

**NS-Runtime Software**

# **USER'S MANUAL**

**OMRON**

## **NOTE**

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# Notice


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OMRON products are manufactured for use according to proper procedures by a qualified operator and only for the purposes described in this manual.

The following conventions are used to indicate and classify precautions in this manual. Always heed the information provided with them. Failure to heed precautions can result in injury to people or damage to property.

 **DANGER** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. Additionally, there may be severe property damage.

 **WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. Additionally, there may be severe property damage.

 **Caution** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or property damage.

## OMRON Product References

All OMRON products are capitalized in this manual. The word "Unit" is also capitalized when it refers to an OMRON product, regardless of whether or not it appears in the proper name of the product.

The abbreviation "Ch," which appears in some displays and on some OMRON products, often means "word" and is abbreviated "Wd" in documentation in this sense.

The abbreviation "PLC" means Programmable Controller.

The abbreviation "host" means a controller, such as an IBM PC/AT or compatible computer, that controls a PT (Programmable Terminal).

## Visual Aids

The following headings appear in the left column of the manual to help you locate different types of information.

**Note** Indicates information of particular interest for efficient and convenient operation of the product.

**1, 2, 3...** 1. Indicates lists of one sort or another, such as procedures, checklists, etc.

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# About this Manual

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This manual provides important information on using the NS-Runtime Software. Please read and be sure you understand this manual before attempting to use the NS-Runtime Software, and keep this manual in a safe place where it is accessible for future reference.

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## Section 1 Overview

This section provides an overview of the NS-Runtime including the functions, features, connection types and communication methods.

A comparison between NS-Runtime and the NS Series is also described.

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## Section 2 Setting up, Starting up and Exiting the NS-Runtime

The NS-Runtime is application software that runs on Microsoft Windows.

This section describes how to install the NS-Runtime on Windows. It also describes methods of starting and exiting the NS-Runtime.

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## Section 3 Creating Projects

This section describes procedures for creating projects, system settings, communications settings and creating screens for the NS-Runtime.

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## Section 4 NS-Runtime Functions

This section describes the NS-Runtime functions.

It mainly describes functions that are added or changed from the NS Series and the CX-Designer, and does not describe functions equivalent to those of the NS Series and the CX-Designer.

For NS Series and CX-Designer functions that this manual does not describe, refer to each manual mentioned in 1-1 About This Manual.

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## Section 5 NS-Runtime System Menu Operations

This section describes the basic methods for operating the System Menu of the NS-Runtime and details on functions.

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## Section 6 Transferring Project Data

This section describes how to send created or modified screen data to the NS-Runtime environment and to register them. It also describes how to read data registered in the NS-Runtime.

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## Section 7 Troubleshooting

This section describes the countermeasures for errors that may occur when creating projects with the CX-Designer or operating them with the NS-Runtime.

This section explains errors specific to the NS-Runtime. For information on other errors, refer to 5 Troubleshooting and Maintenance in the NS Series Programming Manual.

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### **WARNING**

Failure to read and understand the information provided in this manual may result in personal injury or death, damage to the product, or product failure. Please read each section in its entirety and be sure you understand the information provided in the section and related sections before attempting any of the procedures or operations given.

# Related Manuals

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The following manuals are related to the NS-Runtime Software. (The boxes at the end of the catalog numbers indicate the revision code.)

**This  
manual**

## NS-Runtime Software User's Manual ..... V093-E1-□

Describes installing the NS-Runtime Software, basic operations, and the user interface. It also describes special features and application methods of the NS-Runtime Software.

## CX-Designer User's Manual ..... V099-E1-□

Describes basic operations and the user interface of the CX-Designer. It also describes the special features and application methods.

## CX-Designer Online Help

Online help can be used to display CX-Designer operating procedures, settings, and other information on-screen, including detailed setting methods for functional objects and graphics.

## NS Series Programming Manual ..... V073-E1-□

Describes the functions and application methods of NS-series PTs. It also provides troubleshooting methods for problems that might occur with the PT.

## NS Series -V1/-V2 Setup Manual ..... V083-E1-□

Provides information on NS-series version 1 and version 2 PTs (i.e., the NS15-V2, NS12-V1/V2, NS10-V1/V2, NS8-V1/V2, and NS5-V1/V2). It describes how to install and connect a PT, provides basic specifications, and provides other hardware information on the PTs.

## CXONE-AL□□D-V4/LT□□C-V4 CX-One Setup Manual

..... W463-E1-□

Provides an overview of and describes how to install the CX-One FA Integrated Tool Package.

## CX-Designer Introduction Guide..... V089-E1-□

This tutorial describes the procedures for creating and operating simple screens as an example for first users of NS-series PTs.



## Macro Reference ..... V075-E1-□

The online help of the CX-Designer provides detailed information on the macro function of NS-series PTs. PDF data containing the same contents is installed on the hard disk when the CX-Designer is installed. Use either the online help or this PDF data as required.

## PLC Operation Manuals

Refer to the operation manuals for the CPU Unit, Special I/O Units, CPU Bus Units, Communications Units, and other PLC Units that you are using to obtain information on PLC operation and functions.

# Terminology

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The following terminology is used in this manual.

NS-Runtime	Indicates OMRON's NS-Runtime Software (NS-NSRCL□□).
NS-series PT	Indicates a Programmable Terminal in OMRON's NS Series of Programmable Terminals.
PLC	Indicates an OMRON Programmable Controller.
Host	Indicates the PLC, IBM PC/AT or compatible computer, or personal computer controlling an NS-series PT.
CX-One	Indicates OMRON's CX-One Integrated FA Tool Package (CXONE-AL□□C-V4/AL□□D-V4). This package contains the Support Software for most OMRON PLCs and Components.
CX-Designer	Indicates the OMRON CX-Designer.

# Introduction

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The NS-Runtime Software provides the same functionality as an NS-series Programmable Terminal to enable implementing FA onsite information displays and operations on Windows. To enable using the NS-Runtime Software correctly, be sure you have sufficient understanding of the CX-Designer and Programmable Terminal functions and characteristics. Refer to all related manuals when using the NS-Runtime Software.

## • Intended Audience

This manual is intended for the following personnel, who must also have knowledge of electrical systems (an electrical engineer or the equivalent).

- Personnel in charge of introducing FA systems into production facilities.
- Personnel in charge of designing FA systems.
- Personnel in charge of installing and connecting FA systems.
- Personnel in charge of managing FA systems and facilities.

## • Installation Environment

The NS-Runtime operates on an open platform, and usage conditions differ from those of NS-series PTs.

- Never use the NS-Runtime for an FA system that operates 24 hours a day.
- OMRON disclaims responsible for any problems caused by using the NS-Runtime with other software applications or any problems caused by the installation environment.
- It is the user's responsibility to isolate causes of any problems caused by other software applications or by the installation environment.

# Safety Precautions

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## Notation Used for Safety Information

The following notation is used in this manual to provide precautions required to ensure safe usage of the product.

The safety precautions that are provided are extremely important to safety.

Always read and heed the information provided in all safety precautions.

The following notation is used.

 <b>WARNING</b>	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. Additionally, there may be severe property damage.
 <b>Caution</b>	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or property damage.

## Symbols

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### Prohibition

The circle and slash symbol indicates operations that you must not do.

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The circle and slash symbol indicates operations that you must not do. The specific operation is shown in the circle and explained in text. This example indicates prohibiting disassembly.

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The triangle symbol indicates precautions (including warnings). The specific operation is shown in the triangle and explained in text. This example indicates a precaution for electric shock.

---



The triangle symbol indicates precautions (including warnings). The specific operation is shown in the triangle and explained in text. This example indicates a general precaution.

---



The filled circle symbol indicates operations that you must do. The specific operation is shown in the circle and explained in text. This example shows a general precaution for something that you must do.

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The triangle symbol indicates precautions (including warnings). The specific operation is shown in the triangle and explained in text. This example indicates a precaution for high temperatures.

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## Warnings

### WARNING

#### • Security Measures

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##### Anti-virus protection

Install the latest commercial-quality antivirus software on the computer connected to the control system and maintain to keep the software up-to-date.



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##### Security measures to prevent unauthorized access

Take the following measures to prevent unauthorized access to our products.

- Install physical controls so that only authorized personnel can access control systems and equipment.
- Reduce connections to control systems and equipment via networks to prevent access from untrusted devices.
- Install firewalls to shut down unused communications ports and limit communications hosts and isolate control systems and equipment from the IT network.
- Use a virtual private network (VPN) for remote access to control systems and equipment.
- Adopt multifactor authentication to devices with remote access to control systems and equipment.
- Set strong passwords and change them frequently.
- Scan virus to ensure safety of USB drives or other external storages before connecting them to control systems and equipment.



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##### Data input and output protection

Validate backups and ranges to cope with unintentional modification of input/output data to control systems and equipment.

- Checking the scope of data
- Checking validity of backups and preparing data for restore in case of falsification and abnormalities
- Safety design, such as emergency shutdown and fail-soft operation in case of data tampering and abnormalities



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##### Data recovery

Backup data and keep the data up-to-date periodically to prepare for data loss.



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When using an intranet environment through a global address, connecting to a SCADA or an unauthorized terminal such as an HMI or to an unauthorized server may result in network security issues such as spoofing and tampering. You must take sufficient measures such as restricting access to the terminal, using a terminal equipped with a secure function, and locking the installation area by yourself.



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When constructing an intranet, communication failure may occur due to cable disconnection or the influence of unauthorized network equipment. Take adequate measures, such as restricting physical access to network devices, by means such as locking the installation area.



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When using a device equipped with the SD Memory Card function, there is a security risk that a third party may acquire, alter, or replace the files and data in the removable media by removing the removable media or unmounting the removable media. Please take sufficient measures, such as restricting physical access to the Controller or taking appropriate management measures for removable media, by means of locking the installation area, entrance management, etc., by yourself.



# Application Precautions

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- For information on device connections and settings for a computer where the NS-Runtime is installed, also refer to NS-V1/V2 series Programmable Terminals Setup Manual V083-E1-□.
- Use this product under Windows general specifications.
- When unpacking the product, check the CD and the USB dongle carefully for any damages.
- Do not install unnecessary applications in a computer where the NS-Runtime is installed.
- Exit all applications that are not directly related to the NS-Runtime.
- Disable sharing hard disks, printers or other devices with other computers on any network.
- Some notebook computers set the RS-232C port to modem or infrared line by default. Change the settings according to the operating instructions for your computer so that the RS-232C port can be used as a normal serial port.
- Some notebook computers set the RS-232C port not to supply rated power to the port to save energy by default. There are Windows settings and also possibly settings for computer specific utilities or BIOS settings for power saving. Disable the settings according to the operating instructions for your computer to provide power to the port.
- The whole systems may stop depending on the way the NS-Runtime started/ended. Follow the procedure to start/end the NS-Runtime.
- Start actual system application only after sufficiently checking screen data, macros, and the operation of the program in the host.
- Include programming that regularly accesses the RUN signal and confirms that the NS-Runtime is operating normally.
- Confirm the safety of the system before pressing touch switches.
- Do not accidentally press touch switches when the backlight is not lit or when the display does not appear.
- Signals from the touch switches may not be input if the switches are pressed consecutively at high speed. Confirm each input before proceeding to the next one.
- Before initializing screen data, confirm that existing data is backed up at the CX-Designer.
- When changing the password with the system menu, do not reset or turn OFF the power supply until writing is finished (i.e., until the Write Button returns to its original condition). It may become impossible to manipulate screens if the password is not set correctly.
- Do not attempt to disassemble, repair, or modify the product in any way.
- Dispose of the product according to local ordinances as they apply.



# ***Terms and Conditions Agreement***

## **WARRANTY**

- The warranty period for the Software is one year from the date of purchase, unless otherwise specifically agreed.
- If the User discovers defect of the Software (substantial non-conformity with the manual), and return it to OMRON within the above warranty period, OMRON will replace the Software without charge by offering media or download from OMRON's website. And if the User discovers defect of media which is attributable to OMRON and return it to OMRON within the above warranty period, OMRON will replace defective media without charge. If OMRON is unable to replace defective media or correct the Software, the liability of OMRON and the User's remedy shall be limited to the refund of the license fee paid to OMRON for the Software.

## **LIMITATION OF LIABILITY**

- THE ABOVE WARRANTY SHALL CONSTITUTE THE USER'S SOLE AND EXCLUSIVE REMEDIES AGAINST OMRON AND THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. IN NO EVENT, OMRON WILL BE LIABLE FOR ANY LOST PROFITS OR OTHER INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF USE OF THE SOFTWARE.
- OMRON SHALL HAVE NO LIABILITY FOR DEFECT OF THE SOFTWARE BASED ON MODIFICATION OR ALTERNATION TO THE SOFTWARE BY THE USER OR ANY THIRD PARTY.
- OMRON SHALL HAVE NO LIABILITY FOR SOFTWARE DEVELOPED BY THE USER OR ANY THIRD PARTY BASED ON THE SOFTWARE OR ANY CONSEQUENCE THEREOF.

## **APPLICABLE CONDITIONS**

USER SHALL NOT USE THE SOFTWARE FOR THE PURPOSE THAT IS NOT PROVIDED IN THE ATTACHED USER MANUAL.

## **CHANGE IN SPECIFICATION**

The software specifications and accessories may be changed at any time based on improvements and other reasons.

## **ERRORS AND OMISSIONS**

The information in this manual has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.





# Section 1

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## Overview

This section provides an overview of the NS-Runtime including the functions, features, connection types and communication methods.

A comparison between NS-Runtime and the NS Series is also described.

1-1 About this manual .....	1-2
1-2 About NS-Runtime .....	1-3
1-3 CX-Designer Menu List.....	1-6
1-4 Comparison between the NS Series and the NS-Runtime.....	1-8

## 1-1 About this manual

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This manual describes specifications and the system configuration of the NS-Runtime and screen creation methods using the CX-Designer.

This manual also explains added and modified functions from the existing NS Series and CX-Designer. However, functions equivalent to those of the NS Series and the CX-Designer are not explained in this manual.

For functions of the NS Series and the CX-Designer that are not described in this manual, please refer to documents including the documents listed in the table below.

Document	Manual No.
NS Series Programming Manual	V073-E1-□
Host Connection Manual (Host Link)	V098-E1-□
Macro Reference	V075-E1-□
CX-Designer Online Help	Provided with CX-Designer

## 1-2 About NS-Runtime

The NS-Runtime is software that provides functions equivalent to the NS Series, enables to display information and perform operations for FA manufacturing sites and runs on Windows.

### 1-2-1 NS-Runtime features

The following are the features of the NS-Runtime.

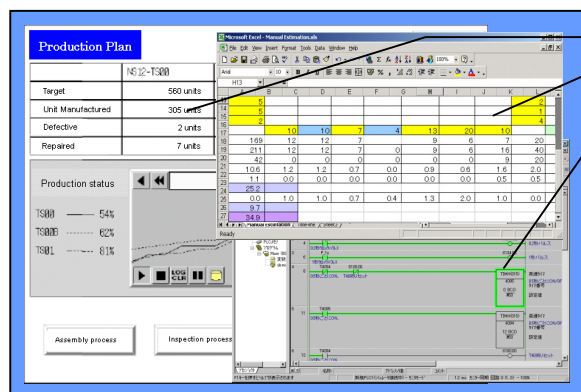
#### Other applications can be used at the same time.

The NS-Runtime is software that runs on Windows.

The NS-Runtime, therefore, can be used with other OMRON software simultaneously.

Moreover, software such as commercially available form software and applications created by users and the NS-Runtime can be used at the same time.

Specified applications can also be started up from the NS-Runtime.

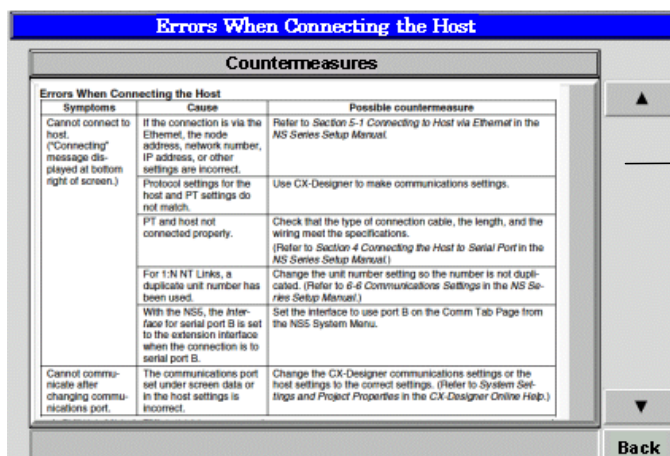


Other applications can be overlapped on the screen data, and they can be used at the same time.

#### Specified document file can be displayed

With the NS-Runtime, a specified PDF file can be displayed at the timing when an alarm occurs or at a specified timing. Therefore, for example, a PDF file that describes alarm's causes and countermeasures can be displayed when an alarm occurs.

Furthermore, because specified applications can be started up from the NS-Runtime, document data created with those applications and an NS-Runtime project can be displayed at the same time.



Displays a PDF file on a screen

### Note

- ◆ To display the PDF file, Adobe Reader must be installed in the operating environment of the NS-Runtime Software.

## 1-2-2 NS-Runtime Specifications

NS-Runtime Specifications are listed below.

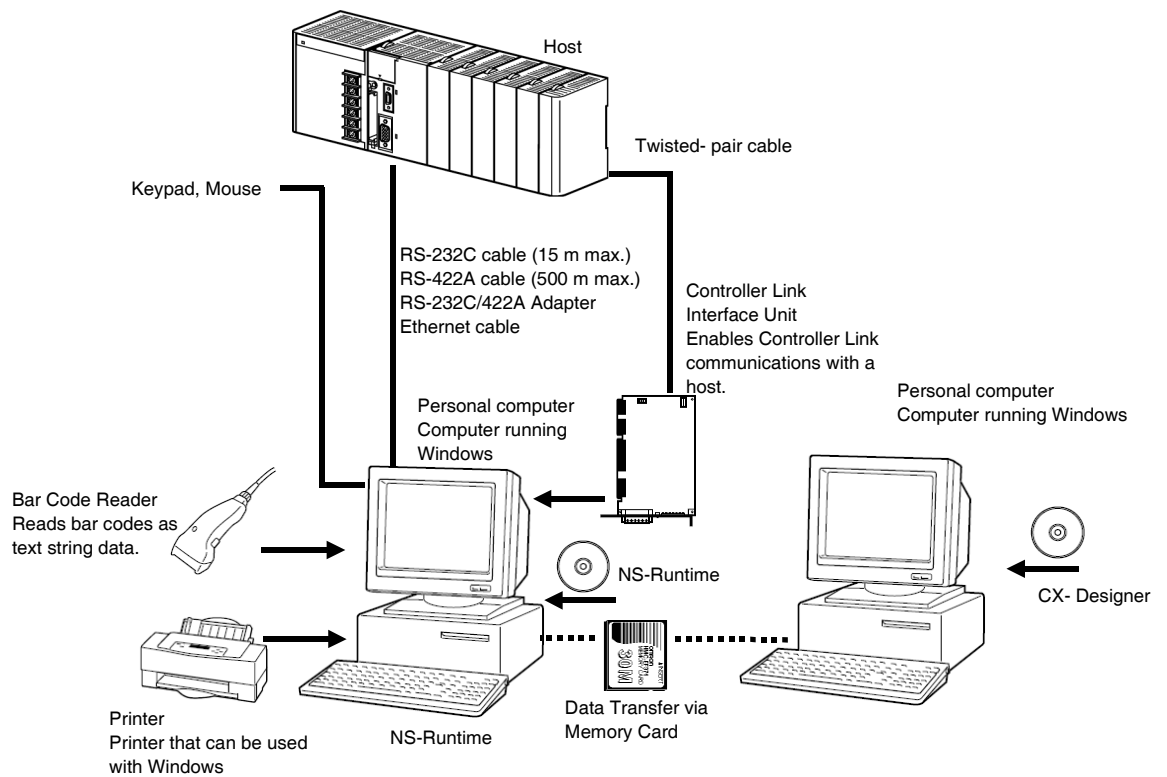
Item	Specifications
Screen size	3840 x 2400 dots max.
Connection method with host	Host Link, Ethernet, Ethernet /IP, Controller Link and Toolbus
Project data version	Versions 6.6 to 8.1 are supported.

### Note

- ◆ Communications with non-OMRON PLCs are not supported.
- ◆ Methods for connecting to the Host, 1:1 NT Link and 1:N NT Links (Standard, High-Speed) are not supported.
- ◆ The NS-Runtime has functionality basically equivalent to that of NS-series PTs. There are some differences, however, depending on differences between the PT and the NS-Runtime environment, including operating system.
- ◆ We recommend using the NS-Runtime with Ethernet.
- ◆ For the OSs of Windows7 and later, connection via Controller Link is not supported.

### 1-2-3 System Configuration

This section describes the system configuration used for the NS-Runtime.  
The NS-Runtime runs on Windows.



#### Note

- ◆ The computer must support RS-442A to be able to connect using RS-422A.

## 1-3 CX-Designer Menu List

The NS-Runtime has the following pull-down menus that are different from CX-Designer's. Menus not described here are the same as the existing CX-Designer's menus.

### File Menu

There are following changes in the File Menu.

Item	Function	Reference
New project	Creates new projects. The NS-Runtime is added.	3-1
Print	Document Table Setting is added to the Print Item Details.	—
Data Transfer Security	This menu cannot be used.	—

- Edit Menu

There is no change in the Edit Menu.

- Find Menu

There is no change in the Find Menu.

- View Menu

There is a following change in the View Menu.

Item	Function	Reference
Show Touch Points	This menu cannot be used.	—

- PT Menu

There are following changes in the PT Menu.

Item	Function	Reference
Transfer	When the CX-Designer and NS-Runtime is installed in the same environment, a function to copy project data to the NS-Runtime project storage folder will be added.	6-1
System Setting	Sets an NS-Runtime's parameter operating.  The following changes are made. -A folder can be specified to save history data. -Maximum screen size can be set.	3-2
Alarm/Event Setting	Registers and modifies the alarm/event.  Setting items for the display document table are added, which enables to show on a document display object when an alarm occurs.	4-3
Data Log Setting	Always logging can be set up to 160,000 points.	4-4
Document Table Setting	Registers document files (PDF files) to display on document display objects.	4-2-2
Screen/Sheet Properties	Setting range is changed as follows. 3840 x 2400 dots max.	3-4

- Functional Objects Menu

There are the following changes in the Functional Objects Menu.

Item	Function	Reference
Video Display	This menu cannot be used.	–
Document Display	This is a newly added functional object that displays specified document files (PDF files). Select this Document Display to start creating.	4-2

- Fixed Objects Menu

There is no change in the Fixed Objects Menu.

- Tools Menu

There is the following change in the Tools Menu.

Item	Function	Reference
Convert	The PT model can be converted between NS-series PT projects and NS-Runtime projects.	3-5

- Window Menu

There is no change in the Window Menu.

- Help Menu

There is no change in the Help Menu.

## 1-4 Comparison between the NS Series and the NS-Runtime

There are the following differences between the NS Series and NS-Runtime.

Items related to Hardware, communications and data transfer

Item	NS Series	NS-Runtime
Resolution	1024 X 768 dots max. (When using NS15)	3840 X 2400 dots max.
Connectable PLCs	Any of the following Series: C, CV, CS, CJ, CP, or NSJ	Any of the following Series: CV, CS, CJ, CP, or NSJ
Connection Method to the Host	<ul style="list-style-type: none"> <li>- 1:1 NT Link</li> <li>- 1:N NT Link (Standard, High-Speed)</li> <li>- Ethernet</li> <li>- EtherNet/IP</li> <li>- Controller Link (When mounting Controller Link I/F unit)</li> <li>- Host Link</li> <li>- Memory Link</li> </ul>	<ul style="list-style-type: none"> <li>- Ethernet</li> <li>- Ethernet/IP</li> <li>- Controller Link (When mounting Controller Link I/F unit)</li> <li>- Host Link</li> <li>- Toolbus</li> </ul>
Connection to the Temperature Controller	Provided	Not Provided
Connection to another company's PLC	<ul style="list-style-type: none"> <li>- Mitsubishi FX-series, A-series, and Q/QnA-series PLCs</li> <li>- SIEMENS S7-300 Series PLCs</li> <li>- OMRON Trajexia Motion Controller</li> <li>- Yaskawa MP-series Machine Controller</li> <li>- Yaskawa Varispeed F7 Inverter or VS mini V7 Servo Drive</li> <li>- Rockwell Automation (Allen-Bradley) SLC500, MicroLogix, PLC-5, CompactLogix, CompactLogix, and ControlLogix Controllers</li> <li>- Devices that support Modbus RTU</li> <li>- Yokogawa Electric FA-M3/FA-M3R-series PLCs</li> </ul>	Not Provided
Connection to the Barcode Reader	Barcode Reader can be connected to Serial Ports.	Barcode Reader can be connected to USB Ports.
Transferring project data to the NS Series/NS-Runtime	<ul style="list-style-type: none"> <li>- Serial</li> <li>- Ethernet</li> <li>- Modem</li> <li>- Controller Link</li> <li>- USB</li> <li>- Memory Card</li> <li>- Data Transfer using SPMA</li> </ul>	<ul style="list-style-type: none"> <li>- Memory Card</li> <li>- When the CX-Designer and NS-Runtime is installed in the same environment, project data that is being edited can be copied to the NS-Runtime's project storage folder using CX-Designer's transfer function.</li> </ul>



**Note**

- ◆ Data from other devices can be accessed from an application on a computer by going through the networks. This is referred to as SPMA (Single Port Multi Access).
- ◆ To communicate on a Controller Link network, a 3G8F7-CLK21-V1, 3G8F7-CLK12-V1, or 3G8F7-CLK52-V1 Controller Link Support Board must be installed in advance in the NS-Runtime's operating environment. Refer to the *Controller Link Support Boards for PCI Bus Installation Guide* (Cat. No. W467) for information on mounting and setting methods.
- ◆ To communicate on an Ethernet network, set the conversion table in the communications settings of the CX-Designer.
- ◆ Host Link connections are not supported for CJ2 CPU Units.

## NS-Runtime Overall Operations

Item	NS Series	NS-Runtime
Project Startup	Power ON	Executes the NS-Runtime
Exiting projects	Power OFF	- Exits from the system menu or by operating screen. - Turns ON the system memory \$SB63  The system menu has below two exit functions. - Exits the NS-Runtime only (Operating system will not end) - Exits the NS-Runtime and operating system. (The system ends.)
Inputting characters and numerals using a hardware keyboard	Not Supported.	Supported.

1-4 Comparison between **the NS Series and the NS-Runtime**

System Menu

Item	NS Series	NS-Runtime
Displaying the system menu	<ul style="list-style-type: none"> <li>- Press two of four corners on a screen (For the NS15, press one of the four corners of the touch panel twice.)</li> <li>- Start from a command button or Multifunction Object</li> <li>- Storing 4002 in \$SW0</li> </ul>	<ul style="list-style-type: none"> <li>- Double click on one of four corners.</li> <li>- Start from a command button or Multifunction Object</li> </ul>
Memory card transfer	Provided.	Provided.
Device monitor	Provided.	The CX-Programmer and the Switchbox Utility can start up.
Displaying capture data	Provided.	Not Provided.
PLC data trace	Provided.	The CX-Programmer can start up.
Starting External Applications	Ladder monitor and Programming Console can start up.	The CX-Programmer and the Switchbox Utility can start up.
Resizing window	Not Provided.	Window can be resized from the system menu.
Exit NS Series/NS-Runtime	Not Provided.	The NS-Runtime can be exited from the system menu.
Confirming Screen Data	When an address is displayed, the allocated unit number and communications settings can be displayed for the SAP library.	Not Provided.

## System Settings and Project Properties

Item	NS Series	NS-Runtime
Changing value of Device Monitor	Set whether enable/disable to change value from device monitor	The NS-Runtime does not support the device monitor function.
Specifying a save destination of history data	No specification function.	Specify a folder to save data.
Video	Make video display settings including selecting video board	The NS-Runtime does not support the video display function.
Printer Settings	Make settings of a printer to connect with the PT.	No printer setting. (Printer specified with the operating system will be used.)
Pop-up Menu	Show Delimiter is supported.	No Show Delimiter function
Advanced PT operation settings	Option settings are supported for switching screens.	Not Provided.
NT compatibility for system memory	It is possible to select system memory allocations compatible with the NT-series PTs.	Not Provided.
Initializing system memory at startup	It is possible to select either starting up with the previously displayed screen and label number, or starting up with the startup screen set in the system settings and the labels set in the project properties.	Not Provided. With the NS-Runtime, the startup screen set in the system settings and the labels set in the project properties are always used at startup.
Connecting to a serial port while ignoring communications errors on the other serial port	It is possible to select either displaying "Connecting" when serial port A or B has not connected at startup, or to go ahead and perform communications with only the host that is connected.	Not Provided. With the NS-Runtime, only graphics, labels, and other parts that do not require communications will be displayed if serial port A or B is not connected.
Screen saver startup time	The startup time of the screen saver can be indirectly specified.	Not Provided.
Function keys	The Key Status Notification Address can be set (NS15 only)	Not Provided.

**Note**

- ◆ The NS-Runtime does not support the Device Monitor. However the CX-Programmer and the Switchbox Utility can be started up from the NS-Runtime. They can be substituted for NS Series Device Monitor, Ladder Monitor and Programming Console.

#### Functional Objects and History Functions

Item	NS Series	NS-Runtime
Document Display	-	The Document Display Object can be used with the NS-Runtime to display PDF files. PDF files to be displayed can be registered in the Document Table Setting of the CX-Designer.
Video Display	Provided	Not Provided
Alarm/Event Settings	-	PDF files (document table number) can be specified to display on document display objects when alarms or events occur.
Data Log	Always Logging Points: 50,000 points max.	Always Logging Points: 160,000 points max.

#### Macros

Item	NS Series	NS-Runtime
Macro Functions	-	Thirty-one macro functions are added to the NS-Runtime, including the module startup, string manipulation and window manipulation.

#### SAP Library

Item	NS Series	NS-Runtime
Temperature Controllers	-	SAP Library parts that connect to Temperature Controllers through NS direction connections are not supported.

#### **Note**

- ◆ Normal operation though SAP Library parts may not be possible if the baud rate is too slow. Increase the baud rate if necessary.
- ◆ SPMA cannot be used for the communications path when SAP Library parts are used via EtherNet/IP.

System Memory (●: Available, X: Not Available, \*: Functions differ)

Item	NS Series	NS-Runtime
\$SB4 (Battery Low Notification)	○	X
\$SB6 to \$SB8 (Backlight Brightness Adjustment)	○	X
\$SB9 (Backlight Control)	○	X
\$SB10 (Backlight Flash Control)	○	X
\$SB11 (Backlight Status)	○	X
\$SB12 to \$SB 14 (Buzzer)	○	* Beep Sound
\$SB15 (Control of Video)	○	X
\$SB16, \$SB17 (Processing Priority Registration)	○	X
\$SB20 to \$SB23 (Contrast Adjustment)	○	X
\$SB24 (Video Capture)	○	X
\$SB25 (Start Printing/Capture Screen)	○	* Windows' desktop will be captured/printed.
\$SB26 (Stop Printing)	○	X
\$SB27 (Test Pattern Printing)	○	X
\$SB28 (Printer Head Cleaning)	○	X
\$SB29 (Update Printer Status)	○	X
\$SB30 (Printer Busy Status/Capture Busy Status)	○	X
\$SB31 (Notification of Printer Error/Capture Screen Error)	○	X
\$SB53 (Prohibit Starting Screen Saver)	○	X
\$SB63 (Exits NS-Runtime)	x	○

**Note**

- ◆ Although HR512 to HR1535 can be accessed from the NS-Runtime, these words can be used only for function block instances. They cannot be used in user programming.



