OMRON

Programmable Terminal NA Series

Practice Guide
Demonstration Screens
for Safety CPU

NA5-15□101□
NA5-12□101□
NA5-9□001□
NA5-7□001□

Practices

Guide

sysmac
always in control

V447-E1-05

■ Introduction

This guide describes reference information to operate safety CPU demonstration screens. Safety information is not provided in this document. Be sure to obtain manuals for NA-series programmable terminals, read and understand the safety points and other information required for use, and test sufficiently before using the equipment.

Terms and Conditions Agreements

Thank you for your usage of products of Omron Corporation (Omron). Without any special agreements, these terms and conditions shall apply to all transactions regardless of who sells.

● Definitions of Terms
- Omron product(s): Omron's factory automation system devices, general control devices, sensing devices, and electronic/mechanical components.
- Catalogues: Any and all catalogues (including "Best Components" and other catalogues), specifications, instructions and manuals relating to Omron products, including electronically provided data.
- Conditions: Use conditions, rating, performance, operating environment, handling procedure, precautions and/or prohibited use of Omron products described in the catalogues.
- User application(s): Application of Omron products by a customer, including but not limited to embedding/using Omron products into customer's components, electronic circuit boards, devices, equipment or systems.
- Conformity: (a) conformity, (b) performance, (c) no infringement of intellectual property of third party, (d) compliance with laws and regulations, and (e) conformity to various standards of Omron products in user applications.

● Note about Descriptions
Understand the followings as to contents of the catalogues.
- Rating and performance are tested separately. Combined conditions are not warranted.
- Reference data is intended to be used just for reference. Omron does NOT guarantee that the Omron Product can work properly in the range of reference data.
- Examples are intended for reference. Omron does not warrant the conformity in usage of the examples.
- Omron may discontinue Omron products or change specifications of them because of improvements or other reasons.

● Note about Use
Adopt and use Omron products considering the following cautions.
-   Use the product in conformance to the conditions, including rating and performance.
-   Check the conformity and decide whether or not Omron products are able to be adopted. Omron makes no guarantees about the conformity.
- Make sure in advance that electricity is properly supplied to Omron products and they are set up rightly in your system for intended use.
- When you use Omron products, ensure the followings: (i) allowance in aspect of rating and performance, (ii) safety design which can minimize danger of the application when the product

does not work properly, (iii) systematic safety measures to notify danger to users, and (ⅳ) periodical maintenance of Omron products and the user application.

- Omron assumes no responsibility for any direct or indirect loss, damage and expense resulting from infection of our products, installed software, any computer devices, computer programs, network, and databases with the followings:

  - DDoS attack (distributed DoS attack),

  - Computer virus and other technically harmful program, and

  - Unauthorized access.

      Please conduct the followings by yourself: (i) antivirus software, (ii) data input/output, (iii) lost data recovery, (ⅳ) protections against computer virus that contaminate Omron products or the installed software, and (ⅴ) measures to protect Omron products from unauthorized access.

- Omron products are designed and manufactured as commodity for general industrial products. For this reason, the usages (a) to (d) are to be unintended. Omron makes no guarantees on Omron products, if you use Omron products for those purposes.

However, special applications that Omron expects or usages with especial agreement are excluded.

(a)   Applications requiring high-level safety (e.g. nuclear control facilities, combustion facilities, aerospace and aviation facilities, railroad facilities, elevating facilities, amusement facilities, medical facilities, safety devices or other applications which has possibility to influence human lives or bodies)

(b)   Applications requiring high reliability (e.g. gas/water/electricity supply system, 24-hour operating system, applications handling with rights/property, such as payment system)

(c) Applications in a harsh condition or environment (e.g. outdoor facilities, facilities with potential of chemical contamination or electromagnetic interference, facilities with vibration or impact, facilities on continual operation for a long period)

(d)   Applications under conditions or environment which are not described in the catalogues

- Omron products in the catalogues are not intended to be used in automotive applications (including two-wheel vehicles). Please DO NOT use Omron products in automotive applications. Contact our sales personnel for automotive products.

● Warranty

Warranty of Omron products is subject to followings.

- Warranty Period: One year after your purchase. However, except when there is a separate statement in the catalogues.

- Coverage: Omron will provide one of the services listed below, on the basis of Omron's decision.

(a) Free repairing of the malfunctioning Omron products (except electronic/mechanical components) at Omron maintenance service sites.

(b) Free replacement of the malfunctioning Omron products with the same number of substitutes.

- Exceptions: This warranty does not cover malfunctions caused by any of the followings.

(a) Usage in the manner other than its original purpose
(b) Usage out of the conditions
(c) Usage out of Note about Use in these conditions
(d) Remodeling/repairing by anyone except Omron
(e) Software program by anyone except Omron
(f) Causes which could not be foreseen by the level of science and technology at the time of shipment of the products.
(g) Causes outside Omron or Omron products, including force majeure such as disasters

● Limitation of Liability

The warranty described in this Terms and Conditions Agreements is a whole and sole liability for Omron products. There are no other warranties, expressed or implied. Omron and its distributors are not liable for any damages arisen from or relating to Omron products.

● Export Control

Customers of Omron products shall comply with all applicable laws and regulations of other relevant countries regarding security export control, in exporting Omron products and/or technical documents or in providing such products and/or documents to a non-resident.
Omron products and/or technical documents may not be provided to customers if they violate the laws and regulations.

Table of Contents

1 Related Manuals

Manuals

No.	Model	Title
V117	NA5-15W□□□□ NA5-12W□□□□ NA5-9W□□□□ NA5-7W□□□□	Programmable Terminal User's Manual (Hardware)
V118	NA5-15W□□□□ NA5-12W□□□□ NA5-9W□□□□ NA5-7W□□□□	Programmable Terminal User's Manual (Software)
V120	NA5-15W□□□□ NA5-12W□□□□ NA5-9W□□□□ NA5-7W□□□□	Programmable Terminal Startup Guide
Z395	NX-SL5□□□ NX-SI□□□□ NX-SO□□□□ NX-CSG□□□	Safety Control Unit/Communication Control Unit User's Manual
Z396	NX-CSG□□□	Communication Control Unit User's Manual Built-in Function

Technical Guides

No.	Model	Title
V448	NA5-15W□□□□ NA5-12W□□□□ NA5-9W□□□□ NA5-7W□□□□	Programmable Terminal NA Series Practice Guide IAG Library to Visualize Integration of Control and Safety
V452	NA5-15W□□□□ NA5-12W□□□□ NA5-9W□□□□ NA5-7W□□□□	Programmable Terminal NA Series Practice Guide IAG Library for Simple Login to HMI

2 Precautions

(1) When building an actual system, check the specifications of the component devices of the system, use within the ratings and specified performance, and implement safety measures such as safety circuits to minimize the possibility of an accident.

(2) For safe use of the system, obtain the manuals of the component devices of the system and check the information in each manual, including safety precautions, precautions for safe use.

(3) It is the responsibility of the customer to check all laws, regulations, and standards that the system must comply with.

(4) All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form, or by any means, mechanical, electronic, photocopying, recording, or otherwise, without the prior written permission of OMRON.

(5) The information in this guide is current as of December 2019. It is subject to change without notice because of product's update.

Special information in this document is classified as follows:

Precautions for Safe Use

It describes precautions on what to do and what not to do to ensure safe usage of the product.

Precautions for Correct Use

It describes precautions on what to do and what not to do to ensure proper operation and performance.

Additional Information

Additional information to read as required.
This information is provided to increase understanding or make operation easier.

Copyrights and Trademarks

- Sysmac® is a trademark or registered trademark of Omron Corporation in Japan and other countries for Omron factory automation products.
- Screenshots are used in accordance with Microsoft Corporation guidelines.
- Windows and Visual Basic are the registered trademarks of Microsoft Corporation in the USA and other countries.
- EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.
- EtherNet/IP™ is the registered trademark of ODVA, Inc.
- Company names and product names in this document are the trademarks or registered trademarks of their respective companies.

3 Overview

3-1 Functions and Features

This guide describes NA's demonstration screens that visualize the information about a safety CPU and I/O units at job sites.

Implemented functions are as follows:

1) Monitoring on LEDs of the safety I/O unit
2) Monitoring on production data of controllers, safety CPU, and I/O units
3) Registration of safety signature information of the safety CPU unit and reading of current values
4) Displaying data logging results of safety variables
5) Downloading restored files
6) Simple login procedure at sites for implementing 3), 4), or 5).

The demo screens have the following features:

■ Easy installation and start-up

Since each function is modularized with an IAG library, you only have to paste IAGs on pages to design screens.

Controllers don't need communication ladder program because NA can access to each controller and I/O unit directly to get necessary data. It is not necessary to share variables or to design with alignment. Systems will start up in a short time.

■ Not affected by equipment configuration change

NA itself can read configurations of safety controllers and I/O units at starting up and make a direct access to each of them to get necessary data according to the configuration. That's why NA doesn't require design change even after changing of equipment configuration.

■ No disturbance in high-speed and high-precision operation

A controller doesn't have a monitor and communication program for settings not originally related to high-speed and high-precision control. It enables minimize the influence of tact on control program.
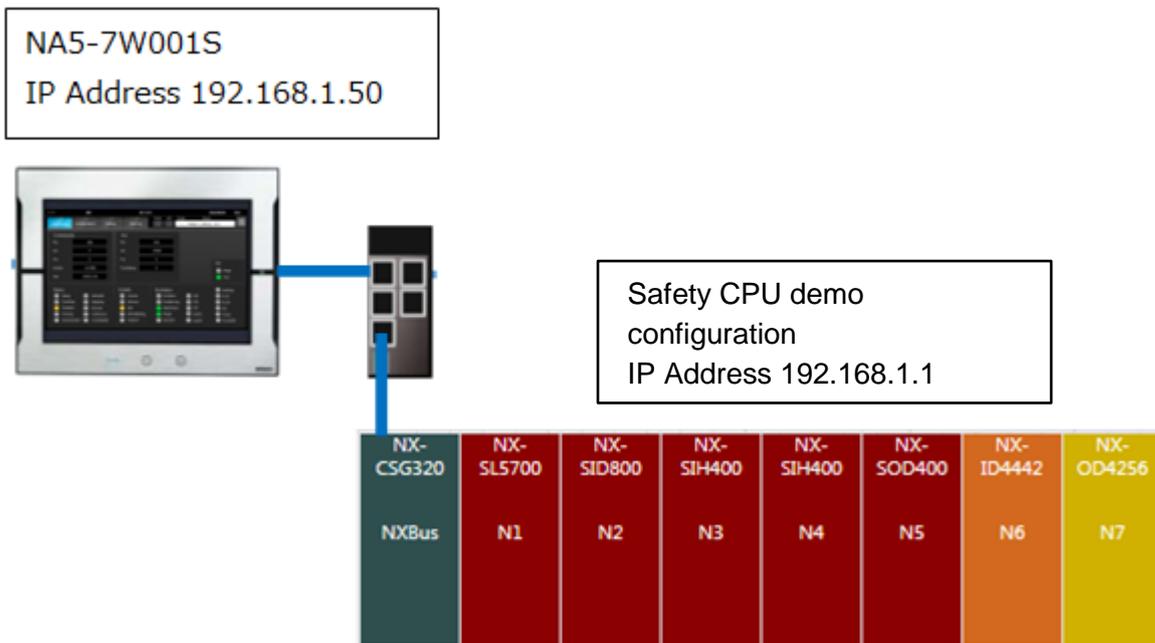

NA5 accesses to a safety CPU and I/O units directly
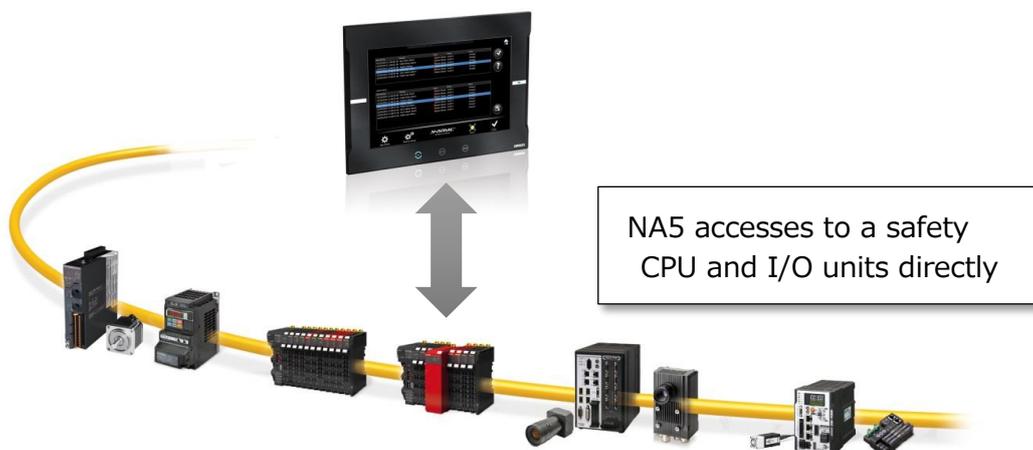
3-2 Demonstration Configuration

Demonstration was validated with the following components.
It is possible to connect another safety CPU configuration to the demonstration project.
Refer to 4-3-1 "Add External Devices" and 4-3-2 "Add Internal Devices" for a setting method.

NA5-7W001S
IP Address 192.168.1.50

Safety CPU demo
configuration
IP Address 192.168.1.1

NX-CSG320	NX-SL5700	NX-SID800	NX-SIH400	NX-SIH400	NX-SOD400	NX-ID4442	NX-OD4256
NXBus	N1	N2	N3	N4	N5	N6	N7

Manufacturer	Device	Model	Version
Omron	Safety network controller	NX-CSG320	Ver. 1.00
Omron	Programmable terminal	NA5-12W101S	NA: 1.10 Runtime: 1.10.23 OS 7.2.1
Omron	SysmacStudio	SYSMAC-SE□□□□	Ver. 1.25
Omron	PC (OS: Windows7)		
Omron	Safety CPU unit	NX-SL5700	
Omron	Safety input unit	NX-SID800 NX-SIH400	
Omron	Safety output unit	NX-SOD400	
Omron	Digital input unit	NX-ID4442	
Omron	Digital output unit	NX-OD4256	
	EtherNet/IP cable x2		
Omron	Switching hub	W4S1-05B	

3-3 Project Files and Supporting Range

3-3-1 Project Files

Download the following project files.

Screen Size (in.)	File Name
NA7/ 9	SafetyCPU_Demo_7inch_RevD.csm2
NA12/ 15	SafetyCPU_Demo_12inch_RevD.csm2

We provide IAG components used in the demo project separately.

3-3-2 Supported Models and Specifications

The demo screens support the following models.

Programmable Terminal	Supported Version	Remarks
NA5-[][]W	1.10 or later	-

Safety CPU Unit	Supported Version	Remarks
NX-SL5500	No version limit	
NX-SL5700	No version limit	
NX-SL3300	No version limit	Data logging and Restored file download are not supported.
NX-SL3500	No version limit	Data logging and Restored file download are not supported.

