

NV Series
NV3W (-V1)
NV4W
NV3Q

Programmable Terminals

PROGRAMMING MANUAL

OMRON

NOTE

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NV Series

NV3W (-V1)

NV4W

NV3Q




Programmable Terminals

Revised May 2015

Notice

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.

| | |
|-------------------------------------|--|
| Precautions for Safe Use | Indicates precautions on handling the product to ensure that the product is used safely. |
|-------------------------------------|--|

| | |
|--|--|
| Precautions for Correct Use | Indicates precautions to ensure that product functions and performances are realized, to ensure that the reliability of the product is maintained, and to ensure that the product is otherwise used correctly. |
|--|--|

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

Reference Indicates supplementary information on procedures, descriptions, and settings.

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

CS1G-CPU□□-V1 Boxes in model numbers indicate variable characters. For example, “CS1G-CPU□□-EV1” indicates the following models: CS1G-CPU42-EV1, CS1G-CPU43-EV1, CS1G-CPU44-EV1, and CS1G-CPU45-EV1.

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About this Manual

This manual describes how to create screens for and maintain the NV-series PTs using the NV-Designer and includes the sections described below.

Please read this manual carefully and be sure you understand the information provided before attempting to use the NV-Designer. Be sure to read the precautions provided in the following section.

Precautions

This section provides general precautions for using the NV-series PTs and related devices.

Section 1 Overview

This section introduces the features and functions of the NV-Designer.

Section 2 PT Internal Data Structure and Display Methods

This section describes the internal data structure of an NV-series PT, how to control the screens displayed on the PT, and how to control the backlight.

Section 3 NV-Designer Outline and Configuration

This section gives the system requirements for running the NV-Designer, describes the windows and menus of the NV-Designer, and explains the parameters in the NV-Designer Configuration.

Section 4 Overall Flow of NV-Designer Operation

This section describes the overall procedure for using the NV-Designer to set up an NV-series PT for operation.

Section 5 Creating and Saving Projects (Including Screen Data)

This section describes how to create, save, and manipulate projects for NV-series PTs, including operations that can be performed between projects.

Section 6 NV Configuration

This section describes the parameters in the NV Configuration in detail.

Section 7 Descriptions of Parts

This section describes how to create screens using the various parts provided by the NV-Designer.

Section 8 Using PT Functions

This section describes special functions that can be used with NV-series PTs and the NV-Designer.

Section 9 Transferring Screens

This section describes how to transfer screens to and from an NV-series PT using both communications and SD memory cards.

Appendix

The appendix describes how to use the NV Memory Editor, which allow you to edit the internal memory of the PT from the NV-Designer.

Related Manuals

The following manuals are used for NV-series PTs. (The boxes at the end of the catalog numbers indicate the revision code.)

**This
Manual**

NV-series PT Programming Manual V104-E1-□

This manual describes the software functionality of NV-series PTs, how to install the NV-Designer, and the features of the NV-Designer.

For more information on NV-Designer operating procedures, refer to the online help in the NV-Designer.

NV-series PT Setup Manual V103-E1-□

This manual describes how to connect an NV-series PT to an OMRON PLC, features and specifications, methods to set up communications and operation, and procedures for maintenance and troubleshooting.

Refer to the *NV-series PT Programming Manual* (V104-E1-□) for more information on PT functions and specific operating procedures.

NV-series PT Host Connection Manual V105-E1-□

This manual describes how to connect an NV-series PT to a PLC produced by a manufacturer other than OMRON, including PLC memory area designations, communications settings, and connection methods.

Terminology

The following terminology is used in this manual.

| | |
|-------------|---|
| PT | In this manual, indicates an NV-series Programmable Terminal. |
| NV Series | Indicates products in the OMRON NV Series of Programmable Terminals. |
| PLC | Indicates a Programmable Controller in the OMRON SYSMAC CS/CJ/CP, C, or CVM1/CV Series of Programmable Controllers. |
| CPU Unit | Indicates a CPU Unit in the OMRON SYSMAC CS/CJ/CP, C, or CVM1/CV Series of Programmable Controllers. |
| NV-Designer | Indicates the OMRON NV-Designer. |
| Host | Indicates the PLC, IBM PC/AT or compatible computer, or personal computer functioning as the control device and interfaced with the NV-series PT. |

Introduction

● 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.

● General Precautions

- The user must operate the product according to the performance specifications described in the operation manuals.
- Do not use the PT touch switch input functions for applications where danger to human life or serious property damage is possible, or for emergency switch applications.
- Before using the product under conditions which are not described in the manual or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, and other systems, machines and equipment that may have a serious influence on lives and property if used improperly, consult your OMRON representative.
- Make sure that the ratings and performance characteristics of the product are sufficient for the systems, machines, and equipment, and be sure to provide the systems, machines, and equipment with double safety mechanisms.
- This manual provides information for connecting and setting up an NV-series PT. Be sure to read this manual before attempting to use the PT and keep this manual close at hand for reference during installation and operation.

Safety Precautions

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.

Definition of Precautionary Information

| | |
|--|--|
|  WARNING | Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage. |
|--|--|

Symbols

| | |
|---|---|
|  | Prohibition Indicates a general prohibition. |
|  | Caution Indicates general cautionary, warning, or danger level information. |

|  WARNING | |
|--|---|
| Always ensure that the personnel in charge confirm that installation, inspection, and maintenance were properly performed for the PT. "Personnel in charge" refers to individuals qualified and responsible for ensuring safety during machine design, installation, operation, maintenance, and disposal. |  |
| Ensure that installation and post-installation checks are performed by personnel in charge who possess a thorough understanding of the machinery to be installed. |  |
| Do not use the input functions of the PT, such as the function switches or switches on the touch panel, in applications that involve human life, in applications that may result in serious injury, or for emergency stop switches. |  |
| Do not attempt to disassemble, repair, or modify the PT. Doing so may impair the safety functions. |  |
| Do not attempt to take the Unit apart and do not touch any internal parts while the power is being supplied. Doing either of these may result in electrical shock. |  |
| The PT uses an analog touch panel. Never press more than two points on the panel at a time. Otherwise, it may activate a switch somewhere between the two points. |  |

Precautions for Safe Use

1. When unpacking the Units, check carefully for any external scratches or other damage. Also, shake the Units gently and check for any abnormal sound.
2. The PT must be installed in a control panel.
3. The mounting panel must be between 1.6 and 4.8 mm thick. Tighten the Mounting Brackets evenly to a torque of between 0.1 and 0.25 N·m for the NV3W/NV3Q and between 0.2 and 0.3 N·m for the NV3W-V1 and NV4W to maintain water and dust resistance. Make sure the panel is not dirty or warped and that it is strong enough to hold the Units.
4. Do not let metal particles enter the Units when preparing the panel.
5. Do not connect an AC power supply to the DC power terminals.
6. Do not perform a dielectric voltage test.
7. Use a DC power supply that will provide a stable output even if the input is momentarily interrupted for 10 ms, and which has reinforced or double insulation.

| Model | Rated power supply voltage | Capacity |
|-----------------------------|--|------------|
| NV3W-M□20L NV3W-M□20L-V1 | 5 VDC (allowable range: 4.5 to 5.5 VDC) | 1 W min. |
| NV4W-M□□□ NV3W-M□□□ | 24 VDC (allowable range: 21.6 to 26.4 VDC) | 1.7 W min. |
| NV3W-M□20 | | 2 W min. |
| NV3W-M□40 | | 1.9 W min. |
| NV3Q-MR□□ | | 2.4 W min. |
| NV3Q-SW□□ | | 3.6 W min. |

8. Use a twisted-pair cable to connect to the power terminals. Tighten the terminal screws to a torque of between 0.22 and 0.30 N·m. Make sure the screws are properly tightened.
9. To prevent malfunctions caused by noise, ground the PT correctly.
10. Do not touch the surface of the circuit boards or the components mounted on them with your bare hands. Discharge any static electricity from your body before handling the boards.
11. Turn OFF the power supply before connecting or disconnecting cables.
12. The maximum tensile load for cables is 30 N. Do not apply loads greater than this.
13. Confirm the safety of the system before turning ON or OFF the power supply.
14. Cycle the power supply after changing the DIP switch settings.
15. Do not perform the following operations while the SD memory card is being accessed (NV4W/NV3Q only):
 - Turning OFF the power supply to the PT
 - Removing the memory card
 Always follow the specified procedure when removing the memory card.
16. Start actual system application only after sufficiently checking screen data and the operation of the program in the PLC (host).
17. Do not press the touch switch with a force greater than 30 N.
18. Do not use a screwdriver or any other tool to press a touch switch.
19. Confirm the safety of the system before pressing any touch switch.
20. Do not accidentally press touch switches when the backlight is not lit or when the display does not appear. Confirm the safety of the system before pressing touch switches.

21. Before initializing screen data, confirm that existing data is backed up at the NV-Designer.
22. When changing the password with the system menu, do not reset or turn OFF the power supply until writing is finished.
23. Before using the SPMA function to change memory values in the PLC or transfer ladder programming, confirm that the PT is operating. The SPMA function cannot be used unless the PT is operating.
24. Dispose of any battery that has been dropped on the floor or otherwise subjected to excessive shock.
25. Dispose of the Units and batteries according to local ordinances as they apply.



廢電池請回收

26. When mounting the Battery, be sure to use the correct Battery and mount it correctly.
27. Do not disassemble or short-circuit the battery.
28. Do not connect a USB connector to any device that is not applicable.
29. Before connecting a USB connector to a device, make sure that the device is free of damage.
30. Do not turn OFF the power supply to the PT while downloading or uploading screen data or the system program. Doing so may corrupt the screen data or system program.
31. Periodically inspect the installation condition of the PT if it is being used in an environment subject to contact with water.
32. The whole system may stop depending on how the power supply is turned ON or OFF. Turn ON or OFF the power supply according to the specified procedure.
33. 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.
34. To use numeric input functions safely, always make maximum and minimum limit settings.
35. Do not use benzene, paint thinner, or other volatile solvents, and do not use chemically treated cloths.
36. The PT uses an analog touch panel. Deterioration over time can cause the touch points to move. Calibrate the touch panel if the touch points move too much.
37. Water resistance will be lost if the front sheet is torn or is peeling off. Do not use the PT if the front sheet is torn or is peeling off.
38. The Rubber Packing will deteriorate, shrink, or harden depending on the operating environment. Inspect and replace the Rubber Packing periodically (approximately once per year).
39. To use the NV3W in an environment with strong noise, connect the following noise filter to the power supply line: RSEL-2001W manufactured by TDK-Lambda Corp.
40. A Waterproof Packing cannot be reused. To ensure waterproof performance, replace the Waterproof Packing with a new one each time you reinstall the PT.
41. Screen burn-in will occur if the same pattern is continuously displayed for a long period of time (24 hours or longer, as a guideline). To prevent screen burn-in, use a screen saver or switch displays periodically (NV3W only).

Precautions for Correct Use

1. Do not install the PT in any of the following locations.
 - Locations subject to rapid changes in temperature
 - Locations subject to temperatures or humidity outside the range specified in the specifications
 - Locations subject to condensation as the result of high humidity
 - Locations subject to splashing chemicals or solvents
 - Locations subject to oil splashes
 - Locations subject to continuous water splashing
 - Locations subject to corrosive or flammable gases
 - Locations subject to strong shock or vibration
 - Locations outdoors subject to direct wind and rain
 - Locations subject to strong ultraviolet light
 - Locations subject to dust
 - Locations subject to direct sunlight
2. Take appropriate and sufficient countermeasures when installing systems in the following locations.
 - Locations subject to static electricity or other forms of noise
 - Locations subject to strong electromagnetic or magnetic fields
 - Locations close to power supply lines
 - Locations subject to possible exposure to radioactivity

Conformance to EC Directives

This product is EMC compliant.

● Concepts

OMRON products are electronic devices that are incorporated in machines and manufacturing installations. OMRON PTs conform to the related EMC Directives (see note) so that the devices and machines into which they are built can more easily conform to EMC directives. However, customers may use a wide variety of equipment and manufacturing installations. Therefore the customer must check whether the Directives are satisfied for the actual system. EMC-related performance will vary depending on the configuration, wiring, and other conditions of the equipment or control panel in which the PT is installed. The customer must, therefore, perform final checks to confirm that the overall machine or device conforms to EMC standards.

Note The applicable EMC (Electromagnetic Compatibility) standards for NV-series PTs are as follows:

NV3W: EN 61000-6-2, EN 61000-6-4

NV3W-V1/NV4W/NV3Q: EN 61131-2

● Conformance to EC Directives

NV-series PTs conform to EC Directives. To ensure that the machine or device in which the NV-series PT is used complies with EC Directives, the PT must be installed as follows:

- The NV-series PT must be installed in a control panel.
- You must use reinforced insulation or double insulation for the DC power supply and the DC power supply must have minimal voltage fluctuations and provide a stable output even if the power supply input is interrupted for 10 ms.
- NV-series PTs complying with EC Directives also conform to the Common Emission Standard (EN 61131-2 or EN 61000-6-4). Radiated emission characteristics (10-m regulations) may vary depending on the configuration of the control panel used, other devices connected to the control panel, wiring, and other conditions. You must therefore confirm that the overall machine or equipment complies with EC Directives.
- This is a class A product. It may cause radio interference in residential areas, in which case the user may be required to take adequate measures to reduce interference.

Conformance to KC Standards

Observe the following precaution if you use NA-series PTs in Korea.

A 급 기기 (업무용 방송통신기자재)
이 기기는 업무용(A 급) 전자파적합기기로서
또는 사용자는 이 점을 주의하시기 바라며,
지역에서 사용하는 것을 목적으로 합니다.

Class A Device (Broadcasting Communications Device for Business Use)

This device obtained EMC registration for office use (Class A), and it is intended to be used in places other than homes. Sellers and/or users need to take note of this.

Terms and Conditions Agreement

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

● 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

Overview

This section introduces the features and functions of the NV-Designer.

| | | |
|-------|---|---|
| 1-1 | NV-Designer Features | 2 |
| 1-1-1 | NV-Designer Features and Functions | 2 |
| 1-2 | System Versions | 4 |
| 1-2-1 | NV-series PT Models and System Versions | 4 |
| 1-2-2 | NV System Version Upgrade Procedure. | 4 |

1-1 NV-Designer Features

The NV-series Programmable Terminals (PTs) are easy to operate and compact.

1-1-1 NV-Designer Features and Functions

The NV-Designer is a programming application used to create screens for NV-series PTs.

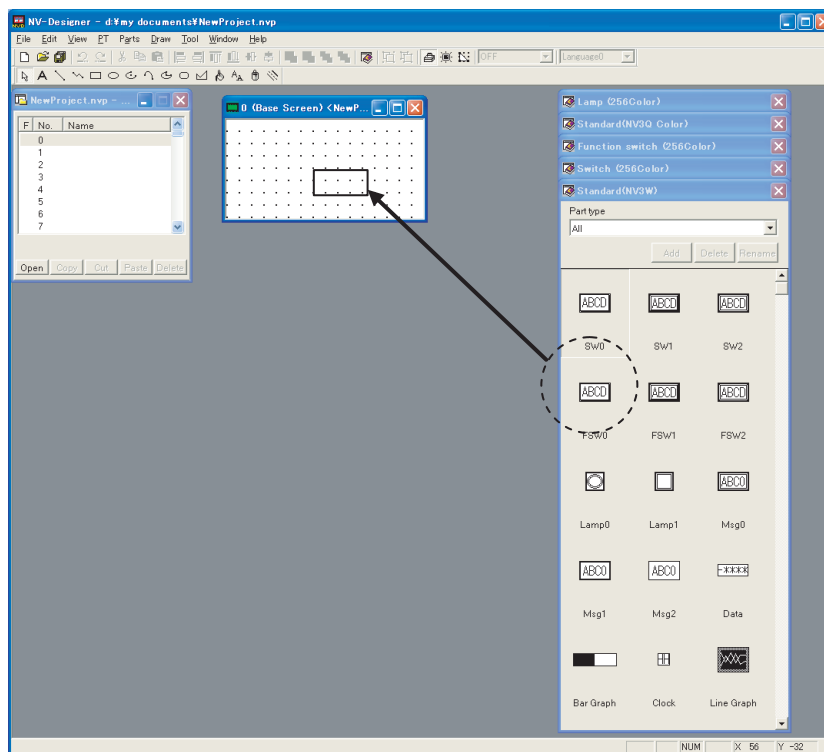
Design Screens Easily Like a Paint Application

The NV-Designer can be used to transfer screens to and data from an NV-series PT, to print data, and to perform other operations.

Drag and Drop Parts to the Screen

The libraries contain various “parts,” such as bit switches that allow you to turn PLC I/O points ON and OFF by touching the bit switch, data parts for displaying PLC data, and keyboard parts that can rewrite PLC data.

Parts can be easily positioned by dragging and dropping them to the screen.



Easy to Register Original Parts

Custom parts created by the user can be dragged and dropped to a library to be registered and used like normal parts.

Easy to Print Design Status and Settings

Screen previews can be printed together with the properties of the edited base screen and edited part attributes.

Multi-language Support

With Windows you can use of various languages, such as Japanese, English (Europe), Simplified Chinese, Traditional Chinese, Korean, and Turkish.

Use True Type Fonts

The NV-Designer features the True Type fonts commonly used for Windows applications, MS Word, and Excel.

Characters can be displayed beautifully from small to large.

Exporting and Importing Character Strings Using the Display Language Switching Function

Character strings changed by using the Display Language Switching that appear on a base screen of the NV-Designer can be exported to a text file.

The text file can be opened and edited in Excel, then imported for use as the character string displayed on the base screen.

Transferring Screens with an SD Memory Card (NV4W/NV3Q Only)

The screens can be transferred using an SD memory card even if the PT cannot be connected to the NV-Designer.

Project data can be transferred directly by using SD memory cards.

Multifunction Objects (NV3W-V1/NV4W/NV3Q Only)

Multifunction Objects are parts that enable performing multiple operations with a single touch using a function switch or custom switch. The operations that are set will be executed in sequence when the Multifunction Object is touched. Up to 32 operations can be set. This enables using one touch to perform operations that were previously performed using combinations of multiple parts. (For the NV3Q, Multifunction Objects are supported for PT system version 1.1 and higher.)

Automatic Firmware Update

The NV-series PT firmware can be updated to the most recent version when screens are transferred from the NV-Designer.

1-2 System Versions

The system program version (abbreviated as "system version") in the NV-series PT determines the project system versions that can operate in the NV-series PT.

1-2-1 NV-series PT Models and System Versions

The system versions that can be installed depend on the model of the NV-series PT. The following table shows the possible combinations.

Applicable Versions for the NV-series PTs

| NV Series | NV-Designer System Version |
|----------------|-------------------------------------|
| NV3W Series | Version 1.1 or higher |
| NV3W-V1 Series | Version 2.0 or higher |
| NV4W Series | Version 1.1 or higher |
| NV3Q Series | Version 1.1 or higher ^{*1} |

^{*1} Version 1.2 or higher is required for an NV3Q-SW PT with lot number 111000 or later.

Functions and NV System Versions

| | NV system version | Vertical displays | Alarm lists and histories | Operation security | Multifunction objects | PLC multiple connections | Continued PT operation for non-fatal errors in OMRON PLCs | Larger SD memory cards (from 1 GB to 2 GB) | NV-Designer version |
|---------|-----------------------|-------------------|---------------------------|--------------------|-----------------------|--------------------------|---|--|-----------------------|
| NV3W | Version 1.1 or higher | Supported. | Not supported. | Not supported. | Not supported. | Not supported. | Supported. | Not supported. | Version 1.1 or higher |
| | Version 1.0 or higher | Supported. | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Version 1.0 or higher |
| NV3W-V1 | Version 2.0 or higher | Supported. | Supported. | Supported. | Supported. | Supported. | Supported. | Not supported. | Version 2.0 or higher |
| NV4W | Version 1.1 or higher | Supported. | Supported. | Supported. | Supported. | Supported. | Supported. | Supported. | Version 1.1 or higher |
| NV3Q | Version 1.1 or higher | Not supported. | Supported. | Supported. | Supported. | Supported. | Supported. | Supported. | Version 1.1 or higher |
| | Version 1.0 or higher | Not supported. | Supported. | Supported. | Not supported. | Not supported. | Not supported. | Not supported. | Version 1.0 or higher |

The most recent NV system version can be installed using the Support Software.

1-2-2 NV System Version Upgrade Procedure

The NV system version must be upgraded to use new features. The most recent firmware is included with the NV-Designer. Upgrade your NV-Designer designer before you attempt to update the system version of your NV-series PTs.

Upgrading the System Program Version with an SD Memory Card (NV4W/ NV3Q Only)

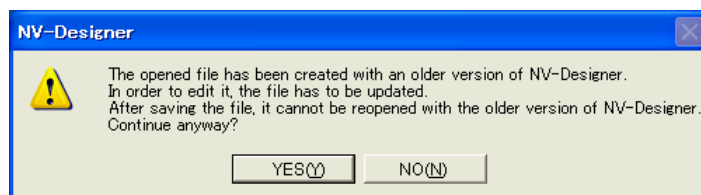
With the NV4W or NV3Q, the version of the system program can be updated using an SD memory card. When saving data to the SD memory card, save the newest version of the system program on the same card. When the data is read by the PT, the firmware and screen data for the newest version will automatically be transferred to the PT.

Version Upgrades when Transferring Screens

The firmware can be updated when transferring screens from the NV-Designer by selecting the automatic firmware update.

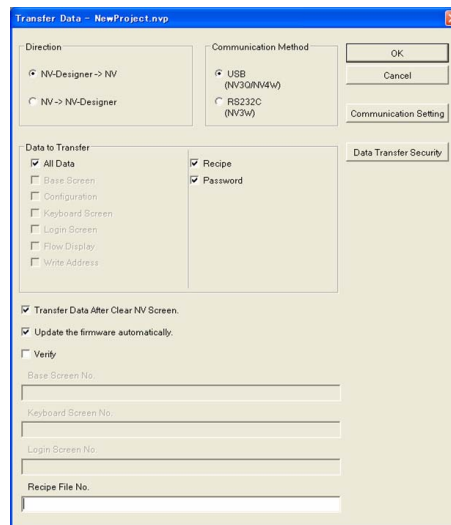
Note

- (1) Updating the firmware in the NV-series PT and transferring the project are performed at the same time from the NV-Designer. It is not possible to update only the firmware. (The NV Ver_UP Tool is required.)
- (2) When screen data that was created on an old version of the NV-Designer is read with the new version of the NV-Designer, the screen data is automatically updated to the new version. (The following confirmation dialog box will be displayed.)



The following dialog box will be displayed when **Transfer** is selected from the PT Menu of the NV-Designer.

Data Transfer Dialog Box



Data to Transfer: All Data

Direction: NV-Designer → NV

Select the *Update the firmware automatically* Check Box, and then click the OK Button.

Updating the firmware and transferring the project will start at the same time.

Note Automatically updating the firmware is possible only when all data is transferred.

Note

- (1) Never turn OFF the power supply to the PT while the version is being upgraded. Also, do not unplug the cable between the computer and the NV-series PT. The PT may not restart if transferring the system fails.
- (2) The SPMA function cannot be used while the version is being upgraded or screens are being transferred.

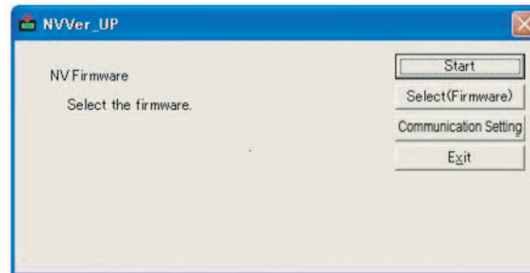
Version Upgrade Procedure Using NV Ver_UP Tool

NV Ver_UP is a special tool to upgrade the firmware version of the PT.

The NV Ver_UP version upgrade tool is installed at the same time as the NV-Designer.

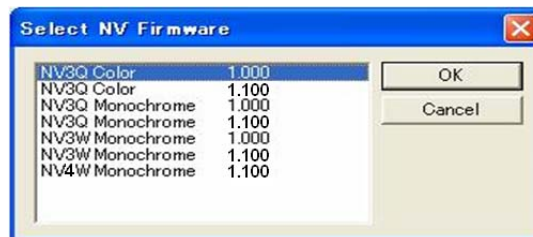
Click the **Start** Button at the bottom left of the window or select **All Programs** from the menu displayed by pressing the **Ctrl** Key and the **Esc** Key, and then select **CX-One - NV-Designer - Tools - NV Ver_UP** from the OMRON Menu.

NV Ver_UP Dialog Box



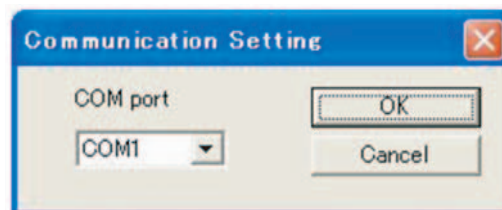
Select the firmware (Select (Firmware) Button) and set the communications conditions (Communication Setting Button). The applicable settings dialog box will be displayed when either of the buttons is clicked.

Select NV Firmware Dialog Box



Select the most recent firmware version (i.e., highest version number) for the model that you are using. Click the OK Button to return to the NV Ver_UP Dialog Box.

Communication Setting Dialog Box



Make the communications setting, and then click the OK Button to return to the NV Ver_UP Dialog Box. These selections cannot be made for the NV3W-V1, NV4W and NV3Q.

For the NV3W, select the COM port that you are actually using.

Upgrading the version will start when the Start Button is clicked.

The NV Ver_UP version upgrade tool will end when the Exit Button is clicked.

Note

- (1) Never turn OFF the power supply to the PT while the version is being upgraded.
- (2) Do not unplug the cable between the computer and the NV-series PT. Otherwise, the PT may not restart.

SECTION 2

PT Internal Data Structure and Display Methods

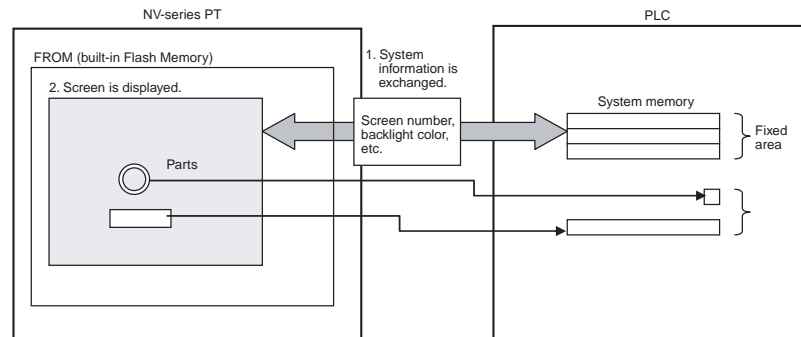
This section describes the internal data structure of an NV-series PT, how to control the screens displayed on the PT, and how to control the backlight.

| | | |
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| 2-1 | Internal Data Types and Structure | 8 |
| 2-1-1 | Overview of Internal Operation | 8 |
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2-1 Internal Data Types and Structure

2-1-1 Overview of Internal Operation

This section describes the structure of internal data of an NV-series PT.



The internal data can be largely divided into two parts.

1. System information is exchanged.

System information is constantly exchanged between the PT and PLC, including the screen number and backlight color from the PLC, or to notify the PLC of PT status.

The system information area is stored in an area called the system memory. System memory must be initialized using the NV-Designer before use.

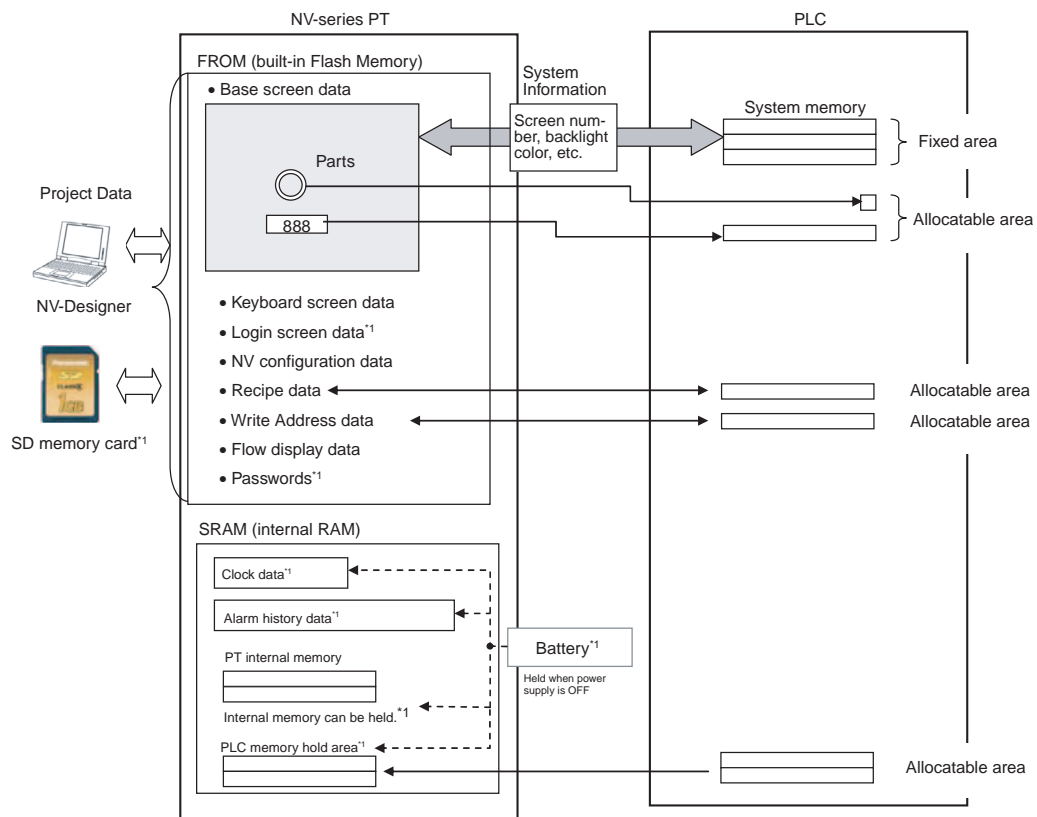
2. Screen is displayed.

The NV-series PT has multiple screens that contain functional parts selected from the parts libraries. One of the screens can be displayed.

The functional parts specify the desired PLC address and they read/write data.

2-1-2 Details of Internal Operation

The NV-series PT has FROM (internal Flash Memory) and SRAM (built-in RAM). Data is exchanged with the PLC as shown in the following diagram.



*1: Not supported by the NV3W.

■ FROM (built-in Flash Memory)

Stores project data created with the NV-Designer (function data, such as base screens and NV Configuration).

Project data can be backed up or restored using SD memory cards.

| Data | | Description |
|-------------|-----------------------|--|
| Screen data | Base screen data | Screen data containing parts that have been selected from the parts libraries. |
| | Keyboard screen data | Screen data containing keyboard parts that open when the corresponding data parts are pressed. |
| | Login screen data | The Screen data is used to enter passwords according to the password levels specified for operation security. (Not supported by the NV3W) |
| | NV configuration data | Configuration data related to the NV-series PT that includes the setting information for functions, such as the system memory, startup screen number, language switching, and other functions. |
| | Recipe data | Settings to read/write multiple values at one time from or to PLC memory. |
| | Write Address data | Condition and operation settings for writing data to the PLC according to the status of a memory location in the PLC while the specified screen is displayed. |
| | Flow display data | Settings for character flows displayed on the bottom of the screen and the display conditions. |
| | Passwords | Settings to restrict displays and operations depending on the part and user. (Not supported by the NV3W) |

■ SRAM (Internal RAM)

Stores alarm history data collected by the PT, internal memory values, and clock data.

Data saved in the built-in RAM will be deleted 1 minute after power supply is turned OFF, but it can be backed up with an optional Battery. (These functions are not supported by the NV3W (-V1).)

| Data | Description |
|----------------------|--|
| Clock data | Clock data in PT. |
| Alarm history data | PLC data defined as alarms is constantly monitored and the time when the alarm occurred and was removed is recorded as history data. |
| PT internal memory | NV-series PT internal memory. The specified area can be held while the power supply is OFF. |
| PLC memory hold area | PLC data that is constantly read from the specified memory locations and can be held even when the power supply is turned OFF. |

2-2 Displaying Screens

2-2-1 Startup Screen

Screen 0 is displayed as default when the PT is started.

This screen can be changed in NV Configuration from the NV-Designer.

2-2-2 Switching Screens

One of the following three methods can be used to change the displayed screen registered in the NV-series PT.

- Switching screens using function switches (functional parts) on PT screens
- Switching screens using the ladder program
- Switching screens after a specified time (automatic paging)

Switching Screens Using Function Switches (Functional Parts) on PT Screens

The PT screen can be switched using a function switch from a parts library.

The operation depends on the operating mode set for the function switch.

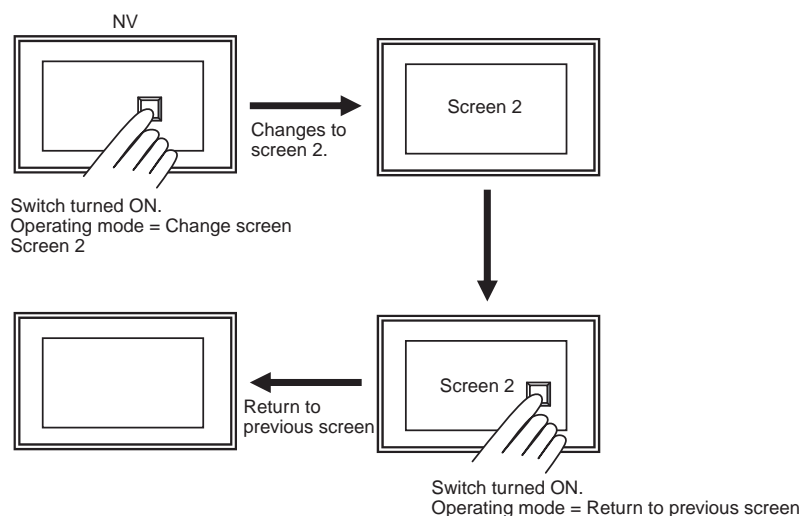
■ Operating Mode: Change Screen

When the function switch is touched, the screen will change to the preset screen number.

However, the information in the PLC internal system memory (first word in the Word Area (screen number specified by PLC)) will not be updated.

You can also return to the previous screen by using a function switch with the operating mode set to.

Example:



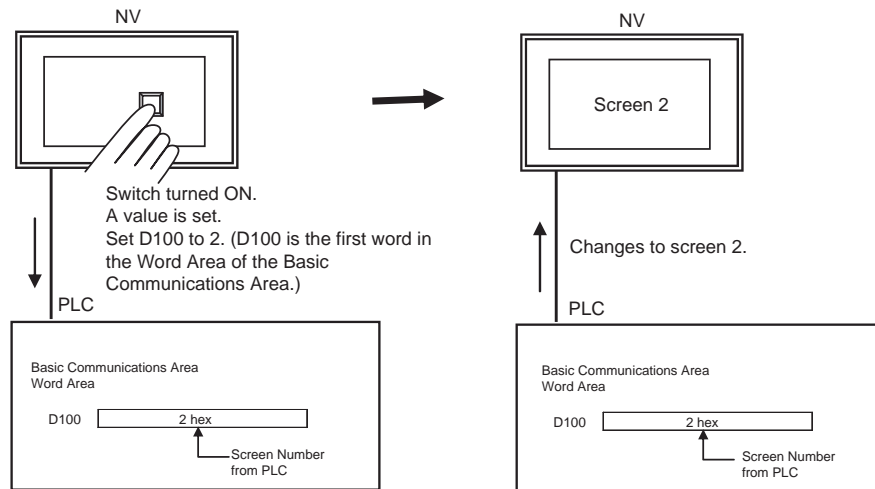
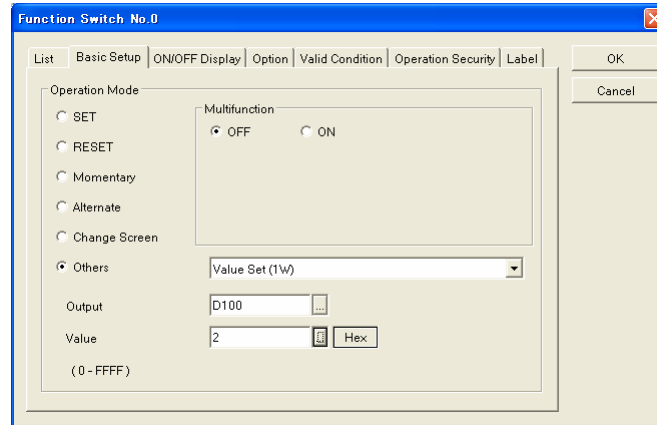
■ Operating Mode: Set Value

When the switch is touched, the PT writes the screen number to switch to in the PLC internal system memory (first word in the Word Area (screen number specified by PLC)) and the screen is switched.

Example: Data format: 1 word

Output word: D100 (first word in the Word Area of System Memory)

Value: 2 (desired screen number in hexadecimal)

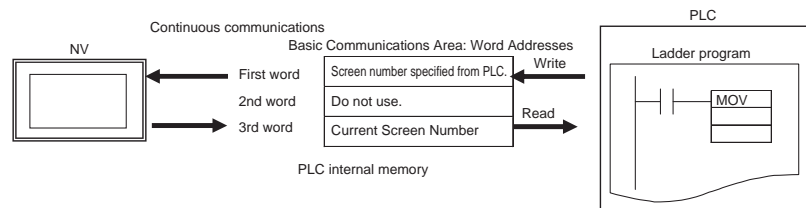


Refer to 7-5 *Function Switches* for details on Switch Functions.

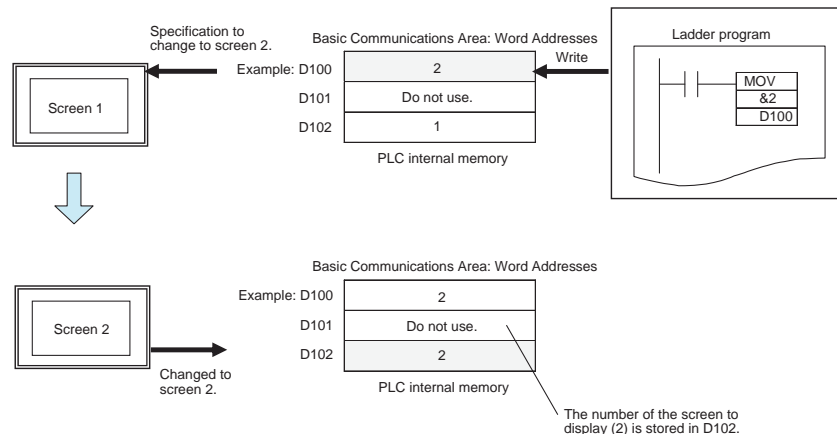
Switching Screens Using the Ladder Program

Create a ladder program that writes the screen number to the first word of the PLC system memory to switch the screen.

Communications between the PT and the PLC



Example: Changing from Screen 1 to Screen 2



Precaution for Correct Operation

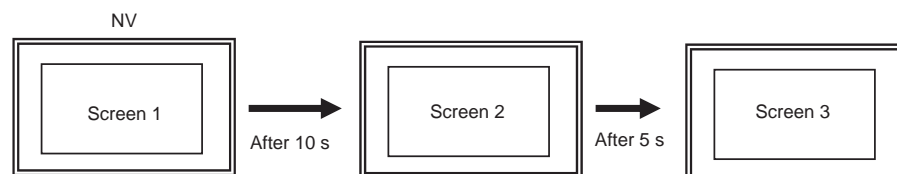
Screen numbers are displayed in decimal on the NV-Designer but they must be in hexadecimal when writing the screen number to the PLC internal system memory.

Switching Screens after a Specified Time (Auto-Paging)

The automatic paging function can be used to automatically switch to a specified screen after a specified period of time has passed. Settings are made in the NV Configuration of the PT.

Application Example:

1. Screen 1 is displayed for 10 seconds and then screen 2 is displayed.
2. Screen 2 is displayed for 5 seconds and then screen 3 is displayed.



Refer to 6-2-6 Auto-Paging Tab Page for details.

2-3 Backlight Display Methods

2-3-1 Specifying Backlight Colors

The backlight color of a monochrome NV3W (-V1), NV4W or NV3Q can be specified.

It can be specified using one of the following two methods.

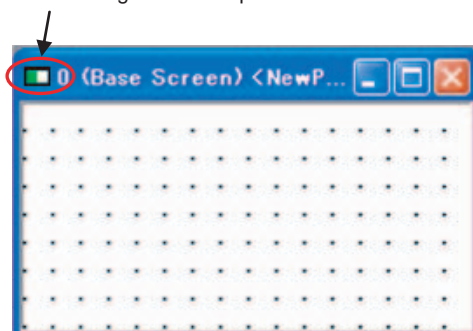
1. Initial Settings

Backlight colors and operation are set in the base screen properties from the NV-Designer.

| Model | Backlight color | Operation |
|------------------|--------------------------------------|-----------------|
| NV3W (-V1), NV4W | White (green), pink (orange), or red | Lit or flashing |
| NV3Q monochrome | White, pink, or red | Lit or flashing |
| NV3Q color | Not supported. | Not supported. |

The specified backlight color will be displayed in a rectangle on the left edge of the title bar.

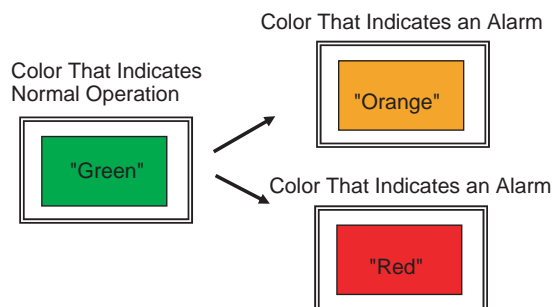
Indicates that the base screen is white or green.
The backlight colors depend on the model of the PT.



2. Changing the Backlight during Operation

The backlight color can be changed by using specifications from the PLC.

Application Example That Switches the Backlight Color



Specify the color and either lit or flashing in the Bit Area in system memory. Refer to 8-1 *Switching Backlight Colors* for details.

2-3-2 Automatic Backlight OFF Function

The PT can be set so that the backlight automatically turns OFF if the touch screen not touched for a specified period of time. This can be done on the Setup 1 Tab Page of the NV Configuration. The time can be set between 1 and 30 minutes.

SECTION 3

NV-Designer Outline and Configuration

This section gives the system requirements for running the NV-Designer, describes the windows and menus of the NV-Designer, and explains the parameters in the NV-Designer Configuration.

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3-1 System Requirements

3-1-1 System Requirements

Refer to the *CX-One Version 4.□ Setup Manual* (Cat. No. W463) for the system requirements to operate the NV-Designer.

3-1-2 Installation

Install the NV-Designer using the CX-One or CX-One Lite Installer.

For details, refer to the *CX-One Version 4.□ Setup Manual* (Cat. No. W463) provided with the CX-One.

3-1-3 Re-installation

Uninstall the NV-Designer and then re-install it.

For details on how to uninstall the NV-Designer, refer to the *CX-One Version 4.□ Setup Manual* (Cat. No. W463) provided with the CX-One.

3-1-4 Precautions for the OS of Windows other than Windows XP

Because of the operating specifications of Windows, the file may be saved in a different location to that of a previous version of Windows. Be careful of the following points if you are using Windows XP.

Having Multiple Users of NV-Designer

Files saved in the Program Files Folder or other system folders cannot be shared. To share the Parts Libraries, use a file that can be shared, or copy the file to each user.

File Save Location

If you try to save a file in the Program File Folder or other system folders, it will be saved in another location. We recommend that you save files in another folder, such as the My Documents Folder.

Note The screen data cannot be saved in the Program File Folder or other system folders.

Files Saved in the Program File Folder or Other System Folders

The file will not be displayed in Explorer even if you open the folder where it is saved.

Open the folder where the file is saved and click the Compatible Files Button displayed at the top of the screen to display the file screen.



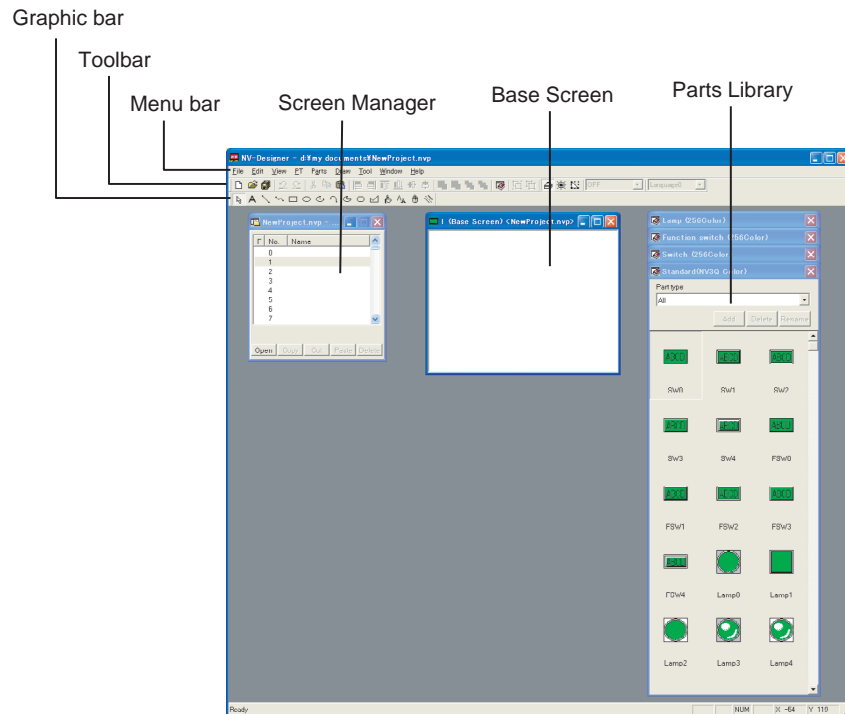
Additional Information

Additional Information Operating Specifications of Windows

When using Windows, files cannot be saved in the Program File Folder or other system folders even if it is specified as the save location in application software, such as NV-Designer. They will be saved it in a virtual folder (VirtualStore). VirtualStore is a unique folder for each user. It cannot be shared with other users.

3-2 NV-Designer Window Names and Menus

3-2-1 Names of Window Components



Menu Bar

All NV-Designer functions are displayed in the menus.

Toolbar

Frequently used commands are displayed as icons on the menu bar.

Graphic Bar

Frequently used drawing commands are displayed as icons on the menu bar.

Screen Manager

The screens are managed by base screen numbers.

Base Screen

Creates a screen. The screen is displayed at the PT's screen size. The size cannot be changed, but the display can be zoomed in or out.

Parts Library

Parts used for creating screens are displayed in parts libraries.



Additional Information

When the NV-Designer is started, the Standard Parts Libraries for all parts for the model that is set will be displayed in front.

3-2-2 Menus

The NV-Designer's operations and functions are displayed on menus according to their application.

| Menu | Submenu/Command | | Description |
|------|-------------------|--|--|
| File | New | | Displays the Model Selection Dialog Box. |
| | Open | | Opens the specified NV-Designer project file (*.nvp). |
| | Close | | Closes an open NV-Designer project file (*.nvp). |
| | Save | | Saves the specified NV-Designer project file (*.nvp). |
| | Save As | | Saves the specified NV-Designer project file (*.nvp) with a different name. |
| | Delete | | Deletes the specified NV-Designer project file (*.nvp). |
| | Print | | Displays the Print Dialog Box. Specifies the data to be printed. |
| | Print Style Setup | | Prints the selected items. |
| | Printer Setup | | Sets up the printer before printing. |
| | Keyboard Screen | | Displays the Edit Keyboard Screen Dialog Box. Used to name or delete keyboard screens. |
| | Login Screen | | Displays the Edit Login Screen Dialog Box. The Login Screens are used to enter passwords according to the password levels specified for the operation security function. |
| | Export Text | | The character strings for switching the display language can be exported to a text file. The text data can also be edited and imported. |
| | Import Text | | Imports text from a text file. The imported text can be checked by selecting PT - Multi Language Exchange String List. |
| | Exit | | Exits the NV-Designer. |

| Menu | Submenu/Command | | Description |
|------|----------------------------|-------------------|--|
| Edit | Undo | | Undoes the previous operation. |
| | Redo | | Redoes the previous operation. |
| | Cut | | Cuts the selected parts. |
| | Copy | | Copies the selected parts. |
| | Repeat | | Creates a base part which is copied to enable the creation of multiple parts with different functions. |
| | Paste | | Pastes the parts that were last cut or copied. |
| | Copy Bitmap of Base Screen | | Copies the base screen contents as bitmap data. |
| | Align | Left | Aligns the left sides of the selected graphics. |
| | | Right | Aligns the right sides of the selected graphics. |
| | | Top | Aligns the top edges of the selected graphics. |
| | | Bottom | Aligns the bottom edges of the selected graphics. |
| | | Horizontal Center | Aligns the horizontal centers of the selected graphics. |
| | | Vertical Center | Aligns the vertical centers of the selected graphics. |
| | Centering | | Centers multiple graphics figures. |
| | Justify Horizontal | | Aligns the selected graphics with equal horizontal spaces. |
| | Justify Vertical | | Aligns the selected graphics with equal vertical spaces. |
| | Rotate | | Rotates the selected graphics. |
| | Flip | Right/Left | Flips the selected graphics left to right. |
| | | Top/Bottom | Flips the selected graphics top to bottom. |
| | Delete | | Deletes the selected items. |
| | Erase Screen | | Deletes the base screen |
| | Bring Previous | | Moves the selected graphic up one layer. |
| | Bring Next | | Moves the selected graphic back one layer. |
| | Bring Forefront | | Places the selected graphics on the top. |
| | Bring Behind All | | Places the selected graphics on the back. |
| | Group | | Creates a group of character strings, graphics, or parts. |
| | Ungroup | | Ungroups a group of parts. |
| | Select | | Selects character strings, graphics, and parts. |
| | Select All | | Selects all character strings, graphics, and parts on the base screen. |

| Menu | Submenu/Command | | Description |
|------|-------------------------|------|--|
| View | Redraw | | Redraws the contents of the screen that is being edited. |
| | Grid | | Sets the grid on base screens edited with the NV-Designer. |
| | Toolbar | | Displays and hides the toolbar. |
| | Status bar | | Displays or hides the status bar. |
| | Graphic bar | | Displays and hides the graphic bar. |
| | Zoom | 400% | Changes the magnification of the base screen that is being edited. |
| | | 200% | |
| | | 100% | |
| | | 75% | |
| | | 50% | |
| | Zoom Box | | Displays a Zoom Box so that detailed sections can be drawn and fine adjustments can be made to positions when creating a base screen. |
| | Parts No. | | Displays the parts numbers of all parts on the base screen that is being edited. |
| | Parts Attribute | | Displays the attributes of all parts on the base screen that is being edited. |
| | Status | OFF | Places a bit switch, function switch, or lamp on the screen in OFF status. |
| | | ON | Places a bit switch, function switch, or lamp on the screen in ON status. |
| | Language No. | | Changes the language number when switching the display language is being used. |
| | Keyboard Parts | | Displays or hides the keyboard parts. |
| | Address Cross Reference | | The system memory used for communications with the PLC and the communications addresses used by parts on the screen are displayed in a list. |

| Menu | Submenu/Command | | Description |
|-------|-------------------------------------|-------------------------------|--|
| PT | Transfer | Transfer | Transfers the base screen data, NV Configuration data, and other data created on the NV-Designer to the PT. |
| | | Verify | Compares the file that is open on the NV-Designer and the file transferred to an NV-series PT. If the contents differ, the differences will be displayed. Compares files read to the NV-Designer. |
| | | Create SD Memory Card File | Names a file in the SD memory card and saves the base screen data in it. |
| | | Read from SD Memory Card File | Reads base screen data from a file on the SD memory card. |
| | NV Configuration | | Displays the NV Configuration Dialog Box. Sets basic items, such as the PT's system memory, parameters for communications with PLCs and computers (NV-Designer), PLC multiple connection, auto-paging, startup screen settings, Setup 1 settings (clock, backlight, key press sound, battery error display, file compression, system menu language, switching display language, backlight brightness, contrast adjustment), Setup 2 settings (SD memory card menu), memory hold, recipes, alarm history, line graphs, and operation security. |
| | Recipes | | Specifies the first control address and creates the settings for each model for the function that reads and writes the settings for a model from and to the specified PLC address as commanded by the PLC. |
| | SD Recipe | | Creates the recipe files to be used during use of SD recipe. |
| | Flow displays | | Text messages can be displayed like an electric scoreboard moving across the Flow Display Dialog Box from right to left. |
| | Writing memory (Write Address) | | Used to set operations to set or reset bits, set values, perform calculations, etc. in PLC memory when conditions in the PLC are met while the specified screen is displayed. |
| | Password | | Displays the Edit Operation Security Password Dialog Box so that you can set the passwords when the operation security password function is being used. |
| | Multi Language Exchange String List | | If the Switch Display Language Option is selected in the NV-Designer Configuration, the language number and language type can be selected. The character string for each language number can also be edited in the list. |
| | Data Log | | Performs settings related to the data log. |
| | Screen Properties | | Used to set the properties of a base screen (i.e., the name, background, and backlight operation). |
| Parts | Open Parts Library | | Opens the Parts Library Selection Dialog Box. Select the parts library to use and click the Open Button. |
| | Edit Attributes | | Edits the selected parts. |
| | Draw | | Used to edit screens of custom switch parts. |
| | Parts List | | Displays the parts attributes used by a base screen in a list. |

| Menu | Submenu/Command | | Description |
|---------|----------------------------------|-------------------|--|
| Draw | Select | | Used to select a character string, graphic, functional part, etc. |
| | Text | | Creates a character string. |
| | Line | | Creates a straight line. |
| | Continuous line | | Creates continuous lines. |
| | Rectangle | | Creates a rectangle. |
| | Pie/Oval | | Creates a circle or oval. |
| | Arc | | Creates a circular or oval arc. |
| | Spline | | Creates a curved line. |
| | Sector | | Creates a circular or oval sector. |
| | Rounded Rectangle | | Creates a square with rounded corners. |
| | Polygon | | Creates a polygon. |
| | Fill In | | Fills areas enclosed by lines and graphics with a color. |
| | Character Type | | Sets the language, font, character size, attributes (e.g., bold), and colors (character and background colors). |
| | Color Setup | | Sets the colors and patterns for graphics. |
| | Line Type | | Sets the line thickness and type. |
| Toolbar | Resource Report | | Displays the resource report (amount of free memory and memory used by NV configuration, base screens, and keyboard screens). |
| | Base Screen Memory Usage | | Displays the amount of memory used by the base screens. Displays the amount of memory and the communications addresses used by the parts. |
| | NV-Designer Configuration | | Displays the NV-Designer Configuration Dialog Box. Sets the configuration of the NV-Designer screen display, the folder where the parts libraries used by the NV-Designer are stored, the current folder, whether to enable automatic backup, the backup time interval, items for creating graphics, menu and dialog languages, and whether to enable switching the display language. |
| | Convert | PLC Model Convert | Changes the model of the selected PLC in the file that is being edited. |
| | | NV Model Convert | Changes the model of PT in the file that is being edited. |
| | Convert Fixed (NV-Designer) Font | | Converts the fixed (NV-Designer) font as a batch to another font. |
| | Change Address | | Converts the addresses set in the projects according to the specified conditions. |
| Window | Close All | | Closes all open base screens. |
| | Cascade | | Overlaps more than one base screen and displays them. |
| | Arrange | | Displays more than one base screen side-by-side. |
| | Arrange Icons | | Returns the toolbar icons to the defaults. |
| Help | Contents | | Displays the contents of NV-Designer help. |
| | Keyword | | Displays the window for keyword-based searches of NV-Designer help. |
| | About NV-Designer | | Displays the version of the NV-Designer. |

Pop-up Menus on Base Screens

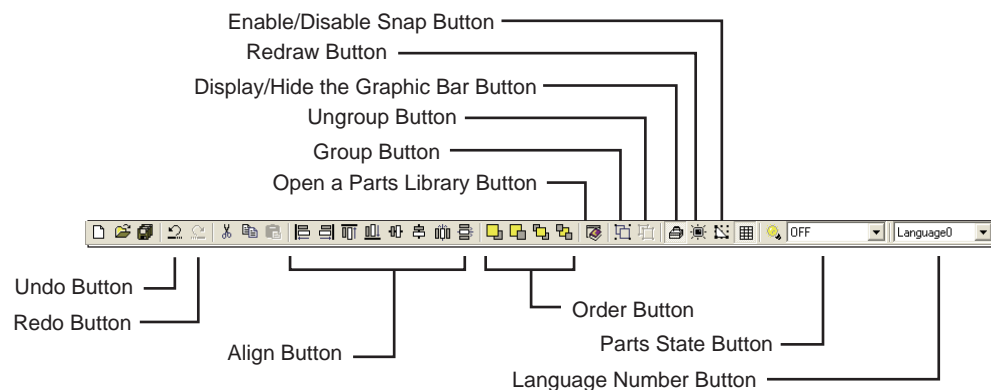
| Pop-up Menus | Description |
|------------------|--|
| Paste | Pastes the parts. |
| Screen Attribute | Sets the background colors and patterns. |

Pop-up Menu When a Functional Part or Character String Is Selected

| Pop-up Menu | | Description |
|----------------------------------|--------------------|---|
| Cut | | Cuts the selected parts. |
| Copy | | Copies the selected parts. |
| Paste | | Pastes the parts that were last cut or copied. |
| Functional Parts: Attribute | | Sets the attributes of a part. |
| Character String: Character Type | | Sets the language, font, character size, attributes (e.g., bold), and colors (character and background colors). |
| Status | ON | Places a bit switch, function switch, or lamp on the screen in OFF status. |
| | OFF | Places a bit switch, function switch, or lamp on the screen in ON status. |
| Align | Left | Aligns the left sides of the selected graphics. |
| | Right | Aligns the right sides of the selected graphics. |
| | Top | Aligns the top edges of the selected graphics. |
| | Bottom | Aligns the bottom edges of the selected graphics. |
| | Horizontal Center | Aligns the horizontal centers of the selected graphics. |
| | Vertical Center | Aligns the vertical centers of the selected graphics. |
| | Justify Vertical | Aligns the selected graphics with equal vertical spaces. |
| | Justify Horizontal | Aligns the selected graphics with equal horizontal spaces. |
| Delete | | Deletes the selected items. |
| Order | Bring Forefront | Places the selected graphics on the top. |
| | Bring Behind All | Places the selected graphics on the bottom. |
| | Bring Previous | Moves the selected graphic up one layer. |
| | Bring Next | Moves the selected graphic back one layer. |
| Group | | Creates a group of character strings, graphics, or parts. |
| Ungroup | | Ungroups a group of parts. |

3-2-3 Toolbar Functions**Part Names and Functions**

The names of icons and other items on the toolbar are given below.

