OMRON

Programmable Terminal NA-series

Replace Guide
From NS to NA

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

SYSMAC
always in control

■ 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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  (b) Usage out of the conditions
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Table of Contents

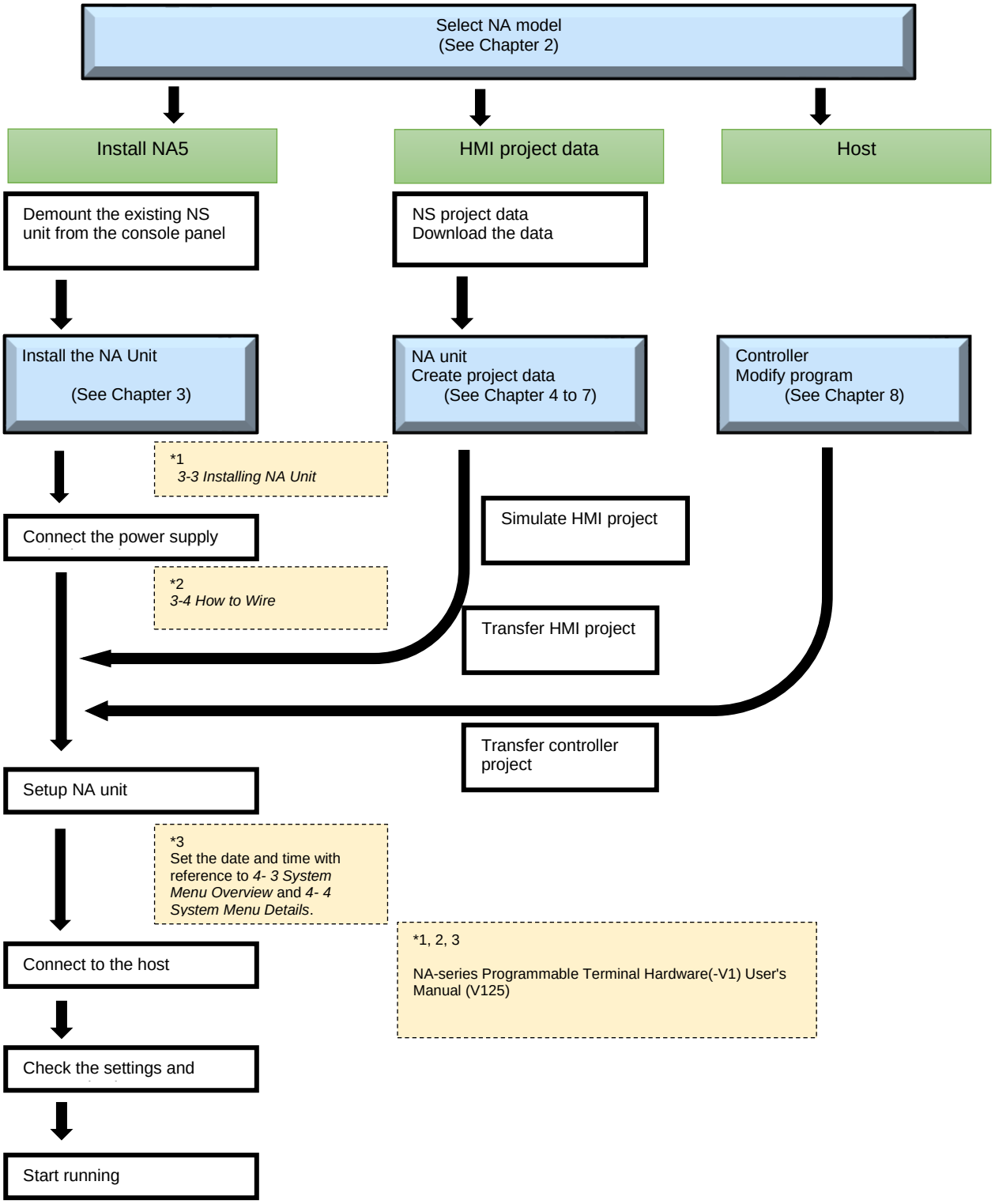
Related Manuals

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
V073	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

1 How to Replace NS to NA5

The following diagram illustrates the procedure for replacing an NS series unit to an NA series unit.



2 Select NA Model

2-1 Communication Protocols and External Devices

The table below shows communication protocols and host configurations for a NA system, which depending on the unit model and communication protocol in your NS system.
Refer to “NA-series Programmable Terminal Device Connection User's Manual” (V119) for available PLCs for each communication protocol.

<table>
<tr><th rowspan="2">NS Port</th><th colspan="3">NS host configuration</th><th colspan="2">Change in host configuration for NA</th></tr>
<tr><th colspan="2">Connect to</th><th>Protocol</th><th>Protocol</th><th>What to do with host unit</th></tr>
<tr><td rowspan="13">Ethernet</td><td rowspan="10">OMRON PLC</td><td>CV series</td><td>FINS</td><td>N/A</td><td>Replacement of the PLC is recommended.</td></tr>
<tr><td rowspan="2">CS1H/CS1G/CS1D</td><td>FINS</td><td rowspan="3">N/A</td><td rowspan="3">Connection with CS and CP series CPU Units will be supported soon.
Please contact our sales representative for details.</td></tr>
<tr><td>EtherNet/IP</td></tr>
<tr><td>CP1H/CP1L/CP2E</td><td>FINS</td></tr>
<tr><td>CJ1M Built-in ETN</td><td>FINS</td><td rowspan="2">FINS Ethernet</td><td rowspan="4">No change in the host configuration.</td></tr>
<tr><td>CJ1H/CJ1G/CJ1M + CJ1W-ETN21/CJ1W-EIP21</td><td>FINS</td></tr>
<tr><td rowspan="2">CJ2H/CJ2M</td><td>FINS</td><td>FINS Ethernet</td></tr>
<tr><td>EtherNet/IP</td><td>CIP Ethernet</td></tr>
<tr><td>NJ5/ NJ3/NJ1</td><td rowspan="2">EtherNet/IP</td><td rowspan="2">Ethernet</td><td rowspan="2">You need to change the connection to an EIP unit to a CPU Unit with built-in port.</td></tr>
<tr><td>NX7/ NX1/NX1P</td></tr>
<tr><td colspan="2">Delta Tau
Power PMAC EtherLite</td><td>Modbus/TCP</td><td>Modbus/TCP</td><td>Replacing with OMRON CK3E or CK3M series CPU Unit enables communications via Modbus/TCP.
Please consider this proposal.</td></tr>
<tr><td rowspan="4">Serial port A/B</td><td colspan="2" rowspan="3">OMRON PLC</td><td>Host Link</td><td rowspan="3">Change to the connection via Ethernet port</td><td rowspan="3">The serial connection will be supported soon.
Please contact our sales representative for details.
The serial connection will be available only in Host Link. If you connect more than one NS unit through 1:N NT Link, change the protocol to the Ethernet port connection.</td></tr>
<tr><td>1:1 NT Link</td></tr>
<tr><td>1:N NT Link</td></tr>
<tr><td colspan="3">OMRON Temperature Controller</td><td rowspan="6">N/A</td><td rowspan="6">--</td></tr>
<tr><td colspan="3">Other PLC</td></tr>
<tr><td colspan="3">Memory Link</td></tr>
<tr><td colspan="3">Modem</td></tr>
<tr><td colspan="3">Barcode Reader</td></tr>
<tr><td>Controller Link</td><td colspan="3">Controller Link device</td></tr>
<tr><td>Video input
RGB input</td><td colspan="3">Video camera and other video equipment</td></tr>
</table>

2-2 Display Size

Select an NA series unit according to the display size of your NS unit.
NS series units are equipped with 4:3 displays, but NA series units are equipped with 16:10 wide-type displays. An NA5 that has “W” in its model number is the wide display type.

NS Units to be Replaced				Recommended NA5 Units		
	Display Size	Resolution (Dots)			Panel size	Resolution (dot)
NS15	15.0 inches	1024 x 768	→	NA5-15W□□□□-V1	15.4 W	1280 x 800
NS12	12.1”	800 x 600	→	NA5-12W□□□□-V1	12.1 W	1280 x 800
NS10	10.4”	640 x 480				
NS8	8.1”	640 x 480	→	NA5-9W□□□□-V1	9.0 W	800 x 480
NS5	5.7”	320 x 240	→	NA5-7W□□□□-V1	7.0 W	800 x 480

2-3 SD Card (or USB Stick Memory)

The data logging function in the NA series stores the collected log data to an SD card or USB stick memory. Therefore, an SD card or USB stick memory must be mounted on the NA unit during the operation.

Note that you cannot use a USB stick memory in a high-vibrational environment. Also, the NA-series units are not equipped with a feature to fix the mounted stick memory. We recommend the SD card to store a long-time log data.

You need to consider the room for inserting and ejecting the SD card when installing an NA unit.

3 Install the NA Unit

Refer to “3-3 Installing NA Units” in “Programmable Terminal NA Series Hardware (-V1) User’s Manual” (V125) for details.

3-1 Panel cutout

3-1-1 Differences in Front Size and Panel Cutout Dimensions

The following is a comparison table of NS series and NA series.

(Units: mm)

NS				NA5			
NS	Thickness	Front dimensions	Panel cutout	NA5	Thickness	Front dimensions	Panel cutout
NS15	75.8	405 x 304	383.5 x 282.5	NA5-15W□□□□-V1	69	420 x 291	(392 + 1.0) x (268 + 1.0)
NS12	48.5	315 x 241	302 x 228	NA5-12W□□□□-V1		340 x 244	(310 + 1.0) x (221 + 1.0)
NS10							
NS8		232 x 177	220.5 x 165.5	NA5-9W□□□□-V1		290 x 190	(261 + 1.0) x (166 + 1.0)
NS5	54.0	195 x 142	184 x 131	NA5-7W□□□□-V1		236 x 165	(197 + +0.5) x (141 + +0.5)

3-1-2 Differences of Panel Cutout

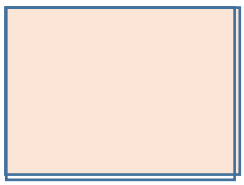
If the larger panel cutout size is necessary, you must enlarge the window in your control panel. Replacement from an NS15, NS12, or NS10 unit will leave a gap in height, which requires an adjustment plate. We do not provide dedicated plates because any replacements require widening the panel cutout. Please prepare one for yourself.

NS15 To NA5-15W□□□□-V1

Cut the width by 9 mm

A 14 mm gap in height

NS12/ NS10 To NA5-12W□□□□-V1



Cut the width by 8 mm

A 7 mm gap in height

NS8 To NA5-9W□□□□-V1

Cut the width by 41 mm

Heights are the same

NS5 To NA5-7W□□□□-V1

Cut the width by 13 mm

Cut the height by 10 mm

3-1-3 Differences of Front Size

Increase in the front size may cause an interference with devices around the panel.
The degree of interference depends on the cut in the panel cutout: same cuts in right/left or top/bottom, either of right/left, or either of top/bottom.

NS	NA5	Changes in front size	
		Width	Height
NS15	NA5-15W□□□□-V1	+20	-14
NS12	NA5-12W□□□□-V1	+25	+3
NS10			
NS8	NA5-9W□□□□-V1	+58	+13
	NA5-7W□□□□-V1	+4	-12
NS5	NA5-7W□□□□-V1	+41	+23

3-2 Precautions for Connecting to a Power Source

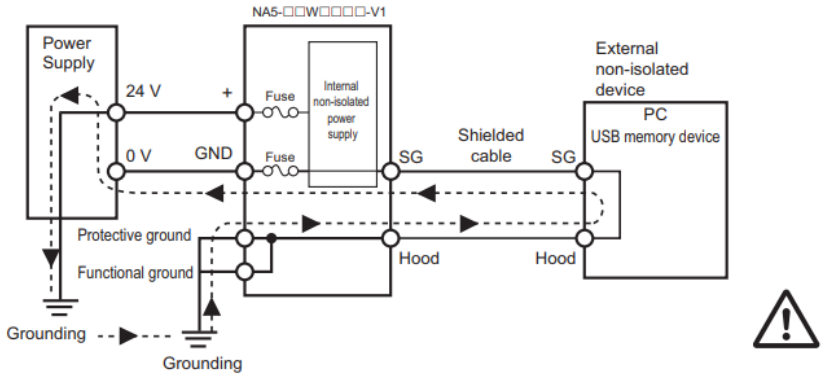
3-2-1 Differences in Power Circuit

The internal power supply of the NS series units is an isolated circuit, but in the NA series units, internal power supply is a non-isolated DC power supply.

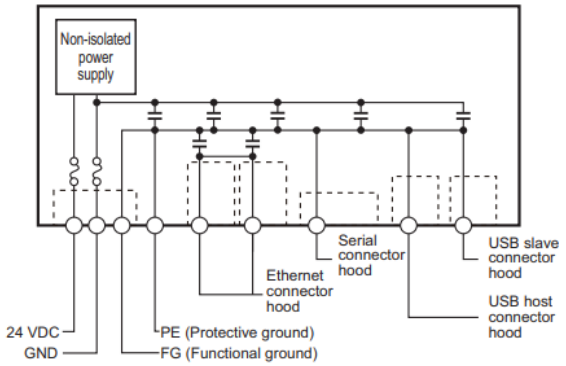
⚠ WARNING

Replacing an NS unit that is positively grounded to 24 V supply power with an NA unit as is will cause a short circuit and damage the device, as illustrated below. Ground the negative side or add an isolation transformer.
Also, to use a power supply that does not contain a protection circuit, supply power to the NA unit through a fuse or other protective element.

24 V Grounding Power Supply



NA5-□□W□□□□-V1 grounding diagram



3-2-2 Change in Supply Terminals

NS series units are equipped with a screwed supply terminal block, but NA series units' supply terminal block is a connector-type.
Change the power cable, if necessary.

Do not place heavy goods on the cable or pull the cable with force because the connector is mounted in the joint.

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4 Create NA HMI Project Data

You cannot reuse NS project data for NA series units.
Open a NS project data in CX-Designer to see your system configuration and settings of functional object properties. Then, create an NA project data by using Sysmac Studio.

4-1 Major Differences Between NS and NA

The following table shows major differences between NS and NA that you need to know in creating an NA project data.

Item	NS series	NA
Display resolution	4:3 display	16:9 wide-type display. Based on the object layout in the NS unit, objects will be arranged on the upper left of the NA screen, and a blank space will be left on the right side.
Serial port	Two serial ports for a PLC, bar code reader, and Memory Link device.	Serial 1 port is reserved for future expansion and not for PLC. Use an Ethernet port for connection to the host PLC.
Video input	The video input object can display video inputs from a video input board attached on the expansion I/F or RGB input board on the user screen.	You cannot connect an I/F board usable in NS series units. Video inputs are not available.
Project data	NS series-specific project data. No compatibility with NA series project data.	NA series-specific project data. No compatibility with NS series project data.
Support tool	You can edit and transfer project data with CX-Designer, which included in CX-One.	You can edit and transfer HMI project data with Sysmac Studio.
Memory on a host device	You can directly assign device addresses of a host PLC. Also, you can use variables. Tags are available while connecting via EtherNet/IP.	To specify the data for an HMI object, you can use a global variable. Also, you can specify a device address for a device variable where the global variable is assigned. Note that only tags are available while connecting via CIP Ethernet, and you cannot use device addresses.
The maximum sheets for one screen *A sheet is called as background page in NA.	10 sheets	1 sheet (page) However, you can use a base screen, to which a sheet is applied, as sheet in NA series units. Therefore, you can use more than one sheet.
PT clock setting	You can set or change the internal clock from the system menu, the date and time objects, and the system memory.	You cannot set the clock with the DateTime object. Use the system menu or a subroutine.
Pressing multiple points on the touch-screen at a time	You can press multiple points on the touch-screen at a time except in NS15 units.	NA units do not support pressing multiple points on the touch-screen at a time. However, pressing a function key at the bottom of the NA unit and a point on the touch-screen together is possible. Also, you can press more than one Na's function key simultaneously. Please consider modifying the implementation as needed.
System ten-key	Japanese language input, including single Kanji input, is available with a string input ten-key pad.	The IME input function enables Hiragana and Kanji input using Roman characters. You can input Chinese and other languages.
User-made keypad	You can create a user keypad using command buttons or **Key Button** of Multifunction, and the pop-up function. You can specify a keypad for each functional object.	The custom keypad function allows you to create a user keypad. Keypads are determined depending on what you input: the numeral and the hexadecimal keypads for numerical values, and the string keypad for character strings.
The number of pop-ups	Up to 3 pop-ups at a time	Only 1 pop-up
Macro (Called as Subroutine in NA)	You use NS-specific scripts. Macro set conditions are grouped by project, screen, and functional object. Project: Loading a project, alarm/event occurring, alarm/event cleared, bit changing, and value changing	Visual Basic 2008 (VB hereafter) is adopted. There are limited or extended functions. Subroutine descriptions in this document conform to Visual Basic. A subroutine is defined as either of global subroutine or page subroutine, and unlike NS series, you cannot

	Screen: Loading a screen and unloading a screen	create a subroutine for each object. Set conditions for subroutines are consolidated in Events. Some macros for NS series can be substituted with the Events and Actions feature of NA series. Please consider the macro behavior in replacing.
Password authentication for manipulating objects	You can create a password authentication, which requires a password for manipulating an object.	Please consider employing the account security method, which requires user authentication with a password on the login page and enables you to switch access to an object by the security level. See the alternative VB code in Chapter 5-9 for your reference.

4-2 Differences in Ethernet Host Connection

All NA series units connect to a host unit in an Ethernet port.
NS series units specifies all SYSMAC-NJ series units as “SYSMAC-NJ”, but in NA series, controllers are set by models, such as NJ, NX, and other. Change settings for the model of the controller to connect.

NS series		NA		
Communication Settings - Host Type	Communication Settings - Protocol	Device References - External Device - Device Configuration		
		Device Vendor	Device Series	[Communication Driver]
SYSMAC-CJ1	FINS	Omron	CJ	FINS Ethernet
SYSMAC-CJ2				
SYSMAC-CJ2	EtherNet/IP	Omron	CJ	CIP Ethernet
SYSMAC-NJ	EtherNet/IP	Omron	NJ	Ethernet
			NX7	
			NY	
			NX1P2	
			NX102	
			NX-CSG320	

4-3 Host Addresses and Variables

4-3-1 How to Assign Data

For NS series units, information about the contacts and channels of a host, which is assigned to a functional object or alarm, is specified by using a device address, variable, or tag (network variable). Device address is referred as just “address” in CX-Designer.

Device to Connect	Data	Data Type Assignment in NS
CJ1/CJ2	Device address	The data type will be automatically selected for a functional object using a device address.
CJ2/NJ	Tag (Network variable)	The data type selected for a variable will be used.
NJ	Global variable	

In NA series, data are assigned to objects with NA *Global Variables* or *System Variables* in all cases.

You need to map host addresses of connecting devices, variables, and tags (network variables) to global variables of the NA series.

Device to Connect	Data	Variable mapping	Data Type Assignment in NA	Remarks
CJ1/CJ2	Device address	Required	Though device addresses do not require data types, you need to	Select a data type according to a functional object used in

			select adequate data types in the NA series.	the NS unit.
CJ2/NJ	Tag (Network variable)	Required	The data type set for the variable will be used.	
NJ	Global variable	Required		
-	Global variable	Not required	You can map the global variables.	NA's internal variables
-	System variable	Not required	Use the data types given by the system.	

Precautions for Correct Use

When mapping a host address of a connecting device to an NA global variable, pay particular attention to the size of the global variable. For instance, mapping the whole DM area to an array may burden the data transmission and impair the NA unit's responsiveness.

4-3-2 Variable Data Type Conversion

NS series units comply with data types of CJ series and NJ/NX series.
In NA series units, data types of global variables and device variables are VB data type and data types depending on devices, respectively.

When you enter a device variable in **AT** of the **Global Variables** tab page and their data types are different, the data acquired from the device will be automatically converted according to the data type. The data that changed in the HMI will be reversibly converted. Data types other than BCD will be converted to the same types, but named differently.

NS Data Type				NA Data Type		
Data Type	Size	Data Type	Location	Device Variable		Global variable
				CJ	NJ	
Boolean	1-bit	BOOL	Format for storing functional object value, variable, and tag	BOOL		Boolean
Signed integer	1 bytes	SINT		-	SINT	SByte
Unsigned integer	1 bytes	BYTE USINT		-	BYTE USINT	Byte
Signed integer	2-byte	INT		INT		Short
Unsigned integer		WORD UINT CHANNEL		WORD UINT		UShort
Signed integer	4-byte	DINT		DINT		Integer
Unsigned integer		UDINT DWORD		UDINT DWORD		UInteger
Floating point		REAL		REAL		Single

Signed integer	8-byte	LINT		LINT		Long
Unsigned integer		ULINT LWORD		ULINT LWORD		ULong
Floating point		LREAL		LREAL		Double
Character string	Variable length	STRING		STRING		String
Date & Time	-	TIME		-	TIME	Date
		DATE		-	DATE	
		TIME_OF_DAY		-	TIME_OF_DAY	
		DATE_AND_TIME		-	DATE_AND_TIME	

The following shows data types of BCD variables.
Because BCD type is not available in [Global Variables], use a signed or unsigned integer type for signed or unsigned NS data type, respectively.

NS Data Type				NA Data Type		
Data Type	Size	Data Type	Location	Device Variable		Global variable
				CJ	NJ	
Unsigned BCD integer (For CJ only)	2-byte	UINT_BCD	Variable and tag	UINT_BCD	-	UShort
	4-byte	UDINT_BCD		UDINT_BCD	-	UInteger
	8-byte	ULINT_BCD		ULINT_BCD	-	ULong
Unsigned BCD integer	4-byte	BDC2 (Unsigned 1-WORD)	Value storing format for functional objects	UINT_BCD	-	UInteger
	8-byte	BDC2 (Unsigned 2-WORD)		UDINT_BCD	-	ULong
Signed BCD integer	4-byte	BCD1 (Signed 1-WORD, highest-order digit is F)		Convert the data type with the PLC program because the signed BCD integer is unavailable in the NA series.		
		BCD2 (Signed 1-WORD, upper1-bit)				
	8-byte	BCD1 (Signed 2-WORD, highest-order digit is F)				
		BCD2 (Signed 1-WORD, upper 1-bit)				

When you use a structure or a union, pay attention to the member structure and data type consistency of member variables.

4-3-3 Processing BCD Type

If your HMI is connected to a PLC older than the CJ series, in some cases, most of the data in the PLC are treated as the BCD type integer values.

In NS series units, you can determine whether to handle the integers as BCD type or BIN type integer by specifying in the property of a function or functional object. If the data in the PLC are BCD type, they are handled as BCD integers.

On the other hand, in NA series units, only BIN integers are available in internal processing but not BCD integers. However, if data is set to a BCD type integer, such as UINT_BCD, DINT_BCD, LINT_BCD, in the **Data Type** field of the **Device Variables** pane and it is mapped to a global variable, the PLC will handle the data as the BCD type integer and NA can automatically convert BCD-BIN internally. Just after being imported, the data type of the imported device variable is either of CHANNEL, DWORD, or LWORD. Change the data type to UINT_BCD, DINT_BCD, or LINT_BCD, respectively.

This auto-conversion function is not available for a signed BCD integer. You must set variables in the NA series with variable types according to the number of bytes stored, and must convert the BCD and BIN types using a VB program on the NA or a program on the PLC.

4-3-4 Specify Device Address of NS

In the NA series, specify device addresses in the **Device Variables** pane. Enter a device address

in the **AT** field.
You can use a device address directly for specifying the functional object data in the NS series. On the other hand, device address specification method in NA is an indirect way using a device variable and global variable: you specify the with a global variable and specify a device Variables for the AT, and a device address for the AT of the device variable. Also, the global variable and device variable have variable types. You need to specify correct types for each variable.

Replace data specification with the initial address and the number of access points, which used for a broken-line graph and macro in NS, with the method using an array containing the same number of elements as the access points.

Specified device addresses in the NS series unit are registered to the CX-Designer's variable table with names "AutoGen + number." Only the initial address of the contact data is registered as BOOL, and the numeral or string data as CHANNEL, respectively. The variable table does not include information of how to handle as other data types, such as signed or unsigned, BCD, array, and others. Check the settings of the functional object to which the address or variable is assigned to select a correct variable type.

4-3-5 How to Connect to CJ Series Unit

For data assignment in connecting to a CJ series PLC via CIP Ethernet, you can use tags only. Therefore, you may need to change the data assignment method or connection method depending on the current data assignment.

			Connection in NA	
		Where to be assigned in NS	FINS Ethernet	CIP Ethernet
Connection in NS	FINS	Device address	With no change	**To tags**
		Variable		
	EtherNet/IP	Device address	With no change	**To tags**
		Variable		
		Tag	**Tags to variables**	With no change

Connection via CIP Ethernet	Replace all the variables and device addresses used for data specification with tags. In addition, register the tags to a CJ series CPU Unit as network variables. Conduct the following procedure. **To Tags** 1. Import variables to device variables following the procedures in "4-3-7 Import CX-Programmer Variable Table to NA Device Variables" and "4-3-9 Import NS Variable Table to NA Device Variables." 2. Click the header **AT** of the **Device Variables** pane in Sysmac Studio to sort the variables by AT. 3. Select the variables whose AT fields are filled and copy them with the Ctrl + C keys. 4. Paste them with the Ctrl + V on the Symbol Table edit pane of CX-Programmer. The **Paste Symbol** dialog appears. Select the **Comment** column and click the **Left** button to move an AT specification to the **Address** column. Click **OK** to finalize variable pasting.

	5. Double-click each pasted variable to display the **New Symbol** dialog, then check the **Net. Variable** box and click **OK** to handle the variables as network variables. 6. Return to the **Device Variables** edit pane and delete AT of the variable whose **AT** is set to treat it as tag.
Connection via FINS Ethernet	The network configuration will change following the change in communications from Ether IP. Therefore, you need to change the FINS network configuration, such as FINS node address and FINS routing table. If you are using tags for data assignment, replace the tags with variables. **Tags to variables** 1. First, import variables to device variables following the procedures in "4-3-7 Import CX-Programmer Variable Table to NA Device Variables" and "4-3-9 Import NS Variable Table to NA Device Variables." 2. Click the header **AT** of the **Device Variables** pane in Sysmac Studio to sort the variables by AT. Then extract tags whose **AT** fields are empty. Perform the following for the extracted tags. 3. Search for tags with the same names in the variable table edit pane of CX-Programmer. Check the **Address/Value** column. 4. Set the values of **Address/Value** in CX-Programmer to the **AT** fields of the tags in the **Device Variables** pane of Sysmac Studio.

Refer to "NA-series Programmable Terminal Device Connection User's Manual" (V119) for details.

4-3-6 Where to Register NS Variables

In the NS series, device address specifications, variables, and tags are registered to the variable table of CX-Designer. Variables in the NA series are registered as shown in the table below.

NS Connecting Host	Import to
NS internal memory (PTMEM)	Global Variables HMI − Data − Global Variables
Serial connection FINS connection host Ethernet/IP connection host	Device Variables Configurations and Setup - Device References - External Device - Variable *Select the host name for **External Device**.

Refer to Section 3 "Connecting an OMRON NJ/NX/NY-series Controller" in "NA-series Programmable Terminal Device Connection User's Manual" (V119) for details on importing the variable table while connecting to an NJ series unit.

You can import the data from the CX-Designer variable table following the procedures in "4-3-8 Import NS Variable Table to NA Global Variables" and "4-3-9 Import NS Variable Table to NA Device Variables," though it is not an intuitive operation like the one Sysmac Studio or CX-Programmer provides.

4-3-7 Import CX-Programmer Variable Table to NA Device Variables

Refer to Section 4 “Connecting an OMRON CJ-series PLC” in “NA-series Programmable Terminal Device Connection User’s Manual” (V119) for details on importing data from the CX-Programmer variable table while connecting to a CJ series unit.

4-3-8 Import NS Variable Table to NA Global Variable

Import the variables assigned to the internal NS memory (PTMEM) to NA’s global variables.

1. Open the Symbol (variable) Table in CX-Designer.
2. Press the **All** button under **Host** to filter hosts.

Symbol Table

Add | Find | Find Unused Symbols | Prev. | Next | Clear searc

Host	Name	Type	Address Type/Number	I/O Comment	Tag
All		All	All		All
PTMEM	AutoGen1	BOOL	$B0		None
PTMEM	AutoGen2	CHANNEL	$W0		None
PTMEM	AutoGen3	BOOL	$SB0		None
PTMEM	AutoGen4	BOOL	$SB11		None
PTMEM	AutoGen5	CHANNEL	$SW6		None
PTMEM	AutoGen6	CHANNEL	$SW7		None
PTMEM	AutoGen7	CHANNEL	$SW8		None
PTMEM	AutoGen8	CHANNEL	$SW12		None
PTMEM	AutoGen9	BOOL	$SB9		None
PTMEM	AutoGen10	BOOL	$B1		None
HOST3	AutoGen11	CHANNEL	00000i0		None
HOST3	AutoGen12	CHANNEL	00000i4		None
HOST4	TAG_Z	CHANNEL[10]			Network Variable

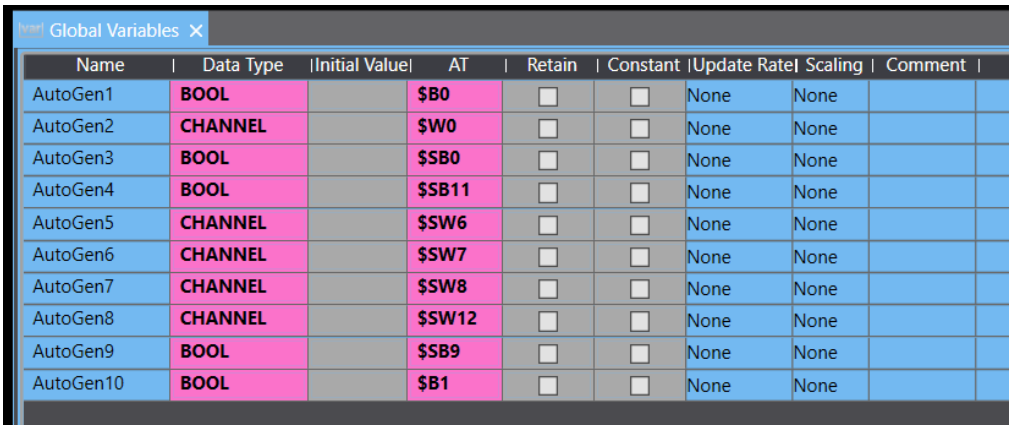
3. Select **PTMEM** to display PTMEM (Internal NS memory) variables only.

Symbol Table

Add | Find | Find Unused Symbols | Prev. | Next | Clear sea

Host	Name	Type	Address Type/Number	I/O Comment	Tag
PTMEM		All	All		All
PTMEM	AutoGen1	BOOL	$B0		None
PTMEM	AutoGen2	CHANNEL	$W0		None
PTMEM	AutoGen3	BOOL	$SB0		None
PTMEM	AutoGen4	BOOL	$SB11		None
PTMEM	AutoGen5	CHANNEL	$SW6		None
PTMEM	AutoGen6	CHANNEL	$SW7		None
PTMEM	AutoGen7	CHANNEL	$SW8		None
PTMEM	AutoGen8	CHANNEL	$SW12		None
PTMEM	AutoGen9	BOOL	$SB9		None
PTMEM	AutoGen10	BOOL	$B1		None

4. Press the Ctrl + A keys to select all and the Ctrl + C keys to copy to the buffer.
5. Paste into an empty Excel sheet.
6. Move column E (I/O comment) to column I.
7. Fill up columns E and F in all the rows with data with “FALSE.” In the same way, enter “0” and “” in columns G and H, respectively.
8. If a string in column D, Address Type/Number, begins with “$H,” change column E to “TRUE.”
9. Insert a column to the left of column D.
10. Delete column A (Host).
11. Select columns from A to H of the rows with data and press the Ctrl + C keys to copy.
12. Select **Data** - **Global Variables** in Sysmac Studio and paste.



13. Unusable Data Type and AT will be shown in pink. Modify them in the next step.

Refer to “4-3-2 Variable Data Type” for how to replace data types.
In this example, change BOOL to Boolean and CHANNEL to Ushort, respectively.

Data in AT column are displayed as error because the letter “$” at the top is not allowed by the Na series variable naming rules.
If a device is assigned to the system memory $SB or $SW, refer to “4-5 System Memory” to replace with a system variable or other.

4-3-9 Import NS Variable Table to NA Device Variables

Import the variables assigned to a host device connected to the Ethernet port or serial port to NA device variables.
If you have imported the variables of the host from the CX-Programmer’s symbol table, variables you are going to import may have the same name and get duplicated.

1. Open the Symbol (variable) Table in CX-Designer.
2. Press the **All** button under **Host** to filter hosts.
3. Press the Ctrl + A keys to select all and the Ctrl + C keys to copy.
4. Paste into an Excel sheet.
5. Delete column A.
6. Insert a column to column C.
7. Select columns from A to D of the rows with data and press the Ctrl + C keys to copy.
8. Select **Device References** - **External Device** - **Variables** in Sysmac Studio. Then Select **Paste** from the right-click menu to import variables.
9. Unusable Data Type and AT will be shown in pink. Modify them in the next step.

Refer to the table in “4-3-2 Variable Data Type” for replacing data types.
For example, importing a variable whose type is SINT or CHANNEL results in an error. Modify the data type to WORD or UINT according to the original data type.

4-4 Project Settings and Functional Objects

This section provides comparative tables of functions of NS series and NA series.
Refer to appendices for details of properties.

4-4-1 Appendix 1: Project Common Settings

NS	NA	Remarks	Item in Appendix
System Memory	System Variable	-	System Memory
Alarm/Event	HMI - User Alarms	-	Alarm
Unit/Scale	HMI - Scale Transformations	Only scale transformation is supported. Unit transformation is not available.	Scale
Broken-line Graph	HMI - Data Group	-	Broken-line Graph
Data Block	HMI − Recipe	Resources is the corresponding function but settings and features are quite different.	Data Block
Data Log	HMI - Data Logging	-	Data Log
Operation Log	Configurations and Setup - Operation Log Settings	-	-
Dialog Setting	No corresponding function	-	-
String Table	HMI - Resources	Resources is the corresponding function but settings and features are quite different.	-

→ Appendix 1: Project Common Settings

4-4-2 Appendix 2: Object Common Settings

NS	NA	Remarks	Item in Appendix
Frame	Standard Controls - Tab Control	-	Frame
Common Setting of Object: Frame	No corresponding function	-	-
Common Setting of Object: Flicker	No corresponding function	-	-
Common Setting of Object: Text Attributes	Object - Properties - Appearance - Font	-	Text Attributes
Common Setting of Object: Control Flag	Object - Properties - Behavior Object - Animations - Enable Object - Animations - Visibility	-	Common of Parts
Common Setting of Object: Size/Position	Object - Properties - Layout	-	

→ Appendix 2: Object Common Settings

4-4-3 Appendix 3: Buttons

NS	NA	Remarks	Item in Appendix
ON/OFF Button (Momentary)	Buttons - MomentaryButton	-	ON/OFF Button ON/OFF Button_Shape
ON/OFF Button (Alternate)	Buttons - ToggleButton	To group objects into a radio button, go Standard Controls - Radio Button.	
ON/OFF Button (SET)	Buttons - SetButton	-	
ON/OFF Button (RESET)	Buttons - ResetButton	-	
Word Button (Set Value)	Buttons - Button	Select **SetVariable** from **Events and Actions** to set an input value.	Word Button Word Button_Shape
Word Button (Increment/Decrement)	Button - Button	Select **IncreaseVariable** or **DecreaseVariable** from **Events and Actions**, to set increase/decrease value.	
Word Button (Display Pop-up Menu)	Standard Controls - DropDown	-	
Command Button (Switch Screen)	Buttons - Button	Select **ShowPage** from **Events and Actions** to specify an destination screen.	Command Button Command Button_Function Command Button_DB
Command Button (Backward)	Button - Button	Select **ShowPreviousPage** from **Events and Actions**.	
Command Button (Key Button)	-	This function cannot be substitute by a part. A subroutine can partly perform the function.	
Command Button (Control Pop-up Screen - Close pup-up screen)	Button - Button	Select **ClosePage** from **Events and Actions** to specify the page name to close.	
Multifunction	Button - Button	No dedicated part. Setting more than one event or action in **Events and Actions** enables to perform multiple functions with one part.	Multifunction Multifunction_Function

→ Appendix 3: Buttons

4-4-4 Appendix 4: Lamps

NS	NA	Remarks	Item in Appendix
Bit Lamp	Lamps - Bit Lamp	-	Bit Lamp Bit Lamp_Shape
Word Lamp	Lamps - Data Lamp	-	Word Lamp Word Lamp_Shape
Text	Standard Controls - Label or Standard Controls - TextBox	-	Text
Text (Message Display)	Lamps - Data Lamp	Unlike NS series units, you cannot change the font type and size for every state. Colors of backgrounds and texts are changeable.	-
Numeral Display & Input/ String Display Input (Input Enable)	Standard Controls - Data Edit	-	Numeral Display String Display
Numeral Display & Input/ String Display Input (Input Disable)	Standard Controls - Data Display	-	
List Selection	Standard Controls - ListBox	-	List
Thumbwheel Switch	No corresponding function	There is no replaceable single object. You can create a similar function by combining data display parts and event/action of a button.	-
Date Object Time Object	Standard Controls - DateTime	Displaying date and time are performed in one setting. You can display date only or time only by configuring the display format. In NA series units, the date/time setting is not available in the form of functional object.	DateTime DateTime_Format
Bitmap	Standard Controls - Image	-	BMP

→ Appendix 4: Lamps

4-4-5 Appendix 5: Graphs

NS	NA	Remarks	Item in Appendix
Level Meter	Gauges - Linear Gauge (Horizontal/Vertical)	-	Level Meter
Analogue Meter	Gauges - Rotational Gauge	-	Analogue Meter
Broken-line Graph	HMI Controls - Broken-line Graph	-	Broken-line Graph
Data Log Graph	HMI Controls - Trend Graph	-	Data Log DateTime_Format

→ Appendix 5: Graphs

4-4-6 Appendix 6: Alarms

NS	NA	Remarks	Item in Appendix
Alarm/Event Display	No corresponding function	-	-
Alarm/Event Summary and History	HMI Controls - User Alarms Viewer	*HistoricalMode* is selected	Alarm History
Data Block Table	HMI Controls - Recipe Viewer	-	Data Block
Contents Display	Lamps - Data Lamp	You cannot change the color or font of texts for every state.	Contents Display
Video Display	No corresponding function	-	-
Temporary Input	No corresponding function	-	-
Consecutive Line Drawing	No corresponding function	-	-

→ Appendix 6: Alarms

4-5 System Memory

NS series units has bits and integers for states of system operation in the range of $SB0 to 63 and $SW0 to 40 in the PT Memory.

In the NA series, you can duplicate the system memory functions of the NS series with system variables, Events and Actions function, and subroutines.
There are no system variables for the functions unavailable in NA series, e.g., Video Input.
A system variable that has a corresponding function may have different behavior or value, e.g., beginning with 0 or 1.
Refer to System Memory in “4-4-1 Appendix 1: Project Common Settings” for details.

For the system memories $SB54 to 58 and $SW39, regarding the password function, see “5-9 Password.”

4-5-1 System Memory: Variable Mapping

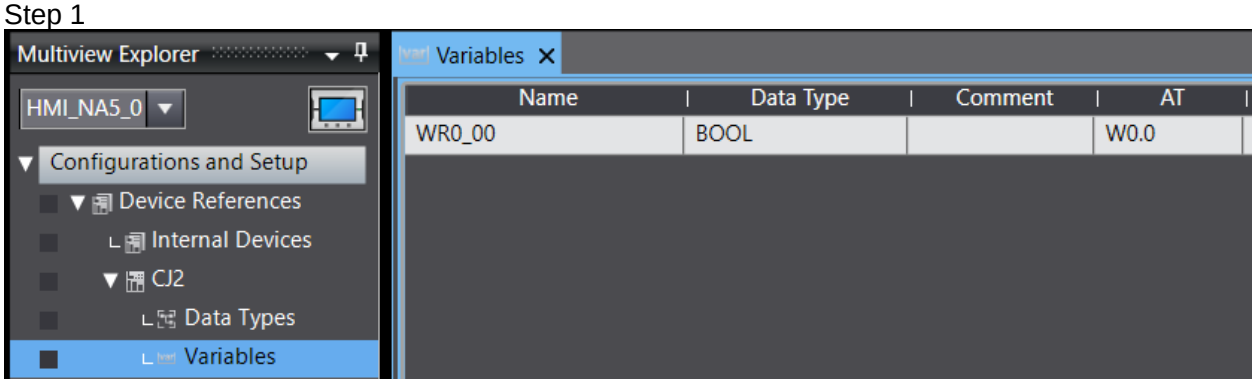
This section shows how to replace system memories, supported by variable mapping in the System Memory sheet in “Appendix 1: Project Common Settings.”

The procedure depends on whether you have assigned the system memory to a connecting host unit or used inside the NS unit.

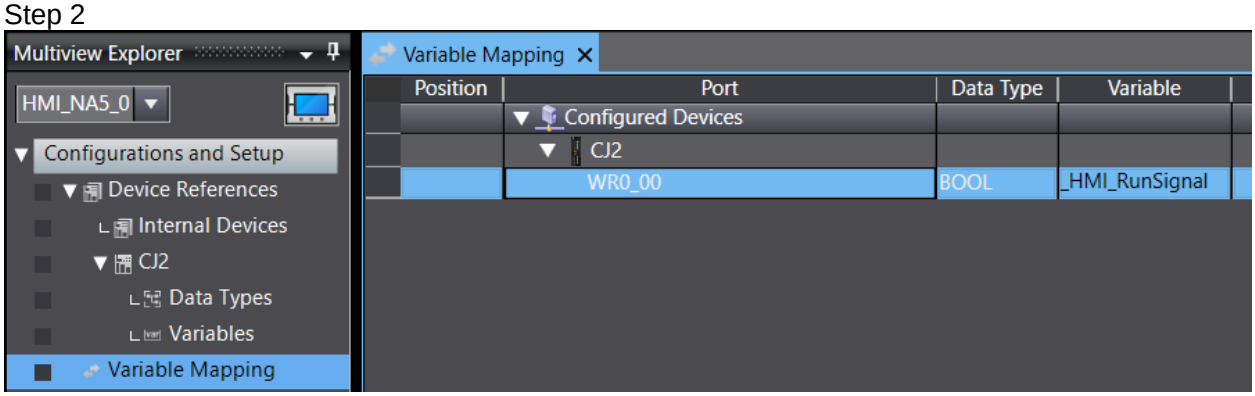
The following provides how to replace the system memory that has been assigned to a connecting host unit.
This is an example of the system memory $SB0 assigned to WR0.00 in the host unit.

1. Create a variable of WR0.0 in the Variables tab in Device References.
2. In the Variable Mapping tab, assign the system variable *_HMI_RunSignal* to the variable you have created in Step 1.

Step 1



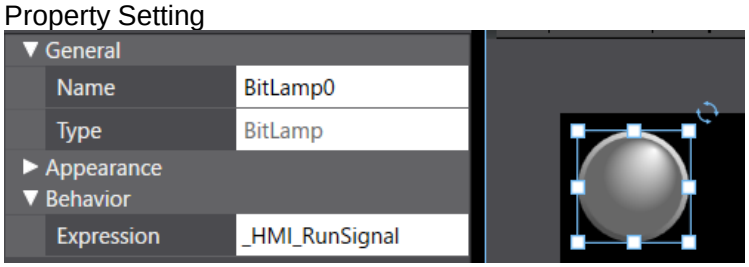
Step 2



The following describes how to replace the system memory that you have used inside the NS unit.
This is an example of the system memory $SB0 assigned to the display address of a Bit Lamp Object.

1. Enter *_HMI_RunSignal* in the Expression property of the Bit Lamp Object.

Property Setting



Other system memories, which are supported by variable mapping, can be replaced in the same manner.

4-5-2 System Memory: Global Event

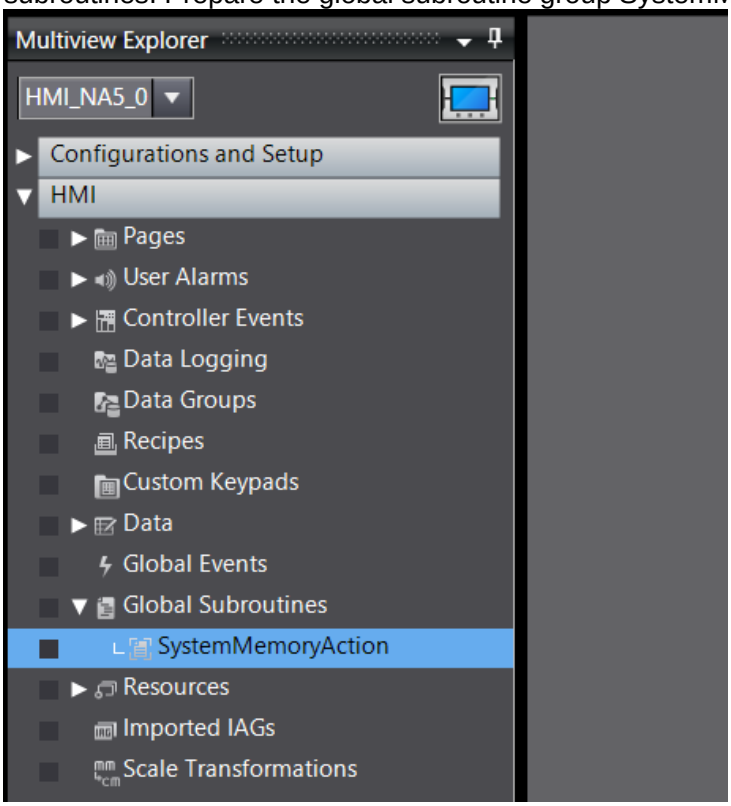
This section shows how to replace system memories, supported by global event in the System Memory sheet in “Appendix 1: Project Common Settings.”
The following describes how to replace the system memory that you have used inside the NS unit. A variable name is either SB** or SW**.
If you have assigned the system memory to the connecting host unit, map the system memory to a variable in advance.
Then, replace $SB** or $SW** with the mapped variable name.

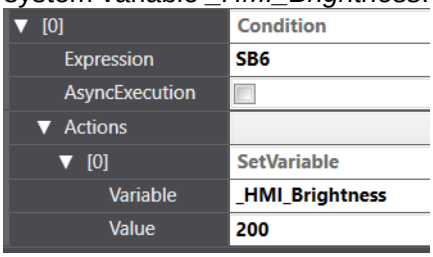
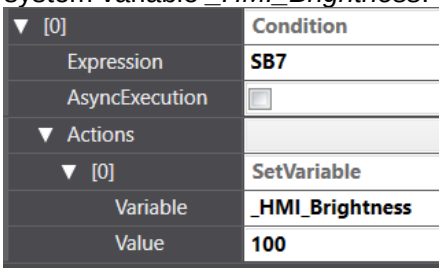
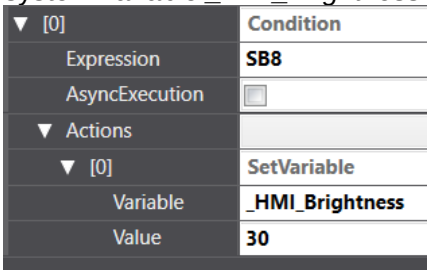
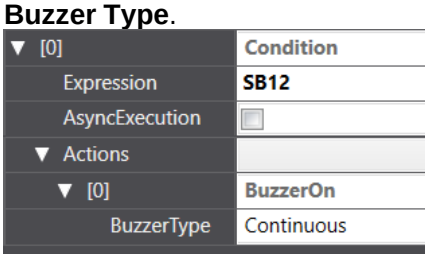
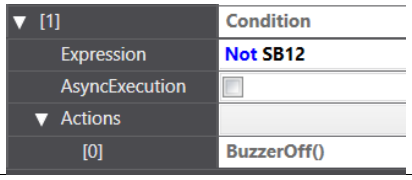
1. Write a subroutine that will be executed when $SB** turns ON or OFF, according to the table below.
2. In **Condition** of **Events** under **Events and Actions** of the global event, Enter *Variable 1* in the **Expression** box and any event in the **Actions**.

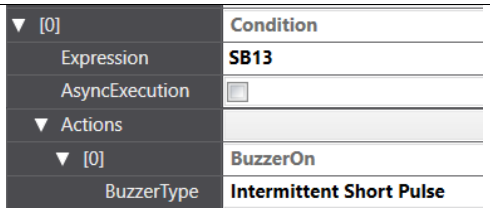
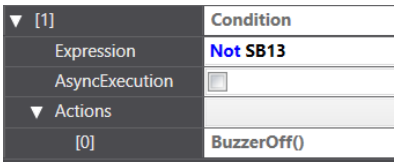
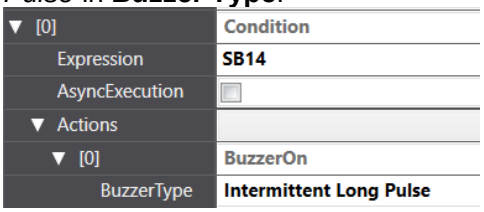
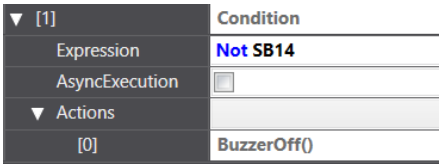
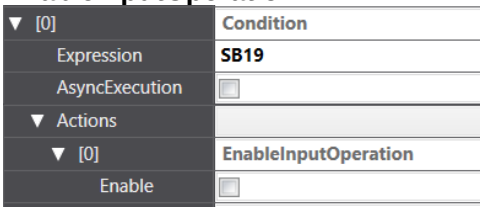
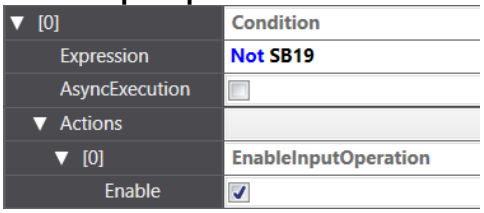
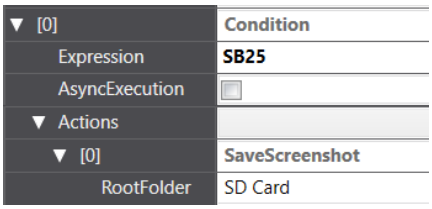
   Enter *Not Variable 1* in the **Expression** box and any event in the **Actions**.

   This event will be executed only once when the condition is met.

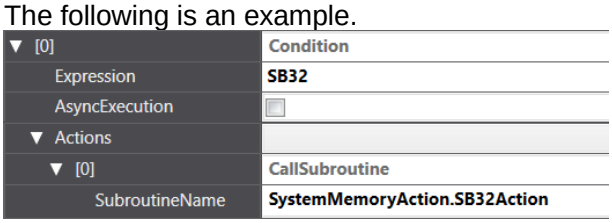
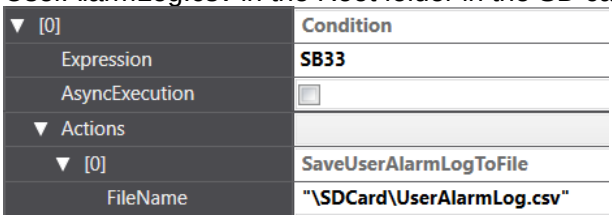
You use Global Subroutines in this chapter.
This chapter describes the procedure using a global subroutine group *SystemMemoryAction* to add subroutines. Prepare the global subroutine group SystemMemoryAction in advance.

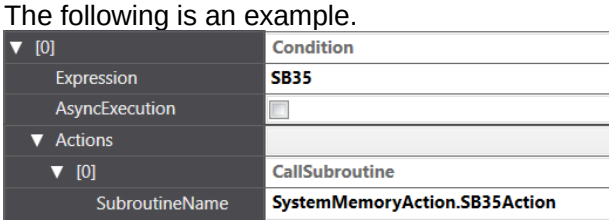


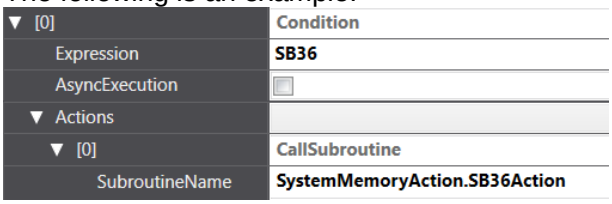
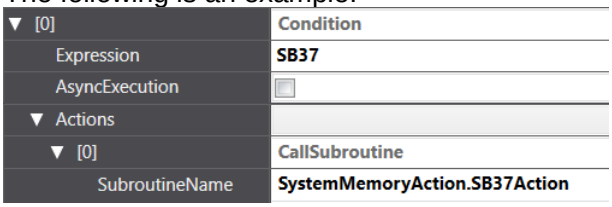
NS System Memory		How to Reproduce in NA	
		Execution Condition	Setting Up Global Events
$SB6	Brightness Adjust (High) *1	ON	Click **Actions** - **SetVariable**, and enter a value for the system variable *_HMI_Brightness*. 
$SB7	Brightness Adjust (Middle) *1	ON	Click **Actions** - **SetVariable**, and enter a value for the system variable *_HMI_Brightness*. 
$SB8	Brightness Adjust (Low) *1	ON	Click **Actions** - **SetVariable**, and enter a value for the system variable *_HMI_Brightness*. 
$SB12	Continuous Buzzer	ON	Click **Actions** - **BuzzerOn**, and select *Continuous* in **Buzzer Type**. 
		OFF	Select *BuzzerOff* in **Actions**. 
$SB13	Short Intermittent Buzzer	ON	Click **Actions** - **BuzzerOn**, and select *Intermittent Short Pulse* in **Buzzer Type**.