NX1 Controller	Supported Version	Remarks
NX1-[][][][]	No version limit	

NX7 Controller	Supported Version	Remarks
NX7-[][][][]	1.18 or later	

NJ Controller	Supported Version	Remarks
NJ[]-[][][][]	1.18 or later	

Safety Control Unit	Supported Version	Remarks
NX-CSG320	No version limit	

NA5 can access to NX102 CPU unit connected via Ethernet, the safety CPU and I/O unit mounted on CPU racks of CSG unit, and the safety CPU and I/O unit connected to NX coupler unit, which is configured with NX102 series CPU unit via EtherCAT.
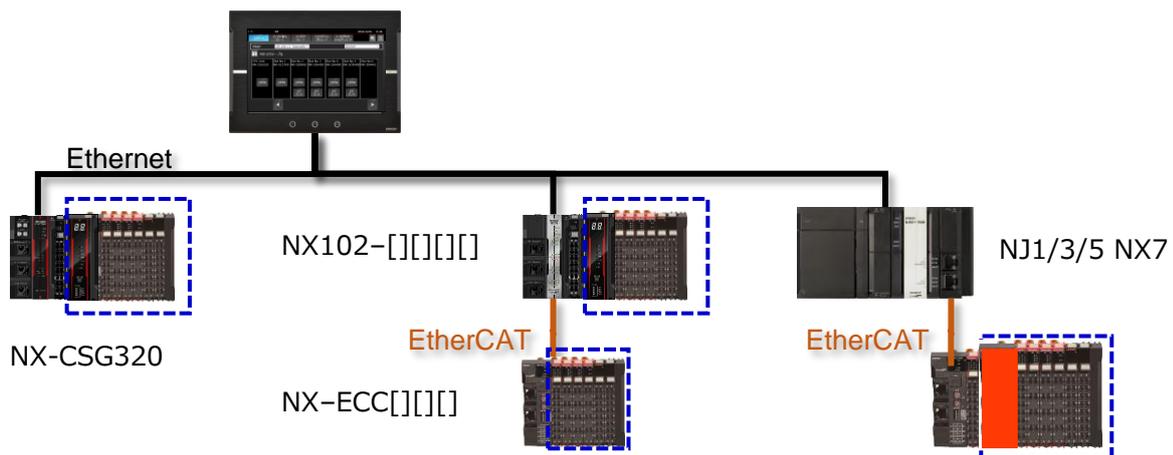
4 Preparation for Demo Screen

Preparation procedure for safety CPU demonstration screens is shown in the flowchart below.
It is necessary to register the safety CPU to monitor in 4-3 "Add Devices." Make registration of an external device or an internal device according to your project management.

```
┌─────────────────────────────┐
│   4-1   Import Projects      │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│   4-2 Set NA Clock          │
└─────────────────────────────┘
              │
              ▼
           ◇ 4-3
           Add Devices ───────────► NA and controllers are
              │                     managed in the same project
   NA and controllers are managed              │
   in separate projects                        │
              │                                ▼
┌─────────────────────────────┐   ┌─────────────────────────────┐
│ 4-3-1 Add External Devices  │   │ 4-3-2 Add Internal Devices  │
└─────────────────────────────┘   └─────────────────────────────┘
              │                                │
              ▼◄───────────────────────────────┘
┌─────────────────────────────┐
│ 4-4 Transfer Projects to NA │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────────────────────┐
│ 4-5 Prepare Setting Files                    │
│   ┌─────────────────────────────────────┐    │
│   │ 4-5-1 Prepare Data Log Setting Files│    │
│   └─────────────────────────────────────┘    │
│   ┌─────────────────────────────────────┐    │
│   │ 4-5-2 Prepare Restored File         │    │
│   └─────────────────────────────────────┘    │
└─────────────────────────────────────────────┘
```
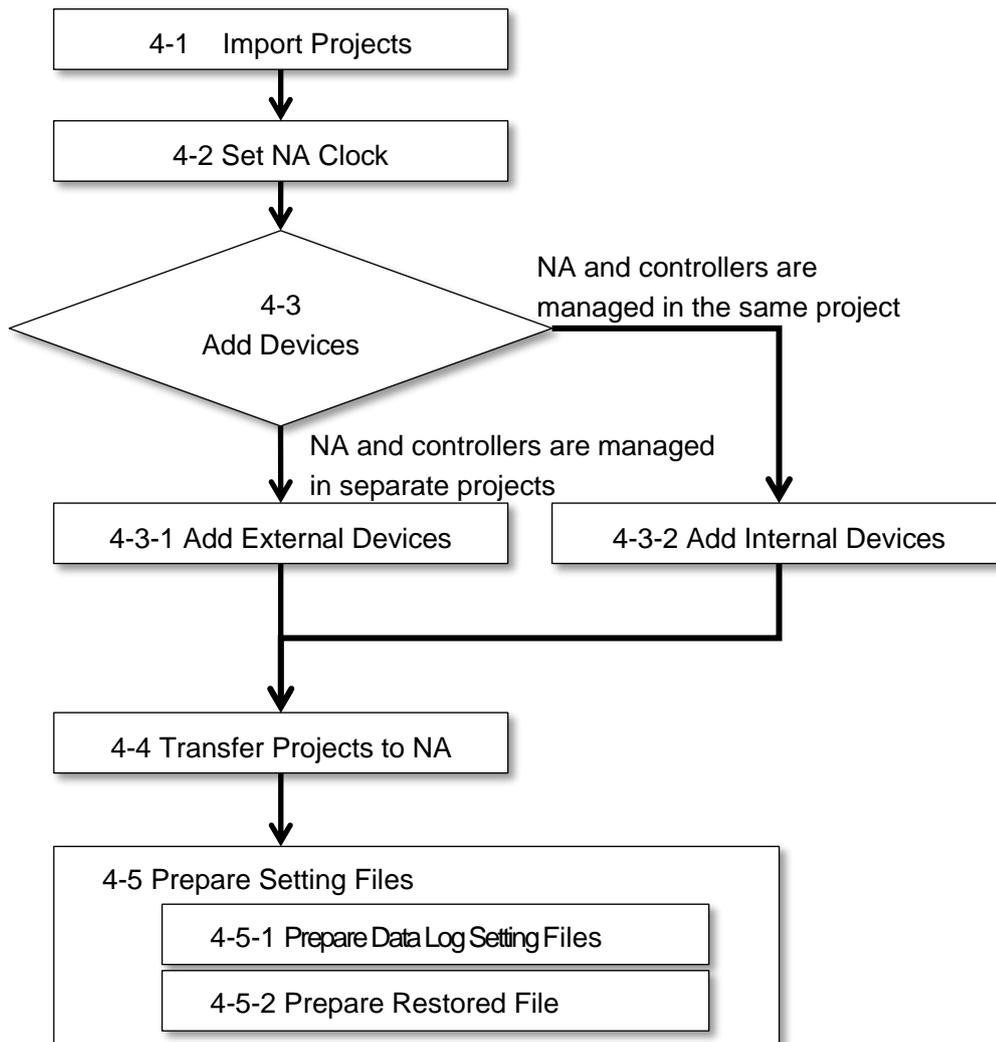
📑 Additional Information

In the steps of 4-3 "Add Devices," you can add a controller easily only by setting an IP address if you don't need to share variables with controllers for demonstration purposes only. Refer to 4-3-1 "Add External Devices."

4-1 Import Projects

1. Set the PC's IP address to 192.168.1.100.

   Make sure that the IP address of your PC does not overlap with IP addresses of devices that configures the connected system.
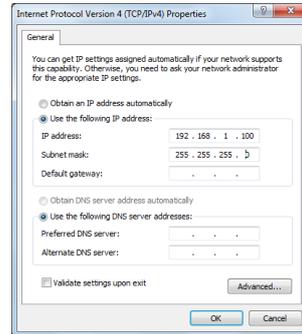
2. Start Sysmac Studio.

   Note: Sysmac Studio Ver. 1.25 must be installed in advance.

3. Select [Import].
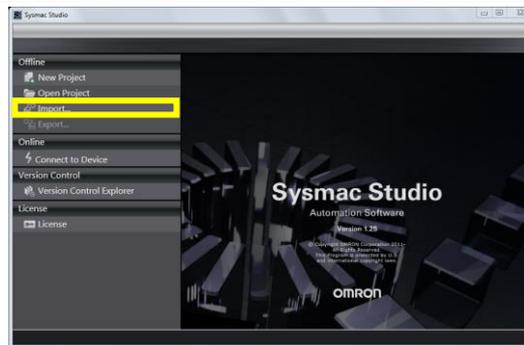
4. The dialog box shown on the right appears. Select a project file of the safety CPU demo screen and click [Open].
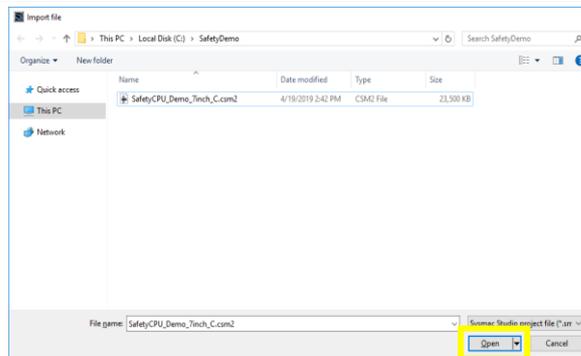
5. The project file is imported and opened automatically.
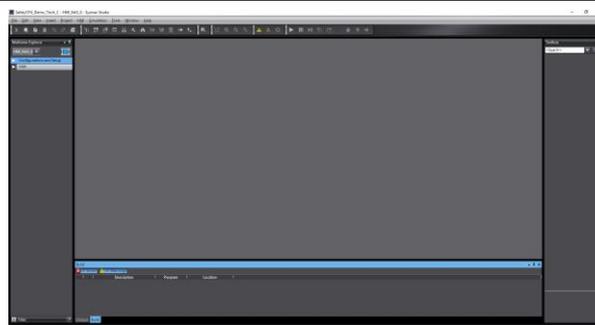
4-2 Set NA Clock

This section describes how to set the NA's clock.
Be sure to set the clock because the current time display on this demo screen and the update time (local time) of Safety Signature function refer to the clock.
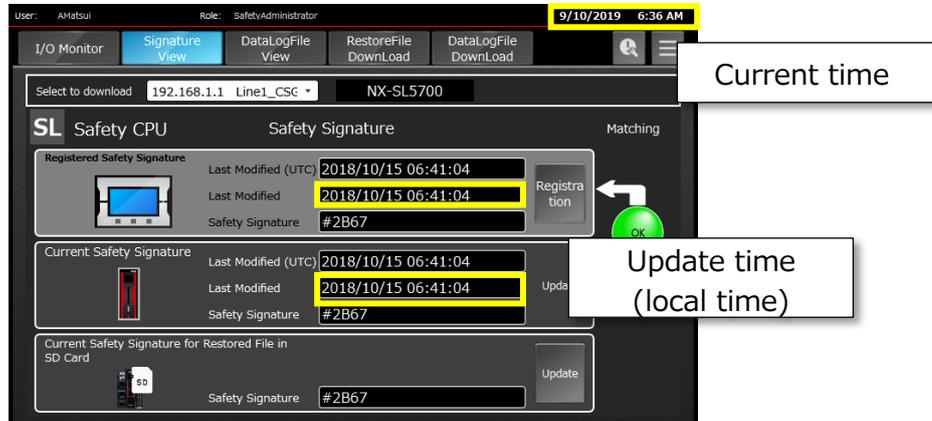
1. Power on NA.	
2. In the top window of Multiview Explorer, select NA. Note: If NA has been already selected, setting is not necessary.	
3. Click [HMI] – [Communication Setup].	
4. Select [Ethernet Connection via a Hub] and set the destination IP address to 192.168.1.50. If NA's IP address is different, change the setting in System Menu or others.	
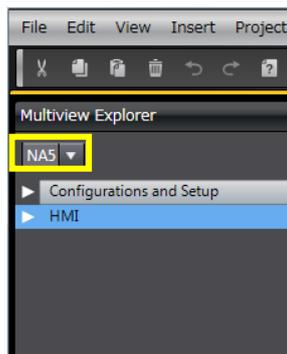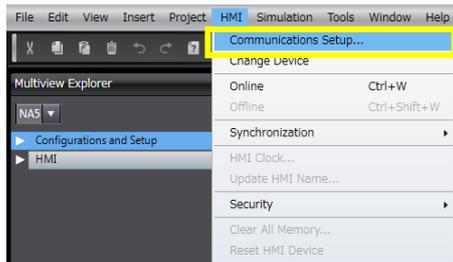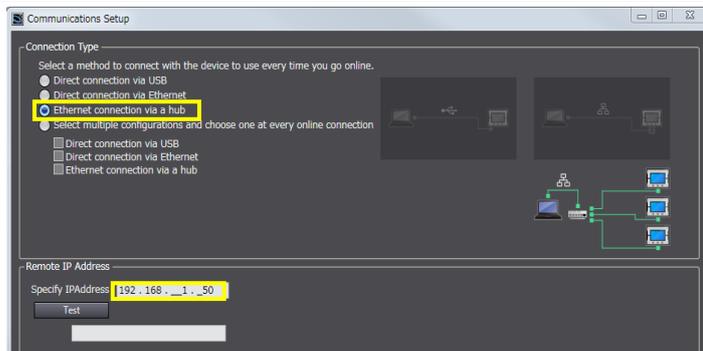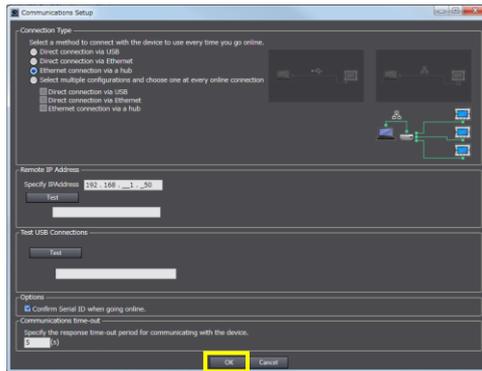
5. Click [OK].	
6. Select the Online icon in the Toolbar. If NA's version is 1.09 or earlier, it must be upgraded when connected online. Upgrade the current NA version following to a dialog. After upgrading is completed, NA will be reset. Select Online icon in the Toolbar again.	
7. Click [HMI] – [HMI Clock].	
8. Select a proper time zone. Then click [Apply].	
9. Click [Yes].	
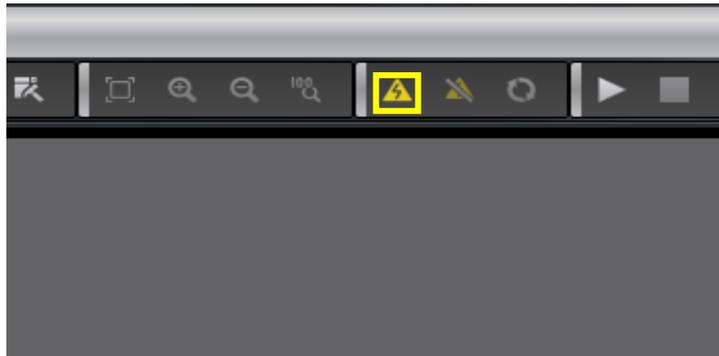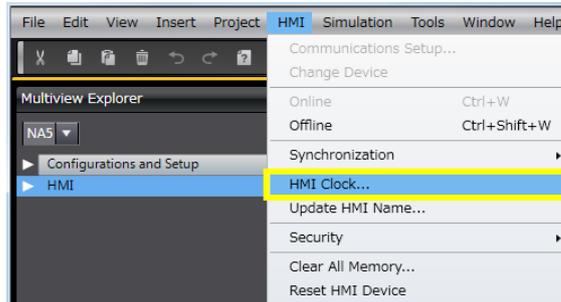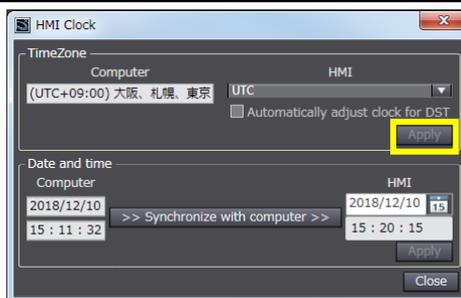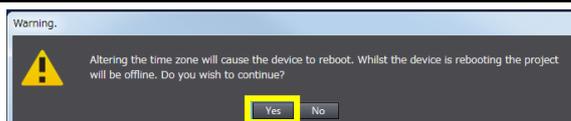
10. After restarting NA, click [Synchronize with Computer] – [Apply].	
11. Click [Close].	
12. Click the Online icon in the Toolbar.	