**Undo Button**

Undoes the previous operation.

Redo Button

Redoes the operation that was undone using the Undo Button.

Align Button

Aligns character strings, graphics, and parts.

Order Button

Changes the order of character strings, graphics, and parts if they are overlapped.

Parts are set at the foreground as a default.

Open a Parts Library Button

Opens a parts library.

Group Button

Creates a group of character strings, graphics, or parts.

Ungroup Button

Ungroups a group of parts.

Display/Hide the Graphic Bar Button

Displays and hides the graphic bar.

Redraw Button

Redraws the contents of the screen that is being edited.

Enable/Disable Snap Button

Enables/disables the snap function when positioning character strings, graphics, or parts.

Parts State Button

Turns ON/OFF the selected switches and lamps or changes the message part number.

Language Number Button

Changes the language number of the selected base screen.

**Precaution for Correct Operation**

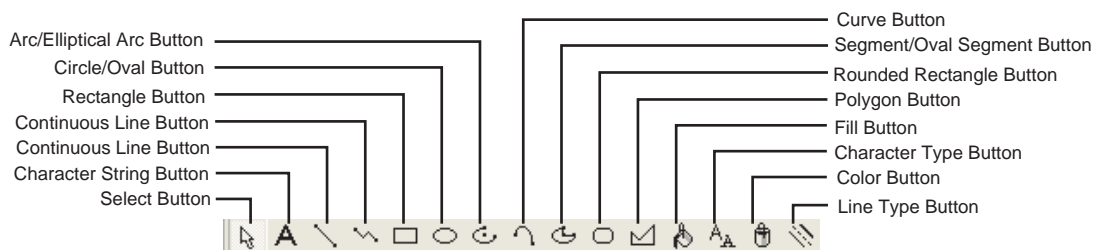
The Undo Button is effective only for operations such as drawing and editing character strings, graphics, and parts, and some operations in editors activated from the menu bar.

The Undo Button cannot be used for other operations.

3-2-4 Graphic Bar Functions

Part Names and Functions

The names of icons and other items on the graphic bar are given below.

**Select Button**

Used to select a character string, graphic, functional part, etc.

Character String Button

Creates a character string.

Continuous Line Button

Creates a straight line.

Continuous Line Button

Creates continuous lines.

Rectangle Button

Creates a rectangle.

Circle/Oval Button

Creates a circle or oval.

Arc/Elliptical Arc Button

Creates a circular or oval arc.

Curve Button

Creates a curved line.

Segment/Oval Segment Button

Creates a circular or oval sector.

Rounded Rectangle Button

Creates a square with rounded corners. The radius of the rounded corners can be changed in the line settings.

Polygon Button

Creates a polygon.

Fill Button

Fills areas enclosed by lines and graphics with a color.

Character Type Button

Sets the size and style (bold, outline, underline) of characters.

Color Button

Changes the color of character strings and graphics.

Line Type Button

Sets the line thickness and type.

3-2-5 Screen Manager

The Screen Manager is a dialog box for managing the base screens in a project.

It can be used as a list for opening screens.

Screens can be copied, pasted, cut, and deleted using the Screen Manager.

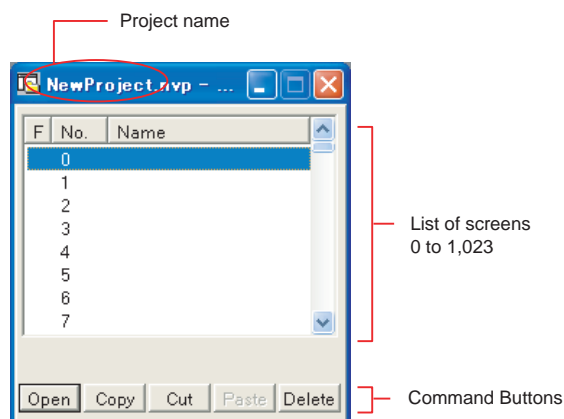
Multiple projects can be started simultaneously and editing can be performed between the Screen Managers.

Project Name and Base Screen List

The project name is displayed at the upper left of the window.

Serial numbers starting from 0 will be assigned to projects that have not yet been saved.

This is how projects can be distinguished if multiple projects are created.



A base screen is displayed by its number and name.

Note The number of screens that can be registered depends on the contents of the screens.

Creating Screens

Double-click the number of the base screen that you want to create, or select the number and click the Open Button.

Editing the Screen

Copy: Select the screen to copy, click the Copy Button, input a different screen number, and click the Paste Button.

Move: Select the screen to move, click the Cut Button, input a different screen number, and click the Paste Button.

Delete: Select the screen to delete and then click the Delete Button.



Additional Information

- The copy, paste, cut, and delete functions can also be accessed by right-clicking on the desired screen.
- The "+" sign will be displayed in the F column if a screen is copied and pasted.
- Multiple Screen Managers can be displayed simultaneously and screens can be copied or moved between files. However, if the models of NV-series PT are different and the screen cannot be pasted, a message saying so will be displayed.

3-2-6 Base Screens

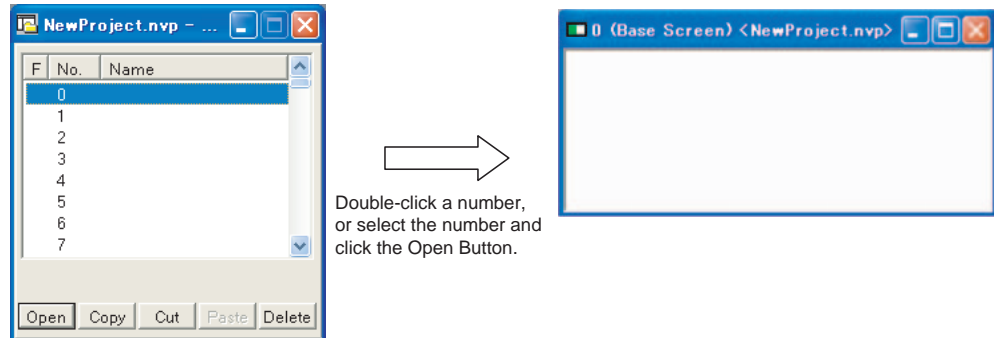
Base screens are essentially the same size as the screens displayed on the PT.

(You can zoom the screen display in and out.)

Character strings and parts are positioned on the screen to create a base screen.

Opening a Base Screen

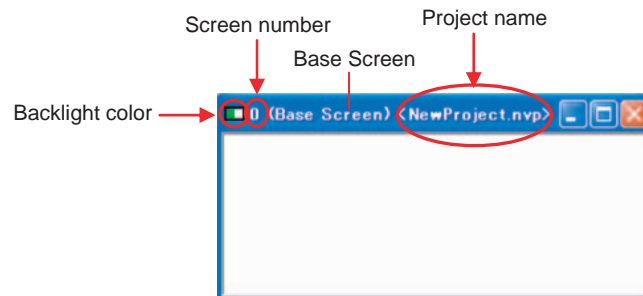
Double-click a number in the number column in the Screen Manager (or select the number and click the Open Button) to open a base screen.



Parts of Base Screens

The screen number will be displayed on the top left of the base screen, and the project name will be displayed on the right of "Base Screen."

The backlight color is displayed on the top left of the base screen.



Closing a Base Screen

Click the Close Button in the title bar to close the base screen.

If anything has been created on the base screen, the base screen will be registered in the Screen Manager when the base screen is closed.

If nothing has been created on the base screen, the base screen will simply close.

To close multiple screens at once, select Window – Close All from the Menu Bar.



Precaution for Correct Operation

1. The base screen will not be saved even it is registered in the Screen Manager. To save the base screen, select Save from the File Menu and save the entire project.
2. If the base screen is changed and it is closed, there will be no warning message asking whether you want to save it before closing.

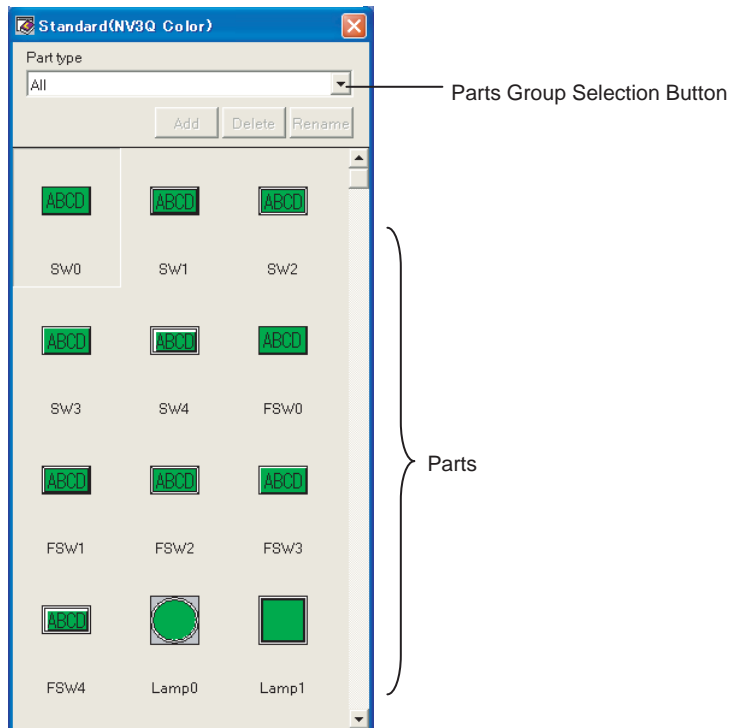
3-2-7 Parts Libraries

A parts library contains parts, such as switches, lamps, data displays, and keyboards, that you can use to create screens.

They can be easily positioned on base screens by dragging and dropping them.

When the NV-Designer is started, the Standard Parts Libraries for all parts for the model that is set will be displayed in front.

Standard Parts Library



Refer to 7-2-2 *Parts Libraries* for details on the parts libraries.

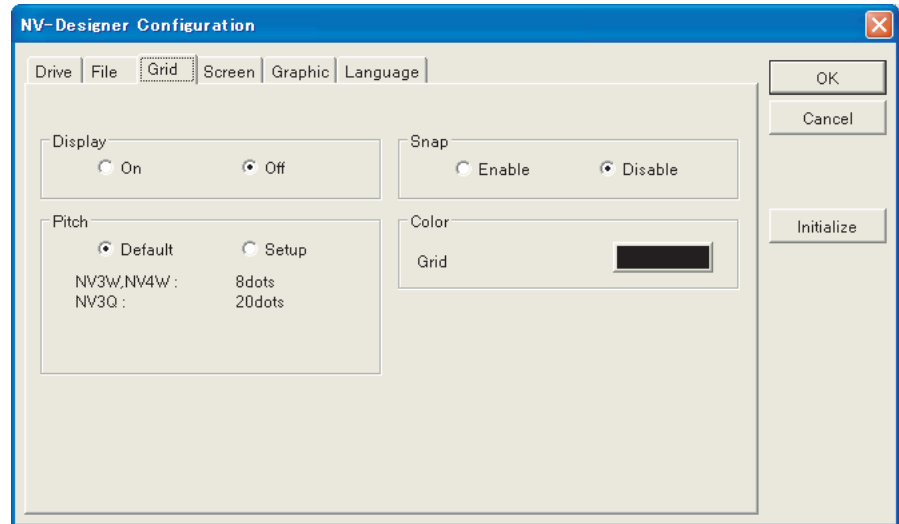
3-3 NV-Designer Configuration

The display while creating base screens and the data save location can be changed in the NV-Designer Configuration.

3-3-1 Customizing the Screen Creation Display

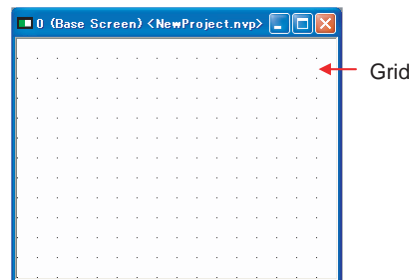
Grid Display and Setup

- 1,2,3... 1. Click the Grid Tab from the View Menu.



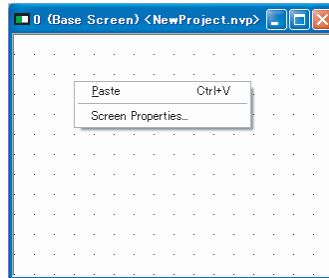
2. Select the On Option under Display.
3. Select the pitch, snap, and color as required and click the OK Button.

The grid will be displayed on the base screen as shown in the following figure.

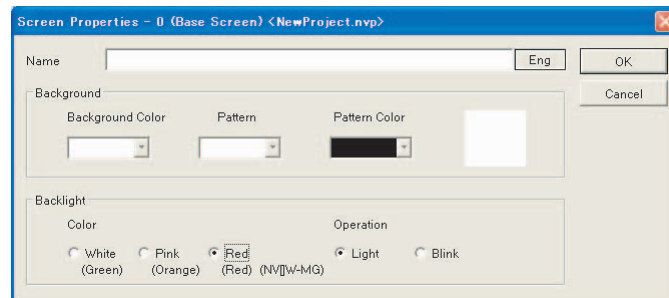


Changing Base Screen Properties (Background and Backlight)

- 1,2,3... 1. Right-click on the base screen and select Screen Properties from the pop-up menu.
Or select Screen Properties from the PT Menu.



The following Screen Properties Dialog Box will be displayed.
Example for the NV3W



- The background pattern and color can be changed for the NV3W-M□□□(□) (-V1), NV4W-M□□□, and NV3Q-MR□□.
- The background color can be changed for the NV3Q-SW□□.

3-3-2 NV-Designer Configuration

Setting Method

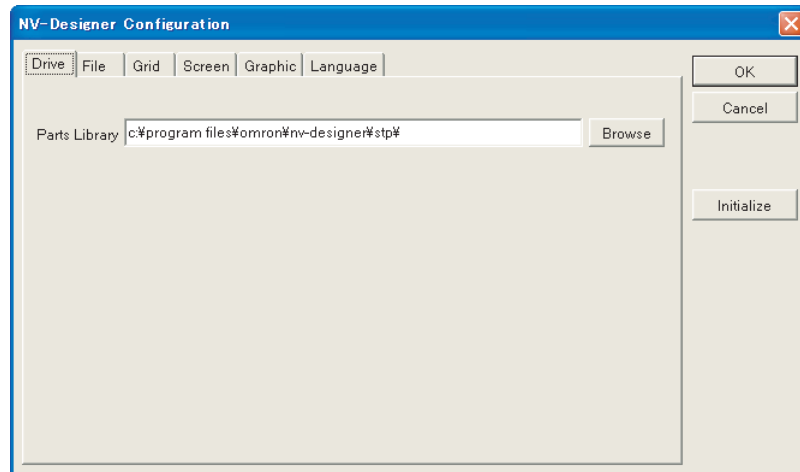
Select NV-Designer Configuration from the Tool Menu.

NV-Designer Configuration and Initial Values

| Tab | Description | Item | | | Initial Value |
|--------------|---|---|--------------------|-------------|--|
| Drive | Specify the data folder of the parts libraries that are used by the NV-Designer. | Parts Library | | | Installation folder/STP |
| File | Enables/disables automatic backup and sets the backup interval. | Current Folder | | | C:\documents and settings\ UserName\ |
| | | Auto-Backup: Every 5 to 30 minutes | | | Not selected. |
| Grid | Displays/hides the grid, enables/disables snapping to the grid, and sets the grid interval, color, etc. | Display: On/Off | | | Off |
| | | Pitch | Default | | NV3W: 8 dots NV3W-V1: 12 dots NV3Q: 20 dots NV4W: 20 dots |
| | | | Setup | X direction | 20 dots |
| | | | | Y direction | 20 dots |
| | | Snap: Enable/Disable | | | Disabled |
| | | Color: Grid | | | Black |
| | | Display Guideline | | | Only left and upper sides are checked. |
| | | | Distance | 8 | |
| Screen | NV-Designer Screen Display Settings | Toolbar: Display/Hide | | | View |
| | | Graphic Bar: Display/Hide | | | View |
| | | Zoom Box: Display/Hide | | | Hide |
| | | Parts Information | Parts No. | | Hide |
| | | | Parts Attribute | | Hide |
| | | Fill Pointer | Display/Hide | | View |
| | | | Fill Pointer Color | | Black |
| | | Keyboard Parts | | | Display/Hide |
| Tips Display | Shows Tips before Saving a Project. | View | | | |
| Graphic | Sets the drawing method for circles and ovals. | Circle/Oval: Start from Center Point/Start from Top Left Corner | | | Start from Top Left Corner |
| Language | Sets the language to use by default. | Default Character Set: | | | Japanese |
| | | Menu and Dialog Language: Japanese, English or Korean | | | English |
| | | Multi-Language Exchange: On/Off | | | Off |

3-3-3 Drive Tab Page

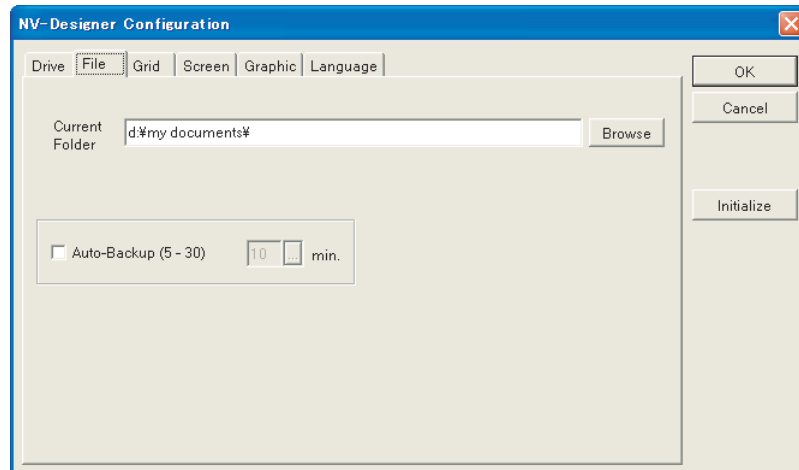
This tab page is used to specify the data folder of the parts libraries that are used by the NV-Designer.




| Setting | Description |
|---------------|--|
| Parts Library | The parts libraries where the data folder is stored is displayed. To change the folder of the parts libraries, click the Browse Button and specify the folder for the parts libraries in the dialog box that is displayed. |

3-3-4 File Tab Page

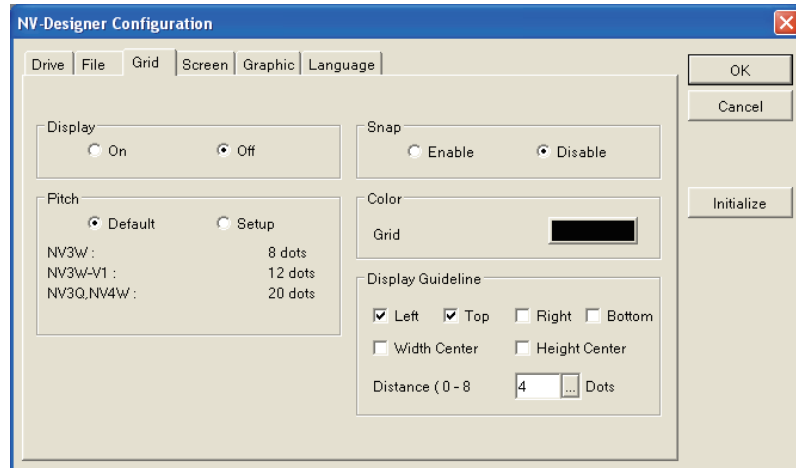
This tab page is used to enable/disable automatic backup and sets the backup interval.




| Setting | Description |
|----------------|--|
| Current Folder | The default folder for saving and reading files is set on the File Tab Page. |
| Auto-Backup | <p>Data is periodically backed up to the disk when the Auto-Backup Check Box is selected.</p> <p>The backup interval can be set in 1 minute increments between 5 and 30 minutes.</p> <p>If the NV-Designer is forced to close, backed up project files will be automatically recovered when it is restarted.</p> <p>Click the  Button and set the time to automatically backup in the Set Value Dialog Box that is displayed.</p> |

3-3-5 Grid Tab Page

This tab page is used to display/hide the grid, enable/disable snapping to the grid, and set the grid pitch, color, etc.



| Setting | Description |
|--------------------|--|
| View | Displays or hides the grid on base screens edited with the NV-Designer. |
| Pitch | Sets the grid pitch if grids are displayed. (2 to 80) Default: The grid display is fixed in the X-direction and Y-direction with the following pitch. NV3W: 8 dots NV3W-V1: 12 dots NV3Q/NV4W: 20 dots Setup: The pitch of the grid display can be adjusted in units of dots. |
| Snap | Enables/disables the snap function which aligns the position of parts or the starting/ending points of graphics with the grid. |
| Color (grid color) | Sets the color of the grid displayed on the base screen. Click the  Button and select the color from the dialog box that appears. |
| Display Guideline | Sets whether to display the guideline to seize the positional relationship with other parts when moving a part. |

Display Guideline

Sets whether to display the guideline to seize the positional relationship with other parts when moving a part.



Additional Information

The grid settings can also be displayed from the Menu Bar.

Select View – Grid from the Menu Bar.

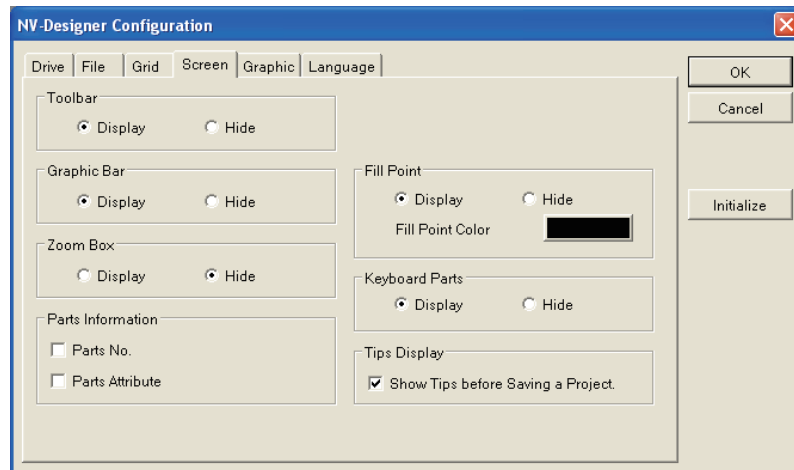
It can also be selected using the Alt + G shortcut keys.


Enable/Disable Snap with Toolbar Button

Click the Snap ON/OFF Button on the toolbar.

3-3-6 Screen Tab Page

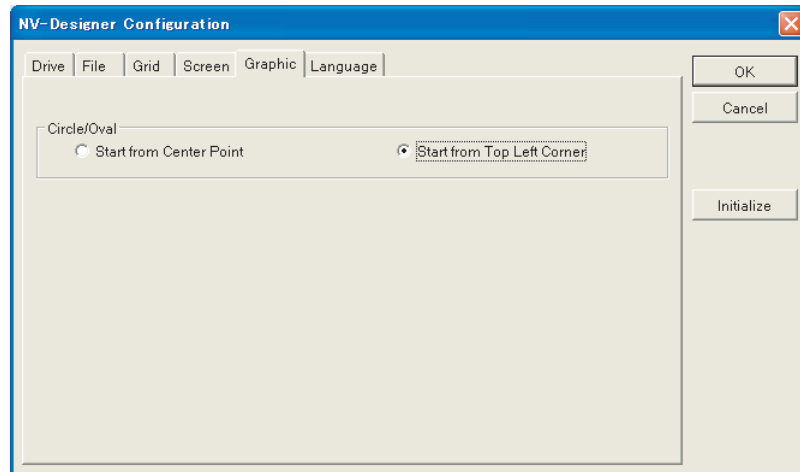
This tab page is used to set the screen display setting for the NV-Designer.



| Setting | Description |
|------------------------------------|--|
| Toolbar | Sets whether to display or hide the toolbar on the editing screens when the NV-Designer is started. The toolbar can also be displayed and hidden from the View Menu on the menu bar. |
| Graphic Bar | Sets whether to display or hide the graphic bar on the editing screens when the NV-Designer is started. The graphic bar can also be displayed and hidden from the View Menu on the menu bar. |
| Zoom Box | Characters and parts drawn on the screen can be zoomed for checking. |
| Parts Information | Enables/disables the communications address used by the part. Parts No.: Displays the parts numbers of all parts on the base screen. Parts Attribute: Displays the communications address of the main attribute PLC of the parts on the base screen. |
| Fill Point | Displays/Hides the fill pointer for filling closed areas. |
| Fill Point Color | Click the  button and select the color from the dialog box that will be displayed. |
| Keyboard Parts | Displays/Hides the keyboard parts. |
| Tips Display | Displays/hides the message that indicates that there will be multiple saved files from the NV-Designer. |
| Shows Tips before Saving a Project | |

3-3-7 Graphic Tab Page

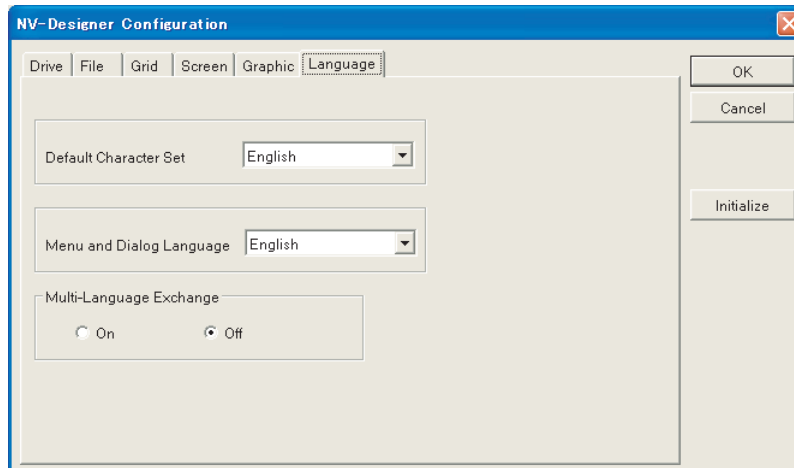
Sets the drawing method for circles and ovals.



| Setting | Description |
|----------------------------|---|
| Circle/Oval | Changes the method for drawing circles and oval, either starting from the center or from the top left. |
| Start from Center Point | <p>A circle or oval is drawn inscribed in a rectangle that has the specified start point as the center of the circle or oval and for which the specified start point to the end point is half of the distance between diagonally opposed corners of the rectangle.</p> <div> </div> |
| Start from Top Left Corner | <p>A circle or oval is drawn inscribed in a rectangle that has the start and end points as a diagonal line.</p> <div> </div> |

3-3-8 Language Tab Page

This tab page sets the language to use by default.



| Setting | Description |
|--------------------------|--|
| Default Character Set | <p>Sets the default language when parts are pasted from a parts library.</p> <p>It can be chosen from Japanese, English, Simplified Chinese, Traditional Chinese, Korean, or Turkish.</p> <p>For example, even if the menu and dialog boxes are displayed in Japanese, you can set the characters on the parts to be displayed in English or European English.</p> |
| Menu and Dialog Language | <p>Sets the language displayed in the menus and dialog boxes.</p> <p>It can be chosen from Japanese, English, Korean, Simplified Chinese, or Traditional Chinese.</p> |
| Multi-Language Exchange | <p>Sets whether to enable or disable the display language switching function. If switching the display language is enabled, Multi Language Exchange String List – Edit Properties can be selected from the PT Menu.</p> <p>If switching the display language is enabled, a dialog box to edit character strings for switching display languages will be displayed to let you select the language for each language number.</p> <p>You can register the language and corresponding character string for each part in advance and then change all registered parts at the same time using a function switch or a command from the PLC.</p> |



Additional Information

To change the display, the NV-Designer must be restarted.

The set language will be enabled when the NV-Designer is restarted. Restart the NV-Designer.

SECTION 4

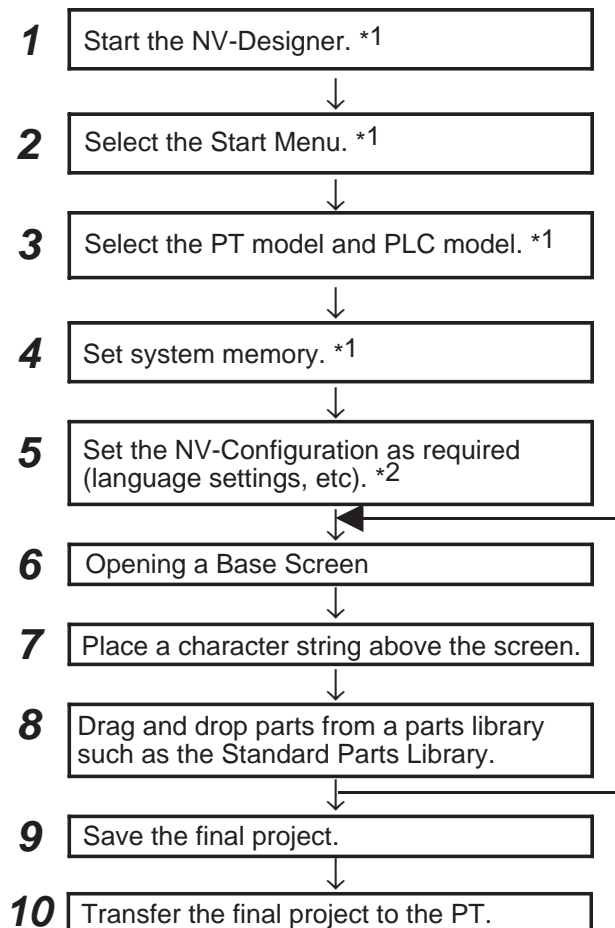
Overall Flow of NV-Designer Operation

This section describes the overall procedure for using the NV-Designer to set up an NV-series PT for operation.

| | | |
|--------|---|----|
| 4-1 | Overall Flow of Operation | 40 |
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| 4-2-1 | Starting the NV-Designer | 41 |
| 4-2-2 | Using the New Project Wizard | 42 |
| 4-2-3 | NV-Designer Configuration (Optional) | 43 |
| 4-2-4 | Creating Base Screens | 43 |
| 4-2-5 | Saving the Screens and Settings (Project) | 48 |
| 4-2-6 | Transferring the Final Project to the PT | 49 |
| 4-2-7 | Setting the PT System Menu | 50 |
| 4-2-8 | Setting Up PLC Communications | 51 |
| 4-2-9 | Connecting the PT and PLC | 52 |
| 4-2-10 | Starting PLC Communications | 52 |

4-1 Overall Flow of Operation

Refer to the following steps when using the NV-Designer for the first time.

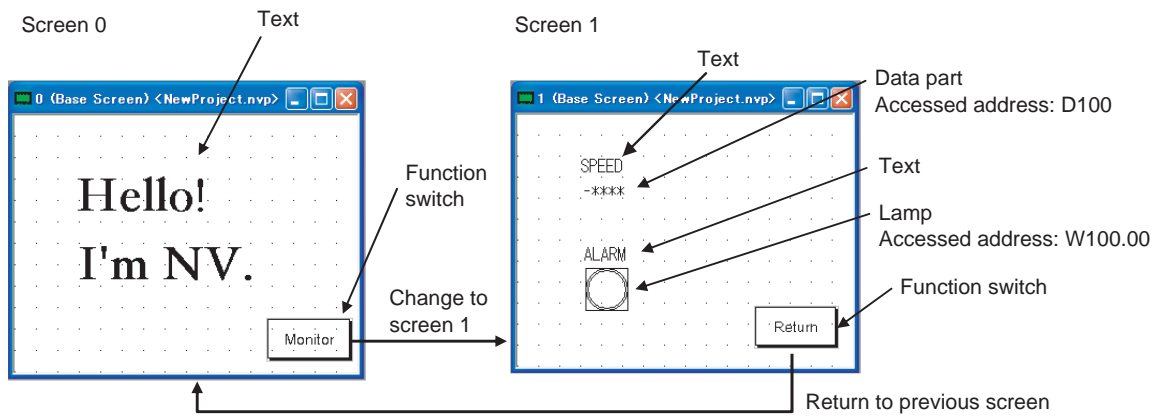


*1 For details, refer to *SECTION 5 Creating and Saving Projects (Including Screen Data)*.

*2 For details, refer to *SECTION 3 NV-Designer Outline and Configuration*.

4-2 Creating a Simple Screen

This section describes how to create a simple screen and operate it.
Screen to be created:



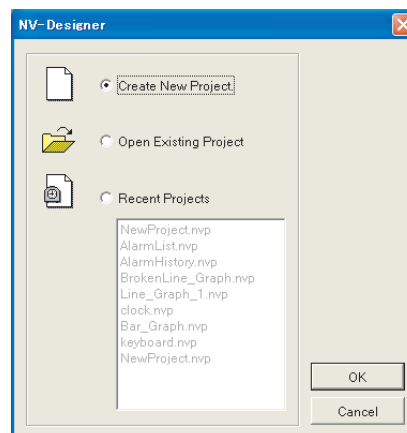
4-2-1 Starting the NV-Designer

When the NV-Designer is started, select the PT model and the PLC it connects to.

- 1,2,3...**
1. Select Program – OMRON – CX-One – NV-Designer to start the NV-Designer.

Note When Windows 8 is running, the NV-Designer startups from the startup screen.

2. Select Create New Project from the Start Menu and click the OK Button.



4-2-2 Using the New Project Wizard

When Create New Project is selected from the Start Menu, the New Project Wizard will be displayed. Use the following procedure to set up the project.

1,2,3...

1. Set the PT model as shown below in the status for creating the project and then click the Next Button.

NV Model: NV3Q

NV Model: Monochrome

2. Set the PLC model as shown below for the communications parameters and then click the Next Button.

PLC model: OMRON SYSMAC-CS/CJ/CP Series

3. Set the system memory and then click the OK Button. Set the system memory by specifying the area for controlling the PT system in the PLC internal memory. The system memory is used to switch between base screens, so make sure that you set it. In this example, it is left set to the default values.

Note The default words for the Bit Area are CIO 0 to CIO 2. If CIO 0 to CIO 2 are allocated to real I/O, be sure to change the settings (e.g., to words in the Work Area).

Example: With a CP-series PLC, CIO 0 to CIO 2 are allocated to built-in inputs, so the words allocated to the Bit Area must always be changed from the defaults.

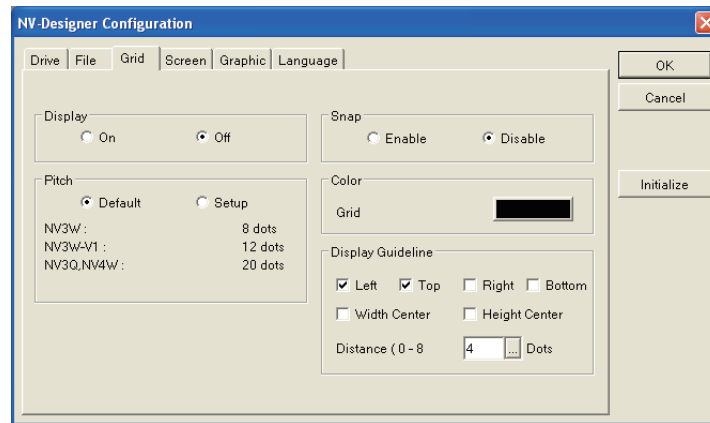
4-2-3 NV-Designer Configuration (Optional)

The NV-Designer Configuration can be used to change the display settings for the NV-Designer.

1,2,3...

1. Select NV-Designer Configuration from the Tool Menu.
2. Change the parameters in the following window.

(Example: A grid can be displayed on the base screens by specifying it in here.)



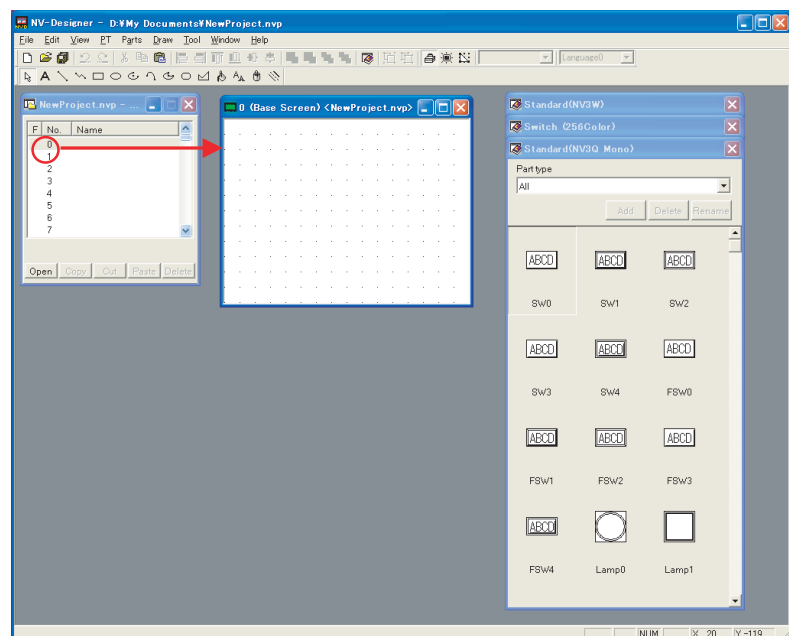
4-2-4 Creating Base Screens

Use the following procedure to create the sample screen.


Opening Screen 0

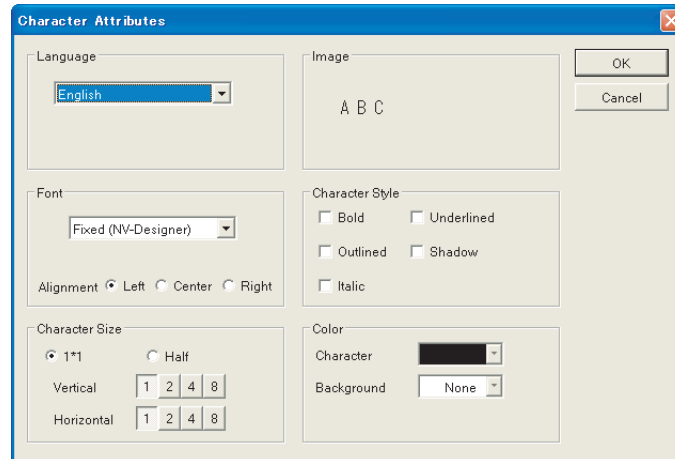
1,2,3...

1. Double-click "0" in the Screen Manager at the upper left of the window. The base screen with screen number 0 will open.



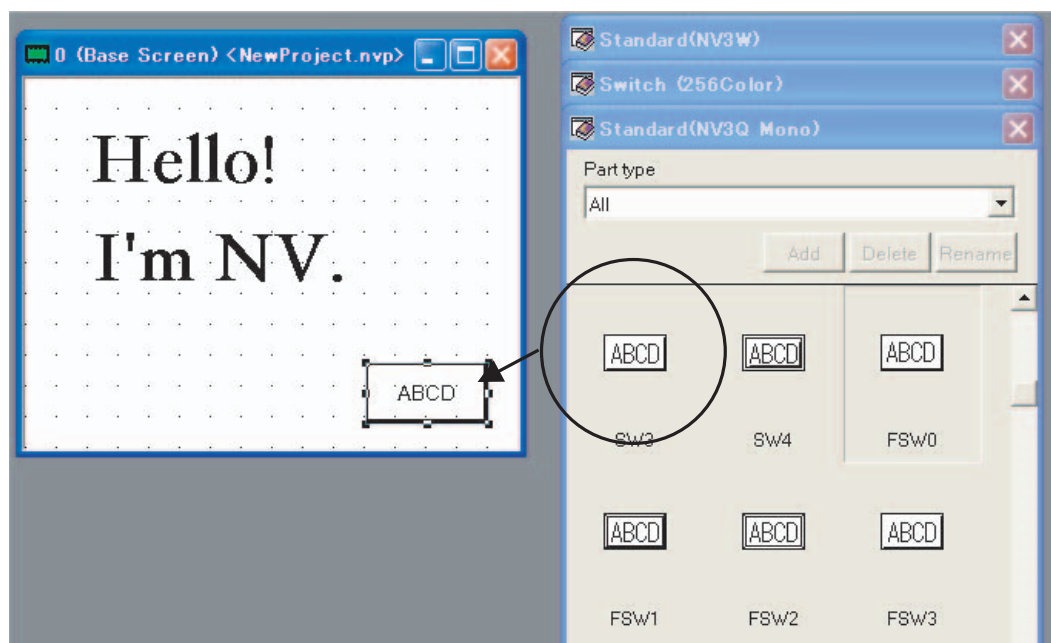
Setting Character Strings

- 1,2,3... 1. Click the  Button on the graphic bar and click on the base screen where you want to type in a character string.
2. Enter a character string on screen 0. Enter "Hello! I'm NV."
3. Select the character string that you just entered and select Character Attribute from the Graphic Menu. Set the character color and size.

**Setting Function Switches**

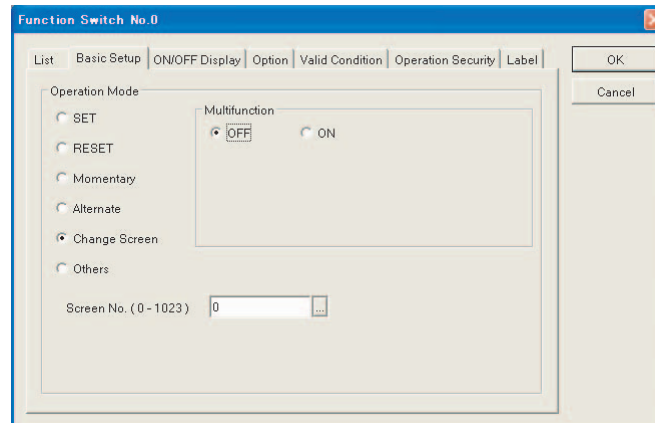
Use the following procedure to create a function switch (labeled "Monitor") on screen 0 to switch the screen display.

- 1,2,3... 1. Select the function switch parts library.
2. Drag the part called FSW0 and drop it on the base screen.

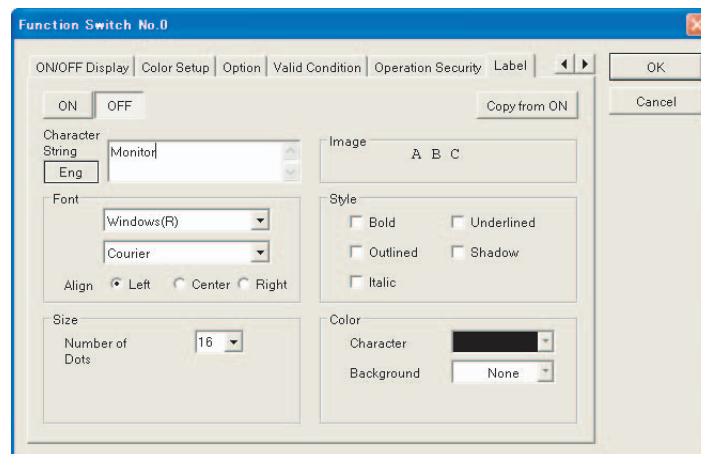


3. Double-click the function switch that was pasted.

4. On the Basic Setup Tab Page, leave the operation mode set to Change Screen and the screen set to 1.



5. On the Label Tab Page, set the text to display on the switch as shown below.



ON Switch Display Settings

Text: Enter "Monitor".

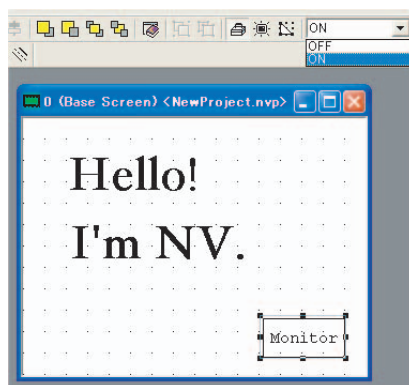
Font: Windows (Courier)

Color: Black

OFF Switch Display Settings

Click the OFF Button to change the setting display. Click the *Copy from ON* Button. (The ON settings will be copied.)


- Change the status between OFF and ON at the top right of the tool bar and check the displays.



Opening Screen 1

- 1,2,3...**
- Double-click "1" in the Screen Manager at the upper right of the window. The base screen with screen number 1 will open.

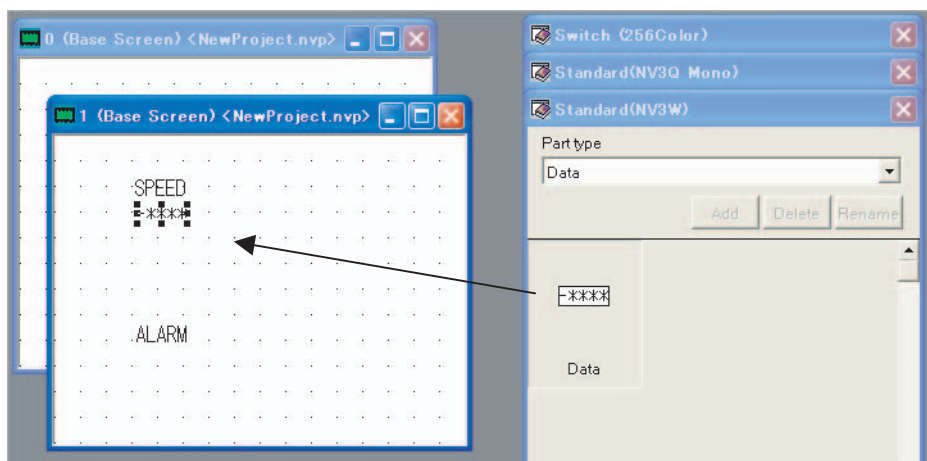
Setting Character Strings

- 1,2,3...**
- Click the  Button on the graphic bar and enter the following character string on screen 1.
Speed, Alarm

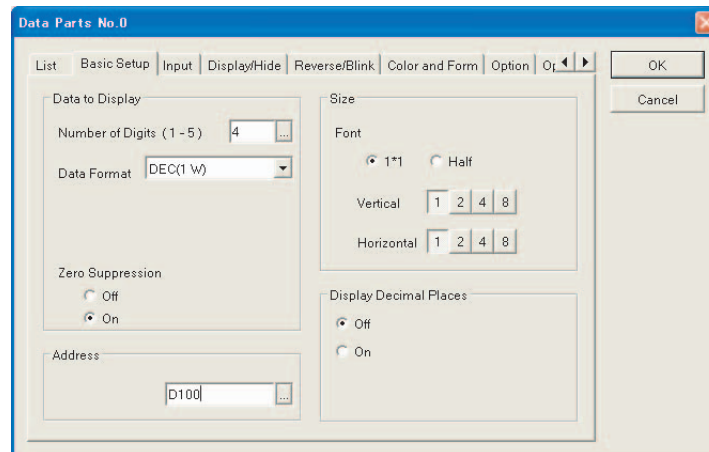
Setting Data

Use the following procedure to create a data part that will display the contents of a word address in the PLC on screen 1.

- 1,2,3...**
- Select Data from the Standard Parts Library.
 - Drag the part called Data and drop it on the base screen.



- Double-click the part that was pasted and specify "D100" on the Basic Set-up Tab Page as the communications address in the PLC.

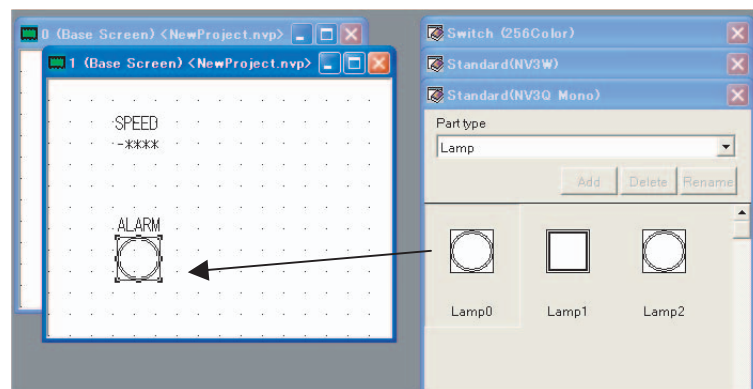


Setting Lamps

Use the following procedure to create a lamp that will display the status of a bit in the PLC on screen 1.

1,2,3...

- Select the lamp parts library.
- Drag the part called Lamp0 and drop it on the base screen.



- Double-click the part that was pasted and specify "W100.00" on the Basic Setup Tab Page as the communications address in the PLC.

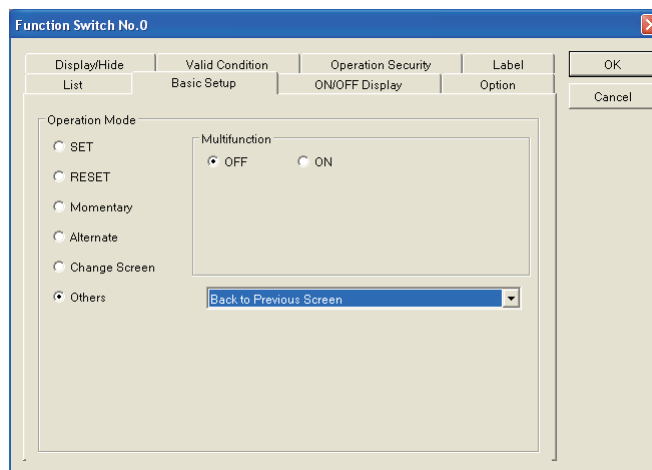
Setting Function Switches

Use the following procedure to create a function switch (labeled "Return") to switch the screen to the previously displayed screen (screen 0).

1,2,3...

- Select the function switch parts library.
- Drag the part called FSW0 and drop it on the base screen.
- Double-click the function switch that was pasted.

4. On the Basic Setup Tab Page, select Others for the operating mode and select *Back to Previous Screen*.



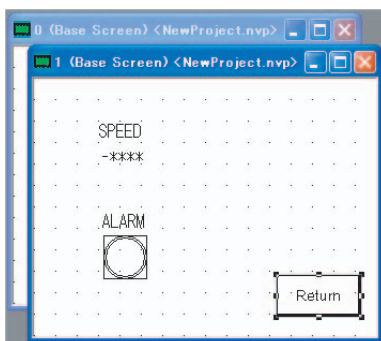
5. On the Label Tab Page, set the text to display on the switch as shown below.

ON Switch Display Settings

Character string: Enter "Return".

OFF Switch Display Settings

Character string: Set to Copy when ON



4-2-5 Saving the Screens and Settings (Project)

Save the final project.

1,2,3...

