Cat. No. V109-E1-04

NB-series

NB3Q-TW□□B
NB5Q-TW□□B
NB7W-TW□□B
NB10W-TW01B

Programmable Terminals

STARTUP GUIDE MANUAL

OMRON

NB-series
NB3Q-TW□□B
NB5Q-TW□□B
NB7W-TW□□B
NB10W-TW01B
Programmable Terminals

Startup Guide Manual

Revised August 2012

Introduction

Thank you for purchasing an NB-series Programmable Terminal.

NB-Series Programmable Terminals (PTs) are designed to handle information generated in FA production sites. Be sure to understand the functions and performances etc thoroughly before using PT correctly.

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 facilities.
- 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 NB-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.

NB-series Manuals

NB-series manuals are organized in the sections listed in the following tables. Refer to the appropriate section in the manuals as required.

Programmable Terminals Startup Guide Manual (Cat. No. V109) (This manual)

Section	Contents
Section 1 NB Overview	This section provide specifications of the NB Unit, describes its names and functions of the various parts.
Section 2 System Design	This section describes the manual structure, takes NB7W as an example to introduce the operation procedures of the NB system.
Section 3 Installation and Wiring	This section describes how to install and wire the NB Unit.
Section 4 Screen Creation	This section describes how to create a demonstration project through NB-Designer.
Section 5 Run	This section describes how to start running at the Host side and prepare to send screen data to NB7W.
Section 6 Maintenance and Troubleshooting	This section describes the maintenance and inspection methods for preventing errors occurring, and troubleshooting measures when errors occur.

Programmable Terminals NB-Designer Operation Manual (Cat. No. V106)

Section	Contents
Section 1 Introduction	This section provides an outline of the NB-series PTs, including their functions, features, connection types and communication methods.
Section 2 Installation and Startup of NB-Designer	This section describes how to install and start the NB-Designer.
Section 3 Functions of NB-Designer	This section describes the functions of NB-Designer.
Section 4 Functions of NBManager	This section describes the functions of NBManager.
Section 5 Maintenance and Abnormality Handling	This section describes the maintenance and check to prevent the abnormality occurrence and the handling of the abnormalities occurred in NB Unit.
Section 6 Descriptions of New Functions Added into NB□□-TW01B	This section describes the new functions added into NB□□-TW01B, the system attributes and the component attributes.
Appendices	The appendices provide lists of the NB Units, the Communication Units, the applicable PLCs, and the list of NB-Designer functions.

Programmable Terminals Setup Manual (Cat. No. V107)

Section	Contents
Section 1 Part Names and Functions	This section describes the names and functions of the various parts of an NB Unit.
Section 2 Installing the NB Unit and Connecting Peripheral Devices	This section describes the methods used to install the NB Unit and connect peripheral devices.
Section 3 System Setting Mode	This section describes the System Setting Mode.
Section 4 Calibrate Mode	This section describes the Calibrate Mode.
Appendices	The appendices provide information on specifications, dimensions, wirings, and lists of the NB Units, the applicable PLCs and options.

Programmable Terminals Host Connection Manual (Cat. No. V108)

