

Programmable Terminal NA-series

# Practices Guide Questions & Answers On Page Editing

NA5-15W□□□□

NA5-12W□□□□

NA5-9W□□□□

NA5-7W□□□□



Practices  
Guide

## ■ Introduction

This guide provides reference information on editing pages of the NA. It does not provide safety information.

Be sure to obtain the NA-series Programmable Terminal User's Manuals, read and understand the safety points and other information required for use, and test sufficiently before actually using the equipment.

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# Related Manuals

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The following manuals are related to this manual.

Cat.No.	Model	Manual Name
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
V118	NA5-15W□□□□ NA5-12W□□□□ NA5-9W□□□□ NA5-7W□□□□	NA-series Programmable Terminal Software User's Manual
V119	NA5-15W□□□□ NA5-12W□□□□ NA5-9W□□□□ NA5-7W□□□□	NA-series Programmable Terminal Device Connection User's Manual
V120	NA5-15W□□□□ NA5-12W□□□□ NA5-9W□□□□ NA5-7W□□□□	NA-series Programmable Terminal Startup Guide

# 1 Introduction

This chapter provides the list of questions and answers that arise from page editing on NA-series PTs, as described in this manual. Refer to Chapter 2 for more details of each article.

## 1-1 List of Questions and Answers

Questions	Answers	Details described in:
How can I display the setting fields of Properties, Animations, or Events and Actions for an object?	Select an item from the [View] menu at the top.	2-1-2 How To Display the Properties Tab
How can I view description of each function or object on Sysmac Studio?	Select "Description" from the context menu to show or hide the description.	2-1-3 How To Display Description of Objects
How can I deactivate an input object such as a button (i.e. the control flag function in NS)?	Uncheck the [IsEnabled] checkbox under [Behavior] in the [Properties] tab page.	2-2-1 Settings to Enable Input
How can I indirectly specify input permission for an input object such as a button (i.e. the control flag function in NS)?	Select [Animations] – [Enable] in the [Animations] tab page and set in [Expression] the indirect specification condition.	2-2-1 Settings to Enable Input
How can I perform show/hide settings for objects (i.e. the control flag function in NS)?	Open the [Properties] tab page and uncheck the [IsVisible] checkbox under [Appearance].	2-2-2 Show/Hide Settings
How can I blink an object?	In the [Animations] tab page, select [Animations] - [Blink] and set in [Expression] the indirect specification condition.	2-2-3 Settings to Blink an Object
There are several fields such as [Variable], [Expression], or [Value] to specify variables. What are the differences between these three?	You can only specify variables in [Variable], whereas you can not only enter variables but also show arithmetic results in [Expression] and [Value].	2-2-4 Differences between Variable, Expression, and Value
Can I find which functional object in NS corresponds with which object in NA?	Refer to "2-3-1 NS – NA Functional Objects Correspondence Table" in this manual.	2-3-1 NS – NA Functional Objects Correspondence Table
How can I unify the aspect ratios of an image file and an object?	Uncheck the checkbox of [LockAspectRatio] under [Appearance] in the [Properties] tab page.	2-3-2 Automatic Adjustment of Aspect Ratio for Image Objects
Can I create an object that enters a fixed value to a variable (i.e. the Set Value function by the WORD button in NS)?	In the [Events and Actions] tab page, select "SetVariable" as [Actions] and set the value to enter.	2-3-3 How To Enter a Fixed Value and To Increase/Decrease a Value
Can I increase a variable (i.e. the Increase/Decrease Value function by the WORD button in NS)?	In the [Events and Actions] tab page, select "IncreaseVariable" as [Actions] and set the value to add.	2-3-3 How To Enter a Fixed Value and To Increase/Decrease a Value
Can I decrease a variable (i.e. the Increase/Decrease Value function by the WORD button in NS)?	In the [Events and Actions] tab page, select "DecreaseVariable" as [Actions] and set the value to subtract.	2-3-3 How To Enter a Fixed Value and To Increase/Decrease a Value
Can I create an object that is equivalent to a Multifunction object in the NS series?	You can set several functions in the [Events and Actions] tab page.	2-3-4 How To Create Multifunction Objects
Can I learn about the date and time formats?	It complies with the date and time format of Visual Basic. You can also specify an arbitrary format.	2-3-5 Date and Time Display Format
Can I change the state of a button object by not only pressing it down but also the value of an address?	You must combine a button with a lamp to make a single button. At that time, set the button transparent and specify the appearance with the lamp.	2-3-6 Changing the State of the Button Object
Which NA object corresponds with the message indicator function of the NS series?	The Data Lamps do. Unlike the NS-series, you cannot specify a different size or type of the font for each state.	2-3-7 How To Create a Message Indicator
Can I remove gradation of a Lamp object? (the upper right corner of the Lamp object shown below)	It is not possible to remove gradation from a Lamp object. However, part of the Lamp functions can be substituted by specifying [ColorChange] in the [Animations] tab page for a graphical object.	2-3-8 How To Create a Lamp Object with No Gradation



Questions	Answers	Details described in:
How can I show a decimal point in a Data Display object (i.e. the scale setting in NS)?	Enter a computational expression in [Expression] under [Behavior] in the [Properties] tab page.	2-3-9 Decimal Display of Integer-type Values
How can I deactivate the popup that comes up when selecting an already raised alarm event?	Uncheck the "Popup" checkbox of the User Alarm.	2-3-10 Alarm Objects
Cannot distinguish the raised alarms from the reset alarms by default. How can I do it?	Add "Status" to [ColumnTitles], [ColumnOrder], and [ColumnWidths] under [Appearance] in the [Properties] tab page.	2-3-10 Alarm Objects
How can I set a macro equivalent to the one that is run in NS upon loading a project?	In the Global Events menu, set a subroutine that is created for "ProjectInitialization", the condition to start up the project.	2-4-1 How To Specify Subroutines (Macro) in the System Settings
How can I set a macro equivalent to the one that is run in NS when an alarm event is raised or reset?	Set a subroutine that is created for an event and action of each user alarm.	2-4-1 How To Specify Subroutines (Macro) in the System Settings
How can I set a macro equivalent to the one that is run in NS when a value is changed?	In the Global Events menu, set a subroutine that is created for "Condition", the condition for a value to change.	2-4-1 How To Specify Subroutines (Macro) in the System Settings
Is it possible to connect an NA with a CJ-series CPU?	You can connect the target CPU by registering it as an external device. At this point, only Ethernet connection is supported (i.e. the NA units do not support serial connection).	2-4-2 Connecting with the CJ-series CPU
Is it possible to switch the screen from the PLC? Is it also possible to report the current screen from NA to PLC?	On the NJ, specify a String-type variable and assign it to "_HMI_CurrentPage", a system variable that specifies the current screen. You can change the screen by entering the name of the destination screen in the variable assigned to the system variable. If the address values are directly linked with the page numbers as in NS series, you must write Visual Basic.	2-4-3 How To Switch the Screen by the PLC Variables



# 2 Questions and Answers

This chapter provides questions and answers that arise when you edit pages of the NA. The questions and answers are classified into the three categories including the system settings, the settings common to objects, and the settings unique to each object.

## 2-1 System Settings

### 2-1-1 Differences between NS and NA

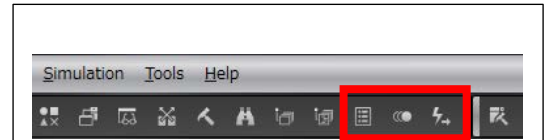
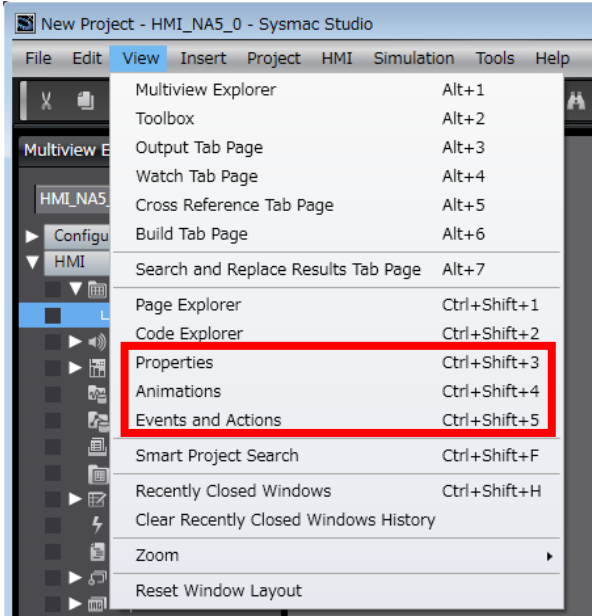
The following table shows the major differences between NS and NA.

Items	NS	NA
Maximum number of sheets that can be applied to a single screen * In NA, it is called a background page.	10 sheets	1 sheet Note, however, that in NA the basic screen to which the sheet is applied can also be used as a sheet. As a result, multiple sheets (pages) can be applied to a single screen.
Settings of the clock built in the PT	Entry is possible from a date or time object or from the system memory, in addition to the system menu.	You cannot perform input from a date or time object. Need to perform settings from the system menu. The system variable for date and time is available, but it has been specified for reading only.
System ten key	You can enter Japanese texts (including Chinese characters) with the text input ten key.	At this point you cannot enter Japanese from the text input ten key. You must create a user ten key. The version upgrade scheduled in September includes implementation of the function to input Japanese.
User-defined ten key	Users can relatively create a ten key by using a command button or a [key button] as a multifunctional object.	Although users can create a ten key, you must use Visual Basic. The version upgrade scheduled in September includes implementation of the function to edit the system ten key.
Number of popups displayed	Up to three popups can be displayed at a time.	Only a popup can be displayed.
Macro * In NA, it is called a subroutine.	NS uses its own scripts.	NA adopts Visual Basic 2008. Part of the functions is limited or expanded.

## 2-1-2 How To Display the Properties Tab

By default, the tabs of Properties and other aspects are not displayed. To display these tabs, select an item to display from the [View] menu. (See the figure below.)

On Sysmac Studio Ver1.11 and later, you can display the Properties tab by double-clicking the object.



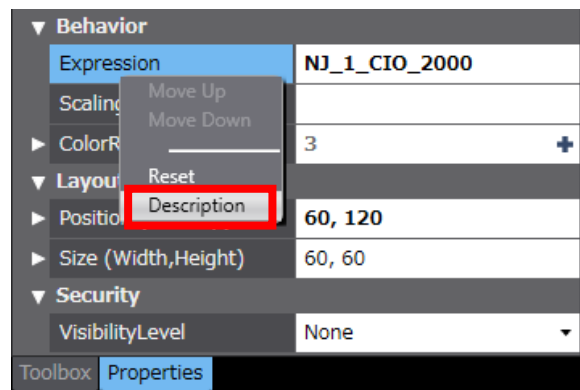
You can also use the icons (enclosed in the red rectangular above) under the menu bar to show the tabs.

The icons signify Properties, Animations, and Events and Actions from the left.

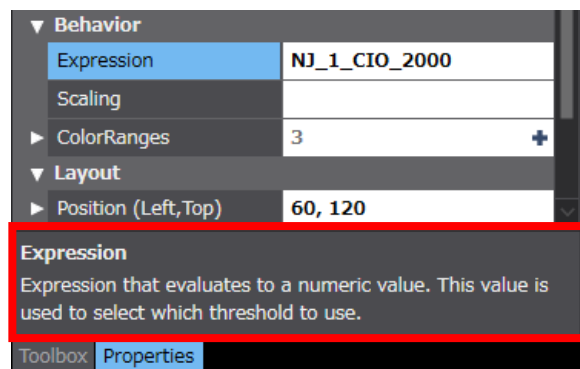
## 2-1-3 How To Display Description of Objects

By default, the descriptions of objects are not displayed. To display them, select "Description" from the context menu.

1. Select "Description" from the context menu.



2. The description is displayed at the bottom of the tab. Repeat step 1 to hide the description.

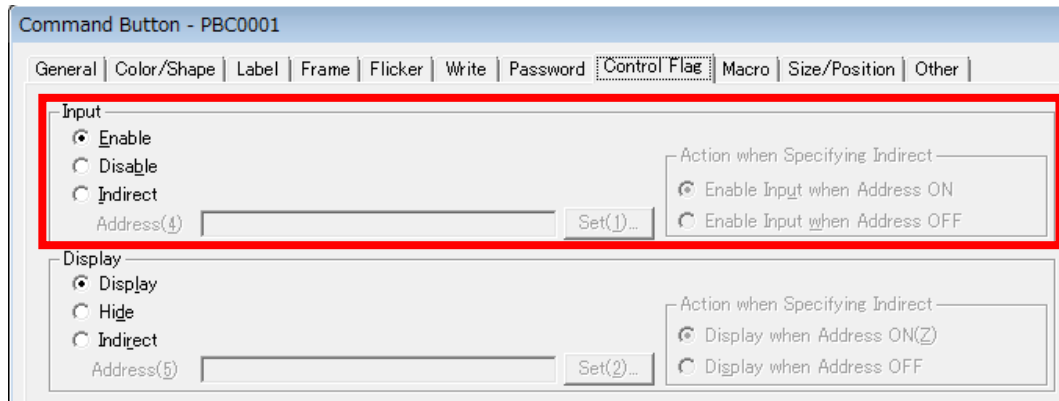


## 2-2 Functions Common to Objects

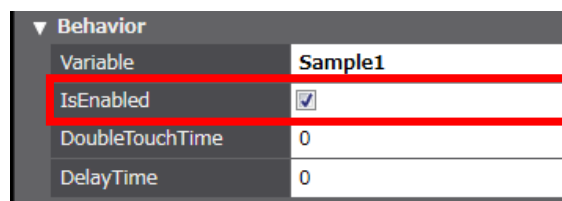
This section describes the functions that are common to several objects.