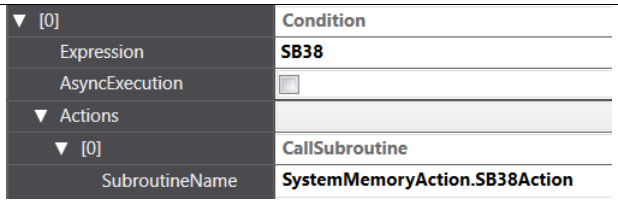
<table>
<tr><td></td><td></td><td></td><td> 
</td></tr>
<tr><td></td><td></td><td>OFF</td><td>Select BuzzerOff in Actions.
 
</td></tr>
<tr><td>$SB14</td><td>Long Intermittent Buzzer</td><td>ON</td><td>Click Actions - BuzzerOn, and select Intermittent Long Pulse in Buzzer Type.
 
</td></tr>
<tr><td></td><td></td><td>OFF</td><td>Select BuzzerOff in Actions.
 
</td></tr>
<tr><td>$SB19</td><td>Prohibit Input *2</td><td>ON</td><td>Check the Enable box for Actions - EnableInputOperation.
 
</td></tr>
<tr><td></td><td></td><td>OFF</td><td>Uncheck the Enable box for Actions - EnableInputOperation.
 
</td></tr>
<tr><td>$SB25</td><td>Start Printing/Capture Screen</td><td>ON</td><td>Select SaveScreenshot for Actions and specify the destination in the RootFolder box.
 
</td></tr>
</table>

<table>
<tr><td>$SB32</td><td>Initialize Alarm/Event History</td><td>ON</td><td>Substitute this with the NA function ClearUserAlarmLog().
Copy and paste the following subroutine in the global subroutine in advance.
Sub SB32Action
‘Initialize Alarm/Event history
ClearUserAlarmLog()
‘Automatically off SB32
SB32 = False
End Sub

Then, create an event, select CallSubroutine in Actions, and register the subroutine.
The following is an example.
 
</td></tr>
<tr><td>$SB33</td><td>Save Alarm/Event History</td><td>ON</td><td>Select SaveUserAlarmLogToFile for Actions.
Since $SB33 automatically turns OFF after the execution, add an action fpr the process of turning OFF $SB33.
In the following settings, the log data will be saved as UserAlarmLog.csv in the Root folder in the SD card.
 
</td></tr>
<tr><td>$SB35</td><td>Initialize Data Log</td><td>ON</td><td>Substitute this with the NA function ClearDataLogBuffer(DataSetName).
Copy and paste the following subroutine in the global subroutine in advance.
Sub SB35Action
‘Initialize data log
‘Specify data set to initialize as argument
ClearDataLogBuffer("DataSetName")
'Automatically off SB35
SB35 = False
End Sub

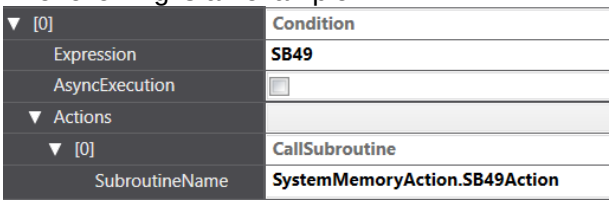
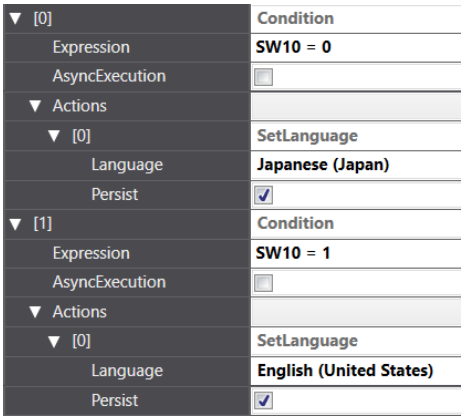
Then, create an event, select CallSubroutine in Actions, and register the subroutine.
The following is an example.
 
</td></tr>
<tr><td>$SB36</td><td>Save Data Log</td><td>ON</td><td>Substitute this with the NA function ExportDataLogBuffer(DataSetName).</td></tr>
</table>

			Copy and paste the following subroutine in the global subroutine in advance. Sub SB36Action ‘Save data log ‘Save data set specified as argument ExportDataLogBuffer("DataSetName") 'Automatically off SB36 SB36 = False End Sub Then, create an event, select CallSubroutine in Actions, and register the subroutine. The following is an example. 
$SB37	Initialize Operation Log	ON	Substitute this with the NA function *ClearOperationLogBuffer().* Copy and paste the following subroutine in the global subroutine in advance. Sub SB37Action 'Initialize operation log ClearOperationLogBuffer() 'Automatically off SB37 SB37 = False End Sub Then, create an event, select CallSubroutine in Actions, and register the subroutine. The following is an example. 
$SB38	Save Operation Log	ON	Substitute this with the NA function *SaveOperationLogToFile(FileName).* Copy and paste the following subroutine in the global subroutine in advance. Sub SB38Action ‘Save operation log ‘Specify path to save as argument SaveOperationLogToFile("¥SDCard¥OperationLog.csv") ‘Automatically off SB38 SB38 = False End Sub Then, create an event, select CallSubroutine in Actions, and register the subroutine. The following is an example.

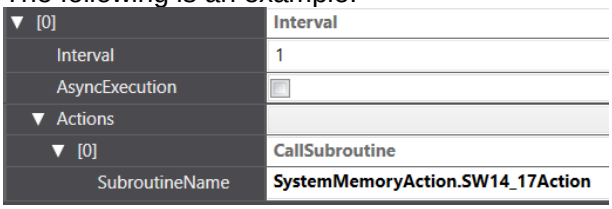
<table>
<tr><td></td><td></td><td></td><td> 
</td></tr>
<tr><td>$SB49</td><td>Stop Memory Card</td><td>ON</td><td>Substitute this with the NA function EjectSDMemory().
Copy and paste the following subroutine in the global subroutine in advance.
Sub SB49Action
‘Make SD card removable

EjectSDMemory()
‘Automatically off SB49
SB49 = False
End Sub

Then, create an event, select CallSubroutine in Actions, and register the subroutine.

The following is an example.
 
</td></tr>
<tr><td>$SW10</td><td>Current Label No.</td><td>When changing value</td><td>Set SetLanguage in Actions.
Specify the value of SW10 in Expression to display the label in the corresponding language.
In the following configuration, the label will be displayed in Japanese when SW10 = 0, and in English when SW10 = 1.
 

Checking the Persist box retains the display language settings after turning OFF and ON the NA unit.</td></tr>
<tr><td>$SW14 to 17</td><td>Current Date and Time</td><td>Interval</td><td>Copy and paste the following subroutine in the global subroutine in advance.
Sub SW14_17Action
‘Convert second and minute
Dim second = _HMI_Second
Dim minite = _HMI_Minute
SW14 = ((minite << 8) Or second)</td></tr>
</table>

			‘Convert date and time Dim hour = _HMI_Hour Dim day = _HMI_DateTime.Day SW15 = ((day << 8) Or hour) ‘Convert year and month Dim month = _HMI_DateTime.Month Dim year = _HMI_DateTime.Year year = year Mod 100 SW16 = ((year << 8) Or month) ‘Convert day of the week SW17 = _HMI_DateTime.DayOfWeek End Sub Then, create an event, select CallSubroutine in Actions, and register the subroutine. The following is an example. 

*1: In the NS series, if the backlight brightness adjustment system bits turned ON at the same time, the higher brightness bit has the priority.
In the NA series, the brightness adjustment setting of the system bit that turned on last is enabled.

*2: In NS series units, you are allowed to operate a dialog shown by the system, but in NA series, all the touch-screen operations are prohibited.

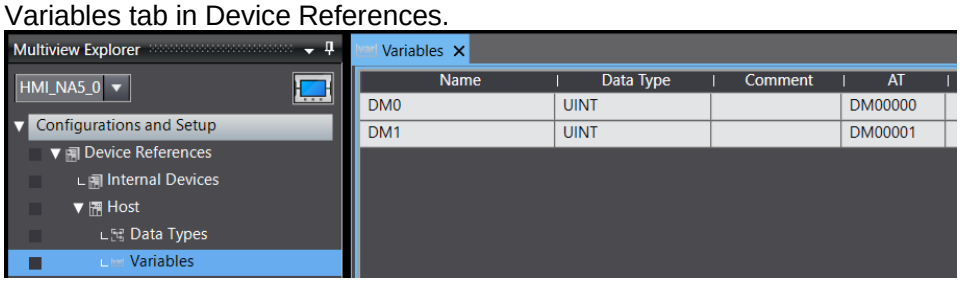
If the above system memories are assigned to the connecting host unit, you can replace the process of controlling the system memories from the connecting host unit by mapping the system memories following the method in “4-5-1 System Memory: Variable Mapping" and assigning them to expressions in the global event.

4-5-3 System Memory: Supported by VB

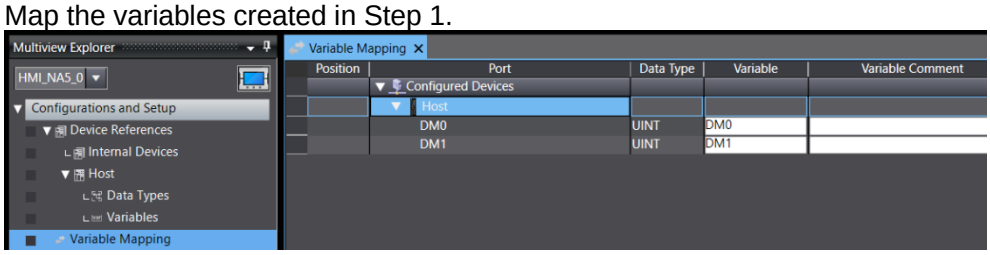
This section shows how to replace system memories, supported by VB in the System Memory sheet in “Appendix 1: Project Common Settings.”

Replace the system memories $SW0 (Current screen number) and $SW1 (Current pop-up screen number) using the procedure shown below.
In this example, $SW0 is assigned to DM0 in the connecting host unit, and $SW1 is assigned to DM1.
If other addresses have been assigned, please read as above.
The control method of current screen numbers differs in the NS and NA series. Therefore, the behavior cannot be duplicated perfectly.
For example, the connecting host unit can specify a pop-up page number to display on the NA unit, but the NA unit does not notify the pop-up page number to the connecting host unit.

1. Create variables DM0 and DM1, to which the connecting host unit is assigned, in the Variables tab in Device References.



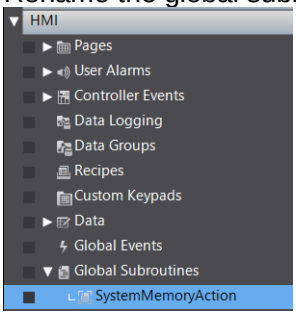
2. Map the variables created in Step 1.



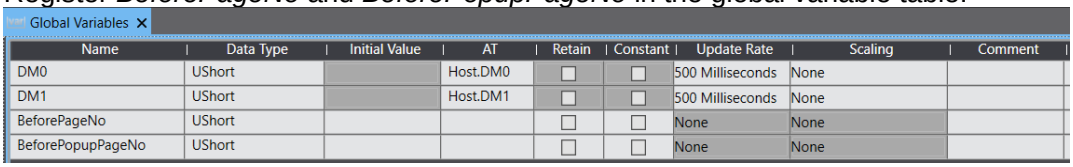
3. Copy and paste the following to the global subroutine.

```
Dim switchingPage As Boolean

'Page number in Host to NA
Sub ConvertHostPageNoToNAPageNo
  If switchingPage Then Exit Sub
  switchingPage = True

  BeforePageNo = DM0
  _HMI_CurrentPageIndex = DM0

  switchingPage = False
End Sub

'Page number in NA to Host
Sub ConvertNAPageNoToHostPageNo
  If switchingPage Then Exit Sub
  switchingPage = True

  BeforePageNo =CType(_HMI_CurrentPageIndex, UShort)
  DM0 = CType(_HMI_CurrentPageIndex, UShort)

  switchingPage = False
End Sub

'Pop-up page number in Host to NA
'Pop-up page number is notified from Host to NA only
Sub ConvertHostPageNoToNAPageNoPopupPage
  If switchingPage Then Exit Sub
  switchingPage = True

  If DM1 = 0 Then
    ClosePage(_HMI_CurrentPage)
    BeforePopupPageNo = DM1
    switchingPage = False
    Exit Sub
  End If

  BeforePopupPageNo = DM1
  _HMI_CurrentPageIndex = DM1

  switchingPage = False
End Sub
```

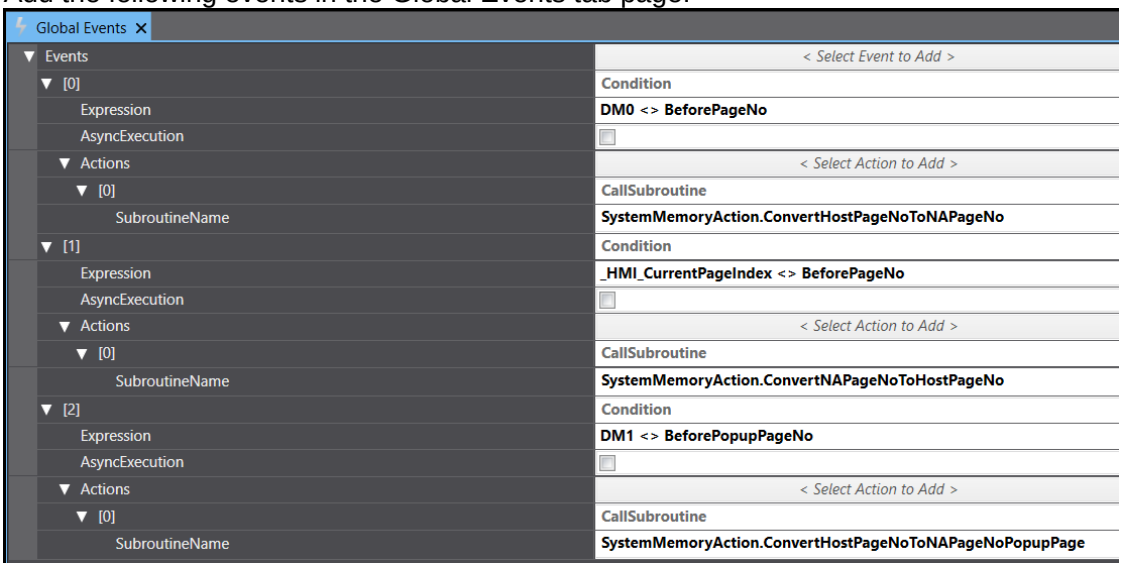
4. Rename the global subroutine group you have edit in Step 3 as *SystemMemoryAction*.



5. Register *BeforePageNo* and *BeforePopupPageNo* in the global variable table.



6. Add the following events in the Global Events tab page.



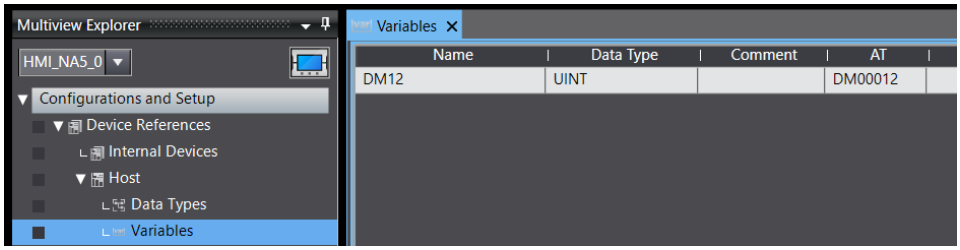
The table provides expressions and subroutines for events described in Step 6.
You can copy and paste them for adding events.

Event No.	Expression	Subroutine
0	DM0 <> BeforePageNo	SystemMemoryAction.ConvertHostPageNoToNAPageNo
1	_HMI_CurrentPageIndex <> BeforePageNo	SystemMemoryAction.ConvertNAPageNoToHostPageNo
2	DM1 <> BeforePopupPageNo	SystemMemoryAction.ConvertHostPageNoToNAPageNoPopupPage

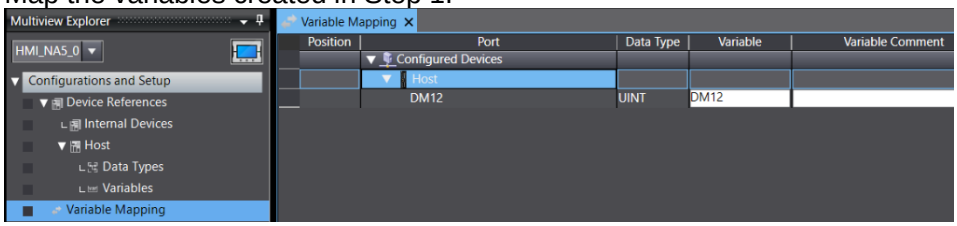
Note: Setting a screen number 10,000 or greater will cause an error in the above method.
Do not set 10,000 or greater for the screen number.
In addition, if you use the pop-up screen number currently displayed as the input condition in the ladder diagram of the connecting host unit, the ladder diagram may not run properly.
Change the input condition of the ladder to the current screen number, or other workaround is necessary.

You can duplicate $SW12, Backlight Brightness Control (32 levels), using the following procedure.
In this example, $SW12 is assigned to DM12 in the connecting host unit.
If other addresses have been assigned, please read as above.

1. Create a variable of DM12 in the Variables tab in Device References.



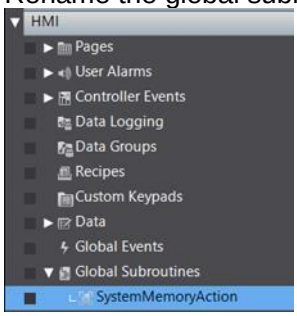
2. Map the variables created in Step 1.



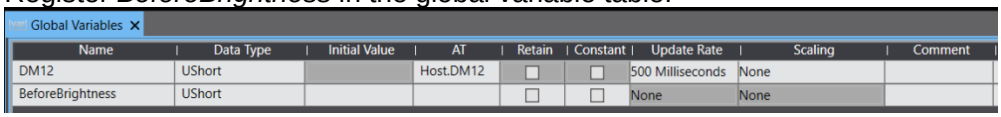
3. Copy and paste the following to the global subroutine.

```
Const MaxBrightness As Integer = 200
Const MaxBrightnessLevel As Integer = 32
Const BrightnessInterval As Double = CType(MaxBrightness, Double) /
CType(MaxBrightnessLevel, Double)
Dim RequiredBrightness As Integer = MaxBrightness 'Default value

Sub ChangeBrightness
  BeforeBrightness = DM12
  _HMI_Brightness = TranslateBrightnessLevel(DM12)
End Sub

'1->1
'.....
'32->200
Function TranslateBrightnessLevel(brightnessLevel As Integer) As Integer
  If brightnessLevel < 1 Then
    Return 1
  Else If brightnessLevel >= MaxBrightnessLevel Then
    Return MaxBrightness
  End If

  Return Math.Round(BrightnessInterval * brightnessLevel)
End Function
```

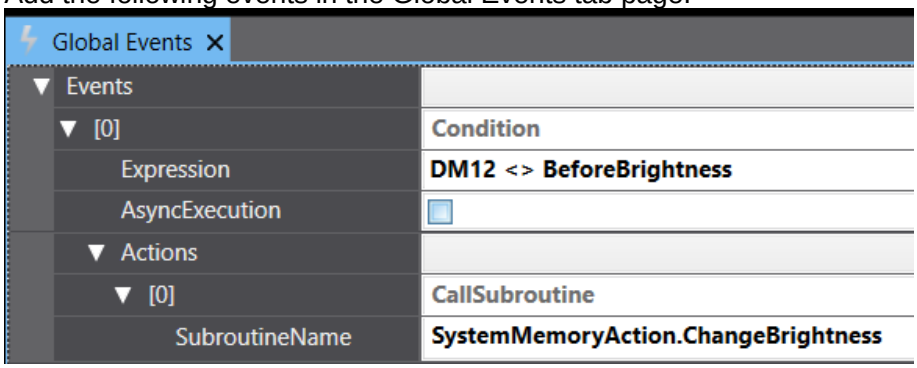
4. Rename the global subroutine group you have edit in Step 3 as *SystemMemoryAction*.



5. Register *BeforeBrightness* in the global variable table.



6. Add the following events in the Global Events tab page.



The table provides expressions and subroutines for events described in Step 6.
You can copy and paste them for adding events.

Event No.	Expression	Subroutine
0	DM12 <> BeforeBrightness	SystemMemoryAction.ChangeBrightness

4-5-4 System Memory: Array

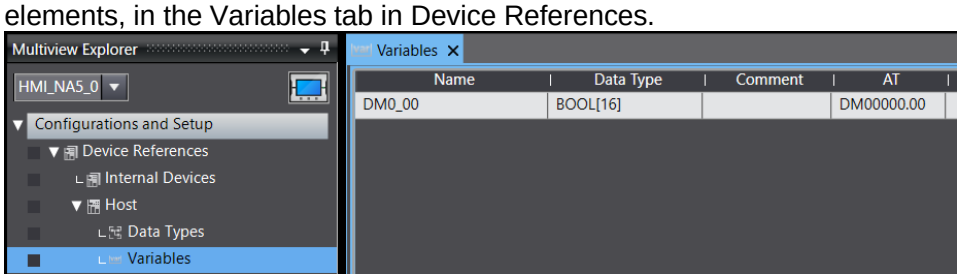
This section shows how to replace system memories, Array in the System Memory sheet in “Appendix 1: Project Common Settings.”

You can replace the system memories $SW27 to 36 (offset value for index I0 to I9) using the following procedure.
You will use $SW27 to 36 for the indirect reference of address. Therefore, look up the address range for the indirect reference in advance, using the cross reference or another method.

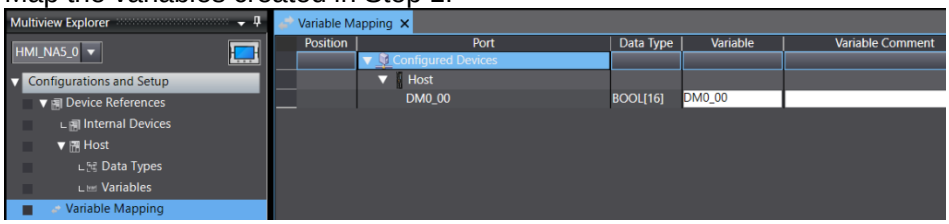
- Example of indirect reference with ON/OFF Button Object (bit data)
  This section describes the replacing method using the following setting.

Object used	ON/OFF Button Object
Address used for	Output and Display addresses
Indirect reference address range	D0.00 to 0.16
System memory	SW27

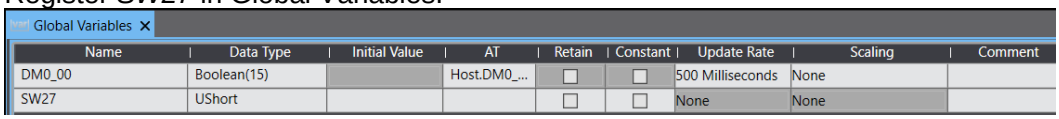
1. Create an array, which is assigned to DM0.00 in the connecting host unit and has 16 elements, in the Variables tab in Device References.



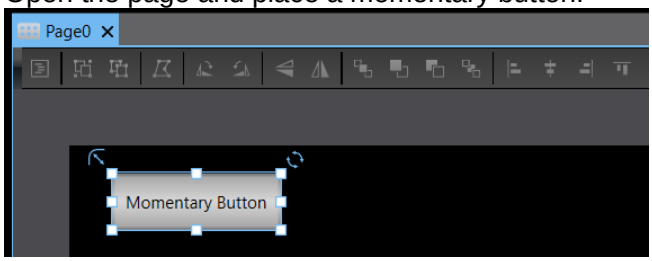
2. Map the variables created in Step 1.



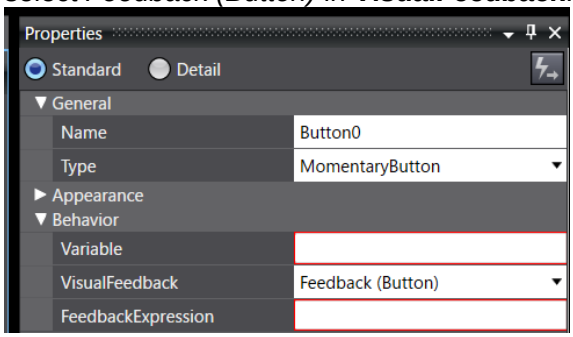
3. Register *SW27* in Global Variables.



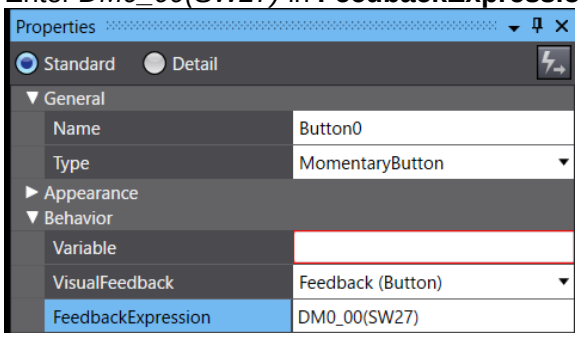
4. Open the page and place a momentary button.



5. Open the Properties pane while selecting the momentary button created in Step 4. Then, select *Feedback (Button)* in **VisualFeedback**.



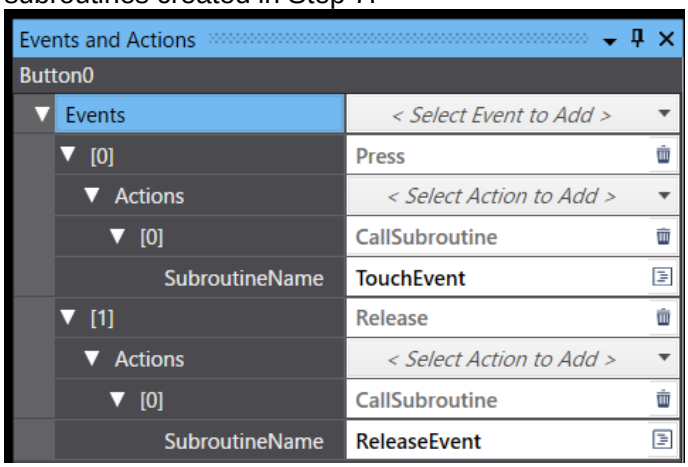
6. Enter *DM0_00(SW27)* in **FeedbackExpression.**



7. Open Page Subroutines to copy and paste the following.

```
Sub TouchEvent
  DM0_00(SW27) = True
End Sub

Sub ReleaseEvent
  DM0_00(SW27) = False
End Sub
```

8. In **Events and Actions** of the button, add *Press* and *Release* events. Then, assign the subroutines created in Step 7.

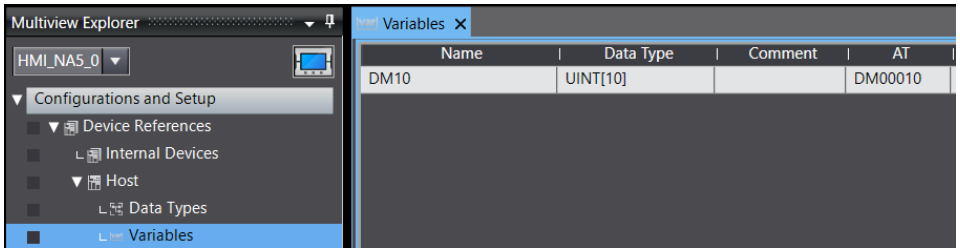


Note: When setting the Variable property, you cannot specify a variable as an index for an array. Therefore, the elements of the array that turns ON/OFF are indirectly referenced in the subroutine.
In the Expression property, you can specify variable as an index for an array.
You can specify an expression as an index to move the offset position.

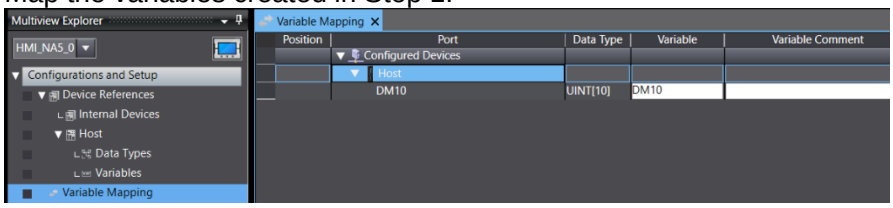
- Example of indirect reference with Numeral Display/ Input Object (word data)
  This section describes the replacing method using the following setting.

Object used	Numeral Display and Input
Address used for	Address
Indirect reference address range	D10 to 19
System Memory	SW27

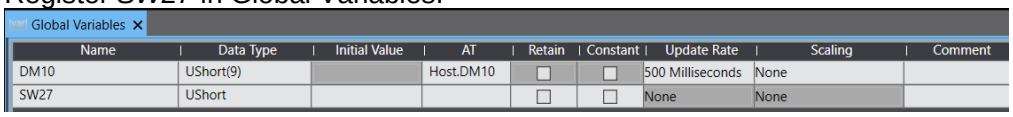
1. Create an array, which is assigned to DM10 in the connecting host unit and has 10 elements, in the Variables tab in Device References.



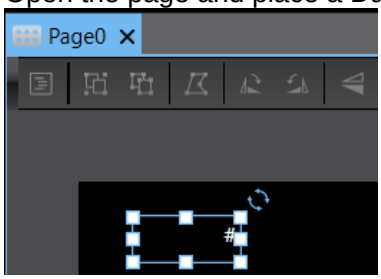
2. Map the variables created in Step 1.



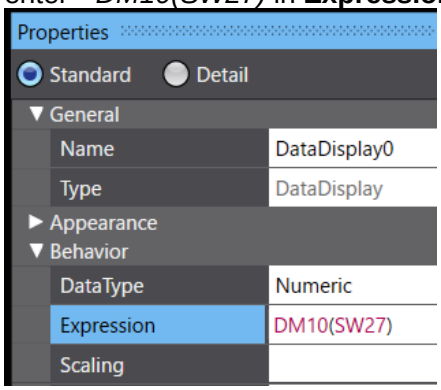
3. Register *SW27* in Global Variables.



4. Open the page and place a Data Display Object.



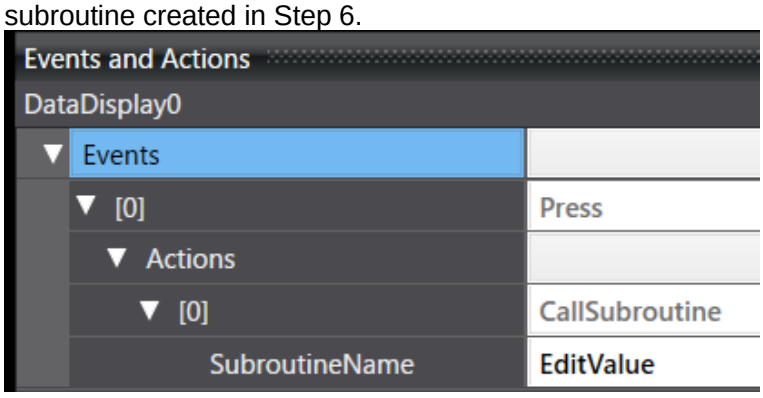
5. Open the Properties pane while selecting the Data Display Object created in Step 4. Then, enter *DM10(SW27)* in **Expression**.



6. Open Page Subroutines to copy and paste the following.

```
Sub EditValue
  Dim val As String = "DM10(" & SW27 & ")"
  EditVariable(val, , , , , , , , , )
End Sub
```

7. In **Events and Actions** of the Data Display Object, add *Press* event. Then, assign the subroutine created in Step 6.



4-6 About Macro

The Macro Functionality of the NS series enables you to add a new function to the basic functions by writing a program.

Macros can be replaced with subroutines in the NA series. You can write codes with VB, but a part of features and library functions is supported. Refer to Subroutine Reference Manual for usable functionalities and library functions.

You can register a functionality common with screens as Global Subroutine and a functionality run on the currently displayed screen only as Page Subroutine.
It is possible to call and execute a subroutine from a global event, object event, and button or lamp on the screen.
If a functionality you want is prepared as an Action, you do not have to write a subroutine; you can select the action to execute an event since executing a subroutine is one of the actions. In addition, you can specify more than one action to an event to combine formated processing and subroutines.

Also, NA subroutines run on Visual Basic. Refer to information from Microsoft and third-party vendors for basic knowledge like syntax, grammar, and variables of Visual Basic.

4-6-1 Macro Execution Conditions

The table below shows the relations of NS macro execution conditions and NA subroutine execution conditions.

<table>
<tr><th colspan="2">NS Macro Execution Condition</th><th colspan="2">NA Subroutine Execution Condition</th></tr>
<tr><td>Classification</td><td>Macro Execution Condition</td><td>Location</td><td>Execution Condition</td></tr>
<tr><td rowspan="11">Project</td><td>When loading a project</td><td>Global event</td><td>ProjectInitialization</td></tr>
<tr><td>Alarm/Event ON</td><td rowspan="2">User alarm</td><td>Raised</td></tr>
<tr><td>Alarm/Event OFF</td><td>Acknowledged
Cleared</td></tr>
<tr><td>Bit change: ON/OFF</td><td rowspan="6">Global event</td><td rowspan="4">＊2</td></tr>
<tr><td>Bit change: Rise</td></tr>
<tr><td>Bit change: Fall</td></tr>
<tr><td>Value change: Value change</td></tr>
<tr><td>Value change: Value = Set value</td><td>Condition: <Variable> = <Set value></td></tr>
<tr><td>Value change: Value > Set value</td><td>Condition: <Variable> > <Set value></td></tr>
<tr><td>Value change: Value < Set value</td><td>Condition: <Variable> < <Set value></td></tr>
<tr><td rowspan="2">Screen</td><td>When loading a screen</td><td rowspan="2">Page</td><td>PageDisplayed</td></tr>
<tr><td>When unloading a screen</td><td>PageHidden</td></tr>
<tr><td rowspan="3">Part object</td><td>When pressing a display area
Touch ON</td><td rowspan="2">Button, Shape, Image, Data display, Text box</td><td>Press</td></tr>
<tr><td>Touch OFF</td><td>Click
Release</td></tr>
<tr><td>When selecting a list</td><td>List box DropDown</td><td>SelectionChanged</td></tr>
</table>

	Before inputting numeral Before inputting string Before inputting numeral and string	Global event or Page	No equivalent execution condition (*1)
	Before writing numeral Before writing string Before writing numeral and string		
	When changing numeral or string		∗2
	Value change: Numerical value = Set value		Condition: <Variable> = <Set value>
	Value change: Numerical value > Set value		Condition: <Variable> > <Set value>
	Value change: Numerical value < Set value		Condition: <Variable> < <Set value>
	When changing value : Execute when ON/OFF		Condition: <Variable> = <Set value>
	When changing value : Execute when ON		
	When changing value : Execute when OFF		
	Alarm/Event selected	-	No equivalent execution condition

*1: Register HMI_IsDataInput_before (variable type: Boolean) to global variables. Then, detect a change of the system variable, _HMI_IsDataInput, with the following expression in **Events and Actions** - **Event** - **Condition** and **Events and Actions** - **Action** - **Subroutine**, in **Global Events** or **Page**.

Event	Condition	_HMI_IsDataInput <> HMI_IsDataInput_before
Action	CallSubroutine	OnChangeDataInput

In the subroutine OnChangeDataInput:

```
Sub OnChangeDataInput
  If _HMI_IsDataInput_before
    Write to REM
  Else
    Start input to REM
  End if
  HMI_IsDataInput_before = _HMI_IsDataInput
End Sub
```

You can get changes in numeric or string data input. However, Macro execution conditions of the NA series are not the same as those of the NS series: for example, before inputting and after starting inputting, and before writing and during writing to after finishing writing.

∗2: With the NS series, changes in numerical values and character strings that are mainly monitored by each part can execute macros. However, the NA series does not have similar execution conditions for each object, and you must configure them for a global event or page.

In addition, you need to prepare a variable to save the previous value separately from the monitored variable. Compare the monitored variable with the previous value in the subroutine, and if they do not match, detect a change of value and assign the variable value to the previous value.

You can detect a value change without preparing the previous value if it is a bit change rather than a change in a numeral or character string. In other words, when the latest value is True, the bit is considered raised; when the latest value is False, the bit is considered fell.

Also, you can use **Standard Controls** - **CheckBox** for an execution condition on the bit change. The event **Checked** in **Events and Actions** of an check box object corresponds to **ON** (up-differentiated), and **Unchecked** corresponds to **OFF** (down-differentiated).

4-6-2 Variables Used in NS Macros

NS-series macros use PT Memories as storage destinations for calculated values and as arguments. Variables are not allowed.
On the contrary, only variables are available in the NA series. Replace the PT memories with global variables or variables defined in a VB program. However, the sample functions described later use array variables representing the virtually defined PT memories. In other words, we are using the number of array indexes as an argument.

4-6-3 About PT Memory

For the PT memories used in the NS-series macros, define the following global variables as arguments of sample functions that substitute macro functions, and describe them. If you do not use a sample function, you do not have to define the global variables.
If you have used $W and $HW in the 2-word or longer data type, the following variables are not available. Prepare new variables.

NS	NA		
	Variable Name	Data type	Retain Attribute
$B	NS_Memory_B	Boolean(32768)	☐
$W	NS_Memory_W	Ushort(32768)	☐
$HB	NS_Memory_HB	Boolean(8192)	☑
$HW	NS_Memory_HW	UShort(8192)	☑

■ PT Memory Size Adornment
You can specify the word size by adding the letter “W” or “L” at the end of a PT memory.
For the NA series, use variable types.

■ Access to Numerals by Bit-type PT Memory
In the NS series, by specifying the number of bits following ":" after the Bit-type PT memory in the macro, you can handle up to 32 bits collectively as an Integer-type value in units of 4 bits.
The NA series does not have a corresponding functionality.

■ Indexed Variable
In the NS series, by adding either of "I0" to "I9" after the PT memory, you can reference the PT memory address numbers relatively slid by the amount specified with the index registers $SW27 to $SW36.
Though you cannot use indexed variables in the NA series, PT memories defined above can achieve the equivalents: PT memories use array number for accessing, and adding/subtracting an offset value to/from an array number works similarly as index specification.

4-6-4 About Host Address (Argument for READCMEM and WRITECMEM)

A host address can be the argument for the NS macro functions, READCMEM and WRITECMEM. Because these macro functions are difficult to replace, a replacing method for this argument is omitted.

4-6-5 Different Behaviors from NS Macros

■ Overflow on variable assignment

NS	Variables are assigned to the extent possible, truncating the high-order digits. The running program will not stop and continue.
NA	An overflow exception occurs and the subroutine function terminates at the point. The error message will appear at the bottom of the screen. To have the same behavior as NS, enclose the assignment location with “Try” and “End Try” to ignore the exception.

■ Assigning a decimal number to an integer

NS	Omit decimals and assign the integer part only.
NA	Round-off the decimals to assign. For example, there are Integer-type variables A, B, and C and the original expression is: A = B / C The calculated value will be rounded, so describe as the following: A = B / C : IF A > (B / C) Then A = A – 1 You can assign the value rounding the decimals as in NS.

4-6-6 Replacing NS Macro Function

This section provides a correspondence table for replacing the NS macro functions with NA VB.

Here we use the codes shown in the table to explain arguments.

Variable Type in NS	Argument Code	Variable Type in NA
Bit	B	Boolean
WORD	w, w1, w2	Short, UShort
DWORD	D	Long, ULong
FLOAT	f, f1, f2	Single, Double
Internal memory	M, M1, M2	Integer: Array number of the array NS_Memory_□(m)
Object ID/ Page number	n	String (Object name/ page name)

The table below provides the NS macro functions and their alternate VB functions and expressions.
The grayed cells represent Math class library functions that are not mentioned in Subroutine Reference Manual. Their operations are not guaranteed.

NS Macro Function	Argument and Return Value	NA VB Function and Expression
Numerical Operation and Value Conversion		
ACOS	FLOAT ACOS(f)	Math.Acos(f)

ASIN	FLOAT ASIN(f)	Math.Asin(f)
ATAN	FLOAT ATAN(f)	Math.Atan(f)
ATAN2	FLOAT ATAN2(f1, f2)	Math.Atan2(f1, f2)
BCD	DWORD BCD(d)	*See sample functions
BITSET	BITSET(P, b, w)	*See sample functions
CEIL	FLOAT CEIL(f)	Math.Ceiling(f) Function CEIL(f As Single) As Integer Dim ret As Integer = f If (ret < f) Then ret = ret + 1 Return ret End Function
COS	FLOAT COS(f)	Math.Cos(s)
DEG2RAD	FLOAD DEG2RAD(f)	Math.PI / 180.0 * f
EXP	FLOAT EXP(f)	Math.Exp(s)
FADD	FLOAT FADD(f1, f2)	f1 + f2

FCOMP	WORD FCOMP(f1, f2)	Function FCOMP(f1 As Single, f2 As Single) As Single
		If (f1 < f2) Then Return -1
		If (f1 > f2) Then Return 1
		Return 0
		End Function

FDIV	FLOAT FDIV(f1, f2)	(f1 / f2)
FSET	FLOAT FSET(d)	f = d
FSUB	FLOAD FSUB(f1, f2)	(f1 – f2)
FLOOR	FLOAT FLOOR(f)	Math.Floor(f) Function FLOOR(f As Single) As Integer Dim ret As Integer = f If (ret > f) Then ret = ret - 1 Return ret End Function
FMUL	FLOAT FMUL(f1, f2)	(f1 * f2)
LOG	FLOAT LOG(f)	Math.Log(f, Math.E)
LOG10	FLOAT LOG10(f)	Math.Log10(f)
POW	FLOAT POW(f1, f2)	Math.Pow(f1, f2)
RAD2DEG	FLOAT RAD2DEG(f)	180.0 / Math.PI * f
SIN	FLOAT SIN(f)	Math.Sin(f)
SQRT	FLOAT SQRT(f)	Math.Sqrt(f)
TAN	FLOAT TAN(f)	Math.Tan(f)
Operations of Memory, String, and Time		
LOCALTIME	WORD LOCALTIME(M1,M2)	Prepare the difference between the local time and UTC. A DateTime-type variable must include the difference. To use a value on a PT memory in another processing, you need to convert the value into a DateTime-type variable. If the data is handled in the DateTime-type in the

		NS unit, conversion is not necessary.
MEMCOPY	MEMCOPY(M1, M2, w)	*See sample functions
MEMSET	MEMSET(M, w1, w2)	*See sample functions
SETTIME	SETTIME(M)	SetDateTime() You must convert the original numeric data into a Date-type variable because a Date-type variable is required for argument.
STRCPY	STRCPY(M1, M2)	*See sample functions
STRCPYW	STRCPYW(M1, M2)	*See sample functions
STRM2W	STRM2W(M1, M2)	Difficult to substitute.
STRW2M	STRW2M(M1, M2)	Difficult to substitute.
SWAP		*See sample functions
SWAPL		*See sample functions
Operations of Screens and Objects		
CLOSEPOPW	CLOSEPOPW(PageNumber)	ClosePage(PageName)
GETNUMVAL	GETNUMVAL()	Difficult to realize.
GETPARTS	GETPARTS(n,Left,Top,Right,Bottom)	Difficult to realize.
MOVEPARTS	MOVEPARTS(n, X, Y)	Object's properties Left and Top represent the display coordinates of the object. Assign the arguments to them.
MOVEPOPW	MOVEPOPW(n, X, Y)	Difficult to substitute.
MOVEPOPWDOWN	MOVEPOPWDOWN(n, Y)	Difficult to substitute.
MOVEPOPWLEFT	MOVEPOPWLEFT(n, X)	Difficult to substitute.
MOVEPOPWRIGHT	MOVEPOPWRIGHT(n, X)	Difficult to substitute.
MOVEPOPWUP	MOVEPOPWUP(n Y)	Difficult to substitute.
MSGBOX	MSGBOX(message, title, iconType)	*See sample functions Microsoft.VisualBasic.MsgBox(message, [buttoNS,], [title,] [helpfile, context]) Note: To realize a corresponding setting to NS series argument iconType, use the argument "buttons" to set the button feature and displayed icon. Button feature is the same as the NS series, but the icon is different. The return value represents a push button. The combination of the push button and value is different.
RELEASEFOCUS	RELEASEFOCUS()	Moving the focus on a hidden DataEdit object will release the focus.
RSTALARMCNT	RSTALARMCNT(sw)	Difficult to substitute.
SETFOCUS	SETFOCUS(n)	SetInputFocus()
SHOWPAGE	SHOWPAGE(n)	_HMI_CurrentPageIndex = n
SHOWPAGEBCD	SHOWPAGEBCD(n)	_HMI_CurrentPageIndex = BCD(n) *Use the sample function for BCD(n).
External Memory and Interface		
READCF	READCF(D,n,"FNAME",Dev)	Difficult to substitute.

READCMEM	READCMEM(D, [a] ,w)	Difficult to substitute.
READHOSTB	READHOSTB(D,h,ch,addr,r,n)	Difficult to substitute.
READHOSTW	READHOSTW(D,h,ch,addr,r,n)	Difficult to substitute.
WRITECF	WRITECF(S,n,”FNAME”,Dev)	Difficult to substitute.
WRITEMEM	WRITECMEM([a],S,n)	Difficult to substitute.
WRITEHOSTB	WRITEHOSTB(h,ch,addr,r,S,n)	Difficult to substitute.
WRITEHOSTW	WRITEHOSTW(h,ch,addr,r,S,n)	Difficult to substitute.

4-6-7 Sample Alternate Functions for NS Macro Functions

Among the NS series macro functions, some can be realized by VB programs even though they cannot be realized with existing library functions. Sample codes are shown below. The value range check for arguments is omitted, so please add code as necessary.

NS Function	Alternate Sample Function

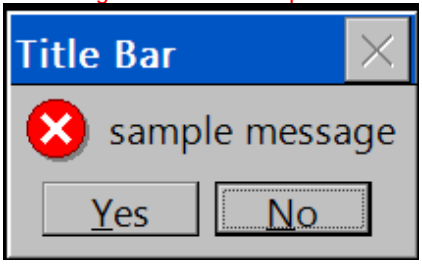
BCD	Function BCD(ByVal iNum As ULong) As ULong
	Dim f1 As Boolean = False
	If (iNum < 0) Or (99999999L < iNum)
	Throw New ApplicationException("Out of range parameter on BCD()")
	End If
	REM Workaround for VAL function since an exception occurs in the ranges of 8000 to 9999 and 80000000 to 99999999.
	If (8000L<= iNum) And (iNum <= 9999)
	iNum = iNum + 10000
	f1 = True
	End If
	If (80000000L<= iNum) And (iNum <= 99999999L)
	iNum = iNum - 30000000L
	f2 = True
	End If
	Dim ret As ULong = Microsoft.VisualBasic.Val("&H" & iNum.ToString)
	If f1 Then ret = ret - 65536
	If f2 Then ret = ret + &H30000000L
	Return ret
	End Function

BIN	Function BIN(iNum As Integer) As Integer
	If (iNum < 0) Or (&H99999999L < iNum)
	Throw New ApplicationException("Out of range parameter on BIN()")
	End If
	Dim sNum As String = iNum.ToString("X")
	If Not Microsoft.VisualBasic.IsNumeric(sNum) Then Return 0
	Return Microsoft.VisualBasic.Val(sNum)
	End Function

BITSET	REM The 1st argument is the offset number of $B. Sub BITSET(m As UShort, b As UShort, w As UShort) Dim bv As Boolean = True If (0 = b) Then bv = False Dim ww As UShort For ww = 1 To w PTMEM_B(m) = bv m = m + 1 Next End Sub
MEMCOPY	Sub MEMCOPY(ByVal M1 As Integer, ByVal M2 As Integer, d As Integer) Dim n As Integer

	For n = 1 to d PT_Memory_W(M2) = PT_Memory_W(M1) M1 = M1 + 1 M2 = M2 + 1 Next End Sub

NS Function	Alternate Sample Function
MEMSET	Sub MEMCOPY(ByVal M1 As Integer, w1 As Integer, w2 As Integer) Dim n As Integer For n = 1 to w2 PT_Memory_W(M1) = w1 M1 = M1 + 1 Next End Sub

MSGBOX	Sub MSGBOX
	Dim msg As String
	Dim title As String
	Dim style As Microsoft.VisualBasic.MsgBoxStyle
	Dim response As Microsoft.VisualBasic.MsgBoxResult
	Dim Res1 As String
	
	msg = "sample message"
	style = Microsoft.VisualBasic.MsgBoxStyle.DefaultButton2 Or Microsoft.VisualBasic.MsgBox Style.Critical Or Microsoft.VisualBasic.MsgBoxStyle.YesNo
	title = "Title Bar"
	response = Microsoft.VisualBasic.MsgBox(msg, style, title)
	If response = Microsoft.VisualBasic.MsgBoxResult.Yes Then
	'Describe behavior when Yes button pressed
	Res1 = "Yes_Click"
	Else
	'Describe behavior when the button other than Yes pressed
	Res1 = "No_Click"
	End If
	End Sub
	
	Executing the above sample code displays this message box.
	 

STRCPY	Sub STRCOPY(ByVal M1 As Integer, M2 As Integer) Dim wd As UShort

	Dim lp As Boolean = True Do While lp wd = PTMEM_W(M2) If 0 = (wd And &HFF00) wd = PTMEM_W(M1) And &hFF lp = False Else If 0 = (wd And &HFF) wd = wd And &hFF00 lp = False End If PTMEM_W(M1) = wd M1 = M1 + 1 M2 = M2 + 1 Loop End Sub
STRCPYW	Sub STRCOPY(ByVal M1 As Integer, M2 As Integer) While PTMEM_W(M2) <> 0 PTMEM_W(M1) = PTMEM_W(M2) M1 = M1 + 1 M2 = M2 + 1 End While PTMEM_W(M1) = 0 End Sub
SWAP	Sub SWAP(ByVal M As Integer, w As Integer) Dim n As Integer Dim wH As Integer Dim wL As Integer For n = 1 to w wH = (PT_Memory_W(M) >> 8) And &hFF wL = PT_Memory_W(M) And &HFF PT_Memory_W(M) = (wL << 8) Or wH M = M + 1 Next End Sub
SWAPL	Sub SWAPL(ByVal M As Integer, w As Integer) Dim n As Integer Dim ww As Integer For n = 1 to w ww = PT_Memory_W(M) PT_Memory_W(M) = PT_Memory_W(M+1) PT_Memory_W(M) = ww M = M + 2 Next End Sub

NS Function	Alternate Sample Function

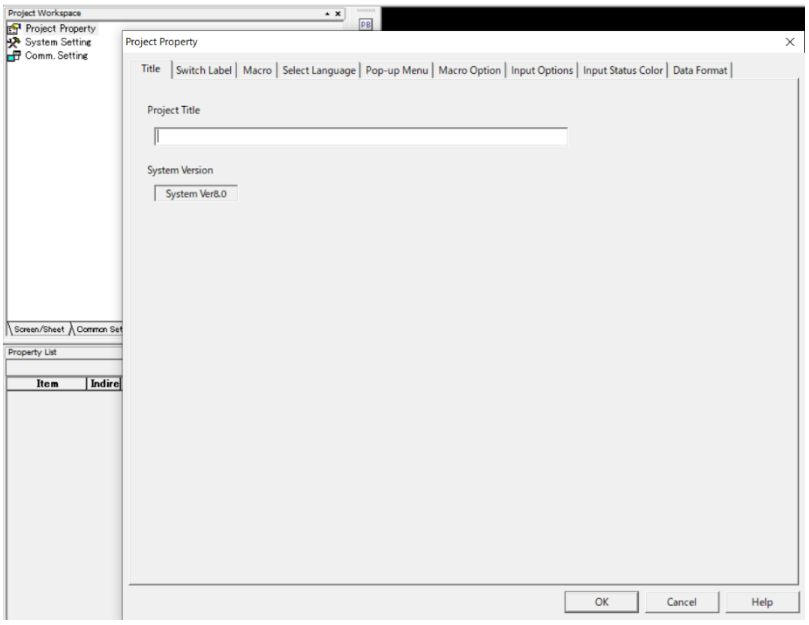
SETTIME	REM SetDateTime() does not work in a simulation.
	Sub SETTIME(M As Integer)
	  Dim DateString As String
	  Dim wYear As UShort = 2000 + (NS_Memory_W(M+2) And &HFF)
	  Dim wMonth As UShort = (NS_Memory_W(M+2) >> 8) And &HFF
	  Dim wDay As UShort = (NS_Memory_W(M+1) >>8) And &HFF
	  Dim wHour As UShort = (NS_Memory_W(M+1) And &HFF)
	  Dim wMinute As UShort = (NS_Memory_W(M) And &HFF)
	  Dim wSecond As UShort = (NS_Memory_W(M) >> 8) And &HFF
	  DateString = wYear.ToString() & “-“ & wMonth.ToString() & "-" & wDay.ToString() _
	  & “ “ & wHour.ToString() & “:“ & wMinute.ToString() & “:” + wSecond.ToString()
	  SetDateTime(Date.Parse(DateString))
	End Sub

5 Replacement Examples: Common Settings

This chapter describes the examples for replacing common settings such as project properties and system settings.

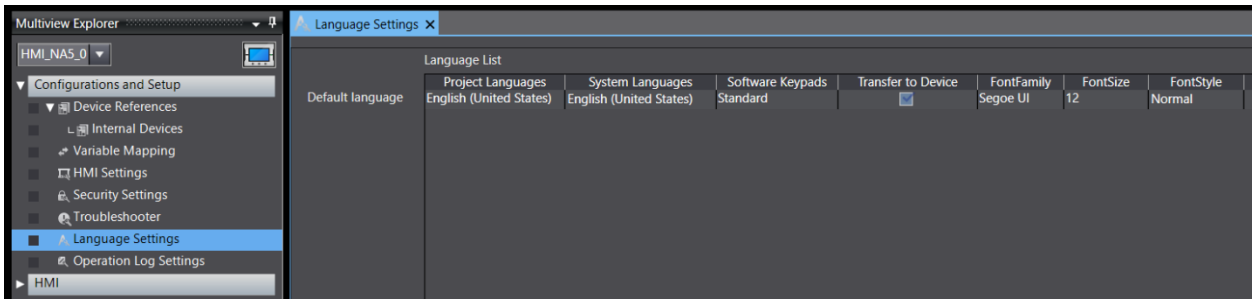
5-1 Project Properties

To show the Project Properties dialog box of an NS project, click **Project Properties** in Project Workspace window. The following sections describes replacement examples for each tab on the top of the dialog box.



