

NA-series HMI Programmable Terminal

Practices Guide Creating Basic Pages

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

The following manuals are related to this manual.

Cat.No.	Model	Manual Name
SBCA-362	SYSMAC-SE2□□□	Sysmac Studio Version 1 Operation Manual
SBSA-545	NA5-15W□□□□ NA5-12W□□□□ NA5-9W□□□□ NA5-7W□□□□	NA-series Programmable Terminal Hardware User's Manual
SBSA-546	NA5-15W□□□□ NA5-12W□□□□ NA5-9W□□□□ NA5-7W□□□□	NA-series Programmable Terminal Software User's Manual
SBSA-547	NA5-15W□□□□ NA5-12W□□□□ NA5-9W□□□□ NA5-7W□□□□	NA-series Programmable Terminal Device Connection User's Manual
SBSA-548	NA5-15W□□□□ NA5-12W□□□□ NA5-9W□□□□ NA5-7W□□□□	NA-series Programmable Terminal Startup Guide

1 Introduction

In this chapter, you will learn what information is required to create the pages on the NA-series PTs while confirming the contents included in this guide. You will also learn the system configuration required and the procedure for creating pages.

1-1 Overview

1-1-1 Overview

As summarized below, this guide explains the procedures to perform settings of the NA series, to create basic pages, and to transfer them to the actual unit.

1 . Creating Projects

- Creating a Project
- Registering Global Variables
- NA Communication Settings
- Registering Variables

2 . Creating Basic Pages

- Adding Pages
- ON/OFF Switches
- Bit Lamps
- Labels
- Off-line Testing
- Button to Switch Pages
- Data Edit/Display
- Gauges (Graphs)
- Alarms
- PDF Display
- Video Display
- Integrated Simulation

3. Check on Actual Unit

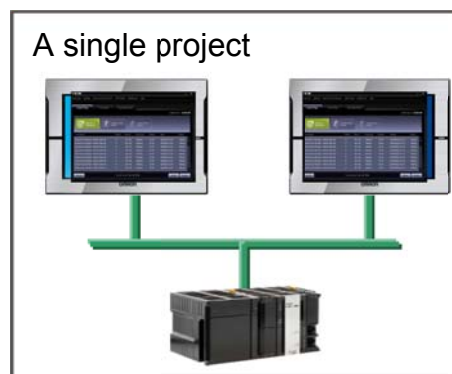
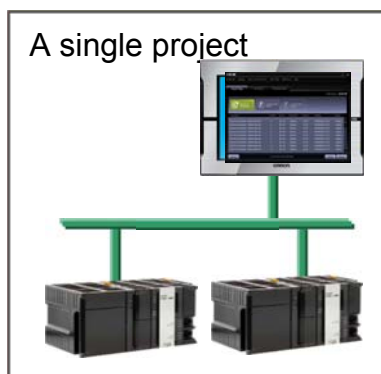
- Synchronization
- Operation

1-2 System Configuration

1-2-1 System Configuration

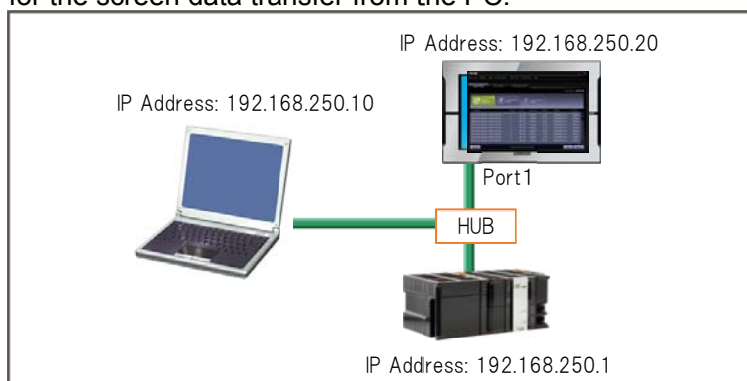
The NA series can include multiple NJ units or NA units within a single project as shown in the figures below.

This guide deals with the projects for the one-to-one (1:1) NJ-NA configuration where a single NJ is connected with a single NA.



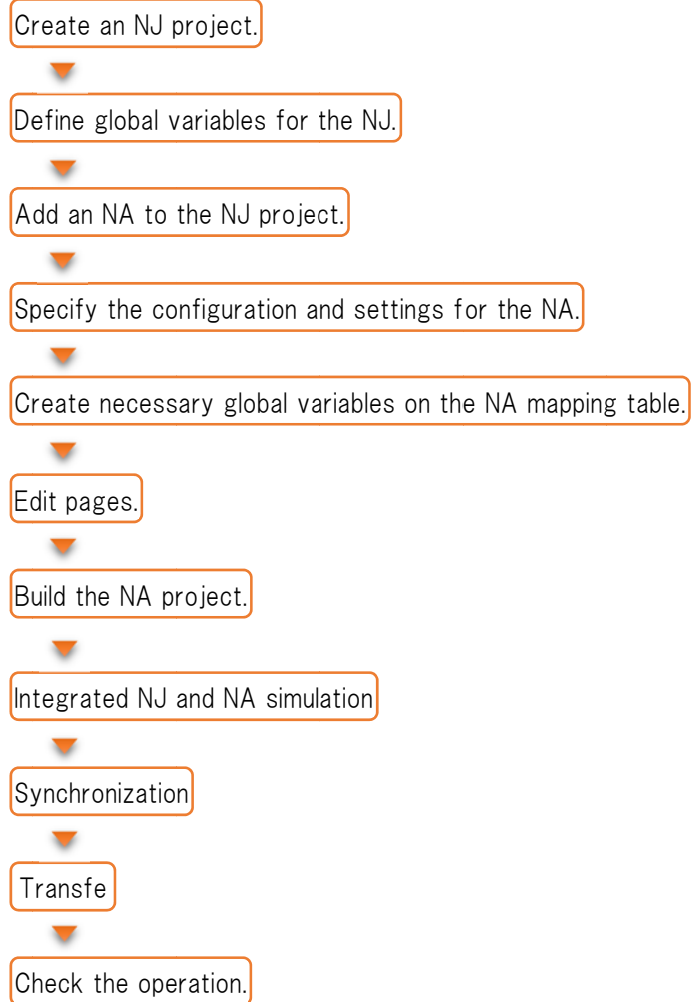
The figure below shows the configuration used in this guide.

The Ethernet is used for communications between the NJ series and NA series, as well as for the screen data transfer from the PC.



1-3 Procedure to Create Pages

1-3-1 Procedure to Create Pages



2 Project Creation

This chapter describes the settings for the NJ that are required before creating pages of the NA series.

2-1 Creating Projects

2-1-1 Creating a Project

There are two ways to create a project to create pages for the NA series as described below:

- (1) Add NA to the existing NJ project.
- (2) Create a new NA project.

In this guide, you will practice (1).

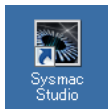
For (2), refer to the reference materials at the end of the guide.

2-2 Starting up Sysmac Studio

2-2-1 Starting up Sysmac Studio

Start up Sysmac Studio in either way described below:

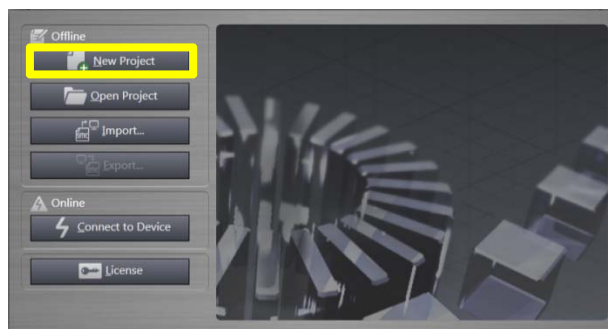
- Double-click the icon on the desktop.



- Select [START]-[All Programs]-[OMRON]-[Sysmac Studio]-[Sysmac Studio].

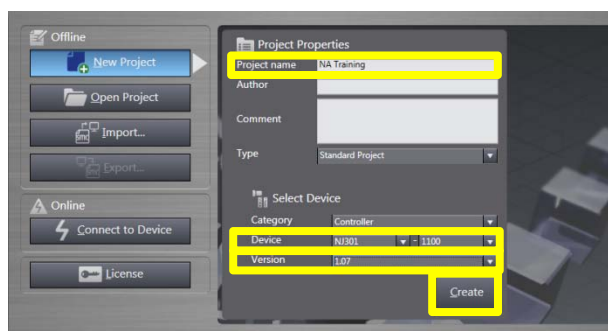
2-2-2 Creating a New Project

1. First, create a new project for the NJ.
Click [New Project] on the Project window.



2. Specify the following items, and click [Create]. A project file is then created.

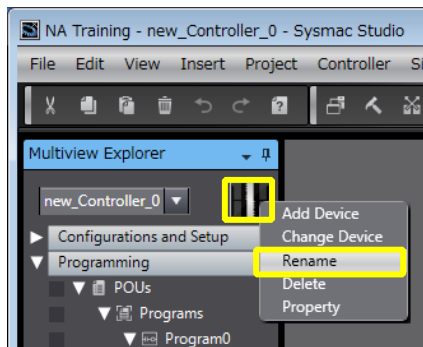
- Project name
"Arbitrary project name"
- Device
"NJ301-1100" *
- Version
"1.07" *



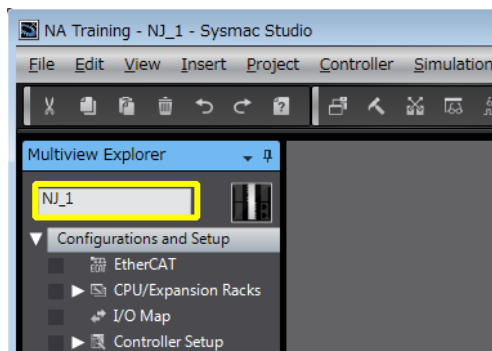
* Specify the model and version of the NJ to be connected. The versions that are supported for the NA series are 1.01 and later.

2-2-3 Changing the Controller Name

1. For easy identification, change the controller name.
Right-click the NJ icon and select "Rename".



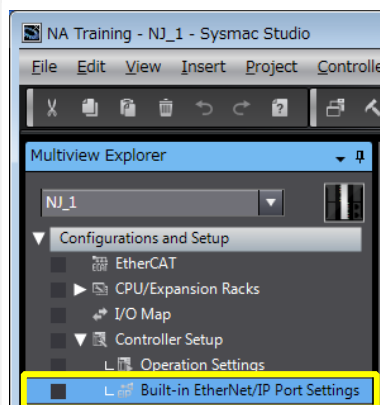
2. Change the controller name to "NJ_1".



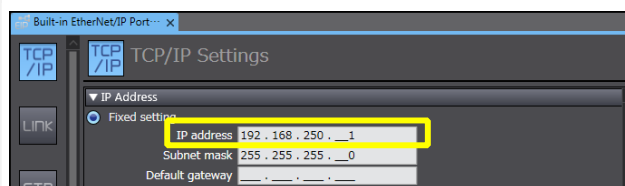
2-2-4 Confirming the IP Address

To connect NJ with Sysmac Studio via EtherNet/IP™, confirm the IP address of the NJ side as described below.

1. Double-click [Configurations and Setup]-[Controller Setup]-[Built-in EtherNet/IP Port Settings].



2. Confirm that the IP address is specified as "192.168.250.1".

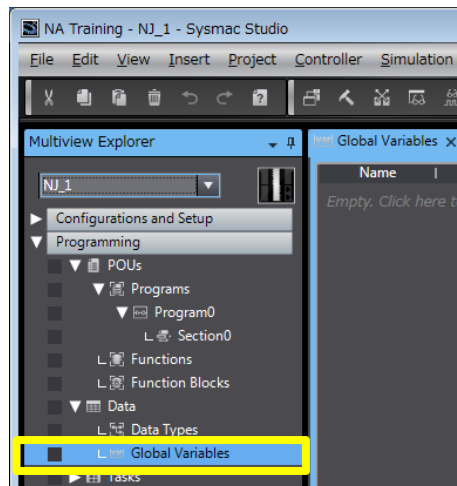


2-3 Registering Global Variables

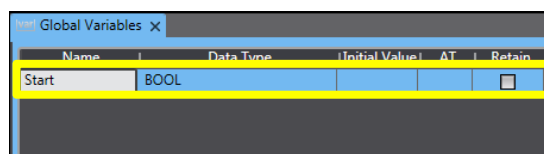
2-3-1 Registering Global Variables

To exchange data with the NA, register the global variables of the NJ.

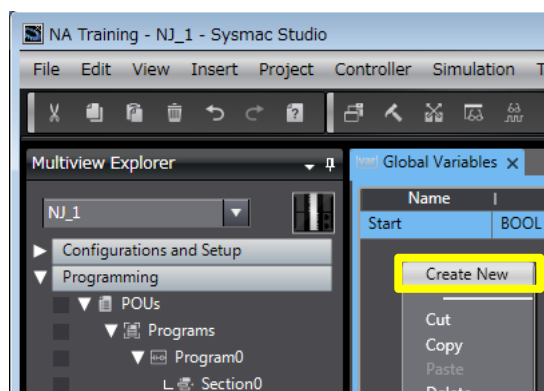
1. Double-click [Programming]-[Data]-[Global Variables].



2. Click the variable table and register a variable name.



3. Subsequently, right-click on the variable table and select "Create New". Otherwise, press the "Insert" key.



4. Register all of the variables listed on the right.

The screenshot shows the 'Global Variables' window. The table has columns: Name, Data Type, Initial Value, AT, Retain, and Constant. The table contains the following data:

Name	Data Type	Initial Value	AT	Retain	Constant
Start	BOOL			<input type="checkbox"/>	<input type="checkbox"/>
Lamp	BOOL			<input type="checkbox"/>	<input type="checkbox"/>
ALM1	BOOL			<input type="checkbox"/>	<input type="checkbox"/>
ALM2	BOOL			<input type="checkbox"/>	<input type="checkbox"/>
Num1	INT			<input type="checkbox"/>	<input type="checkbox"/>
Num2	INT			<input type="checkbox"/>	<input type="checkbox"/>

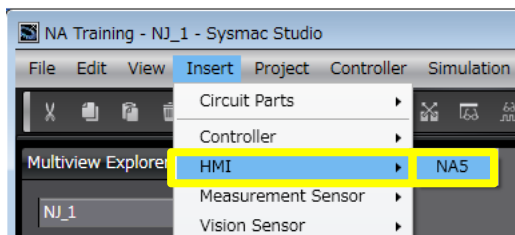
3 Basic Settings

This chapter describes the basic procedure to create an NA project, to specify communication settings, and to register variables.

3-1 Adding an NA

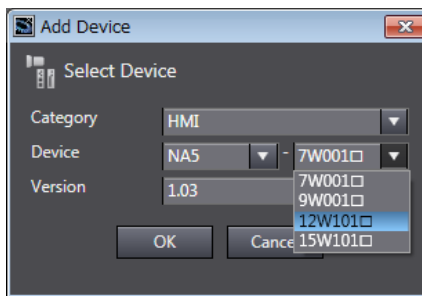
3-1-1 Adding an NA

1. Add an NA to the project.
Select [Insert]-[HMI]-[NA5].

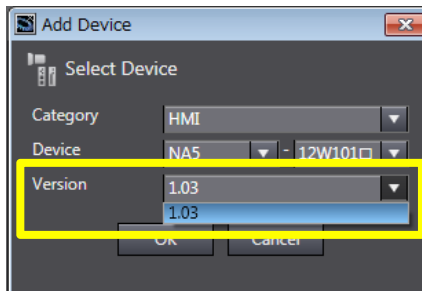


2. Select an option from among the list according to the actual unit.
For example, if you use a 12-inch model, select "12W001□".

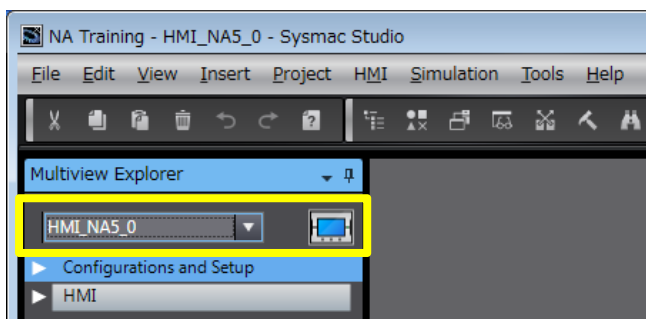
For details on models, refer to Chapter 7.