## Section 2

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### Setting up, Starting up and Exiting the NS-Runtime

The NS-Runtime is application software that runs on Windows.

This section describes how to install the NS-Runtime on Windows. It also describes methods of starting and exiting the NS-Runtime.

2-1 Preparations for Installation .....	2-2
2-2 Installing the NS-Runtime .....	2-3
2-3 Uninstallation Procedure.....	2-5
2-4 Starting the NS-Runtime.....	2-6
2-5 Ending the NS-Runtime.....	2-7
2-6 User Interface.....	2-9

## 2-1 Preparations for Installation

The system requirements for the NS-Runtime are given in the following table.

Item	Requirement
Operating system (OS)	Windows 7/8/8.1/10
CPU	Celeron 1.3 GHz or higher (Recommended)
Memory	1 GB minimum
Hard disk	Approx. 50 MB or more available space * When the CX-Server is not installed, 280MB available space is additionally required.
Disk Drive	CD-ROM drive

Install the following software when necessary.

Item	Details
Adobe Reader	It is necessary when using the document display function.

### Note

- ◆ When using the document display function, do not install Adobe Acrobat in the NS-Runtime environment.
- ◆ Use the Adobe Reader that is supported by the OS.
- ◆ The Adobe Reader that is provided by Windows Store does not correctly operate on the NS-Runtime. Use the one that is provided by Adobe Systems Inc.
- ◆ For details on the document display, refer to 4-2 Document Display.
- ◆ You must be logged in as a user with Administrators or Power Users privileges to use the NS-Runtime and the CX-Designer.
- ◆ Refer to the Readme file for information on restrictions.



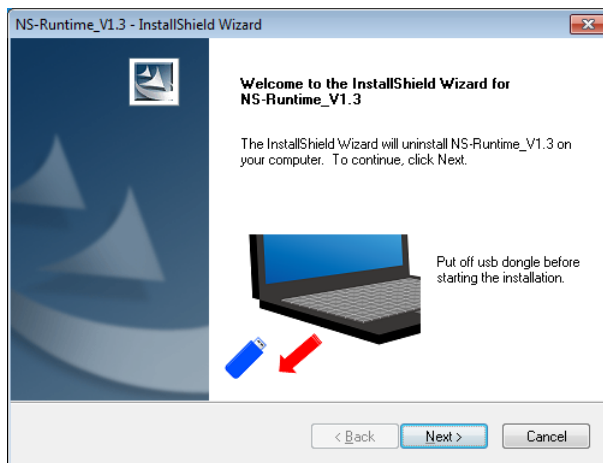
## 2-2 Installing the NS-Runtime

### 2-2-1 Installation Procedure

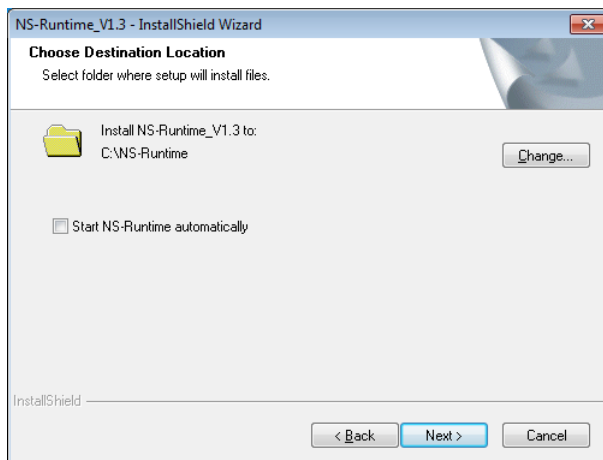
Install the NS-Runtime in the hard disk.

To install the NS-Runtime, execute the installation program provided.

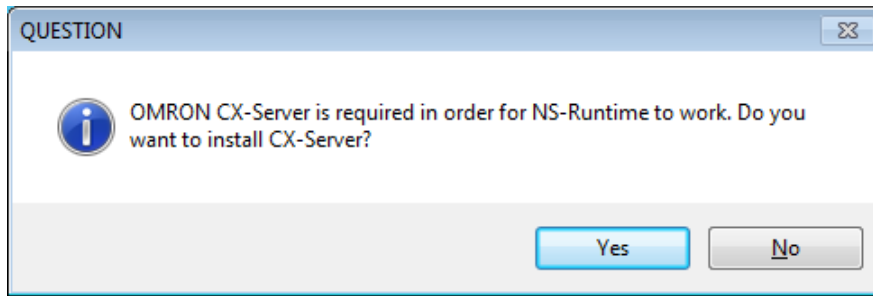
1. Remove the USB dongle from the PC.
2. Start up Windows.
3. Close all applications before executing installation.  
Place the NS-Runtime CD-ROM in the CD-ROM drive. The setup program is started automatically.  
If the setup program does not start automatically, such as after executing uninstall, double-click the CD-ROM directory Setup.exe from Windows Explorer to execute the set up program.
4. The NS-Runtime Setup Wizard will be displayed. Install the NS-Runtime by following the instructions in the Setup Wizard.



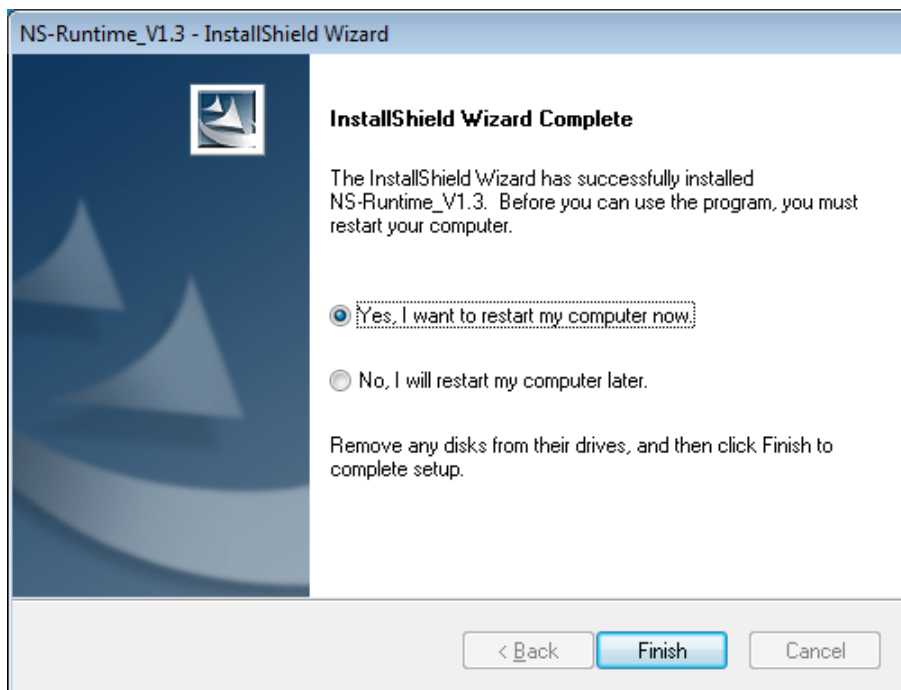
5. When the Setup Wizard is running, a message confirming whether to start up the NS-Runtime automatically when Windows starts up. Check the checkbox to start up automatically. When you did not check the checkbox, start up the NS-Runtime according to the procedures described in 2-4 Starting the NS-Runtime.



6. A message will be displayed to confirm installation of the CX-Server. Click the **Yes** Button. The CX-Server will be installed. (When the CX-Server has already been installed, this message will not be displayed.)



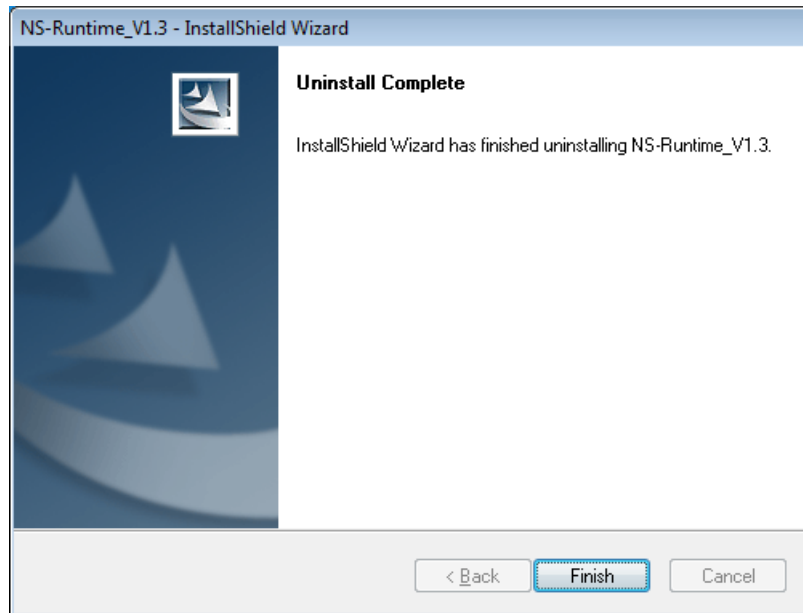
7. When installation has been completed, the following dialog box will be displayed. Select either now or later to restart your computer and click the **Finish** Button. This completes installation. Make sure to restart the computer before using the NS-Runtime.



## 2-3 Uninstallation Procedure

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1. Remove the USB dongle from the PC.
2. To uninstall the NS-Runtime, select **Control Panel** on Windows.
3. Double-click **Uninstall a Program**.
4. Double-click **NS-Runtime\_V□.□** (□.□ indicates the version number) from the list. Follow the instructions displayed in window messages to uninstall the NS-Runtime.
5. When uninstalling the NS-Runtime has been finished, a message will be displayed indicating that the uninstall operation has been completed. Check the message and then click the **Finish** Button.



## 2-4 Starting the NS-Runtime

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If the automatic installation was selected when the NS-Runtime was installed, the NS-Runtime starts up when Windows starts up. When not using the automatic startup or to start up the NS-Runtime manually, use the following procedure.

1. To start the NS-Runtime, click the Windows **Start** Button, and then select ***NS-Runtime***. Otherwise, select *NS-Runtime* on the Start screen.
2. The NS-Runtime will start up and transferred project data will automatically opened.

### **Note**

- ◆ Connect the USB dongle provided with the NS-Runtime before starting up the NS-Runtime.
- ◆ Refer to 5-4 Transferring Data for information on transferring project data.
- ◆ Only one copy of the NS-Runtime application can be run at one time.
- ◆ When using EtherNet/IP as the protocol for the connected hosts, make sure to start up the NS-Runtime while all the hosts registered in the project are already started up.

## 2-5 Ending the NS-Runtime

Use one of the following operations to exit the NS-Runtime.

- Exit using the system memory \$SB63
- Exit from the system menu.
- Click the **X** Button at the top right of the main window.
- Click the NS-Runtime icon at the top left of the Main Window and select **Close** from the displayed Control Menu Box.
- Click the Alt + F4 Keys at the same time.

### Exiting using the system memory \$SB63

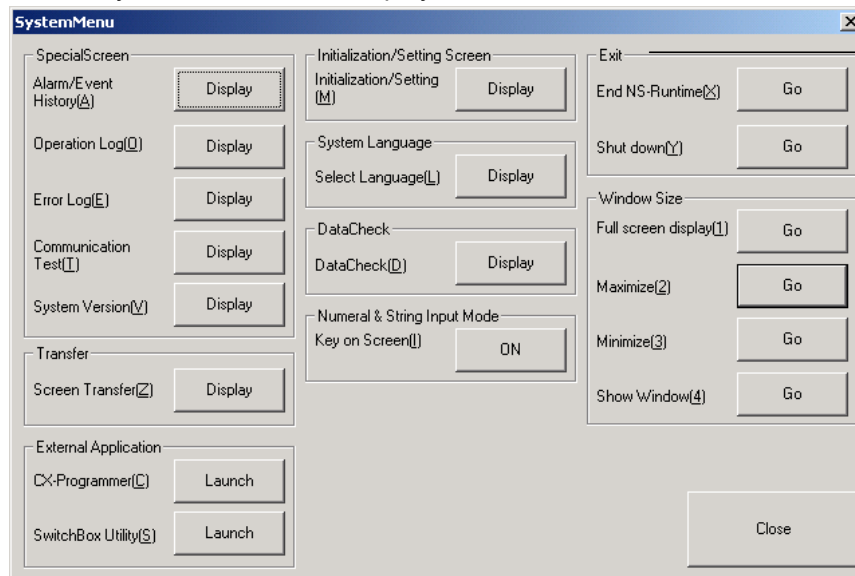
If the \$SB63 is turned ON, the NS-Runtime will end.

#### Note

- ◆ A confirmation dialog box does not appear when exiting the NS-Runtime.

### Exiting from the system menu

1. Double-click any of the four corners of the NS-Runtime main window.
2. The system menu will be displayed.



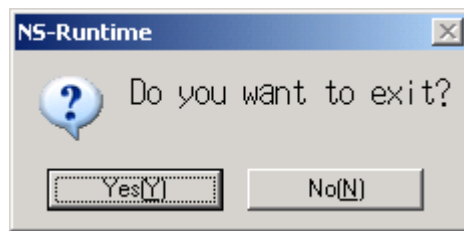
Select  
End NS-Runtime or  
Shut Down

3. To exit the NS-Runtime, select the **End NS-Runtime**.

To exit the NS-Runtime and to exit the operating system, select **Shut Down**.

4. A confirmation message will appear. Select the **Yes** Button. The NS-Runtime ends.

**End NS-Runtime**



**Shut Down**



## 2-6 User Interface

### Main Window

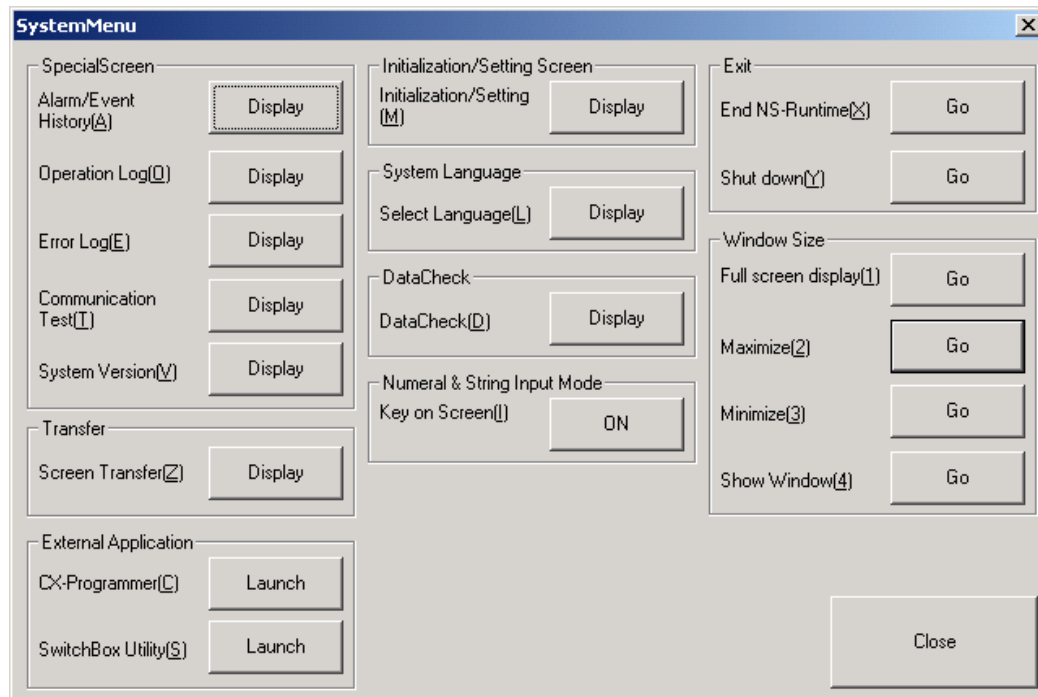
Screens created with the CX-Designer will be displayed.

#### Note

- ◆ The main window size can be set in the System Setting of the CX-Designer. For details, refer to 3-2 System Settings.
- ◆ When starting up the NS-Runtime, the main window will be displayed in full screen. From the system menu, main window size can be changed to Full screen display, Maximize, Minimize or Show Window. For details, refer to 5-11 Window Size.
- ◆ If the main window size is larger than the screen size, the screen part exceeding the window size will be shown in a background color.

### System Menu

The system menu is a menu screen to make settings for the NS-Runtime and transfer screens. Refer to 5 NS-Runtime System Menu Operations for details.







## Section 3

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# Creating Projects

This section describes procedures for creating projects, system settings, communications settings and creating screens for NS-Runtime.

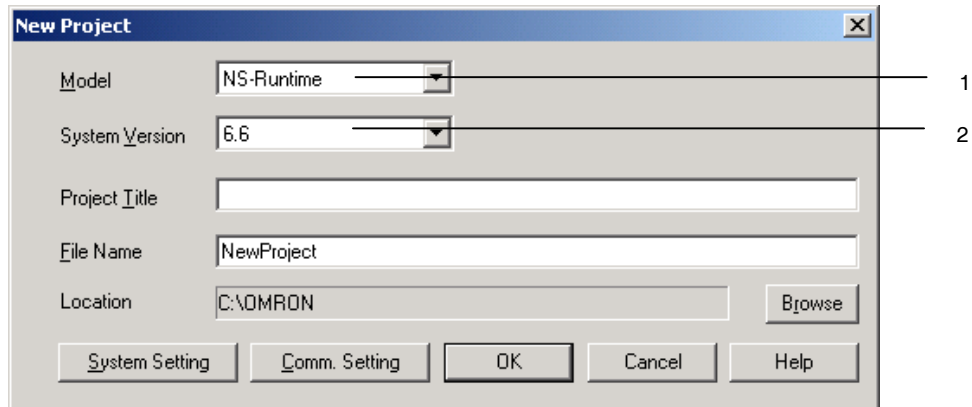
3-1 Creating Projects.....	3-2
3-2 System Settings.....	3-4
3-3 Communications Settings.....	3-9
3-4 Creating Screens .....	3-13
3-5 Converting Projects.....	3-14

## 3-1 Creating Projects

### 3-1-1 Creating New Projects

This section describes procedures for creating new projects in order to start creation.

1. Select the **File** Menu – **New Project**, or select the **New Project** under the toolbar.
2. New Project Dialog Box will be displayed. Select an NS Series Model and a System Version. Click the **OK** Button.  
Select NS-Runtime from the Model and a desired system version from the System Version to use it with the NS-Runtime.



No	Item	Description
1	Model	Select the NS-Runtime to create an NS-Runtime targeted project.
2	System Version	Select the system version in which to create a project for the NS-Runtime.

#### Note

- ◆ When the NS-Runtime is chosen from the Model, the System Version between 6.6 and 8.1 can only be selected.
- ◆ When creating a project for other PT models, refer to the Creating Projects in the CX-Designer Online Help.

3. New Screen Dialog Box will be displayed. Input the screen number and title. Click the **OK** Button.
4. When a new screen is opened, start creating a screen.

#### Note

- ◆ When using the NS-Runtime, set the NS-Runtime's main window size from the System Setting Dialog Box. For further information, please refer to 3-2 System Settings.

### 3-1-2 Project Property settings

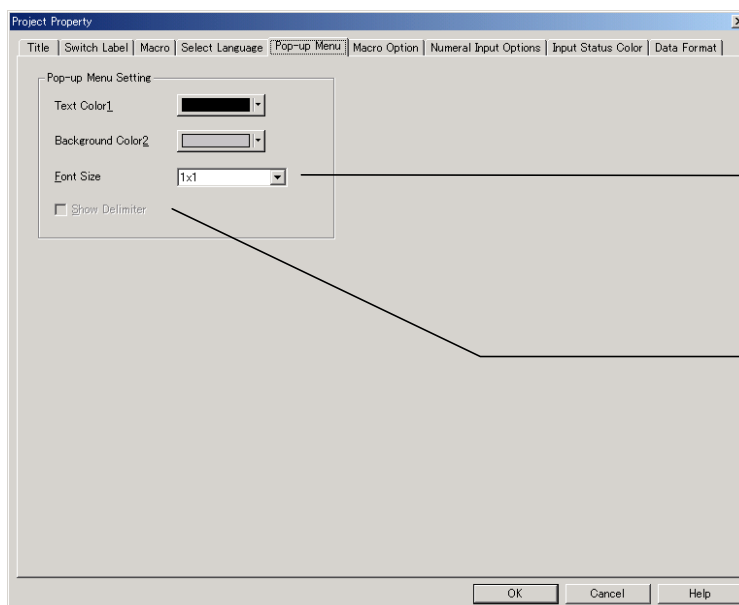
Regarding the Project Property Dialog Box (PT Menu– Project Properties Menu), the following settings are different from those of the NS Series.

With the NS-Runtime the Pop-Up Menu is displayed in MS Sans Serif (when the system language is any language other than Japanese) or MS P Gothic (when the system language is Japanese).

The relationships between font size settings with the CX-Designer and font sizes used with the NS-Runtime are as follows.

Font size set with the CX-Designer	Font size displayed on the NS-Runtime
1 x 1	16 pt
1 x 2	
2 x 1	24 pt
2 x 2	
3 x 3	36 pt
4 x 4	60 pt
8 x 8	96 pt

Delimiter is not shown. Therefore, there is no setting for the delimiter in the Pop-up Menu Tab Page.



Font size (pt) corresponding to the scale set with the CX- Designer will be shown on the NS-Runtime.

No setting

Other setting items are the same as those for the NS Series. For details on each item, refer to the System Settings and Project Properties in the CX-Designer Online Help.

## 3-2 System Settings

This section describes methods for setting the NS-Runtime Operating parameter.

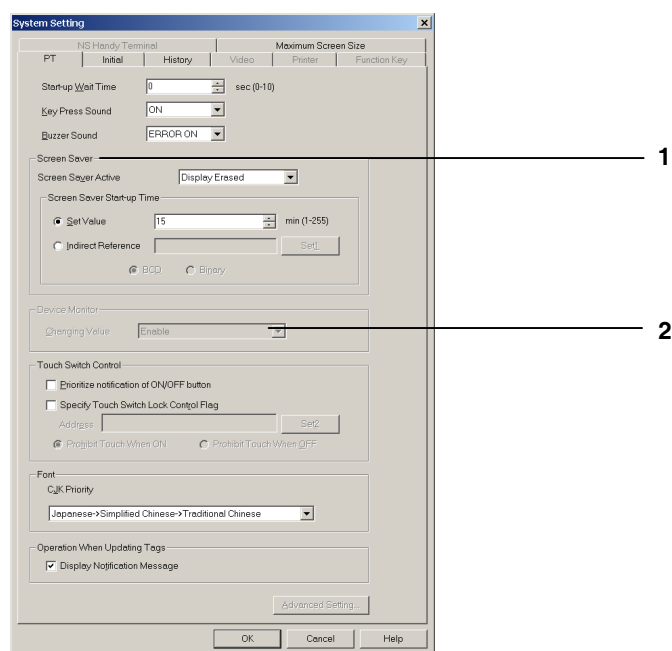
Only Items different from NS Series system settings are explained here. For the setting items common to the NS Series, please refer to the System Settings and Project Properties in the CX-Designer Online Help.

Display System Setting Dialog Box in the following procedure.

1. Select PT Menu – System Setting.
2. System Setting Dialog Box will be displayed.

### 3-2-1 PT Operations

Select PT Tab.

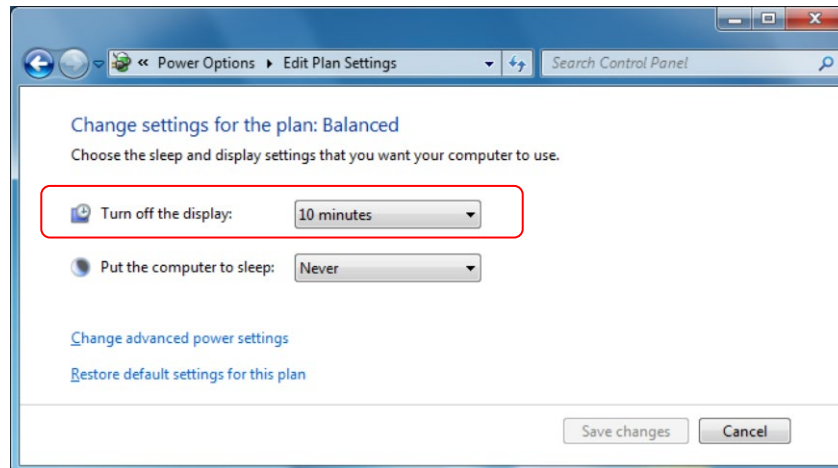


No	Item	Description
1	Screen Saver	If the <i>Screen Saver Active</i> Field is set to <i>Display Erased</i> , the monitor's power supply will be turned OFF if there are no operations on the computer, including the NS-Runtime, for the time set in the <i>Screen Saver Start-up Time</i> . Also, with the NS-Runtime, the screen saver start-up time cannot be set indirectly.
2	Device Monitor, Changing Value	The NS-Runtime does not support Device Monitor function. Therefore, no setting is required for the Changing Value.

**Note**

- ◆ The NS-Runtime does not support the Device Monitor. However, the CX-Programmer and the SwitchBox Utility can start up from the system menu and they can be alternatively used as functions of Device Monitor, Ladder Monitor and Programming Console.
- ◆ When the NS-Runtime starts up, Windows' Power Options setting will be changed according to the Screen Saver settings of a project that is opened.

In order to change the power options settings after using the NS-Runtime, select the **Control Panel – Power Options** from Windows. Then select the **Power Options Properties Dialog Box – Power Schemes Tab Page** and change the Turn off monitor settings.



### 3-2-2 Initial Tab Page

Click the **Initial Tab – System Memory List** Button. The Initial Value for System Memory Dialog Box will be displayed.

If these options are selected, system memory in each field will communicate with the allocation addresses set in the Initial Tab Page.

Setting methods are the same as those for the NS Series. However, \$SB that can be used for the NS-Runtime is different from those for the NS Series. For information on the usable \$SB, refer to 4-1 System Memory.

### 3-2-3 History Tab Page

Specifying a folder to save history data with an NS-Runtime project.  
Select **History Tab**.

**System Setting**

NS Handy Terminal | Maximum Screen Size

PT | Initial | **History** | Video | Printer | Function Key

**Operation Log**

No. of Records: 100 ☒ Use Ring Buffer

**Character Code for Log File**

☒ ASCII Code ☐ Unicode

**Logfile Output Format**

☐ Vertical Axis: Address/Horizontal Axis: Time

☒ Vertical Axis: Time/Horizontal Axis: Address

☐ Save the data with offset time display format

\*Select the "Vertical Axis: Time/Horizontal Axis: Address" as log file output format to enable the setting "Save the data periodically" that you have made for the data log.

**Data Log/Broken-line History**

☒ Hold data of always logging (Data Log)

☐ Hold data of broken-line graph history

**Save destination of history data**

Folder Path: D:

**Save Cycle**

☐ Set the save cycle for Internal Holding Memory

24 hour 0 min 0 sec Interval

OK Cancel Help

No	Item	Description
1	Save destination of history data	Specify a folder to save Operation Log, Alarm History, Data Log and Error Log. Specify a folder of up to 160 characters.
2	Set the save cycle for Internal Holding Memory	Deselect this option to save when the NS-Runtime ends. Select this option to save \$HB/\$HW status and each history data at a specified interval. Set the Save Cycle to between one second to 24 hours 0 second 0 minute. No need to set the Save Cycle in a normal situation but set this when there is a possibility of not ending the NS-Runtime environment normally.

**Note**

- ◆ Saved \$HB/\$HW status and each logging data will be automatically read when the NS-  
Runtime starts up next time.
- ◆ A folder specified as a save destination of history data is used in the following purposes as  
well.
  - Destination to save BMP files created by \$SB25(Screen capture).
  - Destination to save data files to be used for data blocks (When the Memory Card is selected  
as a destination to read/write data files).
  - Destination to save files specified with READCF/WRITECF macro.
- ◆ Even when the *Set the 'save cycle for Internal Holding Memory'* is specified, \$HB, \$HW and  
history data will be saved when the NS-*Runtime ends.*

### 3-2-4 Printer Tab Page

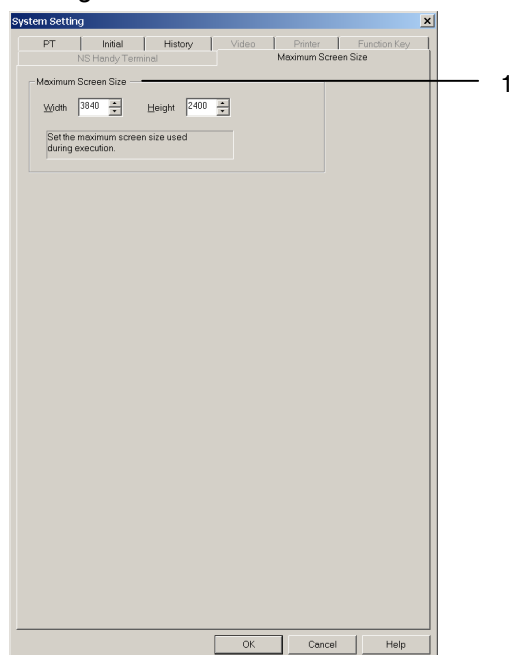
There is no Printer Tab with an NS-*Runtime* project, because a printer set with Windows will  
be used.

### 3-2-5 Video Tab Page

There is no Video Tab because the NS-*Runtime* does not support video display.

### 3-2-6 Maximum Screen Size Tab Page

Setting the NS-*Runtime* main window size in the Maximum Screen Size.





No	Item	Details
1	Maximum Screen Size	Set the main window size of the NS-Runtime. Width: 1 to 3,840 dots, Height: 1 to 2,400 dots

Changed screen/sheet size will be modified as follows.

Before change	After change
Screen/sheet for which a size exceeding the Width/Height have been set.	The size will be changed to the Width/Height set in the Maximum Screen Size.
Screen/sheet for which a size not exceeding the Width/Height have been set.	The screen size will not be changed.

### 3-2-7 Function Keys

In the NS-Runtime, there are no function key tab page settings.

## 3-3 Communications Settings

The methods for setting the communications with the host are described here.

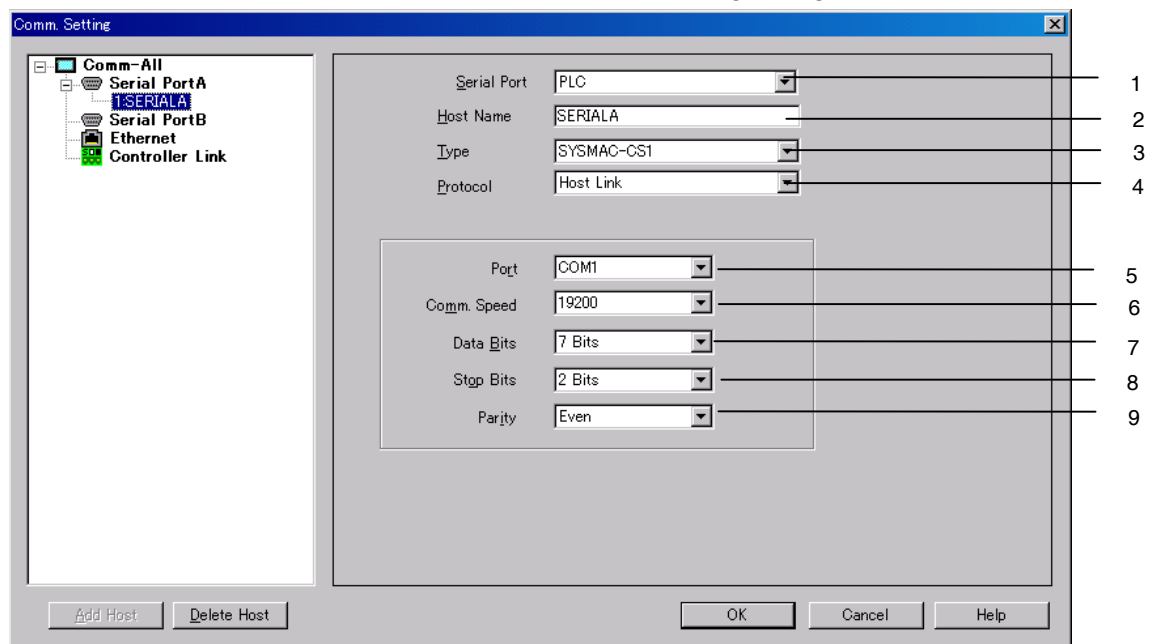
The NS-Runtime can communicate to the host through Serial Port A or Serial Port B (Host link, toolbus), Ethernet, and Controller Link.