4-3 Add Devices

In this project file, it is necessary to register the safety CPU to be monitored. There are two methods: adding as an external device and as an internal device. NA can monitor multiple safety CPU units. The maximum number of registrable units is 16, including controllers to which the safety CPU is not connected.

4-3-1 Add External Devices

This section describes how to add devices to another project.
If there is no need to communicate between a CPU unit and NA except monitoring a safety PLC, such as demonstrations, you don't have to set the IP address to add a safety CPU unit.   This is a recommended method.

1. Right-click [Config/Setting] – [Device Reference]. Then Left-click [Add] – [External Device].	
2. ExternalDevice0 is added. Double-click it.	
3. Click [Device] and select NX-CSG320. Note: NX102, NX7, and NJ are also selectable.	
4. Enter the IP address. Now you have added the safety CPU unit that you want to connect.	
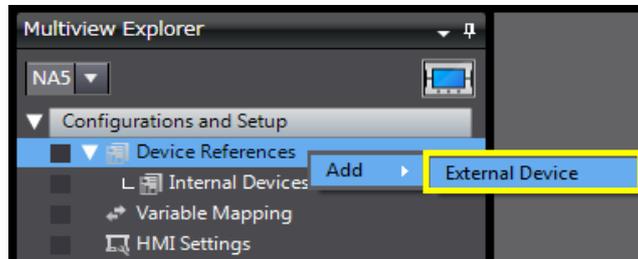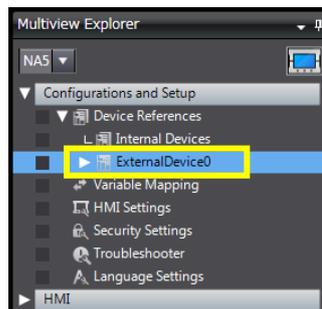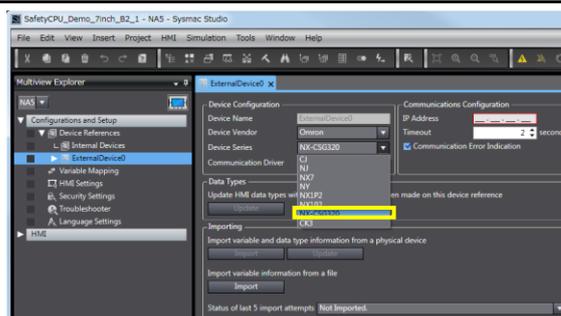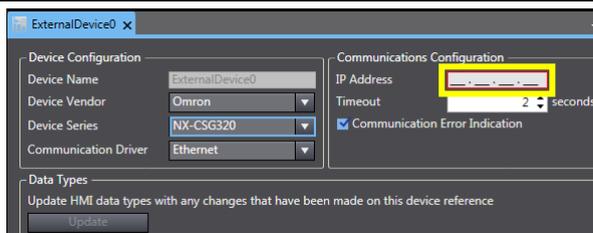
4-3-2 Add Internal Devices

In this section, how to add devices to an existing project is described. If you need communications between the CPU unit and NA, or need display/operation screens, other than this demo (e.g. designing an actual customer's equipment), the following procedure is recommended.
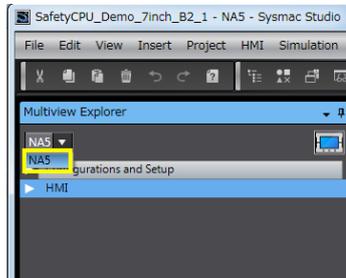
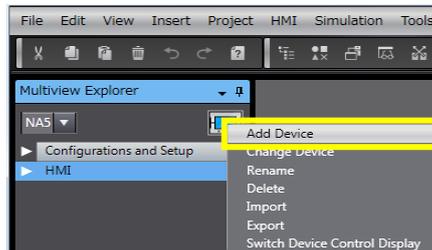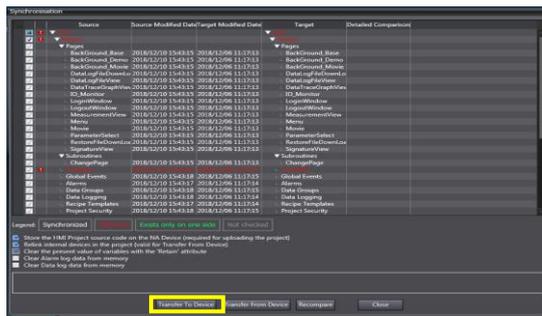|	
1. In the top window of Multiview Explorer, select NA. Note: If NA has been already selected, setting is not necessary.	
2. Right-click NA icon.	
3. Left-click [Add Device].	
4. Set the device as shown on the right and click [OK]. Select the unit's version in use for Version. Note: NX102, NX7, and NJ are also available.	
5. The controller is added. Implement necessary settings. Now you have added the safety CPU unit that you want to connect.	
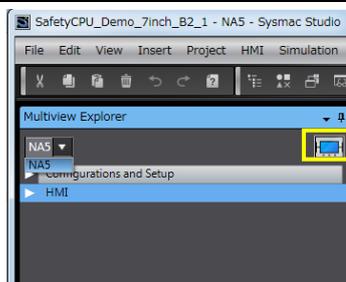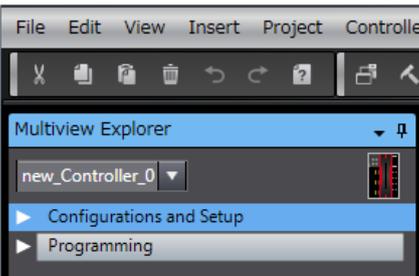
4-4 Transfer Projects to NA
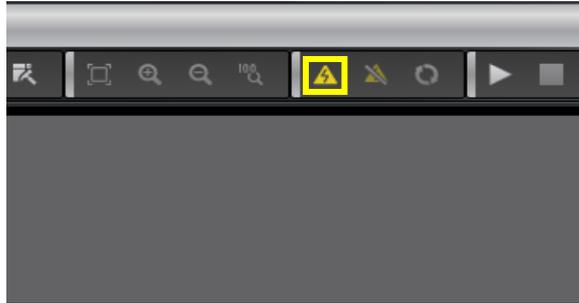
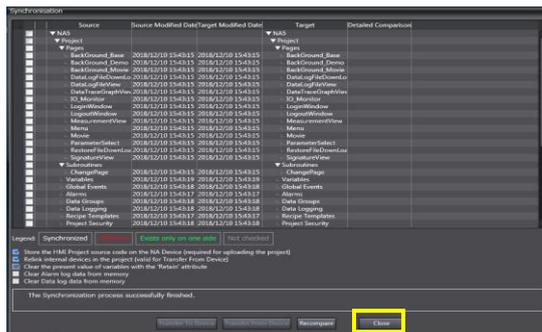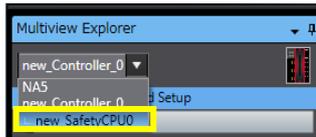|	
1. Click the Online icon in the Toolbar.	
2. Click the Sync icon in the Toolbar.	
3. When the Synchronization Window is displayed, click [Transfer to Device] to start transfer.	
4. When transfer is completed, press [Close].	
5. If NA restarts and the initial screen which was set in the project file displayed, download is completed. Note: The menu screen is displayed in the default setting.	
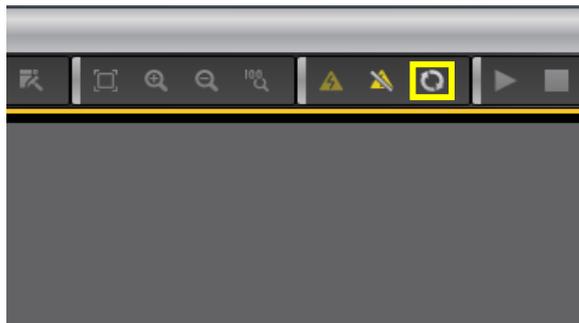
4-5 Prepare Setting Files

4-5-1 Prepare Data Log Setting File

Before downloading, you need to create a data log setting file with Sysmac Studio and to save it to the folder *DataLogSettingFile* in a USB stick memory plugged in NA.

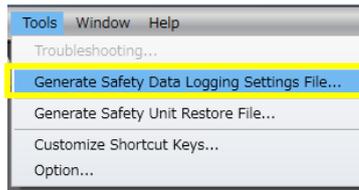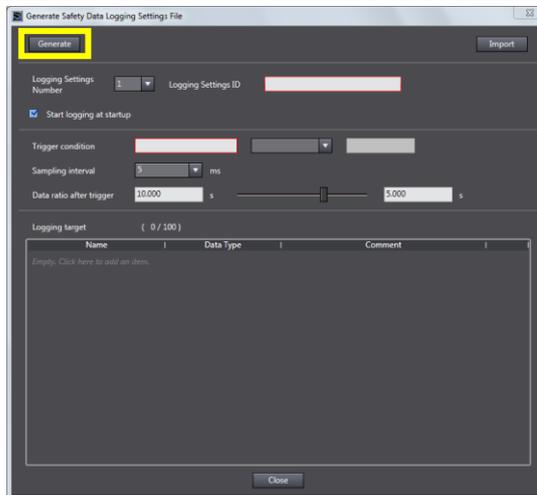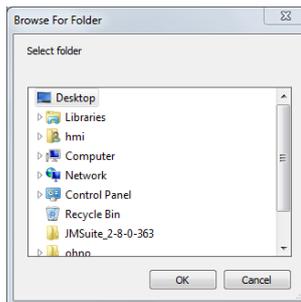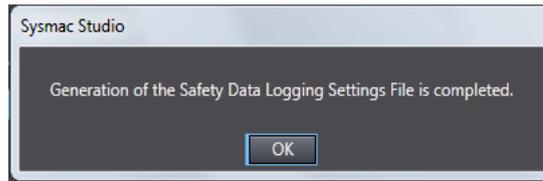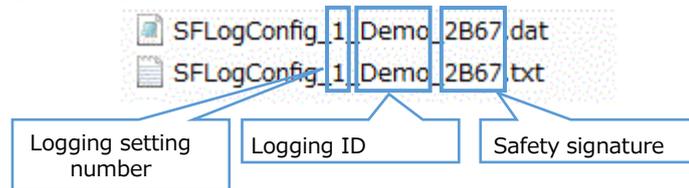|	
1. Create a data log setting file using Sysmac Studio. Import a safety project to log the data.	
2. Select the safety CPU unit in Multiview Explorer.	
3. Click the Online icon.	
4. Click [Tools] – [Generate Safety Data Logging Settings File].	
5. Enter setting items. Press the [Generate] button.	
6. Designate a destination in your PC.	

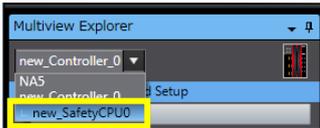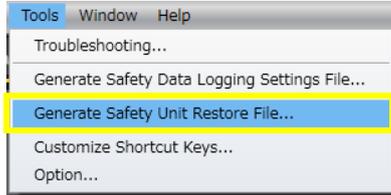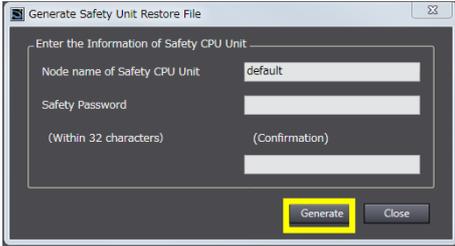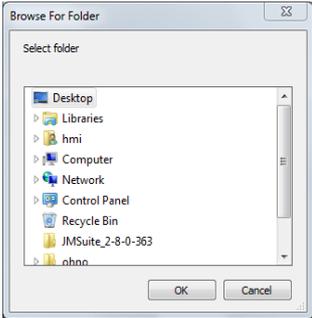|	
7. This message appears after setting files generated. Press [OK].	Sysmac Studio Generation of the Safety Data Logging Settings File is completed. OK
8. Check the generated data setting files. A file name contains the logging setting number, the logging ID, and the safety signature.	[Sample] SFLogConfig_1_Demo_2B67.dat SFLogConfig_1_Demo_2B67.txt Logging setting number Logging ID Safety signature
9. Create a folder named *DataLogSettingFile* under the Root directory of the USB memory used for NA.	
10. Save the data setting files to the DataLogSettingFile folder in a USB memory stick. Insert the stick memory to NA.	

Before downloading a restored file, you have to create a restored file with Sysmac Studio and to store it in the *Restorefile* folder in a USB memory stick that is to be plugged in NA.

1.	Create a restored file by Sysmac Studio. Import a safety project to restore.	
2.	Select the safety CPU unit in Multiview Explorer.	
3.	Click the Online icon.	
4.	Click [Tools] – [Generate Safety Unit Restore File].	
5.	Enter the information about the safety CPU. Press [Generate].	
6.	Designate a destination and Click [OK]. A backup file (SLSystem.dat) is created in the appointed place.	
7.	Create a folder named *Restorefile* under the root directory in the USB stick memory for NA.	
	Save the safety CPU unit's restored file (SLSystem.dat) created by Sysmac Studio to the folder. Insert the USB stick memory into NA.	

5 Demonstration Procedures
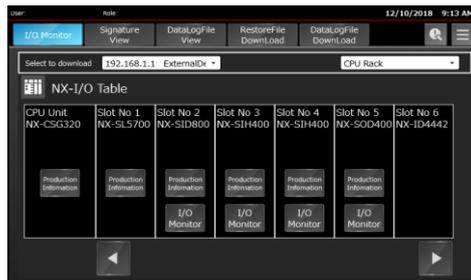
5-1 Monitoring on Safety I/O LEDs

You can check LED statuses of the safety I/O units on NA without opening a control panel. The procedure is shown below.

5-1-1 Check the Unit LED Status

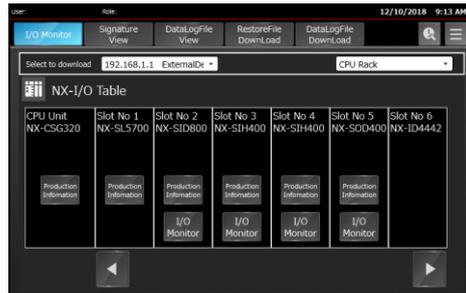|	
1. Press [Safety CPU Demo Screen].	
2. I/O Table Screen for the connected controllers appears. If six or more units are installed, press the button [◄] or [►] to move to the right or left page.	
3. Press the I/O Monitor button for the I/O unit you want to check. The button enclosed in a yellow frame is for the NX-SID800, in the slot No2.	
4. The status of the selected I/O unit is indicated. Press the [◄] or [►] buttons to see other I/O units. The display is automatically updated at 1 second interval.	

Precautions for Correct Use

It is not possible to monitor I/O status of safety CPU and ordinary I/O units.

