Programmable Terminal NA-series

Replace Guide Procedure for Creating Project Data From NS to NA

NA5-15□101□(-V1)
NA5-12□101□(-V1)
NA5-9□001□(-V1)
NA5-7□001□(-V1)

V470-E1-03

■ Introduction

This guide provides reference information for creating NA pages but no safety information.
Be sure to obtain the manuals for NA Series Programmable Terminal, read and understand the safety points and other information required for use, and test sufficiently before actual use of the equipment.

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  (c) Usage out of Note about Use in these conditions
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Table of contents

Related Manuals

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

No.	Model	Title
W504	SYSMAC-SE2□□□	Sysmac Studio Version 1 Operation Manual
V117	NA5-15W□□□□ NA5-12W□□□□ NA5-9W□□□□ NA5-7W□□□□	NA-series Programmable Terminal Hardware User's Manual
V125	NA5-15W□□□□-V1 NA5-12W□□□□-V1 NA5-9W□□□□-V1 NA5-7W□□□□-V1	NA-series Programmable Terminal Hardware (- V1) User's Manual
V118	NA5-15W□□□□(-V1) NA5-12W□□□□(-V1) NA5-9W□□□□(-V1) NA5-7W□□□□(-V1)	NA-series Programmable Terminal Software User's Manual
V119	NA5-15W□□□□(-V1) NA5-12W□□□□(-V1) NA5-9W□□□□(-V1) NA5-7W□□□□(-V1)	NA-series Programmable Terminal Device Connection User's Manual
V120	NA5-15W□□□□ NA5-12W□□□□ NA5-9W□□□□ NA5-7W□□□□	NA-series Programmable Terminal Startup Guide
V117	NS5-□Q□□(-V□) NS8-TV□□(-V□) NS10-TV□□(-V□) NS12-TS□□(-V□) NS15-TX□□(-V□)	NS-series Programmable Terminals SETUP MANUAL
SBSA-512	NS5-□Q□□(-V□) NS8-TV□□(-V□) NS10-TV□□(-V□) NS12-TS□□(-V□) NS15-TX□□(-V□)	NS-series Programmable Terminals PROGRAMMING MANUAL
V075	NS5-□Q□□(-V□) NS8-TV□□(-V□) NS10-TV□□(-V□) NS12-TS□□(-V□) NS15-TX□□(-V□)	NS-Series Programmable Terminals Macro Reference
V469	NA5-15W□□□□(-V1) NA5-12W□□□□(-V1) NA5-9W□□□□(-V1) NA5-7W□□□□(-V1)	Programmable Terminal NA-series Replace Guide From NS to NA

1 Description of This Manual

This manual describes the specific procedure of *Programmable Terminal NA-series Replace Guide From NS to NA (Cat. No. V469), Section 4 Create NA HMI Project Data*.
The description is based on the assumption that the CJ-series PLCs are connected and the communications method NS: FINS will be replaced with NA: FINS Ethernet.
In the following table, the combinations with Yes in To be described in this manual are to be described.

NS Series		NA Series			To be described in this manual
Comm.Setting – Host Type	**Comm.Setting – Protocol**	**Device References – External Device – Device Configuration**			
		Device Vendor	**Device Series**	**Communication Driver**	
SYSMAC-CJ1	FINS	Omron	CJ	FINS Ethernet	Yes
SYSMAC-CJ2					Yes
SYSMAC-CJ1	EtherNet/IP	Omron	CJ	FINS Ethernet	Yes
SYSMAC-CJ2			CJ	CIP Ethernet	Yes *1
SYSMAC-NJ	EtherNet/IP	Omron	NJ	Ethernet	---
			NX7		---
			NY		---
			NX1P2		---
			NX102		---
			NX-CSG320		---

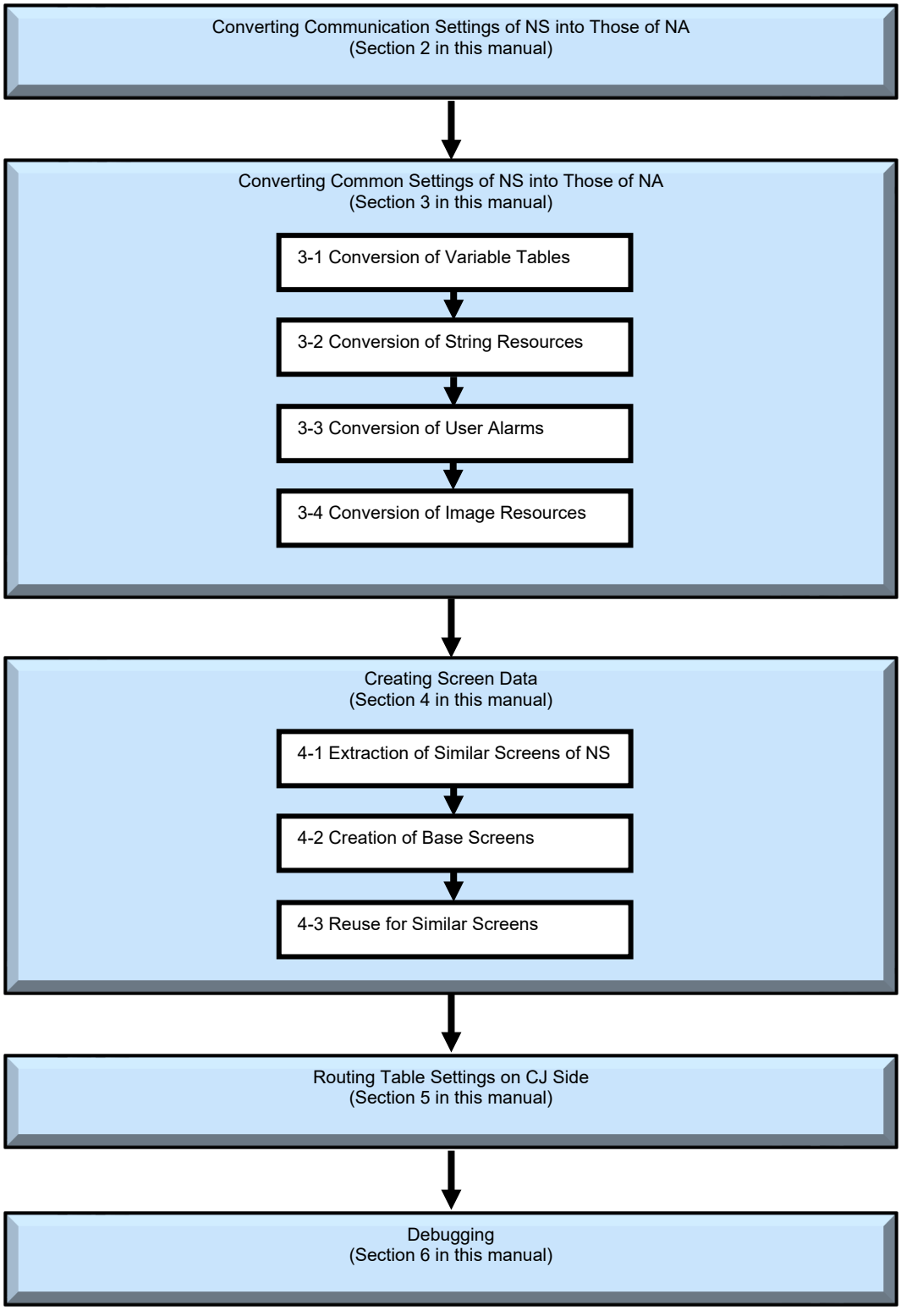
*1 The cases where communications are made with only addresses without tag variables are to be described in this manual.

Refer to the *Programmable Terminal NA-series Replace Guide From NS to NA (Cat. No. V469)* for selecting a screen replacement model and considering replacement in terms of hardware or by function.

Incidentally, Excel is used in the screen replacement procedure.
The version is Microsoft Office 365 Version 2108.

1-1 Screen Data Replacement Flow

There are broadly three steps in replacement of screens.
First, replace the settings of NS in use with those of NA. (Section 2, Section 3)
Then, replace the screens of NS one by one with the screens of NA. (Section 4)
Finally, perform debugging to check whether the NA screens are replaced correctly. (Section 6)

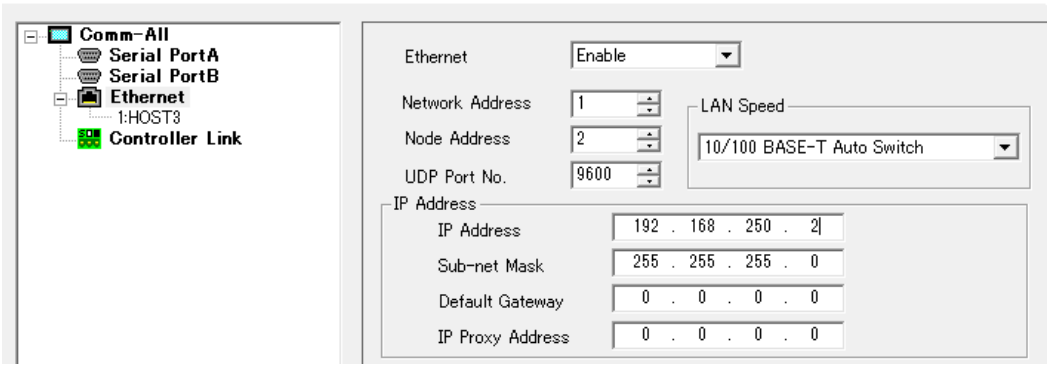


2 Converting Communication Settings of NS into Those of NA

2-1 Conversion of Ethernet Port Settings

This section describes how to convert the Ethernet port settings of NS into those of NA.
The following Ethernet port settings are used as examples to describe the conversion of communication settings.
If the settings are different from those of NS to replace actually, match each with the other while configuring them.
The settings are converted into the Ethernet port 1 of NA.

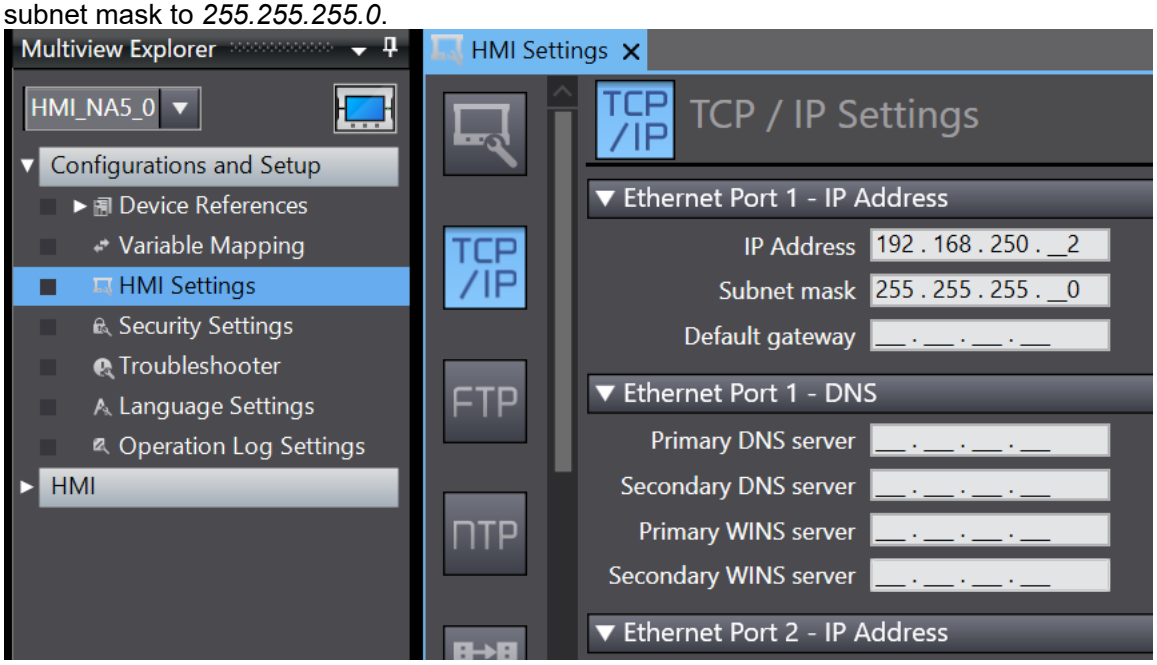
Comm. Setting



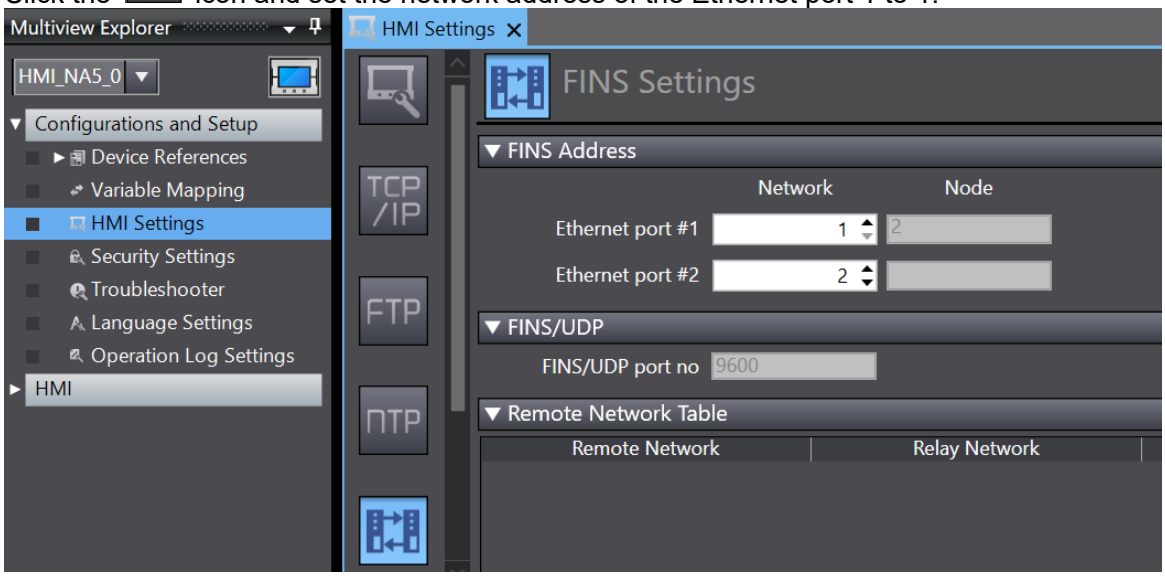
1. Create a new project with Sysmac Studio.

2. Double-click **Multiview Explorer** – **HMI Settings**.

3. Click the **TCP/IP** icon, and set the IP address of the Ethernet port 1 to *192.168.250.2* and the subnet mask to *255.255.255.0*.



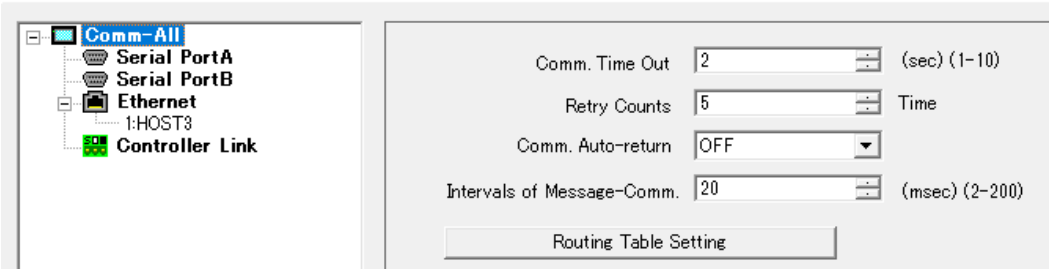
4. Click the  icon and set the network address of the Ethernet port 1 to 1.



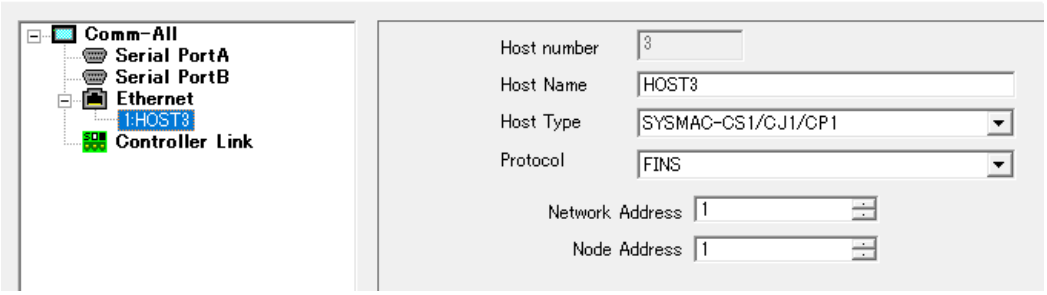
2-2 Conversion of Connected Device Settings

This section describes how to convert the communication settings of NS into those of NA.
The conversion-source communication settings of NS are the protocols **FINS** for Ethernet connection.
The following NS settings are used as examples to describe the conversion of communication settings.
If the settings are different from those of NS to replace actually, match each with the other while configuring them.

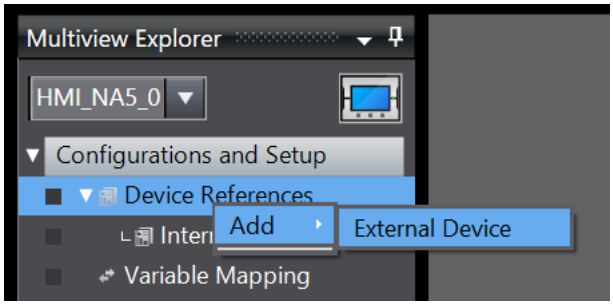
Comm. Setting



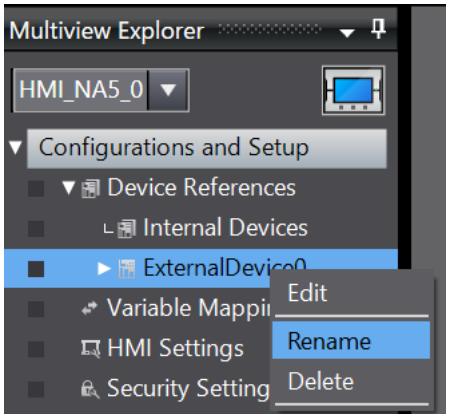
Comm. Setting



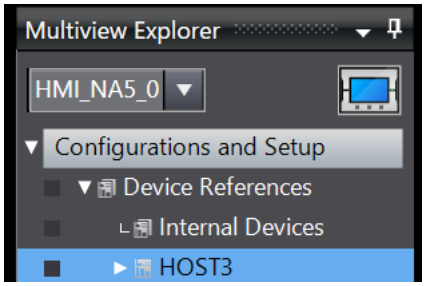
1. Right-click **Multiview Explorer** – **Configurations and Setup** – **Device References** of the project file created in *2-1 Conversion of Ethernet Port Settings*, and click **Add** – **External Device**.



2. When **ExternalDevice0** is added under **Internal Devices**, right-click it and click **Rename**.

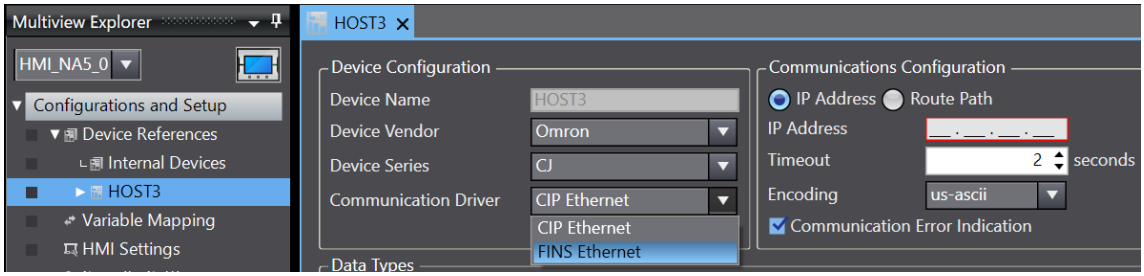


3. Enter the host name of NS.

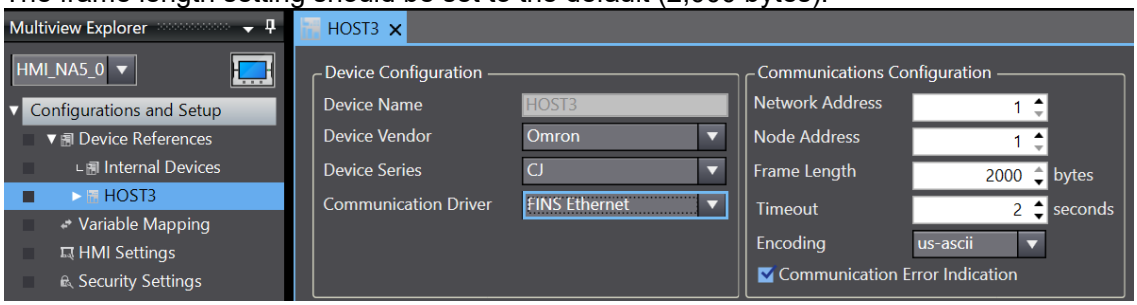


4. Double-click **HOST3**.

5. When the communication settings screen is displayed, change **Communication Driver** to *FINS Ethernet*.



6. Set the network address, node address, and timeout according to the communication settings on the screen to replace.
   The frame length setting should be set to the default (2,000 bytes).



7. When string display & input objects are used in NS, set the character encoding method according to the following character code conversion table.
   If string display & input objects are not used, set *us-ascii*.

NS		NA
System language	Character display format	Character encoding method
Japanese	Multibyte code (Shift-JIS)	Shift-JIS
Chinese (Simplified Chinese, Traditional Chinese)	Multibyte code (GB2312)	GB18030
English, Italian, Spanish, German, French	Multibyte code (Latin1)	iso-8859-1
All languages	Unicode (UTF-8)	UTF-8
All languages	Unicode (UTF-16)	UTF-16

Additional Information

When *CJ* and *CIP Ethernet* are selected respectively for **Device Series** and **Communication Driver**, the address specification is only available with network variables. Physical address specification is not available.

3 Converting Common Settings of NS into Those of NA

3-1 Conversion of Variable Tables

The addresses used in NS are managed on variable tables.
When **Communication Driver** of PLC is FINS, the variables with a data size of one word or more will be set as CHANNEL type by default.
NA does not support the CHANNEL type, so an error will occur if you convert them as they are.
Therefore, before converting them, you are recommended to set the data type in actual use.
In CX-Designer, variable names are automatically generated, but we will describe the procedure for conversion into the variable names to be used in NA.

A rough workflow is as follows.

1. Extracting variables used in NS
2. Converting host addresses into variable names
3. Converting internal addresses of NS into variable names
4. Converting data type of variables into data type in actual use
5. Reflecting variable tables created in procedures 2 to 4 in those of Sysmac Studio

In this procedure, variable names are corrected under the following rules.

Device type	Data type	Address type	Address	Variable name after correction
Host	BOOL	CIO	00000.00	CIO_00000_00
Host	BOOL	WR	WR00000.00	WR_00000_00
Host	BOOL	HR	HR0000.00	HR_00000_00
Host	BOOL	AR	AR00000.00	AR_00000_00
Host	BOOL	DM	DM00000.00	DM_00000_00
Host	BOOL	EM	EM00000.00	EM_00000_00
Host	BOOL	EM0 to 18*1	EM0_00000.00	EM_0 to 18_00000_00
Host	BOOL	TU	TU00000	TU_00000
Host	BOOL	CU	CU00000	CU_00000
Host	CHANNEL	CIO	00000	CIO_00000
Host	CHANNEL	WR	WR00000	WR_00000
Host	CHANNEL	HR	HR00000	HR_00000
Host	CHANNEL	AR	AR00000	AR_00000
Host	CHANNEL	DM	DM00000	DM_00000
Host	CHANNEL	EM	EM00000	EM_00000
Host	CHANNEL	EM0 to 18*1	EM0_00000	EM_0 to 18_00000
Host	CHANNEL	T	T00000	T_00000
Host	CHANNEL	C	C00000	C_00000
NS	BOOL	$B	$B0	B_0
NS	BOOL	$SB	$SB0	SB_0
NS	BOOL	$HB	$HB0	HB_0
NS	CHANNEL	$W	$W0	W_0
NS	CHANNEL	$SW	$SW0	SW_0
NS	CHANNEL	$HW	$HW0	HW_0

*1 Match it with the EM bank No. to use.

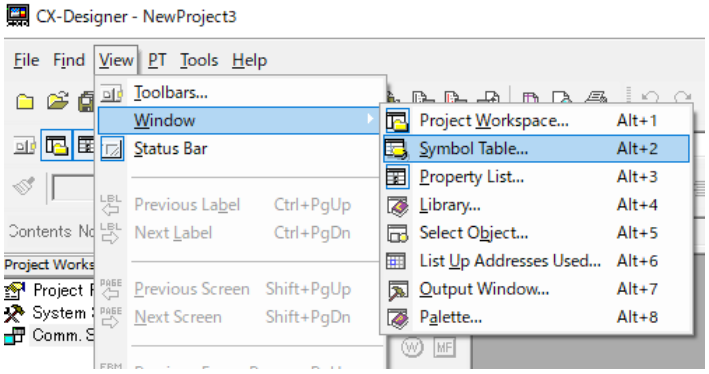
The purpose is to improve the readability of in which address the variable after conversion is used. Therefore, it is not necessary to perform the procedure as described. There is no problem as long as variable names conform to the naming convention of NS.
Set appropriate variable names, according to the system of NA to actually replace.

Restrictions on the variable names of NS are as follows.
- A number cannot be used as the first letter.
- Blank characters cannot be used.
- Addresses cannot be used as the names.
- 64 characters max.
- The following symbols and characters cannot be used. (Underscores [_] can be used)
  [!], ["], [$], [%], [&], ['], [(], [)], [-], [=], [^], [~], [|], [@], [`], [[], [{], [;], [+], [:], [*], []], [}], [,], [<], [.], [>], [/], [?]

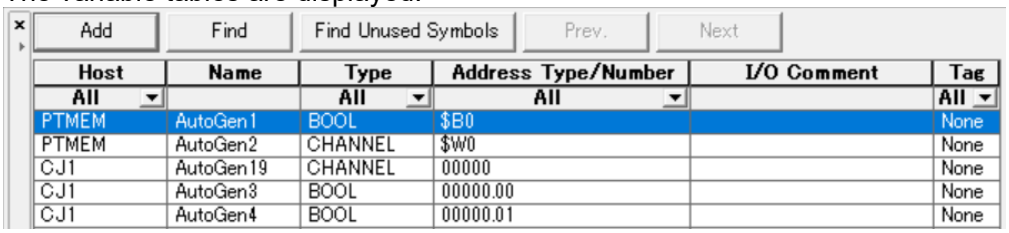
3-1-1 Extracting Variables Used in NS

1. Open the screen data to convert in CX-Designer.

2. Click **View** – **Window** – **Symbol Table** from the menu bar.

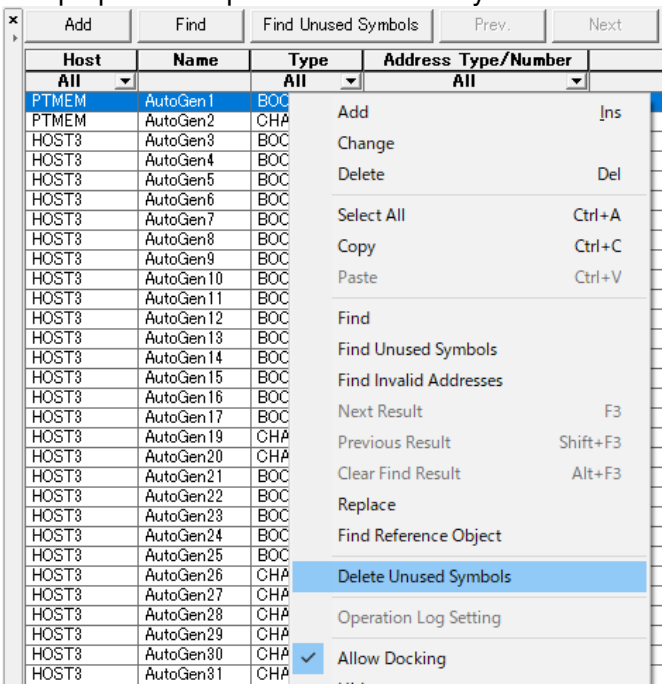


3. The variable tables are displayed.



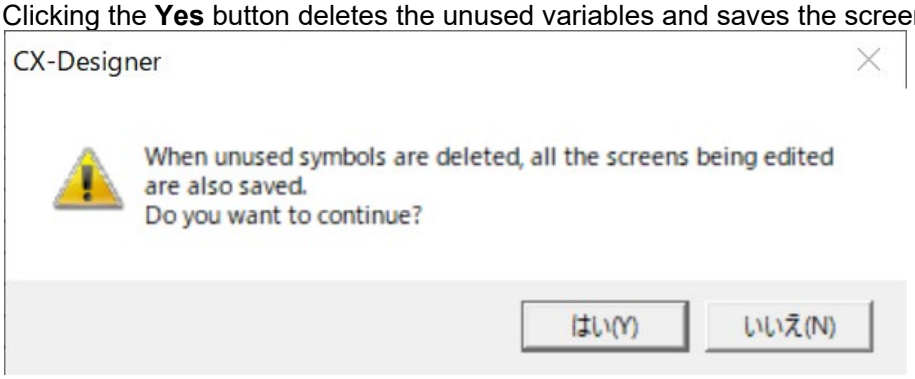
Host	Name	Type	Address Type/Number	I/O Comment	Tag
All		All	All		All
PTMEM	AutoGen1	BOOL	$B0		None
PTMEM	AutoGen2	CHANNEL	$W0		None
CJ1	AutoGen19	CHANNEL	00000		None
CJ1	AutoGen3	BOOL	00000.00		None
CJ1	AutoGen4	BOOL	00000.01		None

4. Right-click a variable table, and click **Delete Unused Symbols**.
   Doing this deletes the variable that is not used in the NS screen.
   The purpose is to prevent unnecessary variables from being converted.

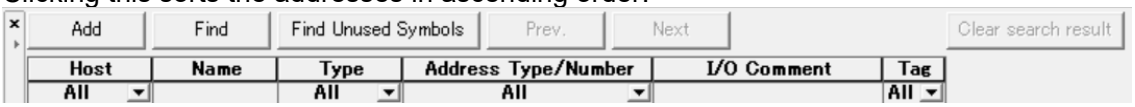


Additional Information

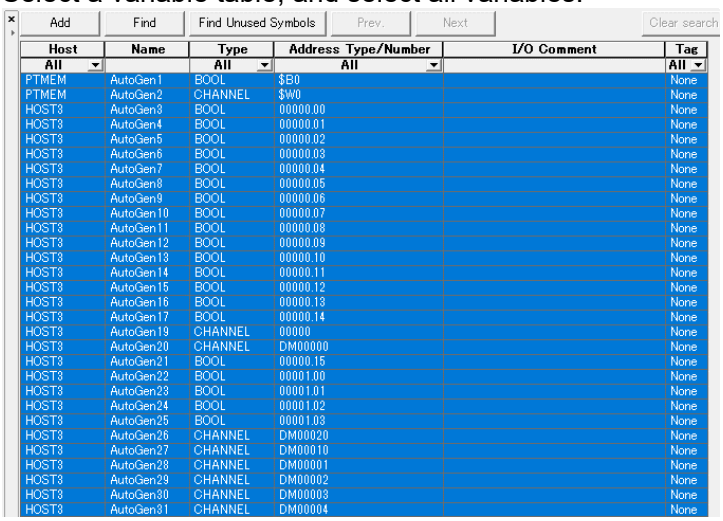
When unused variables are deleted, the screen data will be saved.
You are recommended to make a backup in case of a failure.
The dialog shown below will be displayed when **Delete Unused Symbols** is clicked.
Clicking the **Yes** button deletes the unused variables and saves the screen data.



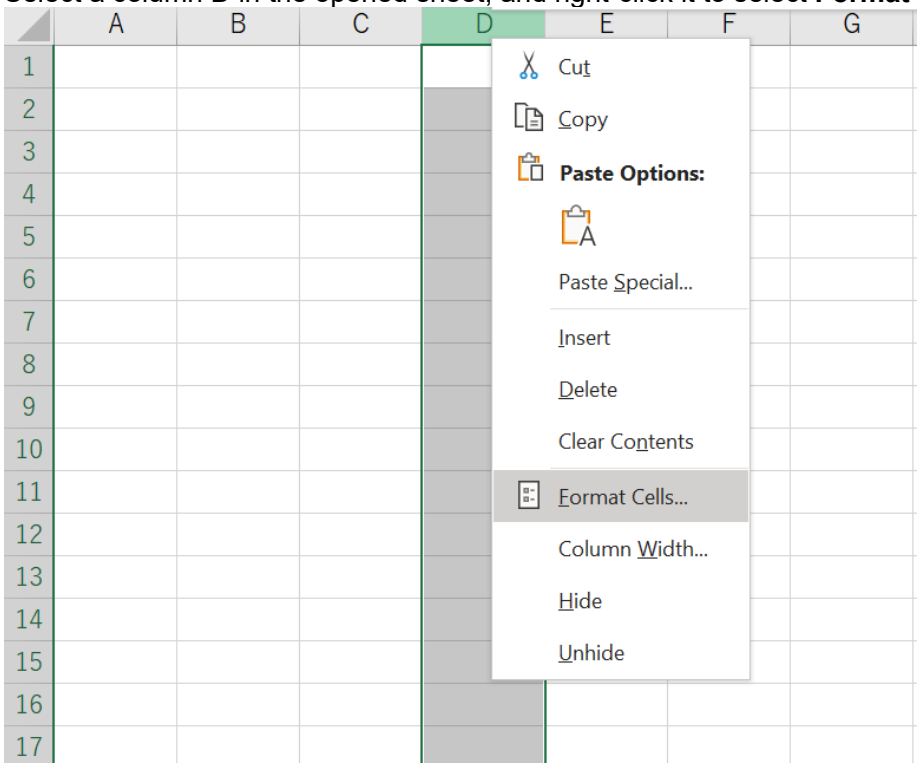
5. Select a variable table, and select all variables.
   Clicking this sorts the addresses in ascending order.



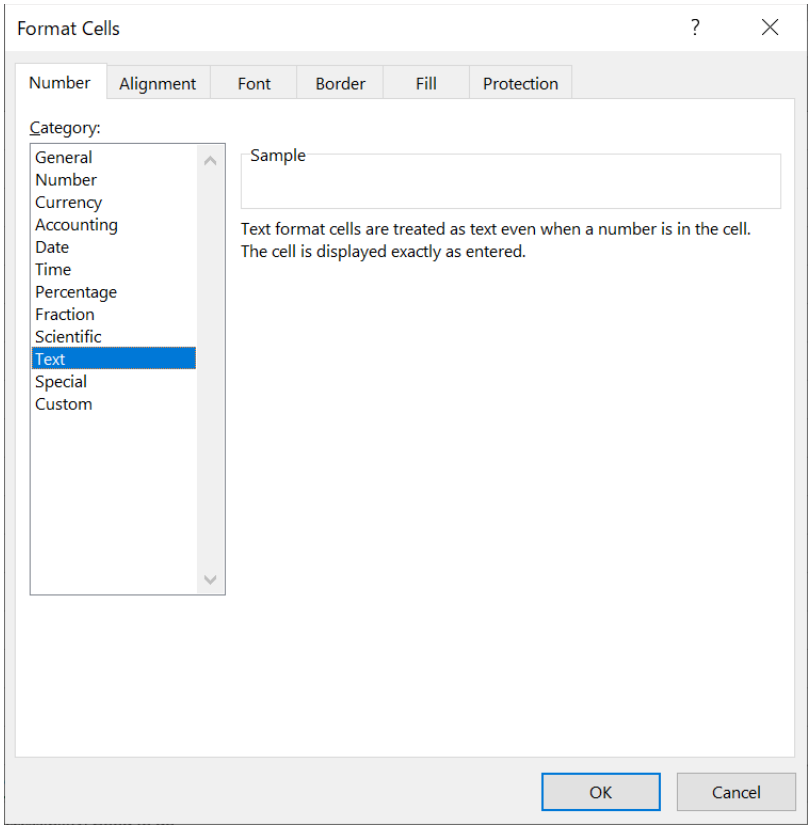
6. Select a variable table, and select all variables.



7. Copy all the variables.
8. Start Excel.
9. Select a column D in the opened sheet, and right-click it to select **Format Cells**.



10. Select the display format **Text**, and click the **OK** button.
    If this processing is skipped, information on the bit addresses **.00** and **.10** of BOOL-type variables will be lost.



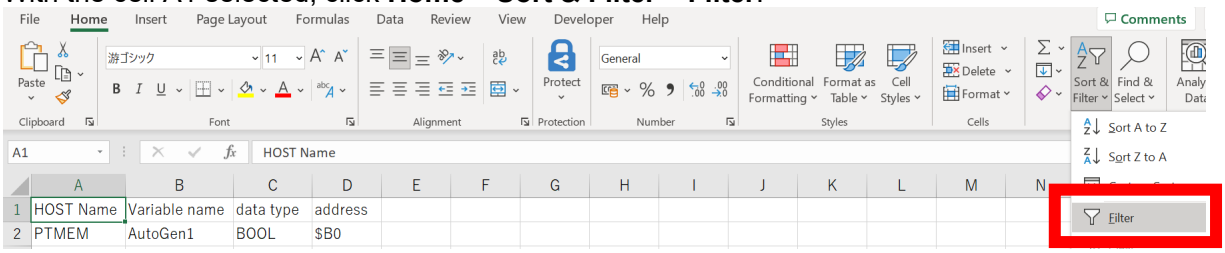
11. With the cell A2 selected, paste the copied variable information.

	A	B	C	D	E
1					
2	PTMEM	AutoGen1	BOOL	$B0	
3	PTMEM	AutoGen2	CHANNEL	$W0	
4	HOST3	AutoGen3	BOOL	00000.00	
5	HOST3	AutoGen4	BOOL	00000.01	
6	HOST3	AutoGen5	BOOL	00000.02	
7	HOST3	AutoGen6	BOOL	00000.03	
8	HOST3	AutoGen7	BOOL	00000.04	

12. Add the following words to the first row.
    This step is used for filtering below.

	A	B	C	D
1	HOST Name	Variable name	data type	address
2	PTMEM	AutoGen1	BOOL	$B0

13. With the cell A1 selected, click **Home** – **Sort & Filter** – **Filter**.



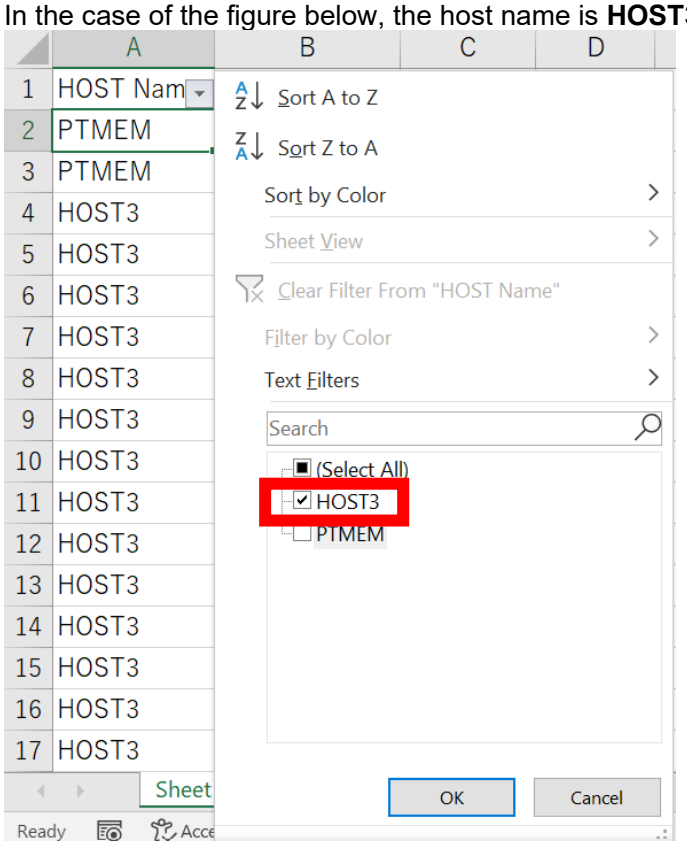
14. Save the Excel file with a desired name.

3-1-2 Changing Variable Names in Host Addresses

1. In order to change the variable names, select a column D, and copy & paste it to another empty column.
   In the following case, they are copied to from a column D to a column F.