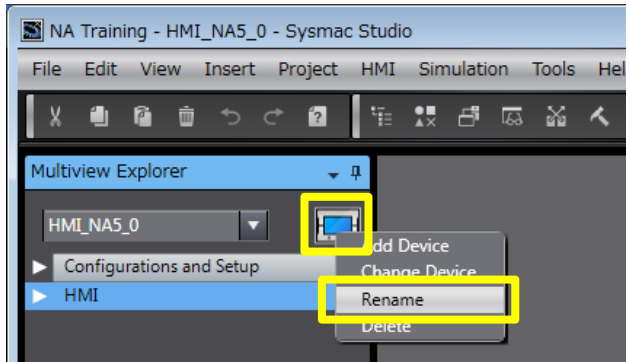
3. Select the version.



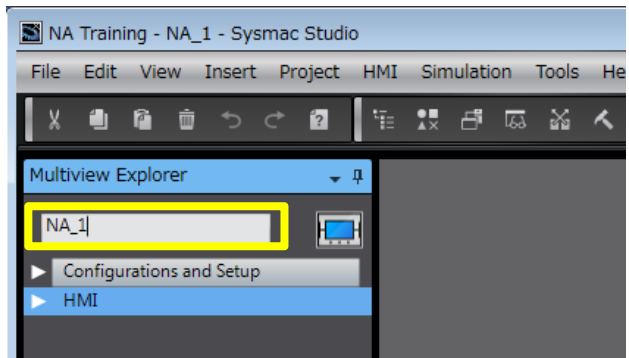
4. An NA is now added, and the display is changed accordingly.



5. Change the NA name for easy identification. Right-click the NA icon and select "Rename".

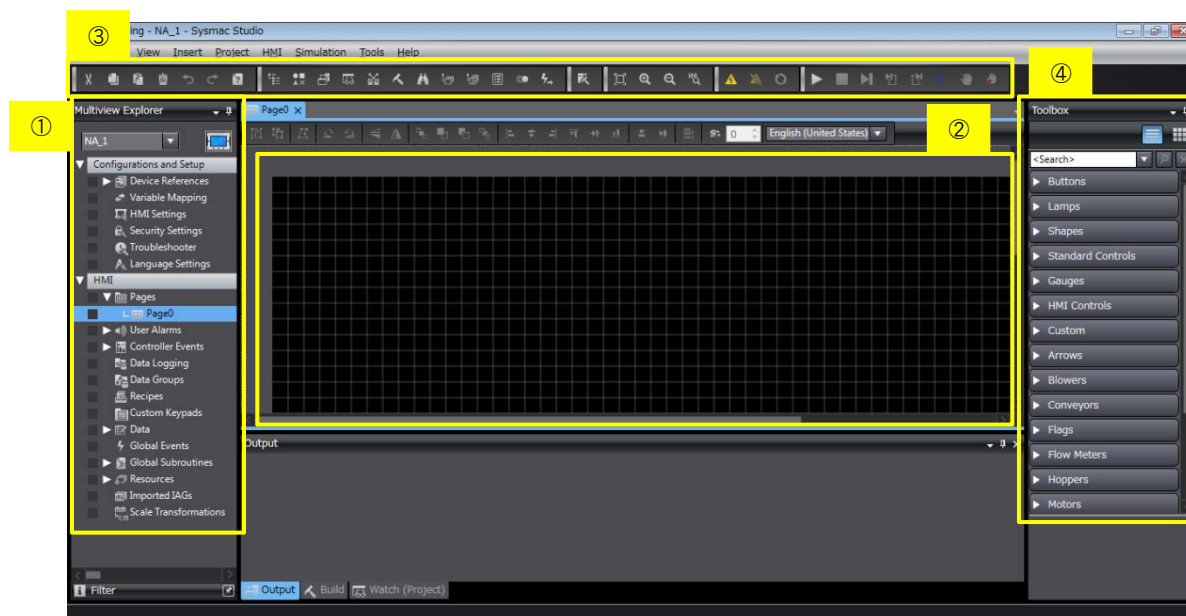


6. Change the name to "NA_1".



3-2 Sysmac Studio Window Components for Creating NA Pages

3-2-1 Sysmac Studio Window Components for Creating NA Pages



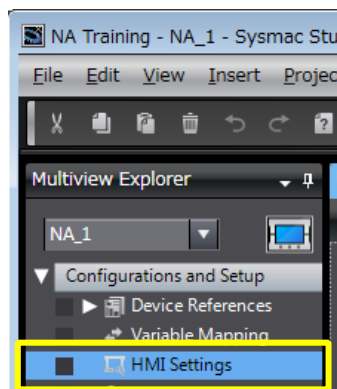
	Name	Description
①	Mutiview Explorer	Used to select items to set or pages to create.
②	Edit Pane	Used to perform configuration settings or to create pages.
③	Toolbar	The frequently-used functions such as “Build” or “Synchronization” are collected here to facilitate execution.
④	Toolbox	Contain the objects to make screendata.

3-3 NA Communication Settings

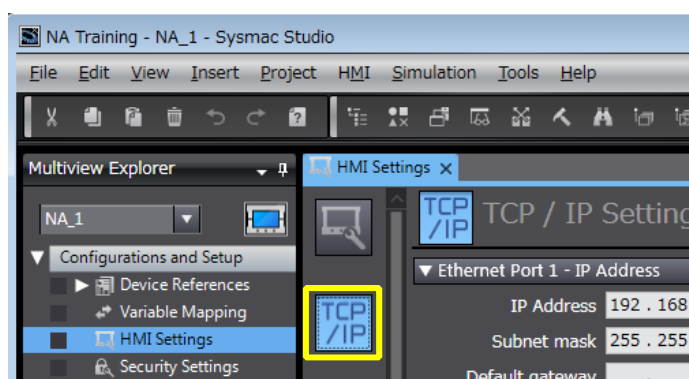
3-3-1 NA Communication Settings

Specify the Ethernet communication settings following the procedure below.

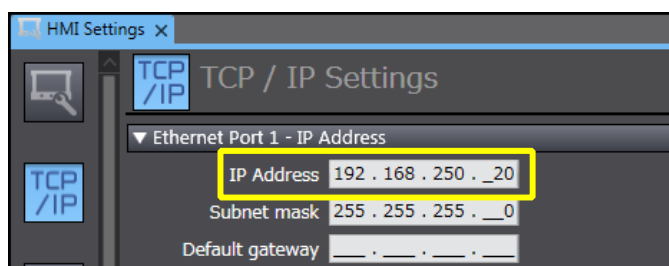
1. Double-click [Configurations and Setup]-[HMI Settings].



2. Click the "TCP/IP" icon.



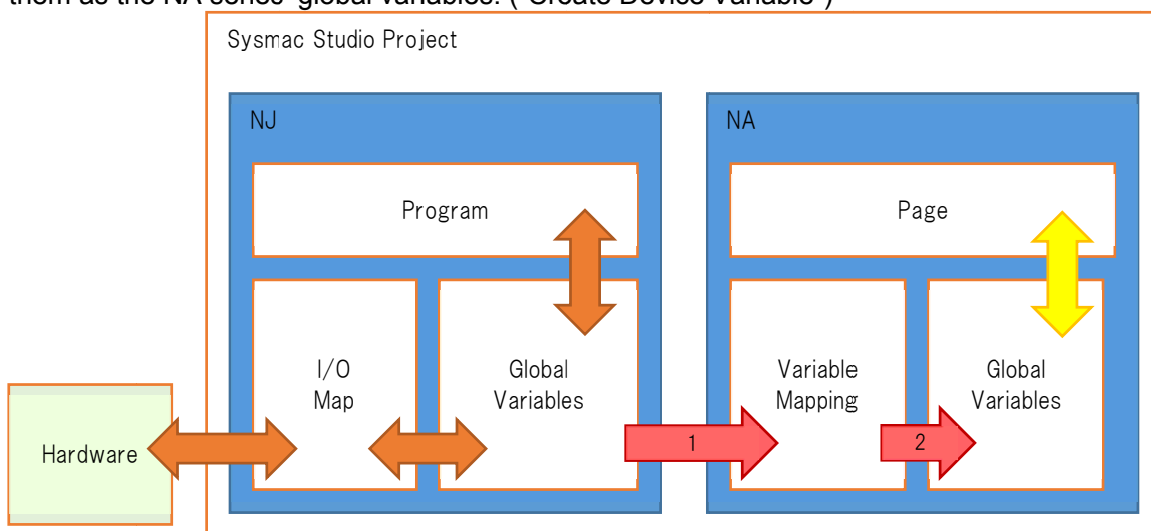
3. Set 192.168.250.20 in "IP Address".



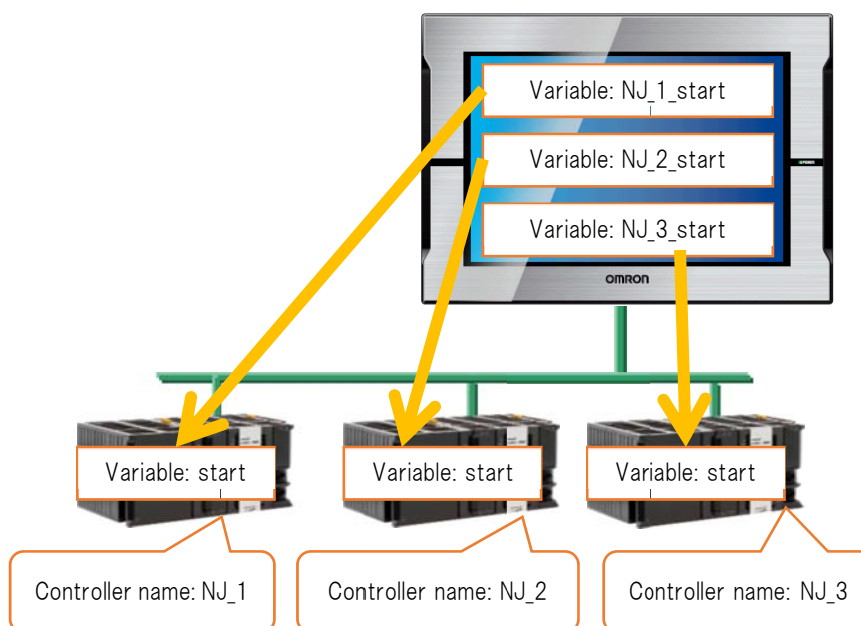
3-4 Registering Variables

3-4-1 Variable Mapping Scheme

1. When an NJ exists within the same project in which an NA exists, all of the NJ's global variables will be automatically reflected in the NA's variable mapping table.
2. You can select the variables required to create the pages of the NA series and register them as the NA series' global variables. ("Create Device Variable")



The function is called "variable mapping", and the names of the NA's global variables allocated at this time are specified as "*NJ controller name_NJ global variable name*". When NA is connected with NJ at 1: N, each NJ is identified by the controller name.



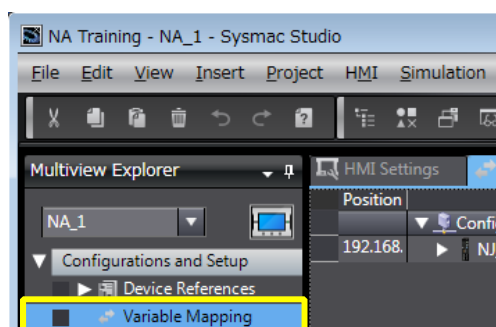
Precautions for Correct Use

If you change the variable type or other items of the NJ while variable mapping has been already performed, a mapping error may occur because the change is

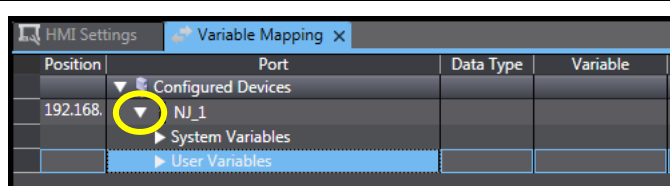
automatically reported to the NA.

3-4-2 Variable Mapping Procedure

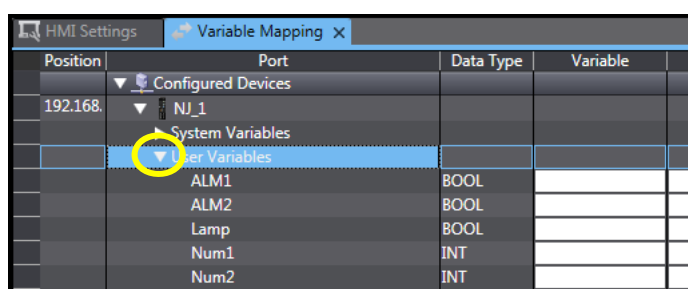
1. Double-click [Configurations and Setup]-[Variable Mapping].



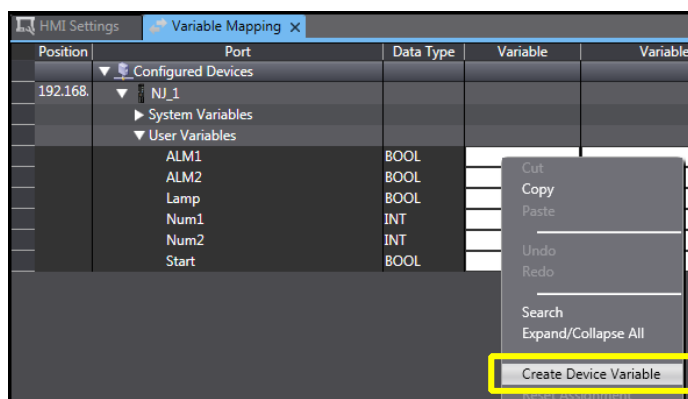
2. The controllers that exist within the project appear on the table. When you click the arrowhead to the left of "NJ_1", the categories of the variables defined for the NJ_1 controller appear.



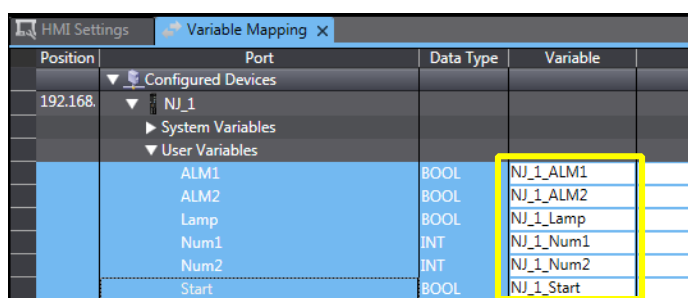
3. Subsequently, when you click the arrowhead to the left of "User Variables", you can confirm the variables defined as global variables.



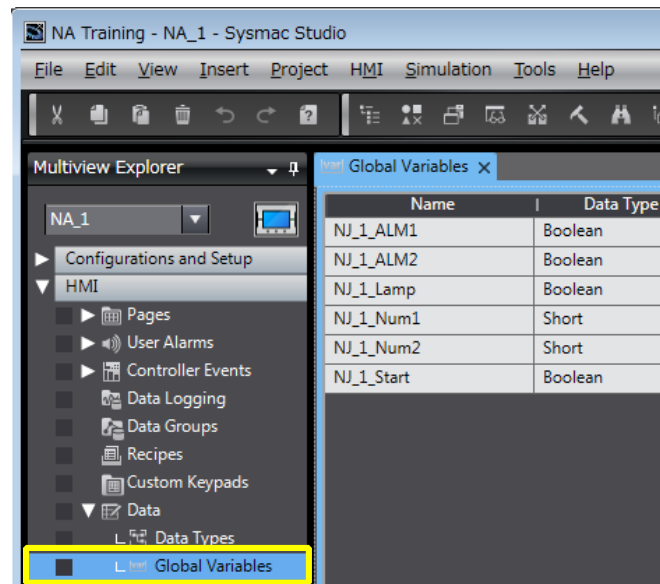
4. Perform variable mapping for all the user variables. Select all the variables from "ALM1" to "Start" and then right-click on the rows to select "Create Device Variable".