5-1-2 Display Unit Production Information

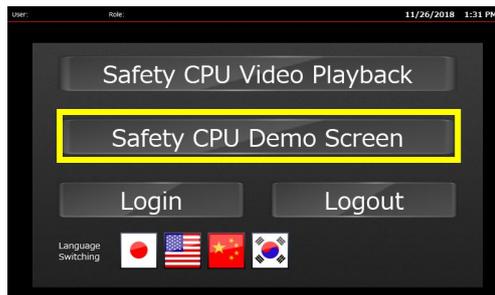|	
1. Press the Safety CPU Demo Screen.	
2. I/O Table Screen for connected controllers appears. If six or more units are installed, press the button [◄] or [►] to move to the right or left pages.	
3. Press the [Production Information] button of the unit you want to check.	
4. The information on the selected unit is displayed. You can see details as the following: ・Slot No. ・Model ・Unit version ・Lot No. ・Serial No. ・Hardware version	

5-2 Register and Confirm Safety Signature

Safety CPU program always must run correctly through equipment design to its operation. In this section, procedure to check that a safety signature is not unintentionally tampered from the original one by using NA at site at the time of startup, is described.
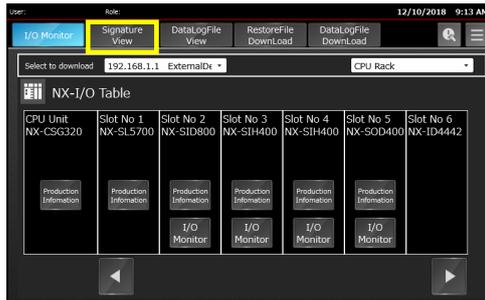
5-2-1 Registration

When designing equipment or changing a safety program, register a correct safety signature in NA first.

|	
1. Press [Safety Demo Screen].	
2. Press the [Signature View] button.	
3. The Safety Signature Viewer screen appears. A current safety signature and a signature in the SD card are read out from the safety controller, and displayed. Note: A signature in a safety controller is read out periodically. When the data is read out, the writing "Update" will blink. A signature for a restored file in the SD card is read out when a page is opened or the [Update] button is pressed.	
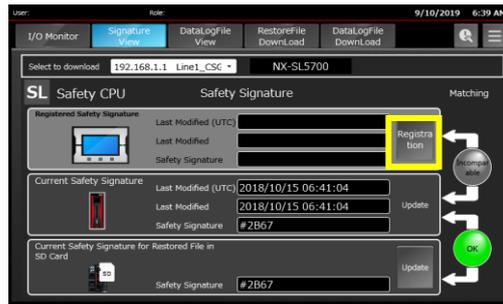
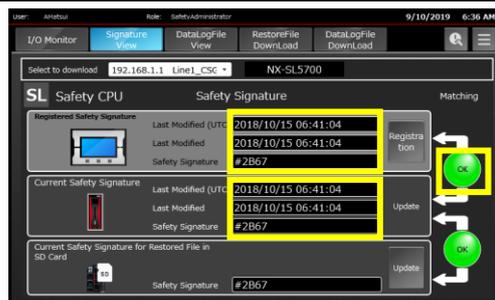|	
4. Press [Registration].	
5. Password Validation screen appears. Then enter the password, *omron123*.	
6. Press [Registration].	
7. The current safety signature information and registration time are recorded in the registered safety signature. Then, [OK] lamp turns green.	

📋 Precautions for Correct Use

Once the "Current Safety Signature" is registered, the data will be retained even after you turn off NA. If the Current Safety Signature has already been registered, the [Match] lamp will turn on as the Safety Signature Viewer screen appears.

📋 Precautions for Correct Use

Even if you have logged in before registering a safety signature after starting NA, the login screen will appear to prevent incorrect entry. Log in again following Step 4.

📓 Additional Information
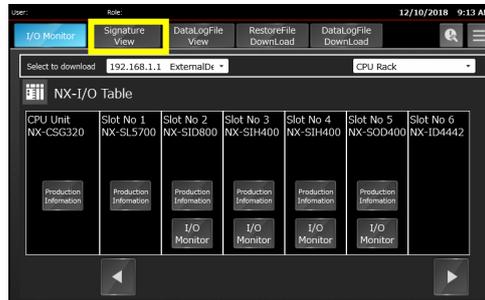
Users registered in this project:

Username	Authority	Password
Administrator	Administrator	omron123
AMatsui	SafetyAdministrator	omron123
KFujiwara	Maintenance_Group1	omron123
KNagaoka	Maintenance_Group1	omron123
YKawashima	Maintenance_Guest	omron123
TChiba	Operator_Group1	omron123
CSugano	Operator_Group1	omron123

Only the user "AMatsui", who is authorized as SafetyAdministrator, can save safety signatures.
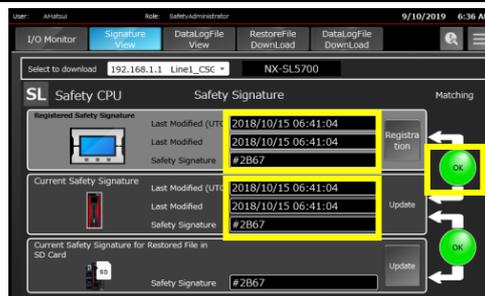
5-2-2 Confirmation

This section shows how to acknowledge the status of the safety signature which registered in accordance with the registration procedure in 5-2-1 "Registration."

|	
1. Press [Signature View].	
2. Confirm that the information of Current Safety Signature and Registered Safety Signature are the same. If they are the same, the [OK] lamp on the right turns green.	
3. Check a safety signature for a restored file in the SD card and a signature in the safety controller. Press [Update] in Current Safety Signature for the Restored File in SD Card field.	
4. The current safety signature of the restored file in the SD card is read out. Check if the safety signature is the same as the current safety signature. If they are the same, the [OK] lamp on the right turns green.	
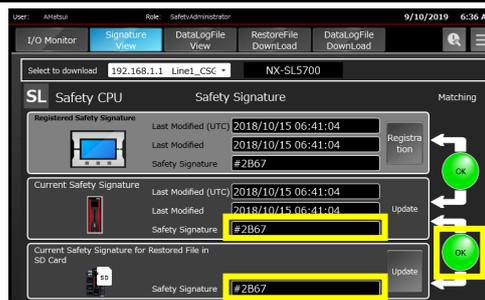
Additional Information

You can save screenshots to the USB memory by pressing NA 's function key 1. The screenshot helps you record the person who has confirmed the signature.

Initial State

Authorized user not exist

No Authorized User Found

Close

Registration

Authorized user exist

Password Entry

Verify password

Authority   SafetyAdministrator
Username   AMatsui
Password

Registration

Passwords not match

Registration NG

Verify password

Authority   SafetyAdministrator
Username   AMatsui
Password   ●●●●●●●●

Registration

Passwords match

Registration Completion

Signature is registered successfully.

Close

Safety Signature Registered

Close

Safety CPU Video Playback

Safety CPU Demo Screen

Login   Logout

Language Switching

On-access judgment on safety signature

Signatures not match

Safety Signatures Mismatch Error

Close

Signatures match

5-3 Display Data Logging Results

The safety CPU unit can acquire log data based on a Data Log Setting file generated by Sysmac Studio. This section describes how to download the Data Log Setting file and to display logging results in an NA trend graph.

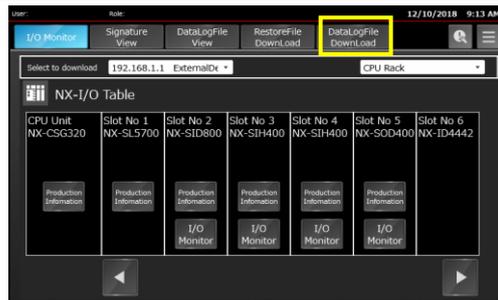### 5-3-1 Download Data Log Setting File and Implement Data Logging

Create a data log setting file with Sysmac Studio and save it to a designated folder in NA's USB memory stick. Then transfer the file to the memory card of the CPU unit in which the safety CPU unit is installed.
Refer to 4-5-1 "Prepare Data Log Setting Files" for the procedure to create the data log setting file.

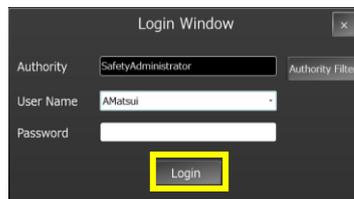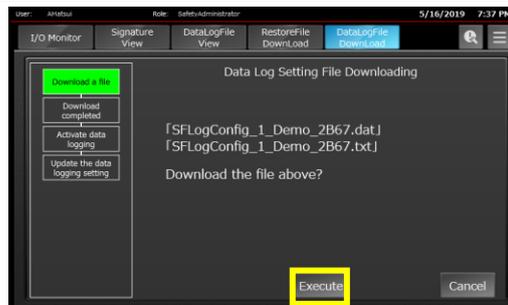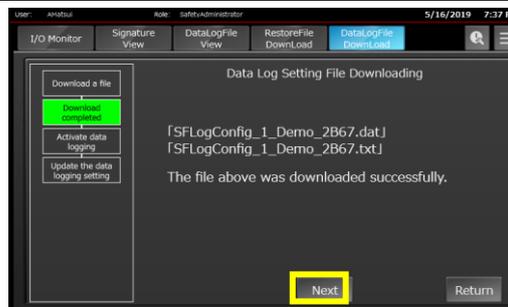|	
1. Press [Safety CPU Demo Screen].	
2. Press the [Data Log File Download] button.	
3. Login window appears. Enter the followings: Username: AMatsui Password: omron123	
4. Press [Login]. Note: Once you logged in, you do not have to log in for the second time or later.	
5. Download screen is displayed. Select the file to download. Note: If the OK lamp turns red (NG), check that you selected the right file.	
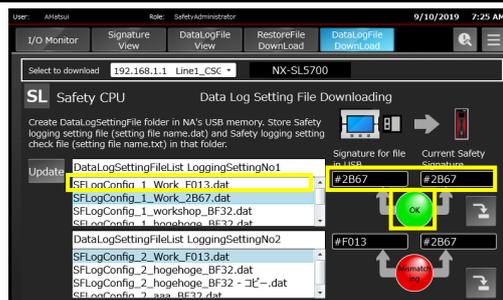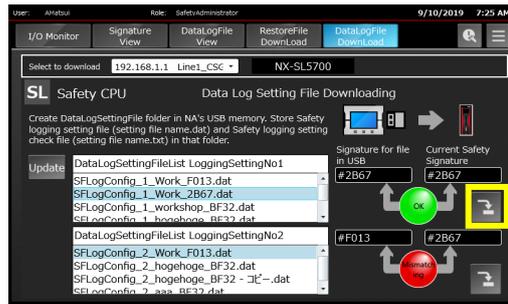
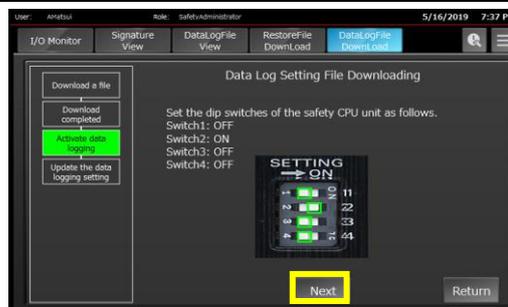|	
6. Press the download button.	
7. The filename you want to download is displayed. Press [Execute].	
8. The completion dialog box appears. Press [Next].	
9. On/ off the dip switches according to the instruction shown on the screen. Press [Next].	
10.Hold down the [SERVICE] switch in front of the safety CPU unit, following to the instruction. Release your finger from the switch after confirming the 7-segment display in the top of the unit has turned as described in the right. Press [Completed].	
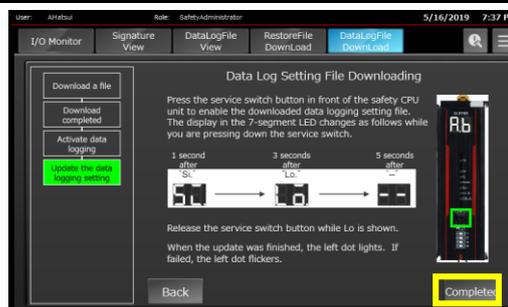
If you have logged in before downloading the Data Log Setting file, the login screen does not appear. Press Data Log File Download to go to the file download window.

The error message below appears when:
- USB memory is not inserted into NA, or
- Designated destination folder does not exist.

Be sure that the USB stick memory is plugged and the *DataLogSettingFile* folder has been prepared there.

Additional Information

Users registered in this project:

Username	Authority	Password
Administrator	Administrator	omron123
AMatsui	SafetyAdministrator	omron123
KFujiwara	Maintenance_Group1	omron123
KNagaoka	Maintenance_Group1	omron123
YKawashima	Maintenance_Guest	omron123
TChiba	Operator_Group1	omron123
CSugano	Operator_Group1	omron123

Users with the authority of Administrator, SafetyAdministrator, Maintenance_Group1, Maintenance_Guest, or Operator_Group1 can download the data log setting file.
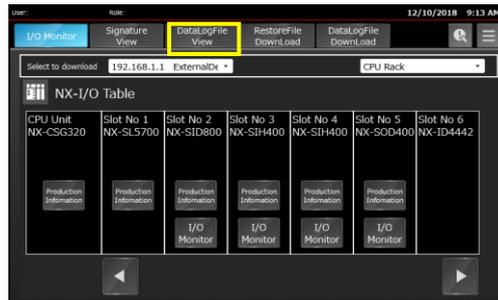
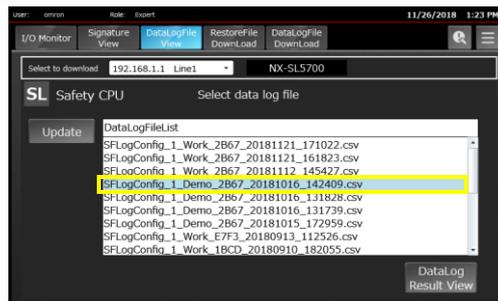NA reads the results of data logging and displays them in a trend graph form.

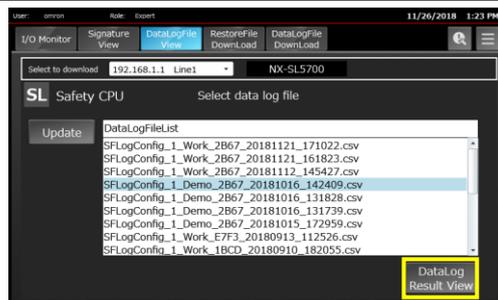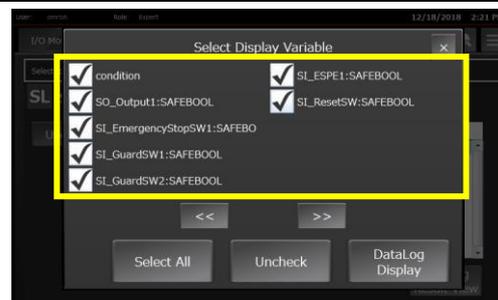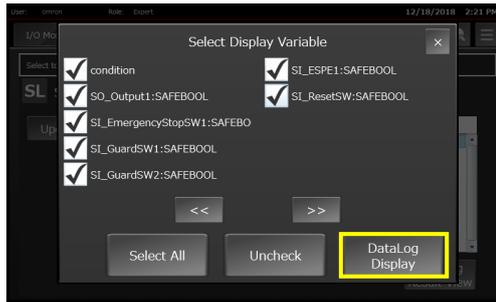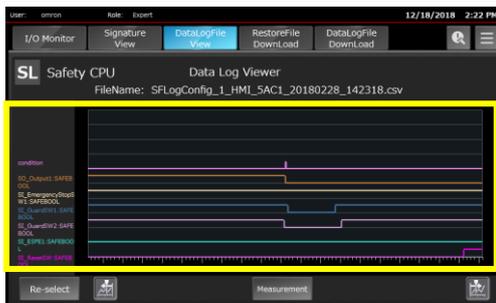|	
1. Press [Safety CPU Demo Screen].	
2. Press the [DataLogFileView] button.	
3. Select the data log file that you want to display.	
4. Press the [DataLog Result View] button.	
5. The variables logged in the file are listed. Select variables to display.	

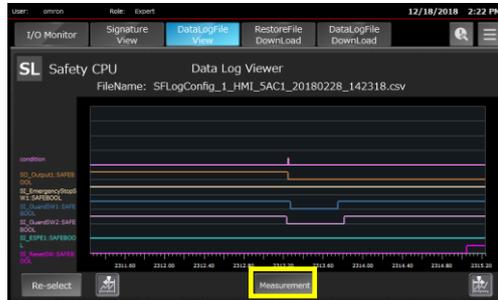|	
6. Press the [DataLog Display] button.	
7. The timing chart of the variables selected in the previous step (Step 6) is displayed.	

5-3-3 Measurement of Time Length between Two Points on a Graph

Display the difference between the rise and fall times of any of the variables in the data logging results displayed in trend graphs.