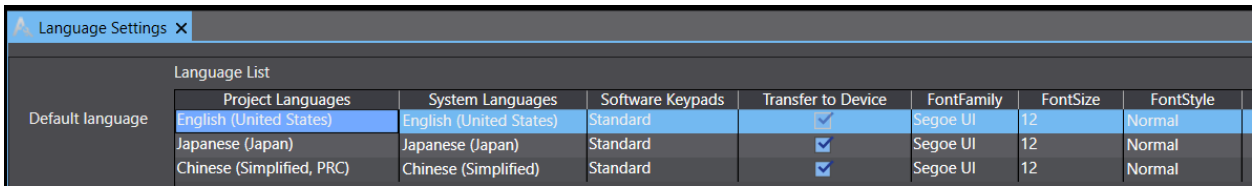
5-1-1 Switch Label Tab

Select **Configurations and Setup** - **Language Settings** to setup labels.



Every click on the  button increases a language. Click the button as many as languages you use.

Project Languages corresponds to **Label name** in the NS series.
You can also specify the system language and default fonts for each project language.
If you display characters that are not compatible with the specified font, such as displaying Kanji characters while specifying an English font, the display on Sysmac Studio and the display on the NA unit will not match. Therefore, specifying default fonts in this tab is useful.

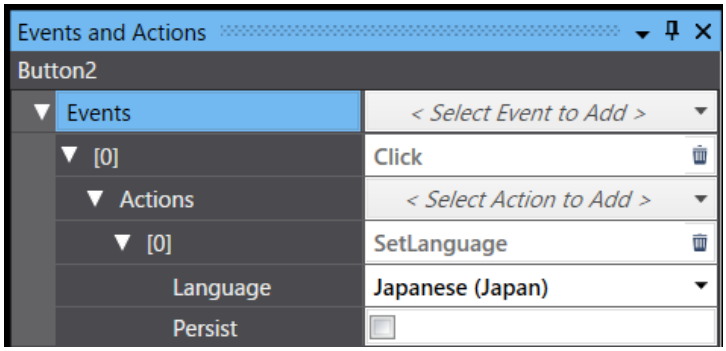


This table provides the recommended fonts for languages.

Language	Recommended Font Family
Japanese	Meiryo, MS Gothic
Simplified Chinese	Microsoft YaHei, SimSun
Traditional Chinese	Microsoft JhengHei, MingLiU
Korean	Malgun Gothic, Gulim, GulimChe

- Toggling Display Language During the Operation

In the NS series, changing the value of the system memory $SW10 enables to toggle the languages to display.
IN the NA series, select **SetLanguage** in **Events and Actions** to switch languages.

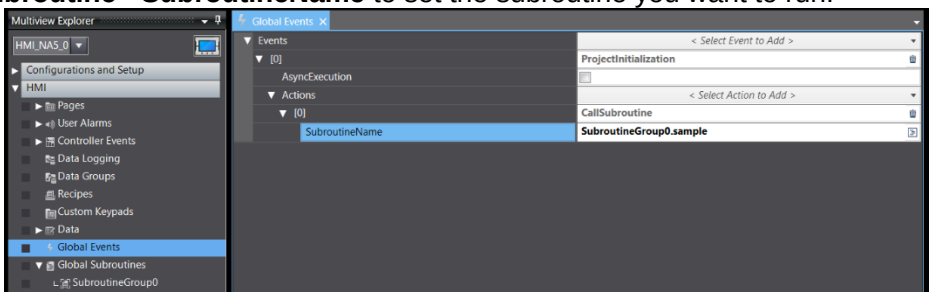


Or use SetLanguage function in a subroutine. In that case, you cannot specify an argument for the subroutine that is set in **Actions** in **Events and Actions**. Therefore, create a function without an argument and give an argument to SetLanguage function within the prepared function.
Refer to NA-series Subroutine Reference Manual for details of SetLanguage function.

5-1-2 Macro Tab

- When Loading a Project

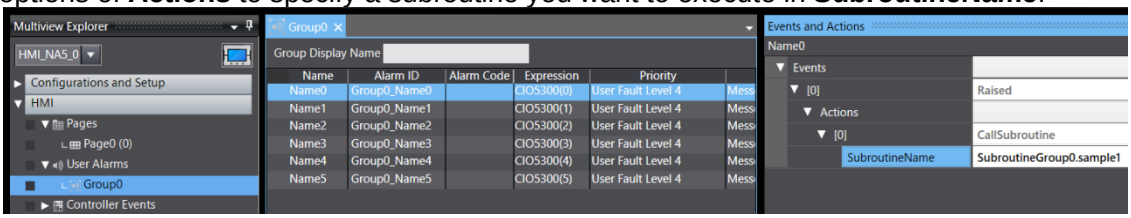
Select **HMI** - **Global Events**. Then, select **Events** - **ProjectInitialization**, and click **Actions** - **CallSubroutine** - **SubroutineName** to set the subroutine you want to run.



- On timing Alarm/Event occurred/On timing Alarm/Event is canceled

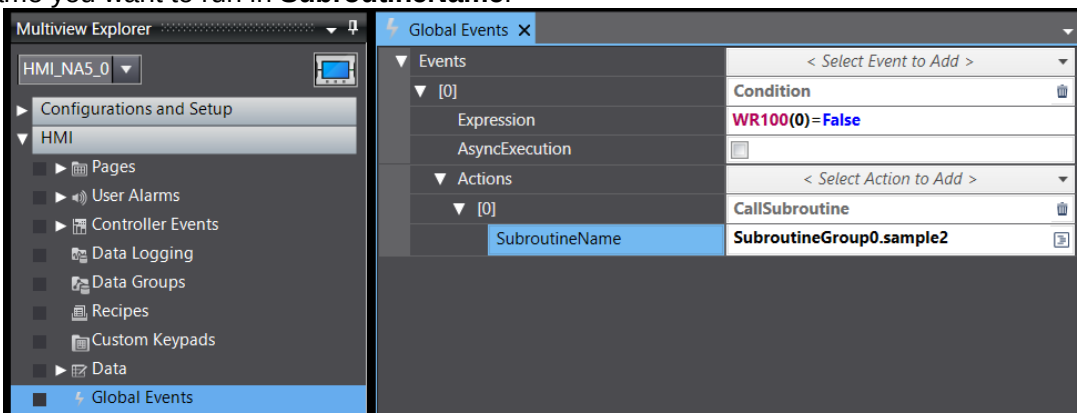
For the NS series, you can set macros for all alarm occurrences and cancels, but for the NA series, you need to configure for each alarm.

Click **HMI** - **User Alarms** to select an alarm which executes a subroutine. Then, select **Raised** or **Cleared** from the options of **Events**. And select **CallSubroutine** from the options of **Actions** to specify a subroutine you want to execute in **SubroutineName**.



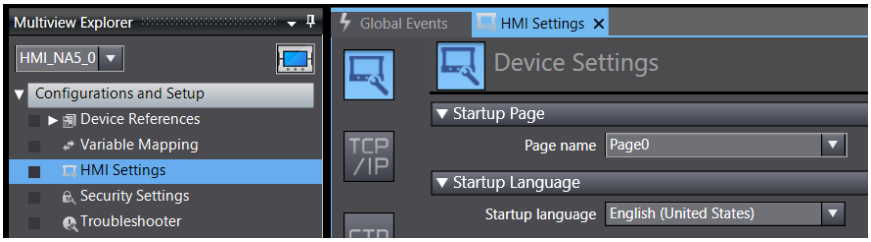
- When a bit changed

Click **HMI** - **Global Events**. Then select **Condition** from the options of **Events** to describe a condition in **Expression**. Then, click **Actions** - **CallSubroutine.** -Specify a subroutine's name you want to run in **SubroutineName**.



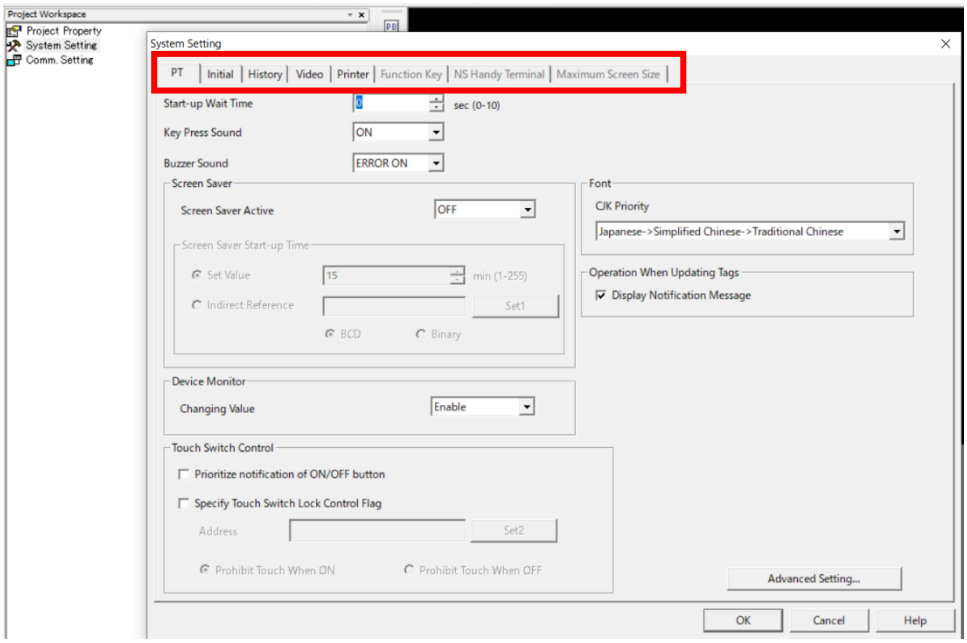
5-1-3 Language Selection Tab

NA system language depends on the currently running project's language.
Set an initial project language in **Configurations and Setup** - **Device Settings** - **Setup Language**.



5-2 System Setting

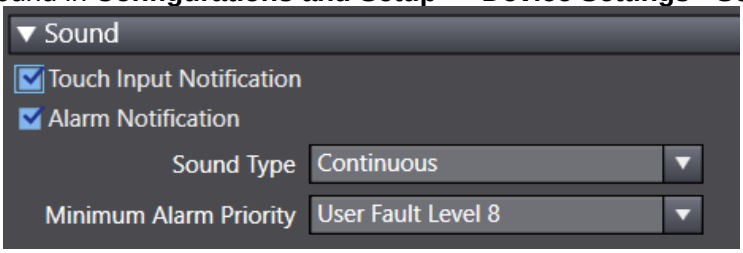
To show the System Setting dialog box of an NS project, click **System Setting** in the Project Workspace window. The following sections describes replacement examples for each tab on the top of the dialog box.



5-2-1 PT Tab

- Key Press Sound/ Buzzer Sound

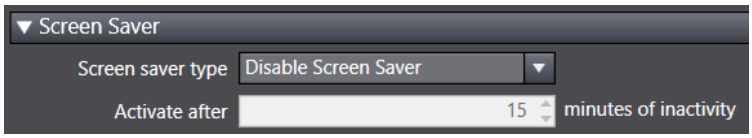
Configure the sound in **Configurations and Setup** - **Device Settings** - **Sound**.



- Screen Saver

Configure a screen saver in **Configurations and Setup** - **Device Settings** - **Screen Saver**.

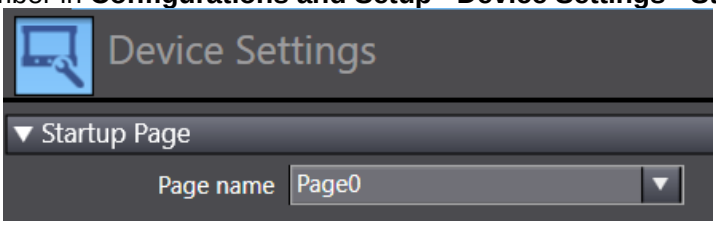
The screen saver activates in an NS unit after 255 minutes of inactivity at the maximum, but 60 minutes in an NA unit.
Also, NA units do not have the indirect reference of the wait time. You must specify a fixed value.



5-2-2 Initial Tab

- Initial Screen

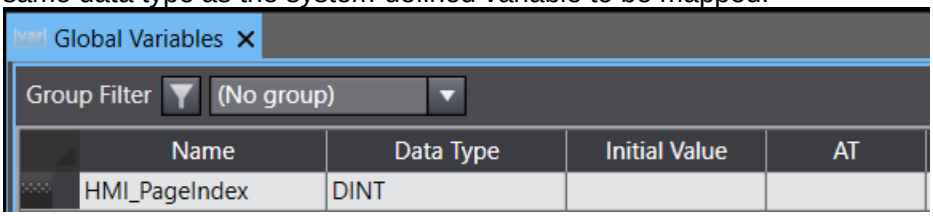
Set the page number in **Configurations and Setup** - **Device Settings** - **Startup Page**.



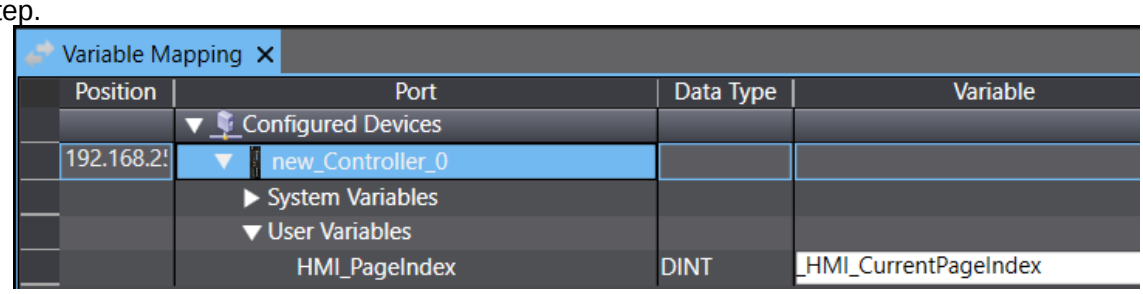
- System Memory

Add system-defined variables of the “Supported” items in the “System Memory” sheet in “Appendix 1: Project Common Settings” to Variable Mapping, following the procedure below.

1. Create a controller variable to be assigned to an NA system variable in the Controller side. Select the same data type as the system-defined variable to be mapped.



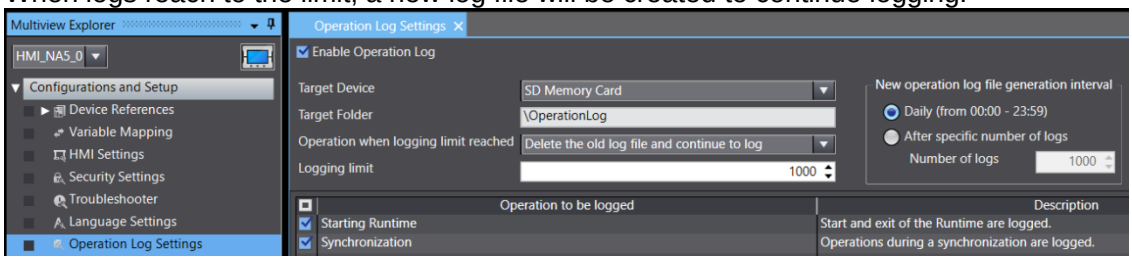
2. Move to the HMI side. Click **Configurations and Setup** − **Variable Mapping**. Manually enter a system-defined variable that is mapped to the controller variable created in the previous step.



5-2-3 History Tab

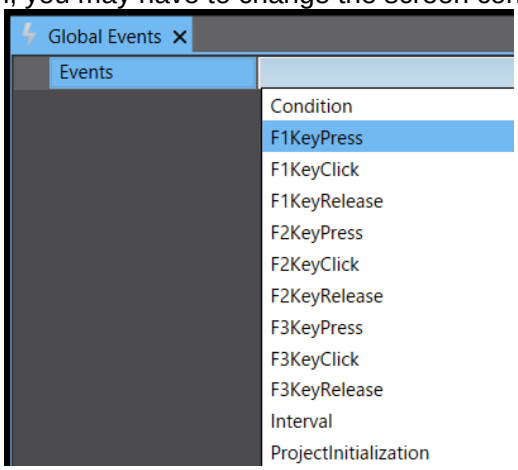
- Operation Log

Set the upper limit of logging in **Configurations and Setup**– **Operation Log Settings**. When logs reach to the limit, a new log file will be created to continue logging.



5-2-4 Function Key Tab (For NS15)

Click **HMI** - **Global Events**. In the Global Events tab, select **F1KeyPress** to **F3KeyRelease** from the options of **Events**. Then, select functionalities for each event from **Actions** to perform actions related to pressing and releasing keys. In NS15, function keys can only write addresses, bur in the NA series units, they can take screen shots and execute subroutines.
Because NA series units have fewer function keys than the NSH5, you must reassign actions to Touch Switches.
Also, while NS15 units have function keys on the left side of the screen, in the NA series units the function keys are located at the bottom of the screen. Therefore, if you use function keys in association with the screen, you may have to change the screen configuration.



5-3 Variable Table

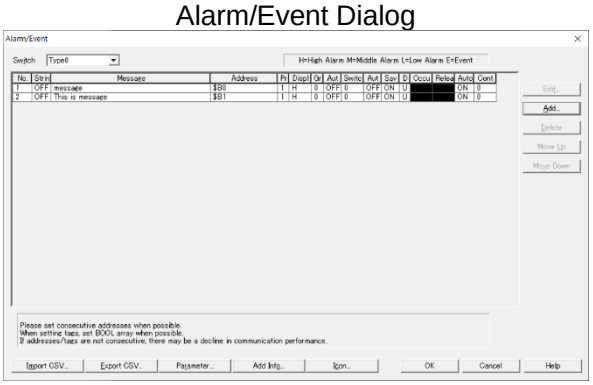
Import the variable table in an NS unit to the NA series variables.

Refer to “4-3-6 Specify Device Address of NS” to “4-3-9 Import NS Variable Table to NA Device Variables” for detailed import procedure.
For device addresses or variables set as “start address + number of monitor points” in the Broken-line Graph Group, only the start addresses will be imported. Follow the procedure in “5-6 Broken-line Graph Group Setting” to set correct arrays.

5-4 Alarm/ Event Settings

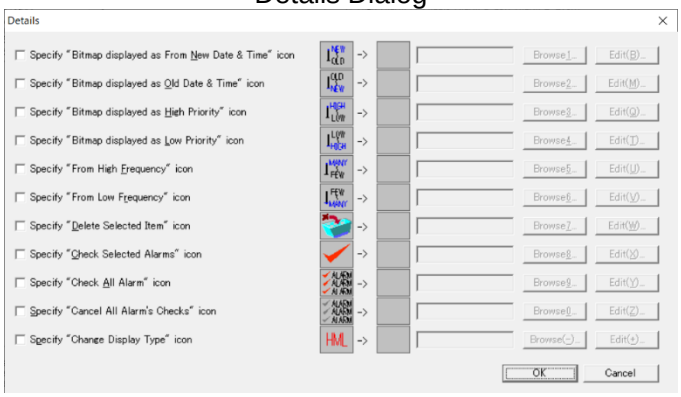
NS series Alarm/Event Settings consists of the Alarm/Event, Alarm/Event Details, Details, and Alarm/Event Parameter dialogs.

Alarm/Event Dialog

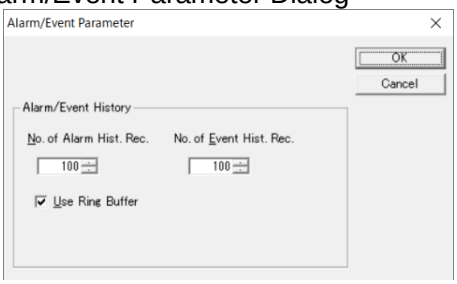


Alarm/Event Details Dialog

Details Dialog



Alarm/Event Parameter Dialog

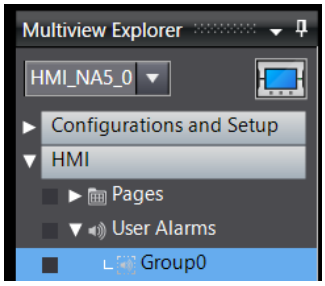


The table below provides the relation of NS and NA Alarm/Event settings.

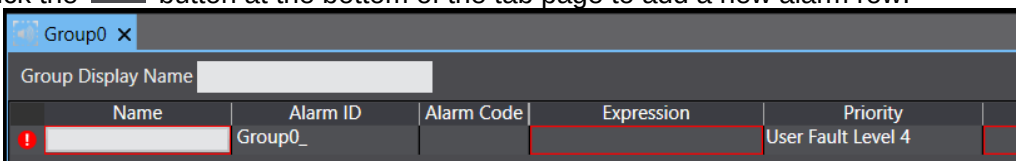
NS	Supported/Unsupported in NA	Remarks
Occurred Text	Partly supported	You can select the display color in a user alarms viewer object. Because the object uses the same colors in all alarms, you are not allowed to set display colors depending on each alarm, like for the NS series.
Released Text	Partly supported	
Message	Supported	
Address	Supported	Both rising and falling of a bit variable are supported.
Detection Type	Supported	
Priority	Partly supported	The NS series offers 9999 levels of priority, but in the NA series, 9 levels: User Fault Level 1 to 8 and User Information. The NA series has the narrower setting range, so use **Alarm Code** as compensation.
Display Type	Unsupported	No corresponding function
Group	Supported	The NS series registers groups by numbers 0 to 99, but the NA series group names are given by strings. There is the item **Group** in the alarm settings, but a user alarms viewer object cannot display only a designated group on the HMI screen.
Switch Screen	Partly supported	After selecting an alarm an performing the operation on the dialog box that appears, the displayed screen switches to the screen set for the alarm. Unlike the NS series, NA screens are not switched just after being selected on an alarm object.
Switch Contents	Unsupported	No corresponding function
Save to History	Partly supported	You cannot have the option not to save because the alarm and event history is mandatorily saved.
Delete when Alarm/Event is canceled	Partly supported	Alarms and events will be disappeared after cancellation.
Add Info	Partly supported	You can register up to 3 additional information in an entire project of the NS series. In the NA series, you can register 1 additional information for each alarm.
Icon	Partly supported	The NA series does not have dedicated icons such as the alarm/event summary and history object icons. Create processes corresponding to the original icons by using buttons and other objects. Note that some original icons cannot be realized.

5-4-1 How to Replace

1. Double-click **Group0** under **HMI − User Alarms** in Multiview Explorer.

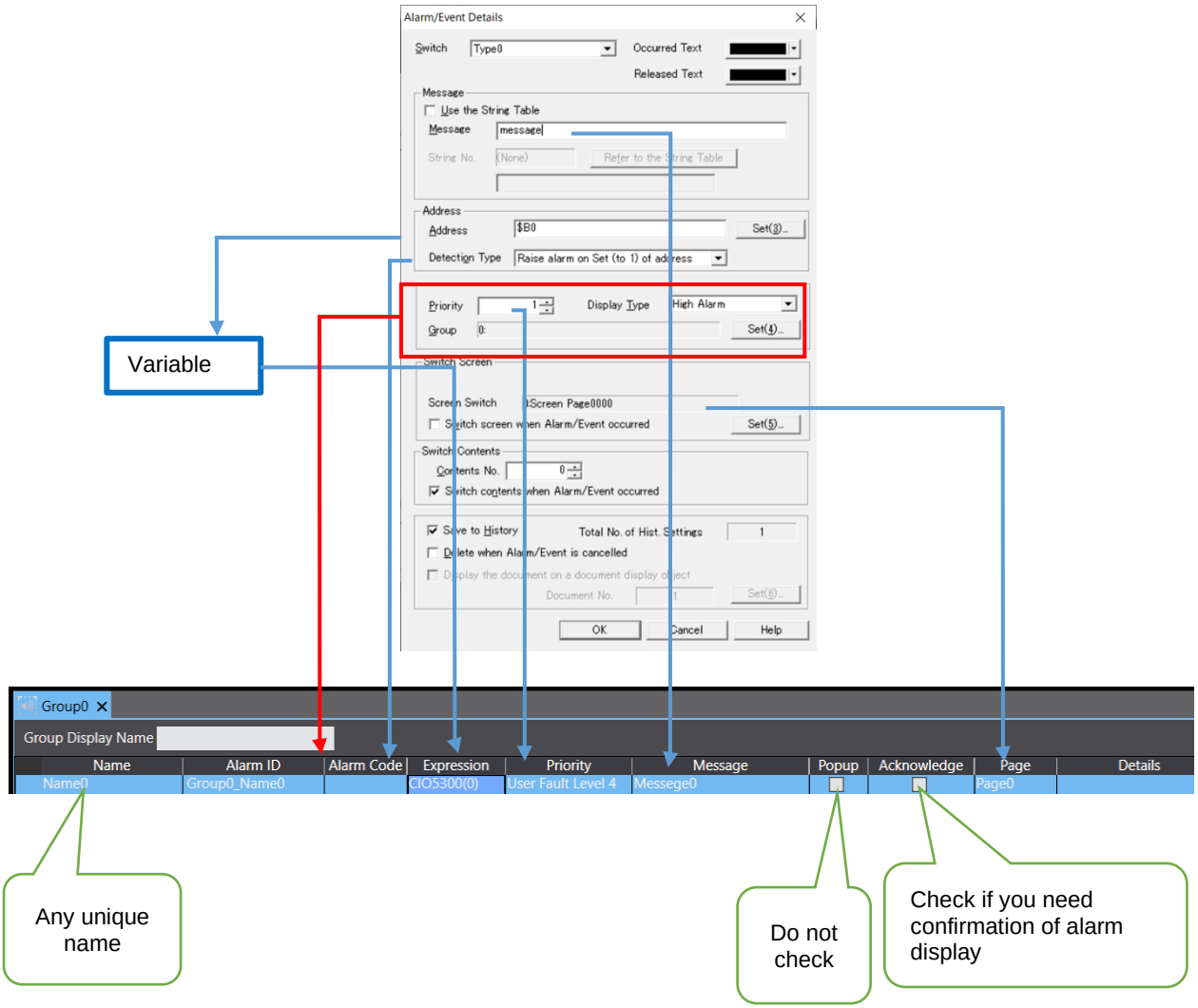


2. Click the  button at the bottom of the tab page to add a new alarm row.

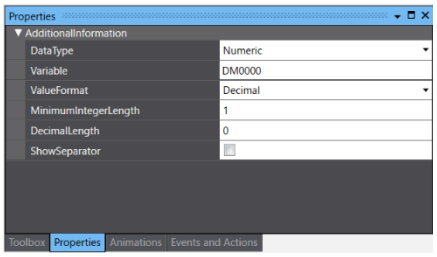


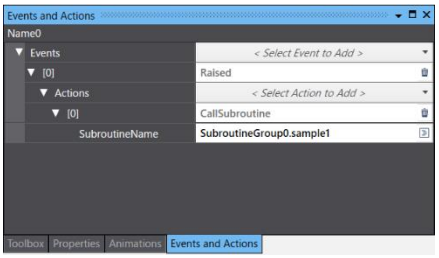
3. Make the settings for the added row following this table. Items not in the table are set to defaults.

Item	Setting
Name	The NS series does not have this item. Leaving this field blank causes an error, so entering a name is required. Names must be unique.
Alarm Code	If you are filtering alarms by group in NS, enter a value of the group name in this field. This item can perform as the alternate functionality for display filtering by group, which is not supported by the NA series. Leave this field empty if you are not using the filtering by group.
Expression	Enter a variable name that corresponds to the original address. When the Detection Type is “Up”, enter the variable name, and for “Down,” enter “variable name = False.”
Priority	Select from the 9 options of User Fault Level 1 to 8 and User Information. As mentioned before, since the setting range in the NA series is narrower than the NS series, you need to re-asses the priority if you have set 10 levels or more for your NS.
Message	Set a message. You can set the message here in the default language only. If you want to set in more than one language, you need to make the setting in **HMI** - **Resources** - **Alarm Strings**.
Popup	Uncheck the box.
Acknowledge	Check this box only if you need confirmation of alarm display.
Page	Enter a name of the destination page if selecting the alarm switches the currently displayed page. If the original project does not include the page switching action, leave this field empty.

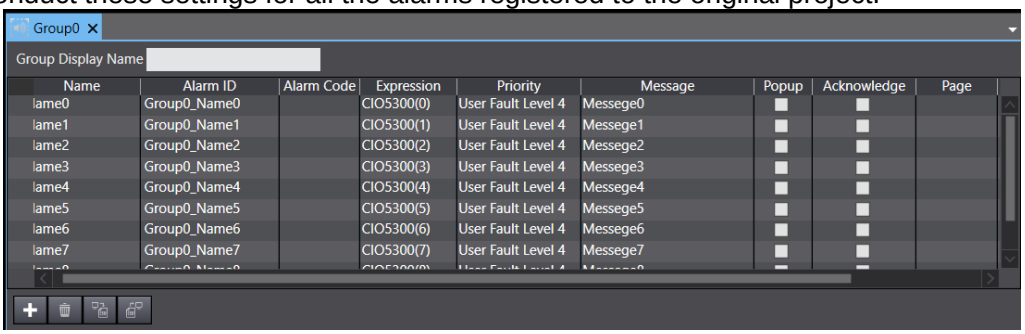

Alarm/Event Details
Switch
Type0
Occurred Text
Released Text
Message
Use the String Table
Message
message
String No.
(None)
Refer to the String Table
Address
Address
$B0
Set(3)...
Detection Type
Raise alarm on Set (to 1) of address
Priority
1
Display Type
High Alarm
Group
0:
Set(4)...
Switch Screen
Screen Switch
0:Screen Page0000
Switch screen when Alarm/Event occurred
Set(5)...
Switch Contents
Contents No.
0
Switch contents when Alarm/Event occurred
Save to History
Total No. of Hist. Settings
1
Delete when Alarm/Event is cancelled
Display the document on a document display object
Document No.
1
Set(6)...
OK
Cancel
Help
Variable
Group0
Group Display Name
Name
Alarm ID
Alarm Code
Expression
Priority
Message
Popup
Acknowledge
Page
Details
Name0
Group0_Name0
CIO5300(0)
User Fault Level 4
Messege0
Page0
Any unique name
Do not check
Check if you need confirmation of alarm display

4. Configure **AdditionalInformation** in the **Properties** tab.
Click **Events** in the **Events and Actions** tab page. You can set actions for the events, **Acknowledged**, **Cleared**, and **Raised**. The following example shows the setting of CallSubroutine.
Make settings as required.



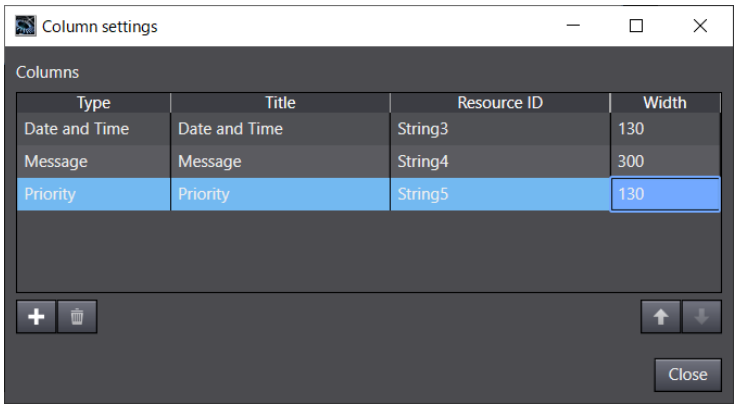


5. Conduct these settings for all the alarms registered to the original project.

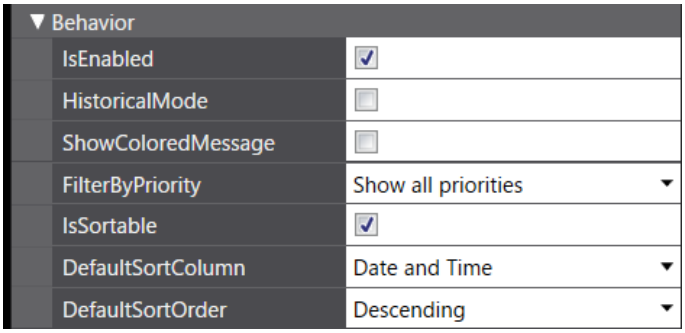


It is possible to export the alarm setting data to an Excel file, edit the file, and import the edited data.
The second icon from the right exports the setting data , and the rightmost icon imports.

6. Put a user alarms viewer object on the page, then configure the displayed column in **Properties** - **Appearance** - **Column**.



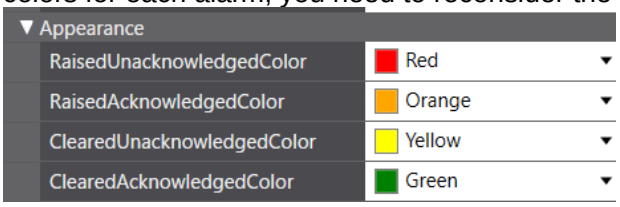
7. You can configure **DefaultSortColumn** and **DefaultSortOrder** in **Behavior** in the **Property** tab.
Checking **HistoricalMode** displays the **Alarm History** data, and unchecking displays the **Currently Occurred Alarms** data.



5-4-2 Non-replaceable Functionalities

- Occurred Text/ Released Text

For the NA series, you can set text colors for each state such as occurrence or release, and those colors are common with all the alarms shown on Alarm Objects. It is not allowed to set different colors for each alarm in the same manner as the NS series. If you are designating different colors for each alarm, you need to reconsider the text colors.



- Priority with 10 or more levels

9999 levels are available in the alarm priority in the NS series, but 9 levels in the NA series. If you have set 10 levels or more for your NS unit, reconsider the priority.

- Display Type

The NA series does not have a corresponding setting. In addition to fewer priority levels, the NA series does not provide a minute data classification as compared to the NS series. To display a specific type only, classify the display data by priority, group, or alarm code, and then, filter the data.

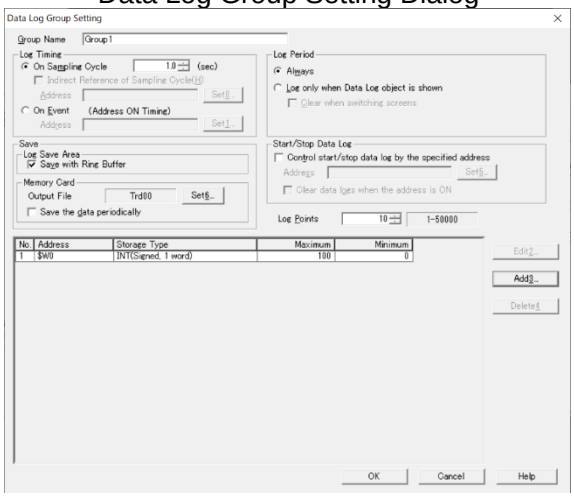
- Additional Information (More Than One)

The NS series allows you to register up to three additional information messages, display and record a designated address's value when an alarm rises.
However, you can set only one additional information message in the NA series. If you have set more than one additional information message in your NS unit, you must delete the information other than the top-priority one.

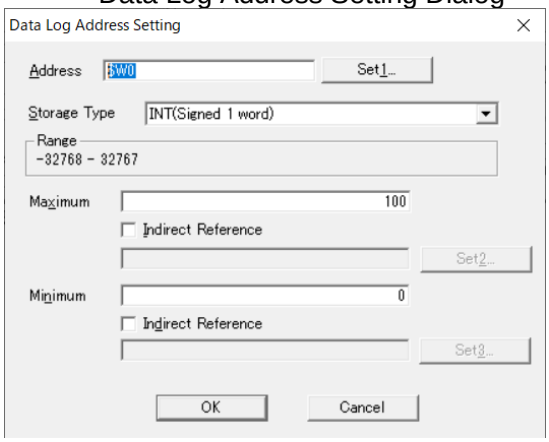
5-5 Data Log Settings

NS series Data Log Settings consists of the Data Log Group Setting and Data Log Address Setting dialogs.

Data Log Group Setting Dialog



Data Log Address Setting Dialog

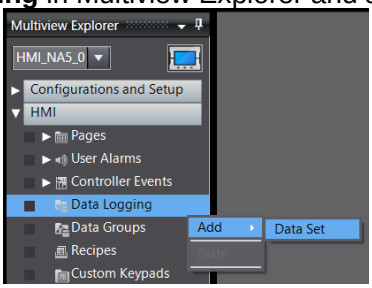


The table below provides the relation of NS and NA data log settings.

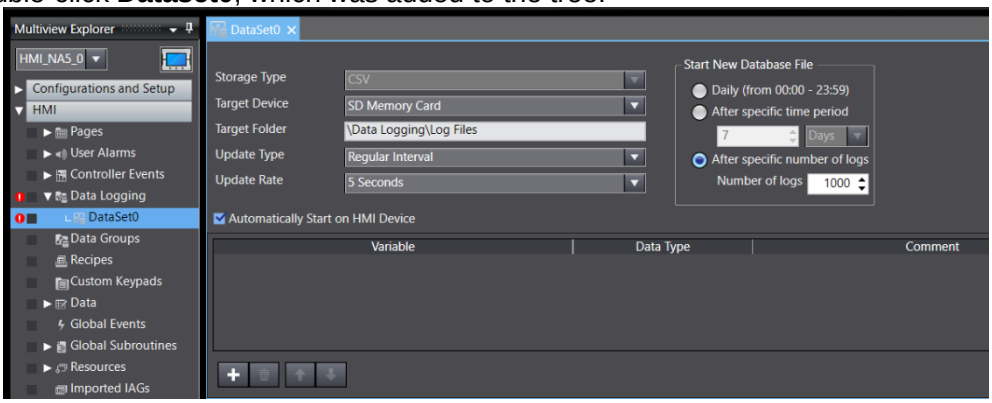
NS		Supported/Unsupported in NA	Remarks
Data Log Group	Log Timing	Partly supported	Indirect reference of sampling cycle is not supported.
	Save	Partly supported	The NA series units create a new file automatically to continue logging when the number of logs reach a set limit.
	Memory Card	Partly supported	You can specify a device where you save the data but not a file name. The file will be named automatically based on the date and time of file creation.
	Log Period	Unsupported	Data logging is not available only while an object is being displayed.
	Start/Stop Data Log	Partly supported	ON and OFF of an address (variable) can control starting and stopping logging, but not clearing logs when the address is ON.
	Log Points	Partly supported	The NA series units create a new file automatically to continue logging when the number of logs reach a set limit. Therefore, you cannot set your NA unit to stop logging when logs reach the specified limit. A real logging limit is the maximum capacity of an external memory designated as storage.
Data Log Address Setting	Maximum/ Minimum	Partly supported	You can set the maximum and minimum values with fixed values only. Indirect reference is not available.

5-5-1 How to Replace

1. Right-click **HMI** - **Data Logging** in Multiview Explorer and select **Add** - **Data Set**.



2. Double-click **Dataset0**, which was added to the tree.

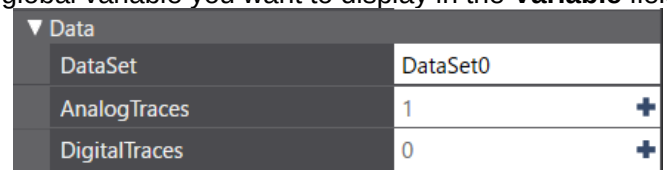


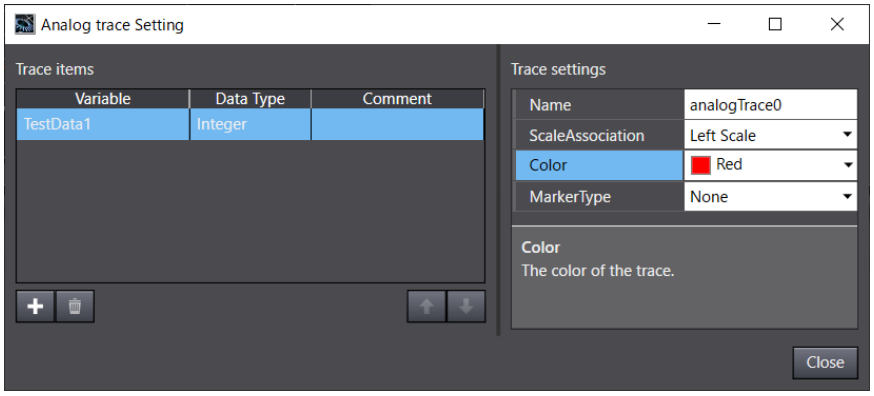
3. Conduct the following settings.

Item	Setting
Target Device	Select either of the SD card or USB stick memory to save logs.
Target Folder	Specify the folder to save log files. The files will be named automatically based on the date and time of file creation.
Update Type	Regular Interval: Logs are saved regularly. On Condition: Logs are saved by condition with variables.
Update Rate	Logs are saved at a fixed interval configured in this field. Indirect reference supported by the NS series is not available. You can use fixed values only.
Expression	Logs are saved when a condition expression in this field is met.
Start New Database File	Specifies the conditions for generating new log files.
Automatically Start on HMI Device	Checking this box saves logs automatically when you boot up the HMI. If you uncheck it, logs will not be saved unless you perform an action to start saving logs.
Variable	Specify global variables to log. Data types and comments are displayed automatically for the specified global variables.

4. After setting the data logging, add a Trend Graph Object on the page.

Select **Data** - **Data Set** in the Properties tab and specify the data group name you have created in the previous step for **Data Set**.
Then, click the ✚ button in the **AnalogTraces** or **DigitalTraces** field to open the trace setting dialog. Enter the global variable you want to display in the **Variable** field.



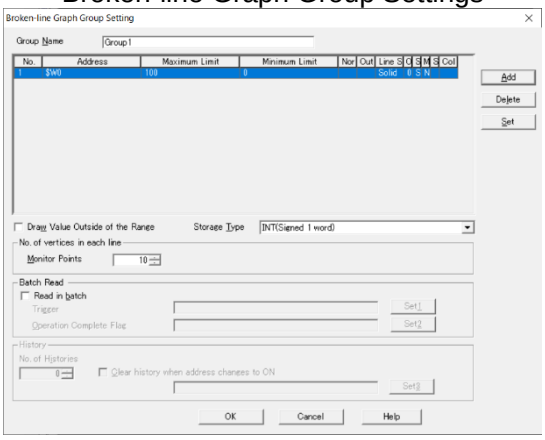


5. Configure settings of line, scale, and other items for each axis.

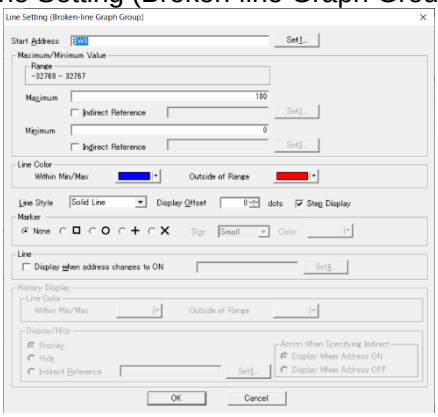
5-6 Broken-line Graph Group Settings

NS series Broken-line Graph Settings consists of the Broken-line Graph Group Setting and Line Setting dialogs.

Broken-line Graph Group Settings



Line Setting (Broken-line Graph Group)



In the NA series, the setting that DataSeries of DataGroup is set to *Array* is the corresponding feature.
The NS series broken-line graph settings include settings related to graph drawing, e.g., line color. However, in the NA series, the DataGroup setting has setting items for global variables and data type only, and those for graph drawing are in Properties of a broken-line graph object.
Therefore, this section describes not only settings of a data group but broken-line graph object and variable settings.

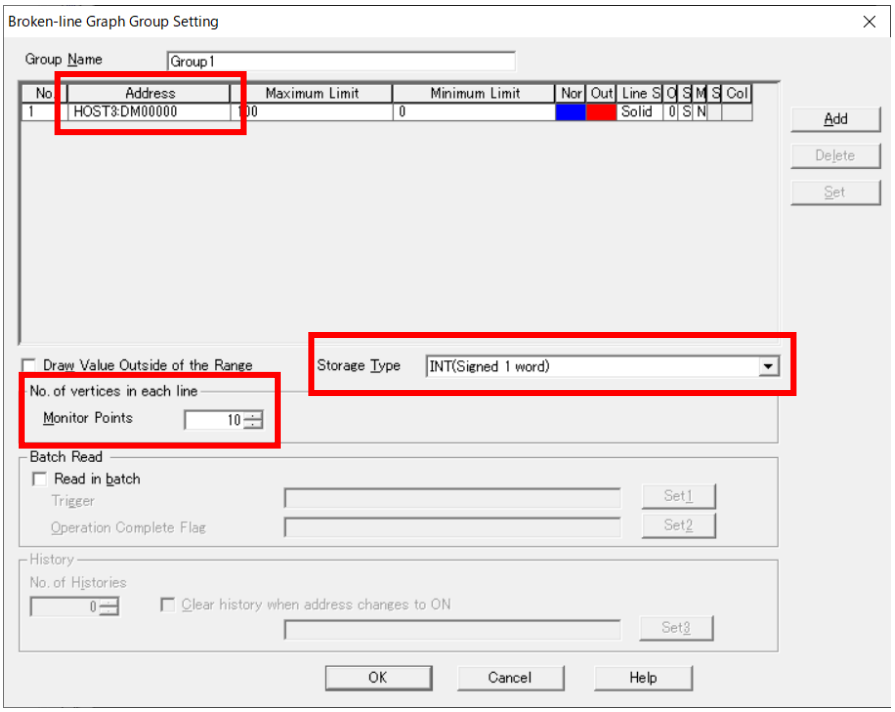
5-6-1 Functionality Correspondence Table

The table below provides the relation of NS and NA Broken-line graph settings.

NS		Supported/Unsupported in NA	Location	Remarks
Broken-line Graph Group	Draw Value Outside of the Range	Not supported	-	Values outside of the range are not displayed.
	Read in Batch	Not supported		Always reads values in batch.
	History	Not supported		You cannot save the broken-line graph history.
	Storage Type	Supported	Global Variables and Device Variables	Select a correct variable type when defining an array, according to the storage format.
	Monitor Points	Partly supported		The NS series units can monitor up to 1000 points, but the NA series units can monitor 800. To monitor the 801st point and more, modify the offset, which determines the beginning of monitoring, in **Data** - **Offset** of the broken-line graph object.
Line Setting	Start Address	Partly supported		Set an array that has as many as the monitor points of the start address.
			DataGroup	Add the registered array to **Data Series** in DataGroup tab.
	Line Setting: Maximum/Minimum Value	Partly supported	Broken-line graph object	Only fixed values are available for the maximum and minimum values. Indirect reference is not supported.
	Line Setting: Line Color	Partly supported		Only colors for **Within** supported. You cannot use colors out of the range.
	Line Setting: Line Style	Partly supported		The NA series supports solid line only. Dash line and dot line are not supported. Step display is not supported.
	Line Setting: Line	Supported		This item is not available. You can control displaying/hiding a line with a subroutine. To hide the line, use HideTraceInGraph function, and use ShowTraceInGraph function to show the line.

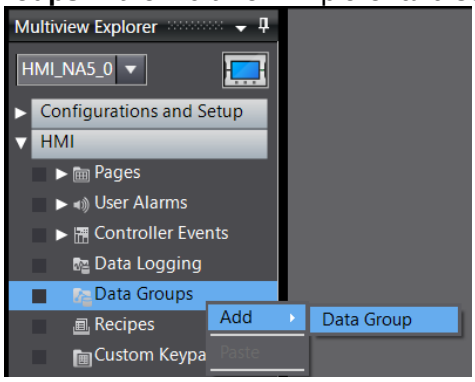
5-6-2 How to Replace

1. Register arrays in the global and device variables, respectively, according to the setting of the start address of the NS series Broken-line Graph Group.

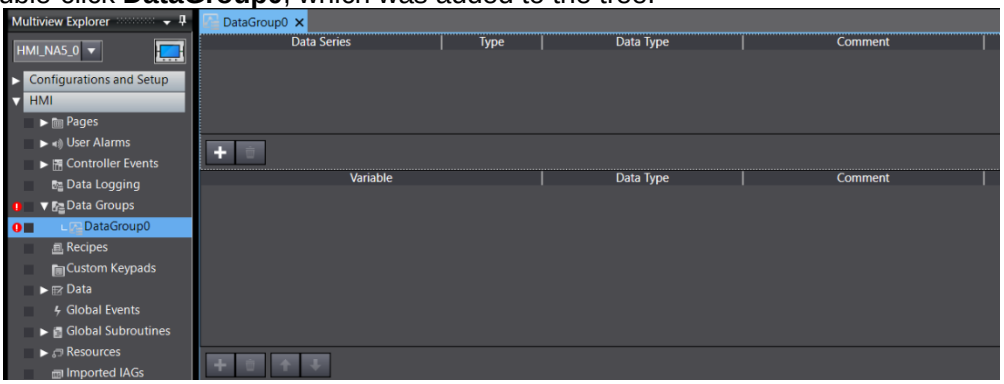


- PT Internal Memory
  ① Double-click **Global Variables** under **HMI** to open the Global Variables edit pane.
  ② Select **New** from the right-click menu. Enter any variable name. The variable's data type must correspond to the **Storage Type** of the NS series Broken-line Graph Group, and the variable must have as many elements as **Monitor Points**.
- Device Address
  ① Follow the same steps as 1) and 2) in "PT Internal Memory."
  ② Select the added array and open the right-click menu. Then select **Register To Controller**. A dialog box that allows you to associate a global variable and device variable appears.
  ③ Select a device from the **Device** drop-down list in **Controller Variable Details**. Then press the **Add Global Variable** button.
- Variable
  ① Only the start address is registered as variable.
  If the variable is used outside of the Broken-line Graph Group Setting, copy and paste the variable and use the added variable in the Data Group Setting.
  ② Select **HMI** - **Global Variables**. Choose the target variable on the edit pane, then set the variable's data type to the corresponding type to the **Storage Type** of the NS series Broken-line Graph Group, and the variable must have as many elements as **Monitor Points**.
- Tag
  It is not necessary to register a variable.

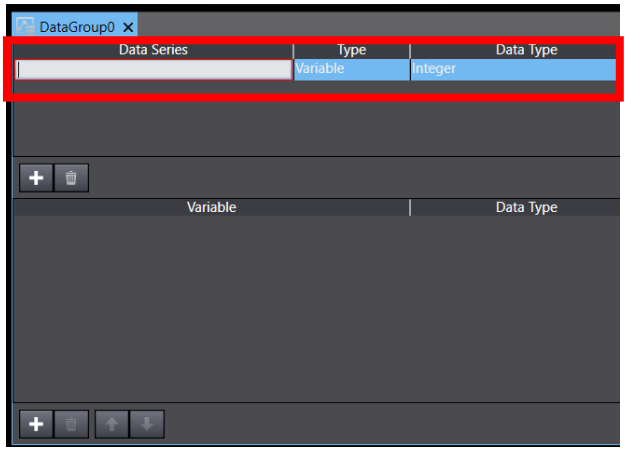
2. Right-click **HMI** - **Data Groups** in the Multiview Explorer and select **Add** - **Data Group**.



3. Double-click **DataGroup0**, which was added to the tree.



4. Click the  button to create a new data series.



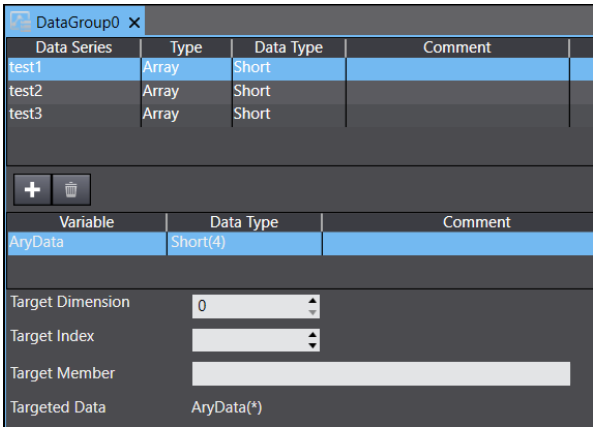
5. Configure the following for the data series.

One graph line is drawn per data series, so create as many data series as you want to display on a single graph.

Item	Setting
Data Series	Enter any name.
Type	Select *Array*.
Data Type	Select the variable type corresponding to the storage type of the NS-line Graph Group Setting.

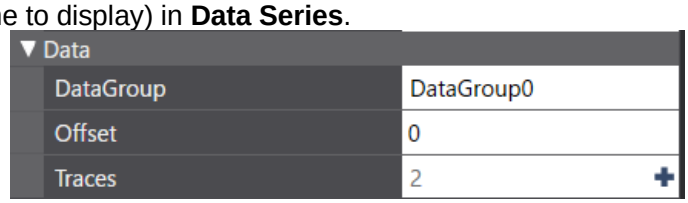
6. Configure attributes of the data series.

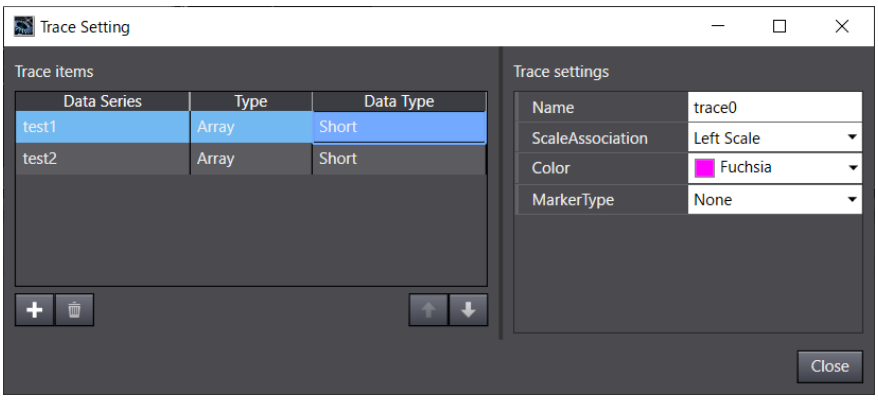
Item	Setting
Variable DataType	Specify an array to display. The **Data Type** field will be automatically filled depending on the array that was specified in the variable setting.
Target Dimension	Default value of *0*.
Target Index	This field is used for a multidimensional array only. Set the first index of the target. If you use a 1D array, leave this field blank, the default.
Target Member	This field is used for a structure array only. Enter the member names.