5. The NA variables are now created. The names of the variables are specified as "Controller name_NJ variable name".



6. The created variables are registered as the global variables for the NA project. Click [HMI]-[Data]-[Global Variables] and check if they are registered as the global variables.



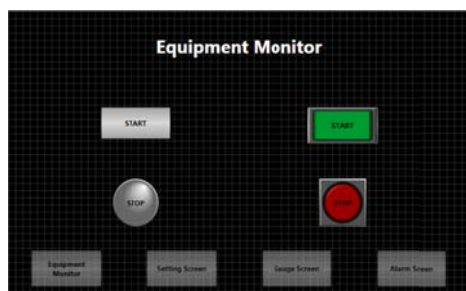
4 Creating Basic Pages

This chapter describes the procedure to create basic pages.

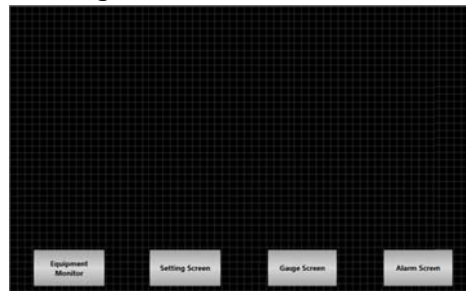
- Images of Pages to Create

In this chapter, you are to create the following pages.

(1) Equipment Monitor



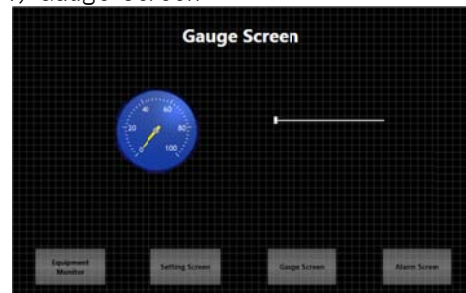
(2) Background



(3) Setting Screen



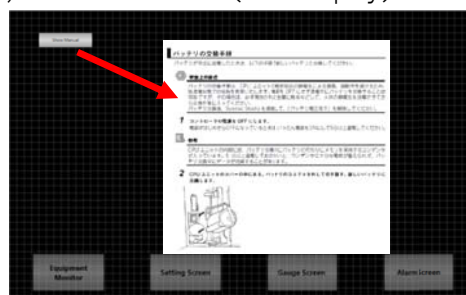
(4) Gauge Screen



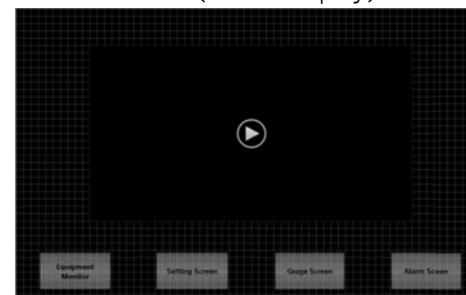
(5) Alarm Screen



(6) Troubleshooter 1 (PDF Display)



Troubleshooter 2 (Video Display)



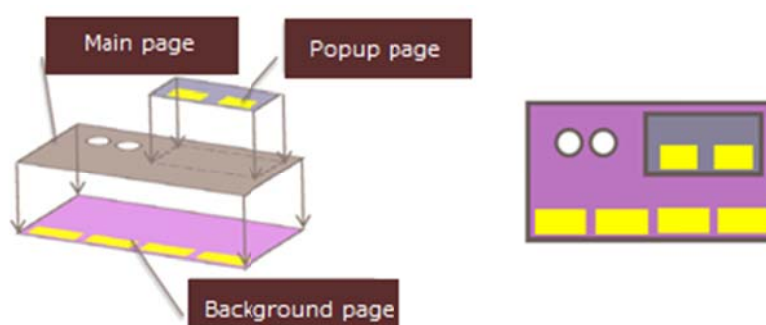
4-1 Adding Pages

4-1-1 Page Types

In NA, you can create the following three types of pages:

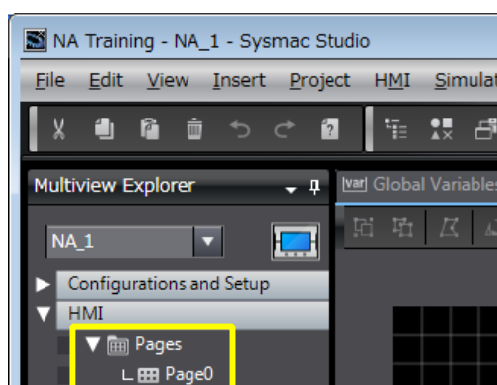
Classification	Description	NS Equivalents
Main pages	The basic pages displayed during NA operation.	Basic screens
Popup pages	The pages that can be overlayed on another page.	Pop-up screens
Background pages	The pages that can be specified as background to overlay the main pages.	Sheets
-	Not supported in NA	Frames

* The Background pages are to be created as the Main pages. You can specify a Main page as background from the Properties settings of the page.

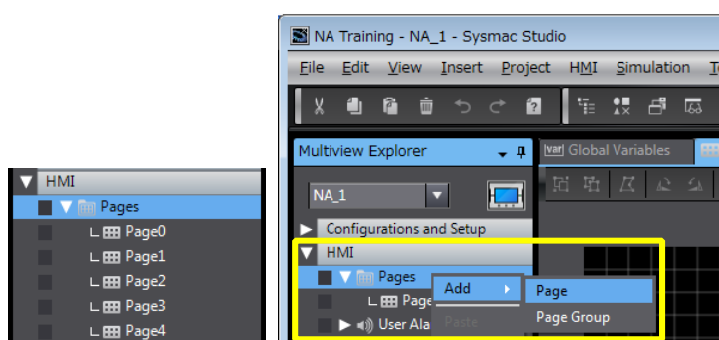


4-1-2 Adding Pages

1. When you click the arrowhead of [Pages] under [HMI], you can see that a page has already been created.



2. Right-click on [Pages] under [HMI] and select [Add]-[Page]. Repeat the same action to create 5 pages.

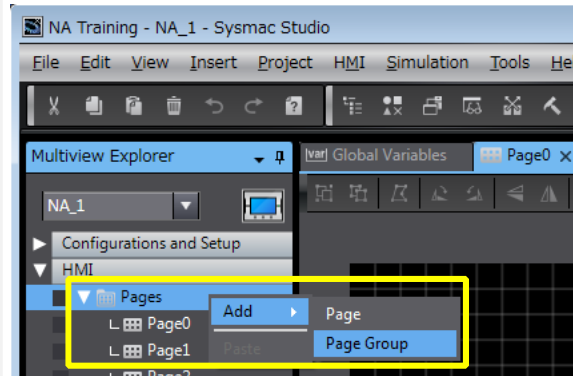


4-1-3 Creating Page Groups

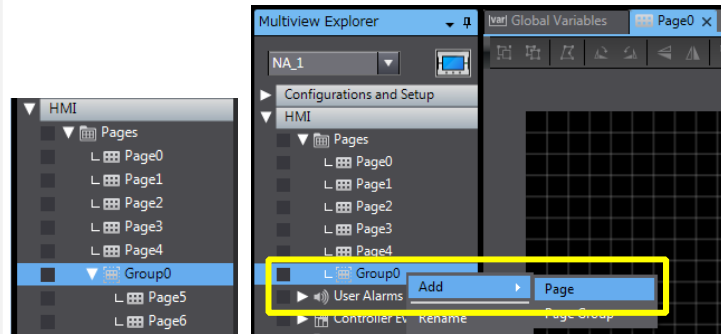
- Pages and Page Groups

You can create multiple pages as a group. By grouping multiple pages, you can easily copy the multiple pages such as alarm/troubleshooter pages as a unit. In this subsection, you are to group the troubleshooter pages.

1. Right-click on [Pages] under [HMI] and select [Add]-[Page Group].



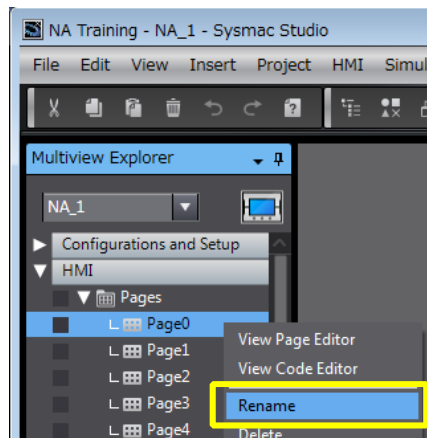
2. Right-click on the created [Group0] and select [Add]-[Page]. Repeat the same action to create 2 pages.



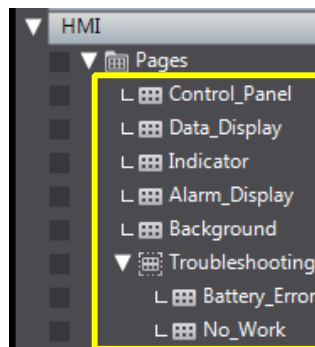
4-1-4 Changing the Page Names

In NA, the pages are managed by the names instead of the numbers.

1. Right-click on a page and select [Rename].




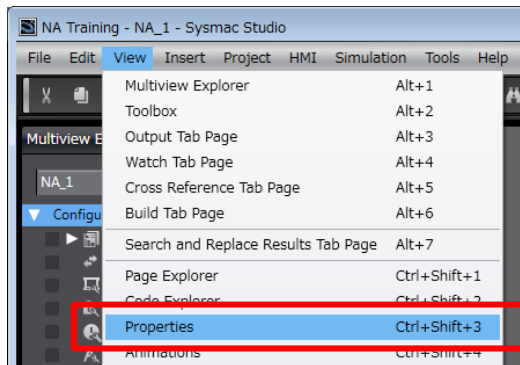
2. Change all the page names as described on the right.



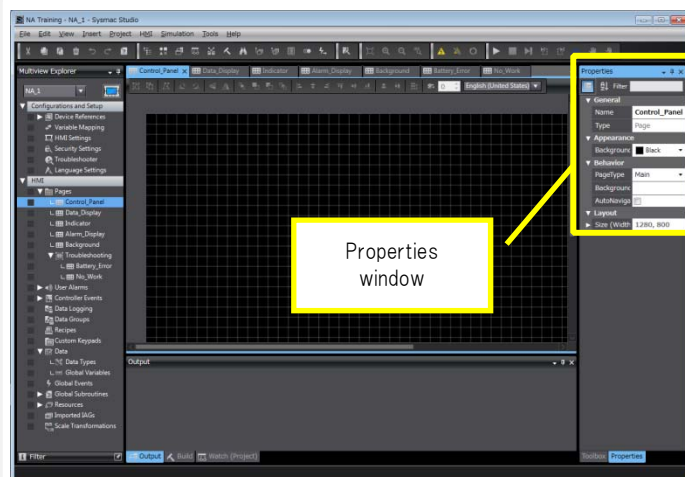
4-1-5 Specifying a Background Page

You can specify a background page for each page. The setting can be performed from [Properties].

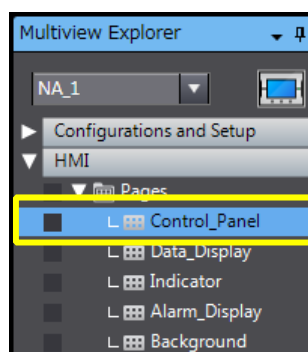
1. Select [View]-[Properties].
If you use the toolbar, click the  icon.



2. The [Properties] window appears on the right of the screen.

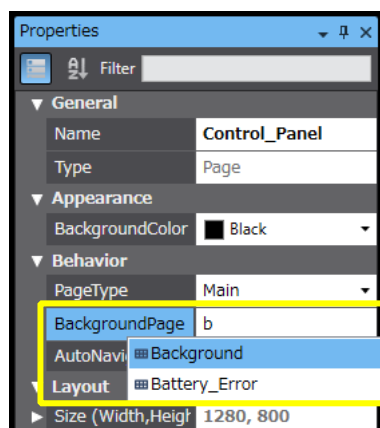


3. The properties of the selected page appear.
Double-click [HMI]-[Pages]-[Control_Panel].



4. The [Properties] window for the "Control_Panel" page appears on the right of the screen.
If you enter "b" in [BackgroundPage], the candidates appear. Select "Background" from among them.

Perform the same settings for all the pages except "Background".



4-2 Creating ON/OFF Switches

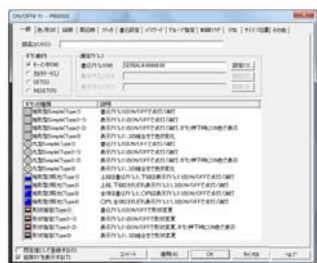
4-2-1 Object Properties

IN the NA series, the functional parts laid out on pages are called “objects”.

In the NS series, the functional objects placed on pages are all defined only by “Properties”. The objects in the NA series, in contrast, are defined by the categories including “Properties”, “Events and Actions”, and “Animations”, all of which have their own window for setting.

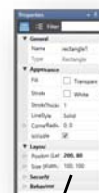
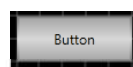
For example, if you specify the appearance or variable of a switch, you use the “Properties” window. You use “Events and Actions” to perform settings for switching pages.

NS series



Properties

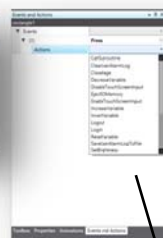
NA series



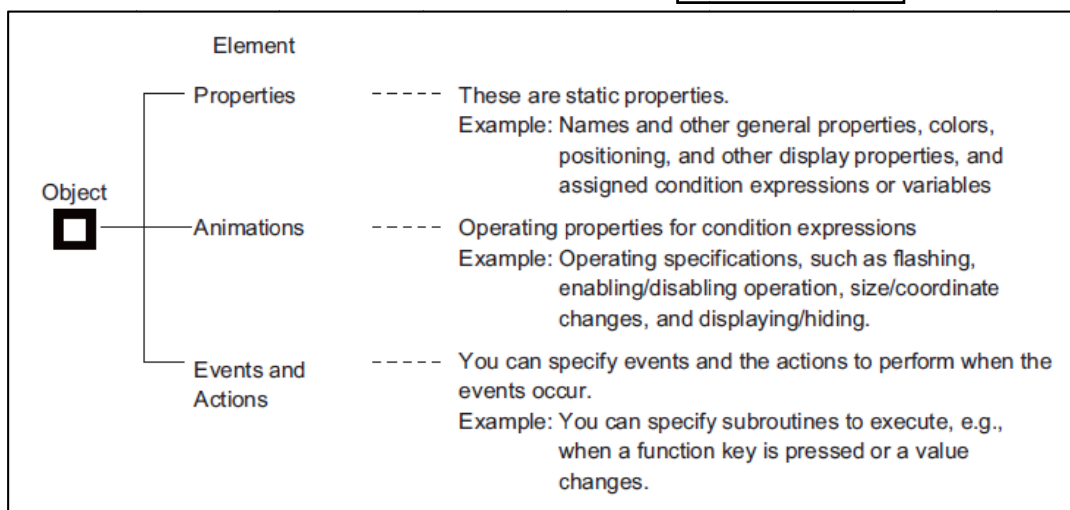
Properties



Animations



Events and Actions



4-2-2 Switches

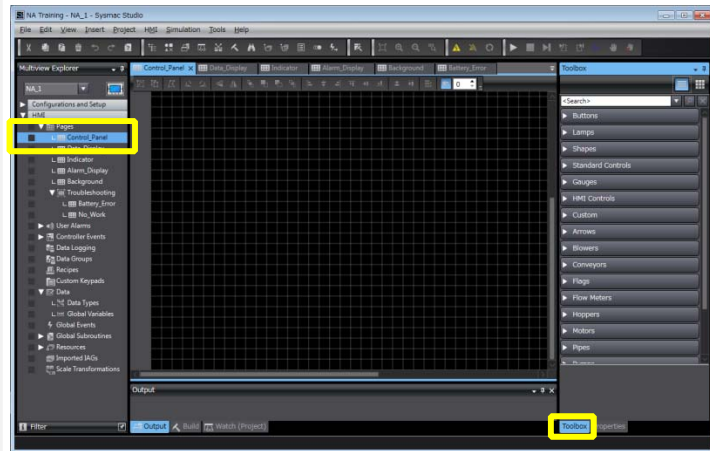
There are 5 switch objects as described below. Use “Momentary Button” for ON/OFF momentary switches, or “Button” to switch pages.