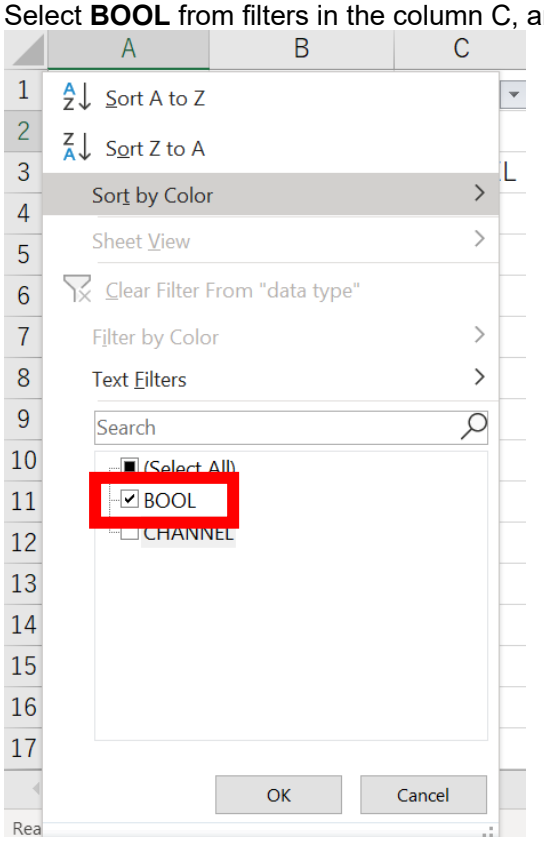
	A	B	C	D	E	F
1	HOST Name	Variable name	data type	address		
2	PTMEM	AutoGen1	BOOL	$B0		$B0
3	PTMEM	AutoGen2	CHANNEL	$W0		$W0
4	HOST3	AutoGen3	BOOL	00000.00		00000.00
5	HOST3	AutoGen4	BOOL	00000.01		00000.01
6	HOST3	AutoGen5	BOOL	00000.02		00000.02
7	HOST3	AutoGen6	BOOL	00000.03		00000.03
8	HOST3	AutoGen7	BOOL	00000.04		00000.04
9	HOST3	AutoGen8	BOOL	00000.05		00000.05
10	HOST3	AutoGen9	BOOL	00000.06		00000.06
11	HOST3	AutoGen10	BOOL	00000.07		00000.07

2. Select **Host Name** from filters in the column A, and click the **OK** button.
   In the case of the figure below, the host name is **HOST3**.



• BOOL Variable Name Change

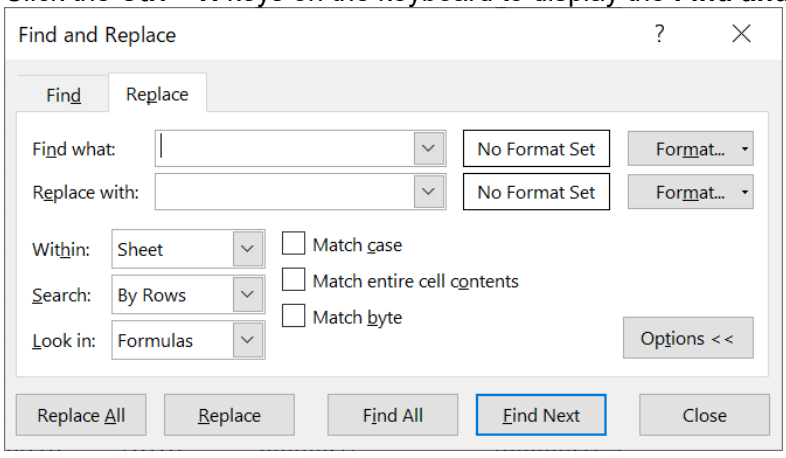
1. Select **BOOL** from filters in the column C, and click the **OK** button.



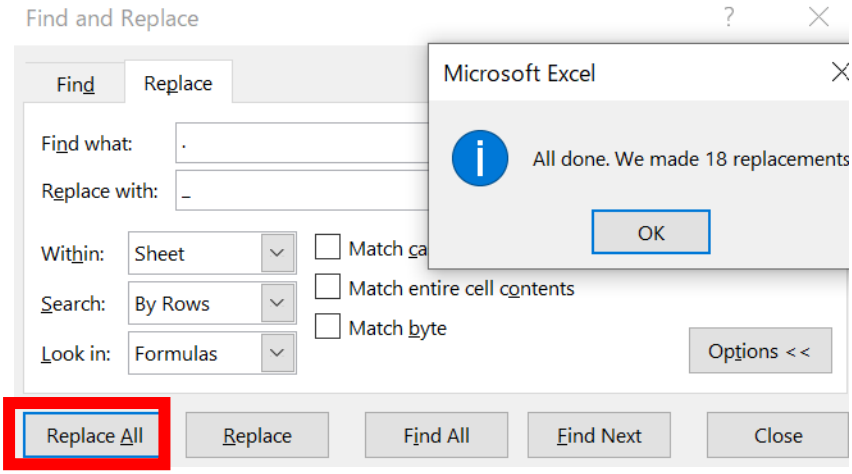
2. Select the column where the addresses were copied.

	A	B	C	D	E	F
1	HOST Nam	Variable nam	data type	address		
4	HOST3	AutoGen3	BOOL	00000.00		00000.00
5	HOST3	AutoGen4	BOOL	00000.01		00000.01
6	HOST3	AutoGen5	BOOL	00000.02		00000.02
7	HOST3	AutoGen6	BOOL	00000.03		00000.03
8	HOST3	AutoGen7	BOOL	00000.04		00000.04
9	HOST3	AutoGen8	BOOL	00000.05		00000.05
10	HOST3	AutoGen9	BOOL	00000.06		00000.06

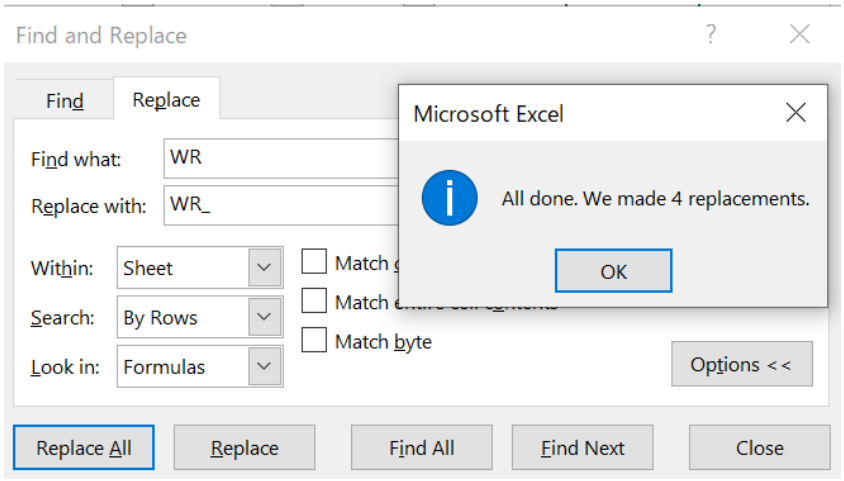
3. Click the **Ctrl + H** keys on the keyboard to display the **Find and Replace** dialog.



4. Set the text string to find and the text string after replaced respectively to . and _, and click the **Replace All** button.
   When the replacement is completed successfully, . used in bit input will be replaced with _.
   The reason this variable name replacement is performed is that . cannot be used under the variable naming convention of NS.



5. Set the text string to find and the text string after replaced respectively to *WR* and *WR_*, and click the **Replace All** button.
   The reason this name replacement is performed is that the addresses cannot be used as they are under the variable name convention of NS.
   ***WR* was replaced in this step; however, when the other memory area *HR*, *AR*, *DM*, *EM*, *EM0_18*, *TU*, or *CU* is used, insert _ between the memory area and the address in the same way.**

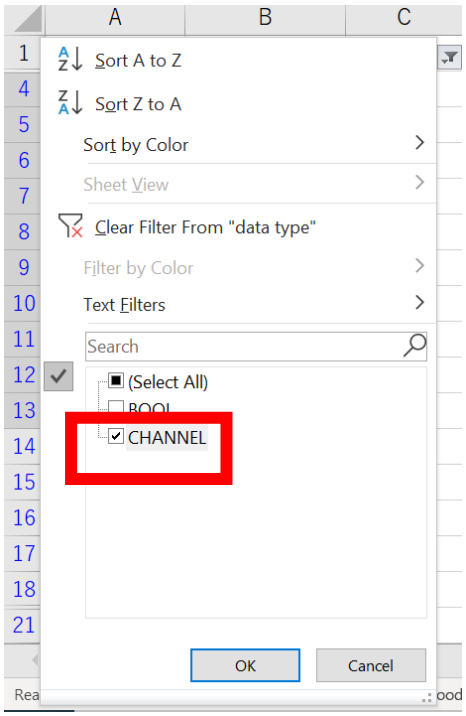


6. Prefix *CIO_* to the address using the CIO area.
   This is because no value can be entered in the head under the variable name convention of NS.

	A	B	C	D	E	F	G
1	HOST Nam	Variable nam	data type	address			
4	HOST3	AutoGen3	BOOL	00000.00		CIO_00000_00	
5	HOST3	AutoGen4	BOOL	00000.01		CIO_00000_01	
6	HOST3	AutoGen5	BOOL	00000.02		CIO_00000_02	

• CHANNEL Variable Name Change

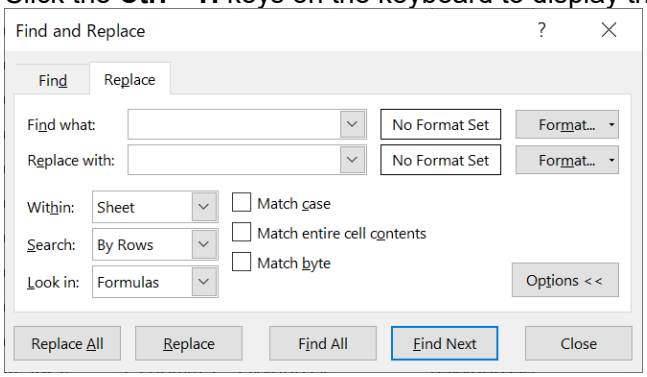
1. Select **CHANNEL** from filters in the column C, and click the **OK** button.



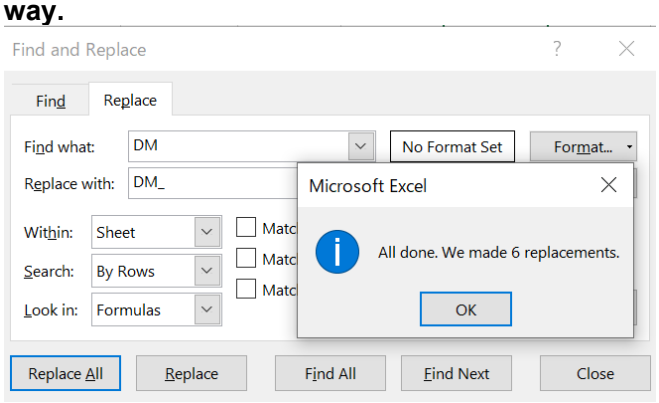
2. Select the column where the addresses were copied.

	A	B	C	D	E	F
1	HOST Nam	Variable nam	data type	address		
19	HOST3	AutoGen19	CHANNEL	00000		00000
20	HOST3	AutoGen20	CHANNEL	DM00000		DM00000
26	HOST3	AutoGen26	CHANNEL	DM00001		DM00001
27	HOST3	AutoGen27	CHANNEL	DM00002		DM00002
28	HOST3	AutoGen28	CHANNEL	DM00003		DM00003
29	HOST3	AutoGen29	CHANNEL	DM00004		DM00004
30	HOST3	AutoGen30	CHANNEL	DM00010		DM00010
31	HOST3	AutoGen31	CHANNEL	DM00020		DM00020

3. Click the **Ctrl + H** keys on the keyboard to display the **Find and Replace** dialog.



4. Set the text string to find and the text string after replaced respectively to *DM* and *DM_*, and click the **Replace All** button.
The reason this name replacement is performed is that the addresses cannot be used as they are under the variable name convention of NS.
***DM* was replaced in this step; however, when the other memory area *HR*, *AR*, *DM*, *EM*, *EM0_18*, *T*, or *C* is used, insert _ between the memory area and the address in the same way.**



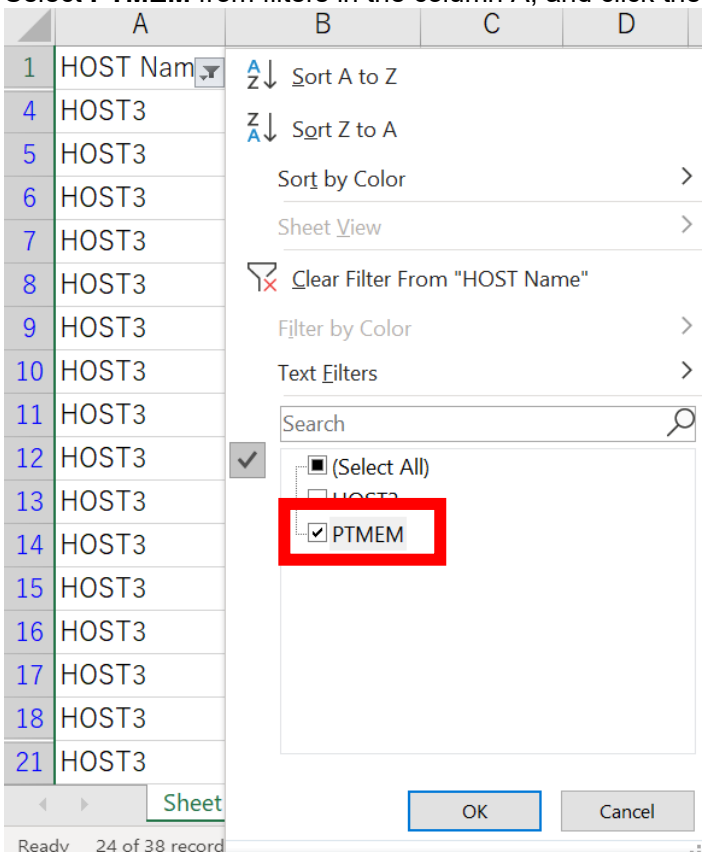
5. Prefix *CIO_* to the address using the CIO area.
This is because no value can be entered in the head under the variable name convention of NS.

	A	B	C	D	E	F
1	HOST Nam	Variable nam	data type	address		
19	HOST3	AutoGen19	CHANNEL	00000		CIO_00000
20	HOST3	AutoGen20	CHANNEL	DM00000		DM_00000
26	HOST3	AutoGen26	CHANNEL	DM00001		DM_00001
27	HOST3	AutoGen27	CHANNEL	DM00002		DM_00002
28	HOST3	AutoGen28	CHANNEL	DM00003		DM_00003
29	HOST3	AutoGen29	CHANNEL	DM00004		DM_00004
30	HOST3	AutoGen30	CHANNEL	DM00010		DM_00010
31	HOST3	AutoGen31	CHANNEL	DM00020		DM_00020

6. Clear the filters in the column A and the column C.

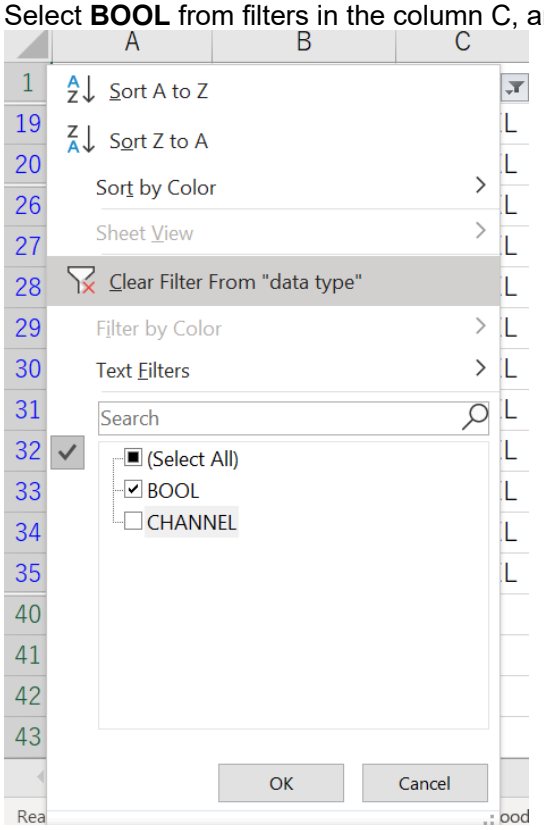
3-1-3 Changing Variable Names in NS Internal Addresses

1. Select **PTMEM** from filters in the column A, and click the **OK** button.

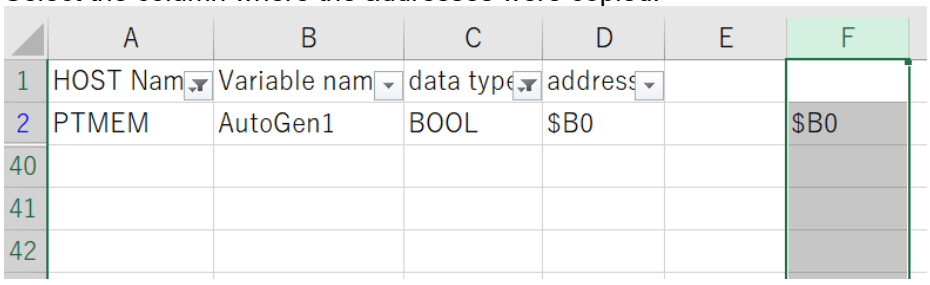


• BOOL Variable Name Change

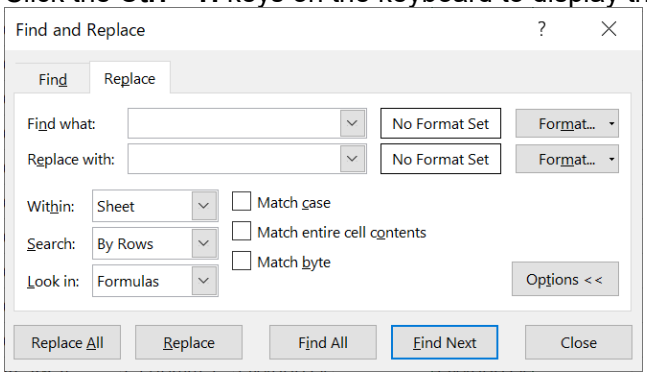
1. Select **BOOL** from filters in the column C, and click the **OK** button.



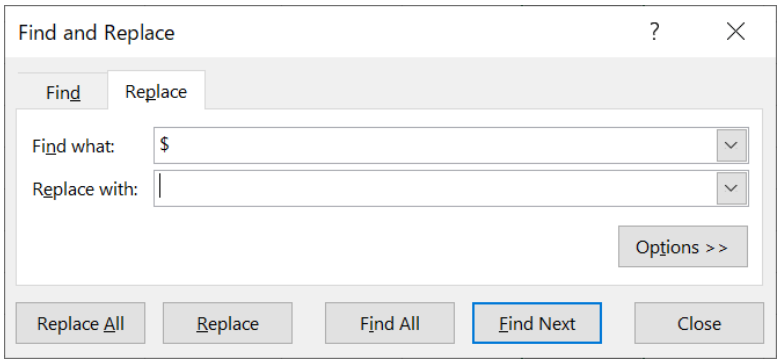
2. Select the column where the addresses were copied.



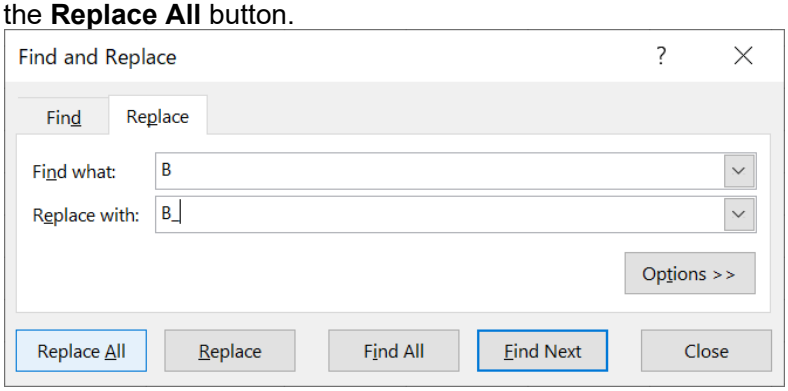
3. Click the **Ctrl + H** keys on the keyboard to display the **Find and Replace** dialog.



4. Set the text string to find and the text string after replaced respectively to *$* and a blank, and click the **Replace All** button.
   The reason this name replacement is performed is that *$* cannot be used under the variable name convention of NS.

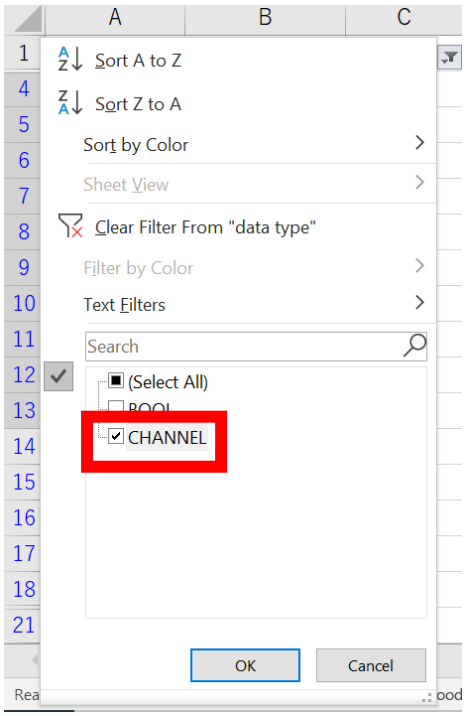


5. Set the text string to find and the text string after replaced respectively to *B* and *B_*, and click the **Replace All** button.

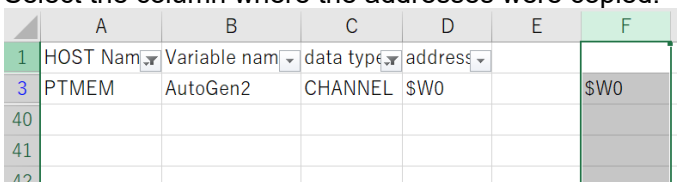


• CHANNEL Variable Name Change

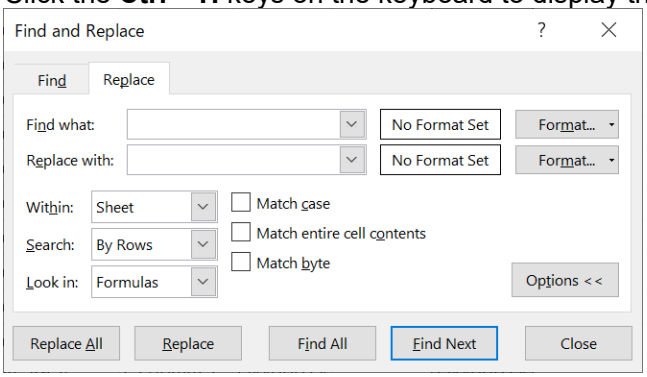
1. Select **CHANNEL** from filters in the column C, and click the **OK** button.



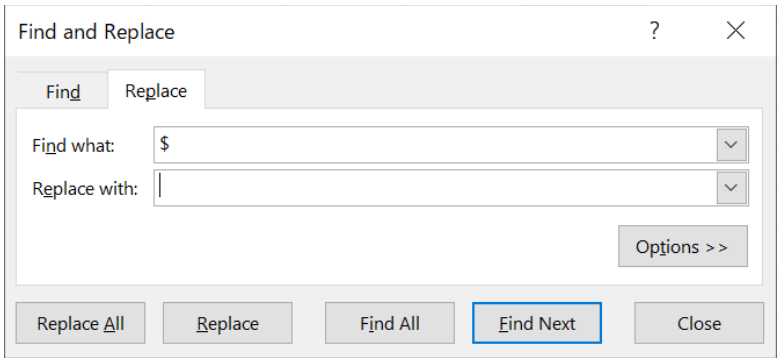
2. Select the column where the addresses were copied.



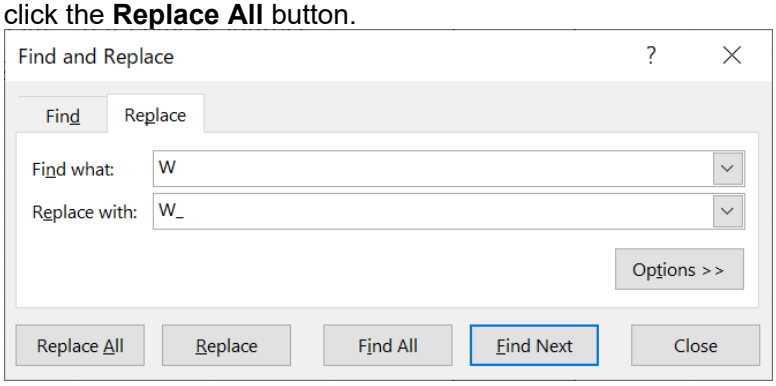
3. Click the **Ctrl + H** keys on the keyboard to display the **Find and Replace** dialog.



4. Set the text string to find and the text string after replaced respectively to *$* and a blank, and click the **Replace All** button.
The reason this name replacement is performed is that *$* cannot be used under the variable name convention of NS.

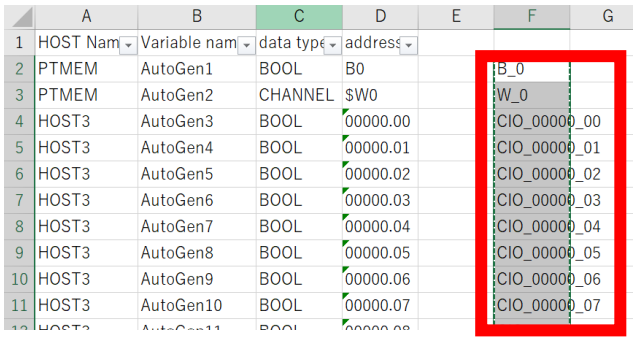


5. Enter *W* and *W_* into the text string to find and the text string after replaced respectively, and click the **Replace All** button.



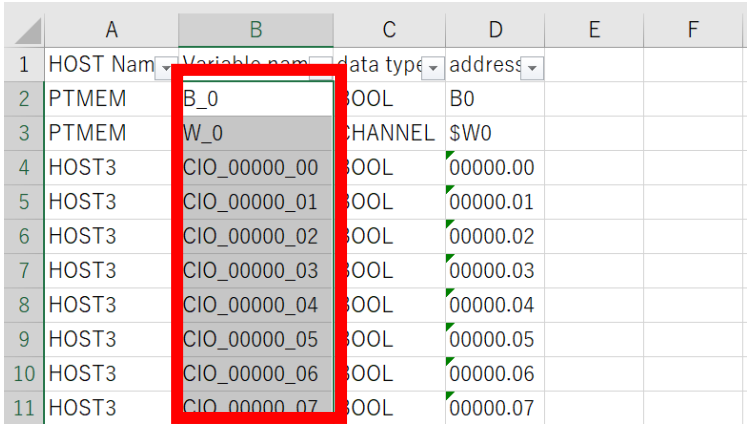
6. Clear the filters in the column A and the column C.

7. Select and cut the cells containing the variable names in the column where the variable names were edited.



	A	B	C	D	E	F	G
1	HOST Nam	Variable nam	data type	address			
2	PTMEM	AutoGen1	BOOL	B0		B_0	
3	PTMEM	AutoGen2	CHANNEL	$W0		W_0	
4	HOST3	AutoGen3	BOOL	00000.00		CIO_00000_00	
5	HOST3	AutoGen4	BOOL	00000.01		CIO_00000_01	
6	HOST3	AutoGen5	BOOL	00000.02		CIO_00000_02	
7	HOST3	AutoGen6	BOOL	00000.03		CIO_00000_03	
8	HOST3	AutoGen7	BOOL	00000.04		CIO_00000_04	
9	HOST3	AutoGen8	BOOL	00000.05		CIO_00000_05	
10	HOST3	AutoGen9	BOOL	00000.06		CIO_00000_06	
11	HOST3	AutoGen10	BOOL	00000.07		CIO_00000_07	

8. Paste the cut variables to the column B.



	A	B	C	D	E	F
1	HOST Nam	Variable nam	data type	address		
2	PTMEM	B_0	BOOL	B0		
3	PTMEM	W_0	CHANNEL	$W0		
4	HOST3	CIO_00000_00	BOOL	00000.00		
5	HOST3	CIO_00000_01	BOOL	00000.01		
6	HOST3	CIO_00000_02	BOOL	00000.02		
7	HOST3	CIO_00000_03	BOOL	00000.03		
8	HOST3	CIO_00000_04	BOOL	00000.04		
9	HOST3	CIO_00000_05	BOOL	00000.05		
10	HOST3	CIO_00000_06	BOOL	00000.06		
11	HOST3	CIO_00000_07	BOOL	00000.07		

Precautions for Correct Use

The maximum number of global variables that NA can register is 35,000, with 30,000 variables for communications with host addresses.
Be careful not to exceed the maximum registration limit during conversion.
The following shows an extract from *Programmable Terminal User's Manual (Software), 4-1-1 Variables*.

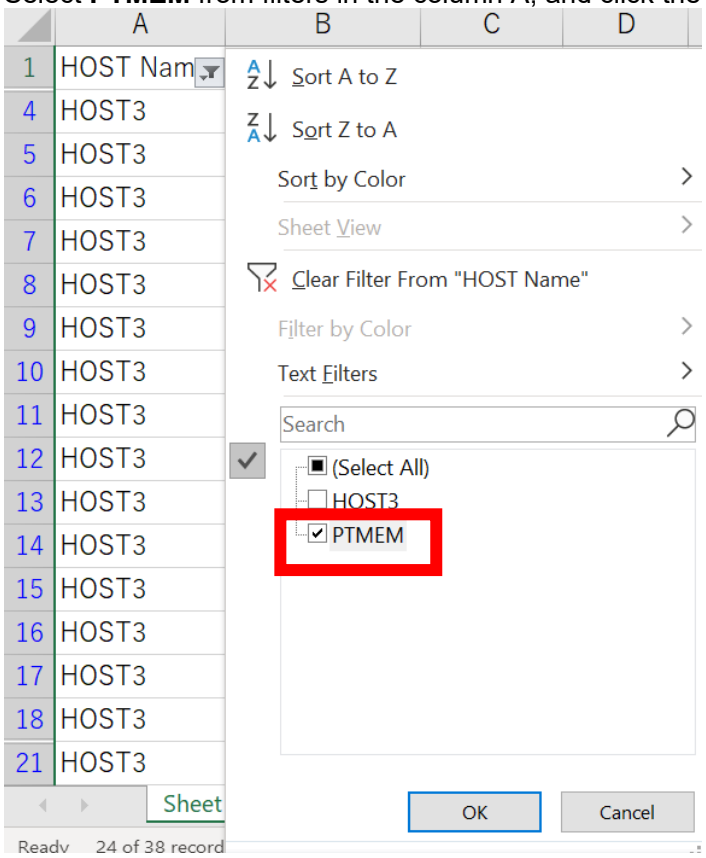
Variable type			Description
Global variables			Global variables are defined by the user and can be accessed from anywhere in the project. You can register up to 35,000 total in the entire project and up to 30,000 for each connected device.*1 Global variables are declared in the HMI global variable table. Global variables include external variables and internal variables, which are described below.
	External variables		External variables are global variables that are used to access data in Controllers and other connected devices. External variables are assigned to device variables in the variable mapping.
	Internal variables		An internal variable can be used only within the HMI. All global variables that are not external variables are internal variables.
		System-defined variables	System-defined variables are provided in advance in the HMI. The names and all attributes are defined by the system. They have specific functions. You cannot change the variable names or any other attributes of these variables.
Subroutine variables			Subroutine variables are defined by the user and are used only within subroutines. Subroutine variables are declared in Dim statements in page subroutines or global subroutines. You can use all of the data types that are supported by Visual Basic.

3-1-4 Converting Data Type of Variables into Data Type for NA

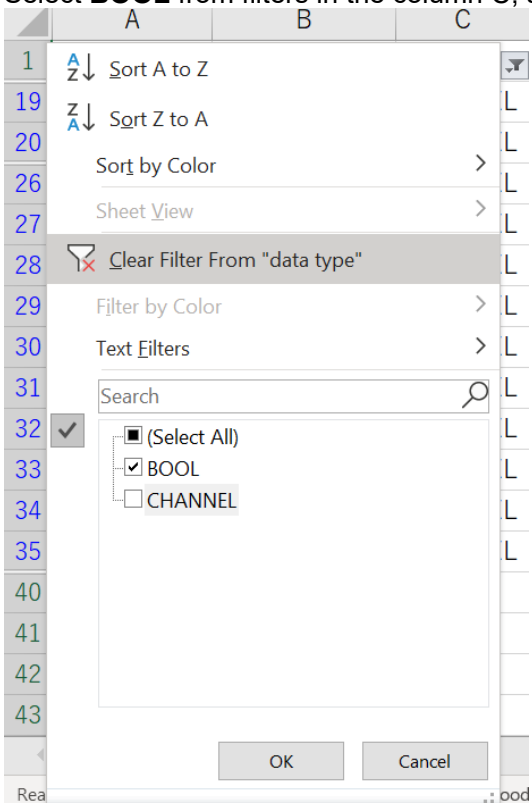
• BOOL Data Type Conversion

For the BOOL variables in internal addresses of NS, the data type changes when they are replaced with those of NA, so some corrections are required.

1. Select **PTMEM** from filters in the column A, and click the **OK** button.



2. Select **BOOL** from filters in the column C, and click the **OK** button.



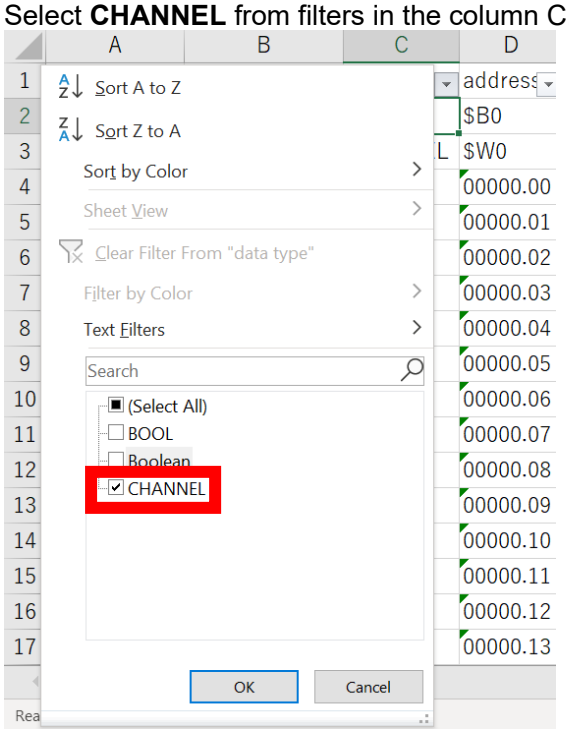
3. Using **Find and Replace** – **Replace All**, replace BOOL with Boolean.

HOST Nam	Variable nam	data type	address
PTMEM	B_0	Boolean	$B0

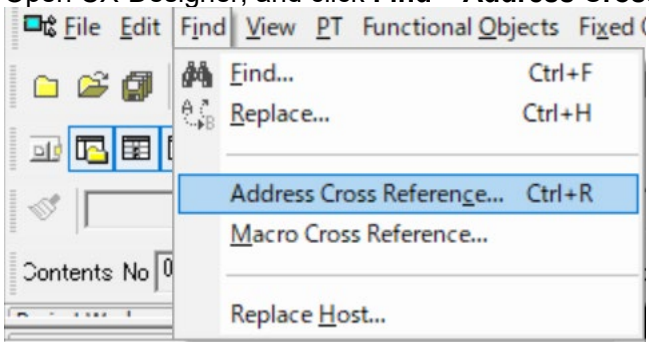
4. Clear the filters in the column A and the column C.

• CHANNEL Data Type Conversion

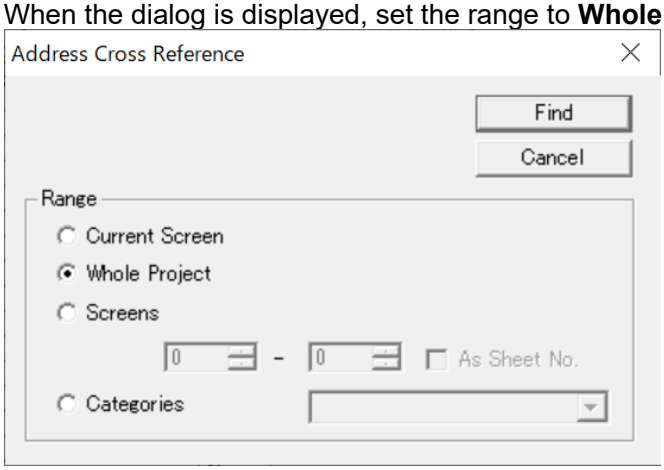
1. Select **CHANNEL** from filters in the column C, and click the **OK** button.



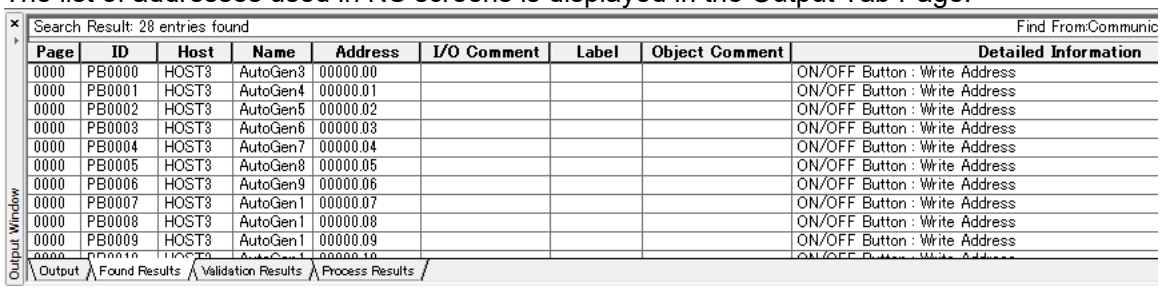
2. Open CX-Designer, and click **Find** – **Address Cross Reference** from the menu bar.



3. When the dialog is displayed, set the range to **Whole Project**, and click the **Find** button.

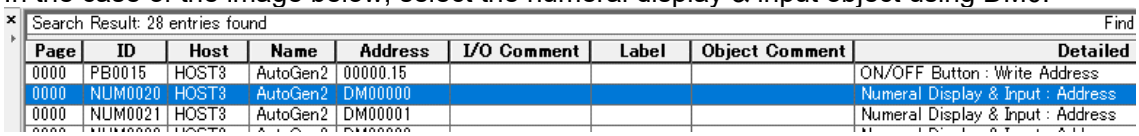


4. The list of addresses used in NS screens is displayed in the Output Tab Page.

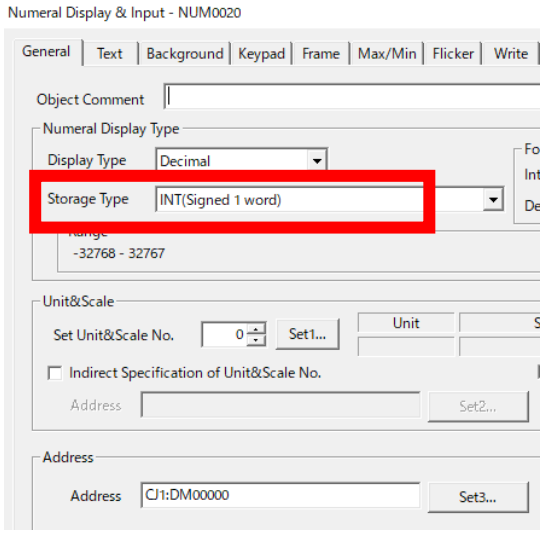


5. Click the address column twice.
   Clicking this sorts the addresses in ascending order.

6. Among the cross-references, double-click a location where the address is specified.
   In the case of the image below, select the numeral display & input object using DM0.



7. Double-clicking it displays the setting dialog for the object using the selected address.
In the case of the following numeral display & input object, the data type set as the storage type represents the data type used in the set address.
In the case of the image below, the storage type highlight in red is the *INT* type, so it turns out that the *INT* type is in use.
You can also confirm that the setting communications address is *DM00000*.



8. Open Excel and correct the data type in the column C of the row where the address is *DM00000* to the corresponding data type.
The corresponding data type varies according to whether the address is a host address or an NS internal address.
For the host address, you only have to enter the data type set in NS as it is; however, for the NS internal address, you need to correct it to the data type corresponding to that for NA.
The following shows an example of the host address.

	A	B	C	D
1	HOST Nam	Variable nam	data type	address
3	PTMEM	W_0	CHANNEL	$W0
19	HOST3	CIO_00000	CHANNEL	00000
20	HOST3	DM_00000	INT	DM00000
26	HOST3	DM_00001	CHANNEL	DM00001
27	HOST3	DM_00002	CHANNEL	DM00002

The data type of variables in NS internal addresses should be corrected according to the following data type correspondence table.

Data type for NS	Data type for NA
INT	Short
DINT	Integer
LINT	Long
UINT	UShort
WORD	UShort
UNIT_BCD	UShort
UDINT	UInteger
DWORD	UInteger
UDINT_BCD	UInteger
REAL	Single
LREAL	Double

9. Repeat steps 6 to 8 to correct the data type of CHANNEL variables.

Additional Information

In NA, variables can be converted into an array.
Screen creation can be more efficient by creating an array, so we will describe some examples.
Specifically, when consecutive addresses are displayed in the screen, you can copy some objects by changing the array element through the use of the **Duplicating objects** function of Sysmac Studio.
Decide whether to actually create an array, according to whether the same data type is used in consecutive CHs judging from the address usage.

● Converting BOOL Variables into Array

As shown below, we will describe how to create an array when 16 bits of 0CH are all used in NS.