1. Select the PT Menu – Communication Setting
2. Comm. Setting Dialog Box will be displayed.

### 3-3-1 Serial Port A / Serial Port B

Serial Port A / Serial Port B can communicate by means of the host link and toolbus methods.

1. Select Serial Port A and Serial Port B in the Comm. Setting Dialog Box.

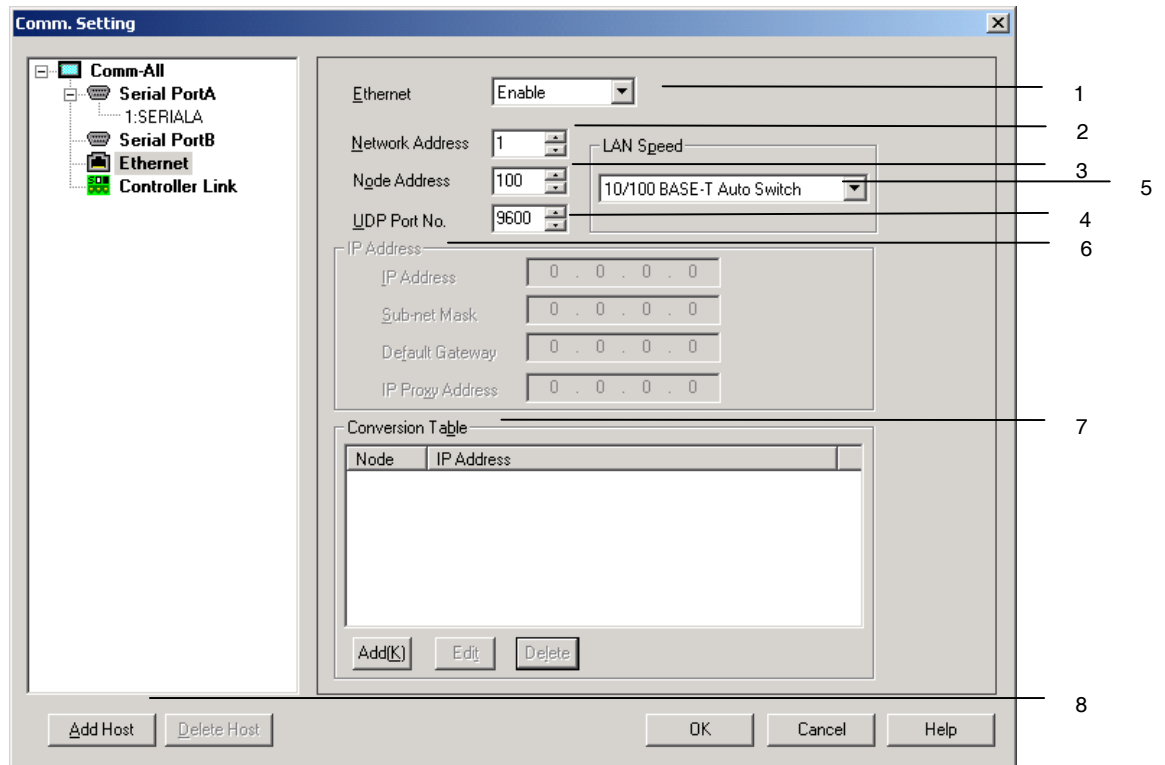


No.	Item	Description
1	Serial Port	Set the PLC when using a Serial Port.
2	Host Name	Set any host name.
3	Type	Select SYSMAC-CV, SYSMAC-CS1, SYSMAC-CJ1/CP1 or SYSMAC-CJ2.
4	Protocol	Select Host Link or toolbus.
5	Port	Set a COM port name that is used for communicating in the NS-Runtime environment.
6	Comm. Speed	Set 19200, 38400, 57600 or 115200 for the baud rate.
7	Data Bits	When setting Host Link for the Protocol, set 4 Bits, 5 Bits, 6 Bits, 7 Bits or 8 Bits for the data bits.
8	Stop Bits	When setting Host Link for the Protocol, set 1 bit or 2 bits for the stop bit length.
9	Parity	When setting Host Link for the Protocol, set Even, Odd, None, Mark or Space for the parity bits.

### 3-3-2 Ethernet

Making settings for Ethernet communications.

1. Select the Ethernet in the Comm. Setting Dialog Box.

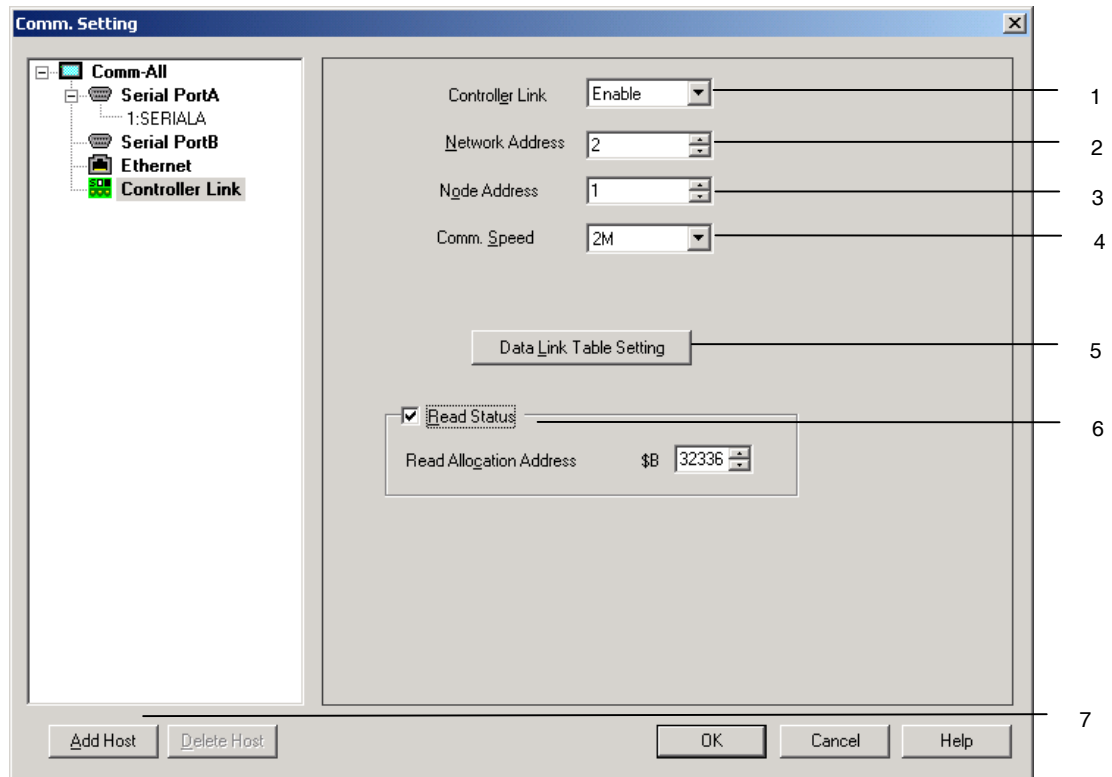


No.	Item	Description
1	Ethernet	Select the Enable when communicating through Ethernet.
2	Network Address	Set the Network Address to between 1 and 127.
3	Node Address	Set the Node Address to between 1 and 254.
4	UDP Port No.	Set the UDP port number between 1024 and 65535.
5	LAN Speed	Set 10/100BASE-T Auto Switch or 10BASE-T (fixed) for the speed setting method for the Ethernet.
6	IP Address	IP Address cannot be set with the CX-Designer. Communications will be performed using the IP Address set in the NS-Runtime environment.
7	Conversion Table	Show a table of conversion from FINS Node Address to IP Address when communicating through Ethernet. When using Ethernet communications, click the Add Button and set the IP address conversion table.
8	Add Host	Add hosts. Sets the host name, host type, network address and node address for the host.

### 3-3-3 Controller Link

Making settings for Controller Link communications.

1. Select the Controller Link in the Comm. Setting Dialog Box.



No.	Item	Details
1	Controller Link	Select the Enable when communicating through the Ethernet.
2	Network Address	Set the Network Address to between 1 and 127.
3	Node Address	Set the Node Address to between 1 and 32.
4	Comm. Speed	Set the baud rate (bps) to 500k, 1M or 2M.
5	Data Link Table Setting	Specify the data link table.
6	Read Status	Select this option when reading the status of controller link. Then set the read allocation address to a multiple of 16 within a range of \$B0 to \$B32336.
7	Add Host	Add hosts. Set the host name, host type, network address and node address for hosts.

## 3-4 Creating Screens

### 3-4-1 Creating New Screens

1. Select the **File** Menu – **New Screen** or click the **New Screen** in the Toolbar.
2. New Screen Dialog Box will be displayed. Set the screen number and title. Click the **OK** Button.
3. A new screen will be displayed.

### 3-4-2 Screen Properties Setting

The following settings in the Screen Properties Dialog Box (PT-Screen/Sheet Properties) differ from those of the NS Series. The setting range depends on the NS-Runtime environment.



No	Item	Description
1	Screen Size	<p>Set the screen size displayed on the NS-Runtime. Screen size that can be set depends on the NS-Runtime environment. 3840 x 2400 (dot) max.</p> <p>Note: Users cannot create a screen whose size exceeds the NS-Runtime's main window size set in the System Setting Dialog Box.</p>

Other Items are the same as those for the NS Series. For details refer to the Creating Screens in the CX-Designer Online Help.

## 3-5 Converting Projects

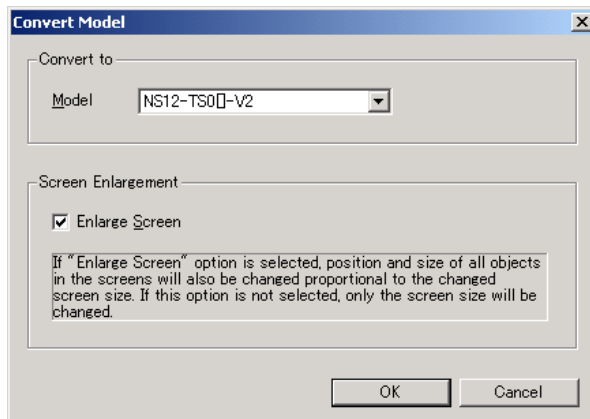
Converting projects to supported PT models.

### Note

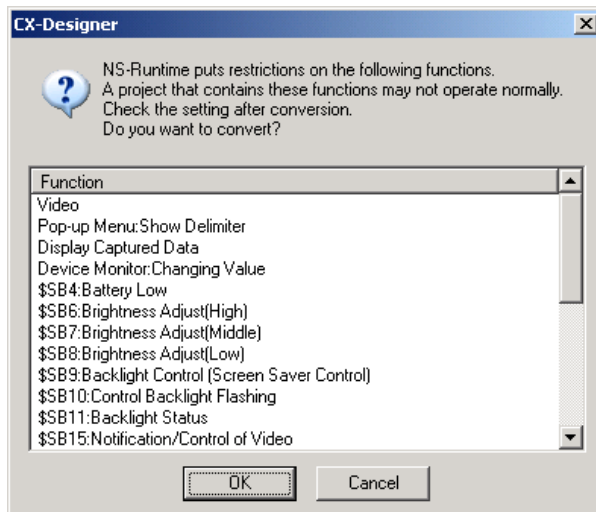
- ◆ To convert projects from the NS Series (NS15/12/10/8/7/5, NSJ12/10/8/5, NSH5) to the NS-  
Runtime, projects before conversion must be between 6.6 and 8.1.

When converting projects whose versions are earlier than version 6.6, change the project versions into version 6.6 or higher by selecting the **Tools** Menu – **Convert** – **Version**. Note that you cannot convert the projects created in Version 8.2 or later.

1. Select the Tools Menu – Convert – Model.
2. The Convert Model Dialog Box will be displayed. Select *NS-Runtime* as the model and click the **OK** Button.



3. Messages will be displayed to confirm the functional differences between NS Series and NS-Runtime. Check the information and if you still want to convert, click the OK Button.



4. Specify a name for the converted project in the Convert to Dialog Box. Click the **Save** Button to convert the model.

### Model Conversion from the NS Series to the NS-Runtime

After the PT models are converted, the screens will be resized as listed below.

Model before conversion	Model after conversion	Screen Size
NS15	NS-Runtime	Base screens will be resized to 3,840 x 2,400 dots.
NS12	NS-Runtime	Base screens will be resized to 3,840 x 2,400 dots.
NS10	NS-Runtime	Base screens will be resized to 3,840 x 2,400 dots.
NS8	NS-Runtime	Base screens will be resized to 3,840 x 2,400 dots.
NS5-SQ/TQ	NS-Runtime	Base screens will be resized to 3,840 x 2,400 dots.
NS5-MQ	NS-Runtime	Base screens will be resized to 3,840 x 2,400 dots.
NSJ12	NS-Runtime	Base screens will be resized to 3,840 x 2,400 dots.
NSJ10	NS-Runtime	Base screens will be resized to 3,840 x 2,400 dots.
NSJ8	NS-Runtime	Base screens will be resized to 3,840 x 2,400 dots.
NSJ5-SQ/TQ	NS-Runtime	Base screens will be resized to 3,840 x 2,400 dots.
NSH5-SQ	NS-Runtime	Base screens will be resized to 3,840 x 2,400 dots.

The communications settings of the hosts of the serial port A and B will be changed as follows.

Before Conversion		After Conversion
Host Type	SYSMAC-PLC	SYSMAC-CS1
	Others	Cannot convert
Protocol	Host Link	Host Link
	NT Link (1:1)	
	NT Link (1:N)	
	Others	Cannot convert
Port Name	-	Serial Port A : COM1 Serial Port B : COM2
Comm. Speed	-	19200
Data Bit	-	7
Stop Bit	-	2
Parity	-	Even

There is no change in settings of the hosts of Ethernet and Controller Link.

For the Ethernet, however, the NS Series PT's IP address setting will be deleted.

The NS-Runtime will communicate using the IP address set for the operating environment.

**Note**

- ◆ Although screen data for the NS5-MQ0[]-V2 is displayed in 16 grayscale levels on the CX-Designer displays and the NS5-MQ0[]-V2 screen, the data will be displayed in color if it is converted to data for a PT model with color displays on the CX-Designer or transferred to a PT with a color display screen. The color codes that are used when creating the screen data for the NS5-MQ0[]-V2 will be displayed for screen data and the image colors will be used for BMP and JPEG data.
- ◆ In order to change the main window size (Maximum Window Size) of the NS-Runtime after converting the model into the NS-Runtime, change the setting from the Maximum Screen Size Tab Page in the System Setting Dialog Box (PT Menu – System Setting). For further information, refer to 3-2 System Settings
- ◆ Always confirm the communications settings after conversion. Then change the settings according to the operating environment. For the details on communications settings, refer to 3-3 Communications Settings.

**Model Conversion from the NS-Runtime to the NS Series**

The NS-Runtime has functionality not supported by the NS-series PTs. Therefore, the settings of some functions will be changed when the model is converted. It may not be possible to convert some functions depending on the settings. If that occurs, the conversion process will be canceled.

Function		Conversion
Functions that will have settings changed and converted	Screen size	The screen size will be converted to match the specified NS-series PT. (Refer to the following table for details.)
	Communications settings (serial port A/B)	If Host Link is set, the communications conditions will be converted. (Refer to the following table for details.)
		If Toolbus is set, it will be converted to NT Link (1:N). (Refer to the following table for details.)
	Document display object	Document display objects will be deleted from the screens.
	Document display settings	These settings will be cleared.
	Alarm/event settings	Any settings to display a document on a document display object will be cleared.
	System settings	The settings for the saving destination for history data will be cleared.
		The settings for the saving interval will be cleared.
Functions that may not be converted depending on the setting	Data log settings	Conversion will not be performed if the number of records in the log exceeds 50,000 for a normal log.
	Macros	Macros used will not be converted if they supported only by the NS-Runtime.

After the PT models are converted, the screens will be resized as listed below.

Model before conversion	Model after conversion	Screen Size
NS-Runtime	NS15	Base screens will be resized to 1,024 x 768 dots.
	NS12	Base screens will be resized to 800 x 600 dots.
	NS10	Base screens will be resized to 640 x 480 dots.
	NS8	Base screens will be resized to 640 x 480 dots.
	NS5-SQ/TQ	Base screens will be resized to 320 x 240 dots.
	NS5-MQ	Base screens will be resized to 320 x 240 dots.



Model before conversion	Model after conversion	Screen Size
NS-Runtime	NSJ12	Base screens will be resized to 800 x 600 dots.
	NSJ10	Base screens will be resized to 640 x 480 dots.
	NSJ8	Base screens will be resized to 640 x 480 dots.
	NSJ5-SQ/TQ	Base screens will be resized to 320 x 240 dots.
	NSH5	Base screens will be resized to 320 x 240 dots.

The communications settings of the hosts of the serial port A and B will be changed as follows.

Before Conversion		After Conversion
Host Type	SYSMAC-CS1/SYSMAC-CJ1/CP1 SYSMAC-CV/SYSMAC-CJ2	SYSMAC-PLC
Protocol	Host Link	Host Link
	Toolbus	1:N NT Link
Port Name	COM port	---
Comm. Speed (Host Link)	19,200	19,200
	38,400, 57,600, or 115,200	9600
Data Bits (Host Link)	4 bits, 5 bits, 6 bits, 7 bits, 8 or bits	7 bits (fixed)
Stop Bits (Host Link)	1 bit/ 2 bits	2 bits (fixed)
Parity (Host Link)	Even, Odd, None, Mark, or Space	Even (fixed)
Comm. Speed (1:N NT Link)	---	High speed
Unit No. (1:N NT Link)	---	0

### Note

- ◆ The project data will be changed if you specify to convert the model to one of the following models (if the project to be converted is a version lower than the one given in the following table).

NS model to be converted	Project data version after conversion
NS15	Ver. 8.1
NS5-□□1□-V2	Ver. 8.0
NSJ5-□□1□	Ver. 8.0
NSH5-□□1□-V2	Ver. 8.0

- ◆ After the conversion, check the communications settings and make changes according to the operating environment. For details on communications settings, refer to information on setting the system and projects in the online help for the CX-Designer.
- ◆ When the model is converted to an NS-series PT, the document table settings will be cleared, but the set PDF files will not be deleted. The PDF files will remain in the project folder and other specified folders. Delete the PDF files manually if they are not required.
- ◆ Refer to *4-5 Macros* for information on macros for NS-Runtime.
- ◆ The model conversion will stop if there are items that cannot be converted to the NS-series PT. If this occurs, the items that cannot be converted will be displayed in the Output Window. Check the details, revise the project data so that it can be converted, and then attempt to perform model conversion again.



# Section 4

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## NS-Runtime Functions

This section describes the NS-Runtime functions.

It mainly describes functions that are added or changed from the NS Series and the CX-Designer, and does not describe functions equivalent to those of the NS Series and the CX-Designer.

For NS Series and CX-Designer functions that this manual does not describe, refer to each manual mentioned in 1-1 About This Manual.

4-1 System Memory .....	4-2
4-2 Document Display.....	4-7
4-3 Alarm/Event Setting.....	4-15
4-4 Data Logs .....	4-16
4-5 Macros.....	4-17

## 4-1 System Memory

The NS-Runtime is provided with system memory that is used for exchanging information between the host and the NS-Runtime, such as for controlling the NS-Runtime and notifying the status. The system memory is divided into bit and word sections.

### 4-1-1 System Bit Memory (\$SB)

System bit memory is used to exchange information between the host and NS-Runtime, such as for controlling the NS-Runtime and notifying the host of NS-Runtime status, in bit units.

The system bit memory contains 64 bits with predefined functions.

The system bit memory is listed in the following table.

Address	Classification	Function
\$SB0	Notification	Operation Signal (Pulse)
\$SB1	Notification	RUN Signal (Always ON)
\$SB2	Notification	Screen Switch Strobe
\$SB3	Control	Prohibit Shifting to System Menu
\$SB4	-	Reserved
\$SB5	Notification	Numerical and Character Input Detection
\$SB6	Control	Backlight Brightness Adjustment (High)
\$SB7	Control	Backlight Brightness Adjustment (Medium)
\$SB8	Control	Backlight Brightness Adjustment (Low)
\$SB9	Control	Backlight Control (Screen Saver Start/Cancel)
\$SB10	Control	Backlight Flash Control
\$SB11	Notification	Backlight Status
\$SB12	Control	Continuous Buzzer
\$SB13	Control	Short Intermittent Buzzer
\$SB14	Control	Long Intermittent Buzzer
\$SB15	-	Reserved
\$SB16	-	Reserved
\$SB17	-	Reserved
\$SB18	Control	Display Keypad with Temporary Input
\$SB19	Control	Prohibit Input
\$SB20	-	Reserved
\$SB21	-	Reserved
\$SB22	-	Reserved
\$SB23	-	Reserved
\$SB24	-	Reserved
\$SB25	Control	Start Printing/Capture Screen
\$SB26	-	Reserved
\$SB27	-	Reserved
\$SB28	-	Reserved
\$SB29	-	Reserved
\$SB30	-	Reserved
\$SB31	-	Reserved
\$SB32	Notification/Control	Initialize Alarm/Event History
\$SB33	Notification/Control	Save Alarm/Event History
\$SB34	Notification/Control	Internal Holding Memory (\$HB/\$HW) Initialization
\$SB35	Notification/Control	Initialize Data Log
\$SB36	Notification/Control	Save Data Log
\$SB37	Notification/Control	Initialize Operation Log
\$SB38	Notification/Control	Save Operation Log
\$SB39	Control	Log Functional Object Operation
\$SB40	Control	Log Switch Screen Operation
\$SB41	Control	Log Macro Operation
\$SB42	Notification/Control	Initialize Error Log
\$SB43	Notification/Control	Save Error Log

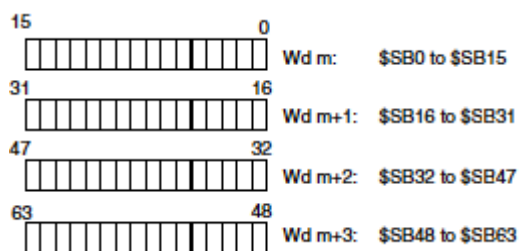
Address	Classification	Function
\$SB44	-	Reserved
\$SB45	Control	Macro Error Dialog Control
\$SB46	Notification	Macro Error Notification
\$SB47	Notification	History Processing Error Flag
\$SB48	Notification	Memory Card Free Space Check Flag
\$SB49	Notification/Control	Stop Memory Card
\$SB50	Notification	Memory Card Removing Status
\$SB51	Notification	Periodical Data Log Save in Process Flag
\$SB52	Notification	Data Block Operation Complete Flag
\$SB53	-	Reserved
\$SB54	Notification	Password Level 1 Operable Status
\$SB55	Notification	Password Level 2 Operable Status
\$SB56	Notification	Password Level 3 Operable Status
\$SB57	Notification	Password Level 4 Operable Status
\$SB58	Notification	Password Level 5 Operable Status
\$SB59 to \$SB62	-	Reserved
\$SB63	Control	Exit NS-Runtime

Note: The notification bits are not write-prohibited. Also, the system will not restore values, except when the status has changed.

System memory is allocated to PLC areas as shown below.

Allocated Addresses for System Memory (Under CX-Designer **PT – System Setting – Initial**)

\$SB = m



Operations of system bit memory different from those of the NS Series are described below. For other system bit memory, refer to 2-4 System Memory in the NS Series Programming Manual.

System bit memory	Description
\$SB4 (Battery Low)	\$SB4 cannot be used with NS-Runtime.
\$SB6 to \$SB8 (Brightness Adjust)	\$SB6 to \$SB8 cannot be used with the NS-Runtime.
\$SB9 (Backlight Control (Screen Saver Start/Cancel))	\$SB9 cannot be used with the NS-Runtime.
\$SB10 (Control Backlight Flashing)	\$SB10 cannot be used with the NS-Runtime.
\$SB11 (Backlight Status)	\$SB11 cannot be used with the NS-Runtime.

System bit memory	Description
\$SB12 to \$SB14 (Buzzer)	<p>When bits \$SB12 to \$SB14 turn ON, the buzzer sounds while the bit remains ON.</p> <p>\$SB12 starts a continuous buzzer (1 second intervals), \$SB13 starts a short intermittent buzzer (0.5 second intervals), and \$SB14 starts a long intermittent buzzer (1 second intervals, same as \$SB12).</p> <p>The buzzer may not stop at the same time the \$SB12 to \$SB14 turn OFF, because the buzzer does not stop in the middle of sounding.</p> <p>For other operations, refer to 2-4 System Memory in the NS Series Programming Manual.</p>
\$SB15 (Notification/Control of Video)	\$SB15 cannot be used with the NS-Runtime.
\$SB16, \$SB17 (Processing Priority Registration)	\$SB16 and \$SB17 cannot be used with the NS-Runtime.
\$SB20 to \$SB23 (Contrast Adjustment)	\$SB20 to \$SB23 cannot be used with the NS-Runtime.
\$SB24 (Video Capture)	\$SB24 cannot be used with the NS-Runtime.
\$SB25 (Start Printing/Capture Screen) (See note.)	<p>When \$SB25 turns ON, \$SB25 starts printing the screen displayed on the desktop, or capturing and saving it as a bitmap file in a specified folder.</p> <p>For other operations, refer to 2-4 System Memory in the NS Series Programming Manual.</p>
\$SB26 (Stop Printing)	\$SB26 cannot be used with the NS-Runtime.
\$SB27 (Test Pattern Printing)	\$SB27 cannot be used with the NS-Runtime.
\$SB28 (Printer head-cleaning)	\$SB28 cannot be used with the NS-Runtime.
\$SB29 (Update Printer Status)	\$SB29 cannot be used with the NS-Runtime.
\$SB30 (Printer Busy Status/Capture Busy Status)	\$SB30 cannot be used with the NS-Runtime.
\$SB31 (Notification of Printer Error/Capture Screen Error)	\$SB31 cannot be used with the NS-Runtime.
\$SB53 (Prohibit Screen Saver Startup)	\$SB53 cannot be used with the NS-Runtime.
\$SB63 (Exit NS-Runtime)	<p>\$SB63 exits the NS-Runtime.</p> <p>When \$SB63 turns ON, the NS-Runtime ends.</p> <p>When the NS-Runtime exits, the communication address allocated to \$SB63 will turn OFF automatically.</p>

Note: Specify a folder to save bit map files in the system setting dialog box. For details, refer to 3-2-3 History Tab Page.

## 4-1-2 System Word Memory (\$SW)

System word memory (\$SW) is used to exchange information between the host and NS-Runtime in word units, such as for controlling the NS-Runtime and notifying the status.

The system word memory contains 41 items with predefined functions.

The system word memory is listed in the following table.

Address	Classification	Function
\$SW0	Notification/control	Current Screen No.
\$SW1	Notification/control	Current Pop-up Screen 1 No.
\$SW2	Notification/control	Position of Pop-up Screen 1 (X Coordinate)
\$SW3	Notification/control	Position of Pop-up Screen 1 (Y Coordinate)
\$SW4	Notification/control	Current Pop-up Screen 2 No.
\$SW5	Notification/control	Position of Pop-up Screen 2 (X Coordinate)
\$SW6	Notification/control	Position of Pop-up Screen 2 (Y Coordinate)
\$SW7	Notification/control	Current Pop-up Screen 3 No.
\$SW8	Notification/control	Position of Pop-up Screen 3 (X Coordinate)
\$SW9	Notification/control	Position of Pop-up Screen 3 (Y Coordinate)
\$SW10	Notification/control	Current Label No.
\$SW11	Control	Destination(0:Printer, 1:Memory Card)
\$SW12	-	Reserved
\$SW13	Control	Password Number for Canceling Input Prohibition
\$SW14	Notification	Current Time (min, s)
\$SW15	Notification	Current Date and Time (Day, Hour)
\$SW16	Notification	Current Date and Time (Year, Month)
\$SW17	Notification	Current Day (Day of the Week)
\$SW18	Notification	No. of Generated Alarms and Events
\$SW19	Notification	Generated Alarm/Event ID No.
\$SW20	Notification	Cancelled Alarm/Event ID No.
\$SW21	Notification	Alarm/Event ID of Executed Alarm/Event Object Macro
\$SW22	-	Reserved
\$SW23	Notification	Macro Error No.
\$SW24	Notification	Macro Error Screen No.
\$SW25	Notification	Macro Error Object ID No.
\$SW26	Notification	Error Macro Execution Timing
\$SW27	Control	Offset Value for Index I0
\$SW28	Control	Offset Value for Index I1
\$SW29	Control	Offset Value for Index I2
\$SW30	Control	Offset Value for Index I3
\$SW31	Control	Offset Value for Index I4
\$SW32	Control	Offset Value for Index I5
\$SW33	Control	Offset Value for Index I6
\$SW34	Control	Offset Value for Index I7
\$SW35	Control	Offset Value for Index I8
\$SW36	Control	Offset Value for Index I9
\$SW37	Control	Data Log Group No.
\$SW38	Notification	Data Block Error No.
\$SW39	Notification	Authentication Level
\$SW40	Control	Alarm/Event History Initialization Range

Note: The notification words are not write-prohibited. In addition, the system will not restore values, except when the status has changed.

#### 4-1 System **Memory**

System word memory is allocated to PLC areas as shown below. Allocated Addresses for system memory are set under **PT – System Setting – Initial** from the CX-Designer. BCD or binary data storage can be selected for each group by clicking the **System Memory List** Button in the Initial Tab Page.

\$SW = n

Wd n+1: \$SW1

•  
•  
•

Wd n+40: \$SW40

For information on the system word memory, refer to 2-4 System Memory in the NS Series Programming Manual.



## 4-2 Document Display

Document Display is a functional object used for displaying specified document files (PDF file).

Document display object enables users to display documents including operation manuals and production instruction on the NS-Runtime.

In order to display documents, they need to be registered in document tables beforehand.

Document files can be displayed at all-time or displayed when an alarm/event occurs.

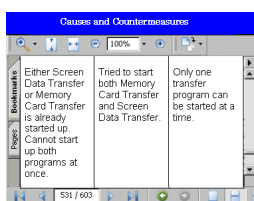
Documents to be displayed can be switched.

Displaying when an alarm/event occurs.

Document Table	
Document No.	Document File
1	A.PDF
2	B.PDF
3	C.PDF
4	D.PDF
5	E.PDF
---	---

Alarm/Event Setting		
No.	Address	Document No.
1	\$B100	1
2	\$B101	3
3	\$B102	10
---	---	---

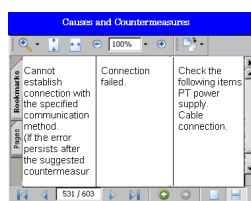
\$B100 ON (Alarm 1 occurs)



Display A.PDF  
(document No. 1)  
which is set with  
the alarm 1.