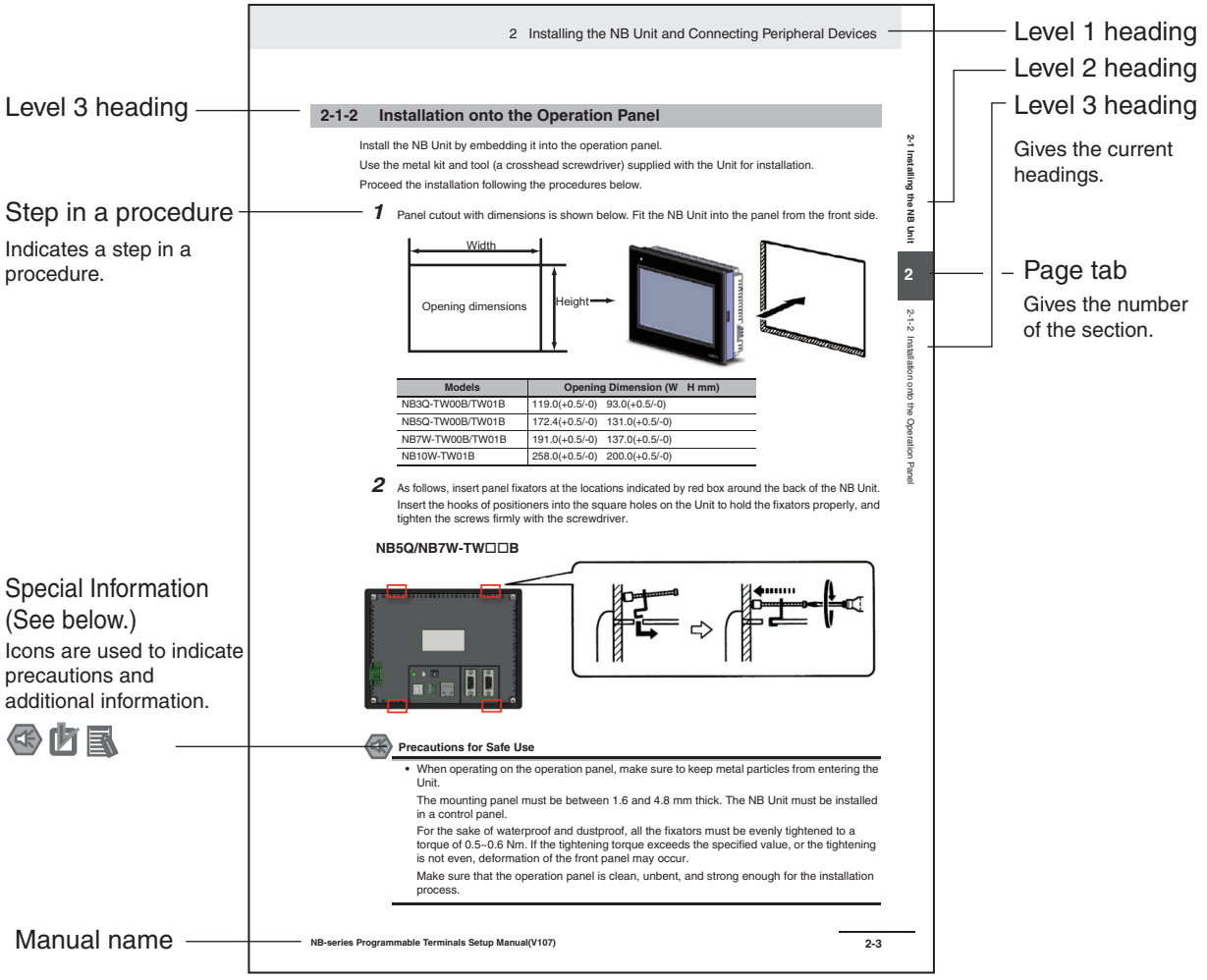
Section	Contents
Section 1 List for All PLCs Supported by NB series	This section lists all PLCs supported by NB Units.
Section 2 Connecting to SIEMENS PLCs	This section describes the connection to SIEMENS PLCs.
Section 3 Connecting to Mitsubishi PLCs	This section describes the connection to Mitsubishi PLCs.
Section 4 Connecting to Schneider PLCs	This section describes the connection to Schneider PLCs.
Section 5 Modbus Connection	This section describes the connection on Modbus protocol.
Section 6 Connecting to Delta PLCs	This section describes the connection to Delta PLCs.
Section 7 Connecting to LG PLCs	This section describes the connection to LG PLCs.
Section 8 Connecting to Panasonic PLCs	This section describes the connection to Panasonic PLCs.
Section 9 Connecting to Allen-Bradley (Rockwell) PLC	This section describes the connection to Allen-Bradley PLC.
Section 10 Connecting to PLC of GE Fanuc Automation Inc.	This section describes the connection to PLC of GE Fanuc Automation Inc.

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

Manual Structure

Page Structure and Icons

The following page structure and icons are used in this manual.



This illustration is provided only as a sample and may not literally appear in this manual.

Special Information

Special information in this manual is classified as follows:

Precautions for Safe Use
Precautions on what to do and what not to do to ensure using the product safely.

Precautions for Correct Use
Precautions on what to do and what not to do to ensure proper operation and performance.

Additional Information
Additional information to increase understanding or make operation easier.

Terminology

The following terminology is used in this manual.