Button types	Functions
Button	A simple button with no particular action.
Momentary Button	Sets the bit only while it is held down.
Reset Button	Sets the bit to False when pressed.
Set Button	Sets the bit to True when pressed.
Toggle Button	Switches the bit between True and False when either turned on or off.

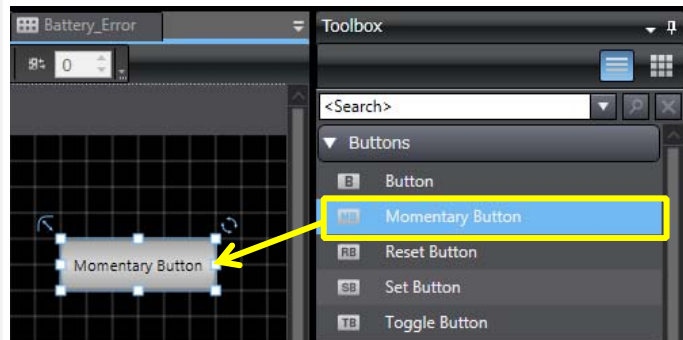
4-2-3 Creating ON/OFF Switches

Create the START button on the “Control_Panel” page. Drag and drop the object from the Toolbox to the page.

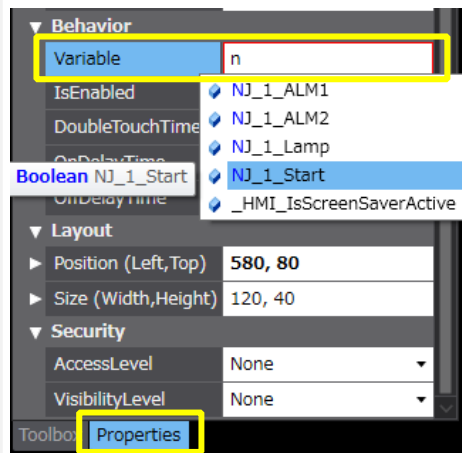
1. Open the “Control_Panel” page and click the “Toolbox” tab.



2. From [Toolbox], select [Buttons]-[Momentary Button], and drag and drop it to the page.

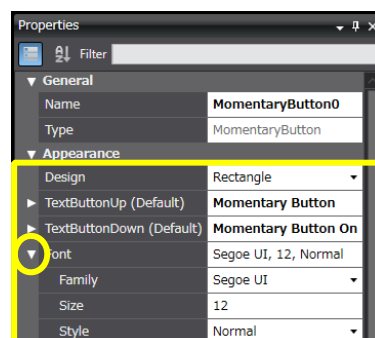


3. Use [Properties] to set text attributes. While keeping the object selected, select the [Properties] tab and enter “NJ_1_Start” in [Variable] under [Behavior]. If you enter “n” the variable’s first character, the variables starting with “n” appear.



4. Set the text attributes of the objects in the following fields under [Appearance].
[TextButtonUp]
START
[TextButtonDown]
START
[Font]
Family: Segoe UI
Size: 20
Style: Bold

If you click the arrowhead, you can edit the font family, size, and style.



5. After placing the object on the page, you can change its size by dragging the handle. You can move it by dragging itself.



6. You can also change the shape or color with [Properties].

[Changing shape]

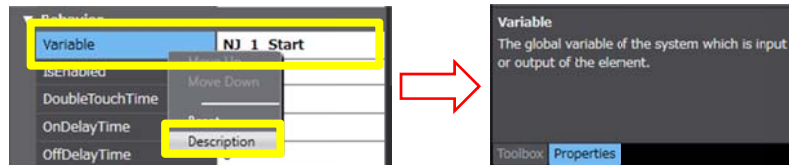


[Changing color]



Additional Information

When you right-click on an item and click “Description”, the description for the item appears at the bottom right of the screen.

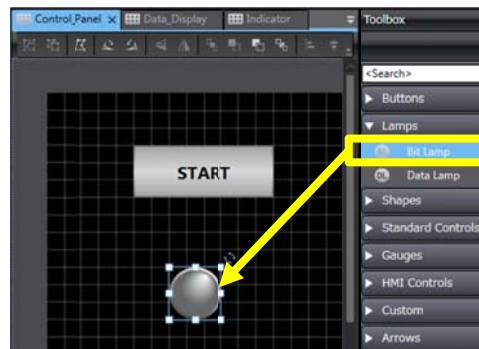


4-3 Creating Bit Lamps

4-3-1 Creating Bit Lamps

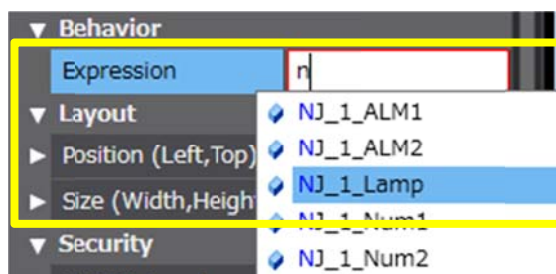
Create a Bit Lamp on the "Control_Panel" page.

1. Select the [Toolbox] tab. Select [Lamps]-[Bit Lamp] and then drag and drop it to the page.



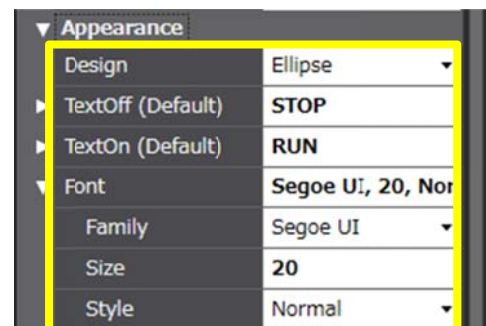
2. Select the [Properties] tab and specify the variable in [Expression] under [Behavior].

When you enter a character, the list of candidates appears. Select "NJ_1_Lamp" from the list.

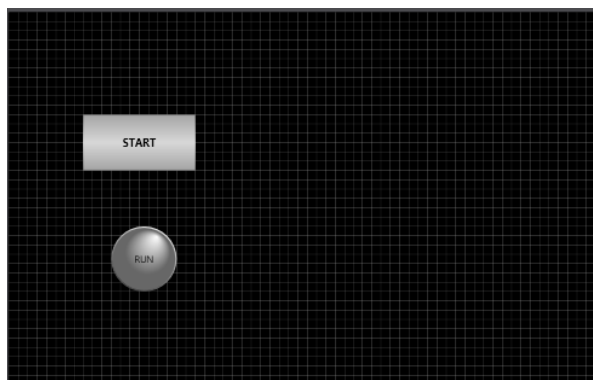


3. Change the text string and its attributes as described below.

[TextOff]
STOP
[TextOn]
RUN
[Font]
Family: Segoe UI
Size: 20
Style: Bold



4. Adjust the size and position just the same as the Button. You can change the color or shape from [Properties].





Additional Information

In [Expression], you can specify a conditional expression using variables as described below:

How to specify [Expression]

When you assign a Boolean variable for an object such as Lamp, specify [Expression] under [Behavior] in [Properties] as below.

Example 1: To execute the function when a Boolean variable (bInSample) is True;

bInSample=True

* If the value is True, you can omit the [=True] part.

Example 2: To execute the function when an Integer variable (intSample) is less than 20;

intSample<20

Example 3: To execute a function when a Boolean variable (bInSample) is True and also when an Integer variable (intSample) is less than 20;

(bInSample=True) AND (intSample<20)

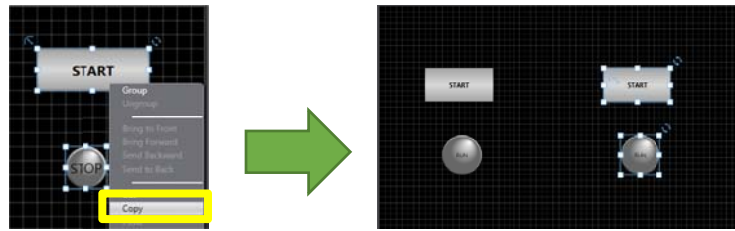
Example 4: To set the value obtained by adding 100 to an Integer variable (intSample);

intSample+100

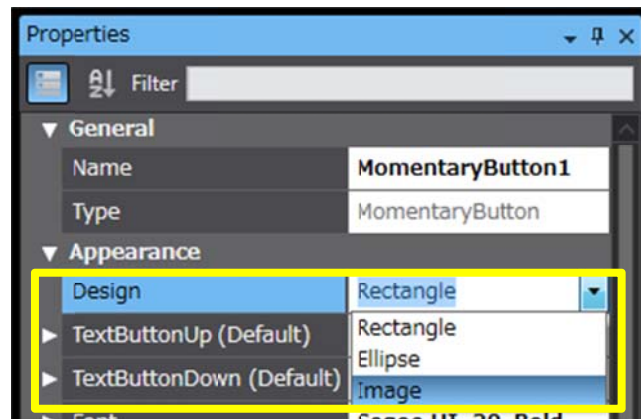
4-3-2 Importing the NS Objects


You can import image files to be used for the designs of the objects such as buttons or lamps. This subsection describes the procedure to import the NS objects.

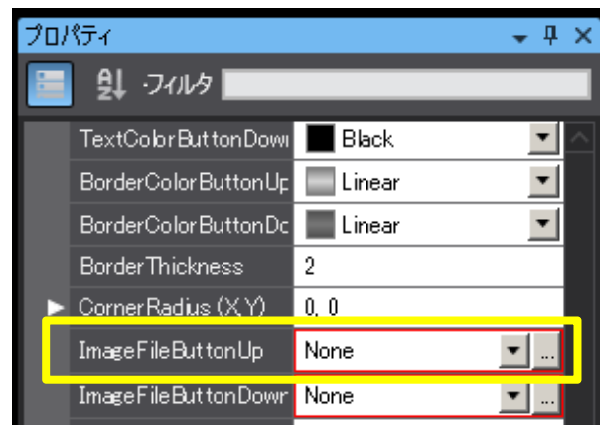
1. Select the Button and the Lamp you created, and copy and paste them.



2. Select the Button object, and change [Design] to "Image" under [Appearance] in [Properties].



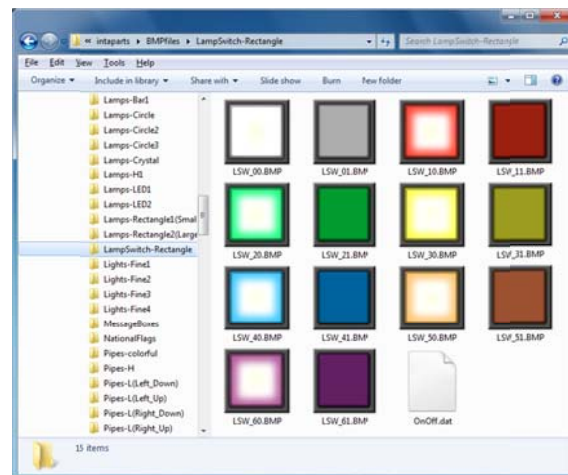
3. Click the  button in [ImageFileButtonUp] under [Appearance].



4. Open the folder located at the following path.

C:\Program Files\OMRON\CX-One\CX-Designer\intaparts\BMPfiles\LampSwitch-Rectangle

Select LSW_21.BMP and click "Open".





Additional Information

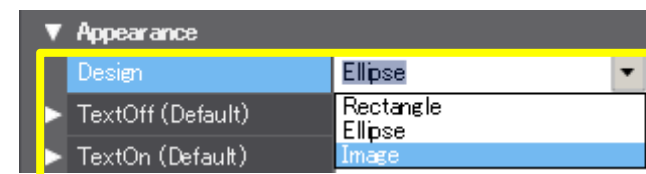
To display the bmp file images on the Explorer as shown in Step 4, you must perform the following settings.

- 1) Select [START]-[Computer] and right-click on it to select [Properties].
- 2) Click [Advanced system settings] to open the [System Properties] dialog box.
- 3) Click the [Advanced] tab and click the [Settings...] button of the [Performance] field.
- 4) Check the checkbox of "Show thumbnails instead of icons".

5. Similarly, set the "LSW_20.BMP" file in [ImageFileButtonDown].



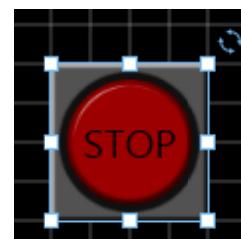
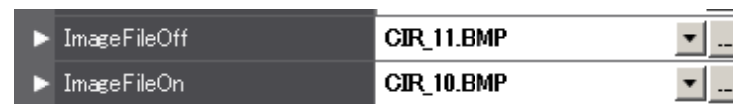
6. You can use the NS image files for the Lamp as well. Select the Lamp object and change [Design] to "Image" in [Properties].



7. Specify the following image files respectively for the Lamp.

File path
C:¥Program
Files¥OMRON¥CX-One¥CX-Desig
ner¥intaparts¥BMPfiles¥Lamps-Cir
cle

ImageFileOff: CIR_11.BMP
ImageFileOn: CIR_10.BMP

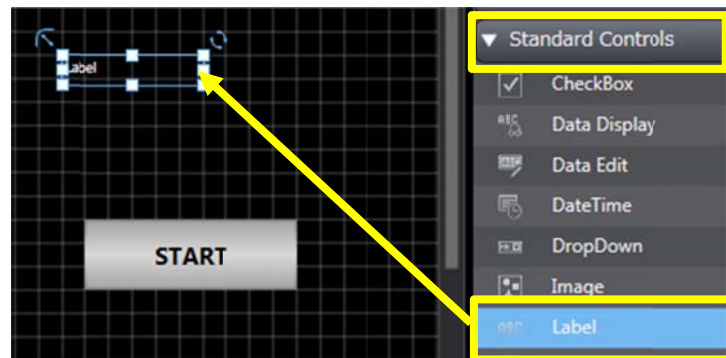


4-4 Creating Labels

4-4-1 Creating Labels

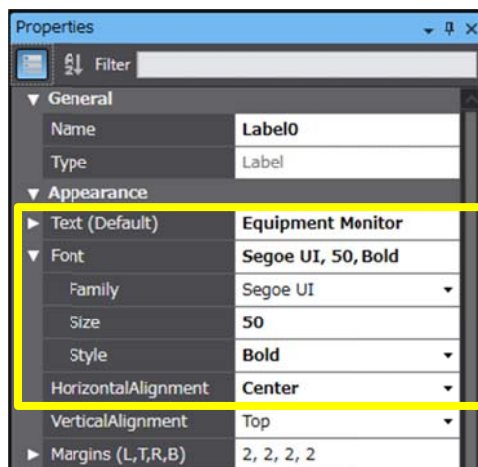
Create a Label on the “Control_Panel” page.

1. Select the [Toolbox] tab. Select [Standard Controls]-[Label] and then drag and drop it to the page.

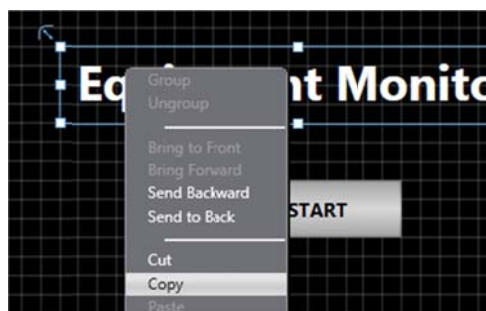


2. Click the [Properties] tab and specify the Label as describe below. Adjust the size and position accordingly.

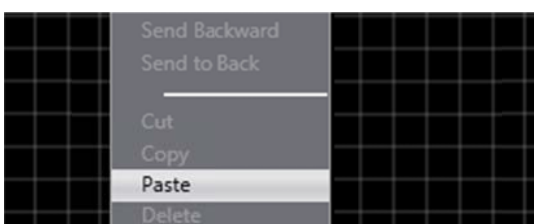
[Text(Default)]
Equipment Monitor
[Font]
Family: Segoe UI
Size: 50
Style: Bold
[HorizontalAlignment]
Center



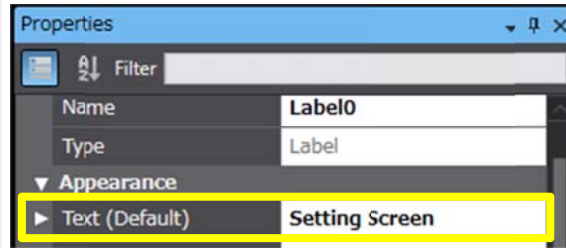
3. Subsequently, place the Label object on the other pages. Copy the created Label.



