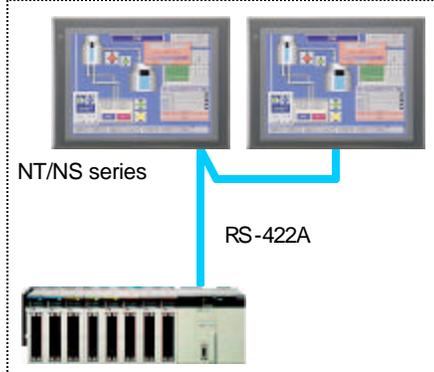
1.4 Connection topology

RS232C <PT:PLC=1:1>



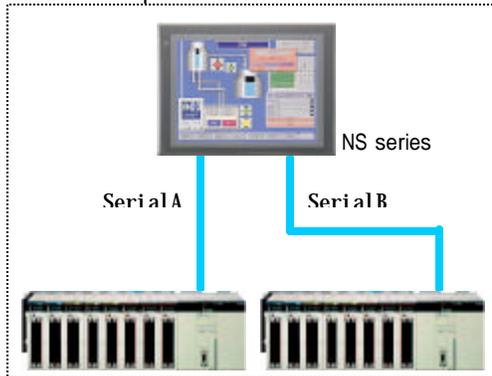
Cable length
 NT: up to 15 m
 NS: up to 15m

RS422A <PT:PLC=N:1>



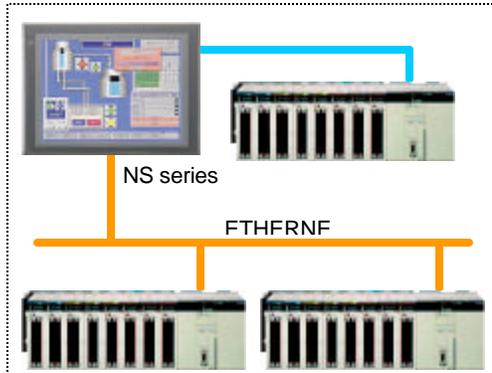
Cable length
 NT: up to 500m
 *Since NT has an RS422A port, direct connection is also available.
 NS: up to 500m
 *An RS-232C/422A conversion unit (NS-AL002) allows NS to use up to 500m of cable.
 When using CJ1W-CIF11, the total cable length is up to 50m .

RS232C two ports <PT:PLC=1:2>



Cable length
 NT: This topology is not available for NT.
 NS: 15m each
 Available combination:
 NT link 1:1+NT link 1:1
 NT link 1:1+NT link 1:N
 NT link1:N+NT link 1:N

Ethernet < PT:PLC=M:N>



Cable length
 NT: This method is not available for NT.
 NS: Network devices such as Ethernet units are additionally required (Complying with IEEE802.3).

1.5 Available PLCs (as of September 2004)

? CPU unit/NT link 1:1

Model	Specification	PLC model
CQM1-CPU41-V1/CPU42-V1/CPU43-V1/CPU44-V1	Equipped with a 9-pin connector for RS-232C.	C series?CQM1
CQM1H-CPU21/CPU51/CPU61		C series?CQM1H
CPM1-10/20CDR-? +CPM1-CIF01	Connected to the peripheral port.	C series?CPM1
CPM1A-10/20/30/40CD? -? +CPM1-CIF01		C series?CPM1A
CPM2A-30/40/60CD? ? -? +CPM1-CIF01	Connected to the RS-232C port or peripheral port.	C series?CPM2A
CPM2C-10/20? ? ? ? ? -? ? 1	Equipped with a 9-pin connector for RS-232C.	C series?CPM2C
C200HS-CPU21/CPU23/CPU31/CPU33		C series?C200HS
C200HE-CPU32(-Z)? 2/CPU42(-Z)		C series?C200HE(-Z)
C200HG-CPU33(-Z)? 2/CPU43(-Z)/CPU53(-Z)? 2/CPU63(-Z)		C series?C200HG(-Z)
C200HX-CPU34(-Z) ? 2/CPU44(-Z)/CPU54(-Z) ? 2/CPU64(-Z)/CPU65-Z/CPU85-Z		C series?C200HX(-Z)
CV500/1000/2000-CPU01-V1 CVM1-CPU01-V2/CPU11-V2/CPU21-V2	Equipped with a connector for RS-232C (Switch type/9-pin type)	CVM1/CV series ?CV500/1000/2000H ?CVM1