### 2-2-1 Settings to Enable Input

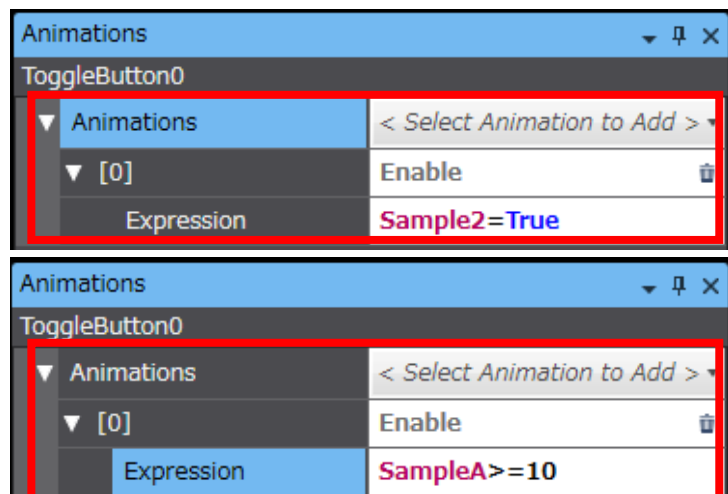
This subsection describes how to perform in the NA series the settings that are equivalent to the function of enabling input in the NS series.



1. Select an object for which to enable input and open the [Properties] tab. Check or uncheck the checkbox of [IsEnabled] under [Behavior] to respectively enable or disable input.

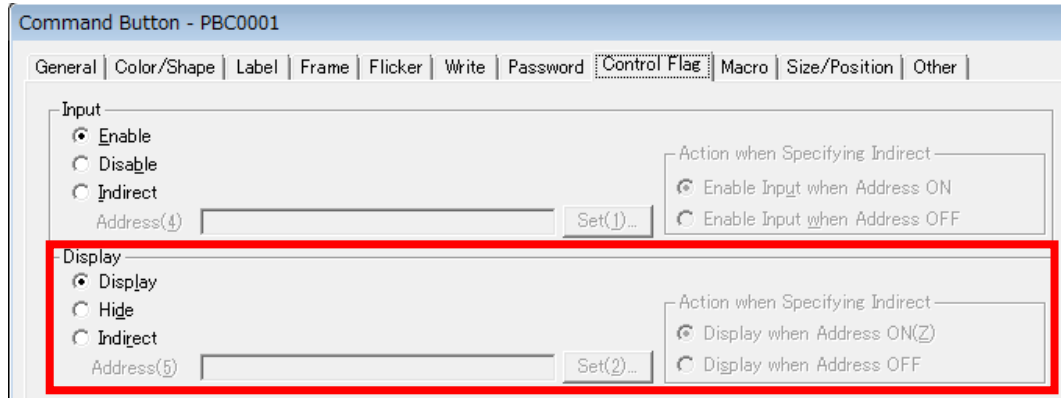


2. To control input by the state of the variable, select the target object and open the [Animations] tab. From [Animations], select "Enable" and specify the condition to enable input in [Expression]. In the NS series, all you can do to perform the settings is to turn ON or OFF the bit address. In the NA series, however, you can also specify the condition by numeric values.

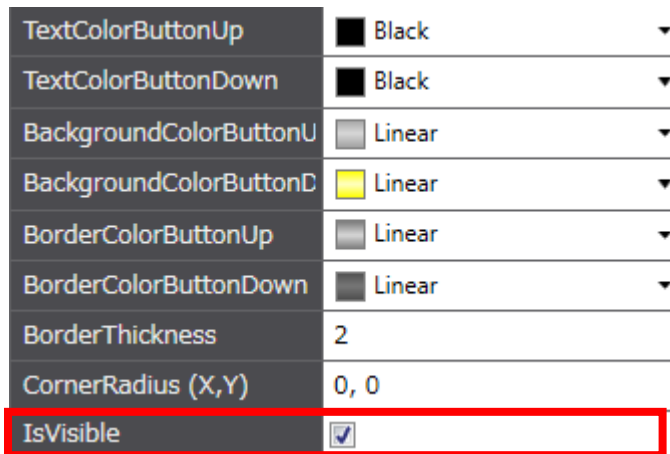


## 2-2-2 Show/Hide Settings

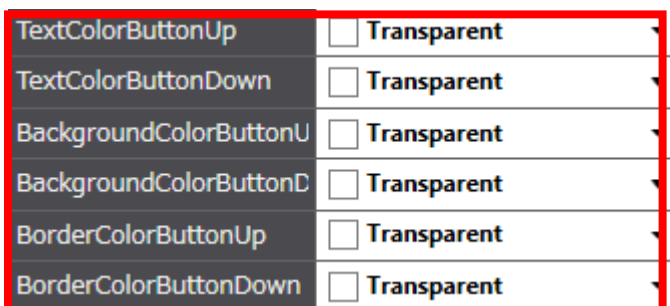
This subsection describes how to perform in the NA series the show/hide settings that are equivalent to the function in the NS series.



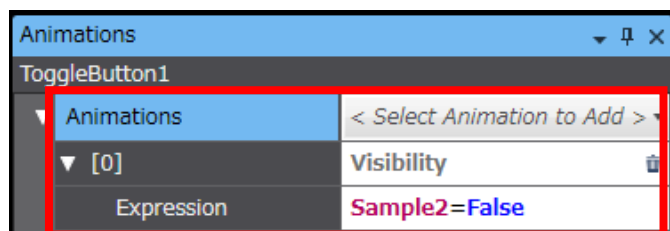
1. Select an object for which to perform settings, and open the [Properties] tab. Check or uncheck the checkbox of [IsVisible] under [Appearance] to respectively show/hide the object. Beware that, while in the NS series the functions of the object work even if it is hidden, the hidden objects in NA series do not operate even if it is touched.



2. If you wish to hide an object while keeping its functions available, set all the parameters to specify the colors (enclosed by the red rectangular in the figure on the right) to "Transparent".



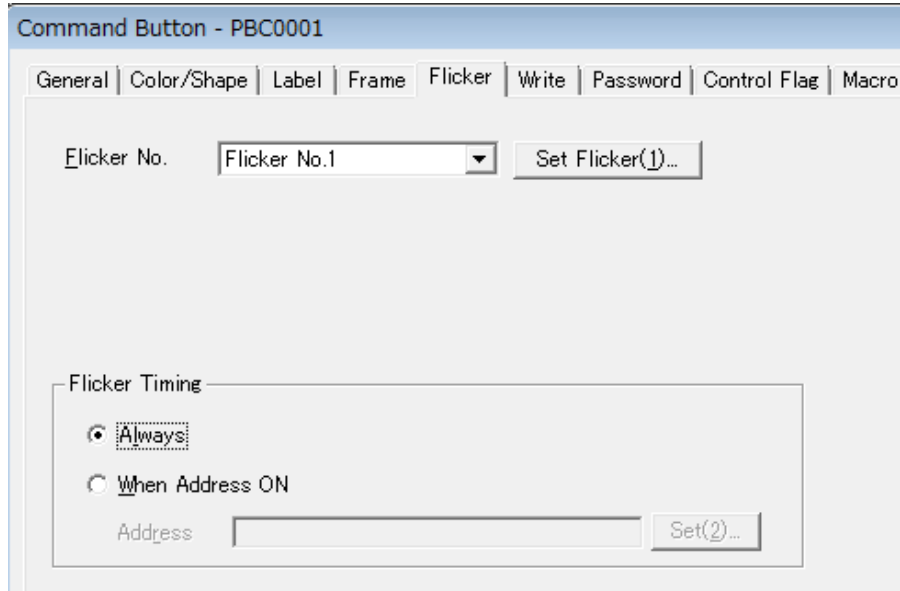
3. To control show/hide of an object by the state of the variable, select the target object and open the [Animations] tab. From [Animations], select "Visibility" and specify the condition to show the object in [Expression].



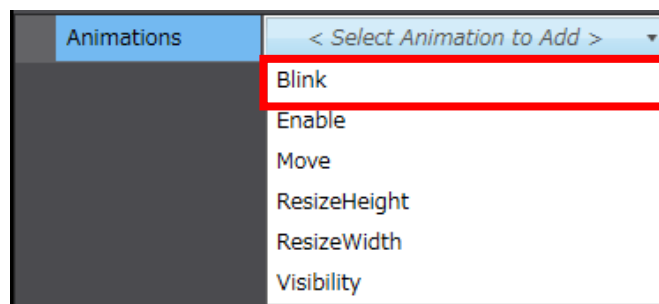
## 2-2-3 Settings to Blink an Object

This subsection describes how to perform in the NA series the settings for what is called as Flicker in the NS series.

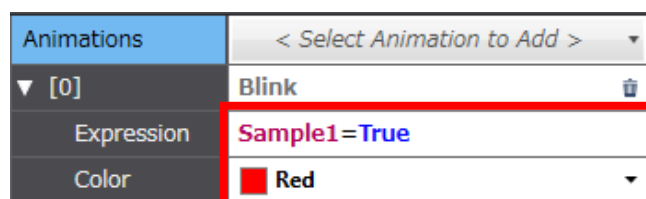
The function is called “Blink” in the NA series.



1. Select an object for which to perform settings, and open the [Animations] tab. From [Animations], select “Blink”.



2. Specify the condition to blink the object in [Expression], and specify the color for blinking in [Color]. Unlike the NS series, you cannot change the blinking speed.



3. To constantly blink the object, select “True” in [Expression].



## 2-2-4 Differences between Variable, Expression, and Value

The title of the field in which a variable is assigned for an object varies from [Variable] to [Expression] to [Value], depending on the object or item.

The indication of [Variable] is mainly used by the objects such as Data Edit or Button that write values. You can only set a variable in this field.

The indication of [Expression] is mainly used by the objects such as Data Display or Lamp that read values, in the fields for specifying startup conditions or display targets. You can set arithmetic expressions in addition to variables.

The indication of [Value] is mainly used by the objects that write fixed values or variable values. While you can only set a variable in the [Variable] field, you can also enter an arithmetic expression in this field. Thus, you can enter a value obtained by adding a fixed value to a variable value.

Variable: Only a variable can be set.

IsEnabled	<input checked="" type="checkbox"/>
DataType	Numeric
Variable	SampleA

Expression: An arithmetic expression can be entered in addition to variables.

DataType	Numeric	Expression	SampleA
DataType	Numeric	Expression	SampleA / 10

Value: As is the case with Expression, an arithmetic expression can be entered in addition to variables.

\* In the example below, the value obtained by adding Variable "SampleB" and Variable "SampleC" is stored in Variable "SampleD".

Events	< Select Event to Add >
▼ [0]	Press
▼ Actions	< Select Action to Add >
▼ [0]	SetVariable
Variable	SampleD
Value	SampleB+SampleC

[Expression] is mainly used in the [Properties] tab, and [Value] in the [Events and Actions] tab. The figure on the left shows the settings on the [Events and Actions] tab for a Label object.

In [Expression] and [Value], you can use exponentiations and remainders besides the four arithmetic operations.

Input Values		Expression	Displayed Results
SampleA	####	SampleA	####
SampleB	####	SampleA/10	####
SampleC	####	SampleA*10	####
		SampleA+1	####
		SampleA-1	####
		SampleA^2 (exponentiations)	####
		SampleA mod3 (remainders)	####
SampleB+SampleC			
	####		

## 2-3 Functions Unique to Each Object

This section describes the functions of the individual object.

### 2-3-1 NS – NA Functional Objects Correspondence Table

The following table shows correspondence between NS functional objects and NA objects.

NS Functional Objects	NA Objects	Remarks
ON/OFF Buttons (Momentary)	[Buttons]-[Momentary Button]	
ON/OFF Buttons (Alternate)	[Buttons]-[Toggle Button]	
ON/OFF Buttons (Set)	[Buttons]-[Set Button]	
ON/OFF Buttons (Reset)	[Buttons]-[Reset Button]	
Word Buttons (Set Value)	In [Events and Actions], select [SetVariable] and specify an input value.	You can specify the events and actions for not only Buttons but also Labels or Shapes. Refer to "2-3-3 How To Enter a Fixed Value and To Increase/Decrease a Value".
Word Buttons (Increment/Decrement)	In [Events and Actions], select either [IncreaseVariable] or [DecreaseVariable] and set a value.	You can specify the events and actions for not only Buttons but also Labels or Shapes. Refer to "2-3-3 How To Enter a Fixed Value and To Increase/Decrease a Value".
Word Buttons (Display Pop-up menu)	[Standard Controls]-[DropDown]	
Command Buttons (Switch Screen)	In [Events and Actions], select [ShowPage] and determine the destination page.	You can specify the events and actions for not only Buttons but also Labels or Shapes.
Command Buttons (Backward)	In [Events and Actions], select [ShowPreviousPage].	You can specify the events and actions for not only Buttons but also Labels or Shapes.
Command Buttons (Key Buttons)	-	No substitution exists at this point on an object basis. Part of the functions, however, can be reproduced with the use of Visual Basic.
Command Buttons (Control Pop-up Screen – Close Pop-up Screen)	In [Events and Actions], select [ClosePage] and specify the screen to close.	
Bit Lamps	[Lamps]-[Bit Lamp]	
Word Lamps	[Lamps]-[Data Lamp]	
Multifunction objects	-	No particular object exists. You can create an object that has multiple functions by specifying several events and actions for the object. Refer to "2-3-4 How To Create Multifunction Objects".
Text objects	[Standard Controls]-[Label] or [TextBox]	Use Label for a single row, or TextBox for multiple rows. Unlike the NS series, you can specify the events and actions to perform input operations such as writing a value in a variable.
Message Indicator Function (Text objects)	[Lamps]-[Data Lamp]	Unlike the NS series, you cannot specify a different font type/size for each state. However, you can specify a different background/text color for each state. Refer to "2-3-7 How To Create a Message Indicator".