Terms	Descriptions
NB Unit	Indicates the main Unit of the products in the OMRON NB Series of Programmable Terminal.
NB Series	Indicates products in the OMRON NB□□ Series of Programmable Terminal. In this manual, unless otherwise specified, NB□□ Series is taken as the subject concerned.
PLC	Indicates a Programmable Controller.
CP Series	Indicates the following products in the OMRON CP Series of Programmable Controllers: CP1H, CP1L, CP1E
CS/CJ Series	Indicates the following products in the OMRON CS/CJ Series of Programmable Controllers: CS1G, CS1H, CS1G-H, CS1H-H, CJ1G, CJ1M, CJ2M, CJ2H
C Series	Indicates the following products in the OMRON C Series of Programmable Controllers: C200HX(-Z), C200HG(-Z), C200HE(-Z), CQM1, CQM1H, CPM1A, CPM2A, CPM2C
Serial Communication Unit	Indicates a Serial Communication Unit for an OMRON SYSMAC CS/CJ-Series PLC.
Serial Communication Board	Indicates a Serial Communication Board for an OMRON SYSMAC CS/CJ-Series PLC.
Communication Board	Indicates a Communication Board for an OMRON C200HX/HG/HE(-Z) PLC.
CPU Unit	Indicates a CPU Unit in the OMRON CP, CS/CJ or SYSMAC C Series of Programmable Controllers.
NB-Designer	Indicates the OMRON NB-Designer.
Host	Indicates the PLC and other units functioning as the control devices for NB-Series Units.
PT	Indicates an OMRON Programmable Terminal.
HMI	Indicates an OMRON Programmable Terminal.

CONTENTS

Read and Understand this Manual

Please read and understand this manual before using the product. Please consult your OMRON representative if you have any questions or comments.

Warranty and Limitations of Liability

WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

Application Considerations

SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the products.

At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this manual.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

Disclaimers

CHANGE IN SPECIFICATIONS

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

It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the products may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

PERFORMANCE DATA

Performance data given in this manual is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

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.

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.

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

Precautions for Safe Use
Indicates precautions on what to do and what not to do to ensure using the product safely.

Precautions for Correct Use
Indicates precautions on what to do and what not to do to ensure proper operation and performance.

Note Indicates suggestive information and precautions on operation of the product.

Symbols

- Prohibition
  Indicates a general prohibition.

- Caution
  Indicates general cautionary, warning, or danger level information.

⚠WARNING

Do not attempt to take the product apart and do not touch the product inside while the power is being supplied. Otherwise it may result in electric shock.

Always ensure that the personnel in charge confirm that installation, inspection, and maintenance were properly performed for the NB Unit.

"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 touch switch, etc. of the NB Unit, 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 NB Unit. Otherwise it may impair the safety functions.

Never press more than two points on the touch panel of the NB Unit at a time. Otherwise, it may activate a switch somewhere between the two points.

Precautions for Safe Use

- When unpacking the NB Units and the peripheral devices, check carefully for any external scratches or other damages. Also, shake the Units gently and check for any abnormal sound.
- The NB Unit must be installed in a control panel.
- The mounting panel must be between 1.6 and 4.8 mm thick. Tighten the Mounting Brackets evenly to a torque of between 0.5 and 0.6 N·m to maintain water and dust resistance. If the tightening torque exceeds the specified value, or the tightening is not even, deformation of the front panel may occur. What is more, make sure the panel is not dirty or warped and that it is strong enough to hold the Units.
- Do not let metal particles enter the Units when preparing the panel.
- Do not connect an AC power supply to the DC power terminals.
- Use a DC power with a slight voltage fluctuation and that will provide a stable output even if the input is momentarily interrupted for 10 ms.
  Rated Power Supply Voltage: DC 24 V (Allowable range DC 20.4 ~ 27.6 V)
- Do not perform a dielectric voltage test.
- Making the connection by using terminal screws crimping on a twisted-pair cable with a crimping range of 12~26 AWG, and only 6.5 mm of insulation peel of the cable needs to be peeled off. Tighten the terminal screws at a torque of between 0.3 and 0.5 N·m. Make sure the screws are properly tightened.
- To prevent malfunctions caused by noise, ground the Unit correctly.
- Do not touch the packaging part of the circuit board with your bare hands. Discharge any static electricity from your body before handling the board.
- When using the No. 6 pin of the serial communication port COM1 connector for a voltage of DC+5V, make sure the supply equipment's current capacity is below 250mA before using it. The DC+5V voltage output of the NB unit is +5V±5%, and the maximum current is 250mA. (The serial communication port COM1 of NB3Q-TW00B and NB3Q-TW01B is unable to output the current.)
- Turn OFF the power supply before connecting or disconnecting cables.
- Always keep the connector screws firmly tightened after the communication cable is connected.
- The maximum tensile load for cables is 30 N. Do not apply loads greater than this.
- Confirm the safety of the system before turning ON or OFF the power supply, or pressing the reset button.
- The whole system may stop depending on how the power supply is turned ON or OFF. Turn ON/OFF the power supply according to the specified procedure.
- Reset by pressing the reset button, or restart the power supply, once the DIP switch settings are changed.
- To ensure the system's safety, make sure to incorporate a program that can confirm the normal functionality of the NB Unit before running the system.
- Start actual system application only after sufficiently checking screen data, macros and the operation of the program at the host side.
- Do not press the touch panel with a force greater than 30 N.
- Do not use hard or pointed objects to operate or scrub the screen, otherwise, the surface of the screen may be damaged.
- Confirm the safety of the system before pressing the touch panel.
- Signals from the touch switches may not be input if the touch switches are pressed consecutively at high speed. Confirm each input before proceeding to the next one.
- Do not accidentally press the touch panel when the backlight is not lit or when the display does not appear. Make sure of the safety of the system before pressing the touch panel.
- To use numeric input functions safely, always make maximum and minimum limit settings.
- Before initializing screen data, confirm that existing data is backed up at the NB-Designer.