? 1: The CPU uses a conversion cable (CPM2C-CN111 or CS1W-CN114/118), RS-232C adapter (CPM1-CIF01), or RS-422A adapter (CPM1-CIF11) for conversion.

? 2: Any of the communication boards (C200HW-COM02/COM04/COM05/COM06(-V1)) is required.

? CPU unit/NT link 1:N

Model	Specification	PLC model
CS1G-CPU42H/CPU43H/CPU44H/CPU45H	Equipped with a 9-pin connector for RS-232C	CS series?CS1G
CS1H-CPU63H/CPU64H/CPU65H/CPU66H/CPU67H		CS series?CS1H
CS1D-CPU65H/CPU67H		CS series?CS1D
CJ1G-CPU42H/CPU43H/CPU44H/CPU45H? 1		CJ series?CJ1G
CJ1H-CPU65H/CPU66H? 1		CJ series?CJ1H
CJ1M-CPU11/CPU12/CPU13/CPU21/CPU22/CPU23? 1 CJ1M-CPU11/CPU12/CPU13 ETN		CJ series?CJ1M
CQM1H-CPU61/51 serial communication board CQM1H-SCB41		C series?CQM1H
C200HE-CPU32(-Z)? 2/CPU42(-Z)		C series?C200HE(-Z)
C200HG-CPU33(-Z)? 2/CPU43(-Z)/CPU53(-Z)? 2/CPU63(-Z)	C series?C200HG(-Z)	
C200HX-CPU34(-Z)? 2/CPU44(-Z)/CPU54(-Z)? 2 /CPU64(-Z)/CPU65-Z/CPU85-Z	C series?C200HX(-Z)	

? 1: The CPU can be connected to serial communication unit CJ1W-SCU21/SCU41.

? 2: Any of the communication boards (C200HW-COM02/COM04/COM05/COM06(-V1)) is required.

? CPU unit/host link

Model	Specification	PLC model
CPM 1-10CDR/20CDR-? /CPM1A-10CD/20CD/30CD /40CD? -?	Either RS-232C adapter or RS-422A adapter can be connected to the peripheral port.	C series†CPM1
CPM2A-30CD/40CD/60CD? ? -?	Equipped with a 9-pin connector for RS-232C	C series†CPM2A
CPM2C-10/20? ? ? ? ? -?	The communication connector can be used as either peripheral port or RS-232C port. ? 2	C series†CPM2C
CQM1-CPU21/CPU41-V1/CPU42-V1/CPU43-V1 /CPU44-V1	Equipped with a 9-pin connector for RS-232C	C series†CQM1
CQM1H-CPU11/CPU21/CPU51/CPU61	Equipped with a 9-pin connector for RS-232C? 3	C series†CQM1H
C200HS-CPU21/CPU23/CPU31/CPU33	Equipped with a connector for RS-232C (switch type/9-pin type)	C series†C200HS
C200HE-CPU32(-Z)? /CPU42(-Z)		C series†C200HE(-Z)
C200HG-CPU33(-Z)? /CPU43(-Z)/CPU53(-Z) ? 1 /CPU63(-Z)		C series†C200HG(-Z)
C200HX-CPU34(-Z) ? /CPU44(-Z)/CPU54(-Z) ? 1 /CPU64(-Z)/CPU65-Z/CPU85-Z		C series†C200HX(-Z)
CJ1M-CPU11/CPU12/CPU13/CPU21/CPU22/CPU23? 1 CJ1M-CPU11/CPU12/CPU13 ETN	Equipped with a 9-pin connector for RS-232C	CJ series†CJ1M
CS1G-CPU42(-V1)/CPU43(-V1)/CPU44(-V1)/CPU45(-V1)	Equipped with a 9-pin connector for RS-232C	CS series†CS1G
CS1H-CPU63(-V1)/CPU64(-V1)/CPU65(-V1)/CPU66(-V1) /CPU67(-V1)		CS series†CS1H
CV500-CPU01-V1/CV1000-CPU01-V1 /CV2000-CPU01-V1/CVM1-CPU01-V2/CPU11-V2 /CPU21-V2	Equipped with a connector for RS-232C (switch type/9-pin type)	CVM1/CV series †CV500/1000/2000 †CVM1