1. Select Save As from the File Menu.
2. Specify the save location and click the Save Button.



Important

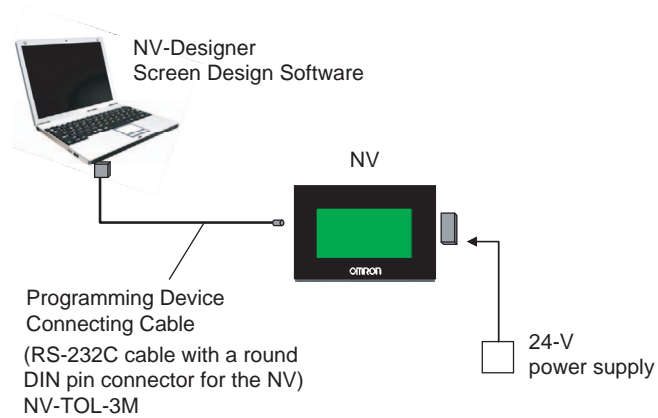
The created screens and settings (project) can be printed by selecting Print from the File Menu.

4-2-6 Transferring the Final Project to the PT

1,2,3... 1. Connect the PT and NV-Designer as shown in the following diagrams.

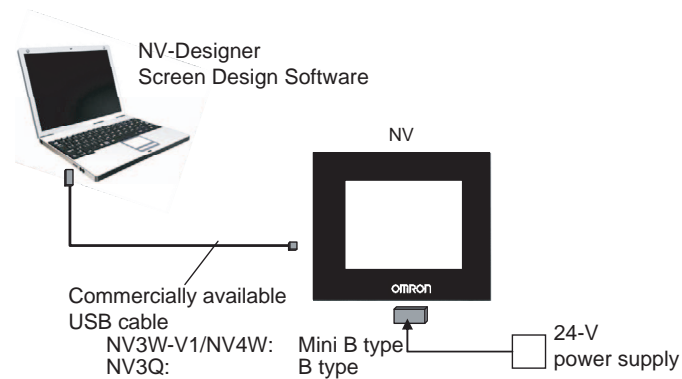
- Example for the NV

Connect the tool port on the back of the NV to the computer.



- Example for the NV3W-V1/NV4W/NV3Q

Connect the USB port on the back of the NV to the computer.

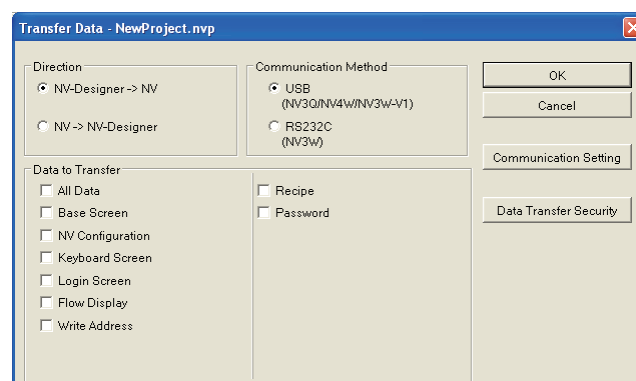


2. Select Transfer - Transfer from the PT Menu. The Data Transfer Dialog Box will be displayed.

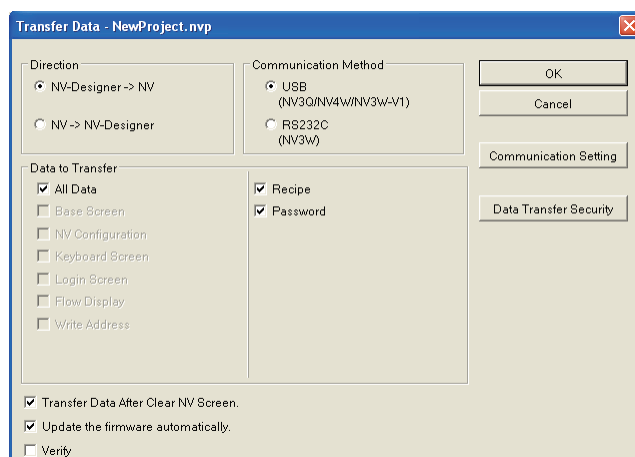
3. Set the method of communications with the PT.

NV3W: RS232C

NV3W-V1/NV4W/NV3Q: USB



- Specify the data to transfer to the PT. Select All Data.

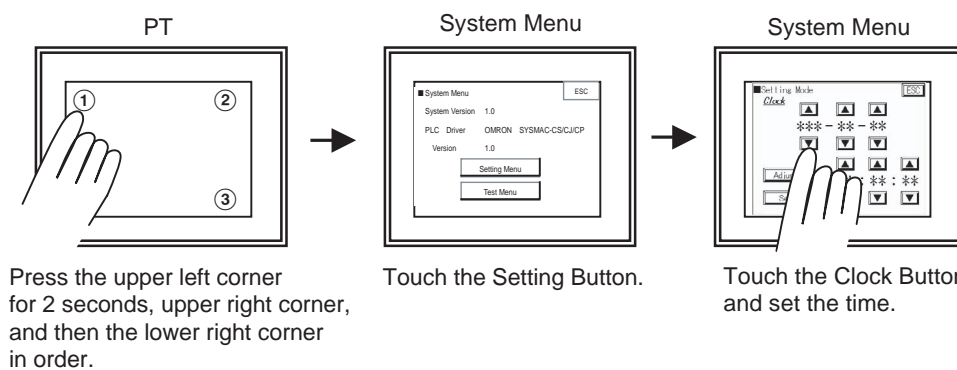


- Click the OK Button. The project will be transferred to the PT.

4-2-7 Setting the PT System Menu

Example: Set the clock in the NV3Q.

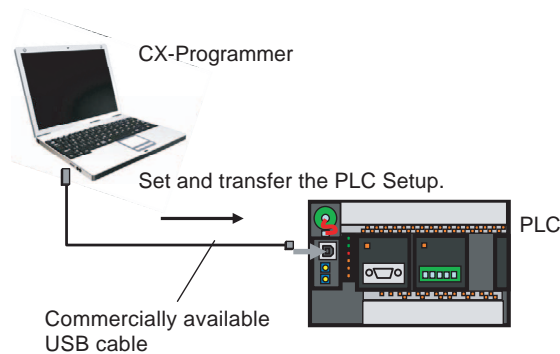
- 1,2,3...**
- Press the upper left corner for 2 seconds, upper right corner, and then the lower right corner in order.
 - Touch the Setting Menu Button.
 - Touch the Clock Button.
 - Set the time.



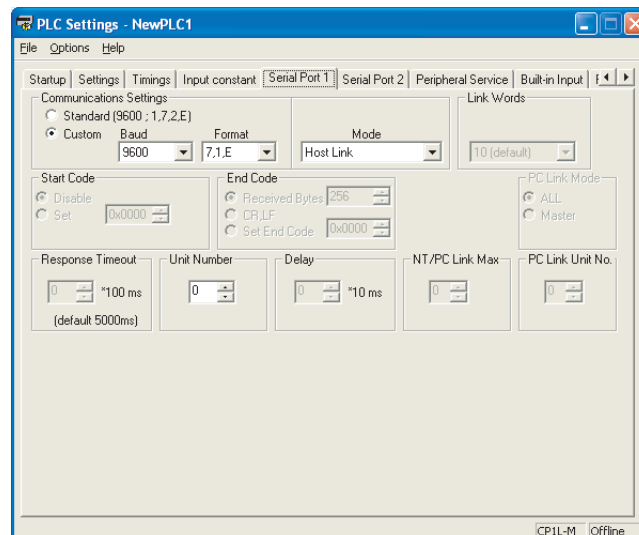
Refer to the *NV-Series PT Setup Manual* (Cat. No. V103) for details on the System Menu.

4-2-8 Setting Up PLC Communications

The communications settings must be changed in the PLC so that it can communicate with the PT. In this section, an NV3Q PT and a CP-series PLC are used as an example.



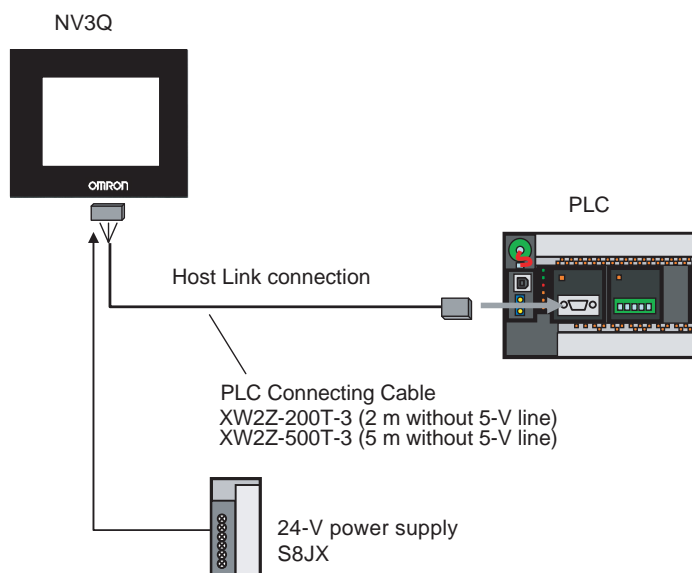
- 1,2,3...**
1. Start the CX-Programmer.
 2. Make the following settings on the Serial Port 1 Tab Page for the CP1E and the Serial Port Tab Page for other PLCs in the PLC Setup.
 Communications setting: User settings
 Baud rate: 9,600 bps
 Parameters: 7, 1, E
 Host link No.: 0



3. Transfer the PLC Setup from the CX-Programmer to the PLC.

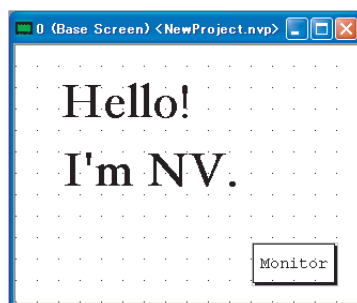
4-2-9 Connecting the PT and PLC

You can connect the PLC to the NV3Q using a RS-232C cable.

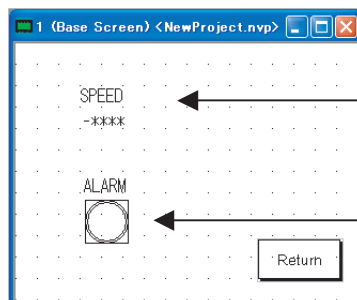


4-2-10 Starting PLC Communications

- 1,2,3...
1. Turn ON the PLC.
 2. Screen 0 will be displayed. Touch the Monitor Switch.



3. The screen will change to screen 1 and the following information will be monitored.



The contents of D100 will be displayed.

The lamp color changes when CIO 100.00 turns ON.

4. Touch the Back Switch to return to the previous screen (screen 0).

SECTION 5

Creating and Saving Projects (Including Screen Data)

This section describes how to create, save, and manipulate projects for NV-series PTs, including operations that can be performed between projects.

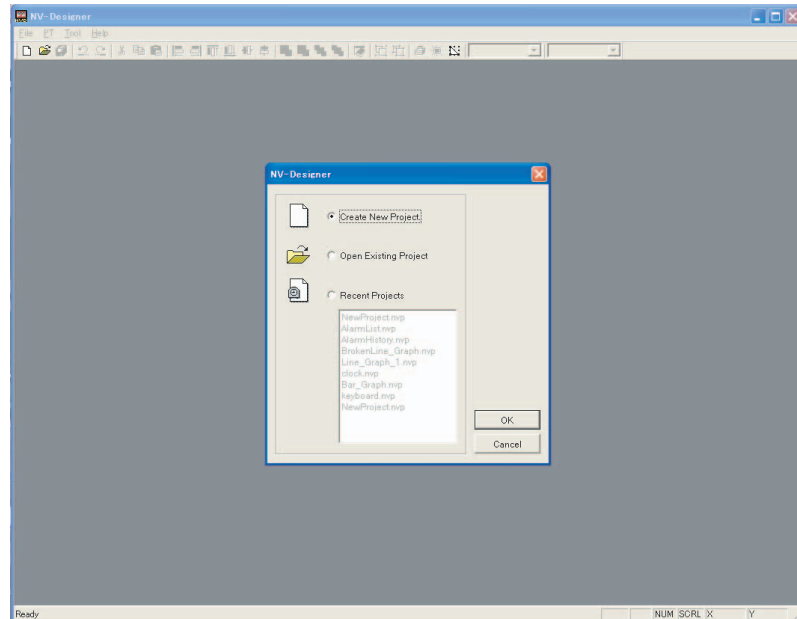
| | | |
|-------|---|----|
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| 5-1-1 | Starting the NV-Designer and Using the New Project Wizard | 54 |
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5-1 Starting the NV-Designer and Creating New Projects

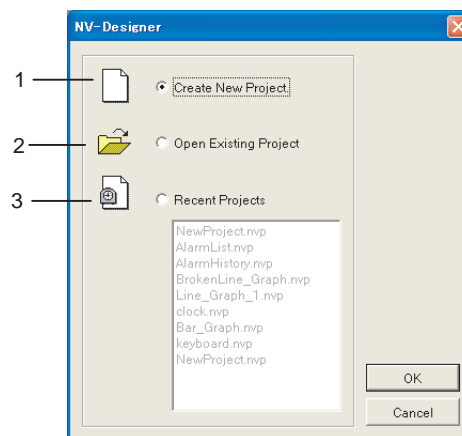
This section describes how to start the NV-Designer and create projects.

5-1-1 Starting the NV-Designer and Using the New Project Wizard

- 1,2,3...
1. Select Program – OMRON – NV-Designer – NV-Designer from the Windows Start Menu to start the NV-Designer. (The menu commands may be different if a different Program Folder was specified during installation.)
 2. When the NV-Designer is started, the NV-Designer Dialog Box will be displayed.



3. Select an option in the NV-Designer Dialog Box and click the OK Button.



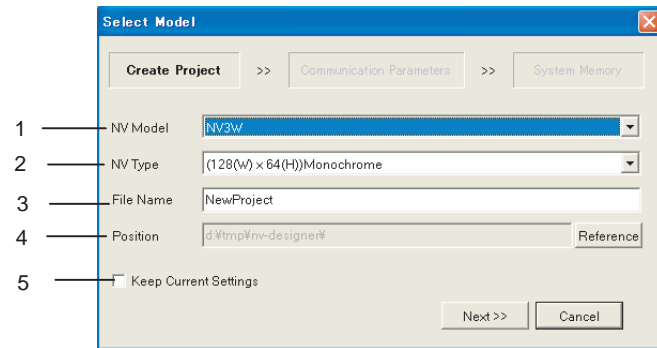
| | Item | Description |
|---|-----------------------|--|
| 1 | Create New Project | Select this option to create a new project. |
| 2 | Open Existing Project | Select this option to read and edit a project that is saved to the disk. A dialog box for opening the project will be displayed for you to select the project that you want to edit. |
| 3 | Recent Projects | Select this option to open a project that has been used recently. |

4. Select Create New Project from the Start Menu. The following Select Model Dialog Box will be displayed.

The following setting status will be displayed at the top of the Wizard Dialog Box.

Create Project >> Communication Parameters >> System Memory

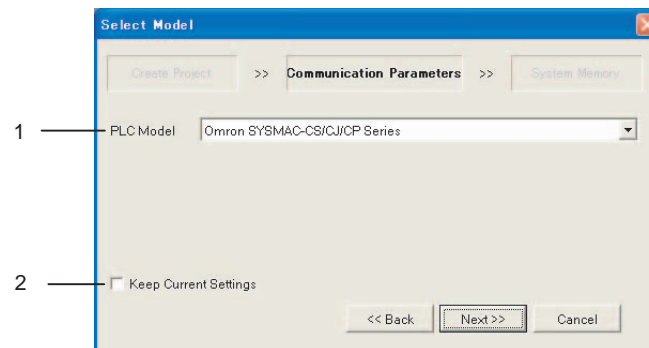
5. Set the status for creating the project and then click the Next Button



| | Item | Description |
|---|-----------------------|--|
| 1 | NV Model | Select the model of the NV-series PT from the drop-down list. NV3W (default), NV3W-V1, NV4W, or NV3Q |
| 2 | NV Type *1 | Select the model of NV-series PT from the drop-down list. NV3W: Monochrome (default) or vertical and monochrome NV3W-V1: Monochrome (default) or vertical and monochrome NV4W: 2 shades of gray (default), 8 shades of gray, vertical with 2 shades of gray, or vertical with 8 shades of gray NV3Q: Monochrome (default) or color |
| 3 | File Name | Enter the name of the file in which to save the project. The default file name is NewProject. |
| 4 | Position | Use the Reference Button to specify the location where the project is to be saved. The default location is c:\documents and settings\user\my documents\. |
| 5 | Keep Current Settings | Select this check box to use the above settings the next time you create a file. |

*1 To change the model setting, select Convert - NV Model Convert from the Tool Menu of the NV-Designer.

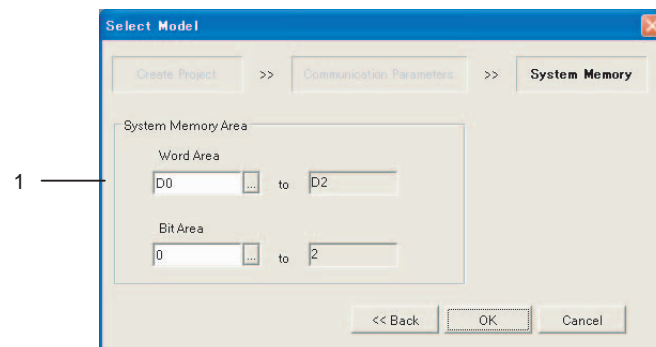
6. Set the status for the communications settings and then click the Next Button. (Click the Cancel Button to display the Startup Window without a project.)



| | Item | Description |
|---|-----------------------|--|
| 1 | PLC Model*1 | Select the PLC model to connect from the drop-down list. The default is the OMRON SYSMAC CS/CJ/CP* Series. |
| 2 | Save Current Settings | Select this check box to use the above settings the next time you create a file. |

*1 To change the model setting, select Convert – PLC Model Convert from the Tool Menu of the NV-Designer.

7. Set the status for system memory and then click the Next Button (Click the Cancel Button to display the Startup Window without a project.)



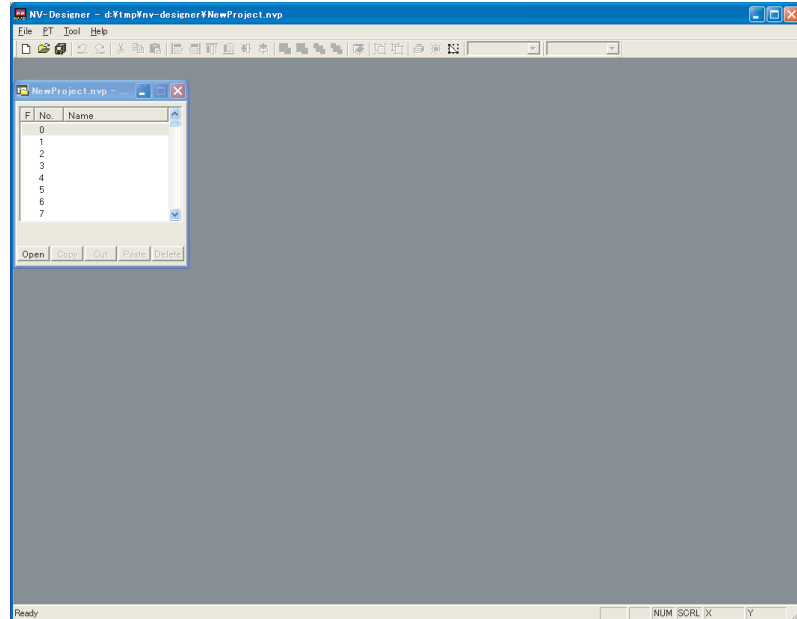
| | Item | Description |
|---|--------------------|---|
| 1 | System Memory Area | Sets the words used as system memory for basic communications with the PLC. Refer to 6-2-3 <i>System Memory</i> for details. |
| | Word Area | Sets the memory area and first address of the area of memory used for communications between the PT and PLC in word units, such as for the screen number. The default is D0 to D2. |
| | Bit Area | Sets the memory area and first address of the area of memory used for communications between the PT and PLC in bit units, such as for the screen saver. The default is 0 to 2. |

Note The default words for the Bit Area are CIO 0 to CIO 2. If CIO 0 to CIO 2 are allocated to real I/O, be sure to change the settings (e.g., to words in the Work

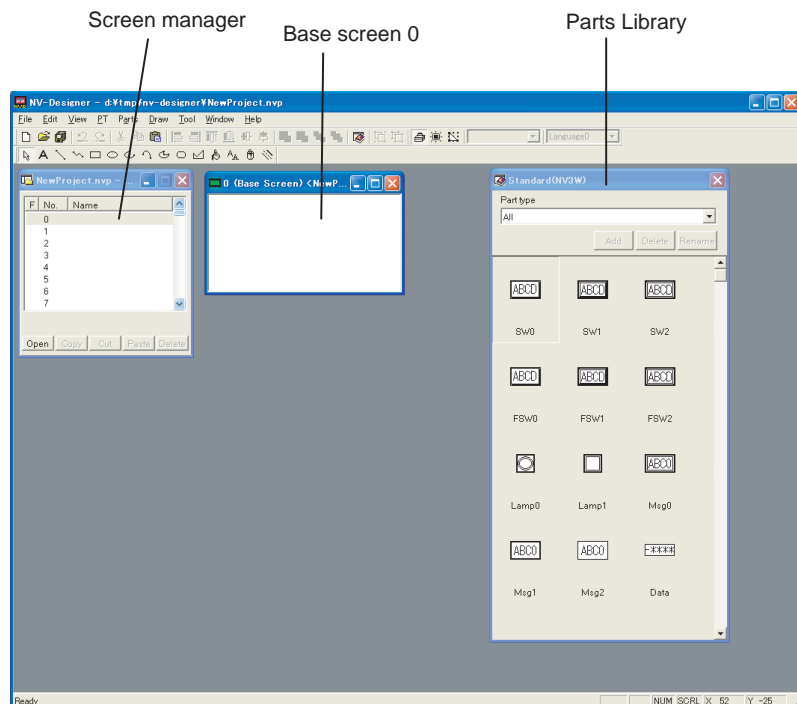
Area).

Example: With a CP-series PLC, CIO 0 to CIO 2 are allocated to built-in inputs, so the words allocated to the Bit Area must always be changed from the defaults.

8. When the NV-Designer is started, a project is created at the same time. The following Main Window will be displayed.



9. Double-click "0" in the Screen Manager. Base screen 0 and the Parts Library will open as shown in the following graphic.



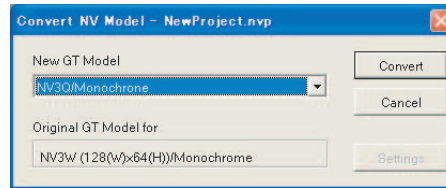
**Additional Information**

Multiple projects can be created and opened simultaneously using the NV-Designer. It is also possible to copy and move screens between projects, as well as to copy and move parts on a screen.

5-2 Checking or Converting the Model

5-2-1 NV Model Convert

Select Convert - NV Model Convert from the Tool Menu of the NV-Designer.



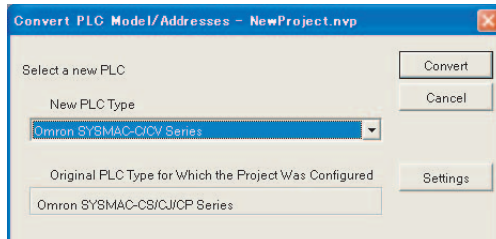
NV Model Conversion Table

| After conversion | | NV3W | | NV3W-V1 | | NV4W | | | | NV3Q | | | |
|-------------------|--------------------------------|----------------|---------------------|----------------|---------------------|------------------|--------------------------------|------------------|--------------------------------|----------------|---------------------|----------------|----------------|
| | | Monochrome | Vertical monochrome | Monochrome | Vertical monochrome | 2 shades of gray | Vertical with 2 shades of gray | 8 shades of gray | Vertical with 8 shades of gray | Monochrome | Vertical monochrome | Color | Vertical color |
| Before conversion | | | | | | | | | | | | | |
| NV3W | Monochrome | --- | Not supported. | Supported. | Not supported. | Supported. | Not supported. | Supported. | Not supported. | Supported. | Supported. | Supported. | Supported. |
| | Vertical monochrome | Not supported. | --- | Not supported. | Supported. | Not supported. | Supported. | Not supported. | Supported. | Supported. | Supported. | Supported. | Supported. |
| NV3W-V1 | Monochrome | Not supported. | Not supported. | --- | Not supported. | Supported. | Not supported. | Supported. | Not supported. | Supported. | Supported. | Supported. | Supported. |
| | Vertical monochrome | Not supported. | Not supported. | Not supported. | --- | Not supported. | Supported. | Not supported. | Supported. | Supported. | Supported. | Supported. | Supported. |
| NV4W | 2 shades of gray | Not supported. | Not supported. | Not supported. | Not supported. | --- | Not supported. | Supported. | Not supported. | Supported. | Not supported. | Supported. | Not supported. |
| | Vertical with 2 shades of gray | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | --- | Not supported. | Supported. | Not supported. | Supported. | Not supported. | Supported. |
| | 8 shades of gray | Not supported. | Not supported. | Not supported. | Not supported. | Supported. | Not supported. | --- | Not supported. | Supported. | Not supported. | Supported. | Not supported. |
| | Vertical with 8 shades of gray | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Supported. | Not supported. | --- | Not supported. | Supported. | Not supported. | Supported. |
| NV3Q | Monochrome | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | --- | Not supported. | Supported. | Not supported. |
| | Vertical monochrome | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | --- | Not supported. | Supported. |
| | Color | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Supported. | Not supported. | --- | Not supported. |
| | Vertical color | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Not supported. | Supported. | Not supported. | --- |

Note Models can be converted only if the number of dots of the model after the conversion is the same or larger than the model before conversion. If the NV4W is changed from 8 shades of gray to 2 shades of gray or the NV3Q is changed from color to monochrome, the NV-Designer will automatically reduce the number of shades or colors.

5-2-2 PLC Model Convert

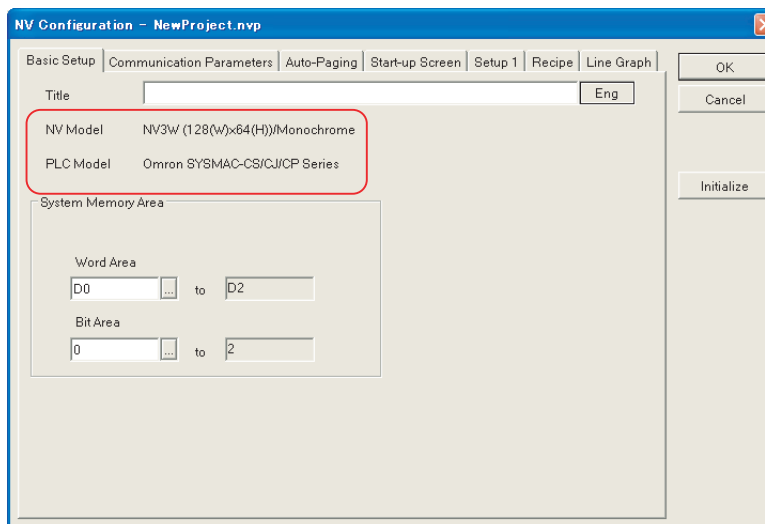
Select Convert – PLC Model Convert from the Tool Menu of the NV-Designer.



5-2-3 Checking the Model

Check the NV-series PT model and PLC model of the screen being created. Select NV Configuration from the PT Menu of the NV-Designer. Check the models on the Basic Setup Tab Page.

NV Configuration Dialog Box



5-3 Creating Base Screens

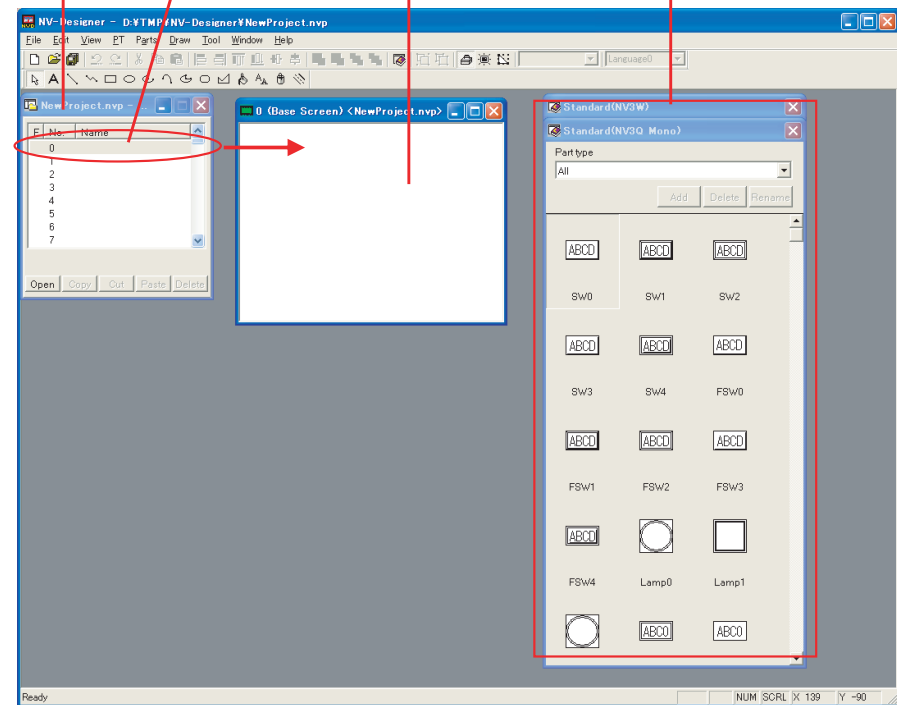
Click "0" in the Screen Manager. Base screen 0 and the Parts Library will be displayed.

Screen Manager

Double-click "0."

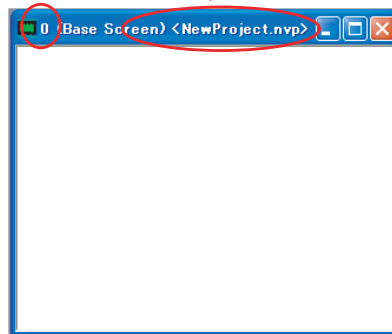
Base screen 0

Parts Library



Screen number

Project name



Additional Information

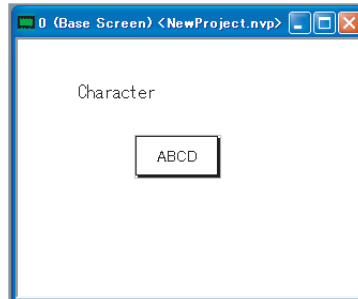
Select Zoom from the View Menu to zoom in and out of the base screen.

5-4 Positioning Character Strings, Graphics, and Parts

You can position character strings, graphics, and parts on the opened base screen. Refer to the following methods for positioning.

Refer to 7-1-2 *Entering Character Strings and Graphics* for details on how to position character strings and graphics.

Refer to 7-2-1 *Positioning Parts* for details.



Note Bit map data that is on the clipboard can be pasted on a screen.

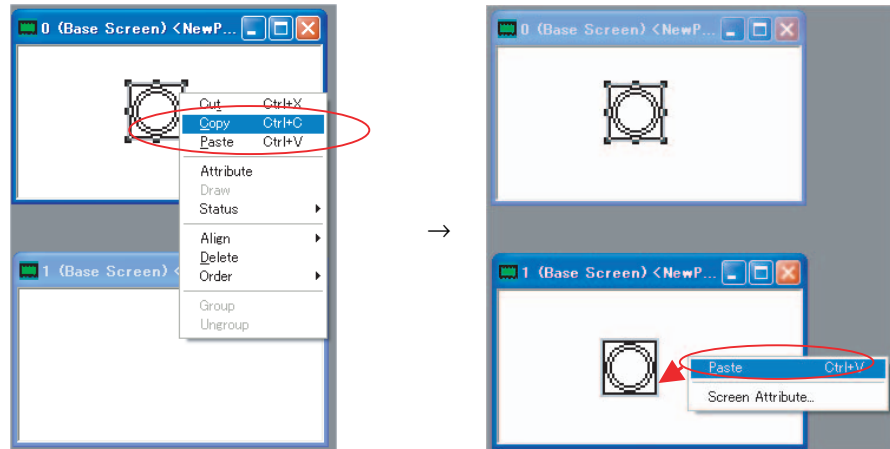
5-5 Copying and Moving Parts and Screens

5-5-1 Copying and Moving Parts between Screens

With the NV-Designer, you can copy or move parts and graphics on base screens between different projects or within the same project.

Copying Parts between Screens

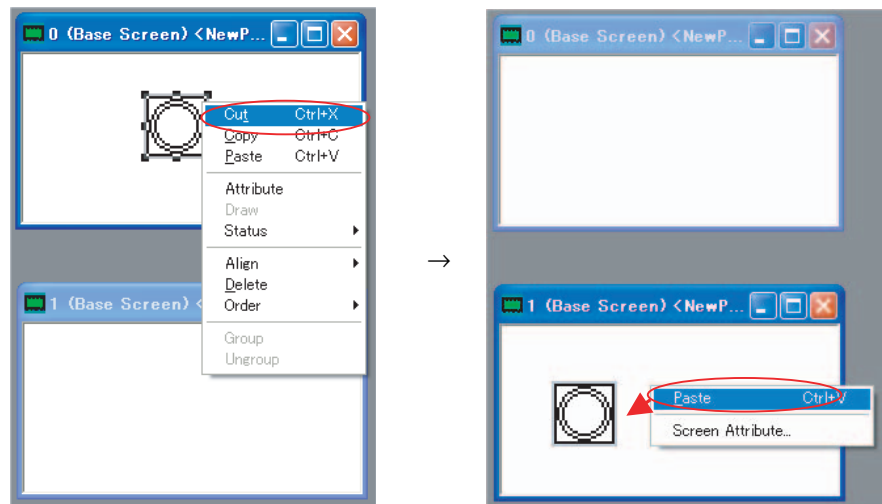
Right-click the part to be copied and select Copy. Then right-click where you want the copy to be made and select Paste.



Note If you copy parts between screens for different models of PT, the parts will automatically be converted to allow for differences in parts colors and functionality between the PTs.

Moving Parts between Screens

Right-click the part to be moved and select Cut. Then right-click where you want to move the part and select Paste.



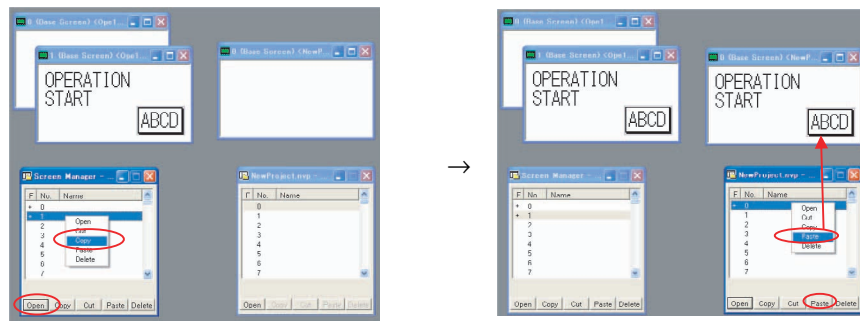
Note If you move parts between screens for different models of PT, the parts will automatically be converted to allow for differences in parts colors and functionality between the PTs.

5-5-2 Copying and Moving Screens between Projects

With the NV-Designer, you can copy or move base screens between different projects.

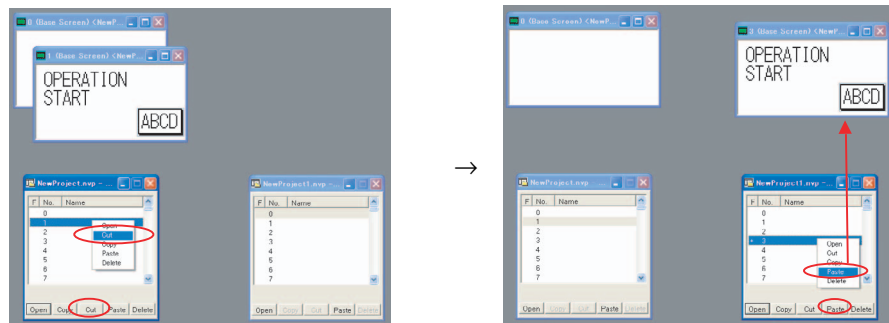
Copying Screens between Projects

Right-click the screen to copy in the Screen Manager and select Copy (or select the screen and click the Copy Button). Then right-click the screen where you want the copy to be made in the Screen Manager for a different product and select Paste (or select the screen and click the Paste Button). After pasting the screen, you can double-click it to display the copy.



Moving Screens between Projects

Right-click the screen to move in the Screen Manager and select Cut (or select the screen and click the Copy Button). Then right-click the screen where you want the copy to be made in the Screen Manager for a different product and select Paste (or select the screen and click the Paste Button). After moving the screen, you can double-click the screen to display it.



Note You cannot copy screens between different models of PT.

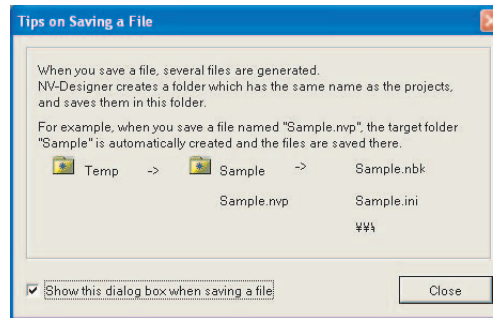
5-6 Saving the Project

5-6-1 Save

Select Save from the File Menu.

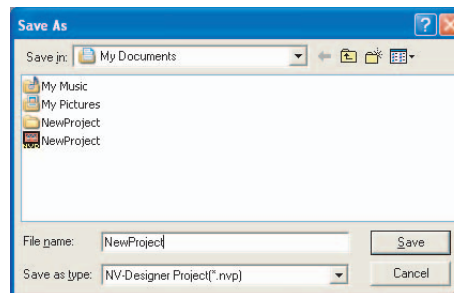
5-6-2 Save As

- 1,2,3... 1. Select Save As from the File Menu. The following message will be displayed.



To stop displaying this message, clear the *Display this dialog box when saving* Check Box.

2. Click the Close Button.
3. Specify the save location in the Save As Dialog Box and Click the Save Button.



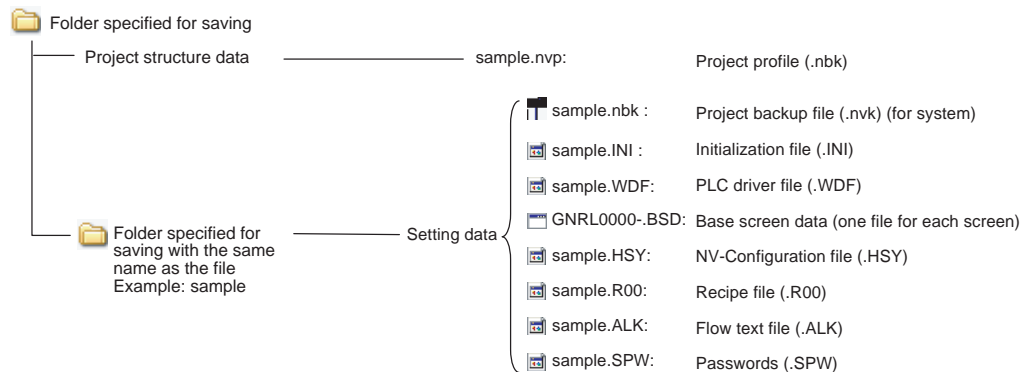
5-7 Project and Execution Files

5-7-1 Projects

Projects include screen data and settings. With the NV-Designer, PT screen data and the model settings are managed together as a project.

When the created project is saved, the project file (.nvp: the file that is related to the NV-Designer and started to access the project) that is named at that time and a project folder will be newly created under the specified folder when the project is saved. Files with project settings will be created in the Project Folder.

When "sample" is specified as the file name.



- Screen data is saved in base screen data files (.BSD). A separate file is used for each screen.
- Setting files are created when the settings are saved.

5-7-2 Execution Files of the PT Model after Transfer

When projects are transferred to the PT or SD memory card from the NV-Designer, they are converted to the following PT execution files.

- Save folder and execution file name after transfer.

Save folder:

| | | |
|-------------------|-----------------|---|
| Base screens: | base***.gsd | ***: 000 to fff is the screen number. |
| Keyboard screens | keyb***.gsd | ***: 000 to fff is the keyboard number. |
| Login screens: | login***.gsd | ***: 000 to fff is the login screen number. |
| PLC driver: | plc_drv.gsd | |
| NV Configuration: | nvconfig***.gsd | |
| Recipes: | recip***.gsd | ***: 000 to fff is the recipe number. |
| Write Address: | devw.gsd | |
| Flow text: | flow.gsd | |
| Passwords: | pswd.gsd | |
| Firmware: | firmware.gsd | |

SECTION 6

NV Configuration

This section describes the parameters in the NV Configuration in detail.

| | | |
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| 6-2-11 | Other Settings | 96 |

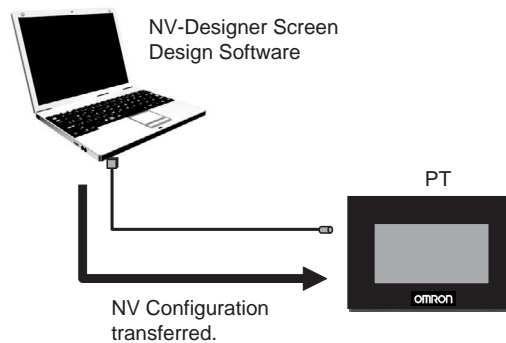
6-1 NV Configuration

The initial conditions must be set in NV Configuration before using the PT.

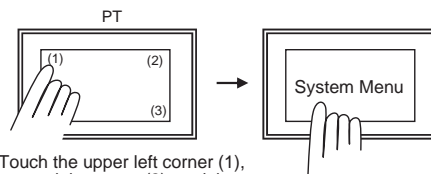
6-1-1 Setting Parameters

There are the following two methods for setting parameters in the NV Configuration.

- 1,2,3...**
1. **Setting from the NV-Designer**
First, set the NV Configuration parameters in the NV-Designer, and then connect the NV-Designer to the PT and transfer the NV Configuration to the PT.



2. **Setting from the System Menu on the PT**
After transferring the NV Configuration, parts of it can be modified from the PT System Menu using the following procedure. Touch the front panel on the upper left corner, upper right corner, and lower right corner in that order to display the System Menu.



Touch the upper left corner (1), upper right corner (2), and then the lower right corner (3) in order.

The following parameters can be set from the PT System Menu only:
PT clock, LCD contrast, backlight, touch switches, and memory initialization.

6-1-2 NV Configuration Parameters

| Tab page | Item | | PT | | | | Setting Method | |
|----------------------------|-------------------------------------|------------------|--|--|--|--|-----------------|---|
| | | | NV3W | NV3W-V1 | NV4W | NV3Q | NV- Designer | System Menu on the PT |
| Basic Setup | Title | | Supported. | Supported. | Supported. | Supported. | Supported. | Not sup- ported. |
| | PLC Model | | Supported. | Supported. | Supported. | Supported. | Supported. | Not sup- ported. |
| | Displaying the NV model | | Supported. | Supported. | Supported. | Supported. | Supported. | Not sup- ported. |
| | System Memory Area | | Supported. | Supported. | Supported. | Supported. | Supported. | Not sup- ported. |
| Communication Parameters | | | Supported. | Supported. | Supported. | Supported. | Supported. | Supported. |
| PLC Multiple Connection *1 | | | Not sup- ported. | Supported. | Supported | Supported | Supported | Not sup- ported. |
| Auto-Paging | | | Supported. | Supported. | Supported. | Supported. | Supported. | Not sup- ported. |
| Startup Screen | | | Supported. | Supported. | Supported. | Supported. | Supported. | Not sup- ported. |
| Setup 1 | Clock | PLC Clock | Supported. | Supported. | Supported. | Supported. | Supported. | Not sup- ported. |
| | | NV Clock | Not sup- ported. | Not sup- ported. | Supported. | Supported. | Supported. | NV3W (-V1): Not sup- ported. NV4W: Supported. NV3Q: Sup- ported. |
| | | Summer Time | Not sup- ported. | Not sup- ported. | Supported. | Supported. | Supported. | Not sup- ported. |
| | | Transfer Outside | Not sup- ported. | Not sup- ported. | Supported. | Supported. | Supported. | Not sup- ported. |
| | Automatic Backlight Off | | Supported. | Supported. | Supported. | Supported. | Supported. | Not sup- ported. |
| | Key Press Sound | | Supported. | Supported. | Supported. | Supported. | Supported. | Not sup- ported. |
| | Battery Error Display | | Not sup- ported. | Not sup- ported. | Supported. | Supported. | Supported. | Not sup- ported. |
| | File Compression | | Supported. | Supported. | Supported. | Supported. | Supported. | Not sup- ported. |
| | System Menu Language | | Supported. | Supported. | Supported. | Supported. | Supported. | NV3W: Not supported. NV3W-V1: Supported. NV4W: Supported. NV3Q: Sup- ported. |
| | Setup of Multi-Language Exchange | | Supported. | Supported. | Supported. | Supported. | Supported. | Not sup- ported. |
| | Backlight Brightness Set- ting | | Supported. (Adjust and transfer) | Supported. (Adjust and transfer) | Supported. (Adjust and transfer) | Supported. (Adjust and transfer) | Supported. | Supported. |
| | Contrast Adjustment | | | | Not sup- ported. | Not sup- ported. | Supported. | Supported. |

| Tab page | Item | PT | | | | Setting Method | |
|--------------------|-------------------------------|----------------|----------------|------------|------------|----------------|---|
| | | NV3W | NV3W-V1 | NV4W | NV3Q | NV-Designer | System Menu on the PT |
| Setup 2 | SD Memory Card Menu | Not supported. | Not supported. | Supported. | Supported. | Supported. | NV3W (-V1): Not supported. NV4W: Supported. NV3Q: Supported. |
| Hold Memory | Hold PLC Memory Value | Not supported. | Not supported. | Supported. | Supported. | Supported. | Not supported. |
| | Holding Internal Memory Value | Not supported. | Not supported. | Supported. | Supported. | Supported. | Not supported. |
| Recipe | | Supported. | Supported. | Supported. | Supported. | Supported. | Not supported. |
| Alarm History | | Not supported. | Not supported. | Supported. | Supported. | Supported. | Not supported. |
| Line Graphs | | Supported. | Supported. | Supported. | Supported. | Supported. | Not supported. |
| Operation Security | | Not supported. | Supported. | Supported. | Supported. | Supported. | NV3W: Not supported. NV3W-V1: Supported. NV4W: Supported. NV3Q: Supported. |

*1 PLC multiple connection is supported when communications are performed using Modbus.

6-1-3 Default Setting

The default settings for the NV Configuration are given below.

| Tab page | Item | Setting |
|------------------------------------|---|---|
| Basic Setup | PLC Model | OMRON SYSMAC-CS/CJ/CP Series Host Link |
| | System Memory Area: Word Area | D0 to D2 |
| | System Memory Area: Bit Area | 0 to 2 |
| Communication Parameters | COM Port: Baud Rate | 9,600 bps |
| | COM Port: Data Length | 7 |
| | COM Port: Stop Bits | 1 |
| | COM Port: Parity Bit | Even |
| | Communication Error Handling: Retry | 5 times |
| | Communication Error Handling: Wait time | 3 seconds |
| | Transmission Delay | 0 ms |
| PLC Multiple Connection | PLC Multiple Connection | No |
| Auto-paging | Auto-paging | Off |
| Start-up Screen | Start-up Screen No. | 0 |
| | Delay | 0 |
| Setup 1 | Clock | NV clock |
| | Clock: Summer Time ^{*1*2} | Inactive |
| | Clock: Transfer Outside ^{*1*2} | Off |
| | Automatic Backlight OFF | Off |
| | Key Press Sound | Enabled |
| | Battery Error Display ^{*1*2} | Off |
| | File Compression | On |
| | System Menu Language | Dependant on NV-Designer language setting |
| | Setup of Multi-Language Exchange: Refer to PLC | Off |
| | Backlight Brightness Setting | Off |
| | Contrast Adjustment | Off |
| Setup 2 ^(*1) | Counting-Down Timer | No |
| | Free Space on the SD card: Notify when SD card has little space ^(*2) | Off |
| | SD Memory Card Menu: Automatic Display ^(*2) | Off |
| | Function when writing to SD Card: Screen display when writing ^(*2) | Yes |
| | Function when writing to SD Card: Output during write ^(*2) | No |
| | Function when writing to SD Card: Stop Writing Control ^(*2) | No |
| | Function when writing to SD Card: Output when error occurs ^(*2) | No |
| Hold Memory ^(*1*2) | Holding PLC Memory | Off |
| | Hold NV Internal Memory Value: Data memory | Off |
| | Hold NV Internal Memory Value: Internal Relay | Off |
| Recipe | Use Recipe | Off |
| | SD Recipe | Off |
| Alarm History ^(*1*2) | Record | Not supported. |
| Line Graphs | Record | Not supported. |
| Operation Security | Operation Security Function Available ^{*1} | Off |
| Index registration ^(*1) | Record | Not supported. |

*1 These functions are not supported by the NV3W.

*2 These functions are not supported by the NV3W-V1.

6-2 Setting the NV Configuration from the NV-Designer

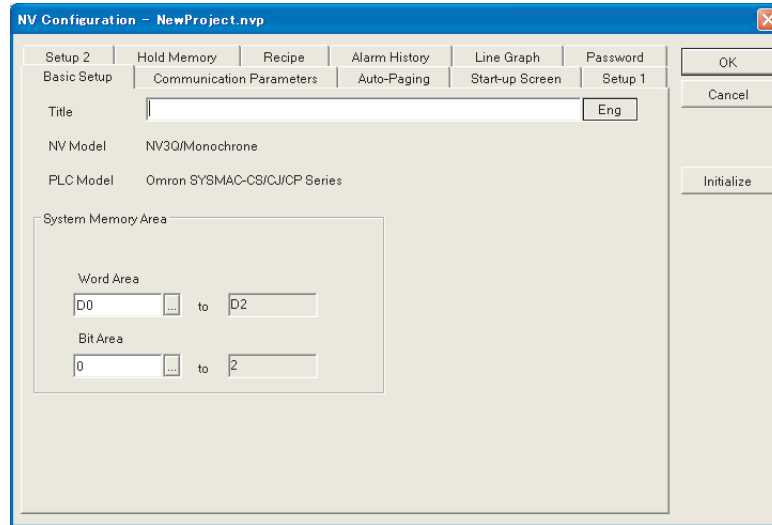
This section describes the procedure for setting the NV Configuration from the NV-Designer. Refer to the Setup Manual for information on how to set the NV Configuration from the System Menu.

6-2-1 Setting Method

- 1,2,3...**
1. Select PT – NV Configuration from the NV-Designer Menu to open the NV Configuration Dialog Box. If multiple project files are already open, the Select File Dialog Box will be displayed. Select a project file to set up.
 2. Set the required items. (Refer to *6-2-2 Basic Settings Tab Page* and following sections for details.)
 3. Save the file and transfer it to the PT. (Refer to *9-1 Transferring Screens from the NV-Designer* for details.)

Note The settings will be reflected in the PT once the setting file has been transferred from the NV-Designer.

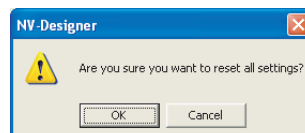
NV Configuration Dialog Box



| Tab page | Description | Reference |
|--|---|--|
| Basic Setup | Sets the PT model and system memory. Set the first words in the Word Area and Bit Area in the PLC. | 6-2-2 Basic Settings Tab Page |
| Communication Parameters | Sets the serial communications settings between the PT and PLC. | 6-2-4 Communication Parameters Tab Page |
| PLC Multiple Connection (NV4W/ NV3Q only) | Sets parameters when multiple PLCs or OMRON EJ1 Temperature Controllers are connected using Modbus. | 6-2-5 PLC Multiple Connection Tab |
| Auto-Paging | Enables auto-paging, which automatically switches the screen displayed on the PT after a certain period of time. | 6-2-6 Auto-Paging Tab Page |
| Start-up Screen | Sets the number of the screen displayed on the PT when the power supply is turned ON and its display time. | 6-2-7 Start-up Screen Tab Page |
| Setup 1 | Sets the clock reference, automatic backlight OFF function, key press sound, battery error display, file compression, display language switching, backlight brightness, and contrast. (NV3W (-V1) only) | 6-2-8 Setup 1 Tab Page |
| Setup 2 (NV3W-V1/ NV4W/NV3Q only) | Enables/disables displaying the counting-down timer and SD Memory Card Menu. | 6-2-9 Setup 2 Tab Page (NV3W-V1/ NV4W/NV3Q Only) |
| Hold Memory (NV4W/NV3Q only) | Sets the words to be held for PLC and PT internal memory. | 6-2-10 Hold Memory Tab Page (NV4W/ NV3Q Only) |
| Recipe | Sets whether to use the recipe function, and also the control address for the recipe function. | 8-5 Recipes |
| Alarm History (NV4W/NV3Q only) | Sets sampling for groups 0 and 1, as well as the control address for the alarm history. | 7-11 Alarm Lists (NV3W-V1/NV4W/ NV3Q) |
| Line Graph | Sets sampling for groups 0 to 4 for line graphs. | 7-10 Line Graphs |
| Password (NV3W-V1/NV4W/ NV3Q only) | Sets security using passwords. | 8-6 Security Functions |
| Index registration (NV3W-V1/NV4W/ NV3Q only) | Performs the settings related to the addresses to be used as the indexes. | 7-3-5 Index Modifiers |

Initialize Button

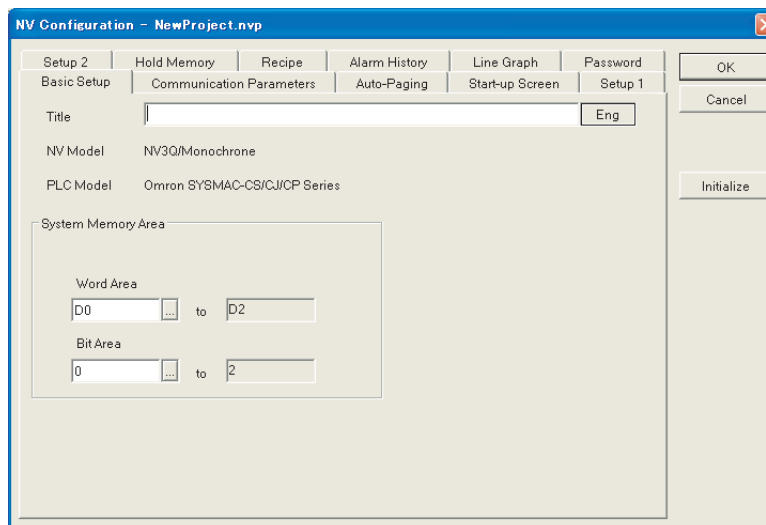
The following message will be displayed when the Initialize Button is clicked in the NV Configuration Dialog Box.



Click the OK Button to reset all parameters to default values.