7. Add the broken-line graph object on the page.

Enter the name of the data group you have created in **DataGroup** under **Data** in the Properties tab.
Then, click the button in the **Traces** field to open the Trace Setting window. Enter the data series name (= line to display) in **Data Series**.





8. Configure settings of line, scale, and other items for each axis.

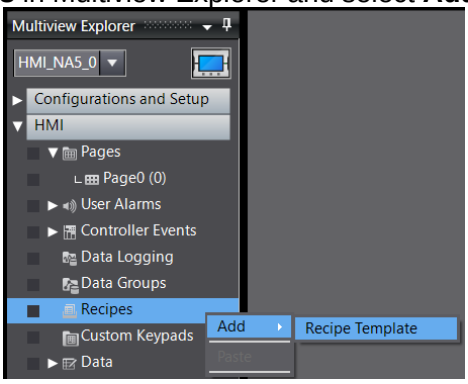
5-7 Data Block Settings

You can replace Data Blocks with Recipes.
However, settings and features are quite different.

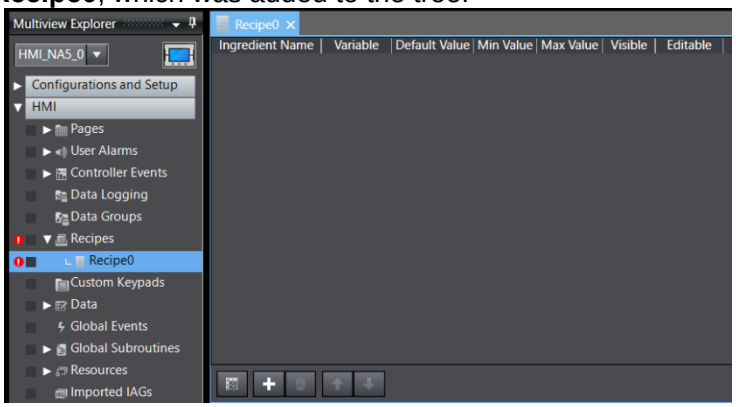
NS	Supported/Unsupported in NA	Remarks
Record Setting	Partly supported	You can set the number of maximum records only.
Specify Interlock	Not supported	Input interlock with variable conditions is not possible.
Record Label Setting	Not supported	Character code setting is not available.
Field Name	Supported	
Address	Supported	
Data Format	Supported	The data types of registered variables are automatically applied.
Record Label	Supported	
Recipe Data	Supported	

5-7-1 How to Replace

1. Right-click **HMI** - **Recipes** in Multiview Explorer and select **Add** - **Recipe Template**.

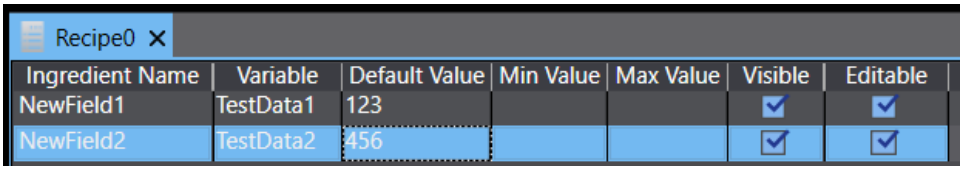


2. Double-click **Recipe0**, which was added to the tree.



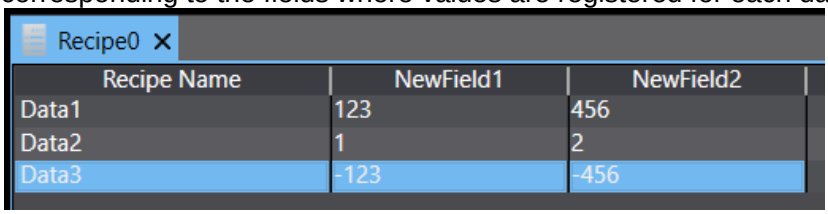
3. Click the button to add a field. Then configure the settings.

Field Name and **Address** of an NS series data block are corresponding to **Ingredient Name** and **Variable**, respectively.



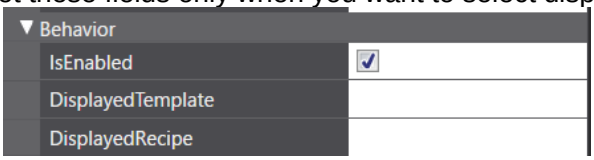
4. Click the button to register values for recipes.

These are corresponding to the fields where values are registered for each data block record.



5. Add a recipe viewer object on the page.

To display all registered recipes, leave the fields **DisplayedTemplate** and **DisplayedRecipe** blank, the default. Set these fields only when you want to select display items.



6. Configure the background color, text, and other settings.

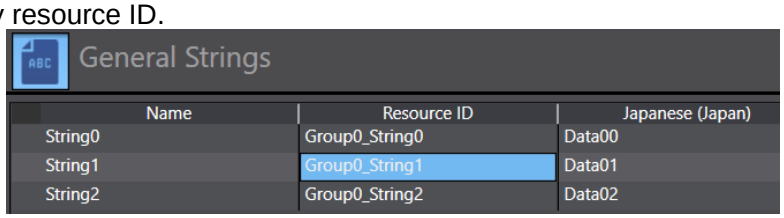
5-8 String Table Setting

You can replace the String Table Setting with **Resources** in **HMI**.

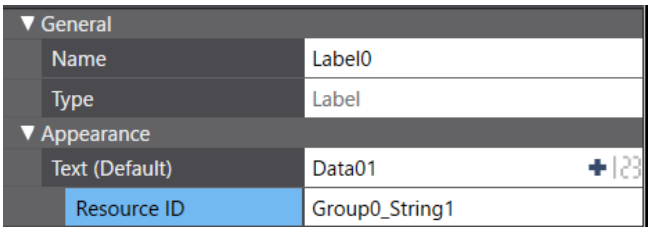
While the NA series has one string table per language, the NA series has five string groups, including General Strings, Alarm Strings, Images, and others.
Use General Strings, Alarm Strings, and Images for replacement of the NS series.

In the NS series, a string table is applied to alarm/event strings, whereas in the NA series, **Alarm Strings** in **Resources** is applied.

In addition, the NS series manages strings by string number in the string table, whereas the NA series manages by resource ID.



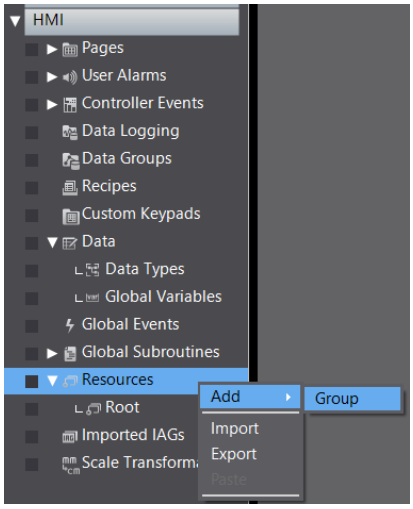
Enter the ID registered in **Resources** into **Resource ID** of the object to display the string registered in **Resources**.



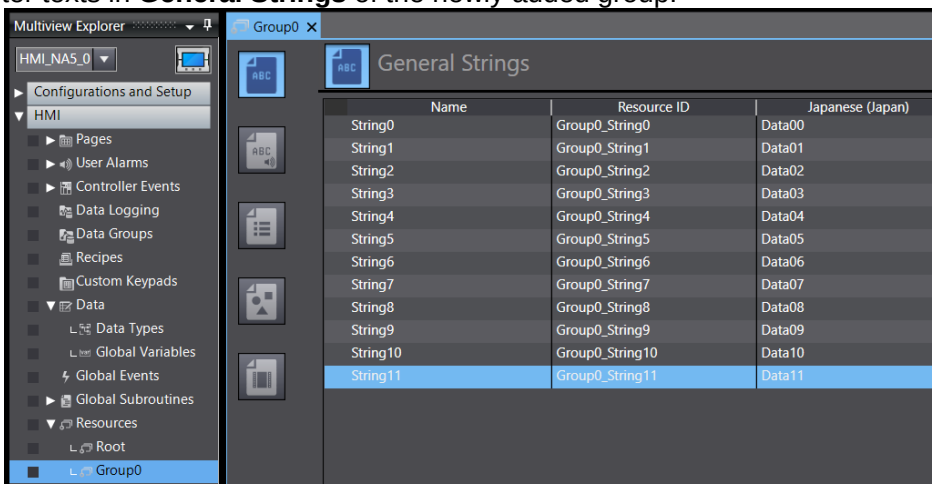
5-8-1 Example of Indirect Reference

You can specify Resource IDs for label and text box objects using conditional expressions. In this way, you can achieve the similar behavior as if the string number were set to Indirect Reference in the NS series.

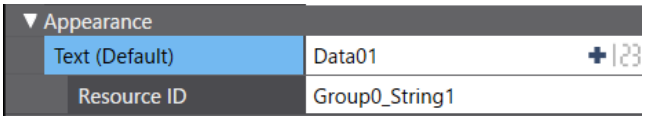
1. Right-click **HMI** - **Resources** in Multiview Explorer and select **Add** - **Group**.
   The group Root exits by default, but we recommend creating a new group for management reason.



2. Register texts in **General Strings** of the newly added group.

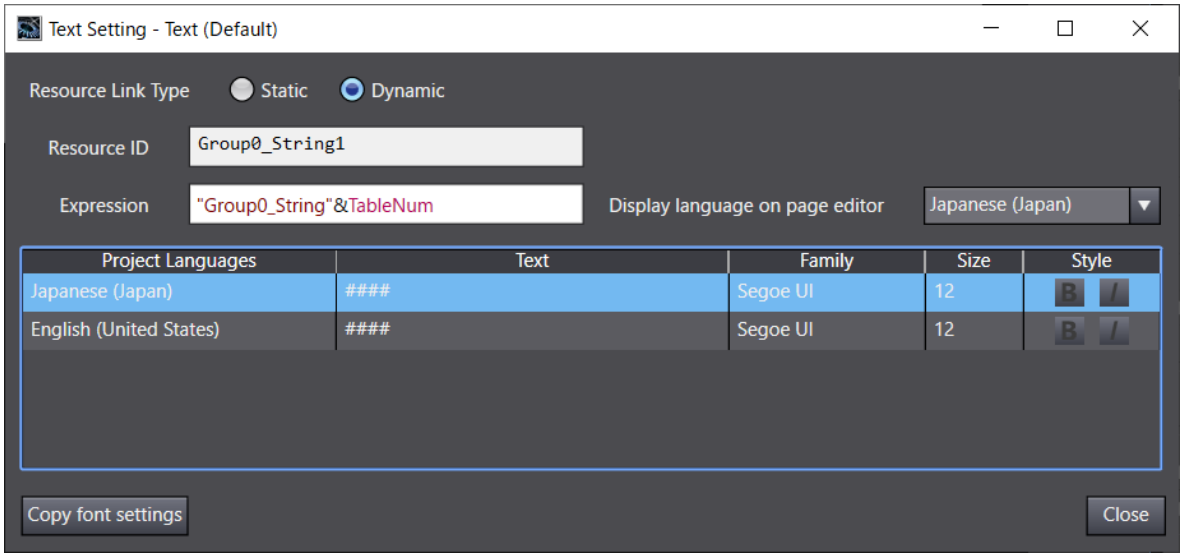


3. After completing entering the texts, create a label or text box object. Then click the button.



4. Selecting *Dynamic* for **Resource Link Type** allows you to enter in the **Expression** field.

Enclose the part to be fixed in double quotation marks, followed by & and then a numeric-type variable.
In the example show below, up to Group0_String is fixed, and the string can be switched according to the value of the numeric type variable TableNum.



5-9 Password

The password function of the NS series allows you to enter a password to operate a functional object and has up to five passwords and operation levels.
For the NA series, the security function is available. This function controls whether an entry to an object is allowed/prohibited and whether the object is shown/hidden, depending on the privilege of the logged-in user. In the NA series, instead of entering a password at the time of operating the object as in the NS series, the user logs in with a username and password before operating the object.

To enter the password at the point of operating an object as in the NS series, follow this procedure.

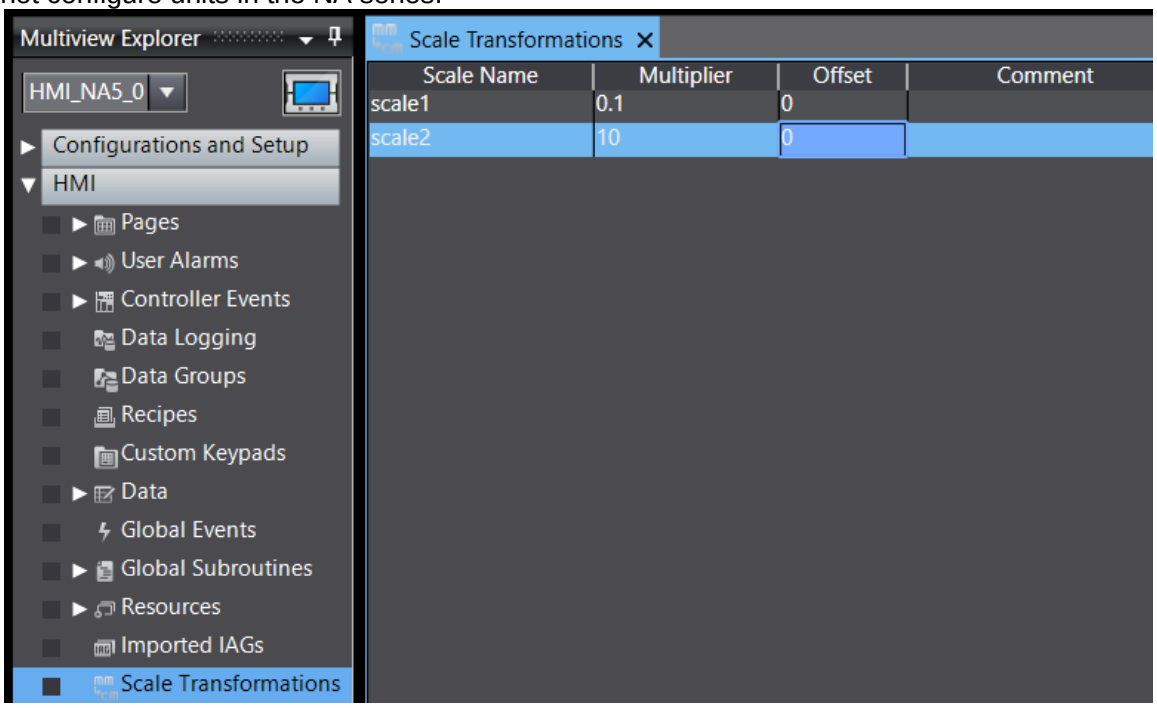
1. Define five String type variables, NS_passwords1 to NS_passwords5, to store the password string as global variables.
2. In addition, define Boolean type variables NS_SB54 to 58, which are substituted for the NS system memories $SB54 to 58 and Integer type variable NS_SW39, which is substituted for $SW39, as global variables.
3. Create a subroutine NS_checkPassword().

```
Sub NS_checkPassword()
   Dim lvl As Integer = 0
   Dim pwd As String
   pwd = Microsoft.VisualBasic.InputBox("Enter the password")
   select pwd
   case NS_passwrods1:
      lvl = 1
   case NS_passwrods2:
      lvl = 2
   case NS_passwrods3:
      lvl = 3
   case NS_passwrods4:
      lvl = 4
   case NS_passwrods5:
      lvl = 5
   End Select
   If lvl > 0
      NS_SW39 = lvl
      NS_SB54 = True
   End if
  If  lvl > 1 Then NS_SB55 = True
  If  lvl > 2 Then NS_SB56 = True
  If  lvl > 3 Then NS_SB57 = True
  If  lvl > 4 Then NS_SB58 = True
End Sub
```

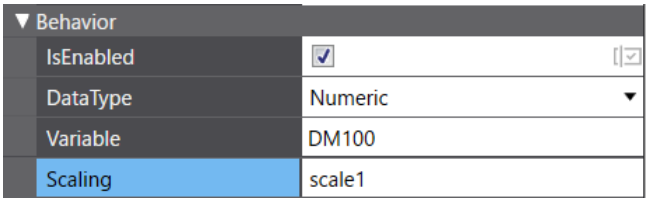
4. Select **Press** from the Events options in **Events and Actions** of the object. Then select **CallSubroutine** from the options of Actions, and specify the subroutine NS_checkPassword() in SubroutineName.

5-10 Unit/Scale Settings

Double-click **Scale Transformations** under **HMI** in Multiview Explorer to open the **Scale Transformations** edit pane. Configure multiplier and offset values. Unlike in the NS series, you cannot configure units in the NA series.



Enter the registered scale transformations in the **Scaling** field in Properties of a data display or data input object.



5-11 Dialog Setting

The NA series does not have a corresponding functionality.
To realize the same behaviors as the NS series, you need to utilize pup-ups.

Since the NA series can only display one pop-up screen at a time, the following method is useful to display additional confirmation dialog, etc. on the pop-up.

1. Place a button object the same size as the screen size at the very front of the page. Make inputs disabled on this button object. By hiding this button object normally and making the object visible when displaying the confirmation dialog, the currently displayed window will be covered by this object, and all buttons there will get non-enterable.
2. Arrange objects for the confirmation dialog in front of the button object. These objects should also be normally hidden so that they will be displayed and operated when the confirmation dialog is displayed.

5-12 Device Data Transfer Setting

The NA series does not have a corresponding functionality.
The following describes how to achieve the function with a subroutine.

1. Define transfer source address and transfer destination address of a transfer entry in Global Variables. If the transfer entry has more than one data element, define as an array with as many members as the elements.
2. Define the bit address of a device data transfer trigger as a Boolean variable in Global Variables.
3. Create a function NS_DataTransfer in Global Subroutines. You need as many functions as device data transfer triggers.

```
Sub NS_DataTraNSfer1
   Dim I As Integer
   DestinationVariable1 = SourceVariable1
   DestinationVariable2 = SourceVariable2
   DestinationVariable3 = SourceVariable3
   ...
   For I = 0 To SourceArray4.Length – 1
      DestinationArray4(i) = SourceArray4(i)
   Next
   For I = 0 To SourceArray5.Length – 1
      DestinationArray5(i) = SourceArray5(i)
   Next
   ...
End Sub
```

4. Register the data transfer triggers in Global Events.
   Events must be the same number of triggers, and you need to specify corresponding functions for them.

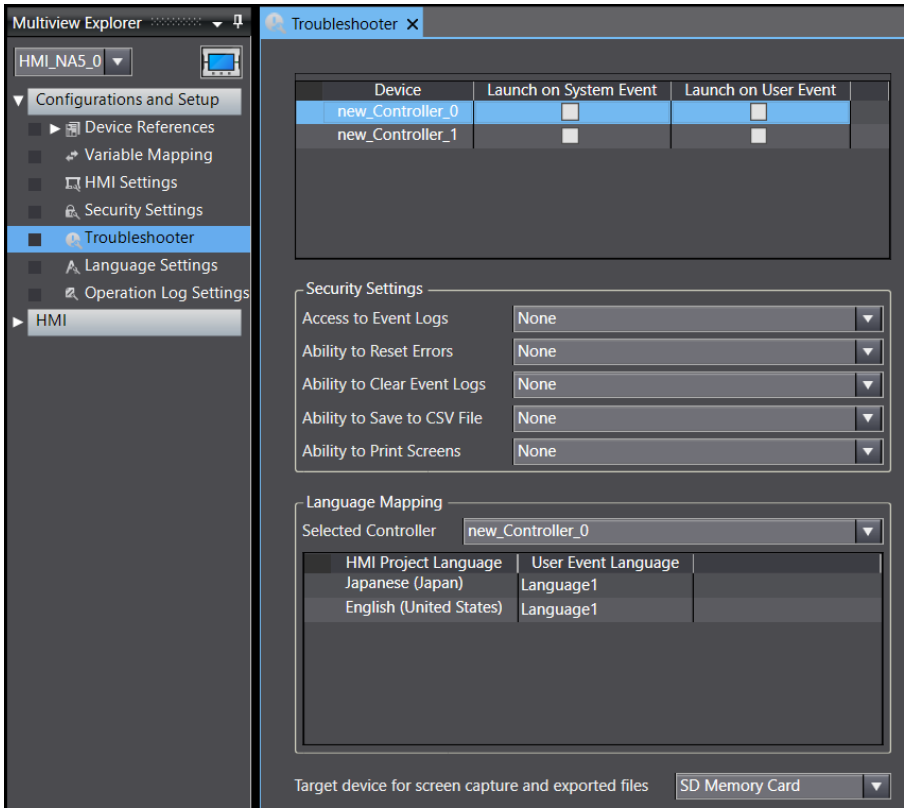
Trigger Type	Event	Action
Rising Edge	Enter *Variable* in **Condition** - **Expression** Specify the function *NS_DataTraansfer*** in **CallSubroutine**	
Falling Edge	Enter *Not Variable* in **Condition** - **Expression**	
Cycle	Select *Interval* in **Interval**.	

5-13 Troubleshooter Setting

The table below provides the relation of NS and NA troubleshooter settings.

NS	Supported/Unsupported in NA	Remarks
Screen Setting	Partly supported	While in the NS series, you need to copy the screen settings from Sysmac Studio or import via a CSV file, in the NA series, you can reuse events set in the controller, cooperating in Sysmac Studio. However, you cannot display a screen you want to show while pressing the Show Detail button.
Theme	Not supported	The theme to be displayed is fixed.
Language Assignment	Supported	Configure the language assignment in the **Language Mapping** area.
User Authentication	Supported	Configure user authentications in the **Security Settings** area.
Monitor Errors	Supported	Check the **Launch on System Event** and **Launch on User Event** check boxes.

Double-click **Troubleshooter** under **Configurations and Setup** to open the Troubleshooter setting tab page.



6 Replacement Examples: Functional Objects

This chapter describes examples of replacing functional objects such as ON/OFF buttons and bit lamps.

6-1 Functional Difference Between NS and NA: Common in Objects

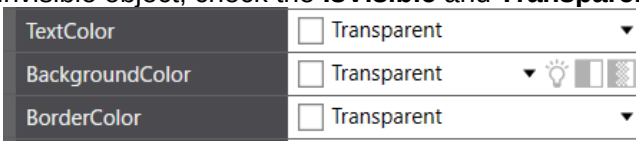
This section provides items common in components but have different features in the NS and NA series.

6-1-1 Behaviors of Overlapped Objects

In the NS series, objects without input function, e.g., shape, lamp, and label, do not prevent press inputs into objects behind. You can operate a button even when those objects are front of it. However, all objects do not allow you to operate objects behind them. For example, you cannot press a button if you have put another shape object in front of the button.
Therefore, do not place an object in front of a button.
Or remove a button behind and set the behavior of the button in **Events and Actions** - **Press** of the front object.

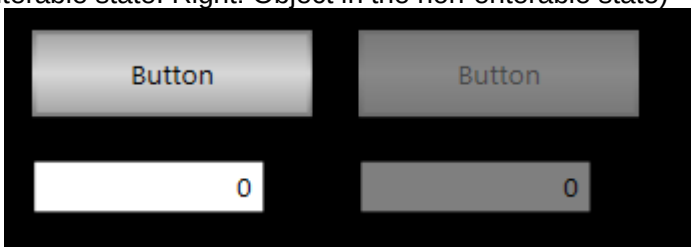
6-1-2 Behaviors of Hidden Objects

You can operate hidden objects, except Numeral Display and Input, and String Display and Input objects in the NS series.
In the NA series, if you uncheck the **IsVisible** check box to hide an object, you are not allowed to operate the object.
To create an operable invisible object, check the **IsVisible** and **Transparent** check boxes.



6-1-3 Appearance of Non-Enterable Object

The Na series objects will be forcibly grayed-out when they are in the non-enterable state.
(Left: Object in the enterable state. Right: Object in the non-enterable state)



To prohibit operations without changing the object's appearance, overlay another shape object on the object, not controlling inputs. Make the overlaid shape transparent. Then, show it while input is prohibited and hide while input is allowed.

6-1-4 Where to Use Macros in Object Settings

The table below shows where you can set subroutines in the NA series for replacing macros executed in the NS series object settings.

NS Functionality	NA Setting
Touch ON	Display **Events and Actions** of the object and select *Press* from the options in **Events**. Then, select *CallSubroutine* in **Actions**.
Touch OFF	Display **Events and Actions** of the object and select *Click* or *Release* from the options in **Events**. Then, select *CallSubroutine* in **Actions**.
Execute when ON	Display **Events and Actions** of the page and select *Condition* from the options in **Events** to enter [*Variable name = True*] in **Expression**. Then, select *CallSubroutine* in **Actions**.
Execute when OFF	Display **Events and Actions** of the page and select *Condition* from the options in **Events** to enter [*Variable name = False*] in **Expression**. Then, select *CallSubroutine* in **Actions**. Execute when OFF
Execute when ON/OFF	Display **Events and Actions** of the page and select *Condition* from the options in **Events** to enter [*Variable name = True*] and [*Variable name = False*] in **Expression**, respectively. Then, select *CallSubroutine* in **Actions**. Execute when OFF
Before inputting numeral	No corresponding function
Before writing numeral	No corresponding function
When changing value	No corresponding function
When an address value changed	No corresponding function
Set Value = Address Value	Display **Events and Actions** of the page and select *Condition* from the options in **Events** to enter [*Variable name = Set value*] in **Expression**. Then, select *CallSubroutine* in **Actions**.
Set Value != Address Value	Display **Events and Actions** of the page and select *Condition* from the options in **Events** to enter [*Variable name <> Set value*] in **Expression**. Then, select *CallSubroutine* in **Actions**.
Set Value < Address Value	Display **Events and Actions** of the page and select *Condition* from the options in **Events** to enter [*Variable name < Set value*] in **Expression**. Then, select *CallSubroutine* in **Actions**.
Set Value <= Address Value	Display **Events and Actions** of the page and select *Condition* from the options in **Events** to enter [*Variable name <= Set value*] in **Expression**. Then, select *CallSubroutine* in **Actions**.
Set Value > Address Value	Display **Events and Actions** of the page and select *Condition* from the options in **Events** to enter [*Variable name > Set value*] in **Expression**. Then, select *CallSubroutine* in **Actions**.
Set Value >= Address Value	Display **Events and Actions** of the page and select *Condition* from the options in **Events** to enter [*Variable name >= Set value*] in **Expression**. Then, select *CallSubroutine* in **Actions**.

6-2 Non-replaceable Functionalities: Common in Objects

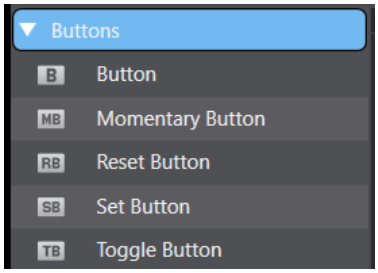
The following table shows the functionalities common in the NS series functional objects that cannot be replaced in the NA series.

NS Functionality	Remarks
Indirect reference of color/ Indirect reference of text color	The functions change the color of objects, such as ON/OFF buttons, bit lamps, and labels, and texts according to the value of an address. The NA series does not have corresponding functionalities and use the color code of the NS series.
Three-dimensional Frame	Simple frame only. Three-dimensional frame is not available.
Frame ON/OFF Display	This functionality is not supported because three-dimensional frame is not available.
Flicker	The NA series has the flicker functionality, but you cannot modify the flickering point and rate.
Turn ON the specified address when the value is confirmed	No corresponding function.
Display Write Confirmation Dialog	No corresponding function is available because the NA series does not have the dialog setting function.
Record to Operation Log - Message	The NA series cannot record messages for each object in the operation log.
Password	You can display a password input dialog box while pressing an object following the tangled procedure in “5-9 Password,” but the behavior differs from the NS series. Instead, we recommend using the NA security function and logging in with authorized username in advance.

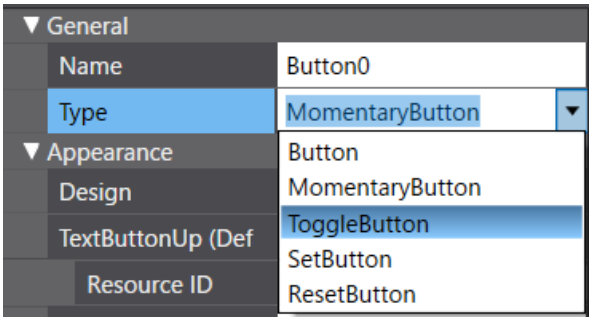
6-3 ON/OFF Button

In the NA series, button objects are classified into different objects: Button, Set Button, Toggle Button, Momentary Button, and Reset Button. Lay out an object for an action you want to create. Buttons are divided into different objects, but you can change the button type in **General** - **Type** in the Properties tab after placing the object.

Different objects in Toolbox



Change the button type in **General** - **Type** in the object’s Properties tab



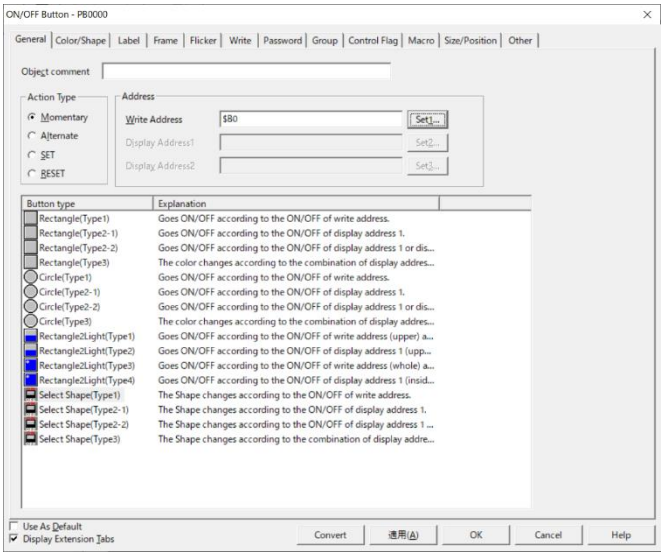
Precautions for Correct Use

There are some differences in the behavior of the momentary button between the NS and NA series. When communication with the controller is disconnected while you are pressing the momentary button, the NS unit checks the button state when communication is restored and writes the value to the allocation memory if there is a difference. Still, the NA unit does not write to the memory but only

reads the value of the allocated memory. Therefore, depending on the settings, the display may differ from the operation state, so please debug it when replacing it to ensure that unexpected behavior does not occur.

6-3-1 Button Types

The NS series ON/OFF button has various display statuses, e.g., write destination, display bit data, etc.



This section describes replacement procedure for each button type.
In the NA series, you can perform settings in **Behavior** - **VisualFeedback** in the **Properties** tab, which corresponds to Button type in the NS series. Some ON/PFF button types supported in the NS series have no functionalities in the NA series.

NS Action Type	NA Setting	Remarks
Rectangle/Circle/Select Shape (Type1)	Variable (Button)	
Rectangle/Circle/Select Shape (Type2-1)	Feedback (Button)	Enter an expression for changing the state in **FeedbackExpression**.
Rectangle/Circle/Select Shape (Type2-2)	Touch (Button) + Feedback (Button)	Enter an expression for changing the state in **FeedbackExpression**.
Rectangle/Circle/Select Shape (Type3)	No corresponding setting	This type does not have a functionality as a button itself, but you can create a similar display by overlaying buttons, lamps, and shapes.
Rectangle2Light(Type1)	Variable (Button) + Feedback (Indicator)	Select *Bottom* or *Custom* for **IndicatorPosition** to adjust the width, height, and position of the indicator.
Rectangle2Light(Type2)	No corresponding setting	
Rectangle2Light(Type4)	Variable (Button) + Feedback (Indicator)	I the NA series, the indicator corresponds to the ○ in an NS series object, but its shape is rectangle.
Rectangle2Light(Type4)	No corresponding setting	

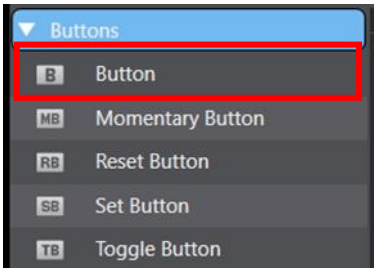
6-3-2 Non-replaceable Functionalities

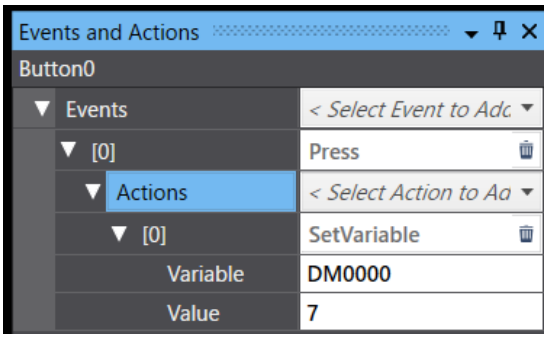
NS Tab	NS Functionality	Remarks
Label	Link with the Specified Address ON/OFF	In the NS series, you can change the status of objects and labels with different addresses, respectively, but in the NA series, the status of an object and that of a label is linked.
Group Specification	Group Specification	No corresponding function. You need create an action that when you press a button, it turns all the variables assigned to other buttons in the group OFF by using a subroutine.

Other	Do not allow sound for this object	No corresponding function.

6-4 Word Button

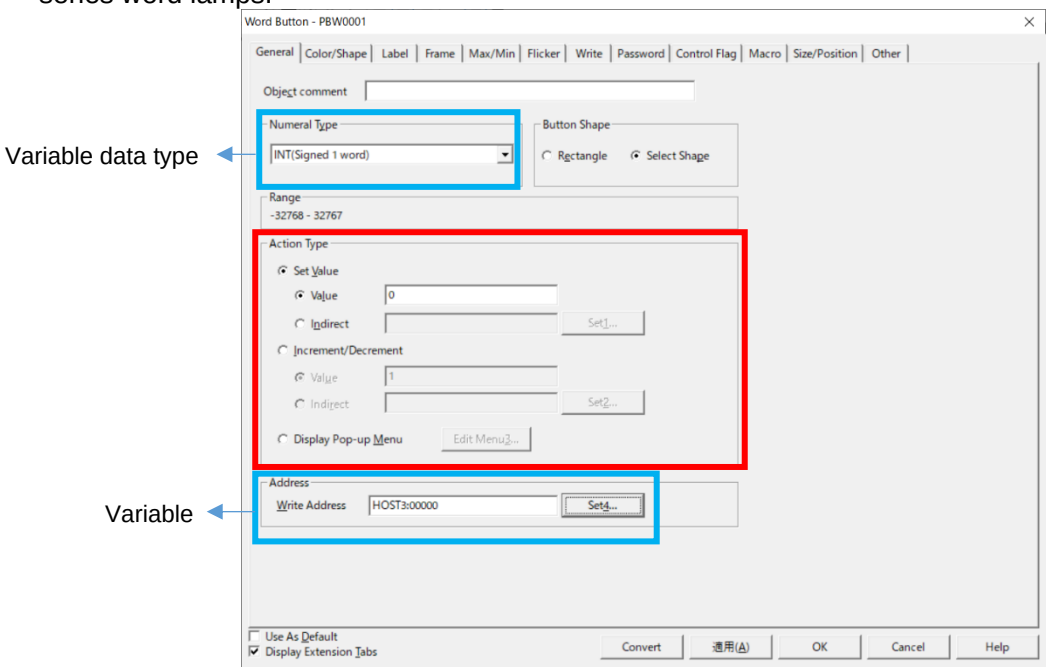
The NA series does not have a specific button with corresponding functionality. However, you can realize the functionality using a simple Button object in the following way: select *Press* from the **Events** options in **Events and Actions**. Then, select an appropriate action from the **Actions** options.





6-4-1 Button Actions

The table below provides alternate settings in the NA series for the button action settings of NS series word lamps.

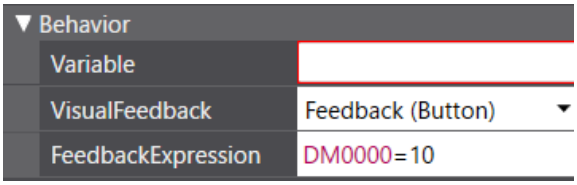


NS Action Type	NA Action	Remarks
Set Value - Value	SetVariable	Enter a value in the **Value** box.
Set Value - Indirect	SetVariable	Enter a variable name for indirect reference in the **Value** box.
Increment/Decrement - Value	IncreaseVariable DecreaseVariable	Enter a value to add or subtract in the **Value** box.

Increment/Decrement - Indirect	IncreaseVariable DecreaseVariable	Enter a variable name for indirect reference in the **Variable** box.
Display Pop-up Menu	No corresponding function	

● Set Value Match Color

You can select the set value match color when you choose **Set Value** in the Action Type area in the NS series. In the NA series, since buttons do not have a feedback expression, it is impossible to change a status using variables.
If you want to set the set value match color, prepare a momentary button and configure it to change when the value comes to the set value. For this example, the state changes when the value of the variable DM0000 comes to 10.



Leaving the Variable box blank will issue a warning at a build.
If you do not want the warning, create a dummy variable, and enter it in the Variable box.

6-4-2 Non-replaceable Functionalities

NS Tab	NS Functionality	Remarks
Max/Min	Maximum Limit/ Minimum Limit	Configure the action so that a button works within the range of limits of inputs. You need a subroutine to replace these settings including the options, Return to the minimum/maximum value when the maximum/minimum value is exceeded.
Other	Do not allow sound for this object	No corresponding function.

6-5 Command Button

The NA series does not have a specific button with corresponding functionality. However, you can realize the following settings The selected standard Button object in the following way: select *Click* from the **Events** options in **Events and Actions**. Then, perform an appropriate setting in the **Actions** fields. Note that some functionalities cannot be replaced.

NS Functionality	NA Action	Remarks
Switch Screen - Specified Screen	ShowPage	Enter a destination page name in **PageName**.
Switch Screen - Indirect Specification of Screen No.	SetVariable	Enter the system-defined variable _HMI_CurrentPageIndex in the **Variable** box, and the indirect referencing variable name in the **Value** box, respectively.
Switch Screen - Selection by Pop-up Menu	No corresponding function	
Switch Screen - Backward	ShowPreviousPage	
Switch Screen - Forward	No corresponding function	
Switch Screen - Write Screen No. when Pressing the button	SetVariable	Enter the write destination variable name in the **Variable** box, and the system-defined variable _HMI_CurrentPageIndex in the **Value** box, respectively.
Key Button	No corresponding function	
Control Pop-up Screen - Close Local Pop-up Screen	ClosePage	Enter the name of the page you want to close in **PageName**.
Control Pop-up Screen - Close Specified Pop-up Screen	ClosePage	Enter the name of the page you want to close in **PageName**.
Control Pop-up Screen - Move Local Pop-up Screen	No corresponding function	
Display System Menu - System menu Top Page (Initialize Tab)	ShowSystemMenu	
Display System Menu - Switch Box Function	No corresponding function	
Display System Menu - Display Captured Data	No corresponding function	
Stop Buzzer	BuzzerOff	
None	No corresponding function	You can realize the same action by leaving **Events** settings empty. If another functionality, e.g., the Touch ON macro, is registered, configure a corresponding functionality.
Video Control - Video Capture	No corresponding function	
Video Control - Contrast Adjustment	No corresponding function	

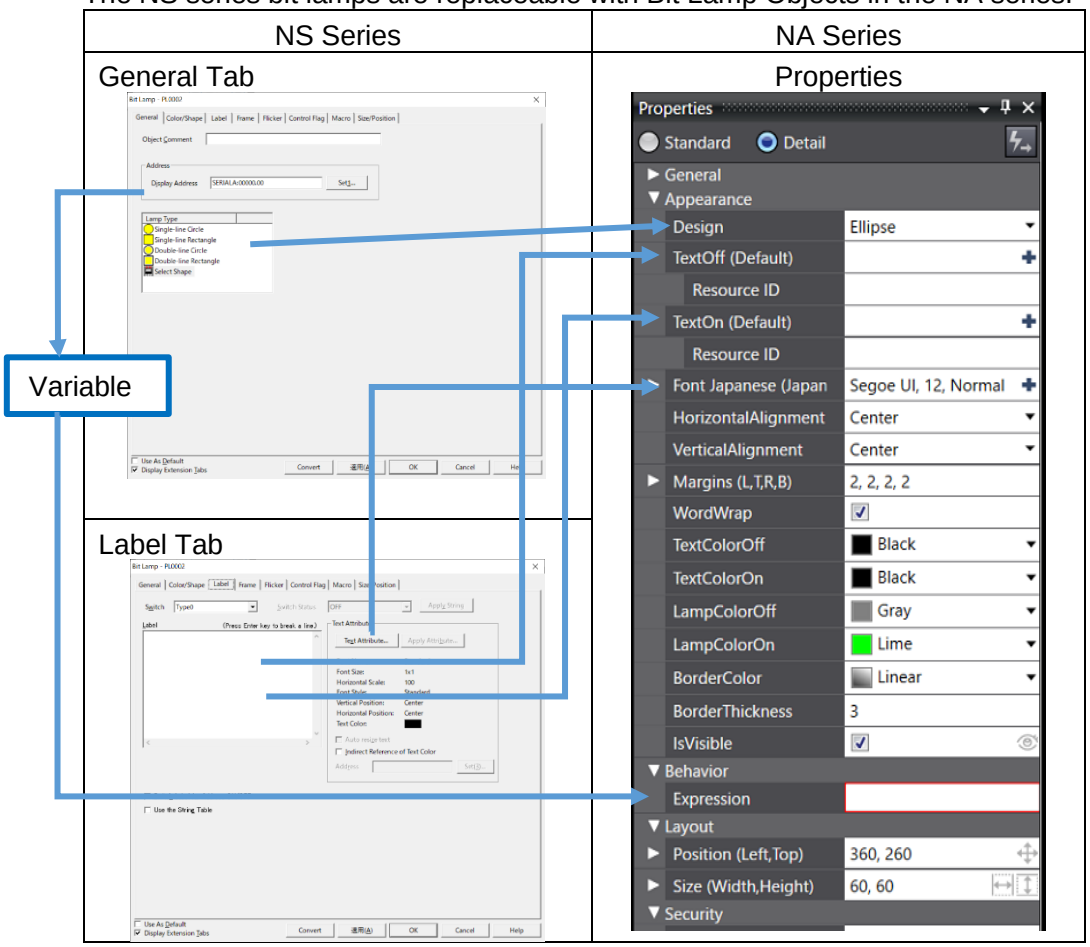
Video Control - Vision Sensor Console Output	No corresponding function	
Data Block Control - Read data from CSV file to PLC Data Block	No corresponding function	
Data Block Control - Write data from PLC Data Block to CSV file	No corresponding function	
Data Block Control - Read data from CSV file to NS PT Memory	No corresponding function	
Data Block Control - Write data from NS Data Block to CSV file	No corresponding function	
Data Block Control - Read data from NS PT Memory to PLC Data Block	No corresponding function	
Data Block Control - Write data from PLC Data Block to NS PT Memory	No corresponding function	
Data Block Control - Read record label	No corresponding function	
Data Block Control - Delete record	No corresponding function	
Authentication Cancellation	Logout	

6-5-1 Non-replaceable Functionalities

NS Tab	NS Functionality	Remarks
Other	Do not allow sound for this object	No corresponding function.

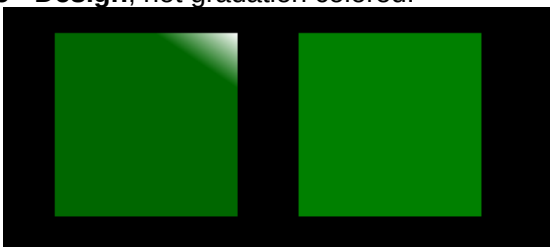
6-6 Bit Lamp

The NS series bit lamps are replaceable with Bit Lamp Objects in the NA series.



When you select Ellipse or Rectangle in **Appearance** - **Design** and choose a color, the upper-right part of the object will be forcibly colored gradationally, and the appearance will differ from an NS series bit lamp. If you want the same appearance, select *Image* in **Appearance** - **Design** to use an image file for the lamp's appearance. No gradation on the lamp. Note that you need to prepare an image file.

Left: Rectangle in **Appearance** - **Design**, forcibly gradation colored.
Right: Image in **Appearance** - **Design**, not gradation colored.



6-6-1 Non-replaceable Functionalities

NS Tab	NS Functionality	Remarks
General	Double-line Circle	The NA series has only single-line frame.
General	Double-line Rectangle	The NA series has only single-line frame.
Macro	Macro Execution Condition	In the NA series, you cannot register an action to a lamp. Set a subroutine in **Events and Actions** of a page or global event.

6-7 Word Lamp

The NS series bit lamps are replaceable with Data Lamp Objects in the NA series.
Just like bit lamps, when you select Ellipse or Rectangle in **Appearance** - **Design** and choose a color, the upper-right part of the object will be forcibly colored gradationally.

6-7-1 Non-replaceable Functionalities

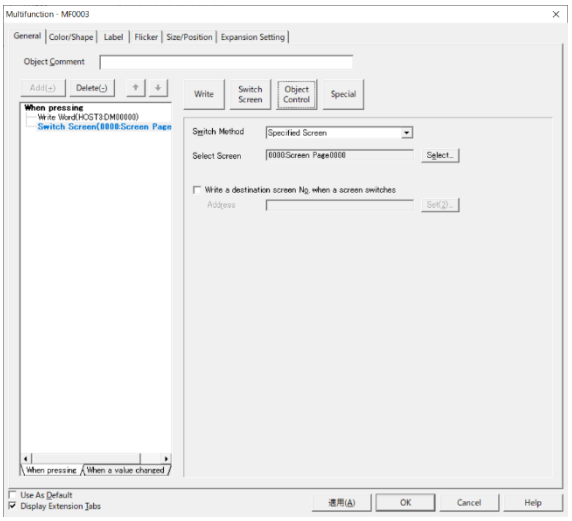
NS Tab	NS Functionality	Remarks
General	Double-line Circle	The NA series has only single-line frame.
General	Double-line Rectangle	The NA series has only single-line frame.
Label	Switch label according to the address value	It is impossible to read strings from a file. Enter a label directly in **Behavior** - **ColorRanges** in Properties.
Macro	Macro Execution Condition	In the NA series, you cannot register an action to a lamp. Set a subroutine in **Events and Actions** of a page or global event.

6-8 Multifunction

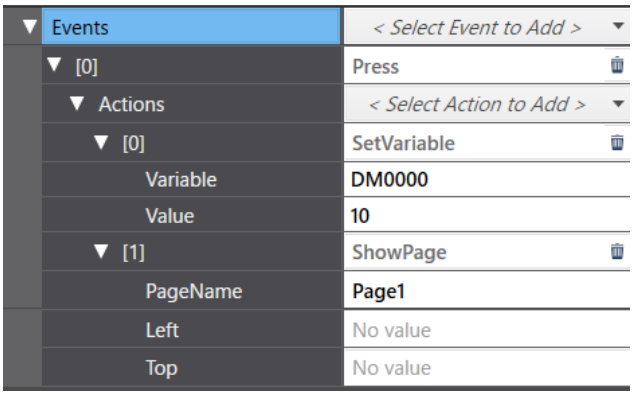
The NA series does not have a directly-corresponding object, but you can achieve a similar functionality by registering multiple **Events and Actions** settings for a button object.

In the following example, a single object assigns a value to a variable and switches pages.

NS series



NA



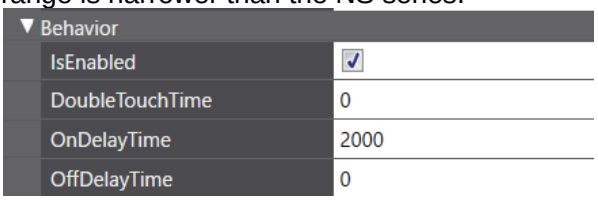
The table below provides relations between NS functionalities by a Multifunction object and NA actions.
Functionalities that can be replaced with a command button are omitted.

NS Functionality	NA Action	Remarks
Switch Screen - Next Page	No corresponding action	
Switch Screen - Previous Page	No corresponding action	
Object Control - Contents Control	No corresponding action	
Object Control - Alarm/Event Control - Clear	ClearUserAlarmLog	
Object Control - Alarm/Event Control - Save	SaveUserAlarmLogToFile	
Object Control - Alarm/Event Control - Home/End	CallSubroutine	Execute ScrollAlarmViewerList. The number of scrolling rows cannot be greater than the maximum of history records.
Object Control - Alarm/Event Control - Next/Previous	No corresponding action	
Object Control - Alarm/Event Control - From New Date & Time	CallSubroutine	Execute SortViewer.
Object Control - Alarm/Event Control - From Old Date & Time	CallSubroutine	Execute SortViewer.
Object Control - Alarm/Event Control - From High Priority	CallSubroutine	Execute SortViewer.
Object Control - Alarm/Event Control - From Low Priority	CallSubroutine	Execute SortViewer.
Object Control - Alarm/Event Control - From High Frequency	No corresponding action	The NA series alarm does not support frequency of occurrence.
Object Control - Alarm/Event Control - From Low Frequency	No corresponding action	The NA series alarm does not support frequency of occurrence.
Object Control - Alarm/Event Control - Check Selected Alarm	CallSubroutine	Execute AcknowledgeUserAlarm.
Object Control - Alarm/Event Control - Delete Selected Alarm	No corresponding action	The NA series alarm does not have a functionality to delete individual alarms.
Object Control - Alarm/Event Control - Check All Alarms	CallSubroutine	Execute AcknowledgeAllUserAlarms.
Object Control - Alarm/Event Control - Cancel All Alarms' Checks	No corresponding action	You cannot cancel the confirmed alarm.
Object Control - Alarm/Event Control - Change Display Type	CallSubroutine	Execute FilterByText. Configure the target column or text filtering, as needed.

NS Functionality	NA Action	Remarks
Object Control - Data Log Control - Start	StartDataLogging	
Object Control - Data Log Control - Stop	StopDataLogging	
Object Control - Data Log Control - Log Clear	No corresponding action	
Object Control - Data Log Control - Save to File	CallSubroutine	Execute ExportDataLogBuffer.
Object Control - Data Log Control - Read File	No corresponding action	
Object Control - Data Log Control - Pause	No corresponding action	
Object Control - Data Log Control - Move the cursor forward	CallSubroutine	Execute the function MoveTrendCursor.
Object Control - Data Log Control - Move the cursor backward	CallSubroutine	Execute the function MoveTrendCursor.
Object Control - Scroll Object	No corresponding function	
Special - Password Setting	No corresponding action	
Special - Confirmation Dialog Box	No corresponding action	
Special - Macro	CallSubroutine	Describe the processing, which is defined in Macro, in the subroutine.
Special - Initialize Operation Log	No corresponding action	
Special - Save Operation Log	CallSubroutine	Execute the function SaveOperationLogToFile.

6-8-1 Double Pressing and ON and OFF Delay Functions

In the NS series, Double Pressing and ON/OFF Delay functionalities are only supported by the Multifunction Object. These functionalities are available on Momentary Button, Toggle Button, Button, Set Button, and Reset Button in the NA series.
However, settable value range is narrower than the NS series.



NS Functionality	NS Setting Range	NA Setting Range
Double Pressing	0.5 to 30.0 s	0 to 2000 ms
On Delay	0.5 to 15.0 s	0 to 2000 ms
OFF Delay	0.5 to 15.0 s	0 to 2000 ms

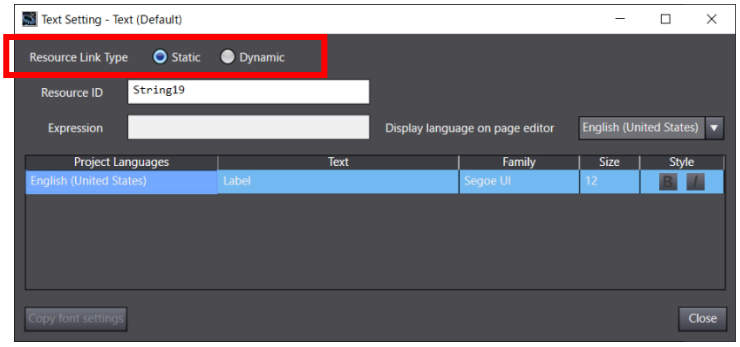
6-8-2 Non-replaceable Functionalities

NS Tab	NS Functionality	Remarks
General	Prohibiting Simultaneous Pressing	Simultaneous pressing is not supported.
Color/Shape	Double-line Rectangle	The NA series has only single-line frame.
Color/Shape	Double-line Circle	The NA series has only single-line frame.
Color/Shape	Polygon	It is impossible to make a Button Object's appearance polygon. Instead, create a Polygon Object in **Shapes** - **Polygon**, then configure an action in **Events and Actions**.
Color/Shape	Sector	You cannot create a sector shape object.
Expansion Setting	Wait for completion of communication (Synchronous communication)	

6-9 Text

The NS series Text Objects are replaceable with Label Objects in the NA series.

To display a fixed character string on a label object, select *Static* for **Resource Link Type** in **Behavior** - **Text (Default)** in Properties of the object. Double-click a Label Object to display this setting dialog.