? 1: Any of the communication boards (C200HW-COM02/COM04/COM05/COM06(-V1)) is required.

? 2: Conversion cable CPM2C-CN111 can be used for branching. The communication connector can be used as a single peripheral port or RS-232C port via conversion cable CS1W-CN114/118.

? 3: CQM1H-CPU11 has a peripheral port only.

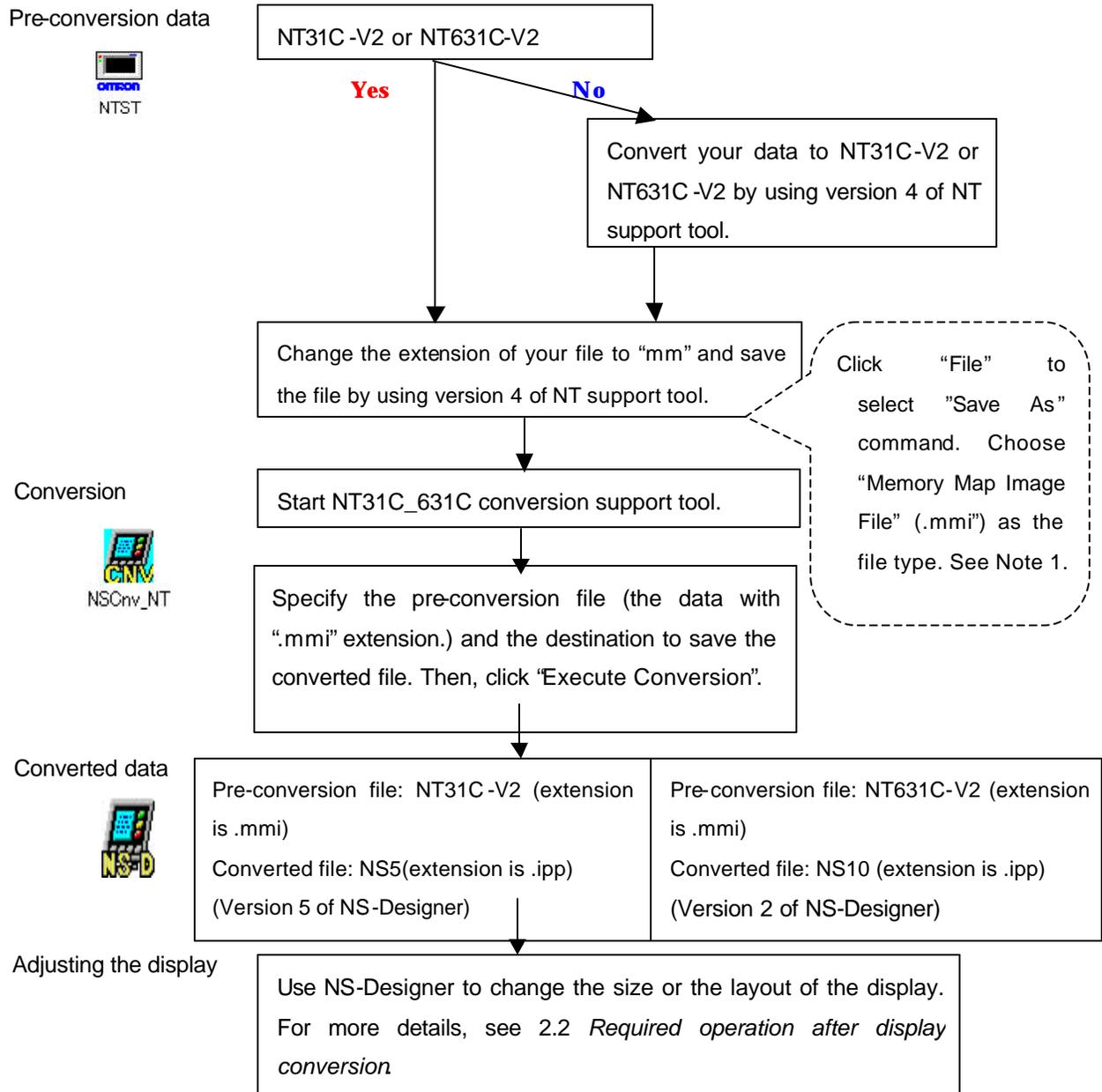
1.6 Communication cable

RS-232C	Same	
RS-422A	The shape of terminals on the terminal block differs between NT and NS.	
	NT631/C	For‡ Round-shaped crimping terminal M3 or M3.5.
	NT-AL001 NS-AL002	For‡ Round-shaped crimping terminal M3 (M3.5 is not available) NT-AL001: Isolated between RS232C and RS422A. NS-AL002: not isolated between RS232C and RS422A.
	CJ1W- CIF11	Bar-shaped crimping terminal
	‡ NT-AL001 on the RS-232C side is the same. ‡ NT31/31C has no 25-pin connector. A terminal block is required.	
Tool connection	Same	
Bar-code connection	Same	
5V PS for RS-232C port	NT31/631/625 C: Port A only. 250mA (max.) NS :Port A and B. 250mA in total (max.)	

Chapter 2 Procedure for display conversion from NT series to NS series (from the viewpoint of software)

2.1 Procedure flowchart