4. Paste it to the “Data_Display” page.



5. Change [Text (Default)] to “Setting Screen” in [Properties].



Setting Screen

6. Similarly, copy and paste the Label respectively to the “Indicator” and “Alarm_Display” pages and then modify the text respectively.

«Indicator page»

Gauge Screen

«Alarm_Display page»

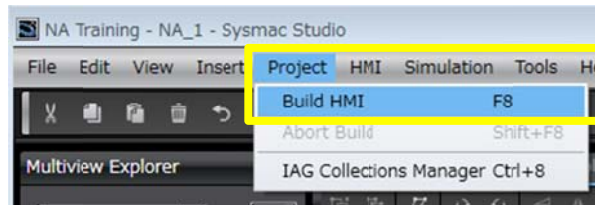
Alarm Screen

4-5 Off-line Testing 1

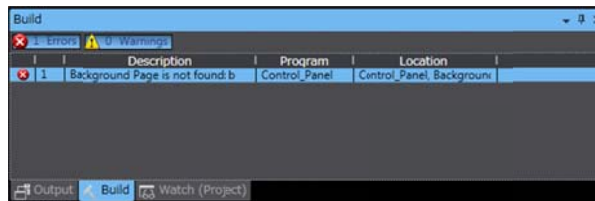
4-5-1 Build

Check if there is no error in the created pages to confirm that they operate properly.

1. Select [Project]-[Build HMI].



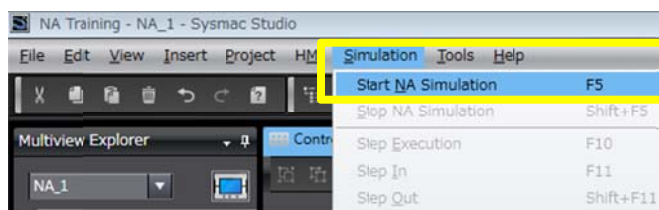
2. The Build window appears at the bottom of the screen. If there is any error, the error or warning is displayed. With an error, you cannot start up the simulator. Correct the error.



4-5-2 Simulation Only with the NA unit.

Perform simulation only with the NA unit.

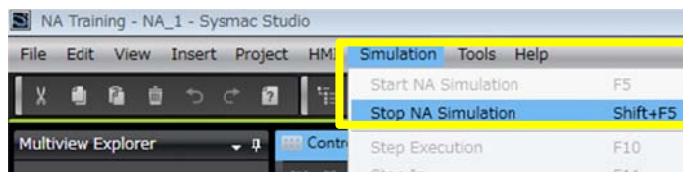
1. Select [Simulation]-[Start NA Simulation].



2. The simulator screen appears. Turn ON/OFF the switches to confirm the behaviors.



3. To stop the simulator, select [Simulation]-[Stop NA Simulation].



4-6 Creating the Button to Switch Pages

4-6-1 Events and Actions

To create a button to switch pages, perform settings to display the new page upon pressing the button. Use [Events and Actions] to perform such settings.

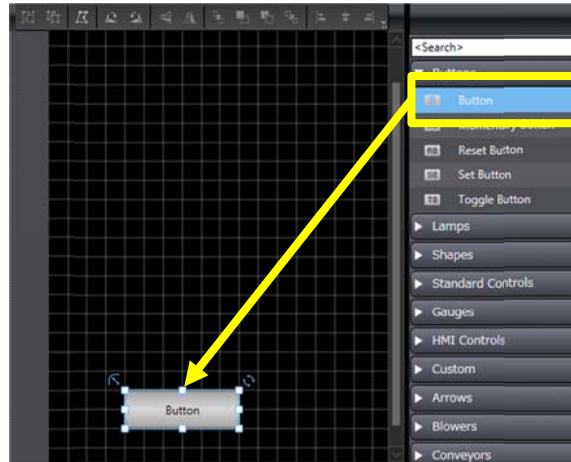
● Available Actions

Actions	Description
CallSubroutine	Calls scripts (Visual Basic).
ClearUserAlarmLog	Clears the alarm logs.
ClosePage	Closes the specified page.
SetVariable	Sets the variable to a specified value.
IncreaseVariable	Increases the variable to a specified quantity.
DecreaseVariable	Decreases the variable by specifying the quantity.
DisableTouchScreenInput	Disables the touch screen.
EnableTouchScreenInput	Enables the touch screen.
EjectSDMemory	Ejects the SD Memory card.
Logout	Makes the current user log out.
Login	Displays the log-in screen.
ResetVariable	Sets the Boolean variable to False.
SaveUserAlarmLogToFile	Saves the alarm log in a file.
SetBrightness	Changes the screen brightness.
SetLanguage	Changes the current language.
ShowDocument (FullScreen)	Displays a document full-screen.
ShowDocument (Window)	Displays a document to fit in the window.
ShowPage	Displays a new page.
ShowPreviousPage	Displays the previous page.
ShowSystemMenu	Displays the system menu.
StartDataLogging	Starts data logging.
StopDataLogging	Stops data logging.


4-6-2 Creating the Buttons to Switch Pages

Create the Buttons to switch pages on the “Background” page.

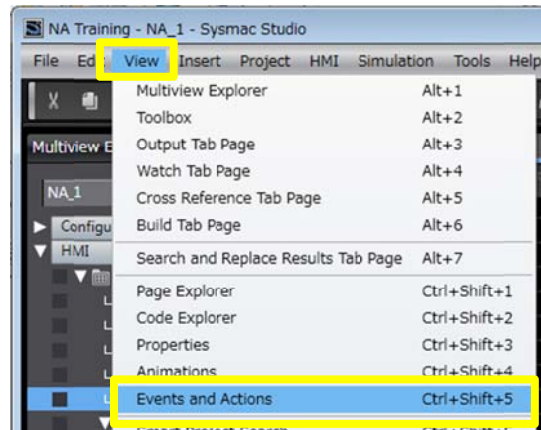
1. Open the “Background” page.
Select from the Toolbox [Buttons]-[Button], and then drag and drop it to the page.



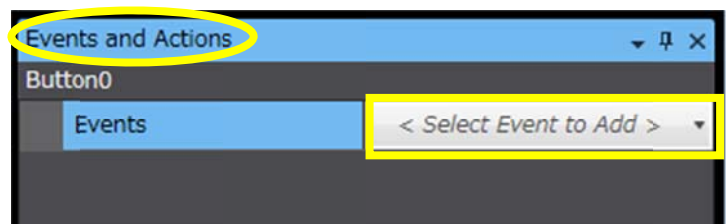
2. Set the Button so that the page is switched when the Button is pressed.
Perform settings in [Events and Actions].

Select [View]-[Events and Actions].
If you use the toolbar, click the  icon.

The [Events and Actions] window appears on the right side of the screen.

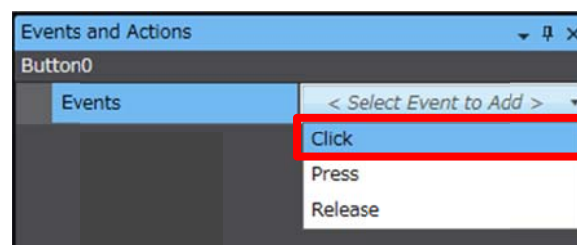


3. While selecting the Button object, click the cell indicating <Select Event to Add> to the right of [Events].



4. Select “Click”.

The event occurs at the time of:
Click: when you release the object
Press: while you are holding down the object
Release: when you release the object



Additional Information

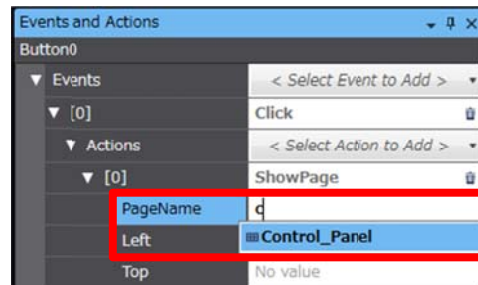
For both *Click* and *Release*, the event occurs when the object is released, but the operation when the page is changed is different. If the page changes when an object set for *Click* is touched but not yet released, the event does not occur. If the page changes when an object set for *Release* is touched but not yet released, the event does occur.

5. Click the cell to the right of [Actions], and select “ShowPage”.



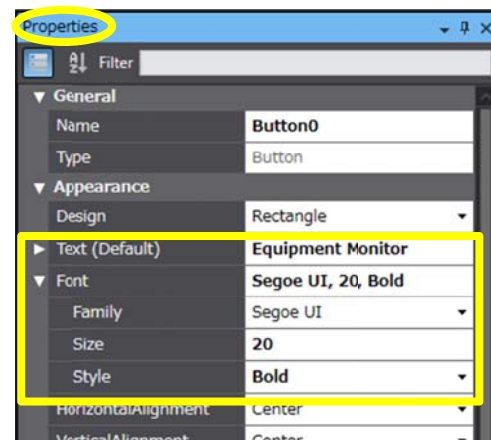
6. Click the cell to the right of [PageName] and select “Control_Panel”.

This completes the settings for switching pages.



7. Next, specify the properties. Click the [Properties] tab and perform the settings as described below.

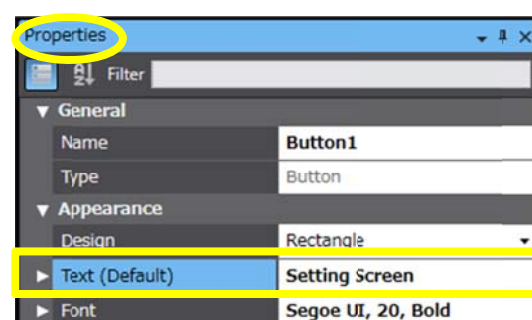
[Text(Default)]
Equipment Monitor
[Font]
Family: Segoe UI
Size: 20
Style: Bold



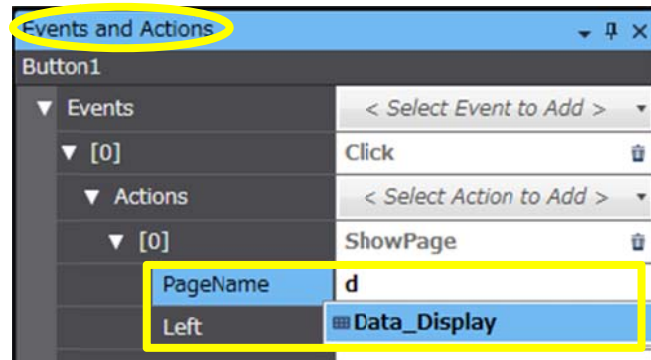
8. Similarly, create the Button to switch to the “Data_Display” page. Copy the previously created Button for switching pages, and paste it to the “Data_Display” page.



9. In [Properties], change [Text (Default)] to “Setting Screen”.



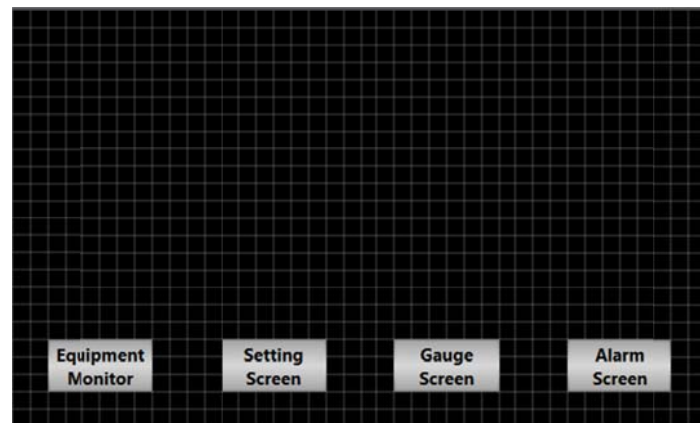
10. In [Events and Actions], set "Data_Display" in [PageName].



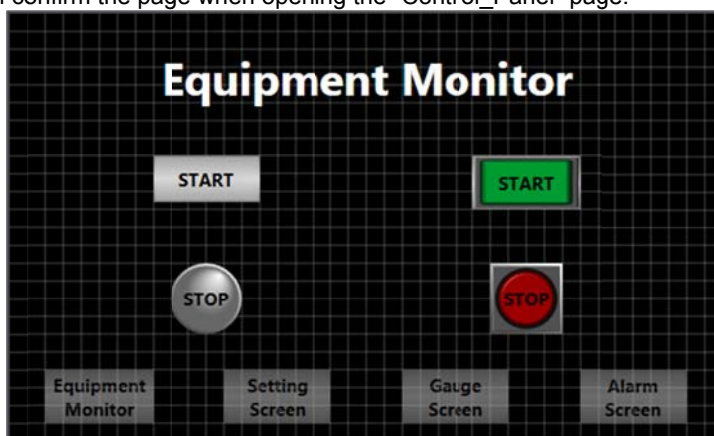
11. Similarly, create the Buttons to switch to the "Indicator" and "Alarm_Display" pages respectively.

- 1) Copy and past the Button to the respective pages.
- 2) In [Properties], change the text to "Gauge Screen" and "Alarm Screen" respectively.
- 3) In [Events and Actions], change [PageName] to "Indicator" and "Alarm_Display" respectively.

12. Last, adjust the size and position of each Button.



* The "Background" page is specified as a background.
You can confirm the page when opening the "Control_Panel" page.

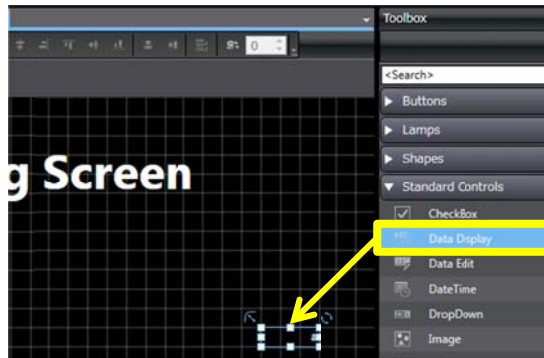


4-7 Creating Data Display/Edit Objects

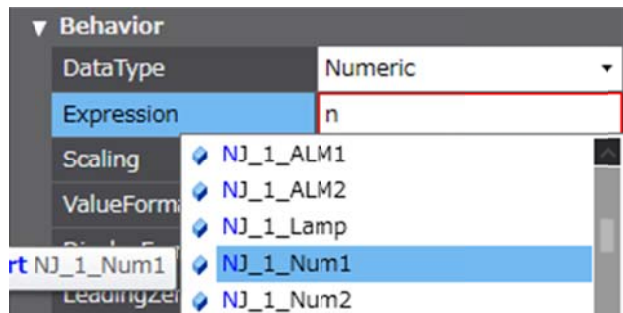
4-7-1 Creating Data Display Objects

Create on the “Data_Display” page a Data Display object.

1. From [Toolbox], select [Standard Controls]-[Data Display] and drag and drop it to the page.



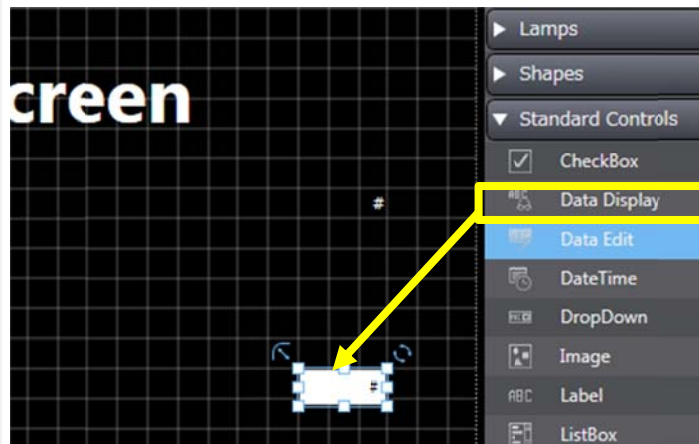
2. Set “NJ_1_Num1” in [Expression] under [Behavior].