1.	Press [Measurement] at the bottom of the timing chart screen.	
2.	The Measurement Screen is displayed. Select two variables as a measurement start condition and a measurement termination condition.	
3.	Set the measuring conditions for the selected variable, Rising or Falling.	
4.	Press the [Start Measurement] button to display the difference of time between the two conditions.	
5.	Press the [◄] or [►] button to change the object to measure. You can find the next (or previous) data that satisfies the measurement conditions.	
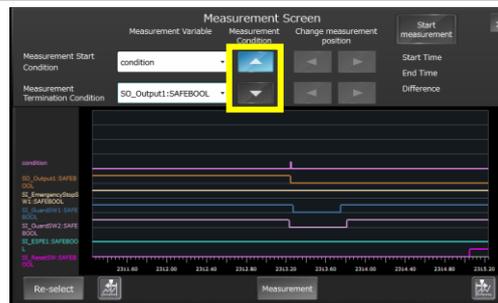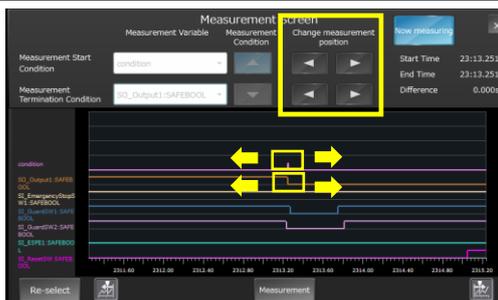
Start:
User-created
Screen

No Data Log Setting
Folder

Checking
initial error

No Data Log
Setting folder

OK

Unsupported Unit

Unsupported unit

OK

Main Screen

Press

Lack of Setting Check
File

Lack of files

OK

Download
Confirmation

Failed Download

Execute

Failed download

OK

1

2

1   **2**

Download
Completion

Return

Next

Data
Logging
Validating

Return

Back   Next

Data Logging
Setting File
Update

Completed
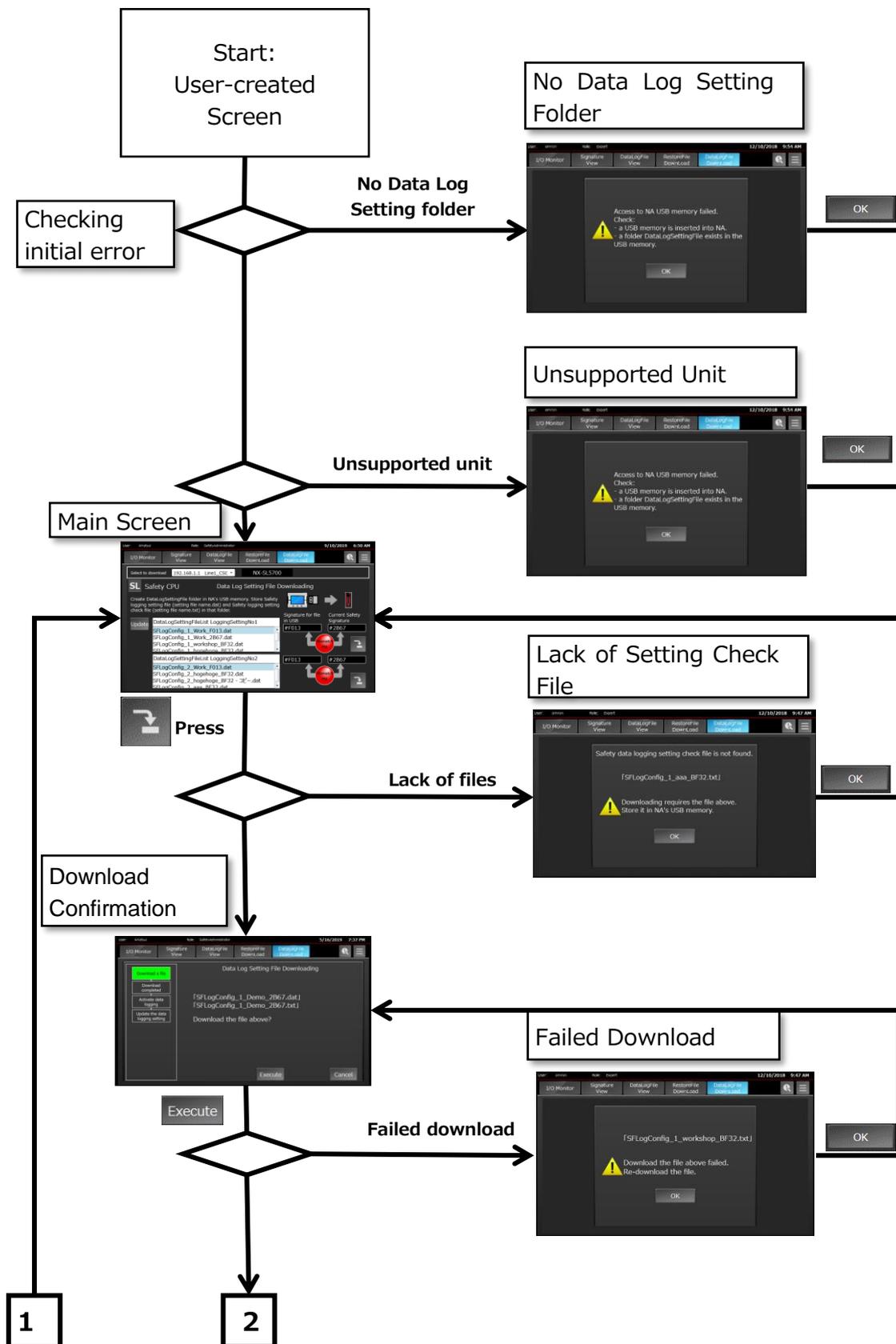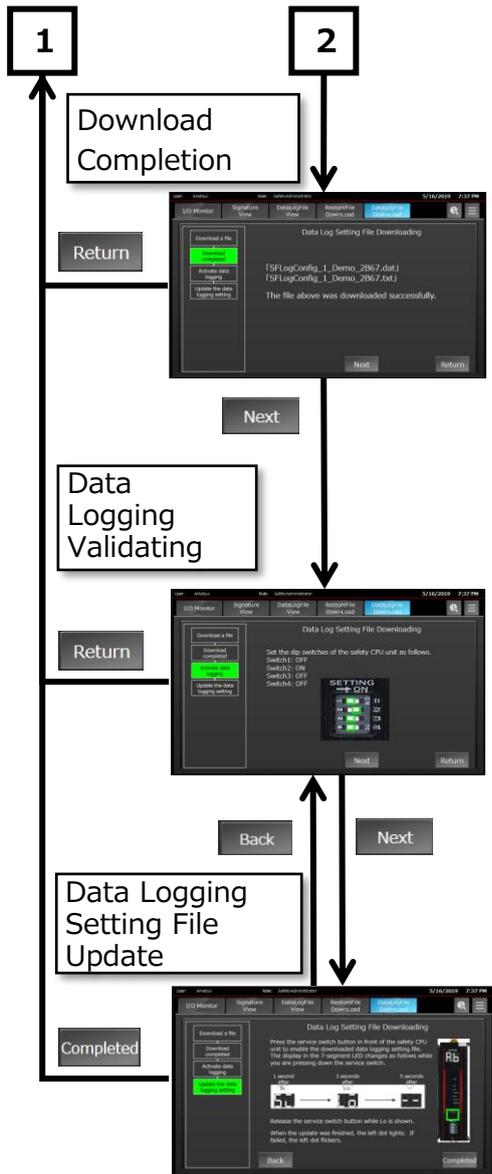
Data Log File
Selection Screen
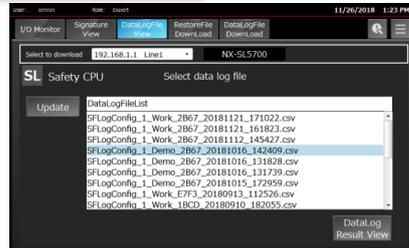
DataLog
Result View

Variable Selection
Screen
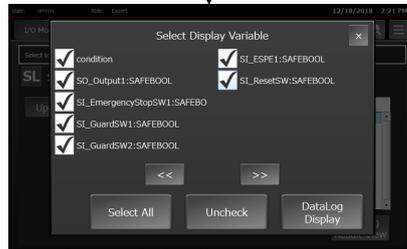
DataLog
Display

Timing Chart
Screen
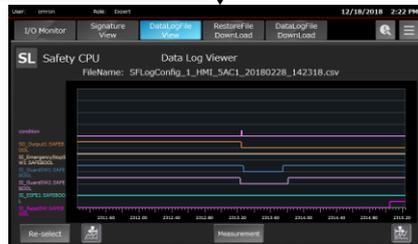
Measurement

Measurement
Screen

5-4 Restore Safety Programs in Sites

Safety program for a safety CPU unit can be changed on Sysmac Studio. Conventionally, program restoring at job site has required Sysmac Studio. However, this demo screen enables a restored program to be downloaded from NA's USB memory.

5-4-1 Transfer of Restored Files

Transfer the restored file from NA's USB stick memory to the CPU unit's memory card. Refer to 4-5-2 "Prepare Restored File" for file creating procedure.

1.	Press [Safety CPU Demo Screen].	
2.	Press [RestoreFile Download].	
3.	Login window appears. Enter the followings: Username: SafetyAdministrator Password: omron123	
4.	Press [Login].	
5.	Restored File Download screen appears. Confirm safety signatures, and then press the download button.	
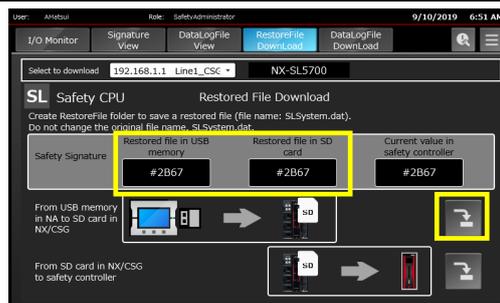
6. Confirmation dialog window is displayed. Press [Execute].	
7. If the download is successfully completed, press [Completed].	
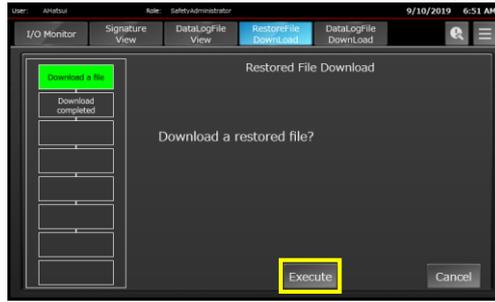
5-4-2 Restoring

Implement a restoring procedure using the restored file that transferred in the previous section (5-4-1).

1. Continued from the Step 7, 5-4-1. Confirm safety signatures, and then, press the download button at the bottom of the screen.	
2. Start the Restore Mode. On/ off the power switch and dip switches of the safety CPU unit following the instruction on the screen. Then, press [Next].	
3. NA is standing by for a start instruction. Press [Next] after confirming that the screen display is right.	
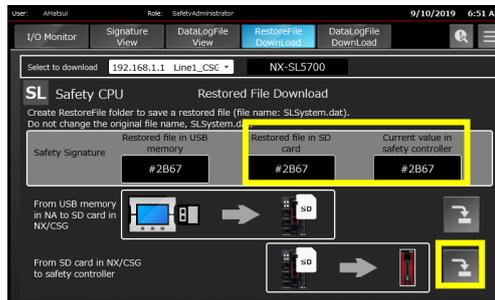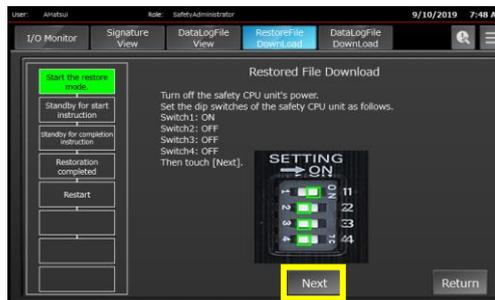
4. NA is standing by for a completion instruction. Operate the service switch of the safety CPU unit following the instruction on the screen. Then, press [Next].	
5. Restoring has been completed. The safety signature including the date is displayed repeatedly. Ensure the display is correct. Then press [Next].	
6. Reboot the safety CPU unit. Operate the power switch and DIP switches of the safety CPU unit in accordance with the instruction on the screen. Press [Completed].	
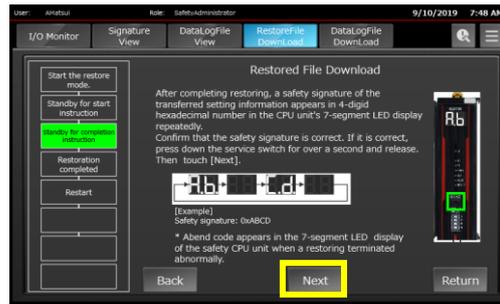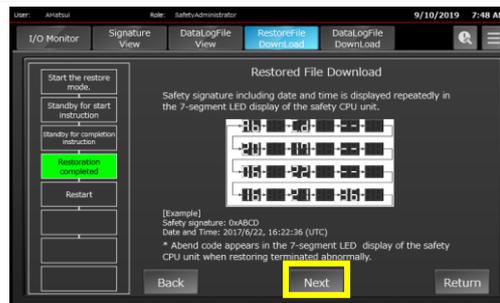
 Precautions for Correct Use

If you have already logged in before downloading the restored file, the login screen does not appear. Click the Restored File Download button to go to Restore File Download screen.

 Precautions for Correct Use

Do not change the original filename, *SLSystem.dat.*

The error message below appears when:
- A USB stick memory is not inserted into NA,
- A designated destination folder does not exist, or
- A restored file does not exist.

Be sure that the USB stick memory is plugged and the *RestoreFile* folder has been prepared there.
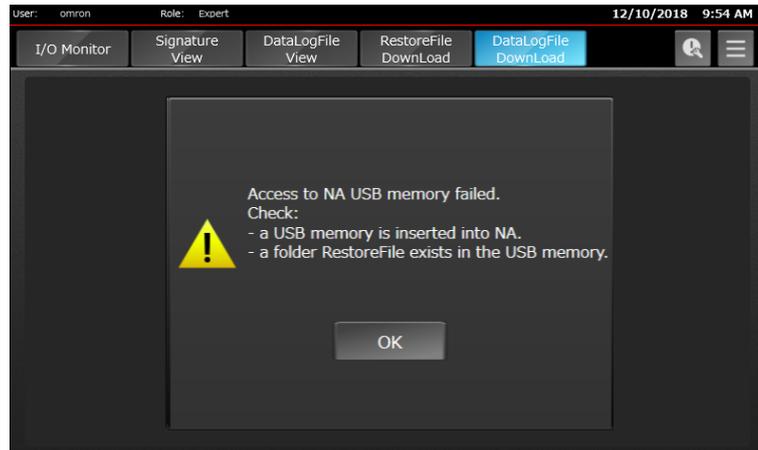
![icon] Additional Information

Users registered in this demo project:

Username	Authority	Password
Administrator	Administrator	omron123
AMatsui	SafetyAdministrator	omron123
KFujiwara	Maintenance_Group1	omron123
KNagaoka	Maintenance_Group1	omron123
YKawashima	Maintenance_Guest	omron123
TChiba	Operator_Group1	omron123
CSugano	Operator_Group1	omron123

Users with authority of Administrator, SafetyAdministrator, SafetyAdministrator, or Maintenance_Guest can download the restored file.

Additional Information

You can also restore a safety program using the dip switches and LED display on the front of the safety CPU unit.