NS Functional Objects	NA Objects	Remarks
Numeral Display and Input objects String Display and Input objects (Enable to input)	[Standard Controls]-[Data Edit]	The Numeral Display and Input objects and the String Display and Input objects have been reorganized to be the Data Edit objects and Data Display objects.
Numeral Display and Input objects String Display and Input objects (Unable to input)	[Standard Controls]-[Data Display]	
List Selection objects	[Standard Controls]-[ListBox]	
Thumbwheel Switches	-	No substitution exists on an object basis. A similar function can be created by combining a numeric object and the events and actions of a button object.
Analog meters	Gauges	
Level meters	Gauges	
Broken-line Graph objects	No corresponding object/function exists at this point. To be supported in the next version upgrade.	
Bitmap objects	[Standard Controls]-[Image]	
Alarm/Event Display object	No corresponding object/function exists.	
Alarm/Event Summary and History object	[HMI Controls]-[User Alarms Viewer]	In the NS series, you can display alarms/events by only specifying the group or display type. In the NA series, however, no corresponding function is available at this point.
Date objects	[Standard Controls]-[DateTime]	You can display date only. While the NS series allows direct date settings from an object, the NA series only allows settings from the system menu.
Time objects	[Standard Controls]-[DateTime]	You can display time only. While the NS series allows direct date settings from an object, the NA series only allows settings from the system menu.
Data Log Graph objects	[HMI Controls]-[Trend Graph]	
Data Block Table objects	[HMI Controls]-[RecipeViewer]	
Video Display objects	[HMI Controls]-[Media Player]	
Temporary Input objects	No corresponding object/function exists.	
Consecutive Line Drawing	[Shapes]-[Polyline]	
Contents Display objects	[Lamps]-[Data Lamp]	You can create a similar function using a Data Lamp. There is a limitation, however, of being unable to specify a different text color or font for each state.
Frames	No corresponding object/function exists at this point. To be supported in the next version upgrade.	

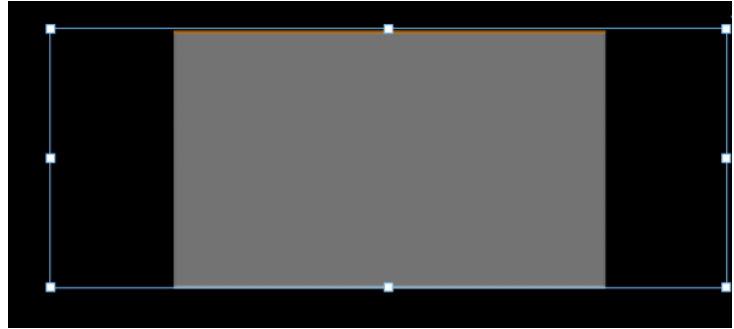


## 2-3-2 Automatic Adjustment of Aspect Ratio for Image Objects

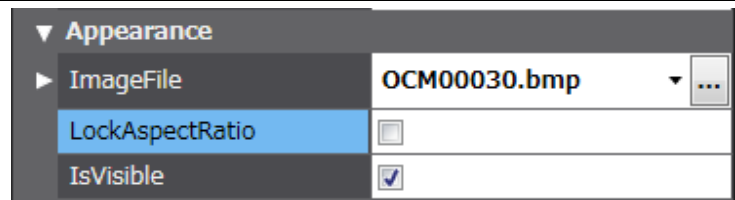
When you use an external image for a Button or Lamp object, the aspect ratio of the object and the image is automatically adjusted. As for the default of an Image object, however, the image's original size is kept when it is displayed.

Following is the procedure to automatically adjust the aspect ratio.

4. By default, when you set an image to an Image object, the height matches the object whereas the width does not, producing blanks on both ends.



5. Select the Image object and open the [Properties] tab. Uncheck the checkbox of [LockAspectRatio] under [Appearance].



6. The image's aspect ratio matches that of the object.



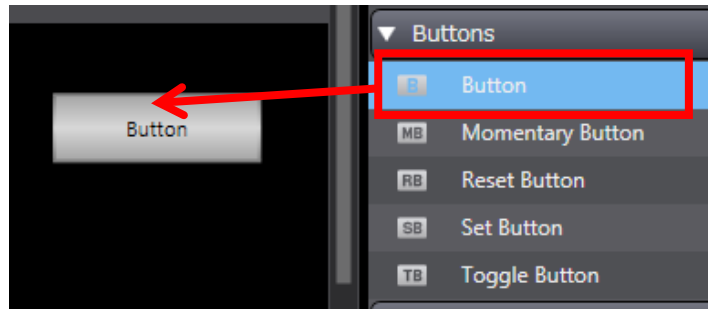
### 2-3-3 How To Enter a Fixed Value and To Increase/Decrease a Value

To enter a fixed value or to increase or decrease a value in a variable or address in the NS series, you use a Word Button.

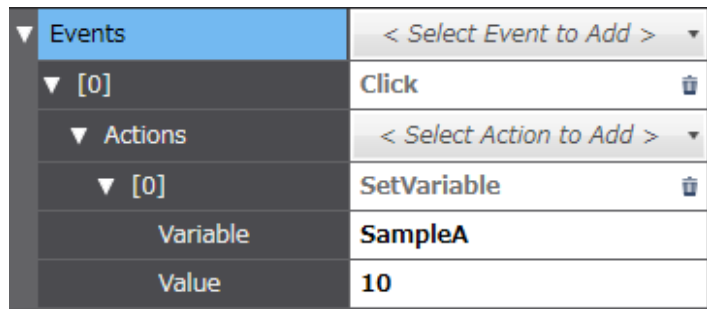
In the NA series, you use Events and Actions.

- Entering a Fixed Value

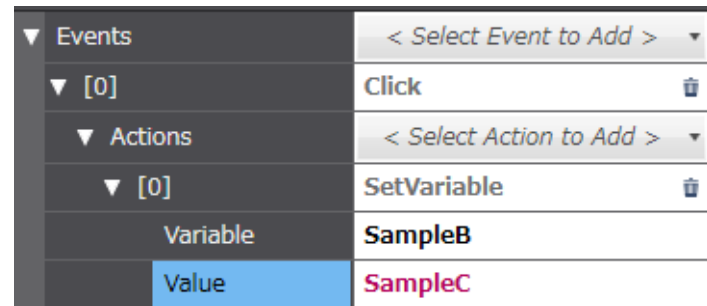
1. Select [Buttons] – [Button] in the Toolbox. Drag and drop it to the page.



2. In the [Events and Actions] tab page, select “click” as [Events] and “SetVariable” as [Actions]. Then, set a target variable in [Variable] and an input value in [Value].

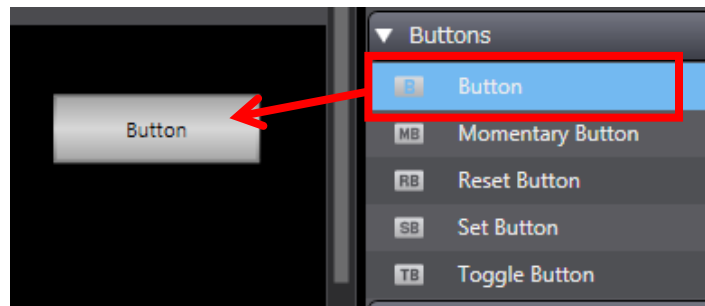


3. You can indirectly specify the input value by setting a variable instead of a fixed value in [Value]. The example on the right shows the value of Variable SampleC is entered in SampleB.

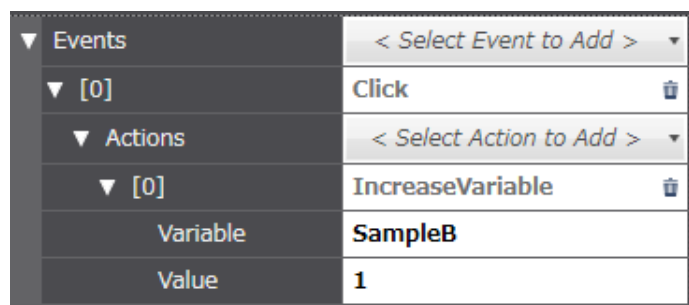


● Increasing/Decreasing a Value

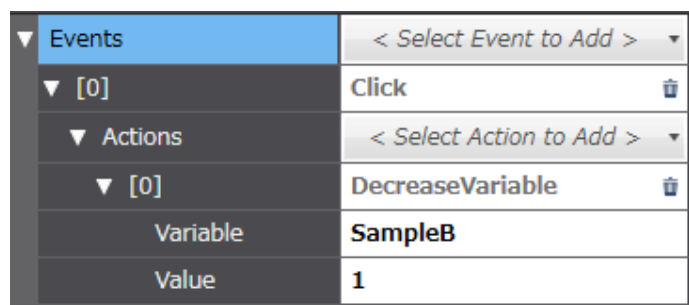
1. Select [Buttons] – [Button] in the Toolbox. Drag and drop it to the page.



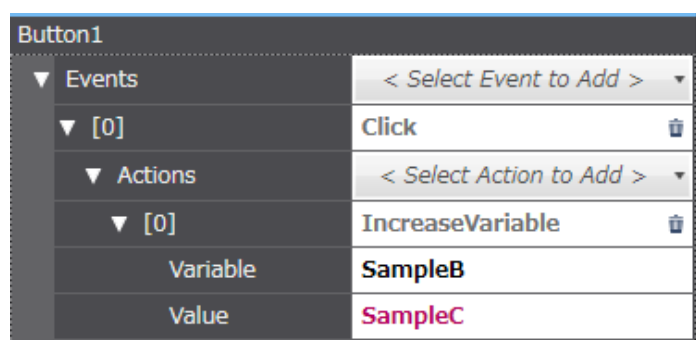
2. In the [Events and Actions] tab page, select “click” as [Events] and “IncreaseVariable” as [Actions]. Then, set a target variable in [Variable] and an increment value in [Value].



3. For subtraction, select “DecreaseVariable” as [Actions] and set a decrement value in [Value].



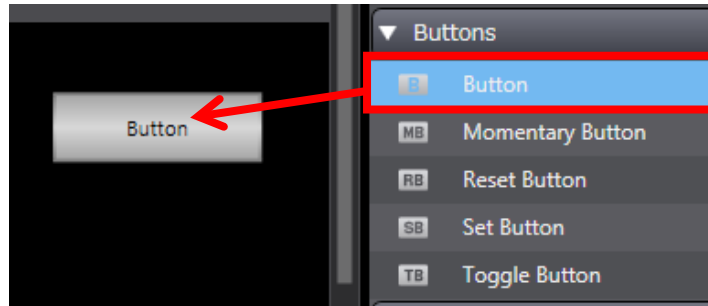
4. You can indirectly specify the increment/decrement value by setting a variable instead of a fixed value in [Value].



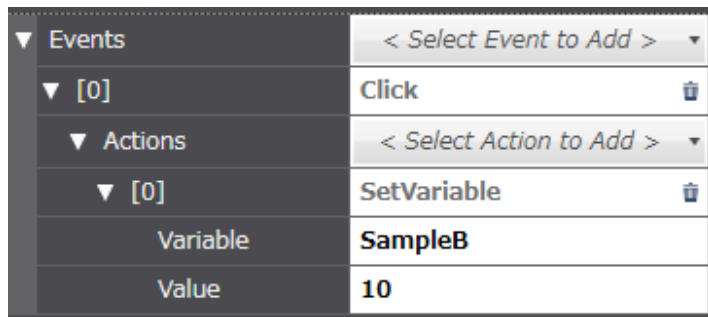
## 2-3-4 How To Create Multifunction Objects

In the NS series, there exist the Multifunction objects that have multiple functions within the single object. In the NA series, by contrast, such objects that are dedicated for multifunction do not exist. You can realize multifunction, however, by assigning multiple events and actions to a single object.

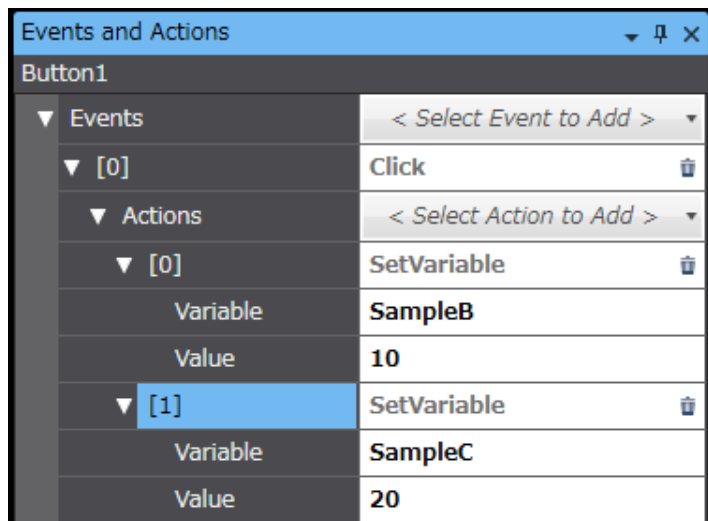
1. Select [Buttons] – [Button] in the Toolbox. Drag and drop it to the page.



2. In the [Events and Actions] tab page, select “click” as [Events] and “SetVariable” as [Actions]. Then, set the target variable in [Variable] and an input value in [Value].



3. Subsequently select “SetVariable” as [Actions] and set a target variable in [Variable] and an input value in [Value], both of which are different from those set in Step 2 above.



## 2-3-5 Date and Time Display Format

While the NS series has the respective independent date and time objects, the NA series has the integrated data and time display objects. You can still display only date or time by specifying the format.

15 types of formats are available. The users can arbitrarily specify one of them.

In addition in the NS series, you can set the clocks built in the PTs by specifying input permission for either a date or a time object. In the NA series, however, you cannot specify time from a DateTime object.

Formats	Display Examples (for 13:08:54 on June 5 <sup>th</sup> 2015)
ShortDatePattern	06/05/2015
LongDatePattern	Friday,05 June 2015
FullDateShortTimePattern	Friday,05 June 2015 13:08
FullDateTimePattern	Friday,05 June 2015 13:08:54
ShortDateTimePattern	06/05/2015 13:08
ShortDateLongTimePattern	06/05/2015 13:08:54
MonthDayPattern	June 05
Rfc1123Pattern	Fri,05 June 2015 13:08:54 GMT
SortedDateTimePattern	2015-06-05T13:08:54
ShortTimePattern	13:08
LongTimePattern	13:08:54
UniversalSortedDateTimePattern	2015-06-05 13:08:54Z
UniversalSortedDatePattern	Friday,05 June 2015 04:08:54
YearMonthPattern	2015 June
UseCustomDateTimePattern	User-defined setting <sup>*1</sup>

\*1: Users can arbitrarily specify [CustomFormat] as shown below.