NT 31C_631C conversion support tool that came with NS-Designer allows users to convert the NT display to NS display. See the following procedure flowchart.



Note1) Memory map image file (with .mmi as its extension) is a file type in which display data is compressed and the information (such as grouping information, grid setting information) used only on the support tool is deleted.

See APPENDIX 3: NT-series Screen Data Conversion to NS.

2.2 Required operation after display conversion

? Modification of display size and touch switch mesh

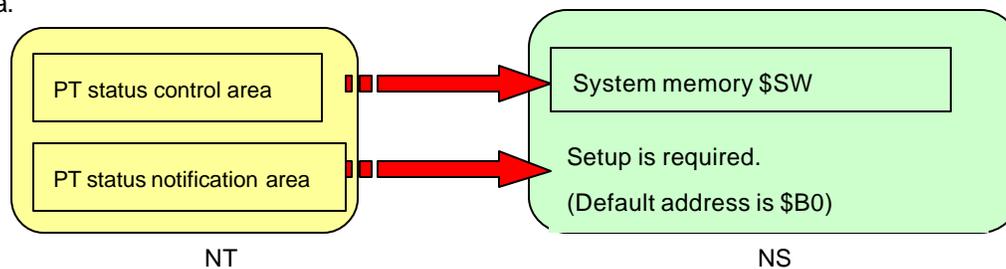
	Display size	Touch switch mesh
NT600M	Change the number of dots in height from 400 to 480.	Change the number of dots in height from 50 to 20.
NT600S	Change the number of dots in height from 400 to 480.	Change the number of dots in height from 50 to 20.
NT30/C	Not required.	Not required.
NT620C	Not required.	Not required.
NT620S	Change the number of dots in height from 400 to 480.	Change the number of dots in height from 25 to 20.
NT625C	Not required.	Not required.
NT31/C	Not required.	Not required.
NT63/C	Not required.	Not required.