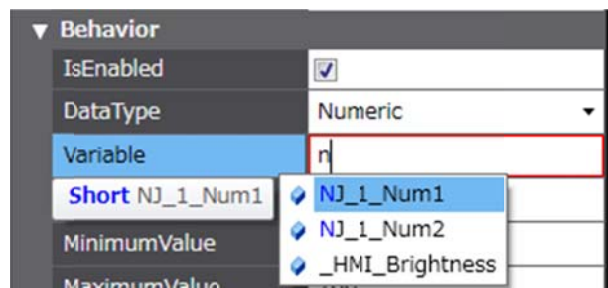
4-7-2 Creating Data Edit Objects

Create on the "Data_Display" page a Data Edit object.

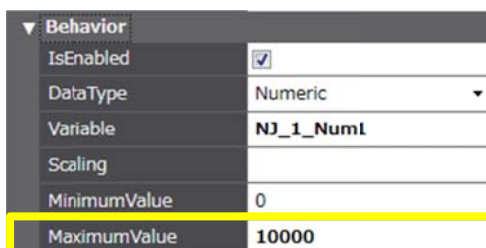
1. From [Toolbox], select [Standard Controls]-[Data Edit] and drag and drop it to the page.



2. In [Properties], set "NJ_1_Num1" in [Variable].




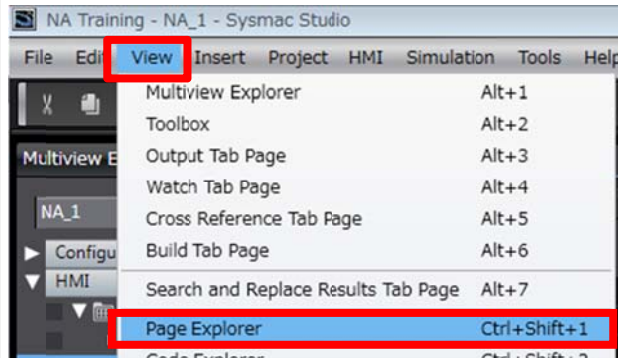
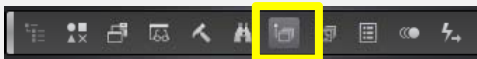
3. Specify the maximum and minimum values for the Data Edit object. Change [MaximumValue] to 10000.



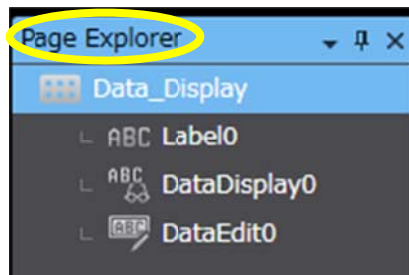
4-7-3 Batch Modification of Objects by the Page Explorer

The Page Explorer displays the objects included in the pages in the tree format. It allows you to edit the properties including the text size and others that are common to the objects which have been already placed on the pages. It is useful especially when editing the duplicated objects.

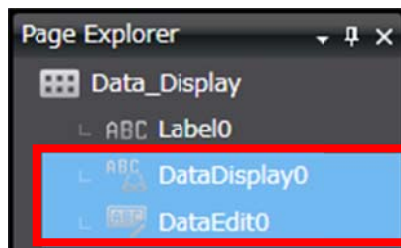
1. Select [View]-[Page Explorer].
If you use the toolbar, click the  icon.



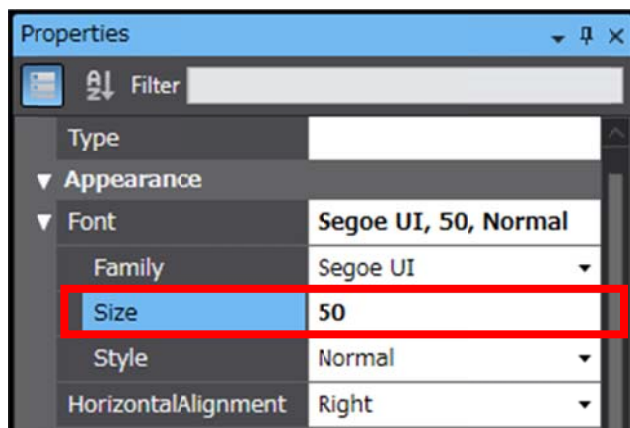
2. The [Page Explorer] window appears on the left side of the screen.



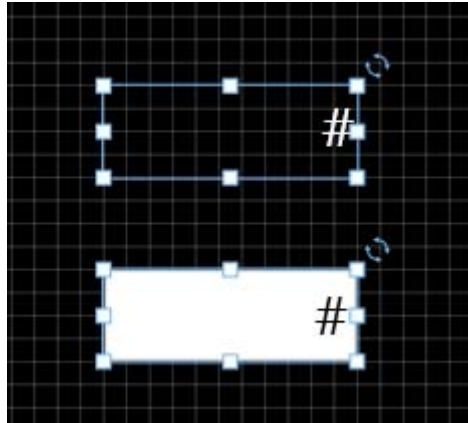
3. In [Page Explorer], select "DataDisplay0" and "DataEdit0".



4. Change [Size] to 50 under [Font].



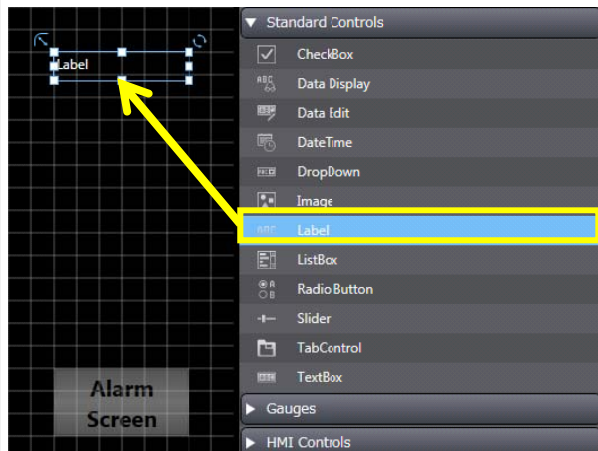
5. Modify the objects' sizes and adjust the positions.



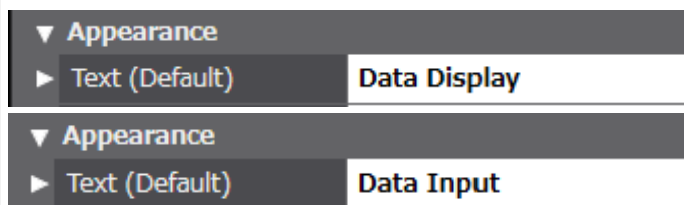
4-7-4 Creating the Labels

Create the Labels of the Data objects.

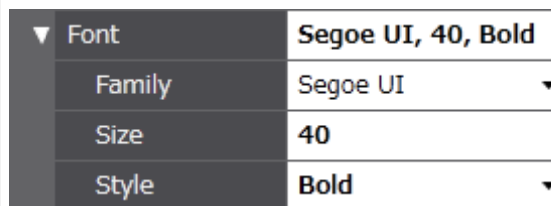
1. From [Toolbox], select [Standard Controls]. Drag and drop two Label objects to the page.



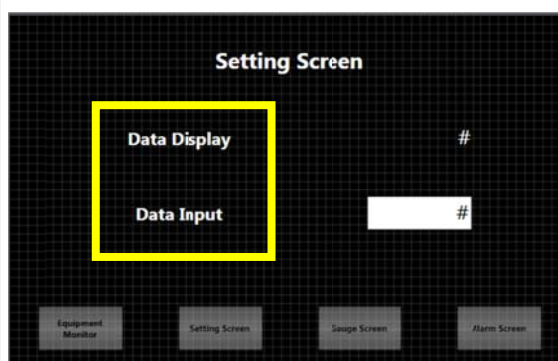
2. In [Properties], change [Text (Default)] to [Data Display] and [Data Input] respectively.



3. Change the font settings to [Size: 40] and [Style: Bold].





4. Adjust the sizes and positions of the Label objects.



4-8 Creating Gauges

4-8-1 Gauge Objects

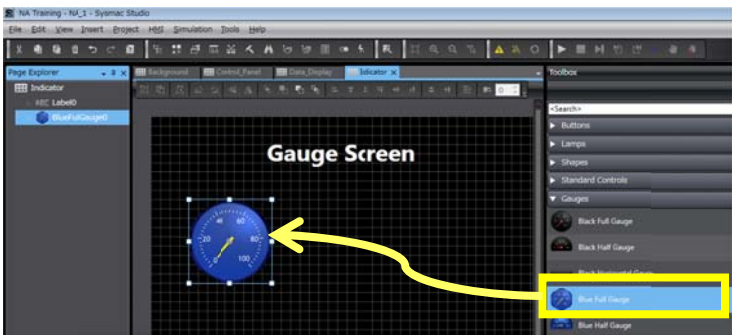
The Gauge objects display the digital values of variables in the analog format.
The NA series provides two basic gauge types.

Types	Description	Appearance
Linear Gauge	Linearly displays fluctuation of the analog values. Can be placed vertically or horizontally.	
Rotational Gauge	Displays fluctuation of the analog values in a rotational angle format.	

4-8-2 Creating Gauges

Create a Gauge on the “Indicator” page.

1. From [Toolbox], select [Gauges]-[Blue Full Gauge] and drag and drop it to the page.



2. In [Properties], set “NJ_1_Num2” in [Variable] under [Behavior].

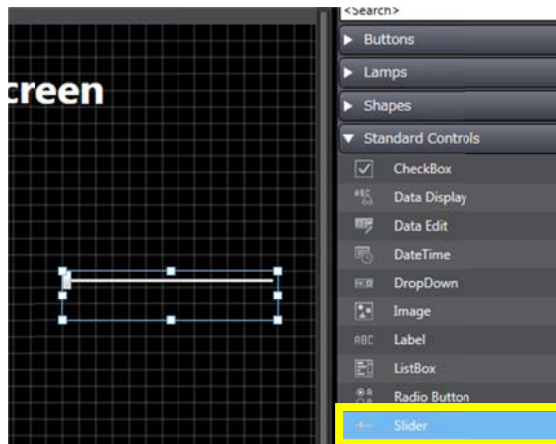
This completes the settings for the gauge.
The tick appearance can be changed in [Properties].



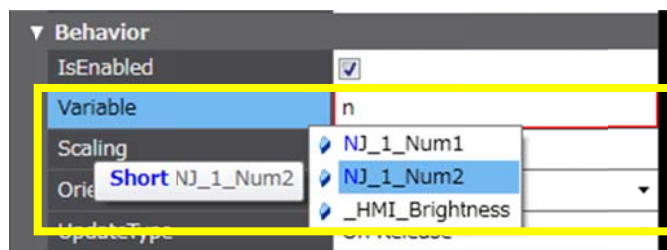
4-8-3 Creating Sliders

Create a Slider for checking the operation.

1. From [Toolbox], select [Standard Controls]-[Slider] and drag and drop it to the page.



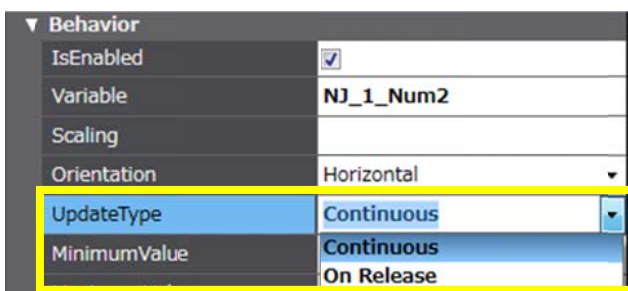
2. In [Properties], set "NJ_1_Num2" in [Variable] under [Behavior].



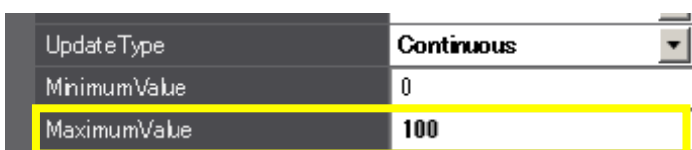
3. Change [Update Type] to "Continuous" under [Behavior].

Continuous: the value changes in accordance with the movement of the slider.

On Release: the value changes at the time when you release the slider.



4. According to the gauge settings, change [MaximumValue] to 100 under [Behavior].



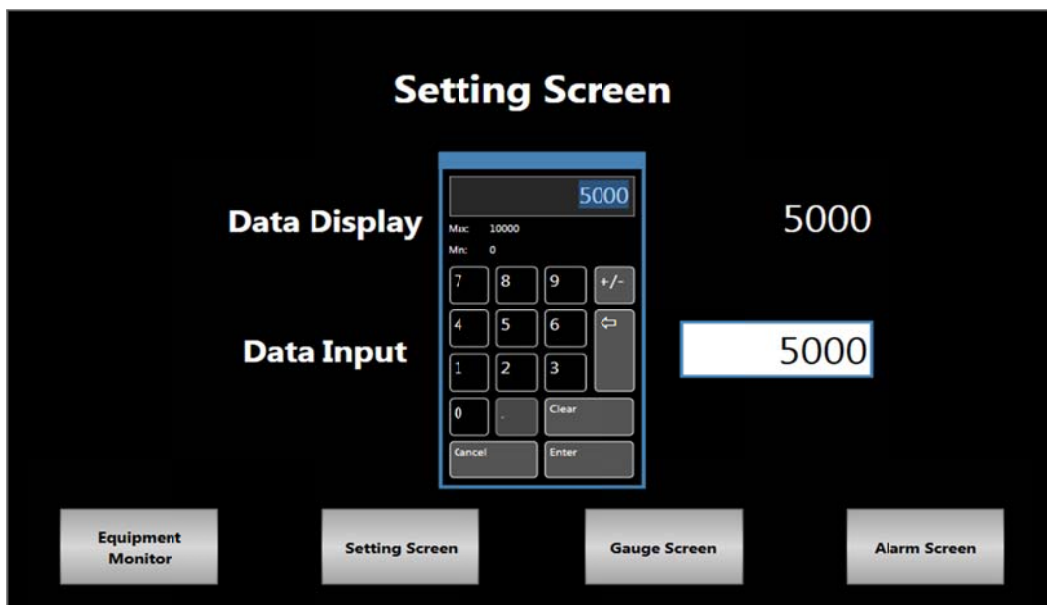
4-9 Off-line Testing 2

4-9-1 Off-line Testing 2

Build the project and start up the simulator.

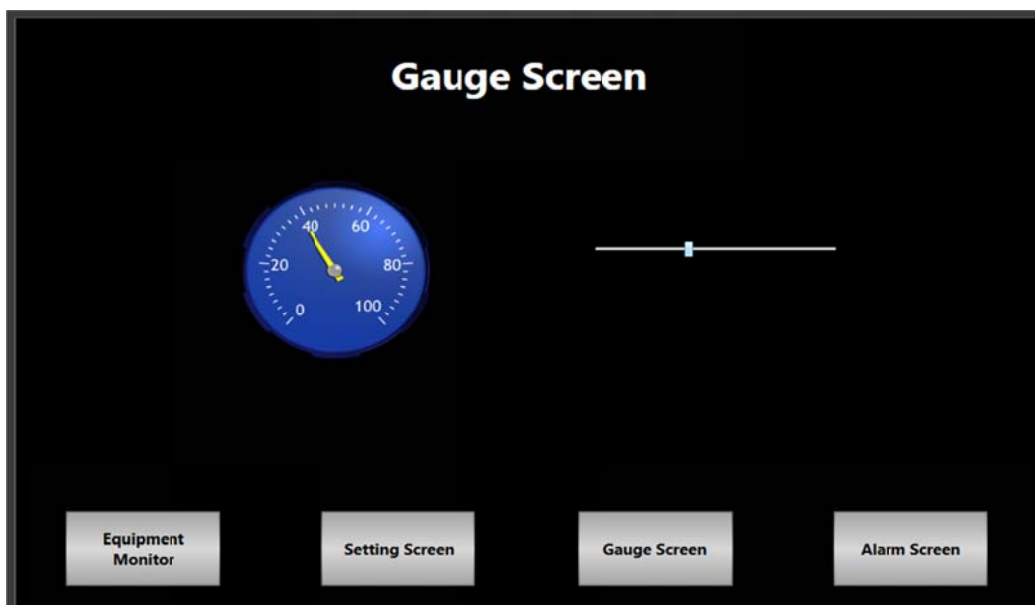
[Operation Check 1]

- (1) Click the [Setting Screen] Button to switch the page.
- (2) When you click the Data Edit object, a numeric keypad appears. Specify a value and click the Enter key.