### • Setting Examples for UseCustomDateTimePattern

CustomFormat Settings	Display Examples (for 13:08:54 on June 5 <sup>th</sup> 2015)
yyyy/MM/dd HH:mm:ss	2015/06/05 13:08:54
yy-MM-dd dddd HH:mm:ss dddd	15-06-05 Friday 13:08:54
yy/M/d ddd H:m:s	15/6/5 Fri 13:8:54
MMMM dd tt hh:mm:ss	June 05 PM 01:08:54
MMM dd hh:mm:ss t	Jun 05 01:08:54 P

#### Note:

The Formats are case sensitive. Thus, if you set as YYYY/MM/DD, the year and date are not properly displayed.

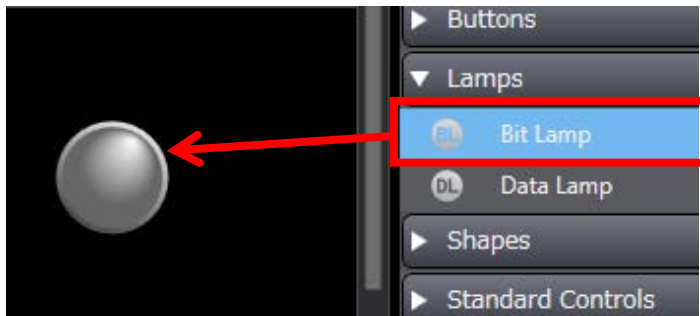
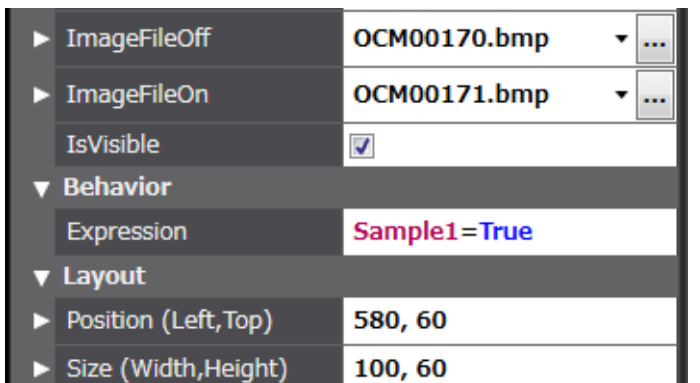
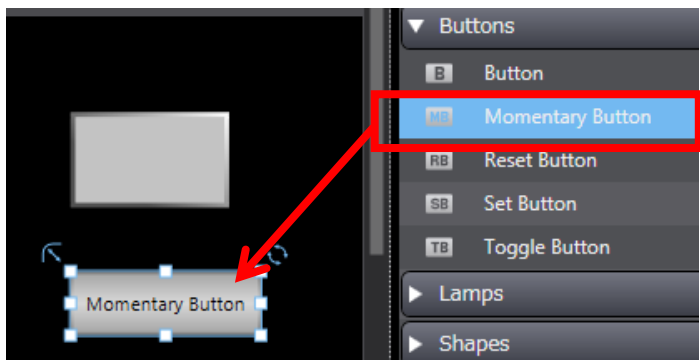
## 2-3-6 Changing the State of the Button Object

In the NA series, states of a Button object can only be changed when it is pressed down. Thus, it does not have the same function of state change by an address as the NS series does.

To make the behaviors of the Button objects equivalent to those of the NS series, you must combine the Button object with a Lamp object.

- Changing the State by Turning ON/OFF the Write Address

This is equivalent to Type 1 Buttons in the NS series. The state is not changed when pressed down, but changed when turning ON or OFF the write address.

<p>1. Select the [Toolbox] tab. On the tab page, select [Lamps] – [Bit Lamp], then drag and drop it to the page.</p>	 A screenshot of a software interface's toolbox. The 'Lamps' category is expanded, and 'Bit Lamp' is highlighted with a red box. A red arrow points from the 'Bit Lamp' icon to a grey sphere on the page.
<p>2. Select the Bit Lamp and open the [Properties] tab page. Specify [Appearance] and [Layout] arbitrarily. At the same time, specify the condition to change the state (i.e. the write address as defined in the NS series).</p>	 A screenshot of the properties panel for a 'Bit Lamp' object. The 'ImageFileOff' is set to 'OCM00170.bmp' and 'ImageFileOn' is set to 'OCM00171.bmp'. The 'IsVisible' checkbox is checked. Under 'Behavior', the 'Expression' is set to 'Sample1=True'. Under 'Layout', the 'Position (Left,Top)' is '580, 60' and 'Size (Width,Height)' is '100, 60'.
<p>3. Select the [Toolbox] tab. On the tab page, select [Buttons] – [Momentary Button], then drag and drop it to the page. (Select a Toggle Button if you need toggle operation, or a Set Button for set operation. You can select a button to create depending on the function.)</p>	 A screenshot of a software interface's toolbox. The 'Buttons' category is expanded, and 'Momentary Button' is highlighted with a red box. A red arrow points from the 'Momentary Button' icon to a rectangular button on the page.

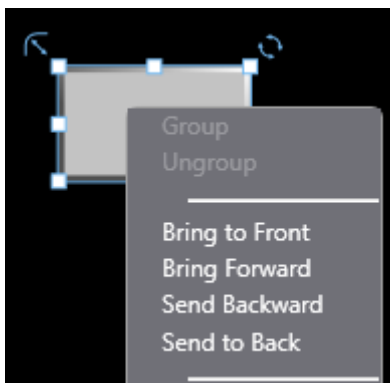
4. Set all the parameters to specify the colors of the Momentary Button to "Transparent".

TextColorButtonUp	<input type="checkbox"/> Transparent	▼
TextColorButtonDown	<input type="checkbox"/> Transparent	▼
BackgroundColorButtonU	<input type="checkbox"/> Transparent	▼
BackgroundColorButtonD	<input type="checkbox"/> Transparent	▼
BorderColorButtonUp	<input type="checkbox"/> Transparent	▼
BorderColorButtonDown	<input type="checkbox"/> Transparent	▼

5. For the behavioral condition of the Momentary Button, specify the same variable as that specified for the Bit Lamp created in Step 2 above. Adjust [Position] and [Size] to those of the Bit Lamp created in Steps 1 and 2.

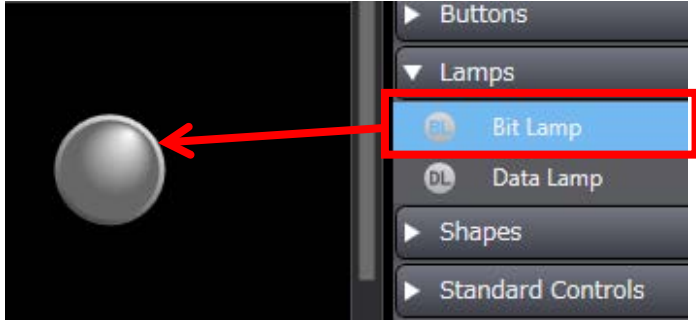
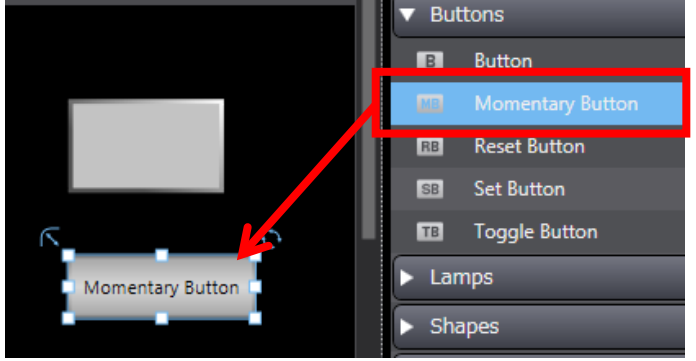
▼ Behavior	
Variable	Sample1
IsEnabled	<input checked="" type="checkbox"/>
DoubleTouchTime	0
OnDelayTime	0
OffDelayTime	0
▼ Layout	
▶ Position (Left,Top)	580, 60
▶ Size (Width,Height)	100, 60

6. If the objects are overlapped with each other, the one in the back does not operate. Right-click the Lamp and select [Send to Back] from the context menu so that the Button comes forward.



● Changing the State by Turning ON/OFF the Display Address

This is equivalent to Type 2-1 Buttons in the NS series. The state is not changed when pressed down, but changed when turning ON or OFF the display address.

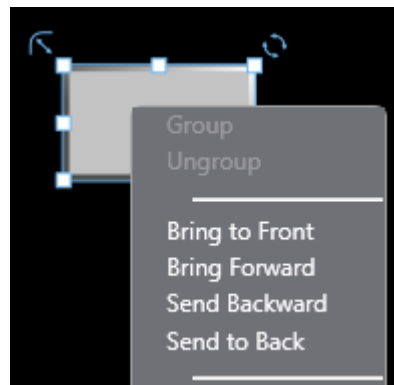
<p>1. Select the [Toolbox] tab. On the tab page, select [Lamps] – [Bit Lamp], then drag and drop it to the page.</p>																																	
<p>2. Select the Bit Lamp and open the [Properties] tab page. Specify [Appearance] and [Layout] arbitrarily. At the same time, specify the condition to change the state (i.e. the display address as defined in the NS series). If you only enter variable name in [Expression], it is defined as accompanied by “=True”.</p>	<table border="1"> <tr> <td>▶ ImageFileOff</td> <td>OCM00170.bmp</td> <td>▼</td> <td>...</td> </tr> <tr> <td>▶ ImageFileOn</td> <td>OCM00171.bmp</td> <td>▼</td> <td>...</td> </tr> <tr> <td>IsVisible</td> <td><input checked="" type="checkbox"/></td> <td></td> <td></td> </tr> <tr> <td>▼ Behavior</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Expression</td> <td>Sample2=True</td> <td></td> <td></td> </tr> <tr> <td>▼ Layout</td> <td></td> <td></td> <td></td> </tr> <tr> <td>▶ Position (Left,Top)</td> <td>580, 60</td> <td></td> <td></td> </tr> <tr> <td>▶ Size (Width,Height)</td> <td>100, 60</td> <td></td> <td></td> </tr> </table>	▶ ImageFileOff	OCM00170.bmp	▼	...	▶ ImageFileOn	OCM00171.bmp	▼	...	IsVisible	<input checked="" type="checkbox"/>			▼ Behavior				Expression	Sample2=True			▼ Layout				▶ Position (Left,Top)	580, 60			▶ Size (Width,Height)	100, 60		
▶ ImageFileOff	OCM00170.bmp	▼	...																														
▶ ImageFileOn	OCM00171.bmp	▼	...																														
IsVisible	<input checked="" type="checkbox"/>																																
▼ Behavior																																	
Expression	Sample2=True																																
▼ Layout																																	
▶ Position (Left,Top)	580, 60																																
▶ Size (Width,Height)	100, 60																																
<p>3. Select the [Toolbox] tab. On the tab page, select [Buttons] – [Momentary Button], then drag and drop it to the page. (Select a Toggle Button if you need toggle operation, or a Set Button for set operation. You can select a button to create depending on the function.)</p>																																	
<p>4. Set all the parameters to specify the colors of the Momentary Button to “Transparent”.</p>	<table border="1"> <tr> <td>TextColorButtonUp</td> <td><input type="checkbox"/> Transparent</td> <td>▼</td> </tr> <tr> <td>TextColorButtonDown</td> <td><input type="checkbox"/> Transparent</td> <td>▼</td> </tr> <tr> <td>BackgroundColorButtonU</td> <td><input type="checkbox"/> Transparent</td> <td>▼</td> </tr> <tr> <td>BackgroundColorButtonD</td> <td><input type="checkbox"/> Transparent</td> <td>▼</td> </tr> <tr> <td>BorderColorButtonUp</td> <td><input type="checkbox"/> Transparent</td> <td>▼</td> </tr> <tr> <td>BorderColorButtonDown</td> <td><input type="checkbox"/> Transparent</td> <td>▼</td> </tr> </table>	TextColorButtonUp	<input type="checkbox"/> Transparent	▼	TextColorButtonDown	<input type="checkbox"/> Transparent	▼	BackgroundColorButtonU	<input type="checkbox"/> Transparent	▼	BackgroundColorButtonD	<input type="checkbox"/> Transparent	▼	BorderColorButtonUp	<input type="checkbox"/> Transparent	▼	BorderColorButtonDown	<input type="checkbox"/> Transparent	▼														
TextColorButtonUp	<input type="checkbox"/> Transparent	▼																															
TextColorButtonDown	<input type="checkbox"/> Transparent	▼																															
BackgroundColorButtonU	<input type="checkbox"/> Transparent	▼																															
BackgroundColorButtonD	<input type="checkbox"/> Transparent	▼																															
BorderColorButtonUp	<input type="checkbox"/> Transparent	▼																															
BorderColorButtonDown	<input type="checkbox"/> Transparent	▼																															



5. For the behavioral condition of the Momentary Button, specify the write address as defined in the NS series. Adjust [Position] and [Size] to those of the Bit Lamp created in Steps 1 and 2.

▼ Behavior	
Variable	Sample1
IsEnabled	<input checked="" type="checkbox"/>
DoubleTouchTime	0
OnDelayTime	0
OffDelayTime	0
▼ Layout	
▶ Position (Left,Top)	580, 60
▶ Size (Width,Height)	100, 60

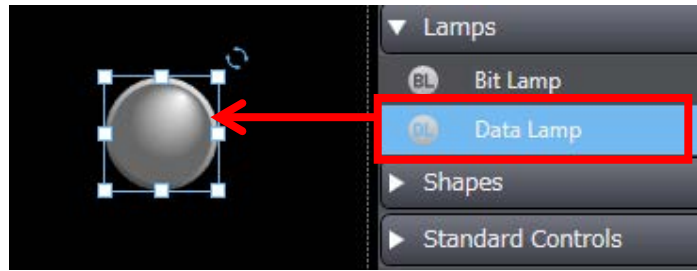
6. If the objects are overlapped with each other, the one in the back does not operate. Right-click the Lamp and select [Send to Back] from the context menu so that the Button comes forward.



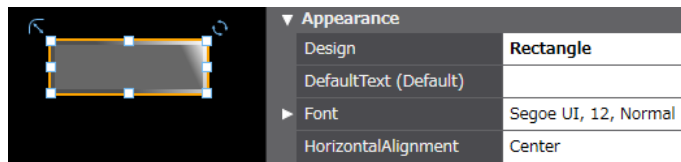
## 2-3-7 How To Create a Message Indicator

In the NS series, there is the Message Indicator that enables its state to be changed by the value of the variable. In the NA series, you can realize the function by using a Lamp object. Note, however, that in the NS series you can specify the different font type or color for each state whereas in the NA series you cannot change the basic settings. You can still change background or text colors as before.