- When changing the password with the screen, do not reset or turn OFF the power supply until writing is finished. Failure to save the password may cause the screen to fail to function.
- When using an equipment monitor, confirm the safety of the system before carrying out the following operations:
  - Changing monitor data.
  - Changing operation mode.
  - Forced setup/reset.
  - Changing the current value or the set value.
- Do not connect a USB connector to any device that is not applicable.
- When connecting the equipment with the USB HOST connector, make sure the supply equipment's current capacity is below 150mA before using it. The DC+5V voltage output of the NB Unit is +5V±5%, and the maximum current is 150mA.
- Before connecting a USB connector to a device, make sure that the device is free of damage.
- Commercially available and the recommended USB HUBs are different from the general specifications of the NB Unit. The unit may not function well in an environment subject to noise, static electricity. Therefore, when using a USB HUB, employ sufficient noise and static electricity insulation measures, or install it at a site free of noise or static electricity.
- While uploading or downloading screen data or system programs, do not perform the following operations that may corrupt the screen data or the system program:
  - Turning OFF the power supply of the NB Unit.
  - Pressing the PT's reset switch.
- Dispose of the Units and batteries according to local ordinances as they apply.

- When exporting products with lithium primary batteries containing perchlorate at 6ppb or above to or delivering them through California, USA, the following precautionary measures have to be publicized. Perchlorate material - applicable through special processing. Refer to http://www.dtsc.ca.gov/hazardouswaste/perchlorate.
  NB-Series products contain lithium primary batteries. When exporting products containing this kind of batteries to or delivering them through California, USA, label all the product packages as well as the appropriate delivery packages.
- Do not use benzene, paint thinner, or other volatile solvents, and do not use chemically treated cloths.
- Do not dispose the Units together with general waste at waste yards. When disposing them, follow the related local ordinances or rules.
- Customers may not replace the backlight lamp inside the NB Unit. Please contact OMRON's customer service center.
- Deterioration over time can cause the touch points to move. Calibrate the touch panel periodically.
- Water and oil resistance will be lost if the front sheet is torn or is peeling off. Do not use the Unit, if the front sheet is torn or is peeling off.
- The rubber packing will deteriorate, shrink, or harden depending on the operating environment. Inspect and replace the rubber packing periodically.
- The communication cables of the COM1 and COM2 connectors are not interchangeable. Confirm the pins of the ports before carrying out communications. (NB3Q-TW00B and NB3Q-TW01B only have COM1.)
- Periodically check the installation conditions in applications where the PT is subject to contact with oil or water.
- Do not perform the following operations during the communication of the USB memory:
  - Turning off the power supply of the NB Unit.
  - Pressing the Reset button on the NB Unit.
  - Removing the USB memory.
- Do not use the USB memory in the environment subject to strong vibration.

Precautions for Correct Use

- Do not install the unit in any of the following locations:
  Locations subject to severe 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 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
  Locations subject to splashing oil or chemicals

- 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 electric field or magnetic field
  Locations close to power supply lines
  Locations subject to possible exposure to radioactivity

- Precautions for software:
  The update, restoration, uninstall and reinstallation of software in running status is prohibited in order to guarantee the correct use of the product.