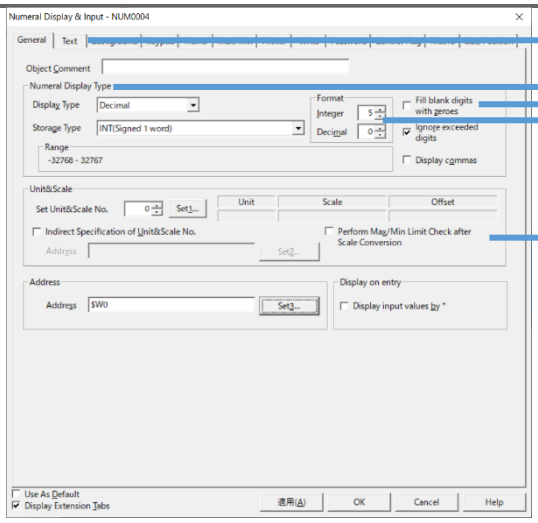
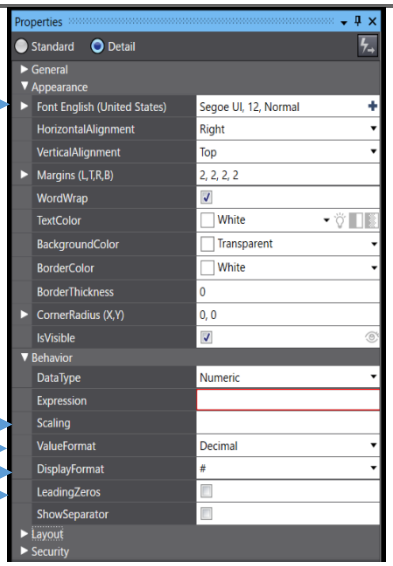
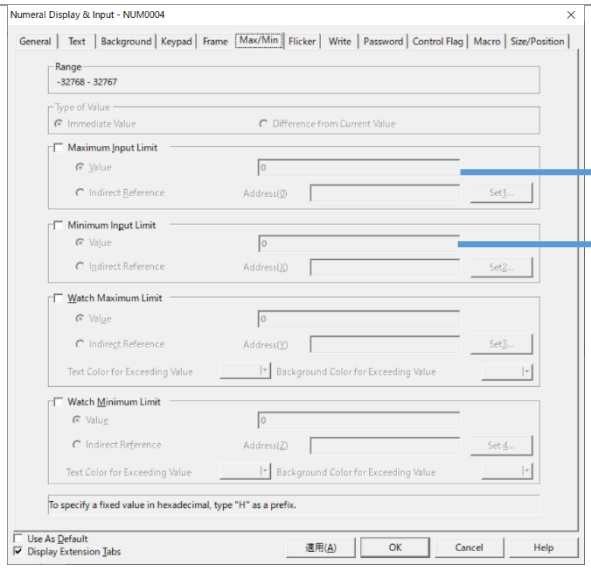
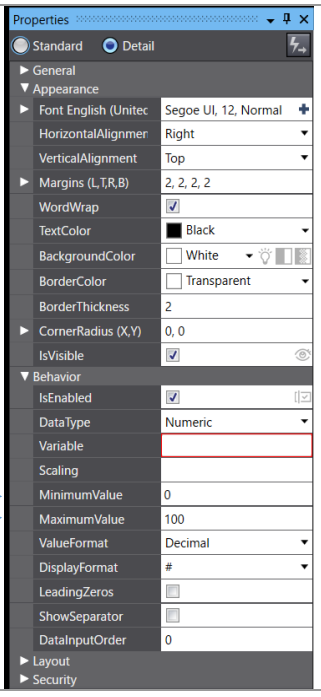


If you have selected the option, Use as a Message Display, or indirectly referenced a string for the NS text object, select *Dynamic* for **Resource Link Type** in **Behavior** - **Text (Default)** in Properties of the label object. Refer to 5-8-1 *How to Replace* for the setting procedure.

6-10 Numeral Display and Input

You can replace a String Display and Input Object with a Data Display Object or a Data Input Object. If you want only to display numerals, use a data display object, and also need to input, use a data input object.

Put an object on the page, then select *Numeric* and *Text* in **Behavior** - **DataType** in Properties.

NS series Numeral Display and Input General Tab	NA series Data Display Object Properties
	
Max/Min Tab	**Data Input Object Properties**
	

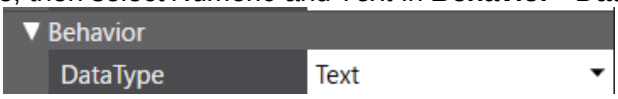
6-10-1 Non-replaceable Functionalities

NS Tab	NS Functionality	Remarks
General	Display Type - Binary	
General	Display Type - Octal	
General	Storage Type - All BCD types	
General	Ignore exceeded digits	
General	Display input values by *	Only a character string can hide numerals and strings currently being entered.
Keypad	Input Method	The keypad is fixed to what you select in the Language Settings tab page. To display a desired keypad, set a subroutine in **Events and Actions** of the Data Display Object to run the subroutine EditVariable.
Keypad	Display Position of Keypad/Pop-up Screen	The keypad display position is automatically determined. You cannot display it at the desired position.
Max/Min	Type of Value - Difference from Current Value	
Max/Min	Watch Maximum Limit/ Watch Minimum Limit	You can change the colors in **Animations** - **ColorChange**. Note that only the numeral color in data display, and the background color in data input, are changeable. You are not allowed to change the both colors of numerals and background.
Control Flag	Display/Hide (Numeral display)	
Macro	Before inputting numeral	
Macro	Before writing numeral	
Macro	When changing value	
Macro	Value = Set Value	Set a subroutine in **Events and Actions** of a page or global event.
Macro	Value> Set Value	
Macro	Value< Set Value	

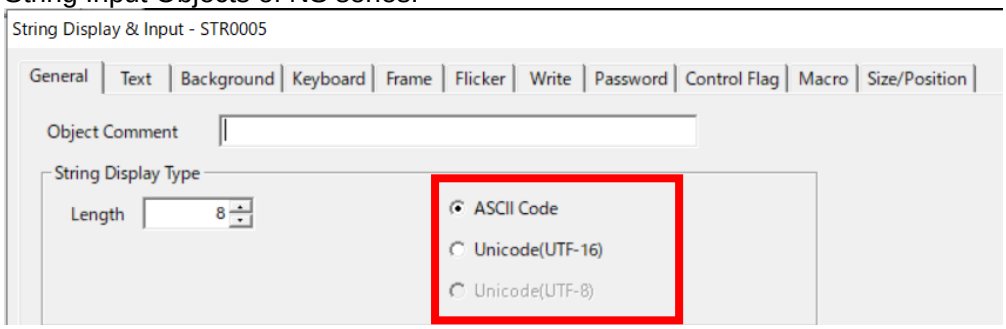
6-11 String Display and Input

You can replace a String Display and Input Object with a Data Display Object or a Data Input Object. If you have disabled inputs, use a Data Display Object, and if not, use a Data Input Object.

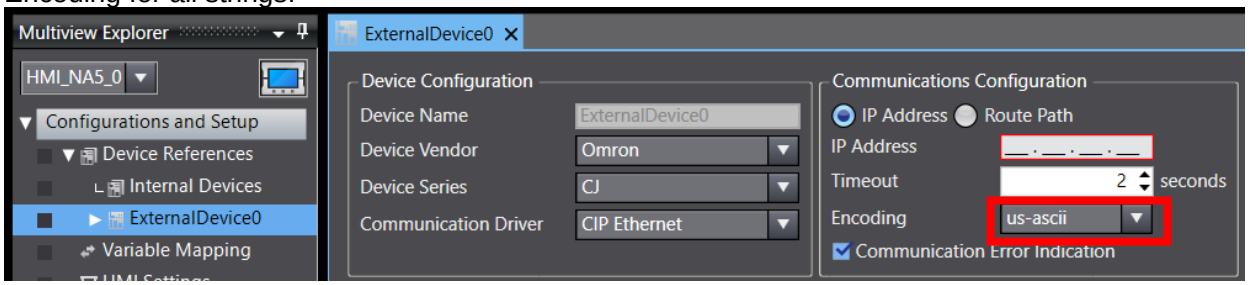
Put the object on the page, then select *Numeric* and *Text* in **Behavior** - **DataType** in Properties.



You can select a character code in the String Display Type area for a String Display Object and an String Input Objects of NS series.



You do not have to consider the character code if you use NS internal addresses to display strings. However, if you are using CJ host addresses, selecting an appropriate character encoding scheme in Sysmac Studio for the replacement is necessary.
The following shows the setting in Sysmac Studio. You can select a encoding scheme in the setting Encoding for all strings.

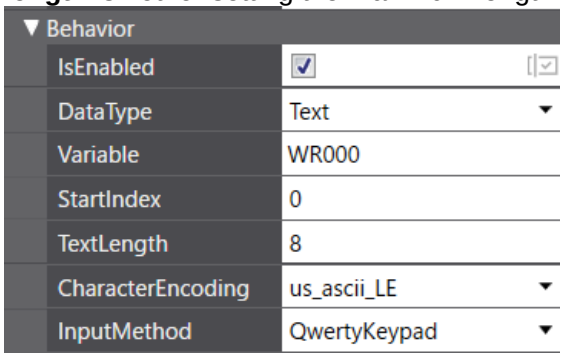


The table below provides the character code conversions.

NS		NA
System Language	String Display Type	Character Encoding Scheme
Japanese	ASCII code (Shift-JIS)	Shift-JIS
Chinese (Simplified and Traditional)	ASCII code (GB2312)	GB18030
English, Italian, Spanish, German, and French	ASCII code (Latin1)	ISO-8859-1
All Languages	Unicode (UTF-8)	UTF-8
All Languages	Unicode (UTF-16)	UTF-16

6-11-1 StartIndex and TextLength

StartIndex and **TextLength**, the data input object properties, are available only when specifying a numerical-type array for **Variable** and handling the array value as ASCII.
Entering values in **StartIndex** and **TextLength** will result in an error if you have set a string type variable in **Variable**. **TextLength** is not for setting the maximum length of input.

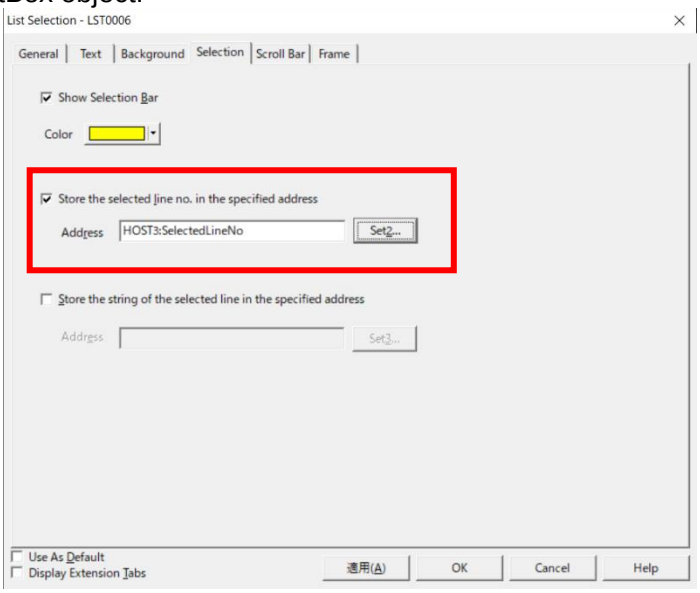


6-11-2 Non-replaceable Functionalities

NS Tab	NS Functionality	Remarks
General	String Display Type	The text length cannot be configured while a string type variable is used.
General	Pop-up Menu	
General	Address Information	It is not allowed to set different variables to reference for each language.
General	Input Process	
Keyboard	Input Method	The keypad is fixed to what you select in the Language Settings tab page. To display a desired keypad, set a subroutine in **Events and Actions** of the Data Display Object to run the subroutine EditVariable.
Keyboard	Display Position of Keypad/Pop-up Screen	The desired position of a keypad is determined automatically. You cannot display it at the desired position.
Keyboard	String Input	Fixed to **Add to the current string**.
Macro	Before inputting string	
Macro	Before writing string	
Macro	When changing string	

6-12 List Selection

Only an action that the option **Store the selected line No. in the specified address** is enabled can be replaced with a ListBox object.



6-12-1 Non-replaceable Functionalities

NS Tab	NS Functionality	Remarks
General	List Data	The NA series cannot have the list data in an internal variable or a file. The data is stored statically in **Behavior** - **Items** in Properties of the ListBox object. Edit fixed strings, which are managed by resource ID, in **Resources** - **General Strings**. You are not allowed to switch a displayed string dynamically during the operation because strings in the ListBox object are fixed.
General	Character Code	
General	List Size	
Selection	Show selection bar	The selection bar is always displayed. The bar color is not changeable.
Selection	Store the selected line No. in specified address	A selection in the ListBox Object is to be output to a numeral only.
Scroll Bar		The scroll bar is mandatory. The scroll bar is displayed automatically on the object with too many options considering its size.
External Control	Block	
External Control	Start Line	
External Control	Update	

6-13 Analogue Meter

The NS Analogue Meter Object can be replaced with an NA Gauge Object: Full Gauge or Half Gauge.
Only **Needle** is available for indication.

6-13-1 Non-replaceable Functionalities

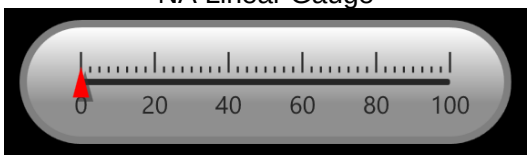
NS Tab	NS Functionality	Remarks
General	Width Rate	
General	Shape - Quarter circle	Configure **StartAngle** and **EndAngle** in **Properties** - **Appearance** of the object to realize a similar appearance.
General	Color inside a meter	
General	Display Type	The option *Fill* is not supported.
Range	Indirect	Only fixed values are supported.

6-14 Level Meter

The NS Level Meter Object can be replaced with an NA Gauge Object: Vertical Gauge or Horizontal Gauge.
However, the appearances differ significantly: the NS level meter looks like a bar chart, and in the NA linear gauge, the marker moves to indicate a value as illustrated below.

NS Level Meter

NA Linear Gauge



6-14-1 Non-replaceable Functionalities

NS Tab	NS Functionality	Remarks
Range	Indirect	Only fixed values are supported.

6-14-2 Realizing the Same Appearance as NS Object

To get the same bar chart appearance as the NS level meter object, use a Rectangle Object from **Shapes**, not a Vertical/Horizontal Linear Gauge Object. Specify a variable in **Animations** - **ResizeWidth** for a graph whose indicator increases/decreases in the horizontal direction, and **Animations** - **ResizeHeight** if the indicator moves vertically, to adjust the size of the rectangle. Another object is required to create the scale. In addition, if you want different colors for levels, multiple rectangle objects are necessary.

6-15 Broken-line Graph

The NS Broken-line Graph Object can be replaced with the NA Broken-line Graph Object.

Functionalities not supported by the NA broken-line graph object, e.g., zooming in/out the graph, moving the cursor, can be realized with subroutines.

We offer the IAG Library for the NA series, which include basic function features.
You can get an NA IAG library from the OMRON website. Visit the following link. https://assets.omron.com/m/5bf56e1c1780d236/original/IAG-Software.zip

6-15-1 Non-replaceable Functionalities

This table shows the functionality not supported by the object settings.

NS Tab	NS Functionality	Remarks
General	Direction	Fixed to the setting corresponding to the NS setting Right.
General	Line Style	Only the solid line is supported in both of the vertical and horizontal directions.
General	Indirect reference of showing scale line	Not available in both of the vertical and horizontal directions.
General	Specify the No. of points shown	
Graph	Draw Value Outside of the Range	If a value exceeds the upper or lower limit, it will be displayed as the maximum or minimum value.
Scroll Bar		A scroll bar is not displayed.
-	Test Function	Broken-line graphs are displayed as fixed images on the simulator. To test a graph display, transfer the project to the NA unit.

The NA series has the following restrictions on the number of graphs you can put on a page:
1) One graph object, including a trend graph object, per page
2) Up to eight graph objects, including a trend graph object, per HMI project
The limits are total of broken-line graph objects and trend graph objects.

6-16 Bitmap

The NS series Bitmaps are replaceable with Image Objects in the NA series.

6-16-1 Non-replaceable Functionalities

This table shows the functionality not supported by the object settings.

NS Tab	NS Functionality	Remarks
General	Indirect Reference of Display File	

6-17 Alarm/Event Display

The NA series does not have an alternate functionality, but you can realize it following the method below.

1. Define a String type global variable, NS_alarmMessage.
2. Name the alarm as [fixed string + serial number] in the user alarm setting. For this example, the fixed string is “Group0_alm.”
3. Create a subroutine NS_getAlarmMessage as a global subroutine.

```
Sub NS_getAlarmMessage
Dim almID As String
Dim almMsg As String
Dim almDt As Date
Dim almMsg_Newest As String
Dim almDt_Newest As Date
Dim i As Integer
```

```
'Repeats as many times as set alarms. In this example, 22 alarms are set.
For i = 0 To 21
    almID = "Group0_alm" + i.ToString
    If IsUserAlarmActive(almID)
        GetAlarmInfo( almID, , , , , almMsg, , almDt, , )
     If DateTime.Compare( almDt, almDt_Newest ) > 0
        almDt_Newest = almDt
        almMsg_Newest = almMsg
     End if
    End If
Next

If almMsg_Newest <> “”
 NS_alarmMessage = almMsg_Newest + “ “ + almDt_Newest
Else
   NS_alarmMessage = “”
End If
 End Sub
```

When assigning a string to the variable NS_alarmMessage, you can change display contents by adding various alarm setting information that GetAlarmInfo() acquired.

4. Select *Interval* for **Events** and *CallSubroutine* for **Actions** of the global event to call NS_getAlarmMessage.
5. Put a data display object on a page where you display an alarm object. Then, select *String* for **Data Type** in **Behavior** in Properties and *NS_alarmMessage* for **Expression**.

Follow this procedure to realize the flowing string.

1. Add the integer type global variable, before_Second.
2. Add the subroutine nagare() in Actions - CallSubroutine of the page.

The data display object's **Name** attribute is DataDisplay0.
The value used in the IF statement depends on the width of the data display object and the screen size.

```
Sub nagare()
    DataDisplay0.Left = DataDisplay0.Left – 16
    If DataDisplay0.Left < -200 Then DataDisplay0.Left = 800
    before_Second = _HMI_Second
End Sub
```

3. Select *Condition* from the **Events** options in **Events and Actions** of the page. Then, enter *_HMI_Second*<> in **Expression**. And select *CallSubroutine* from the options of **Actions** and specify *nagare()* in **SubroutineName**.
4. Arrange the data display object as much as behind because a flowing string will be displayed without relation to other objects on the right and left sides of the display area. Then, put a rectangle object, which cover the string, in front of the data display object.

The Data Display Object moves to the left by 16 dots per second.
However, the display position moves sideways regardless of the coordinates of the data display object on Sysmac Studio. Therefore, you need to modify values for VB functions to adjust the display position.

For another method, edit the string to be displayed as flowing string, not hanging the position of the data display object.
Execution condition for a subroutine is the same as mentioned above, but describe the subroutine as the following.
Enter *strAlarmMove* into **Expression**, the Data Display Object's property.

```
Dim pos As Integer

Sub nagare
   Dim px As Integer = NS_alarmMessage.Length

   If (px > 0)
      Dim strMove As String = NS_alarmMessage + "              "
      px = px + 8

      pos = pos - 1
      If (pos > px) Or (pos < 1)
         pos = px
      End If

      strAlarmMove = Microsoft.VisualBasic.Right(strMove, pos) _
                     + "              " _
                     + Microsoft.VisualBasic.Left(strMove, px - pos)
   Else
      strAlarmMove = ""
   End If

   before_Second_13 = _HMI_Second
End Sub
```

6-18 Alarm/Event Summary and History

You can replace an Alarm/Event Summary and History Object with a User Alarms Viewer Object.

6-18-1 Non-replaceable Functionalities

This table shows the functionality not supported by the object settings.

NS Tab	NS Functionality	Remarks
General	Group Specification	
General	Display Type	
General	Default Display Order (Frequency)	The NA series does not have a functionality to record the frequency.
General	Date and Time Display Format	The date and time display format is fixed.
General	Display in the Same Line	The NA series always displays alarm occurrence and clearance in the same row.
General	Movement when Alarm/Event is Selected	
Display	Line Height	Automatically tuned depending to text size.
Display	Display Optimization	
Display	Display a title	Header cannot be hidden. Setting the lowest value, 1, for the height makes the header as if it were hidden.
Display	Message box display	
Display	Ruled Line	
Display	History Display Type	You cannot display occurrence and cancellation in the same row.
Icon		Subroutines can substitute some functions. Assign a corresponding functionality to a button or other object.
Vertical Scroll Bar	Use Scroll Bar	The scroll bar is displayed automatically on the object when the display contents exceed the object size. It cannot be hidden.
Horizontal Scroll Bar	Use Scroll Bar	The scroll bar is displayed automatically on the object when the display contents exceed the object size. It cannot be hidden.
Macro		Pressing an icon does not start an action including macro.

6-18-2 Replacing Icons

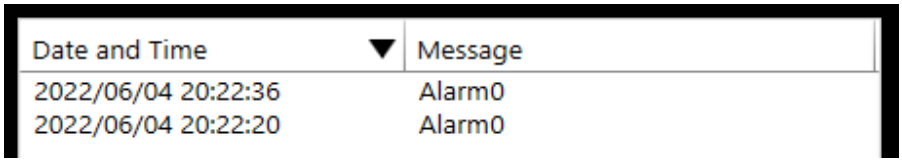
In the NS series, you can sort and delete displayed alarms with icons.
The NA series alarm objects do not have these icons, but you can realize someicons functionalities with subroutines.

Functionality of Icon	Alternate Subroutine	Remarks
From New Date & Time	SortViewer	If sorting targets are not in the columns, an error occurs when you run a subroutine. It is possible to sort alarms by touching the header. Every time you touch the header, sorting order, ascending or descending, switches.
From Old Date & Time	SortViewer	
From High Priority	SortViewer	
From Low Priority	SortViewer	

From High Frequency	-	
From Low Frequency	-	
Delete Selected Alarm	-	
Check Selected Alarm	AcknowledgeUserAlarm	
Check All Alarms	AcknowledgeAllUserAlarms	
Cancel All Alarms' Check	-	
Change Display Type	-	

6-18-3 Setting for Distinguishing Occurrence and Cancellation of Alarms

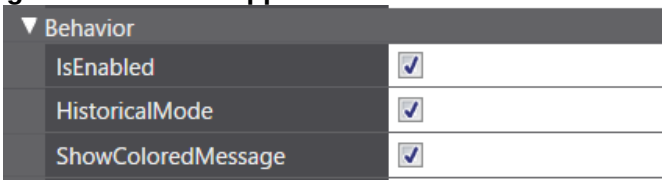
User alarm viewer objects of the NA series cannot display an alarm occurrence and cancellation in the same row. Depending on the setting, you cannot differentiate them.



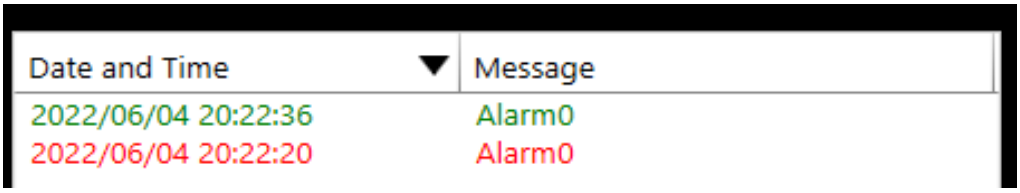
The following method enables you to distinguish the information.

- Coloring Messages

Check the **ShowColoredMessage** box in **Behavior**. The color of an alarm string will change according to the color set in the **RaisedUnacknowledgedColor** or **RaisedAcknowledgedColor** field in **Appearance**.

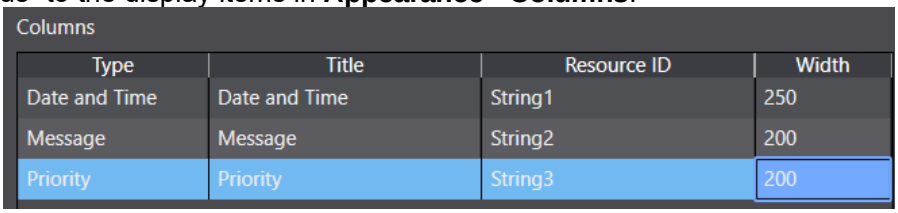


The following illustrates an alarm occurrence message shown in red and cancellation in green.

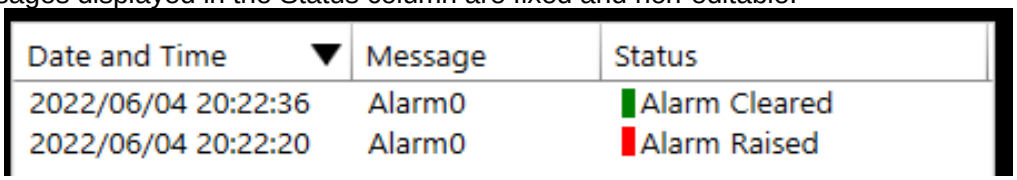


- Adding Status to Display Items

Add “Status” to the display items in **Appearance** - **Columns**.



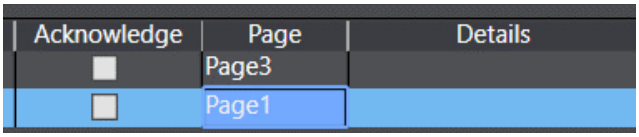
An occurrence and a cancellation will be displayed as “Alarm Raised” and “Alarm Cleared” in the Status column.
Messages displayed in the Status column are fixed and non-editable.



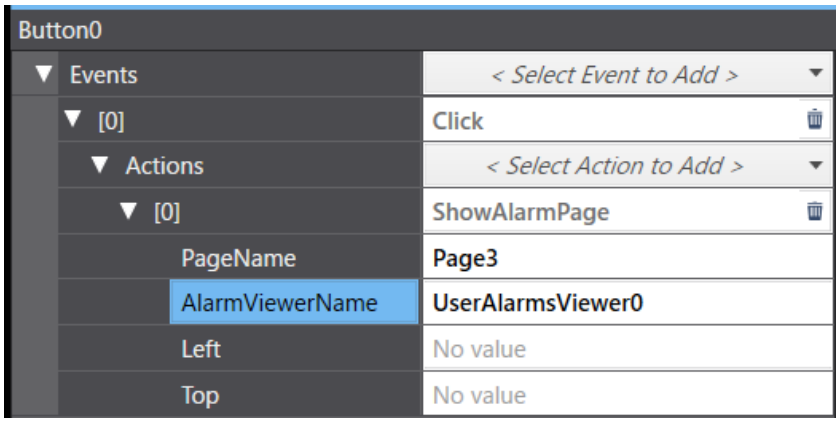
6-18-4 Alternative for Page Transition When Selecting an Alarm

This section describes an alternative for the functionality to go to a page after selecting a displayed alarm.
In the NS series, selecting an alarm switches the currently displayed page to the page you set. However, in the NA series, additional action is required after selecting an alarm for page transition.

1. Enter destination page names in the **Page** field for each alarm in the User Alarm Group setting tab page.



2. Create an object. Then select *Click* from **Events** and *ShowAlarmPage* from **Actions** in **Events and Actions**.
   Enter the page name where the user alarm viewer object is in **PageName** and the name of the user alarm viewer object in **AlarmViewerName**.



   This setting enables you to go to the set page when you press the object while selecting the alarm on the user alarm object.

6-19 Date and Time

The NS series Date Object and Time Object are replaceable with a DateTime Object in the NA series.

In the NS series, the date and time are displayed separately with a date object and time object, respectively. In the NA series, the date and time is displayed with a single object. By changing the display format, you can display either date or time alone.

In the NS series, you press an object to edit the date and time settings to change the system clock. However, in the NA series, a DateTime object only displays data and does not change the system clock setting.

Change the system clock setting from the system menu or use a subroutine.
To use the subroutine, you must combine button objects and data input objects to input date and time data.

6-20 Data Log Graph

The NS series Data Log Graph is replaceable with Trend Graph Object in the NA series.
Trend graph objects do not support zooming in/out of a graph and moving the cursor. You can use subroutines to substitute these functionalities. We offer the IAG Library for the NA series, which include subroutines used in combination with a trend graph object.. You can get an NA IAG library from the OMRON website. Visit the following link.
https://assets.omron.com/m/5bf56e1c1780d236/original/IAG-Software.zip

6-20-1 Non-replaceable Functionalities

This table shows the functionality not supported by the object settings.

NS Tab	NS Functionality	Remarks
General	Direction	Fixed to the setting corresponding to the NS setting Right.
General	Draw Value Outside of the Range	If a value exceeds the upper or lower limit, it will be displayed as the maximum or minimum value.
General	Line Style	Only the solid line is supported in both of the vertical and horizontal directions.
Time Axis	Scale	Indirect reference is not supported.
Time Axis	Use Cursor	Use of cursor is selectable, but the feature to store values of the color or cursor position is not available.
Time Axis	Graph Display Position	
Numeral Value Axis	Scale Settings	Only the functionality of setting the maximum and minimum values as fixed values is supported.
Icon		Subroutines can substitute some functions. Assign a corresponding functionality to a button or other object.
Scroll Bar		A scroll bar is not displayed.
-	Test Function	Trend graphs are displayed as fixed images on the simulator. To test a graph display, transfer the project to the NA unit.

The NA series has the following restrictions on the number of graphs you can put on a page:
1) One graph object, including a broken-line graph and trend graph, per page
2) Up to eight graph objects, including a broken-line graph and trend graph, per HMI project

6-20-2 Replacing Icons

For the NS series data log graphs, you can use icons to stop or restart drawing a graph, but the NA series trend graph objects do not have those icons. You can substitute subroutines for some functionalities.

Functionality of Icon	Alternate Subroutine	Remarks
Stop	StopDataLogging	**StopDataLogging** in **Events and Actions** works in the same way.
Restart	StartDataLogging	**StartDataLogging** in **Events and Actions** works in the same way.
Status	-	Difficult to replace
Log Clear	-	Executing ClearDataLogBuffer alone does not delete all the data. You must delete log files stored in the external memory.
Pause	-	Difficult to replace
Save to File	ExportDataLogBuffer(DataSetName)	
Read File	-	Difficult to replace

6-21 Data Block Table

Recipe Viewer is corresponding to Data Block Table in the NA series, though the feature is largely different.
In the NA series, you use subroutines to read or write the data.
We offer the IAG Library for the NA series, which include basic function features. You can get an NA IAG library from the OMRON website. Visit the following link.
https://assets.omron.com/m/5bf56e1c1780d236/original/IAG-Software.zip

6-21-1 Non-replaceable Functionalities

This table shows the functionality not supported by the object settings.

NS Tab	NS Functionality	Remarks
General	Display No. of rows	
Background	Color of Odd Rows	You cannot set different colors for each row.
Background	Color of Even Rows	You cannot set different colors for each row.
Vertical Scroll Bar		A scroll bar is not displayed.
Horizontal Scroll Bar		A scroll bar is not displayed.
Macro		Pressing an icon does not start an action including macro.

6-21-2 Replacing Icons

NS Data Blocks allow you to read or write data with icons, but in NA recipes, you cannot use those icons. You can substitute subroutines for some functionalities.

Functionality of Icon	Alternate Subroutine	Remarks
Read Data File	ImportRecipes	
Write Data File	-	Use “Export_recipe” in the AN series IAG Library.
Write to the address	WriteRecipeToController	
Read from the address	ReadRecipeFromController	
Add the record	AddRecipe	
Delete the record	DeleteRecipe	

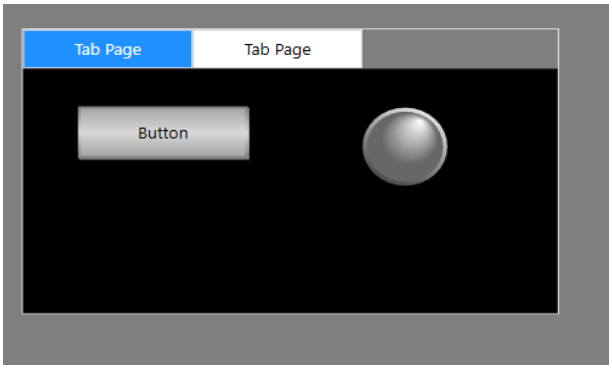
6-22 Frame

Replaceable with Tab Control Object.

6-22-1 Functional Differences

The table below shows functional differences you should consider.

Functionality	Difference
Tab page arrangement	NS series: Four edges of the screen NA series: Top and bottom of the screen You cannot place a tab page on the right and left sides.
Origins of coordinates of an object inside the frame	NS series: Coordinates of the upper-left corner of the frame NA series: Coordinates of the uppe-left corner of the page
Object frame	Both of the NS series and NA series do not have the setting field for object frame. However, frames are forcibly given on the NA series objects. (See the illustration below)

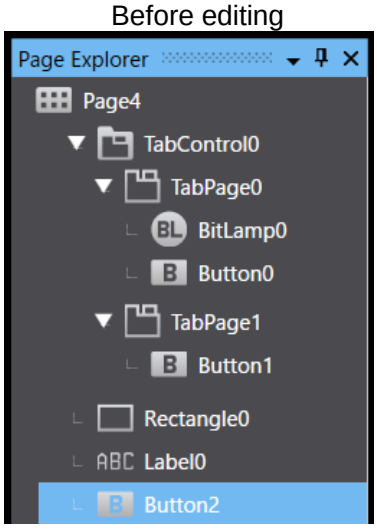


6-22-2 Workaround When You Cannot Arrange an Object on Tab Control Object

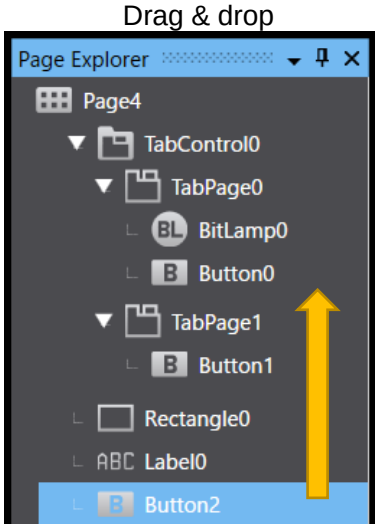
When you attempt to arrange an object on a tab control object on the Edit Pane, sometimes you may fail, and the object is placed on the base screen. In that case, try to manipulate the objects on Page Explorer, where you can edit easier.

See the screen shots below. To put the object Button2 on the tab control object, select *Button2* in Page Explorer then drag and drop on a desired tab page in the tab control object.

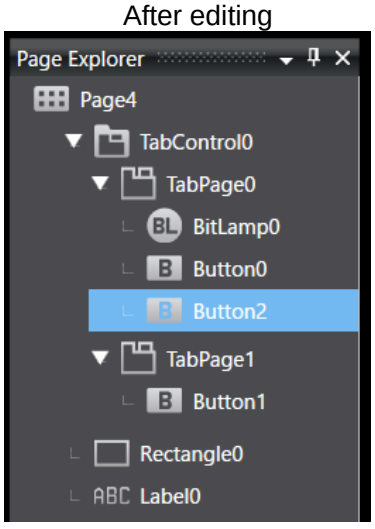
Before editing



Drag & drop



After editing



6-23 Table

No functionality for direct replacement.

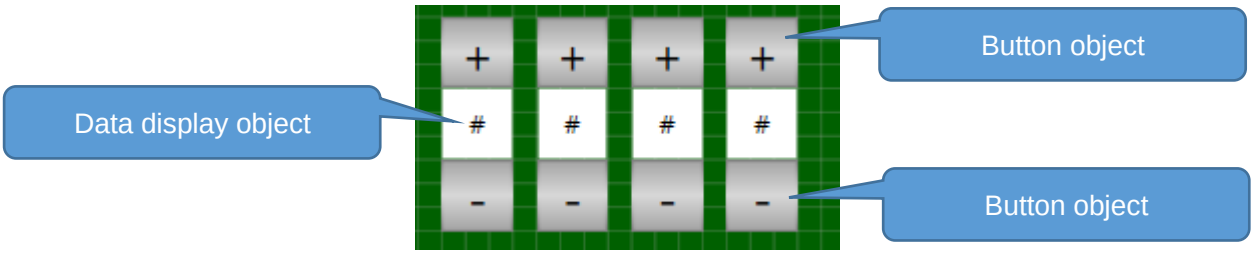
Replace a table with Button, Lamp, Data Display, or Data Input Object according to the type of functional object in the pull-down menu **Table Type**. To copy an object and paste it tiled in the vertical or horizontal direction, select the object and right-click to choose **Create Duplicate Objects...** from the menu.

6-24 Thumbwheel Switch

There is no features for replacement.
However, combination of data display objects, objects such as buttons, and subroutines can achieve a thumbwheel switch. This section provides the replacement procedure. Details of the procedure depends on digits and numerical notation system. In this example, replace a thumbwheel switch of unsigned 4-digit decimal.

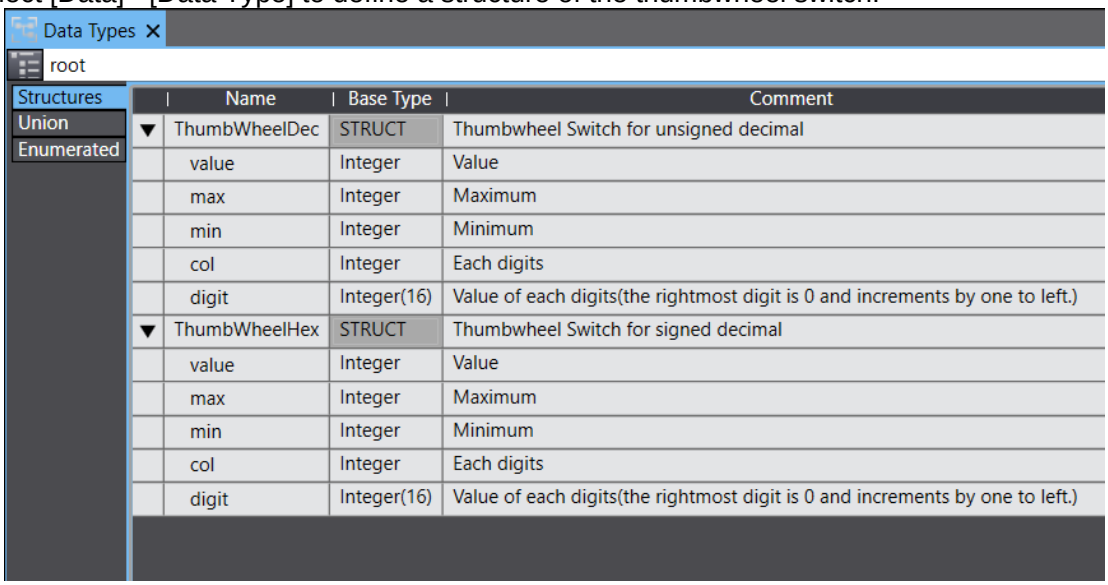
6-24-1 Replace Thumbwheel Switch: Arrange Objects

In the page editor, arrange button objects and data display objects to represent a thumbwheel switch.



6-24-2 Replace Thumbwheel Switch: Define a Structure

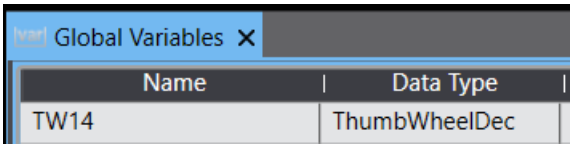
Select [Data] - [Data Type] to define a structure of the thumbwheel switch.



Name	Base Type	Comment
ThumbWheelDec	STRUCT	Thumbwheel Switch for unsigned decimal
value	Integer	Value
max	Integer	Maximum
min	Integer	Minimum
col	Integer	Each digits
digit	Integer(16)	Value of each digits(the rightmost digit is 0 and increments by one to left.)
ThumbWheelHex	STRUCT	Thumbwheel Switch for signed decimal
value	Integer	Value
max	Integer	Maximum
min	Integer	Minimum
col	Integer	Each digits
digit	Integer(16)	Value of each digits(the rightmost digit is 0 and increments by one to left.)

6-24-3 Replace Thumbwheel Switch: Register the Structure

Register the thumbwheel switch structure as a global variable.
Basically, one structure is prepared for one thumbwheel switch. If you want to more than one thumbwheel switches in a page, register the same number of structures as the switches.



6-24-4 Replace Thumbwheel Switch: Configure Global Subroutine

Create a subroutine that commonalizes the operations of the + and - buttons in each digits of the thumbwheel switch as a global subroutine.

The function WheelDec_init reflect the value of variable “value”, which is the member variable of the thumbwheel switch structure, on the elements of the member variable “digit.” You need to initialize other member variables than “digit” in advance.

The function WheelDecSw is for the processes pressing the + and - buttons in each digit. Specify the thumbwheel switch structure, a digit number (the rightmost digit is 0 and increments by one to left.), and True for the + button and False for the - button, for the first, second, and third argument, respectively.

For unsigned decimal

```
Dim Wheel_mulDec() As Integer = { 1, 10, 100, 1000, 10000, _
        100000, 1000000, 10000000, 100000000 }

Sub WheelDec_init(tw As ThumbWheelDec)
    Dim i As Integer
    Dim v As Integer = tw.value
    For i = 0 To 7
        tw.digit(i) =v Mod 10
        v = v / 10
    Next
End Sub

Sub WheelDecSw(tw As ThumbWheelDec, col As Integer, up As Boolean)
    Dim m As Integer = Wheel_mulDec(col)
    Dim d As Integer = tw.digit(col)
    Dim x As Integer = tw.value

    x = x - (m * d)
    If ( up )
        If d >= 9 Then d = 0 Else d = d + 1
    Else
        If d <= 0 Then d = 9 Else d = d - 1
    End If
    x = x + (m * d)

    If (x < tw.min) Or (x > tw.max) Then Exit Sub
```

```
    tw.digit(col) = d
    tw.value = x
End Sub
```

6-24-5 Replace Thumbwheel Switch: Configure Page Subroutine

For a button object, you cannot specify an argument in a function that specifies CallSubroutine for an action of the Click event. In other words, you are not allowed to specify a function with an argument that is defined in a global subroutine. Therefore, define the page subroutine in the code view of the page as shown below.

The function Wheel_init14 sets initial values of members in the thumbwheel switch structure.

The functions Wheel_u1 and the followings are for the processes after pressing the + and - buttons. In this example, the letter “u” stands for “up (+)” and “d” for “down (-)”, and numbers from 1 to 1000 stands for the ones place to the thousands place, respectively.

```
Sub Wheel_init14
    TW14.value = 2345
    TW14.max = 8765
    TW14.min = 12
    TW14.col = 4
    WheelDec_init(TW14)
End Sub

Sub Wheel_u1()
    WheelDecSw(TW14, 0, True)
End Sub

Sub Wheel_u10()
    WheelDecSw(TW14, 1, True)
End Sub

Sub Wheel_u100()
    WheelDecSw(TW14, 2, True)
End Sub

Sub Wheel_u1000()
    WheelDecSw(TW14, 3, True)
End Sub

Sub Wheel_d1()
    WheelDecSw(TW14, 0, False)
End Sub

Sub Wheel_d10()
    WheelDecSw(TW14, 1, False)
End Sub
```

```
Sub Wheel_d100()
    WheelDecSw(TW14, 2, False)
End Sub

Sub Wheel_d1000()
    WheelDecSw(TW14, 3, False)
End Sub
```

6-24-6 Replace Thumbwheel Switch: Configure Page Switching Event

Select PageDisplayed from the [Events] under [Events and Actions] and CallSubroutine from [Actions]. Then, enter the page subroutine Wheel_init14 in SubroutineName.

6-24-7 Replace Thumbwheel Switch: Configure Button Event

In the page editor, select Click from [Events] for the + and - buttons. Then select CallSubroutine from [Actions] to enter the page subroutines from Wheel_u1 to Wheel_u1000, and Wheel_d1 to Wheel_u1 in SubroutineName, respectively.

6-24-8 Replace Thumbwheel Switch: Configure Data Display Object

In the page editor, enter *TW14.digit(0)*, *TW14.digit(1)* and so on, from the right, in **Expression** for the data display objects of each digit. Select Decimal for [ValueFormat], and “#” for [DisplayFormat].

6-25 Temporary Input

No corresponding function.

6-26 Consecutive Line Drawing

No corresponding function.

6-27 Contents Display

No corresponding function.

6-28 Video Display

No corresponding function.

7 Other Important Points

This chapter provides the additional information you should know to convert NS screen data to NA screen data.

- The text size differs between Sysmac Studio and an NA unit

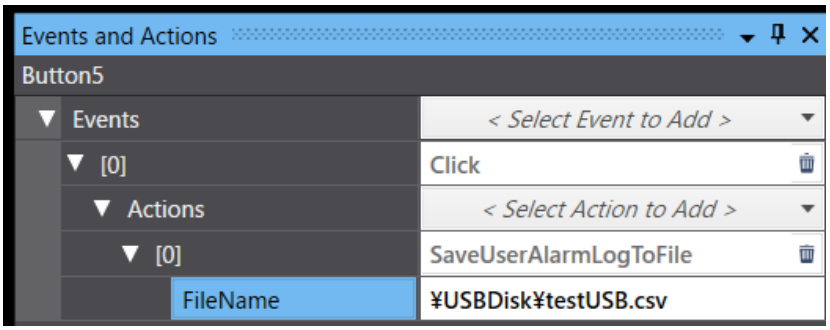
Segoe UI, the default of the text family, is an English font. Therefore, a Japanese or Chinese character may cause this issue.
Change the test family according to your language, following the table below.

Language	Recommended Font Family
Japanese	Meiryo, MS Gothic
Simplified Chinese	Microsoft YaHei, SimSun
Traditional Chinese	Microsoft JhengHei, MingLiU
Korean	Malgun Gothic, Gulim, GulimChe

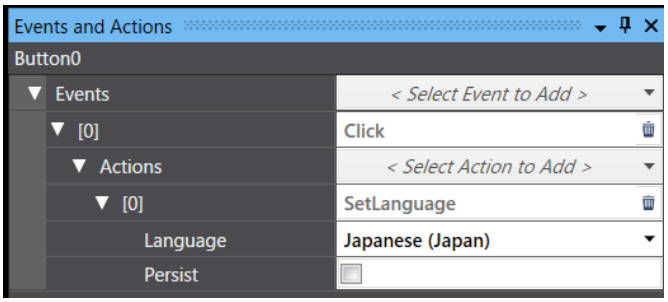
- How to specify a path to save the log file

The formats to specify a path to save the user alarm log are shown below.
A file name must include an extension.

Save to	Format
SD card	¥SDCard¥file name
USB stick memory	¥USBDisk¥file name



● Japanese Hiragana and Katakana cannot be input through a character keypad.
To enter Japanese, you need to select Japanese for the system language of NA.
If you use Korean, Simplified Chinese, or Traditional Chinese, select a corresponding system language.
Because the system language corresponds to a user language, changing the user language changes the system language.
Select **Events and Actions** - **SetLanguage** then select the language you want to set in the **Language** selection.



	Language List		
	Project Languages	System Languages	Software Keypads
Default language	English (United States)	English (United States)	Standard
	Japanese (Japan)	Japanese (Japan)	Standard
	Chinese (Simplified, PRC)	Chinese (Simplified)	Standard

8 Change Controller Program

There are differences in system functionalities and functional objects between NA series units and NS series units. Some of these differences can be resolved with VB programs, but some cannot be migrated to NA units due to performance or functional issues.
In those cases, you need to change programs in the controller.

8-1 Example of Changing Controller Program

To create a screen that monitors 200 channels at a time from addresses D1000 to D2999, use the index register, *iO*, to assign addresses to the numeric display objects as follows. The numeric display objects and host communication processing of NS units achieve monitoring with less load. Index register values range from 0 to 2700.

D1000*i0*	D1001*i0*	D1002*i0*	...	D1009*i0*
D1010*i0*	D1011*i0*	D1012*i0*	...	D1019*i0*
D1020*i0*	D1021*i0*	D1022*i0*	...	D1029*i0*
...	...	...	...	
D1190*i0*	D1191*i0*	D1192*i0*		D1199*i0*

To achieve this using an NA unit, you need to replace an assigned address with an array variable, and also, use VB for processing. In this example, define a numerical type variable idx, which refers to the first channel, and an array numeric variable DD(200). Then, lay out a data display object assigning conditional expressions to the variables in the range of DDisp(0) to Ddisp(199).
Also, define an array type network variable Dmon(2000) to monitor a value in the PLC.
Direct assigning to the data display object, like Dmon(22+idx), would ne the same manner as NS, but it is impossible. Therefore, copy the monitoring variables to the display variables by using a VB program.

Ddisp(0)	Ddisp(1)	Ddisp(2)	...	Ddisp(9)
Ddisp(10)	Ddisp(11)	Ddisp(12)	...	Ddisp(19)
Ddisp(20)	Ddisp(21)	Ddisp(22)	...	Ddisp(29)
...	...	...	...	
Ddisp(190)	Ddisp(191)	Ddisp(192)	...	Ddisp(199)

```
Sub Monitor_E_Mem
   Dim i as Integer
If _HMI_CurrentPageIndex <> page number of the monitor screen Then Exit Sub
   For i = 0 to 199
      DDisp(i) = DMon(idx + i)
   Next
End Sub
```

Select **Events** - **Interval** - **1 Second** in the global event to run this subroutine.
Because running this subroutine on screens other than the monitor screen does not make sense, use the system variable _HMI_CurrentPageIndex, which shows a currently displayed screen index, to prevent copying.

Now you can achieve the similar monitoring function as NS, but the subroutine has an issue: it may issue read commands for one channel per For loop. Usually, 1 to 10read commands are required to get all the data in one screen. In this example, there are 200 loops, so the number of read

commands increases by 200. Therefore, the monitoring interval will extend 20 times or more. For instance, a screen that used to refresh every 0.2 seconds will refresh every 4 seconds.

To avoid this issue, copy the memory in the PLC, using the variables idx(DM200) and EDisp (200 channels from DM20000). It is not necessary to add VB functions and Events attributes to global events in the NA series.