[Operation Check 2]

- (1) Click the [Gauge Screen] Button to switch the page.
- (2) Operate the Slider and confirm that the needle of the Gauge moves in accordance with the slider movement.



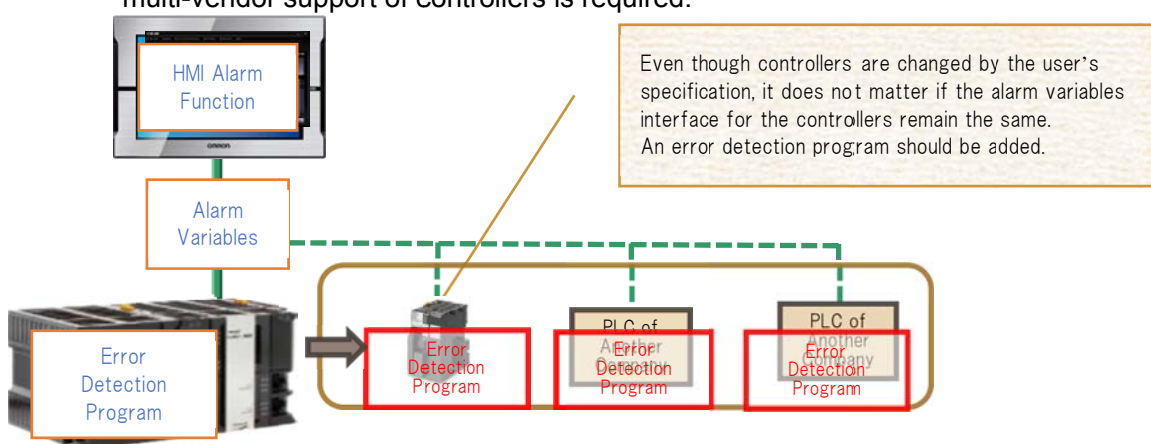
4-10 Creating Alarms

4-10-1 Alarm Mechanism

Just as the conventional PTs, the NA has the function to manage alarms that give the users the warnings of errors and problems occurred in the machines. The NA's alarm mechanism is prepared to combine the following two schemes depending on the environment where the system is established.

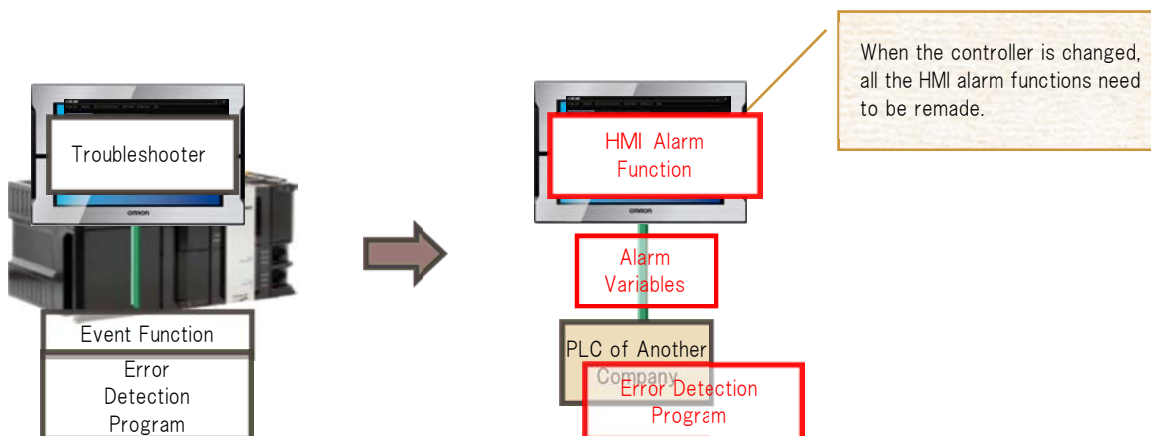
(1) Managing the alarm list/log on the NA side (HMI alarms)

In the "HMI Alarms" scheme, the PT has the alarm processing function. Therefore, alarm management by the controller is simple. This scheme is often selected when multi-vendor support of controllers is required.



(2) Managing the alarm list/log on the NJ side (Troubleshooter)

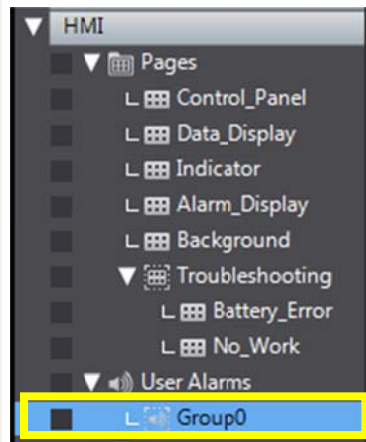
In the "Troubleshooter" scheme, the controller has the event processing function, and the PT only displays the events. This makes the entire management including the PT simple, and allows the users to reduce design man-hours. Therefore, this scheme is used for the system in which the configuration of NJ and NA is fixed.



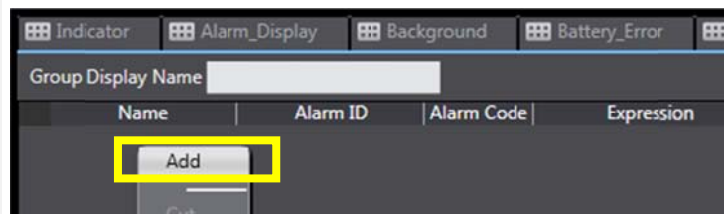
4-10-2 Creating Alarm Lists

First, create an alarm list.

1. Double-click to open [HMI]-[User Alarms]-[Group0].



2. Right-click on the Edit Pane and select "Add".



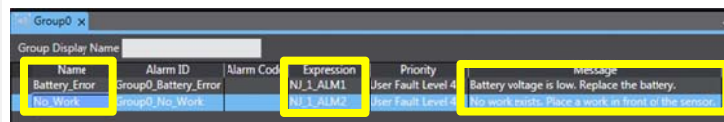
3. Register the following alarms respectively.

<Alarm1>

- Name: Battery_Error
- Expression: NJ_1_ALM1
- Message: Battery voltage is low. Replace the battery.

<Alarm2>

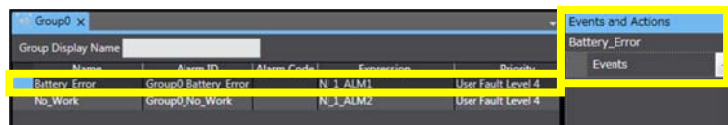
- Name: No_Work
- Expression: NJ_1_ALM2
- Message: No work exists. Place a work in front of the sensor.



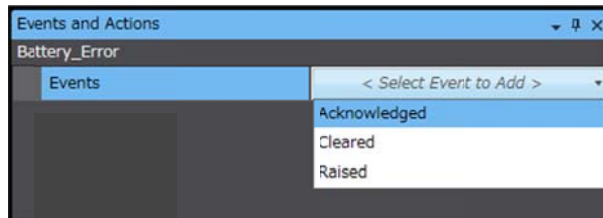
4-10-3 Displaying the Troubleshooter

Perform settings so that the troubleshooter is displayed when confirming errors.

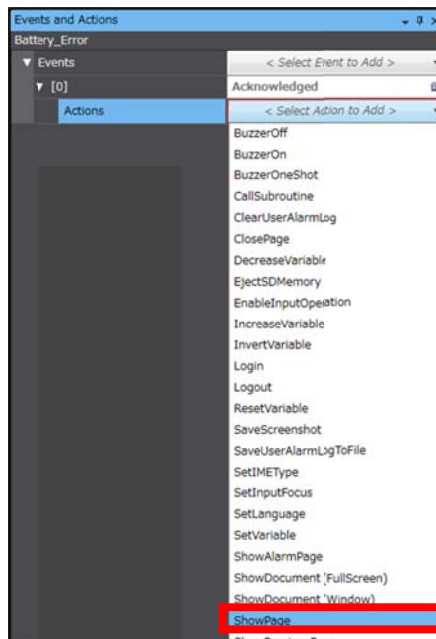
1. While keeping one of the specified alarms selected, open the [Events and Actions] window.



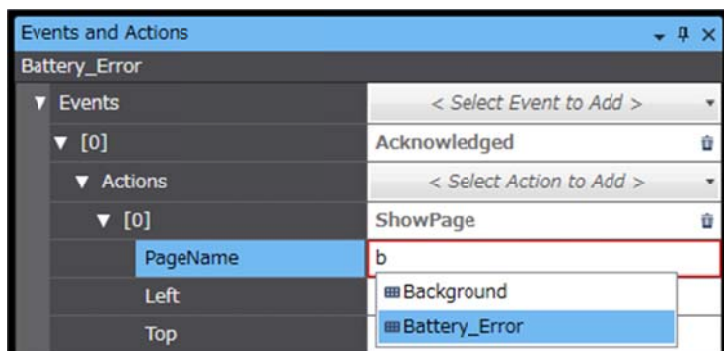
2. Perform the settings for changing the page upon confirming alarms. Click the cell indicating <Select Event to Add> to the right of [Events], and select "Acknowledged".



3. Click the cell to the right of [Actions], and select "ShowPage".



4. Click the cell to the right of [PageName] and select "Battery_Error".



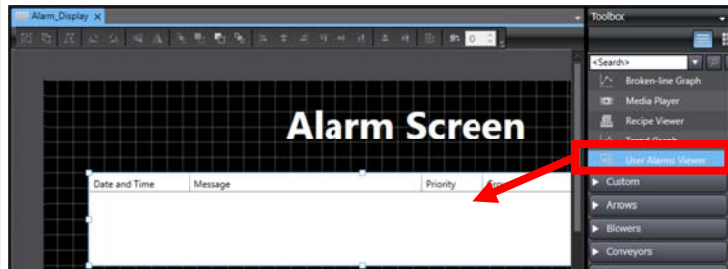
5. Similarly for the No Work error, perform the settings so that the “No_Work” page is displayed when confirming the error.

Events and Actions	
No_Work	
▼ Events	< Select Event to Add >
▼ [0]	Acknowledged
▼ Actions	< Select Action to Add >
▼ [0]	ShowPage
PageName	No_Work
Left	No value
Top	No value

4-10-4 Creating Alarm Objects (Active Display Mode)

The Alarm objects include the mode in which to display the currently raised alarms (Active Display Mode) and the other mode in which to display the log (Log Display Mode). First, create the Active Display Mode Alarm object.

1. Open the “Alarm_Display” page and drag and drop to the page from [Toolbox] the [User Alarms Viewer] object under [HMI Controls].

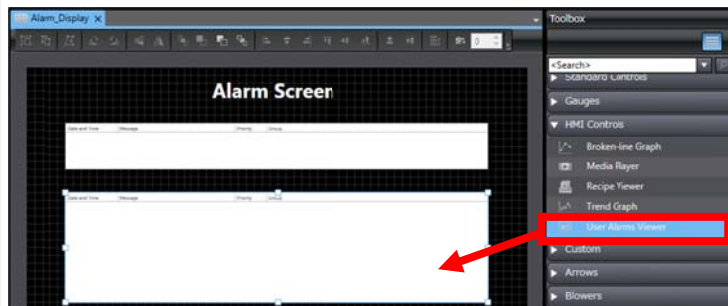


2. Use [Properties] to change text attributes and others.

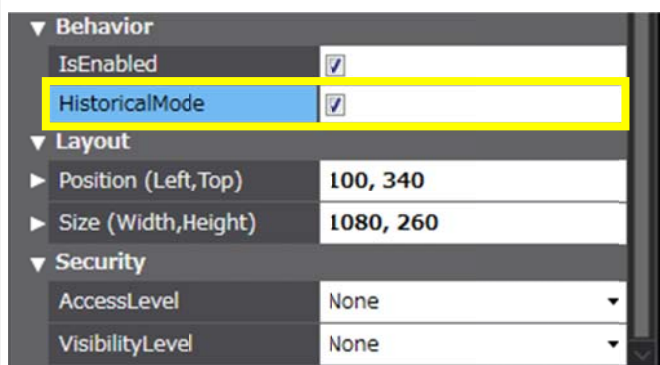
4-10-5 Creating Alarm Objects (Log Display Mode)

Create the object that displays alarm logs.

1. From [Toolbox], select [User Alarms Viewer] and drag and drop it to the page.



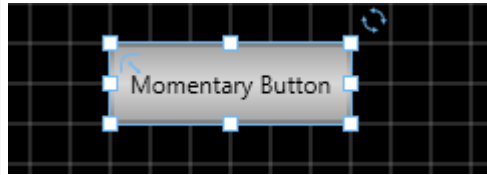
2. Open the [Properties] window and check the checkbox of “HistoricalMode”.



4-10-6 Creating a Switch to Cause Alarms

To check operations, create a switch that causes alarms.

1. Place a Momentary Button on the page.



2. Specify the properties as described below.

[TextButtonUp(Default)]
Alarm1
[TextButtonDown(Default)]
Alarm1
[Variable]
NJ_1_ALM1

3. Copy and paste the object, and specify the properties as described below.

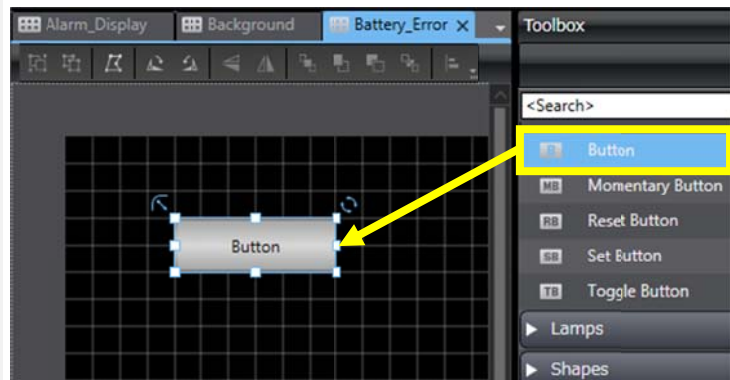
[TextButtonUp(Default)]
Alarm2
[TextButtonDown(Default)]
Alarm2
[Variable]
NJ_1_ALM2

4-11 Displaying PDF Files

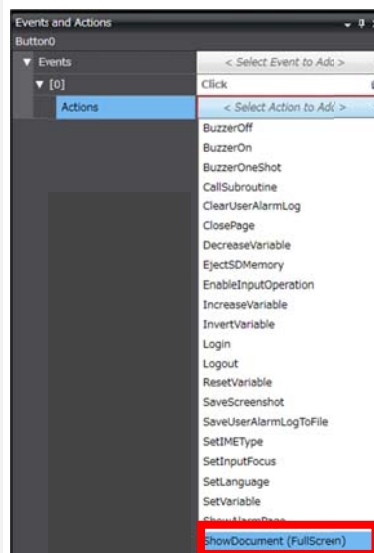
4-11-1 Displaying PDF Files


Perform the settings for displaying a PDF file when pressing a Button.

1. Place a Button object on the “Battery_Error” page.

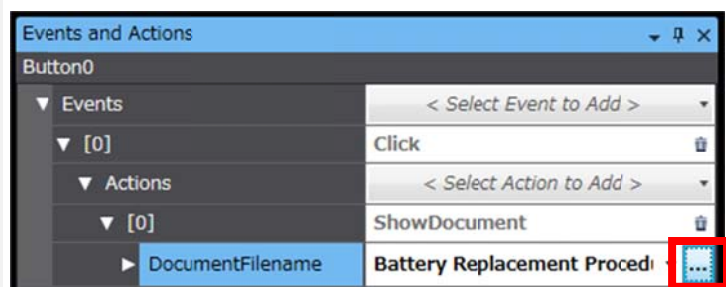


2. In [Events and Actions], perform the settings for displaying the document when clicking the Button. Select “Click”, and then “ShowDocument (Full Screen)”.