6-2-2 Basic Settings Tab Page

This tab page is used to set the system memory for basic communications with the PLC. Always set the system memory when you create a new project.



| Item | Description |
|---------------|---|
| Title | Input the title of the configuration file (internal file). Titles are convenient when there are several configurations for different PTs. |
| NV Model | Sets the model of PT to be displayed when the NV-Designer is started. Note If you change the PT model, select Convert - NV Model Convert from the Tool Menu. |
| PLC Model | Sets the model of PLC to be displayed when the NV-Designer is started. Note If you change the PLC model, select Convert – PLC Model Convert from the Tool Menu. |
| System Memory | Sets system memory. Set the first words in the Word Area and Bit Area. |
| Initialize | Click this button to reset all parameters to their default settings. |

Setting System Memory

System Memory

Sets the areas used in the system memory.

Refer to 6-2-3 *System Memory* for information on the system memory.

Word Area

Sets the memory area and first address of the area of memory used for communications between the PT and PLC in word units, such as for the screen number.

Bit Area

Sets the memory area and first address of the area of memory used for communications between the PT and PLC in bit units, such as for the screen saver. Click the button by the Word Area or Bit Area in the System Memory Area to display the Address Setting Dialog Box. Set the PLC memory area and address in this dialog box.

Word Area

Bit Area

| | Item | Description |
|---|------------------------------------|--|
| 1 | Area | Click the Area Box and select an area from the pull down menu. |
| 2 | Channel No. (i.e., word address) | Enter the address directly or by using the keypad. Corrections can be made by clicking the Back or Clear Button. |
| 3 | Bit Number (When setting Bit Area) | |

**Precaution for Correct Operation**

Do not allocate words that are used for real I/O to the Bit Area in system memory. The output status for allocated bits may turn ON or OFF, or the operation of the PT may change when an input turns ON or OFF.

Note

(1) Word Area

Sets the memory area and first address of the area of memory used to read/write data in word units, such as for the screen number.

(2) Bit Area

Sets the memory area and first address of the area of memory used to read/write data in bits, such as for the automatic backlight OFF function. Refer to 6-2-3 System Memory.

6-2-3 System Memory

System Memory

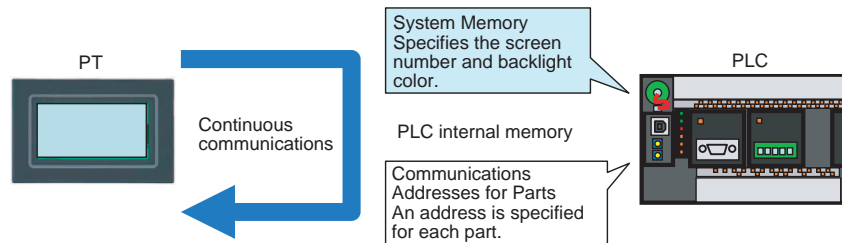
The PT is constantly communicates with the internal memory of the PLC. The PLC internal memory is divided into the following two areas.

■ System Memory

The system memory is used to control the system, such as for specifying the screen number or backlight status. The specified words in the PLC memory are allocated for communications, which are performed constantly.

■ Communications Addresses for Parts

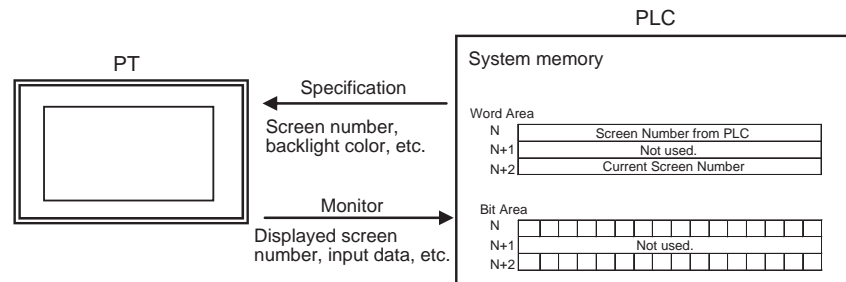
The addresses used by parts can be specified freely. Communications are performed only for the addresses used by the parts displayed on the screen.



Operations Using the System Memory

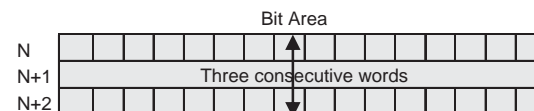
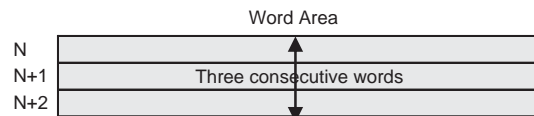
The following parameters can be specified and monitored from the system memory.

- Specify: Displayed screen number, backlight color, backlight ON/flashing.
- Monitor: Displayed screen number, data being input, battery backup error, low battery.



Contents of System Memory

Three words are allocated for the Word Area and three words are allocated for the Bit Area.



The following words are set as the system memory by default.

Word Area: D0 to D2

Bit Area: 0 to 2

The first address can be changed in the NV Configuration from the NV-Designer.

NV3W System Memory Map

Word Area

| Bits | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|
| Word | | | | | | | | | | | | | | | | |
| N + 0 | Screen Number from PLC (PLC tells the NV to using this number.) | | | | | | | | | | | | | | | |
| N + 1 | Do not use. | | | | | | | | | | | | | | | |
| N + 2 | Current Screen Number (PLC reads this number from the NV.) | | | | | | | | | | | | | | | |

Word Area Description

| | |
|------------------------|--|
| Screen Number from PLC | This word contains the number in hexadecimal of the screen specified by the PLC for the NV to display. |
| Current Screen Number | This word contains the number in hexadecimal of the screen currently displayed by the NV. |

Bit Area

| Bits | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------|--------------------|------------------------------|------------------------|-----------------|----|-----------------------------|----------------------|---|---|---|---|---|---|---|-----------------|
| Word | | | | | | | | | | | | | | | | |
| N + 0 | Buzzer | Screen Display Bit | Backlight Control Enable Bit | Backlight ON/Flash Bit | Backlight color | | Key Press Sound Disable Bit | Display Reversal Bit | | | | | | | | |
| N + 1 | Do not use. | | | | | | | | | | | | | | | |
| N + 2 | | | | | | | | | | | | | | | | Data Entry Flag |

Bit Area Description

| | |
|------------------------------|--|
| Buzzer | Turn ON this bit to turn ON the buzzer. |
| Screen Display Bit | Turn ON this bit to make the PT display the screen specified by the PLC. (This bit is effective only when it changes from OFF to ON.) |
| Backlight Control Enable Bit | Turn ON this bit to enable controlling the backlight (flashing and color). |
| Backlight ON/Flash Bit | OFF: Lit (normal), ON: Flashing |
| Backlight color | 00: Not lit, 01: Green (white), 10: Red, 11: Orange (pink) |
| Key Press Sound Disable Bit | When turned ON, disables the key press sound so that there is no sound when the PT touch panel is touched even if the key press sound is enabled in the NV Configuration from the NV-Designer. |
| Display Reversal Bit | Turn ON this bit to make the entire black/white display in reverse. |
| Data Entry Flag | This bit will be ON while data is being entered and will turn OFF when data entry has been completed. (This bit is effective only when a keyboard is being used.) |

NV3W-V1 System Memory Word Area Map

| Word | Bits | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---|----|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|
| N + 0 | Screen Number from PLC (PLC tells the NV to using this number.) | | | | | | | | | | | | | | | | |
| N + 1 | Do not use. | | | | | | | | | | | | | | | | |
| N + 2 | Current Screen Number (PLC reads this number from the NV.) | | | | | | | | | | | | | | | | |

Word Area Description

| | |
|------------------------|---|
| Screen Number from PLC | This word contains the screen number specified by the PLC for the NV to display in hexadecimal. |
| Current Screen Number | This word contains the number in hexadecimal of the screen currently displayed on the NV. |

Bit Area

| Word | Bits | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------|--------------------|------------------------------|------------------------|-----------------|----|-----------------------------|---------------------------|---|---|----------------------|---|-----------------------------|-------------------|---|---|-----------------|
| N + 0 | Buzzer | Screen Display Bit | Backlight Control Enable Bit | Backlight ON/Flash Bit | Backlight color | | Key Press Sound Disable Bit | Display Reversal Bit (*1) | | | Backlight Brightness | | | | | | |
| N + 1 | Do not use. | | | | | | | | | | | | | | | | |
| N + 2 | | | | | | | | | | | | | Password Change Screen Flag | Login Screen Flag | | | Data Entry Flag |

Bit Area Description

| | |
|------------------------------|---|
| Buzzer | Turn ON this bit to turn ON the buzzer. |
| Screen Display Bit | Turn ON this bit to make the PT display the screen specified by the PLC. (This bit is effective only when it changes from OFF to ON.) |
| Backlight Control Enable Bit | Turn ON this bit to enable controlling the backlight (flashing and color). |
| Backlight ON/Flash Bit | OFF: Lit (normal), ON: Flashing |
| Backlight color | NV4W: 00: Not lit, 01: Green (white), 10: Red, 11: Orange (pink) NV3Q Monochrome: 00: Not lit, 01: White, 10: Red, 11: Pink NV3Q Color: 00: Not lit, 01: Lit, 10: Lit, 11: Lit |

| | |
|-----------------------------|--|
| Key Press Sound Disable Bit | When turned ON, disables the key press sound so that there is no sound when the PT touch panel is touched even if the key press sound is enabled in the NV Configuration from the NV-Designer. |
| Display Reversal Bit | Turn ON this bit to make the entire black/white display in reverse. |
| Backlight Brightness | Adjusts the backlight brightness. 0000: Not adjusted 0001 - 1111: The greater the value is the brighter the backlight becomes. |
| Data Entry Flag | This bit will be ON while data is being entered and will turn OFF when data entry has been completed. (This bit is effective only when a keyboard is being used.) |
| Login Screen Flag | This bit will be ON while the login screen is being displayed and will turn OFF when it has closed. |
| Password Change Screen Flag | This bit will be ON while the password change screen or password management screen is being displayed and will turn OFF when the screen has closed. |

NV4W/NV3Q System
Memory MapWord Area

| Bits | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|
| Word | | | | | | | | | | | | | | | | |
| N + 0 | Screen Number from PLC (PLC tells the NV to using this number.) | | | | | | | | | | | | | | | |
| N + 1 | Do not use. | | | | | | | | | | | | | | | |
| N + 2 | Current Screen Number (PLC reads this number from the NV.) | | | | | | | | | | | | | | | |

Word Area Description

| | |
|------------------------|---|
| Screen Number from PLC | This word contains the screen number specified by the PLC for the NV to display in hexadecimal. |
| Current Screen Number | This word contains the number in hexadecimal of the screen currently displayed on the NV. |

Bit Area

| Bits | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------|--------------------|------------------------------|------------------------|-----------------|----|-----------------------------|---------------------------|---|---|------------------------------|-----------------------------|-------------------|------------------|---------------------------|-----------------|
| Word | | | | | | | | | | | | | | | | |
| N + 0 | Buzzer | Screen Display Bit | Backlight Control Enable Bit | Backlight ON/Flash Bit | Backlight color | | Key Press Sound Disable Bit | Display Reversal Bit (*1) | | | Backlight Brightness | | | | | |
| N + 1 | Do not use. | | | | | | | | | | | | | | | |
| N + 2 | | | | | | | | | | | SD Memory Card Insertion Bit | Password Change Screen Flag | Login Screen Flag | Battery Low Flag | Battery Backup Error Flag | Data Entry Flag |

*1 NV4W-□□□/NV3Q-MR□1 only

Bit Area Description

| | |
|------------------------------|---|
| Buzzer | Turn ON this bit to turn ON the buzzer. |
| Screen Display Bit | Turn ON this bit to make the PT display the screen specified by the PLC. (This bit is effective only when it changes from OFF to ON.) |
| Backlight Control Enable Bit | Turn ON this bit to enable controlling the backlight (flashing and color). |
| Backlight ON/Flash Bit | OFF: Lit (normal), ON: Flashing |
| Backlight color | NV4W: 00: Not lit, 01: Green (white), 10: Red, 11: Orange (pink) NV3Q Monochrome: 00: Not lit, 01: White, 10: Red, 11: Pink NV3Q Color: 00: Not lit, 01: Lit, 10: Lit, 11: Lit |

| | |
|------------------------------|---|
| Key Press Sound Disable Bit | When turned ON, disables the key press sound so that there is no sound when the PT touch panel is touched even if the key press sound is enabled in the NV Configuration from the NV-Designer. |
| Display Reversal Bit | Turn ON this bit to make the entire black/white display in reverse. |
| Backlight Brightness | Adjusts the backlight brightness. 0000: Not adjusted 0001 - 1111: The greater the value is the brighter the backlight becomes. |
| Data Entry Flag | This bit will be ON while data is being entered and will turn OFF when data entry has been completed. (This bit is effective only when a keyboard is being used.) |
| Login Screen Flag | This bit will be ON while the login screen is being displayed and will turn OFF when it has closed. |
| SD Memory Card Insertion Bit | Off: Not inserted On: Inserted |
| Password Change Screen Flag | This bit will be ON while the password change screen or password management screen is being displayed and will turn OFF when the screen has closed. |
| Battery Backup Error Flag | This bit will be ON if clock data or PLC memory holding data held in the SRAM (built-in RAM) are not backed up properly. (This bit will also be ON if SRAM is not backed up by the battery. "🔋" is displayed at the lower right of the window.*1) |
| Battery Low Flag | This bit will turn ON when the battery charge becomes low. Replace the battery within a week after this bit turns ON. ("🔋" is displayed at the lower right of the screen.*1) |

*1 If displaying battery errors is not enabled, it will not be displayed.

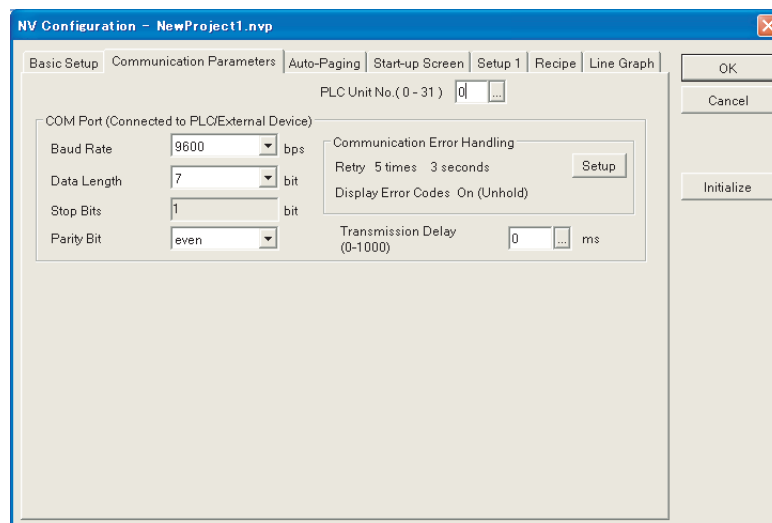
*2 The Battery Backup Error Flag and Battery Low Flag will function even if the display for a discharged battery is disabled.

6-2-4 Communication Parameters Tab Page

Sets the serial communications settings between the PT and PLC.

Note Communications parameters can be set from the Port Screen in the Setting Mode of the PT System Menu.

■ NV3W



■ NV3W-V1

■ NV4W/NV3Q

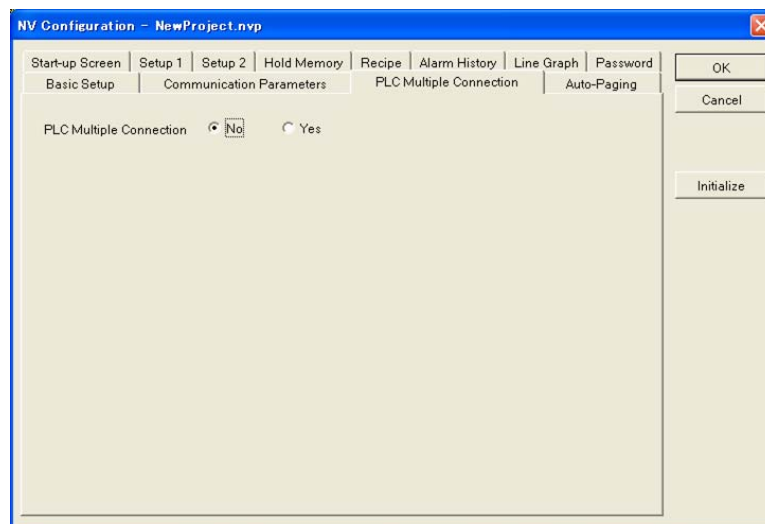
| Item | Description |
|--|--|
| PLC Unit No. (0 - 31) | Specifies the Host Link unit number of the connected PLC from 0 to 31. This setting is required only the Host Link unit number of the PLC is not 0. If communications are performed using Modbus, set the PLC unit number to between 1 and 247. |
| COM Port (Connected to PLC or External Device) | Sets the baud rate and transmission format for communications with the connected PLC. <ul style="list-style-type: none"> • Baud Rate Select from 9,600, 19,200, 38,400, 57,600, or 115,200 bps. • Data Length Select 7 bits or 8 bits. • Stop bits Always 1 bit. • Parity Select none, odd, or even. |

| Item | Description |
|------------------------------|---|
| Communication Error Handling | <p>Click the Setup Button and open the Communications Error Handling Dialog Box to set the following parameters.</p> <ul style="list-style-type: none"> • Number of retries Set the number of retries for communications errors to between 0 and 255. • Waiting time Set the number of retries for communications errors to between 0 and 64 seconds. • Display Error Codes Select Off, On (hold), or On (Unhold). |
| Transmission Delay | <p>The time between receiving data from the PLC and when data is sent from the PT can be adjusted. A delay time longer than the set value can be obtained by setting the transmission delay parameter. Set this parameter when data transmission from the PT is too fast for the PLC to receive it properly. The setting range is between 0 to 1,000 ms.</p> |

Note When connecting to an OMRON EJ1 Temperature Controller using Modbus-RTU, set a transmission delay of at least 5 ms in the communications parameters in the NV Configuration of the PT. Communications may not be performed correctly if a transmission delay of 4 ms or less is set. Use a value of the least 5 ms (default) for the port B send wait time in the EJ1. Communications may not be performed correctly if a send wait time of 4 ms or less is set.

6-2-5 PLC Multiple Connection Tab

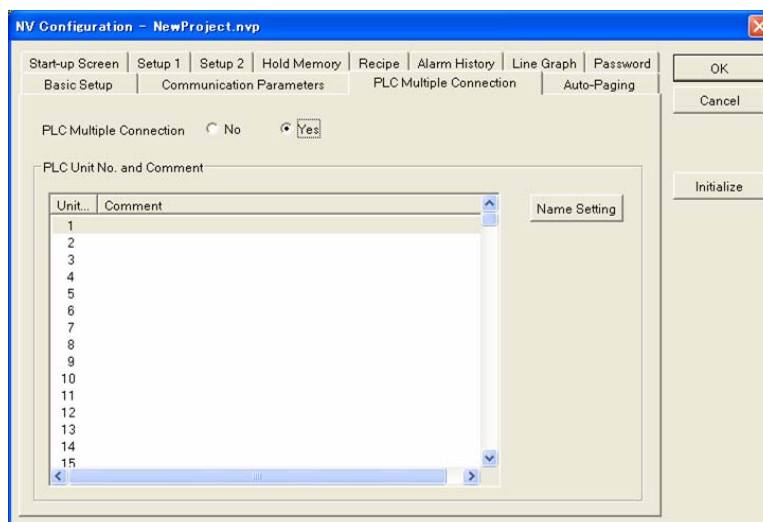
This tab page is used to set parameters when connecting multiple PLCs or OMRON EJ1 Temperature Controllers using Modbus. The following dialog box will be displayed when the PLC Multiple Connection Tab is clicked in the NV Configuration Dialog Box.



| Item | Description |
|-------------------------|--|
| PLC Multiple Connection | <ul style="list-style-type: none"> • No PLC multiple connection is not used. • Yes PLC multiple connection is used. If the Yes Option is selected, the PT will recognize the unit number set in the PLC. |

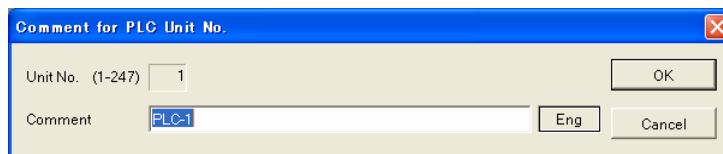
PLC Unit Number and Comment

The following dialog box is displayed if the Yes Option is selected for PLC multiple connection.



A comment can be registered for each unit number.

Click a unit number to select it, and then click the Comment Button. The following dialog box will be displayed.



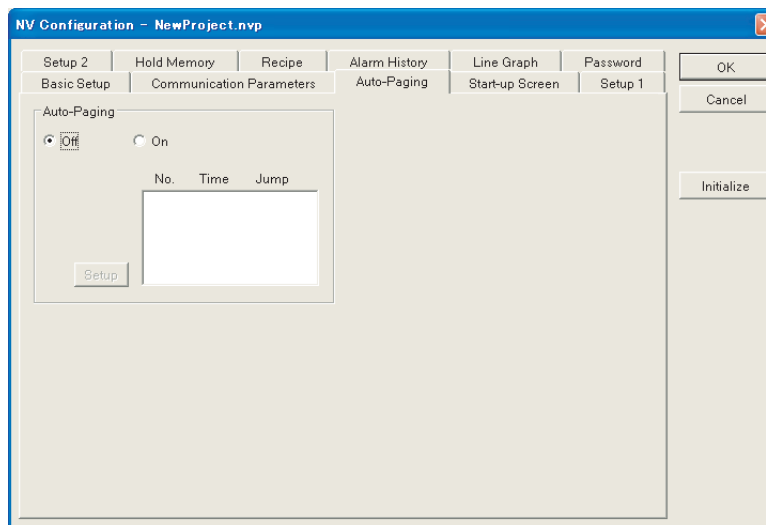
| | Item | Description |
|---|-------------|---|
| 1 | Unit Number | Displays the selected unit number. The unit number cannot be changed. |
| 2 | Comment | Input a comment for the unit number (64 characters). |

Click the OK Button to register the comment. The registered comment will be displayed when you return to the original dialog box.

Note Inputting comments (optional) for PLC unit numbers makes it easier to identify the PLCs when setting addresses, e.g., for parts.

6-2-6 Auto-Paging Tab Page

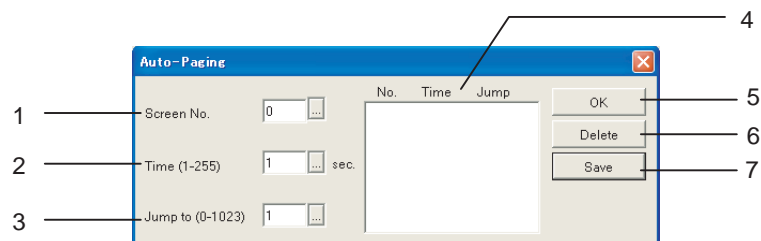
Open the Auto-Paging Tab Page from the NV Configuration Dialog Box. The auto-paging function is used to automatically switch to a specified screen after a specified period of time has passed.



| Item | Description |
|-------------|---|
| Auto-Paging | <ul style="list-style-type: none"> • Off Screens will not be switched automatically. • On Screens will be automatically switched according to the settings. The Setup Button will be enabled if the error code display is enabled. Click the Setup Button and set the screen number to display, the display time, and jump destination. |

Setting Up Auto-Paging

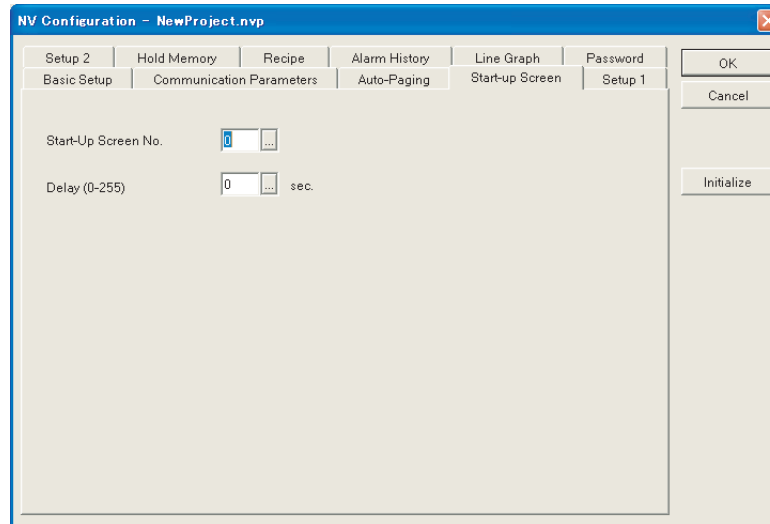
Select the On Option for Auto-Paging and click the Setup Button. The Auto-Paging Dialog Box will be displayed. Set the screen number, time, and jump destination, then click the Save Button.



| | Item | Description |
|---|-----------------------|--|
| 1 | Screen No. | Enter the number of the screen to switch to automatically within the range given in parentheses. |
| 2 | Time | Sets the time the switched screen is displayed. It can be set to between 1 and 255 seconds. |
| 3 | Jump to | Sets the screen number to switch to. |
| 4 | Settings Display Area | Sets up auto-paging. |
| 5 | OK Button | Closes the Auto-Paging Dialog Box and returns to the Auto-Paging Tab Page. |
| 6 | Delete Button | Deletes the screens saved in auto-paging. |
| 7 | Save Button | Saves the settings. |

6-2-7 Start-up Screen Tab Page

Open the Start-up Screen Tab Page from NV Configuration. Set the number of the screen to display and the time until it is displayed after turning ON the power supply. This function is useful when the time required for the PLC to turn ON is longer than the time required for the PT. There will be no communications between the PLC and PT during the startup delay, so even if the PLC takes longer to start a timeout error will not be displayed on the PT screen.



| Item | Description |
|---------------------|---|
| Start-Up Screen No. | Enter the number of the screen to display when the power supply is turned ON within the range given in parentheses. Click the button next to the box and set the startup screen from the dialog box that appears. |
| Delay | Set the display time of the startup screen to between 0 and 255 seconds. Click the button next to the box and set the time to display the screen from the dialog box that appears. |

When the startup screen display time has elapsed, the screen number stored in the first address of the Word Area in system memory that is set in the Basic Setup of the NV Configuration will be displayed.

Note There will be no communications between the PLC and PT during the startup screen delay time. Functional parts on the startup screen will not be displayed during the startup screen delay time.

6-2-8 Setup 1 Tab Page

Open the Setup 1 Tab Page from the NV Configuration Dialog Box to set the clock, backlight, etc.

■ NV3W (-V1)

The screenshot shows the 'NV Configuration - NewProject1.nvp' dialog box with the 'Setup 1' tab selected. The dialog is divided into several sections with various settings:

- Clock:** 'Read from PLC' is set to ☒ Off, with an ☐ On option.
- File Compression:** ☐ Off, ☒ On.
- System Menu Language:** A dropdown menu showing 'English'.
- Automatic Backlight Off:** 'Auto-Off' is set to ☒ Off, with an ☐ On option.
- Setup of Multi-Language Exchange:** 'Refer to PLC' is set to ☒ Off, with an ☐ On option.
- Key Press Sound:** ☐ Disable, ☒ Enable.
- Backlight Brightness Setting:** ☒ Off, ☐ On.
- Contrast Adjustment:** ☒ Off, ☐ On.

Buttons on the right include 'OK', 'Cancel', and 'Initialize'.

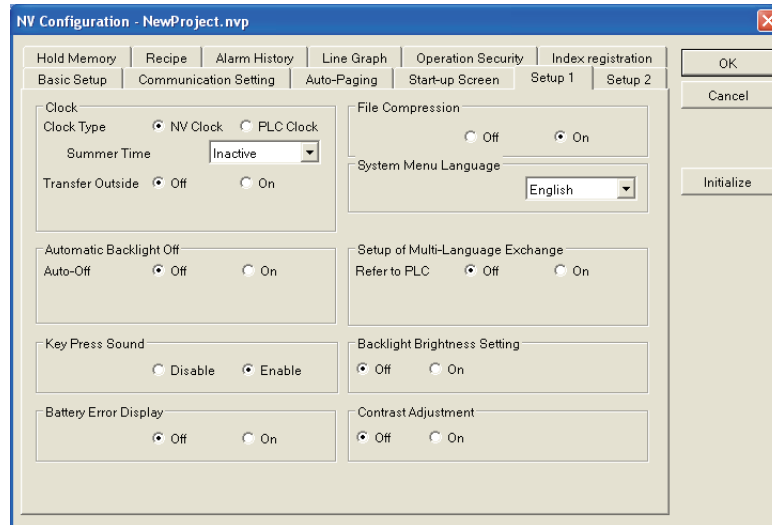
■ NV3Q

The screenshot shows the 'NV Configuration - NewProject1.nvp' dialog box with the 'Setup 1' tab selected. The dialog is divided into several sections with various settings:

- Clock:** 'Clock Type' is set to ☒ NV Clock, with an ☐ PLC Clock option. 'Summer Time' is set to 'Inactive' in a dropdown menu. 'Transfer Outside' is set to ☒ Off, with an ☐ On option.
- File Compression:** ☐ Off, ☒ On.
- System Menu Language:** A dropdown menu showing 'English'.
- Automatic Backlight Off:** 'Auto-Off' is set to ☒ Off, with an ☐ On option.
- Setup of Multi-Language Exchange:** 'Refer to PLC' is set to ☒ Off, with an ☐ On option.
- Key Press Sound:** ☐ Disable, ☒ Enable.
- Backlight Brightness Setting:** ☒ Off, ☐ On.
- Battery Error Display:** ☒ Off, ☐ On.

Buttons on the right include 'OK', 'Cancel', and 'Initialize'.

■ NV4W



| Item | | Description |
|--|-----------------------------------|---|
| Clock | Clock | Sets the reference for the clock displayed on the PT. For the NV4W/NV3Q, set either the NV clock or the PLC clock. For the NV3W (-V1), specify if PLC data is to be accessed for the clock displays. |
| | Transfer Outside (NV4W/NV3Q only) | Sets whether to transfer displayed clock data to an external device, such as the PLC. If you specify accessing PLC data, a setting item will be displayed to enter the communications address. Set the address in the PLC from which clock data will be output. Refer to <i>Setting the Clock Function</i> on page 91 for details. |
| Automatic Backlight Off ^{*1} | | <p>Sets whether to automatically turn OFF the backlight.</p> <ul style="list-style-type: none"> • Off The backlight is not automatically turned OFF. • On The backlight is automatically turned OFF. If the On Option is selected, a box to specify the amount of time taken until the backlight is automatically turned OFF will be displayed. Set time to between 1 and 30 minutes. |
| Key Press Sound | | <p>Sets the sound that is made when the screen is touched.</p> <ul style="list-style-type: none"> • Disable The operation sound is disabled. • Enable The operation sound is enabled. |
| Battery Error Display ^{*2} (NV4W/NV3Q only) | | <p>Sets whether to display the battery low mark (🔋).</p> <ul style="list-style-type: none"> • Off The battery low mark is not displayed. • On The battery low mark is displayed when the battery charge is low and when it is out of charge. |
| File Compression ^{*3} | | <p>Sets whether to compress the data transferred to the PT.</p> <ul style="list-style-type: none"> • Off Screen data is not compressed. • On Screen data is compressed. |
| System Menu Language | | <p>Sets the language for the System Menu. Select one of the following from the pull down menu.</p> <ul style="list-style-type: none"> • English (default) • Japanese |

| Item | Description |
|--|---|
| Startup of Multi-Language Exchange ^{*4} | <p>Sets whether to specify the language number from the PLC when using the multi-language exchange function.</p> <ul style="list-style-type: none"> • Off Language numbers are not specified from the PLC. • On Language numbers are specified from the PLC. If you specify accessing PLC data, a setting will be displayed to enter the communications address (2 words). Set the address in the PLC from which the language number will be set. The following two words are used for the communications addresses. <p>First word: Language number specified by the PLC (sent from PLC to PT) First word +1: Number of language currently displayed on PT (sent from PT to PLC) For details, refer to <i>8-7 Switching the Display Language</i> and to information on switching the display language in the NV-Designer online help.</p> |
| Backlight Brightness Setting | <p>Sets the brightness of the backlight.</p> <ul style="list-style-type: none"> • Off The brightness of the backlight is not set. • On The brightness of the backlight is set. If setting the brightness is enabled, a setting item will be displayed to enter the value. Set the value to within the range given in parentheses. |
| Contrast Adjustment (NV3W (-V1)/NV4W only) | <p>Sets contrast adjustment.</p> <ul style="list-style-type: none"> • Off The contrast is not set. • On The contrast can be adjusted. If setting the brightness is enabled, a setting item will be displayed to enter the value. Set the value to within the range given in parentheses. |

*1 After the backlight has been automatically turned OFF, touching the screen will turn it back ON. Even if there is a touch switch on the screen where you touch it, it will not be activated.

*2 The Battery Backup Error Flag and Battery Low Flag of the system memory will function even if the display for a battery error is disabled.

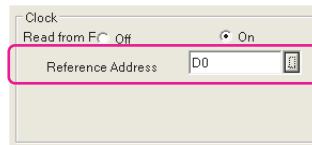
*3 The number of saved screens can be increased by compressing them but the screen switching speed will be slower. Check the speed by actually testing operation.

*4 To use the multi-language exchange function, the following settings are required: Multi-language exchange setting on the Language Tab Page of the NV Configuration and the language settings in the computer's operating system. Refer to *8-7 Switching the Display Language* for details.

Setting the Clock Function

NV3W (-V1)

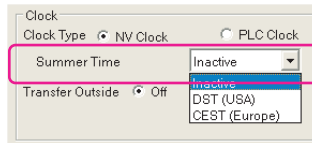
Specify if PLC data is to be accessed for the clock displays. If accessing PLC data is enabled, a setting item will appear to set the first communications address. Set the memory area and address in the PLC.



If accessing PLC data is enabled, this setting will be displayed. Either enter the setting directly or click the button on the right of the box and enter the setting from the dialog box that will appear.

NV4W/NV3Q

Select either the NV Clock or PLC Clock for the Clock. If the NV clock is selected, you will be able to activate or inactivate summer time.

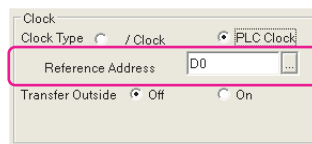


If the NV clock is selected, this setting will be displayed. Select inactivate, DST (USA), or CEST (EU) from the pull down menu.

The summer time settings are outlined in the following table.

| Setting | Description |
|-----------|---|
| Inactive | Summer time is not used. |
| DST (USA) | The USA summer time system is used. (Period: From 2:00 AM on the 2nd Sunday in March until 2:00 AM on the 1st Sunday in November) |
| CEST (EU) | The EU summer time system is used. (Period: From 1:00 AM on the last Sunday in March until 1:00 AM on the last Sunday in October) |

If using the PLC Clock is selected, a setting item will appear to set the first communications address. Set the PLC memory area and address.



If using the PLC Clock is enabled, this setting will be displayed. Either enter the setting directly or click the button on the right of the box and enter the setting from the dialog box that will appear.

The words that can be set in the PLC to access clock data are given below. CS/CJ/CP-series PLCs: Specify A351 as the first communications address.

| Word | Upper byte (bits 08 to 15) | Lower byte (bits 00 to 07) |
|------|----------------------------|--|
| A351 | Minutes (00 to 59 BCD) | Seconds (00 to 59 BCD) |
| A352 | Date (01 to 31 BCD) | Hour (00 to 23 BCD) |
| A353 | Month (01 to 12 BCD) | Year (00 to 99 BCD) |
| A354 | --- | Day of week (00 to 06 BCD) 00: Sunday, 01: Monday, 02: Tuesday, 03: Wednesday, 04: Thursday, 05: Friday, 06: Saturday |

C-series (C200HX/HG/HE(-Z), CQM1H, CPM2A/CPM2C, CPM1/CPM1A): Specify AR18 as the first communications address.

| Word | Upper byte (bits 08 to 15) | Lower byte (bits 00 to 07) |
|------|----------------------------|--|
| AR18 | Hour (00 to 23 BCD) | Minutes (00 to 59 BCD) |
| AR19 | Minutes (00 to 59 BCD) | Seconds (00 to 59 BCD) |
| AR20 | Date (01 to 31 BCD) | Hour (00 to 23 BCD) |
| AR21 | Year (00 to 99 BCD) | Month (01 to 12 BCD) |
| AR22 | --- | Day of week (00 to 06 BCD) 00: Sunday, 01: Monday, 02: Tuesday, 03: Wednesday, 04: Thursday, 05: Friday, 06: Saturday |

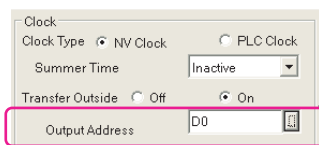
CVM1/CV-series PLCs: Specify CIO 2561 (equivalent to G001) as the first communications address.

| Word | Upper byte (bits 08 to 15) | Lower byte (bits 00 to 07) |
|-----------------------------------|----------------------------|--|
| CIO 2561 (Equivalent to G001.) | Minutes (00 to 59 BCD) | Seconds (00 to 59 BCD) |
| CIO 2562 (Equivalent to G002.) | Date (01 to 31 BCD) | Hour (00 to 23 BCD) |
| CIO 2563 (Equivalent to G003.) | Month (01 to 12 BCD) | Year (00 to 99 BCD) |
| CIO 2564 (Equivalent to G004.) | --- | Day of week (00 to 06 BCD) 00: Sunday, 01: Monday, 02: Tuesday, 03: Wednesday, 04: Thursday, 05: Friday, 06: Saturday |

Note If using the PLC clock is selected, the PT will calculate clock data based on the specified addresses in the PLC. If addresses that do not contain clock data are specified, the PT will still use the contents of those addresses as clock data. Be sure to check the correct clock data addresses in your PLC manual and specify the correct addresses.

Settings to Transfer Clock Data to an External Device (NV4W/NV3Q Only)

If the On Option is selected for Transfer Outside, a setting will appear to set the first output address. Set the PLC memory area and address for transferring clock data.



If the On Option is selected for Transfer Outside, this setting will be displayed. Either enter the setting directly or click the button on the right of the box and enter the setting from the dialog box that will appear.

Note If the On Option is selected for Transfer Outside, clock data will be transferred to D0 as a default. The address can be reset according to the PLC that is connected. Error ER1103 will occur if an address that does not exist in the PLC is set.

System Menu Language

The language for the System Menu can be selected from the following:
Japanese or English



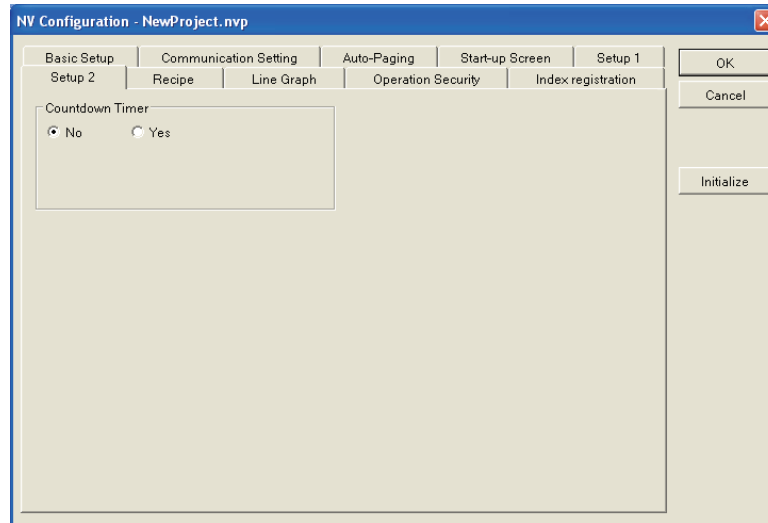
Additional Information

With the NV3W-V1/NV4W/NV3Q, the System Menu language can be selected directly from the System Menu.

6-2-9 Setup 2 Tab Page (NV3W-V1/NV4W/NV3Q Only)

Open the Setup 2 Tab Page from the NV Configuration Dialog Box to perform settings such as the one for SD memory card.

■ NV3W-V1

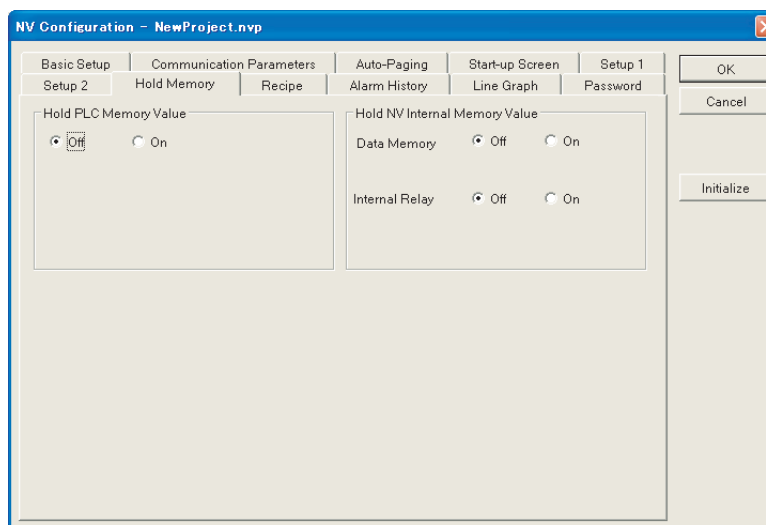


| Item | | Description |
|---|--------------------------------------|--|
| Countdown Timer | | <ul style="list-style-type: none"> • No [Countdown Timer] is disabled. • Yes [Countdown Timer] is enabled. |
| Free Space on the SD card (NV4W/NV3Q only) | Notify when SD card has little space | <ul style="list-style-type: none"> • No [Notify when SD card has little space] is disabled. • Yes [Notify when SD card has little space] is enabled. |
| SD Memory Card Menu (NV4W/NV3Q only) | Automatic Display | <ul style="list-style-type: none"> • Off [SD Memory Card Menu]-[Automatic Display] is disabled. • On [SD Memory Card Menu]-[Automatic Display] is enabled. |

| Item | Description |
|--|--|
| Function when writing to SD Card (NV4W/NV3Q only) | <ul style="list-style-type: none"> • No [Screen display when writing] is disabled. • Yes [Screen display when writing] is enabled. |
| Screen display when writing | <ul style="list-style-type: none"> • No [Output during write] is disabled. • Yes [Output during write] is enabled. |
| Output during write | <ul style="list-style-type: none"> • No [Stop Writing Control] is disabled. • Yes [Stop Writing Control] is enabled. |
| Stop Writing Control | <ul style="list-style-type: none"> • No [Output when error occurs] is disabled. • Yes [Output when error occurs] is enabled. |
| Output when error occurs | |

6-2-10 Hold Memory Tab Page (NV4W/NV3Q Only)

Open the Hold Memory Tab Page from the NV Configuration Dialog Box to set the memory to be held.



| Item | Description |
|-------------------------------|---|
| Hold PLC Memory Value | <p>This function is used to backup PLC memory in the PT.</p> <ul style="list-style-type: none"> • Off The data in PLC memory is not held. • On The data from PLC memory is held. You can back up up to 24 words from the specified address. |
| Hold NV Internal Memory Value | <p>This function is used to backup PT memory in the PT. Data Memory and Internal Relay (i.e., CIO Area) are set separately.</p> <ul style="list-style-type: none"> • Off The data in PT internal memory is not held. • On The data in PT internal memory is held. You can back up from the specified address to the last address. |

Setting the Hold PLC Memory Value Function

The hold PLC memory value function is used to back up the specified PLC memory data in the SRAM of the PT. The PT can back up memory contents that is lost from the PLC when there is a power interruption. PLC memory data held by the PT is automatically written to the PLC memory when power is turned ON again.

If the On Option is selected for Hold PLC Memory Value, a setting will be displayed to enter the first address and number of words. Set the first address in the PLC and number of words to back up.

If the On Option is selected for Hold PLC Memory Value, this setting will be displayed. Either enter the setting directly or click the button on the right of the box and enter the setting from the dialog box that will appear.

Note

An NV-BAT01 Battery (sold separately) is required to back up data.

Setting the Hold NV Internal Memory Function

The hold NV internal memory value function is used to back up the specified data in internal memory in the PT. All values in addresses after the set value will be held.

Data Memory

If the On Option is selected for Data Memory, a setting item will be displayed to enter the GDT start number. Set the first address in internal memory to back up.

If the On Option is selected for Data Memory, this setting will be displayed. Either enter the setting directly or click the button on the right of the box and enter the setting from the dialog box that will appear.

CIO Area

If the On Option is selected for Internal Relay, a setting item will be displayed to enter the WGR start number. Set the first address in internal memory to back up.

If the On Option is selected for Internal Relay, this setting will be displayed. Either enter the setting directly or click the button on the right of the box and enter the setting from the dialog box that will appear.

The PT internal memory is allocated as follows:

| Memory type | | Address range | Size |
|-------------|-------------|-------------------|-------------|
| Words | Data Memory | GDT 0 to GDT 2047 | 2,048 words |
| | CIO Area | WGR 0 to WGR 255 | 256 words |
| Bits | CIO Area | GR 0 to GR 255F | 4,096 bits |



Precaution for Correct Operation

An NV-BAT01 Battery (sold separately) is required to back up data.

Note

“WGR” is used to specify GR data in word units. For example, “WGR1” specifies the 16 bits from GR10 to GR1F.

6-2-11 Other Settings

For information on recipes and passwords, refer to *SECTION 8 Using PT Functions* or to NV-Designer online help. For information on the alarm history (NV4W/NV3Q only) and line graphs, refer to *SECTION 7 Descriptions of Parts* or to NV-Designer online help.

SECTION 7

Descriptions of Parts

This section describes how to create screens using the various parts provided by the NV-Designer.















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7-1 Character Strings and Graphics (Fixed Parts)

7-1-1 Character Strings and Graphics (Fixed Parts)

With the NV Series, the following character strings and graphics (fixed parts) can be displayed on the screen.

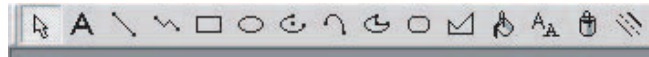
| Fixed part | Icon | Description |
|-------------------|---|---|
| Text |  | Creates a character string. |
| Line |  | Creates a straight line. |
| Continuous line |  | Creates continuous lines. |
| Rectangle |  | Creates a rectangle. |
| Pie/Oval |  | Creates a circle or oval. |
| Arc |  | Creates a circular or oval arc. |
| Spline |  | Creates a curved line. |
| Sector |  | Creates a circular or oval sector. |
| Rounded Rectangle |  | Creates a square with rounded corners. |
| Polygon |  | Creates a polygon. |
| Fill In |  | Fills areas enclosed by lines and graphics with a color. |
| Bit Map | --- | Pastes bit map data from the clipboard to the screen. |
| Character Type |  | Sets the language, font, character size, attributes (e.g., bold), and colors (character and background colors). |
| Color |  | Sets the colors and patterns for graphics. |
| Line Type |  | Sets the line thickness and type. |

Refer to NV-Designer Help for details on each graphic.

7-1-2 Entering Character Strings and Graphics

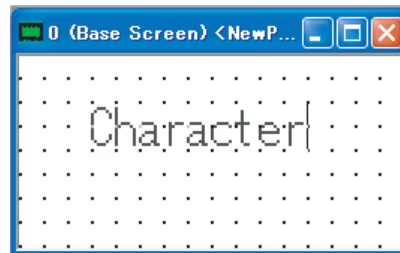
Entering Character Strings


- 1,2,3... 1. Click the Character String Button () on the graphic bar shown below.

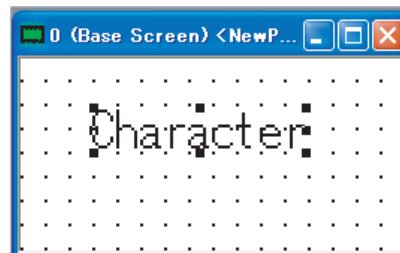



The mouse pointer changes to "I" to indicate that you can input a character string anywhere on the base screen.

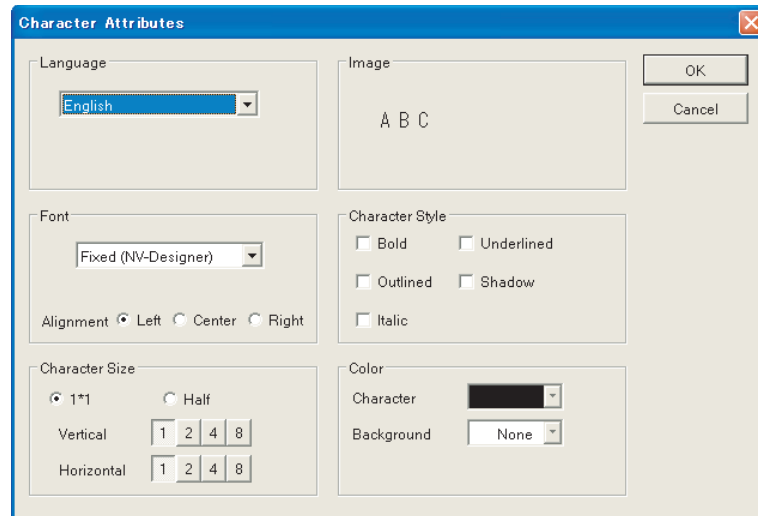
2. Click the position on the base screen where you want to input a character string.
3. Example:
Creates a character string.



4. To exit from the input state, click the Select Button () on the graphic bar.
5. Select the character string.



6. Adjust the position.
7. To change the font, size, color, or other attributes, click the Character Type Button () on the graphic bar.
The Character Attributes Dialog Box will be displayed.





8. Set the font, character size, and other attributes, and then click the OK Button.

Drawing Graphics

Draw the required graphics.

For example, draw a rectangle with rounded corners.

Click the Rectangle Button () on the graphic bar, and then draw the rectangle.

Click the Color Button () on the graphic bar.

For a rectangle with rounded corners, change the line color and pattern of the corners.

Pasting Bitmap Data

1,2,3...

1. Copy bitmap data to the clipboard in advance.
2. Right-click at the position where you want to insert the base screen.
3. Select Paste (Ctrl+V).

Note

- (1) It is not possible to paste data that is larger than the screen.
- (2) For color data and grayscale data, the number of colors or the number of shades of gray will be automatically reduced according to the capabilities of the PT model.

7-1-3 Setting a Layout According to the Text Size

Font Types That Can Be Input

Example for the NV3W

| Font | Characteristics |
|-----------|---|
| Fixed | The font can be half size* or normal size, and can be magnified by 1×, 2×, or 4×. Half-size characters = 8 × 8 dots (H × V) Normal characters = 16 × 8 dots (H × V) |
| True Type | Character sizes are specified as the number of dots. 10 to 64 dots Fonts installed with the NV-Designer are used for display. |
| Windows | Character sizes are specified as the number of dots. 10 to 64 dots Any of the Windows fonts installed in your computer can be used for display. |

Example for the NV3W

| Font | Characteristics |
|-----------|--|
| Fixed | The font can be half size* ¹ or normal size, and can be magnified by 1×, 2×, or 4×. Half-size characters = 8 × 8 dots (H × V) Normal characters = 16 × 8 dots (H × V) |
| True Type | Character sizes are specified as the number of dots. 10 to 96 dots Fonts installed with the NV-Designer are used for display. |
| Windows | Character sizes are specified as the number of dots. 10 to 96 dots Any of the Windows fonts installed in your computer can be used for display. |

Example for the NV4W/NV3Q

| Font | Characteristics |
|-----------|--|
| Fixed | The font can be half size* ¹ or normal size, and can be magnified by 1×, 2×, or 4×. Half-size characters = 8 × 8 dots (H × V) Normal characters = 16 × 8 dots (H × V) |
| True Type | Character sizes are specified as the number of dots. 10 to 240 dots Fonts installed with the NV-Designer are used for display. |
| Windows | Character sizes are specified as the number of dots. 10 to 240 dots Any of the Windows fonts installed in your computer can be used for display. |

*1 Some symbols cannot be used with half-size characters.



Precaution for Correct Operation

Font drawing and character styles are handled using functionality provided by Windows. The appearance of text depends on the version and type of Windows being used and the fonts that are installed.

Size of Character Strings and Parts

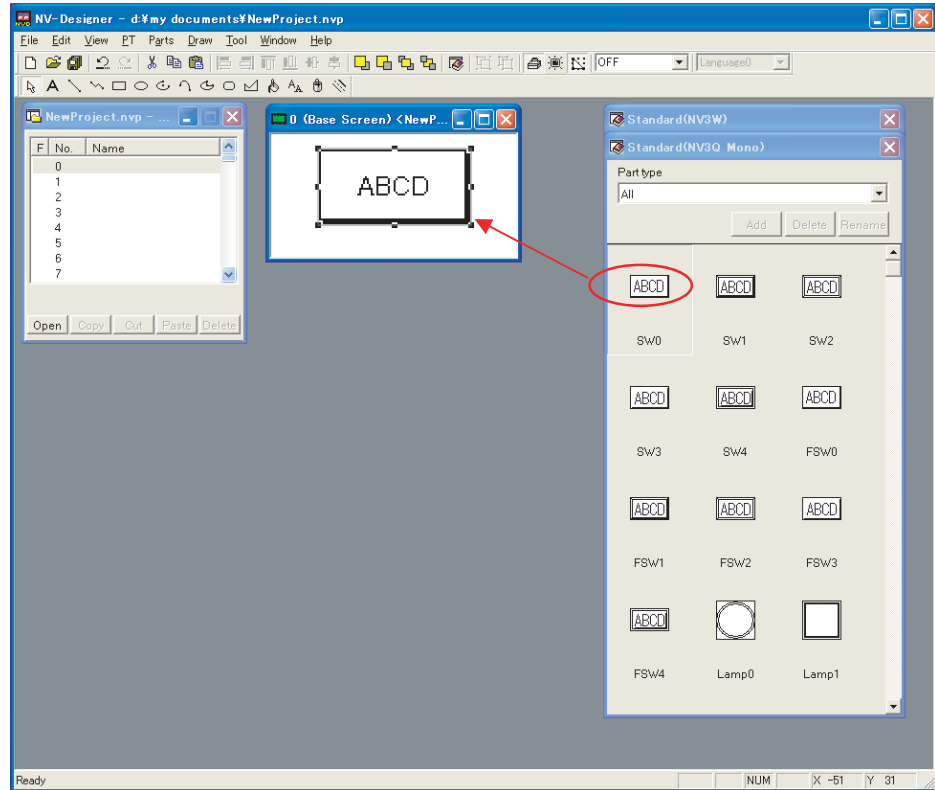
Parts that do not contain a character string can be set to any size. When parts contain characters (e.g. switches), the part size will be limited by the minimum character size (minimum character size = 8 x 8 dots).