[Sample ladder diagram]

9 Revision History

Revision History	Date	Revised Content and Page
01	August 2022	First edition
02	April 2023	Error corrections

Appendix 1: Project Common Settings

◆Models

Models

CX-Designer		Sysmac Studio		
Model Name	Screen size	Model Name	Screen size	Percentage zoom
NS5-SQ0□-V1	320x240	NA5-7W001□-V1	800x480	2
NS5-SQ0□-V2				
NS5-TQ0□-V2				
NS5-MQ0□-V2				
NS5-SQ1□-V2				
NS5-TQ1□-V2				
NS5-MQ1□-V2				
NS7-SV0□	640 x 480	NA5-7W001□-V1	800 x 480	1
NS8-TV0□-V1				
NS8-TV0□-V2				
NS8-TV1□-V1				
NS10-TV0□		NA5-9W001□-V1	800 x 480	1
NS10-TV0□-V1				
NS10-TV0□-V2				
NS12-TS0□	800 x 600	NA5-12W101□-V1	1280 x 800	1.3
NS12-TS0□-V1				
NS12-TS0□-V2				
NS15-TX0□-V2	1024 x 768	NA5-15W101□-V1	1280 x 800	1

◆Project Properties

Project Properties

CX-Designer				Sysmac Studio				
Tab	1st Level	2nd Level	Value	1st Level	2nd Level	3rd Level	4th Level	Set Value
Title	Project Title			Project Properties	Comment			
Switch	No. of Labels			Refer to the "Switch Label" sheet.				
	Switch No.			–	–	–	–	–
	Label Name			–	–	–	–	–
	Initial Label	Label Name		HMI Settings	Device Settings	Startup Language	Startup Language	The same value as the value of Initial Label in NS
Macro	Project	When Loading a Project		Global Events	ProjectInitialization	Subroutines	–	Subroutine name
	Alarm/Event	On timing Alarm /Evento ccurred		–	–	–	–	–
		On timing Alarm /Event is		–	–	–	–	–
	On changing of an address value	When a bit changed		–	–	–	–	–
		When a value changed		–	–	–	–	–
Select	Language			See "Switch Label."				
Pop-up	Pop-up Menu	Text Color	Color	–	–	–	–	–
		Background Color2	Color	–	–	–	–	–
		Font Size	...	–	–	–	–	–
		Show Delimiter	Checked/ Unchecked	–	–	–	–	–
Macro Option	MSGBOX	Recognize "¥n" in the message	Checked/ Unchecked	–	–	–	–	–
Input Options	Numeral Input Options		Clear the input field when the input focus	–	–	–	–	–
			Show the current values when the input focus	–	–	–	–	–
	Input Pad Options		Bar-code and input pas are both enabled.	–	–	–	–	–
			Only input pad is enabled.	–	–	–	–	–
Input Status	Text Color		Color	–	–	–	–	–
	Background		Color	–	–	–	–	–
Data Format	Screen/ Page		Binary/ BCD	–	–	–	–	–
	Specifying the File Line		Binary/ BCD	–	–	–	–	–
	Alarm ID No.		Binary/ BCD	–	–	–	–	–
	Alarm/Event Info.		Binary/ BCD	–	–	–	–	–
	Data Log		Binary/ BCD	–	–	–	–	–
	Macro		Binary/ BCD	–	–	–	–	–
	Consecutive Line Drawing		Binary/ BCD	–	–	–	–	–
	Specifying Contents No.		Binary/ BCD	–	–	–	–	–

◆System Setting

System Setting

CX-Designer				Sysmac Studio				
Tab	1st Level	2nd Level		1st Level	2nd Level	3rd Level	4th Level	Value
PT	Start-up Wait Time			–	–	–	–	–
	Key Press Sound		OFF	HMI Settings	Device Settings	Touch Input Notification		Unchecked
			ON	HMI Settings	Device Settings	Touch Input Notification		Checked
	Buzzer Sound		OFF	HMI Settings	Device Settings	Alarm Notification		Unchecked
			ON	HMI Settings	Device Settings	Alarm Notification		Checked
			ERROR ON	HMI Settings	Device Settings	Alarm Notification		Checked
	Screen Saver Active		None	HMI Settings	Device Settings	Screen Saver	Screen saver type	OFF
			Display Erased	–	–	–	–	Blank
	Screen Saver Start-up Time	Set Value		HMI Settings	Device Settings	Screen Saver	Active After [#] minutes of inactivity	Set the value of NS setting
		Indirect Reference	Address	–	–	–	–	–
			Binary/ BCD	–	–	–	–	–
	Device Monitor	Changing Value	Enable/ Disable	–	–	–	–	–
	Touch Switch Control	Prioritize notification of ON/OFF button	Checked/ Unchecked	–	–	–	–	–
		Specify Touch Switch Lock Control Flag	...	–	–	–	–	–
	Font	CJK Priority	...	–	–	–	–	–
	Operation When Updating Tags	Display Notification Message	Checked/ Unchecked	–	–	–	–	–
	Advanced Setting	Switch screen as high speed	Checked/ Unchecked	–	–	–	–	–
Initial	Initial Screen			HMI Settings	Device Settings	Startup Page	Page name	Set the page name corresponding the startup screen of NS setting
	System Memory	$SB Allocation Address	Address	–	–	–	–	–
		$SW Allocation Address	Address	–	–	–	–	–
		Allow System Memory Compatibility with NT	Unchecked	–	–	–	–	–
			Checked	–	–	–	–	–
			NT30/ 620 Series	–	–	–	–	–
			NT31/ 631 Series	–	–	–	–	–
	Option	System Memory Update Cycle		–	–	–	–	–
		Intervals of RUN signal (Pulse)		–	–	–	–	–
		Initialize System Memory at startup Enable		–	–	–	–	–
			Disable	–	–	–	–	–
		Memory Card Free Space Check Flag		–	–	–	–	–
	System Memory List			–	–	–	–	–

System Setting

CX-Designer				Sysmac Studio				
Tab	1st Level	2nd Level		1st Level	2nd Level	3rd Level	4th Level	Value
History	Operation Log	No. of Records		Operation Log Settings	Logging limit	–	–	Set the same value as setting in NS. Set 100 if the original value is 99 and less.
		Use Ring Buffer	Checked	Operation Log Settings	Operation when logging limit reached	–	–	Set as "Delete the old log file and continue to log."
			Unchecked	Operation Log Settings	Operation when logging limit reached	–	–	Set as "Stop logging."
	Character Code		ASCII Code	–	–	–	–	–
			Unicode	–	–	–	–	–
	Logfile Output Format		Vertical Axis: Address / Horizontal Axis: Time	–	–	–	–	–
			Vertical Axis: Time / Horizontal Axis: Address	–	–	–	–	–
		Save the data with offset time display format	Checked/ Unchecked	–	–	–	–	–
	Data Log/			–	–	–	–	–
	Save Destination of history data			–	–	–	–	–
	Set the save cycle for Internal Holding Memory		Unchecked	–	–	–	–	–
			Checked	–	–	–	–	–
		hour/ min/ sec	Intermediate Number	–	–	–	–	–
Video	Video Board Color which fills		...	–	–	–	–	–
			Color	–	–	–	–	–
	Video Input Method		...	–	–	–	–	–
	Save in a file if memory card is full		...	–	–	–	–	–
Printer	Printer Type		...	–	–	–	–	–
	Mode		...	–	–	–	–	–
	Orientation		...	–	–	–	–	–
Function Key (NS15 only)	Key Status	F1	Address	–	–	–	–	–
		F2	Address	–	–	–	–	–
		F3	Address	–	–	–	–	–

◆Switch Label

Switch Label **Language Settings**

CX-Designer		Sysmac Studio		Remarks
Switch No.	Label Name	Project Languages	System Languages	
0	Type0	Language selected in CX-Designer	Language selected in CX-Designer	NS label names are user-changeable. Select the language of the text on the original label.
1	Type1	Language selected in CX-Designer	Language selected in CX-Designer	
2	Type2	Language selected in CX-Designer	Language selected in CX-Designer	
3	Type3	Language selected in CX-Designer	Language selected in CX-Designer	
4	Type4	Language selected in CX-Designer	Language selected in CX-Designer	
5	Type5	Language selected in CX-Designer	Language selected in CX-Designer	
6	Type6	Language selected in CX-Designer	Language selected in CX-Designer	
7	Type7	Language selected in CX-Designer	Language selected in CX-Designer	
8	Type8	Language selected in CX-Designer	Language selected in CX-Designer	
9	Type9	Language selected in CX-Designer	Language selected in CX-Designer	
10	Type10	Language selected in CX-Designer	Language selected in CX-Designer	
11	Type11	Language selected in CX-Designer	Language selected in CX-Designer	
12	Type12	Language selected in CX-Designer	Language selected in CX-Designer	
13	Type13	Language selected in CX-Designer	Language selected in CX-Designer	
14	Type14	Language selected in CX-Designer	Language selected in CX-Designer	
15	Type15	Language selected in CX-Designer	Language selected in CX-Designer	

Language Selection **System Language**

CX-Designer	Sysmac Studio
Japanese	Japanese (Japan)
English	English (United States)
Italian	Italian (Italy)
Spanish	Spanish (Spain)
German	German (Germany)
French	French (France)
Chinese (Simplified)	Chinese (Simplified, PRC)
Chinese (Traditional)	Chinese (Traditional, Taiwan)

◆Comm. Setting

Comm. Setting **Device References: External Device, HMI Settings**

CX-Designer		Sysmac Studio					Remarks
Comm. – All	Comm. Time Out	External Devices	Device Configuration	Timeout			
	Retry Count	–	–	–	–	–	–
	Comm. Auto-return	–	–	–	–	–	
	Intervals of Message-Comm.	–	–	–	–	–	
	Routing Table Setting	HMI Settings	FINS Settings	Remote Network Table			
	Connect except for a serial port where a communication error occurs	–	–	–	–	–	–
Ethernet	Ethernet	–	–	–	–	–	–
	Network Address	HMI Settings	FINS Settings	FINS Address	Ethernet port #1	Network	
	Node Address	HMI Settings	FINS Settings	FINS Address	Ethernet port #1	Node	Auto-setup only
	UDP Port No.	HMI Settings	FINS Settings	FINS/UDP	FINS/UDP port no		Fixed setting
	LAN Speed		–	–	–	–	Auto-identification only
	IP Address	HMI Settings	TCP/IP Settings	Ethernet Port 1 – IP Address	IP Address		
	Sub-net Mask	HMI Settings	TCP/IP Settings	Ethernet Port 1 – IP Address	Subnet mask		
	Default Gateway	HMI Settings	TCP/IP Settings	Ethernet Port 1 – IP Address	Default gateway		
	IP Proxy Address	–	–	–	–	–	–
	Conversion Table	–	–	–	–	–	–
Host	Host Number	–	–	–	–	–	–
	Host Name	External Devices	Device Configuration	Device Name			
	Host Type	External Devices	Device Configuration	Device Vendor			See the "Comm Path" sheet
	Protocol	External Devices	Device Configuration	Connection Driver			See the "Comm Path" sheet
	Network Address	External Devices	Communications Configuration	Network Address			
	Node Address	External Devices	Communications Configuration	Node Address			
	Use	–	–	–	–	–	–
	IP Address	External Devices	Communications Configuration	IP Address			
	Route Path	External Devices	Communications Configuration	Route Path			

◆**Comm Path**

Communication Path

Communication Path	Comm. Protocol			NA			Remarks
	Serial Port	Host Type	Protocol	Device Vendor	Device Series	Comm. Driver	
Serial Port A Serial Port B	PLC	SYSMAC-PLC	NT Link (1:N)	–	–	–	
			NT Link (1:1)	–	–	–	
			Host Link	–	–	–	
		MELSEC-A	Computer Link	–	–	–	
		MELSEC-F	Computer Link	–	–	–	
		SIMATIC S7-300	3964(R)	–	–	–	
		SYSMAC-CS1	Host Link	–	–	–	
			Toolbus	–	–	–	
		SYSMAC-CJ1/CP1	Host Link	Omron	CJ	FINS Ethernet	For CJ1 units, changing a connected device to an Ethernet device enables the
			Toolbus	Omron	CJ	FINS Ethernet	If there is not Ethernet unit in the system, you need to add one.
		SYSMAC-CV	Host Link	–	–	–	
			Toolbus	–	–	–	
		SYSMAC-CJ2	Host Link	Omron	CJ	FINS Ethernet	Changing a connected device to an Ethernet device enables the replacement.
	Temperature Controller	E5ZN	(CompoWay/F)	–	–	–	
		E5A/E/C/GN	(CompoWay/F)	–	–	–	
		E5A/ER	(CompoWay/F)	–	–	–	
		EJ1	(CompoWay/F)	–	–	–	
	Memory Link			–	–	–	
	Bar-Code Reader			–	–	–	
	Modem for Data Transfer			–	–	–	
	Generic Protocol	YASKAWA MP	Modbus (Memobus) RTU	–	–	–	
		Varispeed/VS mini	Modbus (Memobus) RTU	–	–	–	
		Modbus Machine (Modicon Address Style)	Modbus (Memobus) RTU	–	–	–	
		Modbus Machine (ISO61131 Address Style)	Modbus (Memobus) RTU	–	–	–	
		MELSEC-Q/QnA	Melsec Communication Protocol	–	–	–	
		SLC500/MicroLogix	Allen-Bradley DF1	–	–	–	
		PLC-5	Allen-Bradley DF1	–	–	–	
		ControlLogix/CompactLogix	Allen-Bradley DF1	–	–	–	
		Yokogawa FA-M3/FA-M3R	FA-M3 PC Link	–	–	–	
Ethernet		SYSMAC-CS1/CJ1/CP1	FINS	Omron	CJ	FINS Ethernet	
			EtherNet/IP	Omron	CJ	CIP Ethernet	
		SYSMAC-CV	FINS	–	–	–	
		SYSMAC-CJ2	FINS	Omron	CJ	FINS Ethernet	
			EtherNet/IP	Omron	CJ	CIP Ethernet	
		Trajexia	FINS	–	–	–	
		SYSMAC-NJ	EtherNet/IP	Omron	NJ	CIP Ethernet	
		Modbus Machine (Modicon Address Style)	Modbus/TCP	–	–	–	
		Modbus Machine (IEC61131 Address Style)	Modbus/TCP	–	–	–	
Controller Link		SYSMAC-CS1/CJ1/CP1	FINS	–	–	–	
		SYSMAC-CV	FINS	–	–	–	
		SYSMAC-CJ2	FINS	–	–	–	

◆System Memory

System Memory **System Variables/ User Variables**

CX-Designer			Sysmac Studio						
Address	Description	R/W	Supported by:	Variable Type	Variable Name	Data Type	Variable Represents:	Description	R/W
$SB0	RUN Signal (Pulse)	R	Variable mapping	System variable	_HMI_RunSignal	Boolean	Run Signal	Changes periodically while the HMI is operating. He change interval differs from NS.	R
$SB1	RUN Signal (Always ON)	R	Unsupported	–	–	–	–	–	
$SB2	Screen Switch Strobe	R	Variable mapping	System variable	_HMI_IsPageSwitching	Boolean	Page Switch Strobe	The value is True while a page is switching and becomes False after completing switching the page.	R
$SB3	Prohibit Shifting to System Menu	R/W (Ext Control)	Unsupported	–	–	–	–	–	
$SB4	Battery Low	R	Variable mapping	System variable	_HMI_IsBatteryLow	Boolean	Battery Low	Gives True if the battery voltage has dropped below a specific level.	R
$SB5	Data Input Detector	R	Variable mapping	System variable	_HMI_IsDataInput	Boolean	Data Entry in Progress	Gives True when a data entry object is focused.	R
$SB6	Brightness Adjust, High	R/W (Ext Control)	Global event	System variable	_HMI_Brightness	Integer	Brightness	Specifies the brightness of the screen. Specifying 0 turns off the backlight.	R/W
$SB7	Brightness Adjust, Middle	R/W (Ext Control)	Global event	System variable	_HMI_Brightness	Integer			R/W
$SB8	Brightness Adjust, Low	R/W (Ext Control)	Global event	System variable	_HMI_Brightness	Integer			R/W
$SB9	Backlight Control (Screen Saver Start/Cancel)	R/W (Ext Control)	Variable mapping	System variable	_HMI_IsScreenSaver Active	Boolean	Whether Screen Saver is Active or not	Tells whether the screen saver is active. True: Active, False: Not active	R/W
$SB10	Control Backlight Flashing	R/W (Ext Control)	VB	System variable	_HMI_Brightness	Integer	Brightness	Sets the brightness of the screen.	R/W
$SB11	Backlight Status	R	Variable mapping	System variable	_HMI_IsScreenSaver Active	Boolean	Whether Screen Saver is Active or not	Tells whether the screen saver is active. True: Active, False: Not active	R/W
$SB12	Continuous Buzzer	R/W (Ext Control)	Global event	–	–	–	–	–	
$SB13	Short Intermittent Buzzer	R/W (Ext Control)	Global event	–	–	–	–	–	
$SB14	Long Intermittent Buzzer	R/W (Ext Control)	Global event	–	–	–	–	–	
$SB15	Notification/Control of Video	R/W	Unsupported	–	–	–	–	–	
$SB16	Processing Priority Registration for PortA (NT Link 1:N)	R/W (Ext Control)	Unsupported	–	–	–	–	–	
$SB17	Processing Priority Registration for PortB (NT Link 1:N)	R/W (Ext Control)	Unsupported	–	–	–	–	–	
$SB18	Display Keypad with Temporary Input	R/W (Ext Control)	Unsupported	–	–	–	–	–	
$SB19	Prohibit Input	R/W (Ext Control)	Global event	–	–	–	–	–	
$SB20	Contrast Adjust (NS5 Only)	R/W (Ext Control)	Unsupported	–	–	–	–	–	
$SB21	Contrast Adjust (NS5 Only)	R/W (Ext Control)	Unsupported	–	–	–	–	–	
$SB22	Contrast Adjust (NS5 Only)	R/W (Ext Control)	Unsupported	–	–	–	–	–	
$SB23	Contrast Adjust (NS5 Only)	R/W (Ext Control)	Unsupported	–	–	–	–	–	
$SB24	Video Captyre Trigger	R/W	Unsupported	–	–	–	–	–	
$SB25	Start Printing/Capture Screen	R/W (Ext Control)	Global event	–	–	–	–	–	
$SB26	Stop Printing	R/W (Ext Control)	Unsupported	–	–	–	–	–	
$SB27	Test Pattern Printing	R/W (Ext Control)	Unsupported	–	–	–	–	–	
$SB28	Printer Head Cleaning	R/W (Ext Control)	Unsupported	–	–	–	–	–	
$SB29	Update Printer Status	R/W (Ext Control)	Unsupported	–	–	–	–	–	
$SB30	Printer Busy Status/Capture Busy Status	R	Unsupported	–	–	–	–	–	
$SB31	Notification of Printer Error/ Capture Screen Error	R	Unsupported	–	–	–	–	–	
$SB32	Initialize Alarm/Event History	R/W	Global event	–	–	–	–	–	
$SB33	Save Alarm/Event History	R/W	Unsupported	–	–	–	–	–	

System Memory **System Variables/ User Variables**

CX-Designer			Sysmac Studio						
Address	Description	R/W	Supported by:	Variable Type	Variable Name	Data type	Variable Represents:	Description	R/W
$SB34	Internal Holding Memory ($HB/$HW) Initialization	R/W	Unsupported	User variable	–	–	–	–	
$SB35	Initialize Data Log	R/W	Global event	User variable	–	–	–	–	
$SB36	Save Data Log	R/W	Global event	User variable	–	–	–	–	
$SB37	Initialize Operation Log	R/W	Global event	User variable	–	–	–	–	
$SB38	Save Operation Log	R/W	Global event	User variable	–	–	–	–	
$SB39	Log Functional Object Operation and Address Operation	R/W (Ext Control)	Unsupported	User variable	–	–	–	–	
$SB40	Log Switch Screen Operation	R/W (Ext Control)	Unsupported	User variable	–	–	–	–	
$SB41	Log Macro Operation	R/W (Ext Control)	Unsupported	User variable	–	–	–	–	
$SB42	Initialize Error Log	R/W	Unsupported	User variable	–	–	–	–	
$SB43	Save Error Log	R/W	Unsupported	User variable	–	–	–	–	
$SB44	–	–	Unsupported	User variable	–	–	–	–	
$SB45	Macro Error Dialog Control	R/W (Ext Control)	Unsupported	User variable	–	–	–	–	
$SB46	Notification of Macro Error	R	Unsupported	User variable	–	–	–	–	
$SB47	Logging Process Error Flag	R	Unsupported	User variable	–	–	–	–	
$SB48	Memory Free Space Check	R	Unsupported	User variable	–	–	–	–	
$SB49	Stop Memory Card	R/W	Global event	User variable	–	–	–	–	
$SB50	Memory Card Removing Status (Power OFF)	R	Variable mapping	System variable	_HMI_CanEjectSDCard	Boolean	The status flag whether you can safely eject SD Card	Shows whether you can safely eject the SD card.	R
$SB51	Periodical Data Log Save in Process Flag	R	Unsupported	User variable	–	–	–	–	
$SB52	Data Block Operation Complete Flag	R	Unsupported	User variable	–	–	–	–	
$SB53	Prohibit Screen Saver Startup	R/W	Unsupported	User variable	–	–	–	–	
$SB54	Password Level 1 Operable Status	R	VB	System variable	_HMI_CurrentUserRole	String	The role of Current Login User	Shows the role of user currently logging in.	R
$SB55	Password Level 2 Operable Status	R							
$SB56	Password Level 3 Operable Status	R							
$SB57	Password Level 4 Operable Status	R							
$SB58	Password Level 5 Operable Status	R							
$SB59	–	–	Unsupported	User variable	–	–	–	–	
$SB60	–	–	Unsupported	User variable	–	–	–	–	
$SB61	–	–	Unsupported	User variable	–	–	–	–	
$SB62	–	–	Unsupported	User variable	–	–	–	–	
$SB63	–	–	Unsupported	User variable	–	–	–	–	
$SW0	Current Screen No. (Screen is switched when it is changed)	R/W	VB	System variable	_HMI_CurrentPageIndex	Integer	Current Page Index	Specifies the page number of currently displayed page. While a pop-up screen is displayed, specifies the number of the pop-up. While a pop-up is displayed, writing the value to the memory displays a new pop-up. If a normal page is displayed, the page switches. If the value is the number of a non-existent page, the memory gets the previous value. Because NS system memory's data size is 1-word but NA system variable's size is 2-word, data size conversion is required.	R/W
$SW1	Current Pop-up Screen 1 Number	R/W	VB *1						R/W
$SW2	Position of Pop-up Screen 1 (Top left X coordinate)	R/W	Unsupported	User variable	–	–	–	–	
$SW3	Position of Pop-up Screen 1 (Top left Y coordinate)	R/W	Unsupported	User variable	–	–	–	–	
$SW4	Current Pop-up Screen 2 Number	R/W	Unsupported	User variable	–	–	–	–	
$SW5	Position of Pop-up Screen 2 (Top left X coordinate)	R/W	Unsupported	User variable	–	–	–	–	

*1: A modification may be required in the PLC.

System Memory **System Variables/ User Variables**

CX-Designer			Sysmac Studio						
Address	Description	R/W	Supported by:	Variable Type	Variable Name	Data Type	Variable Represents:	Description	R/W
$SW6	Position of Pop-up Screen 2 (Top left Y coordinate)	R/W	Unsupported	User variable	–	–	–	–	
$SW7	Current Pop-up Screen 3 Number	R/W	Unsupported	User variable	–	–	–	–	
$SW8	Position of Pop-up Screen 3 (Top left X coordinate)	R/W	Unsupported	User variable	–	–	–	–	
$SW9	Position of Pop-up Screen 3 (Top left Y coordinate)	R/W	Unsupported	User variable	–	–	–	–	
$SW10	Urrent Label Number	R/W	Global event	User variable	–	–	–	–	
$SW11	Destination (0:Printer/1:Memory Card)	R/W (Ext Control)	Unsupported	User variable	–	–	–	–	
$SW12	Backlight Brightness Control	R/W (Ext Control)	VB	System variable	_HMI_Brightness	Integer	Brightness	Specifies the brightness of the screen.	R/W
$SW13	Password Number for Canceling Input Prohibition	R/W (Ext Control)	Unsupported	User variable	–	–	–	–	
$SW14	Current Date and Time (Min, Sec)	R	Global event	System variable	_HMI_Minute	Integer	System Clock	To represent minute and second, _HMI_Minute and _HMI_Second are available, respectively. To get the storage type of $SW14, use a VB function.	R
$SW15	Current Date and Time (Date, Hour)	R	Global event	System variable	_HMI_DateTime	DateTime	System Clock	To represent date and hour, _HMI_DateTime.Day and _HMI_Hour are available, respectively. To get the storage type of $SW15, use a VB function.	R
$SW16	Current Date and Time (Year, Month)	R	Global event	System variable	_HMI_DateTime	DateTime	System Clock	To represent year and month, _HMI_DateTime.Year and _HMI_DateTime.Month are available, respectively. To get the storage type of $SW16, use a VB function.	R
$SW17	Current Date and Time (Day of the Week)	R	Global event	System variable	_HMI_DateTime	DateTime	System Clock	_HMI_DateTime.DayOfWeek has the same value as the NS.	R
$SW18	No. of Alarms/Events Occurred	R	Supported	System variable	_HMI_AlarmsRaised	Integer	The alarms currently occurring	The number of alarms currently occurring.	R
$SW19	Occurred Alarm/Event ID	R	Unsupported	User variable	–	–	–	–	
$SW20	Cancelled Alarm/Event ID	R	Unsupported	User variable	–	–	–	–	
$SW21	Alram/Event ID of Alarm/ Event Object Macro	R	Unsupported	User variable	–	–	–	–	
$SW22	–	–	–	User variable	–	–	–	–	
$SW23	Macro Error Number	R	Unsupported	User variable	–	–	–	–	
$SW24	Screen No. Having Macro Error	R	Unsupported	User variable	–	–	–	–	
$SW25	Object ID Having Macro Error	R	Unsupported	User variable	–	–	–	–	
$SW26	Macro Timing Having Error	R	Unsupported	User variable	–	–	–	–	
$SW27	Offset for Index I0	R/W (Ext Control)	Array	User variable	PTMEM_SW27	Integer	The index of an array	Specify this variable as array element.	R/W
$SW28	Offset for Index I1	R/W (Ext Control)	Array	User variable	PTMEM_SW28	Integer	The index of an array	Specify this variable as array element.	R/W
$SW29	Offset for Index I2	R/W (Ext Control)	Array	User variable	PTMEM_SW29	Integer	The index of an array	Specify this variable as array element.	R/W
$SW30	Offset for Index I3	R/W (Ext Control)	Array	User variable	PTMEM_SW30	Integer	The index of an array	Specify this variable as array element.	R/W
$SW31	Offset for Index I4	R/W (Ext Control)	Array	User variable	PTMEM_SW31	Integer	The index of an array	Specify this variable as array element.	R/W
$SW32	Offset for Index I5	R/W (Ext Control)	Array	User variable	PTMEM_SW32	Integer	The index of an array	Specify this variable as array element.	R/W
$SW33	Offset for Index I6	R/W (Ext Control)	Array	User variable	PTMEM_SW33	Integer	The index of an array	Specify this variable as array element.	R/W
$SW34	Offset for Index I7	R/W (Ext Control)	Array	User variable	PTMEM_SW34	Integer	The index of an array	Specify this variable as array element.	R/W
$SW35	Offset for Index I8	R/W (Ext Control)	Array	User variable	PTMEM_SW35	Integer	The index of an array	Specify this variable as array element.	R/W
$SW36	Offset for Index I9	R/W (Ext Control)	Array	User variable	PTMEM_SW36	Integer	The index of an array	Specify this variable as array element.	R/W
$SW37	Data Log Group Number	R/W (Ext Control)	Unsupported	User variable	–	–	–	–	
$SW38	Data Block Error Number	R	Unsupported	User variable	–	–	–	–	

System Memory **System Variables/ User Variables**

CX-Designer			Sysmac Studio						
Address	Description	R/W	Supported by:	Variable Type	Variable Name	Data type	Variable Represents:	Description	R/W
$SW39	Authentication Level	R	VB	System variable	_HMI_CurrentUserRole	String	The right of a user	Shows the right of a user currently logging in.	R
$SW40	Range for Initializing Alarm/ Event History	R/W (Ext Control)	Unsupported	User variable	–	–	–	–	

How to Replace

To realize the NS system memory in NA, PLC program modification will be required in many cases.

Supported	The NA system variable works equally with the NS system memory without a PLC program modification.
Variable mapping	The NA system variable works equally with the NS system memory without a PLC program modification.
VB	Using a subroutine can perform the same function as NS.
Unsupported	No corresponding function is available in NA.

Variable Type	
User variable	Define user variables, PTMEM_SB# and PTMEM_SW#, which assigned to addresses.

◆Alarm

Alarm/Event Settings

CX-Designer				Sysmac Studio				
Function	1st Level	2nd Level	Set Value	Category	Group	Property		Set Value
Alarm/ Event Parameter	Alarm/ Event History	No. of Alarm Hist. Rec.		HMI Settings	Device Settings	Internal Retained Memory Settings	Maximum Number of User Alarm Logs	The minimum value of "No. of Alarm Hist. Rec." plus "No. of Event Hist. Rec."
		No. of Event Hist. Rec.						
		Use Ring Buffer	Checked/ Unchecked	–	–	–	–	–
Add Alarm/ Event Info	Info1 Address			–	–	–	–	–
	Info2 Address			–	–	–	–	–
	Info3 Address			–	–	–	–	–
Icons	Specify "Bitmap displayed as From New Date & Time" icon			–	–	–	–	–
	Specify "Bitmap displayed as From Old Date & Time" icon			–	–	–	–	–
	Specify "Bitmap displayed as From High Priority" icon			–	–	–	–	–
	Specify "Bitmap displayed as From Low Priority" icon			–	–	–	–	–
	Specify "From High Frequency" icon			–	–	–	–	–
	Specify "From Low Frequency" icon			–	–	–	–	–
	Specify "Delete Selected Item" icon			–	–	–	–	–
	Specify "Check Selected Item" icon			–	–	–	–	–
	Specify "Check All Alarm" icon			–	–	–	–	–
	Specify "Cancel All Alarm's Checks" icon			–	–	–	–	–
	Specify "Change Display Type" icon			–	–	–	–	–

Alarm/Event Settings: Alarm/Event Details

CX-Designer				Sysmac Studio				
1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property		Set Value
	Occurred Text		Color	–	–	–	–	–
	Released Text		Color	–	–	–	–	–
Message	Use the String Table		Unchecked	–	–	–	–	–
		Message	Fixed string	User Alarms	Group***	Message		The original text registered as a resource
			Checked					
		String No.	String table number	User Alarms	Group***	Message		The original text registered as a resource
Address	Address		Address	User Alarms	Group***	Expression		A variable mapped to the address
	Detection Type		Raise alarm on Set (to 1) of address/Raise alarm on Reset (to 0) of address	–	–	–	–	–
	Priority			–	–	–	–	–
	Display Type		High Alarm	User Alarms	Group***	Priority		User Fault Level 1
			Middle Alarm	User Alarms	Group***	Priority		User Fault Level 2
			Low Alarm	User Alarms	Group***	Priority		User Fault Level 3
			Event	User Alarms	Group***	Priority		User Information
	Group		Group number	User Alarms	Group name			Group_[Group No.]_ [Group name]
Switch Screen	Screen Switch		Screen number	User Alarms	Group***	Page		Page name
	Switch screen when Alarm/Event occurred		Checked/ Unchecked	–	–	–	–	–
Switch Contents	Contents No.		Contents number	–	–	–	–	–
	Delete when Alarm/Event is canceled		Checked/ Unchecked	–	–	–	–	–
	Save to History		Checked/ Unchecked	–	–	–	–	–
	Delete when Alarm/Event is canceled		Checked/ Unchecked	–	–	–	–	–
	Display the document on a document display object		Checked/ Unchecked	–	–	–	–	–

◆Broken-line Graph

Broken-line Graph: Broken-line Graph Group Setting　　Data Groups

CX-Designer				Sysmac Studio				
Function	1st Level	2nd Level	Set Value	Category	Group	Property		Set Value
Group Name			Group name	Data Groups	Data series name	Data Series		Data series name
Draw Value Outside of the Range			Checked/ Unchecked	–	–	–	–	–
Storage Type			INT (Signed 1 word)	Data Groups	Data series name	Data Series	Data Type	Short
			UINT (Unsigned 1 word)					Ushort
			DINT (Signed 2 words)					Integer
			UDINT (Unsigned 2 words)					Uinteger
			REAL (Real Number)					Single
			BDC2 (Unsigned 1 word)					–
			BDC2 (Unsigned 2 words)					–
			BCD1 (Signed [leftmost digit:F] 1 word)					–
			BCD2 (Signed [leftmost digit:F] 2 words)					–
			BCD2 (Signed [leftmost bit:1] 1 word)					–
			BCD2 (Signed [leftmost bit:1] 2 words)					–
No. of vertices in each line	Monitor Points		Fixed value	–	–	–	–	–
Batch Read	Read in batch		Unchecked	–	–	–	–	–
			Checked	–	–	–	–	–
		Trigger	Address	–	–	–	–	–
		Operation Complete Flag	Address	–	–	–	–	
History	No. of Histories			–	–	–	–	–
	Clear history when address changes to ON		Unchecked Checked Address	–	–	–	–	–

Broken-line Graph: Broken-line Graph Group Set

CX-Designer				Sysmac Studio				
Function	1st Level	2nd Level	Set Value	Category	Group	Property		Set Value
Start Address			Address	Data Groups	Data series name	Variable		A variable mapped to the address
Maximum/ Minimum Value	Maximum	Indirect Reference	Unchecked	–	–	–	–	–
			Fixed value	–	–	–	–	–
			Checked	–	–	–	–	–
		Address	Address	–	–	–	–	–
	Minimum	Indirect Reference	Unchecked	–	–	–	–	–
			Fixed value	–	–	–	–	–
			Checked	–	–	–	–	–
		Address	Address	–	–	–	–	–
Line Color	Within		Color	–	–	–	–	–
	Outside		Color	–	–	–	–	–
Line Style			Solid line, Dotted line, Broken line, 1-dot chain line, or 2-dot chain line	–	–	–	–	–
Display Offset			Fixed value	–	–	–	–	–
Step Display			Checked/ Unchecked	–	–	–	–	–
Marker			None, □, ○, ＋, or ×	–	–	–	–	–
	Size		Large, medium, or small	–	–	–	–	–
	Color			–	–	–	–	–
Line	Display when address changes to ON		Unchecked or Checked: Address	–	–	–	–	–
History Display				–	–	–	–	–
	Line Color	Normal	Color	–	–	–	–	–
		Outside	Color	–	–	–	–	–
	Display/Hide		Display	–	–	–	–	–
			Hide	–	–	–	–	–
			Indirect Reference: Address	–	–	–	–	–
		Action When Specifying	Display When Address ON or Display When Address OFF	–	–	–	–	–

◆Data Log

Data Log Setting

Data Logging

CX-Designer					Sysmac Studio				
1st Level	2nd Level	3rd Level	4th Level	Set Value	Category	Data Set	Property		Set Value
Group Name					Data Logging				Data set name
Log Timing	On Sampling Cycle				Data Logging	Data set name	Update Type		Regular Interval
					Data Logging	Data set name	Update Rate		A value less than the set value on NS
		Indirect Reference of Sampling Cycle		Unchecked	–	–	–	–	–
				Checked	–	–	–	–	–
			Address	Address	–	–	–	–	–
	On Event				Data Logging	Data set name	Update Type		On Condition
		Address		Address	Data Logging	Data set name	Expression		A variable mapped to the address
Save	Log Save Area	Save with Ring Buffer		Checked/ Unchecked	–	–	–	–	–
Memory Card	Output File			File name	–	–	–	–	–
	Save the data periodically			Checked	Data Logging	Data set name	Start New Database File		After specific number of logs
				Unchecked	–	–	–	–	–
Log Period	Always				Data Logging	Data set name	Automatically Start on HMI Device		Checked
	Log only when Data Log object is shown				–	–	–		–
		Clear when switching screens		Checked/ Unchecked	–	–	–		–
Start/Stop Data Log	Control start/stop data log by the specified address			Unchecked	–	–	–		–
				Checked	–	–	–		–
		Address		Address	–	–	–		–
	Clear data logs when the address is ON			Checked/ Unchecked	–	–	–		–
Log Points					Data Logging	Data set name	After specific number of logs	The number of logs	The original value set in the NS

Data Log: Data Log Address Setting

Data Logging: Data Set

CX-Designer					Sysmac Studio				
1st Level	2nd Level			Set Value	Category	Data Set	Property		Set Value
Address				Address	Data Logging	Data set name	Variable		A variable mapped to the address
Storage Type					–	–	–	–	–
Maximum	Indirect Reference			Unchecked	–	–	–	–	–
				Fixed value					
				Checked	–	–	–	–	–
			Address	Address					
Minimum	Indirect Reference			Unchecked	–	–	–	–	–
				Fixed value					
				Checked	–	–	–	–	–
			Address	Address					

◆Data Block

Data Block **Recipe**

CX-Designer			Sysmac Studio			
Function	1st Level	Set Value	Category	Group	Property	Set Value
Parameter		ASCII code	–	–	–	–
		Unicode	–	–	–	–
Icons		Read data file	–	–	–	–
		Write data file	–	–	–	–
		Write to the address	–	–	–	–
		Read from the address	–	–	–	–
		Add the record	–	–	–	–
		Delete the record	–	–	–	–

Data Block: Field **Recipe: Recipe Template, Recipe**

CX-Designer		Sysmac Studio			
Number in the Table	Function	Category	Group	Property	Set Value
①	Field Name	Recipes	Field	Field name	The original value
②	Address	Recipes	Field	Variable	A variable mapped to the address
③	Data Format	–	–	–	–
④	Record label	Recipes	Recipe	Recipe name	The original value
⑤	Recipe data	Recipes	Recipe	Field name	The original value

	No.		0
①	Field Name		New Field
②	Address		SERIALA:0000
③	Data Format		Numeral
	0		
	1	④	⑤
	2		
	3		

Data Block: Record **Data Groups: Data Series**

CX-Designer			Sysmac Studio			
Function	1st Level	Set Value	Category	Group	Property	Set Value
Data Block Name			Data Groups	Data series name	Variable	A variable mapped to the address
Record Setting	File Name	File name	–	–	–	–
	The maximum number of Records		–	–	–	–
Specify Interlock (Data updating prohibition flag)		Checked	–	–	–	–
		Unchecked	–	–	–	–
	Interlock Address	Address	–	–	–	–
Record Label Setting	String Length		–	–	–	–
	Storage String Type	ASCII code	–	–	–	–
		Unicode	–	–	–	–

◆Scale

Unit & Scale　　Scale

CX-Designer	Sysmac Studio		
Function	Category	Group	Remarks
No.	Scale Name	Scale[Set value]	
Comment	Comment	[Unit][Comment]	
Unit name			CX-Designer identifies by No.
Scale	Multiplier	The original value	
Offset	Offset	The original value	

◆Troubleshooter

Troubleshooter

Troubleshooter

CX-Designer					Sysmac Studio			
Function					Category	Group	Item 1	Set Value
Screen Setting	PLC Setting	Event Codes			Controller Events	User Events	Event Code	The original value for NS
		Short Message			–	–	–	–
	NS Setting	Troubleshooting Screen			Controller Events	User Events	Troubleshooter Associated Page	The page name that has been set for NS
Theme	Select a theme			Checked	–	–	–	–
				Unchecked	–	–	–	–
		File name			–	–	–	–
Language Assignment		NS Label Name			Troubleshooter	Language Mapping	HMI Project Language	An adequate language selected from the language setting
		PLC Setting			Troubleshooter	Language Mapping	User Event Language	An adequate language based on the original language setting
	Language setting for Controller troubles and Controller event log	Conform to the system log		Checked	–	–	–	–
				Unchecked	–	–	–	–
			NS Label Name		–	–	–	–
			PLC Setting		–	–	–	–
User	Restrict error cancellation			Checked	–	–	–	–
				Unchecked	Troubleshooter	Security Settings	Ability to Reset Errors	None
				Restrict always	Troubleshooter	Security Settings	Ability to Reset Errors	Level 1
				Restrict at canceling authentication	Troubleshooter	Security Settings	Ability to Reset Errors	Level 1
				Restrict at Level 1 or lower	Troubleshooter	Security Settings	Ability to Reset Errors	Level 1
				Restrict at Level 2 or lower	Troubleshooter	Security Settings	Ability to Reset Errors	Level 2
				Restrict at Level 3 or lower	Troubleshooter	Security Settings	Ability to Reset Errors	Level 3
				Restrict at Level 4 or lower	Troubleshooter	Security Settings	Ability to Reset Errors	Level 4
	Restrict log clear			Checked	–	–	–	–
				Unchecked	Troubleshooter	Security Settings	Ability to Clear Event Logs	None
				Restrict always	Troubleshooter	Security Settings	Ability to Clear Event Logs	Level 1
				Restrict at canceling authentication	Troubleshooter	Security Settings	Ability to Clear Event Logs	Level 1
				Restrict at Level 1 or lower	Troubleshooter	Security Settings	Ability to Clear Event Logs	Level 1
				Restrict at Level 2 or lower	Troubleshooter	Security Settings	Ability to Clear Event Logs	Level 2
				Restrict at Level 3 or lower	Troubleshooter	Security Settings	Ability to Clear Event Logs	Level 3
				Restrict at Level 4 or lower	Troubleshooter	Security Settings	Ability to Clear Event Logs	Level 4
	Restrict switching into Event log screen			Checked	–	–	–	–
				Unchecked	Troubleshooter	Security Settings	Access to Event Logs	None
				Restrict always	Troubleshooter	Security Settings	Access to Event Logs	Level 1
				Restrict at canceling authentication	Troubleshooter	Security Settings	Access to Event Logs	Level 1
				Restrict at Level 1 or lower	Troubleshooter	Security Settings	Access to Event Logs	Level 1
				Restrict at Level 2 or lower	Troubleshooter	Security Settings	Access to Event Logs	Level 2
				Restrict at Level 3 or lower	Troubleshooter	Security Settings	Access to Event Logs	Level 3
				Restrict at Level 4 or lower	Troubleshooter	Security Settings	Access to Event Logs	Level 4

Troubleshooter

Troubleshooter

CX-Designer					Sysmac Studio			
Function					Category	Group	Item 1	Set Value
User Authentication	Restrict screen capture			Checked	–	–	–	–
				Unchecked	Troubleshooter	Security Settings	Ability to Print Screens	None
				Restrict always	Troubleshooter	Security Settings	Ability to Print Screens	Level 1
				Restrict at canceling authentication	Troubleshooter	Security Settings	Ability to Print Screens	Level 1
				Restrict at Level 1 or lower	Troubleshooter	Security Settings	Ability to Print Screens	Level 1
				Restrict at Level 2 or lower	Troubleshooter	Security Settings	Ability to Print Screens	Level 2
				Restrict at Level 3 or lower	Troubleshooter	Security Settings	Ability to Print Screens	Level 3
				Restrict at Level 4 or lower	Troubleshooter	Security Settings	Ability to Print Screens	Level 4
	Restrict saving into csv			Checked	–	–	–	–
				Unchecked	Troubleshooter	Security Settings	Ability to Save to CSV File	None
				Restrict always	Troubleshooter	Security Settings	Ability to Save to CSV File	Level 1
				Restrict at canceling authentication	Troubleshooter	Security Settings	Ability to Save to CSV File	Level 1
				Restrict at Level 1 or lower	Troubleshooter	Security Settings	Ability to Save to CSV File	Level 1
				Restrict at Level 2 or lower	Troubleshooter	Security Settings	Ability to Save to CSV File	Level 2
				Restrict at Level 3 or lower	Troubleshooter	Security Settings	Ability to Save to CSV File	Level 3
				Restrict at Level 4 or lower	Troubleshooter	Security Settings	Ability to Save to CSV File	Level 4
Monitor Error	Host				Troubleshooter	Device	–	–
	Monitor Target			Not to monitor	Troubleshooter	Launch on System Event	–	Unchecked
					Troubleshooter	Launch on User Event Event	–	Unchecked
				User trouble	Troubleshooter	Launch on System Event	–	Unchecked
					Troubleshooter	Launch on User Event Event	–	Checked
				Controller trouble	Troubleshooter	Launch on System Event	–	Checked
					Troubleshooter	Launch on User Event Event	–	Unchecked
				User trouble and	Troubleshooter	Launch on System Event	–	Checked
					Troubleshooter	Launch on User Event Event	–	Checked

◆Password

Password **Security Settings**

CX-Designer					Sysmac Studio			
Function	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Item 1	Set Value
Password	Indirect Reference			None	–	–	–	–
				Level 1	–	–	–	–
				Level 2	–	–	–	–
				Level 3	–	–	–	–
				Level 4	–	–	–	–
				Level 5	–	–	–	–
	Level 1 to Level 5	Password			Security Settings	User Accounts	Password	The original value for NS
							Name	User_Level1, User_Level2, ...
							Role	Autority1, Authority2,…
						Roles and Access Levels	Role/Access Level	Autority1, Authority2,…
							Level 1	Checked
							Level 2	Unchecked
							Level 3	Unchecked
							Level 4	Unchecked
							Level 5	Unchecked
		Input Pad		System Keypad	–	–	–	–
				Specified Pop-up Screen	–	–	–	–
Function Mode	Password				–	–	–	–
	Password (with level)				–	–	–	–
		Cancel authentication if no operation is done for a set period		Checked	–	–	–	–
				Unchecked	–	–	–	–
			Time-out time		–	–	–	–
		Switch screen when canceling the authentication	PLC Language Setting	Checked	–	–	–	–
		Restrict error cancellation		Unchecked	–	–	–	–
			Switch Screen No.		–	–	–	–

◆String Table

String Table **Resource**

CX-Designer		Sysmac Studio				
Function	Label	Category	Group	Item 1	Item 2	Set Value
No.		Resources	NS_StringTable	String	Name	String[Setvalue]
String	Type0	Resources	NS_StringTable	String	The 1st language	The string that has been set for NS
	...	Resources	NS_StringTable	String	The 2nd to 15th language	The string that has been set for NS
	Type15	Resources	NS_StringTable	String	The 16th language	The string that has been set for NS

Appendix 2: Object Common Settings

◆Screen

Screen **Page**

CX-Designer				Sysmac Studio				
Tab	1st Level	2nd Level	Set Value	Category	Group	Property	Set Value	Remarks
	Screen/Sheet No.			Properties	General	PageIndex	The original page number for NS	
Title	Screen Title			Properties	General	Name		
Size/Pop-up	Screen Size	Width		Properties	Layout	Width	Scaled value from NS	Disabled if "Use as Pop-up Screen" has been unchecked.
		Height		Properties	Layout	Height	Scaled value from NS	Disabled if "Use as Pop-up Screen" has been unchecked.
		Use as Default Screen Size	Checked	–	–	–	–	
			Unchecked	–	–	–	–	
	Use as Pop-up Screen		Checked	Properties	Behavior	PageType	Popup	
			Unchecked	Properties	Behavior	PageType	Main	
	Pop-up Screen Display Position		Center of Screen	Properties	Layout	Position	Center	
			Top Left of Screen	Properties	Layout	Position	TopLeft	
			Bottom Left of Screen	Properties	Layout	Position	BottomLeft	
			Top Right of Screen	Properties	Layout	Position	TopRight	
			Bottom Right of Screen	Properties	Layout	Position	BottomRight	
			Any Position	Properties	Layout	Position	Custom	
		X		Properties	Layout	Position (Left, Top) –	Scaled value from NS	
		Y		Properties	Layout	Position (Left, Top) – Top	Scaled value from NS	
	Pop-up Screen Setting	Enable input on other screens	Checked	Properties	Behavior	DisplayMode	Modeless	
			Unchecked	Properties	Behavior	DisplayMode	Modal	
		Close when base screen switches	Checked	Properties	Behavior	CloseOnPageChange	Checked	
			Unchecked	Properties	Behavior	CloseOnPageChange	Unchecked	
		No title bar	Checked	–	–	–	–	
			Unchecked	–	–	–	–	
Background/Others	Background Color	Use as Default Background		Properties	Appearance	BackgroundColor	The same color as NS	
			Checked	–	–	–	–	
			Unchecked	–	–	–	–	
	Background File	Select File Name	Checked	–	–	–	–	
			Unchecked	–	–	–	–	
		Select		–	–	–	–	
	Compression	Compress Screen Data File	Checked	–	–	–	–	
			Unchecked	–	–	–	–	

Screen **Page**

CX-Designer				Sysmac Studio				
Tab	1st Level	2nd Level	Set Value	Category	Group	Property	Set Value	Remarks
Background/Others	The order of display		Display all objects at once	–	–	–	–	
			Display frames and fixed objects first	–	–	–	–	
Function Key	Key Status Address	F1		–	–	–	–	
		F2		–	–	–	–	
		F3		–	–	–	–	
Macro	Macro Execution Condition	When loading a screen		Events and Actions	Event	PageDisplayed	–	
				Events and Actions	Action	CallSubroutine	Subroutine name	
		When unloading a screen		Events and Actions	Event	PageHidden	–	
				Events and Actions	Action	CallSubroutine	Subroutine name	
Comm. Details	Smart Active Parts Communication Interval			–	–	–	–	

◆**Frame**

Frame

CX-Designer					Sysmac Studio			
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value
	Object ID				Properties	General	Name	The original Object ID
General	Frame Page	No. of Frames			Properties	Behavior	TabPages	Add as much as the frames
		Page No. Edited			–	–	–	
		Set Background Color		Checked	–	–	–	
				Unchecked	–	–	–	
			Tab color		Properties	Appearance	BackgroundColor	See the table below
					Properties	Appearance	SelectedItemBackgroundColor	See the table below
					Properties	Behavior	TabPages－[*]－BackgroundColor	See the table below
	Address	Frame Page Ref.			Properties	Behavior	Variable	A variable mapped to the address
	Frame with a Tab	Attach a Tab to the Frame		Checked	Properties	Appearance	TabHeaderVisible	Checked
				Unchecked				Unchecked
			Tab Height		Properties	Appearance	TabHeaderHeight	The set value multiplied by 18
			Tab position	Top	Properties	Appearance	TabHeaderPosition	Top
				Below	Properties	Appearance	TabHeaderPosition	Bottom
				Left	Properties	Appearance	TabHeaderPosition	Top
				Right	Properties	Appearance	TabHeaderPosition	Top

Frame: Tab Color

CX-Designer		Sysmac Studio			
Attach a Tab to the Frame	Set Background Color	Category	Group	Property	Set Value
Unchecked	Unchecked	Properties	Appearance	BackgroundColor	Transparent
		Properties	Appearance	SelectedItemBackgroundColor	Transparent
		Properties	Behavior	TabPages－[*]－BackgroundColor	Transparent
	Checked	Properties	Appearance	BackgroundColor	The same color as NS
Checked	Unchecked	Properties	Appearance	SelectedItemBackgroundColor	The same color as NS
	Checked	Properties	Behavior	TabPages－[*]－BackgroundColor	The same color as NS

◆Text Attributes

Text Attributes

CX-Designer			Sysmac Studio					
Switch		Item	Category	Group	Property	Sub-property	Language	Set Value
Type0	OFF	Label	Properties	Appearance	TextButtonUp (Default)	–	Language selected in CX-Designer	**
		Font Name			Font	Family		See "Text_Family" sheet
		Size				Size		See "Text_Size" sheet
		Font Style				Style		See the table "Font Style"
		Color Setting				TextColor		
		Vertical Position				VerticalAlignment		See the table "Vertical Position"
		Horizontal Position				HorizontalAlignment		See the table "Horizontal Position"
		Horiz. Scale (only Scalable Gothic)				–		–
	ON	Label			TextButtonDown (Default)	–		**
		Font Name			Font	Family		See "Text_Family" sheet
		Size				Size		See "Text_Size" sheet
		FontStyle				Style		See the table "Font Style"
		Color Setting				TextColor		
		VerticalAlignment				VerticalAlignment		See the table "Vertical Position"
		HorizontalAlignment				HorizontalAlignment		See the table "Horizontal Position"
		Horiz. Scale (only Scalable Gothic)				–		–
Type1	Same as above	Same as above			Same as above	Same as above	Language selected in CX-Designer	Same as above
Type2	Same as above	Same as above			Same as above	Same as above	Language selected in CX-Designer	Same as above
Type3	Same as above	Same as above			Same as above	Same as above	Language selected in CX-Designer	Same as above
Type4	Same as above	Same as above			Same as above	Same as above	Language selected in CX-Designer	Same as above
Type5	Same as above	Same as above			Same as above	Same as above	Language selected in CX-Designer	Same as above
Type6	Same as above	Same as above			Same as above	Same as above	Language selected in CX-Designer	Same as above
Type7	Same as above	Same as above			Same as above	Same as above	Language selected in CX-Designer	Same as above
Type8	Same as above	Same as above			Same as above	Same as above	Language selected in CX-Designer	Same as above
Type9	Same as above	Same as above			Same as above	Same as above	Language selected in CX-Designer	Same as above
Type10	Same as above	Same as above			Same as above	Same as above	Language selected in CX-Designer	Same as above
Type11	Same as above	Same as above			Same as above	Same as above	Language selected in CX-Designer	Same as above
Type12	Same as above	Same as above			Same as above	Same as above	Language selected in CX-Designer	Same as above
Type13	Same as above	Same as above			Same as above	Same as above	Language selected in CX-Designer	Same as above
Type14	Same as above	Same as above			Same as above	Same as above	Language selected in CX-Designer	Same as above
Type15	Same as above	Same as above			Same as above	Same as above	Language selected in CX-Designer	Same as above

A name in [Switch] is shown in the default value. Names can be editable. The order takes preference over the name.

**: Register the string of each Type# as resource texts in the default language. Then, register resources in other languages. Select the resource.