Conformance to EC Directives

NB-Series Programmable Terminals are 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. The actual products have been through inspections and are completely in accordance with EMC directives. However, when they are built into customers' systems, whether the systems also comply with these Directives is up to the customers for further inspection.

EMC-related performance of OMRON PTs will vary depending on the configuration, wiring, and other conditions of the OMRON equipment or control panel. 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 are as follows:
EMS (Electromagnetic sensitivity): EN61131-2: 2007
EMI (Electromagnetic Interference): EN61131-2: 2007

Conformance to EC Directives

NB-Series Programmable Terminals are EC compliant. Heed the following precautions in order to ensure that the customer's overall machine and device conform to EC Directives.

1 The PT must be installed in a control panel.

2 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.

3 The PTs conform to the standard EN 61131-2, but radiated emission characteristics (10m 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.

4 This is a Class A product (Product for industry purpose). It may cause radio interference in residential areas, in which case the user may be required to take adequate measures to reduce interference.

Related Manuals

The related manuals are as follows:

Devices and Software	Manual Name	Manual No.
NB series	NB Series NB-Designer Operation Manual	V106
	NB Series Setup Manual	V107
	NB Series Host Connection Manual	V108
	NB Series Startup Guide (This manual)	V109
PLC	SYSMAC CP Series CP1L CPU Unit Operation Manual	W462
	SYSMAC CP Series CP1H/L CPU Unit Programming Manual	W451
	SYSMAC CP Series CP1H CPU Unit Operation Manual	W450
	SYSMAC CP Series CP1E CPU Unit Hardware USER'S Manual	W479
	SYSMAC CP Series CP1E CPU Unit Software USER'S Manual	W480
	SYSMAC C200HX/HG/HE(-E/-ZE) Installation Guide	W302
	SYSMAC C200HX/HG/HE Operation Manual	W303
	SYSMAC C200HX/HG/HE(-ZE) Operation Manual	W322
	SYSMAC CPM1A Operation Manual	W317
	SYSMAC CPM2A Operation Manual	W352
	SYSMAC CPM1/CPM1A/CPM2A/CPM2C/SRM1(-V2) Programming Manual	W353
	SYSMAC CPM2C Operation Manual	W356
	SYSMAC CS1 Series CS1G/H Operation Manual	W339
	SYSMAC CS/CJ Series Serial Communications Boards and Serial Communications Units Operation Manual	W336
	SYSMAC CJ Series CJ1G/H(-H) CJ1M CJ1G Operation Manual	W393
	SYSMAC CS/CJ Series Programming Manual	W394
	SYSMAC CS/CJ Series INSTRUCTIONS Reference Manual	W340
	SYSMAC CS/CJ Series Programming Consoles Operation Manual	W341
	SYSMAC CS/CJ Series Communications Commands Reference Manual	W342
	SYSMAC CJ Series CJ2 CPU Unit Hardware USER'S Manual	W472
	SYSMAC CJ Series CJ2 CPU Unit Software USER'S Manual	W473
	SYSMAC CS/CJ Series CS1W/CJ1W-ETN21 (100Base-TX) Ethernet Units Operation Manual Construction of Networks	W420
	SYSMAC CS/CJ Series CS1W/CJ1W-ETN21 (100Base-TX) Ethernet Units Operation Manual Construction of Applications	W421
	SYSMAC CS/CJ Series CS1W/CJ1W-EIP21 (100Base-TX) EtherNet/IP Units Operation Manual	W465
	SYSMAC CP Series CP1L-EL/EM CPU Unit Operation Manual	W516
External Tool	CX-Programmer Ver.9.□ Operation Manual	W446

1

NB Overview

This section provide specifications of the NB Unit, describes its names and functions of the various parts.

1-1 Models of NB Series

There are 7 models of NB series PTs available now: NB3Q-TW00B/TW01B, NB5Q-TW00B/TW01B, NB7W-TW00B/TW01B and NB10W-TW01B.

With TFT display used, NB series has higher cost performance. The LED backlight used is more environmentally-friendly, energy-efficient and with longer service life compared to traditional CCFL backlight. The display device of NB series (PT: Programmable Terminals) can be used for information display and receive-input operation. It can show operating states of the system and devices in graphic forms to users.