HOST Nam	Variable nam	data type	address
HOST3	CIO_00000_00	BOOL	00000.00
HOST3	CIO_00000_01	BOOL	00000.01
HOST3	CIO_00000_02	BOOL	00000.02
HOST3	CIO_00000_03	BOOL	00000.03
HOST3	CIO_00000_04	BOOL	00000.04
HOST3	CIO_00000_05	BOOL	00000.05
HOST3	CIO_00000_06	BOOL	00000.06
HOST3	CIO_00000_07	BOOL	00000.07
HOST3	CIO_00000_08	BOOL	00000.08
HOST3	CIO_00000_09	BOOL	00000.09
HOST3	CIO_00000_10	BOOL	00000.10
HOST3	CIO_00000_11	BOOL	00000.11
HOST3	CIO_00000_12	BOOL	00000.12
HOST3	CIO_00000_13	BOOL	00000.13
HOST3	CIO_00000_14	BOOL	00000.14
HOST3	CIO_00000_15	BOOL	00000.15

1. Change the data type of the variable *CIO_00000_00* to *BOOL[16]*.

HOST Nam	Variable nam	data type	address
HOST3	CIO_00000_00	BOOL[16]	00000.00
HOST3	CIO_00000_01	BOOL	00000.01
HOST3	CIO_00000_02	BOOL	00000.02

2. Delete the variables from *CIO_00000_01* to *CIO_00000_15*.

HOST Nam	Variable nam	data type	address
HOST3	CIO_00000_00	BOOL[16]	00000.00

● Converting Numerical Variables into Array

As shown below, we will describe how to create an array when the UINT type is used for DM0 to 9CH all in NS.

HOST Nam	Variable nam	data type	address
HOST3	DM_00000	UINT	DM00000
HOST3	DM_00001	UINT	DM00001
HOST3	DM_00002	UINT	DM00002
HOST3	DM_00003	UINT	DM00003
HOST3	DM_00004	UINT	DM00004
HOST3	DM_00005	UINT	DM00005
HOST3	DM_00006	UINT	DM00006
HOST3	DM_00007	UINT	DM00007
HOST3	DM_00008	UINT	DM00008
HOST3	DM_00009	UINT	DM00009

1. Change the data type of the variable *DM_00000* to *UINT[10]*.

HOST Nam	Variable nam	data type	address
HOST3	DM_00000	UINT[10]	DM00000
HOST3	DM_00001	UINT	DM00001
HOST3	DM_00002	UINT	DM00002

2. Delete the variables from *DM_00000_01* to *DM_00009*.

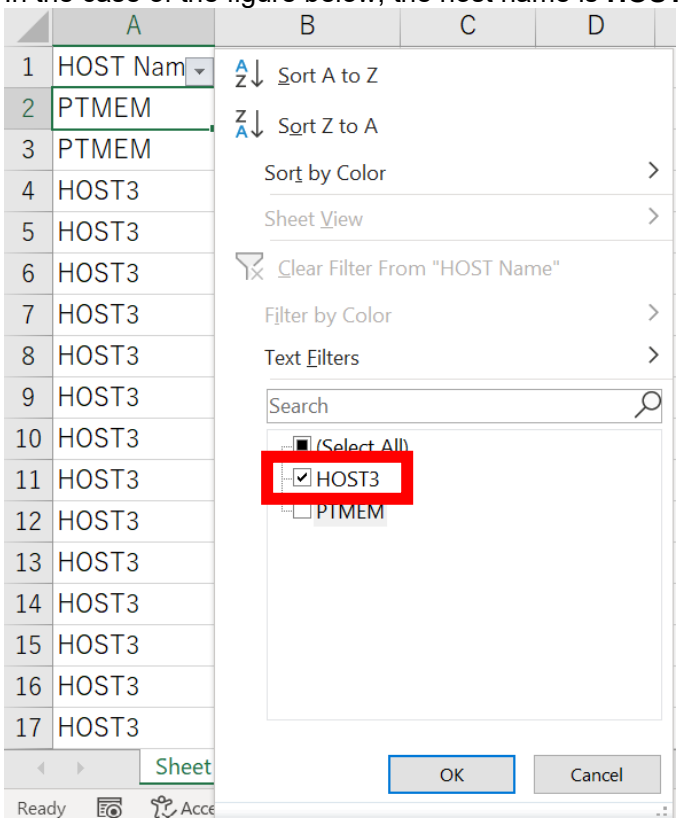
HOST Nam	Variable nam	data type	address
HOST3	DM_00000	UINT[10]	DM00000

Make an array of the sequential CH numbers using the same data type.
When you create an array, we recommend that the address at the end start with 0 to make it clearer.
Although there are no restrictions on the number of array elements, the number of elements should be about 100, because performance will be affected if excessive CHs of elements are secured, for example, all the areas of DM are converted into an array.

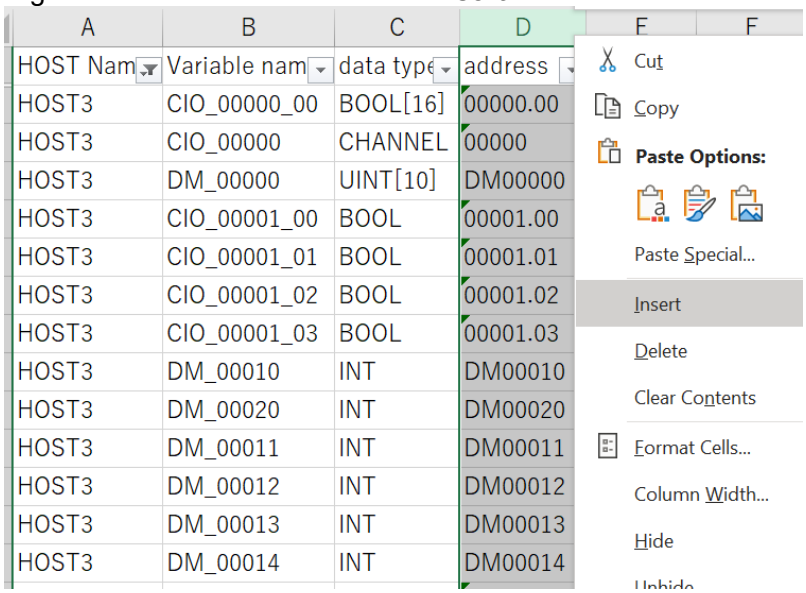
3-1-5 Reflecting Variable Tables in Those of Sysmac Studio

• How to Reflect in the Variable Tables of Host Addresses

1. Select **Host Name** from filters in the column A, and click the **OK** button.
   In the case of the figure below, the host name is **HOST3**.



2. Right-click the column D and click **Insert**.



3. With the variable tables in columns B to E selected, press the **Ctrl + C** keys on the keyboard to copy the cells.

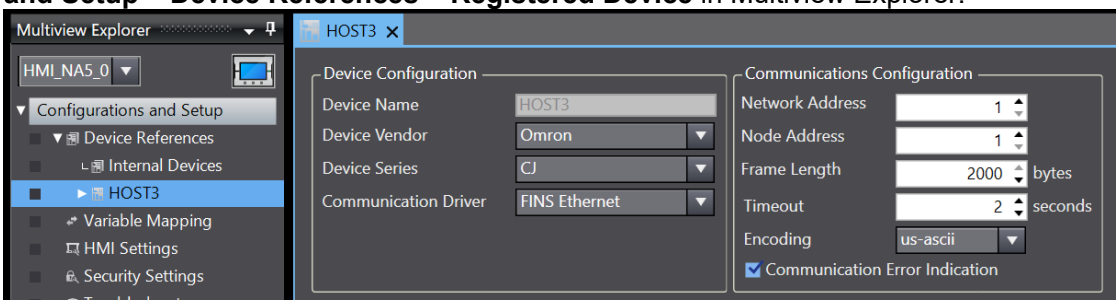
A	B	C	D	E
HOST Nam	Variable nam	data type		dress
HOST3	CIO_00000_00	BOOL		00000.00
HOST3	CIO_00000_01	BOOL		00000.01
HOST3	CIO_00000_02	BOOL		00000.02
HOST3	CIO_00000_03	BOOL		00000.03
HOST3	CIO_00000_04	BOOL		00000.04
HOST3	CIO_00000_05	BOOL		00000.05
HOST3	CIO_00000_06	BOOL		00000.06
HOST3	CIO_00000_07	BOOL		00000.07
HOST3	CIO_00000_08	BOOL		00000.08
HOST3	CIO_00000_09	BOOL		00000.09
HOST3	CIO_00000_10	BOOL		00000.10
HOST3	CIO_00000_11	BOOL		00000.11
HOST3	CIO_00000_12	BOOL		00000.12
HOST3	CIO_00000_13	BOOL		00000.13
HOST3	CIO_00000_14	BOOL		00000.14
HOST3	CIO_00000	CHANNEL		00000

4. Create a new Excel file, put a cursor on the cell A1, and press the **Ctrl + V** keys on the keyboard to paste them.

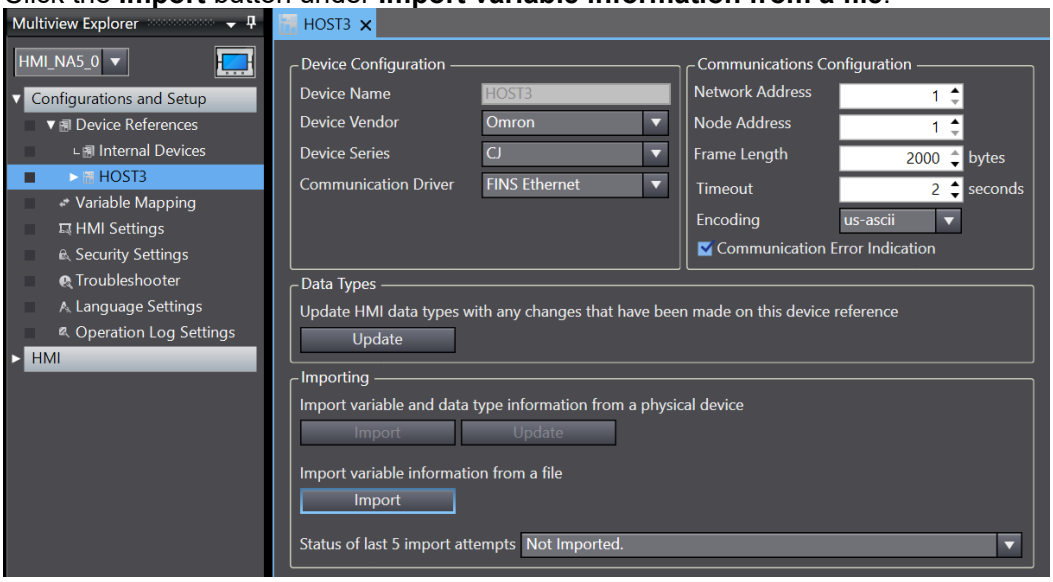
	A	B	C	D
1	CIO_00000_0(	BOOL		00000.00
2	CIO_00000_01	BOOL		00000.01
3	CIO_00000_02	BOOL		00000.02
4	CIO_00000_03	BOOL		00000.03
5	CIO_00000_04	BOOL		00000.04
6	CIO_00000_05	BOOL		00000.05

5. Save the Excel file with a desired name.

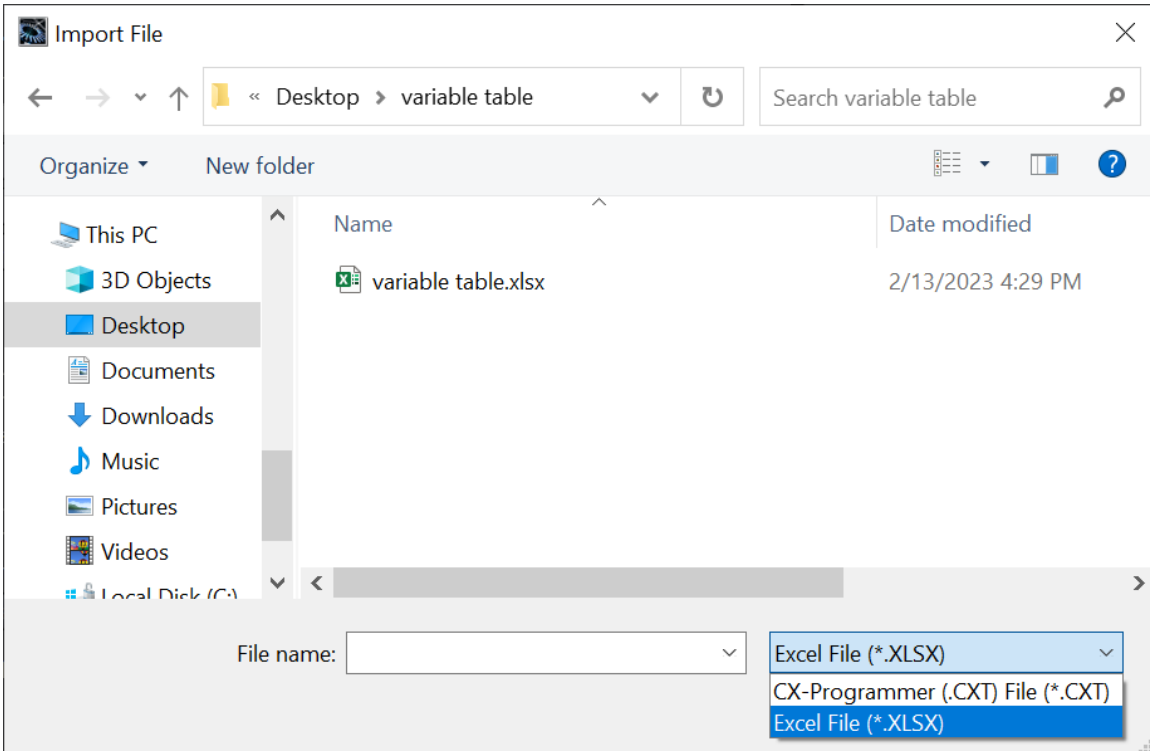
6. Open the Sysmac Studio project file created in Section 2, and double-click **Configurations and Setup** – **Device References** – **Registered Device** in Multiview Explorer.



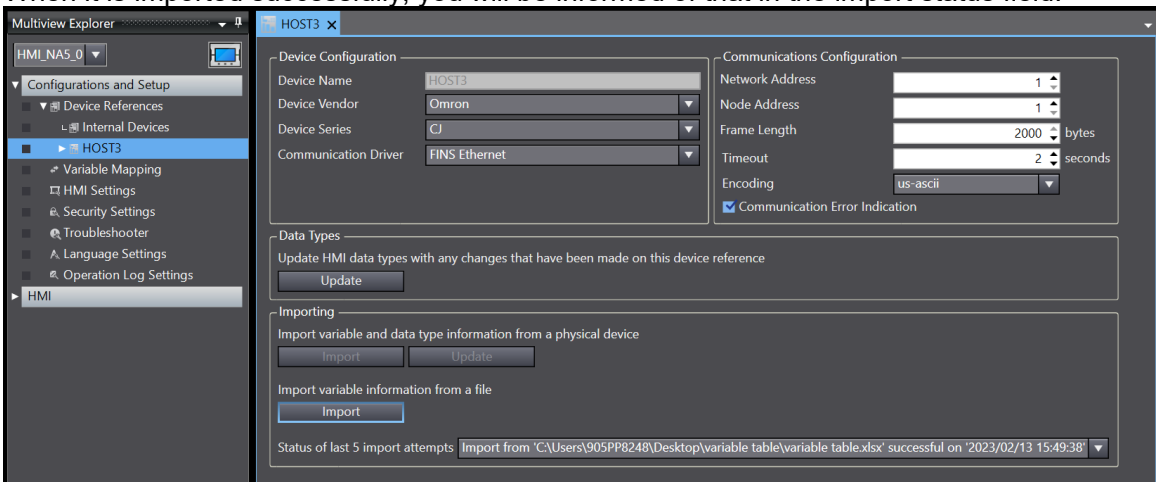
7. Click the **Import** button under **Import variable information from a file**.



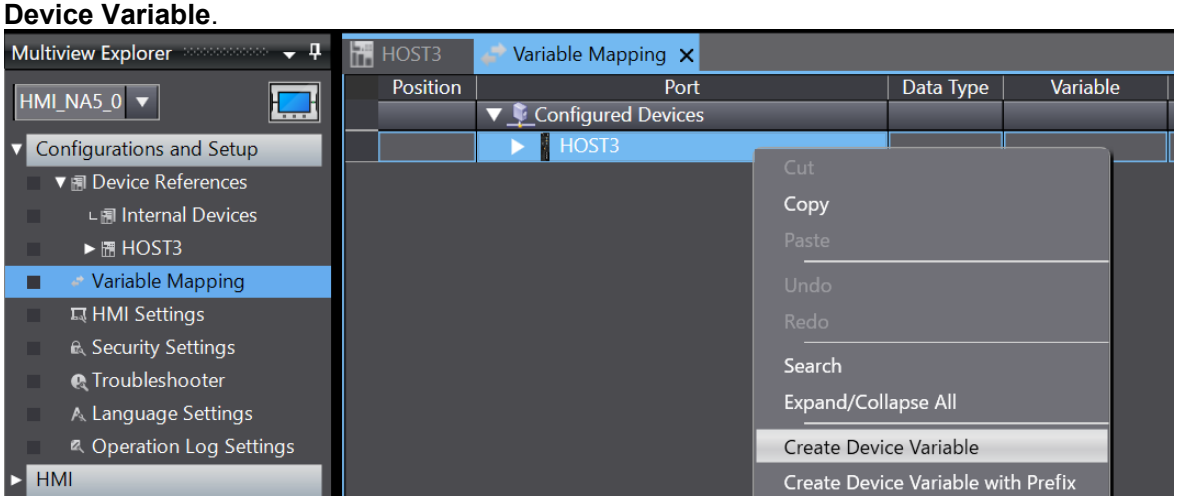
8. Set the file type to display to *Excel File (*.XLSX)*, and select and import the file saved in step 6.



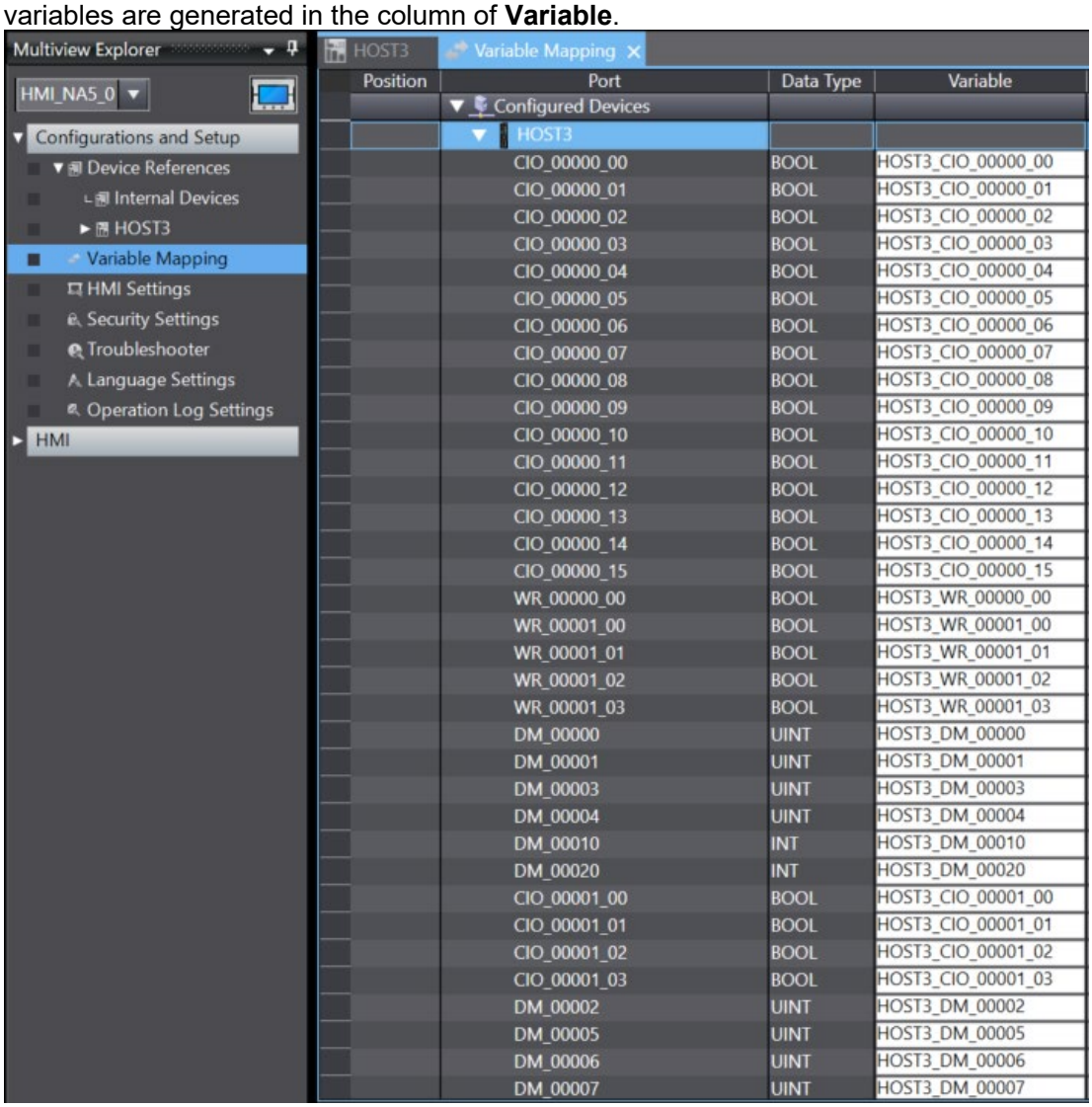
9. When it is imported successfully, you will be informed of that in the import status field.



10. When a set device is displayed under the registered device, right-click it and click **Create Device Variable**.



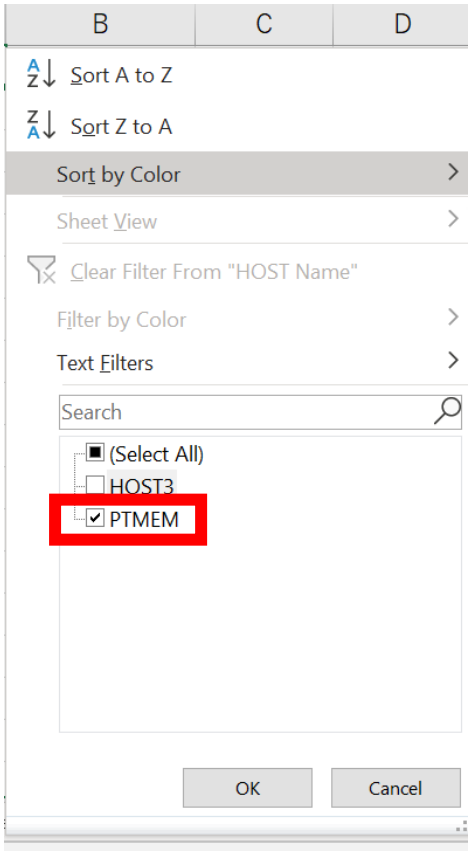
11. Click ▶ in the left of the set device to expand **Variable Mapping**, and check that device variables are generated in the column of **Variable**.



12. Open the Excel file containing those variable tables again, and clear the filter in the column A.

• How to Reflect in the Variable Tables of NS Internal Addresses

1. Select **PTMEM** from filters in the column A, and click the **OK** button.



2. Delete the address information in the column E.

A	B	C	D	E
HOST Nam	Variable nam	data type		address
PTMEM	B_0	Boolean		B_0
PTMEM	W_0	Short		W_0

3. Enter the following settings into the F to I columns as shown below.
They will be required for registration in the global variable tables of Sysmac Studio.

A	B	C	D	E	F	G	H	I
HOST Nam	Variable nam	data type		address				
PTMEM	B_0	Boolean			FALSE	FALSE	0	none
PTMEM	W_0	Short			FALSE	FALSE	0	none

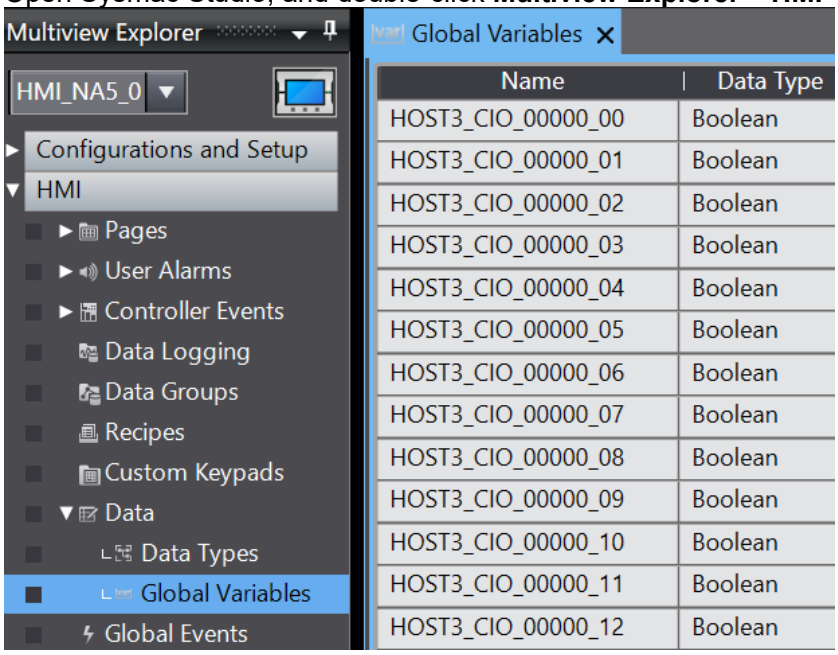
The settings are as follows.

	Column F	Column G	Column H	Column I
Characters to enter	FALSE	FALSE	0	None
Settings on the Sysmac Studio	Retention setting	Constant	Update rate	Scaling

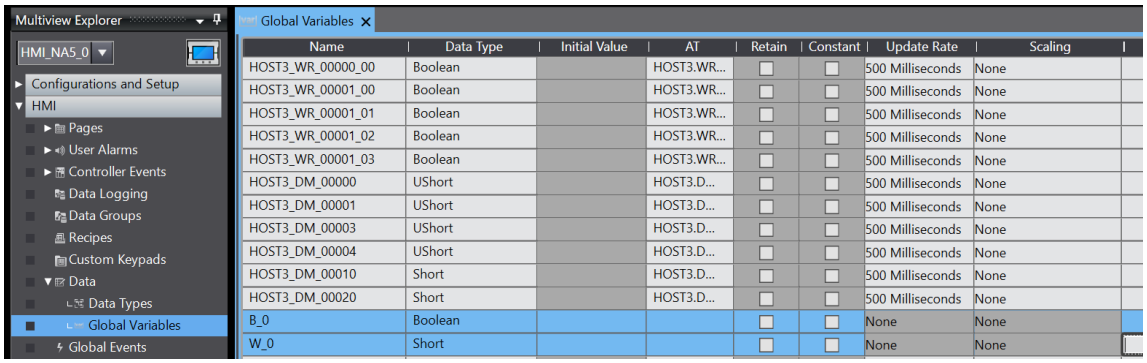
4. Copy the columns B to J of the rows where NS internal variables are registered.

B	C	D	E	F	G	H	I	J
Variable nam	data type		address					
B_0	Boolean			FALSE	FALSE	0	none	
W_0	Short			FALSE	FALSE	0	none	

5. Open Sysmac Studio, and double-click **Multiview Explorer** – **HMI** – **Data** – **Global Variables**.



6. With the global variable tables selected, press the **Ctrl + V** keys on the keyboard to paste the NS internal variables.



Name	Data Type	Initial Value	AT	Retain	Constant	Update Rate	Scaling
HOST3_WR_00000_00	Boolean		HOST3.WR...	☐	☐	500 Milliseconds	None
HOST3_WR_00001_00	Boolean		HOST3.WR...	☐	☐	500 Milliseconds	None
HOST3_WR_00001_01	Boolean		HOST3.WR...	☐	☐	500 Milliseconds	None
HOST3_WR_00001_02	Boolean		HOST3.WR...	☐	☐	500 Milliseconds	None
HOST3_WR_00001_03	Boolean		HOST3.WR...	☐	☐	500 Milliseconds	None
HOST3_DM_00000	UShort		HOST3.D...	☐	☐	500 Milliseconds	None
HOST3_DM_00001	UShort		HOST3.D...	☐	☐	500 Milliseconds	None
HOST3_DM_00003	UShort		HOST3.D...	☐	☐	500 Milliseconds	None
HOST3_DM_00004	UShort		HOST3.D...	☐	☐	500 Milliseconds	None
HOST3_DM_00010	Short		HOST3.D...	☐	☐	500 Milliseconds	None
HOST3_DM_00020	Short		HOST3.D...	☐	☐	500 Milliseconds	None
B_0	Boolean			☐	☐	None	None
W_0	Short			☐	☐	None	None

3-2 Conversion of Text Strings

In NA, all the texts to be registered into objects are to be registered into the string resources. Therefore, in NS, those used to be divided into the normal label, string table, and string storage file; however, it is now necessary to register them into the string resources of Sysmac Studio. The string resources can be divided into some groups, so you are recommended to group the normal label and the others.

The conceptual figure of settings is as follows.
Register the normal label into the root, and then register the characters entered in the string table and string storage file into the other resource groups.

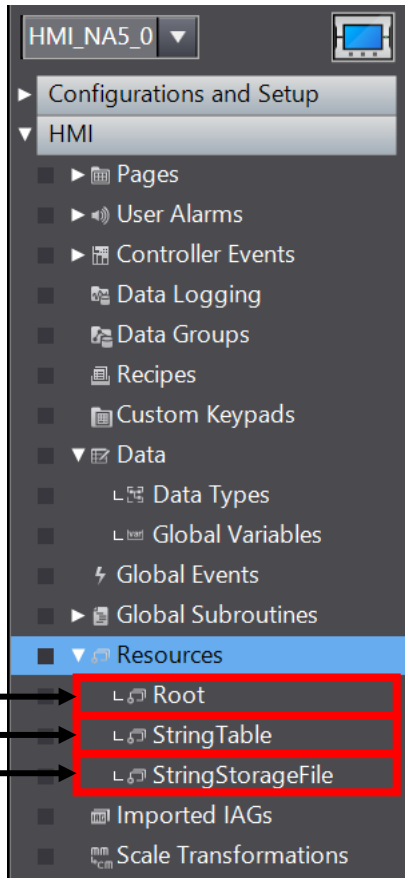
String resources of NS

Normal label of NS
This is a text string to be entered directly in the setting of a label object etc. for display.

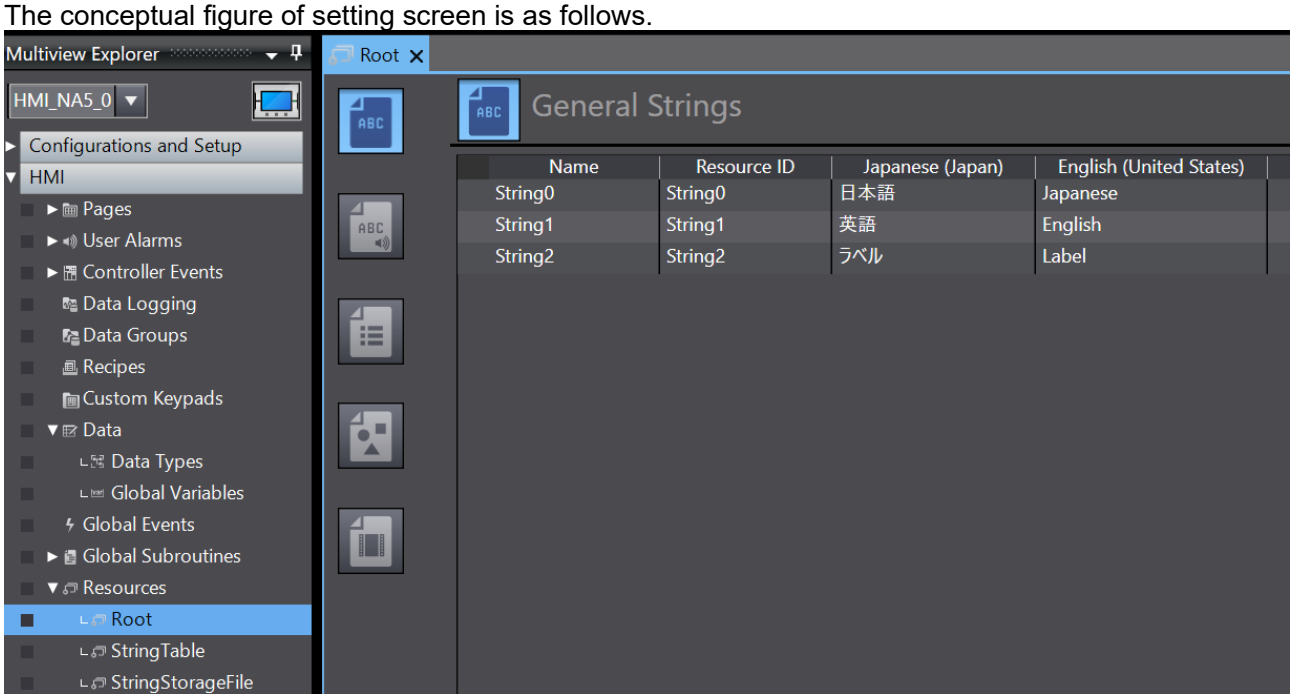
String table of NS
This is a function to manage the text strings used in the project.
From the string table, select characters to be displayed on label objects etc. and assign them.

String storage file
This is a function to display the text strings in the specified text file.
The file referred to can be set for each language.

String resources of NA



For the string resources of NA, multiple languages can be set as with NS.
The conceptual figure of setting screen is as follows.

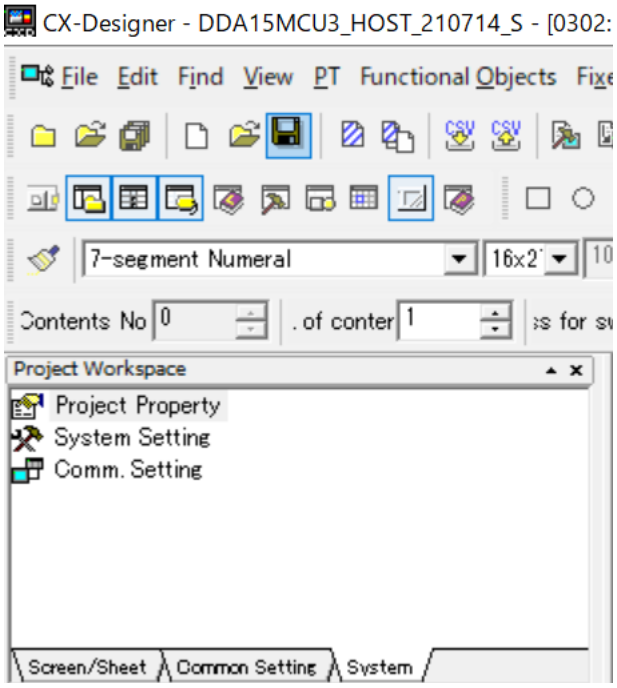


NS also used to manage the string resources for each language in the same way.
Conversion of string resources is realized by replacing that format with the format for NA.
This section describes the conversion procedure.

3-2-1 Conversion of Language Settings

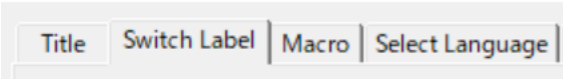
This section describes how to convert the language settings.
NS was able to allow multiple languages to be displayed on one object. Also, NA can register multiple languages into the string resources.
It is necessary to set multiple languages before registering the string resources, so we will describe how to configure the settings first.
It is assumed that Japanese and English are displayed in NS.

1. Open the NS screen data in CX-Designer and double-click **System** – **Project Property** in project workspace.

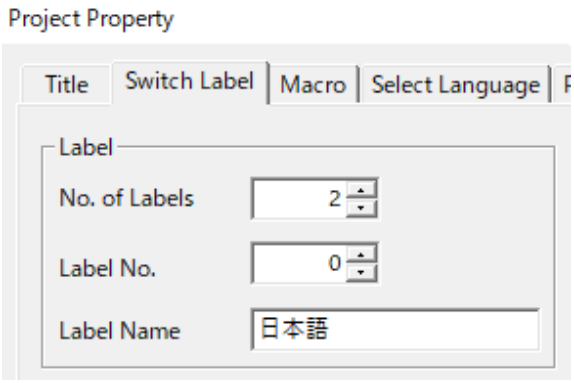


2. Click the **Switch Label** Tab.

Project Property

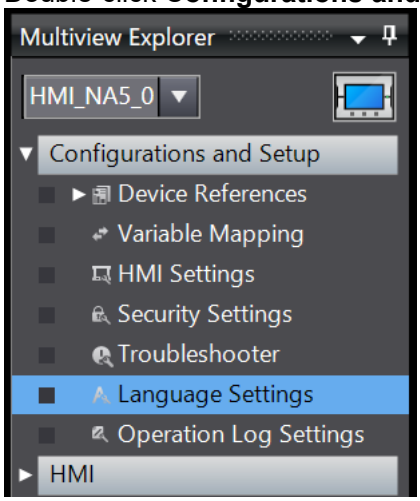


3. Check the set number of labels. The number of labels represents the number of languages that can be displayed.
   It is also linked to the setting of label name.
   In the case of the setup above, setting the label number to *0* displays the Japanese label.
   Change the label number to check the label name to be displayed on all labels.
   This manual describes how to convert the settings when the label number *0* is Japanese and *1* is English.

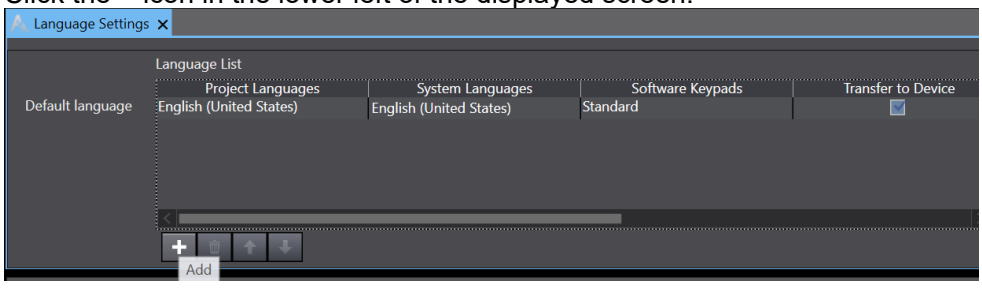


4. Startup Sysmac Studio.

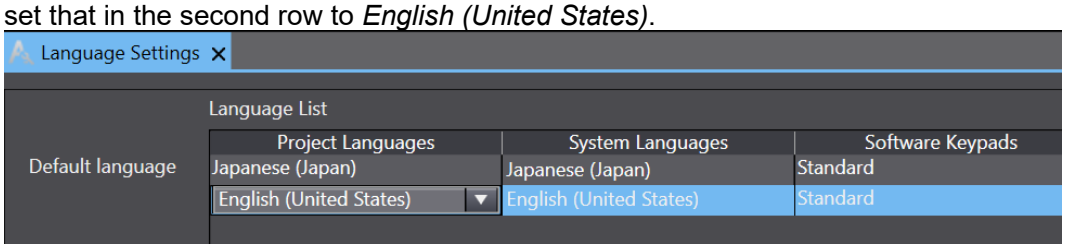
5. Double-click **Configurations and Setup** – **Language Settings** in Multiview Explorer.



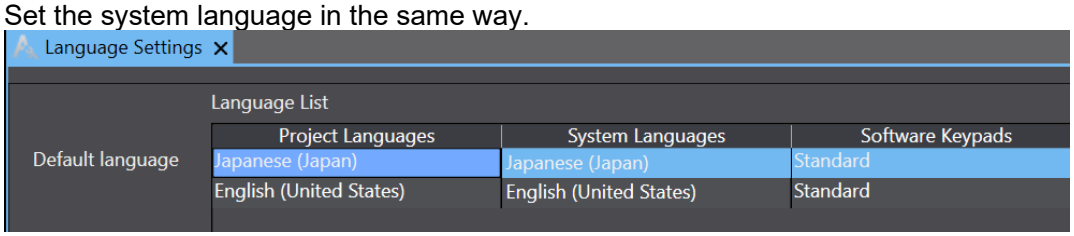
6. Click the **+** icon in the lower left of the displayed screen.



7. When a language is added, set a project language in the first row to *Japanese (Japan)*, and set that in the second row to *English (United States)*.

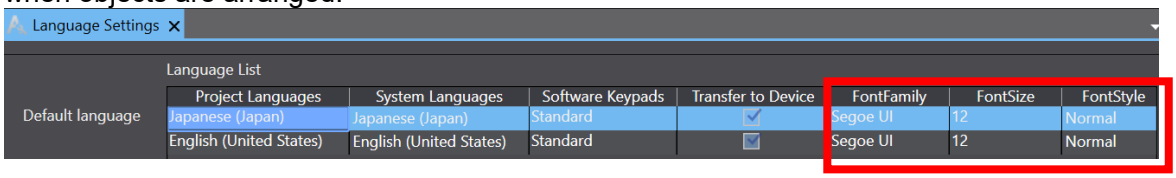


8. Set the system language in the same way.



Additional Information

On **Language Settings**, you can set the default fonts of the objects to be arranged on screens. The settings of **FontFamily**, **FontSize**, and **FontStyle** represent the font settings to be applied when objects are arranged.



The fonts recommended for languages are as follows.