Text Attributes

Vertical Position

CX-Designer	Sysmac Studio
Center	Center
Up	Top
Down	Bottom

Horizontal Position

CX-Designer	Sysmac Studio
Center	Center
Left	Left
Right	Right

Font Style

CX-Designer		Sysmac Studio			
Item 1	Item 2	Category	Group	Property	Set Value
Font Style	Italic	Properties	Appearance	Font - Style	Italic
	Bold				Bold
	Italic + Bold				Bold Italic

◆Common

Frame, Flicker, Control Flag, and Size/Position

CX-Designer					Sysmac Studio				
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value	Remarks
Frame	Three-dimensional Frame			Checked	–	–	–	–	
				Unchecked	–	–	–	–	
		Color (Top/Left)			–	–	–	–	
		Color (Bottom/Right)			–	–	–	–	
		Frame Size			–	–	–	–	
	Draw Border				–	–	–	–	
		Color (Border)			–	–	–	–	
	Frame ON/OFF Display	Link with the Specified Address ON/OFF			–	–	–	–	
			Address		–	–	–	–	
Flicker	Flicker No.			(None)	–	–	–	–	
				Other than (None)	–	–	–	–	
	Flicker Timing			Always	–	–	–	–	
				When Address ON	–	–	–	–	
			Address		–	–	–	–	
Control Flag	Input			Enabled	Properties	Behavior	IsEnabled	Checked	
				Disable				Unchecked	
				Indirect	Animations	Enable			
		Address						Variable mapped to the address	
	Display			Display	Properties	Appearance	IsVisible	Checked	
				Hide				Unchecked	
				Indirect	Animations	Visibility			
		Address						Variable mapped to the address	
Size/Position	Size	Width			Properties	Layout	Width	The same value as NS	
		Height			Properties	Layout	Height	The same value as NS	
	Position from the Upper Left of Screen/Frame/Table	X			Properties	Layout	Left	The same value as NS	The coordinates are to be converted to absolute coordinates when existing inside a frame or table.
		Y			Properties	Layout	Top	The same value as NS	

◆Text_Family

Text: Font Family

Type	CX-Designer	Sysmac Studio
Embedded Font	Fine	Courier New
	Standard	Segoe UI
	Rough	Courier New
	7-segment Numeral	DF7segHMI
	Scalable Gothic	Segoe UI
	Gothic Numeral	Segoe UI
Windows Font	Arial	Arial
	Arial Black	Arial Black
	Arial Narrow	Arial Narrow
	Comic Sans MS	Comic Sans MS
	Courier New	Courier New
	DF7segHMI	DF8segHMI
	Ebrima	Ebrima
	Estrangelo Edessa	Estrangelo Edessa
	Euphemia	Euphemia
	Gautami	Gautami
	Georgia	Georgia
	Gulim	Gulim
	GulimChe	GulimChe
	Impact	Impact
	Iskoola Pota	Iskoola Pota
	Kalinga	Kalinga
	Khmer UI	Khmer UI
	Lao UI	Lao UI
	Latha	Latha
	Lucida Sans Unicode	Lucida Sans Unicode
	Malgun Gothic	Malgun Gothic
	Mangal	Mangal
	Meiryo	Meiryo
	Meiryo UI	Meiryo UI
	Microsoft Himalaya	Microsoft Himalaya
	Microsoft JhengHei	Microsoft JhengHei
	Microsoft JhengHei	Microsoft JhengHei
	Microsoft New Tai Lue	Microsoft New Tai Lue
	Microsoft PhagsPa	Microsoft PhagsPa
	Microsoft Sans Serif	Microsoft Sans Serif
	Microsoft Tai Le	Microsoft Tai Le
	Microsoft Uighur	Microsoft Uighur
	Microsoft YaHei	Microsoft YaHei
	Microsoft YaHei	Microsoft YaHei
	Microsoft Yi Baiti	Microsoft Yi Baiti
	MingLiU	MingLiU

Type	CX-Designer	Sysmac Studio
Windows Font	MingLiU_HKSCS	MingLiU_HKSCS
	MingLiU_HKSCS-ExtB	MingLiU_HKSCS-ExtB
	MingLiU-ExtB	MingLiU-ExtB
	Mongolian Baiti	Mongolian Baiti
	MS Gothic	MS Gothic
	MS Mincho	MS Mincho
	MS PGothic	MS PGothic
	MS PMincho	MS PMincho
	MS UI Gothic	MS UI Gothic
	MV Boli	MV Boli
	NSimSun	NSimSun
	Nyala	Nyala
	Plantagenet Cherokee	Plantagenet Cherokee
	PMingLiU	PMingLiU
	PMingLiU-ExtB	PMingLiU-ExtB
	Raavi	Raavi
	Segoe UI	Segoe UI
	Segoe UI Light	Segoe UI Light
	Segoe UI Semibold	Segoe UI Semibold
	Shruti	Shruti
	SimSun	SimSun
	SimSun-ExtB	SimSun-ExtB
	Sylfaen	Sylfaen
	Symbol	Symbol
	Tahoma	Tahoma
	Times New Roman	Times New Roman
	Trebuchet MS	Trebuchet MS
	Tunga	Tunga
	Verdana	Verdana
	Vrinda	Vrinda
	Webdings	Webdings
	Others than above	Segoe UI

◆Macro

Macros for Functional Objects **Events and Actions**

CX-Designer	Sysmac Studio					
Macro Execution Condition	Target	Tab	Category	Events/Actions	Set Value	Set Value
When Display Area is Pressed	Object or shape	Events and Actions	Event	Press	–	–
			Action	CallSubroutine	Subroutine name	–
Touch ON timing			Event	Press	–	–
			Action	CallSubroutine	Subroutine name	–
Touch OFF timing			Event	Release	–	–
			Action	CallSubroutine	Subroutine name	–
Execute when ON/OFF			Event	Condition	Expression	[Variable mapped to the address] = True
			Action	CallSubroutine	Subroutine name	–
			Event	Condition	Expression	[Variable mapped to the address] = False
			Action	CallSubroutine	Subroutine name	–
Execute when ON			Event	Condition	Expression	[Variable mapped to the address] = True
			Action	CallSubroutine	Subroutine name	–
Execute when OFF			Event	Condition	Expression	[Variable mapped to the address] = False
			Action	CallSubroutine	Subroutine name	–
Before inputting numeral	–	–	–	–	–	–
Before writing numeral	–	–	–	–	–	–
When changing value	–	–	–	–	–	–
When an address value changed	–	–	–	–	–	–
Value = Set Value	Page on which an object exists	Events and Actions	Event	Condition	Expression	[Variable mapped to the address] = set value
			Action	CallSubroutine	Subroutine name	–
Value != Set Value			Event	Condition	Expression	[Variable mapped to the address] != set value
			Action	CallSubroutine	Subroutine name	–
Value < Set Value			Event	Condition	Expression	[Variable mapped to the address] < set value
			Action	CallSubroutine	Subroutine name	–
Value <= Set Value			Event	Condition	Expression	[Variable mapped to the address] <= set value
			Action	CallSubroutine	Subroutine name	–
Value > Set Value			Event	Condition	Expression	[Variable mapped to the address] > set value
			Action	CallSubroutine	Subroutine name	–
Value >= Set Value			Event	Condition	Expression	[Variable mapped to the address] >= set value
			Action	CallSubroutine	Subroutine name	–

Appendix 3: Buttons

◆Button_Common

ON/OFF Buttons: General **Buttons**

CX-Designer				Sysmac Studio			
Tab	1st Level	2nd Level	Set Value	Category	Group	Property	Set Value
General	Object Comment			–	–	–	–
	Button type			See the “ONOFF Button_Shape” sheet			
Color/Shape	Button type			See the “ONOFF Button_Shape” sheet			
Label	Label	OFF		Properties	Appearance	DefaultText (Default)	The original text set for NS
		ON		–	–	–	–
	Text Attribute	OFF		Refer to the “Text Attributes” sheet in “Appendix 2: Object Common Settings.”			
		ON		–	–	–	–
		Indirect Reference of Text Color	Checked	–	–	–	–
	Switch Label for Address ON/OFF		Unchecked	Properties	Behavior	VisualFeedback	Variable
			Checked	–	–	–	–
		Checked	Link with the Write Address ON/OFF	–	–	–	–
			Link with the Display Address ON/OFF	–	–	–	–
			Link with the Specified Address ON/OFF	–	–	–	–
		Address		–	–	–	–
	Use the String Table		Unchecked	–	–	–	–
			Checked	Properties	Appearance	DefaultText (Default)	The original text set for NS
Write	Display Write Confirmation Dialog		Unchecked	–	–	–	–
			Checked				
		Checked	Standard Message	–	–	–	–
			Use Specified Message	–	–	–	–
		Message		–	–	–	–
	Record to Operation Log		Unchecked	Properties	Security	Operation Log	Unchecked
			Checked	Properties	Security	Operation Log	Checked
		Message		–	–	–	–
Group	Group Setting			–	–	–	–
Other	Key Press Sound Control	Do not allow sound for this object		–	–	–	–

◆ON/OFF Button

ON/OFF Button: General　　Button

CX-Designer					Sysmac Studio				
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value	Remarks
General	Action Type			Momentary	Properties	General	Behavior	MomentaryButton	
General	Action Type			Alternate	Properties			ToggleButton	
General	Action Type			SET	Properties			SetButton	
General	Action Type			RESET	Properties			ResetButton	
General	Address	Write Address			See the “ONOFF Button_Shape” sheet				
General	Address	Display Address1			See the “ONOFF Button_Shape” sheet				
General	Address	Display Address2			See the “ONOFF Button_Shape” sheet				
Group	Group Setting				–	–	–	–	

◆**Word Button**

Word Button **Button**

CX-Designer					Sysmac Studio			
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value
General	Object comment				–	–	–	–
	Numeral Type				–	–	–	–
	Button Shape			Rectangle	Properties	Appearance	Design	Rectangle
				Select Shape	Properties	Appearance	Design	Image
	Action Type			Set Value	See the “Word Button_Shape” sheet			
				Increment/Decrement				
				Display Pop-up Menu				
	Address	Write Address						
Max/Min	Maximum Limit			Value	–	–	–	–
				Indirect Reference	–	–	–	–
			Address		–	–	–	–
		Return to the Minimum Value when the Maximum vale is Exceeded			–	–	–	–
	Minimum Limit			Value	–	–	–	–
				Indirect Reference	–	–	–	–
			Address		–	–	–	–
		Return to the Maximum Value when the Minimum vale is Exceeded			–	–	–	–

◆**Command Button**

Command Button **Button**

CX-Designer					Sysmac Studio			
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value
General	Function				See the “Command Button_Function” sheet			
	Button Shape			Rectangle	Properties	Appearance	Design	Rectangle
				Circle	Properties	Appearance	Design	Ellipse
				Select Shape	Properties	Appearance	Design	Image
Color/Shape					See the “Command Button_Shape” sheet			

◆Multifunction

Multifunction Objects **No Dedicated Objects: Assign Action and Event to a button or lamp object**

CX-Designer				Sysmac Studio			
Tab	1st Level	2nd Level	Set Value	Category	Group	Property	Set Value
General				Events and Actions	–	–	See the “Multifunction_Function” sheet
	Perform an action when pressing the object		Checked	Properties	Behavior	IsEnabled	Checked
			Unchecked	Properties	Behavior	IsEnabled	Unchecked
	Double Press		Checked	–	–	–	–
			Unchecked	Properties	Behavior	DoubleTouchTime	0
		Reception start time		–	–	–	–
		Reception closing time		Properties	Behavior	DoubleTouchTime	Value converted to the time unit of ms
	ON-delay		Checked				
			Unchecked	Properties	Behavior	OnDelayTime	0
		Set Time		Properties	Behavior	OnDelayTime	Value converted to the time unit of ms
	OFF-delay		Checked				
			Unchecked	Properties	Behavior	OffDelayTime	0
		Set Time		Properties	Behavior	OffDelayTime	Value converted to the time unit of ms
	Input		Disable input	Properties	Behavior	IsEnabled	Unchecked
			Enable input	Properties	Behavior	IsEnabled	Checked
			Enable Input When Indirect Address ON	Animations	Enable	Expression	[Variable mapped to the indirect reference address] = True
			Enable Input When Indirect Address OFF	Animations	Enable	Expression	[Variable mapped to the indirect reference address] = False
		Indirect Reference		–	–	–	–
	Prohibiting simultaneous pressing		Checked	–	–	–	–
			Unchecked	–	–	–	–
	Record to operation log		Checked	Properties	Security	Operation Log	Checked
			Unchecked	Properties	Security	Operation Log	Unchecked
		Message		–	–	–	–
	Do not allow sound for this object		Checked	–	–	–	–
			Unchecked	–	–	–	–
	Group Setting		None	–	–	–	–
			Group 1	–	–	–	–
			Group 2	–	–	–	–
			Group 3	–	–	–	–
			Group 4	–	–	–	–
			Group 5	–	–	–	–
			Group 6	–	–	–	–
			Group 7	–	–	–	–
			Group 8	–	–	–	–
			Group 9	–	–	–	–
			Group 10	–	–	–	–
			Group 11	–	–	–	–
			Group 12	–	–	–	–
			Group 13	–	–	–	–

No Dedicated Objects: Assign Action and Event to a button or lamp object

CX-Designer				Sysmac Studio			
Tab	1st Level	2nd Level	Set Value	Category	Group	Property	Set Value
General	Group Specification		Group 14	–	–	–	–
			Group 15	–	–	–	–
			Group 16	–	–	–	–
	When a value changed		Checked	–	–	–	–
			Unchecked	–	–	–	–
Expansion Setting	Wait for completion of communication (Synchronous communication)		Unchecked	–	–	–	–
			Checked				
		Continue the operation even when an error occurs	Checked/ Unchecked	–	–	–	–

◆ONOFF Button_Shape

ON/OFF Button Type Conversion Table **Button**

CX-Designer				Sysmac Studio		
Button Types	Tab	1st Level	2nd Level	Category	Property	Set Value
Rectangle (Type 1)				Appearance	Design	Rectangle
				Behavior	VisualFeedback	Variable (Button)
	General	Write Address		Behavior	Variable	Variable
		Display Address1		–	–	–
		Display Address2		–	–	–
	Color/Shape	OFF color	Color	Appearance	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color	–	–	–
		ON color	Color	Appearance	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color	–	–	–
Rectangle (Type 2-1)				Appearance	Design	Rectangle
				Behavior	VisualFeedback	Feedback (Button)
	General	Write Address		Behavior	Variable	Variable
		Display Address1		Behavior	FeedbackExpression	Variable
		Display Address2		–	–	–
	Color/Shape	OFF color	Color	Appearance	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color	–	–	–
		ON color	Color	Appearance	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color	–	–	–
Rectangle (Type 2-2)				Appearance	Design	Rectangle
				Behavior	VisualFeedback	Touch (Button) + Feedback (Button)
	General	Write Address		Behavior	Variable	Variable
		Display Address1		Behavior	FeedbackExpression	Variable
		Display Address2		–	–	–
	Color/Shape	OFF color	Color	Appearance	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color	–	–	–
		ON color	Color	Appearance	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color	–	–	–

CX-Designer				Sysmac Studio		
Button Types	Tab	1st Level	2nd Level	Category	Property	Set Value
Rectangle (Type 3)				Appearance	Design	Rectangle
				Behavior	VisualFeedback	Touch (Button) + Feedback (Button)
	General	Write Address		Behavior	Variable	Variable
		Display Address1		Behavior	FeedbackExpression	Variable
		Display Address2		–	–	–
	Color/Shape	Display Address1 (OFF) Display Address2 (OFF)	Color	Appearance	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color	–	–	–
		Display Address1 (ON) Display Address2 (OFF)	Color	Appearance	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color	–	–	–
		Display Address1 (OFF) Display Address2 (ON)	Color	–	–	–
			Indirect reference of color	–	–	–
		Display Address1 (ON) Display Address2 (ON)	Color	–	–	–
			Indirect reference of color	–	–	–
Circle (Type 1)				Appearance	Design	Ellipse
				Behavior	VisualFeedback	Variable (Button)
	General	Write Address		Behavior	Variable	Variable
		Display Address1		–	–	–
		Display Address2		–	–	–
	Color/Shape	OFF color	Color	Appearance	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color	–	–	–
		ON color	Color	Appearance	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color	–	–	–
Circle (Type 2-1)				Appearance	Design	Rectangle
				Behavior	VisualFeedback	Feedback (Button)
	General	Write Address		Behavior	Variable	Variable
		Display Address1		Behavior	FeedbackExpression	Variable
		Display Address2		–	–	–
	Color/Shape	OFF color	Color	Appearance	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color	–	–	–

CX-Designer				Sysmac Studio		
Button Types	Tab	1st Level	2nd Level	Category	Property	Set Value
Circle (Type 2-1)	Color/Shape	ON color	Color	Appearance	BackgroundColorButtonDown	The same color as NS
			Indirect reference of	–	–	–
Circle (Type 2-2)				Appearance	Design	Rectangle
				Behavior	VisualFeedback	Touch (Button) + Feedback (Button)
	General	Write Address		Behavior	Variable	Variable
		Display Address1		Behavior	FeedbackExpression	Variable
		Display Address2		–	–	–
	Color/Shape	OFF color	Color	Appearance	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color	–	–	–
		ON color	Color	Appearance	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color	–	–	–
Circle (Type 3)				Appearance	Design	Rectangle
				Behavior	VisualFeedback	Touch (Button) + Feedback (Button)
	General	Write Address		Behavior	Variable	Variable
		Display Address1		Behavior	FeedbackExpression	Variable
		Display Address2		–	–	–
	Color/Shape	Display Address1 (OFF) Display Address2 (OFF)	Color	Appearance	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color	–	–	–
		Display Address1 (ON) Display Address2 (OFF)	Color	Appearance	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color	–	–	–
		Display Address1 (OFF) Display Address2 (ON)	Color	–	–	–
			Indirect reference of color	–	–	–
		Display Address1 (ON) Display Address2 (ON)	Color	–	–	–
			Indirect reference of color	–	–	–
Rectangle 2 Light (Type1)				Appearance	Design	Rectangle
				Behavior	VisualFeedback	Variable (Button) + Feedback (Indicator)
				Behavior	IndicatorPosition	Bottom
	General	Write Address		Behavior	Variable	Variable
		Display Address1		Behavior	FeedbackExpression	Variable
		Display Address2		–	–	–

CX-Designer				Sysmac Studio		
Button Types	Tab	1st Level	2nd Level	Category	Property	Set Value
Rectangle 2 Light (Type1)	Color/Shape	OFF color	Color	Appearance	IndicatorColorOff	The same color as NS
			Indirect reference of color	–	–	–
		ON color	Color	Appearance	IndicatorColorOn	The same color as NS
			Indirect reference of color	–	–	–
		OFF color	Color	Behavior	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color	–	–	–
		ON color	Color	Behavior	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color	–	–	–
Rectangle2Light(Type2)				Appearance	Design	Rectangle
				Behavior	VisualFeedback	Touch (Button) + Feedback(Indicator)
				Behavior	IndicatorPosition	Bottom
	General	Write Address		Behavior	Variable	Variable
		Display Address1		Behavior	FeedbackExpression	Variable
		Display Address2		–	–	–
	Color/Shape	OFF color	Color	Appearance	IndicatorColorOff	The same color as NS
			Indirect reference of color	–	–	–
		ON color	Color	Appearance	IndicatorColorOn	The same color as NS
			Indirect reference of color	–	–	–
		OFF color	Color	Behavior	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color	–	–	–
		ON color	Color	Behavior	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color	–	–	–
Rectangle 2 Light (Type3)				Appearance	Design	Rectangle
				Behavior	VisualFeedback	Variable (Button) + Feedback (Indicator)
				Behavior	IndicatorPosition	Top Left
	General	Write Address		Behavior	Variable	Variable
		Display Address1		Behavior	FeedbackExpression	Variable
		Display Address2		–	–	–

CX-Designer				Sysmac Studio		
Button Types	Tab	1st Level	2nd Level	Category	Property	Set Value
Rectangle 2 Light (Type3)	Color/Shape	OFF color	Color	Appearance	IndicatorColorOff	The same color as NS
			Indirect reference of color	–	–	–
		ON color	Color	Appearance	IndicatorColorOn	The same color as NS
			Indirect reference of color	–	–	–
		OFF color	Color	Behavior	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color	–	–	–
		ON color	Color	Behavior	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color	–	–	–
Rectangle 2 Light (Type4)				Appearance	Design	Rectangle
				Behavior	VisualFeedback	Touch (Button) + Feedback(Indicator)
				Behavior	IndicatorPosition	Top Left
	General	Write Address		Behavior	Variable	Variable
		Display Address1		Behavior	FeedbackExpression	Variable
		Display Address2		–	–	–
	Color/Shape	OFF color	Color	Appearance	IndicatorColorOff	The same color as NS
			Indirect reference of color	–	–	–
		ON color	Color	Appearance	IndicatorColorOn	The same color as NS
			Indirect reference of color	–	–	–
		OFF color	Color	Behavior	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color	–	–	–
		ON color	Color	Behavior	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color	–	–	–
Select Shape (Type 1)				Appearance	Design	Image
				Behavior	VisualFeedback	Variable (Button)
	General	Write Address		Behavior	Variable	Variable
		Display Address1		–	–	–
		Display Address2		–	–	–
	Color/Shape	On shape	Shape Shape1	Appearance	ImageFileButtonDown	Image registered as resource
		On shape	Shape Shape2	Appearance	ImageFileButtonUp	Image registered as resource

CX-Designer				Sysmac Studio		
Button Types	Tab	1st Level	2nd Level	Category	Property	Set Value
Select Shape (Type 2-1)				Appearance	Design	Image
				Behavior	VisualFeedback	Variable (Button)
	General	Write Address		Behavior	Variable	Variable
		Display Address1		–	–	–
		Display Address2		–	–	–
	Color/Shape	On shape	Shape Shape1	Appearance	ImageFileButtonDown	Image registered as resource
		On shape	Shape Shape2	Appearance	ImageFileButtonUp	Image registered as resource
Select Shape (Type 2-2)				Appearance	Design	Image
				Behavior	VisualFeedback	Touch (Button) + Feedback (Button)
	General	Write Address		Behavior	Variable	Variable
		Display Address1		Behavior	FeedbackExpression	Variable
		Display Address2		–	–	–
	Color/Shape	On shape	Shape Shape1	Appearance	ImageFileButtonDown	Image registered as resource
		On shape	Shape Shape2	Appearance	ImageFileButtonUp	Image registered as resource
Select Shape (Type 3)				Appearance	Design	Rectangle
				Behavior	VisualFeedback	Touch (Button) + Feedback (Button)
	General	Write Address		Behavior	Variable	Variable
		Display Address1		Behavior	FeedbackExpression	Variable
		Display Address2		–	–	–
	Color/Shape	Display Address1 (ON) Display Address2 (OFF)	Shape Shape1	Appearance	ImageFileButtonDown	Image registered as resource
		Display Address1 (OFF) Display Address2 (OFF)	Shape Shape2	Appearance	ImageFileButtonUp	Image registered as resource
		Display Address1 (ON) Display Address2 (ON)	Shape Shape3	–	–	–
		Display Address1 (OFF) Display Address2 (ON)	Shape Shape4	–	–	–

◆Word Button_Shape

Word Button: Shape **Button**

CX-Designer					Sysmac Studio			
Button Shape	Action	Tab	1st Level	2nd Level	Category	Property	Set Value	Remarks
Rectangle	Set Value				Behavior	VisualFeedback	Variable (Button) + Feedback (Indicator)	
						IndicatorPosition	Custom	
						IndicatorLeft	1	
						IndicatorTop	1	
						IndicatorWidth	Width − 2	
						IndicatorHeight	Height − 2	
		General	Action Type	Set Value	Properties	FeedbackExpression	Variable mapped to Write Address =Set value	
					Events and Actions	Click>SetVariable>Value	The original value	
				Indirect	Properties	FeedbackExpression	Variable mapped to Write Address = Variable mapped to the set address	
					Events and Actions	Click>SetVariable>Value	Variable mapped to the set address	
			Address	Write Address	Events and Actions	Click>SetVariable>Variable	Variable mapped to Write Address	
		Color/Shape	Normal Color		Appearance	BackgroundColorButtonUp	The same color as NS	
					Behavior	IndicatorColorOff	The same color as NS	
			Indirect reference		−	−	−	No corresponding function
				Address	−	−	−	No corresponding function
			Same as Write Address Value		Behavior	IndicatorColorOn	The same color as NS	
	Increment/ Decrement				Behavior	VisualFeedback	Touch(Button)	
		General	Button Actions	Value	Events and Actions	Click>IncreaseVariable>Value	The original value	
				Indirect	Events and Actions	Click>IncreaseVariable>Value	Variable mapped to the set address	
			Address	Write Address	Events and Actions	Click>IncreaseVariable> Variable	Variable mapped to Write Address	
		Color/Shape	Normal Color		Appearance	BackgroundColorButtonUp	The same color as NS	
			Indirect reference		−	−	−	No corresponding function
				Address	−	−	−	No corresponding function
			Color when Pressed		Appearance	BackgroundColorButtonDown	The same color as NS	
	Display Pop-up Menu				−	−	−	No corresponding function

Word Buttons: Shape **Button**

CX-Designer					Sysmac Studio			
Button Shape	Button Actions	Tab	1st Level	2nd Level	Category	Property	Set Value	Remarks
Select Shape	Set Value				Behavior	VisualFeedback	Variable (Button) + Feedback (Indicator)	
						IndicatorPosition	Custom	
						IndicatorLeft	1	
						IndicatorTop	1	
						IndicatorWidth	Width − 2	
						IndicatorHeight	Height − 2	
		General	Button Actions	Set Value	Properties	FeedbackExpression	[Variable mapped to Write Address] = [Set value]	
					Events and Actions	Click>SetVariable>Value	The original value	
				Indirect	Properties	FeedbackExpression	Variable mapped to Write Address = Variable mapped to the set address	
					Events and Actions	Click>SetVariable>Value	Variable mapped to the set address	
			Address	Write Address	Events and Actions	Click>SetVariable>Variable	Variable mapped to Write Address	
		Color/Shape	Normal shape		Appearance	ImageFileButtonUp	Image registered as resource	
			Same as value		−	−	−	
	Increment/ Decrement				Behavior	VisualFeedback	Touch(Button)	
		General	Button Actions	Value	Events and Actions	Click>IncreaseVariable>Value	The original value	
				Indirect	Events and Actions	Click>IncreaseVariable>Value	Variable mapped to the set address	
			Address	Write Address	Events and Actions	Click>IncreaseVariable> Variable	Variable mapped to Write Address	
		Color/Shape	Normal shape		Appearance	ImageFileButtonUp	Image registered as resource	
			Pressed		Appearance	ImageFileButtonDown	Image registered as resource	
	Display Pop-up Menu				−	−	−	No corresponding function

◆Command Button_Shape

Multifunction: Select Shape **Button**

CX-Designer					Sysmac Studio			
Shape	Display Method	Tab	1st Level	Set Value	Category	Group	Property	Set Value
Select Shape					Properties	Appearance	Design	Image
	Normal shape				Properties	Behavior	VisualFeedback	Touch(Button)
		Display Address1			–	–	–	–
		Display Address2			–	–	–	–
		Normal shape			Properties	Appearance	ImageFileButtonUp	The same image file
					Properties	Appearance	ImageFileButtonDown	
	When Pressed				Properties	Behavior	VisualFeedback	Touch(Button)
		Display Address1			–	–	–	–
		Display Address2			–	–	–	–
		Normal Shape			Properties	Appearance	ImageFileButtonUp	Image file that has been set for NS
		Shape when pressed			Properties	Appearance	ImageFileButtonDown	Image file that has been set for NS
	Bit Address				Properties	Behavior	VisualFeedback	Feedback (Button)
		Display Address1			Properties	Behavior	FeedbackExpression	Variable
		Display Address2			–	–	–	–
		OFF shape			Properties	Appearance	ImageFileButtonUp	Image file that has been set for NS
		ON shape			Properties	Appearance	ImageFileButtonDown	Image file that has been set for NS
	Bit Address/ When Pressed				Properties	Behavior	VisualFeedback	Touch (Button) + Feedback (Button)
		Display Address1			Properties	Behavior	FeedbackExpression	Variable
		Display Address2			–	–	–	–
		OFF shape			Properties	Appearance	ImageFileButtonUp	Image file that has been set for NS
		ON shape			Properties	Appearance	ImageFileButtonDown	Image file that has been set for NS
	Same Value				Properties	Behavior	VisualFeedback	Feedback (Button)
		Display Address1			Properties	Behavior	FeedbackExpression	Enter in the Direct Reference or Indirect Reference box.
		Display Address2			–	–	–	–
		Set Value	Storage Format		–	–	–	–
			Direct Reference		Properties	Behavior	FeedbackExpression	Variable mapped to Display Address = Direct Reference value
			Indirect Reference		Properties	Behavior	FeedbackExpression	Variable mapped to Display Address = Indirect Reference value
		Normal shape			Properties	Appearance	ImageFileButtonUp	Image file that has been set for NS
		Same as Value			Properties	Appearance	ImageFileButtonDown	Image file that has been set for NS
	Bit Address 1, 2 (4 shapes)				Properties	Behavior	VisualFeedback	Feedback (Button)
		Display Address1			Properties	Behavior	FeedbackExpression	Variable
		Display Address2			–	–	–	–
		Display Address1 (OFF) Display Address2 (OFF) Shape			Properties	Appearance	ImageFileButtonUp	Image file that has been set for NS
		Display Address1 (ON) Display Address2 (OFF) Shape			Properties	Appearance	ImageFileButtonDown	Image file that has been set for NS

Multifunction: Select Shape **Button**

CX-Designer					Sysmac Studio			
Shape	Display Method	Tab	1st Level	Set Value	Category	Group	Property	Set Value
Select Shape	Bit Address 1, 2 (4 shapes)	Display Address1 (OFF) Display Address2 (ON) Shape			–	–	–	–
		Display Address1 (ON) Display Address2 (ON) Shape			–	–	–	–
Select Shape	Word Address (16 shapes)				Properties	Behavior	VisualFeedback	Feedback (Button)
		Display Address1			Properties	Behavior	FeedbackExpression	Variable
		Display Address2			–	–	–	–
		Shape1 (Value0)			Properties	Appearance	ImageFileButtonUp	Image file that has been set for NS
		Shape2 (Value1)			Properties	Appearance	ImageFileButtonDown	Image file that has been set for NS
		Shape3 (Value2)			–	–	–	–
		Shape4 (Value3)			–	–	–	–
		Shape5 (Value4)			–	–	–	–
		Shape6 (Value5)			–	–	–	–
		Shape7 (Value6)			–	–	–	–
		Shape8 (Value7)			–	–	–	–
		Shape9 (Value8)			–	–	–	–
		Shape10 (Value9)			–	–	–	–
		Shape11 (Value10)			–	–	–	–
		Shape12 (Value11)			–	–	–	–
		Shape13 (Value12)			–	–	–	–
		Shape14 (Value13)			–	–	–	–
		Shape15 (Value14)			–	–	–	–
		Shape16 (Value15)			–	–	–	–
Single-lined Circle Double-lined Circle Sector					Properties	Appearance	Design	Ellipse
Single-lined Rectangle Double-lined Rectangle Polygon					Properties	Appearance	Design	Rectangle
Single-lined Circle Double-lined Circle Single-lined Rectangle Double-lined Rectangle Polygon Sector	Normal Color				Properties	Behavior	VisualFeedback	Touch(Button)
		Display Address1			–	–	–	–
		Display Address2			–	–	–	–
		No Tiling		Checked	Properties	Appearance	BackgroundColorButtonUp	Transparent
					Properties	Appearance	BackgroundColorButtonDown	Transparent
				Unchecked	–	–	–	–
		Normal Color			Properties	Appearance	BackgroundColorButtonUp	The same color as NS
					Properties	Appearance	BackgroundColorButtonDown	
			Indirect reference of color		–	–	–	–

Multifunction: Select Shape **Button**

CX-Designer					Sysmac Studio			
Shape	Display Method	Tab	1st Level	Set Value	Category	Group	Property	Set Value
Single-lined Circle	When Pressed				Properties	Behavior	VisualFeedback	Touch(Button)
Double-line Circle		Display Address1			–	–	–	–
Single-lined Rectangle		Display Address2			–	–	–	–
Double-line Rectangle		No Tiling		Checked	Properties	Appearance	BackgroundColorButtonUp	Transparent
Polygon					Properties	Appearance	BackgroundColorButtonDown	Transparent
Sector				Unchecked	–	–	–	–
		Normal Color			Properties	Appearance	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color		–	–	–	–
		Color when Pressed			Properties	Appearance	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color		–	–	–	–
	Bit Address				Properties	Behavior	VisualFeedback	Feedback (Button)
		Display Address1			Properties	Behavior	FeedbackExpression	Variable
		Display Address2			–	–	–	–
		No Tiling		Checked	Properties	Appearance	BackgroundColorButtonUp	Transparent
					Properties	Appearance	BackgroundColorButtonDown	Transparent
				Unchecked	–	–	–	–
		OFF color			Properties	Appearance	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color		–	–	–	–
		ON color			Properties	Appearance	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color		–	–	–	–
	Bit Address/ When Pressed				Properties	Behavior	VisualFeedback	Touch (Button) + Feedback (Button)
		Display Address1			Properties	Behavior	FeedbackExpression	Variable
		Display Address2			–	–	–	–
		No Tiling		Checked	Properties	Appearance	BackgroundColorButtonUp	Transparent
					Properties	Appearance	BackgroundColorButtonDown	Transparent
				Unchecked	–	–	–	–
		OFF color			Properties	Appearance	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color		–	–	–	–
		ON color			Properties	Appearance	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color		–	–	–	–

Multifunction: Select Shape **Button**

CX-Designer					Sysmac Studio			
Shape	Display Method	Tab	1st Level	Set Value	Category	Group	Property	Set Value
Single-lined Circle Double-line Circle Single-lined Rectangle Double-line Rectangle Polygon Sector	Same Value				Properties	Behavior	VisualFeedback	Feedback (Button)
		Display Address1			Properties	Behavior	FeedbackExpression	Enter in the Direct Reference or Indirect Reference box.
		Display Address2			–	–	–	–
		No Tiling		Checked	Properties	Appearance	BackgroundColorButtonUp	Transparent
					Properties	Appearance	BackgroundColorButtonDown	Transparent
				Unchecked	–	–	–	–
		Set Value	Storage Format		–	–	–	–
			Direct Reference		Properties	Behavior	FeedbackExpression	Variable mapped to Display Address = Direct Reference value
			Indirect Reference		Properties	Behavior	FeedbackExpression	Variable mapped to Display Address = Indirect Reference value
		Normal Color			Properties	Appearance	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color		–	–	–	–
		Same as			Properties	Appearance	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color		–	–	–	–
	Bit Address 1, 2 (4 shapes)				Properties	Behavior	VisualFeedback	Feedback (Button)
		Display Address1			Properties	Behavior	FeedbackExpression	Variable
		Display Address2			–	–	–	–
		No Tiling		Checked	Properties	Appearance	BackgroundColorButtonUp	Transparent
					Properties	Appearance	BackgroundColorButtonDown	Transparent
				Unchecked	–	–	–	–
		Display Address1 (OFF)			Properties	Appearance	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color		–	–	–	–
		Display Address1 (ON)			Properties	Appearance	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color		–	–	–	–
		Display Address1 (OFF)			–	–	–	–
			Indirect reference of color		–	–	–	–
		Display Address1 (ON)			–	–	–	–
			Indirect reference of color		–	–	–	–

Multifunction: Select Shape **Button**

CX-Designer					Sysmac Studio			
Shape	Display Method	Tab	1st Level	Set Value	Category	Group	Property	Set Value
Single-lined Circle	Word Address (16 shapes)				Properties	Behavior	VisualFeedback	Feedback (Button)
Double-line Circle		Display Address1			Properties	Behavior	FeedbackExpression	Variable
Single-lined Rectangle		Display Address2			–	–	–	–
Double-line Rectangle		No Tiling		Checked	Properties	Appearance	BackgroundColorButtonUp	Transparent
Polygon					Properties	Appearance	BackgroundColorButtonDown	Transparent
Sector				Unchecked	–	–	–	–
		Color1 (Value0)			Properties	Appearance	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color		–	–	–	–
		Color2 (Value1)			Properties	Appearance	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color		–	–	–	–
		Color3 (Value2)			–	–	–	–
			Indirect reference of color		–	–	–	–
		Color4 (Value3)			–	–	–	–
			Indirect reference of color		–	–	–	–
		Color5 (Value4)			–	–	–	–
			Indirect reference of color		–	–	–	–
		Color6 (Value5)			–	–	–	–
			Indirect reference of color		–	–	–	–
		Color7 (Value6)			–	–	–	–
			Indirect reference of color		–	–	–	–
		Color8 (Value7)			–	–	–	–
			Indirect reference of color		–	–	–	–
		Color9 (Value8)			–	–	–	–
			Indirect reference of color		–	–	–	–
		Color10 (Value9)			–	–	–	–
			Indirect reference of color		–	–	–	–

Multifunction: Select Shape **Button**

CX-Designer					Sysmac Studio			
Shape	Display Method	Tab	1st Level	Set Value	Category	Group	Property	Set Value
Single-lined Circle Double-lined Circle Single-lined Rectangle Double-lined Rectangle Polygon Sector	Word Address (16 shapes)	Color11 (Value10)			–	–	–	–
			Indirect reference of color		–	–	–	–
		Color12 (Value11)			–	–	–	–
			Indirect reference of color		–	–	–	–
		Color13 (Value12)			–	–	–	–
			Indirect reference of color		–	–	–	–
		Color14 (Value13)			–	–	–	–
			Indirect reference of color		–	–	–	–
		Color15 (Value14)			–	–	–	–
			Indirect reference of color		–	–	–	–
		Color16 (Value15)			–	–	–	–
			Indirect reference of color		–	–	–	–
Rectangle 2 Light	Bit Address 1, 2 (Upper/Lower)				Properties	Appearance	Design	Rectangle
					Properties	Behavior	VisualFeedback	Touch (Button) + Feedback(Indicator)
					Properties	Behavior	IndicatorPosition	Bottom
		Display Address1			–	–	–	–
		Display Address2			–	–	–	–
		No Tiling		Checked	Properties	Appearance	BackgroundColorButtonUp	Transparent
					Properties	Appearance	BackgroundColorButtonDown	Transparent
					Properties	Appearance	IndicatorColorOff	Transparent
					Properties	Appearance	IndicatorColorOn	Transparent
				Unchecked	–	–	–	–
		OFF color	Color		Properties	Appearance	IndicatorColorOff	The same color as NS
			Indirect reference of color		–	–	–	–
		Upper ON color	Color		Properties	Appearance	IndicatorColorOn	The same color as NS
			Indirect reference of color		–	–	–	–
		Lower OFF color	Color		Properties	Behavior	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color		–	–	–	–

Multifunction: Select Shape **Button**

CX-Designer					Sysmac Studio			
Shape	Display Method	Tab	1st Level	Set Value	Category	Group	Property	Set Value
Rectangle 2 Light	Bit Address 1, 2 (Upper/Lower)	Lower ON color	Color		Properties	Behavior	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color		–	–	–	–
Rectangle 2 Light	Bit Address 1, 2 (Circle/Whole)				Properties	Appearance	Design	Rectangle
					Properties	Behavior	VisualFeedback	Touch (Button) + Feedback(Indicator)
					Properties	Behavior	IndicatorPosition	Top Left
		Display Address1			–	–	–	–
		Display Address2			–	–	–	–
		No Tiling		Checked	Properties	Appearance	BackgroundColorButtonUp	Transparent
					Properties	Appearance	BackgroundColorButtonDown	Transparent
					Properties	Appearance	IndicatorColorOff	Transparent
					Properties	Appearance	IndicatorColorOn	Transparent
				Unchecked	–	–	–	–
		OFF color inside the circle	Color		Properties	Appearance	IndicatorColorOff	The same color as NS
			Indirect reference of color		–	–	–	–
		ON color inside the circle	Color		Properties	Appearance	IndicatorColorOn	The same color as NS
			Indirect reference of color		–	–	–	–
		OFF color for the whole button	Color		Properties	Behavior	BackgroundColorButtonUp	The same color as NS
			Indirect reference of color		–	–	–	–
		ON color for the whole button	Color		Properties	Behavior	BackgroundColorButtonDown	The same color as NS
			Indirect reference of color		–	–	–	–
Select Shape	Object frame	Three-dimensional Frame		Checked	–	–	–	–
Single-lined Circle				Unchecked	Properties	Appearance	BorderThickness	0
Double-lined Circle			Color (Left/Top)		Properties	Appearance	BorderColorButtonUp	The same color as NS
Single-lined Rectangle						Appearance	BorderColorButtonDown	The same color as NS
Double-line Rectangle			Color (Right/Bottom)		–	–	–	–
Rectangle 2 Light		Draw Border	Frame Size		Properties	Appearance	BorderThickness	The same value as NS
Rectangle 2 Light					–	–	–	–
			Color (Border)		–	–	–	–
		Frame ON/OFF Display	Link with the Specified Address ON/OFF		–	–	–	–
			Address		–	–	–	–

CX-Designer					Sysmac Studio			
Shape	Display Method	Tab	1st Level	Set Value	Category	Group	Property	Set Value
Select Shape Single-lined Circle Double-lined Circle Single-lined Rectangle Double-lined Rectangle Rectangle 2 Light (Upper/Lower) Rectangle 2 Light (Circle/Whole)	Frame	Draw Border			–	–	–	–
			Color (Border)		–	–	–	–
Polygon Sector	Line	No Line		Checked	–	–	–	–
				Unchecked	Properties	Appearance	BorderThickness	0
		Color			Properties	Appearance	BorderColorButtonUp	The same color as NS
						Appearance	BorderColorButtonDown	The same color as NS
		Style	Thickness		–	–	–	–
			Line Style	Solid Line	–	–	–	–
				Dotted Line	–	–	–	–
				Broken Line	–	–	–	–
				DashDot	–	–	–	–
				DashDotDot	–	–	–	–
	Shade	Shade		Checked	–	–	–	–
				Unchecked	–	–	–	–
		Shade	Color		–	–	–	–
			Depth		–	–	–	–
		Color when Pressed	Direction	Top Left	–	–	–	–
				Top Right	–	–	–	–
				BottomLeft	–	–	–	–
				BottomRight	–	–	–	–
Sector	Angle	Start Point			–	–	–	–
		End Point			–	–	–	–

◆**Command Button_Function**

Command Button: Function

CX-Designer				Sysmac Studio			
Function	1st Level	2nd Level	2nd Level		Category	Property	Set Value
Switch Screen	Specified Screen			Events and Actions	ShowPage	Page name	Screen title
	Indirect Specification of Screen No.			Events and Actions	SetVariable	Variable	_HMI_Current_PageIndex
		Address		Events and Actions	SetVariable	Value	Variable mapped to the address
	Selection by Pop-up Menu			–	–	–	–
	Backward			Events and Actions	ShowPreviousPage	–	–
	Forward			–	–	–	–
	Write Screen No. when Pressing the button		Checked	Events and Actions	SetVariable	Variable	Variable mapped to the address
			Unchecked	–	–	–	–
		Address		Events and Actions	SetVariable	Value	_HMI_Current_PageIndex
Key Button	Transmit to	Input field with focus		–	–	–	–
		Specified input field		–	–	–	–
			Object ID	–	–	–	–
	Transmit Type	Label string		–	–	–	–
		Control code		–	–	–	–
		Specified string		–	–	–	–
			String	–	–	–	–
		Indirectly specification of string		–	–	–	–
			Transmit from	–	–	–	–
			No. of Words	–	–	–	–
Control Pop-up Screen	Action	Close Local pop-up screen		Events and Actions	ClosePage	Page name	Page where the object is placed
		Close specified pop-up screen		Events and Actions	ClosePage	Page name	Page that is to be closed
			Screen No.				
		Move Local pop-up screen		–	–	–	–
Display System Menu	System Menu Top Page (Initialize Tab)			Events and Actions	ShowSystemMenu	–	–
	Switch Box Function			–	–	–	–
	Display Captured Data			–	–	–	–
Stop Buzzer				Events and Actions	BuzzerOff	–	–
None				–	–	–	–
Video Control – Video Capture	File name			–	–	–	–
	Save in a file (If memory card is full)			–	–	–	–

Command Button: Function

CX-Designer				Sysmac Studio			
Function	1st Level	2nd Level	2nd Level		Category	Property	Set Value
Video Control – Contrast Adjustment	Video Input Adjustment	Contrast		–	–	–	–
		Brightness		–	–	–	–
		Depth		–	–	–	–
		Tone		–	–	–	–
	RGB Control Value	Red		–	–	–	–
		Green		–	–	–	–
		Blue		–	–	–	–
Video Control – Vision Sensor Console Output	Signal type			–	–	–	–
Data Block Control				See the “Command Button_DB” sheet.			
Authentication Cancellation				Events and Actions	Logout	–	–

◆Command Button_DB
Command Button: DB Control **Button**

CX-Designer	Sysmac Studio		
Function	Event	Action	VB Function
Read data from CSV file to PLC Data Block	Press	Subroutine	WriteReicipeToController
Write data from PLC Data Block to CSV file			ReadReicipeToController
Read data from CSV file to NS PT Memory			ImportReicipes
Write data from NS PT Memory to CSV file			SaveReicipe
Read data from NS PT Memory to PLC Data Block			WriteReicipeToController
Write data from PLC Data Block to NS PT Memory			ReadReicipeToController
Read record label			GetReicipeName
Delete record			DeleteReicipe

The NS functions seem to be substituted by VB functions. However, since the Recipe feature of NA differs from the Data Block feature of NS, some NS functions may not be available in NA.

◆Multifunction_Function

Multifunction: Function **Events and Actions of Objects and Shapes**

CX-Designer				Sysmac Studio				
Function	1st Level	2nd Level		Category	Action	Option	Set Value	Remarks
Write Bit	Write Address			Properties	Behavior	Variable	Variable mapped to the address	
	Action		Momentary	Properties	General	Type	MomentaryButton	
			Alternate				ToggleButton	
			SET				SetButton	
			RESET				ResetButton	
Write Word	Write Address			Events and Actions	SetVariable	Variable	Variable mapped to the address	Set Value has been selected in [Action] field.
				Events and Actions	IncreaseVariable	Variable	Variable mapped to the address	Increment/Decrement has been selected in [Action] field.
	Numeral Type			–	–	–	–	
	Action		Set Value	Events and Actions	SetVariable	–	–	
			Increment/Decrement	Events and Actions	IncreaseVariable	–	–	
			Display Pop-up Menu	–	–	–	–	
			AND	–	–	–	–	
			OR	–	–	–	–	
			XOR	–	–	–	–	
	Value			Events and Actions	SetVariable	Value	The original value	Set Value has been selected in [Action] field.
				Events and Actions	IncreaseVariable	Value	The original value	Increment/Decrement has been selected in [Action] field.
	Indirect			Events and Actions	SetVariable	Value	Variable mapped to the address	Set Value has been selected in [Action] field.
				Events and Actions	IncreaseVariable	Value	Variable mapped to the address	Increment/Decrement has been selected in [Action] field.
	Maximum Limit	Fixed Value		–	–	–	–	
		Indirect		–	–	–	–	
		Return to the Minimum Value when the Maximum vale is Exceeded		–	–	–	–	
	Minimum Limit	Fixed Value		–	–	–	–	
		Indirect		–	–	–	–	
		Return to the Maximum Value when the Minimum vale is Exceeded		–	–	–	–	
Write String	Write Address			Events and Actions	SetVariable	Variable	Variable mapped to the address	
	String			Events and Actions	SetVariable	Value	Value in quotes	
	Max. No. of Characters			–	–	–	–	
	Character Code		ASCII code	–	–	–	–	
			Unicode (UTF-16)	–	–	–	–	
			Unicode (UTF-8)	–	–	–	–	
	Swap the high-byte and the low-byte		Checked	–	–	–	–	
			Unchecked	–	–	–	–	

CX-Designer				Sysmac Studio				
Function	1st Level	2nd Level		Category	Action	Option	Set Value	Remarks
Write String	Input Process	Fill the blank characters with a specified character	Checked	–	–	–	–	
			Unchecked	–	–	–	–	
			Space	–	–	–	–	
			NULL	–	–	–	–	
Switch Screen	Specified Screen			Events and Actions	ShowPage	Page name	Screen title	
	Indirect Specification of Screen No.			Events and Actions	SetVariable	Variable	_HMI_Current_ PageIndex	
		Address		Events and Actions	SetVariable	Value	Variable mapped to the address	
	Selection by Pop-up Menu			–	–	–	–	
	Backward			Events and Actions	ShowPreviousPage	–		
	Forward			–	–	–	–	
	Next Page			–	–	–	–	
	Previous Page			–	–	–	–	
	Write a destination screen No. when a screen switches		Checked	Events and Actions	SetVariable	Variable	Variable mapped to the address	
			Unchecked	–	–	–	–	
		Address		Events and Actions	SetVariable	Value	_HMI_Current_ PageIndex	
Control Pop-up Screen	Action	Close Local pop-up screen		Events and Actions	ClosePage	Page name	Page where the object is placed	
		Close specified pop-up screen		Events and Actions	ClosePage	Page name	Page that is to be closed	
			Screen No.					
		Move Local pop-up screen		–	–	–	–	
Display System Menu	System Menu Top Page (Initialize Tab)			Events and Actions	ShowSystemMenu	–	–	
	Switch Box Function			–	–	–	–	
	Display Captured Data			–	–	–	–	
	Programming Console (CS Series)			–	–	–	–	
	Programming Console (C Series)			–	–	–	–	
	Operation Log (sort by occurrence)			Events and Actions	ShowOperation LogViewer	–	–	
	Operation Log (sort by frequency)			Events and Actions	ShowOperation LogViewer	–	–	

CX-Designer				Sysmac Studio				
Function	1st Level	2nd Level		Category	Action	Option	Set Value	Remarks
Troubleshooter (NJ-series)	Host Selection			Events and Actions	ShowTroubleshooter	Controller Name	The same value as NS	
	Initial Screen Display		User trouble	Events and Actions	ShowTroubleshooter	StartPage	Active User Events	
			User-defined Event Log	Events and Actions	ShowTroubleshooter	StartPage	User Event Logs	
			Controller error (Function module)	Events and Actions	ShowTroubleshooter	StartPage	Active Controller Events	
			Controller Event Log	Events and Actions	ShowTroubleshooter	StartPage	Controller Event Logs	
Key Button	Transmit to	Input field with focus		–	–	–	–	
		Specified input field		–	–	–	–	
			Object ID	–	–	–	–	
	Transmit Type	Label string		–	–	–	–	
		Control code		–	–	–	–	
		Specified string		–	–	–	–	
			String	–	–	–	–	
		Indirectly specification of string		–	–	–	–	
			Transmit from	–	–	–	–	
			No. of Words	–	–	–	–	
Data Block Control				–	–	–	–	See the “Command Button_DB” sheet.
Contents Control	Switch to the specified			–	–	–	–	
		Contents No.		–	–	–	–	
	Switch to the indirect reference contents No.			–	–	–	–	
		Address		–	–	–	–	
	Switch to the next contents No.			–	–	–	–	
	Switch to the previous contents No.			–	–	–	–	

CX-Designer				Sysmac Studio				
Function	1st Level	2nd Level		Category	Action	Option	Set Value	Remarks
Alarm/	Clear			Events and Actions	ClearUserAlarmLog	–	–	
	Save			Events and Actions	SaveUserAlarmLog ToFile	–	–	
	Home			–	–	–	–	
		Alarm/Event Summary and History Object ID		–	–	–	–	
	End			–	–	–	–	
		Alarm/Event Summary and History Object ID		–	–	–	–	
	Next			–	–	–	–	
		Alarm/Event Summary and History Object ID		–	–	–	–	
	Previous			–	–	–	–	
		Alarm/Event Summary and History Object ID		–	–	–	–	
	From New Date & Time			–	–	–	–	
		Alarm/Event Summary and History Object ID		–	–	–	–	
	From Old Date & Time			–	–	–	–	
		Alarm/Event Summary and History Object ID		–	–	–	–	
	From High Priority			–	–	–	–	
		Alarm/Event Summary and History Object ID		–	–	–	–	
	From Low Priority			–	–	–	–	
		Alarm/Event Summary and History Object ID		–	–	–	–	
	From High Frequency			–	–	–	–	
		Alarm/Event Summary and History Object ID		–	–	–	–	
	From Low Frequency			–	–	–	–	
		Alarm/Event Summary and History Object ID		–	–	–	–	
	Check Selected Alarm			–	–	–	–	
		Alarm/Event Summary and History Object ID		–	–	–	–	

CX-Designer				Sysmac Studio				
Function	1st Level	2nd Level		Category	Action	Option	Set Value	Remarks
Alarm/	Delete Selected Alarm			–	–	–	–	
		Alarm/Event Summary and History Object ID		–	–	–	–	
	Check All Alarms			–	–	–	–	
		Alarm/Event Summary and History Object ID		–	–	–	–	
	Cancel All Alarms' Check			–	–	–	–	
		Alarm/Event Summary and History Object ID		–	–	–	–	
	Change Display Type			–	–	–	–	
		Alarm/Event Summary and History Object ID		–	–	–	–	
Data Log Control	Stop	Data log group No.		Events and Actions	StopDataLogging	DataSet Name	Data set name corresponding to the data group No.	
		Data log group No.						
	Start	Data log group No.		Events and Actions	StartDataLogging	DataSet Name	Data set name corresponding to the data group No.	
	Log Clear	Data log group No.		–	–	–	–	
	Pause	Data Log Graph Object ID		–	–	–	–	
	Save to File	Data log group No.		–	–	–	–	
	Read File			–	–	–	–	
		Data Log Graph Object ID		–	–	–	–	
		Options for showing the read file	Show the file read data only	–	–	–	–	
			Cascade the read data to a graph	–	–	–	–	
	Move the cursor forward			–	–	–	–	
		Data Log Graph Object ID		–	–	–	–	
	Move the cursor backward			–	–	–	–	
		Data Log Graph Object ID		–	–	–	–	

CX-Designer				Sysmac Studio				
Function	1st Level	2nd Level		Category	Action	Option	Set Value	Remarks
Video Control – Video Capture	File name			–	–	–	–	
	Save in a file (If memory card is full)		Update	–	–	–	–	
			Stop	–	–	–	–	
Video Control – Contrast Adjustment	Video Input Adjustment	Contrast		–	–	–	–	
		Brightness		–	–	–	–	
		Depth		–	–	–	–	
		Tone		–	–	–	–	
	RGB Control Value	Red		–	–	–	–	
		Green		–	–	–	–	
		Blue		–	–	–	–	
Video Control – Vision Sensor Console Output	Signal type			–	–	–	–	
Scroll Object	Scroll Down			–	–	–	–	
		Object ID		–	–	–	–	
		Scroll Amount	1 Page	–	–	–	–	
			1/2 Page	–	–	–	–	
			Specified No. of Lines/Dots/Items	–	–	–	–	
	Scroll Down			–	–	–	–	
		Object ID		–	–	–	–	
		Scroll Amount	1 Page	–	–	–	–	
			1/2 Page	–	–	–	–	
			Specified No. of Lines/Dots/Items	–	–	–	–	
	Scroll Down			–	–	–	–	
		Object ID		–	–	–	–	
		Scroll Amount	1 Page	–	–	–	–	
			1/2 Page	–	–	–	–	
			Specified No. of Lines/Dots/Items	–	–	–	–	
	Scroll Down			–	–	–	–	
		Object ID		–	–	–	–	
		Scroll Amount	1 Page	–	–	–	–	
			1/2 Page	–	–	–	–	
			Specified No. of Lines/Dots/Items	–	–	–	–	

CX-Designer				Sysmac Studio				
Function	1st Level	2nd Level		Category	Action	Option	Set Value	Remarks
Password Setting			None	Properties	Security	Access Levels	None	
			Level 1	Properties	Security	Access Levels	Level1	
				Events and Actions	Login	–	–	
			Level 2	Properties	Security	Access Levels	Level2	
				Events and Actions	Login	–	–	
			Level 3	Properties	Security	Access Levels	Level3	
				Events and Actions	Login	–	–	
			Level 4	Properties	Security	Access Levels	Level4	
				Events and Actions	Login	–	–	
			Level 5	Properties	Security	Access Levels	Level5	
				Events and Actions	Login	–	–	
Authentication Cancellation				Events and Actions	Click	Logout		
Confirmation	Standard Message			–	–	–	–	
	Use Specified Message			–	–	–	–	
		Message		–	–	–	–	
Buzzer			Stop Buzzer	Events and Actions	BuzzerOff	–	–	
			Continuous Buzzer	Events and Actions	BuzzerOn	BuzzerType	Continuous	
			Short Intermittent Buzzer	Events and Actions	BuzzerOn	BuzzerType	Intermittent Short Pulse	
			Long Intermittent Buzzer	Events and Actions	BuzzerOn	BuzzerType	Intermittent Long Pulse	
Operation Log Control	Initialize Operation Log			–	–	–	–	
	Save Operation Log			–	–	–	–	

Appendix 4: Lamps

◆Bit Lamp

Bit Lamp **Bit Lamp**

CX-Designer				Sysmac Studio				
Tab	1st Level	2nd Level	3rd Level	Category	Group	Property	Set Value	Remarks
General	Object Comment			–	–	–	–	
	Address	Display Address		Properties	Behavior	Expression	Variable mapped to the address	
	Lamp Type	Single-lined Circle		Properties	Appearance	Design	Ellipse	See the “Bit Lamp_Shape” sheet
		Single-lined Rectangle					Rectangle	See the “Bit Lamp_Shape” sheet
		Double-line Circle					Ellipse	See the “Bit Lamp_Shape” sheet
		Double-line Rectangle					Rectangle	See the “Bit Lamp_Shape” sheet
		Select Shape					Image	See the “Bit Lamp_Shape” sheet
Color/Shape				–	–	–	–	See the “Bit Lamp_Shape” sheet
Label	Label			Refer to the “Text Attributes” sheet in “Appendix 2: Object Common				
	Text Attribute	Text Attributes		Refer to the “Text Attributes” sheet in “Appendix 2: Object Common				
		Indirect Reference of Text Color		–	–	–	–	
	Switch Label for Address ON/OFF	Link with the Write Address ON/OFF		–	–	–	–	
		Link with the Display Address ON/OFF		–	–	–	–	
		Link with the Specified Address ON/OFF		–	–	–	–	
		Address		–	–	–	–	
	Use the String Table		Unchecked	–	–	–	–	
			Checked	Properties	Appearance	DefaultText (Default)	The original text set for NS	
Other	Key Press Sound Control	Do not allow sound for this object		–	–	–	–	

◆Bit Lamp_Shape

Bit Lamp: Select Shape

CX-Designer				Sysmac Studio		
Button Shape	Tab	1st Level	2nd Level	Category	Property	Set Value
Single-lined Circle	Color/Shape	Color1 (OFF)		Appearance	BackgroundColorButtonUp	The same color as NS
Double-lined Circle		Indirect		–	–	–
Single-lined Rectangle			Address	–	–	–
Double-lined Rectangle		Color2 (ON)		Appearance	BackgroundColorButtonDown	The same color as NS
		Indirect		–	–	–
			Address	–	–	–
Select Shape	Color/Shape	Color1 (OFF)		Appearance	ImageFileButtonUp	Image registered as resource
		Indirect		–	–	–
			Address	–	–	–
		Color2 (ON)		Appearance	ImageFileButtonDown	Image registered as resource
		Indirect		–	–	–
			Address	–	–	–

◆Word Lamp

Word Lamp **Data Lamp**

CX-Designer			Sysmac Studio			
Tab	1st Level	2nd Level	Category	Group	Property	Set Value
General	Object Comment		–	–	–	–
	Numeral Type		–	–	–	–
	Button Shape	Rectangle	Properties	Appearance	Design	Rectangle
		Select Shape				Image
	Button Actions	Set Value	See the “Word Lamp_Shape” sheet			
		Increment/Decrement	See the “Word Lamp_Shape” sheet			
		Display Pop-up Menu	See the “Word Lamp_Shape” sheet			
	Address	Write Address	See the “Word Lamp_Shape” sheet			
Color/Shape			See the “Word Lamp_Shape” sheet			
Label	Label		–	–	–	–
	Text Attribute	Text Attributes	Refer to the “Text Attributes” sheet in “Appendix 2: Object Common Settings.”			
		Auto resize text	–	–	–	–
		Indirect Reference of Text Color	–	–	–	–

◆Word Lamp_Shape

Word Lamp: Select Shape

CX-Designer				Sysmac Studio			
Lamp Shape	Tab	1st Level	2nd Level	Category	Property	Setting Item	Set Value
Single-lined Circle	Color/Shape			Appearance	DefaultLampColor		Color specified in Color1 (Value0)
Double-lined Circle		Color1 (Value0)		Behavior	ColorRanges	LampColor	The same color as NS
Single-lined Rectangle						StartValue	>= 0
Double-lined Rectangle		Indirect		–	–	–	–
			Address	–	–	–	–
		Color2 (Value1)		Behavior	ColorRanges	LampColor	The same color as NS
						StartValue	>= 1
		Indirect		–	–	–	–
			Address	–	–	–	–
		Color3 (Value2)		Behavior	ColorRanges	LampColor	The same color as NS
						StartValue	>= 2
		Indirect		–	–	–	–
			Address	–	–	–	–
		Color4 (Value3)		Behavior	ColorRanges	LampColor	The same color as NS
						StartValue	>= 3
		Indirect		–	–	–	–
			Address	–	–	–	–
		Color5 (Value4)		Behavior	ColorRanges	LampColor	The same color as NS
						StartValue	>= 4
		Indirect		–	–	–	–
			Address	–	–	–	–
		Color6 (Value5)		Behavior	ColorRanges	LampColor	The same color as NS
						StartValue	>= 5
		Indirect		–	–	–	–
			Address	–	–	–	–
		Color7 (Value6)		Behavior	ColorRanges	LampColor	The same color as NS
						StartValue	>= 6
		Indirect		–	–	–	–
			Address	–	–	–	–
		Color8 (Value7)		Behavior	ColorRanges	LampColor	The same color as NS
						StartValue	>= 7
		Indirect		–	–	–	–
			Address	–	–	–	–
		Color9 (Value8)		Behavior	ColorRanges	LampColor	The same color as NS
						StartValue	>= 8
		Indirect		–	–	–	–
			Address	–	–	–	–
		Color10 (Value9)		Behavior	ColorRanges	LampColor	The same color as NS
						StartValue	>= 9
		Indirect		–	–	–	–
			Address	–	–	–	–

Word Lamp: Select Shape

CX-Designer				Sysmac Studio			
Lamp Shape	Tab	1st Level	2nd Level	Category	Property	Setting Item	Set Value
Select Shape	Color/Shape			Behavior	DefaultImageFile		Image specified in Shape1 (Value0)
		Shape1 (Value0)		Behavior	ColorRanges	ImageFile	Image file registered as resource
						StartValue	>= 0
		Shape2 (Value1)		Behavior	ColorRanges	ImageFile	Image file registered as resource
						StartValue	>= 1
		Shape3 (Value2)		Behavior	ColorRanges	ImageFile	Image file registered as resource
						StartValue	>= 2
		Shape4 (Value3)		Behavior	ColorRanges	ImageFile	Image file registered as resource
						StartValue	>= 3
		Shape5 (Value4)		Behavior	ColorRanges	ImageFile	Image file registered as resource
						StartValue	>= 4
		Shape6 (Value5)		Behavior	ColorRanges	ImageFile	Image file registered as resource
						StartValue	>= 5
		Shape7 (Value6)		Behavior	ColorRanges	ImageFile	Image file registered as resource
						StartValue	>= 6
		Shape8 (Value7)		Behavior	ColorRanges	ImageFile	Image file registered as resource
						StartValue	>= 7
		Shape9 (Value8)		Behavior	ColorRanges	ImageFile	Image file registered as resource
						StartValue	>= 8
		Shape10 (Value9)		Behavior	ColorRanges	ImageFile	Image file registered as resource
						StartValue	>= 9

◆**Label**

Label Object **Label**

CX-Designer				Sysmac Studio				
Tab	1st Level	2nd Level	3rd Level	Category	Group	Property	Set Value	Remarks
General	Object Comment			–	–	–	–	
	Use as Message Display			–	–	–	–	*
Background	Tile Background		Unchecked	Properties	Appearance	BackgroundColor	Transparent	
			Checked					
		Color		Properties	Appearance	BackgroundColor	The same color as NS	
		Indirect Reference of Color		–	–	–	–	
			Address	–	–	–	–	
Label	Label			Refer to the “Text Attributes” sheet in “Appendix 2: Object Common Settings.”				
	String No.			Properties	Appearance	Resource ID	Resource corresponding to the string No.	
	Indirect			–	–	–	–	*
	Text Attribute	Text Attributes		Refer to the “Text Attributes” sheet in “Appendix 2: Object Common Settings.”				
		Auto resize text		–	–	–		No corresponding function
		Indirect Reference of Text Color		–	–	–		No corresponding function
	Indirect Reference of String			–	–	–	–	*
		File Name		–	–	–	–	
		Address for Specifying File Line		–	–	–	–	
		Clear display when the address value is 0		–	–	–	–	
	Use the String Table			–	–	–	–	*
Message	No. of Statuses			–	–	–	–	
	Address for switching status			–	–	–	–	
	Label			–	–	–	–	
	String No.			–	–	–	–	
	Text Attribute	Text Attributes		–	–	–	–	
	BackgroundColor	Tile Background	Checked	–	–	–	–	
			Unchecked	–	–	–	–	
			Color	–	–	–	–	
	Use the String Table			–	–	–	–	

*These functions can be possible using dynamic resource linking, but modification of PLC programs are also necessary.