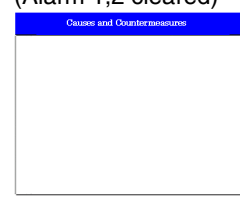
\$B101 ON (Alarm 2 occurs)



Display C.PDF  
(document No. 3)  
which is set with  
the alarm 2.



\$B100, \$B101 OFF  
(Alarm 1,2 cleared)



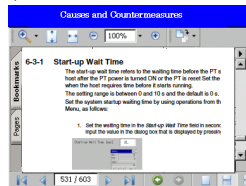
PDF file will be hidden  
when all alarms  
cleared.

Switching PDF file

Address for Indirect reference

: \$W100

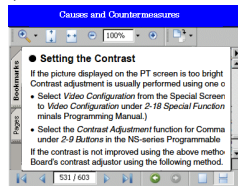
\$W100=2



Display the B.PDF file  
(document No. 2).



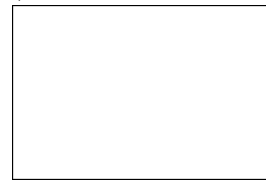
\$W100=5



Display the E.PDF file  
(document No. 5).



\$W100=0



PDF file will be hidden  
when 0 is specified.

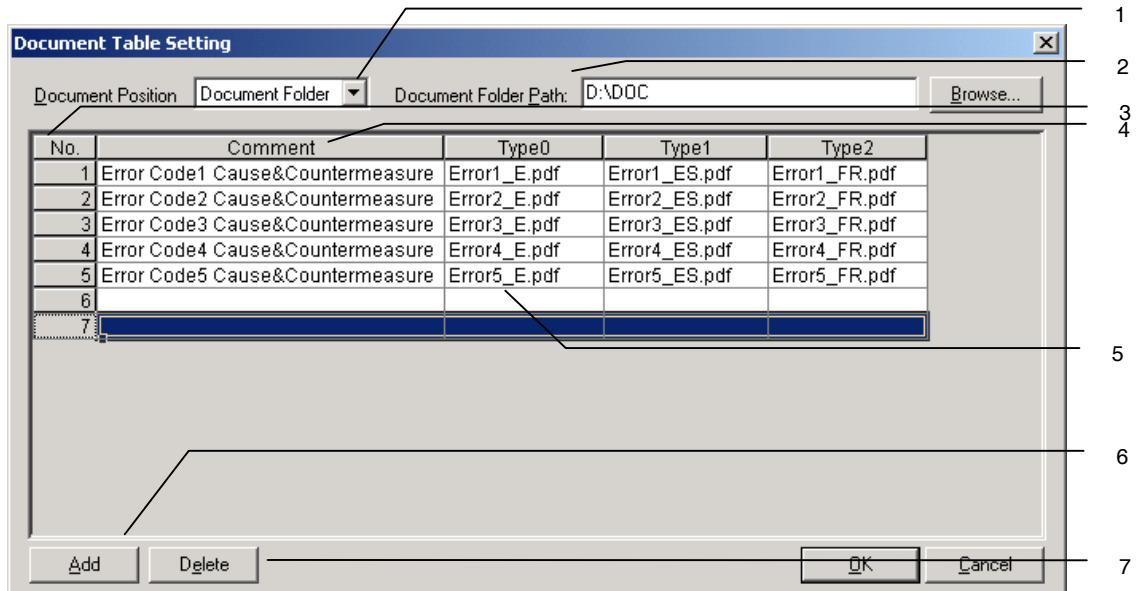
**Note**

- ◆ In order to use the document display, Adobe Reader version must be installed in the NS-Runtime environment.
- ◆ If more than one alarm/event occurs and if a document display is set to display a document when alarm/event occurs, a PDF file to which a higher priority has been given will be displayed.
- ◆ If numbers which are not registered are specified when setting an indirect reference for PDF file you want to display, no document will be displayed.


**4-2-1 Document Table Setting**

This function is used for registering PDF files displayed on a document display object.

1. Select **PT Menu – Document Table Setting** with CX-Designer.
2. Document Table Setting Dialog Box will be displayed.



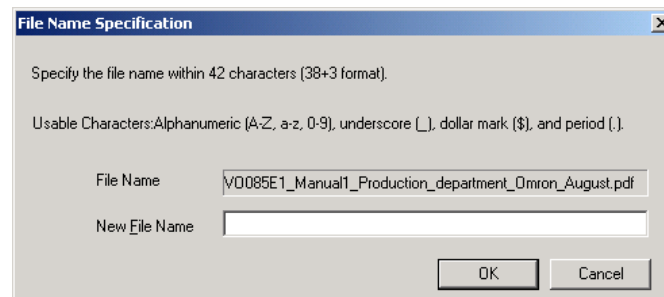
No	Item	Details
1	Document Position	Select a location to store document files you want to display. -Project Folder -Document Folder When selecting the Document Folder, select any folder from the Document Folder Path to save document files.
2	Document Folder Path	When selecting the document folder from the document position, specify any folder to store document files. Specify a full path to folder that exists in the NS-Runtime environment. Folder can be specified from the Browse For Folder Dialog Box displayed by clicking the Browse Button.

No	Item	Details
3	No.	Document number will be displayed.
4	Comment	Enter comments of up to 32 characters.
5	Document File	Set a document file for each label. Enter a file name directly or select a file from a file selector that is displayed by clicking  Button. When selecting the project folder from the document position and selecting a document file from the file selector, the document files will be automatically copied to the project folder. When selecting the document folder from the document position or when directly entering a file name, users need to manually copy the file to the specified folder.
6	Add	Adds document numbers. Up to 5000 numbers can be added. Among the unused numbers, the smallest number will be added.
7	Delete	Deletes selected document numbers.


### Note

- ◆ When setting more than 42 characters for the PDF file name, the following dialog box will be displayed. Rename the file name (Maximum of 42 characters).

In the same way, if the specified file name contains an unusable character, a dialog box asking you to rename will be displayed.



## 4-2-2 Document Display

To create a document display, select the **Functional Objects Menu – Document Display**, or select  icon.

- Setting Items of Functional Object Properties.

This section describes setting items displayed in the document display's functional object properties dialog box.

## 4-2 Document **Display**

Document Display - DOC0000

General | Size/Position | External Control

Object Comment

Document Display Method

☒ Reference

Document No.

Document Position

☐ Indirect Reference

Address

☐ Alarm/Event Reference

☐ Use As Default

☒ Display Extension Tabs

General: Set the method of displaying documents and storage location of document files.

Size/Position: Set the object's size and position.

External Control: Set the communication address that controls the refresh of PDF files.

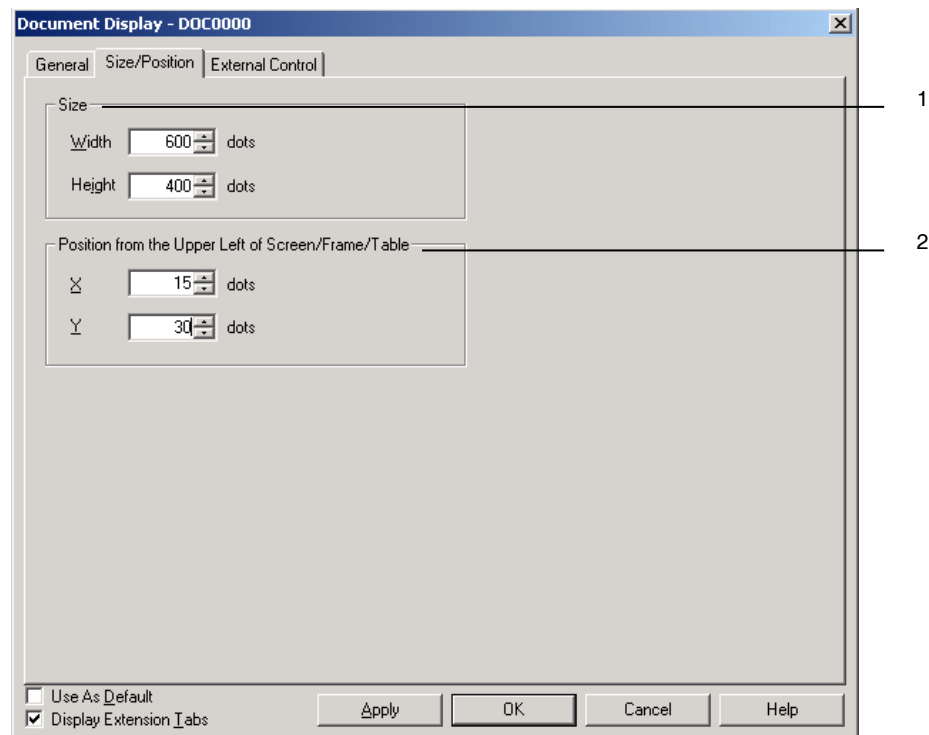
## General Tab Page

Set the document display method and Document storage location

No.	Item	Details
1	Object Comment	Set the comment for the description of pasted objects. (Up to 32 characters. One-byte and two-byte characters are counted as one character.)
2	Reference	Displays a document file whose number is set with the Document No. Click the Set Button to display a Document Table Setting Dialog Box. Select a document you want to display.
3	Indirect Reference	Displays document files using specified communication address as a document number. Save the document number in binary format in the address. When specifying a document number that is not registered in the document table, the document will not be shown.
4	Alarm/Event Reference	Displays documents whose numbers have been set in the Alarm Event Details Dialog Box when an alarm/event occurs. If the alarm/event is cleared, the document file will be hidden.

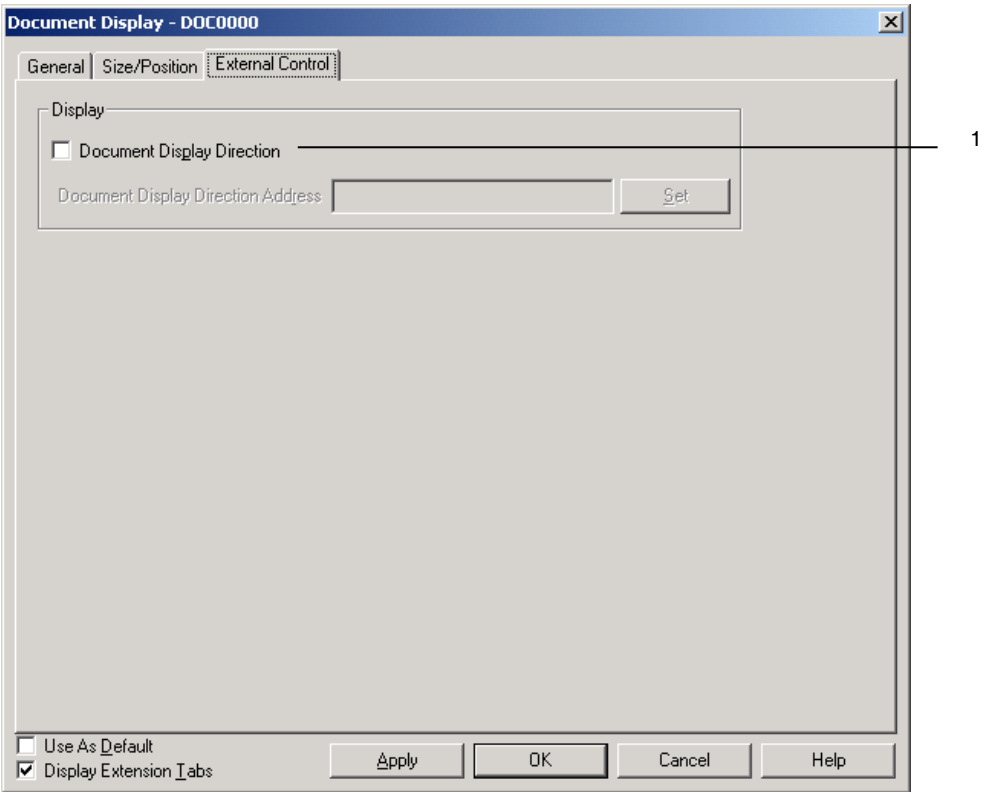
## Size/Position Tab Page (Extension Tab)

Set and display the size and position of the object.



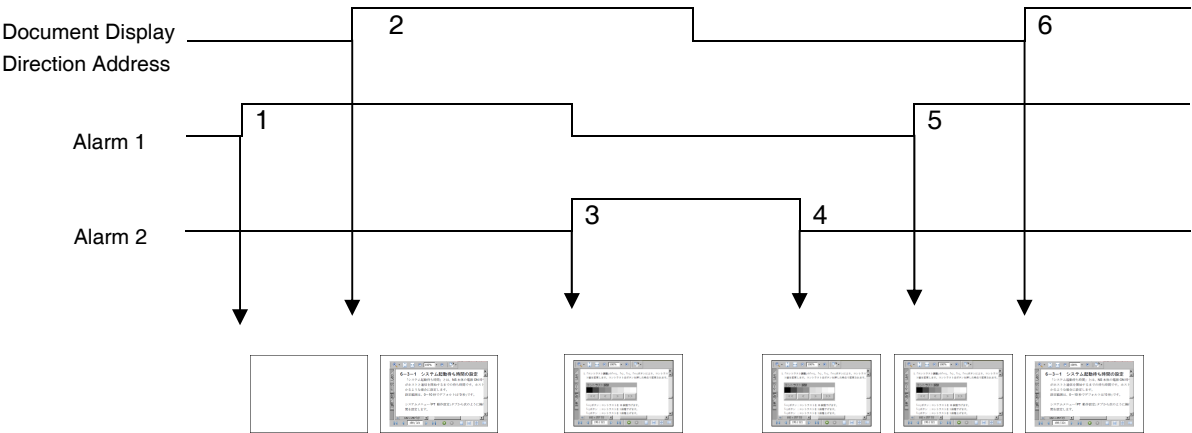
No.	Item	Details
1	Size	Set the size for the functional object. Width: 1 to 2,560 dots Height: 1 to 1,920 dots
2	Position from the Upper Left of Screen/Frame/Table	Specify X and Y coordinates by the position from the upper left of Screen/frame/table. X coordinate: -3,839 to 3,839 dots Y coordinate: -2,399 to 2,399 dots

External Control Tab Page (Extension Tab)  
Set the communication address that controls the refresh of PDF file.



No.	Item	Description
1	Document Display Direction	Select this option to display and refresh the PDF files while the set communication address is ON. Deselect this option to switch the PDF files in the way specified in the Document Display Method field in the General Tab Page.

The document display will display and refresh the PDF files in the following way by turning ON/OFF the Document Display Direction Address. (These operations are performed when a document is displayed when an alarm/event occurs. The operation will be the same when setting the indirect reference.)



#### 4-2 Document **Display**

1. PDF file will not be displayed even if an alarm 1 occurs, because the Document Display Direction Address is OFF.
2. PDF file specified with the alarm 1 will be displayed, because the Document Display Direction Address turns ON.
3. PDF file specified with the alarm 2 will be displayed, because the Document Display Direction Address is ON.
4. PDF file will not be refreshed even if an alarm 2 cleared, because the Document Display Direction Address is OFF. (PDF file will not be hidden.)
5. PDF file will not be refreshed even if an alarm 1 occurs, because the Document Display Direction Address is OFF. (PDF file that is set for the alarm 1 will not be displayed.)
6. PDF file specified with the alarm 1 will be displayed, because the Document Display Direction Address turns ON.

#### **Note**

- ◆ Even if the Document Display Direction Address turns OFF, the PDF file will not be hidden.



## 4-3 Alarm/Event Setting

When alarm/event occurs, PDF files specified with Document Display can be displayed with the NS-Runtime. In response to this new function, setting items to specify a desired PDF file are added to the Alarm/Event Details.

This section describes added items only. For the other items, refer to 2-14 Alarm/Event in the NS Series Programming Manual.

1. Select the Alarm/Event Setting under the PT Menu with the CX-Designer.
2. Alarm Event Dialog Box will be displayed. Click the **Add** or **Edit** Button.

Dis	Group	Auto Screen	Auto Delete	Save History	Detection Type	Occurred Text	Released Text	Document Display	Document Number
M	0	OFF	OFF	ON	Up			ON	1
M	0	ON	OFF	ON	Up			ON	2
M	0	ON	OFF	ON	Up			ON	3

Displays whether or not a document is set to display and document numbers.

3. Alarm/Event Details Dialog Box will be displayed.

1

No.	Item	Description
1	Display the document on a document display object	Select this check box to display PDF file on a document display object when an alarm/event occurs. Click the Set Button to display the Document Table Setting Dialog Box. Then select a document to display.

# 4-4 Data Logs

With the NS-Runtime, maximum number of always logging points has been extended to 160,000 points.

This section describes only the extended items. For the other items, refer to 2-15 Data Logs in the NS Series Programming Manual.

1. Select **PT Menu – Data Log Setting** with the CX-Designer.
2. Data Log Setting Dialog Box will be displayed. Register data log groups by clicking the Add or Edit Button.

No.

Group Name

Log Timing

Entries

Log Points

Log Period

1

Group1

1.0sec

2

10

Always

2

Group2

1.0sec

4

1000

Always

3

Group3

1.0sec

3

10

Log only when

4

Group4

\$B100

4

10

Always

Edit

Add

Delete

Icon

Logging Points Total =

4090

[available#] 155910

Always Log Address Total =

10

[available#] 40

Always Logging Points =

4060

Advanced Setting

OK

Cancel

1

No.	Item	Details
1	Always Logging Points	Always logging is possible for up to 160,000 with the NS- Runtime. The sum of the products of the number of logging points total and the number of points of 'Log only when Data Log object is shown' cannot exceed 160,000 points.

## Note

- ◆ The number of "Always logging points" is the sum of the products of the number of points registered and the number of logging points for each group for which the log period is set to "always."  
(Number registered x Number of log points)+(Number registered x Number of log points)+...  
+(Number registered x Number of log points)

For the above example, calculations would be as follows:  
{2×10(Group 1 )}+{4×1000(Group 2)}+{4×10(Group 4)} = 4060

## 4-5 Macros

### 4-5-1 Functions

In addition to macro of NS Series, the following functions are provided for macro of the NS-  
Runtime.

Action		Function
Manipulating character strings	String Comparison (Case sensitive)	STRCMP/STRCMPW
	String Comparison (Not case sensitive)	STRICMP/STRICMPW
	String Concatenation	STRCAT/STRCATW
	Gets String Length	STRLEN/STRLENW
	Extracts the specified number of characters from the leftmost characters of a string.	STRLEFT/STRLEFTW
	Extracts the specified number of characters from a specified character position of a string.	STRMID/STRMIDW
	Extracts the specified number of characters from the rightmost characters of a string.	STRRIGHT/STRRIGHTW
	Deletes the leftmost spaces of a string	STRLTRIM/STRLTRIMW
	Deletes the spaces at both sides of a string	STRTRIM/STRTRIMW
	Deletes the rightmost spaces of a string	STRRTRIM/STRRTRIMW
	Converts a string to lower case	STRLWR/STRLWRW
	Converts a string to upper case	STRUPR/STRUPRW
Manipulating Window	Finds a window title	WINFIND
	Maximizes a specified window	WINMAX
	Minimizes a specified window	WINMIN
	Restores a size of a specified window	WINNORMAL
	Brings a specified window to the front	WINTOP
	Exits a specified window	WINTERM
Module startup	Starts up an application	EXEC

The timing when a function can be executed as shown below.

	Project Macro					Screen Macro		Functional object Macro							
	When Loading a Project	Alarm/Event On Timing	Alarm/Event Off Timing	When changing a bit	When changing a value	When Loading a screen	When Unloading a screen	Touch On Timing	Touch Off Timing	When changing a value	Before Inputting Numeral/String	When writing Numeral/String	List Selection	When pressing a Display Area	When Selecting an Alarm/Event
STRCMP(W)	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
STRICMP(W)	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
STRCAT(W)	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
STRLEN(W)	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
STRLEFT(W)	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
STRMID(W)	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
STRRIGHT(W)	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
STRLTRIM(W)	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
STRTRIM(W)	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
STRRTRIM(W)	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
STRLWR(W)	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
STRUPR(W)	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
WINFIND	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
WINMAX	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
WINMIN	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
WINNORMAL	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
WINTOP	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
WINTERM	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
EXEC	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

**Table of Function and Argument**

The variety of variables and values, which can be specified as an argument for macro function is described below. Characters such as S,D,n,x,y in the Argument column indicate parameters used in the formats given in 4-5-2 *Details of the Functions*.

Function	Argument	PT Memory				Constant	String	Host Side Address	Specify Index
		\$B \$HB \$SB	Numerical access of bit	\$W \$HW \$SW	Long access of word				
STRCMP(W)	S1			OK			OK		OK
	S2			OK			OK		OK
STRICMP(W)	S1			OK			OK		OK
	S2			OK			OK		OK
STRCAT(W)	D			OK					OK
	S			OK			OK		OK
STRLEN(W)	S			OK			OK		OK
STRLEFT(W)	D			OK					OK
	S			OK			OK		OK
	n		OK	OK	OK	OK			OK
STRMID(W)	D			OK					OK
	S			OK			OK		OK
	n1		OK	OK	OK	OK			OK
	n2		OK	OK	OK	OK			OK
STRRIGHT(W)	D			OK					OK
	S			OK					OK
	n		OK	OK	OK	OK			OK
STRLTRIM(W)	D			OK					OK
	S			OK			OK		OK
STRTRIM(W)	D			OK					OK
	S			OK			OK		OK
STRRTRIM(W)	D			OK					OK
	S			OK			OK		OK
STRLWR(W)	D			OK					OK
	S			OK			OK		OK
STRUPR(W)	D			OK					OK
	S			OK			OK		OK
WINFIND	S1			OK			OK		OK
	S2		OK	OK	OK	OK			OK
WINMAX	S1			OK			OK		OK
	S2		OK	OK	OK	OK			OK
WINMIN	S1			OK			OK		OK
	S2		OK	OK	OK	OK			OK
WINNORMAL	S1			OK			OK		OK
	S2		OK	OK	OK	OK			OK
WINTERM	S1			OK			OK		OK
	S2		OK	OK	OK	OK			OK
WINTOP	S1			OK		OK			OK
	S2			OK	OK				OK
EXEC	S1			OK			OK		OK
	S2			OK			OK		OK
	S3		OK	OK	OK	OK			OK

## 4-5-2 Details of the Functions

This section describes details of standard functions used in macro programming.

<b>EXEC</b>	<b>Application Startup</b>
Applicable versions	System Version 6.6 or higher
Format	EXEC(S1,S2,S3)
Function	<p>Executes the command specified with S1 and displays at S2 window title and in S3 window style.</p> <p>S1: Specify a startup file and a startup argument with S1. (Separate a startup file and a startup argument with a space)</p> <p>Note: Set Unicode when using variables to specify text strings for S1 and S2. Up to 255 characters can be specified for S1 or S2. The argument depends on the application that is being started. Refer to the manual for the application that is being started for details.</p> <p>S2: Window title after a startup (" " displays the default title at startup)</p> <p>Note: If the application being started specifies a window title, the window title specified for S2 will be ignored.</p> <p>S3: Windows size at startup (0=normal, 1=Minimize, 2=Maximize, 3=Hide)</p> <p>Note: Use Unicode if you use symbols to specify strings with S1 and S2. If the application to be started specifies a window title, the window title specified with S2 will be disabled.</p>
Return Value	<p>0: Completed normally</p> <p>-1: Startup failed</p>
Example	<p>EXEC("CMD.EXE", "ABC", 2); 'Execute CMD.EXE and maximize a window titled ABC.</p> <p>EXEC("C:\Program Files\Microsoft Office\Office10\EXCEL.EXE C:\NSR\NScomp.xls", "", 0); 'Open the Nscomp.xls file with Excel and display it in a window of the normal size.</p>

<b>STRCAT(W)</b>	<b>String Concatenation</b>
Applicable versions	System Version 6.6 or higher
Format	<p>STRCAT(D, S) --- ASCII code</p> <p>STRCATW(D, S) --- Unicode</p>
Function	Connects the string S to the string D.
Return Value	None
Example	<p>STRCPY(\$W0, "ABC"); 'Set ABC to \$W0 to \$W1.</p> <p>STRCPY(\$W10, "DEF"); 'Set DEF to \$W10 to \$W11.</p> <p>STRCAT(\$W0, \$W10); 'Set ABCDEF to \$W0 to \$W3.</p>

<b>STRCMP(W), STRICMP(W)</b>	<b>String Comparison</b>
Applicable versions	System Version 6.6 or higher
Format	STRCMP(S1,S2)    STRICMP(S1,S2)    --- ASCII code STRCMPW(S1,S2)    STRICMPW(S1,S2)    --- Unicode
Function	Compares the string. STRCMP(W)        Case sensitive STRICMP(W)       Not case sensitive
Return Value	0:    Agree -1:   Disagree. Character code S1 is smaller than character code S2. 1:    Disagree. Character code S1 is greater than character code S2.
Example	STRCPY(\$W0, "ABC");    'Set ABC to \$W0 to \$W1. \$W10= STRCMP(\$W0, "DEF"); 'Compare ABC and DEF. Character code A, 0 x 41 < Character code D, 0 x 44. Thus the return value , -1, is stored in \$W0.

<b>STRLEFT(W)</b>	<b>Extracts the specified number of characters from leftmost characters of a string</b>
Applicable versions	System Version 6.6 or higher
Format	STRLEFT(D,S,n),    --- ASCII code STRLEFTW(D,S,n)    --- Unicode
Function	Stores n characters from the left of the string S to D.
Return Value	None
Example	STRLEFT(\$W0,"ABCDEFGH",3); 'Extract 3 characters (ABC) from the leftmost string and store ABC in \$W0 and \$W1.

<b>STRLEN(W)</b>	<b>Gets string length</b>
Applicable versions	System Version 6.6 or higher
Format	STRLEN(S)    --- ASCII code STRLENW(S)    --- Unicode
Function	Returns the length of the string S (The number of bytes of S).
Return Value	String Length (The number of bytes of S).
Example	STRCPY(\$W0, "ABC"); \$W10 = STRLEN(\$W0); 'Set 3 to \$W10

<b>STRLTRIM(W)</b>	<b>Deletes the leftmost spaces of a string</b>
Applicable versions	System Version 6.6 or higher
Format	STRLTRIM(D,S)    --- ASCII code STRLTRIMW(D,S) --- Unicode
Function	Deletes the leftmost space of the string S to enter it to D.
Return Value	None
Example	STRLTRIM(\$W0, "    ABC"); 'Store ABC in \$W0 to \$W1.

<b>STRLWR(W)</b>	<b>Converts a string to lower case</b>
Applicable versions	System Version 6.6 or higher
Format	STRLWR(D, S) --- ASCII code STRLWRW(D, S) --- Unicode
Function	Converts upper cases of the string S to lower cases and enter them to D.
Return Value	None
Example	STRCPY(\$W0, "ABC"); STRLWR(\$W10, \$W0); 'Set abc to \$W10 to \$W11

<b>STRMID(W)</b>	<b>Extracts the specified number of characters from a specified character position of a string</b>
Applicable versions	System Version 6.6 or higher
Format	STRMID(D,S,n1,n2) --- ASCII code STRMIDW(D,S,n1,n2) --- Unicode
Function	Extracts n2 characters from n1 of a string specified with S. Then store them in D. (n1: Specify it counting the head of a string as 1.)
Return Value	None
Example	STRMID(\$W0,"ABCDEFGH",2,3); 'Extracts 3 characters (BCD) from the 2nd of the string. Then store BCD in \$W0 to \$W1.



<b>STRRIGHT(W)</b>	<b>Extracts the specified number of characters from rightmost characters of a string</b>
Applicable versions	System Version 6.6 or higher
Format	STRRIGHT(D,S,n)      --- ASCII code STRRIGHTW(D,S,n)      --- Unicode
Function	Extracts n characters from the rightmost characters of the string S. Then sets them in D.
Return Value	None
Example	STRRIGHT (\$W0,"ABCDEFGH",3); 'Extract 3 characters (EFG) from the rightmost characters of the string. Set EFG to \$W0 to \$W1.

<b>STRRTRIM(W)</b>	<b>Deletes the rightmost spaces of a string</b>
Applicable versions	System Version 6.6 or higher
Format	STRRTRIM(D,S)    --- ASCII code STRRTRIMW(D,S)--- Unicode
Function	Deletes the rightmost spaces of the string S to enter them to D.
Return Value	None
Example	STRRTRIM(\$W0, "ABC   "); 'Set ABC to \$W0 to \$W1.

<b>STRTRIM(W)</b>	<b>Deletes the spaces at both sides of a string</b>
Applicable versions	System Version 6.6 or higher
Format	STRTRIM(D,S)    --- ASCII code STRTRIMW(D,S)    --- Unicode
Function	Extracts spaces at both sides of a string specified with S. Then stores them to D.
Return Value	None
Example	STRTRIM(\$W0, "    ABC   "); 'Set ABC in \$W0 to \$W1 excluding spaces at both ends.

<b>STRUPR(W)</b>	<b>Converts a string to upper case</b>
Applicable versions	System Version 6.6 or higher
Format	STRUPR(D, S) --- ASCII code STRUPRW(D, S) --- Unicode
Function	Converts a string S from lower case to upper case. Then set it to D.
Return Value	None
Example	STRCPY(\$W0, "abc"); STRUPR(\$W10, \$W0); 'Set ABC to \$W10 to \$W11.

<b>WINFIND</b>	<b>Finds a window title</b>
Applicable versions	System Version 6.6 or higher
Format	WINFIND(S1,S2)
Function	<p>Searches whether a window specified with S1 has started or not. Set the following search conditions for each bit with S2.</p> <p>The 0 bit to 3rd bit:</p> <ul style="list-style-type: none"> <li>0: Window title that completely matches with S1.</li> <li>1: Window title that matches with the number of characters of S1.</li> <li>2: Window title that matches with the number of characters of S1 (Except for a folder).</li> </ul> <p>The 4th bit:</p> <ul style="list-style-type: none"> <li>0: The search ends when a target is found.</li> <li>1: Searches for all the matched windows.</li> </ul> <p>Use Unicode if you use a symbol to specify a string with S1.</p>
Return Value	The number of find results (0: None, 1 or more: Found, -1: Parameter error)
Example	WINFIND("TEST",0); 'Search whether there is a window titled TEST.

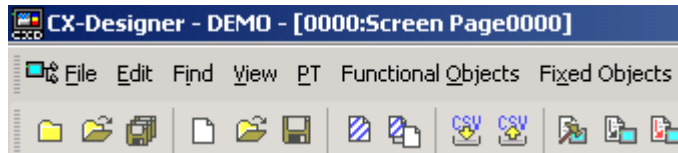
**Note**

- ◆ With the argument S1, specify a string that will be displayed on the title bar of a window you want to search for.

Example:

To find a window below, set as follows.

```
WINFIND("CX-Designer – DEMO – [0000:Screen Page0000]",0);
```



- ◆ If the '1:Window title that matches the number of characters of S1' is specified with the argument S2, the window title that matches the number of the characters specified with S1 will be searched for. In this case the first string displayed on the title bar will be searched for.

In above case, set WINFIND("CX-Designer",1);

This window will be searched for when the macro is executed.

Note:

```
WINFIND("DEMO",1);
```

By making the above setting, the window title will not be searched for. Because the DEMO is not in the first string, although the title bar includes this string.

- ◆ The above information also applies to WINMAX, WINMIN, WINNORMAL, WINTERM, and WINTOP.

<b>WINMAX</b>	<b>Maximizes a specified window</b>
Applicable versions	System Version 6.6 or higher
Format	WINMAX(S1, S2)
Function	<p>Maximizes a window specified with S1.  Set the following search conditions for each bit with S2.  The 0 bit to 3rd bit:  0:Window title that completely matches with S1.  1:Window title that matches with the number of characters of S1.  2:Window title that matches with the number of characters of S1 (Except for a folder).  Use Unicode if you use a symbol to specify a string with S1.</p>
Return Value	<p>0: Completed normally  -1: No specified window</p>
Example	WINMAX("TEST",0) ; 'Maximize a window titled TEST.