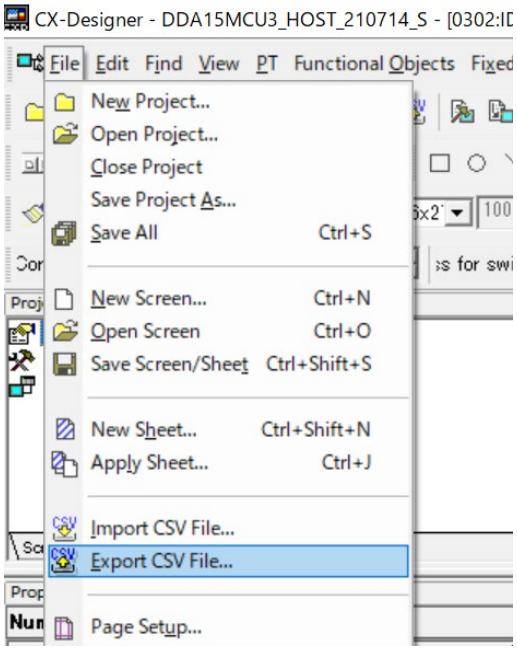
Language	Recommended font family
Japanese	Meiryo, MS Gothic
Chinese (Simplified Chinese)	Microsoft YaHei, SimSun
Chinese (Traditional Chinese)	Microsoft JhengHei, MingLiU
Korean	Malgun Gothic, Gulim, GulimChe

3-2-2 Normal Label

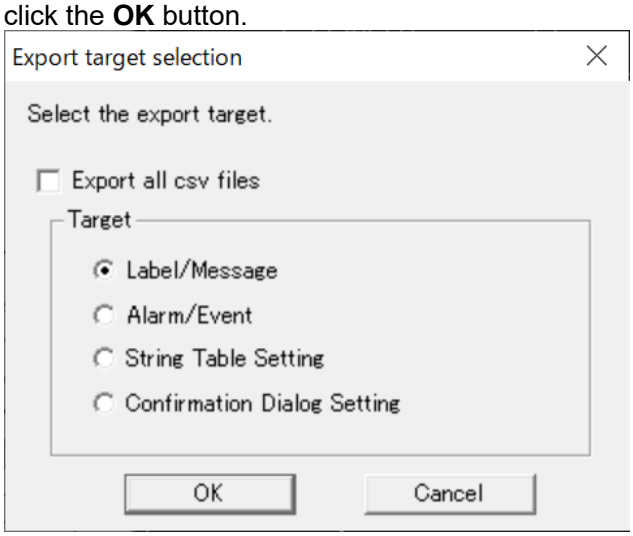
The normal label used in NS can be output to a CSV file in CX-Designer.
By converting that file into a format that can be imported to NA, the normal label can be converted relatively easily.
An example of the conversion procedure is as follows.
This procedure describes how to convert the NS screen data where two languages (Japanese and English) are set for labels, into that for NA.

1. Open the NS screen data in CX-Designer.

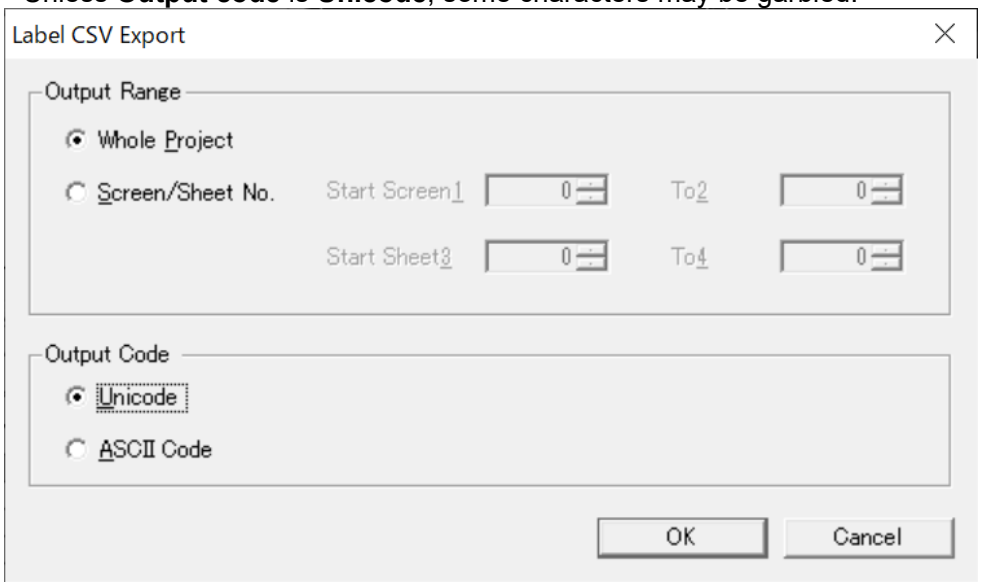
2. On CX-Designer, click **Export CSV File**.



3. When the **Export target selection** screen is displayed, set **Target** to **Label/Message,** and click the **OK** button.

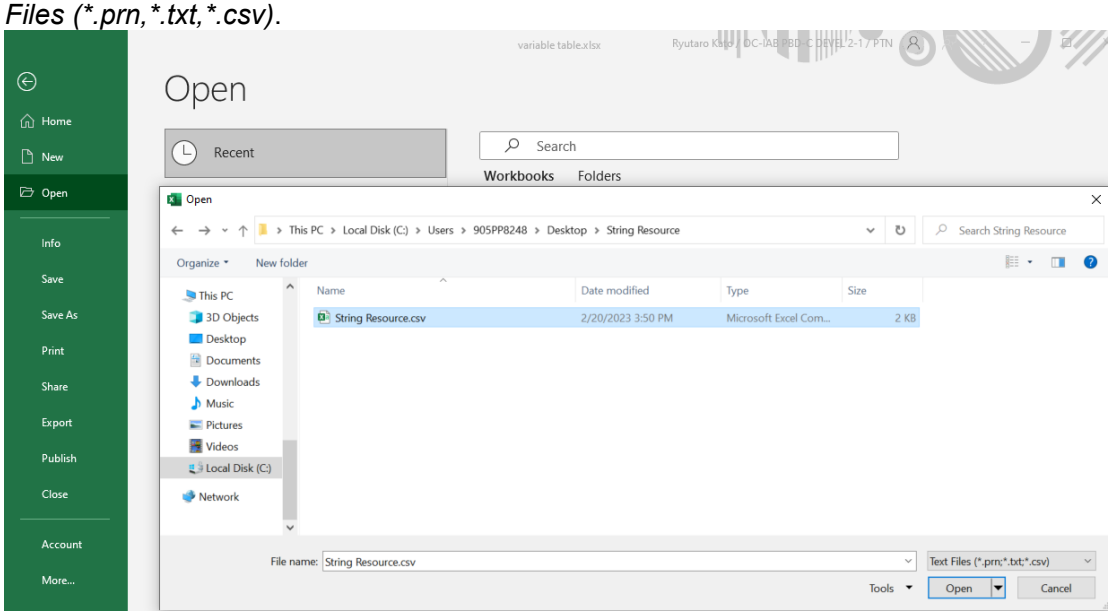


4. When the **Label CSV Export** screen is displayed, set **Output Range** to **Whole Project** and **Output Code** to **Unicode**, and click the **OK** button.
Set a desired file name and export the data.
* Unless **Output code** is **Unicode**, some characters may be garbled.

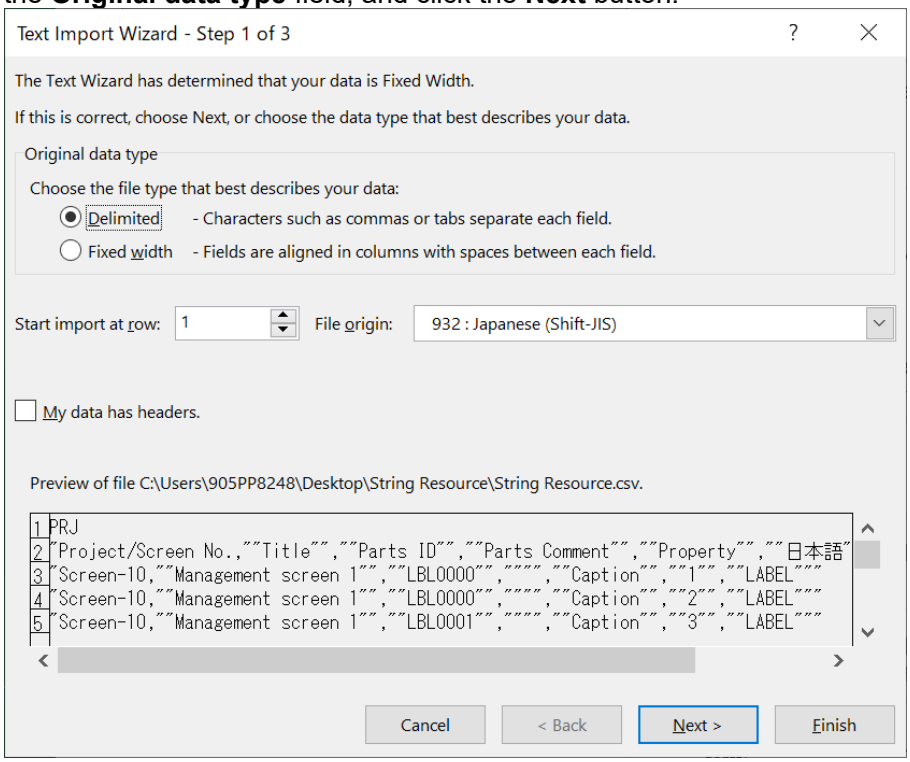


5. Next, import the exported CSV file to Excel, and extract the labels to register into NA.

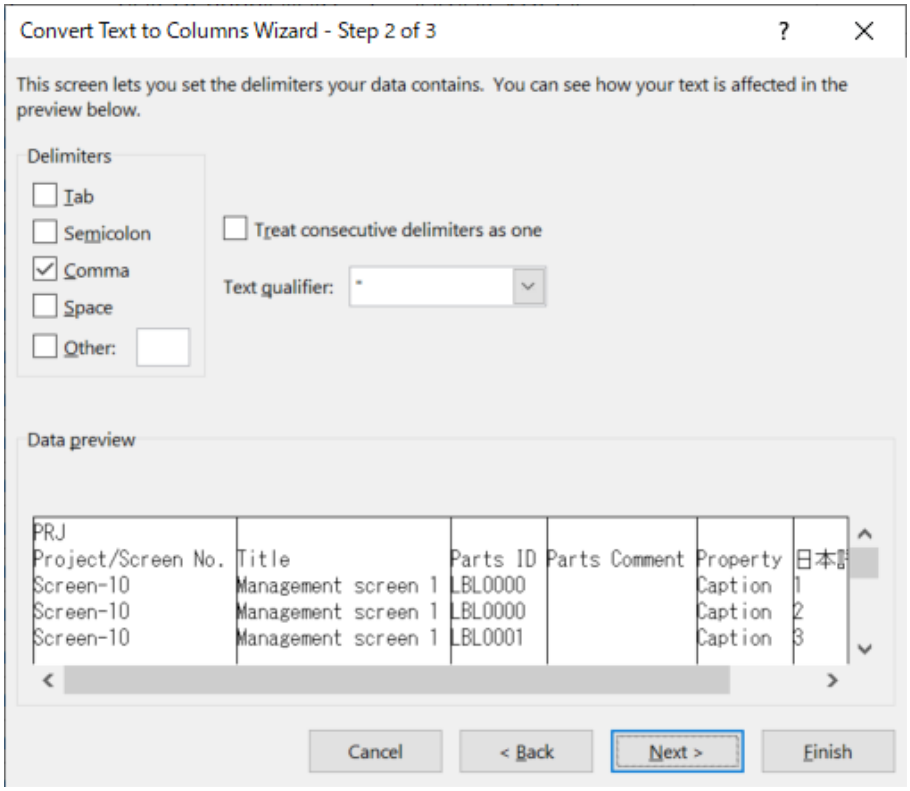
6. Startup Excel and choose **File** – **Open**. Browse and open the csv file output above as *Text Files (*.prn,*.txt,*.csv)*.



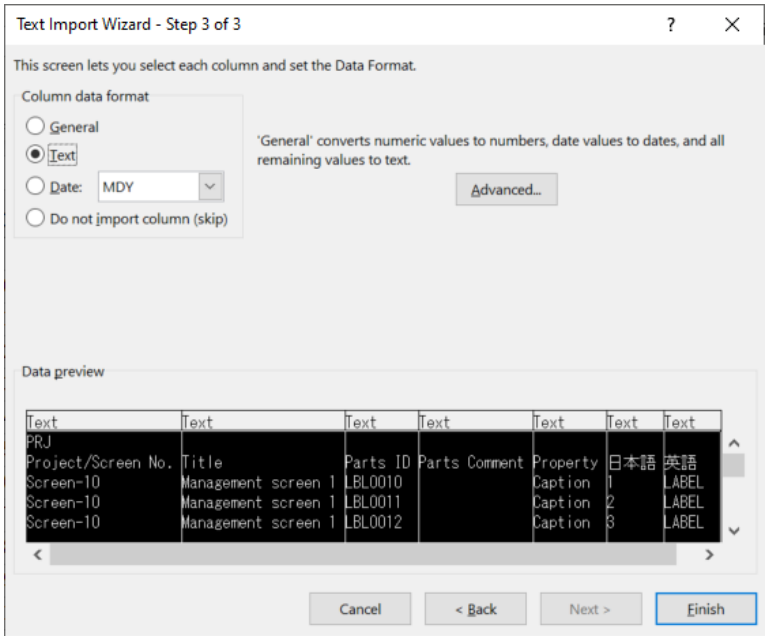
7. When you open it, the following text file wizard will appear.
Select the data format option **Characters such as commas or tabs separate each field** in the **Original data type** field, and click the **Next** button.



8. Select **Comma** as a delimiter and click the **Next** button.



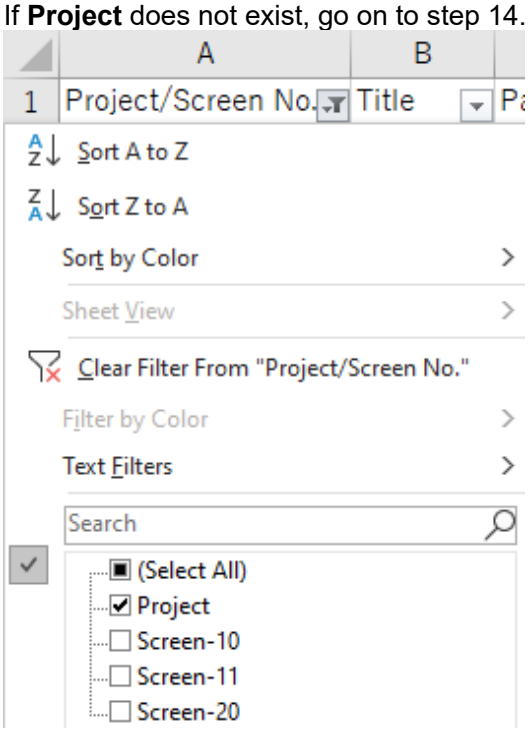
9. Select all columns in the **Data preview** field.
In this state, select **Text** in the **Column data format** field.
Click the **Finish** button.



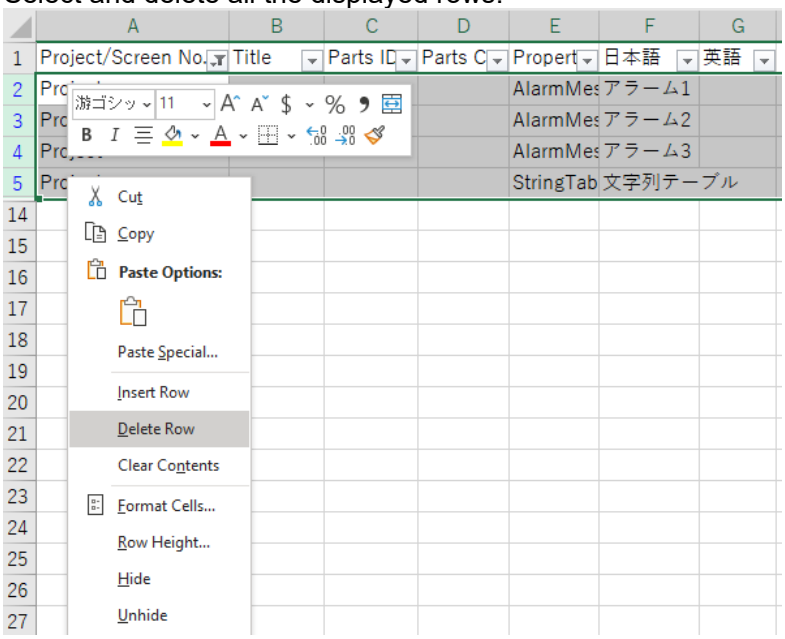
10. When the contents of the CSV file are displayed, delete the first row.

	A	B	C	D	E	F	G
1	PRJ						
2	Project/Screen No.	Title	Parts ID	Parts Cor	Property	日本語	英語
3	Project				AlarmMes	アラーム1	
4	Project				AlarmMes	アラーム2	

11. Filter the column A, and select **Project** only.
If **Project** does not exist, go on to step 14.



12. Select and delete all the displayed rows.

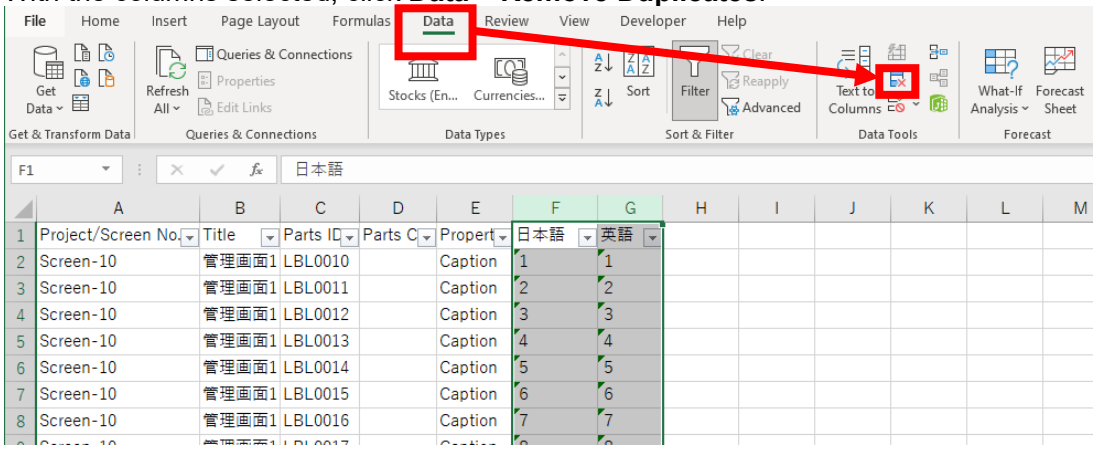


13. Clear the filter.

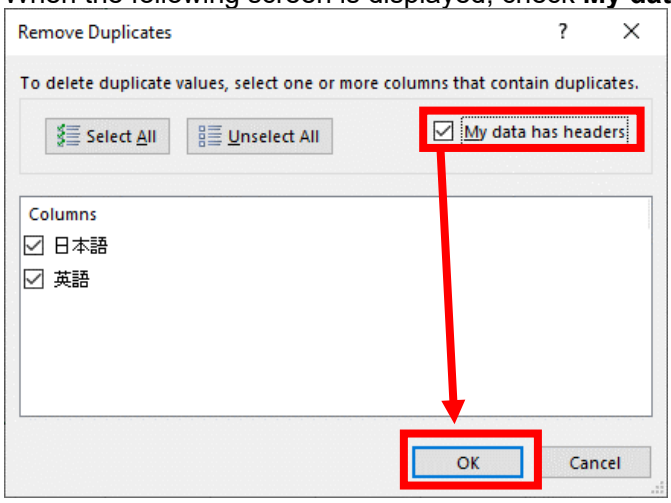
Additional Information

When the string table or the user alarm function is used, labels will be exported together.
These are not required for normal label conversion, so delete them beforehand.
This step is unnecessary if **Project** is not included in the column A of the exported file.

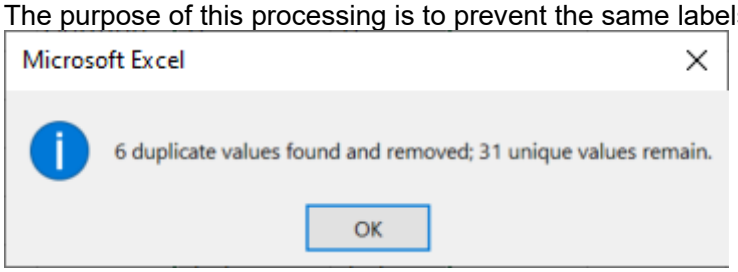
14. The columns F and G are for labels, so select all the columns.
With the columns selected, click **Data** – **Remove Duplicates**.



15. When the following screen is displayed, check **My data has headers** and click the **OK** button.

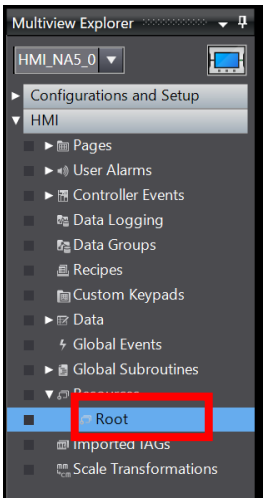


16. The duplicate labels will be deleted.
The purpose of this processing is to prevent the same labels from being registered into NA.

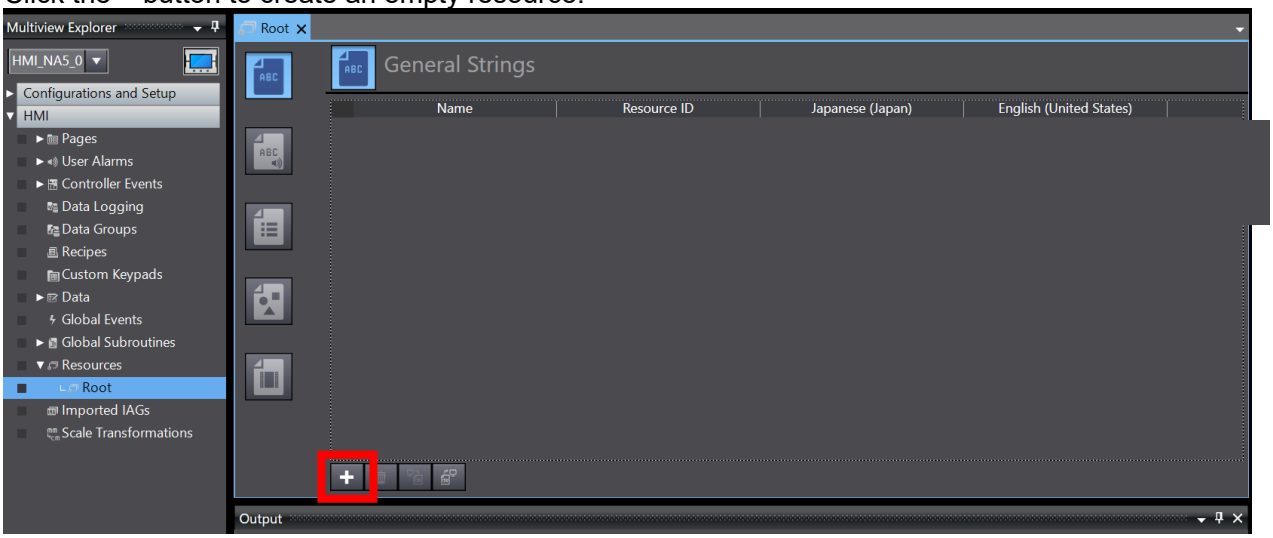


17. Open the project file for screen replacement in Sysmac Studio.

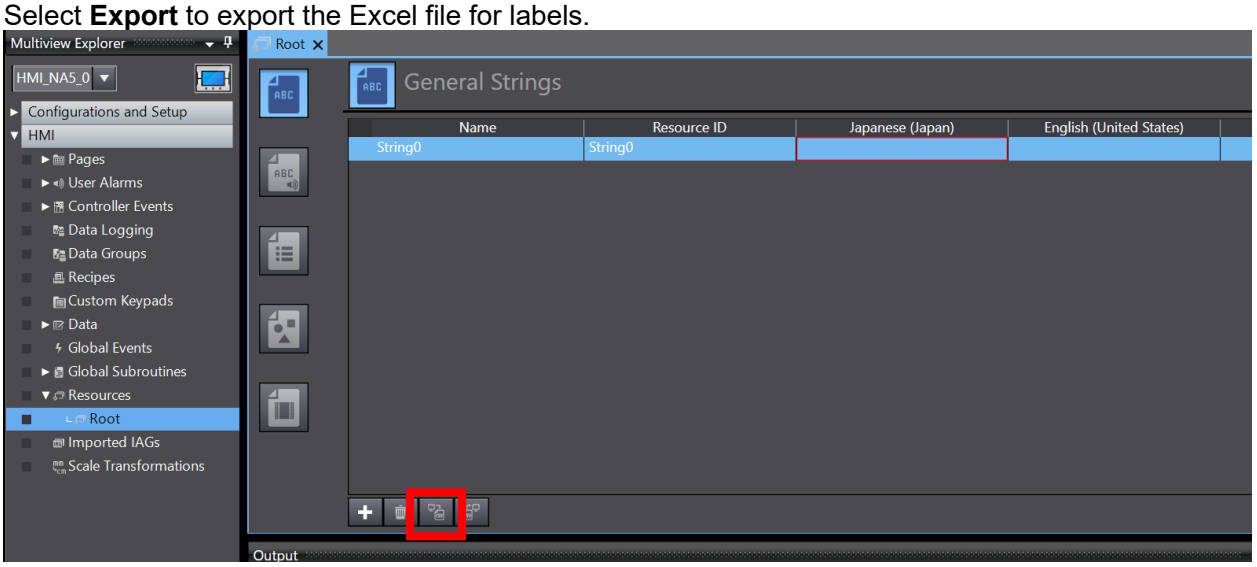
18. Double-click **Resources** – **Root**.



19. Click the **+** button to create an empty resource.



20. Select **Export** to export the Excel file for labels.



21. Open the exported Excel file.

	A	B	C	D
1	Group Name	Resource ID	Japanese (Japan) [ja-JP]	English (United States) [en-US]
2	[root]	String0		
3				
4				
5				
6				
7				
8				
9				
10				
11				

22. The columns C and D are for Japanese and English labels, so copy & paste the labels extracted in NS.

	A	B	C	D	E
1	Group Name	Resource ID	Japanese (Japan) [ja-JP]	English (United States) [en-US]	
2	[root]	String0	1	1	
3			2	2	
4			3	3	
5			4	4	
6			5	5	
7			6	6	
8			7	7	
9			8	8	
10			9	9	
11			10	10	
12			管理画面¥n1	Management¥n1	
13			2/2	2/2	
14			11	11	
15			12	12	
16			13	13	
17			14	14	
18			15	15	
19			16	16	
20			17	17	
21			18	18	
22			19	19	

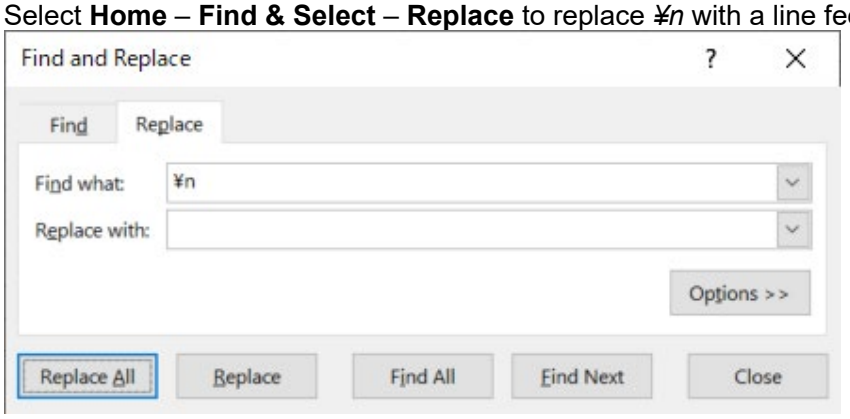
23. Copy the cell A2, and paste it from the cell A3 to the last row where the labels were added.

	A	B	C	D
1	Group Name	Resource ID	Japanese (Japan) [ja-JP]	English (United States) [en-US]
2	[root]	String0	1	1
3	[root]		2	2
4	[root]		3	3
5	[root]		4	4
6	[root]		5	5
7	[root]		6	6
8	[root]		7	7
9	[root]		8	8
10	[root]		9	9
11	[root]		10	10
12	[root]		管理画面¥n1	Management¥n1
13	[root]		2/2	2/2
14	[root]		11	11
15	[root]		12	12
16	[root]		13	13
17	[root]		14	14
18	[root]		15	15
19	[root]		16	16
20	[root]		17	17
21	[root]		18	18
22	[root]		19	19
23	[root]		20	20
24	[root]		管理画面 2	Management 2
25	[root]		1/2	1/2
26	[root]		データロググラフ	データロググラフ
27	[root]		DM100(赤)	DM100(赤)
28	[root]		DM100(青)	DM100(青)
29	[root]		DM100(緑)	DM100(緑)
30	[root]		＋	＋
31	[root]		－	－

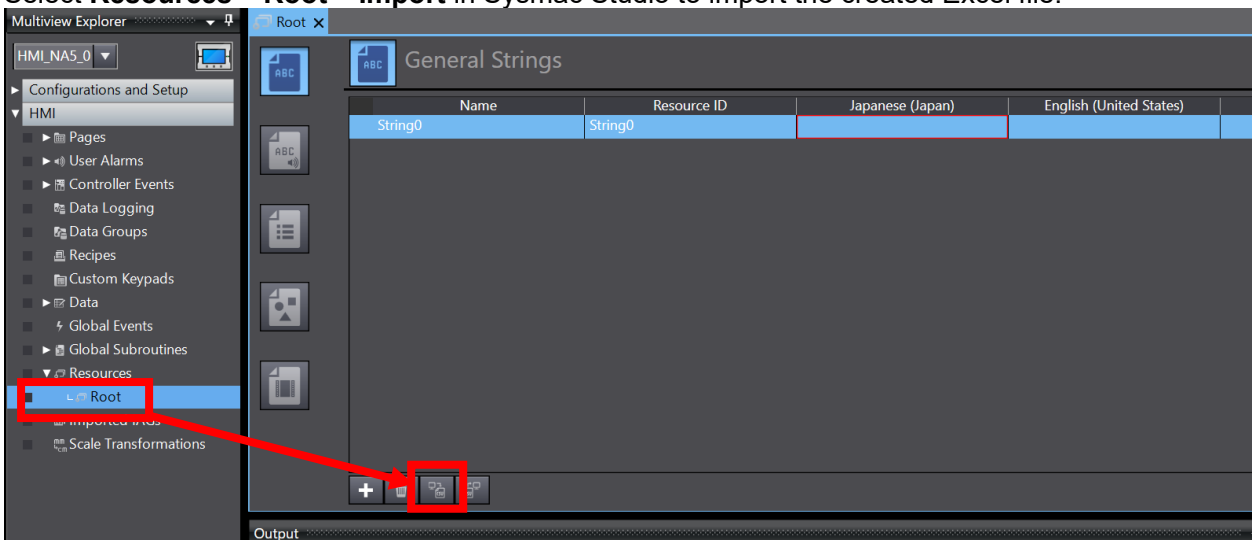
24. Select the cell B2, and drag it to the last row where the labels were added, to set the **Resource ID** data.
Every Resource ID data needs to have a unique name, so avoid duplicate names by registering consecutive data.

	A	B	C	D
1	Group Name	Resource ID	Japanese (Japan) [ja-JP]	English (United States) [en-US]
2	[root]	String0	1	1
3	[root]	String1	2	2
4	[root]	String2	3	3
5	[root]	String3	4	4
6	[root]	String4	5	5
7	[root]	String5	6	6
8	[root]	String6	7	7
9	[root]	String7	8	8
10	[root]	String8	9	9
11	[root]	String9	10	10
			管理画面	Management
12	[root]	String10	1	1
13	[root]	String11	2/2	2/2
14	[root]	String12	11	11
15	[root]	String13	12	12
16	[root]	String14	13	13
17	[root]	String15	14	14
18	[root]	String16	15	15
19	[root]	String17	16	16
20	[root]	String18	17	17
21	[root]	String19	18	18
22	[root]	String20	19	19
23	[root]	String21	20	20
			管理画面	Management
24	[root]	String22	2	2
25	[root]	String23	1/2	1/2
26	[root]	String24	データロググラフ	データロググラフ
27	[root]	String25	DM100(赤)	DM100(赤)
28	[root]	String26	DM100(青)	DM100(青)
29	[root]	String27	DM100(緑)	DM100(緑)
30	[root]	String28	+	+
31	[root]	String29	−	−

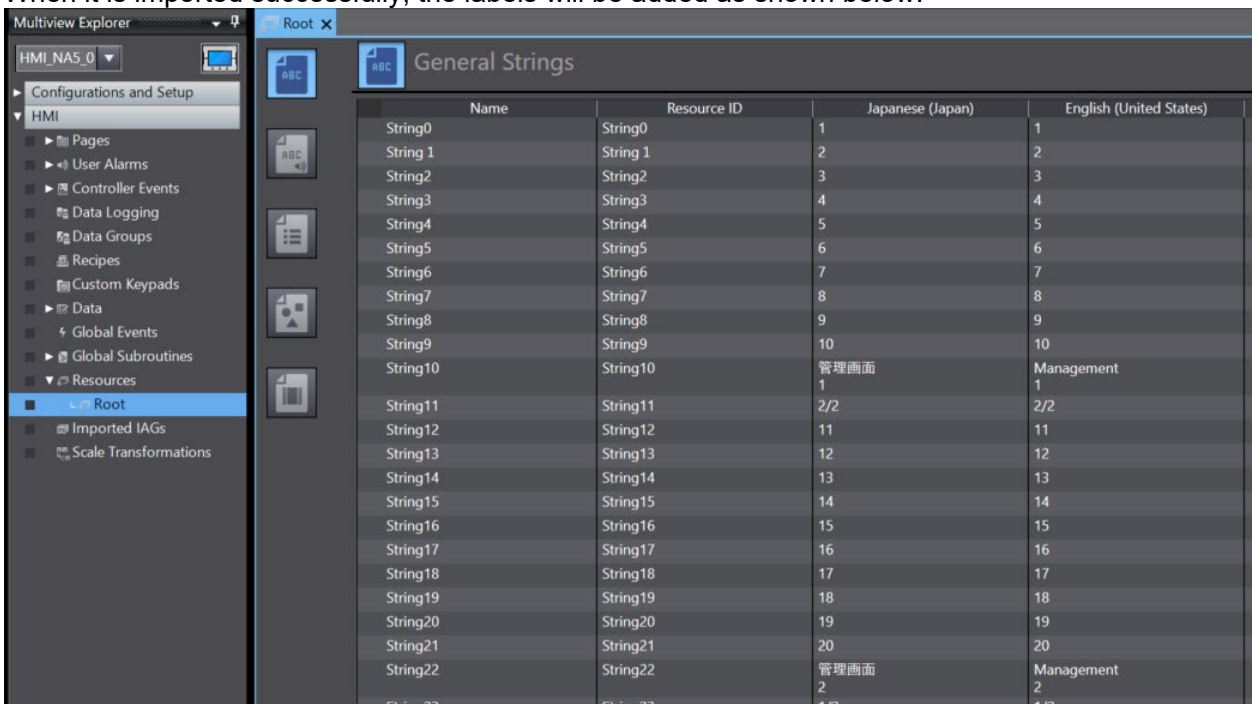
25. Convert the line feed code because it is different between NS and NA.
Select **Home** – **Find & Select** – **Replace** to replace *¥n* with a line feed (**Ctrl + J** keys).



26. Select **Resources** – **Root** – **Import** in Sysmac Studio to import the created Excel file.



27. When it is imported successfully, the labels will be added as shown below.

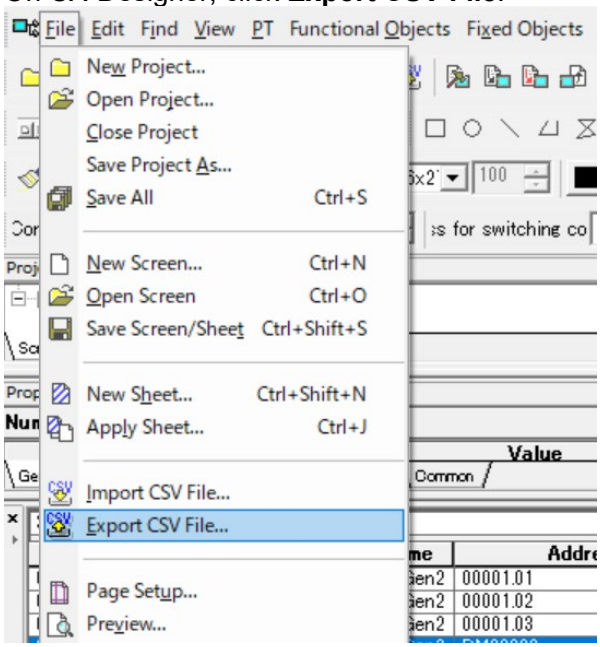


3-2-3 String Table

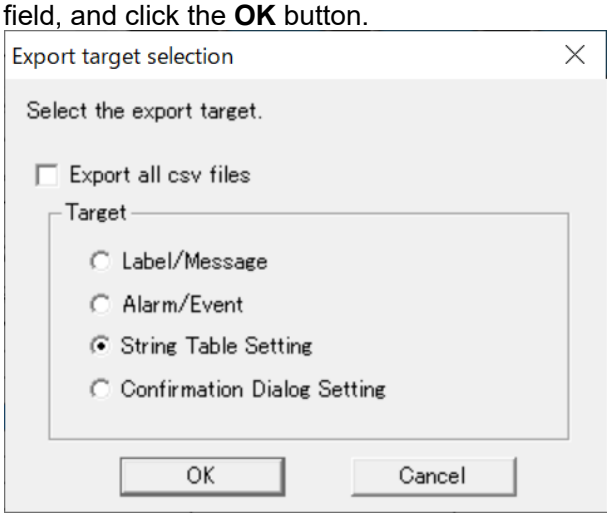
The string table can be converted in the same way as *3-2-2 Normal Label*.

1. Open the NS screen data in CX-Designer.

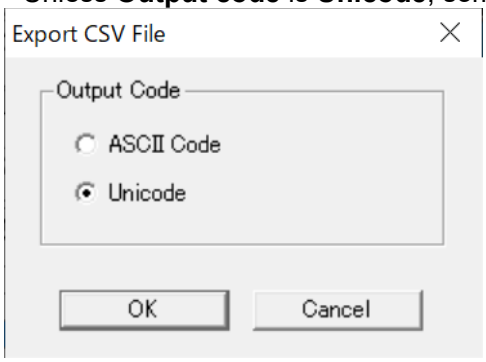
2. On CX-Designer, click **Export CSV File**.



3. When the **Export target selection** dialog appears, select **String Table Setting** in the **Target** field, and click the **OK** button.



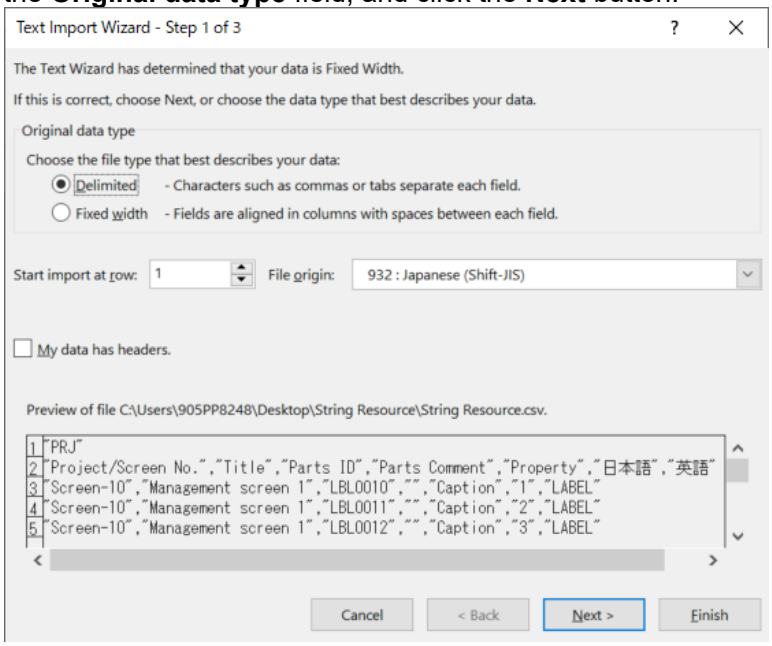
4. Set the output code to **Unicode**, and click the **OK** button.
   Set a desired file name and export the data.
   * Unless **Output code** is **Unicode**, some characters may be garbled.