When designing the screen layout, consider the size of the characters being used and the screen layout design according the number of dots constituting the screen of PT model being used.

7-2 Parts

7-2-1 Positioning Parts

Drag parts from the parts library of the Standard Dialog Box and drop them on the base screen.



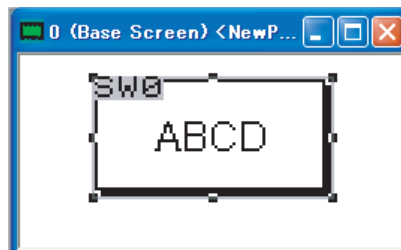
Double-click a part on the screen, and then set the attributes of the part.



Additional Information

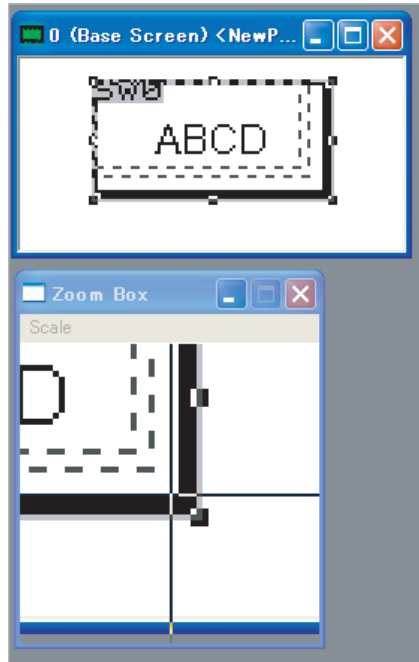
You can display the attribute information (e.g., address) of parts on the screen. Select Parts Attribute from the View Menu.

Example:



You can display the parts numbers of parts placed on the screen. Select Parts No. from the View Menu.

Example:



When you want to draw a very fine part or fine-tune the position of a part, select Zoom Box from the View Menu.



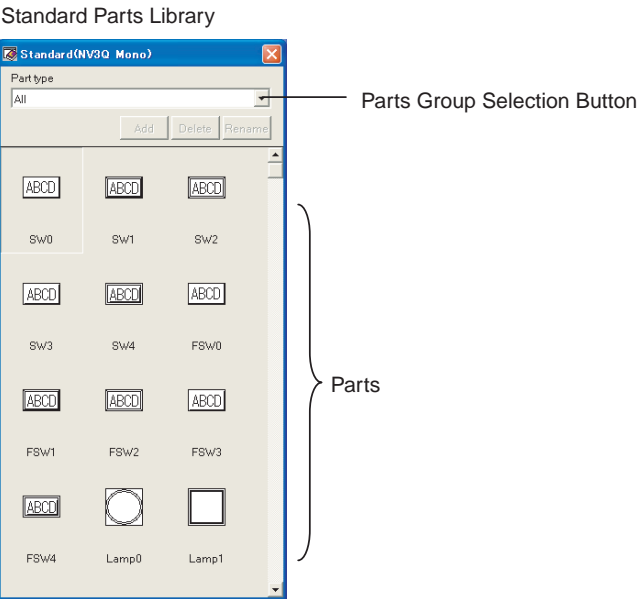
Precaution for Correct Operation

1. The zoom box will not be displayed properly on Windows Vista or Windows 7 computers on which Aero is enabled. If you use the zoom box, disable Aero.
2. The following limitations apply to positioning parts on a base screen.
 - A part cannot be placed on top of another part.
 - Character strings and graphics cannot be placed on top of parts.
(If a part overlaps a character string or graphic, the character string or graphic will be placed in the background behind the part.)

7-2-2 Parts Libraries

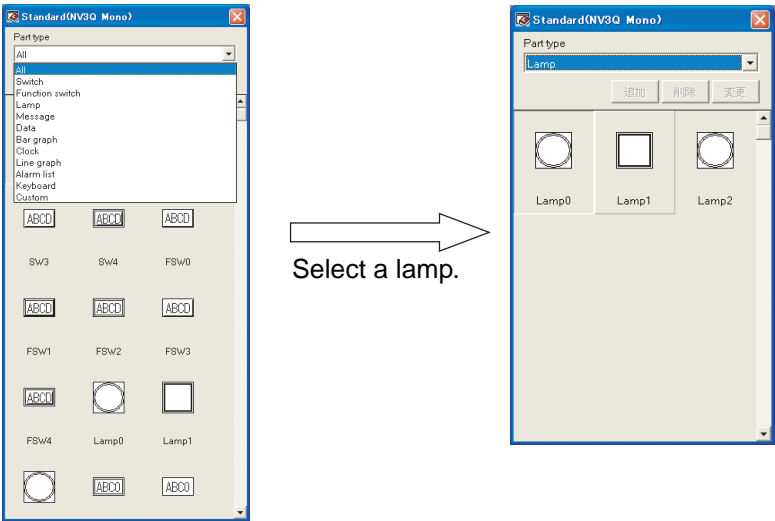
A parts library contains parts, such as switches, lamps, data displays, and keyboards, that you can use to create screens. They can be easily positioned on base screens by dragging and dropping them.

When NV-Designer is started, all parts in the Standard Parts Library for the set model will be displayed in front.



Parts Group Selection Button

Buttons are displayed by type.



See Also

Refer to 7-2-4 Available Parts Libraries.

All of the parts registered in the parts libraries can be viewed as PDF data.

7-2-3 Opening Parts Library

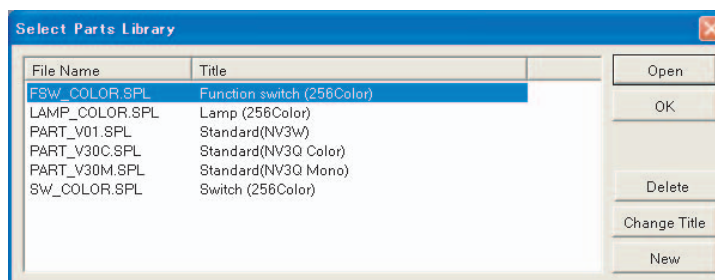


Additional Information

The standard parts library will open when a base screen is opened.

Opening the Parts Library from the Menu Bar

- 1,2,3... 1. Select Open Parts Library from the Parts Menu.
2. The Select Parts Library Dialog Box will be displayed.



Select the parts library to use and click the Open Button.

Here, select the *Function switch (256 Color)* Parts Library.

3. Here, the *Function Switch (256 Color)* parts library is displayed.



By repeating steps 1 to 3, multiple parts libraries can be opened and used simultaneously.

Click the title bar of the parts library to display the parts library currently being in the front.

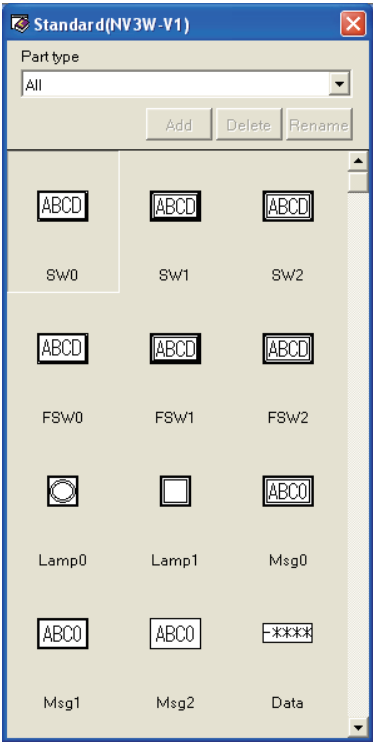
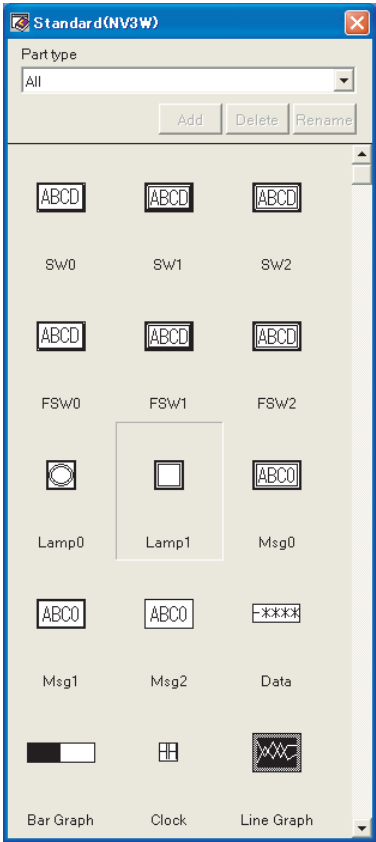
7-2-4 Available Parts Libraries

There are basically two types of parts libraries.

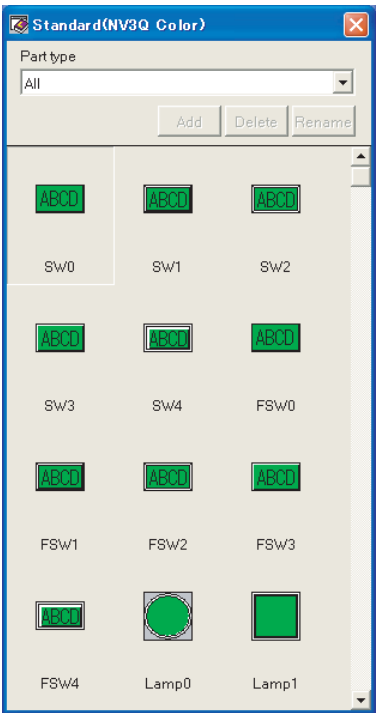
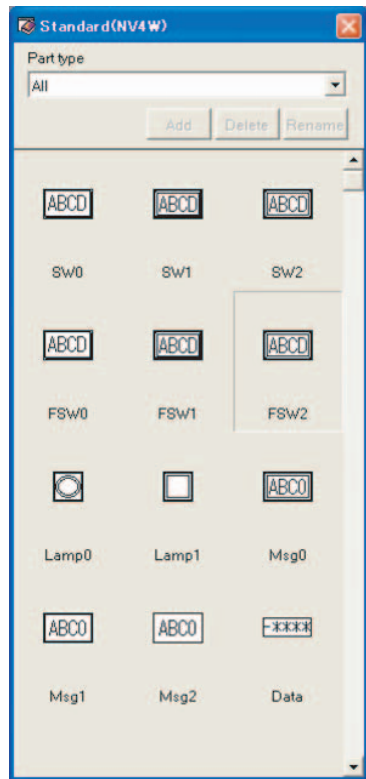
Parts

| Type | Description | Library name | Standard parts library | File name | NV-series PT |
|-----------------------------|---|-------------------------------------|------------------------------|---------------------|------------------|
| Standard parts library | These are the standard parts libraries, provided for each model. | Standard Parts Libraries | Standard (NV3W) | PART_V01.SPL | For the NV3W |
| | | | Standard (NV3W-V1) | PART_V11.SPL | For the NV3W-V1 |
| | | | Standard (NV4W) | PART_V12.SPL | For the NV4W |
| | | | Standard (NV3Q Mono) | PART_V30M.SPL | NV3Q mono-chrome |
| | | | Standard (NV3Q Color) | PART_V30C.SPL | NV3Q color |
| 256-color parts libraries | These libraries contain parts that can be displayed in 256 colors. There are three types of parts: Bit Switches, Function Switches, and Lamps. | 256-color lamp library | Lamp (256Color) | LAMP_COLOR.SPL | NV3Q color |
| | | 256-color switch library | Switch (256Color) | SW_COLOR.SPL | |
| | | 256-color function switch library | Function switch (256Color) | FSW_COLOR.SPL | |
| 4,096-color parts libraries | These libraries contain parts that can be displayed in 4,096 colors. These libraries enable more visual expressions than the 256-color libraries. | 4,096-color lamp library | Lamp (4,096Color) | LAMP_COLOR4096.SPL | NV3Q color |
| | | 4,096-color switch library | Switch (4,096Color) | SW_COLOR4096.SPL | |
| | | 4,096-color function switch library | Function switch (4,096Color) | FSW_COLOR4096.SPL | |
| | | 4,096-color icon switch library | ICON Switch (4,096Color) | SW_ICON4096.SPL | |
| | | 4,096-color metallic switch library | METALLIC Switch (4,096Color) | SW_METALLIC4096.SPL | |
| | | 4,096-color pastel switch library | PASTEL Switch (4,096Color) | SW_PASTEL4096.SPL | |
| | | 4,096-color real switch library | REAL Switch (4,096Color) | SW_REAL4096.SPL | |

Standard Library for an NV3W PT Standard Library for an NV3W-V1 PT



Standard Library for an NV4W PT Standard Library for an NV3Q Color PT



**Standard Library for an NV3Q
Monochrome PT****256-color Lamp Library****256-color Switch Library****256-color Function Switch Library**

4,096-color Lamp Library



4,096-color Switch Library



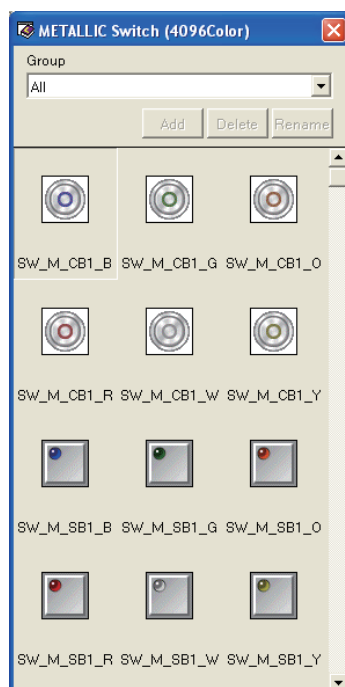
4,096-color Function Switch Library



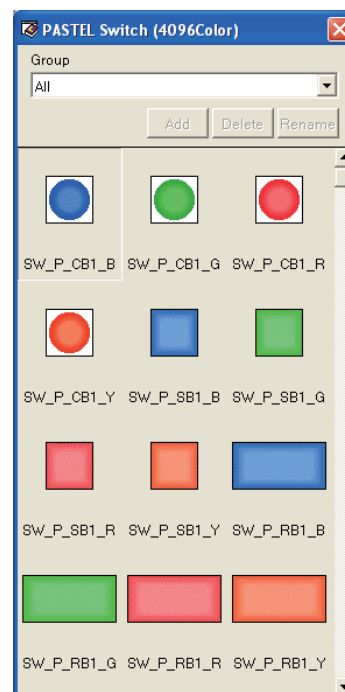
4096-color ICON Switch Library



4096-color METALLIC Switch Library



4096-color PASTEL Switch Library






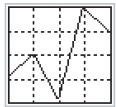




4096-color REAL Switch Library



7-2-5 Parts in the Standard Parts Libraries

Parts in the Standard Parts Libraries

| Standard library part name | Part name | Abbreviation | Example | Description | Applicable NV-series PTs | | | |
|----------------------------|-------------------|---------------|---|--|--------------------------|----------------|------------|------------|
| | | | | | NV3W | NV3W-V1 | NV4W | NV3Q |
| Switch | Bit switches | SW |  | Bit switches are turned ON and OFF in the same way as the corresponding bit in the PLC. | Supported. | Supported. | Supported. | Supported. |
| Function switch | Function switches | FSW |  | A part having a function and which, when touched, switches the screen, performs calculations, etc. | Supported. | Supported. | Supported. | Supported. |
| Lamp | Lamps | Lamp |  | The display color of the lamp changes when the corresponding bit in the PLC turns ON and OFF. | Supported. | Supported. | Supported. | Supported. |
| Message | Message parts | Msg |  | Message parts change the message that is displayed according to changes in the contents of the corresponding address in the PLC. You can switch between up to 16 different messages. | Supported. | Supported. | Supported. | Supported. |
| Data | Data parts | Data | -***** | Data parts display the contents of the corresponding address in the PLC directly on the screen. | Supported. | Supported. | Supported. | Supported. |
| Level meter | Level meters | Level Meter |  | Level meters display changes in the contents of the corresponding address in the PLC. | Supported. | Supported. | Supported. | Supported. |
| Clock | Clock | Clock | HH | A part that displays the date and time based on a referenced clock (PT clock or PLC clock). A single clock part displays any one of the year, month, day, hour, minutes, seconds, or day of the week. | Supported. | Supported. | Supported. | Supported. |
| Line graph | Line graphs | Line Graph |  | Line graphs display changes in the contents of the corresponding address in the PLC. | Supported. | Supported. | Supported. | Supported. |
| Alarm list | Alarm list | Alarm list |  | A list of errors that have occurred can be displayed. | Not supported. | Supported. | Supported. | Supported. |
| | | Alarm History |  | | Not supported. | Not supported. | Supported. | Supported. |

| Standard library part name | Part name | Abbreviation | Example | Description | Applicable NV-series PTs | | | |
|----------------------------|----------------------|---|---------|--|--------------------------|------------|------------|--|
| | | | | | NV3W | NV3W-V1 | NV4W | NV3Q |
| Keyboard | Key-board | Parts that change the value of the PLC memory address being displayed by the Data Part. | | Supported. | Supported. | Supported. | Supported. | |
| | | DEC1 | | | | | | Used to enter decimal values. |
| | | DEC2 | | | | | | Used to enter decimal values (horizontal). |
| | | DEC Sign1 | | | | | | Used to enter signed decimal fractions. |
| | | DEC Sign2 | | | | | | Used to enter signed decimal fractions (horizontal). |
| | | HEX | | | | | | Used to enter hexadecimal values. |
| | | ASCII | | | | | | Used to input ASCII data. |
| Custom | Custom switches | SW (Custom) | | Bit switches are turned ON and OFF in the same way as the corresponding bit in the PLC. The part can be edited. | Supported. | Supported. | Supported. | Supported. |
| | Custom lamps | Lamp (Custom) | | The display color of the lamp changes when the corresponding bit in the PLC turns ON and OFF. This part can be edited. | | | | |
| | Custom message parts | Msg (Custom) | | A part that switches the displayed character string according to the value of a word address, or when the referenced PLC bit address turns ON and OFF. The part can be edited. | | | | |

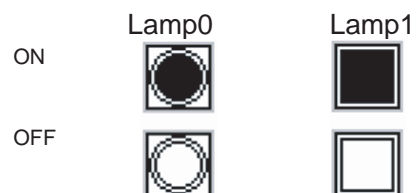
ON and OFF Status for Standard Library Parts

The main NV-series parts (switches, function switches, and lamps) will be as shown below when they are ON and OFF.

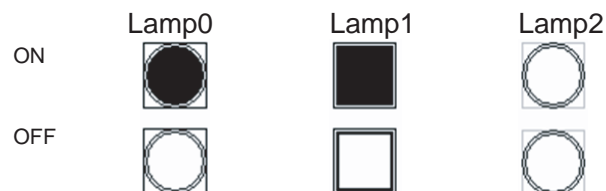
■ NV3W (-V1)/NV4W

Switches

| | | | |
|-----|-----|-----|-----|
| | SW0 | SW1 | SW2 |
| ON | | | |
| OFF | | | |

Function Switches**Lamps**

Note The ON color and OFF color for switches and lamps cannot be set for the NV3W (-V1), and for the NV4W when it is set for 2 shades of gray.

■ NV3Q-MR□1**Switches****Function Switches****Lamps**

■ NV3Q-SW□1










Switches

| | SW0 | SW1 | SW2 | SW3 | SW4 |
|-----|---|---|--|---|---|
| ON |  |  |  |  |  |
| OFF |  |  |  |  |  |

Function Switches

| | FSW0 | FSW1 | FSW2 | FSW3 | FSW4 |
|-----|---|---|--|---|---|
| ON |  |  |  |  |  |
| OFF |  |  |  |  |  |

Lamps

| | Lamp0 | Lamp1 | Lamp2 | Lamp3 | Lamp4 | Lamp5 | Lamp6 |
|-----|---|---|---|---|---|---|---|
| ON |  |  |  |  |  |  |  |
| OFF |  |  |  |  |  |  |  |

7-2-6 Editing Parts Libraries

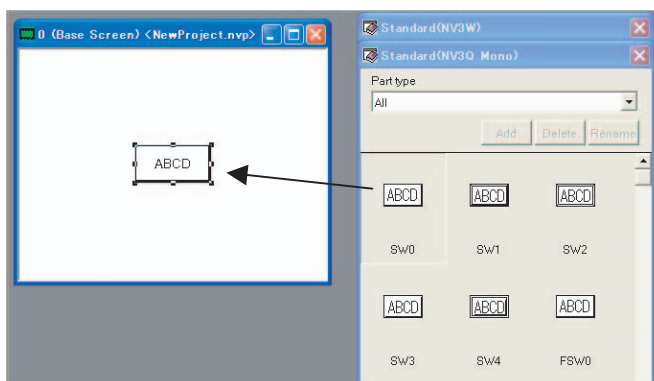
A parts from a library can be edited after being placed on a base screen.



Additional Information

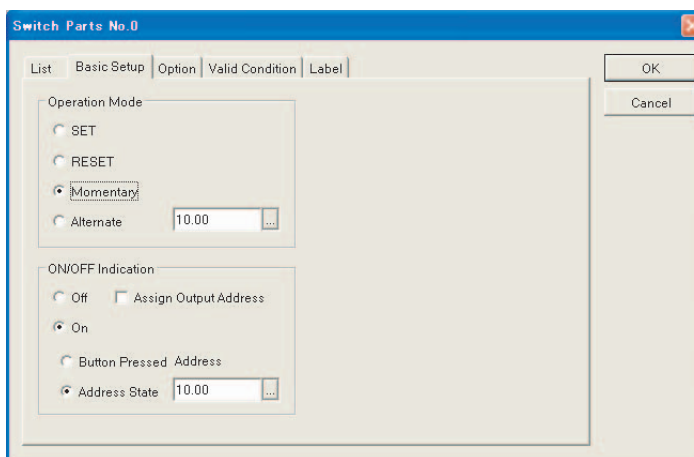
When an edited part is to be left as a library, we recommend creating a new parts library and registering the part in that library.

- 1,2,3... 1. Position the part.



Drag and drop a part from the parts library.

2. Open the Edit Parts Screen.



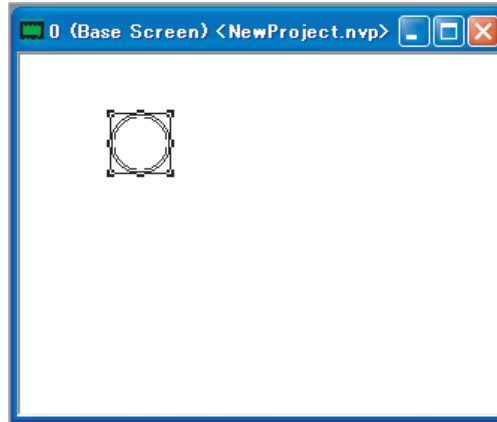
Either double-click the part, or right-click the part and select Attributes.

Change the parts attributes. The actual content to be edited depends on the part that is selected.

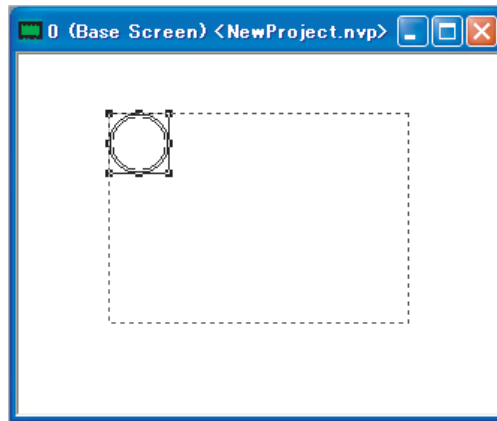
7-2-7 Changing the Size of a Part

The following methods can be used.

When you select a part, a selection border is displayed.



Use the mouse to drag the part handles to the desired size.



To adjust the size of a part without affecting its aspect ratio, hold down the Shift Key while dragging the part to the desired size.

For a part containing text, however, the smallest possible size is limited by the size of the text.



The part cannot be made any smaller.

If the size of the character string is made larger than the standard size, the part is automatically enlarged.

Character size: 16 dots Character size: 48 dots



7-2-8 User-created Parts Libraries

Users can create both their own parts and also their own parts libraries.

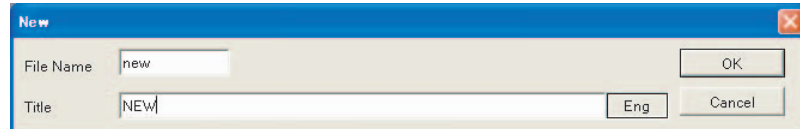
Registering a newly created part (or a part for which the settings have been changed) makes it easy to reuse that part.

The following procedure can be used to register a user-created part and create a parts library.

1,2,3...

1. Input the file name and title of the parts library and click the OK Button.

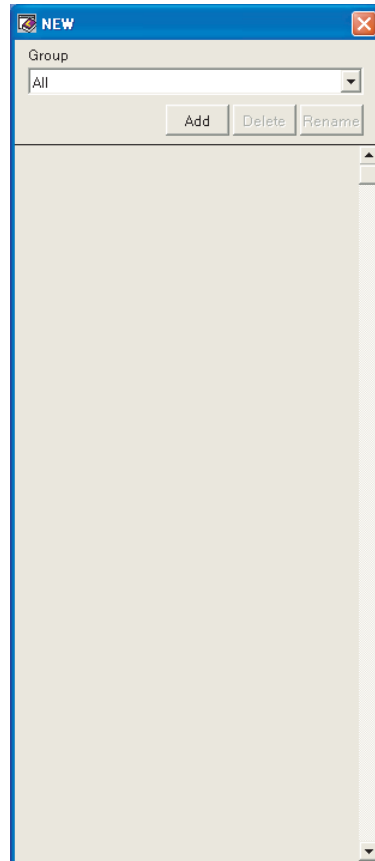
Select Open Parts Library – Create New from the Parts Menu, and enter a file name and title for the parts library.



File name: new

Title: NEW

2. The new parts library will be displayed.

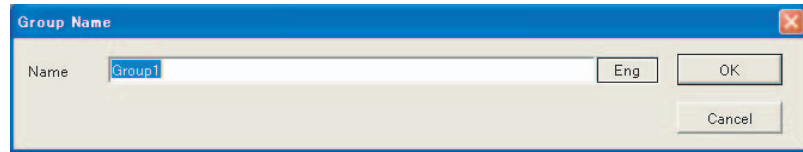


Settings Groups

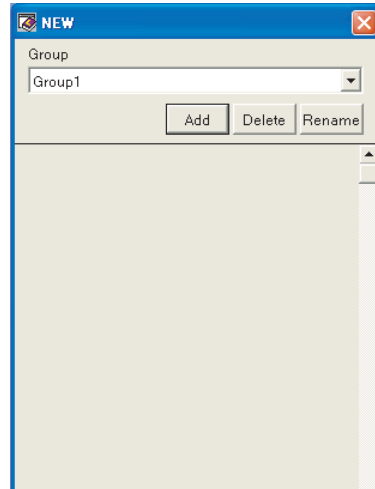
This setting is used when groups are to be created within the parts library.

3. Click the Add Button for the library.

4. Enter a name for the group, and click the OK Button.

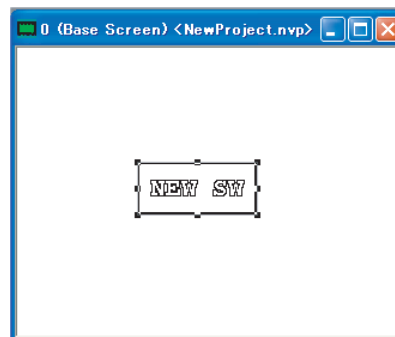


5. The Group Screen will be displayed.

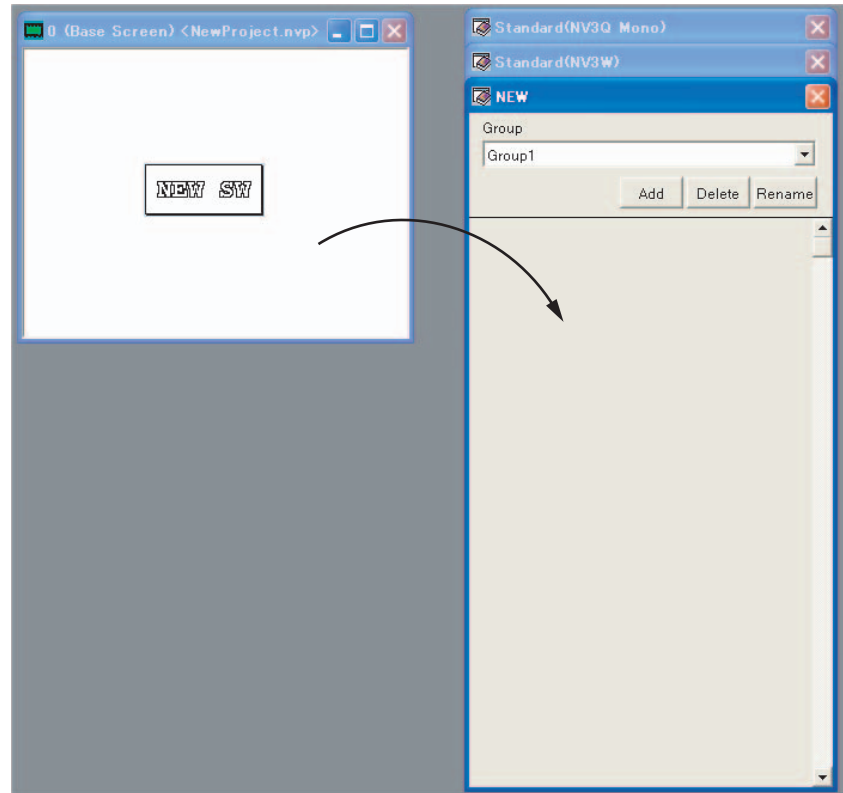


Create the part to register.

6. A user can create a part for the library using a base screen.



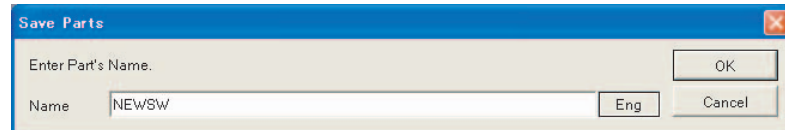
7. Register the part.



Drag and drop the part that you created on the base screen.

Note It is not possible to move parts between groups. Display groups before you attempt to registered parts.

8. Enter a name for the part to be registered.



Enter a name for the part, and then click the OK Button.

Part name: NEWSW



The new, user-created part will be added.

7-3 Specifying Addresses

7-3-1 Specifying Addresses

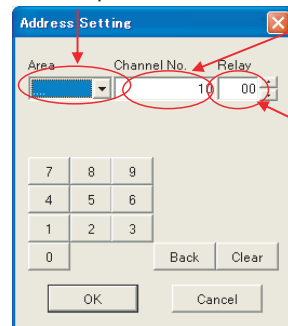
- 1,2,3... 1. On the Basic Settings Tab Page of the functional part, click the following Address Setting Button.



2. The following Address Setting Dialog Box will be displayed.
Select the area, enter an address, and click the OK Button.

• Specifying Bit Addresses

Select the memory area from the pull-down list.

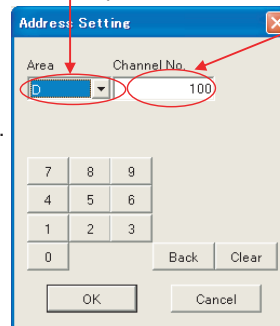


Enter the word address ("Channel No.").

Enter the bit number.

• Specifying Word Addresses

Select the memory area from the pull-down list.

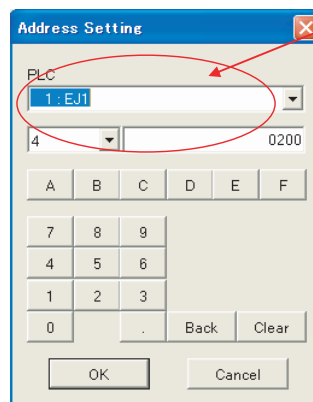


Enter the word address ("Channel No.").

A PLC address or PT internal address can be specified.

Note Using PLC Multiple Connection with a Model Selection of Modbus (RTU Mode | Temperature Controller) or Modbus (RTU Mode):

Unit numbers for the applicable PLC or Temperature Controller can be selected for each part from a pull-down list if PLC multiple connection is enabled in the NV Configuration.



Select the unit number for the applicable PLC or Temperature Controller.

Note The displayed characters (default: PLC-1) are the comment for the PLC multiple connection in the NV Configuration. The characters can be changed as desired (e.g., Temperature Controller).

7-3-2 OMRON PLC Addresses

The OMRON C, CV/CVM1, CS/CJ, and CP-series addresses that can be set by functional parts are listed in the following tables. Not all addresses are supported by all PLCs. Refer to your PLC manuals and specify only addresses that are supported.

C-series and CV/CVM1-series PLCs

| Area | | Area specification in pull-down list | Word |
|----------------|--------------------------|--------------------------------------|-----------------------|
| Bit addresses | I/O bits | --- | 000000 to 614315 |
| | Work bits | | |
| | LR Area | LR | LR 00000 to LR 19915 |
| | Auxiliary Area | AR | AR 00000 to AR95915 |
| | HR Area | HR | HR 00000 to HR51115 |
| | Timer Completion Flags | CNT | TIM 00000 to TIM 4095 |
| | Counter Completion Flags | DM | CNT 0000 to CNT 4095 |
| Word addresses | I/O bits | --- | 0000 to 6143 |
| | Work bits | | |
| | LR Area | LR | LR 000 to LR 199 |
| | Auxiliary Area | AR | AR 000 to AR 959 |
| | HR Area | HR | HR 000 to HR 511 |
| | Timer present values | TIM | TIM 0000 to TIM 4095 |
| | Counter present values | CNT | CNT 0000 to CNT 4095 |
| | Data Memory | DM | DM 0000 to DM 9999 |

CS/CJ-series and CP-series PLCs

| Area | | Area specification in pull-down list | Word | Remarks |
|---------------|--------------------------|--------------------------------------|-------------------------------|---------|
| Bit addresses | I/O bits | --- | 0000.00 to 9999.15 | *1 |
| | Work bits | | | |
| | LR Area | L | L 0000.00 to L 9999.15 | *1 |
| | SR Area | A | A 0000.00 to A 9999.15 | *1 |
| | HR Area | H | H 0000.00 to H 9999.15 | *1 |
| | Timer Completion Flags | T | T 0000 to T 4095 | *1 |
| | Counter Completion Flags | C | C 0000 to C 4095 | *1 |
| | Data Memory | D | D 00000.00 to D 32767.15 | *1 |
| | Work Area | W | W 0000.00 to W 9999.15 | *1 |
| | EM Area current bank | EM | EM 00000.00 to EM 32767.15 | *1 |
| | EM Area specified bank | E | E 0_00000.00 to E 18_32767.15 | *2 |
| | Task Flag | TK | TK 00 to TK 31 | *1 |

| Area | | Area specification in pull-down list | Word | Remarks |
|-----------------------|------------------------|--------------------------------------|-------------------------|---------|
| Word addresses | I/O bits | --- | 0000 to 9999 | |
| | Work bits | | | |
| | LR Area | L | L 0000 to L 9999 | |
| | SR Area | A | A 0000 to A 9999 | |
| | HR Area | H | H 0000 to H 9999 | |
| | Timer present values | T | T 0000 to T 4095 | |
| | Counter present values | C | C 0000 to C 4095 | |
| | Data Memory | D | D 00000 to D 32767 | |
| | Work Area | W | W 0000 to W 9999 | |
| | EM Area current bank | EM | EM 00000 to EM 32767 | |
| | EM Area specified bank | E | E 0_00000 to E 18_32767 | *3 |
| Double-word addresses | Index registers | IR | IR 00 to IR 15 | |

*1 Enter addresses like this on the NV-Designer:

* * * * *

↑ ↑ ↑

Word Bit position

Period

*2 Enter addresses like this on the NV-Designer:

* - * * * * *

↑ ↑ ↑ ↑ ↑

Bank number Underscore Word Bit position

Period

*3 Enter addresses like this on the NV-Designer:

* - * * * * *

↑ ↑ ↑ ↑ ↑

Bank number Underscore Word

*4 The address that can be used depends on the model.

7-3-3 PT Internal Addresses

The following internal addresses in the PT can be accessed by functional parts.

| Area | | Word |
|----------------|-------------|-------------------|
| Bit addresses | CIO Area | GR 0 to GR 255F |
| Word addresses | CIO Area | WGR 0 to WGR 255 |
| | Data Memory | GDT 0 to GDT 2047 |

Note “WGR” is used to specify GR data in word units. For example, “WGR1” specifies the 16 bits from GR10 to GR1F.

7-3-4 Address Input with Modbus (RTU Mode | Temperature Controller) Connection

Select 4 for the area.

For the channel number, input in hexadecimal the Modbus address that is set in the parameters of the OMRON EJ1 Temperature Controller.

Select 4 for the area.

For the channel number, input in hexadecimal the Modbus address from the parameters of the EJ1.

Address Setting Example

Reading the Present Value of Channel 1

1,2,3...

1. Display the Address Setting Dialog Box and select the unit number of the EJ1 from the PLC pull-down list.
2. Select 4 for the area.
3. Input 0200 for the channel number.
4. Click the OK Button.

For details on EJ1 addresses, refer to the parameter list and status list in the appendices of the *EJ1 Modular Temperature Controller User's Manual* (Cat. No. H142).

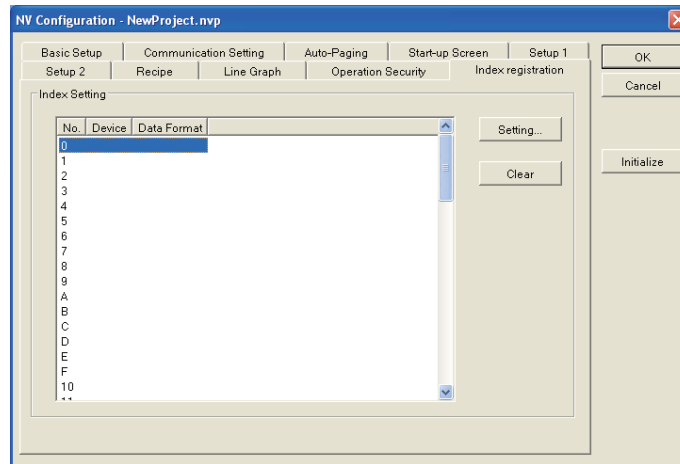
Note

- (1) When Modbus (RTU Mode) is selected, select any of the following address input methods for the area.
 - 1: Reading coil state
 - 2: Reading input bit state
 - 3: Reading holding register contents
 - 4: Reading input register contents
 - 5: Writing single coil state
 - F: Writing coil state
 - 10: Writing holding register contents
- (2) When a Modbus Slave (RTU Mode) is selected, set GR (bit) or WGR/GDT (word) as the address input method for the area.
- (3) For information on connection using Modbus, refer to the *NV-series Host Connection Manual* (Cat. No. V105).

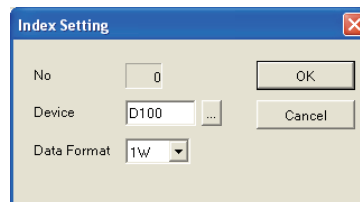
7-3-5 Index Modifiers

For the data parts, the address in which to store the data during execution can be changed using an index modifier. When it is utilized, the data are to be stored in an address specified by adding to the part-assigned address the value stored in the address designated by the index modifier.

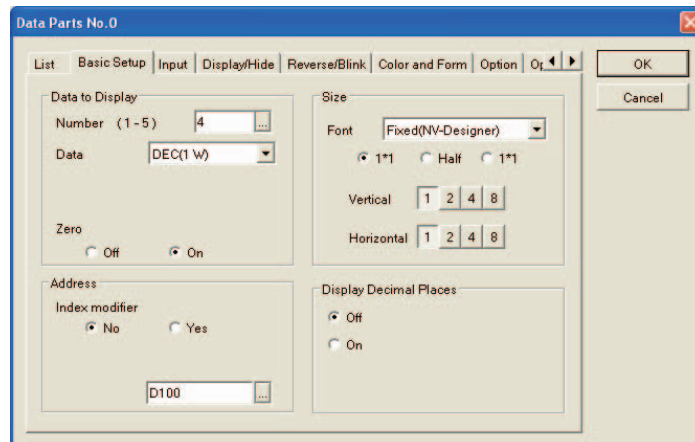
1. Select the Index Registration Tab Page in the NV Configuration Dialog Box.



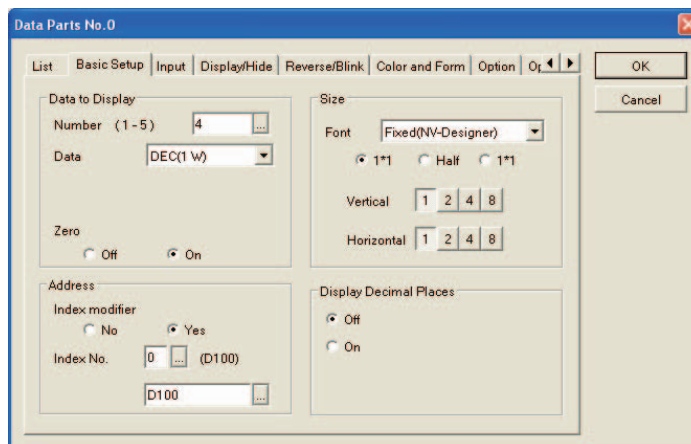
2. Click the Settings button to open the dialog, and specify the address to be used as an index.



3. After creating a data part, double-click the part to open the property dialog.



4. In Communication Address on the Basic Setup Tab Page, select ON of Index Modifier.



5. In the Index field below, set the index number that has been specified in the NV Configuration Dialog Box.

Example

The address specified for the index: D0

The communication address for the part: D100

When 10 is stored in D0, the data part will store the data in D110.

7-4 Bit Switches (“Switch”)

7-4-1 Bit Switches

Bit switches can be used to turn ON and OFF specified bits in the PLC.

Set the bit address when setting the operating mode of the switch.

7-4-2 Default Settings of Bit Switches

| | | | |
|--------------------|---|------------------|---|
| Basic Setup | Operation mode | Momentary | 10.00 |
| | ON/OFF Indication | On | 10.00 |
| Color Setup | The color depends on the bit switch part. | | |
| Option | Key Press Sound | Enabled | |
| Display/Hide | Display | | |
| Valid Condition | Not set. | | |
| Operation Security | Display Restriction | Off | |
| | Operation Restriction | Off | |
| Label | When OFF | Text | |
| | | Font | Fixed (NV-Designer) |
| | | Position | Left |
| | | Size | 1*1, x1 vertically and x1 horizontally. |
| | | Language No. | Language 0 |
| | | Character Style | Not supported. |
| | | Color: Character | Black |
| | | Background color | Not supported. |
| | When ON | Text | A B C D |
| | | Font | Fixed (NV-Designer) |
| | | Position | Left |
| | | Size | 1*1, x1 vertically and x1 horizontally. |
| | | Language No. | Language 0 |
| | | Character Style | Not supported. |
| | | Color: Character | Black |
| | | Background color | Not supported. |

7-4-3 Operation Modes of Bit Switches

| | |
|-----------|---|
| Set | The specified bit in the PLC is turned ON. |
| Reset | The specified bit in the PLC is turned OFF. |
| Momentary | The bit is ON as long as the switch is held down. |
| Alternate | Pressing the switch once turns the bit ON or OFF. |

7-4-4 Bit Switch Settings

See Also

Setting methods are described while creating a screen.
Refer to 4-2-4 *Creating Base Screens*.

7-5 Function Switches

7-5-1 Function Switches

Function switches are used to switch between screens, perform addition or subtraction, switch the displayed language, etc.

7-5-2 Default Settings of Function Switches

| | | | |
|--------------------|----------------------------------|------------------|---|
| Basic Setup | Operation Mode | Change Screen | Screen 0 |
| | | Multi Function | No |
| ON/OFF Operation | ON/OFF Indication | On | 10.00 |
| Color Setup | (Depends on the function switch) | | |
| Option | Key Press Sound | On | |
| Display/Hide | Display | | |
| Valid Condition | Off | | |
| Operation Security | Display Restriction | Off | |
| | Operation Restriction | Off | |
| Label | When OFF | Text | ABCD |
| | | Font | Fixed (NV-Designer) |
| | | Position | Left |
| | | Size | 1*1, x1 vertically and x1 horizontally. |
| | | Language No. | Language 0 |
| | | Character style | Not supported. |
| | | Color: Character | Black |
| | | Background color | Not supported. |
| | When ON | Text | ABDC |
| | | Font | Fixed (NV-Designer) |
| | | Position | Left |
| | | Size | 1*1, x1 vertically and x1 horizontally. |
| | | Language No. | Language 0 |
| | | Character style | Not supported. |
| | | Color: Character | Black |
| | | Background color | Not supported. |

7-5-3 Operation Modes of Function Switches

| | | |
|---------------------------------|---|--|
| Set | The specified bit in the PLC is turned ON. | |
| Reset | The specified bit in the PLC is turned OFF. | |
| Momentary | The bit is ON as long as the switch is held down. | |
| Alternate | Pressing the switch once turns the bit ON or OFF. | |
| Change Screen | The display changes to the specified screen. | |
| Value Set | A 1-word or 2-word value is written to the specified word or words in the PLC. | |
| Add | A 1-word or 2-word value is added to the contents of the specified address in the PLC and the result is written to the specified address in the PLC. | |
| Subtract | A 1-word or 2-word value is subtracted from the contents of the specified address in the PLC and the result is written to the specified address in the PLC. | |
| Display System Menu | Select the screen to be called, such as Clock Set, Contrast, or NV Configuration Main. | |
| Thumbwheel Switch | A function switch can be used as a thumbwheel switch. Touching the switch causes the contents of the specified address in the PLC to be incremented or decremented by 1. | |
| Back to Previous Screen | Returns the previous screen Note: Not recommended when the Operation Security Function is being used. | |
| Change Language No.*1 | The display changes to the specified language. | |
| Change Language No. (INC/DEC)*1 | Switches between multiple specified languages each time the switch is pressed. | |
| To Operate Alarm Parts | NV3W-V1/ NV4W/NV3Q only | This mode is used to manipulate alarm list parts. |
| For Operation Security Function | | Used as a switch for the operation security function. Select the desired function from Login, Logout, Password Change Normal, and Password Management (Manager Only). |
| Multifunction | | Executes multiple operations using one switch. |

*1 *Change Language No.* and *Change Language No. (INC/DEC)* are displayed only if *Multi-Language Exchange* is set to ON under **Tool – NV-Designer Configuration – Language**.

Note Function switches include Multifunction Objects, which can perform multiple operations using one switch. For details, refer to 7-13 *Multifunction Objects*.

7-5-4 Function Switches Settings



See Also

Setting methods are described while creating a screen. Refer to 4-2-4 *Creating Base Screens*.

For details on how to switch between screens, refer to 2-2 *Displaying Screens*.

7-6 Lamps

7-6-1 Lamps

The display color of a lamp changes when the specified bit in the PLC turns ON and OFF.

7-6-2 Default Settings of Lamps

| | | | |
|--------------------|-------------------------------------|-------------------------------------|-------------------------|
| Basic Setup | ON/OFF bit | Address 10.00 | |
| Color Setup | ON color OFF color Background | The color depends on the lamp part. | |
| Operation Security | Display Restriction | Off | |
| Label | When OFF | Text | Not supported. |
| | | Font | True Type (NV-Designer) |
| | | Position | Left |
| | | Size: Number of dots | 16 |
| | | Language No. | Language 0 |
| | | Character style | Not supported. |
| | | Color: Character | Black |
| | | Background color | Not supported. |
| | When ON | Text | |
| | | Font | True Type (NV-Designer) |
| | | Position | Left |
| | | Size: Number of dots | 16 |
| | | Language No. | Language 0 |
| | | Character style | Not supported. |
| | | Color: Character | Depends on the lamp. |
| | | Background color | Not supported. |

7-6-3 Lamp Settings

See Also

Setting methods are described while creating a screen.
Refer to 4-2-4 *Creating Base Screens*.

7-7 Data Parts and Keyboard Parts

7-7-1 Data Parts and Keyboard Parts

Data Parts

- Data parts display the contents of addresses in the PLC PT screen.

Keyboard Parts

- A keyboard part is used to enter numerical values to be displayed by a data part.
- There are two ways to use keyboard parts.
 - a. Display on PT screen: Displayed together with the data part on the PT screen.
 - b. Keyboard Editing Screen: Touching a data part on a PT screen causes the Edit Keyboard Screen to appear. Touching the ENT Key causes the original screen to return.

7-7-2 Default Settings of Keyboard Parts

| | | | |
|--------------------|-----------------------|-----------------------------------|----------------|
| Basic Setup | Image | (Depends on the type of the part) | |
| | Number of keys | Vertical | 4 |
| | | Horizontal | 3 |
| | Keyboard Replacement | Off | |
| Operation | Keyboard ON/OFF | Displayed only when entering data | |
| | Reversed when pressed | On | |
| | Touch sound | Enabled | |
| Color and Form | Image | 1 | |
| | Color Setup | Character color | Black |
| | | Key color | White |
| | | Tiling | Not supported. |
| Operation Security | Display Restriction | Off | |

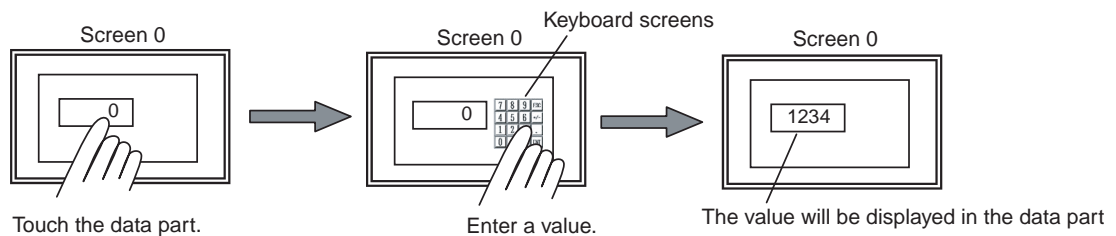
Note With a decimal keyboard, a decimal point can be entered for some parts but not for others.

7-7-3 Default Settings of Data Parts

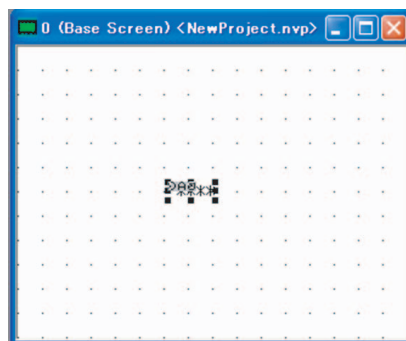
| | | | |
|-----------------------------|----------------------------------|------------------|-----------------------------|
| Basic Setup | Displayed data | Number of digits | 4 |
| | Data format | DEC (1W) | |
| | Zero suppression | On | |
| | Address | D100 | |
| | | Index modifier | No |
| | Size | Font | Fixed (NV-Designer), Normal |
| | | Vertical | 1 |
| | | Horizontal | 1 |
| Decimal point specification | Off | | |
| Input | Off | | |
| Display/Hide | Always displayed | | |
| Reverse/Blink | Normal | Off | |
| | When condition is met (priority) | Off | |
| Color and Form | Color | Characters | Black |
| | | Background | White |
| | Display Frame | Off | |
| Option | Scaling | Off | |
| Operation Security | Display Restriction | Off | |
| | Operation Restriction | Off | |

7-7-4 Settings for Creating an Edit Keyboard Screen

Creating a Sample Screen

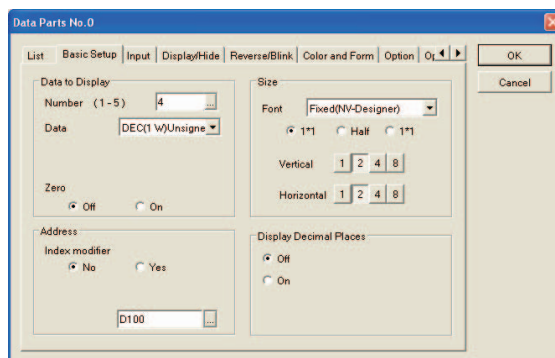


- 1,2,3...** 1. Open base screen 0 and position a data part. (Select *Parts No.* from the View Menu to display part numbers in advance.)



Click "0" in the Screen Manager, and then drag the data part from the standard parts library and drop it on the base screen.

2. Double-click the data part and change the basic setup.



Double-click part number "DAO" then make the basic settings as shown below.

Basic Setup

Data Format: [DEC (1W) Unsigned)]

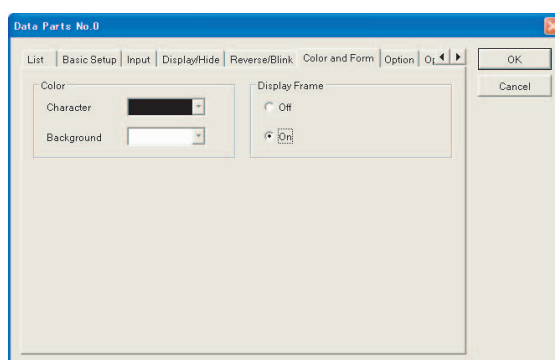
Zero Suppression: Off

Address: D130

Font: Vertical: 2, Horizontal: 2

Index modifier: No

3. Sets the color and form.



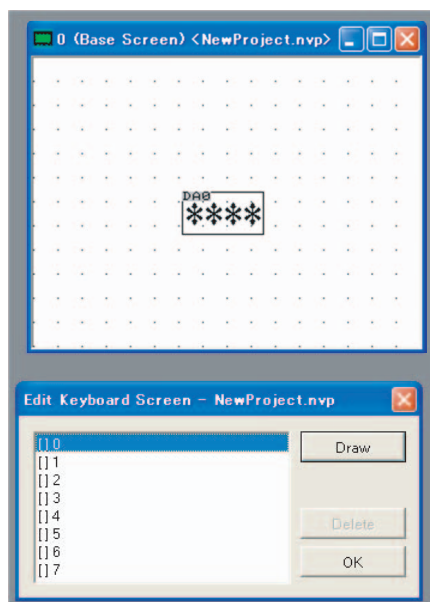
Click the *Color and Form* Tab, make the settings shown below, then click the OK Button.

(Make the input settings later.)

Display Frame: On

Do not change the settings on the Reverse/Blink Tab Page.

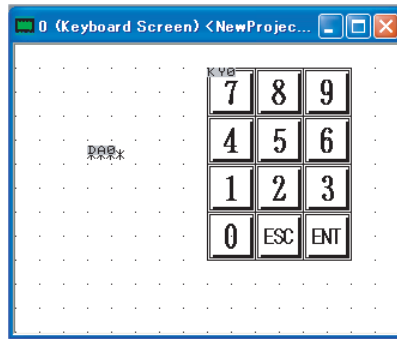
4. Select the Keyboard Screen.



Select File - Keyboard Screen from the menu bar.