<b>WINMIN</b>	<b>Minimizes a specified window</b>
Applicable versions	System Version 6.6 or higher
Format	WINMIN(S1, S2)
Function	<p>Minimizes a window specified with S1.</p> <p>Set the following search conditions for each bit with S2.</p> <p>The 0 bit to 3rd bit:</p> <ul style="list-style-type: none"> <li>0: Window title that completely matches with S1.</li> <li>1: Window title that matches with the number of characters of S1.</li> <li>2: Window title that matches with the number of characters of S1 (Except for a folder).</li> </ul> <p>Use Unicode if you use a symbol to specify a string with S1.</p>
Return Value	<p>0: Completed normally</p> <p>-1: No specified window</p>
Example	WINMIN("TEST",0) ; 'Minimize a window titled TEST.

<b>WINNORMAL</b>	<b>Restores a size of a specified window</b>
Applicable versions	System Version 6.6 or higher
Format	WINNORMAL(S1, S2)
Function	<p>Restores a size of a window specified with S1.</p> <p>Set the following search conditions for each bit with S2.</p> <p>The 0 bit to 3rd bit:</p> <ul style="list-style-type: none"> <li>0: Window title that completely matches with S1.</li> <li>1: Window title that matches with the number of characters of S1.</li> <li>2: Window title that matches with the number of characters of S1 (Except for a folder).</li> </ul> <p>Use Unicode if you use a symbol to specify a string with S1.</p>
Return Value	<p>0: Completed normally</p> <p>-1: No specified window</p>
Example	WINNORMAL("TEST",0) ; 'Restore a size of a window titled TEST.

<b>WINTERM</b>	<b>Exits a specified window</b>
Applicable versions	System Version 6.6 or higher
Format	WINTERM(S1, S2)
Function	<p>Exits a window specified with S1.</p> <p>Set the following search conditions for each bit with S2.</p> <p>The 0 bit to 3rd bit:</p> <ul style="list-style-type: none"> <li>0: Window title that completely matches with S1.</li> <li>1: Window title that matches with the number of characters of S1.</li> <li>2: Window title that matches with the number of characters of S1 (Except for a folder).</li> </ul> <p>The 4th bit:</p> <ul style="list-style-type: none"> <li>0: Sends a WM_CLOSE message to a specified window.</li> <li>1: Sends a WM_DESTROY message to a specified window.</li> </ul> <p>Example: Microsoft Word</p> <p>When the 4th bit is 0,</p> <p>Displays a message saying Do you want to save the document 1?</p> <p>After confirming, Microsoft Word ends.</p> <p>When the forth bit is 1,</p> <p>Exits a window without displaying a confirmation message even when there is a change.</p> <p>Use Unicode if you use a symbol to specify a string with S1.</p>
Return Value	<p>0: Completed normally</p> <p>-1: No specified window</p>
Example	WINTERM("TEST",0); 'Exit a window titled TEST.

<b>WINTOP</b>	<b>Brings a specified window to the front</b>
Applicable versions	System Version 6.6 or higher
Format	WINTOP(S1 ,S2)
Function	<p>Brings a window specified with S1 to the front.</p> <p>Set the following search conditions for each bit with S2.</p> <p>The 0 bit to 3rd bit:</p> <ul style="list-style-type: none"> <li>0: Window title that completely matches with S1.</li> <li>1: Window title that matches with the number of characters of S1.</li> <li>2: Window title that matches with the number of characters of S1 (Except for a folder).</li> </ul> <p>Use Unicode if you use a symbol to specify a string with S1.</p>
Return Value	<p>0: Completed normally</p> <p>-1: No specified window</p>
Example	WINTOP("TEST",0) ; 'Bring a window titled TEST to the front.



## Section 5

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# NS-Runtime System Menu Operations

This section describes the basic methods for operating the System Menu of the NS-Runtime and details on functions.

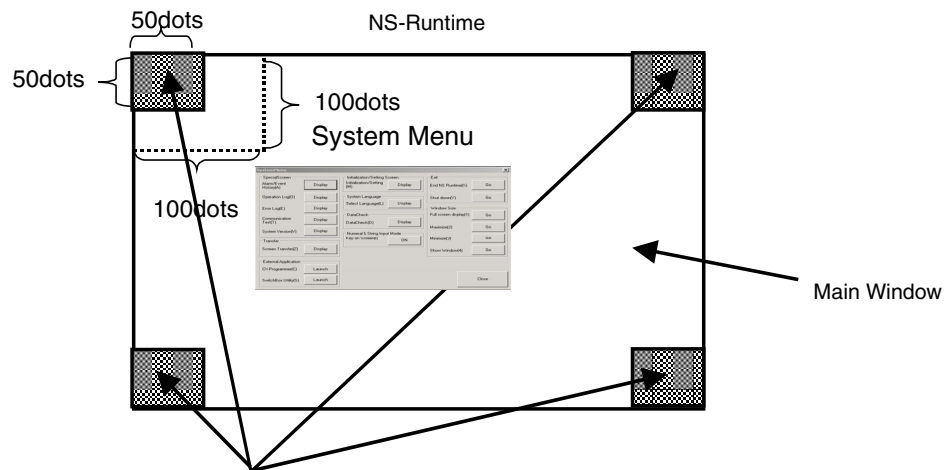
5-1 Displaying and Exiting the System Menu.....	5-2
5-2 System Menu Configuration .....	5-4
5-3 Special Screen.....	5-5
5-4 Transferring Data.....	5-11
5-5 External Application .....	5-12
5-6 Initialization/Setting Screen.....	5-13
5-7 System Language .....	5-44
5-8 Screen Data Check.....	5-45
5-9 Numeral & String Input Mode.....	5-47
5-10 Exit.....	5-48
5-11 Window Size.....	5-49

## 5-1 Displaying and Exiting the System Menu

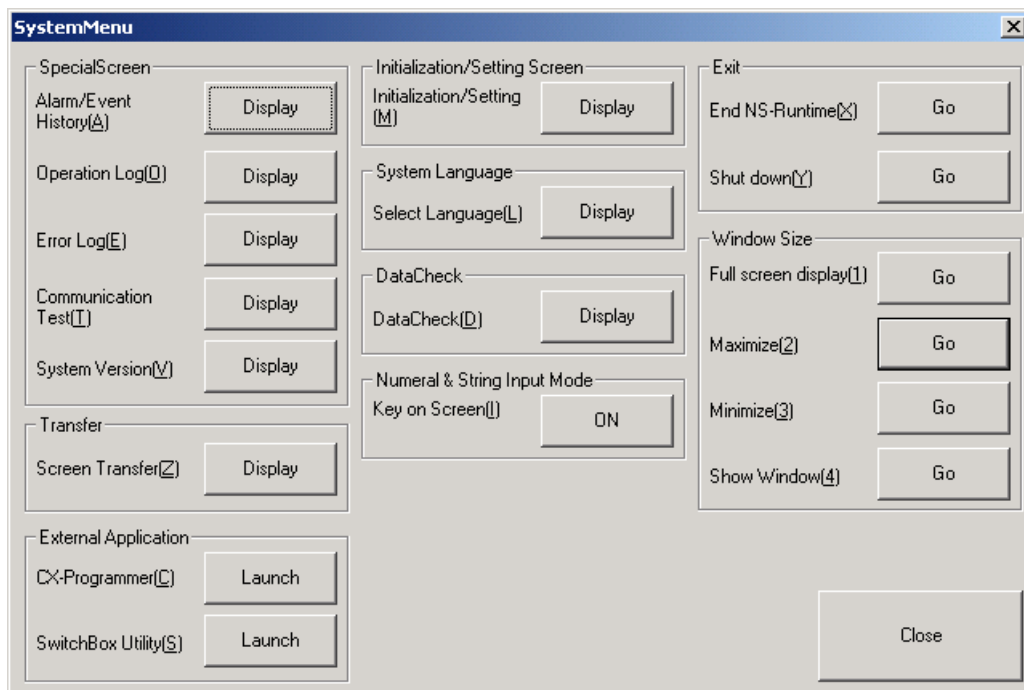
This section describes methods for displaying and exiting the system menu.

### 5-1-1 Displaying the System Menu

The System Menu can be displayed by double-clicking one of the four corners (Range of 50 dots x 50 dots) of the main window. It will be displayed at 100 dots x 100 dots from the top left of the main window. For the second time or more, the system menu will be displayed at the position where it was previously displayed. While \$SB3 is ON, the system menu will not be displayed.



The system menu will be displayed by clicking twice any of the four corners.






**Note**

- ◆ Displaying a screen of Communication Test, Initialization/Setting or Data Check (described later) from the system menu will stop communications with a host. However, the data log and the alarm monitoring will not be stopped.  
When the system menu and screens other than above are displayed, communications will continue.
- ◆ To display the system menu when a pop-up screen is being displayed, double-click any of the four corners of the pop-up screen.

## 5-1-2 Exiting the System Menu

Use one of the following procedures to exit the system menu.

1. Click the **Close** Button in the System Menu.
2. Click the  Button in the System Menu.
3. Click the F4 and the Alt key at the same time.

## 5-2 System Menu Configuration

This section describes items and functions displayed in the system menu.

The following items and functions are displayed in the system menu.

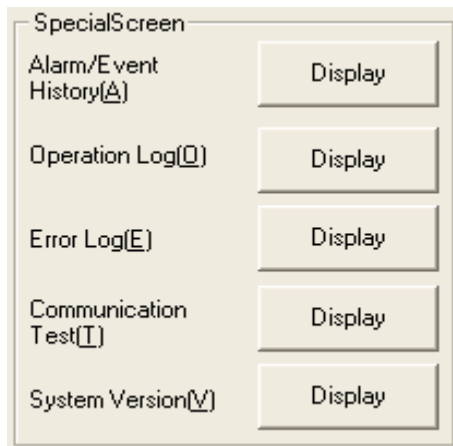
Group Name	Menu Name	Function	Section
Special Screen	Alarm/Even History	Displays the alarm history.	5-3-1
	Operation Log	Displays the operation log.	5-3-2
	Error Log	Displays the error log.	5-3-3
	Communication Test	Checks whether communications with a specified destination are possible or not, by sending and receiving FINS messages.	5-3-4
	System Version	Displays the version display screen.	5-3-5
Transfer	Screen Transfer	Displays the screen data transfer window.	5-4
External Application	CX-Programmer	Starts up CX-Programmer.	5-5-1
	SwitchBox Utility	Starts up SwitchBox Utility.	5-5-2
Initialization/Setting Screen	Initialization/Setting	Initializes data and makes settings for the PT, project, password and communications.	5-6
System Language	Select Language	Switches the system language.	5-7
Data Check	Data Check	Checks screen contents by displaying the registered screen without communicating.	5-8
Numeral & String Input Mode	Key on Screen	Selects the keypad or hardware keyboard to input numerals and strings to functional objects.	5-9
Exit	End NS-Runtime	Ends NS-Runtime.	5-10-1
	Shut Down	Ends NS-Runtime and shuts down Windows.	5-10-2
Window Size	Full screen display	Displays the NS-Runtime main window in a full screen.	5-11-1
	Maximize	Maximizes the NS-Runtime main window.	5-11-2
	Minimize	Minimizes the NS-Runtime main window.	5-11-3
	Show Window	Displays the NS-Runtime main window in the specified size.	5-11-4

### Note

- ◆ From the system menu of NS-Runtime it is possible to start up the CX-Programmer and the SwitchBox Utility whose functions are equivalent to those of NS series Device Monitor, Ladder Monitor, Programming Console and PLC data trace.

## 5-3 Special Screen

This function is used to display the data history, communications test, and version information.



Item	Function
Alarm/Event History	Displays the alarm history.
Operation Log	Displays the operation log.
Error Log	Displays the error log.
Communication Test	Checks whether communications with a specified destination are possible or not, by sending and receiving FINS messages.
System Version	Displays the version display screen.

Details on how to use the functions are explained here.

### 5-3-1 Alarm History

This function is used to display the alarm history. The alarm history can be displayed in order of occurrence or frequency. Up to 1,024 alarms can be displayed.

Display alarm history data by using operations from the System Menu as follows.

1. Click the **Display** Button next to the Alarm/Event History to display the Alarm History (Sort by Occurr.) /(Sort by Freq.) Dialog Box. Alarm history data will be displayed in the order that was previously selected.
2. Select the **Sort by Occurrence** or **Sort by Frequency** in the Alarm History Display Order Field to change the display order.

**Sort by occurrence**

**Alarm Hist. (Sort by Occurr.)**

Time of Occurrence	Time of Cancellation	Message
2006/07/13 15:14:28	2006/07/13 15:14:28	Alarm1
2006/07/13 15:14:27		Alarm2
2006/07/13 15:14:23	2006/07/13 15:14:23	Alarm3
2006/07/13 15:14:20	2006/07/13 15:14:22	Alarm1
2006/07/13 15:14:14	2006/07/13 15:14:24	Alarm2
2006/07/13 15:14:13	2006/07/13 15:14:16	Alarm1

Alarm History Display Order  
☒ Sort by occurrence(1) ☐ Sort by frequency(2)

Exit

**Sort by frequency**

**Alarm Hist. (Sort by Freq.)**

Time of Occurrence	Time of Cancellation	Fre...	Message
2006/07/13 15:14:28	2006/07/13 15:14:28	4	Alarm1
2006/07/13 15:14:27		2	Alarm2
2006/07/13 15:14:13	2006/07/13 15:14:16	1	Alarm3

Alarm History Display Order  
☐ Sort by occurrence(1) ☒ Sort by frequency(2)

Exit

- Click the **Exit** Button to close the dialog box.

**Note**

- ◆ Event history will not be displayed.
- ◆ For details on the alarm history function, refer to 2-20-2 Alarm/Event History in the NS Series Programming Manual.

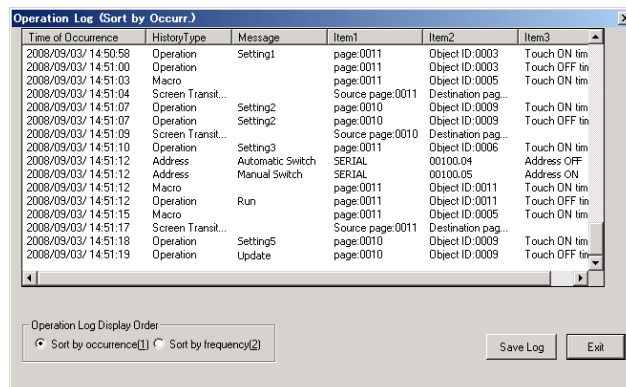
**5-3-2 Operation Log**

This function is used to display the operation log. The operation history can be displayed in order of occurrence or frequency. Up to 1,024 operations can be displayed.

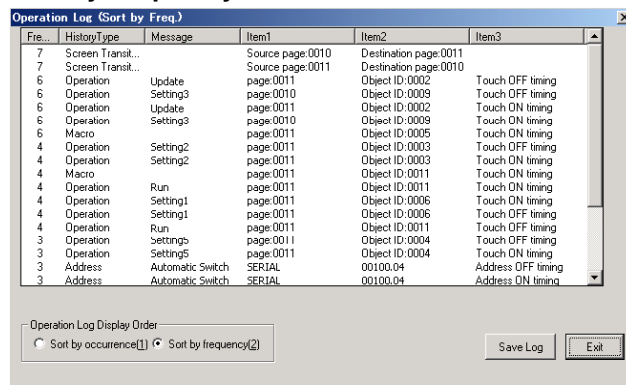
Display operation log data by using operations from the System Menu as follows.

- Click the **Display** Button next to the Operation Log to display the Operation Log (Sort by Occurr.) /(Sort by Freq.) Dialog Box. The operation log data will be displayed in the order that was previously selected.
- Select the **Sort by Occurrence** or **Sort by Frequency** in the Operation Log Display Order Field to change the display order.

### Sort by occurrence



### Sort by frequency



3. Click the **Save Log** Button to save the operation log data to a CSV file.
4. Click the **Exit** Button to close the dialog box.

#### Note

- ◆ For details on the operation log function, refer to 2-20-1 Operation Log Function in the NS series Programming Manual.
- ◆ The function to set messages in the operation log is supported for project data version 8.0 or higher.

### 5-3-3 Error Log

This function is used to display the macro error history. The macro error history can be displayed in order of occurrence or frequency.

Up to 1,024 errors can be displayed.

Display error log data by using operations from the System Menu as follows.

1. Click the **Display** Button next to the Error Log to display the Error Log (Sort by Occurrence) /(Sort by Frequency) Dialog Box. The error log data will be displayed in the order that was previously selected.
2. Select the **Sort by Occurrence** or **Sort by Frequency** in the Error Log Display Order Field to change the display order.

## Sort by occurrence

**Error Log (Sort by Occurrence)**

Time of Occurrence	Page No.	Object ID	Macro ID	Error Type
2006/07/13 15:00:01	0001	0019	0020	BCD code error
2006/07/13 15:00:07	0000	0246	0020	0 division occurs
2006/07/13 15:00:14	0000	0247	0020	Incorrect program
2006/07/13 15:00:16	0000	0246	0020	0 division occurs
2006/07/13 15:00:19	0001	0019	0020	BCD code error
2006/07/13 15:00:22	0000	0247	0020	Incorrect program
2006/07/13 15:00:23	0000	0247	0020	Incorrect program
2006/07/13 15:00:25	0000	0246	0020	0 division occurs
2006/07/13 15:01:20	0000	0247	0020	Incorrect program
2006/07/13 15:01:24	0001	0019	0020	BCD code error
2006/07/13 15:01:27	0001	0019	0020	BCD code error
2006/07/13 15:01:28	0001	0019	0020	BCD code error

Error Log Display Order  
☒ Sort by occurrence(1) ☐ Sort by frequency(2)

Exit

## Sort by frequency

**Error Log (Sort by Frequency)**

Fre...	Page No.	Object ID	Macro ID	Error Type
5	0001	0019	0020	BCD code error
4	0000	0247	0020	Incorrect program
3	0000	0246	0020	0 division occurs

Error Log Display Order  
☐ Sort by occurrence(1) ☒ Sort by frequency(2)

Exit

3. Click the **Exit** Button to close the dialog box.

**Note**

- ◆ For details on the error log function, refer to 2-20-4 Error Log Function in the NS series Programming Manual.

### 5-3-4 Communication Test

This function is used to check whether communications with a specified destination are possible or not, by sending and receiving FINS messages.

Display the Communication Test Screen by using operations in the System Menu as follows.

1. Click the **Display** Button next to the Communication Test to display the Communication Test Screen.

The screenshot shows the 'Communication Test' window. It includes a 'FINS' section with 'Send To (S)' (SERIALA), 'Send Message(M)' (0501), and a 'keyboard' button. Below these are 'No. of Sends' (1) and 'Time-out Period(T)' (3000 ms). A 'Received Message' section displays a list of hexadecimal values (00000 to 00070). To the right of this list are 'Send(S)' and 'Receive' buttons, with a 'FINS' indicator and a 'Send' button. At the bottom, there is a 'Comment' field, a '0 ms' field, and 'Exit(E)' and 'End(E)' buttons. Numbered callouts point to: 1. Send To (S), 2. Send Message(M), 3. SERIALA dropdown, 4. 0501 text box, 5. Received Message list, 6. 0 ms field, and 7. Exit(E) button.

2. Set each of the setting items as follows:

No	Item	Function
1	Send To	Selects the host of the transmission destination from the list of hosts that are registered in the project.
2	Send Message	Sets the FINS command being to be sent.
3	No. of Sends	Displays the number of times messages are transmitted. The number of times is fixed to 1.
4	Time-out Period	Displays the timeout time for when the communication method is set to the Ethernet or Controller Link. (Fixed to 3,000ms) An error message will be displays when the timeout time is exceeded after transmitting the FINS commend. For serial communications, the timeout time set with the Initialization/Setting in the System Menu is used.

3. Click the **Send** Button to start transmission.  
The sending indicator will remain lit until the transmission is completed.  
After transmission, the Receive indicator will remain lit until reception is completed.
4. If communications are performed normally, a response will be received from the transmission destination and the following items will be displayed. For details on FINS commands and information displayed in comments, refer to the FINS Commands Reference Manual (W227).

No	Item	Function
5	Received Message	Displays the data of received results of the FINS command.
6	ms	Displays the time lapsed in ms from sending the FINS command until receiving the FINS response.
7	Comment	Displays the status according to the completion code after reception.

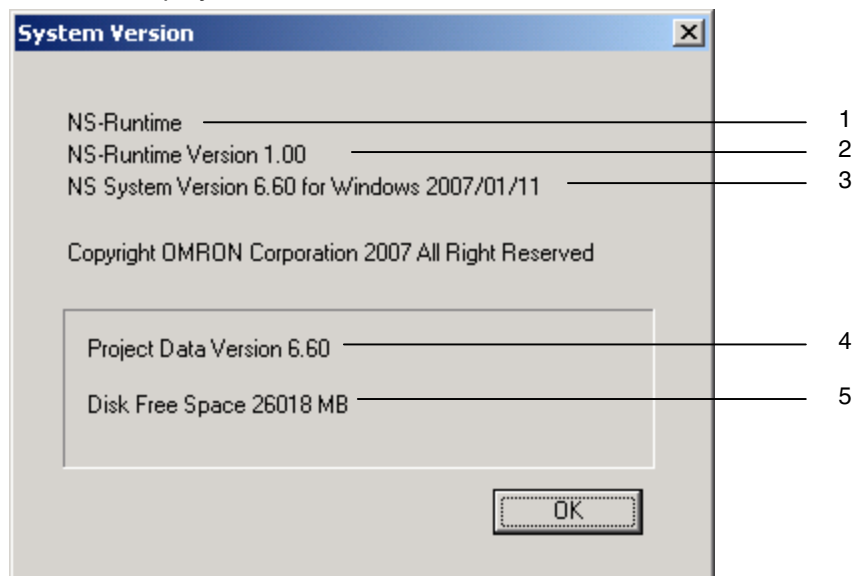
5. Click the **Exit** Button to close the communication test screen.

### 5-3-5 Version Display

This function is used to display information on the NS-Runtime version.

Display the Version Display Screen by using operations in the System Menu as follows.

1. Click the **Display** Button next to the System Version Button. The version display screen will be displayed.



2. The following items will be displayed.

No	Item	Function
1	Model	Displays the product model.
2	Version	Displays the NS-Runtime version.
3	System Version	Displays the system version that the NS-Runtime supports.
4	Data Version	Displays project data version. No version will be displayed when the NS-Runtime does not support the model of transferred project data.
5	Disk Free Space	Displays the free space of the drive in which NS-Runtime is installed.

3. Click the **OK** Button to close the System Version Screen.

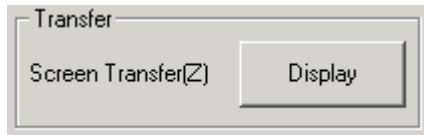


## 5-4 Transferring Data

This function is used to display the project transfer screen.

This section describes the startup method only. For details on transferring project data, refer to 6 Transferring Project Data.

1. Click the **Display** Button next to the Screen Transfer.



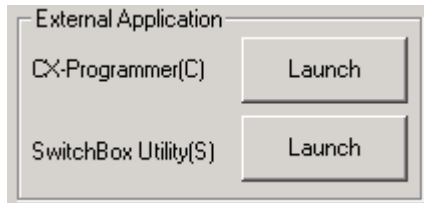
2. Screen Data Transfer Window will be displayed.



## 5-5 External Application

This function is used to start up the CX-Programmer and the SwitchBox Utility.

This section describes methods for starting up external applications. For details on the functions and operations of external applications, refer to the manuals for each application.



Item	Function
CX-Programmer	Starts up the CX-Programmer.
SwitchBox Utility	Starts up the SwitchBox Utility.

### 5-5-1 CX-Programmer

- Click the **Launch** Button next to the CX-Programmer.  
If the CX-Programmer has not installed, the following dialog box below will be displayed.  
Install the CX-Programmer.



### 5-5-2 SwitchBox Utility

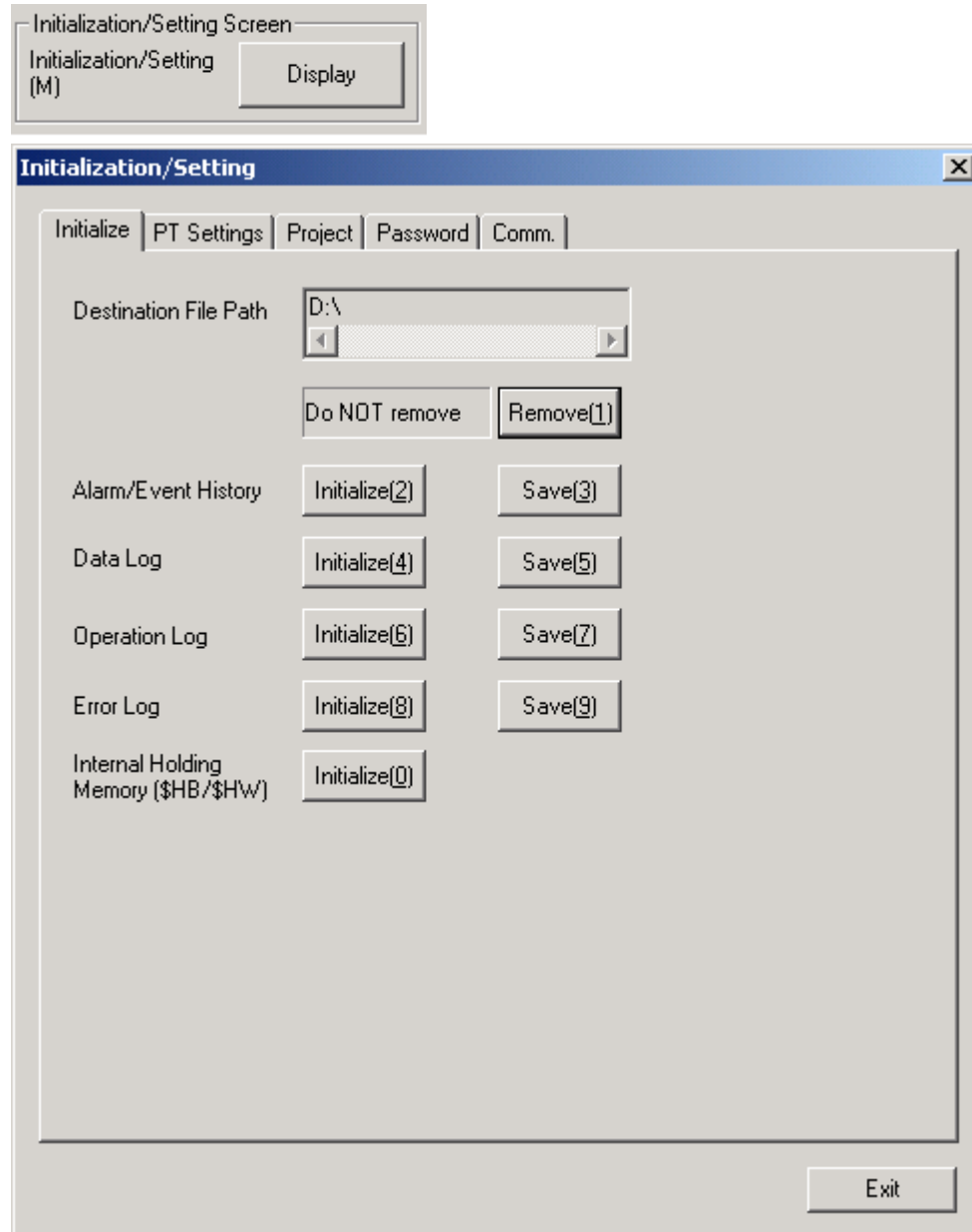
- Click the **Launch** Button next to the SwitchBox Utility to launch the SwitchBox Utility.  
If the SwitchBox Utility has not installed, the following dialog box below will be displayed.  
Install the SwitchBox Utility.



## 5-6 Initialization/Setting Screen

This function is used to initialize the data and make settings of PT operations, project, password and communications.

Click the **Display** Button next to the Initialization/Setting in the System Menu to display Initialization/Setting Screen.

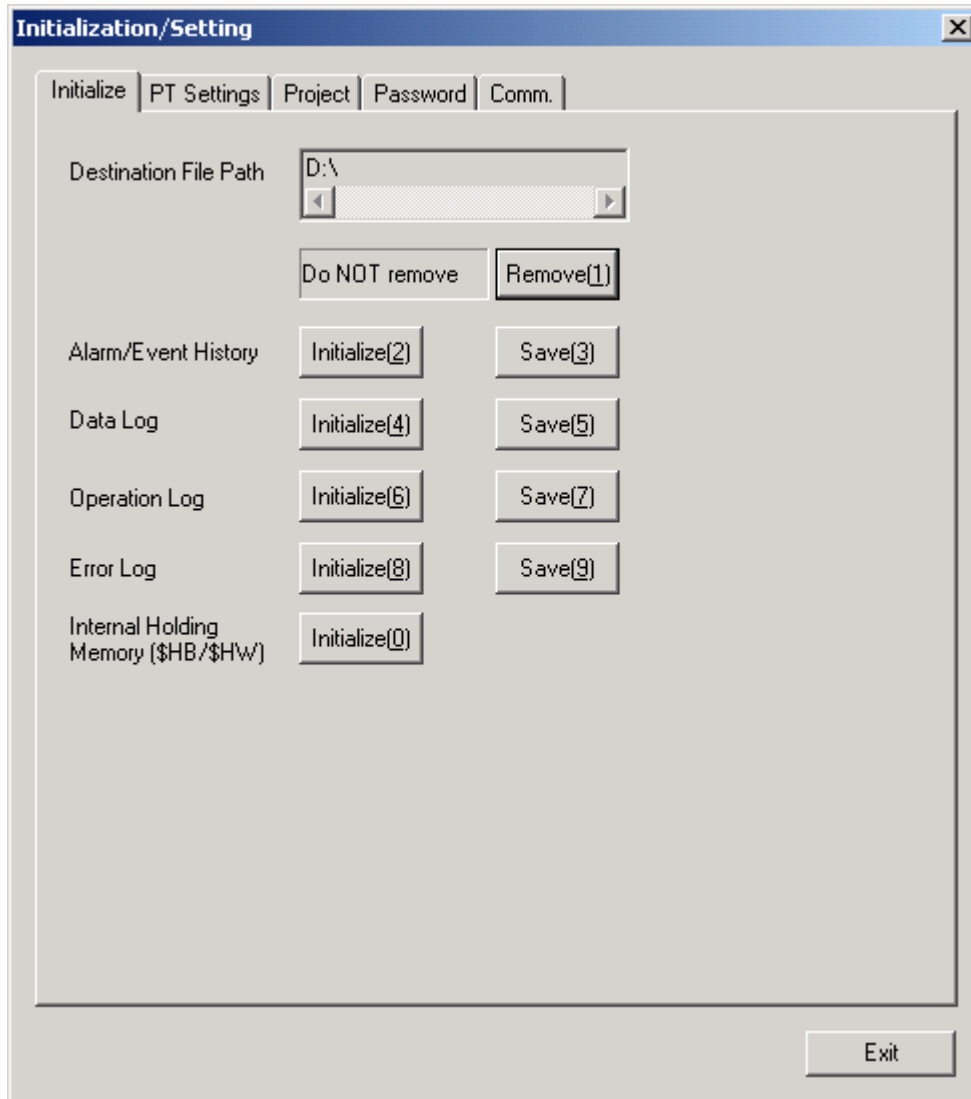


The following items will be displayed in the Initialization/Setting Screen

Tab Name	Item	Function
Initialize	Remove	Removes the drive specified as the save destination of history data.
	Alarm/Event History Initialize/Save	Initializes and saves alarm/event history data.
	Data Log Initialize/Save	Initializes and saves the data log.
	Operation Log Initialize/Save	Initializes and saves the operation log.
	Error Log Initialize/Save	Initializes and saves the error log.
	Internal Holding Memory (\$HB/\$HW) Initialize	Initializes and saves the Internal Holding Memory (\$HB/\$HW).
PT Settings	Screen Saver	Sets whether to use the screen saver.
	Key Press Sound	Sets whether an input sound is heard when the touch switches are clicked.
	Buzzer Sound	Sets whether to sound a buzzer when a command from the host is received or an error occurs.
	Calendar Check	Sets and displays the date and the time of the system clock.
Project	Project Title	Displays the project title.
	No. of Labels	Displays the number of labels set for the project.
	Initial Screen	Sets and displays the screen numbers first displayed after the NS-Runtime is started.
	Initial label	Sets and displays the label number shown on the screen after the NS-Runtime is started.
	Alarm/Event Rec. Method	Displays the method for recording the alarm/event histories.
	Data Log Rec. Method	Displays the method for recording the data log.
	Oper. Log Rec. Method	Displays the method for recording the operation log.
	Error Log Rec. Method	Displays the method for recording the error log.
	System Memory	Displays the allocated hosts and addresses of the system memory (\$SB/\$SW).
Password	Password	Changes a password.
Comm.	Comm. Auto-return	Selects whether automatic recovery is used when a communications error occurs.
	Time-out Interval	Sets and displays the timeout monitor time.
	Retry Counts	Sets and displays the number of communications retries.
	Serial A	Sets and displays whether serial port A is used, the communications method and other details.
	Serial B	Sets and displays whether serial port B is used, the communications method, and other details.
	Ethernet	Sets and displays whether Ethernet is used and communications details.
	Controller Link	Sets and displays whether Controller Link is used and communications details.