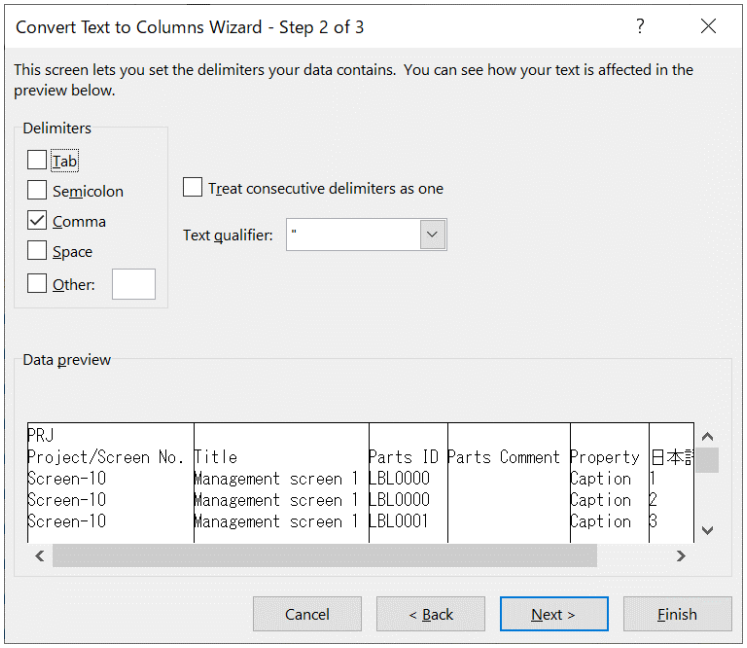
5. Import the exported CSV file to Excel, and extract the labels to register into NA.

6. Open Excel.

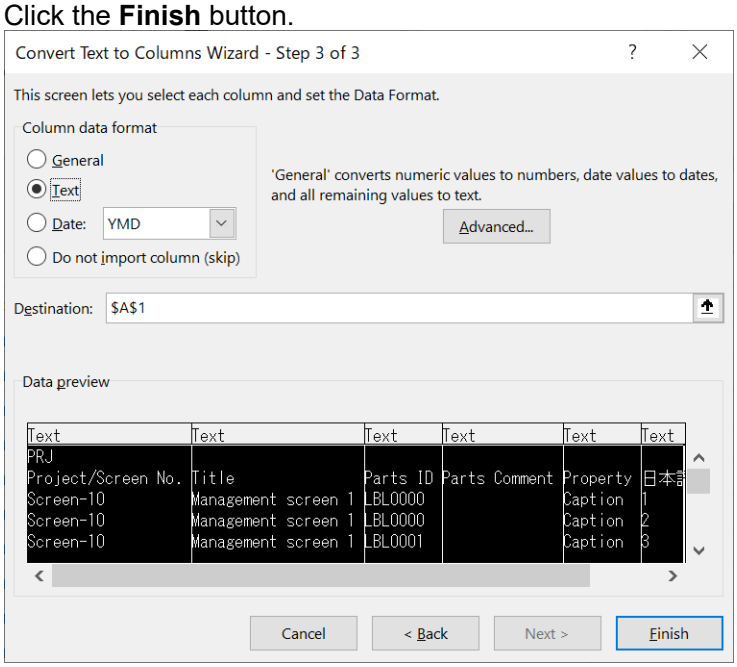
7. Open the CSV file exported previously.
   When you open it, the following text file wizard will appear.
   Select the data format option **Characters such as commas or tabs separate each field** in the **Original data type** field, and click the **Next** button.



8. Select **Comma** as a delimiter and click the **Next** button.



9. Select all columns in the **Data preview** field.
In this state, select **Text** in the **Column data format** field.
Click the **Finish** button.

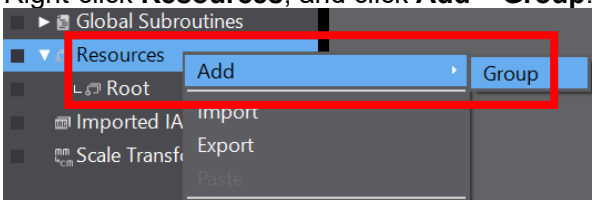


10. The contents of the string table are displayed.

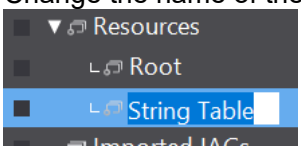
	A	B	C
1	No	日本語	英語
2	0	テキスト0	Text0
3	1	テキスト1	Text1
4	2	テキスト2	Text2
5	3	テキスト3	Text3
6	4	テキスト4	Text4
7	5	テキスト5	Text5
8	6	テキスト6	Text6
9	7	テキスト7	Text7
10	8	テキスト8	Text8
11	9	テキスト9	Text9
12	10	テキスト10	Text10
13	11	テキスト11	Text11
14	12	テキスト12	Text12
15	13	テキスト13	Text13
16	14	テキスト14	Text14
17	15	テキスト15	Text15
18	16	テキスト16	Text16
19	17	テキスト17	Text17
20	18	テキスト18	Text18
21	19	テキスト19	Text19
22	20	テキスト20	Text20
23	21	テキスト21	Text21
24	22	テキスト22	Text22
25	23	テキスト23	Text23

11. Open the project file for screen replacement in Sysmac Studio.

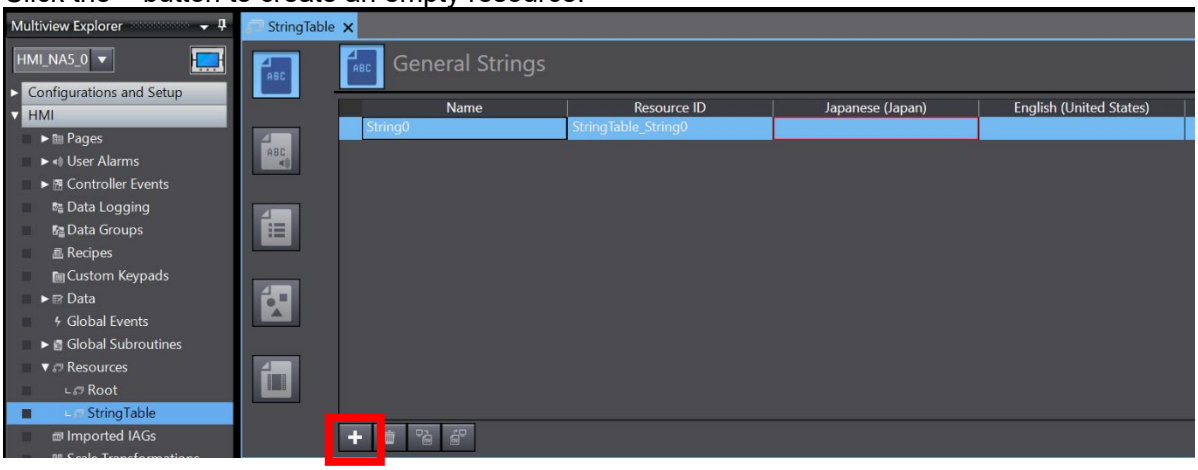
12. Right-click **Resources**, and click **Add** – **Group**.



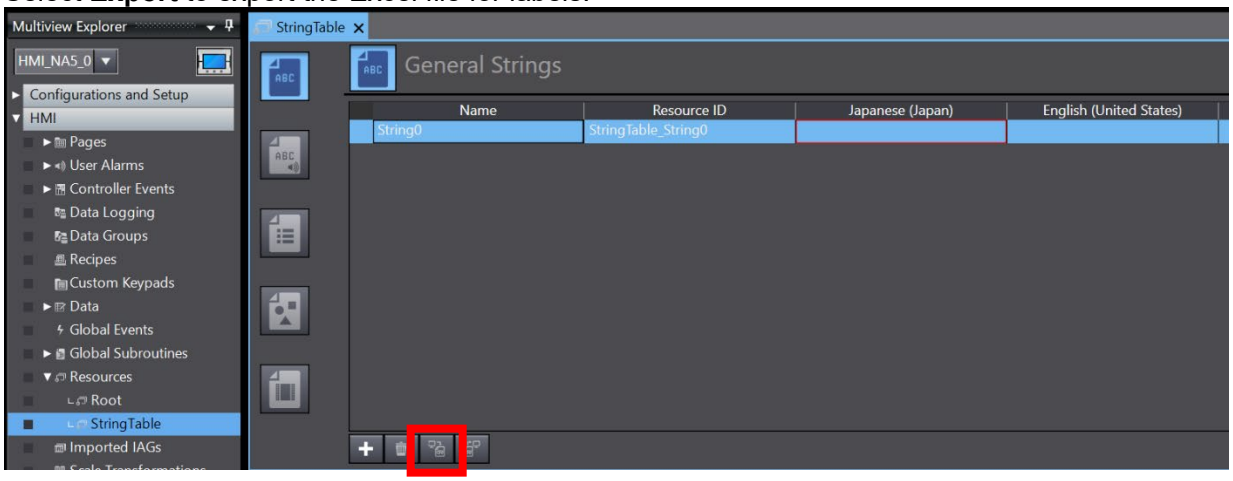
13. Change the name of the added resource group to *String Table*.



14. Click the **+** button to create an empty resource.



15. Select **Export** to export the Excel file for labels.



16. Open the exported Excel file.

	A	B	C	D
1	Group Name	Resource ID	Japanese (Japan) [ja-JP]	English (United States) [en-US]
2	StringTable	StringTable_String0		
3				
4				
5				

17. The columns C and D are for Japanese and English labels, so copy and paste the string tables extracted in NS.

	A	B	C	D
1	Group Name	Resource ID	Japanese (Japan) [ja-JP]	English (United States) [en-US]
2	StringTable	StringTable_String0	S	Text0
3			テキスト1	Text1
4			テキスト2	Text2
5			テキスト3	Text3
6			テキスト4	Text4
7			テキスト5	Text5
8			テキスト6	Text6
9			テキスト7	Text7
10			テキスト8	Text8
11			テキスト9	Text9
12			テキスト10	Text10
13			テキスト11	Text11
14			テキスト12	Text12
15			テキスト13	Text13
16			テキスト14	Text14
17			テキスト15	Text15
18			テキスト16	Text16
19			テキスト17	Text17
20			テキスト18	Text18
21			テキスト19	Text19
22			テキスト20	Text20
23			テキスト21	Text21
24			テキスト22	Text22
25			テキスト23	Text23

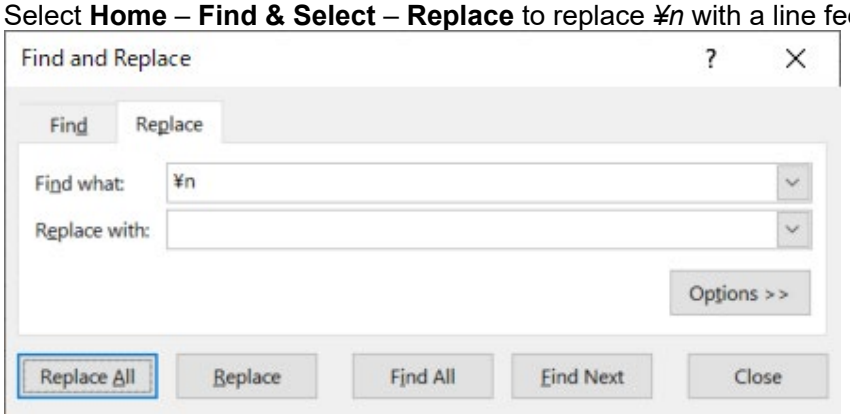
18. Copy the cell A2, and paste it from the cell A3 to the last row where the labels were added.

	A	B	C	D
1	Group Name	Resource ID	Japanese (Japan) [ja-JP]	English (United States) [en-US]
2	StringTable	StringTable_String0	テキスト0	Text0
3	StringTable		テキスト1	Text1
4	StringTable		テキスト2	Text2
5	StringTable		テキスト3	Text3
6	StringTable		テキスト4	Text4
7	StringTable		テキスト5	Text5
8	StringTable		テキスト6	Text6
9	StringTable		テキスト7	Text7
10	StringTable		テキスト8	Text8
11	StringTable		テキスト9	Text9
12	StringTable		テキスト10	Text10
13	StringTable		テキスト11	Text11
14	StringTable		テキスト12	Text12
15	StringTable		テキスト13	Text13
16	StringTable		テキスト14	Text14
17	StringTable		テキスト15	Text15
18	StringTable		テキスト16	Text16
19	StringTable		テキスト17	Text17
20	StringTable		テキスト18	Text18
21	StringTable		テキスト19	Text19
22	StringTable		テキスト20	Text20
23	StringTable		テキスト21	Text21
24	StringTable		テキスト22	Text22
25	StringTable		テキスト23	Text23

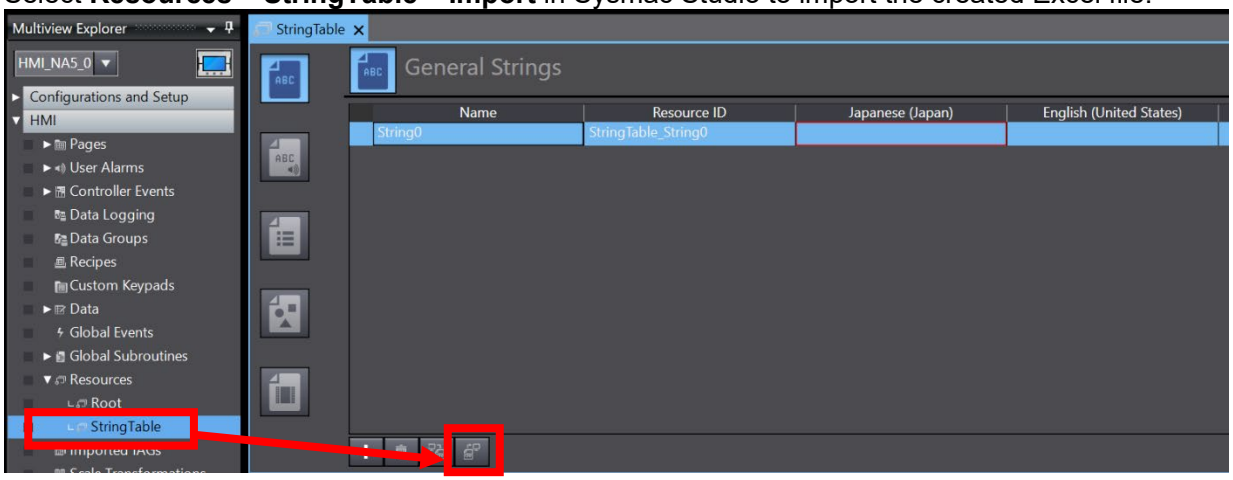
19. Select the cell B2, and drag it to the last row where the labels were added, to set the **Resource ID** data.
The string table No. of NS and the number at the end of **Resource ID** should be the same value.
This is because the values need linking with each other if indirect referencing of string tables is performed in NS.

	A	B	C	D
1	Group Name	Resource ID	Japanese (Japan) [ja-JP]	English (United States) [en-US]
2	StringTable	StringTable_String0	テキスト0	Text0
3	StringTable	StringTable_String1	テキスト1	Text1
4	StringTable	StringTable_String2	テキスト2	Text2
5	StringTable	StringTable_String3	テキスト3	Text3
6	StringTable	StringTable_String4	テキスト4	Text4
7	StringTable	StringTable_String5	テキスト5	Text5
8	StringTable	StringTable_String6	テキスト6	Text6
9	StringTable	StringTable_String7	テキスト7	Text7
10	StringTable	StringTable_String8	テキスト8	Text8
11	StringTable	StringTable_String9	テキスト9	Text9
12	StringTable	StringTable_String10	テキスト10	Text10
13	StringTable	StringTable_String11	テキスト11	Text11
14	StringTable	StringTable_String12	テキスト12	Text12
15	StringTable	StringTable_String13	テキスト13	Text13
16	StringTable	StringTable_String14	テキスト14	Text14
17	StringTable	StringTable_String15	テキスト15	Text15
18	StringTable	StringTable_String16	テキスト16	Text16
19	StringTable	StringTable_String17	テキスト17	Text17
20	StringTable	StringTable_String18	テキスト18	Text18
21	StringTable	StringTable_String19	テキスト19	Text19
22	StringTable	StringTable_String20	テキスト20	Text20
23	StringTable	StringTable_String21	テキスト21	Text21
24	StringTable	StringTable_String22	テキスト22	Text22
25	StringTable	StringTable_String23	テキスト23	Text23

20. Convert the line feed code because it is different between NS and NA.
Select **Home** – **Find & Select** – **Replace** to replace *¥n* with a line feed (**Ctrl + J** keys).



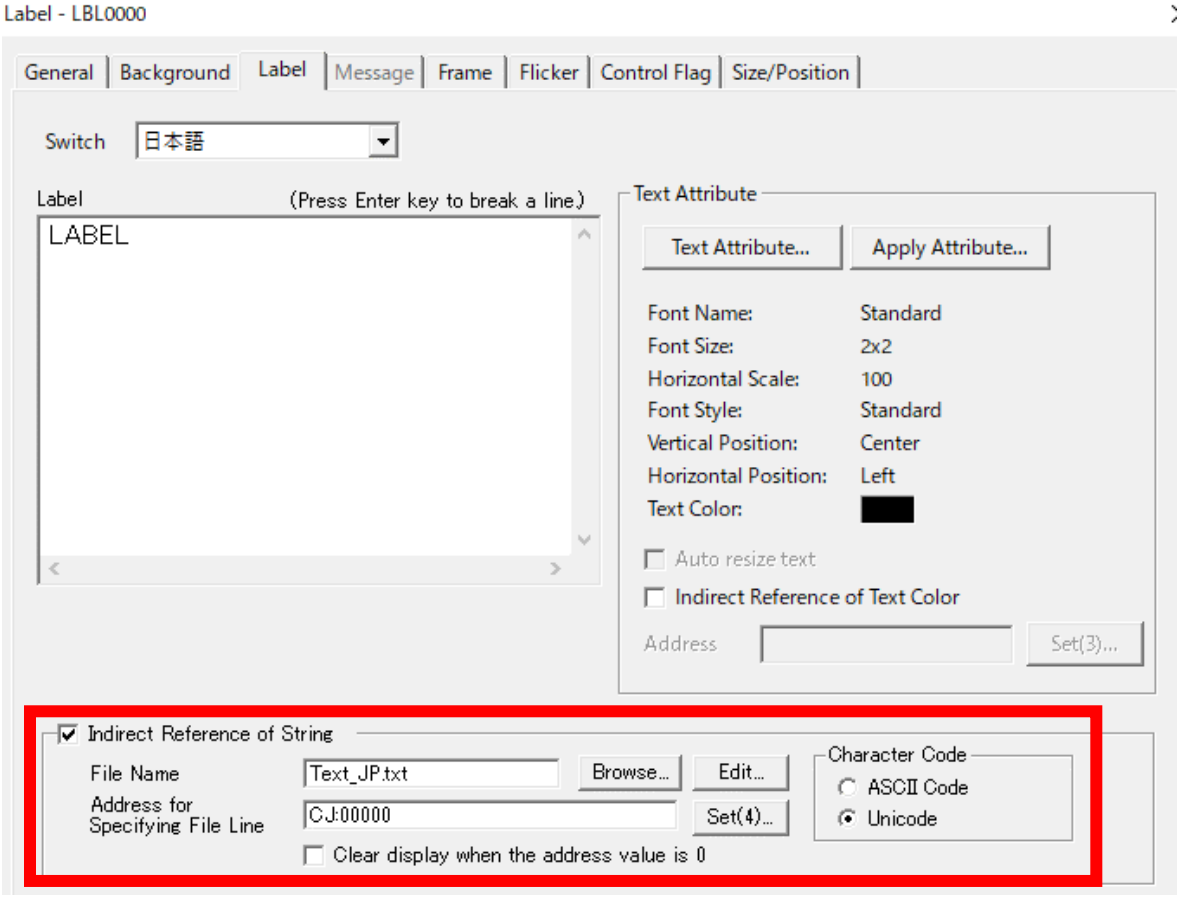
21. Select **Resources** – **StringTable** – **Import** in Sysmac Studio to import the created Excel file.



22. When it is imported successfully, the labels will be added as shown below.

3-2-4 String Storage File

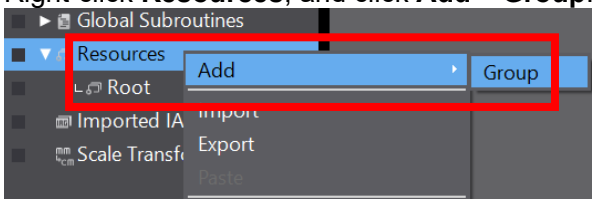
In the label objects etc. of NS, there is a function to display the characters stored in a text file as shown below.



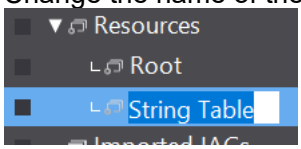
This section describes how to convert this text file into the string resources for NA.
This procedure describes how to convert the NS screen data where two languages (Japanese and English) are set for labels, into that for NA.

1. Open the project file for screen replacement in Sysmac Studio.

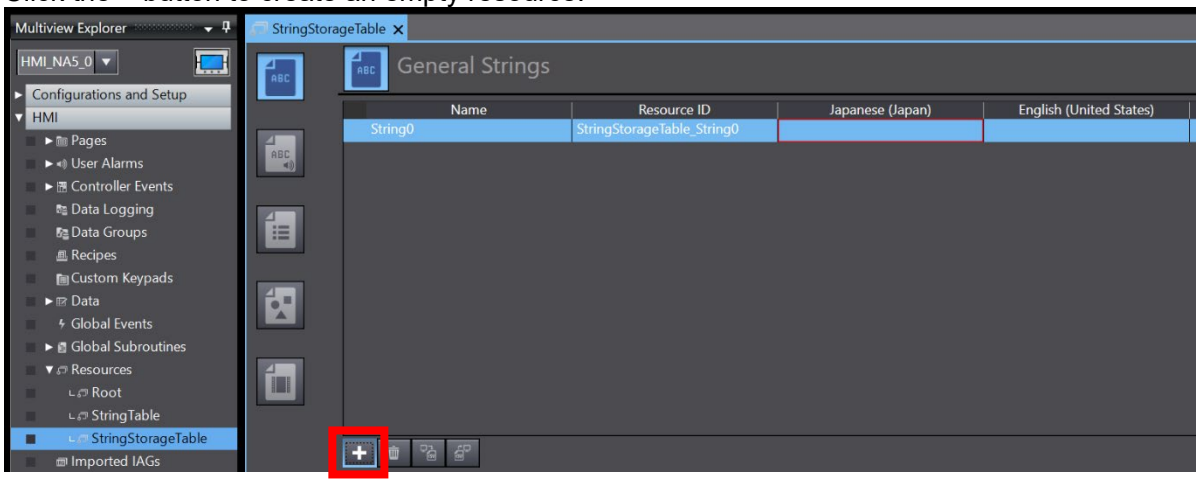
   Right-click **Resources**, and click **Add** – **Group**.



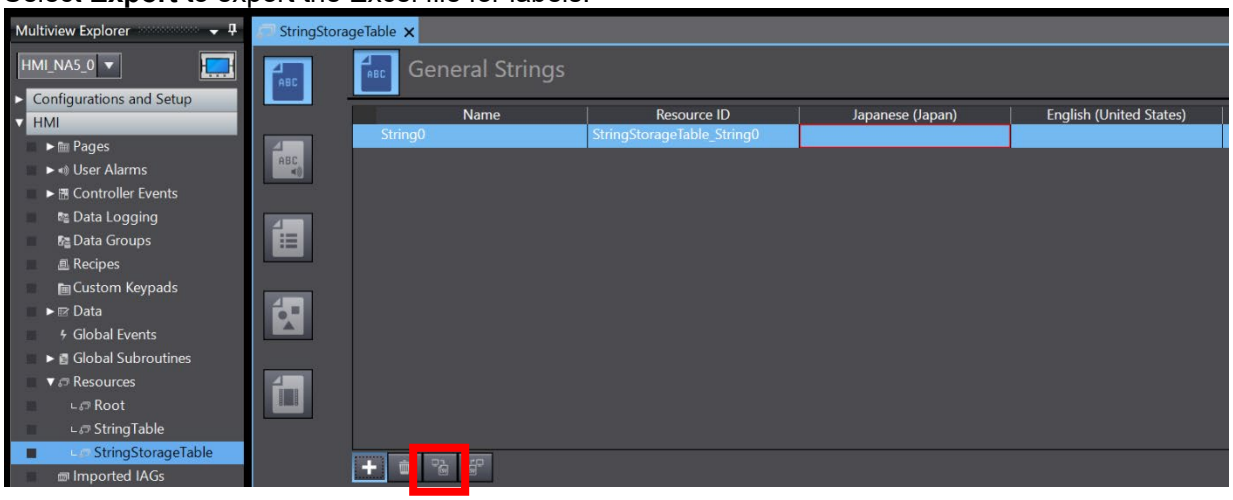
2. Change the name of the added resource group to *String Table*.



3. Click the **+** button to create an empty resource.



4. Select **Export** to export the Excel file for labels.

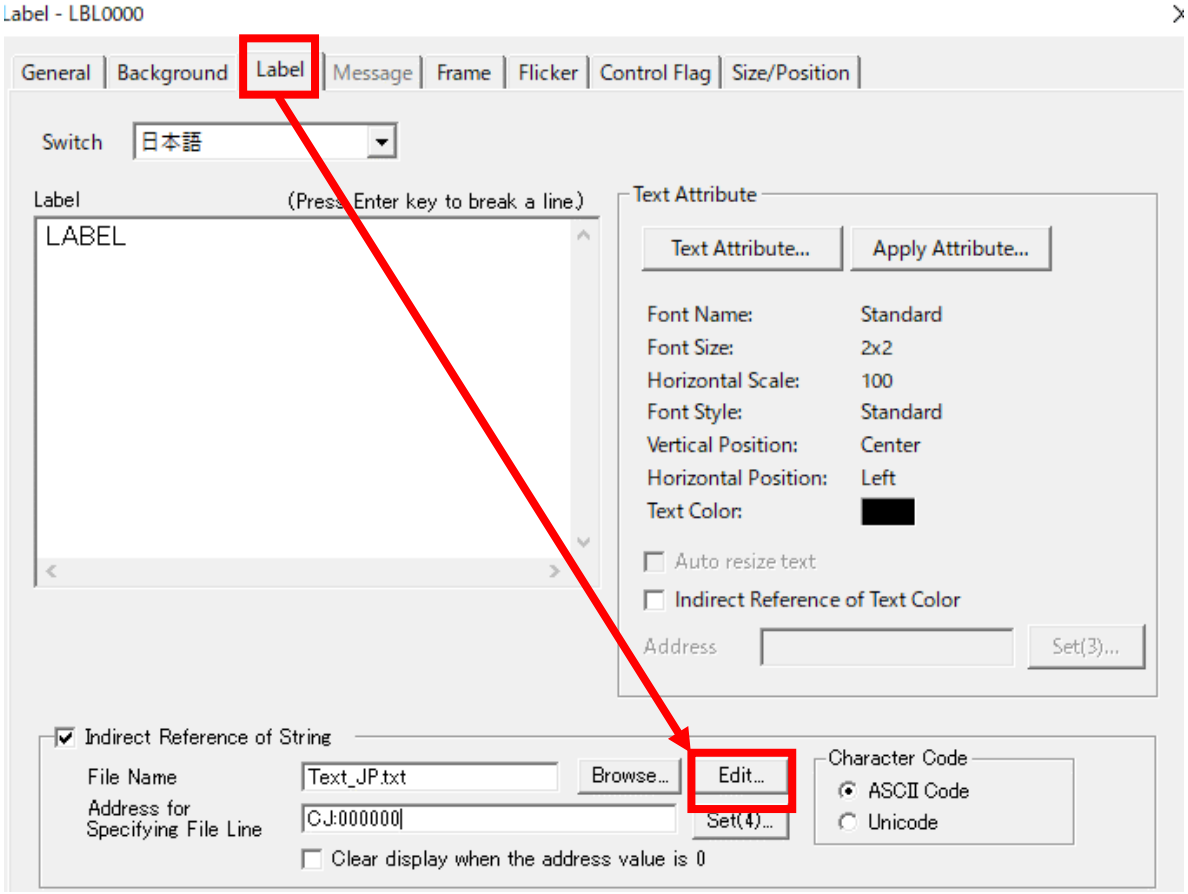


5. Open the exported Excel file.

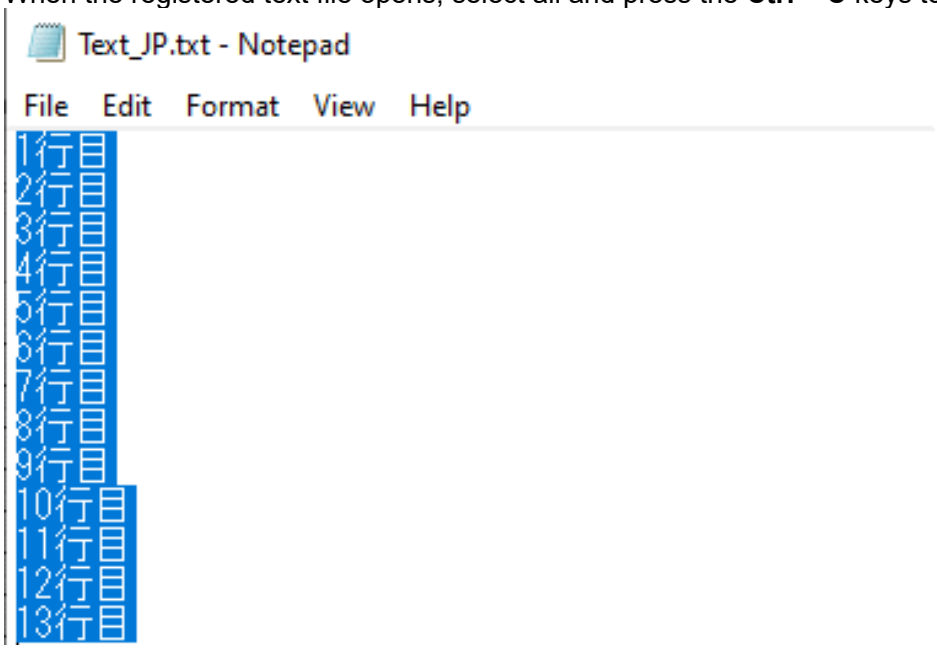
	A	B	C	D
1	Group Name	Resource ID	Japanese (Japan) [ja-JP]	English (United States) [en-US]
2	StringStorageTable	StringStorageTable_String0		
3				
4				
5				
6				

6. Open the NS screen data in CX-Designer.

7. Open the object property containing string storage file settings, and click **Label** – **Edit**.



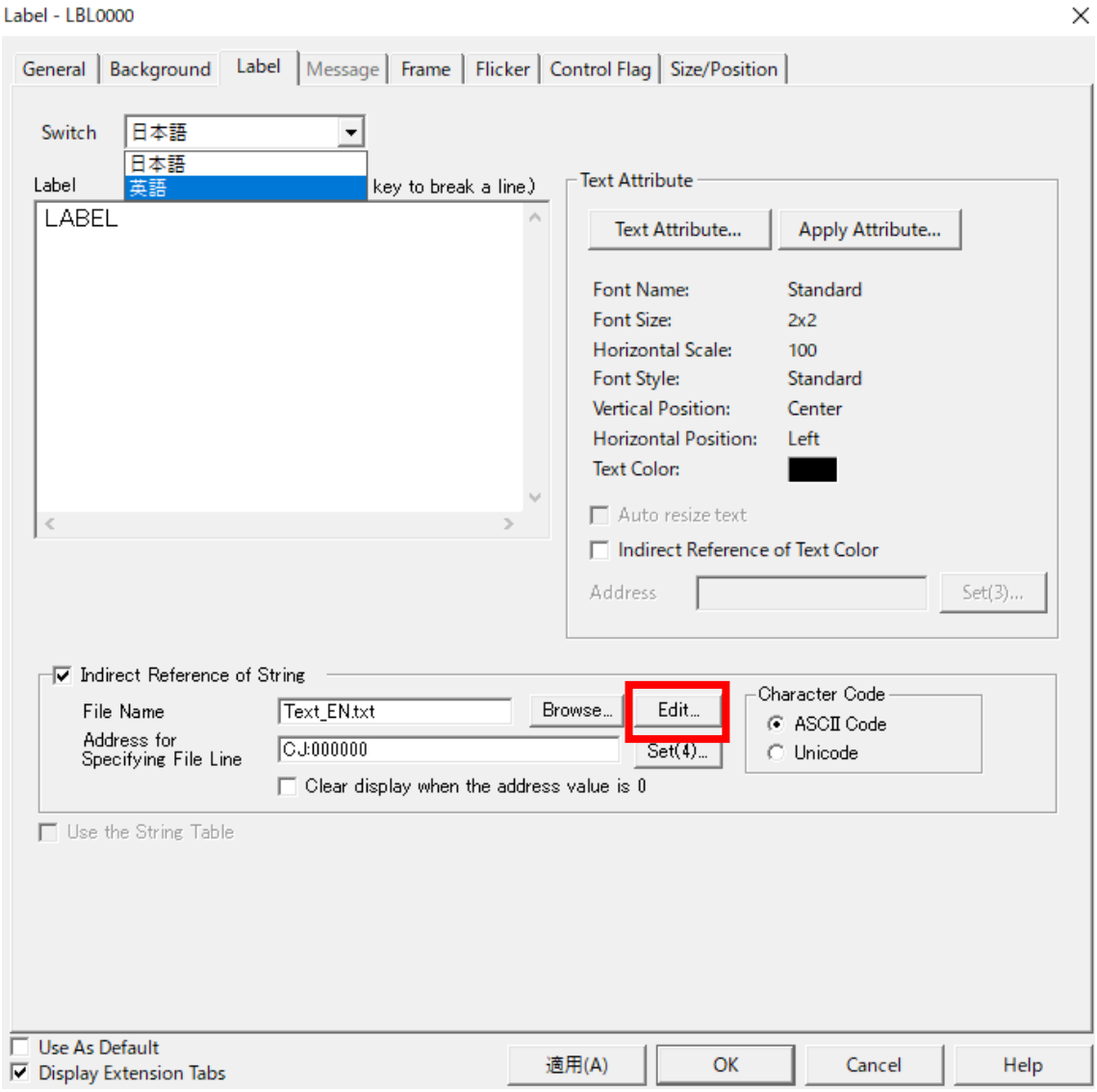
8. When the registered text file opens, select all and press the **Ctrl + C** keys to copy them.



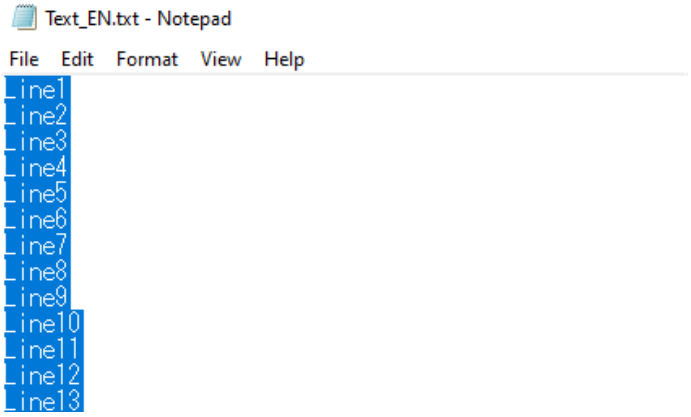
9. Open the exported Excel file, and paste them by pressing the **Ctrl + V** keys with the cell C2 selected.
   * Paste them in the corresponding column for NS and NA

	A	B	C	D
1	Group Name	Resource ID	Japanese (Japan) [ja-JP]	English (United States) [en-US]
2	StringStorageTable	StringStorageTable_String0	1行目	
3			2行目	
4			3行目	
5			4行目	
6			5行目	
7			6行目	
8			7行目	
9			8行目	
10			9行目	
11			10行目	
12			11行目	
13			12行目	
14			13行目	

10. Open CX-Designer again, click the drop-down list in the right of **Switch**, select *English*, and click **Edit**.



11. When the registered text file opens, select all again and press the **Ctrl + C** keys to copy them.



12. Open the exported Excel file, and paste them by pressing the **Ctrl + V** keys with the cell D2 selected.
    * Paste them in the corresponding column for NS and NA

	A	B	C	D
1	Group Name	Resource ID	Japanese (Japan) [ja-JP]	English (United States) [en-US]
2	StringStorageTable	StringStorageTable_String0	1行目	Line1
3			2行目	Line2
4			3行目	Line3
5			4行目	Line4
6			5行目	Line5
7			6行目	Line6
8			7行目	Line7
9			8行目	Line8
10			9行目	Line9
11			10行目	Line10
12			11行目	Line11
13			12行目	Line12
14			13行目	Line13

13. Copy the cell A2, and paste it from the cell A3 to the last row where the labels were added.

	A	B	C	D
1	Group Name	Resource ID	Japanese (Japan) [ja-JP]	English (United States) [en-US]
2	StringStorageTable	StringStorageTable_String0	1行目	Line1
3	StringStorageTable		2行目	Line2
4	StringStorageTable		3行目	Line3
5	StringStorageTable		4行目	Line4
6	StringStorageTable		5行目	Line5
7	StringStorageTable		6行目	Line6
8	StringStorageTable		7行目	Line7
9	StringStorageTable		8行目	Line8
10	StringStorageTable		9行目	Line9
11	StringStorageTable		10行目	Line10
12	StringStorageTable		11行目	Line11
13	StringStorageTable		12行目	Line12
14	StringStorageTable		13行目	Line13

14. Select the cell B2 and change the number at the end from *0* to *1*.
This is because, for the characters to be displayed in the string storage file, a value of the set address starts with 1.

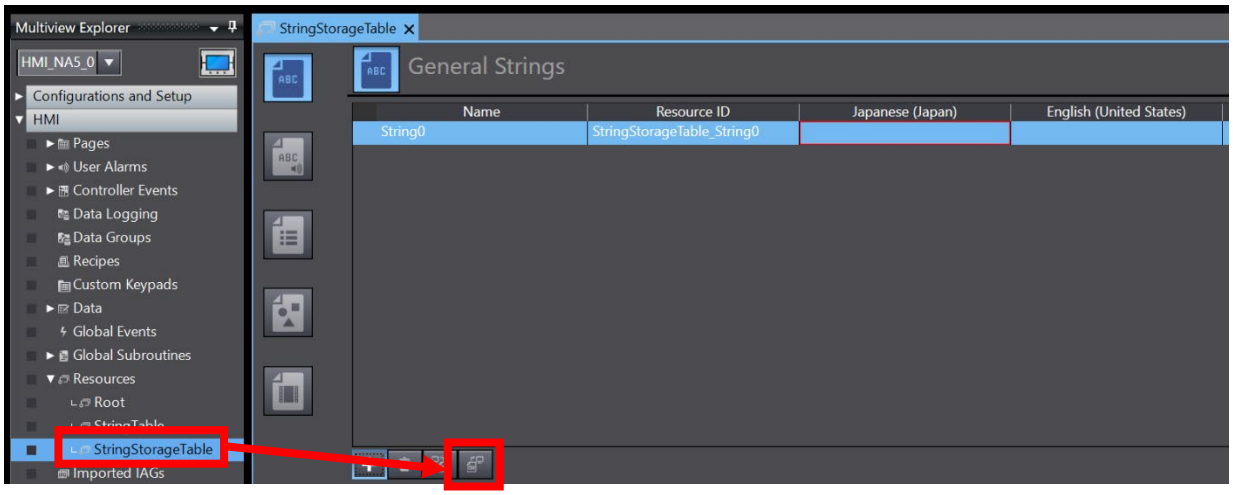
	A	B	C	D
1	Group Name	Resource ID	Japanese (Japan) [ja-JP]	English (United States) [en-US]
2	StringStorageTable	StringStorageTable_String1	1行目	Line1
3	StringStorageTable		2行目	Line2
4	StringStorageTable		3行目	Line3
5	StringStorageTable		4行目	Line4
6	StringStorageTable		5行目	Line5
7	StringStorageTable		6行目	Line6
8	StringStorageTable		7行目	Line7
9	StringStorageTable		8行目	Line8
10	StringStorageTable		9行目	Line9
11	StringStorageTable		10行目	Line10
12	StringStorageTable		11行目	Line11
13	StringStorageTable		12行目	Line12
14	StringStorageTable		13行目	Line13

15. Drag it to the last row where the labels were added, to set the **Resource ID** data.

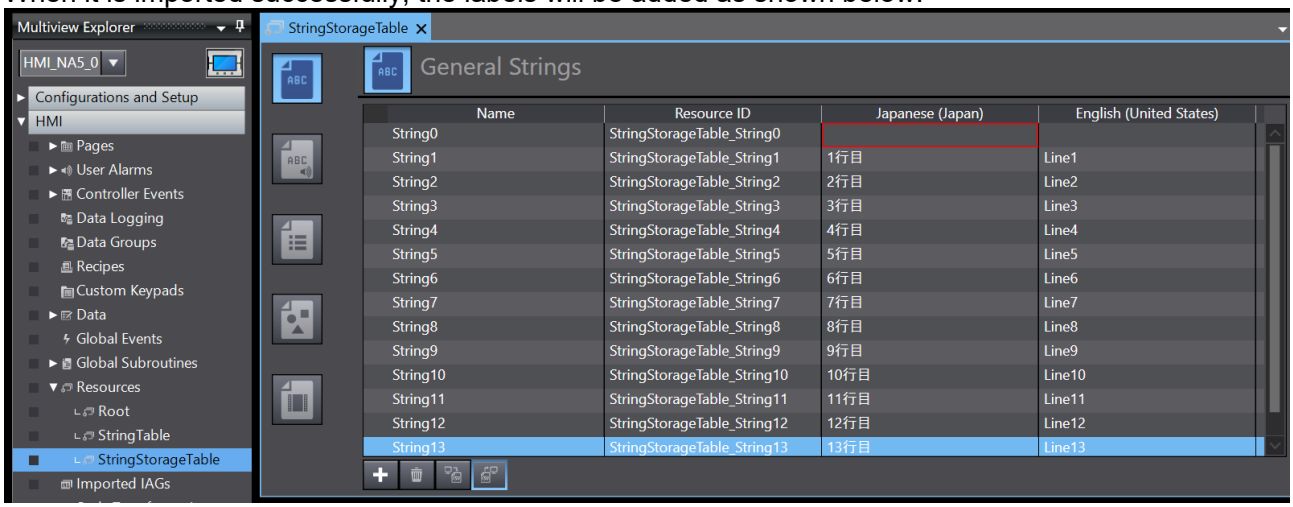
	A	B	C	D
1	Group Name	Resource ID	Japanese (Japan) [ja-JP]	English (United States) [en-US]
2	StringStorageTable	StringStorageTable_String1	1行目	Line1
3	StringStorageTable	StringStorageTable_String2	2行目	Line2
4	StringStorageTable	StringStorageTable_String3	3行目	Line3
5	StringStorageTable	StringStorageTable_String4	4行目	Line4
6	StringStorageTable	StringStorageTable_String5	5行目	Line5
7	StringStorageTable	StringStorageTable_String6	6行目	Line6
8	StringStorageTable	StringStorageTable_String7	7行目	Line7
9	StringStorageTable	StringStorageTable_String8	8行目	Line8
10	StringStorageTable	StringStorageTable_String9	9行目	Line9
11	StringStorageTable	StringStorageTable_String10	10行目	Line10
12	StringStorageTable	StringStorageTable_String11	11行目	Line11
13	StringStorageTable	StringStorageTable_String12	12行目	Line12
14	StringStorageTable	StringStorageTable_String13	13行目	Line13

16. Save the created Excel file, and close the file.

17. Select **Resources** – **StringStorageTable** – **Import** in Sysmac Studio to import the created Excel file.



18. When it is imported successfully, the labels will be added as shown below.



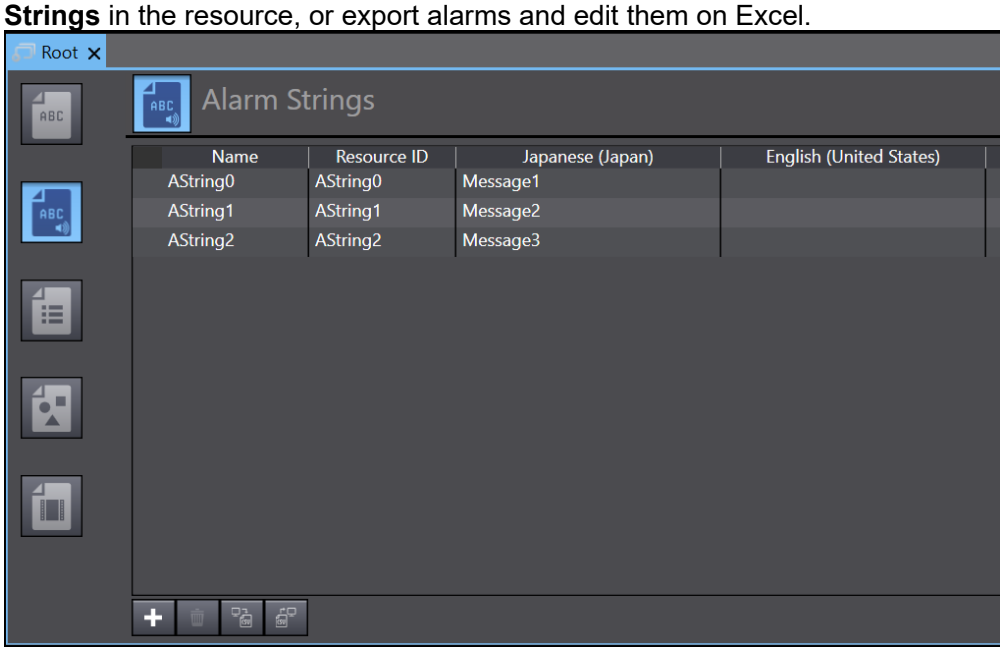
Additional Information

If multiple text files have been registered, add resource groups accordingly.