Processing stage	Procedure and Display
Insert an SD Memory Card	Insert the SD Memory Card where the Safety Unit Restore File are stored under the root directory into the NX102 CPU Unit.
Start RESTORE Mode	Set the pins 1 to 4 of the DIP switch on the Safety CPU Unit as follows: 1 to ON, 2 to OFF, 3 to OFF, and 4 to OFF, and turn ON the power supply to the Controller. The Safety CPU Unit starts in RESTORE mode. SETTING → ON 1 2 3 4
Initializing	Seven-segment indicators in the Safety CPU Unit repeat turning ON and OFF in sequence for each, to test if the devices are lit properly. • If initialization ended in an error, an error code is shown in the seven-segment indicators in the Safety CPU Unit.
Wait for Start command	The safety signature of the Safety Unit Restore File stored in the SD Memory Card is repeatedly shown as a four-digit hexadecimal number in the seven-segment indicators in the Safety CPU Unit. (Example: Supposing the safety signature is 0xABCD) Check the safety signature. If it is correct, press and hold the service switch for one second or more and release. Processing starts.
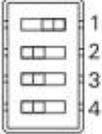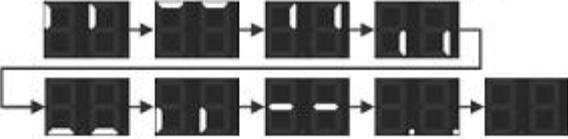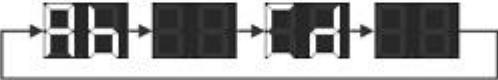
Processing stage	Procedure and Display
Processing	Seven-segment indicators in the Safety CPU Unit repeat turning ON and OFF in four at a time. • If processing ended in an error, an error code is shown in the seven-segment indicators in the Safety CPU Unit.
Wait for Completion Command	The safety signature for the settings information transferred to the Safety CPU Unit is repeatedly shown as a four-digit hexadecimal number in the seven-segment indicators of the Safety CPU Unit. (Example: Supposing the safety signature is 0xABCD) Check the safety signature. If it is correct, press and hold the service switch for one second or more and release. Completion processes starts.
Processing Completion	Seven-segment indicators in the Safety CPU Unit repeat turning ON and OFF in four at a time. • If processing ended in an error, an error code is shown in the seven-segment indicators in the Safety CPU Unit.
Done	The safety signature including the date and time (UTC) is repeatedly shown in the seven-segment indicators of the Safety CPU Unit. (Example: Supposing the safety signature is 0xABCD, and the date is 16:21:36 of June 22, 2017 (UTC))
Restart	After turning OFF the power supply to the Controller, set the pins 1 to 4 of the DIP switch on the Safety CPU Unit as follows: 1 to OFF, 2 to OFF, 3 to OFF, and 4 to OFF, and turn ON the power supply to the Controller. The Safety CPU Unit starts in RUN mode. SETTING ➡ ON 1 2 3 4
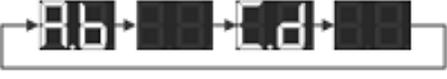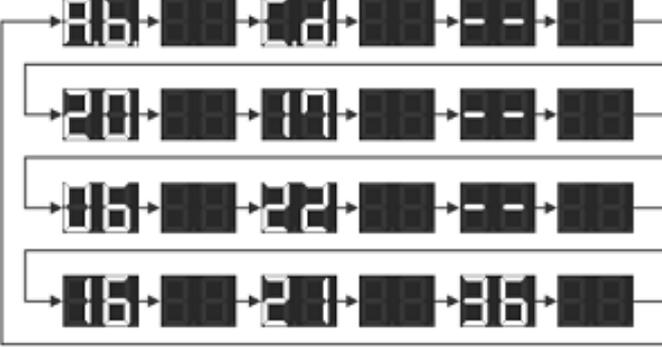
Start:
User-created
screen

No Restored File in
NA's USB Memory

Checking
initial
error

**No restored file in
USB memory**

OK

Unsupported Unit

OK

Main Screen

Unsupported unit

SL Safety CPU   Restored File Download

Download
Confirmation

Cancel

Press

Failed Download

Execute

Error

OK

1

2

1

2

Download
Completion

Completed

Press

Start Restore
Mode

Return

Back

Next

Stand by for
Start Instruction

Return

Back

Next

Stand by for
Completion
Instruction

Return

Back

Next

3

4

5

3 **4** **5**

Back

Restoration
Completion

Return

Back

Next

Restart

Completed

Restored File Download

Safety signature including date and time is displayed repeatedly in the 7-segment LED display of the safety CPU unit.

[Example]
Safety signature: 0xABCD
Date and Time: 2017/6/22, 16:22:36 (UTC)
* Abend code appears in the 7-segment LED display of the safety CPU unit when restoring terminated abnormally.

Back   Next   Return

Restored File Download

Turn off the safety CPU unit's power.
Set the dip switches of the safety CPU unit as follows.
Switch1: OFF
Switch2: OFF
Switch3: OFF
Switch4: OFF
Then turn on the controller's power. The safety CPU unit starts in operation mode.

SETTING

Back   Completed

6 Appendix: Specifications

6-1 Screen Overview

・Base Screens

Menu (Initial Screen)	Safety CPU Demo Movie
Select a screen you want to go.	A demonstration movie is played on this screen.
I/O Table	**Safety I/O LED Monitor**
I/O table for controllers is displayed.	LED statuses of safety I/O units are indicated.
Restored File Download	**Data Log Setting File Download**
You can download a restored file of the safety CPU unit to a controller.	You can download a data log setting file for the safety CPU unit to a controller.
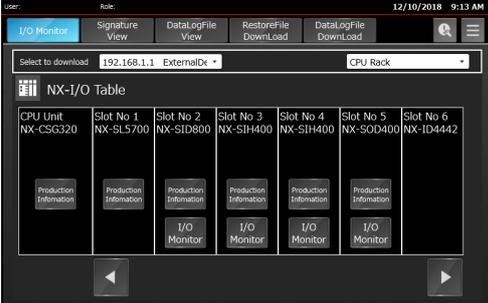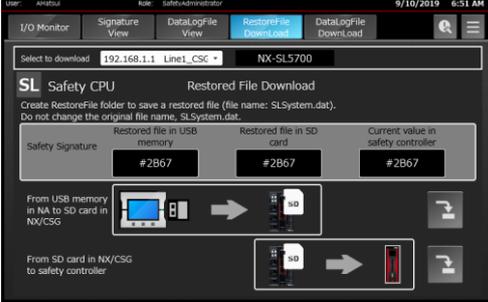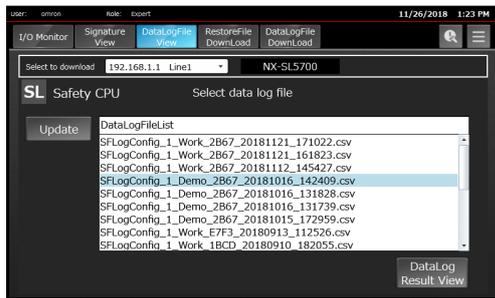
Data Log File Selection	Data Log Display
You can select a data log file to display in this screen.	A timing chart of the selected data log file is displayed.
Safety Signature Confirmation	
Safety signature information of the safety CPU unit is displayed.	
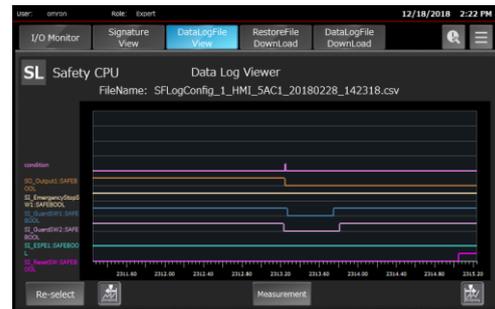
・Poo-up Screens

Display Variable Selection	Measurement
  Select variables to display. The variables are logged in the file that selected in the Data Log File Selection Screen.	 The difference between two variables displayed on the Data Log Display Screen is shown.
Login	Logout
  You can login here.	 When attempting a logout, this pop-up appears.
Authority Filter	
  You can filter users to display on the Login Screen with authorities.	
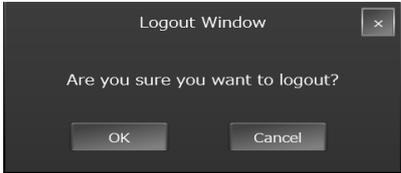
6-2 Screen Transition and Security Levels

Screen Transition Diagram

Safety CPU Demo Function Group

Menu

I/O Table

Safety I/O LED Monitor

Production Information

Safety CPU Demo Movie

Data Log File Selection

Display Variable Selection

Safety Signature Confirmation

Data Log Display

Logout

Restored File Download

Measurement

Login

Data Log Setting File Download

Authority Filter
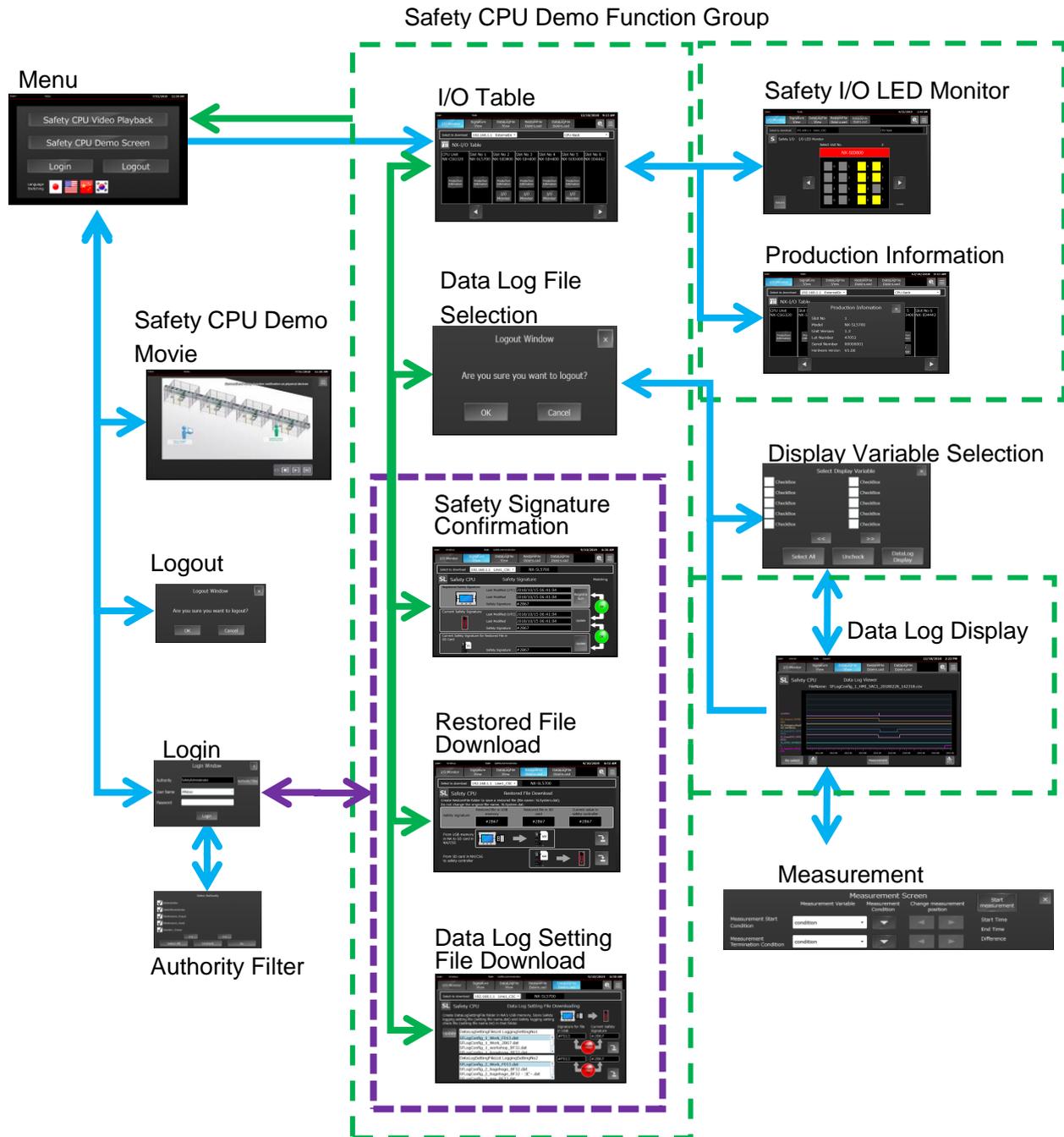
Specific users must login to:
- display the Restored File Download Screen
- display the Data Log Setting File Download Screen
- save a safety signature in the Safety Signature Confirmation Screen

Login in the Login Screen beforehand or in the pop-up login window displayed at screen transition. For the user name and password designated for the demo project, refer to Additional Information in Chapter 5, "Demonstration Procedure for Each Function."

6-3 Screen Specification Details

6-3-1 Menu Screen

This screen is displayed when the safety CPU demo unit starts.
You can jump to each functional screen from here.

・Screen Layout

No	Part	Description
1	Data Display	Displays the user name who logging in.
2	Data Display	Shows the logging in user's authority.
3	Data Display	Displays the current time.
4	Button	Switches to Safety CPU Demo Movie Screen.
5	Button	Switches to Safety CPU Demo Screen.
6	Button	Switches to Login Screen.
7	Button	Switches to Logout Screen.
8	Button	Switches languages.
9	Button	Hidden button. Press and hold for 2 seconds to switch Chinese to Taiwanese. Every time you press and hold the button for 2 seconds, Chinese and Taiwanese are alternated.

6-3-2 I/O Table Screen

On this screen, an I/O table of the selected controller is displayed.

・Screen Layout
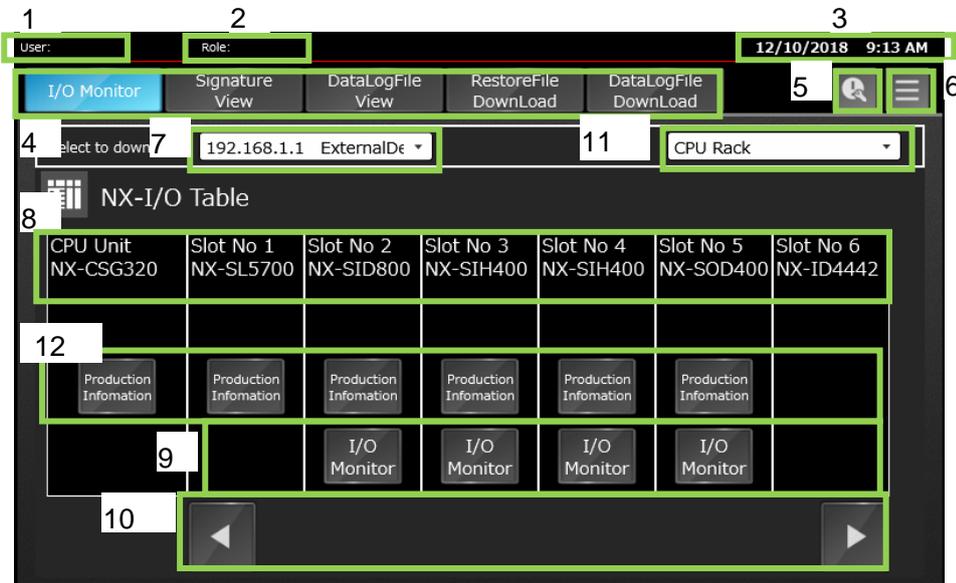
No	Part	Description
1	Data Display	Displays the user name who logging in. It's due to NA's security function.
2	Data Display	Shows the logging in user's authority. It's due to NA's security function.
3	Data Display	Displays the current time.
4	Button	Switches to each Safety CPU Demo Screen.
5	Button	Switches to Troubleshooter Screen of the connected controller.
6	Button	Switches to Menu Screen.
7	DropDown	Selects the controller to display its I/O table.
	Button	Displays the I/O table of the controller chosen from the dropdown list.
8	Data Display	Displays the I/O table of the connected controller.
9	Button	Switches to the Safety I/O LED Monitor Screen of the selected slot number.
10	Button	Moves the display range when 6 or more units are connected to the controller.
11	DropDown	Selects the I/O table to display in [8].
	Button	
12	Button	Displays the selected unit's production information.