### 5-6-1 Initializing Data

The Initialize Tab Page is used to remove the destination drive of save history data. It is also used to initialize or save the alarm/event histories saved during NS-Runtime execution.



The following items will be displayed in the Initialize Tab Page.

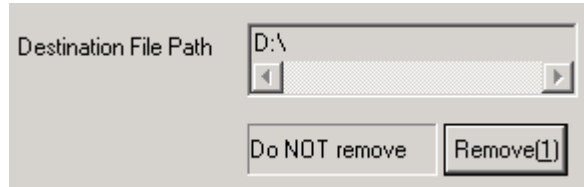
No	Item	Function
1	Remove	Enables to remove the drive registered with a project as the save destination of history data.
2	Alarm/Event History Initialize/Save	Initializes and saves the alarm/event history data.
3	Data Log Initialize/Save	Initializes and saves the data log.
4	Operation Log Initialize/Save	Initializes and saves the operation log.
5	Error Log Initialize/Save	Initializes and saves the error log.
6	Internal holding memory \$HB/\$HW Initialize	Initializes and saves the Internal Holding Memory (\$HB/\$HW).

## Removing the Destination Drive

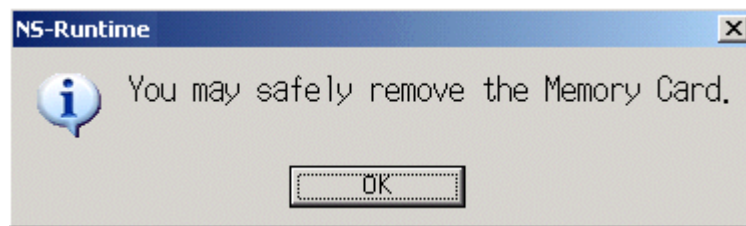
This function is used to stop the device so that the drive, which was specified as the destination to save history data, can be safely removed (Perform the same process as that of Windows' safely remove hardware)

Stop the device by using operations in the Initialize Tab Page as follows.

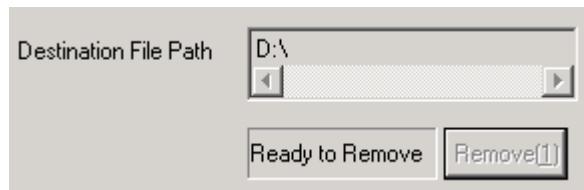
1. Click the **Remove** Button in the Destination File Path field.



2. The following dialog box will be displayed when it is safe to remove the drive.



3. Confirm that it is safe to remove the drive, and remove the removable drive.



4. If a removable drive is not being used as a destination, the following dialog box will be displayed.



### Note

- ◆ In order to use the removable drive again after the Ready to Remove is shown, insert the removable drive into the NS-Runtime environment again. Once the Ready to Remove is shown, the NS-Runtime cannot access a removable drive until the removable drive is inserted again.
- ◆ When turning ON \$SB49 in system memory from the host and when it is safe to remove a memory card, \$SB50 will be turned ON. While the \$SB50 is ON, a memory card inserted into the NS-Runtime environment can be removed. For details, refer to 2-4 System Memory in NS series Programming Manual.

## Initializing and Saving the Alarm/Event History

This function is used to initialize or save the alarm/event histories saved in the NS-Runtime. Use this function when screen data has been changed, to initialize history data, or to save history data on a removable drive as a CSV file.

While the NS-Runtime is running, the alarm/event histories continually check the status of bits registered as alarms/events and record the date, time, and number of times the bits turned ON/OFF.

Up to 1,024 alarms can be recorded.

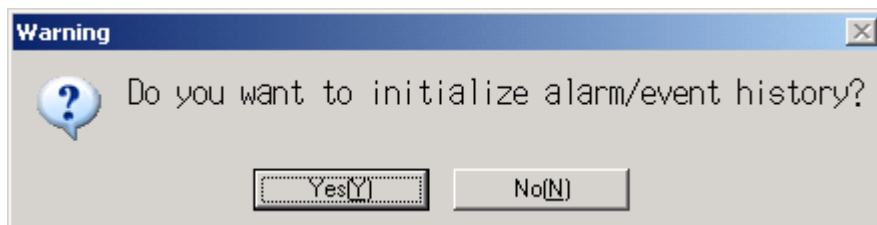
### Note

- ◆ The alarm/event histories can also be initialized by turning ON \$SB32 in system memory from the host.
- ◆ The alarm/event histories can be deleted when project data is downloaded.
- ◆ Always delete the histories when downloading the project data in the following cases:
  - 1) when the alarm/event settings, data log settings, or any other settings related to the histories have been changed or
  - 2) when downloading a project that is different from the one currently in the NS-Runtime.
- ◆ The alarm/event histories can also be saved by turning ON \$SB33 in system memory from the host. For details, refer to 2-4 System Memory in the NS Series Programming Manual.

Initialize or save alarm/event histories by using operations from the Initialize Tab Page as follows.

### Initializing Alarm/Event Histories

1. Click the **Initialize** Button next to the Alarm/Event History.  
A confirmation message will be displayed. Click the **Yes** Button to initialize the data. Click the **No** Button to cancel the initialize function.



2. When the alarm/event history initialization has been completed, the following dialog box will be displayed.



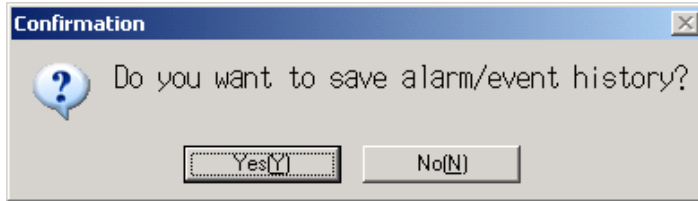
### **Saving Alarm/Event Histories**

Saving the latest history data on a specified drive in CSV file with the following name.

Alarm history data: Alarm.csv

Event history data: Event.csv

1. Click the **Save** Button for the Alarm/Event History. Then the following dialog box will be displayed. Click the **Yes** Button to start saving. Click the **No** Button to cancel the save function.



2. When the alarm/event history saving has been completed, the following dialog box will be displayed.



3. If the alarm/event history saving has failed, the following dialog box will be displayed.





## Initializing and Saving the Data Log

This function is used to initialize or save the data log saved in the NS-Runtime.

Use this function when screen data has been changed, for initializing history data or for saving history data on a removable drive as a CSV file.

The data log is used to record changes over time to the contents of an address that is registered in the log.

Up to 50,000 events can be recorded.

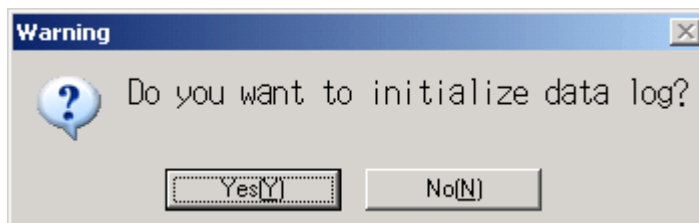
### Note

- ◆ The data log for the specified group can be initialized by setting the group number in \$SW37 and turning ON \$SB35 in the system memory from the host. The data logs for all groups can be initialized by setting \$SW37 to 0.
- ◆ The data log can be deleted when project data is downloaded.
- ◆ Always delete the histories when downloading the project data in the following cases:
  - 1) when the alarm/event settings, data log settings, or any other settings related to the histories have been changed or
  - 2) when downloading a project that is different from the one currently in the NS-Runtime.
- ◆ The data log for the specified group can be saved by setting the group number in \$SW37 and turning ON \$SB36 in the system memory from the host. The data logs for all groups can be saved by setting \$SW37 to 0. For details, refer to 2-4 System Memory in the NS Series Programming Manual.

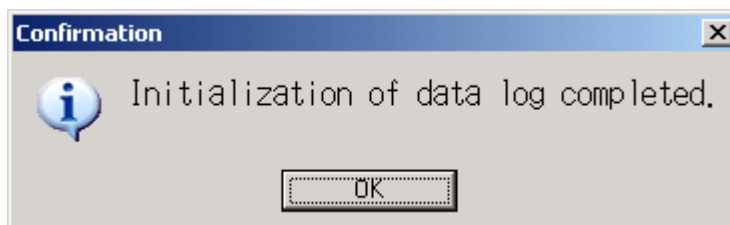
Initialize or save the data log by using operations from the Initialize Tab Page as follows.

### Initializing the Data Log

1. Click the **Initialize** Button next to the Data Log.  
A confirmation message will be displayed. Click the **Yes** Button to initialize the data. Click the **No** Button to cancel the initialize function.



2. When the data log initialization has been completed, the following dialog box will be displayed.

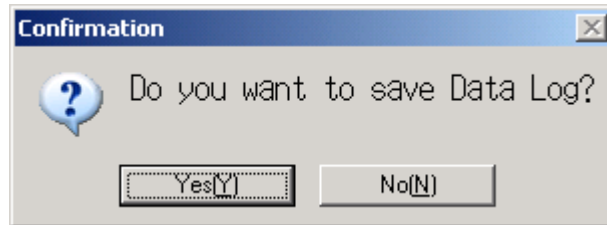


### **Saving the Data Log**

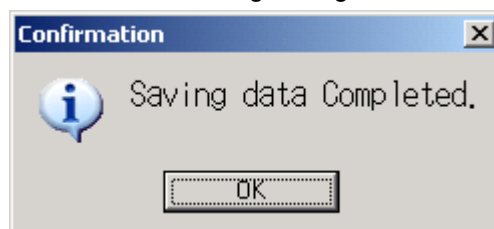
Saving the latest history data on a specified drive in CSV file with the following name.

Data log data: Trend.csv

1. Click the **Save** Button for the data log. A confirmation message will be displayed. Click the **Yes** Button to save the data. Click the **No** Button to cancel the save function.



2. When the data log saving has been completed, the following dialog box will be displayed.



3. If the data log save has failed, the following dialog box will be displayed.



## Initializing and Saving the Operation Log

This function is used to initialize or save the operation log saved in the NS-Runtime.

Up to 1,024 operations can be recorded in order of occurrence.

Use this function when screen data has been changed, for initializing log data, or for saving log data as a CSV file in a removable drive.

The operation log is used to record the number of times the following operations are performed and the order in which they occur.

- Functional object operation history
- Screen display history
- Macro execution history

For details, refer to 2-18-1 Operation Log Function in the NS Series PT Programming Manual

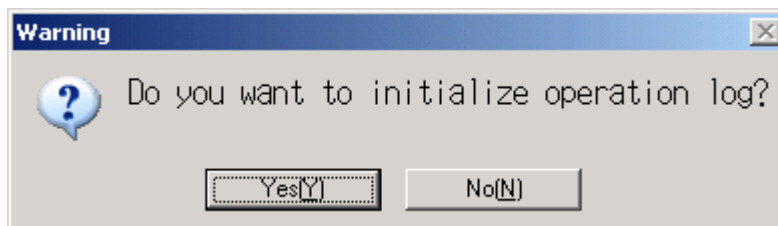
### Note

- ◆ The functional objects that can be recorded are ON/OFF buttons, word buttons, Numeral Display & Input, String Display & Input, thumbwheel switches, data block tables, and Multifunction Objects.
- ◆ The operation log data can also be initialized by setting the system bit memory address \$SB37 to ON from the host.
- ◆ The operation log can be deleted when project data is downloaded.
- ◆ Always delete the histories when downloading the project data in the following cases:
  - 1) when the alarm/event settings, data log settings, or any other settings related to the histories have been changed or
  - 2) when downloading a project that is different from the one currently in the NS-Runtime.
- ◆ The operation log can also be saved by turning ON \$SB38 in system memory from the host. Refer to 2-4 System Memory in the NS Series Programming Manual for details.

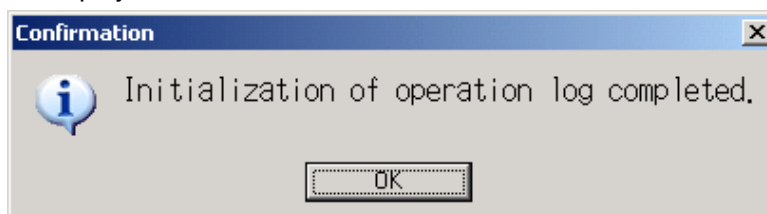
Initialize or save the operation log by using operations from the Initialize Tab Page as follows.

### Initializing the Operation Log

1. Click the **Initialize** Button next to the Operation Log. A confirmation message will be displayed. Click the **Yes** Button to initialize the data. Click the **No** Button to cancel the initialize function.



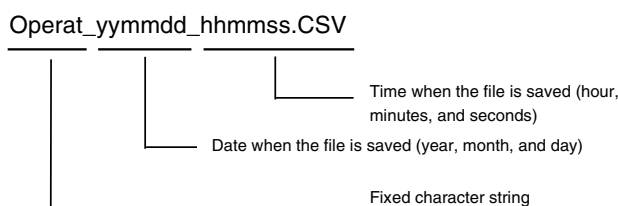
2. When the operation log initialization has been completed, the following dialog box will be displayed.



### Saving the Operation Log

Saving the latest history data on a specified drive in CSV file with the following name.

Operation log data: Operat\_yymmdd\_hhmmss.csv



1. Click the **Save** Button for the operation log. A confirmation message will be displayed. Click the **Yes** Button to save the data. Click the **No** Button to cancel the save function.



2. When operation log saving has been completed, the following dialog box will be displayed.



3. If the operation log saving has failed, the following dialog box will be displayed.



### Note

- ◆ When saving the operation log, the operation log must be controlled from the system memory. For details on controlling the operation log, refer to 2-4 System Memory in the NS Series Programming Manual.

### Initializing and Saving the Error Log

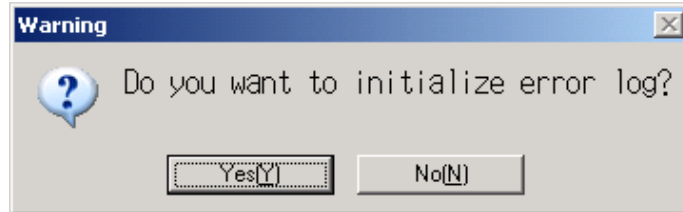
This function is used to initialize the macro error history saved in the NS-Runtime or save the history in a removable drive.

Up to 100 errors can be recorded in the error log. The number of errors that can be recorded, however, also depends on the free space in the memory.

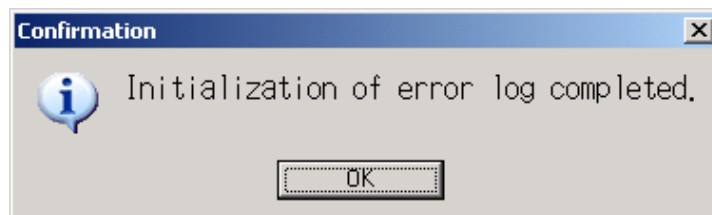
The error log records the errors that occur when the macro function is executed. Initialize or save the error log by using operations from the Initialize Tab Page as follows.

### Initializing the Error Log

1. Click the **Initialize** Button next to the Error Log. A confirmation message will be displayed. Click the **Yes** Button to initialize the data. Click the **No** Button to cancel the initialize function.



2. When the error log initialization has been completed, the following dialog box will be displayed.



### Saving the Error Log

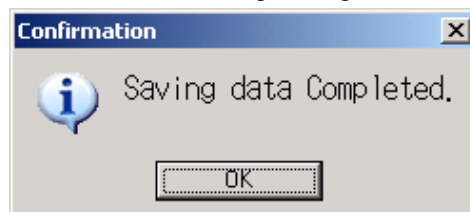
Saving the latest log data on a specified drive in CSV file with the following name.

Error log data: MacroErr.csv

1. Click the **Save** Button for the Error Log. A confirmation message will be displayed. Click the **Yes** Button to save the data. Click the **No** Button to cancel the save function.



2. When the error log saving has been completed, the following dialog box will be displayed.



3. If the error log saving has failed, the following dialog box will be displayed.



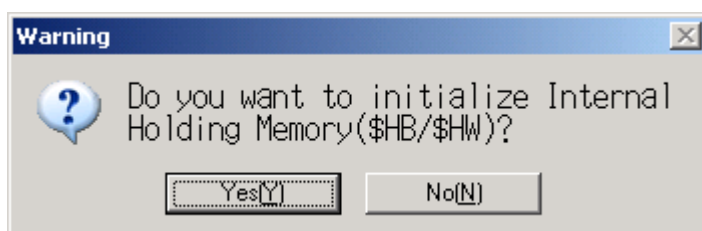
**Note**

- ◆ The error log can be deleted when project data is downloaded.
  - ◆ Always delete the histories when downloading the project data in the following cases:
    - 1) when the alarm/event settings, data log settings, or any other settings related to the histories have been changed or
    - 2) when downloading a project that is different from the one currently in the NS-Runtime.
  - ◆ The error log can also be initialized and saved by turning ON the following bits in the system memory from the host.
    - \$SB42 Initializes Error Log
    - \$SB43 Saves Error Log
- Refer to 2-4 System Memory in the NS Series Programming Manual for details.

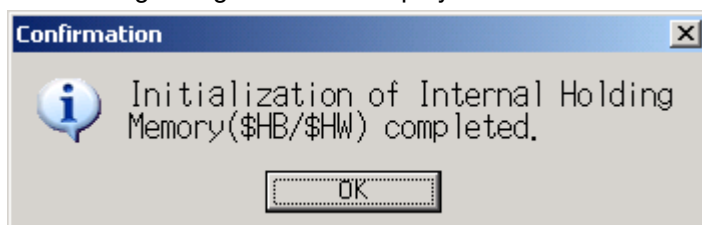
**Initializing Internal Holding Memories (\$HB/\$HW)**

The following procedure is used to initialize the Internal Holding Memories in the NS-Runtime (\$HB0 to \$HB8191 and \$HW0 to \$HW8191). Use the following procedure from the Initialize Tab Page to initialize the Internal Holding Memories (\$HB/\$HW).

1. Click the **Initialize** Button for the Internal Holding Memories (\$HB/\$HW). The following confirmation message will be displayed. Click the **Yes** Button to initialize. Click the **No** Button to cancel the initialize function.



2. When the Internal Holding Memory (\$HB/\$HW) initialization has been completed, the following dialog box will be displayed.

**Note**

- ◆ The internal holding memory (\$HB/\$HW) can be initialized by turning ON the system memory bit \$SB34 from the host. Refer to 2-4 System Memory in the NS Series Programming Manual for details.

## 5-6-2 PT Operations

The PT Settings Tab Page is used to display and make operation settings for each project.

The screenshot shows a software window titled "Initialization/Setting" with a close button (X) in the top right corner. Below the title bar is a tabbed interface with five tabs: "Initialize", "PT Settings" (which is selected), "Project", "Password", and "Comm.". The "PT Settings" tab contains several configuration sections:

- Screen Saver:** Includes two radio buttons: "OFF(1)" and "Display Erased(2)". The "Display Erased(2)" option is selected. Below these is a "Screen Saver Start-up Time" field set to "15" minutes, with a "keyboard" button next to it.
- Key Press Sound:** Includes two radio buttons: "ON(3)" and "OFF(4)". The "OFF(4)" option is selected.
- Buzzer Sound:** Includes three radio buttons: "ON(5)", "OFF(6)", and "ERROR ON(7)". The "OFF(6)" option is selected.
- Backlight:** Includes three radio buttons: "High(8)", "Middle(9)", and "Low(0)". The "High(8)" option is selected.
- Calendar Check:** Includes two text boxes displaying the current date and time: "2006/07/14" and "15:16:30".

At the bottom center of the PT Settings tab is a prominent red button labeled "Write(W)". At the bottom right of the window is a standard "Exit" button.

The following functions will be displayed in the PT Settings Tab Page.

Item	Function
Screen Saver	Makes the screen saver settings. Turns OFF the monitor power when the screen saver is enabled, if operations are not performed for a set time.
Key Press Sound	Sets whether an input sound is heard when the touch switches are clicked.
Buzzer Sound	Sets whether a buzzer sound is heard when a command from the host is received or an error occurs.
Calendar Check	Sets and displays the date and the time of the system clock.
Write	Writes the settings.

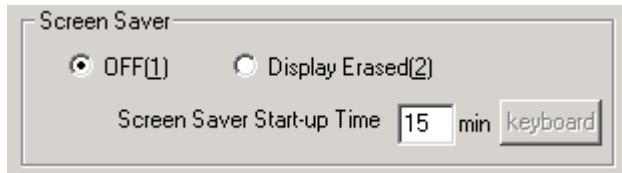
## Screen Saver

This function is used to turn OFF the monitor power when operations are not performed for a set period of time.

The screen saver start-up time can be set to between 1 and 99 minutes.

Set the screen saver movement by using operations from the PT Settings Tab Page as follows.

1. Select either **OFF** or **Display Erased** for the screen saver.



2. When selecting the Display Erased is selected, set the **Screen Saver Start-up Time** to between 1 to 99 minutes. The value can also be input with a keypad that is displayed by clicking the keyboard button.
3. After setting, click the **Write** Button to save the setting. (For details on the write button, refer to *Writing* on page 5-29.)

### Note

- ◆ Clicking any part of the display will cancel the screen saver and display the previously displayed screen. When canceling the screen saver, If the part of the display corresponds to the input for a functional object, the screen saver will only be cancelled. The input for the functional object will not be processed.

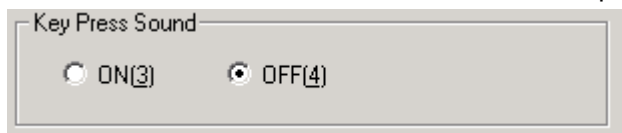
## Key Press Sound

This function is used to set whether an input sound is heard when the touch switches that allow input functions for the NS-Runtime are clicked.

- ON: Input sound is heard when the touch switches that allow input functions for the NS-Runtime are clicked.
- OFF: Input sound is not heard when the touch switches that allow input functions for the NS-Runtime are clicked.

Set the key press sound by using operations from the PT Settings Tab Page as follows.

1. Select either **ON** or **OFF** for the touch switch input sound.



2. After setting, click the **Write** Button to save the setting. (For details on the write button, refer to *Writing* on page 5-29.)



## Buzzer Sound

This function is used to set whether to sound a buzzer at times such as when a command from the host is received or an error occurs.

ON: Buzzer turns ON when a command is received from the host or an error occurs.

OFF: Buzzer is OFF.

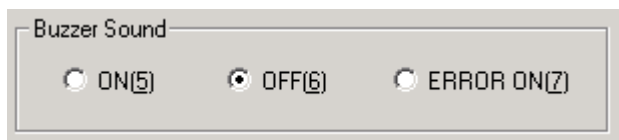
ERR ON: Buzzer turns ON when an error occurs only.

### Note

- ◆ Other commands and settings associated with the buzzer exist, but the settings here have the highest priority.
- ◆ When the buzzer is set to ON or ERR ON, the buzzer will be also heard when messages are displayed with a cross (X) or exclamation mark (!) icon.
- ◆ For details on the buzzer function, refer to 2-20-6 Buzzer Function in the NS Series Programming Manual.

Set the buzzer to ON/OFF/ERROR ON by using operations from the PT Tab Page as follows.

1. Select either **ON**, **OFF**, or **ERROR ON** for the buzzer sound.



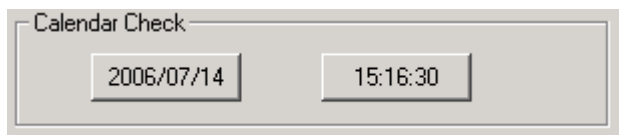
2. After setting, click the **Write** Button to save the setting. (For details on the write button, refer to *Writing* on page 5-29.)

## Calendar Check

This function is used to set the time and date.

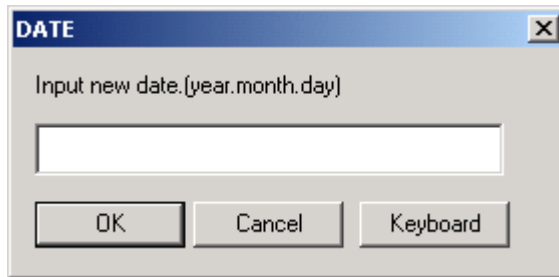
Set the date and time by using operations from the PT Tab Page as follows.

1. Select either date or time for the Calendar Check.



2. The following dialog box will be displayed.  
Use the following methods for setting new date and time.
  - Directly input from the hardware keyboard.
  - Input from the keypad. (A keypad will be displayed by clicking the Keyboard Button.)

<Setting the date>

A dialog box titled "DATE" with a close button (X) in the top right corner. The text inside says "Input new date.(year.month.day)". Below the text is a single-line text input field. At the bottom are three buttons: "OK", "Cancel", and "Keyboard".

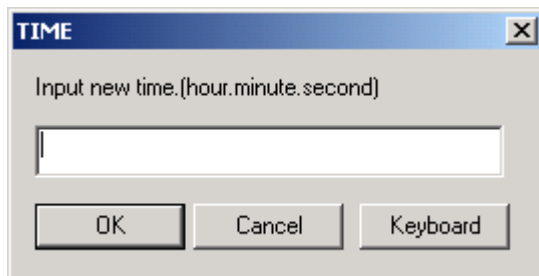
-Use the following input format to set the date.

yyyy.mm.dd (yyyy: year, mm: month, dd: day)

Set the year using four digits.

Example: Set January 1st, 2006 as **2006.1.1**. (Adding 0 prefix to single-digit settings is not required.)

<Setting the time>

A dialog box titled "TIME" with a close button (X) in the top right corner. The text inside says "Input new time.(hour.minute.second)". Below the text is a single-line text input field. At the bottom are three buttons: "OK", "Cancel", and "Keyboard".

-Use the following input format to set the time.

hh.mm.ss (hh: hour, mm: minute, ss: second)

Set the year using the 24-hour clock.

Example: Set 06:01:01 p.m. as **18.1.1**. (Adding 0 prefix to single-digit settings is not required.)

3. Click the **OK** Button to enable the settings.
4. When an incorrect date or time is set, the following dialog box will be displayed.  
Click the **OK** Button to set a correct date or time again.

<Setting the date>



<Setting the time>



5. After setting, click the **Write** Button to save the setting. (For details on the write button, refer to *Writing* below.)

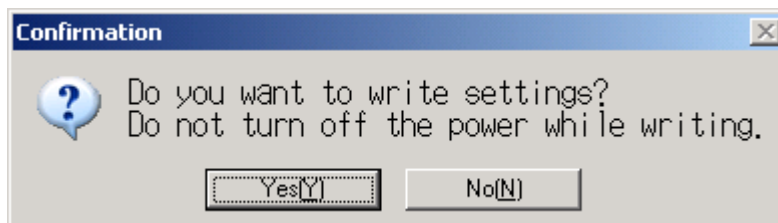
## Writing

This function is used to write settings. When changing each setting, make sure to click the **Write** Button. If the Write Button is not clicked, settings will not be changed.

1. Click the Write Button.



The following dialog box will be displayed. Click the **Yes** Button to write the settings. Click **No** Button to cancel the settings.



2. When the writing has been completed, the following dialog box will be displayed.



### Note

- ◆ Do not turn OFF the power while writing.

### 5-6-3 Project Settings

The Project Tab Page is used to set and display project related information.

The following items are displayed in the Project Tab Page.

No	Item	Function
1	Project Title	Displays the project title.
2	No. of Labels	Displays the number of labels set for the project.
3	Initial Screen	Sets and displays the screen numbers first displayed after the NS-Runtime is started.
4	Initial label	Sets and displays the label number shown on the screen after the NS-Runtime is started.
5	Alarm/Event Rec. Method	Displays the method for recording the alarm/event histories.
6	Data Log Rec. Method	Displays the method for recording the data log.
7	Oper. Log Rec. Method	Displays the method for recording the operation log.
8	Error Log Rec. Method	Displays the method for recording the error log.
9	System Memory	Displays the allocated hosts and addresses of the system memory (\$SB/\$SW).

## Project Title

This function is used to display the project title.

The title is read-only and cannot be edited.

Project Title	Sample Project
---------------	----------------

## The Number of Labels

Multiple label data can be created in each project. This function displays the number of labels set for the project that is registered in the NS-Runtime. The number of labels is read-only and cannot be edited.

No. of Labels	16
---------------	----

### Note

- ◆ For details on multiple labels settings for a project, refer to the System Settings and Project Properties in the CX-Designer's Online Help.
- ◆ For information on how to set multiple labels for a functional object, refer to Labels in 2-8 Common Functional Object Functions in the NS Series Programming Manual.

## Initial Screen

This function is used to set and display the screen number of the screen that is first displayed when the NS-Runtime is started.

Set the initial screen number to between 0 and 3999.

Set and display the initial screen number by using operations from the Project Tab Page as follows.

Initial Screen(P)	3999
-------------------	------

1. The number of the screen that is displayed when the NS-Runtime is started is displayed in the initial screen field.
2. To change the initial screen number, input the screen number. The value can also be input using a keypad that is displayed by clicking the keyboard button.
3. After setting, click the **Write** Button to save the setting. (For details on the write button, refer to *Writing* on page 5-29.)

### Note


- ◆ The initial screen number can also be set from the CX-Designer.

## Initial Label

This function is used to set and display the label number that is shown on the screen when the NS-Runtime is started.

The initial number can be set to between 0 to (the number of label minus 1).

Set and display the label number by using operations from the Project Tab Page as follows.



Initial Label(L) 0

1. The label number that is shown on the screen when the NS-Runtime is started will be displayed on the Initial Label field.
2. To change the initial label, input the label number. The value can also be input using a keypad that is displayed by clicking the keyboard button.
3. After setting, click the **Write** Button to save the setting. (For details on the write button, refer to *Writing* on page 5-29.)

### Note

- ◆ This initial label number can also be set from the CX-Designer.