3-3 Conversion of Alarm/Event Settings

Refer to the *Programmable Terminal NA-series Replace Guide From NS to NA (Cat. No. V469), 5-4 Alarm/Event Settings and 6-18 Alarm/Event Summary and History* for basic conversion procedures for alarms.

In NA, alarm messages are also registered automatically into a resource, as with the objects such as buttons and labels. While objects are registered into **General Strings**, alarm messages are registered into **Alarm Strings**.
When using multiple languages and registering messages by language, directly edit data at **Alarm Strings** in the resource, or export alarms and edit them on Excel.

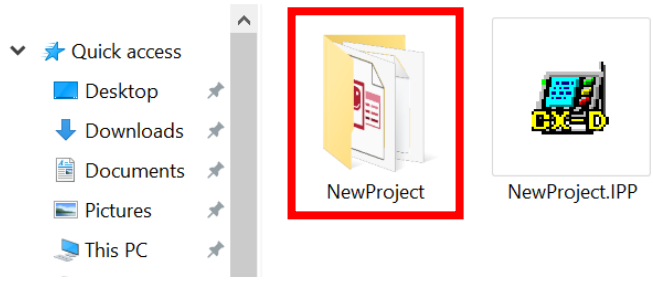


Clicking the  icon allows you to export alarms.
The exported data will be saved as Excel data, so write desired messages.
When the edit is completed, import them by clicking the  icon.

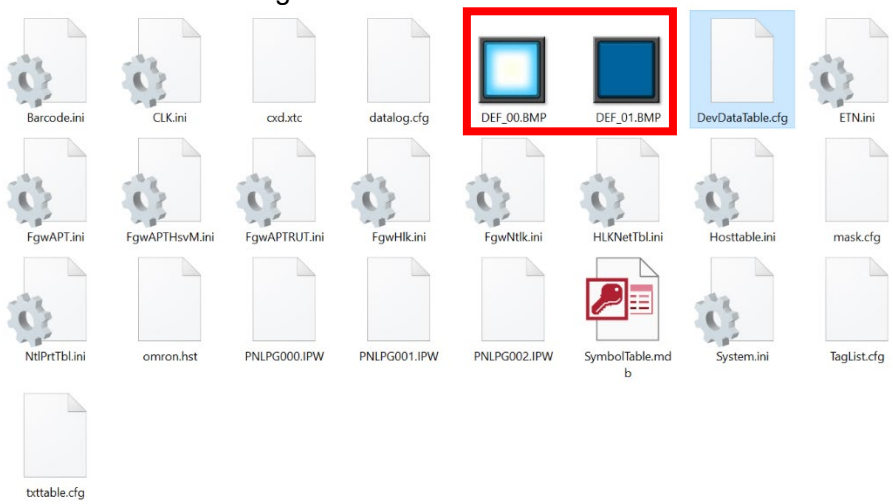
	A	B	C	D
1	Group Name	Resource ID	Japanese (Japan) [ja-JP]	English (United States) [en-US]
2	[root]	AString0	Message1	
3	[root]	AString1	Message2	
4	[root]	AString2	Message3	

3-4 Conversion of Images

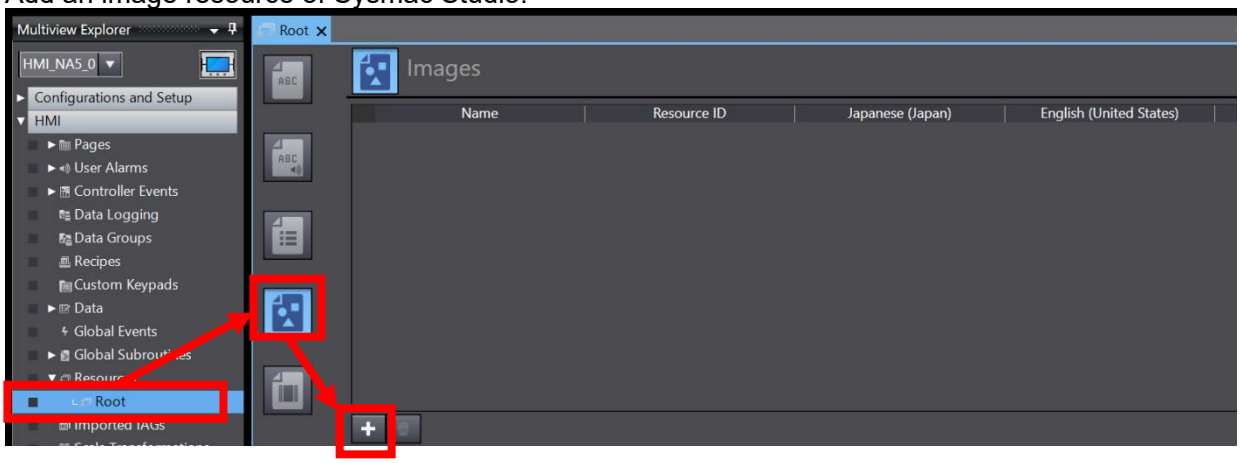
In NA, images to be used for objects are also registered into a resource.
You can get image files from the project file of NS.
The image files used in NS are stored in the project folder.



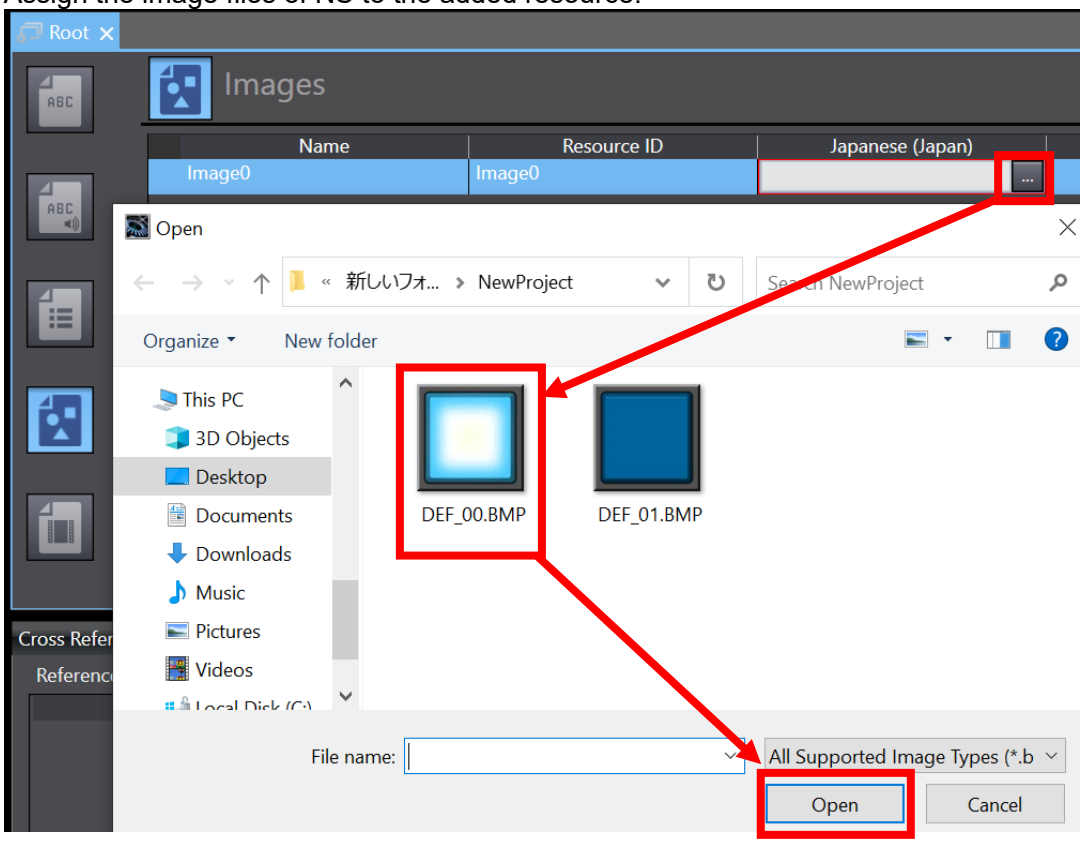
The contents of the folder are shown below.
The images in the red frame represent the image files used in NS.
These files are to be registered into a resource.



1. Add an image resource of Sysmac Studio.



2. Assign the image files of NS to the added resource.

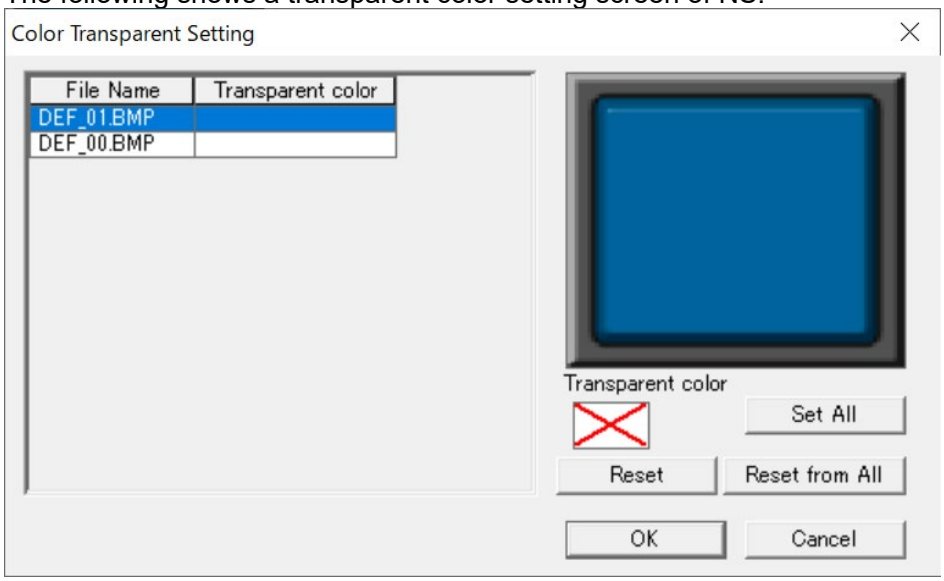


3. When you perform the above steps, the image files of NS can be used on NA.

Precautions for Correct Use

In NS, there is a function to set the transparent color of images.
NA does not have an equivalent function, so you need to apply transparency processing to image files.
The transparency processing can be used via image processing sites on the Internet and commercial image processing software.

The following shows a transparent color setting screen of NS.



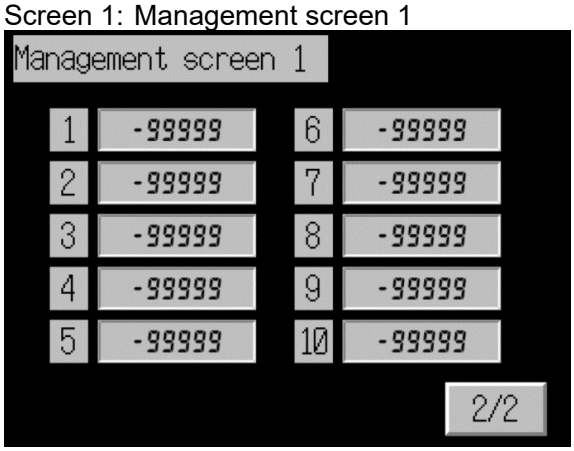
4 Screen Replacement from NS to NA

This section describes the concepts of replacing the screens of NS with those of NA and the procedures for that.
Refer to the *Programmable Terminal NA-series Replace Guide From NS to NA (Cat. No. V469)* for how to select and set the specific objects to replace.

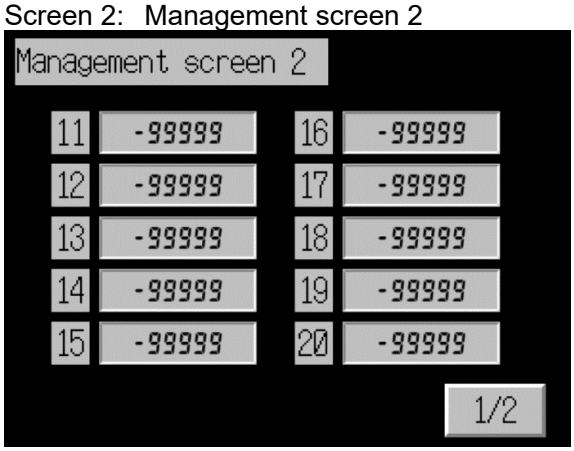
4-1 Extraction of Base Screens and Similar Screens of NS

Some replacement-source screens of NS include multiple similar screens.
It is not efficient to create similar screens again and again, so look through the screens before creation, and extract the base screens and similar screens.
First choose a base screen, find a screen similar to that, and link them to each other.
We will use the following three screens for description as an example of the concept.

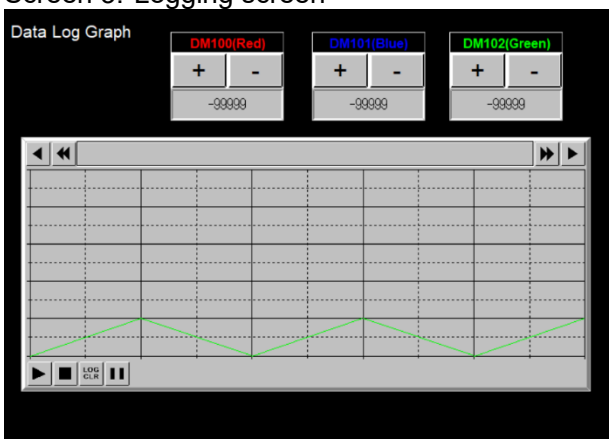
Screen 1: Management screen 1



Screen 2: Management screen 2



Screen 3: Logging screen



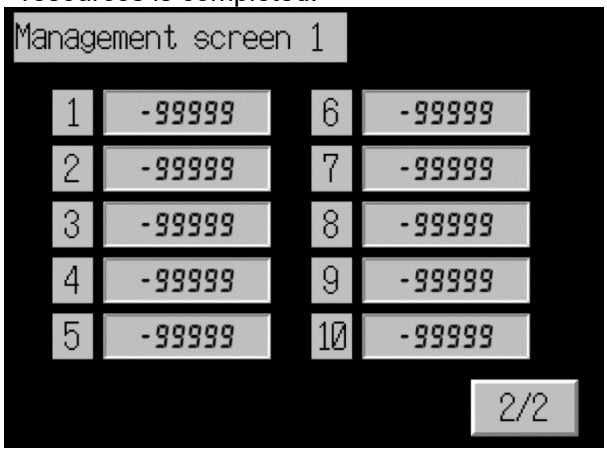
In the above case, it turns out that both the screens 1 and 2 are management screens and also the objects in use are almost the same.
Refer to the screen 1 as a base screen, and the screen 2 as a similar screen.
When actually creating the screen 2, reuse the contents of the screen 1.
The screen 3 is not similar to any screens, so refer to it as a base screen.
Although there is no rule for how to summarize, you are recommended to write down the definition on an Excel table etc. as shown below.

Screen number	Screen name	Base screen	Similar screen * Base screen number
1	Management screen 1	Yes	---
2	Management screen 2	---	1
3	Logging screen	Yes	---

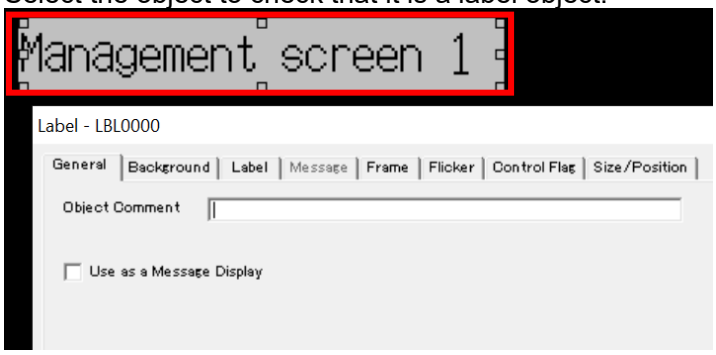
4-2 Creation of Base Screens

In this section, the management screen 1 of NS is replaced with that of NA as an example of screen replacement from NS to NA.

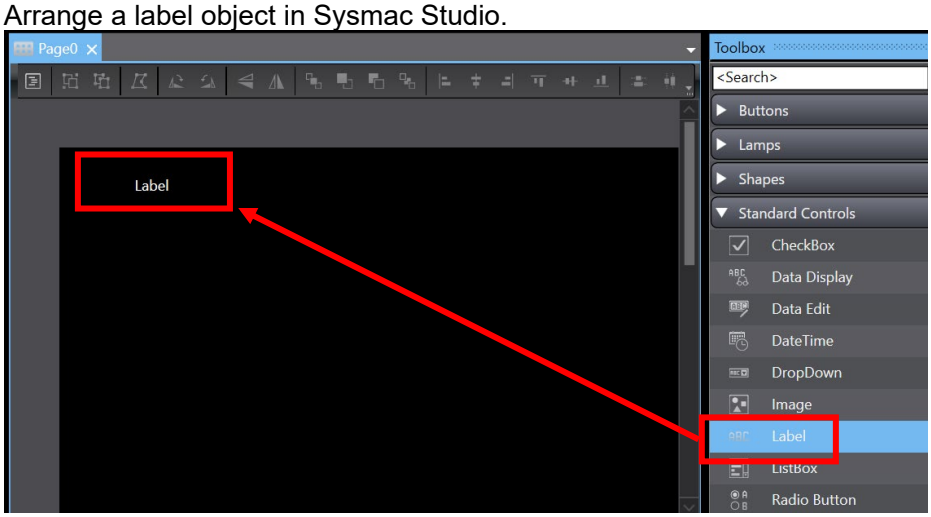
* The procedure is described on the premise that the conversion of memory maps and string resources is completed.



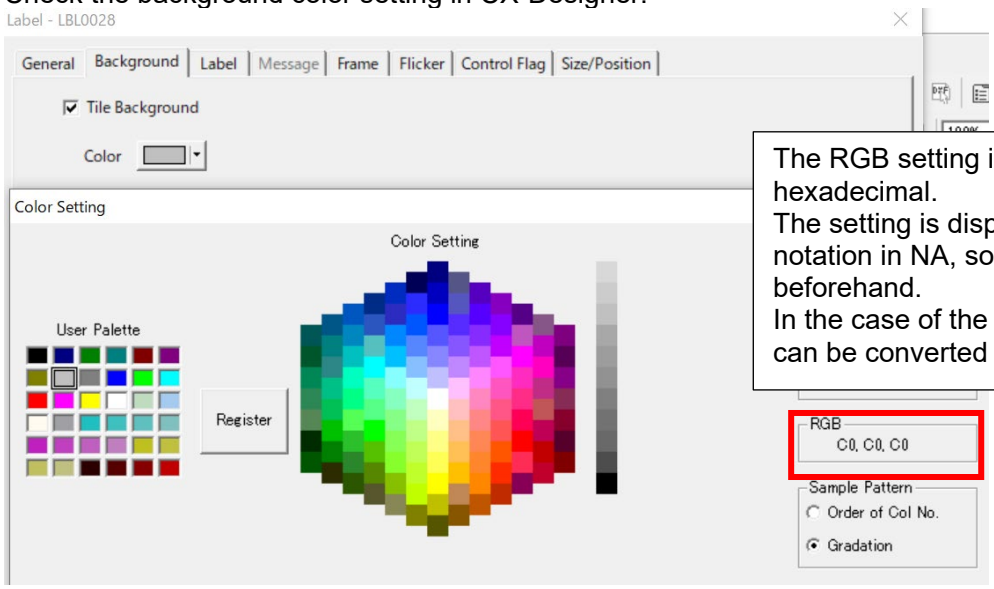
1. On the CX-Designer, check the setting of the object written as **Management screen 1**. Select the object to check that it is a label object.



2. Arrange a label object in Sysmac Studio.

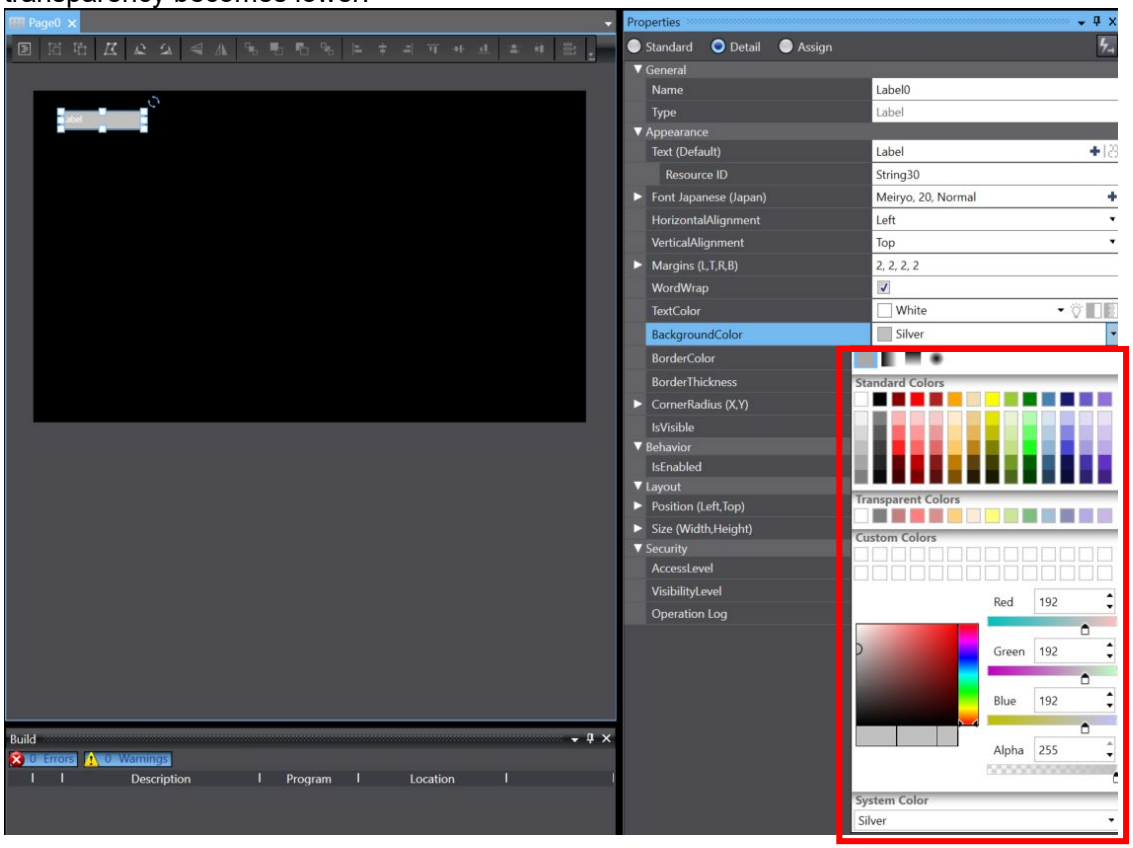


3. Check the background color setting in CX-Designer.

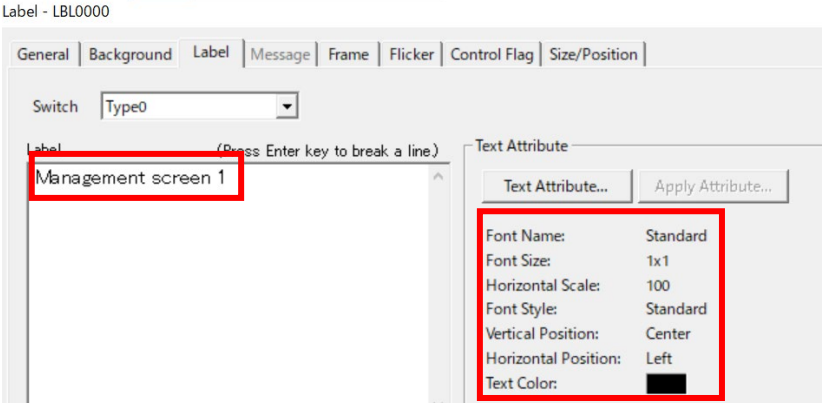


The RGB setting is displayed in hexadecimal.
The setting is displayed in decimal notation in NA, so convert it beforehand.
In the case of the left setting, *0xC0* can be converted into *192*.

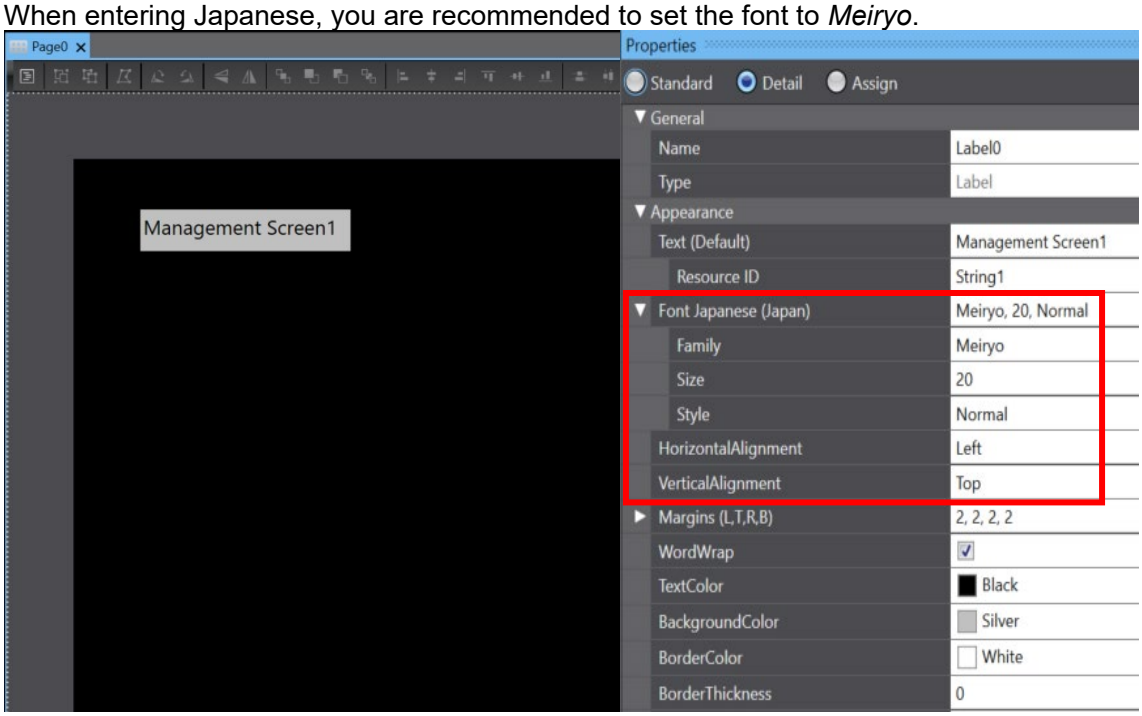
4. Set a background color in Sysmac Studio.
Set the Red, Green, and Blue values in the lower right in the red frame to *192* checked above.
The Alpha value under them should be set to *255*. This setting represents transparency.
When you set it to 0, the background color becomes transparent. As the value increases, the transparency becomes lower.



5. In the label setup of CX-Designer, check the display text and font settings.

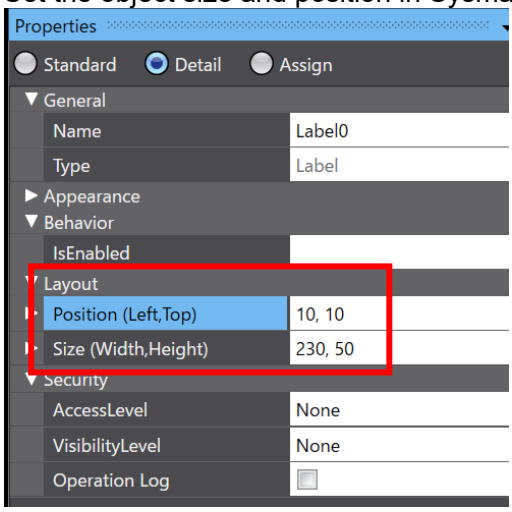


6. Configure the display text and font settings in Sysmac Studio.
   Enter the settings checked above into the default text and font settings.
   The font *Standard* used in NS is not in NA.
   When entering Japanese, you are recommended to set the font to *Meiryo*.



7. Check the **Size/Position** settings in CX-Designer.

8. Set the object size and position in Sysmac Studio.

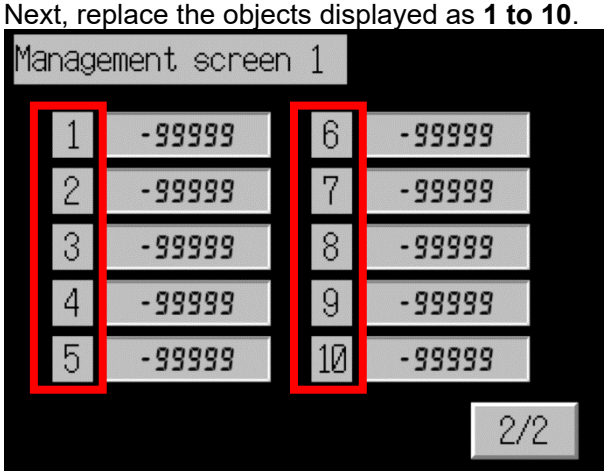


Additional Information

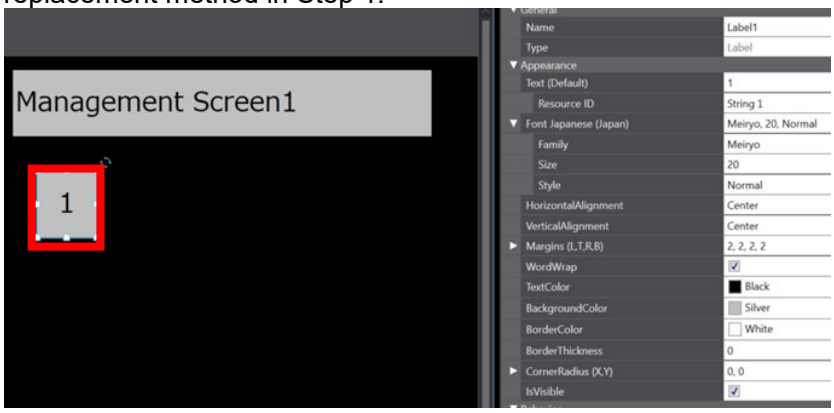
NS and NA are different in resolution even if the same in panel size.
Adjust the object size and position according to the model to replace.
The following shows the resolution for each panel size of NS and NA.
A strict adjustment is not required. The purpose is to provide the same object layout as NS.

Unit type	Display Size	Unit type	Display Size
NS5-SQ0[]-V1	320x240	NA5-7W001□-V1	800x480
NS5-SQ0[]-V2			
NS5-TQ0[]-V2			
NS5-MQ0[]-V2			
NS5-SQ1[]-V2			
NS5-TQ1[]-V2			
NS5-MQ1[]-V2			
NS7-SV0[]	640x480	NA5-7W001□-V1	800x480
NS8-TV0[]-V1			
NS8-TV0[]-V2			
NS8-TV1[]-V1			
NS10-TV0[]		NA5-9W001□-V1	800x480
NS10-TV0[]-V1			
NS10-TV0[]-V2			
NS12-TS0[]	800x600	NA5-12W101□-V1	1280x800
NS12-TS0[]-V1			
NS12-TS0[]-V2			
NS15-TX0[]-V2	1024x768	NA5-15W101□-V1	1280x800
NS-Runtime	3840×2400 *Resolution can be changed in 1 dot units	Soft-NA	800×480 1280×800 1920×1080

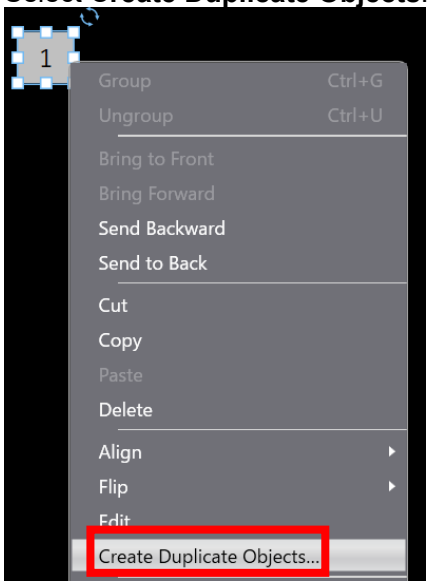
9. Next, replace the objects displayed as **1 to 10**.



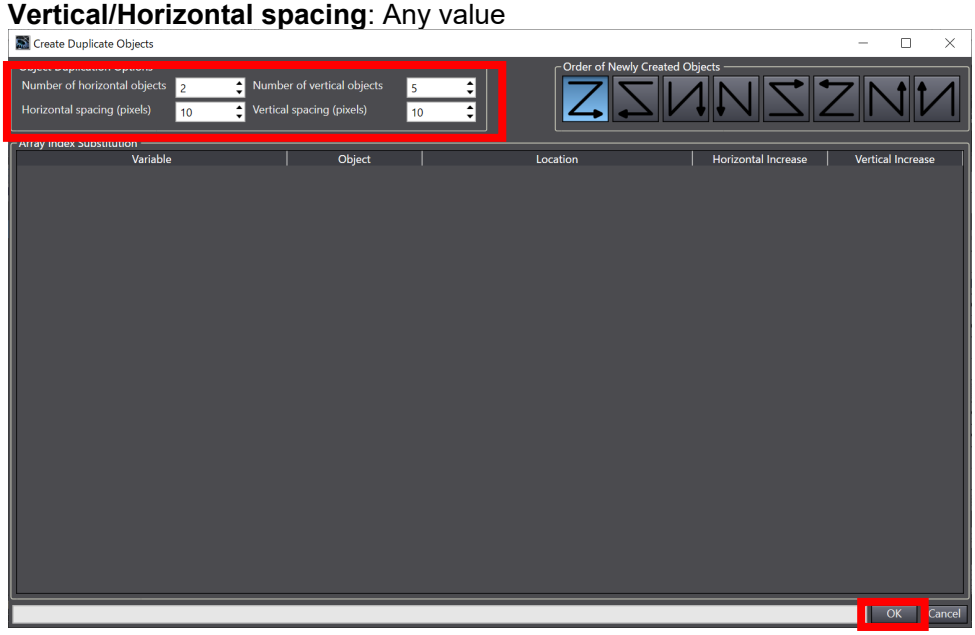
10. The above objects are labels, so create the label object **1** in Sysmac Studio referring to the replacement method in Step 1.



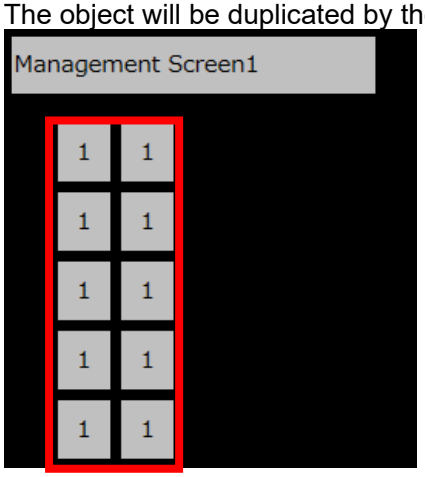
11. Right-clicking the created object displays the following pop-up menu.
Select **Create Duplicate Objects**.



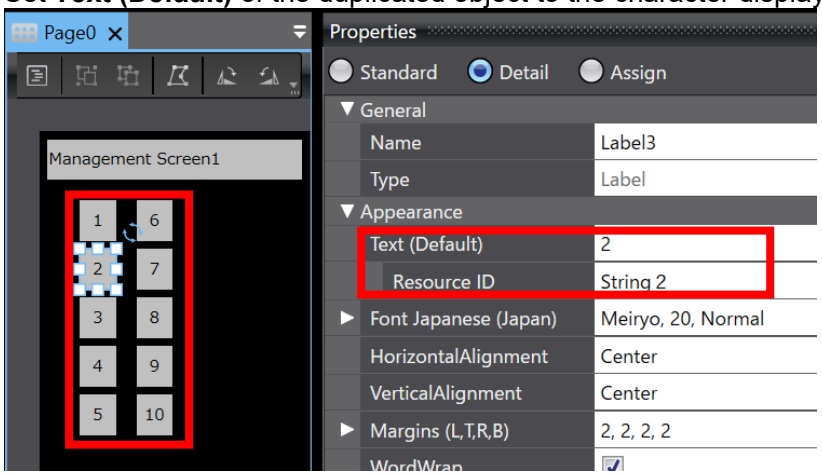
12. When the **Create Duplicate Object** screen is displayed, configure the following settings in the **Object Duplication Options** field, and press the **OK** button.
Number of horizontal objects: 2
Number of vertical objects: 5
Vertical/Horizontal spacing: Any value



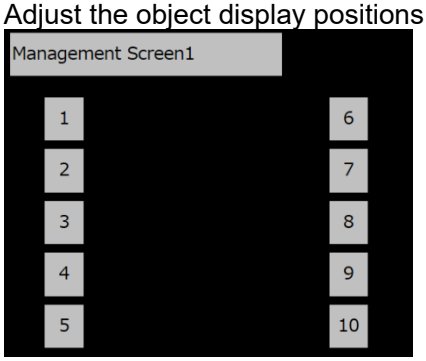
13. The object will be duplicated by the number set on the **Create Duplicate Object** screen.