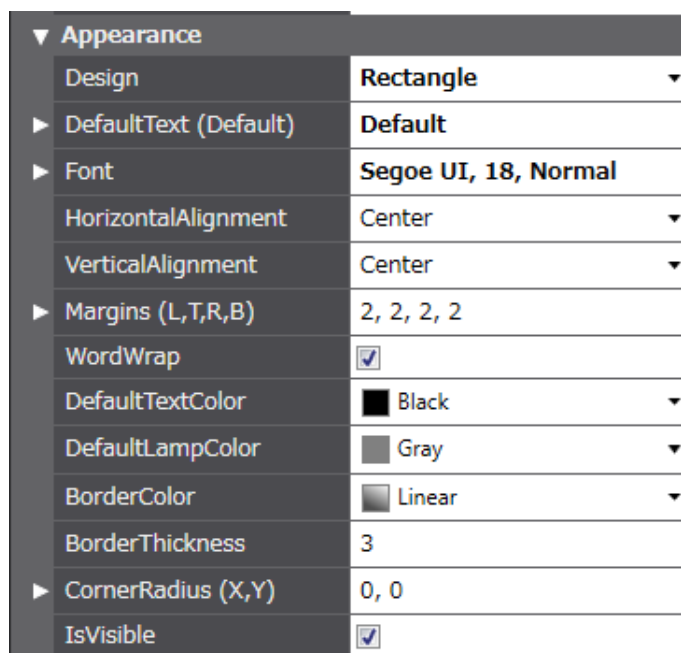
1. Select [Lamps] – [Data Lamp] in the Toolbox. Drag and drop it to the page.



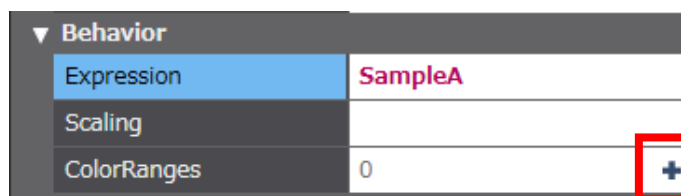
2. Select the object and open the [Properties] tab page. Specify [Design] under [Appearance] as "Rectangle" to adjust the size arbitrarily.



3. Under [Appearance], specify the text, font type, and other parameters arbitrarily to change them from defaults.



4. Set the variable that controls state change in [Expression] under [Behavior], and click the cross (+) in [ColorRanges].



5. A setting field is added under [ColorRanges]. Set the condition in [StartValue]. Set also the text in [Text (Default)], background color in [LampColor], and text color in [TextColor] for the cases where the condition specified in [StartValue] is met. The example on the right shows that if the value of Variable "SampleA" becomes 1 or greater the text reads "State 1", the background color turns white, and the text color turns red.

▼ Behavior	
Expression	SampleA
Scaling	
▼ ColorRanges	1 +
▼ [0]	>= 1 🗑
StartValue	1
▶ Text (Default)	State 1
LampColor	<input type="checkbox"/> White ▼
TextColor	<input checked="" type="checkbox"/> Red ▼

6. To add more conditions, click the cross (+) in [ColorRanges] to add the setting fields and repeat Step 5.

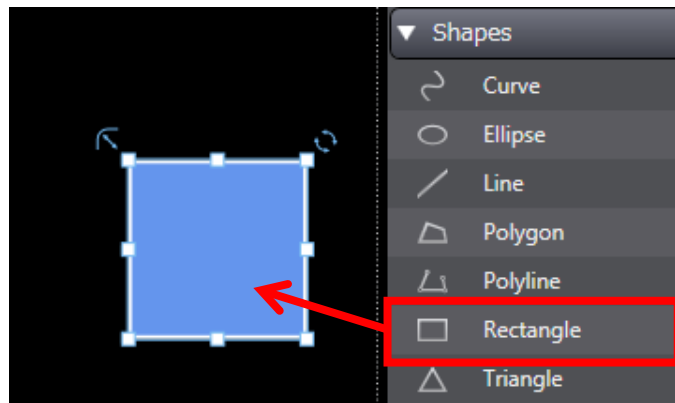
▼ Behavior	
Expression	SampleA
Scaling	
▼ ColorRanges	3 +
▶ [0]	>= 1 🗑
▶ [1]	>= 2 🗑
▶ [2]	>= 3 🗑

## 2-3-8 How To Create a Lamp Object with No Gradation

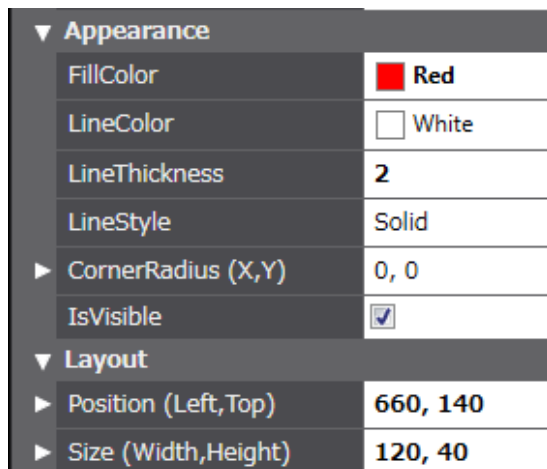
The NA-series Lamp objects are gradated by default. You cannot make a Lamp of which appearance is perfectly identical to a Button even if you specify the same color for the Lamp as that of the Button (see the figure below). You can avoid the gradation by setting [Design] under [Appearance] to "Image" and importing an external image. You can also substitute the partial function of a Lamp by using the animation function.



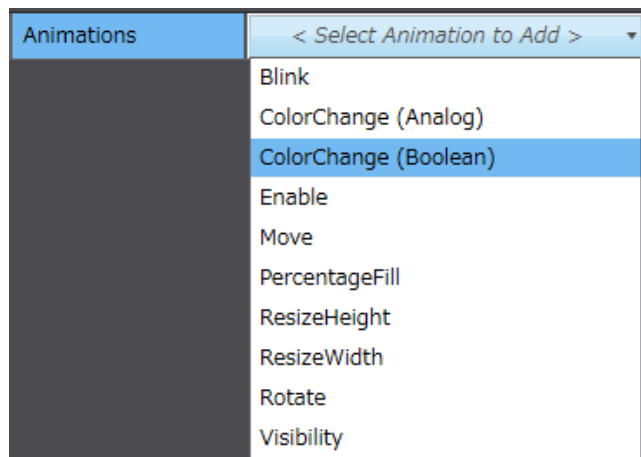
1. Select [Shapes] – [Rectangle] in the Toolbox. Drag and drop it to the page.



2. Select the object and open the [Properties] tab page. Specify [FillColor] and [LineColor] under [Appearance], and [Size] under [Layout] arbitrarily.



3. Open the [Animations] tab page. Select "ColorChange (Boolean)" as [Animations].



4. Specify the condition to change the background color in [Expression], the color at the time when the conditions is “False” in [OffColor], and the color at the time when the condition is “True” in [OnColor].  
Note that for the Shape objects you can only modify the color of background. Unlike the Lamp objects, you cannot change the color of the frame.

Animations	< Select Animation to Add >
▼ [0]	ColorChange (Boolean)
Expression	SampleA=True
OffColor	Red
OnColor	Blue

5. To add a label, select [Standard Controls] – [Label] in the Toolbox. Drag and drop it to the object that has been created up until Step 4 to add an arbitrary text.  
As is the case with the Rectangle objects, you can change the state of the Label objects by specifying “ColorChange” in the [Animations] tab. Except for the frame color, you can reproduce the function almost equivalent to that of Bit Lamp objects.



6. Like a Data Lamp object, if you wish to use a function of switching the state depending on the variable value, select “ColorChange (Analog)” in Step 3.

Animations	< Select Animation to Add >
	Blink
	ColorChange (Analog)
	ColorChange (Boolean)

7. Set the variable that controls state change in [Expression] under [Animations], and click the cross (+) in [ColorRanges].

Animations	< Select Animation to Add >
▼ [0]	ColorChange (Analog)
Expression	SampleA
DefaultColor	Red
ColorRanges	0

8. A setting field is added under [ColorRanges]. Set the condition in [StartValue]. Set also the background color in [Color] for the cases where the condition specified in [StartValue] is met. The example on the right shows that if the value of Variable “SampleA” becomes 5 or greater, the background color turns white. To add more conditions, click the cross (+) in [ColorRanges] to add the setting fields.

Animations	< Select Animation to Add >
▼ [0]	ColorChange (Analog)
Expression	SampleA
DefaultColor	Red
▼ ColorRanges	1
▼ [0]	>= 5
StartValue	5
Color	White

## 2-3-9 Decimal Display of Integer-type Values

This is equivalent to the function specified by “Unit & Scale” in the NS series.

At this point, the Data Display objects are the only objects that can display values with a decimal point for the integer-type variables, with the use of this function. Because the Data Edit objects cannot be specified by arithmetic operations, if you wish to deal with decimals, you must specify the data type of the variable as the floating point type.

The following example explains how to set a scale of “0.1” to Variable “SampleA”.

1. Open the [Properties] tab page of a Data Display object, and specify each parameter as shown in the figure on the right. Specify the scale in [Expression] and the display format in [DisplayFormat].

▼ Behavior	
DataType	Numeric ▼
Expression	SampleA /10
Scaling	
ValueFormat	Decimal ▼
DisplayFormat	###.# ▼

2. In Step 1 above, if you set “1234” in Variable “SampleA”, the result is as shown in the figure on the right.

Input Value	####
Displayed Result	###.#

The scale function is to be implemented for the Data Edit and Data Display objects in the version upgrade scheduled in September.

## 2-3-10 Alarm Objects

The Alarm Objects in the NA series are significantly different from those of the NS series in terms of the behaviors by the default settings. This subsection describes the alarm settings more similar to those of the NS series.

- How To Disable the Popup Screen Upon Confirming Alarms

By default of the NA-series alarm objects, a popup page that includes the alarm's detailed information comes up when you touch the raised alarm. Following is the procedure to disable the popup page.

1. In the Multiview Explorer, select [Group0] under [HMI]-[User Alarms].

Group Display Name							
Name	Alarm ID	Alarm Code	Expression	Priority	Message	Popup	Acknowledge
Alarm1	Group0_Alarm1		blnAlarm1=True	User Fault Level 4	Alarm1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Alarm2	Group0_Alarm2		blnAlarm2=True	User Fault Level 4	Alarm2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Alarm3	Group0_Alarm3		blnAlarm3=True	User Fault Level 4	Alarm2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Alarm4	Group0_Alarm4		blnAlarm4=True	User Fault Level 4	Alarm2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Alarm5	Group0_Alarm5		blnAlarm5=True	User Fault Level 4	Alarm2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

2. Uncheck the checkbox of "Popup".

Popup	Acknowledge
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

● How To Display Information on Raised/Cleared Alarms

The default of the NA-series alarm objects does not display information on raised or cleared alarms. The figure below shows a record including raised/cleared Alarm Messages 1 to 3 respectively. However, without indication of raised or cleared, the table is difficult to understand.

In addition, the NS series can display in a single row an alarm that has been raised and cleared, whereas the NA series forcibly separates the raised from the cleared to display in different rows. You can display neither only alarms that have been raised, nor only those that have been cleared.

Date and Time	Message	Priority	Group
9/30/2015 9:46:55 AM	AlarmMessage2	Level 1	
9/30/2015 9:46:50 AM	AlarmMessage3	Level 1	
9/30/2015 9:46:46 AM	AlarmMessage3	Level 1	
9/30/2015 9:46:44 AM	AlarmMessage2	Level 1	
9/30/2015 9:46:43 AM	AlarmMessage1	Level 1	
9/30/2015 9:46:31 AM	AlarmMessage1	Level 1	

<p>1. Select a User Alarm Viewer on the Page Editor and open the [Properties] tab page. (The figure to the right shows the default settings.)</p>	<table border="1"> <tr> <td>ColumnTitles</td> <td>Date and Time Message Priority Group</td> </tr> <tr> <td>ColumnOrder</td> <td>Time Message Priority Group</td> </tr> <tr> <td>ColumnWidths</td> <td>130.0 300.0 80.0 200.0</td> </tr> </table>	ColumnTitles	Date and Time Message Priority Group	ColumnOrder	Time Message Priority Group	ColumnWidths	130.0 300.0 80.0 200.0
ColumnTitles	Date and Time Message Priority Group						
ColumnOrder	Time Message Priority Group						
ColumnWidths	130.0 300.0 80.0 200.0						
<p>2. Add “Status ” before [ColumnTitles] and [ColumnOrder]. In [ColumnWidths], specify arbitrary width of the item. Since this item is case sensitive, always capitalize “Status ”.</p>	<table border="1"> <tr> <td>ColumnTitles</td> <td>Status Date and Time Message Priority Group</td> </tr> <tr> <td>ColumnOrder</td> <td>Status Time Message Priority Group</td> </tr> <tr> <td>ColumnWidths</td> <td>160.0 210.0 210.0 90.0 70.0</td> </tr> </table>	ColumnTitles	Status Date and Time Message Priority Group	ColumnOrder	Status Time Message Priority Group	ColumnWidths	160.0 210.0 210.0 90.0 70.0
ColumnTitles	Status Date and Time Message Priority Group						
ColumnOrder	Status Time Message Priority Group						
ColumnWidths	160.0 210.0 210.0 90.0 70.0						

With the above settings, the alarm object is displayed as below:

The information on raised/cleared alarms is shown in the “Status” column.

“Alarm Raised” indicates those that have been raised, and “Alarm Cleared” those cleared.