● Major Parameters

Models		NB3Q		NB5Q		NB7W		NB10W
		TW00B	TW01B	TW00B	TW01B	TW00B	TW01B	TW01B
Performance Specifications								
Display Size		3.5”TFT LCD		5.6”TFT LCD		7”TFT LCD		10”TFT LCD
Resolution		QVGA 320×240		QVGA 320×234		WVGA 800×480		
Display Color		65536 colors						
Backlight		LED						
Memory		128M FLASH + 64M DDR2 RAM (NB□□-TW01B supports the USB storage)						
Downloading Programs		USB / Serial Port / Network Interface (Only NB□□-TW01B supports the network interface downloading)						
USB Port		Equivalent of USB 2.0 Full speed NB□□-TW00B: USB Slave ×1 NB□□-TW01B: USB Slave ×1, USB Host ×1						
Communication Ports	Serial Port	COM1: RS-232C/ 422A/485		COM1: RS-232C COM2: RS-232C/422A/485				
	Network Interface	Only supported by the HMI of NB□□-TW01B						
Electrical Specifications								
Rated Power		5W	9W	6W	10W	7W	11W	14W
Rated Voltage		DC24V						
Structural Specifications								
Case Color		Black						
Dimensions W×H×D(mm)		129.8×103.8×52.8		184.0×142.0×46.0		202.0×148.0×46.0		268.8×210.8 ×54.0
Weight		310g	315g	620g	625g	710g	715g	1545g
Software Tools								
Version No.		NB-Designer Ver1.2X For download the application programs, please access your local Omron website. If local site cannot be found, please access Omron IA global site “http://www.ia.omron.com/” at first and select the area where you are.						

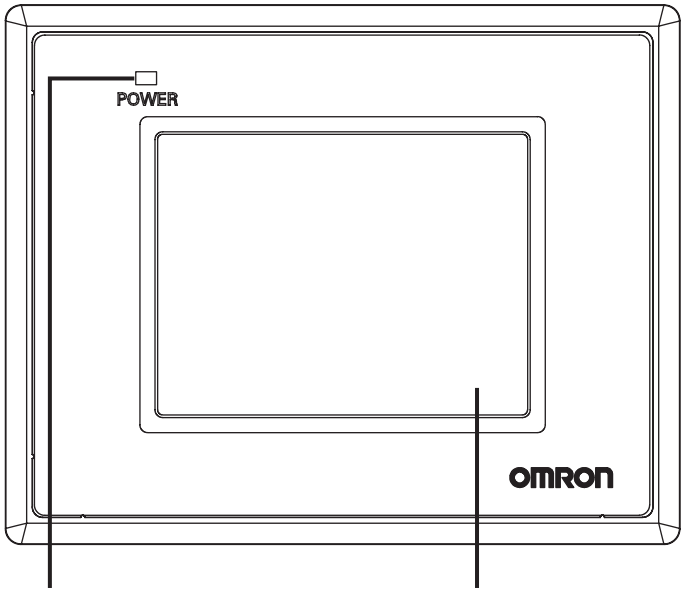
Note NB7W is used as the abbreviated name of NB7W-TW□□B hereinafter.

1-2 Part Names and Functions

This section describes the names and functions of each part of the NB Unit.