◆Numeral Display

Numeral Display and Input Objects

CX-Designer					Sysmac Studio			
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value
					Properties	Behavior	DataType	Numeric
General	Object Comment				–	–	–	–
	Numeral Display Type	Display Type	Decimal		Properties	Behavior	ValueFormat	Decimal
			Hexadecimal		Properties	Behavior	ValueFormat	Hexadecimal
			Binary		–	–	–	–
			Octal		–	–	–	–
		Storage Type			–	–	–	–
		Format	Integer		Properties	Behavior	DisplayFormat	Select the format according to the number of digits
			Decimal		Properties	Behavior	DisplayFormat	Select the format according to the number of digits
		Fill blank digits with zeros		Checked	Properties	Behavior	LeadingZeros	Checked
				Unchecked	Properties	Behavior	LeadingZeros	Unchecked
		Ignore exceeded digits		Checked	–	–	–	–
				Unchecked				
		Display commas		Checked	Properties	Behavior	ShowSeparator	Checked
				Unchecked	Properties	Behavior	ShowSeparator	Unchecked
	Unit and Scale	Set Unit & Scale No.			Properties	Behavior	Scaling	Scale name registered in Scaling
		Indirect Specification of Unit & Scale No.			–	–	–	–
			Address		–	–	–	–
		Perform Max/Min Limit Check after Scale Conversion			–	–	–	–
	Address	Address			Properties	Behavior	Variable	Variable mapped to the address
	Display on entry	Display input values by *			–	–	–	–
Text	Text Attribute	Text Attributes			Refer to the “Text Attributes” sheet in “Appendix 2: Object Common Settings.”			
		Indirect Reference of Text Color			–	–	–	–
Background	Tile Background			Unchecked	Properties	Appearance	BackgroundColor	Transparent
				Checked				
		Color			Properties	Appearance	BackgroundColor	The same color as NS
		Indirect Reference of Color			–	–	–	–
			Address		–	–	–	–
Keypad	Input Method	System Keypad			–	–	–	–
		Large System Keypad			–	–	–	–
		Input from Pop-up Screen			–	–	–	–
		Other Input Method			–	–	–	–
			Input Restriction	No Restriction	–	–	–	–
				Prohibit input from Functional Object	–	–	–	–
				Prohibit input from Bar-Code Reader	–	–	–	–
		Use Temporary Input object		Checked	–	–	–	–
				Unchecked	–	–	–	–

Numeral Display and Input Objects

CX-Designer					Sysmac Studio			
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value
Keypad	Display Position of Keypad/ Pop-up Screen	Above this Object			–	–	–	–
		Below this Object			–	–	–	–
		Top Left of Screen			–	–	–	–
		Bottom Left of Screen			–	–	–	–
		Top Right of Screen			–	–	–	–
		Bottom Right of Screen			–	–	–	–
		Center of Screen			–	–	–	–
		Any Position	X		–	–	–	–
			Y		–	–	–	–
	Input Order				Properties	Behavior	DataInputOrder	The same value as NS
Max/Min	Type of Value	Immediate Value			–	–	–	–
		Difference from Current Value			–	–	–	–
	Maximum Input Limit			Checked	–	–	–	–
				Unchecked	Properties	Behavior	MaximumValue	The max value of the set variable data type
		Value			Properties	Behavior	MaximumValue	Value
		Indirect Reference						
			Address		Properties	Behavior	MaximumValue	Variable mapped to the address
	Minimum Input Limit			Checked	–	–	–	–
				Unchecked	Properties	Behavior	MinimumValue	The min value of the set variable data type
		Value			Properties	Behavior	MinimumValue	Value
		Indirect Reference						
			Address		Properties	Behavior	MinimumValue	Variable mapped to the address
	Watch Maximum Limit			Checked	–	–	–	–
				Unchecked	–	–	–	–
		Value			–	–	–	–
		Indirect Reference			–	–	–	–
			Address		–	–	–	–
		Text Color for Exceeding Value			–	–	–	–
		Background Color for Exceeding Value			–	–	–	–
	Watch Minimum Limit			Checked	–	–	–	–
				Unchecked	–	–	–	–
		Value			–	–	–	–
		Indirect Reference			–	–	–	–
			Address		–	–	–	–
		Text Color for Exceeding Value			–	–	–	–
		Background Color for Exceeding Value			–	–	–	–

Numeral Display and Input Objects

CX-Designer					Sysmac Studio			
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value
Write	Display Write Confirmation Dialog				–	–	–	–
				Standard Message	–	–	–	–
				User Specified Message	–	–	–	–
		Message			–	–	–	–
	Turn ON the specified address when the value is written				–	–	–	–
		Address			–	–	–	–
	Record to operation log			Checked	Properties	Security	Operation Log	Checked
				Unchecked	Properties	Security	Operation Log	Unchecked
		Message			–	–	–	–
Control Flag	Display (Numeral Display)			Display	–	–	–	–
				Hide	–	–	–	–
				Indirect	–	–	–	–
			Address		–	–	–	–
Macro	Macro Execution Condition				See the table below			

Numeral Display: Macro

CX-Designer	Sysmac Studio				
Item	Tab	Category	Events/Actions	Event Option	Set Value
Before inputting numeral	–	–	–	–	–
Before writing numeral	–	–	–	–	–
When changing value	–	–	–	–	–
Value = Set Value	Events and Actions*	Event	Condition	Expression	[Variable mapped to the address] = Set value
		Action	CallSubroutine	–	Subroutine name
Value > Set Value	Events and Actions*	Event	Condition	Expression	[Variable mapped to the address] > Set value
		Action	CallSubroutine	–	Subroutine name
Value < Set Value	Events and Actions*	Event	Condition	Expression	[Variable mapped to the address] < Set value
		Action	CallSubroutine	–	Subroutine name

Events and Actions of the page where the object is placed

◆String Display

String Display and Input Objects

CX-Designer					Sysmac Studio			
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value
					Properties	Behavior	DataType	Text
General	Object Comment				–	–	–	–
	String Display Type	TextLength			–	–	–	–
			ASCII		–	–	–	–
			Unicode (UTF-16)		–	–	–	–
			Unicode (UTF-8)		–	–	–	–
	Pop-up Menu	Use Pop-up Menu		Checked	–	–	–	–
				Unchecked	–	–	–	–
			Menu Button Width		–	–	–	–
	Address Information	Address			Properties	Behavior	Variable	Address set to the default label in NS
	Input Process	Fill the blank characters with a specified character		Checked	–	–	–	–
				Unchecked	Default			
		Space			–	–	–	–
		NULL			–	–	–	–
	Display on entry	Display input characters by *		Checked	Properties	Behavior	MaskedDisplay	Checked
				Unchecked	Default			
Text	Text Attribute	Text Attributes			Refer to the “Text Attributes” sheet in “Appendix 2: Object Common Settings.”			
		Indirect Reference of Text Color			–	–	–	–
Background	Tile Background			Unchecked	Properties	Appearance	BackgroundColor	Transparent
				Checked	Default			
		Color			Properties	Appearance	BackgroundColor	The same color as NS
		Indirect Reference of Color			–	–	–	–
			Address		–	–	–	–
Keypad	Input Method	System Keypad			–	–	–	–
		Large System Keypad			–	–	–	–
		Input from Pop-up Screen			–	–	–	–
		Other Input Method			–	–	–	–
			Input Restriction	No Restriction	–	–	–	–
				Prohibit input from Functional Object	–	–	–	–
				Prohibit input from Bar-Code Reader	–	–	–	–
		Use Temporary Input object		Checked	–	–	–	–
				Unchecked	–	–	–	–

String Display and Input Objects

CX-Designer					Sysmac Studio			
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value
Keypad	Display Position of Keypad/ Pop-up Screen	Above this Object			–	–	–	–
		Below this Object			–	–	–	–
		Top Left of Screen			–	–	–	–
		Bottom Left of Screen			–	–	–	–
		Top Right of Screen			–	–	–	–
		Bottom Right of Screen			–	–	–	–
		Center of Screen			–	–	–	–
		Any Position	X		–	–	–	–
			Y		–	–	–	–
	String Input	Add to the current string.			Default			
		Enter the new string. (Monitor the current string when the input focus has been set.)			–	–	–	–
		Enter the new string. (Clear the current string when the input focus has been set.)			–	–	–	–
		Add to the current string. (Move the cursor to front of string when setting the input focus been set.)			–	–	–	–
	Input Order				Properties	Behavior	DataInputOrder	The same value as NS
Write	Display Write Confirmation Dialog				–	–	–	–
				Standard Message	–	–	–	–
				User Specified Message	–	–	–	–
		Message			–	–	–	–
	Turn ON the specified address when the value is written				–	–	–	–
		Address			–	–	–	–
	Record to operation log			Checked	Properties	Security	Operation Log	Checked
				Unchecked	Properties	Security	Operation Log	Unchecked
		Message			–	–	–	–
Password	Password			None	Properties	Security	Access Levels	None
				Level 1				Level1
				Level 2				Level2
				Level 3				Level3
				Level 4				Level4
				Level 5				Level5
Macro	Macro Execution Condition	Before inputting string			–	–	–	–
		Before writing string			–	–	–	–
		When changing string			–	–	–	–

◆List

List Selection Object

CX-Designer				Sysmac Studio			
Tab	1st Level	2nd Level	3rd Level	Category	Group	Property	Set Value
General	Object Comment			–	–	–	–
	List Data	Collect from $W		–	–	–	–
		Collect from a File		Properties	Behavior	Items	Get the list from the file to assign resources
			Use a File for Indirect Reference	–	–	–	–
	Character Code		ASCII code	–	–	–	–
			Unicode (UTF-16)	–	–	–	–
			Unicode (UTF-8)	–	–	–	–
	List Size	Characters/Line		–	–	–	–
		Max Lines		–	–	–	–
Text	Text Attribute	Text Attributes		Refer to the “Text Attributes” sheet in “Appendix 2: Object Common Settings.”			
Background	Tile Background		Unchecked	Properties	Appearance	BackgroundColor	Transparent
			Checked	Deafult			
		Color		Properties	Appearance	BackgroundColor	The same color as NS
		Indirect Reference of Color		–	–	–	–
			Address	–	–	–	–
Selection	Show selection bar		Checked	–	–	–	–
			Unchecked	–	–	–	–
		Color		–	–	–	–
	Store the selected line No. in the specified address		Checked	–	–	–	–
			Unchecked	–	–	–	–
		Address		Properties	Behavior	Variable	Variable mapped to the address
	Store the string of the selected line in the specified address		Checked	–	–	–	–
			Unchecked	–	–	–	–
		Address		–	–	–	–
Scroll Bar	Use Scroll Bar		Checked	–	–	–	–
			Unchecked	–	–	–	–
	Buttons for Scrolling One Line		Checked	–	–	–	–
			Unchecked	Default			
	Buttons for Scrolling Multiple Lines		Checked	–	–	–	–
			Unchecked	Default			
		Scroll Amount	Lines in 1 Page	–	–	–	–
			Lines in 1/2 Page	–	–	–	–
			Specified No. of Lines	–	–	–	–
	Button Size	Width		–	–	–	–
		Height		–	–	–	–
Password	Password		None	Properties	Security	Access Levels	None
			Level 1				Level1
			Level 2				Level2
			Level 3				Level3
			Level 4				Level4
			Level 5				Level5

List Selection Objects

CX-Designer				Sysmac Studio			
Tab	1st Level	2nd Level	3rd Level	Category	Group	Property	Set Value
Macro	Macro Execution Condition	When selecting a list		–	–	–	–
External Control	Block	Max No. of Blocks		–	–	–	–
		Switching the Display Block	Checked	–	–	–	–
			Unchecked	–	–	–	–
			Address for Switching the Display Block	–	–	–	–
	Start Line	Switching the Display Start Line	Checked	–	–	–	–
			Unchecked	–	–	–	–
			Address for Switching the Display Start Line	–	–	–	–
	Update	Update a List	Checked	–	–	–	–
			Unchecked	–	–	–	–
			Address for Updating a List	–	–	–	–

◆DateTime

Date Objects and Time Objects **DateTime**

CX-Designer					Sysmac Studio				
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value	Remarks
					Properties	Behavior	Variable	_HMI_DateTime	
General	Object Comment				–	–	–	–	–
	Display Format				Properties	Appearance	Format	Value converted based on the conversion table	See the “DateTime_Format” sheet
	Use Large Keypad			Checked	–	–	–	–	–
				Unchecked	–	–	–	–	–
Text	Text Attribute				Refer to the “Text Attributes” sheet in “Appendix 2: Object Common Settings.”				
Background	Tile Background			Unchecked	Properties	Appearance	BackgroundColor	Transparent	–
				Checked	–	–	–	–	–
		Color			Properties	Appearance	BackgroundColor	The same color as NS	–
					Properties	Appearance	HeaderBackgroundColor	The same color as NS	–
		Indirect Reference of Color			–	–	–	–	–
			Address		–	–	–	–	–

◆DateTime_Format

Date and Time: Display Format

CX-Designer		Sysmac Studio			
Switch	Item	Category	Group	Property	Set Value
Type0	Display Format	Properties	Appearance	Format	Value according to the tables right and below
Type1					Settings for each user language are not available. Format will be switched depending on the project language specified as user language.
Type2					
Type3					
Type4					
Type5					
Type6					
Type7					
Type8					
Type9					
Type10					
Type11					
Type12					
Type13					
Type14					
Type15					

Time Display Format

CX-Designer	Sysmac Studio	
Display Format	Format	CustomFormat
xxxx hh時mm分ss秒	CustomFormat	tt hh時mm分ss秒
xxxx hh時mm分	CustomFormat	tt hh時mm分
hh時mm分ss秒	CustomFormat	hh時mm分ss秒
hh時mm分	CustomFormat	hh時mm分
xxxx hh:mm:ss	CustomFormat	tt hh:mm:ss
xxxx hh:mm	CustomFormat	tt hh:mm
hh:mm:ss	LongTimePattern	–
hh:mm	ShortTimePattern	–
hh:mm:ss XXXX	CustomFormat	hh:mm:ss tt
hh:mm XXXX	CustomFormat	hh:mm tt

Date and Time Format

CX-Designer	Sysmac Studio	
Display Format	Format	CustomFormat
yyyy年mm月dd日 dddd	CustomFormat	yyyy年MM月dd日 dddd
yy年mm月dd日 dddd	CustomFormat	yy年MM月dd日 dddd
yyyy年mm月dd日 (dddd)	CustomFormat	yyyy年MM月dd日 (dddd)
yy年mm月dd日 (dddd)	CustomFormat	yy年MM月dd日 (dddd)
yyyy年mm月dd日	CustomFormat	yyyy年MM月dd日
yy年mm月dd日	CustomFormat	yy年MM月dd日
yyyy/mm/dd dddd	CustomFormat	yyyy/MM/dd dddd
yy/mm/dd dddd	CustomFormat	yy/MM/dd dddd
yyyy/mm/dd (dddd)	CustomFormat	yyyy/MM/dd (dddd)
yy/mm/dd (dddd)	CustomFormat	yy/MM/dd (dddd)
yyyy/mm/dd	CustomFormat	yyyy/MM/dd
yy/mm/dd	CustomFormat	yy/MM/dd
ddd mm/dd/yyyy	CustomFormat	ddd MM/dd/yyyy
ddd mm/dd/yy	CustomFormat	ddd MM/dd/yy
(ddd) mm/dd/yyyy	CustomFormat	(ddd) MM/dd/yyyy
(ddd) mm/dd/yy	CustomFormat	(ddd) MM/dd/yy
yyyy.mm.dd dddd	CustomFormat	yyyy.MM.dd dddd
yy.mm.dd dddd	CustomFormat	yy.MM.dd dddd
yyyy.mm.dd (dddd)	CustomFormat	yyyy.MM.dd (dddd)
yy.mm.dd (dddd)	CustomFormat	yy.MM.dd (dddd)
yyyy.mm.dd	CustomFormat	yyyy.MM.dd
yy.mm.dd	CustomFormat	yy.MM.dd
dddd mm.dd.yyyy	CustomFormat	dddd MM.dd.yyyy
dddd mm.dd.yy	CustomFormat	dddd MM.dd.yy
(dddd) mm.dd.yyyy	CustomFormat	(dddd) MM.dd.yyyy
(dddd) mm.dd.yy	CustomFormat	(dddd) MM.dd.yy
yyyy-mm-dd	ShortDatePattern (Numeral)	–
mm/dd/yyyy	CustomFormat	MM/dd/yyyy
mm/dd/yy	CustomFormat	MM/dd/yy
DDD/mm/dd/yyyy	CustomFormat	ddd/MM/dd/yyyy
DDD/mm/dd/yy	CustomFormat	ddd/mm/dd/yy
DDD.MMMM dd.yyyy	CustomFormat	ddd.MMMM dd.yyyy
MMMM dd.yyyy	CustomFormat	MMMM dd.yyyy
DDD.MMM dd.yy	CustomFormat	ddd.MMM dd.yy
MMM dd.yy	CustomFormat	MMM dd.yy
dd/mm/yyyy	CustomFormat	dd/MM/yyyy
dd/mm/yy	CustomFormat	dd/MM/yy
DDD/dd/mm/yyyy	CustomFormat	ddd/dd/MM/yyyy
DDD/dd/mm/yy	CustomFormat	ddd/dd/MM/yy
DDD.dd MMMM.yyyy	CustomFormat	ddd.dd MMMM.yyyy
dd MMMM.yyyy	CustomFormat	dd MMMM.yyyy
DDD.dd MMM.yy	CustomFormat	ddd.dd MMM.yy
dd MMM.yy	CustomFormat	dd MMM.yy
dd.mm.yy	CustomFormat	dd.mm.yy
DDD.dd.mm.yy	CustomFormat	ddd.dd.mm.yy

◆BMP

Bitmap Object **Image Object**

CX-Designer					Sysmac Studio			
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value
General	Object Comment				–	–	–	
	Display File				Properties	Appearance	ImageFile	Image registered in resources
	Indirect Reference of Display File			Checked	–	–	–	–
				Unchecked	–	–	–	–
		Text file for referencing display image			–	–	–	–
		Address for Specifying File Line			–	–	–	–
		Clear the image when the value is 0		Checked	–	–	–	–
				Unchecked	–	–	–	–

Appendix 5: Graphs

◆Level Meter

Level Meter **Vertical Gauge and Horizontal Gauge**

CX-Designer				Sysmac Studio				
Tab	1st Level	2nd Level	Set Value	Category	Group	Property	Set Value	Remarks
General	Object Comment			–	–	–	–	
	Display Direction		Up	Properties	Appearance	IsReversed	Unchecked	Vertical gauge
			Down	Properties	Appearance	IsReversed	Checked	Vertical gauge
			Right	Properties	Appearance	IsReversed	Unchecked	Horizontal gauge
			Left	Properties	Appearance	IsReversed	Checked	Horizontal gauge
	Scale	Scale	Checked	Properties	Tick Major	MajorTickVisibility	Checked	
			Unchecked	Properties	Tick Major	MajorTickVisibility	Unchecked	
		No. of Division		Properties	Appearance	MajorInterval	(Max value in the range − min value in the range) / number of divisions	
		Scale Color		Properties	Appearance	TextColor	The same color as NS	
		Horizontal Size		Properties	Tick Major	MajorTickExtent	The original value	
	Set 0 as the origin		Checked	–	–	–	–	
			Unchecked	–	–	–	–	
	Storage Type			–	–	–	–	
	Address	Address		Properties	Behavior	Expression	Variable mapped to the address	
Range	Range1	Maximum (J)		Properties	Ranges	EndValue	The original value	Range1
			Indirect	–	–	–	–	
		Color		–	–	–	–	
			Indirect	–	–	–	–	
		Background Color		Properties	Ranges	BackgroundColor	The same color as NS	
			Indirect	–	–	–	–	
		Border (L)		Properties	Ranges	StartValue	The original value	
			Indirect	–	–	–	–	
	Range2	Border (L)		Properties	Ranges	EndValue	The original value	Range2
			Indirect	–	–	–	–	
		Color		–	–	–	–	
			Indirect	–	–	–	–	
		Background Color		Properties	Ranges	BackgroundColor	The same color as NS	
			Indirect	–	–	–	–	
		Border (N)		Properties	Ranges	StartValue	The original value	
			Indirect	–	–	–	–	
	Range3	Border (N)		Properties	Ranges	EndValue	The original value	Range1
			Indirect	–	–	–	–	
		Color		–	–	–	–	
			Indirect	–	–	–	–	
		Background Color		Properties	Ranges	BackgroundColor	The same color as NS	
			Indirect	–	–	–	–	
		Minimum (P)		Properties	Ranges	StartValue	The original value	
			Indirect	–	–	–	–	
Background	Color			Properties	Appearance	BackgroundColor	The same color as NS	
		Indirect Reference of Color		–	–	–	–	

◆Analogue Meter

Analogue Meter **Rotational Gauge and Semicircular Gauge**

CX-Designer				Sysmac Studio			
Tab	1st Level	2nd Level	Set Value	Category	Group	Property	Set Value
General	Object Comment			–	–	–	–
	Shape	Display Direction		Use another object depending on the setting			
		Increment Direction	Clockwise	Properties	Appearance	IsReversed	Unchecked
			Anti-clockwise	Properties	Appearance	IsReversed	Checked
		Width Rate		–	–	–	–
		Shape		Use another object depending on the setting			
	Scale	Scale	Checked	Properties	Tick Major	MajorTickVisibility	Checked
			Unchecked				Unchecked
		No. of Division		Properties	Appearance	MajorInterval	(Max value in the range – min value in the range) / number of divisions
		Scale Color		Properties	Appearance	TextColor	The same color as NS
		Scale Length		Properties	Tick Major	MajorTickExtent	Length of scale / (Long side of the object / 2)
		Position		Properties	Scale Bar	ScaleBarExtent	Position / (Long side of the object / 2)
	Color	RimColor		Properties	Scale Bar	ScaleBackgroundColor	Check the IsBarVisible box
		Color inside a meter		–	–	–	–
	Display Type	Fill		–	–	–	A needle indicates the current value in any settings
		Needle					A needle indicates the current value in any settings
		Set 0 as the origin	Checked	–	–	–	–
			Unchecked	–	–	–	–
	Address	Address		Properties	Behavior	Expression	Variable mapped to the address
		Storage Type		–	–	–	–
Needle	Needle Drawing Method		Type1	–	–	–	–
			Type2	–	–	–	–
	Style	Type	Straight Line	Properties	Needle	NeedleType	Rectangle
			Arrow	Properties	Needle	NeedleType	SwordSharp
			Triangular Arrow	Properties	Needle	NeedleType	TriangleSharp
		Width		Properties	Needle	NeedleAscent	Width / Larger value of the object size Default value for a triangular arrow
		Color		Properties	Needle	NeedleBackgroundColor	
Range				Add a range with the [+] button in Properties-Ranges, depending on ranges you need.			
	Range1			Range1			
		Maximum (J)		Properties	Ranges	EndValue	The original value
			Indirect	–	–	–	–
		Color		–	–	–	–
			Indirect	–	–	–	–
		Background Color		Properties	Ranges	Background Color	The same color as NS
			Indirect	–	–	–	–
		Border (L)		Properties	Ranges	StartValue	The original value
			Indirect	–	–	–	–

Analogue Meter **Rotational Gauge and Semicircular Gauge**

CX-Designer				Sysmac Studio			
Tab	1st Level	2nd Level	Set Value	Category	Group	Property	Set Value
Range	Range2			Range2			
		Border (L)		Properties	Ranges	EndValue	The original value
			Indirect	–	–	–	–
		Color		–	–	–	–
			Indirect	–	–	–	–
		Background Color		Properties	Ranges	BackgroundColor	The same color as NS
			Indirect	–	–	–	–
		Border (N)		Properties	Ranges	StartValue	The original value
			Indirect	–	–	–	–
	Range3			Range3			
		Border (N)		Properties	Ranges	EndValue	The original value
			Indirect	–	–	–	–
		Color		–	–	–	–
			Indirect	–	–	–	–
		Background Color		Properties	Ranges	BackgroundColor	The same color as NS
			Indirect	–	–	–	–
		Minimum (P)		Properties	Ranges	StartValue	The original value
			Indirect	–	–	–	–
Background	Color			Properties	Appearance	BackgroundColor	The same color as NS
		Indirect Reference of Color		–	–	–	–

◆Broken-line Graph

Broken-line Graph

Broken-line Graph

CX-Designer					Sysmac Studio			
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value
General	Object Comment				–	–	–	–
	Display Direction				–	–	–	–
	Scale (Vertical)	Scale		Checked	Properties	Left Scale	IsLeftAxisVisible	Check the box of the property if the Scale option has been checked.
				Unchecked	Default			
		No. of Division			Properties	Left Scale	LeftAxisNumberOfMajorTicks	2 for the value less than 2, and 11 for the value 12 and larger.
		Scale Color			Properties	Appearance	GridForegroundColor	*2
		Size			–	–	–	
		Show Scale Line			Properties	Left Scale	LeftAxisGridMajorLinesVisible	Check the box of the property if the Scale option has been checked.
			Line Style	Solid line	–	–	–	–
				Dotted line	–	–	–	–
				Broken line	–	–	–	–
				1-dot chain line	–	–	–	–
				2-dot chain line	–	–	–	–
			Indirect reference of showing scale line		–	–	–	–
	Scale (Horizontal)	Scale		Checked	Properties	Horizontal Axis	IsHorizontalAxisVisible	Check the box of the property if the Scale option has been checked.
				Unchecked	Default			
		No. of Division			Properties	Horizontal Axis	ViewportLength	No. of Division *5
		Scale Color			Properties	Appearance	GridForegroundColor	*2
		Size			–	–	–	
		Show Scale Line			Properties	Horizontal Axis	HorizontalAxisGridLinesVisible	Check the box this property.
			Line Style	Solid line	–	–	–	–
				Dotted line	–	–	–	–
				Broken line	–	–	–	–
				1-dot chain line	–	–	–	–
				2-dot chain line	–	–	–	–
			Indirect reference of showing scale line		–	–	–	–
	Display Update	Specify Display Update Bit		Checked	Properties	Behavior	DisplayUpdateType	Condition
				Unchecked	Properties	Behavior	DisplayUpdateType	Interval
			Address		Properties	Behavior	Expression	Variable mapped to the address
		Specify the No. of Points Shown		Checked	–	–	–	–
				Unchecked	–	–	–	–
			Address		–	–	–	–
Graph	Use the graph of a broken-line graph group			Checked	–	–	–	–
				Unchecked	*1			
	Graph List				–	–	–	–
	Draw Value Outside of the Range				–	–	–	–
	Storage Type				–	–	–	–
	Group Name				Properties	Data	Data Group	The group that has been set.

*1: Register the data of Graph List, Draw Value Outside of the Range, and Storage Type in a data group to reference.
Refore to the Broken-line Graph Group Setting Table in “Appendix 1: Project Common Settings.”

*2: Because only one color can be set for scales, the setting for the vertical scale will be used.

Broken-line Graph

CX-Designer					Sysmac Studio			
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value
Graph	No. of points in each line	Monitor Points			–	–	–	–
		Display Points	No. of Points		Properties	Horizontal Axis	ViewportLength	The original value
			Indirect Reference		–	–	–	–
		Display Start Position	Position		–	–	–	–
			Indirect Reference		–	–	–	–
Background	Color	Indirect Reference of Color			Properties	Appearance	GridBackgroundColor	The same color as NS
					–	–	–	–
Scroll Bar	Use Scroll Bar				–	–	–	–
	Buttons for Scrolling One Line				–	–	–	–
	Buttons for Scrolling Multiple Lines				–	–	–	–
	Button Size				–	–	–	–

◆Data Log

Data Log Object **Trend Graph**

CX-Designer					Sysmac Studio				
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value	Remarks
					Properties	Right Axis	IsRightAxisVisible	Unchecked	
							RightAxisGridMinorLinesVisible	Unchecked	
							RightAxisGridMajorLinesVisible	Unchecked	
General	Object Comment				–	–	–	–	
	Group Name				Properties	Data	DataSet	Converted data group	
	Log Timing				–	–	–	–	
	Direction				–	–	–	–	
	Draw Value Outside of the Range				–	–	–	–	
	Display							Unchecked data will not be registered in Traces	
Time Axis	Scale	The following settings are available only when Scale is checked.		Unchecked	Default				
				Checked	Properties	Time Scale	IsTimescaleVisible	Checked	
		Line		Checked	Properties	Time Scale	TimeScaleGridLinesVisible	Checked	
				Unchecked	Default				
		No. of Division			–	–	–	–	
		Scale Length			–	–	–	–	
		Sub-scale	The following settings are available only when Scale is checked.	Unchecked	Default				
				Checked	–	–	–	–	
			Sub-scalre Line	Checked	–	–	–	–	
				Unchecked	Default				
			No. of Division		–	–	–	–	
	Scale	Time			Properties	Time Scale	ViewportLength	Set a value in the numeral field of ViewportLength. If the value is lass than 1minute, enter 1. If the value is 745 hours or longer, enter 31 days.	
		Indirect Reference			–	–	–	–	
		Unit	Sec		Properties	Time Scale	ViewportLength	Set a unit in the unit field of ViewportLength. Select Minutes because the unit of second is not available	
			Min		Properties	Time Scale	ViewportLength	Set a Unit in the numeral field of ViewportLength. Select Minutes	
			Hour		Properties	Time Scale	ViewportLength	Set a unit in the unit field of ViewportLength. Select Hour	
	Date & Time Display	Date ON		Checked	Refer to the “DateTime_Format” sheet in “Appendix 4: Lamps.”				
				Unchecked	–	–	–	–	
		Time ON		Checked	Refer to the “DateTime_Format” sheet in “Appendix 4: Lamps.”				
				Unchecked	–	–	–	–	
		Switch	Text Color		–	–	–	–	Appearance – GridForegroundColor
			Text Attribute		Refer to the “Text Attributes” sheet in “Appendix 2: Object Common Settings.”				

CX-Designer					Sysmac Studio				
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value	Remarks
Time Axis	Use Cursor	The following settings are available only when Scale is checked.		Unchecked	Properties	Behavior	IsCursor1Visible	Unchecked	
				Checked	Properties	Behavior	IsCursor1Visible	Checked	
		Cursor Color			–	–	–	–	The color is fixed.
		Transmit Numeral Data to			–	–	–	–	
		Data Enable/Disable Bit			–	–	–	–	
		Transfer Date & Time		Checked/Unchecked	–	–	–	–	
			Transfer Date & Time to		–	–	–	–	
			Transmit the data with offset time display format	Checked/Unchecked	–	–	–	–	
	Graph Display Position	Position end of scrolling at the center of data log graph		Checked/Unchecked	–	–	–	–	
		Set Address for Updating Display	The following settings are available only when Scale is checked.	Unchecked	Default				
				Checked	–	–	–	–	
			Scroll Control Flag		–	–	–	–	
			Address for Specifying Scroll Interval		–	–	–	–	
			Unit	Sec	–	–	–	–	
				Min	–	–	–	–	
				Hour	–	–	–	–	
Numeral Value Axis	Scale	The following settings are available only when Scale is checked.		Unchecked	Properties	Left Scale	IsLeftAxisVisible	Unchecked	
				Checked	Properties	Left Scale	IsLeftAxisVisible	Checked	
		Line		Checked	Properties	Left Scale	LeftAxisGridMajorLinesVisible	Checked	
				Unchecked	Properties	Left Scale	LeftAxisGridMajorLinesVisible	Unchecked	
		Color			Properties	Appearance	GridForegroundColor	The same color as NS	The color set for the Time Axis is reflected in Numeral Value Axis
		No. of Division			–	–	–	–	
		Scale Length			–	–	–	–	
		Sub-scale	The following settings are available only when Scale is checked.	Unchecked	Default				
				Checked	–	–	–	–	
			Sub-scalre Line	Checked	Properties	Left Scale	LeftAxisGridMinorLinesVisible	Checked	
				Unchecked	Properties	Left Scale	LeftAxisGridMinorLinesVisible	Unchecked	
			No. of Division		–	–	–	–	
	Scale Settings	The following settings are available only when Scale is checked.		Unchecked	Default				
				Checked	–	–	–	–	
		Storage Type			–	–	–	–	
		Maximum			Properties	Left Scale	LeftAxisMaximumValue	The same value as NS	
			Indirect Reference	Checked/Unchecked	–	–	–	–	
		Minimum			Properties	Left Scale	LeftAxisMinimumValue	The same value as NS	
			Indirect Reference	Checked/Unchecked	–	–	–	–	

CX-Designer					Sysmac Studio				
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value	Remarks
Numeral Value Axis	Scale Settings	Show values		Checked/Unchecked	–	–	–	–	
			Format		–	–	–	–	
			Text Attribute		–	–	–	–	The color set for the Time Axis is reflected in Numeral Value Axis
			Text		–	–	–	–	Appearance – GridForegroundColor
		Set the threshold			–	–	–	–	
			Threshold H		–	–	–	–	
				Checked/Unchecked	–	–	–	–	
			Line Color		–	–	–	–	
			Threshold L		–	–	–	–	
				Checked/Unchecked	–	–	–	–	
			Line Color		–	–	–	–	
			Line Style	Solid line	–	–	–	–	
				Dotted lilne	–	–	–	–	
				Broken line	–	–	–	–	
				Single chain line	–	–	–	–	
				Double chain line	–	–	–	–	
Background	Tile Background	The following settings are available only when Scale is checked.		Unchecked	Properties	Appearance	GridBackgroundColor	Transparent	
				Checked	–	–	–	–	
		Color			Properties	Appearance	GridBackgroundColor	The same color as NS	
		Indirect Reference of Color		Checked/Unchecked	–	–	–	–	
			Address		–	–	–	–	
Icon	Icons	Stop		Checked/Unchecked	–	–	–	–	
		Restart		Checked/Unchecked	–	–	–	–	
		Status		Checked/Unchecked	–	–	–	–	
		Log Clear		Checked/Unchecked	–	–	–	–	
		Pause		Checked/Unchecked	–	–	–	–	
		Save to File		Checked/Unchecked	–	–	–	–	
		Read File		Checked/Unchecked	–	–	–	–	
	Icon Size	Width			–	–	–	–	
		Height			–	–	–	–	
	Options	Show Confirmation Dialog when Stopping		Checked/Unchecked	–	–	–	–	
		Show Confirmation Dialog when Restarting		Checked/Unchecked	–	–	–	–	
		Show Confirmation Dialog when Deleting Log Data		Checked/Unchecked	–	–	–	–	
		Show Confirmation Dialog when Pausing		Checked/Unchecked	–	–	–	–	
		Show Confirmation Dialog when Saving to a File		Checked/Unchecked	–	–	–	–	

CX-Designer					Sysmac Studio				
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value	Remarks
Icon	Options	Show Confirmation Dialog when Reading a CSV File		Checked/Unchecked	–	–	–	–	
		Options for showing the read file		Show the read data only	–	–	–	–	
				Cascade the read data to a graph	–	–	–	–	
Scroll Bar	Use Scroll Bar			Unchecked	Default				
				Checked					
	Buttons for Scrolling One			Checked/Unchecked	–	–	–	–	
	Buttons for Scrolling Multiple Lines	Use Buttons for Scrolling Multiple Lines		Checked/Unchecked	–	–	–	–	
			Lines to Scroll	Lines in 1 Page	–	–	–	–	
				Lines in 1/2 Page	–	–	–	–	
				Specified Lines	–	–	–	–	
	Button Size	Width			–	–	–	–	
		Height			–	–	–	–	

Appendix 6: Alarm and Others

◆Alarm History

Alarm/Event Summary and History Object **User Alarms Viewer**

CX-Designer					Sysmac Studio			
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value
General	Object Comment				–	–	–	–
	Display Data	Currently Occurred Alarms			Properties	Behavior	HistoricalMode	Unchecked
		Alarm History			Properties	Behavior	HistoricalMode	Checked
	Group Specification	Display Only the Specified Group		Checked/ Unchecked	–	–	–	–
	Date and Time Display Format	Date		Checked/ Unchecked	–	–	–	–
		Time		Checked/ Unchecked	–	–	–	–
	Display Type	High Alarm		Checked/ Unchecked	–	–	–	–
		Middle Alarm		Checked/ Unchecked	–	–	–	–
		Low Alarm		Checked/ Unchecked	–	–	–	–
		Event		Checked/ Unchecked	–	–	–	–
	Default Display Order	From New Date & Time			Properties	Behavior	DefaultSortColumn	Date and Time The default sort order is Descending.
		From Old Date & Time			Properties	Behavior	DefaultSortColumn	Date and Time The default sort order is Ascending.
		From High Priority			Properties	Behavior	DefaultSortColumn	Priority The default sort order is Descending.
		From Low Priority			Properties	Behavior	DefaultSortColumn	Priority The default sort order is Ascending.
		From High Frequency			–	–	–	–
		From Low Frequency			–	–	–	–
	Display in the Same Line	Display the same alarm/event in the same line when displaying by frequency		Checked/ Unchecked	–	–	–	–
	Movement when Alarm/Event is Selected	Write the Alarm ID to the Specified Address		Checked/ Unchecked	–	–	–	–
			Address		–	–	–	–
		Switch Screen to the Specified Page Set with Alarm/Event Setting		Checked/ Unchecked	–	–	–	–
		Switch to the Specified Contents Display Set with Alarm/Event Setting		Checked/ Unchecked	–	–	–	–
Display	Selection Bar	Color			Properties	Appearance	SelectedItemColor	The same color as NS
	Line Height				–	–	–	–
	Display Optimization	Minimize column space		Checked/ Unchecked	–	–	–	–
				Checked/ Unchecked	–	–	–	–
		Date Display Optimization		Checked/ Unchecked	–	–	–	–
				Checked/ Unchecked	–	–	–	–
	Title Line			Checked/ Unchecked	–	–	–	–
				Checked/ Unchecked	–	–	–	–
	Message box display	Show alarm message		Checked/ Unchecked	–	–	–	–
	Display Items	Group No.		Checked	Properties	Appearance	Column	Select Group.
				Unchecked	Properties	Appearance	Column	Not select Group.
		Display Type		Checked	Properties	Appearance	Column	Select Priority.
				Unchecked	Properties	Appearance	Column	Not select Priority.
		Priority		Checked	Properties	Appearance	Column	Select Priority.
				Unchecked	Properties	Appearance	Column	Not select Priority.

Alarm/Event Summary and History Object **User Alarms Viewer**

CX-Designer					Sysmac Studio			
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value
Display	Display Items	Checked Time (Date&Time)		Checked/ Unchecked	–	–	–	–
		No. of Occurrences		Checked/ Unchecked	–	–	–	–
		Time of Occur.		Checked	Properties	Appearance	Column	Select Date and Time.
				Unchecked	Properties	Appearance	Column	Not select Date and Time.
		Time of Cancel		Checked/ Unchecked	–	–	–	–
		Info1		Checked	Properties	Appearance	Column	Select Additional Information.
				Unchecked	Properties	Appearance	Column	Not select Additional Information.
		Info2		Checked/ Unchecked	–	–	–	–
		Info3		Checked/ Unchecked	–	–	–	–
	Ruled Line	Display Ruled Line		Checked/ Unchecked	–	–	–	–
	History Display Type	Display Time of Occurrence/ Cancellation in the Same Line		Checked/ Unchecked	–	–	–	–
		Display Time of Occurrence/ Cancellation in the Separated Line		Checked/ Unchecked	–	–	–	–
	Colors for Showing Statuses	Occurring Unchecked			Properties	Appearance	RaisedUnacknow ledgedColor	The same color as NS
		Occurring Checked			Properties	Appearance	RaisedAcknow ledgedColor	The same color as NS
		Cancelled Unchecked			Properties	Appearance	ClearedUnacknow ledgedColor	The same color as NS
		Cancelled Checked			Properties	Appearance	ClearedAcknow ledgedColor	The same color as NS
Text	Text Attribute				Refer to the “Text Attributes” sheet in “Appendix 2: Object Common Settings.”			
	Use Text Color/Font of Alarm/Event Setting			Checked/ Unchecked	–	–	–	–
Background	Tile Background			Checked	–	–	–	–
				Unchecked	Properties	Appearance	BackgroundColor	Transparent
		Color			Properties	Appearance	BackgroundColor	The same color as NS
					Properties	Appearance	HeaderBackgroundColor	The same color as NS
		Indirect Reference of Color			–	–	–	–
			Address		–	–	–	–
Icon	Icons	From New Date & Time		Checked/ Unchecked	–	–	–	–
		From Old Date & Time		Checked/ Unchecked	–	–	–	–
		From High Priority		Checked/ Unchecked	–	–	–	–
		From Low Priority		Checked/ Unchecked	–	–	–	–
		From High Frequency		Checked/ Unchecked	–	–	–	–
		From Low Frequency		Checked/ Unchecked	–	–	–	–
		Delete Selected Alarm		Checked/ Unchecked	–	–	–	–
		Check Selected Alarm		Checked/ Unchecked	–	–	–	–
		Check All Alarms		Checked/ Unchecked	–	–	–	–
		Cancel All Alarms’ Check		Checked/ Unchecked	–	–	–	–
		Change Display Type		Checked/ Unchecked	–	–	–	–
	Options	Enable Deletion of Unchecked Alarms		Checked/ Unchecked	–	–	–	–
		Enable Deletion of Currently Occurred Alarms		Checked/ Unchecked	–	–	–	–
		Display Confirmation Dialog When Deleting Alarms		Checked/ Unchecked	–	–	–	–
		Display Confirmation Box When Canceling Checks		Checked/ Unchecked	–	–	–	–

CX-Designer					Sysmac Studio			
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value
Icon	Icon Size	Width			–	–	–	–
		Height			–	–	–	–
Vertical Scroll Bar	Use Scroll Bar			Checked/ Unchecked	–	–	–	–
	Buttons for Scrolling One Line			Checked/ Unchecked	–	–	–	–
	Buttons for Scrolling Multiple Lines	Use Buttons for Scrolling Multiple Lines		Checked/ Unchecked	–	–	–	–
			Lines to Scroll	Lines in 1 Page	–	–	–	–
				Lines in 1/2 Page	–	–	–	–
				Specified Lines	–	–	–	–
	Button Size	Width			–	–	–	–
		Height			–	–	–	–
Horizontal Scroll Bar	Use Scroll Bar			Checked/ Unchecked	–	–	–	–
	Buttons for Scrolling One Row			Checked/ Unchecked	–	–	–	–
	Buttons for Scrolling Multiple Rows	Use Buttons for Scrolling Multiple Rows		Checked/ Unchecked	–	–	–	–
			Rows to Scroll	Rows in 1 Page	–	–	–	–
				Rows in 1/2 Page	–	–	–	–
				Specified No. of Rows	–	–	–	–
Macro	Macro Execution Condition	When Selecting an Alarm/Event			–	–	–	–

◆Data Block

Alarm History

Recipe

CX-Designer					Sysmac Studio				
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value	Remarks
General	Object Comment				–	–	–	–	
	Data Block Selection	Data block			Properties	Behavior	DisplayedTemplate	Group name	
	Display No. of rows				–	–	–	–	
	Field Settings				–	–	–	–	
Text	Text Attribute				Refer to the “Text Attributes” sheet in “Appendix 2: Object Common Settings.”				
	Indirect Reference of Text Color			Checked/ Unchecked	–	–	–	–	
Background	Color 1				Properties	Appearance	IngredientsHeader BackgroundColor	The same color as NS	
	Color 2				–	–	–	–	Colors cannot be selected for lines.
	Color 3				–	–	–	–	Odd lines and even lines are the same color.
	Color 4				–	–	–	–	Odd lines and even lines are the same color.
	Color 5				Properties	Appearance	Ingredients BackgroundColor	The same color as NS	
Icon	Icons	Read Data File		Checked/ Unchecked	–	–	–	–	
		Write Data File		Checked/ Unchecked	–	–	–	–	
		Write to the address		Checked/ Unchecked	–	–	–	–	
		Read from the address		Checked/ Unchecked	–	–	–	–	
		Add the record		Checked/ Unchecked	–	–	–	–	
		Delete the record		Checked/ Unchecked	–	–	–	–	
	Options	Display confirmation dialog box when reading data file		Checked/ Unchecked	–	–	–	–	
		Display confirmation dialog box when writing data file		Checked/ Unchecked	–	–	–	–	
		Display confirmation dialog box when writing to the address		Checked/ Unchecked	–	–	–	–	
		Display confirmation dialog box when reading from the address		Checked/ Unchecked	–	–	–	–	
		Display confirmation dialog box when adding to the record		Checked/ Unchecked	–	–	–	–	
		Display confirmation dialog box when deleting from the record		Checked/ Unchecked	–	–	–	–	
	Icon Size	Width			–	–	–	–	
		Height			–	–	–	–	

Data Block **Recipe**

CX-Designer					Sysmac Studio				
Tab	1st Level	2nd Level	3rd Level	Set Value	Category	Group	Property	Set Value	Remarks
Vertical Scroll Bar	Use Scroll Bar			Checked/ Unchecked	–	–	–	–	
	Buttons for Scrolling One Line			Checked/ Unchecked	–	–	–	–	
				Unchecked	–	–	–	–	
	Buttons for Scrolling Multiple Lines	Use Buttons for Scrolling Multiple Lines		Checked/ Unchecked	–	–	–	–	
			Lines to Scroll	Lines in 1 Page	–	–	–	–	
				Lines in 1/2 Page	–	–	–	–	
				Specified Lines	–	–	–	–	
	Button Size	Width			–	–	–	–	
		Height			–	–	–	–	
Horizontal Scroll Bar	Use Scroll Bar			Checked/ Unchecked	–	–	–	–	
	Buttons for Scrolling One Row			Checked/ Unchecked	–	–	–	–	
				Unchecked	–	–	–	–	
	Buttons for Scrolling Multiple Rows	Use Buttons for Scrolling Multiple Rows		Checked/ Unchecked	–	–	–	–	
			Rows to Scroll	Rows in 1 Page	–	–	–	–	
				Rows in 1/2 Page	–	–	–	–	
				Specified No. of Rows	–	–	–	–	
		Address		Address	Animations	Visibility		Variable mapped to the address	
Macro	Before inputting numeral/string				–	–	–		
	Before writing numeral/string				–	–	–		