## Alarm/Event History Recording Method

This function is used to display the method for recording the alarm/event histories.

The alarm/event history recording method is read-only and cannot be edited.

This alarm/event history recording method is set from the CX-Designer.

If a ring buffer is used, when the specified number of records is exceeded, the oldest data is deleted and the new data is recorded.

If the ring buffer is not used, the NS-Runtime stops collecting history data when the specified number of records has been reached. Initialize the alarm/event histories to reopen the history records.



Alarm/Event Rec.Method Use Ring Buffer

### Note

- ◆ For details on initializing the alarm/event histories, refer to *Initializing and Saving the Alarm/Event History* in this manual.

## Data Log Recording Method


This function is used to display the data log recording method.

The data log recording method is read only and cannot be edited.

The use of a ring buffer for the data log recording method is fixed.

When the specified number of log entries is exceeded, the oldest data is deleted and the new data is recorded.

Use the CX-Designer to set the number of log entries.



Data Log Rec. Method Use Ring Buffer (fixed)

### Note

- ◆ For information on the data log, refer to *Initializing and saving the Data Log* in this manual and *2-20-3 Data Log Function* in the NS Series Programming Manual.

Operation Log Recording Method

This function is used to display the method for recording the operation log.  
The operation log recording method is read only and cannot be edited.  
This operation log recording method is set from the CX-Designer.  
If the Use Ring Buffer is set, when the specified number of items is exceeded, the oldest data is deleted and the new data is recorded.  
If the log is not saved in ring buffer format, the PT stops collecting log data when the specified number of items has been reached. Initialize the operation log to reopen the record.

Oper. Log Rec. Method	Use Ring Buffer
-----------------------	-----------------

**Note**  
◆ For details on the operation log, refer to *Initializing and Saving the Operation Log* in this manual and 2-20-1 Operation Log Function in the NS Series Programming Manual.

Error Log Recording Method

This function is used to display the error log recording method.  
The error log recording method is read only and cannot be edited.  
The use of a ring buffer for the error log recording method is fixed.  
When the maximum number of items is exceeded, the oldest data is deleted and the new data is recorded.

Error Log Rec. Method	Use Ring Buffer (fixed)
-----------------------	-------------------------

**Note**  
◆ For details on the error log, refer to *Initializing and Saving the Error Log* in this manual and 2-20-4 Error Log Function in the NS Series Programming Manual.

System Memory

The allocated location in the host and address is displayed in the System Memory (\$SB and \$SW) and cannot be edited.

System Memory (\$SB)	Host:SERIALA
	Address:00000
System Memory (\$SW)	Host:SERIALA
	Address:DM00000

**Note**  
◆ Refer to 2-4 System Memory in the NS Series Programming Manual for details on the system memory.

## 5-6-4 Setting Passwords

The NS-Runtime's password function is divided into the following two functions.

### -Password Function

Requires a password input before allowing operations on a password-protected functional object.

### -Password with Levels Function

Requires a password for authentication when performing operations on a password-protected functional object for the first time.

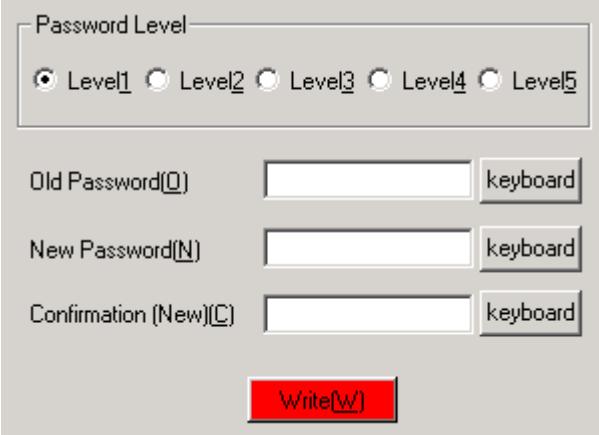
Once authentication has been completed, operations can be performed on all functional objects of the same or lower password levels.

Operations cannot be performed on functional objects protected with higher-level passwords.

The passwords are set from the CX-Designer and up to five passwords (5 levels) can be set for a single project. The passwords can be set and changed from the System Menu.

## Changing the Password

Perform the following procedure from the Password Tab Page to change the password.



The screenshot shows a dialog box titled "Password Level". At the top, there are five radio buttons labeled "Level1", "Level2", "Level3", "Level4", and "Level5". "Level1" is selected. Below this, there are three rows of input fields. The first row is labeled "Old Password(O)" and has a text box followed by a "keyboard" button. The second row is labeled "New Password(N)" and has a text box followed by a "keyboard" button. The third row is labeled "Confirmation (New)(C)" and has a text box followed by a "keyboard" button. At the bottom center, there is a red button labeled "Write(W)".

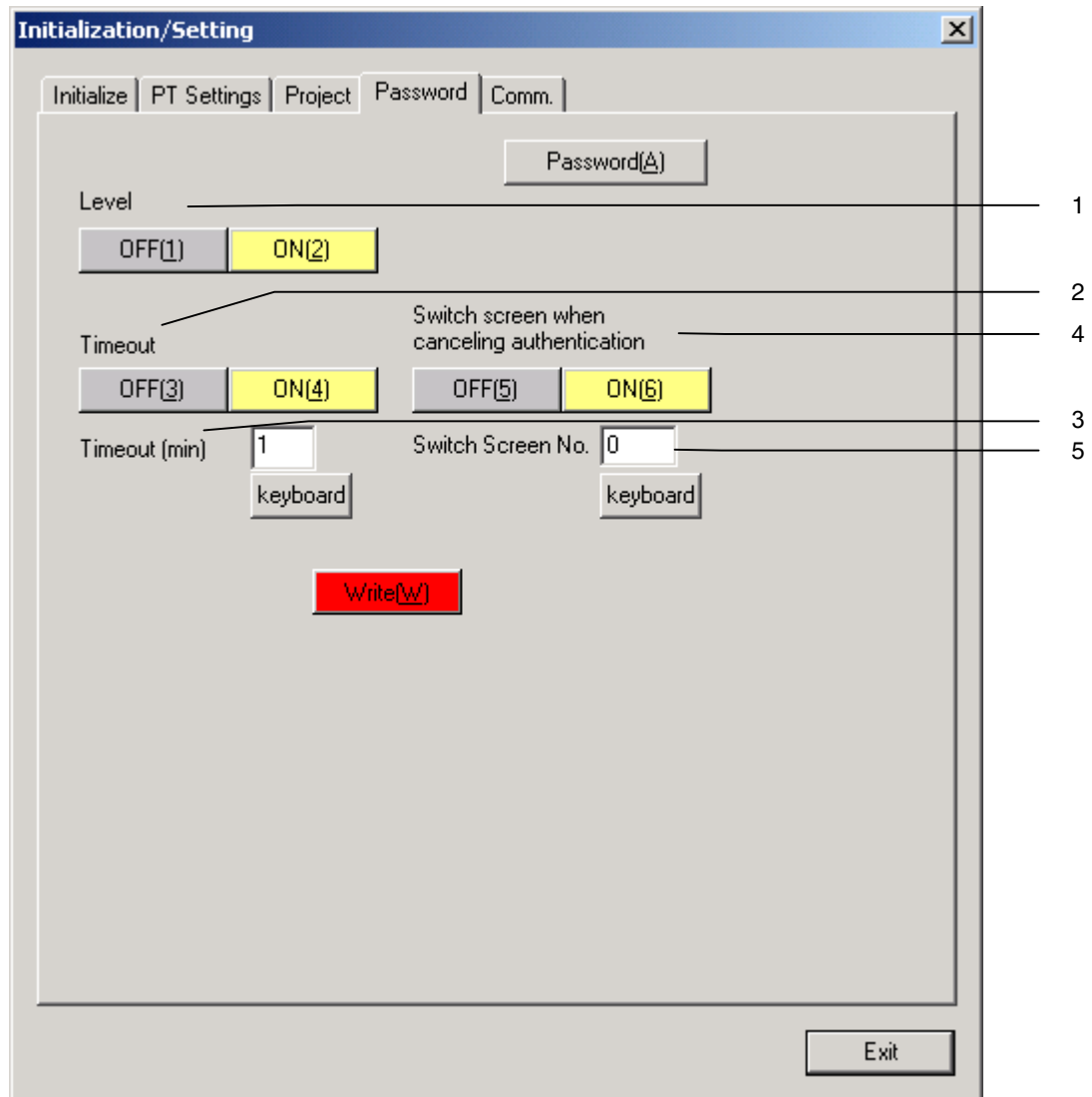
1. Select the password to be changed using the **Level 1** to **Level 5** Buttons
2. Input the old password and new password in the corresponding fields, and then input the new password again in the confirmation field.  
The "\*" symbols are displayed for the password and the actual password will not be shown on the screen.  
Input the password using the input keyboard or directly using the hardware keyboard.
3. After setting, click the **Write** Button to save the setting. (For details on the write button, refer to *Writing* on page 5-29.)



## Setting the Password Function

Perform the following procedure to set a password.

1. Open the **Password** Tab Page and click the Password Button.



No	Item	Function
1	Level	Click the <b>OFF</b> (password) or <b>ON</b> (password with levels) Button to select the function.
2	Timeout	Select the <b>ON</b> or <b>OFF</b> Button to specify whether authentication is automatically canceled (timed out) after a set time has elapsed. This option can be set when the password with levels function has been turned ON.
	On	A user is automatically timed out if there are no functional object operations within the timeout time.
	OFF	Authentication is not automatically canceled. To cancel authentication, click a command button set for cancellation.

No	Item	Function
3	Timeout (min)	When the Timeout Option is set to ON, this setting specifies the timeout time in minutes (1 to 60 minutes).
4	Switch screen when canceling authentication.	Click the <b>ON</b> or <b>OFF</b> Button to specify whether the screen is automatically switched to a specified screen when authentication is canceled. This option can be set when the password with levels function has been turned ON.
	ON	The screen is switched to the specified Switch Screen No. when authentication is canceled.
	OFF	The screen is not switched when authentication is canceled.
5	Switch Screen No.	If the switch screen when authentication is canceled has been turned ON, the screen is changed to the screen number set here when authentication is canceled.

- After setting, click the **Write** Button to save the setting. (For details on the write button, refer to *Writing* on page 5-29.)
- To change the password, click the Password Button.

### Note

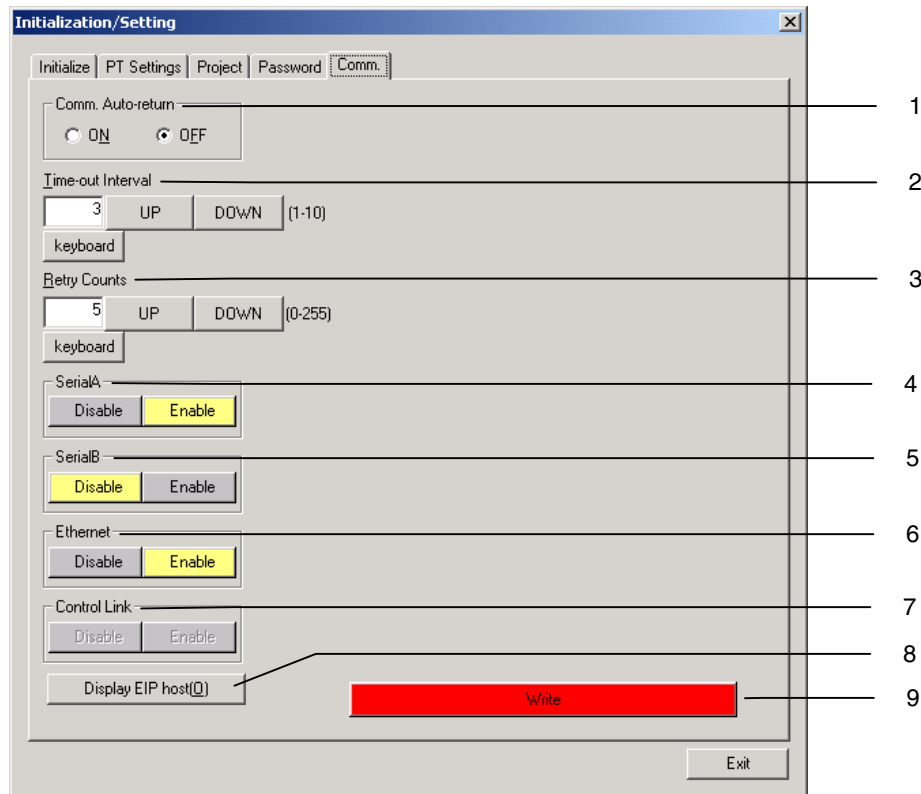
- ◆ When changing passwords, do not end the NS-Runtime until the write operation has been completed (until a write completion message is displayed). If the password is not saved properly, the screen may malfunction.
- ◆ The password settings can also be made from the CX-Designer.
- ◆ If the password is forgotten, it cannot be checked from the NS-Runtime. Check the password using the CX-Designer.

### 5-6-5 Communications Settings

This function is used to display and make communications settings.

After changing settings, click the **Write** Button to save the settings and restart the NS-  
Runtime.

Changed settings are enabled after the NS-Runtime is restarted.



The following items are displayed in the Comm. Tab Page.

No	Item	Function
1	Communications Auto-return	Selects whether automatic recovery is used when a communications error occurs.
2	Time-out Interval	Sets and displays the timeout monitor time.
3	Retry Counts	Sets and displays the number of communications retries.
4	Serial A	Sets and displays whether serial port A is used, the communications method and other details.
5	Serial B	Sets and displays whether serial port B is used, the communications method, and other details.
6	Ethernet	Sets and displays whether Ethernet is used and communications details.
7	Controller Link	Sets and displays whether Controller Link is used and communications details.
8	Display EIP host	Sets and displays detailed conditions for the host used with EtherNet/IP.
9	Write	Writes the settings.

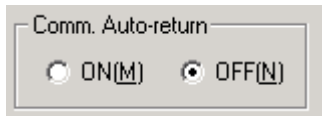
### Communications Auto-return

This function is used to select whether or not to use the communications auto-return using the **ON** and **OFF** Buttons.

**ON:** The NS-Runtime will automatically return to RUN mode when a communications error occurs, without displaying an error message dialog box.

**OFF:** The NS-Runtime will stop running when a communications error occurs and an error message dialog box will be displayed. Click the **OK** Button in the error message dialog box to return to RUN mode. The default setting is OFF.

Set the communications auto-return by using operations from the Comm. Tab Page as follows.



1. Select either ON or OFF for the Comm. Auto-return.
2. After setting, click the **Write** Button to save the setting. (For details on the write button, refer to *Writing* on page 5-29.)
3. The settings are enabled after the NS-Runtime is restarted.

### Time-out Interval

This function is used to set the time before a timeout error occurs when a response is not received from the host. The timeout interval can be set to between 1 and 10 (unit: second). The default setting is 3 seconds.

Set the timeout monitor time by using operations from the Comm. Tab Page as follows.



1. Set the Time-out Interval using the Up and Down buttons or the keypad that are displayed by clicking the Keyboard Button.
2. After setting, click the **Write** Button to save the setting. (For details on the write button, refer to *Writing* on page 5-29.)
3. The settings are enabled after the NS-Runtime is restarted.

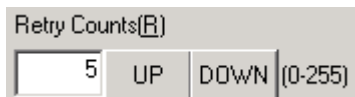
## Retry Counts

This function is used to set the number of retries for communications before an error screen will be displayed, when a communications error occurs while communicating with the host.

If communications are still unsuccessful even after the number of communications retries specified here have been executed, the process set for the communications auto return will be executed.

The number of retries can be set to between 0 and 255 times. The default setting is 5 retries.

Set the communications auto-return by using operations from the Comm. Tab Page as follows.



1. Input the value by using the Up and Down buttons or the keypad that are displayed by clicking the Keyboard Button.
2. After setting, click the **Write** Button to save the setting. (For details on the write button, refer to *Writing* on page 5-29.)
3. The settings are enabled after the NS-Runtime is restarted.

## Serial A / Serial B

This function is used to display and set whether to use the serial ports A /B and the communications conditions.

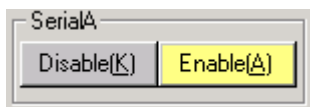
### Note

- ◆ The NS-Runtime supports the host link and toolbus when the serial ports A/B is used for the communications.
- ◆ Host Link connections are not supported for CJ2 CPU Units.

Make the settings for the serial port A by using operations from the Comm. Tab Page as follows.

In the same way, make the settings for the serial port B.

1. Select the **Disable** / **Enable** for the Serial A.



2. When selecting the Enable, set and display the details of serial port A.

No	Item	Function	Setting Range
1	Serial Port	Selects the serial port to be used to connect to the host.	Select any port that can be used with the NS-Runtime environment.
2	Protocol	Selects the method for connecting to the host.	Toolbus, Host Link
3	Comm. Speed	Selects the baud rate.	19200,38400,57600 or 115200
4	Host Selection	Selects the host type.	SYSMAC-CV, SYSMAC-CS1, SYSMAC-CJ1, or SYSMAC-CJ2

3. After setting, click the **Write** Button to save the setting. (For details on the write button, refer to *Writing* on page 5-29.)
4. The settings are enabled after the NS-Runtime is restarted.

## Ethernet

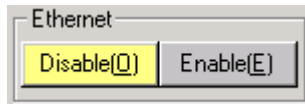
This function is used to display and set whether to use the Ethernet and the detailed conditions.

IP address, subnet mask, and default gateway cannot be set from the system menu.

To change the settings, change them from the **Control Panel – Network Connections** of the Windows.

Make the Ethernet settings by using operations from the Comm. Tab Page as follows.

1. Select **Disable** or **Enable** for the Ethernet.



2. When selecting the Enable, set and display the Ethernet details. To change the settings, use UP and DOWN Buttons, or a keypad that is displayed by clicking the keyboard button.

Ethernet Setting

Network  UP DOWN keyboard 1

Node Address[U]  UP DOWN keyboard 2

MAC Address  3

IP Address Table[H] keyboard 1/4 4

Node	IP					
<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	UP
<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	
<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	
<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	
<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	
<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	
<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	
<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	DOWN

No	Item	Function	Setting Range
1	Network	Sets and displays the local network address.	1 to 127
2	Node Address	Sets and displays the local node address.	1 to 254
3	MAC Address	Displays MAC Address.	Read-only
4	IP Address Table	Sets and displays the node numbers and IP addresses of other nodes connected through Ethernet.	Node: 1 to 255 IP Address :0.0.0.0 to 255.255.255.255

3. After setting, click the **Write** Button to save the setting. (For details on the write button, refer to *Writing* on page 5-29.)
4. The settings are enabled after the NS-Runtime is restarted.

## EtherNet/IP

You can change the IP address and root path of the selected host. The host type can only be displayed. It cannot be changed.

Use the following procedure from the Comm. Tab Page to change the IP address.

1. Click the **Display EIP host** Button.
2. In the Host Name Field, select the host for which you want to change the settings.
3. To change the IP address, click the **Keyboard** Button and enter the IP address using the tenkey that is displayed. To change the root path, press the **Setting** Button by the Communication Path Field and select the host to be connected from the dialog box that is displayed.

The screenshot shows the 'Initialization/Setting' window with the 'Comm.' tab selected. The window contains several sections for configuration:

- Comm. Auto-return:** Radio buttons for ON and OFF.
- Time-out Interval:** A numeric input set to 3, with UP and DOWN buttons, and a range of (1-10).
- keyboard:** A button for keyboard input.
- Retry Counts:** A numeric input set to 5, with UP and DOWN buttons, and a range of (0-255).
- SerialA:** Disable and Enable buttons.
- SerialB:** Disable and Enable buttons.
- Ethernet:** Disable and Enable buttons.
- Control Link:** Disable and Enable buttons.
- Display EIP host(Q):** A button.
- EtherNet/IP Host Settings:**
  - Host Name:** A dropdown menu showing 'HOST3' (callout 1).
  - Host Type:** A text field showing 'SYSMAC-CJ2'.
  - Address(H):** A dropdown menu showing 'Keyboard' (callout 2).
  - Root Path:** A text field showing 'TCP:2\192.168.250.2\backplane0' (callout 3).
  - Communication Path:** A section containing a 'Setting(N)' button (callout 4).
- Write:** A large red button at the bottom center.
- Exit:** A button at the bottom right.

No.	Item	Function	Setting
1	Host Type	Displays the host type.	Display only
2	Address	Sets the IP address of the host (if IP address is selected as the method for specifying the communications destination).	0.0.0.0 to 255.255.255.255
3	Root Path	Displays the root path of the host (if root path is selected as the method for specifying the communications destination).	Display only
4	Communication Path	Displays an EIP host that is on the EtherNet/IP network.	Root path specification

- After making the settings, click the **Write** Button to save the settings. (For details on the **Write** Button, refer to Writing, above.)
- The settings will be enabled when the NS-Runtime is restarted.

### Controller Link

This function is used to set and display whether to use Controller Link and detailed conditions.

Make the Controller Link settings by using operations from the Comm. Tab Page as follows.

- Select **Disable** or **Enable** for the Controller Link.

The image shows a close-up of the 'Control Link' section. It contains two buttons: 'Disable(P)' and 'Enable(L)'. The 'Enable(L)' button is highlighted with a yellow background.



- When selecting the Enable, set and display the Controller Link details. To change the settings, use UP and DOWN Buttons, or the keypad that is displayed by clicking the keyboard button.

Controller Link

Network Address[I] 1

Node Address[U] 1 UP DOWN

keyboard

Comm. Speed

500K[X] 1M[Y] 2M[Z]

1

2

3

No	Item	Function	Setting Range
1	Network Address	Sets and displays the local network address.	Read-only
2	Node Address	Sets the local node address.	1 to 254
3	Comm. Speed	Sets the baud rate.	500K, 1M, 2M

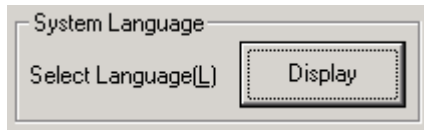
- After setting, click the **Write** Button to save the setting. (For details on the write button, refer to *Writing* on page 5-29.)
- The settings are enabled after The NS-Runtime is restarted.

## 5-7 System Language

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The system language can be selected. The system language will be used on the system menu, keypads, message dialog boxes, etc, on the NS-Runtime.

The system language is displayed in the System Menu using the following procedure.



1. Click the **Display** Button for the system language. The System Language Dialog Box will be displayed. Select the system language.



2. Click the **OK** Button to switch the system language.  
Click the **Cancel** Button not to switch the system language.

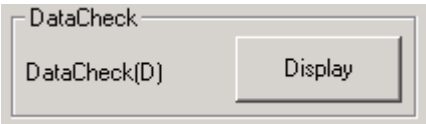
# 5-8 Screen Data Check

Registered screens (numbers 0 to 3,999) can be displayed and checked using operations from the System Menu.

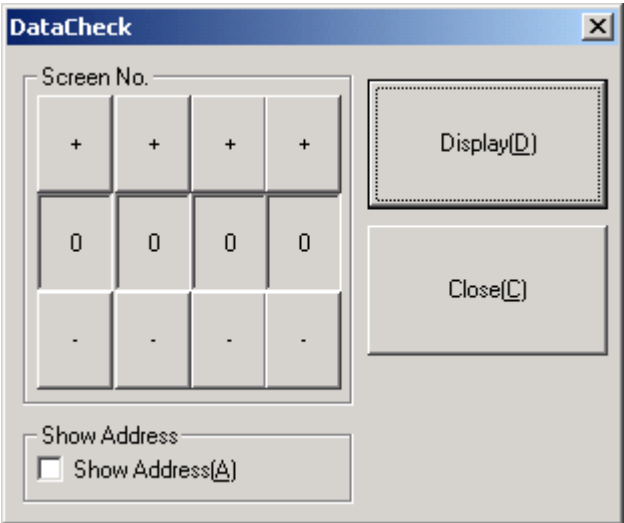
**Note**

- ◆ The screen displayed when checking screen data is a sample and cannot be used to communicate with the host. The flicker function is also disabled.

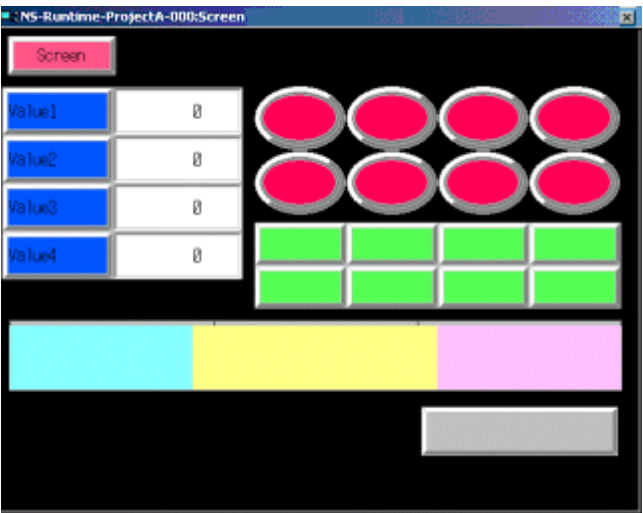
Display the DataCheck Screen by using the following procedure from the System Menu.



1. Click the Display Button next to the Data Check in the system menu. DataCheck Screen will be displayed.



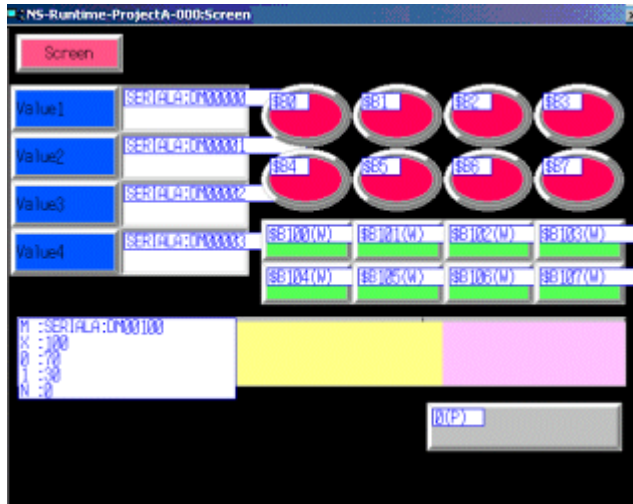
2. Set the screen number and click the **Display** Button. The screen will be displayed as a sample on another screen.



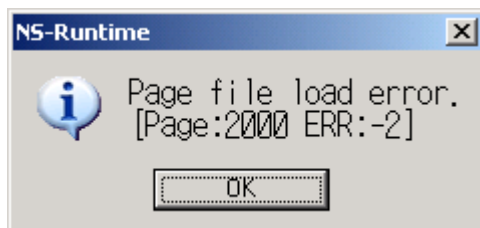
**Note**

- ◆ The window size will be the same as the created screen size. The window size cannot be changed.
- ◆ Document display object will not be displayed.

3. Select the **Show Address** and display the sample screen to display the set address instead of the label objects.



4. If the specified screen number does not exist, the following dialog box will be displayed. Specify an existing screen number.

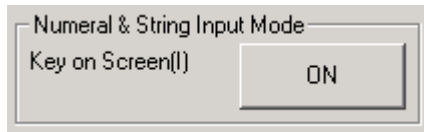


5. Click the displayed sample screen to go back to the DataCheck screen.

## 5-9 Numeral & String Input Mode

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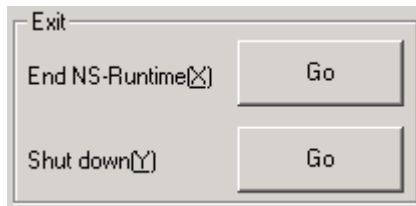
This function is used to set whether to use virtual keyboard and keypad to input numerals and strings to functional objects.



Turn ON the Key on Screen to input numerals and strings with virtual keyboard and keypad.  
Turn OFF the Key on Screen to input them with hardware keyboard. The default setting is ON.

## 5-10 Exit

This function is used to execute the end processing.



Item	Function
End NS-Runtime	Ends the NS-Runtime.
Shut down	Ends the NS-Runtime and shuts down Windows.

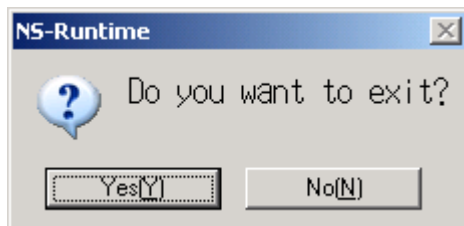
This section describes how to use these functions.

### 5-10-1 End NS-Runtime

This function is used to end the NS-Runtime.

End the NS-Runtime by using the following procedure from the System Menu.

1. Click the **Go** Button next to the End the NS-Runtime. The following message confirming the end will appear.
2. Click the **Yes** Button to end the NS-Runtime. Click the **No** Button to cancel the end function.



#### Note

- ◆ The NS-Runtime can also be shut down by turning On the \$SB63 in the system memory.

### 5-10-2 Shut Down

This function is used to end the NS-Runtime and shut down Windows.

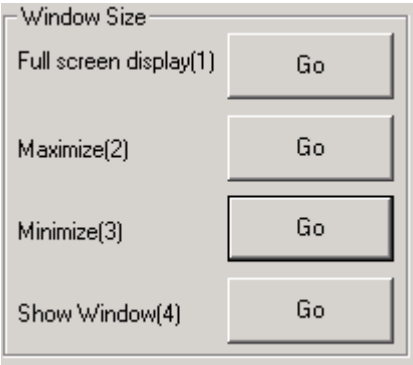
End the system by using operations from the System Menu as follows.

1. Click the **Go** Button next to the Shut down. The following message confirming the end will appear.
2. If the **Yes** Button is clicked the NS-Runtime will end and then Windows will shut down. If the **No** Button is clicked both the NS-Runtime and Windows will not end.



# 5-11 Window Size

This function is used to change the main window size. User can select the Full screen display, Maximize, Minimize or Show window as the main window size.



Item	Function
Full screen display	Displays the NS-Runtime main window in a full screen.
Maximize	Maximizes the NS-Runtime main window.
Minimize	Minimizes the NS-Runtime main window.
Show Window	Displays the NS-Runtime main window in the specified size.

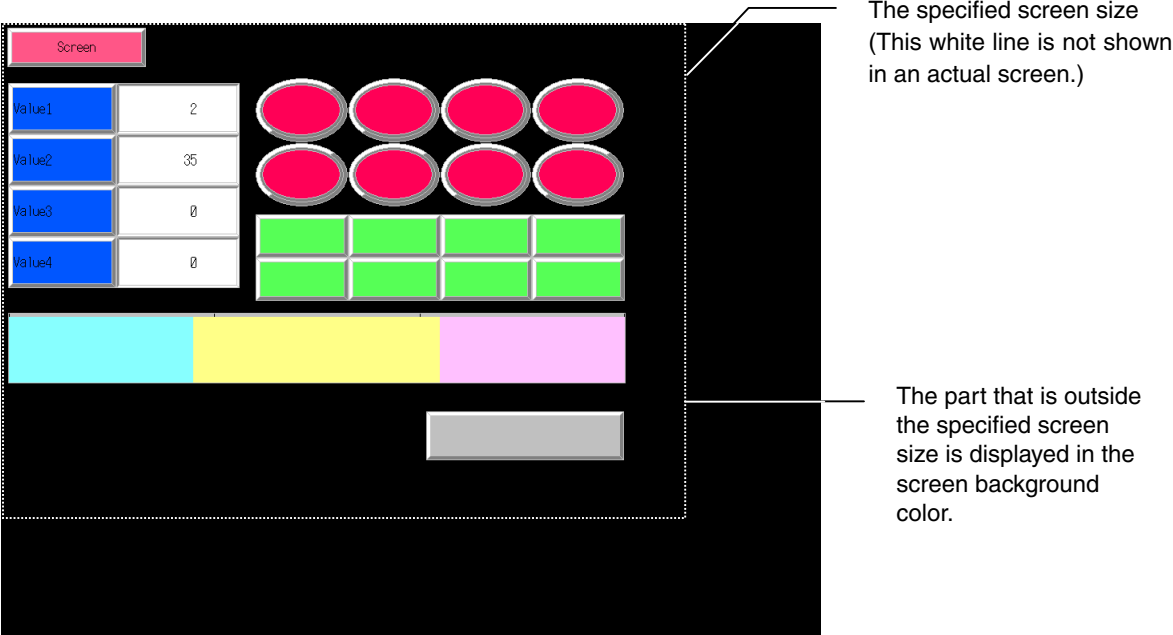
**Note**

◆ Immediately after the NS-Runtime startup, the main window will be displayed in a full screen.