Status	Date and Time	Message	Priority	Group
Alarm Cleared	9/30/2015 9:52:50 AM	AlarmMessage2	Level 1	
Alarm Cleared	9/30/2015 9:52:48 AM	AlarmMessage3	Level 1	
Alarm Raised	9/30/2015 9:52:46 AM	AlarmMessage3	Level 1	
Alarm Raised	9/30/2015 9:52:44 AM	AlarmMessage2	Level 1	
Alarm Cleared	9/30/2015 9:52:40 AM	AlarmMessage1	Level 1	
Alarm Raised	9/30/2015 9:52:38 AM	AlarmMessage1	Level 1	

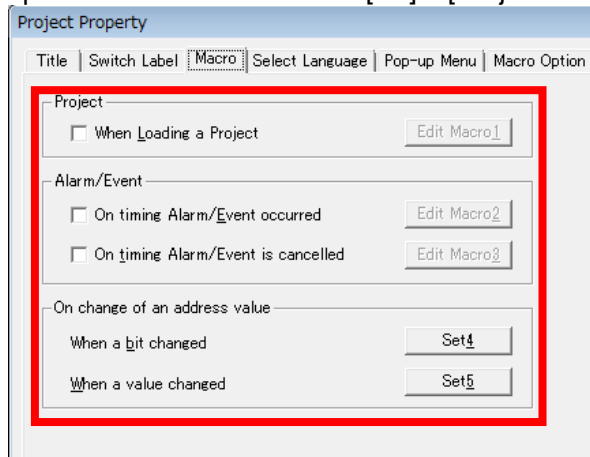


## 2-4 Others

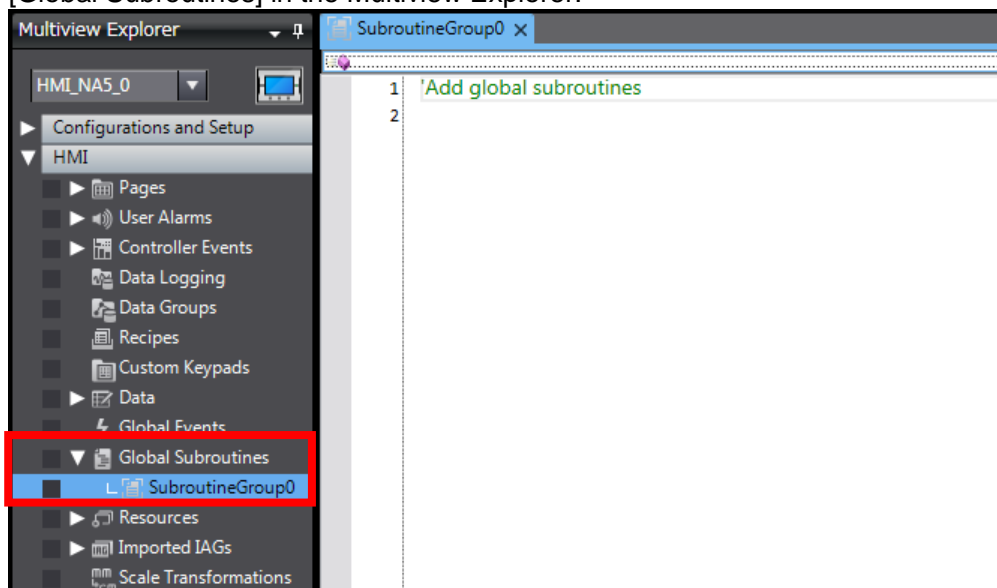
### 2-4-1 How To Specify Subroutines (Macro) in the System Settings

The Subroutines in the NA series correspond to the macro functions in the NS series. Users can arbitrarily write programs to add functions that are not supported by the basic features.

This subsection describes the procedure in the NA series to execute a macro that could be specified in the command of [PT] – [Project Properties] – [Macro] in the NS series.



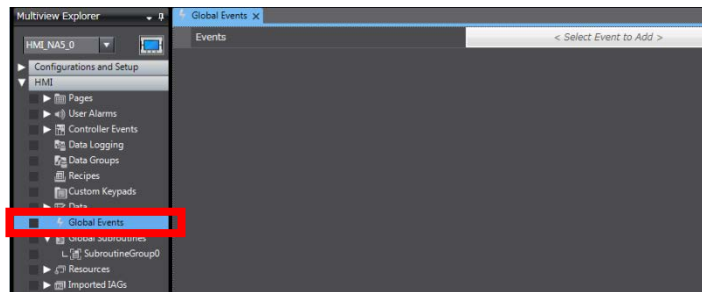
Write the contents of the subroutine on the [SubroutineGroup] tab page under [HMI] – [Global Subroutines] in the Multiview Explorer.



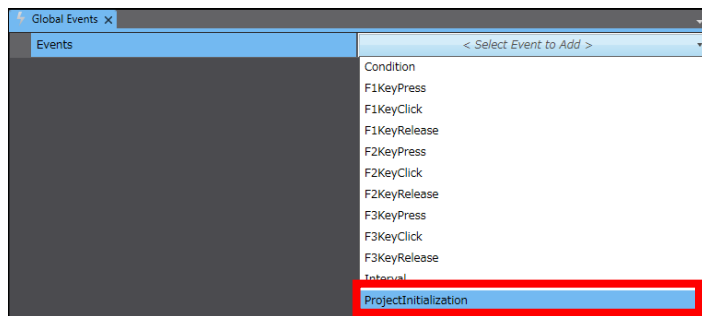
● Creating the Subroutine That Runs Upon Loading a Project

Following is the procedure to create the subroutine that is executed upon starting up the system after power is supplied to the NA series.

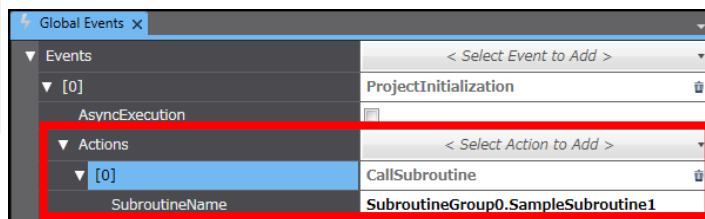
1. In the Multiview Explorer, select [HMI]-[Global Events].



2. In the [Events and Actions] tab page, select "ProjectInitialization" as [Events].



3. Select "CallSubroutine" as [Actions] and specify the subroutine to call in the [SubroutineName] field.

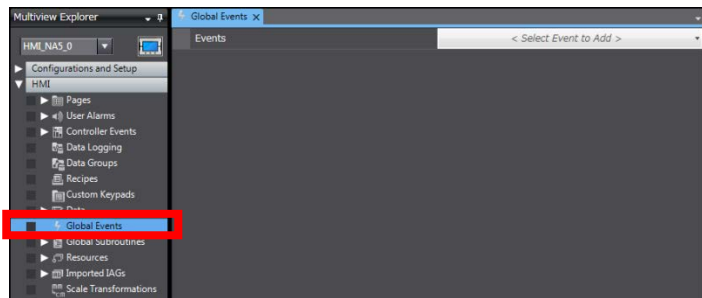


- Creating the Subroutine That Runs Upon Activation/Deactivation of an Alarm Event  
In the NS series, a macro can be run upon activation or deactivation of an alarm. In the NA series, it can also be run even at the timing of confirming an alarm.

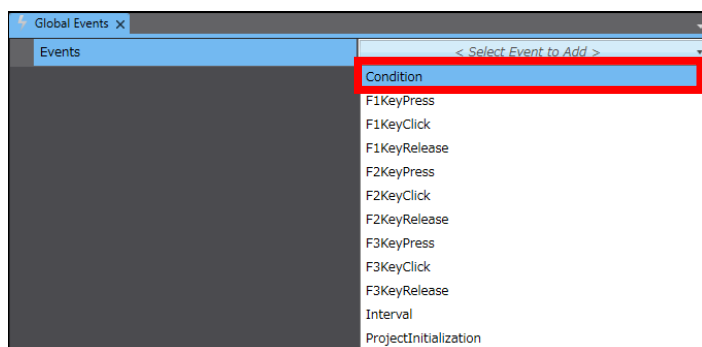
<p>1. In the Multiview Explorer, select [Group0] under [HMI]-[User Alarms].</p>	<table border="1"> <thead> <tr> <th>Name</th> <th>Alarm ID</th> <th>Alarm Code</th> <th>Expression</th> <th>Priority</th> <th>Message</th> </tr> </thead> <tbody> <tr> <td>Alarm1</td> <td>Group0_Alarm1</td> <td></td> <td>binAlarm1=True</td> <td>User Fault Level 4</td> <td>Alarm1</td> </tr> <tr> <td>Alarm2</td> <td>Group0_Alarm2</td> <td></td> <td>binAlarm2=True</td> <td>User Fault Level 4</td> <td>Alarm2</td> </tr> <tr> <td>Alarm3</td> <td>Group0_Alarm3</td> <td></td> <td>binAlarm3=True</td> <td>User Fault Level 4</td> <td>Alarm2</td> </tr> <tr> <td>Alarm4</td> <td>Group0_Alarm4</td> <td></td> <td>binAlarm4=True</td> <td>User Fault Level 4</td> <td>Alarm2</td> </tr> <tr> <td>Alarm5</td> <td>Group0_Alarm5</td> <td></td> <td>binAlarm5=True</td> <td>User Fault Level 4</td> <td>Alarm2</td> </tr> </tbody> </table>	Name	Alarm ID	Alarm Code	Expression	Priority	Message	Alarm1	Group0_Alarm1		binAlarm1=True	User Fault Level 4	Alarm1	Alarm2	Group0_Alarm2		binAlarm2=True	User Fault Level 4	Alarm2	Alarm3	Group0_Alarm3		binAlarm3=True	User Fault Level 4	Alarm2	Alarm4	Group0_Alarm4		binAlarm4=True	User Fault Level 4	Alarm2	Alarm5	Group0_Alarm5		binAlarm5=True	User Fault Level 4	Alarm2
Name	Alarm ID	Alarm Code	Expression	Priority	Message																																
Alarm1	Group0_Alarm1		binAlarm1=True	User Fault Level 4	Alarm1																																
Alarm2	Group0_Alarm2		binAlarm2=True	User Fault Level 4	Alarm2																																
Alarm3	Group0_Alarm3		binAlarm3=True	User Fault Level 4	Alarm2																																
Alarm4	Group0_Alarm4		binAlarm4=True	User Fault Level 4	Alarm2																																
Alarm5	Group0_Alarm5		binAlarm5=True	User Fault Level 4	Alarm2																																
<p>2. Select the alarm event to which to assign a subroutine, and open the [Events and Actions] tab page.</p>																																					
<p>3. To execute the subroutine upon occurrence of the alarm, select "Raised" as [Events]. Similarly, select "Cleared" to execute upon reset, and "Acknowledged" upon confirmation.</p>																																					
<p>4. Select "CallSubroutine" as [Actions] and specify the subroutine to call in the [SubroutineName].</p>	<table border="1"> <thead> <tr> <th>Events</th> <th>Actions</th> <th>SubroutineName</th> </tr> </thead> <tbody> <tr> <td>&lt; Select Event to Add &gt;</td> <td>&lt; Select Action to Add &gt;</td> <td></td> </tr> <tr> <td>[0] Raised</td> <td></td> <td></td> </tr> <tr> <td></td> <td>[0] CallSubroutine</td> <td></td> </tr> <tr> <td></td> <td></td> <td>SubroutineGroup0.SampleSubroutine1</td> </tr> </tbody> </table>	Events	Actions	SubroutineName	< Select Event to Add >	< Select Action to Add >		[0] Raised				[0] CallSubroutine				SubroutineGroup0.SampleSubroutine1																					
Events	Actions	SubroutineName																																			
< Select Event to Add >	< Select Action to Add >																																				
[0] Raised																																					
	[0] CallSubroutine																																				
		SubroutineGroup0.SampleSubroutine1																																			

● Creating the Subroutine That Runs Upon Change of Bit/Value

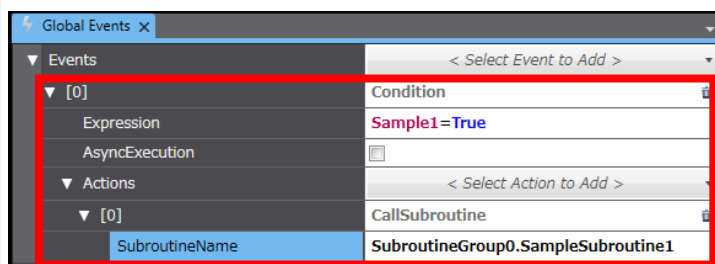
1. In the Multiview Explorer, select [HMI]-[Global Events].



2. In the [Events and Actions] tab page, select "Condition" as [Events].



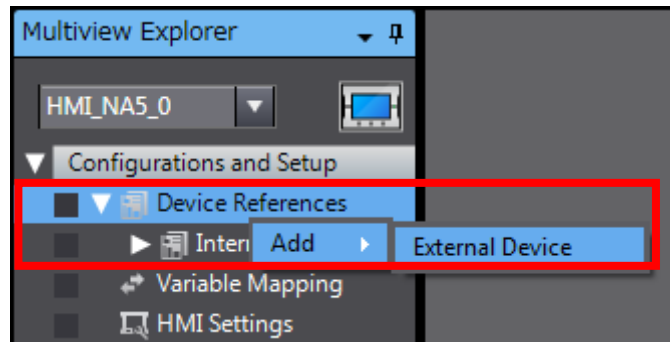
3. Specify the condition of subroutine function in the [Expression] field. Then select "CallSubroutine" as [Actions] and specify the subroutine to call in the [SubroutineName] field.



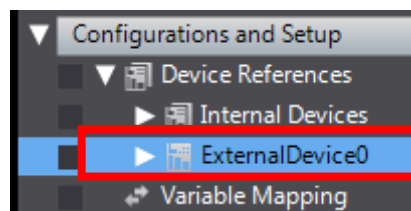
## 2-4-2 Connecting with the CJ-series CPU

The NA series can be connected with the CJ series in addition to the NJ series. To use the variables of the CJ series in NA, you must specify the CJ-series PLC as the connected device, and register the variables of CJ into the NA. Following is the procedure to register the CJ series as the connected device in NA.