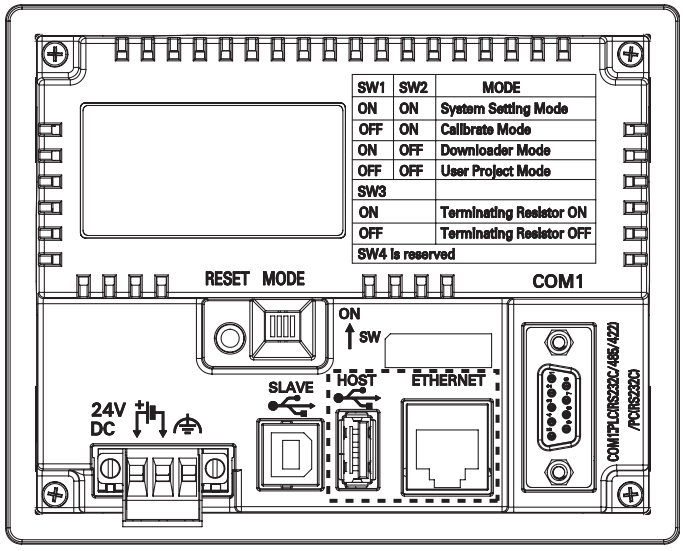
● NB3Q-TW00B/NB3Q-TW01B model

Front view



Power Indicator　　Display

Back view



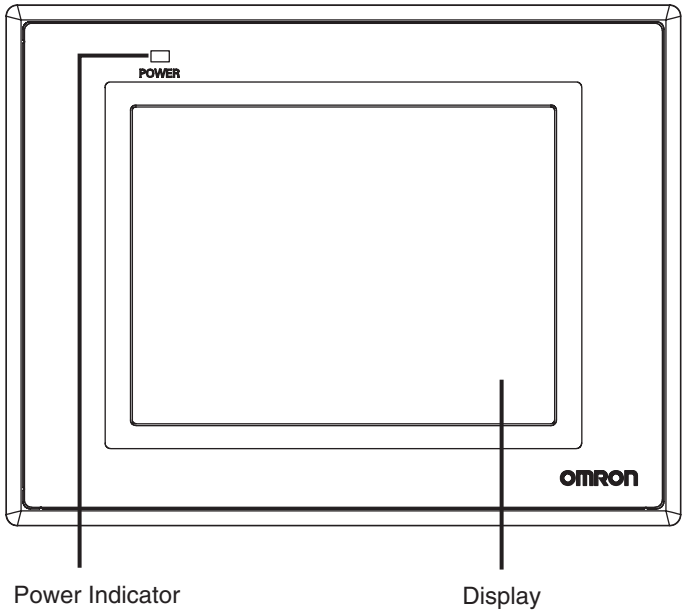
: NB□□-TW01B only

Precautions for Safe Use

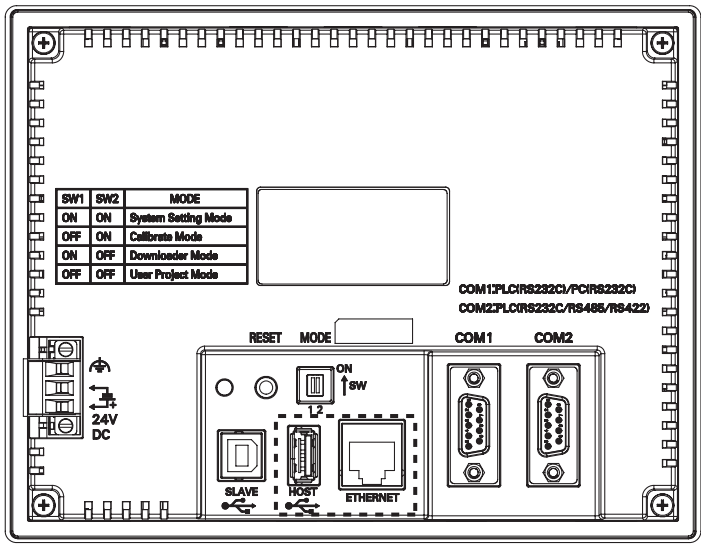
Confirm the safety of the system before turning ON or OFF the power supply, or pressing the reset button.