This section describes how to use these functions.

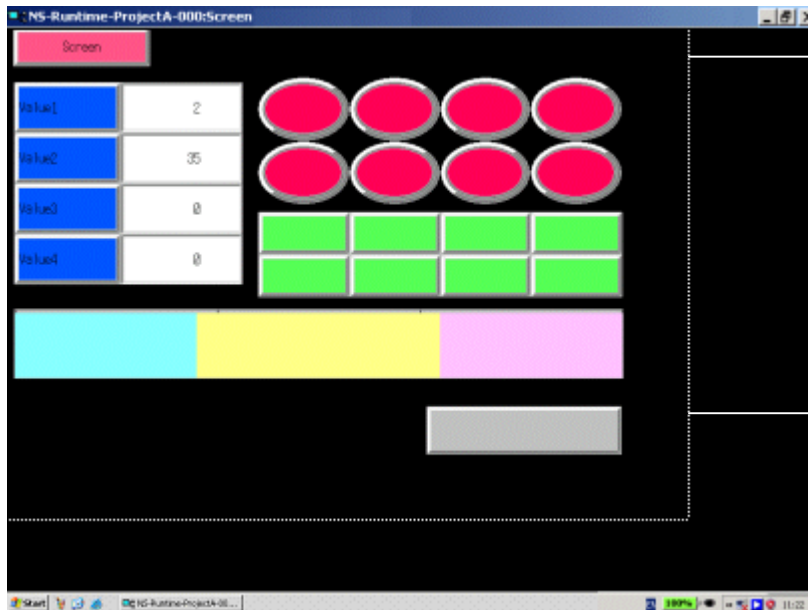
## 5-11-1 Full screen display

1. Click the **Go** Button next to the Full screen display. The NS-Runtime main window will be displayed in a full screen.



## 5-11-2 Maximize

1. Click the **Go** Button next to the Maximize. The NS-Runtime main window will be maximized.  
The NS-Runtime main window will be displayed on the whole screen except for the taskbar.

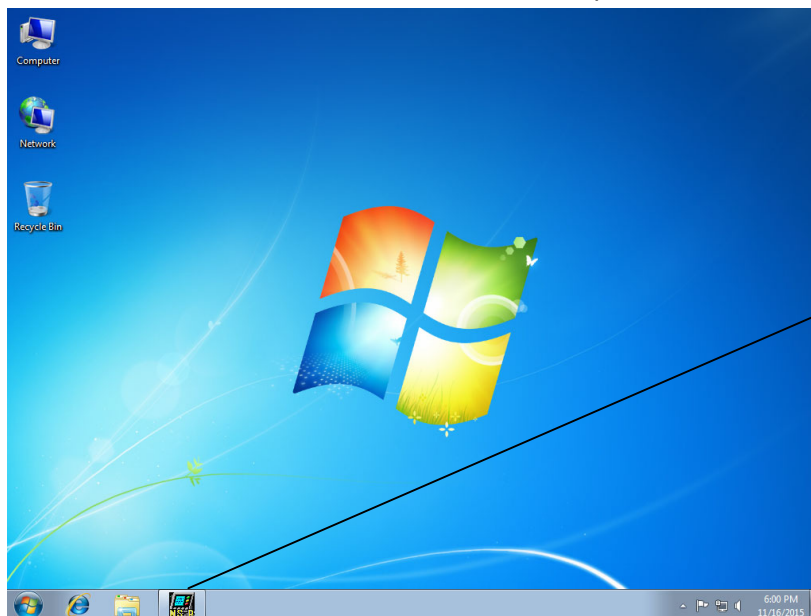


The specified screen size  
(This white line is not shown  
in an actual screen.)

The part that is outside  
the specified screen size  
is displayed in the screen  
background color.

## 5-11-3 Minimize

1. Click the **Go** Button next to the Minimize. The NS-Runtime main window will be minimized.  
Click the button on the taskbar to return to the previous size.

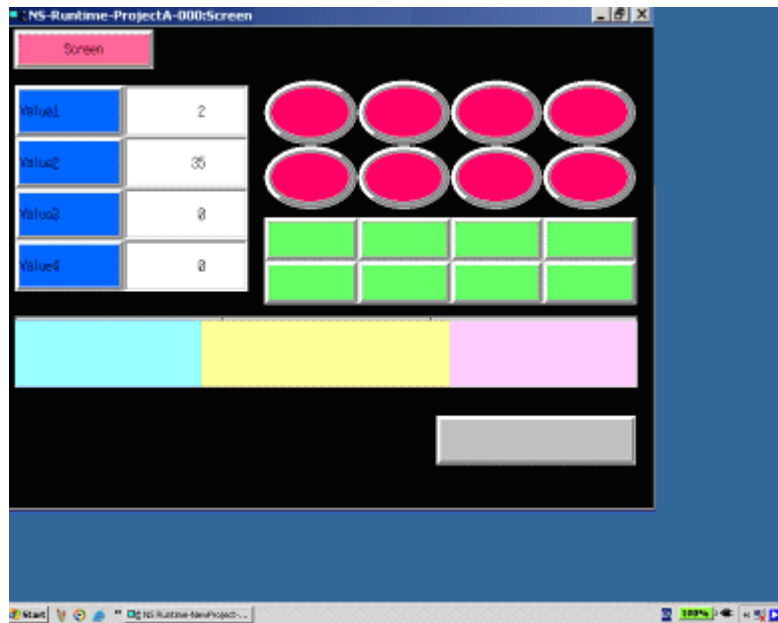


Minimized



### 5-11-4 Show Window

1. Click the **Go** Button next to the Show Window. The NS-Runtime main window will be displayed in the specified size.  
If the window size is smaller than the size specified with the screen data, this function displays only the left-top part of the screen that is within the specified size. In this case, scroll bars will not be displayed.





## Section 6

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# Transferring Project Data

This section describes how to send created or modified screen data to the NS-Runtime environment and to register them. It also describes how to read data registered in the NS-Runtime.

6-1 Transfer Methods .....	6-2
6-2 Transferring Data Using a Memory Card.....	6-3
6-3 Transferring Data from the CX-Designer .....	6-11

## 6-1 Transfer Methods

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Use the following methods to transfer project data to the NS-Runtime.

Method	When to use
Transfer using memory card	When the environment in which screens are created with the CX-Designer and the NS-Runtime environment differ.
Transfer from CX-Designer	When the CX-Designer has been installed in the NS-Runtime environment.

**Note**

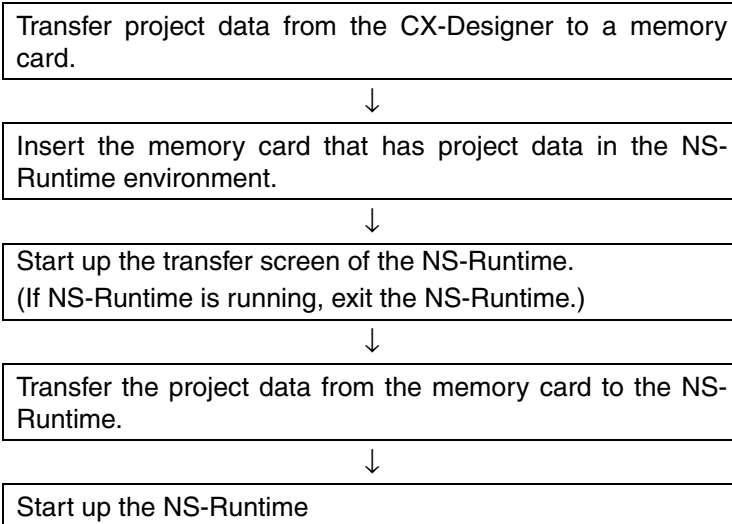
- ◆ To transfer via memory cards, refer to the Appendix 9 List of Optional Products in the NS Series Setup Manual and use recommended memory cards and memory card adapters.

## 6-2 Transferring Data Using a Memory Card

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If the environment in which screens are created with the CX-Designer and the NS-Runtime environment differ, transfer the project data using a memory card.

The procedures for transferring (downloading) data to the NS-Runtime are described as below.

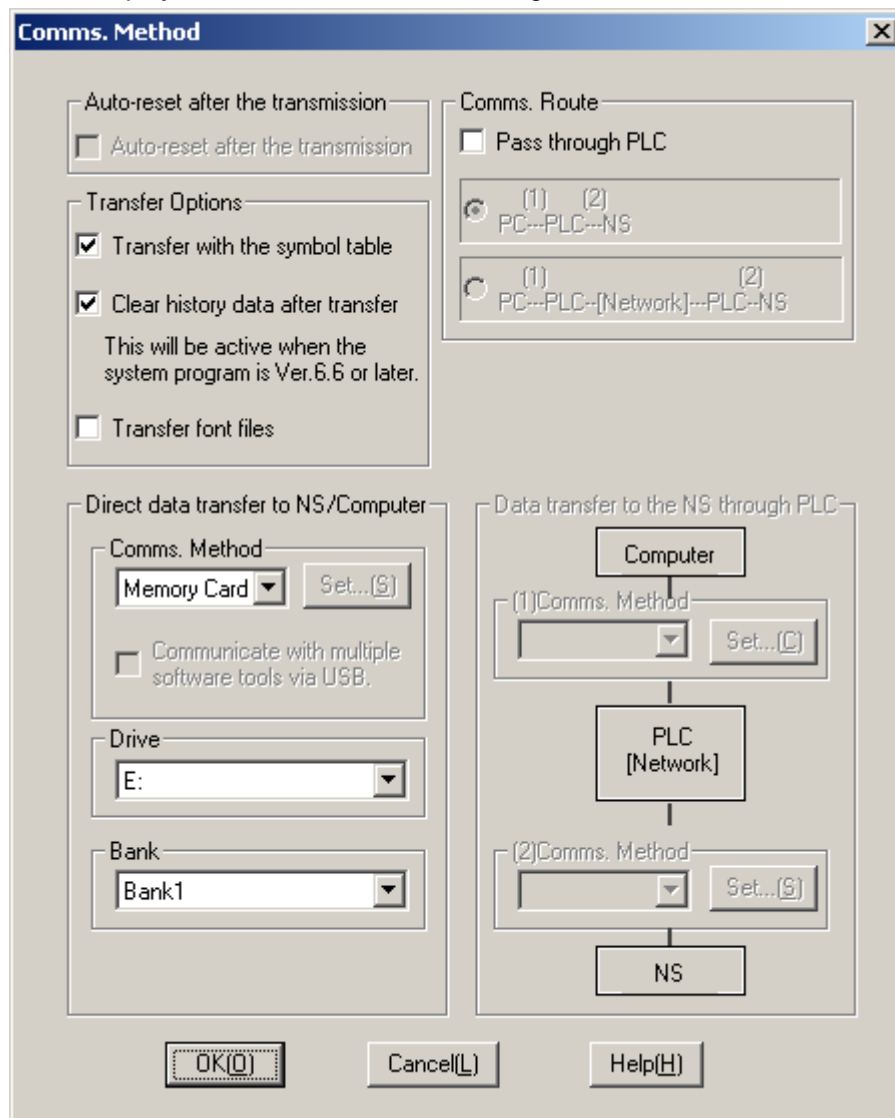
**Note**

- ◆ To upload data from the NS-Runtime, conduct the opposite procedure.

## 6-2-1 Downloading the Project Data

Use the following procedures to download the project data.

1. Insert a memory card in the CX-Designer environment.
2. From the CX-Designer, display the **Comms. Method Dialog Box** by any of the following ways.
  - Select **PT Menu – Transfer – Transfer Setting**
  - Select **PT Menu – Transfer – Quick Transfer [To PT]**. Click the **Setting** Button in the displayed dialog box.
  - Select **PT Menu – Transfer [To PT]**. Click the **Setting** button in the displayed dialog box.
  - Select **PT Menu – Transfer - Transfer Program**. Click the **Comms. Method** button in the displayed Screen Data Transfer Dialog Box.



3. Select the **Memory Card** from the Comms. Method.  
Specify a drive with the **Drive**. (A memory card must be inserted in the drive).  
Specify a bank with the **Bank** to transfer project data.
4. Click the **OK** Button to close the Comms. Method Dialog Box.

5. Transfer the project data by any of the following ways.
  - PT Menu – **Transfer** – **Quick Transfer [To PT]** Menu.  
(Use this method when the project data has been transferred already and you want to send only changed data to the NS-Runtime.)
  - PT Menu – **Transfer** – **Transfer [To PT]**  
(Use this method to send all project data to NS-Runtime.)
  - Screen data Transfer Program (PT Menu – **Transfer** – **Transfer Program**)
6. Insert the memory card that has project data in an NS-Runtime environment.
7. If the NS-Runtime has already started up, start up the transfer screen from the Screen Transfer in the System menu. (A confirmation message will be displayed to ask whether to exit the NS-Runtime. Click the **OK** Button and end the NS-Runtime.)  
If the NS-Runtime is not started up, start up the transfer screen by selecting from the Windows Start menu or Start screen **DriveTrans**.
8. The following screen will be displayed.



9. Select the **Download** from the Direction.  
Specify a drive with the Specify drive. (A memory card must be inserted in the drive.)  
Specify a bank that has project data with the Specify bank.  
The Project file field and the System version field show the project information that is stored in specified bank of the memory card and in the NS-Runtime. Check the information and click the **OK** button.

10. A confirmation dialog box will be displayed to ask whether to clear history data or not. Select either **Yes** or **No**. Then click the **OK** button.



**Note**

- ◆ Always delete the histories when downloading the project data in the following cases:
  - 1) when the alarm/event settings, data log settings, or any other settings related to the histories have been changed or
  - 2) when downloading a project that is different from the one currently in the NS-Runtime.

11. A warning dialog box will be displayed, if the data of models, system programs/screen data versions and languages are different between data stored in the NS-Runtime and data stored in the memory card.  
If the transfer is possible, transfer will be executed when **OK** button is clicked.  
If the transfer is impossible or if the **Cancel** button is clicked, the screen will go back to the step 8. Select the project to transfer again.



12. When the transfer starts, project data that has been stored in the NS-Runtime will be deleted.

While data is being transferred, screen indicating that download in progress will be displayed. On completion of the transfer, the **Transmission Complete** screen will be displayed.



13. Click the **Restart** button to close the transfer screen and to end the NS-Runtime.  
Click the **Exit** button to close the transfer screen.

**Note**

- ◆ The methods for using CX-Designer's Menus and screen data transfer program are the same as those of the NS Series. For details, refer to the Transferring Data to the PT in the CX-Designer Online Help.

## 6-2-2 Uploading the Project Data

Use the following procedures to upload the project data.

1. Insert a memory card in the NS-Runtime environment.
2. If the NS-Runtime has already started up, start up the transfer screen from the Screen Transfer in the System Menu. (A confirmation message will be displayed to ask whether or not to exit the NS-Runtime. Click the **OK** button and end the NS-Runtime.)  
If the NS-Runtime is not started up, start up the transfer screen by selecting from the Windows Start menu or Start screen **DriveTrans**.

3. The following screen will be displayed.

Screen Data Transfer

Direction: Download(W) Screen Storage Drive->Main Unit (selected), Upload(U) Main Unit->Screen Storage Drive

Specify drive(Δ): E:\

Specify bank: BANK1 (selected), BANK2, BANK3, BANK4

Screen Storage Drive: Project file: TEST1.JPP, System version: No System File

Main Unit: Project file: ProjectA.JPP, System version: 6.60

OK, Cancel

4. Select the **Upload** from the Direction.  
Specify a drive with the Specify drive. (A memory card must be inserted in the drive)  
Specify a bank that has project data with the Specify Bank.  
The Project file field and the System version field show the project information that is stored in specified bank of the memory card and in the NS-Runtime.  
Confirm the information and click the **OK** button.

5. Transfer confirmation screen will be displayed. Click the **OK** button to execute the transfer.



6. While data is being transferred, screen indicating that upload in progress will be displayed. On completion of the transfer, the **Transmission Complete** screen will be displayed.



7. Click the **Restart** button to close the transfer screen and to restart the NS-Runtime. Click the **Exit** button to close the transfer screen.

8. Take out the memory card from the NS-Runtime environment.
9. Insert the memory card in a computer in which CX-Designer has been installed.
10. Start up the CX-Designer. Then upload the project data from the memory card.

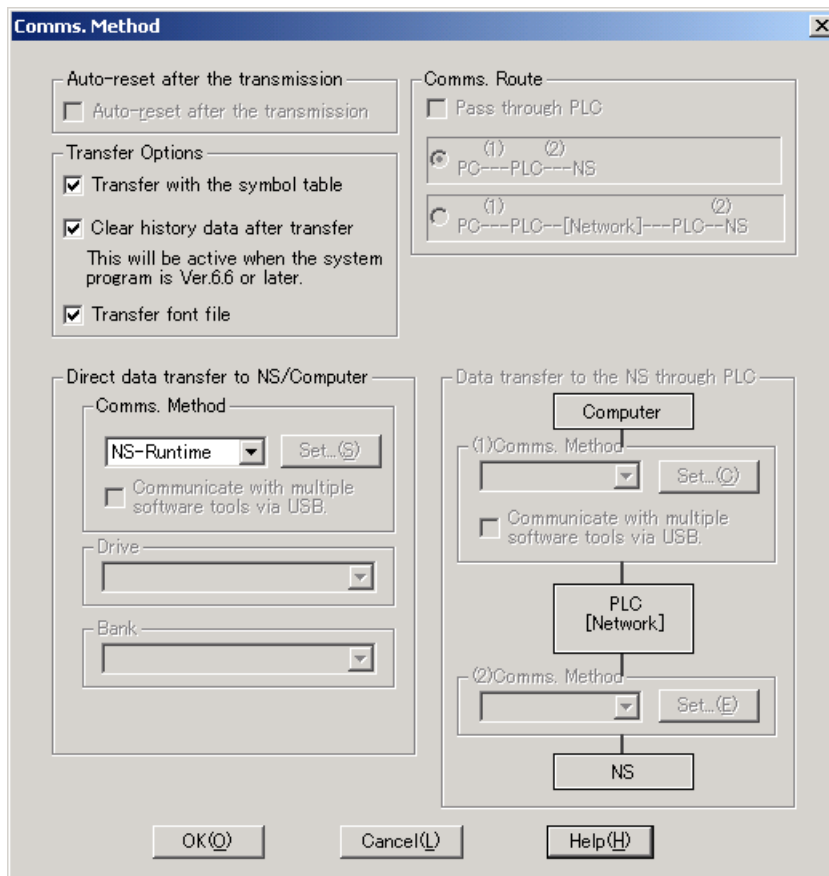
**Note**

- ◆ The methods for using CX-Designer's Menus and screen data transfer program are the same as those for the NS Series. For details, refer to the Transferring Data to the PT in the CX-Designer Online Help.

## 6-3 Transferring Data from the CX-Designer

If the CX-Designer has been installed in the NS-Runtime environment, project data edited with the CX-Designer can be downloaded/uploaded to the NS-Runtime. Use the followings transfer procedures.

1. Exit the NS-Runtime.
2. Display the **Comms. Method Dialog Box** by any of the following ways with the CX-Designer.
  - Select **PT Menu - Transfer - Transfer Setting**
  - Select **PT Menu - Transfer - Quick Transfer [To PT]**. Click the **Setting** Button in the displayed dialog box.
  - Select **PT Menu - Transfer [To PT]**. Click the **Setting** Button in the displayed dialog box.
  - Select **PT Menu - Transfer - Transfer Program**. Click the **Comms. Method** Button in the displayed Screen Data Transfer Dialog Box.



3. Select the **NS-Runtime** from the Comms. Method
4. Click the **OK** Button to close the Comms. Method Dialog Box.
5. Transfer the project data by any of the following methods.
  - PT Menu – **Transfer** – **Quick Transfer [To PT]** Menu  
(Use this method to send only changed data to NS-Runtime.)
  
  - PT Menu – **Transfer** – **Transfer [To PT]** Menu  
(Use this method to send all project data to NS-Runtime.)
  
  - PT Menu – **Transfer** – **Transfer [From PT]** Menu  
(Use this method to receive project data from NS-Runtime.)
  
  - PT Menu – **Transfer** – **Transfer Program** – **Screen data transfer program**
6. After the transfer, restart the NS-Runtime.

**Note**

- ◆ Project data cannot be transferred while NS-Runtime is running.
- ◆ The downloaded project data will be stored in the following project storage folder.  
  \ NS-Runtime Installation folder \ Runtime  
  Project data that is stored in this folder can be directly opened from the CX-Designer.  
  In this case, it is not necessary to transfer the modified project data again.
- ◆ Downloaded project data (Project data stored in \ NS-Runtime Installation folder \ Runtime) cannot be transferred by the CX-Designer if the project data is being edited with another CX-Designer.
- ◆ Operation methods for using CX-Designer's Menus and screen data transfer program are the same as those for NS Series. For details, refer to the Transferring Data to the PT in the CX-Designer Online Help.

## Section 7

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# Troubleshooting

This section describes the countermeasures for errors that may occur when creating projects with the CX-Designer or operating them with the NS-Runtime.

This section explains errors specific to the NS-Runtime. For information on other errors, refer to 5 Troubleshooting and Maintenance in the NS Series Programming Manual.

7-1 Troubleshooting Errors When Creating Screens.....	7-2
7-2 Troubleshooting Errors during NS-Runtime Operation.....	7-3
7-3 Error Messages and Countermeasures .....	7-4

## 7-1 Troubleshooting Errors When Creating Screens

This section describes possible errors occurred when creating screens with the CX-Designer and their countermeasures.

This section explains errors specific to the NS-Runtime. Refer to 5 Troubleshooting and Maintenance in the NS Series Programming Manual for information on other errors.

Symptoms	Cause	Possible Countermeasure
Cannot resize a screen in the screen properties.	Values out of range are set for the screen size.	The size must be the same or smaller than the maximum screen size that is set in the System Setting Menu under the PT Menu.
Cannot convert a Project.	Attempted to convert projects, for which the serial port A/B is set to the following settings, to NS-Runtime.  -Host Type is other than SYSMAC-PLC -Temperature Controller Unit -Memory Link -Bar code -Modem Connection	Convert a project for which serial port is set to the PLC and the host type is set to the SYSMAC-PLC. Or, convert a project for which the serial port is set to the Not used.
	Attempted to convert an NS-Runtime project with more than 50,000 records in a normal log to an NS-series project.	Change the log so that it contains less than 50,000 records and attempt the conversion again.
	Attempted to convert an NS-Runtime project with macros supported only by the NS-Runtime to an NS-series project.	Delete macros that can be used only for NS-Runtime and attempt the conversion again.
	Attempted to convert an NS-Runtime project into an NS-series project using version 3.0 or lower of the CX-Designer.	Projects cannot be converted from NS-Runtime project the NS-series projects using version 3.0 or lower of the CX-Designer.
Cannot set the Save Cycle for \$HB/\$HW and Data Log.	Value out of range has been set for the Save Cycle in the system setting dialog box.	Set a value to between 1 second and 24 hours for the save cycle.
Cannot save data log setting.	The logging points total that have been set in Data Log Setting Dialog Box exceed 160,000 points.	Set it to 160,000 points or less.
Cannot save a document table setting.	Attempted to set an invalid path for the document folder.	Specify a correct path.
	The file extension is not '.pdf'.	Specify a file which extension is '.pdf'.
Cannot arrange a document display object.	Attempted to create a document display object on a frame, sheet or pop-up screen.	Create a document display object on a base screen.
	Attempted to create two or more document display objects on one screen.	Only one document display object can be created on each screen.



## 7-2 Troubleshooting Errors during NS-Runtime Operation

This section describes possible errors occurred during NS-Runtime operation and their countermeasures.

This section explains errors specific to NS-Runtime. For information on other errors, refer to 5 Troubleshooting and Maintenance in the NS Series Programming Manual.

Symptom	Cause	Possible countermeasure
Cannot start a project with the NS-Runtime.	The project model is not NS-Runtime.	Change the project to NS-Runtime. Or, transfer a project which model is NS-Runtime.
	The project is not downloaded.	Download a project using the screen transfer function.
	USB dongle is not connected.	Connect the USB dongle provided with the NS-Runtime.
Cannot display a document.	Adobe(R) Reader is not installed.	Install Adobe(R) Reader.
	Adobe Reader provided by Windows Store is used.	Use Adobe Reader provided by Adobe Systems Inc.
	An invalid file is specified.	Specify a correct PDF file.
	A document number, for which a document file is not set, or a document number out of range has been specified.	Specify a correct document number.
	The document display direction address is turned OFF.	Turn ON the document display direction address. When selecting the document display direction address, the document will be refreshed only when the specified address is ON.
Cannot check a screen using the data check of the system menu.	Screen data that you are trying to check does not exist.	Specify an existing screen data number.
Cannot start up CX-Programmer from the system menu.	CX-Programmer is not installed.	Install the CX-Programmer.
Cannot start up SwitchBox Utility from the system menu.	SwitchBox Utility is not installed.	Install the SwitchBox Utility.
Slow display refresh	Frequent opening/closing of screens and pop-up screens or frequent switching of frames.	If screens or frames are switched or pop-up screens are opened and closed too frequently, the display may update slowly and communications may be delayed. Adjust the interval between screen switches to prevent system overload.
	Frequent executing of macros including READCMEM and WRITECMEM that communicate with the PLC.	Too many communication points or inconsecutive addresses may slow communications. Try to read and write consecutive addresses all at once.
	Short save cycle for the Internal Holding Memory.	Adjust the save cycle to prevent system overload.
	The computer is malfunctioning, e.g., due to noise.	Use an environment with less noise.
Operation is not stable.	The computer is malfunctioning, e.g., due to noise.	Use an environment with less noise.

## 7-3 Error Messages and Countermeasures

This section describes the countermeasures for errors that are peculiar to the NS-Runtime. For information on other error messages, refer to 5-2 Error Messages in the NS Series Programming Manual and the Error messages and Countermeasures in the CX-Designer Online Help.

Messages displayed on the CX-Designer.

Message	Cause	Possible Countermeasure
The project for conversion does not support xx. Cancel the setting of xx before converting.	Attempted to convert a project for which the serial port A/B was set to one of the following settings to NS-Runtime. -Host type other than SYSMAC-PLC -Temperature Controller -Memory Link -Barcode -Modem connection -General-purpose protocol	Convert a project for which the serial ports are set to the SYSMAC-PLC, or convert a project for which the serial ports are set to be not used.
	Attempted to convert a project for which the host type connected to Ethernet was not SYSMAC-CS1/CJ1/CP1 or SYSMAC-CV to NS-Runtime.	Convert a project for which the host type connected to Ethernet is SYSMAC-CS1/CJ1/CP1 or SYSMAC-CV.
Process was aborted because a setting that cannot be converted was found. For details, refer to the Output Window.	Attempted to convert an NS-Runtime project with more than 50,000 records in a normal log to an NS-series project.	Change the log so that it contains less than 50,000 records and attempt the conversion again.
	Attempted to convert an NS-Runtime project with macros supported only by the NS-Runtime to an NS-series project.	Delete macros that can be used only for NS-Runtime and attempt the conversion again.
Only one document display can be placed in a screen.	Attempted to place two or more document display objects on one screen.	Only one document display can be created on each screen.
A document display cannot be created on a sheet.	Attempted to place a document display object on a sheet.	Create a document display object on a base screen.
The object that cannot be arranged on the pop-up screen is contained.	Attempted to place a document display objects on a pop-up screen.	Create a document display object on a base screen.
Some objects cannot be pasted on the frame.	Attempted to place a document display object on a frame object.	Create a document display object on a base screen.
The Document Folder Path is not set.	Document folder path has not specified in a Document Table Setting Dialog Box.	Specify a path.
Specify the Save Cycle to between 1 second and 24 hours.	Value out of range has been set for the save cycle of the Internal Holding Memory in the System Setting Dialog Box.	Set a value to between one second and 24 hours for the save cycle.
Destination folder is not set.	On the system setting dialog box, the save destination of history data has not been selected yet.	Specify a path.

## Messages displayed on the NS-Runtime

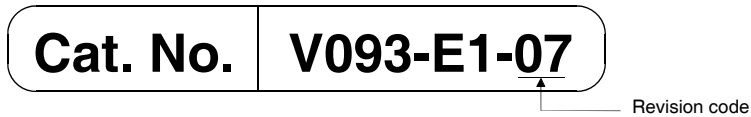
Message	Cause	Possible Countermeasure
Failed to initialize CX-Server. Check if CX-Server is Installed and then re-start the system.	CX-Server is not installed.	Install the CX-Server.
Failed to acquire host information. Check the communication setting with the support tool and transfer the project data again.	Cannot read project data. (Not downloaded or corrupted.)	Download project data.
Failed to initialize communication processing. Exit the application except Run and re-start the system.	Cannot read project data. (Not downloaded or corrupted.)	Download project data.
	Attempted to open a project that is not supported by the NS-Runtime.	Download project data supported by the NS-Runtime. Or, convert the project data to a model that is supported by the NS-Runtime. Then download it.
No project data is registered. Press OK button and download project data.	Project data is not downloaded.	Download project data.
	Two or more projects have been stored in a project storage folder (NS-Runtime's Installation folder \Runtime).	Delete unnecessary project data from a project storage folder.
Cannot start the project because the model is not supported. Change the project model or transfer a project which model is supported. Supported Model: NS-Runtime	Attempted to open a project that is not supported by the NS-Runtime.	Download project data supported by the NS-Runtime. Or, convert the project data to a model that is supported by the NS-Runtime. Then download it.
Error 7:HASP HL Key not found	A USB dongle provided with the NS-Runtime is not connected.	Connect the USB dongle.
Cannot open the project data because it is being edited in CX-Designer.	A project stored in a project storage folder is being opened with the CX-Designer.	Close a project that is opened with the CX-Designer. Then re-start the NS-Runtime.
Please install the Acrobat(R) Reader.	Displayed a screen with a document display object on a computer in which the Adobe(R) Reader is not installed.	Install the Adobe(R) Reader.
Could not startup CX-Programmer. Please install CX-Programmer.	Failed to start up when selecting the CX-Programmer from the system menu.	Install the CX-Programmer.
Could not startup the SwitchBox utility. Please install the SwitchBox utility.	Failed to start up when selecting the SwitchBox Utility from the system menu.	Install the SwitchBox Utility.



# Revision History

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A manual revision code appears as a suffix to the catalog number on the cover of the manual.



The following table outlines the changes made to the manual during each revision. Page numbers refer to the previous version.

Revision code	Date	Revised content
01		Original production
02		Revisions accompanying upgrade from version 1.0 to 1.1 of the NS-Runtime.
03		Revisions accompanying upgrade from version 1.1 to 1.12 of the NS-Runtime.
04		Revisions accompanying upgrade from version 1.12 to 1.20 of the NS-Runtime.
05		Made revisions for upgrading from NS-Runtime version 1.20 to 1.21 and added information on support for Windows 7.
06		Revision accompanying change in USB dongle
07		Revisions for adding safety precautions regarding security.