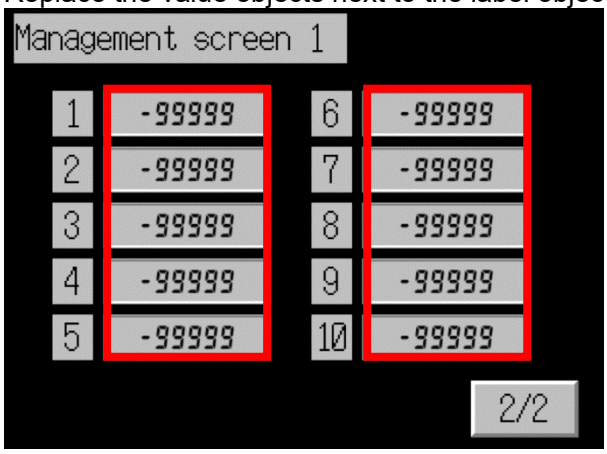
14. Set **Text (Default)** of the duplicated object to the character displayed in NS.



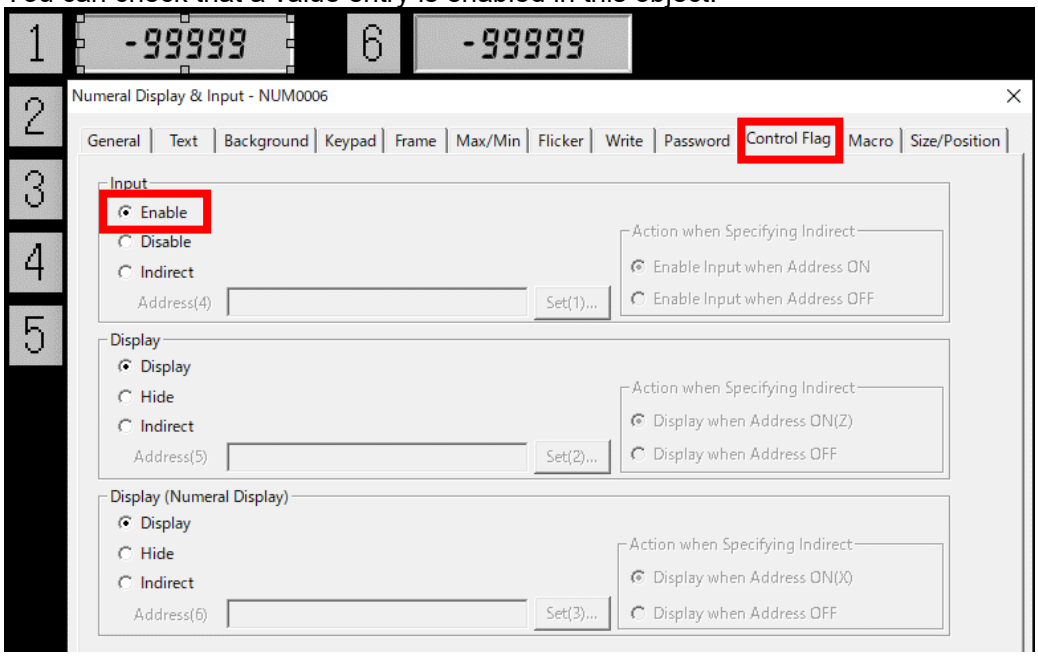
15. Adjust the object display positions to those in NS.



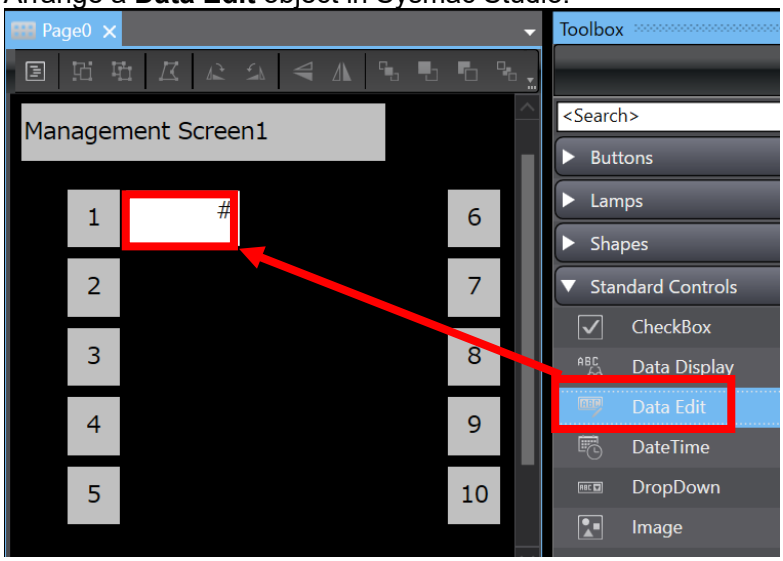
16. Replace the value objects next to the label objects displayed as **1 to 10**.



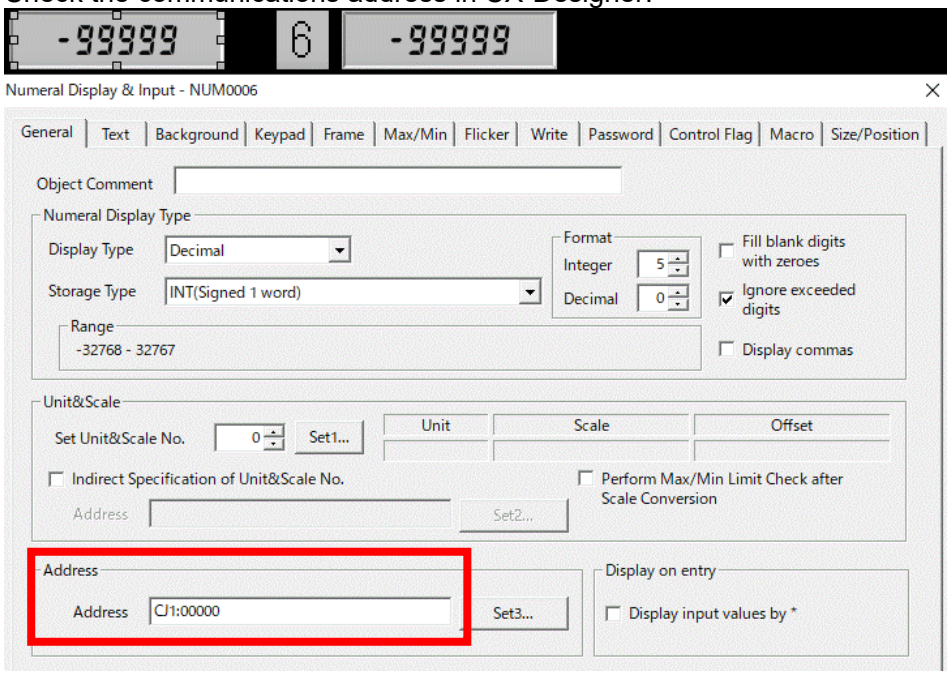
17. Check the value object settings in CX-Designer.
Open **Control Flag**, and check that **Enable** is selected in the **Input** setting field.
You can check that a value entry is enabled in this object.



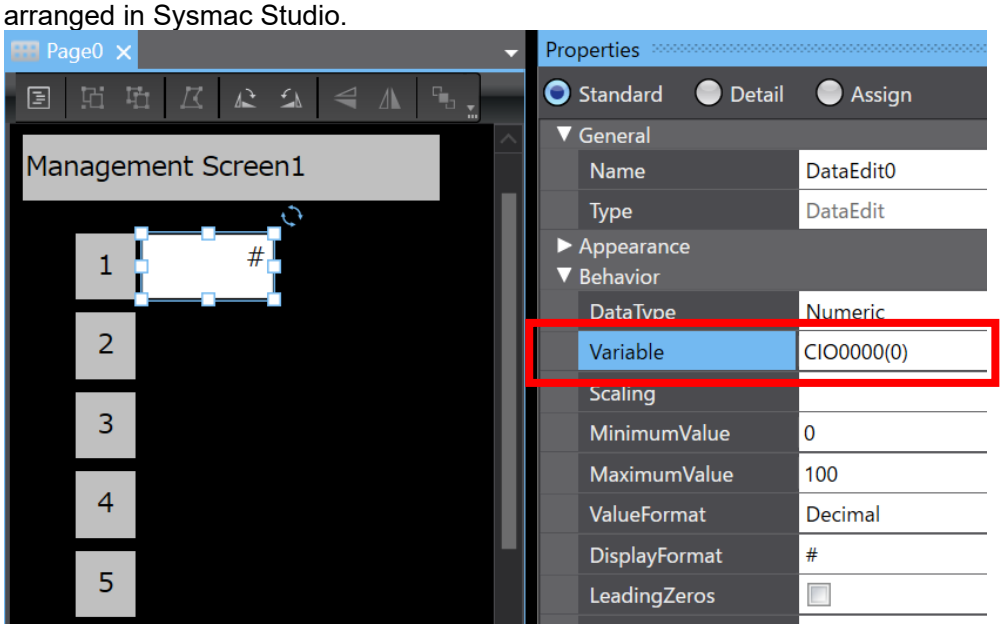
18. Arrange a **Data Edit** object in Sysmac Studio.



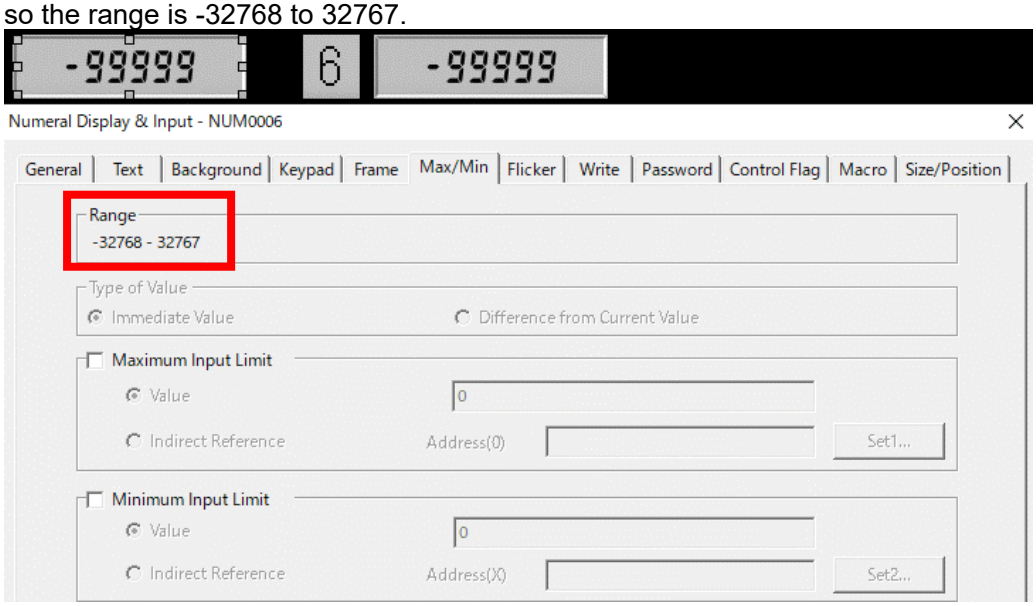
19. Check the communications address in CX-Designer.



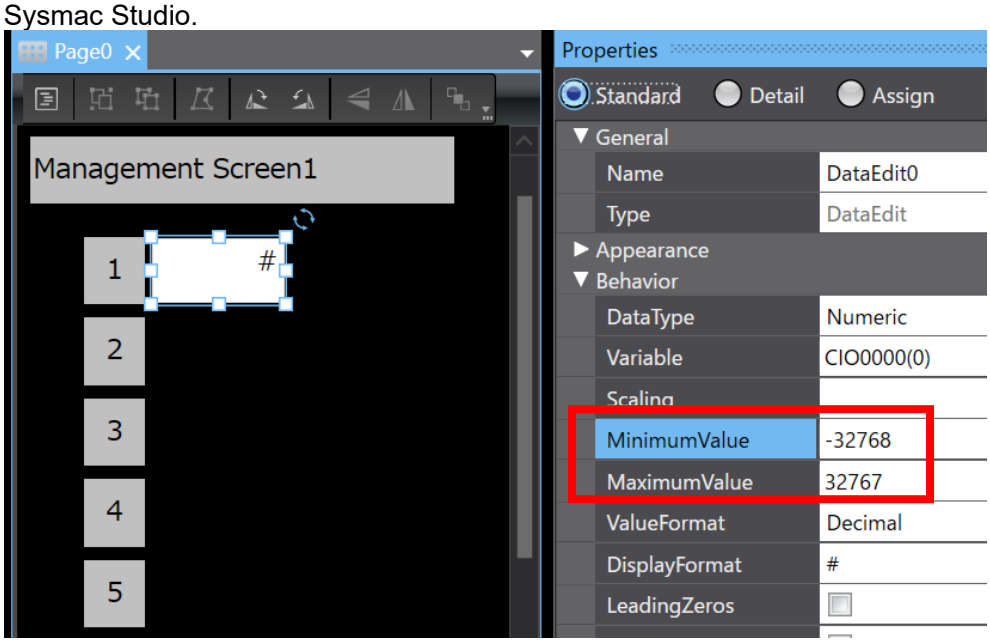
20. Enter the address checked in CX-Designer, into the **Variable** setting of the **Data Edit** object arranged in Sysmac Studio.



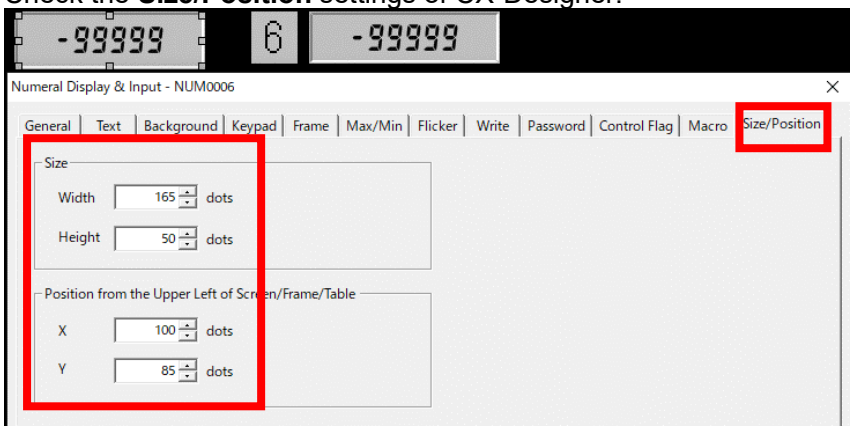
21. Check the **Max/Min** settings in CX-Designer.
In the following case, no settings have been configured, so the **Maximum/Minimum Value** settings of the assigned data type represent the maximum/minimum limits.* It is an INT type, so the range is -32768 to 32767.



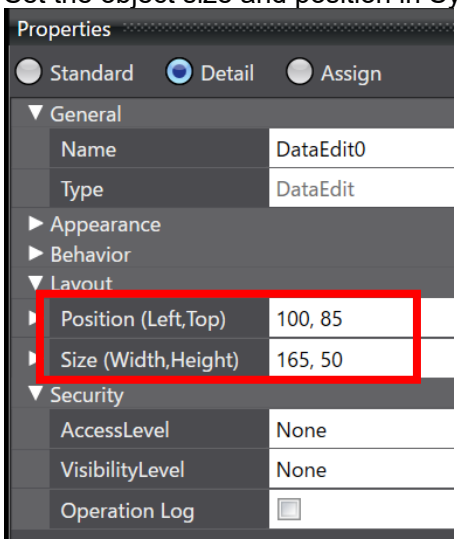
22. Enter the values checked in CX-Designer, into the **Maximum/Minimum Value** fields of Sysmac Studio.



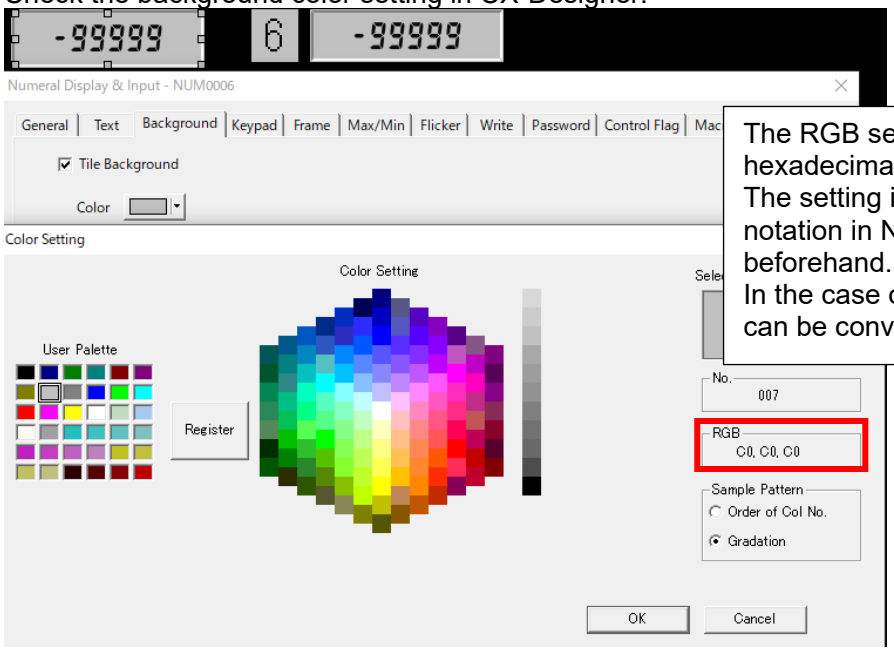
23. Check the **Size/Position** settings of CX-Designer.



24. Set the object size and position in Sysmac Studio.

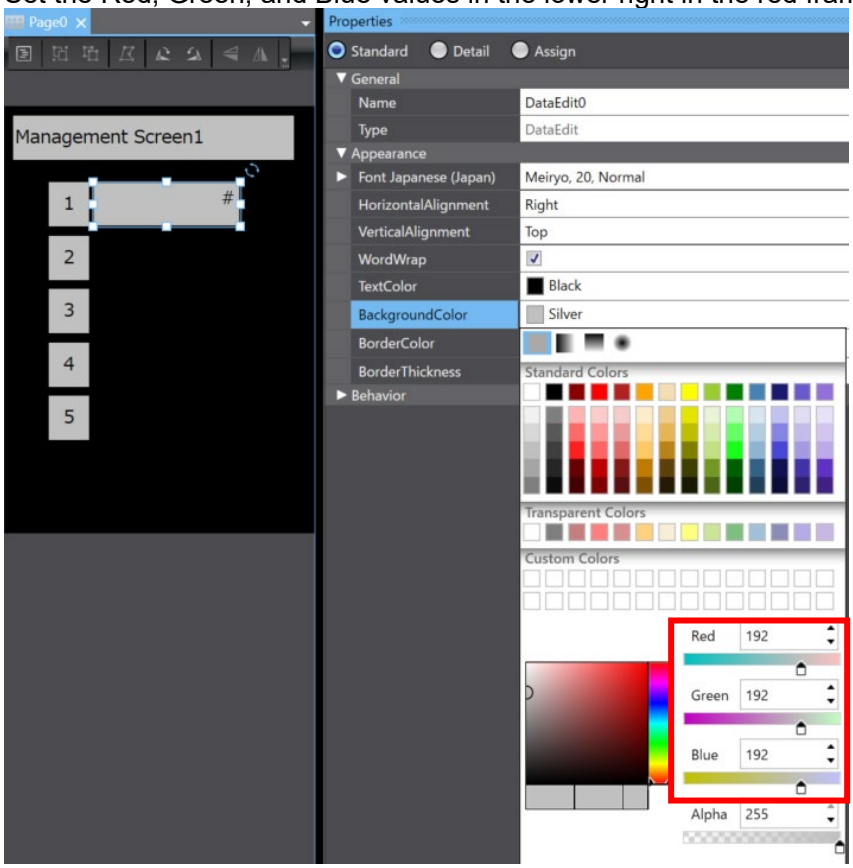


25. Check the background color setting in CX-Designer.

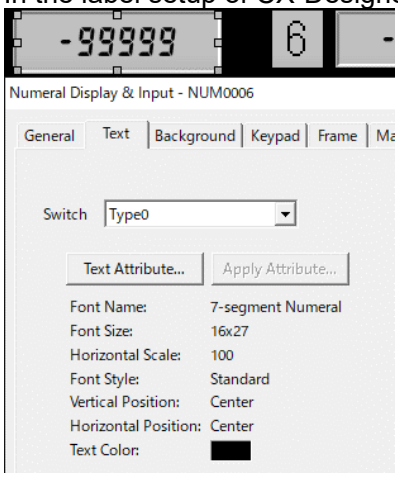


The RGB setting is displayed in hexadecimal.
The setting is displayed in decimal notation in NA, so convert it beforehand.
In the case of the left setting, *0xC0* can be converted into *192*.

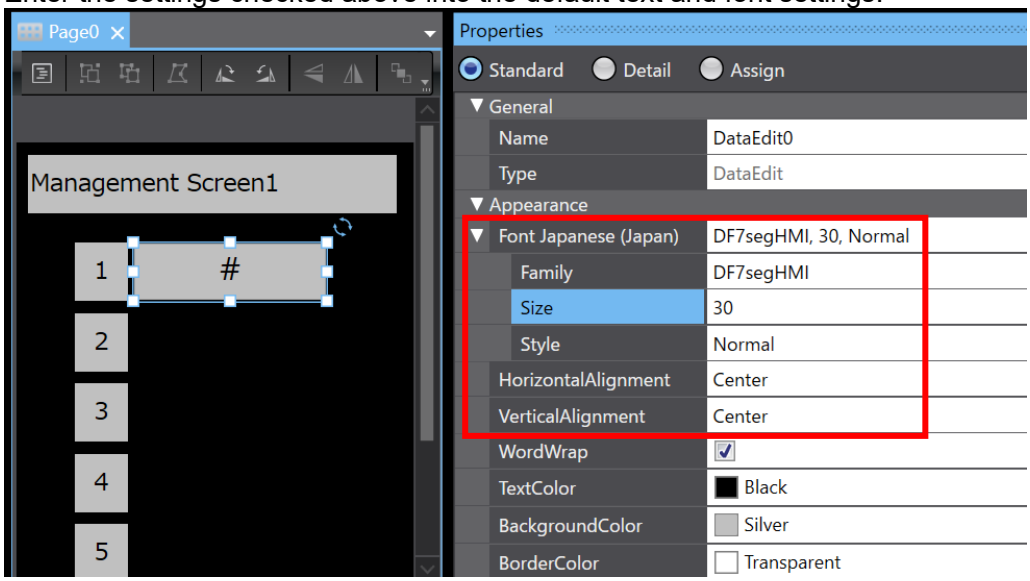
26. Set a background color in Sysmac Studio.
Set the Red, Green, and Blue values in the lower right in the red frame to *192* checked above.



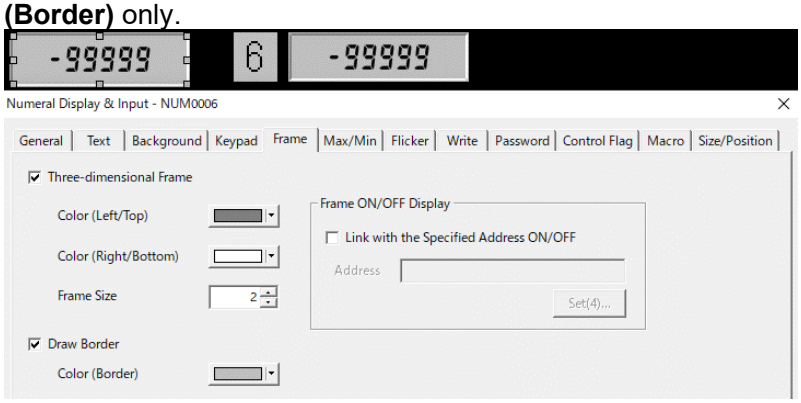
27. In the label setup of CX-Designer, check the display text and font settings.



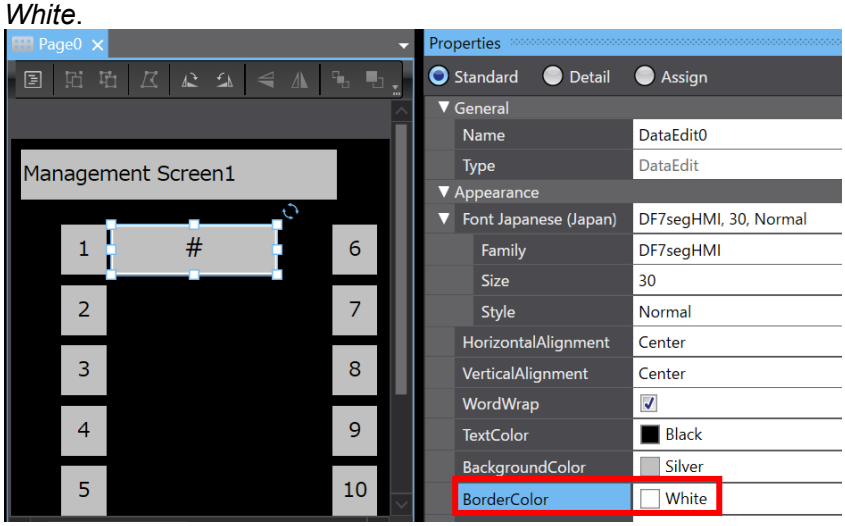
28. Configure the display text and font settings in Sysmac Studio.
Enter the settings checked above into the default text and font settings.



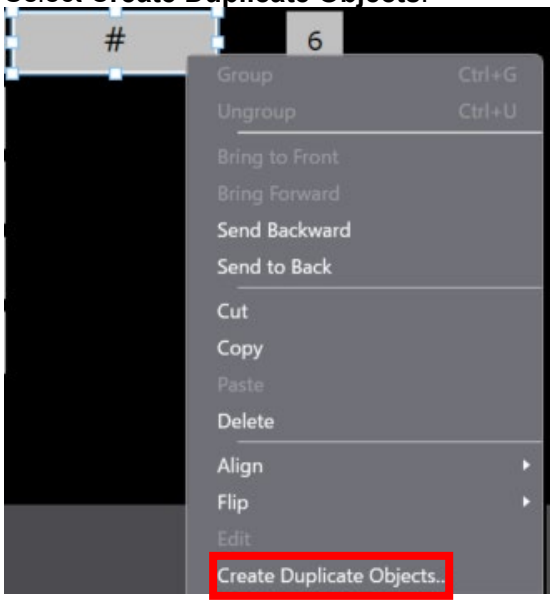
29. Check the **Frame** settings of CX-Designer.
There is no three-dimensional frame setting in NA, so it cannot be replaced. Replace **Color (Border)** only.



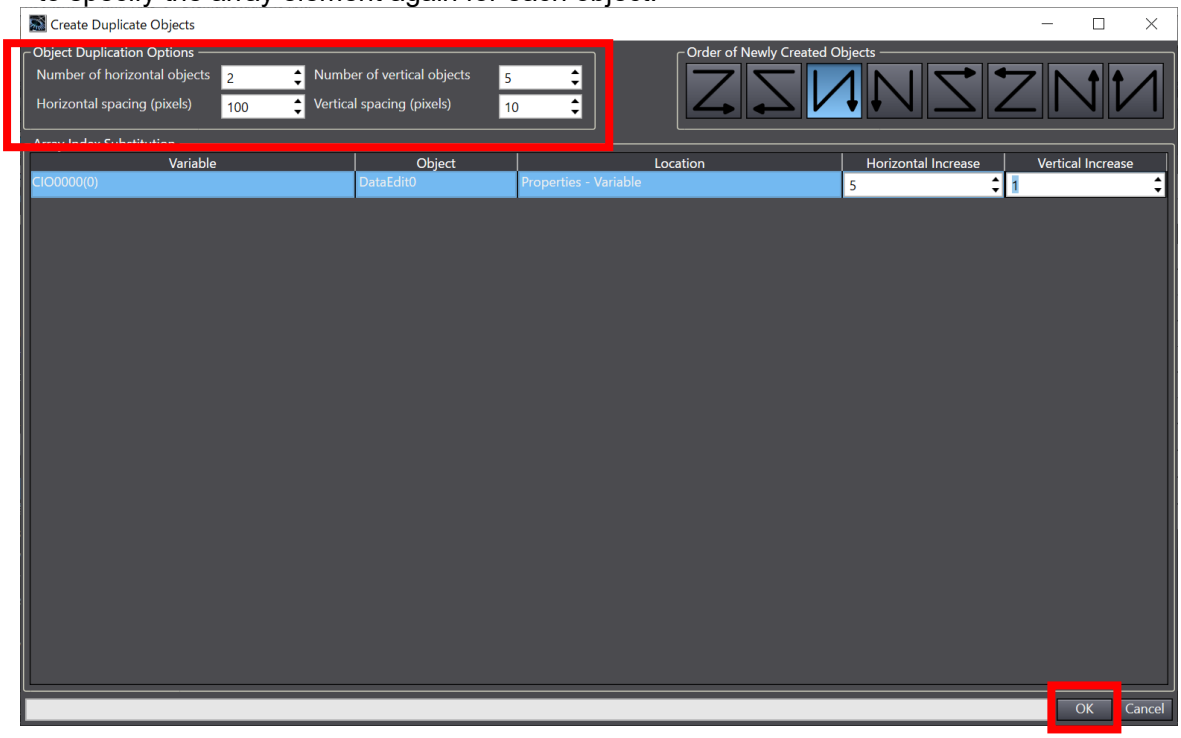
30. Set **BorderColor** and **BorderThickness** of Sysmac Studio.
    If **BackgroundColor** and **BorderColor** are the same, the frame will not be displayed in 3-D in NA, so you are recommended to change **BorderColor**.
    In the case of the following object configuration, you are recommended to set **BorderColor** to *White*.



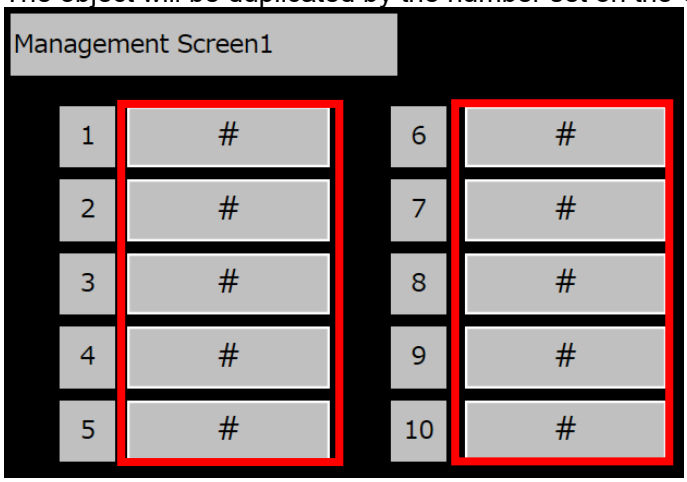
31. Right-clicking the created object displays the following pop-up menu.
    Select **Create Duplicate Objects**.



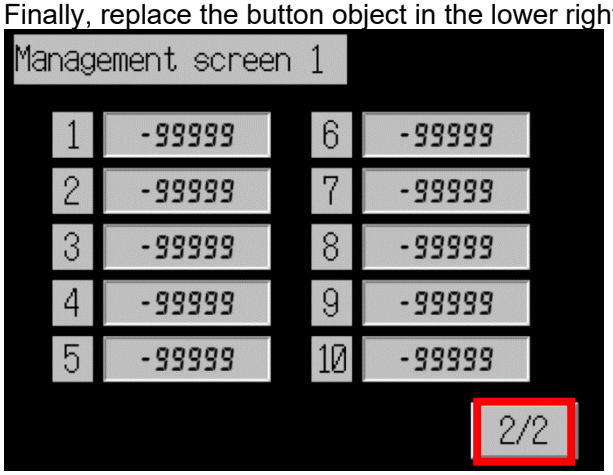
32. When the **Create Duplicate Object** screen is displayed, configure the following settings in the **Object Duplication Options** field, and press the **OK** button.
Number of horizontal objects: 2
Number of vertical objects: 5
Vertical/Horizontal spacing: Any value
* If any array variable is specified in the object to duplicate in the **Object** field, the array element number can be incremented at the time of duplication. Making this setting eliminates the need to specify the array element again for each object.



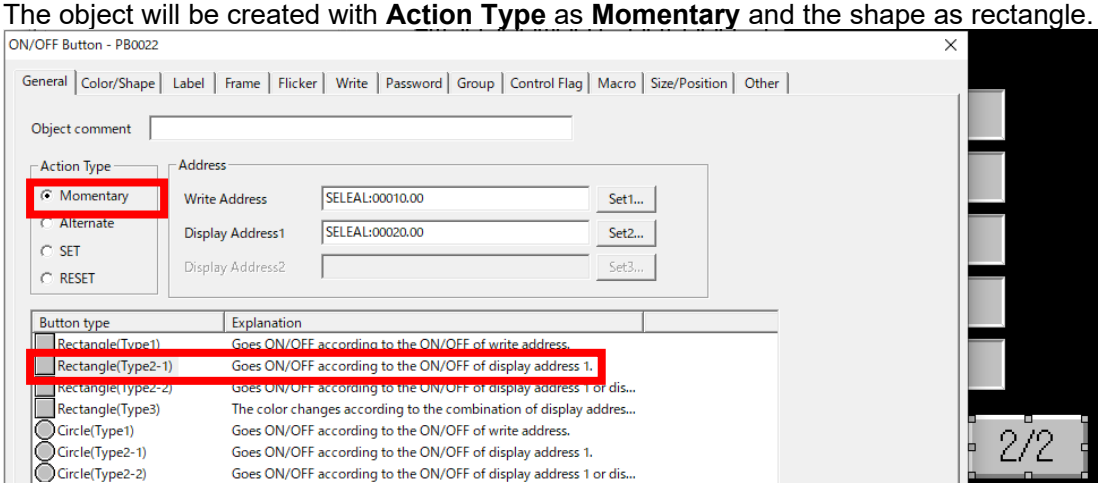
33. The object will be duplicated by the number set on the **Create Duplicate Object** screen.



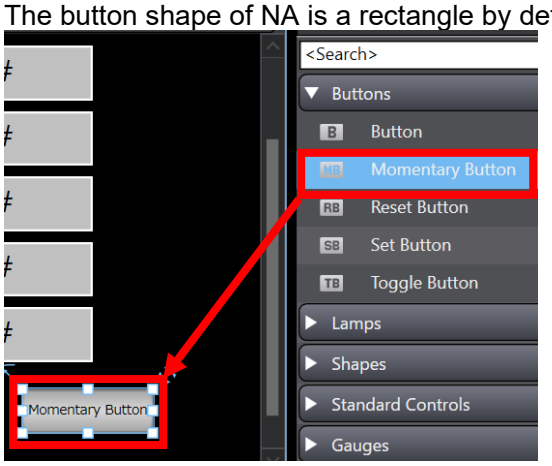
34. Finally, replace the button object in the lower right of the screen.



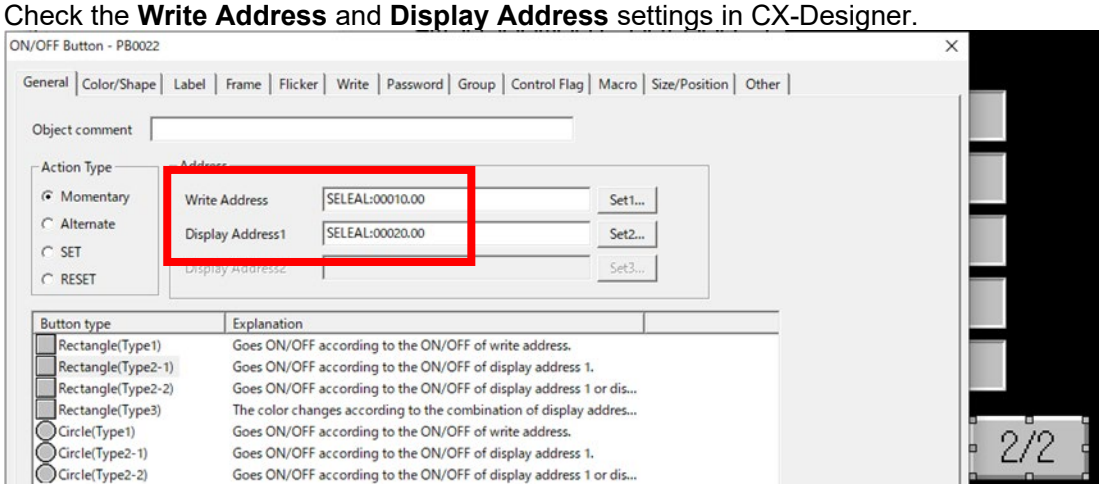
35. Check the button object settings in CX-Designer.
The object will be created with **Action Type** as **Momentary** and the shape as rectangle.



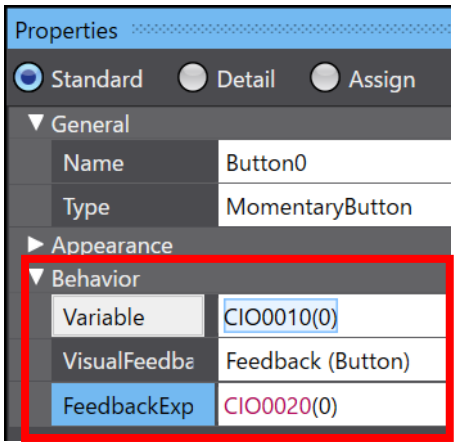
36. Arrange **Momentary Button** in Sysmac Studio.
The button shape of NA is a rectangle by default, so no settings need configuring.



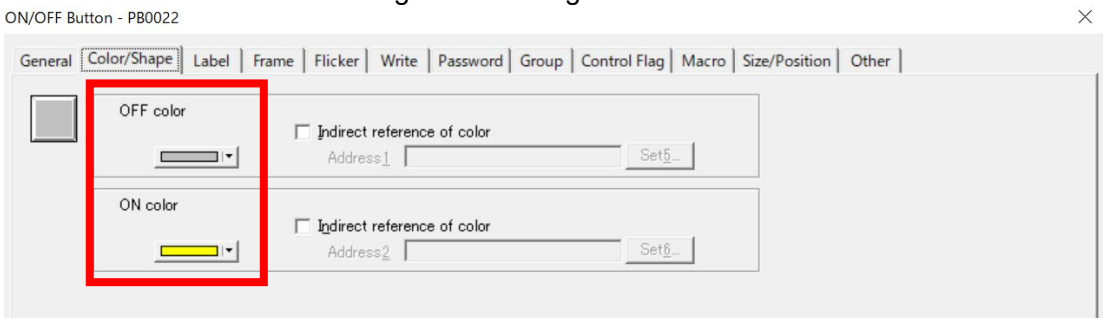
37. Check the **Write Address** and **Display Address** settings in CX-Designer.



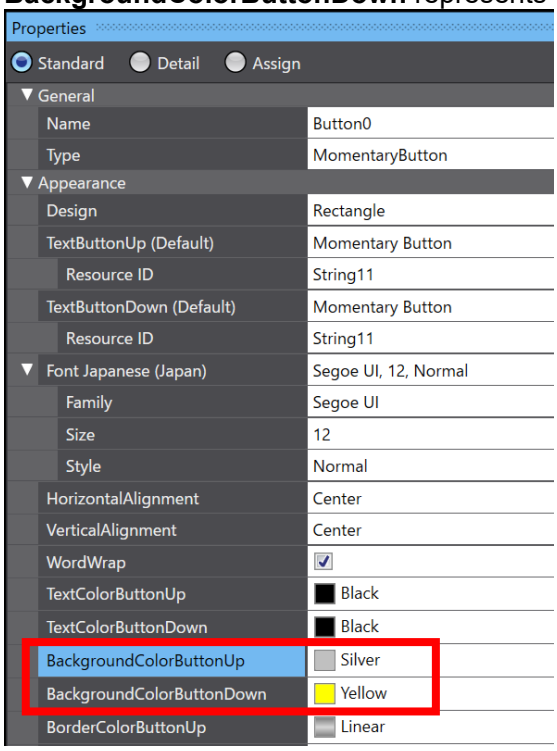
38. Open the button properties in Sysmac Studio, and set the **Write Address** setting of NS to the **Variable** item.
Change the **VisualFeedback** setting to *Feedback (Button)*.
When the **FeedbackExpression** setting item is displayed, set the **Display Address** setting of NS.



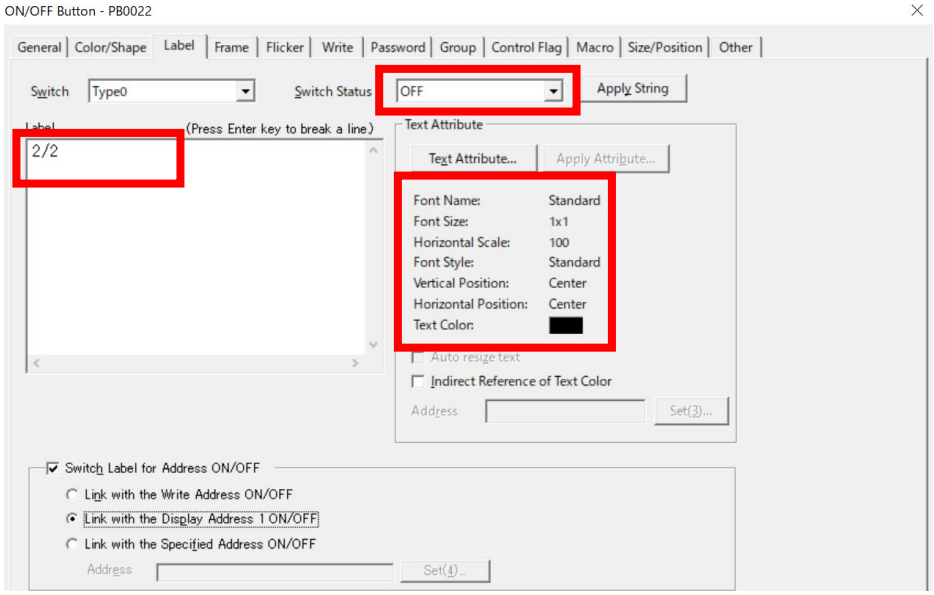
39. Check the **ON/OFF color** settings in CX-Designer.