The Edit Keyboard Screen Dialog Box will be displayed. Click [] 0, and then click the Edit Screen Button.

5. Arrange keyboards and data parts on the keyboard screen.



Drag the DEC Sign 1 Keyboard Part and the data part from the standard parts library and drop them on the keyboard screen.

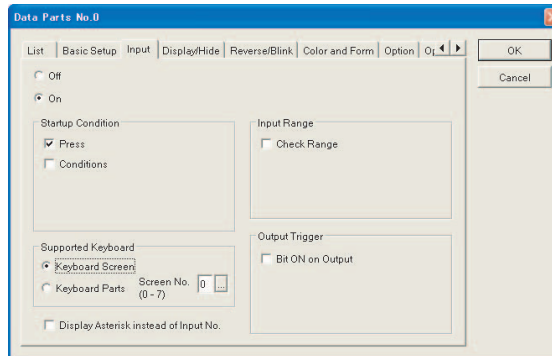
(Do not change the settings of KY0 and DA0 on keyboard screen 0.)

You do not need to set the data format for the data part on the keyboard screen.

The data format of the data that is automatically loaded will be set automatically.

Set the number of data digits to the same or higher than the number of data digits in the data being loaded.

6. Double-click the data part and change the input attributes.

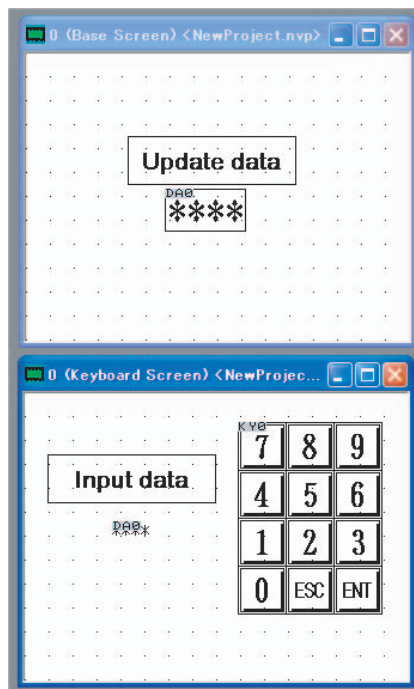


Double-click DA0 on the base screen, then click the Input Tab.

Make the following settings, and then click the OK Button.

Select the *On* Option.

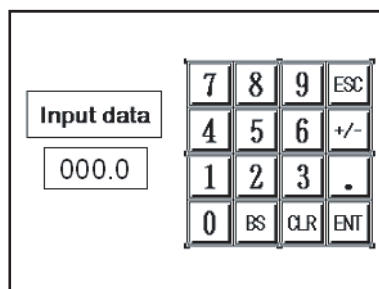
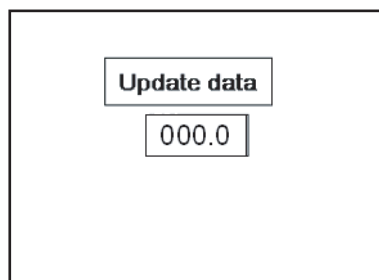
7. Enter text and frames into the data and keyboard parts.



After making the above settings, enter "Update data Change" on DA0 on the base screen.

Next to KY0 on keyboard screen 0, enter the text "Input data" and then place a frame around the text.

8. Transfer the screen to the PT.
9. Check the display on the PT.



When data has been transferred, the parts created on the NV-Designer will be displayed on the PT screen.

Touch the data part on the panel to switch to the *Input data* screen.

Enter a value, then touch the ENT Key to return to the *Update data* screen.

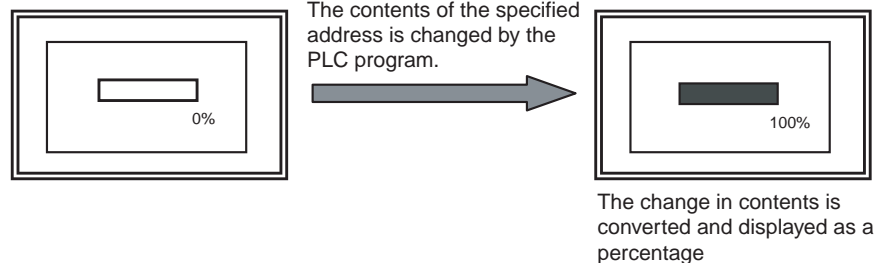
7-8 Level Meters

7-8-1 Default Settings of Level Meters

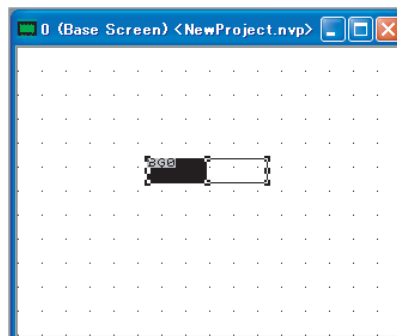
| | | | |
|--------------------|---------------|------------------------|---------------------|
| Basic Setup | Address | Address | D100 |
| | Data Format | DEC 1W unsigned | |
| | Graph Type | Direction | Right |
| | Max./Min. | Max. | Fixed (1 to 65,535) |
| | | Min. | Fixed (0 to 65,534) |
| | Reverse/Blink | Normal | Off |
| | | When Condition is True | Off |
| Color and Form | Image | Black/White | |
| | Display Frame | On | |
| | Graph Design | Color | Black |
| | | Background color | White |
| | | Pattern | White |
| | | Pattern Color | White |
| Display Numeric | Off | | |
| Operation Security | Off | | |

7-8-2 Displaying the Contents of a Word from the PLC Unit a Level Meter

Creating a Sample Screen



- 1,2,3...** 1. Open base screen 0 and position a level meters.



Click "0" in the Screen Manager, and then drag a level meters from the standard parts library and drop it on the base screen.

2. Double-click the level meters. Set the basic setup.

Level Meter Parts No. 0

Basic Setup

Address: D100

Data Format: DEC 1W Unsigned

Graph Type: Direction: ☒ Right ☐ Up ☐ Left ☐ Down

Max/Min: Max: ☐ Fixed (1 - 85535) ☒ Indirect Reference D100 Min: ☐ Fixed (0 - 85534) ☒ Indirect Reference D101

Set the maximum and minimum values.

Leave the default settings (Max.: 100; Min.: 0) as is.

3. Change the set values.

Level Meter Parts No. 0

Display Numeric

Display %: ☒ On ☐ Off

Font: ☒ Fixed (NV-Designer) ☐ Half

Vertical: 1 2 4 8 Horizontal: 1 2 4 8

Color: Numeric: [Black] Background: [White]

Click the Display Numeric Tab.

Select the *On* Option.

Display %: On

Font: Fixed (NV-Designer),
Vertical: 1,
Horizontal: 1

Note The displayed value is the percentage of the difference between the maximum value and minimum value.

Select the *On* Option for the *Display %* attribute to display the percentage followed by the percentage sign.

4. Make the settings on the Display Numeric Tab Page.

0 (Base Screen) <NewProject.nvp>

Graph area showing a black bar and the text '???'.

Click the OK Button to display the value as a percentage enclosed in a frame, and then click a point under the graph as shown on the left.

5. After the settings have been made, transfer the screen data to the PT.

6. Check the display on the PT.



When the transfer has been completed, the level meters created on the NV-Designer will be displayed on the PT.

7. Check the operation of the level meter.

Movement of the Bar

The bar should move between 0% and 100% when the contents of D100 is changed.

7-9 Clocks

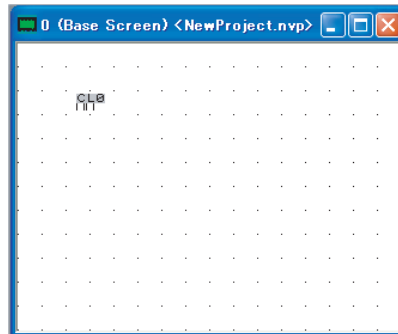
7-9-1 Default Settings for Clocks

| | | | |
|--------------------|------------------------|------------------------|--------------------------|
| Basic Setup | Clock | Hour (in 24-hr format) | |
| | Zero suppression | On | |
| | Size | Font | Fixed (NV-Designer), 1*1 |
| | | Vertical | 1 |
| | | Horizontal | 1 |
| Reverse/Blink | Normal | Off | |
| | When Condition is True | Off | |
| Color and Form | Color | Characters | Black |
| | | Background | White |
| | Display Frame | Off | |
| Operation Security | Off | | |

7-9-2 Displaying Clocks

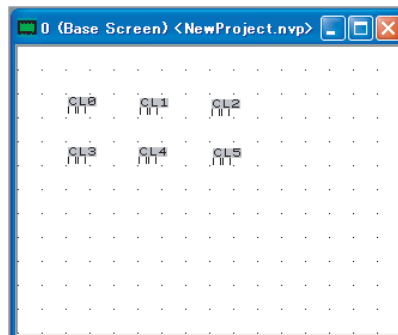
Creating a Sample Screen You can use the following procedure to set the year, month, day, hour, minutes, and seconds.

- 1,2,3...** 1. Open base screen 0 and position a clock part.



Click "0" in the Screen Manager, and then drag the clock part from the standard parts library and drop it on the base screen.

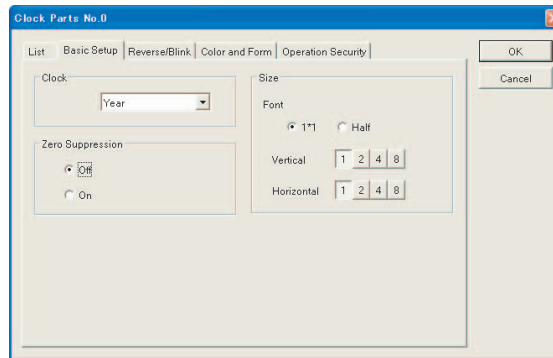
2. Copy and paste the part.



Use the repeat copy function to arrange the parts as shown on the left.

Copying can be done by either right-clicking and selecting Copy, or by using Ctrl + C.

3. Double-click CL0 of the clock part at the upper left and change the settings.



Double-click "CLO" at the upper left and change the settings as shown below.

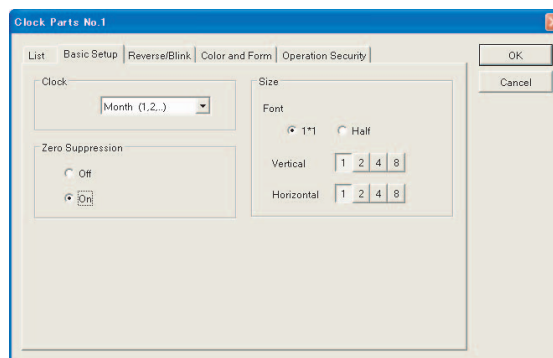
Click the OK Button when you are finished.

Basic Setup

Clock: Year

Zero suppression: Off

4. Double-click the data part in the center and change the settings.



Double-click "CL1" at the upper center and change the settings as shown below.

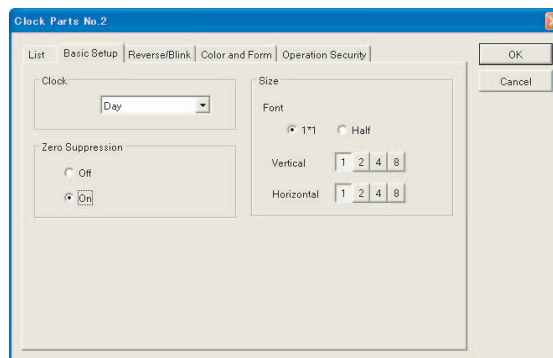
Click the OK Button when you are finished.

Basic Setup

Clock: Month (1, 2, ...)

Note The month can be selected from a table.

5. Double-click the clock part at the upper right and change the settings.



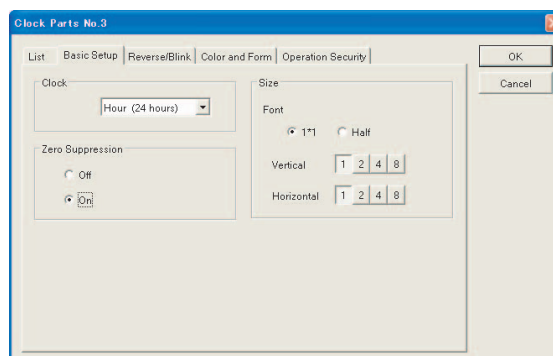
Double-click "CL2" at the upper right and change the settings as shown below.

Click the OK Button when you are finished.

Basic Setup

Clock: Day

6. Double-click the data part at the lower left and change the settings.



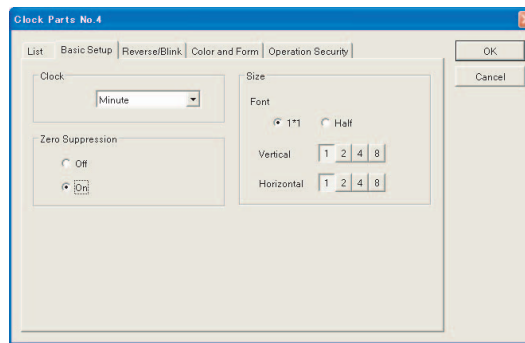
Double-click "CL3" at the upper right and change the settings as shown below.

Click the OK Button when you are finished.

Basic Setup

Clock: Hour (in 24-hr format)

7. Double-click the data part in the lower center and change the settings.



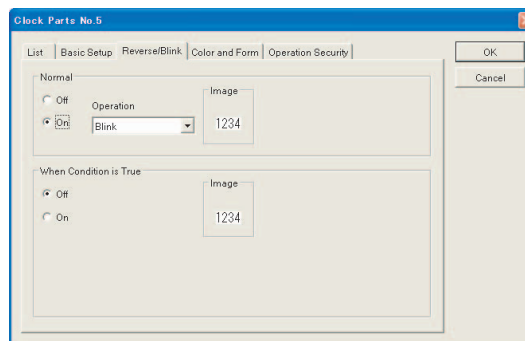
Double-click "CL4" at the upper right and change the settings as shown below.

Click the OK Button when you are finished.

Basic Setup

Clock: Minutes

8. Double-click the data part at the lower right and change the settings.



Double-click "CL5" at the upper left and change the settings as shown below.

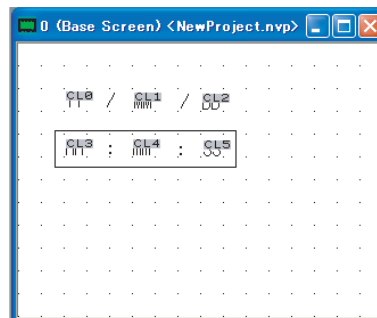
Click the OK Button when you are finished.

Basic Setup

Clock: Seconds

Reverse/Blink: Normal, Blink

9. Enter character strings and frames on the base screen.



After all settings have been made, enclose the date and time in a rectangle as shown on the left, and then enter the year, month, day, hour, minutes, and seconds.

10. Transfer the screen to the PT.

11. Check the display on the PT.

When the transfer has been completed, the clock parts created on the NV-Designer will be displayed on the PT.



Precaution for Correct Operation

When using a clock part, you can select either the PT clock or PLC clock in the NV Configuration.

• Clock in the PT

Settings can be made with the NV4W/NV3Q, provided a Battery is installed.

• PLC Clock

Always set the PLC clock when a Battery is not being used.

- Refer to 6-2-8 Setup 1 Tab Page for details on clock settings.

7-10 Line Graphs

7-10-1 Default Settings for Line Graphs

| | | | |
|--------------------|---------------------|------------------------|-----------------------------------|
| Basic Setup | Function | Data Log | |
| | Reference | Group No. | 0 |
| | | Number of Lines | 1 |
| | Graph Type | Pen Move | |
| | | Number of Scrolls | 1 |
| | Direction | Right | |
| | Stop Update | Off | |
| Display | Display Point | Display Point | NV3W (-V1): 32, NV4W/ NV3Q: 80 |
| | Display Data | Plot Interval (Dot) | 1 |
| | Background Color | White | |
| | Display Frame | Whole | |
| | | Color | Black |
| | Scale | Horizontal Line | On |
| | | Number of Divisions | 4 |
| | | Color | Black |
| | | Vertical Line | On |
| | | Number of Divisions | NV3W (-V1): 4, NV4W/NV3Q: 10 |
| | | Color | Black |
| Operation Security | Display Restriction | Off | |
| Element Setup | Line Settings | Name | |
| | | Line Type/Color/Mark | Type: - |
| | | | Color: Black |
| | | | Mark: None |
| | | Data Format | DEC 1W unsigned |
| | | Max./Min. | Max.: 1 to 65,535 |
| | | | Min.: 0 to 65,534 |
| | Reverse/Blink | Normal | Off |
| | | When Condition is True | Off |

7-10-2 Overview of Line Graphs

Line Graph Characteristics

Line graphs have the following characteristics.

- A single line graph part can display up to eight lines.
- For line graphs, either of two drawing modes can be selected: Data Log or Broken-line Graph.
- Sampled values are saved in the history memory in the PT.
- The line graph data saved in the PT can be saved in CSV format using the NV Memory Editor.

Refer to *Appendix A NV Memory Editor* for information on the NV Memory Editor.

- Data can be sampled in up to five groups.
- Sampling can be started and stopped for each line graph sampling group.

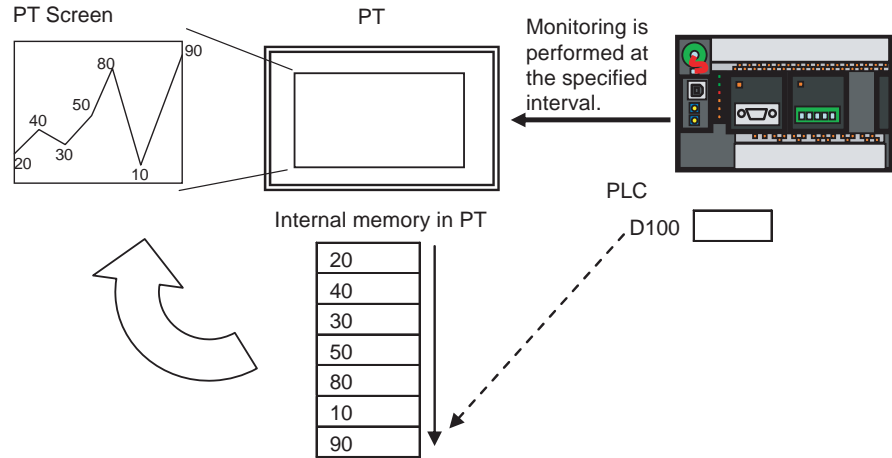
Drawing Mode

■ Data Log

In this mode, data is read from the PLC into the internal memory of the PT at specified intervals in one- or two-word units.

■ Description of Operation

The PT reads data from the PLC at the specified interval, and then saves it into internal memory. The values saved in internal memory in the PT are displayed by the line graph part. The graph is updated at the specified interval.



■ Graph Type

There are two types of line graphs.

Pen Move: Once the display area is full, the graph is scrolled by a set amount equal to a few minutes of data, after which graph drawing is resumed.

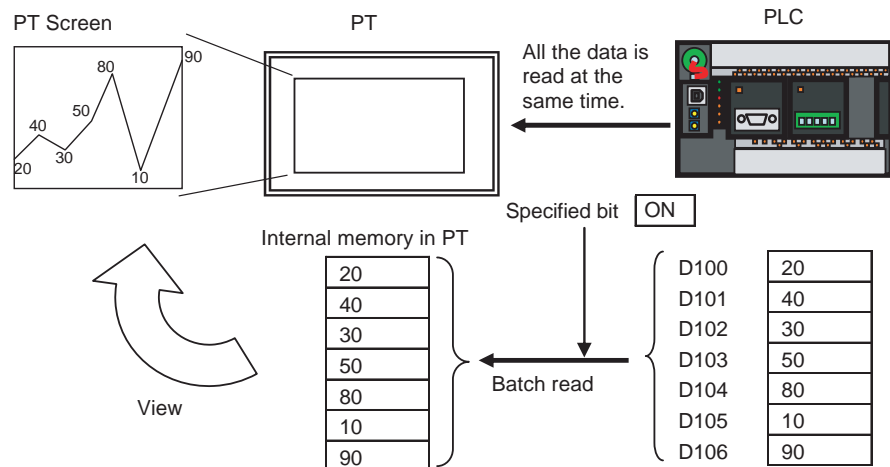
Sheet Move: As monitoring is performed, the graph is drawn in the specified direction.

■ Broken-Line Graph

A bit in the PLC is used as a trigger to prompt the NV-Series to batch-read multiple words of data from the PLC.

■ Description of Operation

When the specified bit in the PLC turns ON, the PT reads data from the PLC. The data is displayed on the line graph. While the bit is ON, the graph is constantly updated.



Settings in the NV Configuration

Up to five sampling methods (groups 0 to 4) can be set.

■ Data Log

Sampling is started from the start address and continued for the number of words equal to (number of graph lines) x (number of words specified for data format). For example, for 5 lines and the DEC 2W data format, 5 (lines) x 2 (words) = 10 words, sampled starting from the start address.

■ Data Format

Specify the data type for sampling data.

■ Number of Lines

Specify the number of graph lines to be used for sampling. This is not the setting for the number of graph lines that are to be displayed. Set the number of graph lines to display with the line graph part.

- Note**
- (1) For the number of graph lines specified above, set a value that is greater than the number of graph lines that are to be displayed.
 - (2) Use a line graph part to set the number of graph lines to be displayed on the screen.

■ Sampling Trigger

Specify the timing at which sampling is to be performed. The internal timer is used to sample the data from the PLC at a constant interval. Select specifying an address to perform sampling based on the status of a bit in the PLC.

■ Storage Area

Set the number of values sampled from the PLC to record. Sampled data is written into internal memory in the PT.

Note The setting must be larger than the setting for Display Point in the line graph part.

■ Line Graph Control (2 Words)

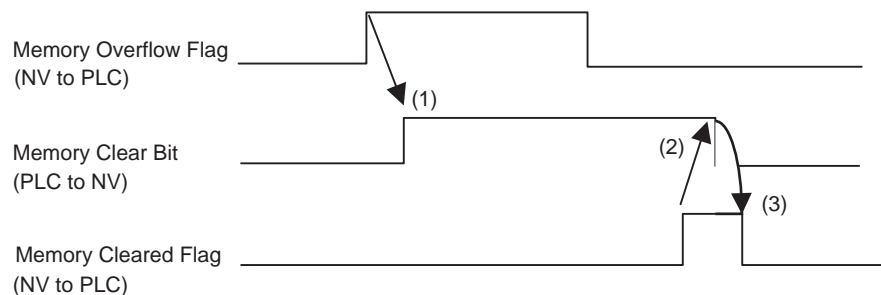
| Word | Bits | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------|------|-------------------------|-------------------------|-------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|-------------------------|-------------------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| n | | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Group 4 Memory Overflow Flag | Group 3 Memory Overflow Flag | Group 2 Memory Overflow Flag | Group 1 Memory Overflow Flag | Group 0 Memory Overflow Flag | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Group 4 Monitor Stop Bit | Group 3 Monitor Stop Bit | Group 2 Monitor Stop Bit | Group 1 Monitor Stop Bit | Group 0 Monitor Stop Bit |
| n+1 | | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Group 4 Memory Cleared Flag | Group 3 Memory Cleared Flag | Group 2 Memory Cleared Flag | Group 1 Memory Cleared Flag | Group 0 Memory Cleared Flag | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Group 4 Memory Clear Bit | Group 3 Memory Clear Bit | Group 2 Memory Clear Bit | Group 1 Memory Clear Bit | Group 0 Memory Clear Bit |

Group Monitor Stop Bits: Sampling will be stopped if the bit is turned ON from the PLC.

Group Memory Overflow Flags: The flag will turn ON if the number of sampled alarms exceeds the number of records to store that is set in the NV Configuration. The flag will remain ON until memory is cleared.

Group Memory Clear Bits: The recorded data will be cleared if the bit is turned ON from the PLC. Do not turn OFF a bit until the corresponding Memory Cleared Flag turns ON.

Group Memory Cleared Flags: The PT will turn ON the corresponding flag when the memory in the PT has been cleared. The flag will not turn OFF until the Memory Clear Bit has been turned OFF.



(1) If the Memory Overflow Flag turns ON, the Memory Clear Bit is turned ON to clear memory contents.

- (2) After confirming that the Memory Cleared Flag has turned ON, turn OFF the Memory Clear Bit.
- (3) When the Memory Clear Bit has been turned OFF, the Memory Cleared Flag will turn OFF automatically.

Description of Line Graph Settings

■ Function

Select Data Log to display a graph created by sampling PLC data (1 or 2 words). Select Broken-line Graph to display a graph of the stored data that is read from the PLC.

■ Reference

Sampling is specified for each group number using the method set in the NV Configuration. For the Number of Lines, set the number of lines to be displayed. Up to 8 lines can be displayed.

■ Graph Type

Select the method used to plot the graph. Either Pen Move or Sheet Move can be selected. If Pen Move is set, the graph will be drawn simulating the movement of a pen. If Sheet Move is set, the graph will be drawn as if the pen were fixed while the sheet is moved.

■ Direction

Set the direction in which either the pen or the sheet is moved, depending on the graph type.

Note The display method depends on the graph type and direction settings, so confirm the operation on the PT.

■ Stop Updating

The specified bit can be used to stop updating the display. Updating the display will be stopped while the specified bit is ON. Sampling will continue.

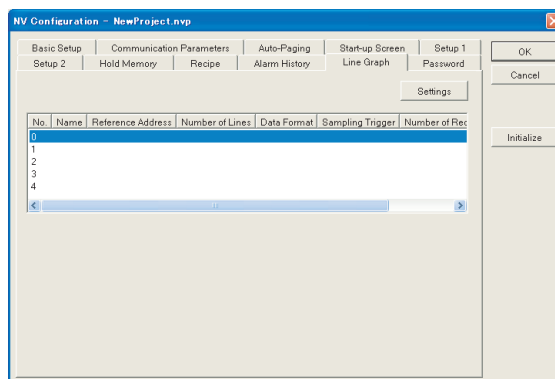
■ Display Points

Set the number of points that are displayed when plotting the graph. If 100 is set for Display Point, then the number of records that is set in the PT Configuration must be greater than 100.

7-10-3 Displaying Graphs after Sampling PLC data for a Specified Interval

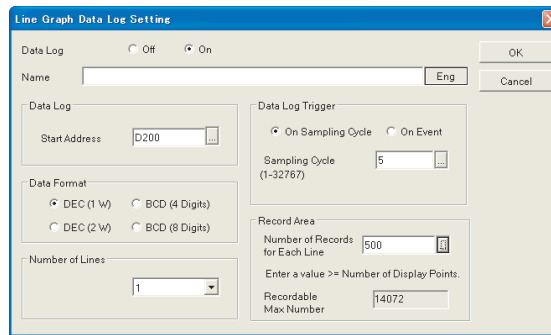
Basic Operation

- 1,2,3... 1. Make the data log settings for the line graph in the NC Configuration.



Select NV Configuration from the PT Menu. Click the Line Graph Tab.

2. Select group 0, click the Settings Button, and then set the log data.

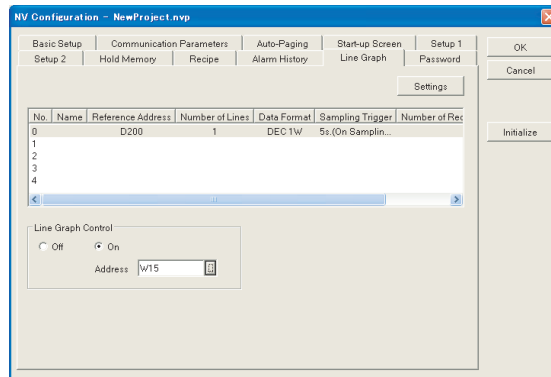


The dialog box is titled "Line Graph Data Log Setting". It has a "Data Log" section with "Off" and "On" radio buttons, where "On" is selected. Below this is a "Name" field with an "Eng" button. The "Data Log" section is expanded, showing "Start Address" as "D200". The "Data Format" section has three radio buttons: "DEC (1 W)" (selected), "BCD (4 Digits)", and "BCD (8 Digits)". The "Number of Lines" is set to "1". The "Data Log Trigger" section has two radio buttons: "On Sampling Cycle" (selected) and "On Event". The "Sampling Cycle" is set to "5". The "Record Area" section has "Number of Records for Each Line" set to "500" and "Recordable Max Number" set to "14072". There is a note: "Enter a value >= Number of Display Points."

Make the following settings, and then click the OK Button.

Sampling: On
 Start Address: D200
 Data Format: DEC (1 W)
 Number of Lines: 1
 Sampling Trigger: On Sampling Cycle
 Sampling Cycle: 5
 Storage Area
 Number of Records for Each Line: 500

3. Set line graph control on the Line Graph Tab Page.

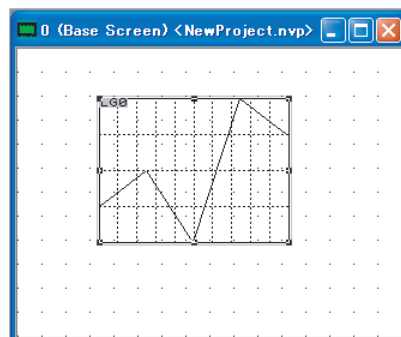


The dialog box is titled "NV Configuration - NewProject.nvp". It has a "Line Graph" tab selected. The "Line Graph Control" section has "Off" and "On" radio buttons, where "On" is selected. The "Address" is set to "W15". There is an "Initialize" button.

Make the following settings, and then click the OK Button.

Line Graph Control: On
 Address: W15

4. Open base screen 0 and position a line graph part.



Double-click "0" in the Screen Manager, and then drag the line graph part from the standard parts library and drop it on the base screen.

5. Double-click the line graph part and change the basic setup.

Double-click the parts number LGO on the base screen, and make the following settings.

Function: Data Log
 Group No.: 0
 Number of Lines: 1
 Graph Type: Pen Move
 Number of Scrolls: 1
 Direction: →
 Stop Update: Off
 Display Points: 80

6. Click the Display Tab and set the attributes.

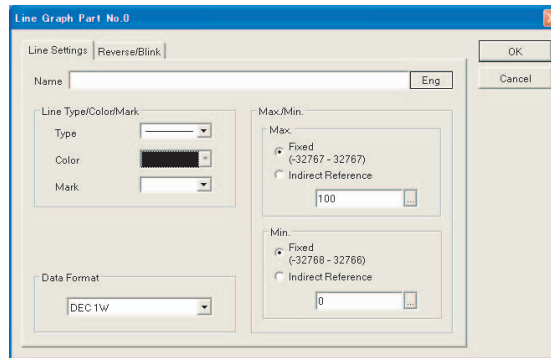
Click the Display Tab and make the following settings.

Display Data Plot Interval (Dot): 1
 Background Color: White
 Display Frame: Whole Scale
 Horizontal Line: On
 Number of Divisions: 5
 Vertical Line: On
 Number of Divisions: 5

7. Click the Element Setup Tab and double-click row 0.

| No. | Comment | Line Type/Color/Mark | Data Format | Max. Value | Min. Value |
|-----|---------|-----------------------------|----------------|------------|------------|
| 0 | | Full Line (Light Black) Off | DEC1W/Unsigned | 100 | 0 |

8. Make the line settings for the line graph.



Make the following settings, and then click the OK Button.

Data Format: DEC 1W

Max./Min.

Max.: Fixed, 100

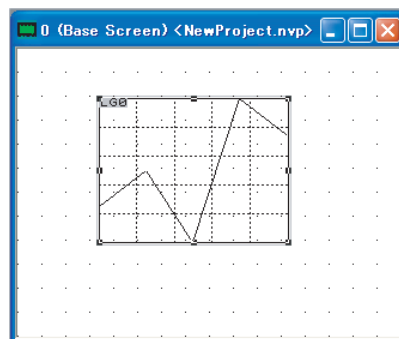
Min.: Fixed, 0

Note Line Type/Color/Mark:
As desired.

Set the maximum and minimum Y-axis values.

Do not change the Reverse/Blink settings for this sample.

9. Make the line settings for the line graph.

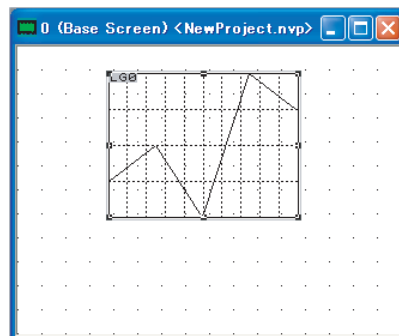


10. Transfer the screen to the PT.
11. Check operation. Place a value between 0 and 100 into D200 and then change the value. Check that the graph is updated every 5 s. Recorded data can be deleted using the data log control address. In this example, turn ON the Group 0 Memory Clear Bit in W16.00 (bit 00 of word 16).

7-10-4 Batch-reading PLC Memory to Display the Graph.

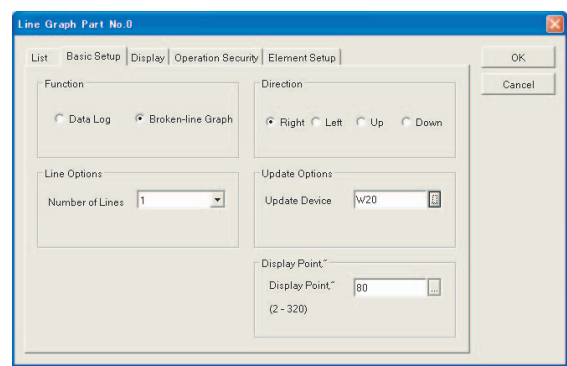
Basic Operation

- 1,2,3... 1. Open base screen 0 and position a line graph part.




Double-click "0" in the Screen Manager, and then drag the line graph part from the standard parts library and drop it on the base screen.

2. Double-click the line graph part and change the basic setup.



Double-click the parts number LG0 on the base screen, and make the following settings.

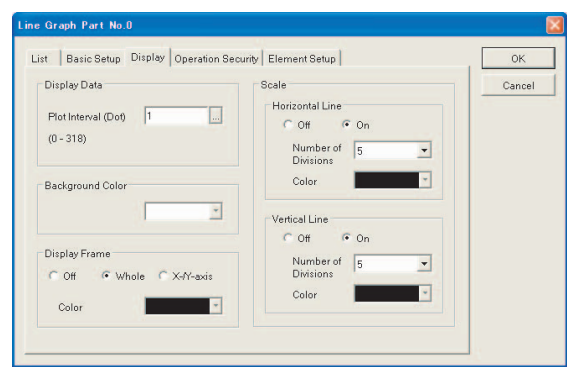
| | |
|------------------|-------------------|
| Function: | Broken-line Graph |
| Number of Lines: | 1 |
| Direction: | Right |
| Update Device: | W20 |
| Display Point: | 80 |



Reference

- When the corresponding bit in the specified word for graph update turns ON, the graph is updated. Graph 0 corresponds to bit 0, graph 1 to bit 1, and so on. While the bit is OFF, the graph is not updated.
- For a broken-line graph, sampling settings are not needed, so there is no need to set the PT Configuration.

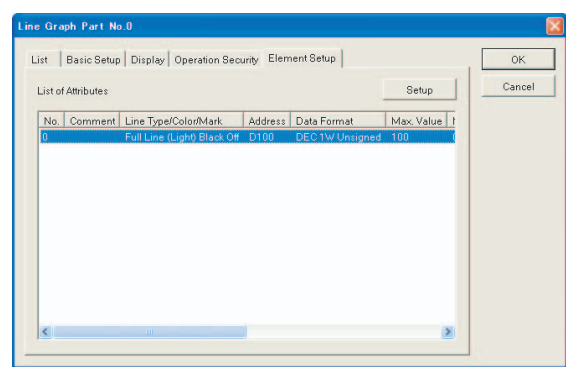
3. Make the display settings.



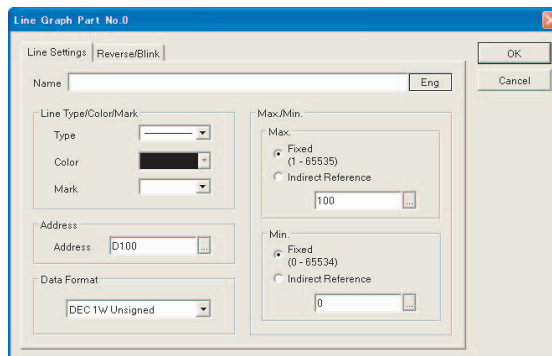
Set the basic setup.

| | |
|----------------------|-------|
| Plot Interval (Dot): | 1 |
| Display Frame: | Whole |
| Scale | |
| Horizontal Line: | On |
| Number of Divisions: | 5 |
| Vertical Line: | On |
| Number of Divisions: | 5 |

4. Click the Element Setup Tab and double-click row 0.



5. Make the line settings for the line graph.

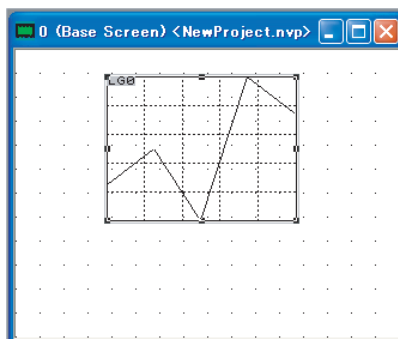


Do not change the Reverse/Blink settings for this sample.

Address: D100

Note Data is read from the words that start with the specified address for the specified number of display points. When the data format is 1 word, data is read in blocks of one times the number of display points. For 2-word data, reading is done in blocks of two times the number of display points.

6. Check the Base Screen



7. Transfer the screen to the PT.

8. Check operation.

Set appropriate values for D100 to D179, and check the operation. To update the graph, turn ON W20.00 (bit 00 of W20).

To stop updating the graph, turn OFF W20.00 (bit 00 of W20).

7-11 Alarm Lists (NV3W-V1/NV4W/NV3Q)

7-11-1 Default Settings of Alarm History (NV4W/NV3Q only)

| | | | | |
|--------------------|---------------------|---------------------------------------|----------------------------|--|
| Basic Setup | Operation Mode | History (Time Order) | | |
| | Reference | Group No. | 0 | |
| | | Alarm Number (i.e., number of alarms) | 32 | |
| | Display Form | Date | MM/dd | |
| | | Time | 24:00:00 | |
| | Display Events | Triggered | | |
| | | Recovered | | |
| | | Acknowledged | | |
| Stop Updating | Off | | | |
| Color and Form | Display Area | Number of Lines | NV3Q: 8 NV4W: 3 | |
| | Display Frame | On | | |
| | | Type | Outside + Inside Frames | |
| | | Color | Black | |
| | Color & String | Language No. | Language 0 | |
| | | Triggered | Color: Black, String: Trig | |
| | | Recovered | Color: Black, String: Rcv | |
| | | Acknowledged | Color: Black, String: Ack | |
| | | Background | Color: White | |
| Operation Security | Display Restriction | Off | | |
| Guidance | Off | | | |
| Element Setup | Language No. | Language No. | Language 0 | |
| | | Message | Alarm 0 to 1F | |

7-11-2 Default Settings for Alarm Lists

| | | | |
|--------------------|---------------------|---------------------------------------|----------------------------|
| Basic Setup | Operation Mode | Active List | |
| | Monitoring | Start Address | 10 |
| | | Alarm Number (i.e., number of alarms) | 32 |
| | | Detection Type | Bit On |
| Color and Form | Display Area | Number of Lines | NV3W-V1/NV4W: 4 NV3Q: 8 |
| | Display Frame | On | |
| | | Type | Outside + Inside Frames |
| | | Color | Black |
| | Color | String | Black |
| | | Background | White |
| Operation Security | Display Restriction | Off | |
| Guidance | Off | | |
| Element Setup | Language No. | Language No. | Language 0 |
| | | Message | Alarm 0 to 1F |

7-11-3 Overview of Alarm Lists

An alarm list part displays a list of messages corresponding to the status of the PLC memory when display conditions have been met.

Parts

For the list of errors that have occurred, either Alarm History or Alarm List can be selected.

■ Alarm History

There are two modes of history display: Time Order (which displays triggered, acknowledged, and recovered alarms) and Frequency Order (which displays the number of times alarms have occurred).

■ Alarm List

A list of current alarms is displayed.



Additional Information

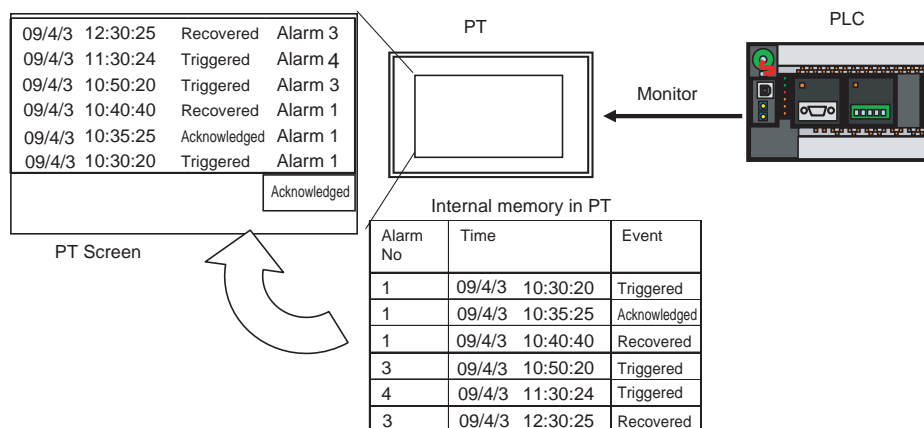
The alarm history saved in the PT can be saved to a file in CSV format using the Memory Editor. Refer to *Appendix A NV Memory Editor* for information on the NV Memory Editor.

Description of Operation

1,2,3...

1. The PT constantly monitors the PLC memory.
2. When an alarm occurs, or when the system recovers from a current alarm, the alarm number, time of the occurrence, and time of the recovery are recorded in internal memory of the PT.
3. Alarm data stored in internal memory is displayed by the alarm list part.
4. Alarm check data is written into internal memory of the PT using the alarm list and the function switch. (To record the data, select the alarm to be checked and press the function switch for which the operation mode has been set to Acknowledged.)

Note Items 1 and 2 are specified in the alarm history settings of the PT Configuration, and item 3 is specified in the attribute settings of the alarm list part. Item 4 is specified in the alarm list operation function of the function switch part.

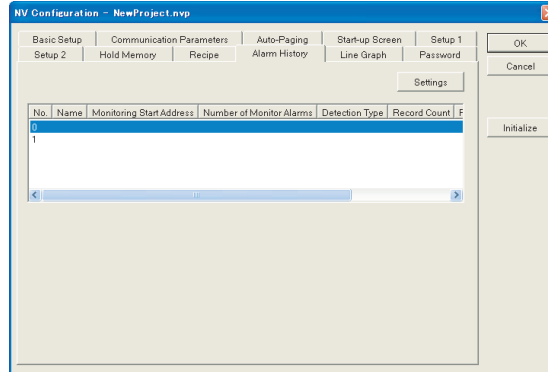


7-11-4 Settings for Constantly Monitoring PLC Memory (History Display) (NV4W/NV3Q only)

Basic Operation

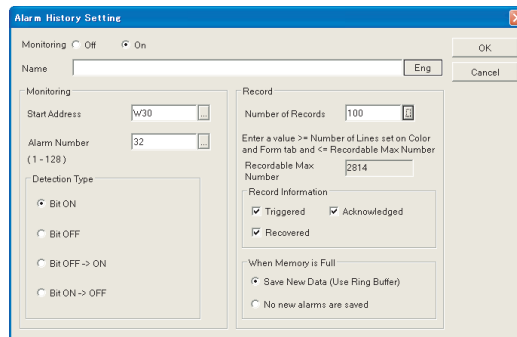
1,2,3...

1. Make the Alarm History settings in the NV Configuration.



Select NV Configuration from the PT Menu. Select No. 0 on the Alarm History Tab Page and then click the Settings Button.

2. Make the alarm history settings for group 0.



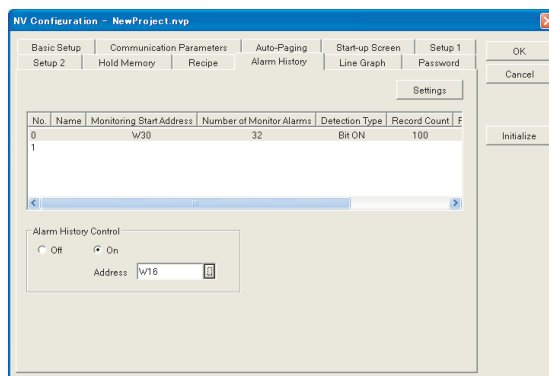
To enable monitoring, make the following settings, and then click the OK Button.

| | |
|--|--|
| Name: | Enter any string. |
| Start Address: | W30 |
| Alarm Number (i.e., number of alarms): | 32 |
| Detection Type: | Bit ON |
| Record | |
| Number of Records: | 100 |
| Record Information: | Triggered, Recovered, and Acknowledged |
| When Memory is Full: | Save New Data (Use Ring Buffer) |

Note

- (1) Up to 128 alarms can be monitored. One bit is allocated for each alarm. When 128 is set, 8 words (8 x 16 bits = 128) are monitored. For example, when the start address is W30, and the number of alarms has been set to 32, the 32 bits starting at W30 are monitored, i.e., W30 and W31CH.
- (2) Set Bit ON for the alarm status when an alarm is to be displayed when the bit turns ON. Set Bit OFF for the alarm status when an alarm is to be displayed when the bit turns OFF.
- (3) The number of records is equal to the number of alarms stored in the PT. A value greater than the number of monitored alarms must be set. Even if the power to the PT is turned OFF, alarms that have already been stored are retained by the battery backup. (If the battery is exhausted, the records will be lost.)
- (4) When the Triggered/Recovered Bit turns ON or OFF, press an acknowledge switch and select the data to be added to the records.

3. Set the alarm history control.



Set the basic setup. After completing the settings, click the OK Button to end setting the PT Configuration.

Alarm History Control: On
Address: W16

Alarm History Control Words (2 Words)

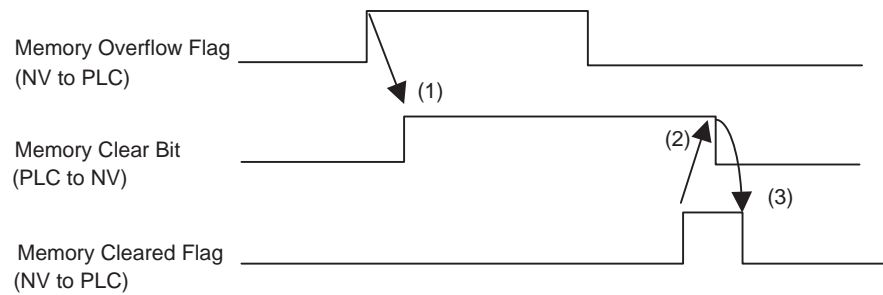
| Word | Bits | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------|------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|------------------------------|------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|--------------------------|
| n | | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Group 1 Memory Overflow Flag | Group 0 Memory Overflow Flag | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Group 1 Monitor Stop Bit | Group 0 Monitor Stop Bit |
| n+1 | | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Group 1 Memory Cleared Flag | Group 0 Memory Cleared Flag | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Reserved. (Do not use.) | Group 1 Memory Clear Bit | Group 0 Memory Clear Bit |

Group Monitor Stop Bits: Monitoring will be stopped if the bit is turned ON from the PLC.

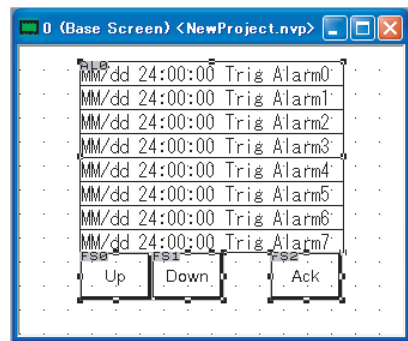
Group Memory Overflow Flags: The flag will turn ON if the number of sampled alarms exceeds the number of records to store that is specified in the NV Configuration. The flag will remain ON until memory is cleared.

Group Memory Clear Bits: The recorded data will be cleared if the bit is turned ON from the PLC. Do not turn OFF a bit until the corresponding Memory Cleared Flag turns ON.

Group Memory Cleared Flags: After PT memory has been cleared, the corresponding bit will be turned ON from the PT. The flag will not turn OFF until the Memory Clear Bit has been turned OFF.

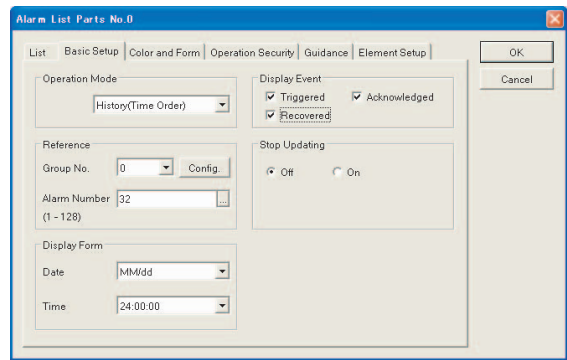


- (1) If the Memory Overflow Flag turns ON, the Memory Clear Bit is turned ON to clear memory contents.
- (2) After confirming that the Memory Cleared Flag has turned ON, turn OFF the Memory Clear Bit.
- (3) When the Memory Clear Bit has been turned OFF, the Memory Cleared Flag will turn OFF automatically.
4. Open base screen 0 and position an alarm list part.



Drag the Alarm History Part from the standard parts library and drop it on the base screen.

5. Double-click the alarm list part and change the basic setup.



Double-click the parts number AL0 on the base screen, and make the following settings.

Operating Mode: History (Time Order)

Reference Group No.: 0

Alarm Number (i.e., number of alarms): 32

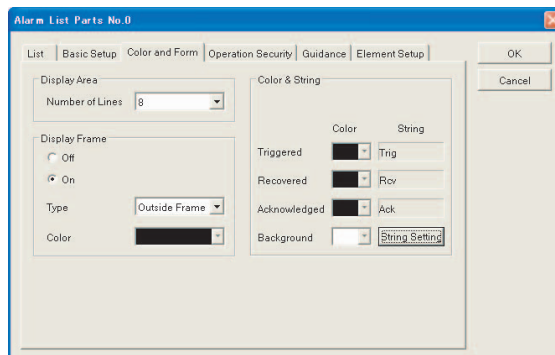
Display Form Date : MM/dd Time: 24:00:00

Display Event: Triggered, Recovered, and Acknowledged

Stop Updating: Off

Note (1) The number set in the NV Configuration is displayed as the Reference Group No.

- (2) The referenced number of alarms sets the number of alarm messages that are recorded. Set the Monitoring Alarm Number in the NV Configuration so that it is greater than or equal to the Current Alarm Number.
 - (3) Stop Updating
The specified bit can be used to stop updating the display. Updating the display will be stopped while the specified bit is ON. Sampling continues.
6. Click the Color and Form Tab and make the settings.



Make the settings as shown below.

Display Area Number of Lines: 8

Display Frame: On

Type: Outside + Inside Frames

Color: Black

Color & String

Triggered, Recovered, and Acknowledged: Black edged:

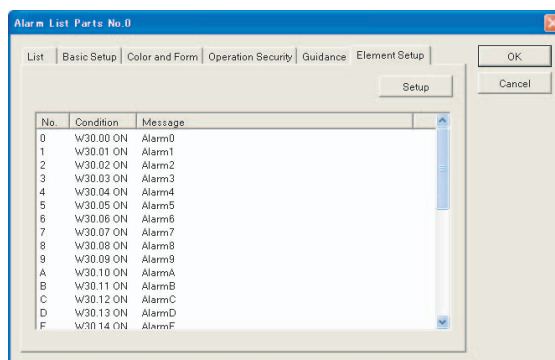
Click the String Setting Button and set character strings as shown below.

Triggered: Fixed (NV-Designer) Trig

Recovered: Fixed (NV-Designer) Rcv

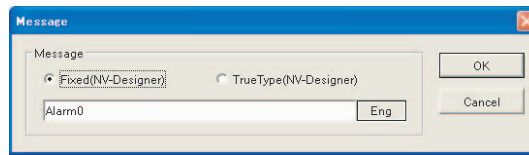
Acknowledged: Fixed (NV-Designer) Ack

7. Click the Element Setup Tab.



Select the number and click the Setup Button or double-click the message to display the Message Dialog Box.

8. Enter the alarm message.

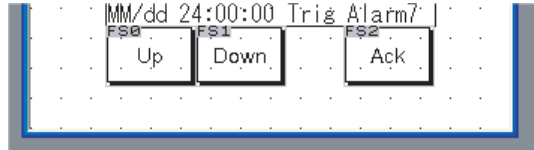


Enter the message to display for the alarm.

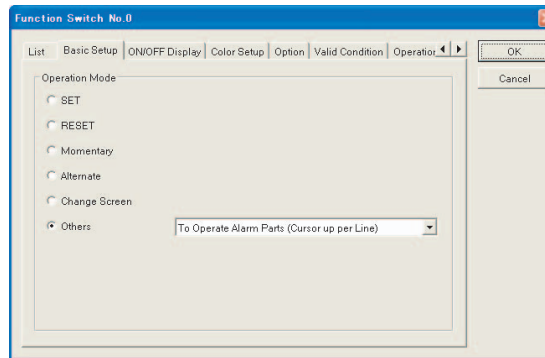
Note Bit 0 of the start monitoring address corresponds to message 0.

Click the OK Button after all of the messages have been entered.

9. Set the function switch for acknowledging the alarm history.



10. Double-click the FS0 function switch and set the operation mode.

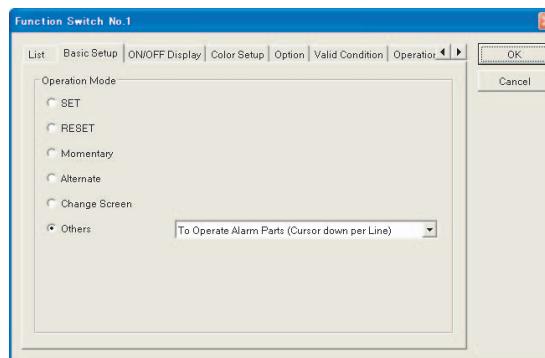


Make the following settings, and then click the OK Button.
Setting to Scroll Up the Alarm Display

Operation Mode: Others, To Operate Alarm Parts (Cursor up per Line)

Color & String: Set as required.