6-3-3 Production Information Screen

Press the Product Information button for a safety I/O unit to see the detail information.

・Screen Layout
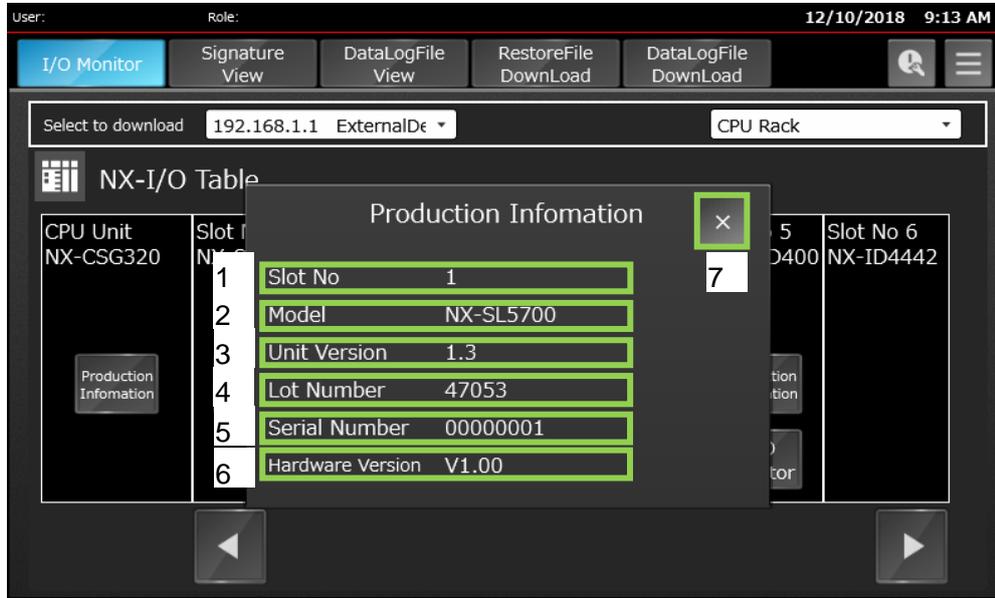
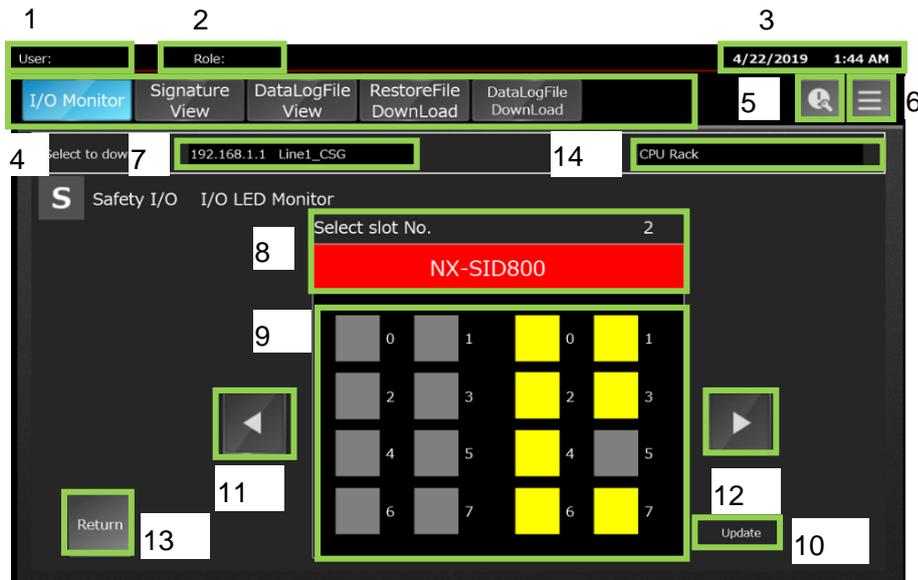| No	Part	Description
1	Data Display	Displays the slot number.
2	Data Display	Displays the unit's model.
3	Data Display	Displays the unit's version.
4	Data Display	Displays the lot number.
5	Data Display	Displays the serial number.
6	Data Display	Displays the hardware version.
7	Button	Closes the window.

6-3-4 Safety I/O LED Monitor Screen

This screen displays an LED monitor of the unit selected in 6-3-2 "I /O Table Screen."
The screen supports the following safety I/O units: NX SI series and NX SO series. The LED status
is updated at 1 second intervals.
Note: The normal NX-I/O units are not supported.

・Screen Layout

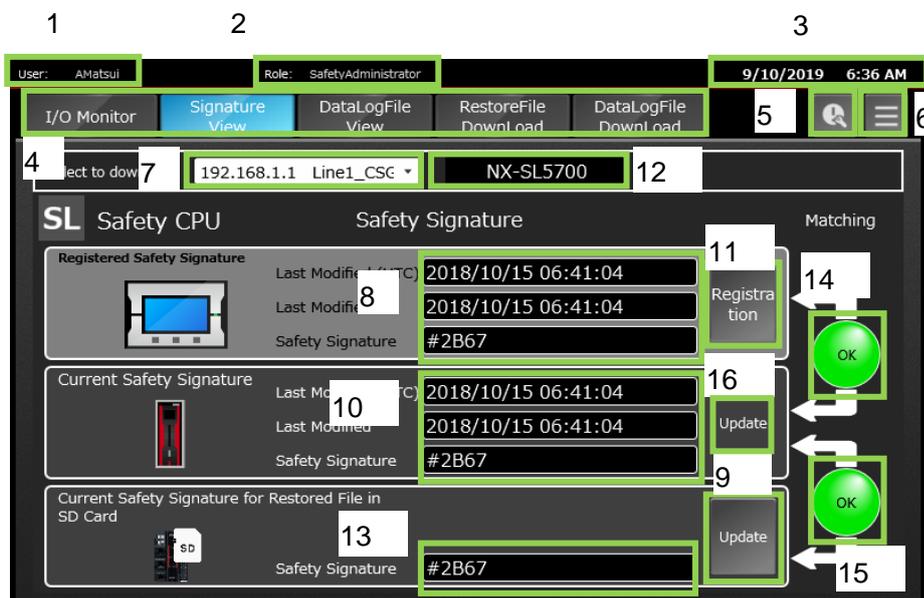| No	Part	Description
1	Data Display	Displays the user name who logging in.
2	Data Display	Shows the logging in user's authority.
3	Data Display	Displays the current time.
4	Button	Switches to each Safety CPU Demo Screen.
5	Button	Switches to the Troubleshooter Screen of the connected controller.
6	Button	Switches to Menu Screen.
7	Data Display	Displays the connecting controller's name and IP address. They are not to be changed on this screen.
8	Data Display	Shows the selected slot number and model
9	Data Display	Displays the LED status of Safety I/O Unit.
10	Label	Blinks during the update of LED status.
11	Button	Indicates the LED status of the unit on the left.
12	Button	Indicates the LED status of the unit on the right.
13	Button	Switches to I/O Table Screen.
14	Data Display	Shows the selected system. You can't change settings in this screen.

The information about safety signatures owned by the connected safety CPU is displayed on this screen.

A safety program designer can register safety signature information in NA. It is necessary to login with the designer authority of the safety program when you register a safety signature.

Two safety signatures, one is owned by the safety CPU and the other is registered in NA, are compared. If those safety signatures are not the same, an error dialog appears. Refer to 5-2-3 "Screen Transition" for details.

・Screen Layout

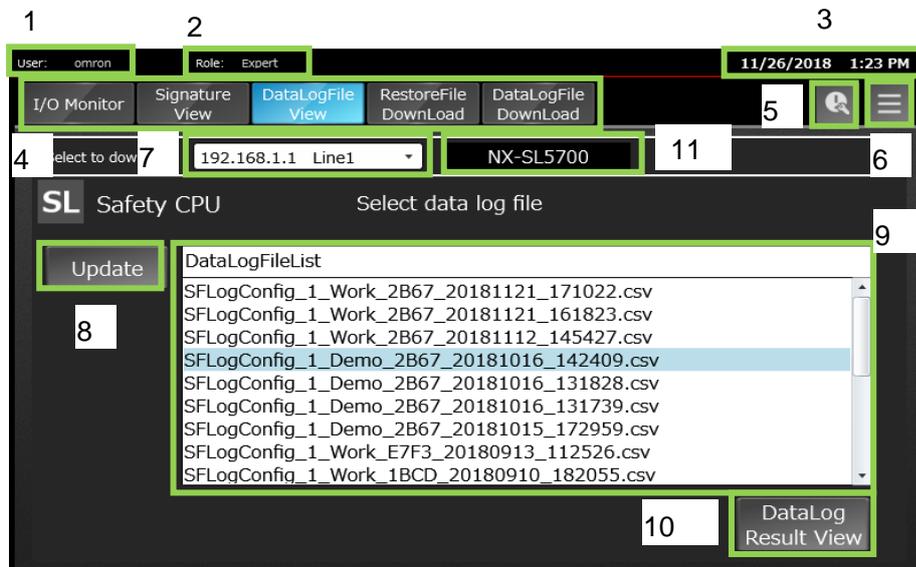| No	Part	Description
1	Data Display	Displays the user's name who is logging in.
2	Data Display	Displays the logging-in user's authority.
3	Data Display	Displays the current time of NA.
4	Button	Switches to each safety CPU demo screen.
5	Button	Switches to the Troubleshooter Screen of the connected controller.
6	Button	Switches to the Menu Screen.
7	DropDown Button	You can select the controller to display its safety signature information. The safety signature of the controller which is selected from the dropdown list is shown in [8].
8	Data Display	Displays the safety signature information that registered in NA.
9	Button	Updates safety signature information.
10	Data Display	Displays the safety signature information that the safety CPU owns.
11	Button	Registers the safety signature information that the safety CPU owns to NA.
12	Data Display	Displays the unit model of the connected safety CPU.
13	Data Display	Displays the safety signature information that stored in an SD card.

No	Part	Description
14	Data Lamp	Displays a result of a comparison of the safety signatures registered in NA and safety CPU.
15	Data Lamp	Displays a result of a comparison of the signatures registered to the SD card and safety CPU.
16	Label	The LED indication updates are displayed. Under automatic update: The writing blinks white Under suspension: The writing is solid white

6-3-6 Data Log File Selection Screen

A list of data logging result files saved in the safety CPU's SD card is displayed. You can select a file from this list.
Press the DataLog Result View button (No.10) after selecting the file and the screen will be changed to the Variable Selection screen.

・Screen Layout

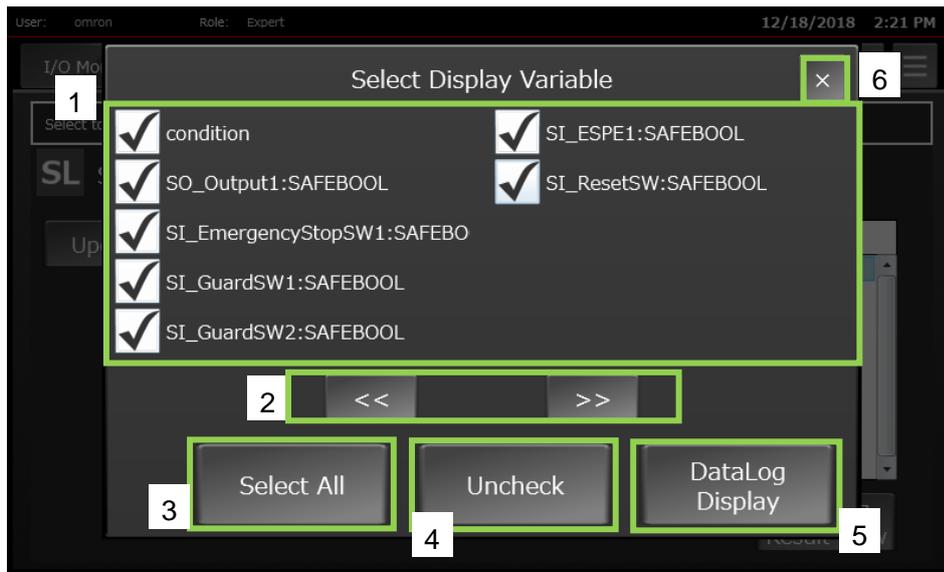| No	Part	Description
1	Data Display	Displays the user name who logging in.
2	Data Display	Shows the logging in user's authority.
3	Data Display	Displays the current time.
4	Button	Switches to each Safety CPU Demo Screen.
5	Button	Switches to the Troubleshooter Screen of the connected controller.
6	Button	Switches to Menu Screen.
7	DropDown Button	Selects the controller to display its data log file. Displays the data log file list of the controller selected from the dropdown list in [9].
8	Button	Updates the data log file list displayed in [9].
9	ListBox	Displays a list of data log files stored in the SD card of the Safety CPU. A file is selected in this box.
10	Button	Opens the file selected in [9] and switches to Variable Selection Screen.
11	Data Display	Shows the connected safety CPU's unit model.

6-3-7 Display Variable Selection Screen

A list of variables that logged in the data log file selected in the previous section, 6-3-6 "Data Log File Selection Screen", is shown in this screen.
Select variables to display on the Data Log Display screen.
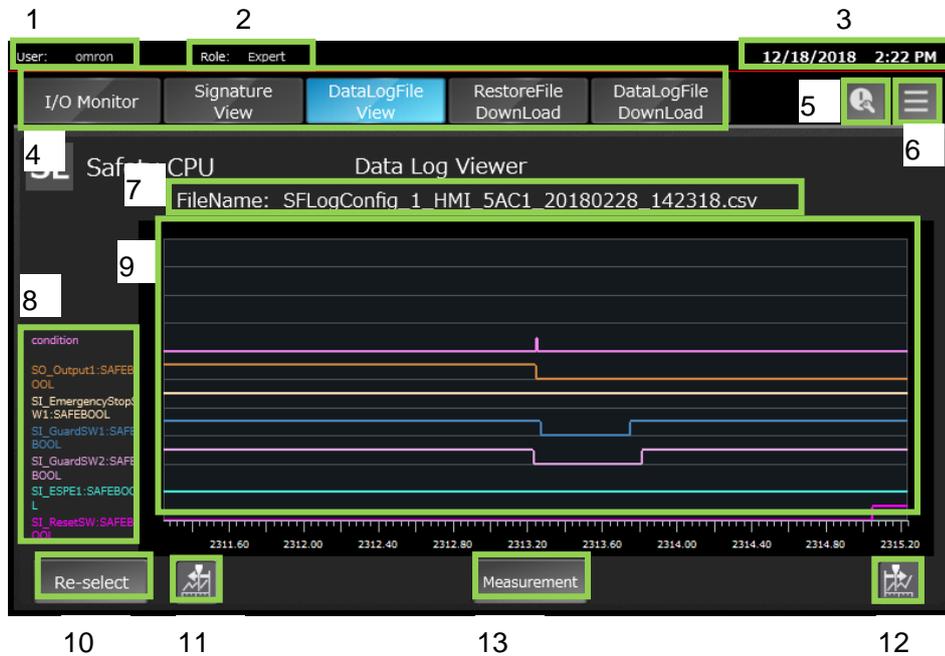You can choose up to 10 variables.

・Screen Layout

No	Part	Description
1	Check Button	Display the variables that are logged in the data log file. Select any variables here. Up to 10 variables are displayed on one screen.
2	Button	Available if 10 or more variables are logged. Switches the variables to be displayed.
3	Button	Selects all the variables on the screen.
4	Button	Deselects all the variables selected with [1].
5	Button	Switches to the Data Log Display screen. This button doesn't work unless at least one variable is selected ([1]).
6	Button	Closes this screen to jump to the Data Log File Selection screen.