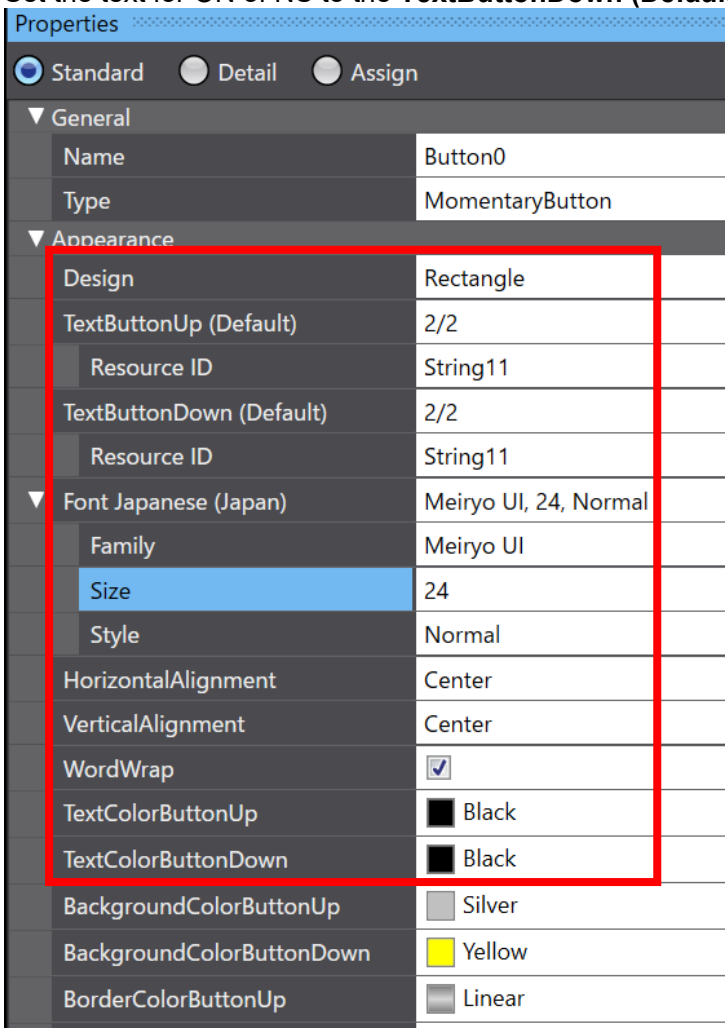
40. Set **BackgroundColorButtonUp** and **BackgroundColorButtonDown** settings in Sysmac Studio.
BackgroundColorButtonUp represents **OFF color** of NS, and **BackgroundColorButtonDown** represents **ON color** of NS.



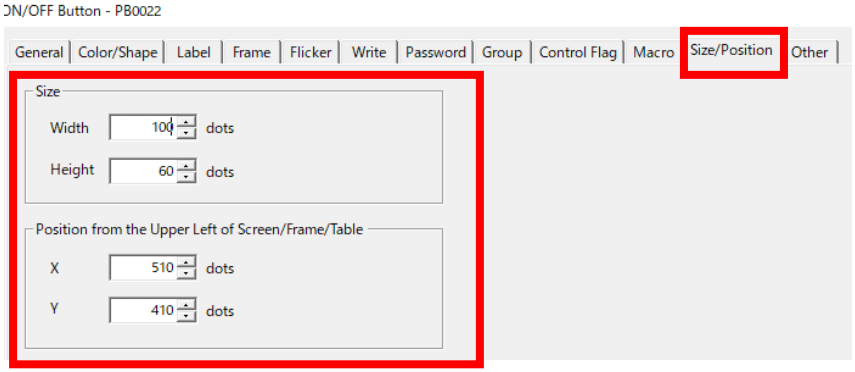
41. Check the display text and font settings in CX-Designer.
You can set another string to **Momentary Button** separately for OFF and ON.
Use the drop-down object in the upper-right red frame to change and check that.



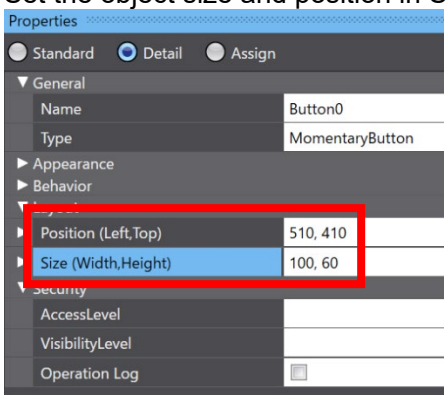
42. Configure the text and font settings checked in Sysmac Studio.
Set the text for OFF of NS to the **TextButtonUp (Default)** item.
Set the text for ON of NS to the **TextButtonDown (Default)** item.



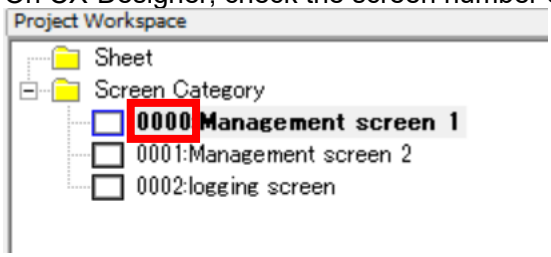
43. Check the **Size/Position** settings of CX-Designer.



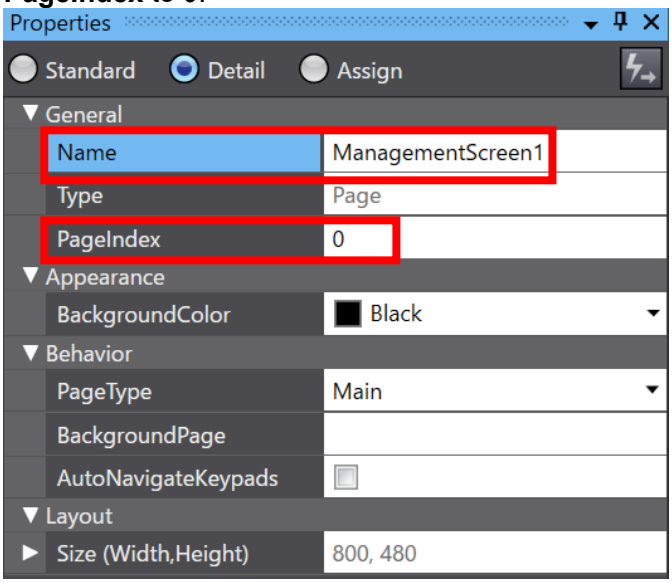
44. Set the object size and position in Sysmac Studio.



45. On CX-Designer, check the screen number of **Management screen 1**.



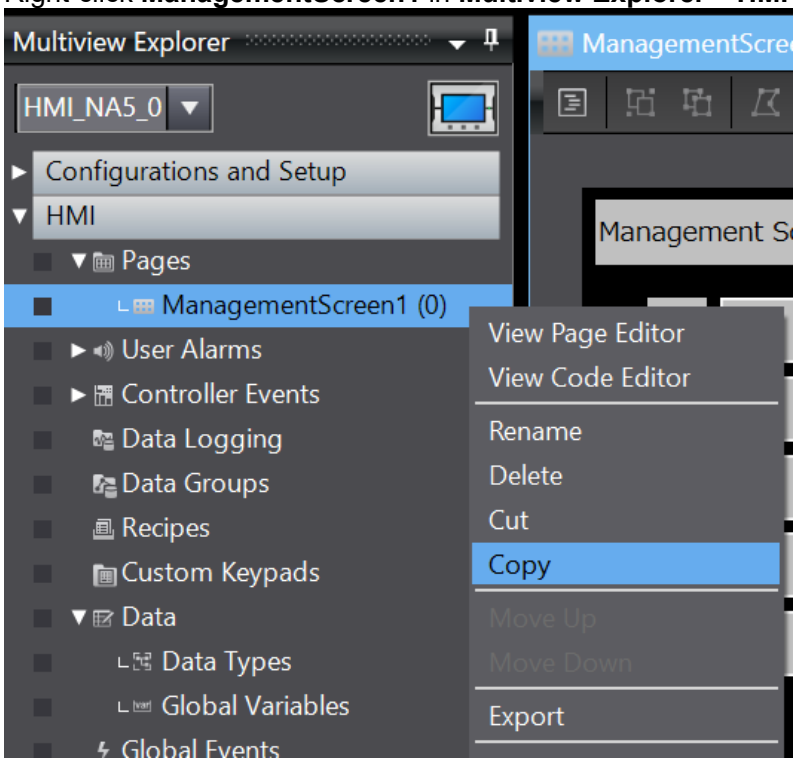
46. Open the **Properties** page in Sysmac Studio, and set **Name** to *ManagementScreen1* and **PageIndex** to *0*.



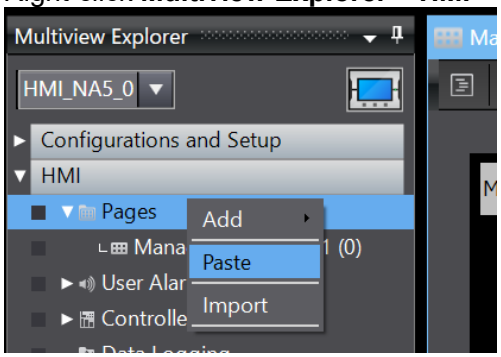
4-3 Reuse for Similar Screens

As an example of reuse for similar screens, this section describes how to reuse **ManagementScreen1** created in *4-2 Creation of Base Screens* for creating **ManagementScreen2**.
Copy the screen, and manually correct the differences from the base screen.

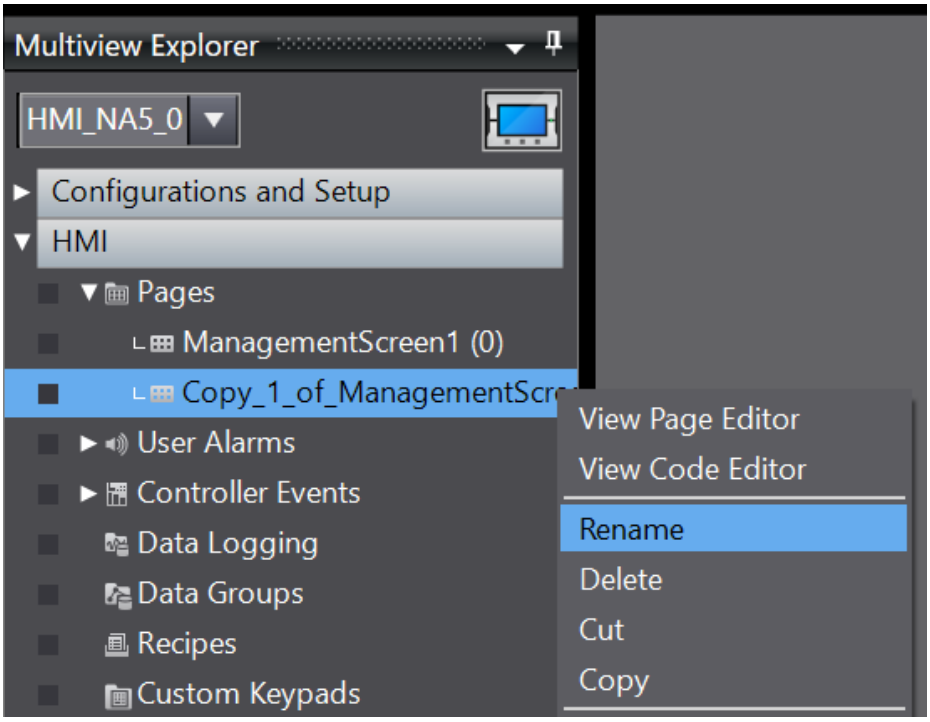
1. Copy the screen.
   Right-click **ManagementScreen1** in **Multiview Explorer** – **HMI** – **Pages**, and select **Copy**.



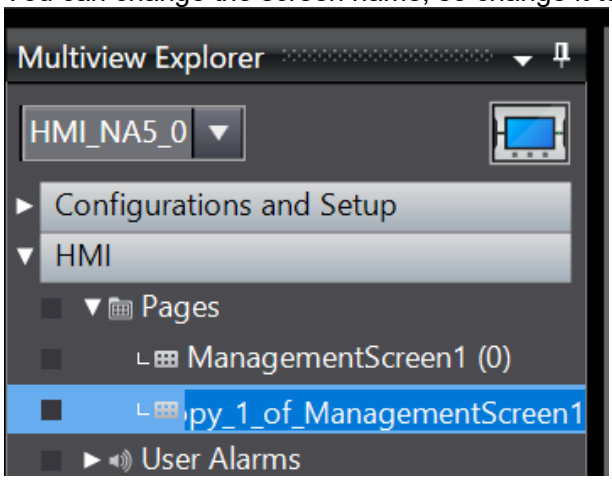
2. Right-click **Multiview Explorer** – **HMI** – **Pages**, and select **Paste**.



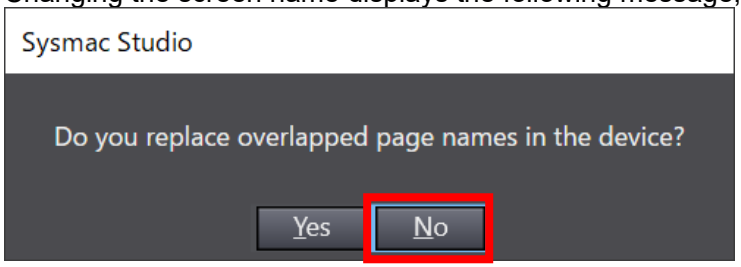
3. Right-click the created **Copy_1_of_ManagementScreen**, and select **Rename**.



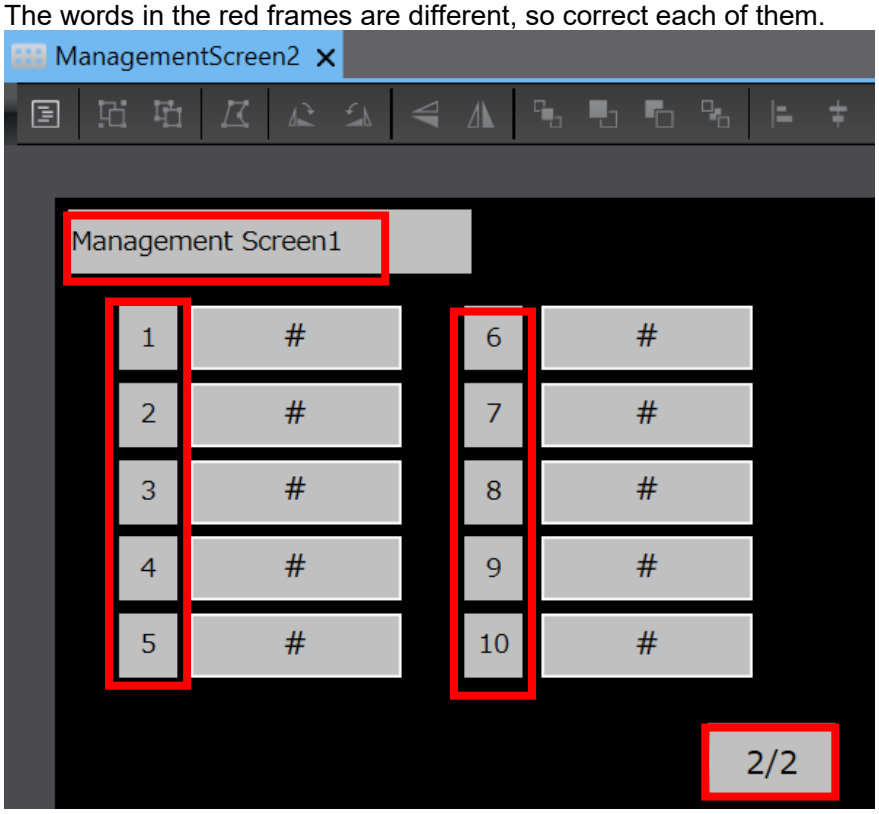
4. You can change the screen name, so change it to *ManagementScreen2*.



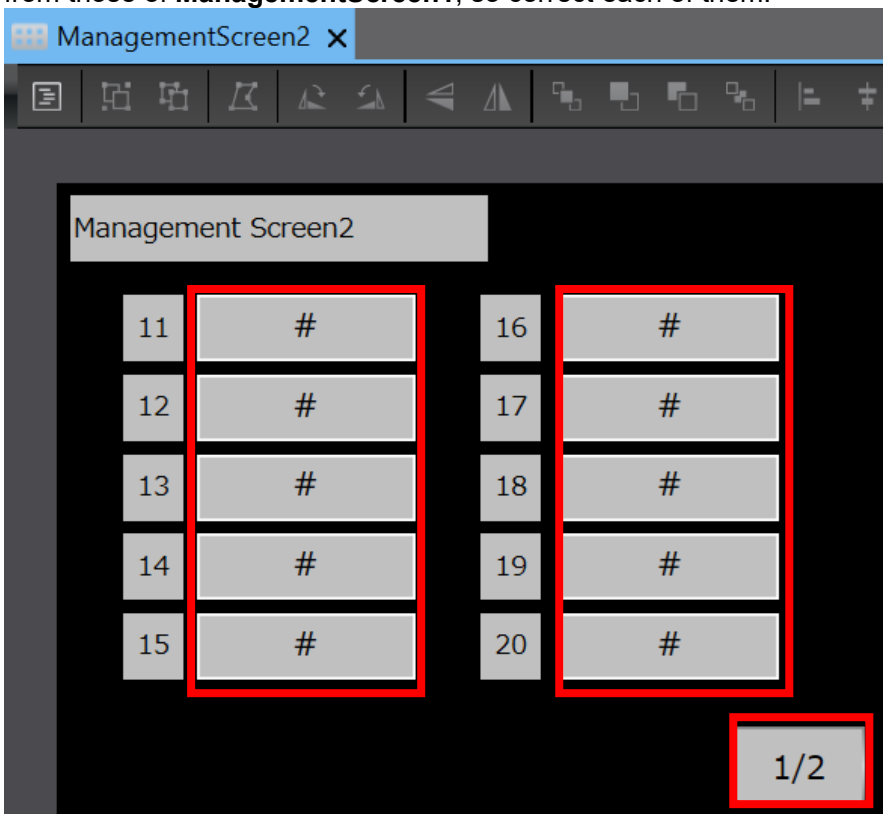
5. Changing the screen name displays the following message, and select **No**.



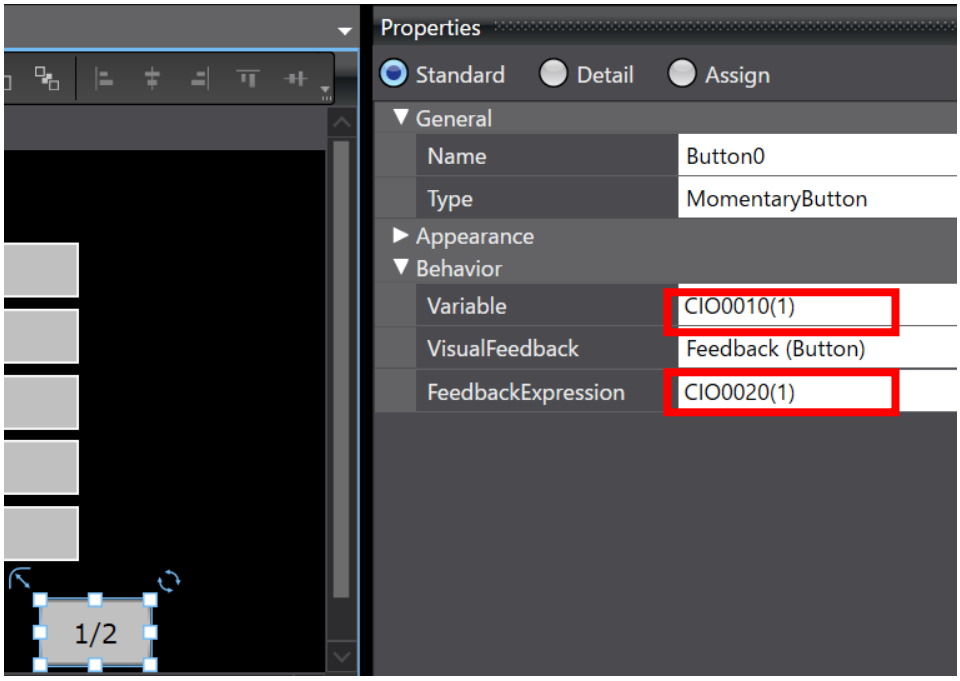
6. Open **ManagementScreen2**.
   The words in the red frames are different, so correct each of them.



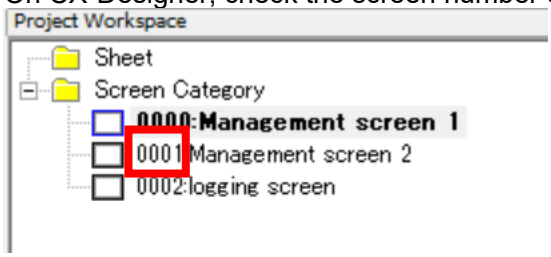
7. The display after correction is as follows.
   The variables set for **Data Edit** objects and **Momentary Button** in the red frames are different from those of **ManagementScreen1**, so correct each of them.



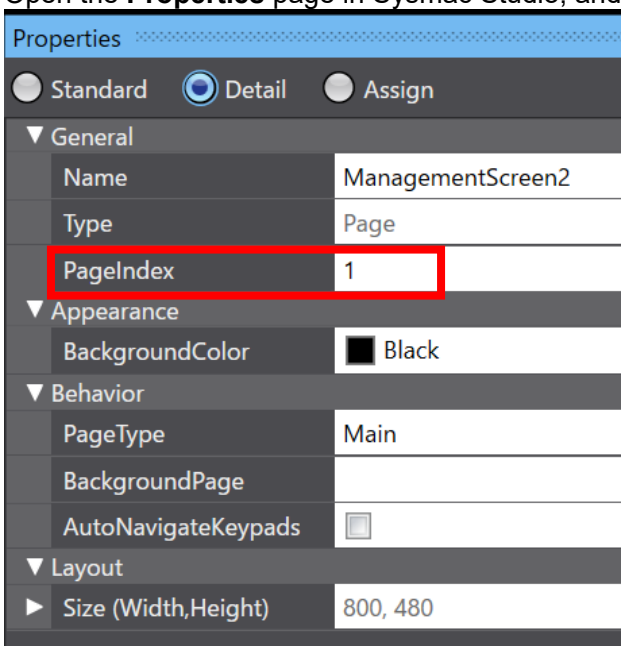
8. Correct the variables as shown below.



9. On CX-Designer, check the screen number of **Management screen 2**.



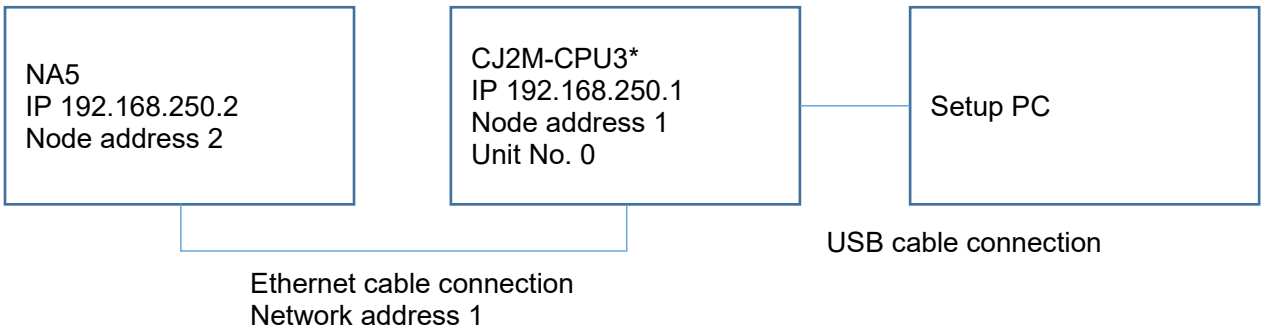
10. Open the **Properties** page in Sysmac Studio, and set **PageIndex** to 1.



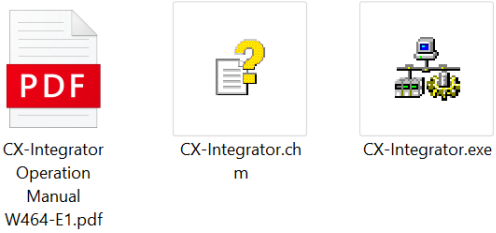
5 Routing Table Settings on CJ Side

To connect NA and CJ via FINS Ethernet, routing table settings needs configuring.
If no routing table settings are configured in the CJ CPU in use, configure them according to the procedure in this section. (No settings need configuring if the routing table settings are already configured for connections with NS.)

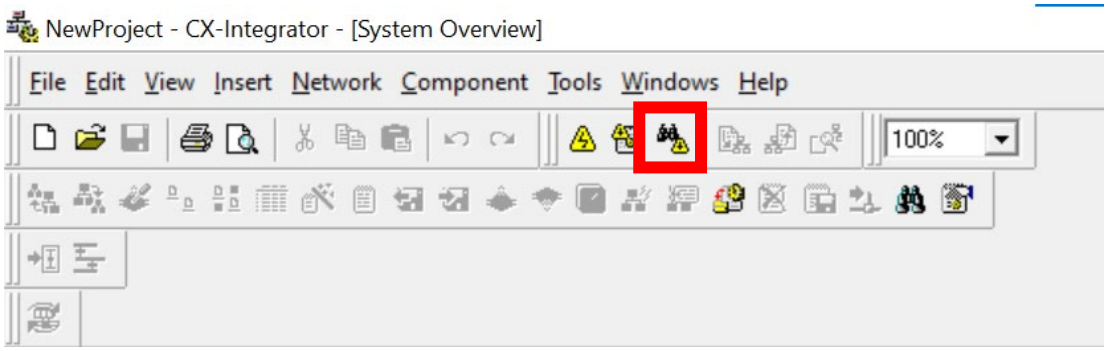
Description is given through the following unit configuration.
Also, set the operating mode of the CJ2M to **PROGRAM mode** beforehand.



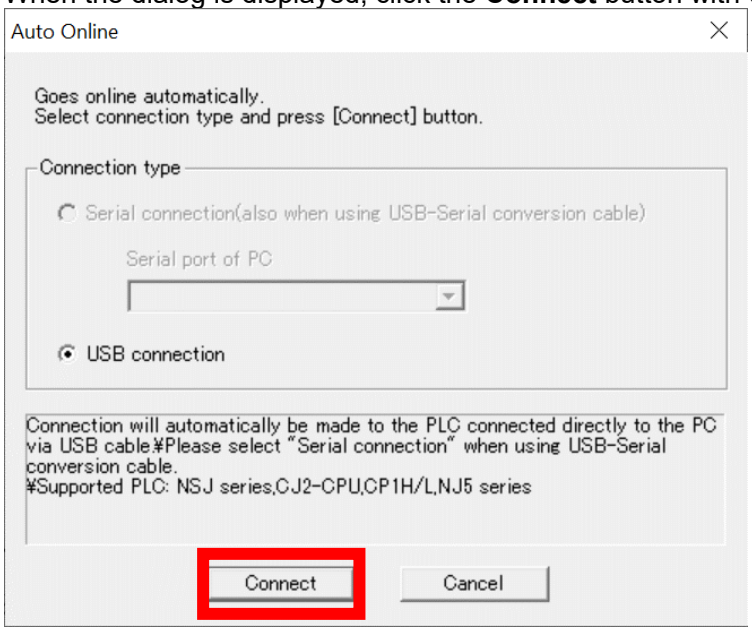
1. Start the CX-Integrator in the setup PC.



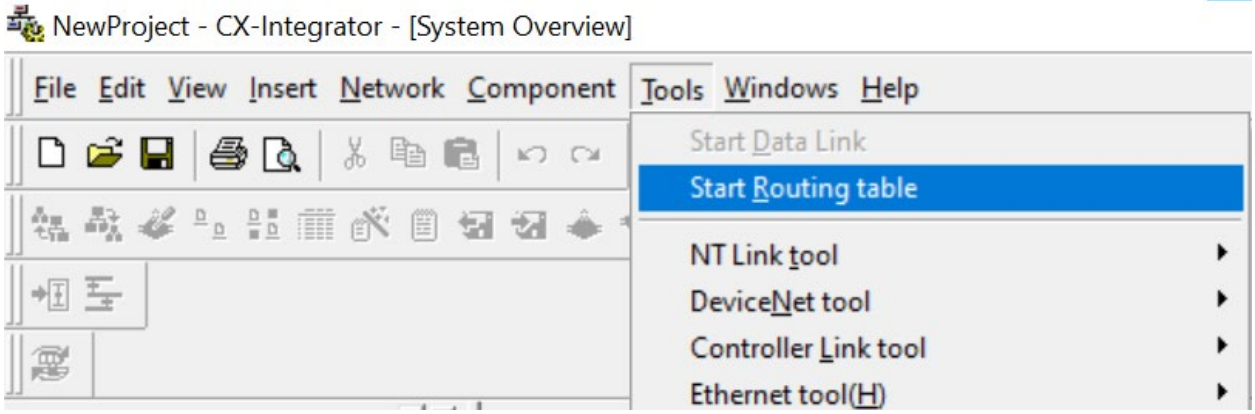
2. Click the **Auto Online** button.



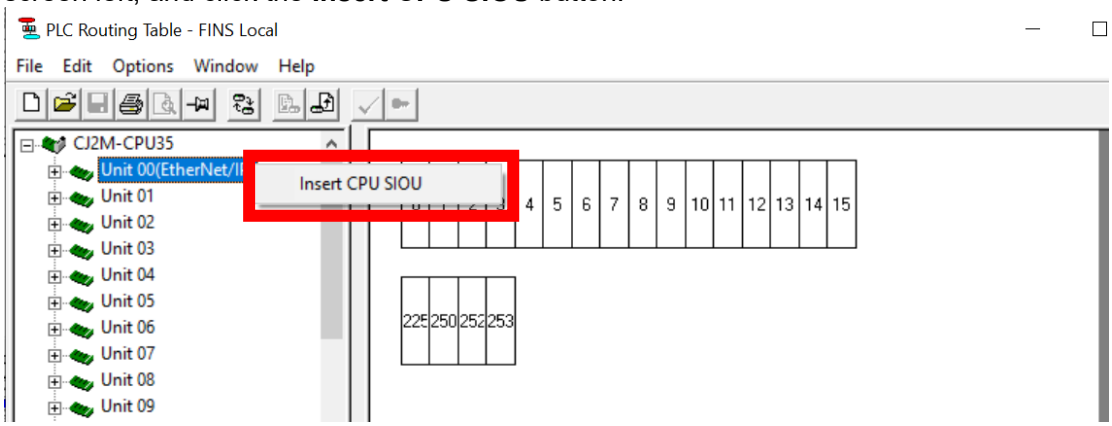
3. When the dialog is displayed, click the **Connect** button with **USB connection** selected.



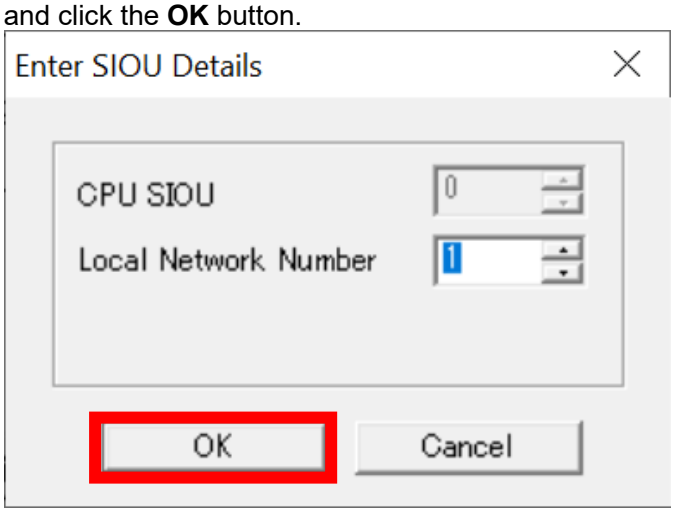
4. Click **Tools** – **Start Routing table** from the menu bar.



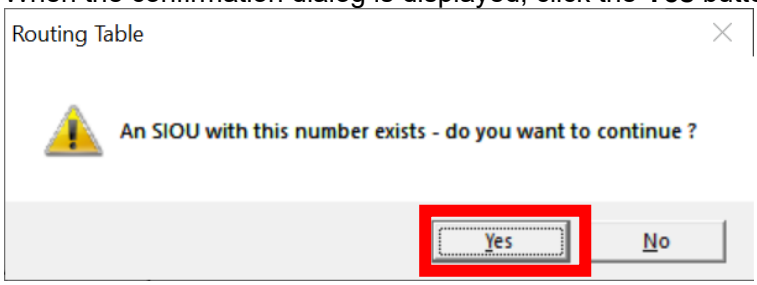
5. When the routing table setting screen is displayed, right-click **Unit 00 (Ethernet/IP)** in the screen left, and click the **Insert CPU SIOU** button.



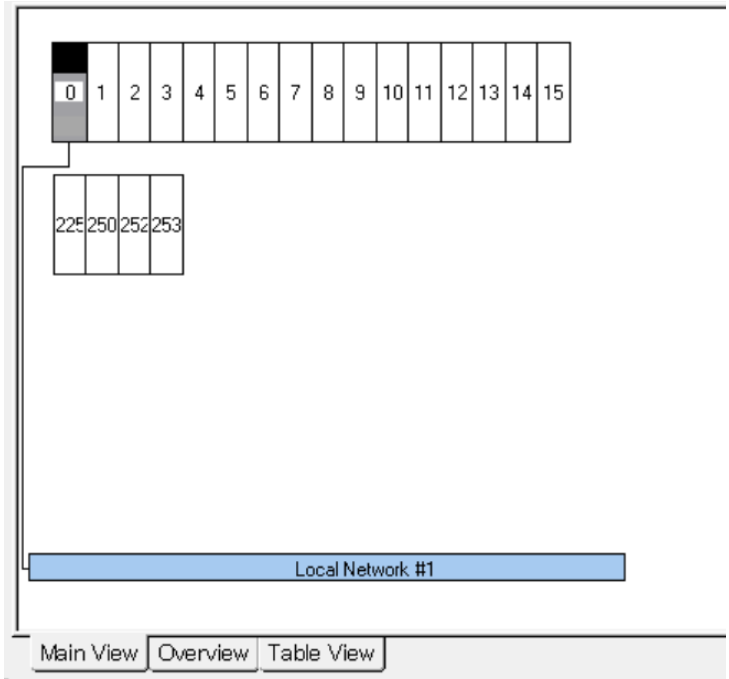
6. When the network address setting dialog is displayed, enter *1* into **Local Network Number** and click the **OK** button.



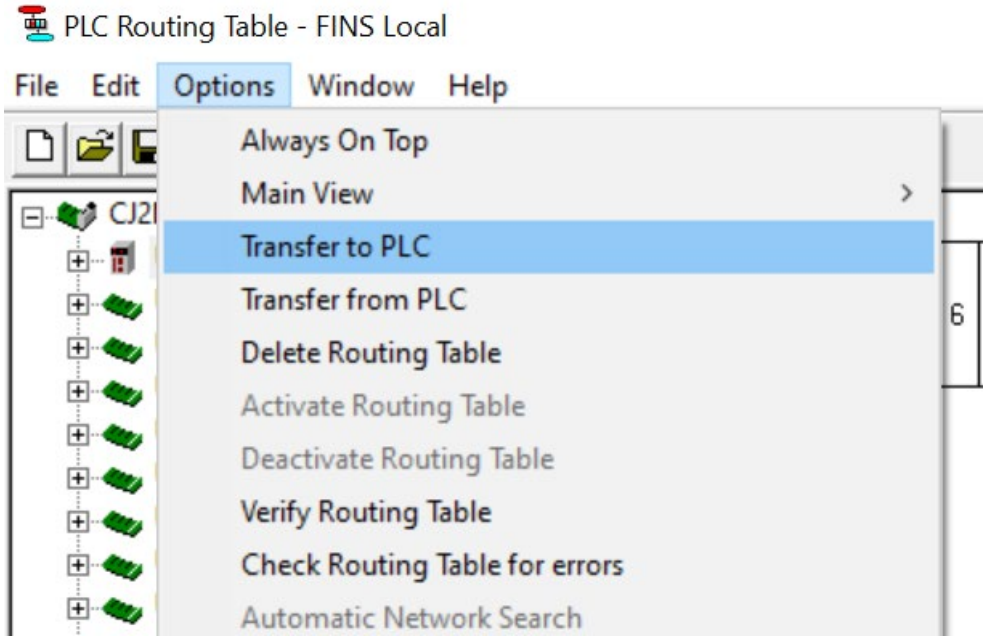
7. When the confirmation dialog is displayed, click the **Yes** button.



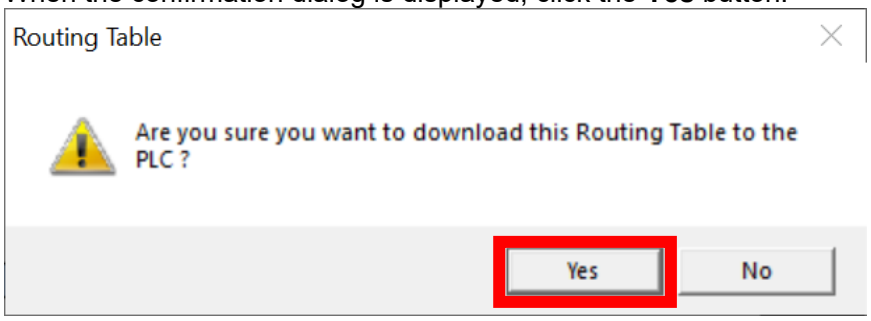
8. Check that the network address of the unit 0 is set at 1.



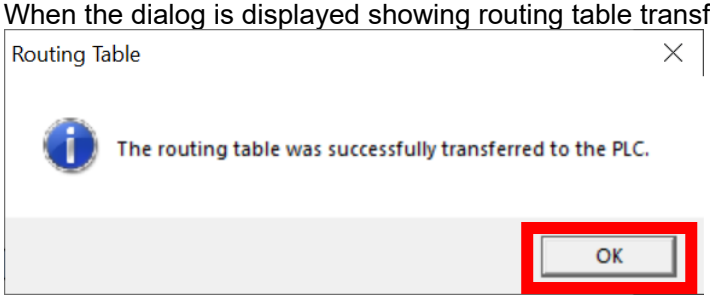
9. Click **Options** – **Transfer to PLC** from the menu bar.



10. When the confirmation dialog is displayed, click the **Yes** button.



11. When the dialog is displayed showing routing table transfer is completed, click the **OK** button.



6 Debugging

This section describes the debugging perspectives.
As a major premise, check the replaced screens of NA operate in the same manner as NS.
Since the following debugging perspectives are minimum confirmation items, the final judgment on debugging items is left to you.

Perspective	Test perspective
Communications Setup	Communications shall be established between NA and devices via designed communications method.
System settings	Check the following setting items. • Touch/Error sound • Screen saver • Initial display screen • System memory
Language settings	The same languages as NS shall have been set.
Alarm settings	Check the following setting items. • Address • Display text string • Group • Screen transition destination * Generally, the items above are major settings. Also check the other settings if any.
Data logging	Check the following setting items. • Address • Logging cycle setting • Logging file path * Check whether it is as specified, otherwise the save location will change.
Broken-line graph	Check the following setting items. • Address • Number of points displayed
Data block	Check the following setting items. • Address • Set value
Password	The behavior shall be equivalent to NS.
Unit	Check the following setting items. • The same scaling shall have been set.
Dialog settings	The dialog displayed shall contain the same words.
Project macro	Macros shall be executed under the same conditions as NS. The macro execution result obtained shall be the same as NS.

Perspective	Test perspective
General object settings	Check the following setting items. • Address assignment • Object shape for OFF/ON • Background color • Text color • Display text string * Check whether no characters lie off their objects. When multiple languages are used, check them for each language. • Font size * Same as above • Object size and layout * Since the resolution changes, the object size and the layout change subtly. Check whether the overall screen layouts are natural compared with the original screens. • Display control • Input control • Flicker setting • Macro setting
Screen transition	Screens shall transition to the same screens as the original ones. * The number of pop-up screens that can be displayed varies between NS and NA. Check whether they behave as described in the conversion specifications.
Error handling	Generate a typical error, such as sudden power interruption of host or NA and cable in/out during communications, and check the error display and recovery method in NA.
Behavior in case of communication error	If communications are cut off, the system shall not exhibit any unexpected behavior when restoring the communications. * If a write operation is performed to the Controller while communications are cut off, the NS Series will perform a write operation when restoring the communications; however, the NA Series will not perform a write operation but read the variables of the Controller then reflect them in the display.

7 Revision History

Revision history	Date	Revised content
01	January 2023	Original production
02	January 2024	Correction of erroneous descriptions
03	March 2024	Addition of NS-Runtime replacement model NS-Runtime has been added to the NS and NA resolution comparison table for reference in "4-2 Creation of Base Screens ".

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

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