11. Double-click the FS1 function switch and set the operation mode.

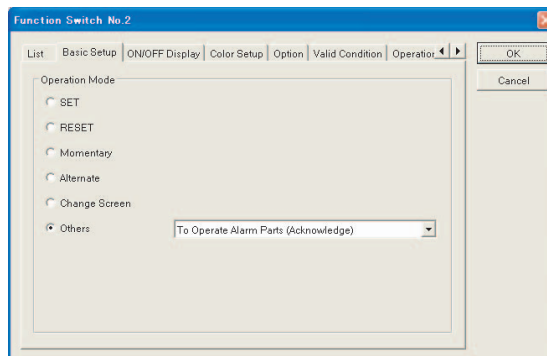


Make the following settings, and then click the OK Button.
Setting to Scroll Down the Alarm Display

Operation Mode: Others, To Operate Alarm Parts (Cursor down per Line)

Color & String: Set as required.

12. Double-click the FS2 function switch and set the operation mode.



Make the following settings, and then click the OK Button.

Set the bit switch for indicating that a triggered alarm has been acknowledged.

Operation Mode: Others, To Operate Alarm Parts (Acknowledge)

Color & String: Set as required.

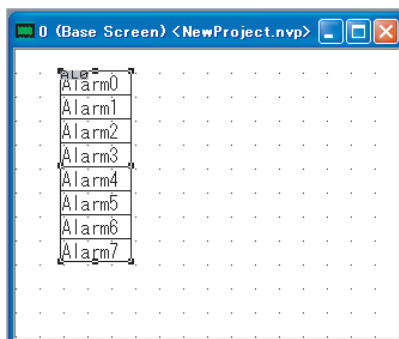
Alarm List Acknowledge data is written to the PT after an alarm is selected and the Acknowledge Button is clicked. This is used when a record of an alarm that is being acknowledged is to be recorded.

13. Transfer the screen to the PT.
14. Check operation. Words W30 and W31 are monitored so that when W30.00 (bit 00 of W30) turns ON, message 0 will display an alarm. Message A will be displayed when W30.10 (bit 10 of W30) turns ON. Message D will be displayed when W30.13 (bit 13 of W30) turns ON. The control address is set to word W16 so that when W16.00 (bit 00 of W16) turns ON, recording is stopped. To delete all of the previously recorded data, turn ON W17.00 (bit 00 of W17).

7-11-5 Triggered Alarm List

Basic Operation

- 1,2,3... 1. Place an Alarm List part on the base screen.



Drag the Alarm List Part from the standard parts library and drop it on the base screen.

2. Double-click the alarm list part and select the basic setup.

Operating Mode: Active List
Monitoring
Start Address: W30
Alarm Number
(i.e., number of
alarms): 32
Detection Type: Bit On

- One bit is allocated to each alarm. When 32 is set, 2 words can be monitored.
- If an alarm status turns ON, the alarm is displayed when the bit turns ON.
- The NV Configuration is not necessary for an alarm list.

3. Sets the color and form.

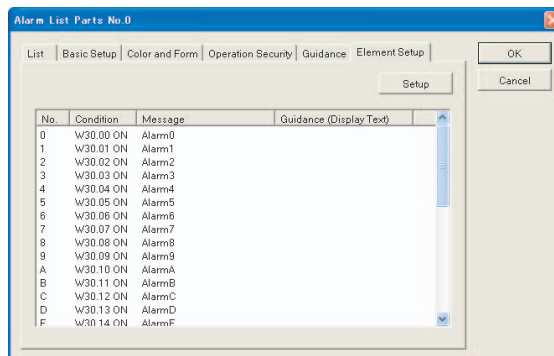
Set the basic setup.
Display Area
Number of Lines: 8
Display Frame: On
Type: Outside Frame + Inside Frame
Color: Black
Color
String: Black
Background: White

4. For Guidance, select Display Text and then make the necessary settings.

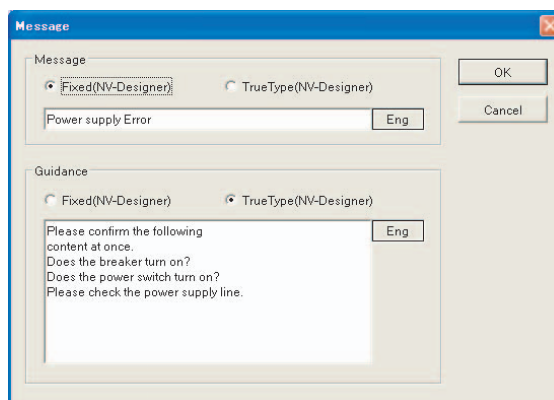
Display Text: Yes
Display Area
Number of Lines: 5
Display Frame: On
Color: Black
Color
String: Black
Background: White

- Guidance is used to display a more detailed explanation of a displayed alarm.
- The Number of Lines in the Guidance Area is given by Number of Lines in the Display Area.

5. Make the element settings.



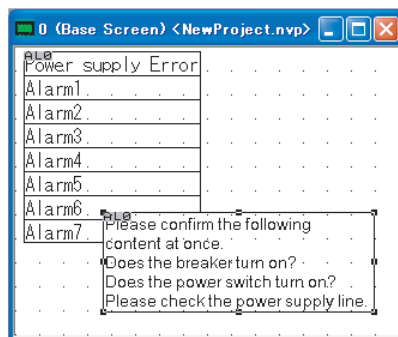
Select the number and click the Setup Button or double-click the message to display the Message Dialog Box.



Enter the message to display for the alarm, as well as the guidance for the message. Double-click the message to display the Input Dialog Box. Click the OK Button when you are finished.

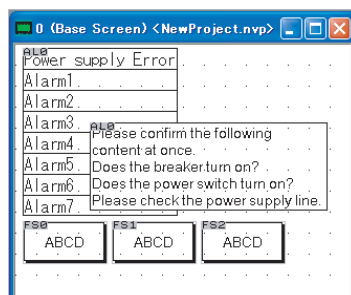
- Message Setting Example
Enter "Power Supply Error."
- Guidance Setting Example
Check the following factors.
Enter "Is the breaker ON? Is the power switch OFF?
Check the power supply line."

6. Position the guidance display.



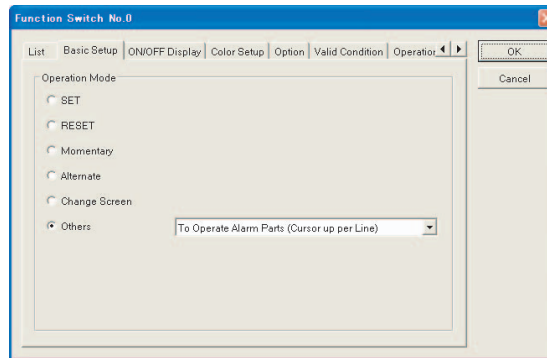
Paste the guidance at the desired position.

7. Then, paste a switch for scrolling.



Paste three FSW0 function switches from the Standard Parts Library on the base screen.

8. Double-click the FS0 function switch and set the attributes.



Make the following settings, and then click the OK Button.
Setting to Scroll Up the Alarm Display

Basic Setup

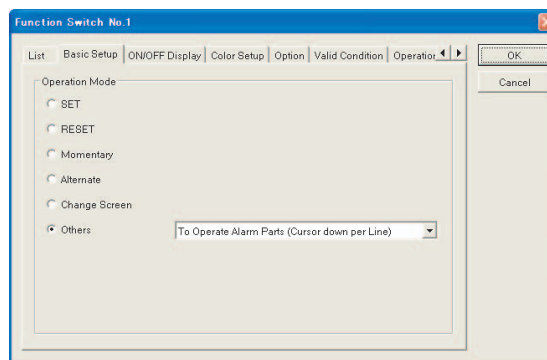
Operation Mode: Others, To Operate Alarm List (Cursor up per line) set as required.

Label

ON String: UP

OFF String: UP

9. Double-click the FS1 function switch and set the operation mode.



Make the following settings, and then click the OK Button.

Setting to Scroll Down the Alarm Display

Basic Settings

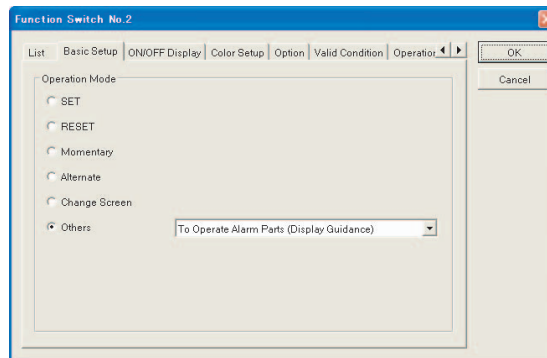
Operation Mode: Others, To Operate Alarm Parts (Cursor down per Line)

Label

ON String: DOWN

OFF String: DOWN

10. Double-click the FS2 function switch and set the operation mode.



Make the following settings, and then click the OK Button.

When a triggered alarm is selected and this switch is pressed, the guidance for the alarm will be displayed.

Basic Settings

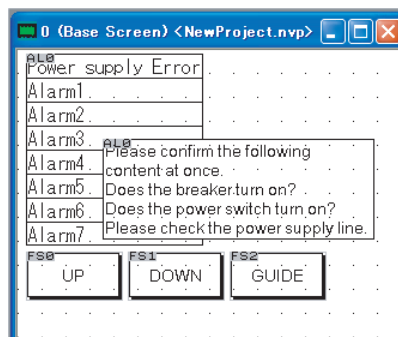
Operation Mode: Others, To Operate Alarm List (Display Guidance)

Label

ON String: GUIDE

OFF String: GUIDE

11. Check the Base Screen. Adjust the size of the function switch.



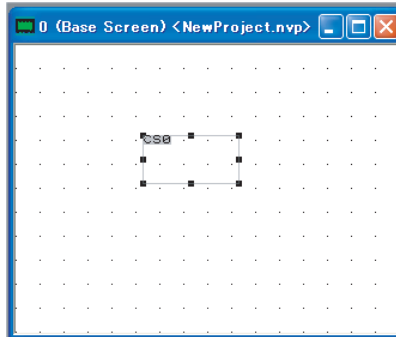
12. Transfer the screen to the PT.
13. Check operation. Message 0 will be displayed when W30.00 (bit 00 of W30) turns ON. To display guidance for a displayed alarm, touch the alarm and press the switch that appears. Touch the guidance to clear it from the screen. Check the operation for other messages.

7-12 Custom Parts

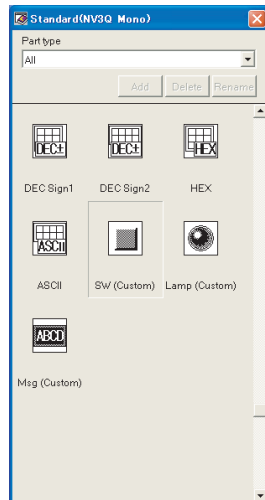
Custom parts allow you to edit part screens to create original parts. There are three types of custom parts: bit switches, lamps, and messages.

7-12-1 Creating a Switch Part

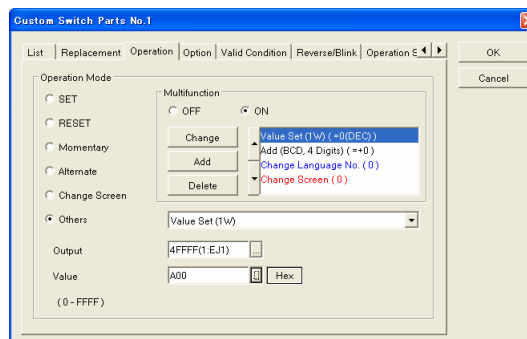
- 1,2,3... 1. Open base screen 0 and position a custom switch part.



Click "0" in the Screen Manager, and then drag the custom switch part (SW (Custom)) and drop it on the base screen.



2. Double-click the custom switch part and make the settings.



Drag a SW (Custom) part from the Standard Parts Library, double-click the part, and then set the switch attributes.

The settings made with each tab page are as follows.

1. Replacement

If On is set, the display can be switched according to the contents of the PLC memory. There are three setting methods.

ON/OFF: The display is switched when a bit turns ON and OFF.

Digit: The display is switched to a hexadecimal (0 to F) display according to one digit (4 bits)

Direct: The display is switched using 1-word units.

2. Operation

Make the desired settings, such as SET or RESET.

3. Option

The switch operation sound and reversing when touched can be set.

Note For Momentary, the display is reversed while the switch is held down.

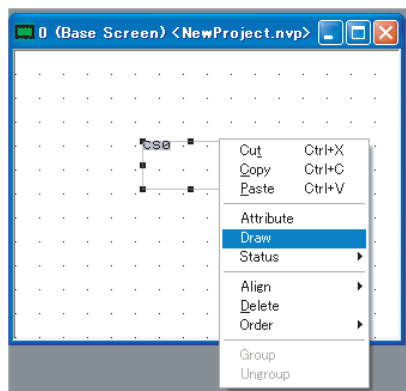
4. Valid Condition

Status in PLC memory can be used to enable and disable switch operation.

5. Reverse/Blink

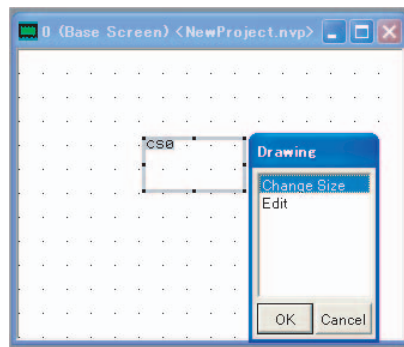
The display method can be set.

3. To change the character string or graphic displayed on a custom switch, place the switch in Edit Mode.



Right-click the switch part and select Edit.

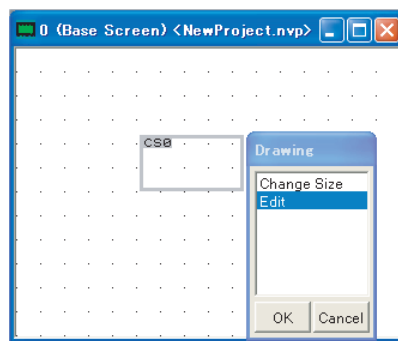
4. Character strings and images can be added to customer switch parts.



The thickness of the part's frame increases. Using the graphic bar, select a character string or straight line to create the desired content within the frame. Click the OK Button when you are finished.

When replacing data, multiple replacement numbers are displayed in the window, each one of which requires the creation of a display. Click the OK Button when you are finished.

Note Resize the window to change the size of a part.



Note Custom switches include Multifunction Objects, which can perform multiple operations using one switch. For details, refer to *7-13 Multifunction Objects*.

7-12-2 Creating Lamps and Message Parts.

Lamp and message parts are created in much the same way as a switch part. For a description of a simple method of creating lamp and message parts, refer to *SECTION 5 Creating and Saving Projects (Including Screen Data)*.

1. Replacement

This is the same as for switch parts.

2. Display/Hide

Lamps and messages can be displayed and hidden based on the status of PLC memory.

3. Reverse/Blink

This is the same as for switch parts.



Additional Information

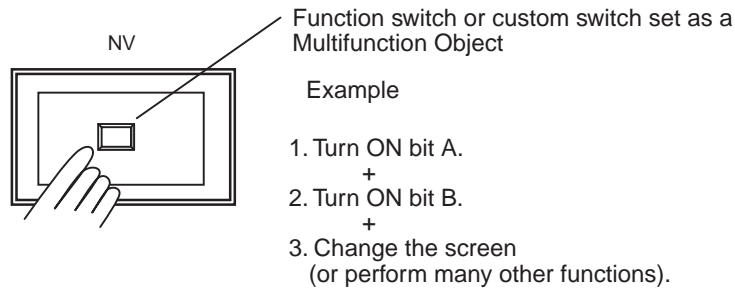
Because the touch panel is analog, switches do not have to be aligned with a grid, and can be placed anywhere on the screen. The smallest possible switch size is 8 x 8 dots.

7-13 Multifunction Objects

7-13-1 Overview of Multifunction Objects

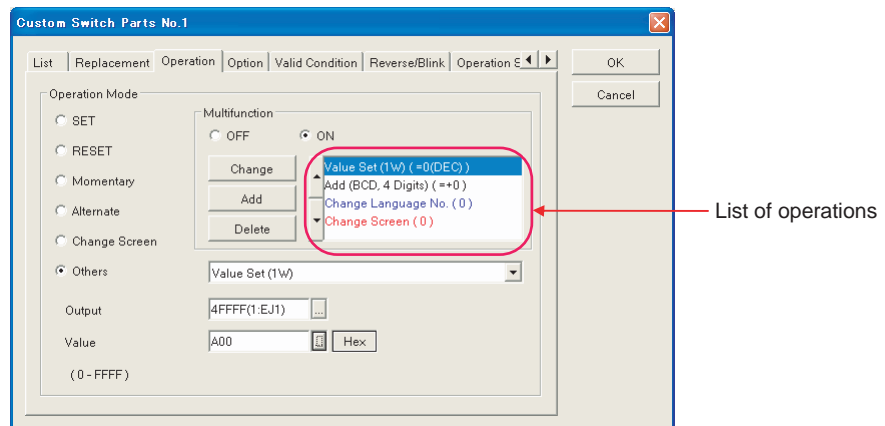
A Multifunction Object is used to perform multiple operations using one function switch or custom switch. A Multifunction Object can be used to set operations, for example, to turn ON multiple bits at the same time or to switch screens and turn ON a bit at the same time. (Up to 32 operations can be performed.)

Applicable models: NV3W-V1, NV3Q and NV4W



7-13-2 Multifunction Object Setting Procedure

The following dialog box will be displayed when the Basic Setup Tab is clicked for a function switch, or the Operation Tab is clicked for a custom switch.



1,2,3...

1. Select the Yes Option in the Multi Function Area.
2. Select the operation to add in the Operation Mode Area, and then click the Add Button. The operation will be added to the list of operations on the right. The display colors will be as follows depending on the operation's position and number of operations that can be registered (i.e., one or multiple).
 - a. Black: Multiple operations can be registered for this operation mode.
 - b. Blue: Only one operation can be registered for this operation mode. These operations will be automatically added at a lower location in the execution order than operations displayed in black.
 - c. Red: Only one operation can be set for this operation mode. These operations will be automatically added to the end of the execution order.

3. To change the execution order, click the up or down arrowheads. Click the Delete Button to delete operations that are not required. To replace an operation selected in the list of operations, make the new setting and then click the Change Button.

Restrictions on Combinations of Operations

Multiple registrations can be made for all operations that can be set using function switches and custom switches. Some operation modes, however, have restrictions on the number of operations that can be registered. Also, operations are performed in order that they are set.

| Operation mode | Display color | Execution order | Number of operations that can be registered | Total number of operations that can be registered |
|---|---------------|---|--|---|
| Set | a. Black | Executed in the set order. | Operations can be registered up to maximum number of operations. | 32 |
| Reset | | | | |
| Momentary | | | | |
| Alternate | | | | |
| Value Set | | | | |
| Add | | | | |
| Subtract | | | | |
| Thumbwheel Switch | | | | |
| Change Language No.* ¹ | b. Blue | Executed after operations displayed in black. | 1 | |
| Change Language No. (INC/DEC)* ¹ | | | | |
| Change Screen | c. Red | Executed at the end. | 1 | |
| System Menu Display | | | | |
| Back to Previous Screen | | | | |
| To Operate Alarm Parts | | | | |
| For Operation Security Function | | | | |

^{*1} *Change Language No.* and *Change Language No. (INC/DEC)* are displayed only if *Multi-Language Exchange* is set to ON under **Tool – NV-Designer Configuration – Language**.

SECTION 8

Using PT Functions

This section describes special functions that can be used with NV-series PTs and the NV-Designer.

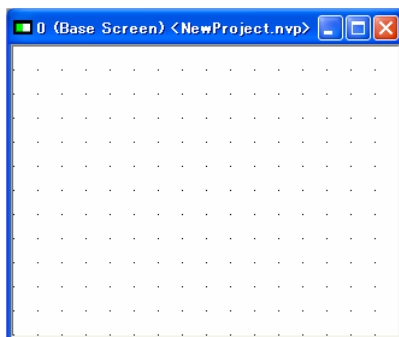
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8-1 Switching Backlight Colors

The initial settings for backlight colors of the PT can be set, and they can then be changed from the PLC.

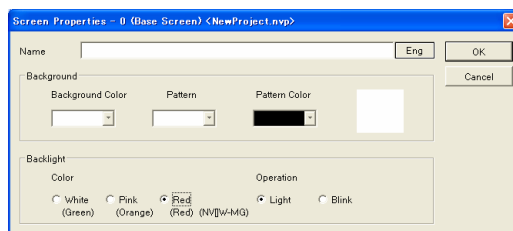
8-1-1 Default Settings for Backlight Color

- 1,2,3... 1. Check the backlight color.



The current color is displayed on the left end of the title bar.

2. Right-click on the base screen and select Screen Properties from the pop-up menu. Or select Screen Properties from the PT Menu.
3. Set the backlight color.



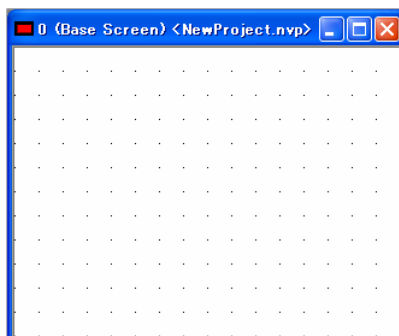
Set the backlight.

Backlight: Red

Operation: Light

Note The backlight colors depend on the model. Refer to the following table.

4. Click the OK Button.



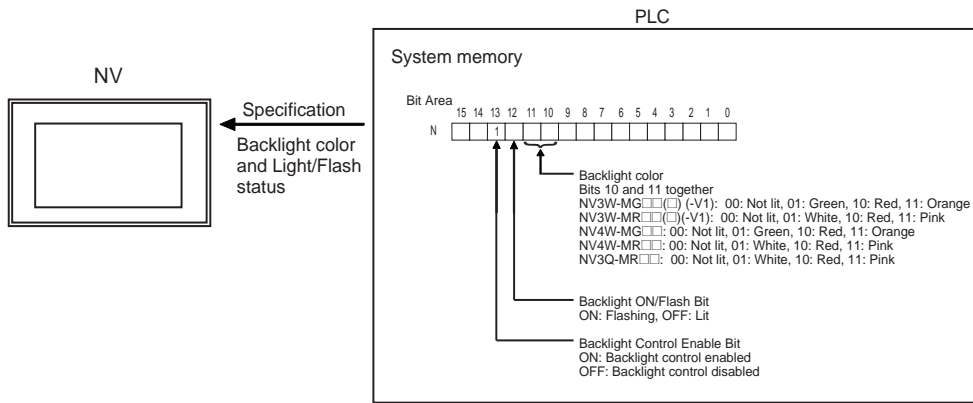
The color at the left end of the title bar will change to red.

Note With the NV3W-MR□□(□) (-V1), NV4W-MR□□, or NV3Q-MR□□ the backlight will be white when the square on the left of the title bar is green/white and pink when the square is orange/pink.

| PT | Backlight color | Color setting | | | Operation setting | |
|--------------------|-----------------|---------------|--------|-----|-------------------|------------|
| | | | | | Light | Blink |
| NV3W-MG□□(□) (-V1) | 3 colors | Green | Orange | Red | Supported. | Supported. |
| NV3W-MR□□(□) (-V1) | 3 colors | White | Pink | Red | Supported. | Supported. |
| NV4W-MG□□ | 3 colors | Green | Orange | Red | Supported. | Supported. |
| NV4W-MR□□ | 3 colors | White | Pink | Red | Supported. | Supported. |
| NV3Q-MR□□ | 3 colors | White | Pink | Red | Supported. | Supported. |
| NV3Q-SW□□ | --- | No attribute | | | No attribute | |

8-1-2 Switching Backlight Colors

The backlight color and light/flash status can be specified in the Bit Area of the System Memory. (The first word of System Memory is specified in the NV Configuration).



■ Backlight Color Specifications

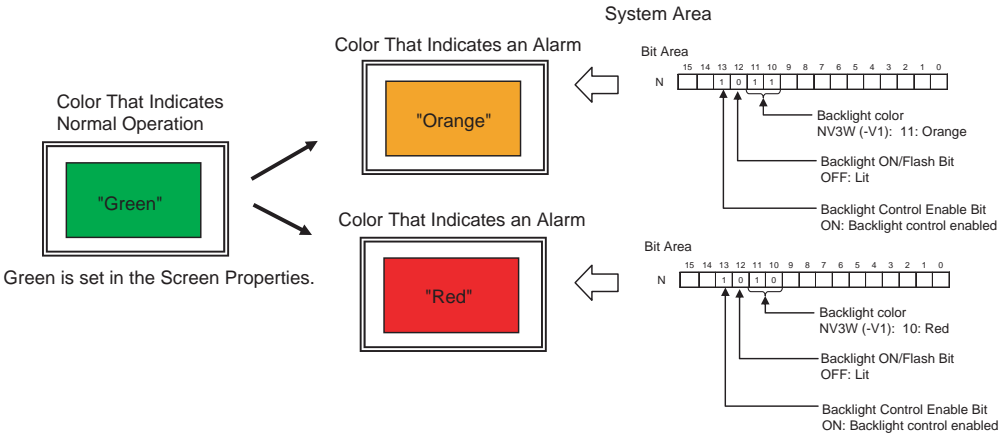
| First word in Bit Area of system memory | | | Backlight color | |
|---|-----|-----|-----------------------|------------------------|
| Bit | | | NV3W-MG□□(□) (-V1) | NV3W-MR□□(□) (-V1) |
| 13 | 11 | 10 | NV4W-MG□□ | NV4W-MR□□ NV3Q-MR□□ |
| ON | OFF | OFF | Not lit | Not lit |
| | OFF | ON | Green | White |
| | ON | OFF | Red | Red |
| | ON | ON | Orange | Pink |

■ Backlight ON/Flash Specifications

| First word in Bit Area of system memory | | Backlight ON/flash | |
|---|-----|-----------------------|------------------------|
| Bit | | NV3W-MG□□(□) (-V1) | NV3W-MR□□(□) (-V1) |
| 13 | 12 | NV4W-MG□□ | NV4W-MR□□ NV3Q-MR□□ |
| ON | OFF | Light | Light |
| | ON | Flash | Flash |

If bit 13 (the Backlight Control Enable Bit) is turned OFF, the backlight will light in the color set in the screen properties.

Application Example That Switches the Backlight Color



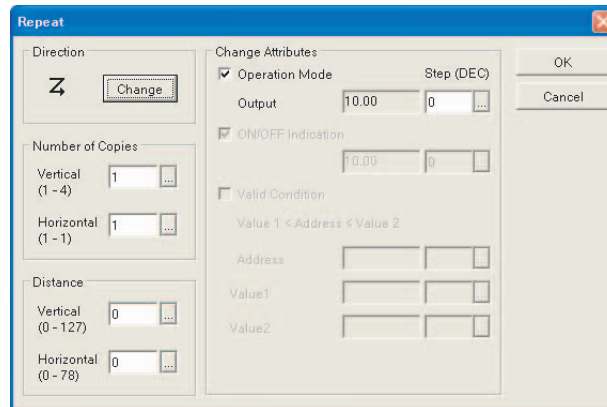
8-2 Repeated Copying

8-2-1 Overview

Multiple copies of the same part can be made using the Repeated Copying Function. Having a template part to copy speeds up work efficiency.

8-2-2 Repeatedly Copying Parts

Select the part that you want to copy and then select Repeat from the Edit Menu. The Repeat Dialog Box will be displayed.



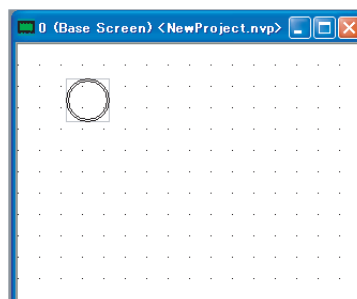
- **Direction:** Sets the copy direction using the Change Button.
- **Number of Copies:** Sets the number of copies created in the vertical and horizontal directions.
- **Distance:** Sets the distance between the parts when copies are made repeatedly.
- **Change Attributes:** Used to change the attributes from the copy source when it is copied repeatedly. The Operation Mode Output and Communications Address are displayed according to the attributes of the original part.
- **Step (DEC):** This value is added to the addresses or screen number of adjacent parts in order.

8-2-3 Example of Repeated Copying

To create 15 lamp parts, 3 vertically and 5 horizontally.

1,2,3...

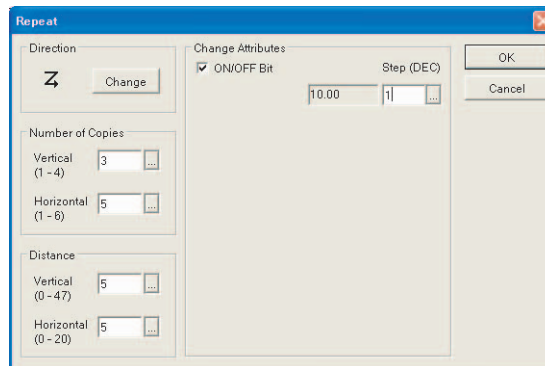
1. Open base screen 0 and drag Lamp 0 onto it.



Paste the lamp on the left side of the screen. Make all the settings that will be the same for all copies.

2. Repeatedly copy the part. Click the lamp and select Repeat from the Edit Menu.

3. Set the attributes that will be copied repeatedly.



Make the following settings, and then click the OK Button.

Direction: Do not change.

Number of copies

Vertical: 3

Horizontal: 5

Pitch

Vertical: 5

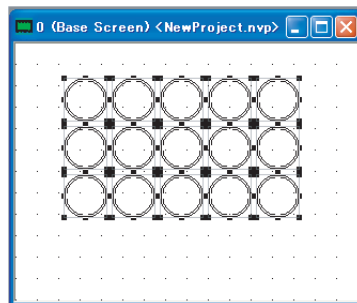
Horizontal: 5

Change Attributes

ON/OFF Bit Select this check box.

Step: 1

4. 15 lamp parts will be created simultaneously.



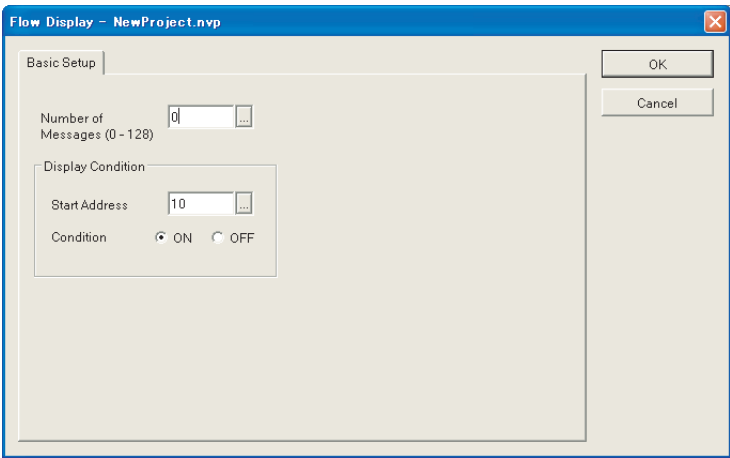
8-3 Flow Display Data

8-3-1 Overview

This function displays flowing characters at the bottom of the screen. Characters can be displayed from any screen that meet the conditions.

8-3-2 Creating Flow Displays

Select Flow Display from the PT Menu. The Flow Display Dialog Box will be displayed.



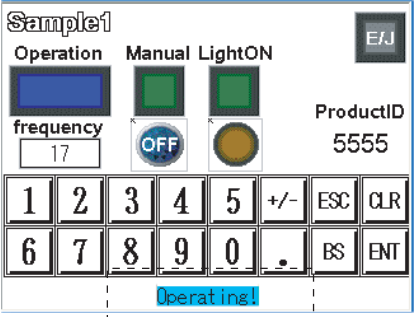
| | |
|---------------------|---|
| Number of Mes-sages | Enter the number of messages to display. The Message Tab Page will be displayed if any value greater than 1 is entered. |
| Start Address | Set the start address in the PLC to use to specify whether to display or hide the messages. Starting from this address, a consecutive number of words corresponding to the number of messages will be used to specify displaying or hiding the mes-sages. |
| Condition | Set the condition of the bit to use to display the message. If a bit in the PLC is in the specified status, the PT will display the corresponding message. |

8-3-3 Default Settings for Flow Displays

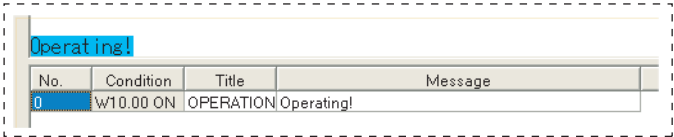
| | | | |
|-------------|--------------------|---------------|----|
| Basic Setup | Number of Messages | 0 | |
| | Display Condition | Start Address | 10 |
| | | Condition | ON |

8-3-4 Example of Creating a Flow Display

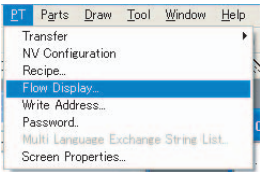
Creating a Sample Screen



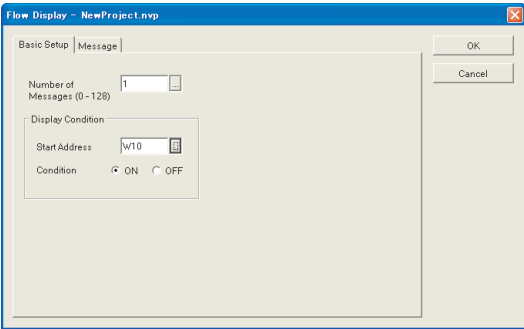
When the RUN Switch is turned ON, the message “Operating!” will appear in the flow display.



- 1,2,3...
1. Select Flow Display from the PT Menu.



2. Specify the number of messages and condition for displaying messages.



Click the Basic Setup Tab and set the following parameters.

Number of Messages: 1

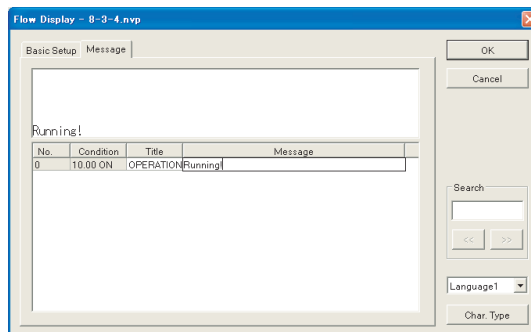
Display Condition

Start Address: W10

Condition: ON

*1 Up to 128 messages can be registered.

3. Click the Message Tab and enter the messages to display.



Up to 128 1*1 characters can be used in a message.

Enter for following for message 1:

Title: OPERATION

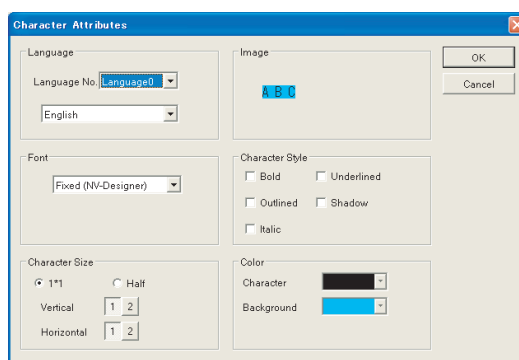
Message:

Language 0: Operating!

Language 1: Running!

Note The message will be displayed in the top pane when the cursor is on the message.

4. Set the character string.



Click the Char. Type Button. Make the characters bold and set the background color.

Character Style: Bold

Color:

Character: Black

Background: Light blue

Note Increase the character size to make the flow display larger.

5. Click the OK Button to return to the Flow Display Dialog Box.
6. Click the OK Button to return to the base screen.
7. Transfer the flow display file to the PT. When the PT is turned ON, the message "Operating!" will appear in the flow display.



Precaution for Correct Operation

The appearance of flow displays are different for each PT model. The NV3W moves 8 dots a time and the NV3W-V1, NV4W and NV3Q moves 32 dots at a time.



Additional Information

- If multiple display conditions are formed at the same time, the message with the lowest number will be displayed.
- The size of the flow display depends on the size of the characters.

Note The character size can be changed in Character Attributes.

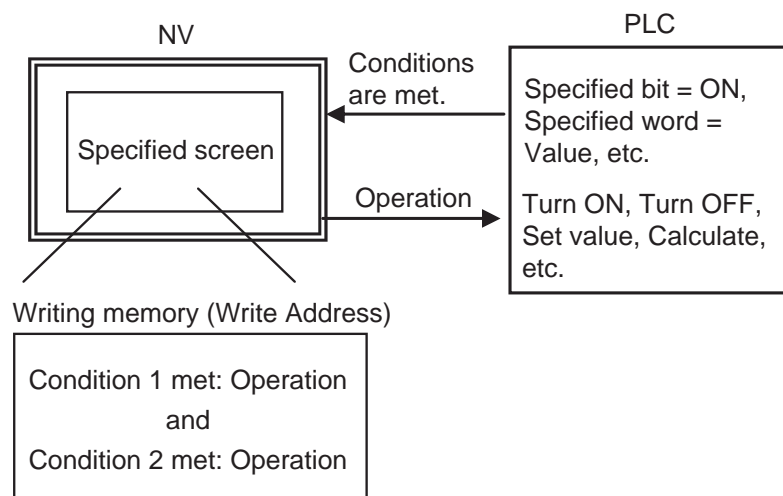
- The following two settings must be changed to delete flow display data that has been transferred to the PT.

1. Set the number of messages on the Basic Setup Tab Page of the flow display to 0.
2. Transfer data: Select the All Data and Transfer Data After Clear NV Screens Options and transfer the data.

8-4 Write Address Data

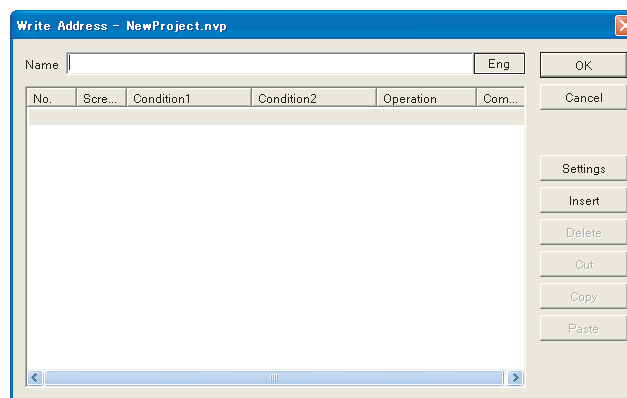
8-4-1 Overview

This function is used to execute operations to set or reset bits, set values, perform calculations, etc., in the PLC or PT memory when conditions in the PLC or PT are met while the specified screen is displayed. It is useful for resetting the Write Bit for the recipe function or Clear Bit for the data log and alarm history.



8-4-2 Write Address Setup Procedure

- 1,2,3... 1. Select Write Address from the PT Menu. The Write Address Dialog Box will be displayed.



2. Click the Settings Button. The Write Address Dialog Box will be displayed.

The 'Write Address' dialog box has three tabs: 'List', 'Condition', and 'Operation'. The 'Condition' tab is active. It shows the following settings:

- Operate:** if screen no. 0 and condition1 are valid
- Specified Screen:**
 - ☐ All Screens
 - ☒ Specified Screen
 - Screen No. (0 - 1023) : 0
- Condition 1:**
 - ☐ Always Operational
 - ☒ Operational under Valid Condition 10.00 ON
- Condition 2:**
 - ☒ Always Operational
 - ☐ Operational under Valid Condition

Buttons: OK, Cancel, and a 'Conditions...' button next to Condition 1.

Sets the following items.

Conditions Tab Page

| | | | |
|------------------|--|-------------------------|---|
| Specified Screen | <ul style="list-style-type: none"> • All Screens • Specified Screen Screen No.: 0 to 1023 (3FF hex) | | |
| Conditions | <ul style="list-style-type: none"> • Always Operational • Operational under Valid Condition | Relation Code | <ul style="list-style-type: none"> • Bit • Word (unsigned) • Double Word (unsigned) |
| | | Address (at this value) | Bit: ON or OFF Word or double word: Communications address = Value 1, =, <, >, ≤, ≥, Value 1 < Communications address < Value 2, Value 1 < Communications address ≤ Value 2, Value 1 < Communications address ≤ Value 2, Value 1 ≤ Communications address < Value 2, Value: Fixed value (Word: 0 to 65,536, Double-word: 0 to 4,294,967,295) |

Operation Tab Page

| | | | | |
|-----------|----------------|---------------------------------------|---|---|
| Operation | Operation Mode | Set, Reset, Momentary, Alternate, etc | | |
| | | Others | Value set (1W), Value set (2W) Add (4-digit BCD), Add (8-digit BCD), Add (DEC 1W), Add (DEC 2W), Sub (4-digit BCD), Add/Sub (8-digit BCD), Sub (DEC 1W), Sub (DEC 2W), for thumb rotary switch | Output: Address, Value Output: Add/Sub Source, Value |

Condition 2 can also be applied. An AND condition is used.

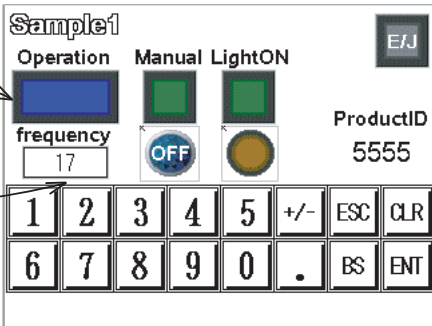
8-4-3 Write Address Default Settings

| | | | |
|-----------|------------------|-----------------------------------|----------|
| Condition | Specified Screen | Valid only for specified screens | 0 |
| | Condition 1 | Operational under Valid Condition | 10.00 ON |
| | Condition 2 | Always Operational | |
| Operation | Operation mode | Set | 10.00 |

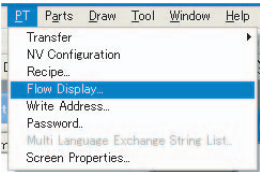
8-4-4 Write Address Setup Example

Creating a Sample Screen

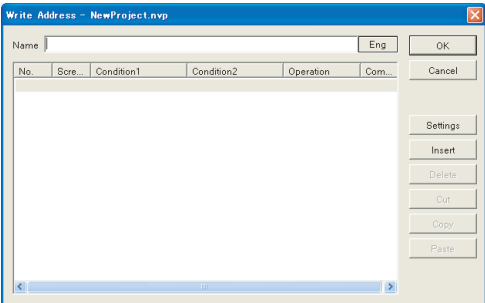
When the Operation Button (CIO 10.00) is turned ON, the frequency (D100) is incremented by 1.



- 1,2,3...
1. Select Write Address from the PT Menu.

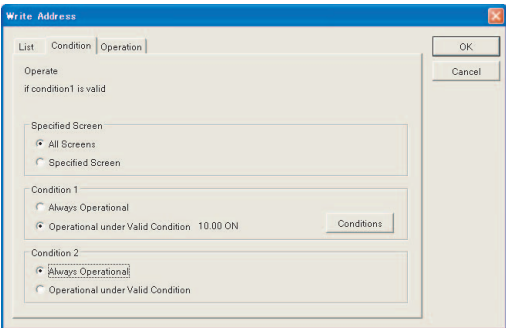


2. Display the Write Address Dialog Box.



Select the first item in the list and click the Settings Button.

3. Display the Write Address Dialog Box.



Make the following settings on the Condition Tab Page.

- Specified Screen:
- All Screens
- Condition 1:
- Operational under Valid Condition
- Condition 2:
- Always Operational

If multiple conditions are selected, an AND condition is used.

4. Enable Condition 1 and click the Conditions Button. The Conditions Dialog Box will be displayed.

The Conditions dialog box has three main sections. The first section contains 'Address Type' set to 'Bit' and 'Relation Code' set to 'Address: ON'. The second section contains 'Address' set to '10.00'. There are 'OK' and 'Cancel' buttons at the top right.

Make the following settings.

Address Type: Bit
 Relation Code: Address: ON
 Address: 10.00

5. Click the Operation Tab and make the following settings.

The Write Address dialog box has three tabs: 'List', 'Condition', and 'Operation'. The 'Operation' tab is selected. It shows 'Operation Mode' with radio buttons for SET, RESET, Momentary, Alternate, Change Screen, and Others (selected). Under 'Others', a dropdown menu is set to 'Add (DEC, Word, Signed, 2's Complement)'. Below this, 'Output' is set to 'D100', 'Device to Add/Sub' is set to 'D100', and 'Value(0 - 32767)' is set to '1'. There are 'OK' and 'Cancel' buttons at the top right.

Operation Mode Others
 Add (DEC/1W)
 Output D100
 Device to Add/Sub: D100
 1

6. Click the OK Button to return to the Write Address Dialog Box. To write multiple conditions or data, select row No. 0 from the list and click the Settings Button.

The Write Address dialog box has three tabs: 'List', 'Condition', and 'Operation'. The 'List' tab is selected. It shows a table with columns: 'No.', 'Sore...', 'Condition1', 'Condition2', 'Operation', and 'Com...'. The first row is '0', 'All S...', '10.00 ON', 'Always Operational', 'Add (DEC, Wo...'. There are 'OK' and 'Cancel' buttons at the top right. Below the table are buttons for 'Settings', 'Insert', 'Delete', 'Cut', 'Copy', and 'Paste'.

Note Up to 100 settings can be registered.

7. Click the OK Button to return to the base screen and transfer the file.



Additional Information

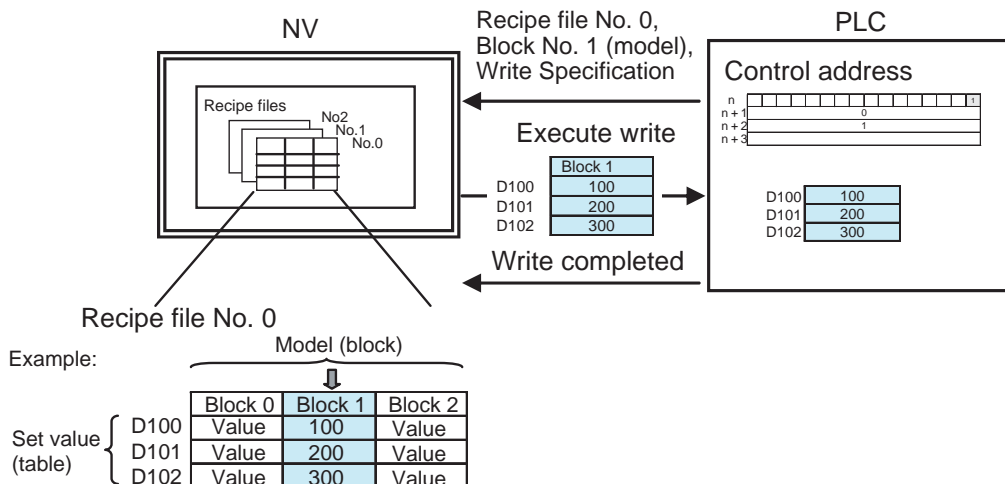
- If All Screens is selected multiple times in the condition settings, the PT will be reading PLC data multiple times, slowing the response. If the screen can be specified, it is recommended to use the Specified Screen Options.
- The Write Address function is performed only once when the specified conditions are met. The operation is performed only once each time when the conditions are met. It is performed again until status changes.

8-5 Recipes

8-5-1 Overview

A model's set values can be written or read to the specified PLC addresses for a command from the PLC or PT.

A model's (block's) set values can be saved in the PT as a table called a recipe file. The recipe file number and block number (model number) can be specified in the control address area of the specified PLC to execute read/write operations. Set values for each model can be read or written simply by changing the block number (or model number).



A recipe table is made from maximum of 100 blocks and 100 set values. Recipe files are specified by their numbers. Up to 100 recipe files (No. 0 to 99) can be stored.



Additional Information

- The total quantity of recipes that can be saved in the PT is approximately 3,600 words. However, it may be less depending on the number of files and whether there are comments.
- The amount of memory that can be used as recipes can be checked in the Resource Report under the Tool Menu of the NV-Designer.



Precaution for Correct Operation

- Do not use the SPMA function when the recipe function is operating.
- Data may be corrupted if there is a power interruption while the recipe data is being updated.
- Recipe data can be read from the PLC to the PT or deleted approximately 100,000 times.

8-5-2 Controlling Recipes

The recipe function allocates 4-word control addresses in the PLC memory. Recipes are controlled from these words. Turn ON word n bit 0 (write) or bit 1 (read) after specifying the file number in word n+1 and the block number in word n+2 in the control words to read or write recipes.

Words for Controlling Recipes

| Word | Bit | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------|-----|---------------------------|----|----|----|----|-------------------------|---------------------|----------------------|---|---|---|---|---|-------------------|------------------|-------------------|
| n | | Error Flag | | | | | Deletion Completed Flag | Read Completed Flag | Write Completed Flag | | | | | | Delete Recipe Bit | Read (PLC to PT) | Write (PT to PLC) |
| n+1 | | File Number (0 to 99 hex) | | | | | | | | | | | | | | | |
| n+2 | | File Number (0 to 99 hex) | | | | | | | | | | | | | | | |
| n+3 | | Error Code | | | | | | | | | | | | | | | |

Contents of Word n

| Bit | Item | Description | Type |
|-----|-------------------------|--|--|
| 0 | Write Bit (PT to PLC) | Turn ON this bit to write values set in a recipe file from the PT to the PLC. The Write Completed Flag will turn OFF when this bit turns OFF. | Turn ON the operation bit. |
| 1 | Read Bit (PLC to PT) | Turn ON this bit to read values set in a recipe file from the PLC to the PT. The Read Completed Flag will turn OFF when this bit turns OFF. | |
| 2 | Delete Recipe Bit | Turn ON this bit to delete a specified recipe file. The Deletion Completed Flag will turn OFF when this bit turns OFF. | |
| 8 | Write Completed Flag | Operation Completed Flag | It will then turn ON when the recipe file data has been written. |
| 9 | Read Completed Flag | This bit will then turn ON when the recipe file data has been read. | |
| 10 | Deletion Completed Flag | This bit will then turn ON when the recipe file data has been deleted. | |
| 15 | Error Flag | This flag will turn ON if an error occurs during data transfer. If the write, read, or deletion is performed normally, the Error Flag will turn OFF. | |

Contents of Words n+1 to n+3

| Word | Item | Description |
|------|--------------|---|
| n+1 | File number | Specify the number of the recipe file to read or write. |
| n+2 | Block number | Specify the number of blocks to read or write. |
| n+3 | Error Code | An error code will be written here if an error occurs during data transfer. 0: Normal ON: The specified file does not exist. 2: The specified block does not exist. 3: Recipe data cannot be written because memory is full. If the write, read, or deletion is performed normally, the Error Code will be 0000 hex. |

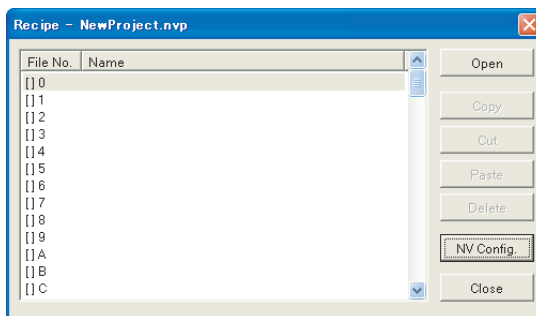


Additional Information

- Write, read, and deletion cannot be performed simultaneously. If all bits are ON, write, read, or deletion will be performed in that order.
- If all flags are OFF, either write, read, or deletion can be performed.

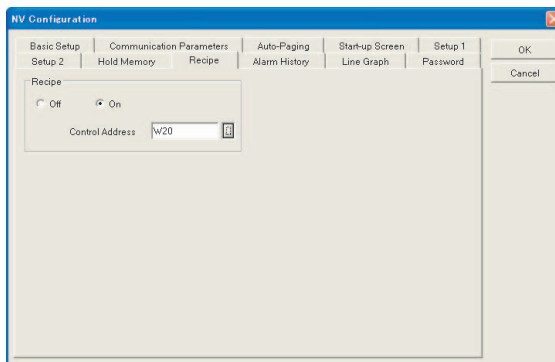
8-5-3 Using Recipes

- 1,2,3... 1. Start the Recipe Menu.



Select Recipe from the PT Menu.

2. Click the NV Config Button to setup the PT Configuration.



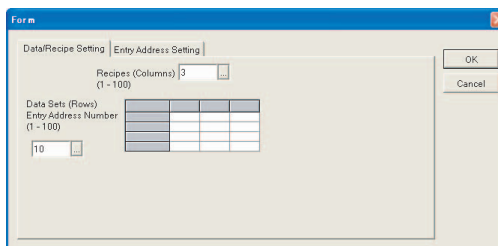
Make the following settings, and then click the OK Button.

Recipe: On

Control Address: W20

Up to 100 (No. 0 to 63) recipe files can be created.

3. Change the Data/Recipe Setting.



Select file 0 from the recipe list and click the Open Button. Change the Data/Recipe Setting as follows:

Data Sets (Rows) Entry

Address Number: 10

Recipes (Columns): 3

- Click the Entry Address Setting Tab and set the attributes.

Make the following settings, and then click the OK Button.

Number Continuously: On
Data Format: DEC (1W)
Address: D200

- Enter the table value in each block.

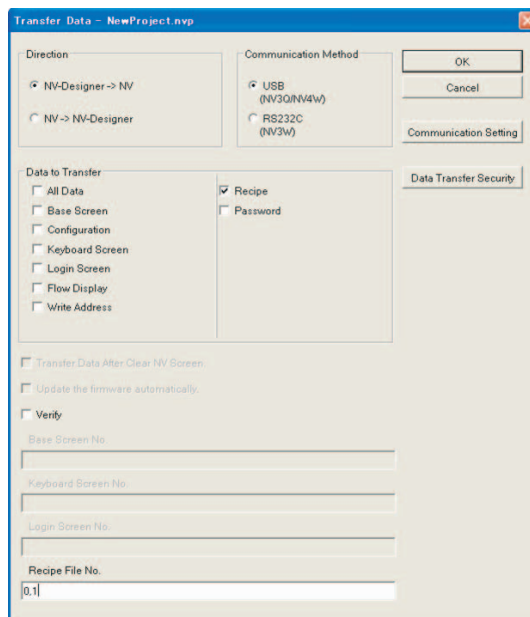
| Address(Data Format) | Comment | No. 0 | No. 1 | No. 2 |
|----------------------|---------|-------|-------|-------|
| D200(DEC1W) | | 10 | 15 | 10 |
| D201(DEC1W) | | 20 | 25 | 30 |
| D202(DEC1W) | | 30 | 35 | 50 |
| D203(DEC1W) | | 40 | 45 | 70 |
| D204(DEC1W) | | 50 | 55 | 90 |
| D205(DEC1W) | | 60 | 65 | 110 |
| D206(DEC1W) | | 70 | 75 | 130 |
| D207(DEC1W) | | 80 | 85 | 150 |
| D208(DEC1W) | | 90 | 95 | 170 |
| D209(DEC1W) | | 100 | 105 | 190 |

Make the following settings, and then click the OK Button.

| | Comment | No. 0 | No. 1 | No. 2 |
|------|---------|-------|-------|-------|
| D200 | | 10 | 15 | 10 |
| D201 | | 20 | 25 | 30 |
| D202 | | 30 | 35 | 50 |
| D203 | | 40 | 45 | 70 |
| D204 | | 50 | 55 | 90 |
| D205 | | 60 | 65 | 110 |
| D206 | | 70 | 75 | 130 |
| D207 | | 80 | 85 | 150 |
| D208 | | 90 | 95 | 170 |
| D209 | | 100 | 105 | 190 |

- Click the Close Button to return to editing the base screen.