6-3-8 Data Log Display Screen

Data log of variables which selected in 6-3-7 "Variable Selection Screen"

・Screen Layout

No	Part	Description
1	Data Display	Displays the user name who logging in.
2	Data Display	Shows the logging in user's authority.
3	Data Display	Displays the current time.
4	Button	Switches to each Safety CPU Demo Screen.
5	Button	Switches to the Troubleshooter Screen of the connected controller.
6	Button	Switches to Menu Screen.
7	Data Display	Shows the selected data log file name.
8	Data Display	Displays the selected variable.
9	BrokenLineGraph	Indicates the data logging result of the selected variable.
10	Button	Switches to Variable Selection Screen.
11	Button	Left-scrolls through a graph of the data logging result.
12	Button	Right-scrolls through a graph of the data logging result.
13	Button	Switches to Measurement Screen.

6-3-9 Measurement Screen

The elapsed time for the two triggers of the variable that is displayed on the Data Log Display screen, described in 6-3-8, is measured in this screen.
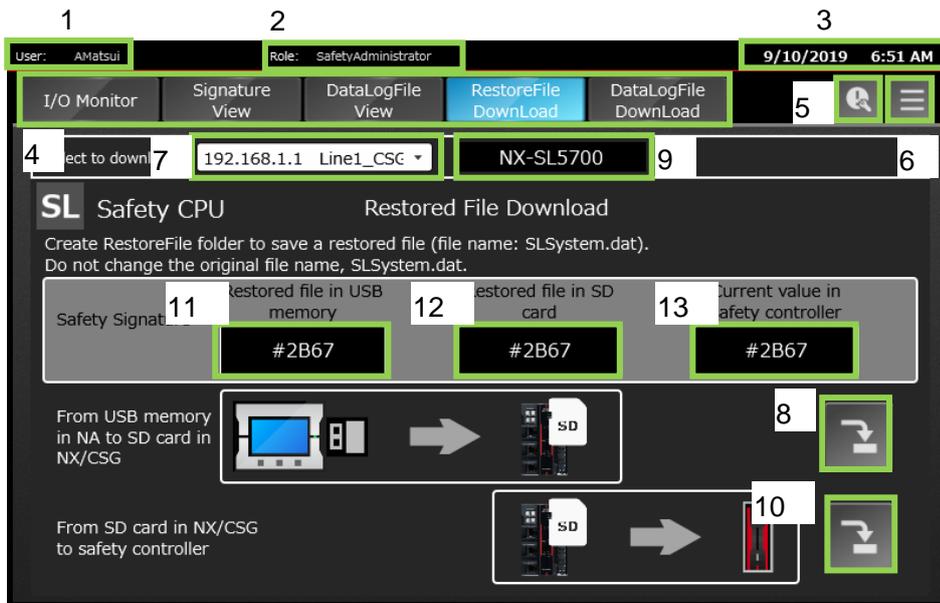
・Screen Layout
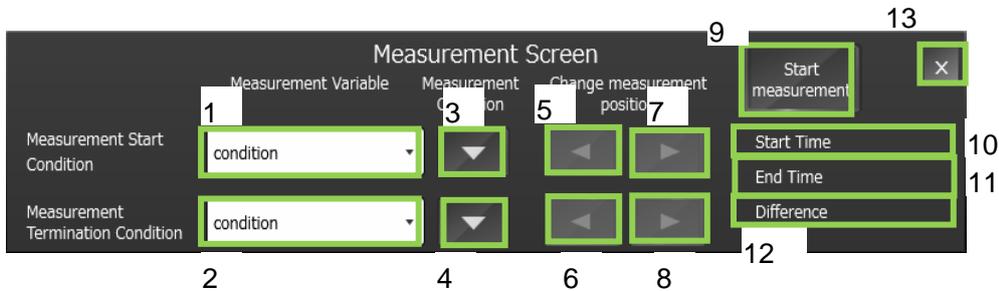
No	Part	Description
1	Drop Down	Selects a variable for the measurement start condition.
2	Drop Down	Selects a variable for the measurement termination condition.
3	Button	Selects a measurement condition for the measurement start condition: rising or falling.
4	Button	Selects a measurement condition for the measurement termination condition: rising or falling.
5	Button	Searches for a position that satisfies the trigger condition forward from the position where the trigger is currently applied under the measurement start condition.
6	Button	Searches the position where the trigger condition is satisfied forward from the position where the trigger is currently applied under the measurement termination condition.
7	Button	Searches the position that satisfies the trigger condition backward from the position where the trigger is currently applied under the measurement start condition.
8	Button	Searches the position that satisfies the trigger condition backward from the position where the trigger is currently applied under the measurement termination condition.
9	Button	Starts measuring.
10	Data Display	Displays the time when the trigger condition of the measurement start condition is satisfied.
11	Data Display	Displays the time when the trigger condition of the measurement termination condition is satisfied.
12	Data Display	Displays the difference between the measuring start time and end time.
13	Button	Closes this screen.

6-3-10 Restored File Download Screen

Download a restored file of the safety CPU unit stored in NA's USB memory to controller's SD card.
Create a new folder "RestoreFile" in the USB memory stick beforehand. Store the file
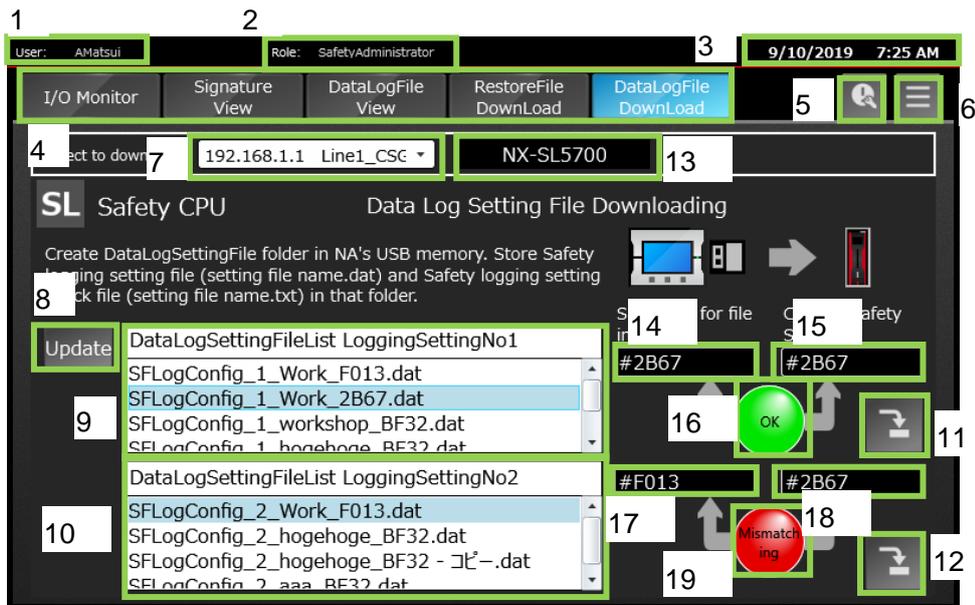(SLSystem.dat) you want to restore in the folder.

・Screen Layout

No	Part	Description
1	Data Display	Displays the user name who logging in.
2	Data Display	Shows the logging in user's authority.
3	Data Display	Displays the current time.
4	Button	Switches to each Safety CPU Demo Screen.
5	Button	Switches to the troubleshooter screen of the connected controller.
6	Button	Switches to Menu Screen.
7	DropDown Button	You can select a controller from the dropdown list. A restored file will be downloaded in the selected controller
8	Button	Transfers a restored file stored in NA's USB memory to an SD card in NX/CSG.
9	Data Display	Displays the connected safety CPU's unit model.
10	Button	You can restore the safety controller.
11	Data Display	Displays the signature information that registered in NA.
12	Data Display	Displays the signature information that registered in an SD card inside NX/CSG.
13	Data Display	Displays the signature information of NX/CSG.

6-3-11 Data Log Setting File Download Screen

Download a data log setting file stored in NA's USB memory stick to controller's SD card.
Create a folder "DataLogSettingFile" in NA's USB stick memory beforehand. Store a safety logging setting file (file name.dat) and a safety logging setting check file (file name.txt) in the folder you have created.
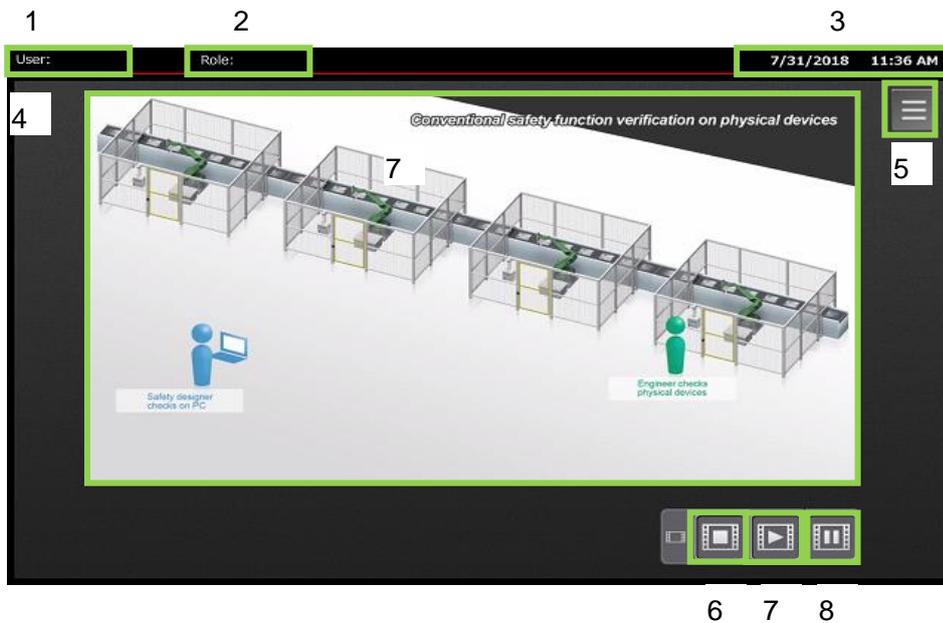
・Screen Layout

No	Part	Description
1	Data Display	Displays the user name who logging in.
2	Data Display	Shows the logging in user's authority.
3	Data Display	Displays the current time.
4	Button	Switches to each Safety CPU Demo Screen.
5	Button	Switches to the Troubleshooter Screen of the connected controller.
6	Button	Switches to Menu Screen.
7	DropDown Button	You can select a controller from the dropdown list. A restored file will be downloaded in the selected controller
8	Button	Downloads the restore file.
9	ListBox	Displays to select a logging file list of logging setting No.1.
10	ListBox	Displays to select a logging file list of logging setting No.2.
11	Button	Downloads the logging file selected in [9].
12	Button	Downloads the logging file selected in [10].
13	Data Display	Displays the connected safety CPU's unit model.
14	Data Display	Displays the signature of the logging file selected in [9].
15	Data Display	Displays the safety signature of the main unit.
16	Data Lamp	Displays a result of a comparison of signatures in [14] and [15].
17	Data Display	Displays the signature of the logging file selected in [10].
18	Data Display	Displays the safety signature of the main unit.
19	Data Lamp	Displays a result of a comparison of signatures in [17] and [18].

6-3-12 Safety CPU Demo Movie Screen

A safety CPU demonstration movie is played on this screen. Both Japanese and English are available. If language other than Japanese is selected on the Menu screen, the English movie will be played.

・Screen Layout

No	Part	Description
1	Data Display	Displays the user name who logging in.
2	Data Display	Shows the logging in user's authority.
3	Data Display	Displays the current time.
4	Media Player	Plays the Safety CPU demo movie.
5	Button	Switches to Menu Screen.
6	Button	Stops the movie.
7	Button	Starts the movie.
8	Button	Pauses

6-3-13 Login Screen

You can login from this screen.

・Screen Layout

No	Part	Description
1	Data Display	User authority which selected in [2] is displayed.
2	DropDown	Select a user from the drop-down list.
3	Data Edit	Enter the password in this box.
4	Button	Switches to Authority Filter Screen.
5	Button	Executes login processing.
6	Button	Closes this screen.

6-3-13 Authority Filter Screen

You can narrow down users you want to display on the Login screen by filtering with user authorities.

・Screen Layout
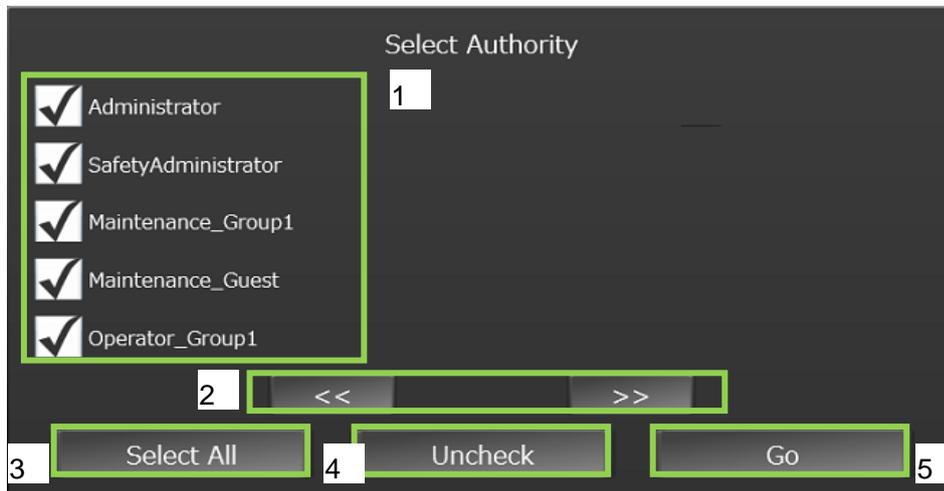
No	Part	Description
1	CheckBox	Check the authority of the user whom you want to display on the Login Screen.
2	Button	Currently displayed authorities are changed by this button.
3	Button	You can select all the authorities with this button.
4	Button	The button unchecks all the selected authorities.
5	Button	The button activates the filter with the selected authority and switches to the Login Screen.

6-3-14 Logout Screen

In this screen, a logout process is implemented.

・Screen Layout
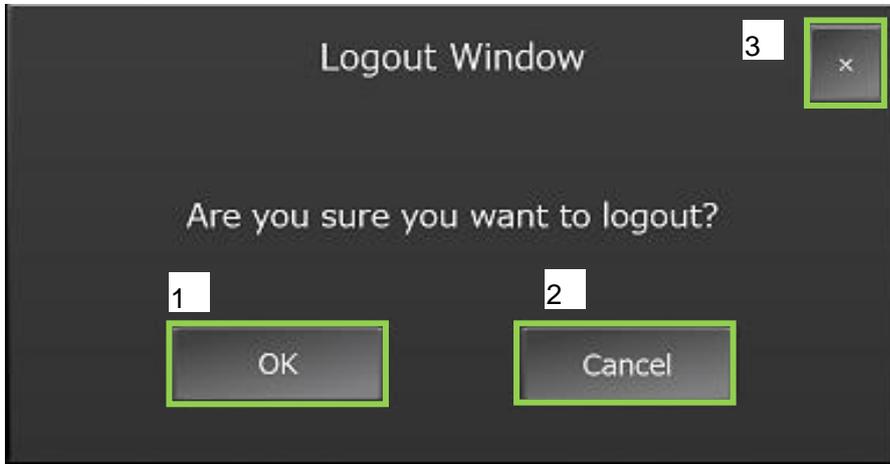
No	Part	Description
1	Button	You will logout pressing this button.
2	Button	This screen is closed without logout processing.
3	Button	The button closes this screen.

Revision History

Revision Code	Date	Description
A	July 2018	First edition
B	December 2018	Added new functions
C	February 2019	Correction of erroneous descriptions
D	May 2019	Added new functions
E	December 2019	Reflected the regarding descriptions with rev. D project files

Authorized Distributor:

Cat. No. V447-E1-05   1219(0718)