Note) When modifying the display size of NT600M, NT600S or NT620S, the position coordinate of each object will be directly converted. Therefore, the objects on NT600M, NT600S, or NT620S will be allocated within 400 dots at the top portion of the display. Additionally, there will be 80 dots of space at the bottom of the display.

Note) Modification of touch switch mesh will cause displacement of touch switch objects.

? System area allocation

After converting the display, the start channel of the PT status control area will be set in the system memory \$SW. Since \$BO (NS internal memory) is set in \$WB, a random address will be used for setting. When using NS series, the system memory can be allocated to the NS internal memory as well as the PLC area.



Additionally, the structure of the system area is different. Therefore, when referring to the information in the system area from a ladder program, the ladder program must be modified (e.g. window control).

? Modification of objects

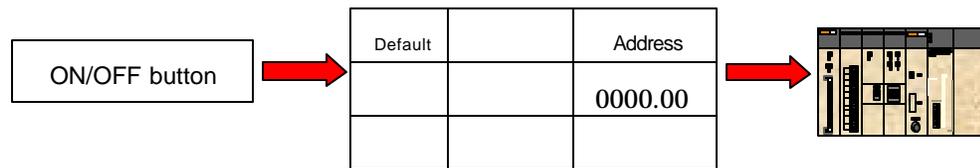
Some functions may need to be modified after conversion. The following table shows the places that need to be modified after conversion:

Modification part	Required operation
Touch switches for switching display and inputting control code	They will be converted to a command button (transparent)+an ON/OFF button. If there is no need to set any lamp address, delete the control flag setting for the command button. Additionally, delete the ON/OFF button after copying the label of the ON/OFF button to the command button (operation will not be affected even as it is).
Lamp	It will be converted as its ON/OFF button control flag is in "input disable" status. If there is no need to change the label color or contents based on the bit ON/OFF status, then use the bit lamp as a substitute (operation will not be affected even as it is).
Alarm	It will be converted to Bitmem.csv. Import the file by the alarm/event setting. Modify the other display and switch display setting.
Mark data (if it is used in the character string)	The mark data will be covered like this: <FFFF>. Change it to a character string or bitmap.
Image lamp	For version 5 and newer versions: Image data will be converted to a BMP file. It will be converted to two bit lamps to display ON and OFF. Set the converted file in "shape specification".
Library lamp	The library data will be converted to a VEC file. It will be converted to two objects. Change the setting in "shape specification" to integrate them into one bit lamp.
Character string indirect specification	The default value of the character string memory table will be converted to a StrTabl.txt. Change the data type of the table number that will be display by the PLC from BCD to BIN.
Fixed character	Format each character if necessary.

< Reference 1 >

Link between object and host

? NT series

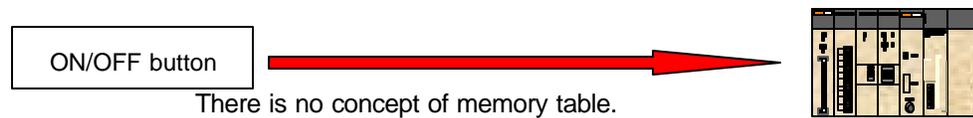


The object will refer to the memory table.

(Memory table entry No.)

Numerical value, character string, bit-memory memory table, and memory table will refer to the host.

? NS series



The functional object will refer to the host.

(00000.00)

<Reference 2>

Host and communication address

? NT series

Only one host can be connected. Therefore, there is no concept of communication host.