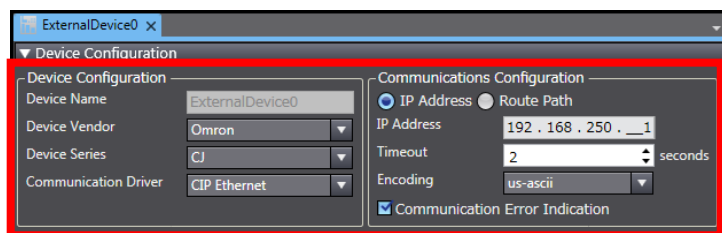
1. In the Multiview Explorer, right-click [Device References] and select [Add] – [External Device].



2. Double-click [ExternalDevice0] that is created under [Device References].



3. In the [ExternalDevice0] tab page, select "CJ" as [Device] in the [Device Configuration] field. Select either "CIP Ethernet" or "FINS Ethernet" as [Communication Driver]. In the [IP Address] field in the [Communications Configuration] field, specify the IP address of the connected PLC.



There are three ways to register in the NA the variables of the CJ registered as an external device:

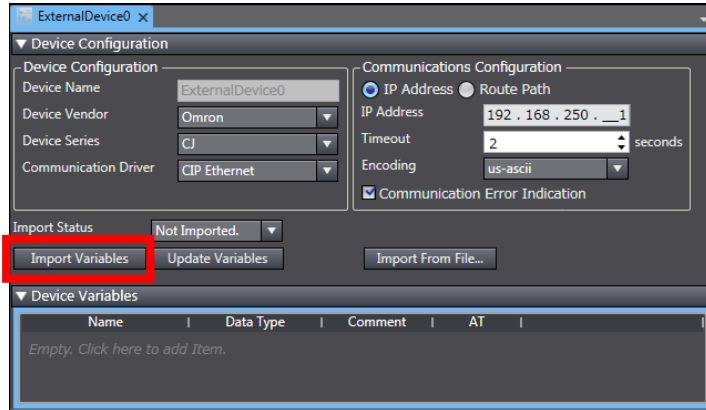
- to import the variables directly from the device or to update the variables,
- to directly enter the variables in the variable table, or
- to copy and paste the variables from a file such as Excel.

Neither way from among those described above allows import of the CJ's system variables.

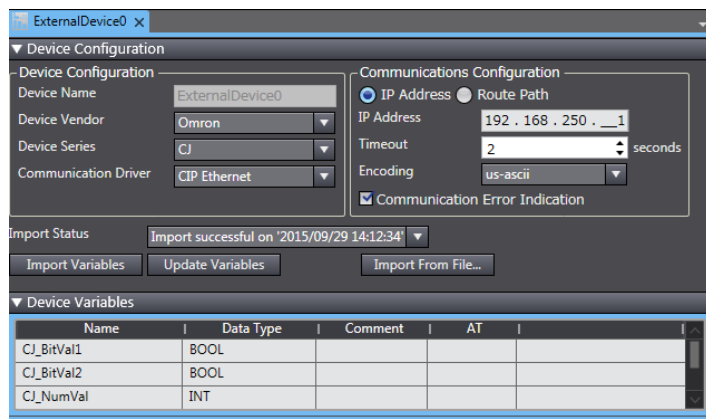
● Importing or Updating the Variables Directly from the Device

This is only available if “CIP Ethernet” is selected as [Communication Driver]. You must transfer the variable table to the CPU unit in advance.

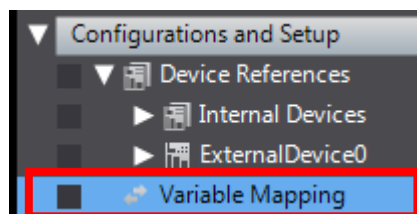
1. While the CJ-series CPU and the computer are connected via an Ethernet cable, select “Import”. (At this time, it does not matter even if “USB” has been selected for communication setting on the Sysmac Studio side.)



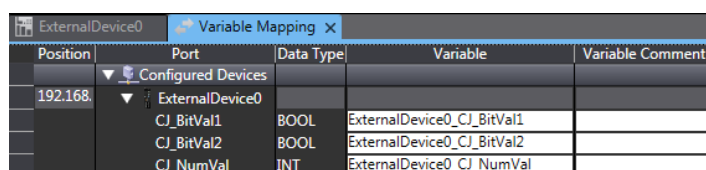
2. The device variables registered in CJ are imported as shown in the [Device Variables] field.



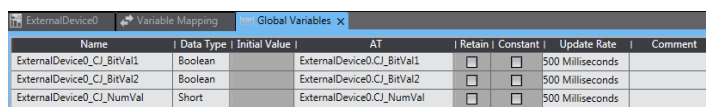
3. In the Multiview Explorer, double-click [Variable Mapping].



4. As is the case with registration of NJ CPU variables, you can create variables by selecting “Create Device Variable” in the context menu.



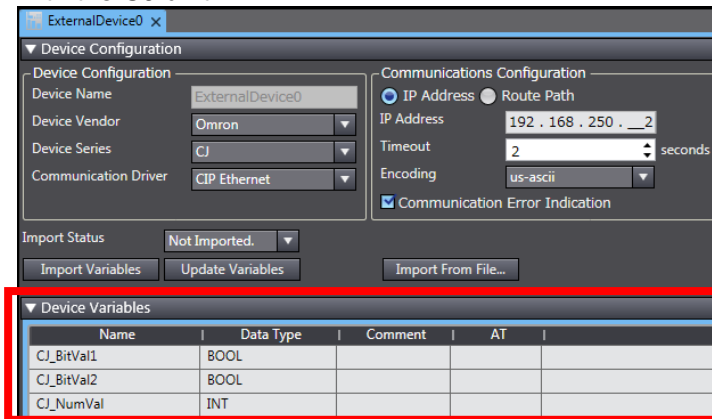
5. The variables created in Step 4 are automatically registered in the [Global Variables] tab page.



- Entering the Variables Directly In the Variable Table

You can directly edit the [Device Variables] field.

Beware, however, that in cases where “CIP Ethernet” is selected as [Communication Driver], if there is discrepancy in the contents of registration between NA and CJ, a tag comparison error occurs upon data transfer as a result of verification of variable names and data types with the CJ unit.



- Copying and Pasting the Variables from a File such as Excel

The [Device Variables] field allows direct editing as well as copy and paste from an Excel file or other text files. When you paste the data, they must have been written beforehand in a specified format.

1. Open the variable table of CX-Programmer. Select the area to copy and then either select “Copy” from the context menu or press the C key while holding down the Ctrl key to copy the variables.

Name	Data Type	Address / Value	Net. Variable	Usage	Comment
P_UF	BOOL	CF010		Work	Underflow (UF) Flag
P_WR	WORD	M51		Work	WR Area Parameter
CJ_BitVal1	BOOL	W0.00	Publication	Work	
CJ_BitVal2	BOOL	W0.01	Publication	Work	
CJ_NumVal	INT	D0	Publication	Work	

2. Paste the copied data to an Excel file.

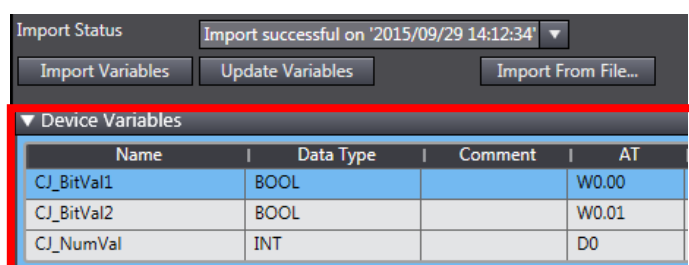
	A	B	C	D	E	F	G	H
1								
2								
3		CJ_BitVal1	BOOL	W0.00		0		
4		CJ_BitVal2	BOOL	W0.01		0		
5		CJ_NumVal	INT	D0		0		
6								
7								

3. Change the order of the pasted data as described below:

Variable name -> Data type -> Comments -> AT (address)

	A	B	C	D	E	F
1						
2						
3		CJ_BitVal1	BOOL		W0.00	
4		CJ_BitVal2	BOOL		W0.01	
5		CJ_NumVal	INT		D0	
6						

4. Paste the rearranged data to the [Device Variables] field. Make sure that you must copy and paste simultaneously the four columns from Variable Name through AT even if the comment fields are blank.



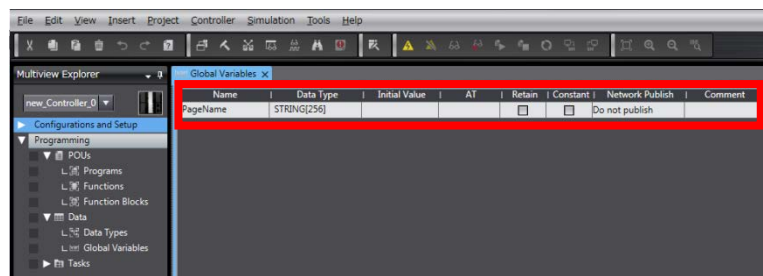
## 2-4-3 How To Switch the Screen by the PLC Variables

The “\_HMI\_CurrentPage” NA system variable stands for the name of the currently displayed page. The NA’s variable mapping function allows allocation of system variables.

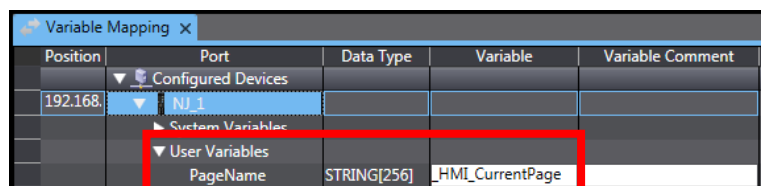
For such settings in which an address value are directly linked with a screen number as in the NS series, you must write a program in Visual Basic.

- How To Allocate the NJ Variables to the NA System Variables

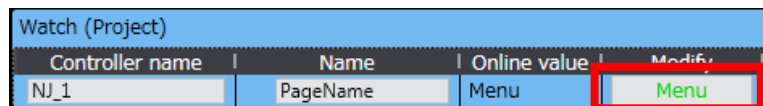
1. Declare on the NJ side a String-type variable in which to store page names.



2. In the NA’s variable mapping function, allocate the “\_HMI\_CurrentPage” NA system variable to the page name variable that has been created in Step 1. (At this time, enter manually the system variable name instead of selecting automatic input from the context menu.)



3. Write the destination page name in the variable created on the NJ side in Step 1. The screen is switched to the corresponding one.





● How To Allocate the CJ Variables to the NA System Variables

1. Declare on the CJ side a String-type variable in which to store page names.

Name	Data Type	Address / Value	Net. Variable
P_UF	BOOL	CF010	
P_WR	WORD	A451	
CJ_BitVal1	BOOL	W0.00	Publication
CJ_BitVal2	BOOL	W0.01	Publication
CJ_NumVal	INT	D0	Publication
CJ_PageName	STRING(8)	D100	Publication
CJ_PageNumber	INT	D10	Publication

2. Allocate to NA the CJ variable created in Step 1. Refer to “2-4-2 Connecting with the CJ-series CPU” for details on allocation.

Device Variables			
Name	Data Type	Comment	AT
CJ_BitVal1	BOOL		
CJ_BitVal2	BOOL		
CJ_NumVal	INT		
CJ_PageName	STRING(8)		
CJ_PageNumber	INT		

3. In the NA’s variable mapping function, allocate the “\_HMI\_CurrentPage” NA system variable to the page name variable that has been created in Step 1. (At this time, enter manually the system variable name instead of selecting automatic input from the context menu.)

ExternalDevice0		
Name	Data Type	Comment
CJ_BitVal1	BOOL	CJ_BitVal1
CJ_BitVal2	BOOL	CJ_BitVal2
CJ_NumVal	INT	CJ_NumVal
CJ_PageName	STRING(8)	_HMI_CurrentPage
CJ_PageNumber	INT	CJ_PageNumber

4. Write the destination page name in the variable created on the CJ side in Step 1. The screen is switched to the corresponding one.

Set New Value

Address: D100

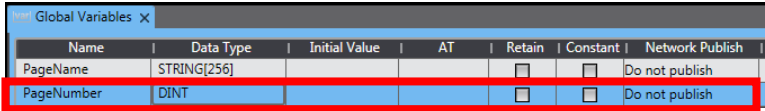
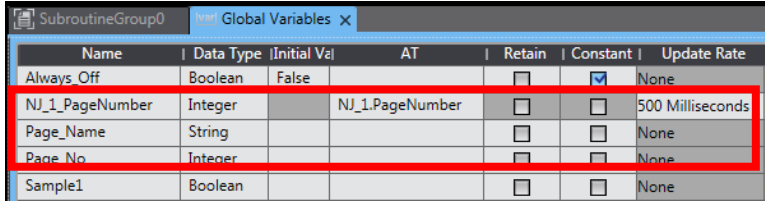
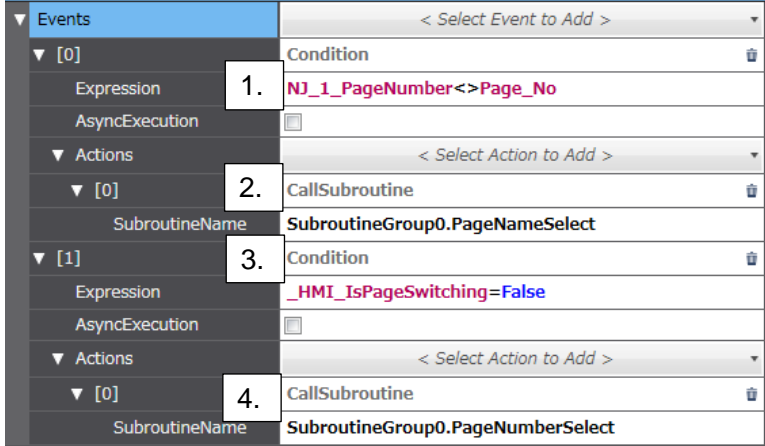
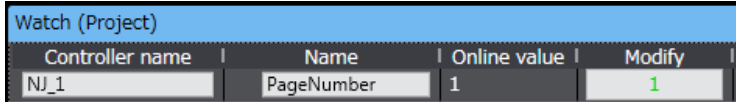
Value: 'Page0'

New Value: Page1

ASCII (Size :0-8)

● Using Visual Basic (Case Statement)

You can use the Case statements of the Visual Basic codes to assign numbers to each screen and to create the behavior to switch to the screen that corresponds with the number.