7. Transfer the recipe file to the PT.



Select PT – Transfer – Transfer from the menu and select the Recipe Check Box.

Note Enter the Recipe File Number if required.

Example Transfer File Settings

Recipe File Number

0, 1

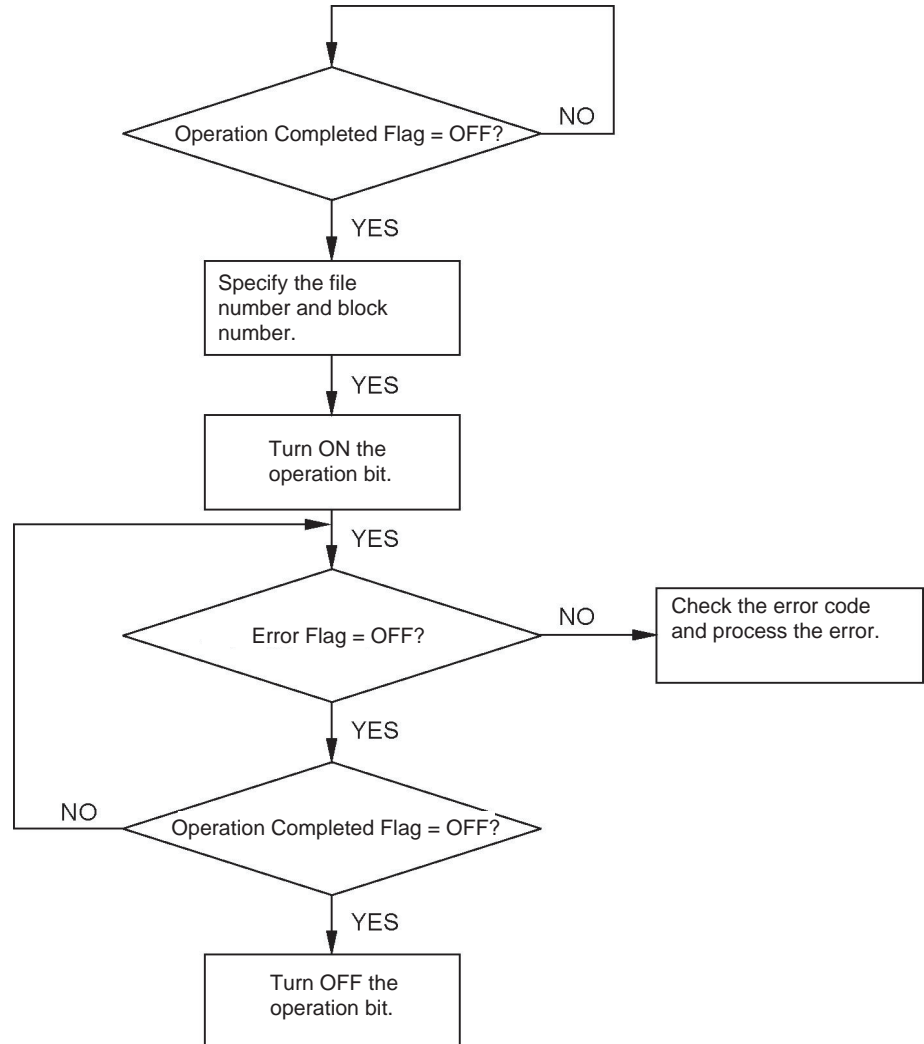
Enter alphanumeric characters and place a comma between file numbers. If nothing is entered, all recipe files will be transferred.

8. Manipulate the control bits.

- a. Specify the file number and block number.
Write 0 in W21 (file number) and 0 in W22 (block number) to specify file 0 and block 0.
- b. Turn ON the Write Bit.
Turn ON W20.00 (Write Bit).
- c. Turn OFF W20.00 (Write Bit) when W20.08 (Write Complete Flag) turns ON. Use the write address function or PLC ladder program to manipulate these bits. W20.15 (Error Flag) will be OFF and W23 (Error Code) is set to 0000 hex when operation is completed normally. The values in block 0 set in step 5 is written to D200 to D209.

8-5-4 Operational Flow of Recipe Function

Use the following procedure to use the recipe function.



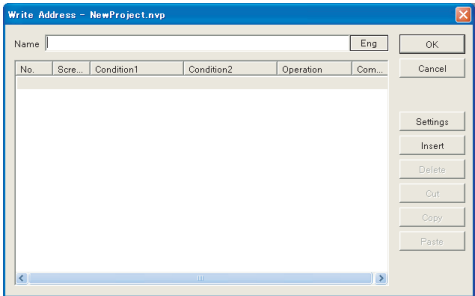
Example of Handshaking Using Write Address Function

The recipes can be used without special programming in the PLC by using the write address function. When the Write Completed Flag (bit 8 of word n) is turned ON by using the write address function, the Write Bit (PT to PLC) (bit 0 of word n) is turned OFF.

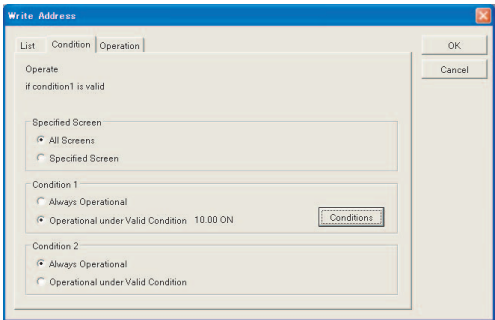
Example: Set W20 as the first control word.

When the Write Completed Flag W20.08 (bit 8 of W20) turns ON, the Write Bit (PT to PLC) W20.00 (bit 00 of W20) is turned OFF.

1,2,3... 1. Select Write Address from the PT Menu.



2. Select Settings.
3. Click the Condition Tab and set the conditions.



Condition: Write Completed Flag
W20.08 is ON

Specified Screen: All Screens

Condition 1: Operational
under Valid
Condition

Address type: Bit

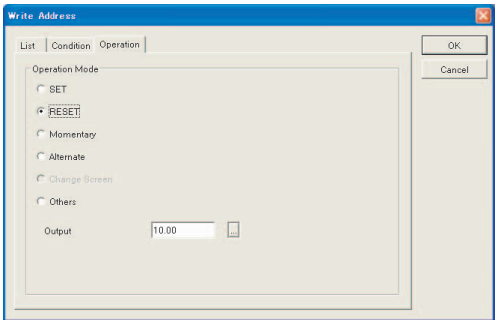
Relation code: Address: ON

Address: W20.08

Condition 2: Always
Operational

Note Specify the screen number
if the screen needs to be
specified.

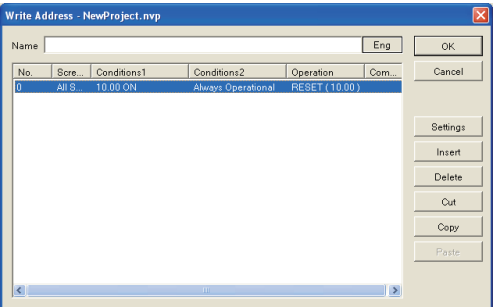
4. Set the operation mode.



Operation: Turn OFF the Write
Bit (W20.00)

Operation Mode: RESET
W20.00

5. The conditions and the operation mode for the address writing are set and displayed.



**Precaution for Correct Operation**

Up to 100 addresses can be written. The PT constantly reads the conditional addresses registered for the write address function to the PLC. As the number of registered addresses increase, the response of the PT to change or update the display will become slow.

8-6 Security Functions

Two security functions with passwords are provided.

Data Transfer Security

The screen data can be prevented from disclosure and changes by setting a password of up to 8 alphanumeric characters for transferring screen data to the PT and prohibiting read/write operations by users other than the administrator.

Operation Security (NV3W-V1/NV4W/NV3Q)

Levels can be set for parts and users to restrict the contents that can be displayed and the operations that can be performed. The user level is managed by passwords.



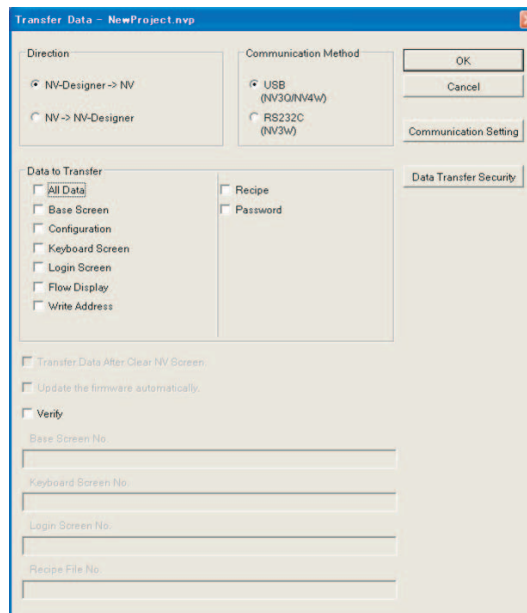
Additional Information

- The password settings can be read by reading the screen data from the NV-Designer.
- We recommend that you use both the operation security function and data transfer security function to protect security passwords.

8-6-1 Data Transfer Security Function

Setting Passwords

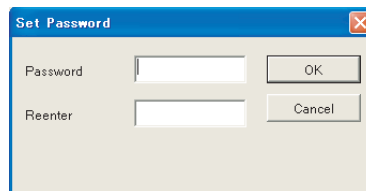
- 1,2,3... 1. Toolbar Select PT – Transfer – Transfer from the toolbar. The Transfer Data Dialog Box will be displayed.



Click the Data Transfer Security Button at the upper right of the dialog box.

2. Set a password.

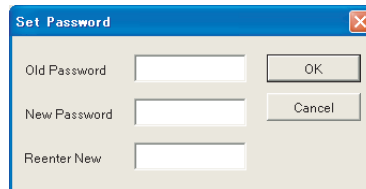
Setting the Password for the First Time



The dialog box titled "Set Password" has a blue header bar with a close button (X) in the top right corner. It contains two text input fields: "Password" and "Reenter". To the right of the "Password" field is an "OK" button, and to the right of the "Reenter" field is a "Cancel" button.

Up to 8 characters can be entered for the password. The password can contain numbers 0 to 9 and letters A to Z. The system does not differentiate between uppercase and lowercase letters.

Password Previously Set



The dialog box titled "Set Password" has a blue header bar with a close button (X) in the top right corner. It contains three text input fields: "Old Password", "New Password", and "Reenter New". To the right of the "Old Password" field is an "OK" button, and to the right of the "New Password" field is a "Cancel" button.

Changing the Password:

Enter the current password in Old Password and then enter the new password in the New Password and Enter New Password Again Boxes.

Deleting the Password:

Enter only the Old Password. Leave the New Password and New Password Again Boxes blank.

**Additional Information**

Passwords cannot be set unless a computer is connected to a PT that is turned ON.

**Precaution for Correct Operation**

Do not forget the password. If you forget the password, the unit memory will have to be cleared to delete the password.

8-6-2 Operation Security (NV3W-V1/NV4W/NV3Q)

Security levels can be set for parts and users to restrict the displays and operations that can be performed. If multiple users are using the PT, disclosure or mishandling of information can be prevented by placing individual user restrictions.

Features

- Security levels can be set for all parts.
- Up to 16 security levels can be set and multiple users can be registered in each level. Up to 64 settings can be registered.
- Different parts can be displayed on the same screen using the different levels. Switches can be set so that they are displayed but switch operation is disabled.
- Users can be added or deleted, and passwords can be changed from the PT.

Security Levels

There are 16 levels of security and they are divided into three categories.

| Security level | Restrictions |
|----------------|--|
| 0 | No restrictions. There is no password for level 0. |

| Security level | Restrictions |
|----------------|--|
| 1 to 14 | Restrictions become higher as the level number increases. Example: Parts with level 0 to 10 can be used under a level 10 password but level 11 parts cannot be used. |
| 15 | All operations are possible. (Administrator) Passwords can be registered in the PT. |

Setting Security

Security levels can be set for parts. They are set on the Operation Security Tab Page of the part attributes. There are also screen creation and parts settings required for using the operation security function.

Screen Properties

Login Screen: The user can enter a password to log on to a level.

Function Switches and Custom Switches

| | |
|---|---|
| For operation security for login | A jump will be made to the login screen for entering passwords when the switch is pressed. |
| For operation security: logout | Returns to level 0 from the level where the user is current logged in. |
| For operation security for changing passwords | This switch can be used to change a password. A jump will be made to the fixed PT screen for changing passwords. |
| For operation security for managing passwords | This switch can be used to add or delete a password. A jump will be made to the fixed PT screen for managing passwords. (Level 15 only) |

Password Change and Management Screen Settings

| Security level | Password Change Screen | Manage Password Screen | | |
|----------------|------------------------|----------------------------|----------------------------|--|
| | | Add | Change | Delete |
| 0 | --- | --- | --- | --- |
| 1 to 14 | Supported. | Not supported. | Not supported. | Not supported. |
| 15 | Supported. | Levels 1 to 15: Supported. | Levels 1 to 15: Supported. | Levels 1 to 15: Supported. (See note 2.) |

Note

- (1) The Password Change and Management Screens cannot be accessed from the menu screen. A switch must be set.
- (2) The logged in password cannot be deleted.



Precaution for Correct Operation

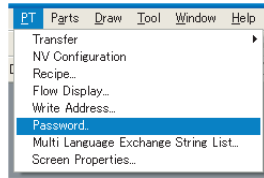
It is possible to return to the screen before you log out with the function switch or custom switch. Do not use the return to previous screen operation mode if you want to restrict switching screens using security levels. The settings in the Change Screen Operation Mode are recommended.

8-6-3 Setting Passwords for Operation Security

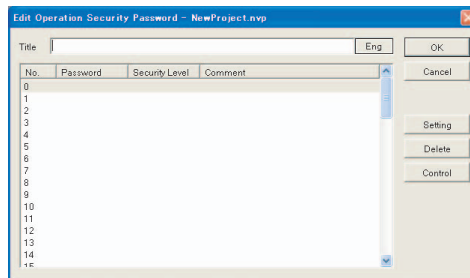
You can set passwords to enable operation security.

Setting Passwords

1,2,3...

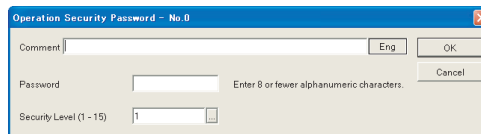


1. Select Password from the PT Menu.



2. The Edit Operation Security Password Dialog Box will be displayed.

Click the Control Button to set the operation security in the PT Configuration. Refer to *8-6-5 Operation Security Settings in the NV Configuration* for details.



3. Select the number to edit and click the Setting Button. The Operation Security Password Dialog Box will be displayed. Make the following settings.

Comment

Enter a comment to identify the password.

Passwords

Set a password. (Up to 8 alphanumeric characters can be used.)

Security Levels (1 to 15)

The security level can be set. (Levels 1 to 15 can be set.)



Precaution for Correct Operation

- More than two passwords can be set for the same level.
- You cannot set the same password.



Additional Information

The password settings can be read by reading the screen data from the NV-Designer. We recommend you also use password protection to protect the security password settings.

8-6-4 Creating the Login Screen for Operation Security

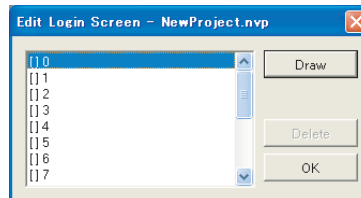
Create the Login Screen for operation security. The Login Screens are used to enter passwords according to the security levels specified for the operation security function. Position the keyboard part and data part for entering the password.

Login Screen

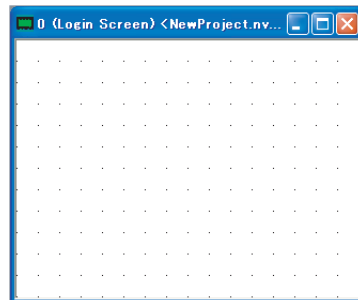
1,2,3...

1. Select Edit Login Screen from the File Menu.

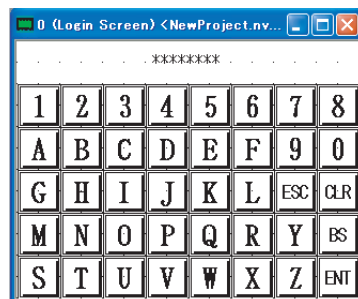
The Edit Login Screen Dialog Box will be displayed.



2. Select the login screen number that you want to edit from the list displayed in the Edit Login Screen Dialog Box. Login screens that have already been edited will have a + next to it.



3. The login screen will be displayed when the Draw Button is clicked.



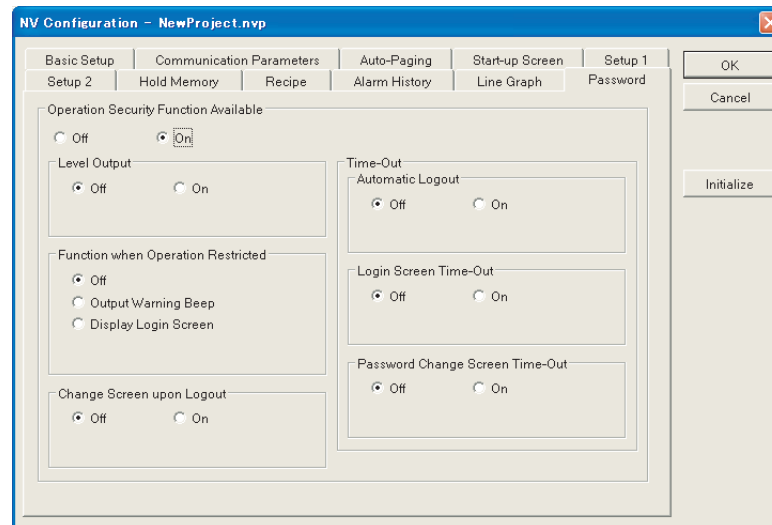
4. Position the data part and keyboard part. You can also position graphics, lamps, message parts, and character strings.

Refer to 7-7 Data Parts and Keyboard Parts

8-6-5 Operation Security Settings in the NV Configuration

The following tab page will be displayed when the Password Tab is clicked in the NV Configuration Dialog Box.

Password Tab Page



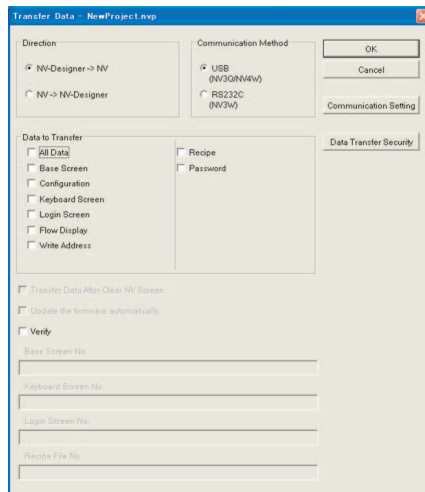
| Item | | Description |
|---------------------------------------|---------------------------------|---|
| Operation Security Function Available | | Enables or disables operation security. |
| Level Output | | Sets whether to output the security level to an address. Specifies the output address if the security level is to be output. |
| Function when Operation Restricted | | Specifies what happens when a part with a higher security level than the current one is touched. <ul style="list-style-type: none"> • Off: No operation. • Output Warning Beep: The buzzer beeps to warn you. • Display Login Screen: A login screen is displayed. Set the login screen number (0 to 15) to display. Note A login screen will need to be created. |
| Change Screen upon Logout | | Sets whether to change the screen when logging out of a security level. To change to the specified screen, set the screen number (0 to 1,023) to display when logging out. |
| Time-Out | Automatic Logout | Sets whether to automatically log out (level 0) after a period of inactivity. Sets the time of inactivity until the automatic logout (1 to 42 minutes). |
| | Login Screen Time-Out | Enables or disables automatically returning to the original screen from the Login Screen where the password is entered. If the timeout function is used for the Login Screen, set the time before returning to the original screen to between 1 and 42 minutes. |
| | Password Change Screen Time-Out | Enables or disables automatically returning to the original screen from the Password Change or Management Screen. If the timeout function is used for the Password Change Screen, set the time before returning to the original screen to between 1 and 42 minutes. |

8-6-6 Transferring Passwords

Transfer the password that was created in Edit Password to the PT.

Transferring Passwords

1,2,3...



1. Select PT – Transfer - Transfer from the menu bar. The Data Transfer Dialog Box will be displayed.
2. Select the NV-Designer → NV transfer direction, and then click the OK Button.



Precaution for Correct Operation

The password settings after transfer can be read.

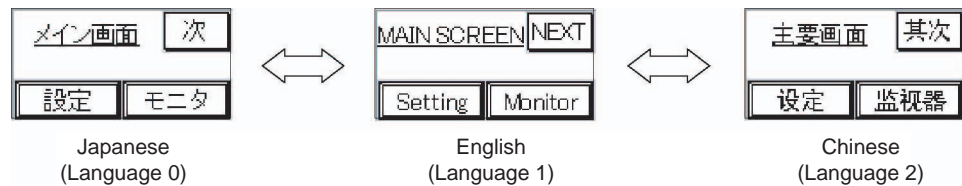
To prevent data leakage, transfer as follows to protect the password.

- Transferring passwords only:
Password: Select.
- Transferring simultaneously with data:
Password: Select.
All Data: Select
- To prevent data disclosure:
Click the Data Transfer Security Button and enter the password.
Password: Select.
All Data: Select (data also for simultaneous transfer)

8-7 Switching the Display Language

8-7-1 Switching the Display Language

You can register the language and corresponding character string for each part in advance and then change all registered parts at the same time using a function switch or a command from the PLC. Set the language and character string for each language number and then specify the language number to switch the language. This can be used to switch the language display. Up to 16 language numbers can be registered (0 to 15).

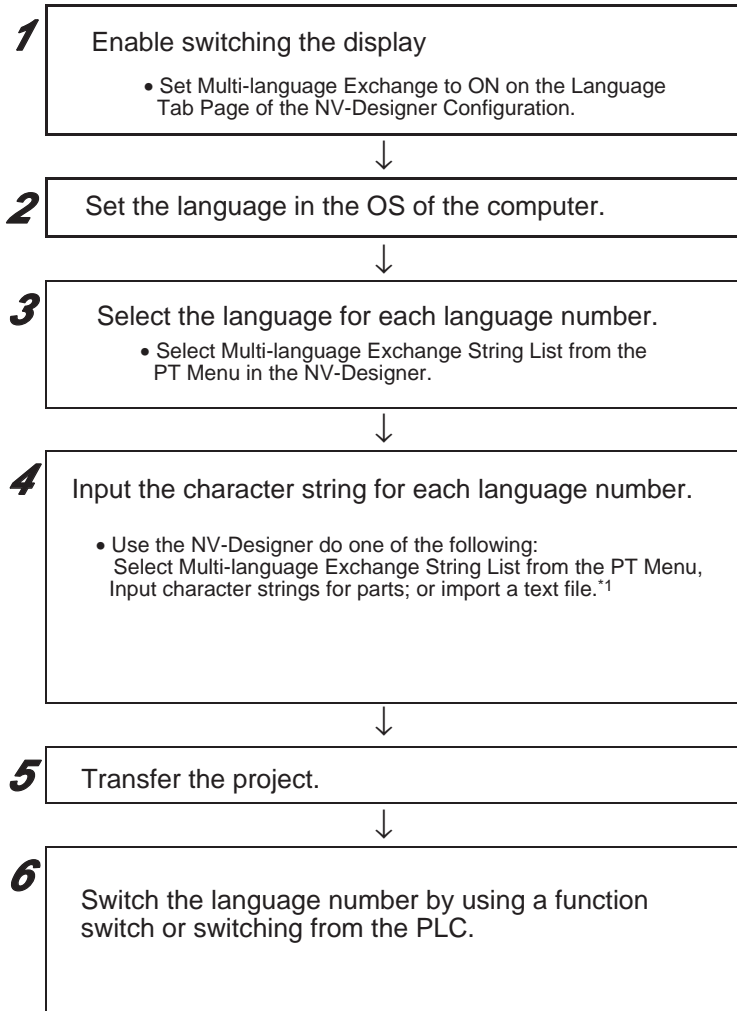


Precaution for Correct Operation

- It is important to determine which languages to register for each language number before creating screens. Otherwise many languages will be displayed.
- When using the display language switching function, memory is used for the number of language times the number of screens so the number of screens that can be registered will be reduced.

Procedure for Switching the Display Language

Use the following procedure to switch the language.



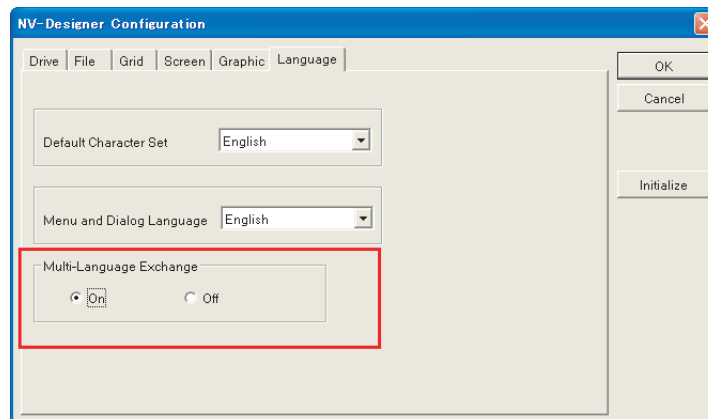
*1 If Microsoft Excel is used to edit a text file with the **File - Open** or **Data - Import External Data**, you may not be able to import the text to the NV-Designer correctly.

8-7-2 Enabling Switching the Display Language.

To enable switching the display language, set the NV-Designer Configuration so that the display language can be switched.

1,2,3...

1. Start the NV-Designer.
2. Select NV-Designer Configuration from the Tool Menu.
3. Click the Language Tab.
4. Set Multi-Language Exchange to On.



This will enable selecting *Multi Language Exchange String List* from the PT Menu. If switching the display language is enabled, a dialog box to edit character strings for switching display languages will be displayed to let you select the language for each language number.

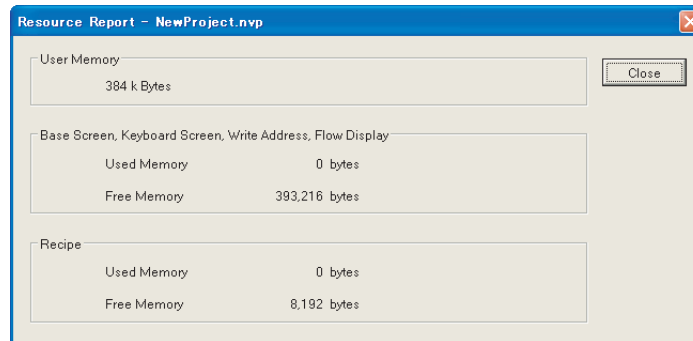
8-8 Displaying Resource Reports

The PT memory status can be displayed with the NV-Designer.

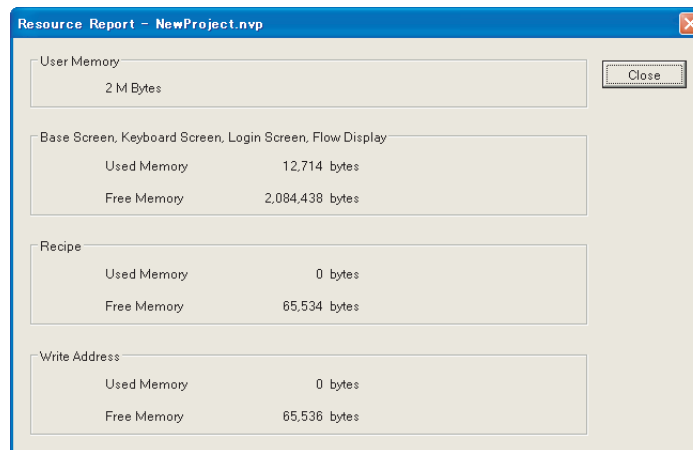
Displaying the Resource Report

Select Resource Report from the Tool Menu. The Memory Usage Dialog Box will be displayed.

■ NV3W



■ NV3W-V1/NV4W/NV3Q



8-9 Base Screen Memory Usage

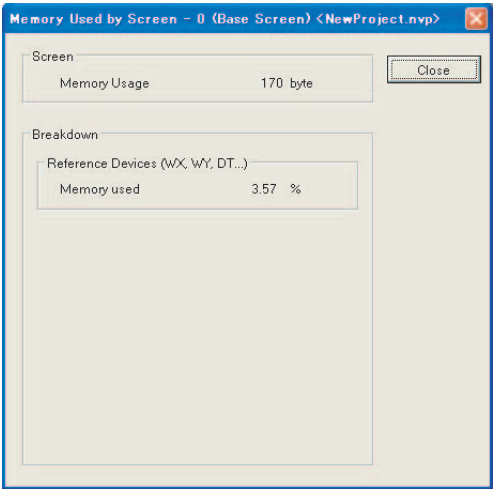
The amount of memory used by the base screens is displayed here.

Displaying the Base Screen Memory

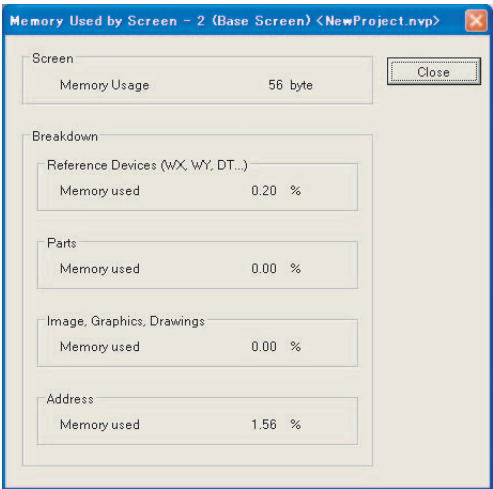
- 1,2,3...
1.

Select Base Screen Memory Use Status from the Tool Menu. The User Memory Dialog Box will be displayed.

■ NV3W



■ NV3W-V1/NV4W/NV3Q



Screen data

The amount of screen data used during editing is displayed.

Breakdown

The percentage of the limit for using parts that has already been used is displayed.

Reference Devices

The percentage of the memory that will be used when the part information is registered in the PT is displayed.

Parts (NV3W-V1/NV4W/NV3Q)

The percentage of the memory that will be used when the parts are attached is displayed.

Image, Graphic, Drawings (NV3W-V1/NV4W/NV3Q)

The percentage of the memory that will be used by the a part image is displayed.

Addresses (NV3W-V1/NV4W/NV3Q)

The percentage of the memory that will be used by communications addresses allocated to parts is displayed.

SECTION 9

Transferring Screens

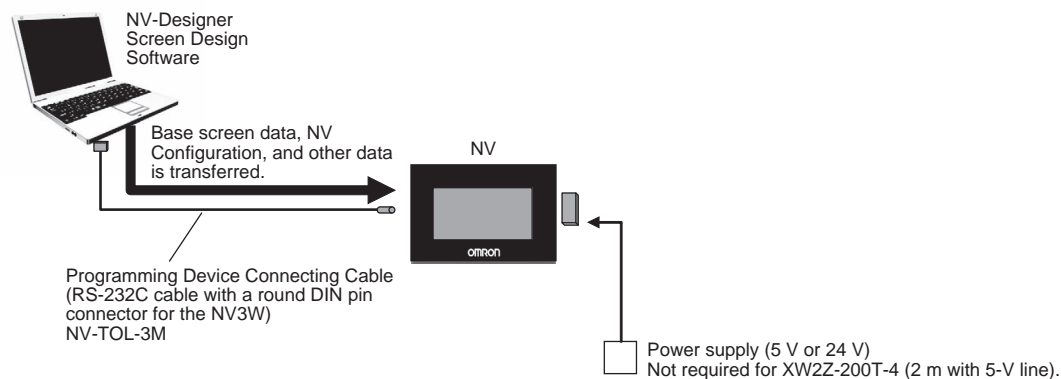
This section describes how to transfer screens to and from an NV-series PT using both communications and SD memory cards.

| | | |
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| 9-1 | Transferring Screens from the NV-Designer | 204 |
| 9-1-1 | Setting Communications Conditions | 205 |
| 9-1-2 | Selecting the Data to Be Transferred | 206 |
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| 9-1-4 | Setting Passwords | 207 |
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| 9-2-1 | SD Memory Cards | 208 |
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| 9-2-4 | Storing Data on an SD Memory Card | 210 |
| 9-2-5 | Reading Data from an SD Memory Card | 210 |
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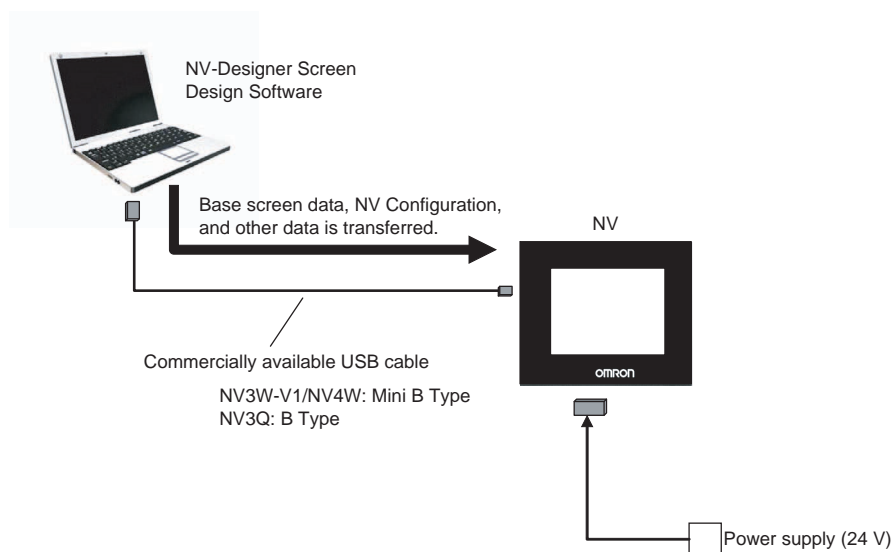
9-1 Transferring Screens from the NV-Designer

Base screen data and NV Configuration data can be transferred from the NV-Designer to the PT. You can transfer the base screens, NV Configurations, keyboard screens, flow display data, write address data, recipe files, and passwords. The data is stored in flash memory in the PT.

■ NV3W



■ NV3W-V1/NV4W/NV3Q



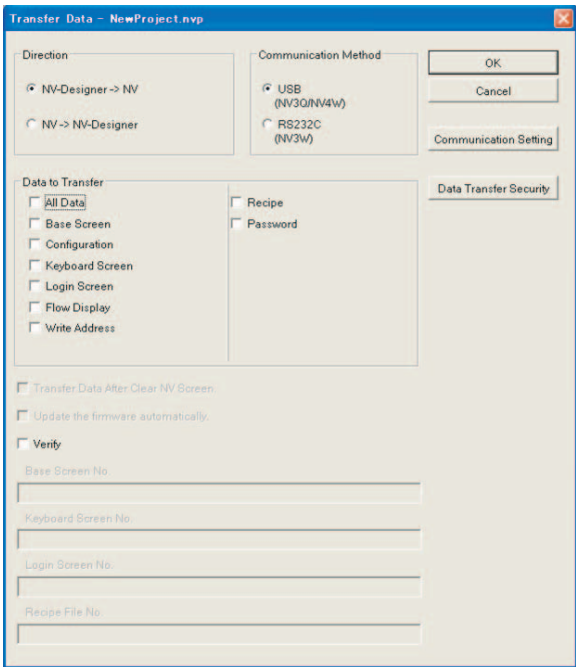
See Also

Refer to the following section for details on connecting the PT and PLC:
Section 6 Connecting the PLC in the Setup Manual.

9-1-1 Setting Communications Conditions

- 1,2,3...
1.

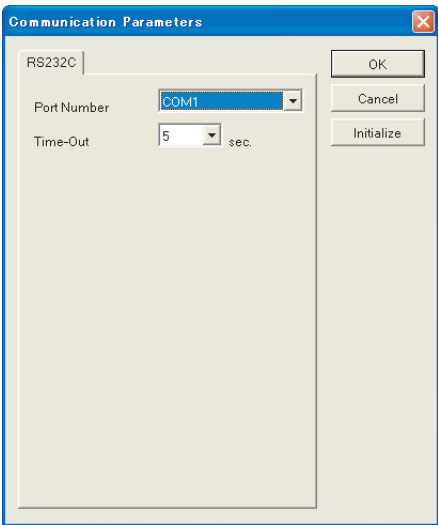
Select Transfer from the PT Menu. The Data Transfer Dialog Box will be displayed. Click the Communication Setting Button at the upper right of the dialog box.



2.

The Communications Parameters Dialog Box will be displayed. Set the communications parameters between the NV and PLC.

■ RS-232C



| | |
|-------------|---|
| Port Number | Displays the COM ports to which a connection can be made (all of the COM ports detected by Windows). The default is the lowest-numbered COM port. |
| Time-Out | 1 to 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, or 60 s Default is 5 s. |

Note

Set the COM port that will be used on the computer in advance using the Windows Device Manager or other utility. Communications will not be possible if

the COM port number does not agree with the COM port to which the PT is connected.

9-1-2 Selecting the Data to Be Transferred

Transfer Data

| | |
|--|--|
| All Data | Select this check box to transfers all of the data. |
| Base Screen | Select this check box to transfer base screen data. Enter the screen number of the base screens. |
| Configuration | Select this check box to transfer the NV Configuration data. |
| Keyboard screens | Select this check box to transfer the keyboard screen data. Enter the keyboard screen numbers. |
| Login Screen (NV3W-V1/NV4W/ NV3Q only) | Select this check box to transfer the login screen data. Enter the login screen numbers. |
| Flow Display | Select this check box to transfer the flow display data. |
| Write Address | Select this check box to transfer the Write Address data. |
| Recipes | Select this check box to transfer recipe files. Enter the Recipe File Number. |
| Password (NV3W-V1/NV4W/ NV3Q only) | Select this check box to transfer passwords. |

Note Enter the screen numbers individually, delimited with commas (1, 3, 5) or as a range (1- 5).

Direction

| | |
|------------------|---|
| NV-Designer → PT | The data that was selected for transfer will be written from the NV-Designer to the PT. |
| PT → NV-Designer | The data that was selected for transfer will be written from the PT to the NV-Designer. |

Transfer Data after Clear NV Screen

Select this check box to transfer data to the PT after deleting all previously transferred data. When this check box is not selected, the NV-Designer will delete the screen data, but any transferred data will not be deleted from the PT.

Update the Firmware Automatically

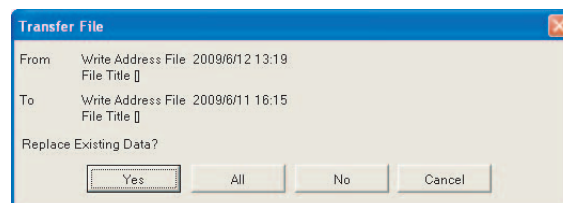
When transfer of all of the data is selected, the new firmware for the PT can be transferred at the same time. When the PT firmware is the same as the file installed on the NV-Designer, automatic update is not performed.

Verify

Select this check box to verify the data after the data from the NV-Designer has been written to the PT. Verification involves checking whether the screens transferred to the PT have been transferred correctly after all data has been transferred to the PT.

9-1-3 Executing the Transfer

- 1,2,3... 1. If there is already screen data in the PT when you click the OK Button to transfer screen data, the following dialog box will be displayed.



2. Click the Yes or All Button to execute the transfer.

9-1-4 Setting Passwords

Passwords can be set in the PT. You can protect the screen data that you have created by setting a password that will prevent uploading and downloading screen data unless the correct password is entered.

**See Also**

Refer to 8-6 *Security Functions*.

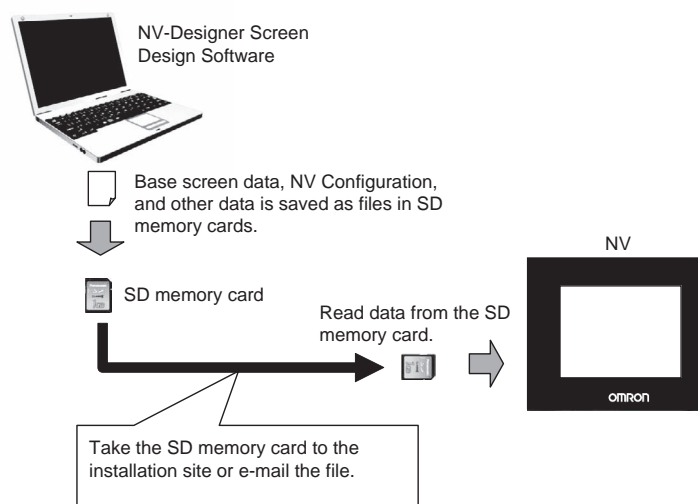
9-2 Transferring and Copying Data Using SD Memory Cards (NV4W/NV3Q)

9-2-1 SD Memory Cards

When connecting to the computer running NV-Designer is not possible, an SD memory card can be used to transfer base screen data or NV Configuration data to a PT. Transferring data in this way is done in the same units as data transfer via communications from the NV-Designer. Each file is handled separately.

Transferring Data between the NV-Designer and PT

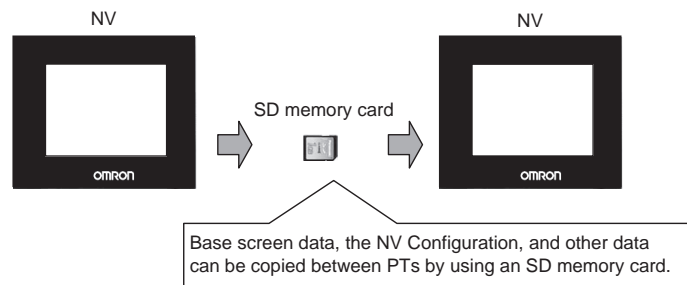
- Using SD Memory Cards to Transfer Data to the PT.



- Base screen data stored in the PT can be transferred to the NV-Designer by using an SD memory card.

Copying Data between PTs

SD memory cards can be used to copy data to other PTs.



**Precaution for Correct Operation**

- To save files from NV-Designer to an SD memory card, select Transfer from the PT Menu. When you select Transfer from the PT Menu, NV-Designer format data is converted to NV format data. Simply copying data from NV-Designer to the SD memory card will prevent the data from being used on the NV.
- Do not use the SD memory card to store data that was not created with NV-Designer.
- Up to 16 items of data can be saved to a memory card.
- Copying using an SD memory card cannot be performed between different types and different models of PT, such as between a monochrome NV3Q and a color NV3Q. Copying can be performed only between the same type of NV3Q or NV4W.

9-2-2 Compatible SD Memory Cards**Manufacturer**

Panasonic

Note OMRON has not confirmed the compatibility of memory card from other manufacturers.

Applicable Memory Capacity

32 MB to 2 GB (32 MB, 64 MB, 128 MB, 256 MB, 512 MB, 1 GB, or 2 GB)

**Precaution for Correct Operation**

SD memory cards with capacities larger than 2G cannot be used.

The applicable memory capacity is 32 MB to 1 GB for system program version 1.0□ of the NV3Q.

File Configuration on SD Memory Card

Specified Folder - nv_data - File Name - PT Data

File Names of PT Data

| Data | File name | |
|------------------|-----------------|--|
| Base Screen | base***.gsd | ***: Screen number, from 000 to fff. |
| Keyboard screens | keyb***.gsd | ***: Keyboard number, from 000 to fff. |
| Configuration | nvconfig***.gsd | |
| Flow Display | flow.gsd | |
| Write Address | devw.gsd | |
| Recipes | recip***.gsd | ***: Recipe number, from 000 to fff. |
| PLC driver | plc_drv.gsd | |
| Login Screen | login***.gsd | ***: Login screen number, from 000 to fff. |
| Password | pswd.gsd | |
| Firmware: | firmware.gsd | |

SD Memory Card Writers

The computer on which NV-Designer is running must be equipped with an SD memory card slot.

9-2-3 Precautions on Using SD Memory Cards

Data stored on an SD memory card may be damaged in the following ways. OMRON is not responsible for the loss of data stored on SD memory cards.

- When the user or a third party mishandles the SD memory card

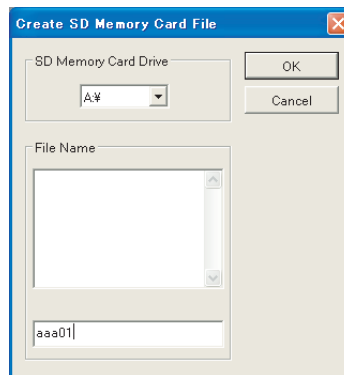
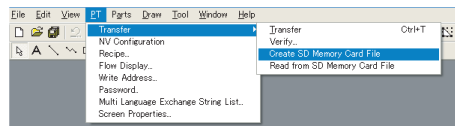
- When the SD memory card is subjected to static electricity or electrical noise
- When the SD memory card is removed, or the power is turned OFF while the card is being accessed, such as when data is being saved or deleted

Note

- (1) OMRON recommends saving important data to other media, and always having a backup.
- (2) Do not pull out the SD memory card or turn OFF the power while the SD memory card access indicator is lit on the PT. (This indicator light while data is being read from or written to the card.) Data may be destroyed.

9-2-4 Storing Data on an SD Memory Card

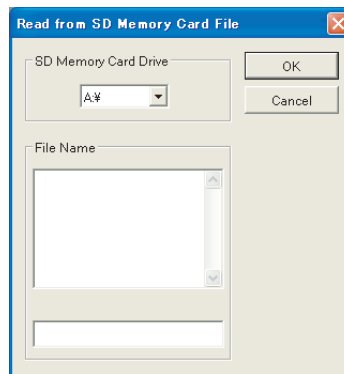
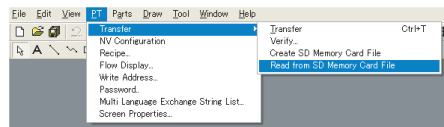
1,2,3...



1. Select Transfer - Create SD Memory Card File from the PT Menu of NV-Designer.
2. Select the SD memory card drive, and then enter a name for the file to be saved.
To overwrite a file, click the name of the existing file.
3. Click the OK Button to save the data to the SD memory card.

9-2-5 Reading Data from an SD Memory Card

1,2,3...



1. Select Transfer - Read from SD Memory Card File from the PT Menu of NV-Designer.
2. Select the SD memory card drive.
3. Select the file to read and click the OK Button. The screen data from the selected file will be displayed by NV-Designer.

9-2-6 Formatting an SD Memory Card

SD memory cards are shipped pre-formatted from the factory, so there is normally no need to format them.

Should formatting ever prove necessary, download the SD Memory Card formatting software from the Panasonic website, and use the software to format the card.

Note For details on formatting, refer to the documentation provided with the formatting software.



Precaution for Correct Operation

If an SD memory card is formatted with the standard formatting utility provided with a personal computer, its file system will not conform to the SD memory card standard. Always use the formatting software provided by Panasonic.

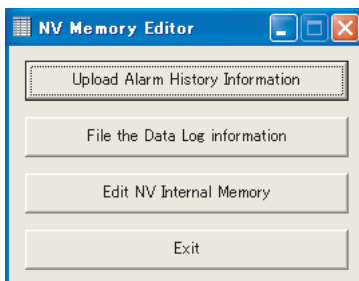
Appendix A

NV Memory Editor

Overview

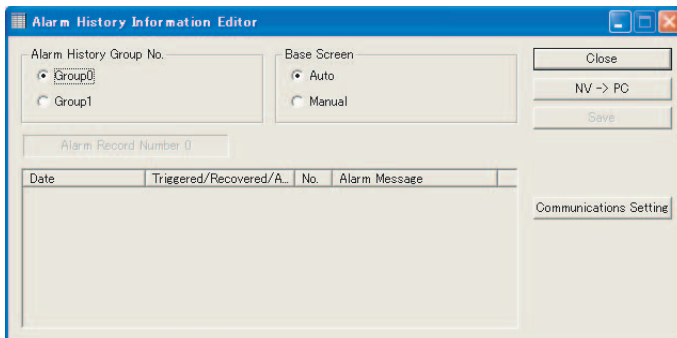
The NV Memory Editor can be used to read alarm history data and line graph data. This data can then be saved in CSV-format files. Data can also be read from the internal memory of the PT, edited, and then written back to memory.

Select NV-Designer - Tools - NV Memory Editor from the Windows Start Menu. The following NV Memory Editor Dialog Box will be displayed.



Saving Alarm History Information from the PT in a CSV File

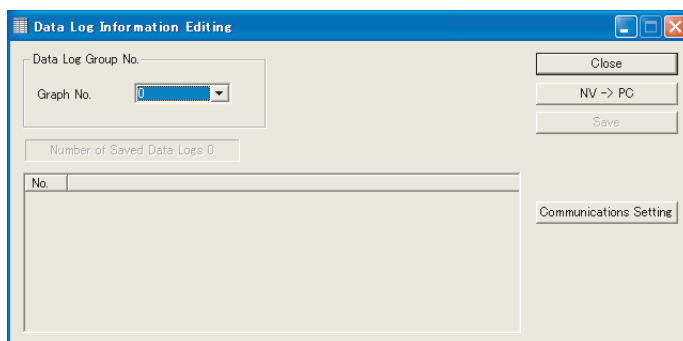
1. Click the Upload Alarm History Information Button. The Alarm History Information Editor Dialog Box will be displayed.



- Select either Group0 or Group1 for the Alarm History Group No.
 - Select either Auto or Manual for the Base Screen.
2. Click the Communications Settings to set communications settings between the PT and PLC.
 3. Click the NV -> PC Button to transfer the alarm history information that is saved in the PT to the computer and display it.
 4. Click the Save Button to save the alarm history information that was transferred in a CSV file.

Reading Line Graph (Data Log) Data from the PT and Saving It in CSV-format Files

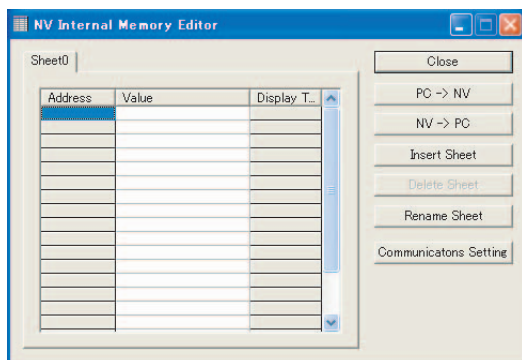
1. Click the File the Data Log Information Button. The following Data Log Information Editing Dialog Box will be displayed.



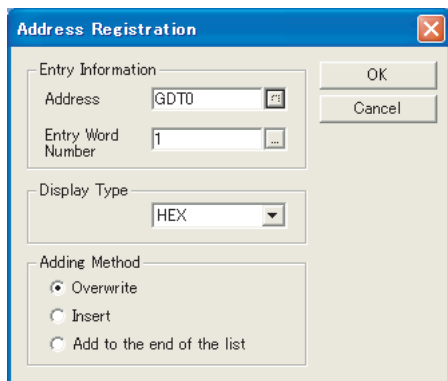
- Specify the Line Graph Sampling Group No.
 - Click the Set Conditions Button to display the Set Line Graph Data Conditions Dialog Box. Select either English or Japanese as the language to save the data in.
 - Click the Communications Settings Button to set communications settings between the PT and PLC.
2. Click the NV -> PC Button to transfer the alarm history information that is saved in the PT to the computer and display it.
 3. Click the Save Button. The previously read data log data will be saved in a CSV-format file.

Editing Internal Memory in the PT

1. Click the Edit NV Internal Memory Button. The following NV Internal Memory Editor Dialog Box will be displayed.

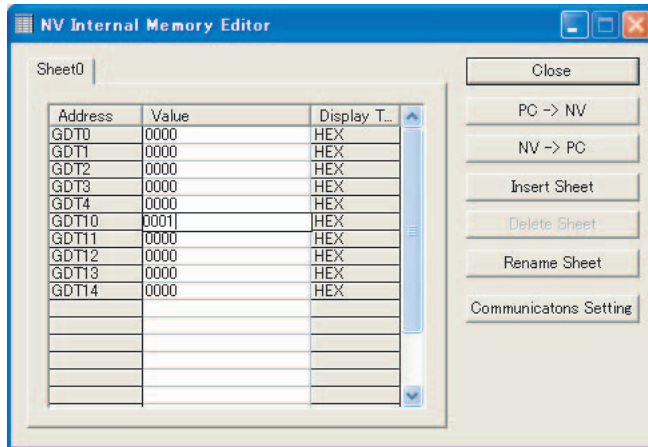


2. Click the NV -> PC Button to transfer the internal memory data that is saved in the PT to the computer.
3. Edit the internal memory of the PT. When any line of the address column is left-clicked, the Register Address Dialog Box will be displayed.



Specify an address in internal memory, then specify the registered number of words, and the display format. Also, select an addition method, and click the OK Button.

4. Enter a value in the value column.



5. Click the PC → NV Button to transfer the edited internal memory data to the PT.

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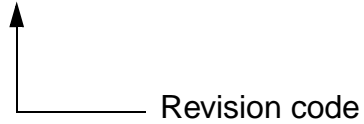
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Revision History

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

Cat. No. V104-E1-06



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 | June 2009 | Original production |
| 02 | December 2009 | Made revisions accompanying version upgrade and the addition of the NV4W. |
| 03 | October 2010 | Changed information on supported operating systems. |
| 04 | October 2011 | Made changes related to a change in the NV3Q-SW LCD. |
| 05 | September 2013 | Changed information on supported operating systems. |
| 06 | May 2015 | Made revisions accompanying version upgrade and the addition of the NV3W-V1. |

Revision History

OMRON Corporation **Industrial Automation Company**
Tokyo, JAPAN

Contact: www.ia.omron.com

Regional Headquarters

OMRON EUROPE B.V.

Wegalaan 67-69, 2132 JD Hoofddorp
The Netherlands
Tel: (31)2356-81-300/Fax: (31)2356-81-388

OMRON ELECTRONICS LLC

2895 Greenspoint Parkway, Suite 200
Hoffman Estates, IL 60169 U.S.A
Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

OMRON ASIA PACIFIC PTE. LTD.

No. 438A Alexandra Road # 05-05/08 (Lobby 2),
Alexandra Technopark,
Singapore 119967
Tel: (65) 6835-3011/Fax: (65) 6835-2711

OMRON (CHINA) CO., LTD.

Room 2211, Bank of China Tower,
200 Yin Cheng Zhong Road,
PuDong New Area, Shanghai, 200120, China
Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200

Authorized Distributor:

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Cat. No. V104-E1-06

0515