? NS series

The following host connection topologies are available:

1. Two serial ports
2. One Ethernet port
3. Controller Link I/F unit (optional unit)

The format for addressing is as follows: "Host name: area name+ address".

e.g. SerialA: DM00000

2.3 Inconvertible functions and countermeasures

The functions listed below cannot be converted by using NT31C_631C conversion support tool.

Inconvertible function	Countermeasure
Temporary input by using user-created numeric keypad.	For version 5 and older versions: Use the system numeric keypad. For version 6 and newer versions: Use the temporary input object.
Percent(%) display for a graph	Perform operations by the macro when the value on the graph changes.
The number of points to be indicated for a broken-line 320 points to 256 points	Additionally create a graph indicated with 257 points to 320 points.
Discontinuous address setting for the broken-line monitor address	Reallocate consecutive addresses.
I/O comment	Copy the I/O comment in the converted csv file to each object.
Alarm list Image library display	Replace it by a window display.
Alarm list Occurred alarm display	Change the alarm/event item setting.
Alarm registration (bit memory table)	The table will be converted to Bitmem.csv. Import the file by the alarm/event setting.
Bit memory table Switch screen	Select the alarm/event display under the Functional Object to "Switch screen when Address ON".
Numerical value, character string memory table initialization	Activate the macro that can allocate a default value to each address.
Operation table	Set the scaling. Or perform operations by the macro.
Image lamp	The image will be converted to a bmp file. Set the file that was converted to "shape specification"(for version 5 and newer versions).
Display attribution History	The operation log, "Screen display history" can be used as a substitute. The screen display history that was displayed during \$BS40 (system memory) was ON will be recorded.
Display attribution Back light ON/blink	Control the system memory \$SB10 (back light blink control bit) by using the macro for screen load/macro for screen unload.
Display attribution	Control the system memory \$SB12 (continuous

Buzzer	buzzer), \$SB13 (discontinuous short buzzer), and \$SB14 (continuous long buzzer) by the macro for screen load/macro for screen unload.
Display attribution Window display	Write the corresponding window screen number in each of the following system memory by the macro for screen load: \$SW1 (pop-up screen 1 No.X), \$SW4 (pop-up screen 2 No.X), and \$SW7 (pop-up screen 3 No.X).
Flicker only for character	No countermeasure available so far.
Cursor inversion and blink for inputting numerical value and character string	No countermeasure available so far.
Display for host connection	No countermeasure available so far.
Fixed display Tiling	Set "tiling" for fixed objects.
Fixed display Image indirect referencing	The image will be converted to a bmp. The indirect referencing of the bit map display can be used as a substitute.
Fixed display Library	The library will be converted to a vec file by the conversion support tool. However, NS cannot indirectly refer to the vec file. If the number of libraries to be indirectly referred to is 10 or less, the "Select Shape" of a word lamp can be used.
Pop-up window Two windows simultaneous display	Click the window screen property to select "pop-up screen setting". Check off "other screen input enable".
Pop-up window Local window replacement	Use the macro.
Window display position coordinate setting Touch switch window close switch	Click the window screen property (pop-up screen) to select "pop-up screen display position". Set the X and Y coordinates by choosing "any position". Command button Pop-up screen control
Touch switch window open/close	Use the macro.
Touch switch copy setting	Use a word switch as a substitute.
Mark data display for fixed and indirect character strings	The mark data will be converted to a bmp file. Allocate it as a bmp.
Touch switch cursor shift	Choose the touch input method for the value input field. Or set the command button to "without

	process" and activate the value input field by SETFORCUS macro.
Touch switch Display print	Create a switch with a system bit allocated.
Numerical value display Indirect specification	No countermeasure available so far.
Touch switch Inversion for input	Set ON/OFF button type: (Type 2-2) Goes ON/OFF according to the ON/OFF of display address 1. For version 6 and newer versions:
PT status notification Battery status	Control the system memory \$SB4 Battery Low (Countermeasure for version 6 and newer).

See Appendix 4 Conversion rules of NT31C_631C conversion support tool.