<p>1. Declare on the NJ side a Numerical-type variable to store page numbers.</p>	
<p>2. Allocate on the NA side the variable declared in Step 1. Then declare respectively the String-type variable to store page names and the variable to store page numbers on the NA side. "Page_Name": Variable to indicate page names "Page_No": Variable to indicate page numbers on the NA side</p>	
<p>3. In the global subroutine, write the code as shown on the right. "PageNameSelect": switches the NA's page based on the NJ's variable value. "PageNumberSelect": reports to the PLC the number corresponding to the currently displayed page. In either case, to add pages to switch to, increase the conditions of Case.</p>	<pre> 3 Sub PageNameSelect 4   Select Case NJ_1_PageNumber 5     Case 0 6       Page_Name="Page0" 7     Case 1 8       Page_Name="Page1" 9     Case 2 10      Page_Name="Page2" 11   End Select 12   Page_No=NJ_1_PageNumber 13   ShowPage(Page_Name) 14 End Sub  15 Sub PageNumberSelect 16 Select Case _HMI_CurrentPage 17 Case "Page0" 18   NJ_1_PageNumber=0 19 Case "Page1" 20   NJ_1_PageNumber=1 21 Case "Page2" 22   NJ_1_PageNumber=2 23 End Select 24 End Sub 25 26 </pre>
<p>4. In the [Global Events] tab page, specify the conditions to execute the code created in Step 3 as described below:  1. Indicate the state that the NJ's page number does not equal to the NA's page number.  2. Specify the name of the subroutine to execute.  3. Indicate that the action is taken when the page is switched.  4. Specify the name of the subroutine to execute.</p>	
<p>5. To switch the page from NJ, modify the "PageNumber" NJ variable. To switch from NA, modify the "_HMI_CurrentPage" NA system variable.</p>	

- Using Visual Basic (String-type Array and the “\_HMI\_CurrentPage” System Variable)  
This method combines the “\_HMI\_CurrentPage” system variable with the user-defined String-type array variable.  
It directly links the page numbers with the array's element numbers and switches to the page number that corresponds with the contents of the array variable.

1. Declare on the NJ side a Numerical-type variable to store page numbers, and a String-type array variable. For the number of elements of the String-type array variable, specify the value greater than the number of pages.

Name	Data Type	Initial Value	AT	Retain	Constant	Network Publish
PageName	STRING[256]			<input type="checkbox"/>	<input type="checkbox"/>	Do not publish
PageNumber	DINT			<input type="checkbox"/>	<input type="checkbox"/>	Do not publish
PageNameAry	Array[0..19] OF STRING[255]			<input type="checkbox"/>	<input type="checkbox"/>	Do not publish

2. Enter the names of the pages as the initial values of the String-type array variable. Beware that you must modify this field if the page names are changed later.

Initial Value Setting	
PageNameAry[0..19]	
[0]	'Page0'
[1]	'Page1'
[2]	'Page2'
[3]	'Page3'
[4]	'Page4'
[5]	'Page5'

3. Allocate on the NA side the variables declared in Step 1. Then, declare the variable to store page numbers.

User Variables		
PageName	STRING[256]	_HMI_CurrentPage
PageNameAry	Array[0..19] OF STRING[255]	NJ_1_PageNameAry
PageNumber	DINT	NJ_1_PageNumber

4. In the global subroutine, write the code as shown on the right. By specifying the variable indicating the page number in the position for the element number of the String-type array variable, the screen is switched to the one that corresponds to the page number.

```

26 Sub PageChange
27     _HMI_CurrentPage=NJ_1_PageNameAry(NJ_1_PageNumber)
28     Page_No=NJ_1_PageNumber
29 End Sub

```

5. In the [Global Events] tab page, specify the conditions to execute the code. The figure on the right shows that the code created in Step 4 is executed every 100 msec.

[2]	Interval	
Interval	100	Milliseconds
AsyncExecution	<input type="checkbox"/>	
Actions	< Select Action to Add >	
[0]	CallSubroutine	
SubroutineName	SubroutineGroup0.PageChange	

6. Changing the “PageNumber” NJ variable switches the screen to the page that has been registered as an initial value for the array variable created in Step 2.  
Example: When “2” is entered, the screen is switched to Page2.

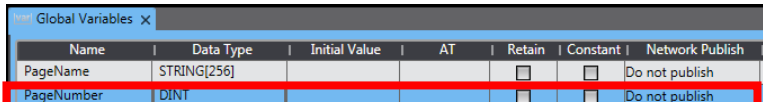
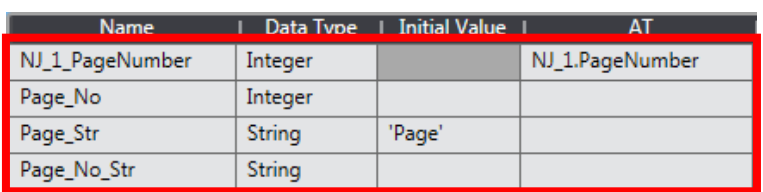
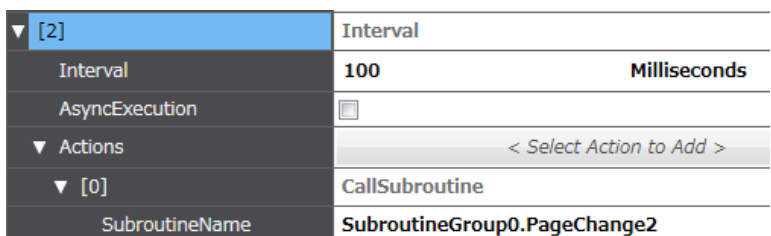
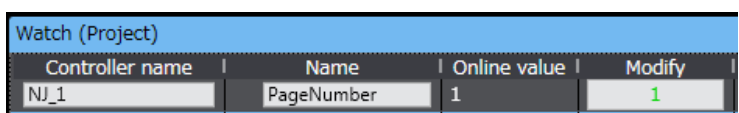
Initial Value Setting	
PageNameAry[0..19]	
[0]	'Page0'
[1]	'Page1'
[2]	'Page2'
[3]	'Page3'
[4]	'Page4'
[5]	'Page5'

● Using Visual Basic (Switching the Screens by the “Page” Variable)

By default, the page name is automatically specified as “Page” followed by the sequential number, such as “Page0”, “Page1”, ...

You can utilize that to switch screens by fixing the “Page” part while defining the numerical value part as variable, and modifying the variable value.

Note, however, that you cannot use this method if the page name has been changed from default.

<p>1. Declare on the NJ side a Numerical-type variable to store page numbers.</p>	 <table border="1"> <thead> <tr> <th>Name</th> <th>Data Type</th> <th>Initial Value</th> <th>AT</th> <th>Retain</th> <th>Constant</th> <th>Network Publish</th> </tr> </thead> <tbody> <tr> <td>PageName</td> <td>STRING[256]</td> <td></td> <td></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Do not publish</td> </tr> <tr> <td>PageNumber</td> <td>DINT</td> <td></td> <td></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Do not publish</td> </tr> </tbody> </table>	Name	Data Type	Initial Value	AT	Retain	Constant	Network Publish	PageName	STRING[256]			<input type="checkbox"/>	<input type="checkbox"/>	Do not publish	PageNumber	DINT			<input type="checkbox"/>	<input type="checkbox"/>	Do not publish
Name	Data Type	Initial Value	AT	Retain	Constant	Network Publish																
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PageNumber	DINT			<input type="checkbox"/>	<input type="checkbox"/>	Do not publish																
<p>2. Declare on the NA side the following variables.          NJ_1_PageNumber: links with the page number variables set on the NJ side.          Page_No: stores page numbers.          Page_Str: set “Page” as the initial value. Used in Visual Basic described below.          Page_No_Str: a String-type variable that stores the numerical value part of the Page.</p>	 <table border="1"> <thead> <tr> <th>Name</th> <th>Data Type</th> <th>Initial Value</th> <th>AT</th> </tr> </thead> <tbody> <tr> <td>NJ_1_PageNumber</td> <td>Integer</td> <td></td> <td>NJ_1.PageNumber</td> </tr> <tr> <td>Page_No</td> <td>Integer</td> <td></td> <td></td> </tr> <tr> <td>Page_Str</td> <td>String</td> <td>'Page'</td> <td></td> </tr> <tr> <td>Page_No_Str</td> <td>String</td> <td></td> <td></td> </tr> </tbody> </table>	Name	Data Type	Initial Value	AT	NJ_1_PageNumber	Integer		NJ_1.PageNumber	Page_No	Integer			Page_Str	String	'Page'		Page_No_Str	String			
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Page_Str	String	'Page'																				
Page_No_Str	String																					
<p>3. In the global subroutine, write the code as shown on the right. By converting the page numbers into text strings and linking them to “Page”, the initial value of “Page_Str”, the text strings such as “Page0” or “Page1” that correspond to the page names are created. The screens can then be switched by assigning the text strings to “_HMI_CurrentPage”, the system variable that indicates page names.</p>	<pre> 31 Sub PageChange2 32     '.ToString : Function to convert strings 33     Page_No_Str=NJ_1_PageNumber.ToString 34     '+ : Operator to connect strings 35     Page_Str=Page_Str+Page_No_Str 36     _HMI_CurrentPage=Page_Str 37     'Return Page_Str to Initial Value 38     Page_Str="Page" 39     Page_No=NJ_1_PageNumber 40 End Sub         </pre>																					
<p>4. In the [Global Events] tab page, specify the conditions to execute the code created in Step 3. The figure on the right shows that the code created in Step 4 is executed every 100 msec.</p>	 <table border="1"> <tr> <td>[2]</td> <td>Interval</td> <td></td> </tr> <tr> <td>Interval</td> <td>100</td> <td>Milliseconds</td> </tr> <tr> <td>AsyncExecution</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>Actions</td> <td colspan="2">&lt; Select Action to Add &gt;</td> </tr> <tr> <td>[0]</td> <td>CallSubroutine</td> <td></td> </tr> <tr> <td>SubroutineName</td> <td colspan="2">SubroutineGroup0.PageChange2</td> </tr> </table>	[2]	Interval		Interval	100	Milliseconds	AsyncExecution	<input type="checkbox"/>		Actions	< Select Action to Add >		[0]	CallSubroutine		SubroutineName	SubroutineGroup0.PageChange2				
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<p>5. Changing the value of the “PageNumber” NJ variable switches the screen from the PLC.</p>	 <table border="1"> <thead> <tr> <th>Controller name</th> <th>Name</th> <th>Online value</th> <th>Modify</th> </tr> </thead> <tbody> <tr> <td>NJ_1</td> <td>PageNumber</td> <td>1</td> <td>1</td> </tr> </tbody> </table>	Controller name	Name	Online value	Modify	NJ_1	PageNumber	1	1													
Controller name	Name	Online value	Modify																			
NJ_1	PageNumber	1	1																			

● Using Visual Basic (Where CJ is the Connected Device)

When CJ is used as the connected PLC, as is the case with NJ, you can use Visual Basic to switch screens from PLC.

1. Declare on the CJ side a Numerical-type variable to store page numbers.

Name	Data Type	Address / Value	Net. Variable
P_UF	BOOL	CF010	
P_WR	WORD	A451	
CJ_BitVal1	BOOL	W0.00	Publication
CJ_BitVal2	BOOL	W0.01	Publication
CJ_NumVal	INT	D0	Publication
CJ_PageName	STRING(8)	D100	Publication
CJ_PageNumber	INT	D10	Publication

2. Allocate on the NA side the variables declared in Step 1. Then, declare respectively the String-type variable to store page names and the variable to store page numbers on the NA side.

Name	Data Type	Initial Value	AT
CJ_BitVal1	Boolean		ExternalDevice0.CJ_BitVal1
CJ_BitVal2	Boolean		ExternalDevice0.CJ_BitVal2
CJ_NumVal	Short		ExternalDevice0.CJ_NumVal
CJ_PageName	String		
CJ_PageNumber	Short		ExternalDevice0.CJ_PageNumber
Page_Name	String		
Page_No	Short		

“Page\_Name”: Variable to indicate page names  
 “Page\_No”: Variable to indicate page numbers on the NA side

3. In the global subroutine, write the code as shown on the right.  
 “PageNameSelect”: switches the NA’s page based on the CJ’s variable value.  
 “PageNumberSelect”: reports to the PLC the number corresponding to the currently displayed page.  
 In either case, to add pages to switch to, increase the conditions of Case.

```

3 Sub PageNameSelect
4   Select Case CJ_PageNumber
5     Case 0
6       Page_Name="Page0"
7     Case 1
8       Page_Name="Page1"
9     Case 2
10      Page_Name="Page2"
11   End Select
12   Page_No=CJ_PageNumber
13   ShowPage(Page_Name)
14 End Sub

15
16 Sub PageNumberSelect
17   Select Case _HMI_Currentpage
18     Case "Page0"
19       CJ_PageNumber=0
20     Case "Page1"
21       CJ_PageNumber=1
22     Case "Page2"
23       CJ_PageNumber=2
24   End Select
25 End Sub
26
    
```

4. In the [Global Events] tab page, specify the conditions to execute the code created in Step 3 as described below:  
 1. Indicate the state that the CJ’s page number does not equal to the NA’s page number.  
 2. Specify the name of the subroutine to execute.  
 3. Indicate that the action is taken when the page is switched.  
 4. Specify the name of the subroutine to execute.

Events	
[0]	Condition
1.	Expression
	CJ_PageNumber <> Page_No
▼ Actions	< Select Action to Add >
[0]	2.
	CallSubroutine("SubroutineGroup0.PageNameSelect")
[1]	3.
	Condition
	Expression
	_HMI_IsPageSwitching=False
▼ Actions	< Select Action to Add >
[0]	4.
	CallSubroutine("SubroutineGroup0.PageNumberSelect")

5. To switch the page from CJ, modify the "PageNumber" CJ variable.  
To switch from NA, modify the "\_HMI\_CurrentPage" NA system variable.

Set New Value

Address:	D10	Set Value
Value:	&0	Close
New Value:	1	Edit Address/Type
0 to 65535 (1CH)		Binary >>

# 3 Revision History

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Revision Code	Date	Revised content
01	July 2015	Original production
02	December 2018	Correction of related manual numbers

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

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