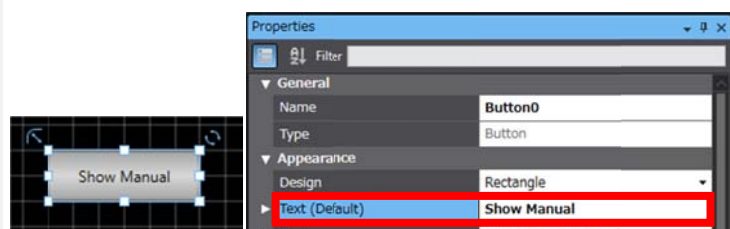


3. Select the PDF file to display. Click the  button and select “Battery Replacement Procedure.pdf” from the desktop.

This completes the settings in [Events and Actions].



4. In [Properties], change [Text(Default)] to “Show Manual”.

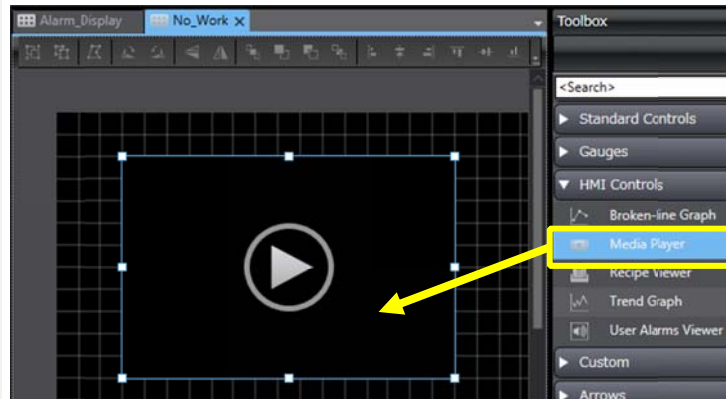



4-12 Displaying Videos

4-12-1 Displaying Videos

Perform the settings for displaying videos.

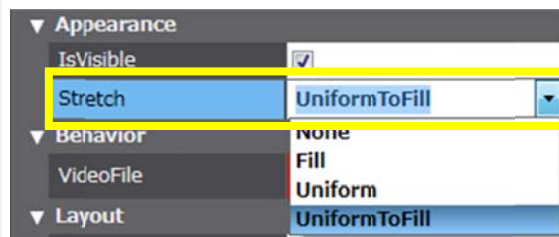
1. Open the “No_Work” page. Select [HMI Controls]-[Media Player] and drag and drop it to the page.



2. In [Properties], click the  button in the cell to the right of [VideoFile] under [Behavior], and select “No_work_L_J.mp4” from the desktop.



3. Change [Stretch] under [Appearance] to “UniformToFill”. The setting allows you to expand/reduce the video so as to fit in the object size. You can arbitrarily modify the object size.



5 Check on the Actual Unit

This chapter describes the procedure to transfer the project data of Sysmac Studio to an NA unit to check the operation.

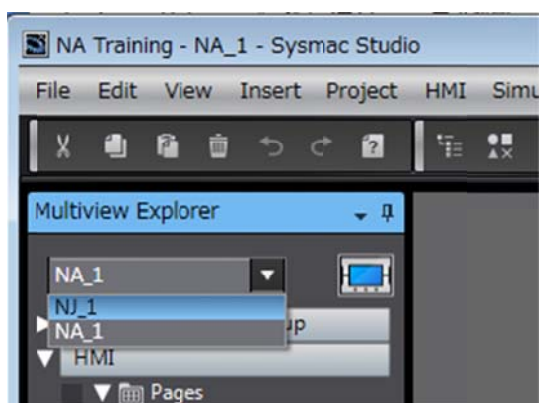
If you do not have any actual unit, you can check the operation with the integrated simulation function described in Chapter 6.

5-1 Creating a Ladder

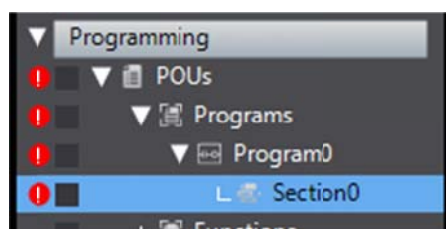
5-1-1 Creating a Ladder

Input the ladder for checking the operation.

1. Change the project to "NJ_1".



2. Double-click [Programming]-[POU]-[Programs]-[Program0]-[Section0].



3. Enter the ladder program shown on the right.

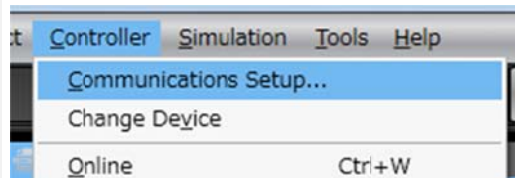


5-2 Synchronization

5-2-1 Synchronization with NJ

To transfer the configurations and settings as well as the programs of the NJ, synchronize with the NJ.

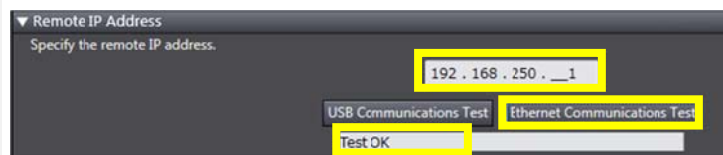
1. Select [Controller]-[Communications Setup...].





2. Select "Ethernet connection via a hub".



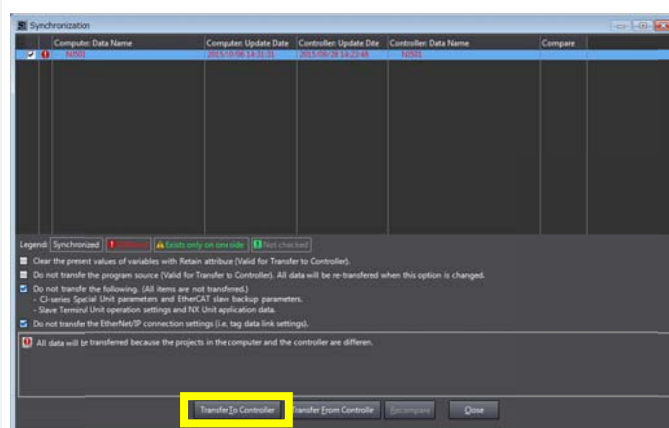
3. Enter the IP address (192.168.250.1) of the controller to be connected in [Remote IP Address]. Click [Ethernet Communications Test] and confirm that "Test OK" appears. Then click [OK].



4. Click the  icon to connect to NJ online.

5. Click the  icon to execute synchronization.

6. Click [Transfer To Controller].

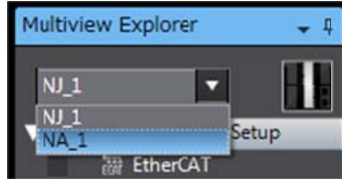


7. This completes the settings on the NJ side.

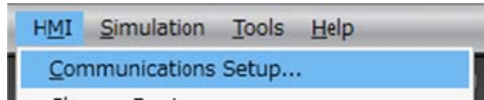
5-2-2 Synchronization with NA

Subsequently, synchronize with NA to transfer the configurations and settings as well as the programs of the NA.

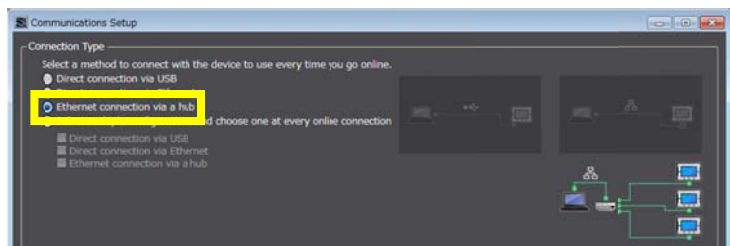
1. Switch the project to "NA_1".



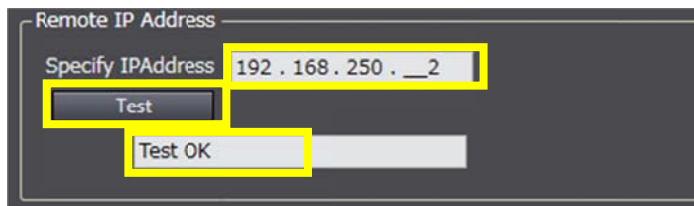
2. Select [HMI]-[Communications Setup...].





3. Select "Ethernet connection via a hub".



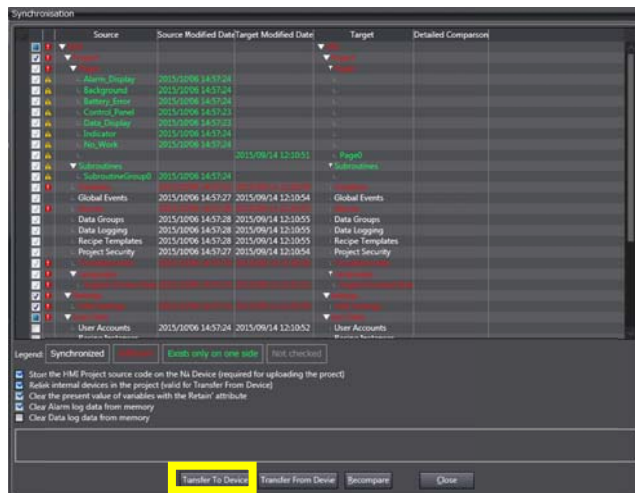
4. Enter the IP address of the NA to be connected in [Remote IP Address]. Click [Test] and confirm that "Test OK" appears. Then click [OK].



5. Click the  icon to connect to NA online.

6. Click the  icon to execute synchronization.

7. Click [Transfer To Device].



5-3 Operations

5-3-1 Checking Operations

Check the operations on each page.

(1) Equipment Monitor

The Lamp objects light up while a START Button is held down.

The indications of the switches and lamps change when turning ON/OFF the switches.

(2) Setting Screen

When you specify the data input, the value is displayed.

(3) Gauge Screen

When you move the slider, the needle of the gauge moves in accordance with the slider movement.

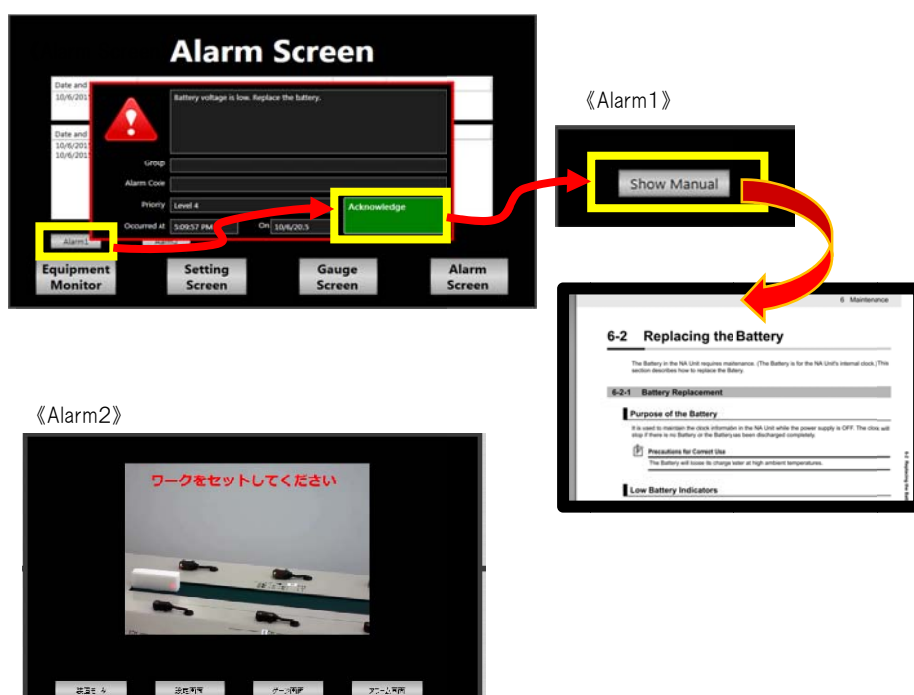
(4) Alarm Screen

Press the Alarm1/Alarm2 Buttons to confirm that the respective Alarms are raised.

· For Alarm1, the Button to show the manual appears when the alarm is confirmed.

When you press the Button, the PDF file that explains how to replace batteries is displayed.

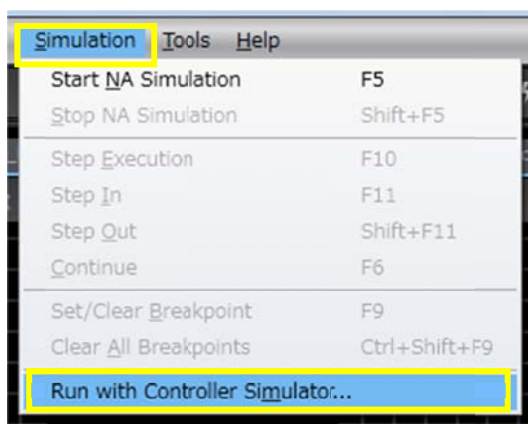
· For Alarm2, a video is played when the alarm is confirmed.



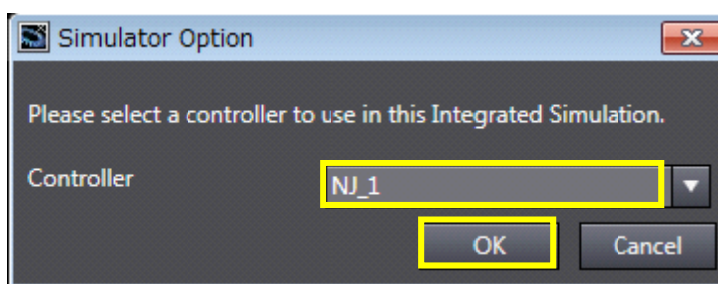
6 Integrated Simulation

When you do not have an actual NJ or NA unit, you can confirm the NJ programs and NA operations using the integrated simulation function as described below.

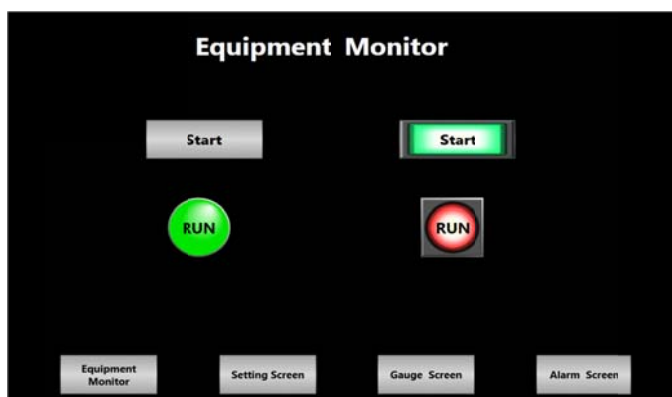
1. Click [Simulation]-[Run with Controller Simulator...].



2. Select the controller to use in the integrated simulation, and click [OK].



3. The Equipment Monitor Screen appears. Confirm that when you press the [START] button the Lamps light up.



7 Reference Materials

7-1 Correspondence Table of Data Types between the NJ-series Controllers and the PTs

7-1-1 Data Types

Following is the correspondence of data types between the NJ-series controllers and the PTs.

Data Types of the NJ-series Controllers	Data Types of the PTs
BOOL	Boolean
INT	Short
DINT	Integer
LINT	Long
UINT	UShort
WORD	UInteger
UDINT	
DWORD	
ULINT	Ulong
LWORD	
REAL	Single
LREAL	Double
STRING	String
SINT	SByte
USINT	Byte
BYTE	
TIME	TimeSpan
DATE	Date
DATE_AND_TIME	
TIME_OF_DAY	

7-2 NA Series Lineup

7-2-1 NA Series Lineup

The NA series offers the lineup of 7-inch, 9-inch, 12-inch and 15-inch screen sizes.
The model differs depending on the screen size.

Models	NA5-15W□□□□	NA5-12W□□□□	NA5-9W□□□□	NA5-7W□□□□
Screen Size	15 inches	12 inches	9 inches	7 inches



Revision History

Revision code	Date	Revised content
01	September 2015	Original production

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