● NB5Q-TW00B/NB5Q-TW01B model

Front view



Back view



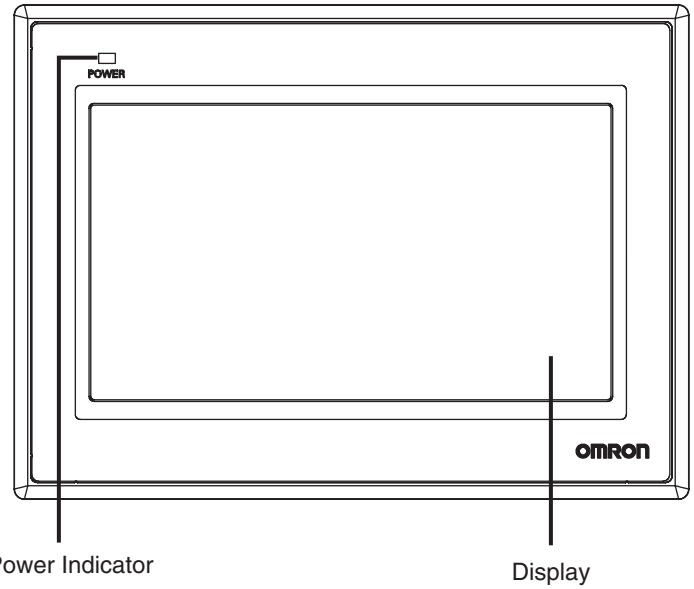
: NB□□-TW01B only

Precautions for Safe Use

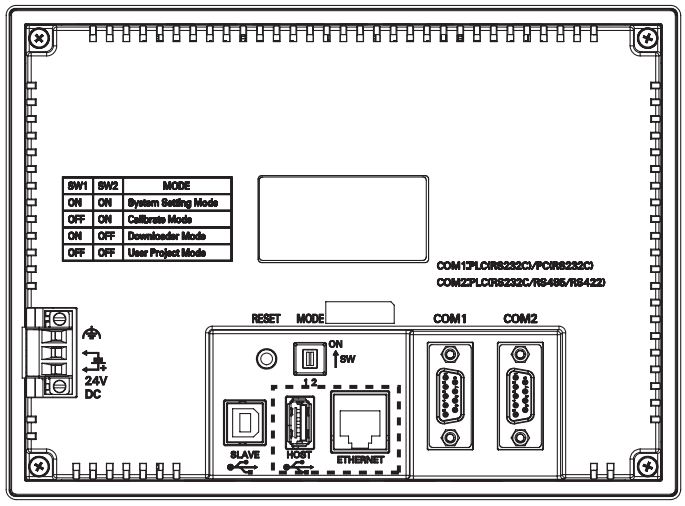
Confirm the safety of the system before turning ON or OFF the power supply, or pressing the reset button.

● NB7W-TW00B/NB7W-TW01B model

Front view



Back view



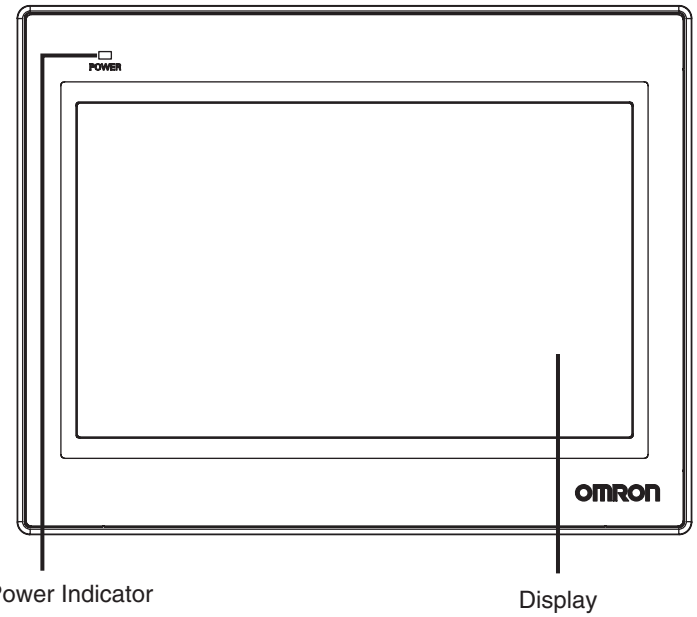
: NB□□-TW01B only

Precautions for Safe Use

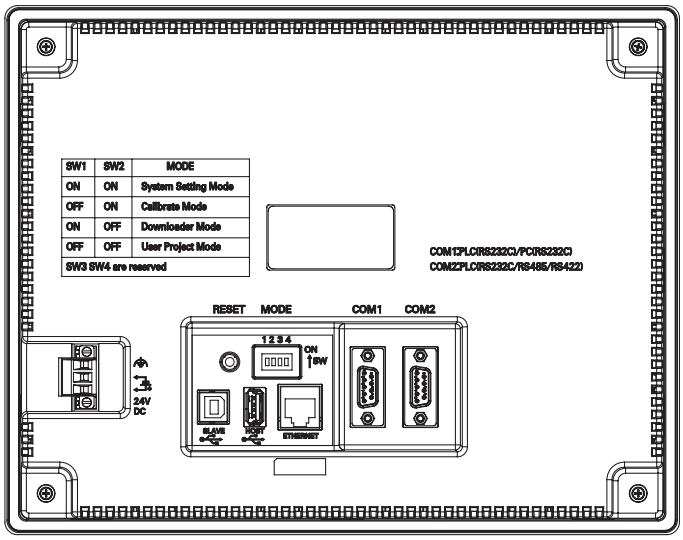
Confirm the safety of the system before turning ON or OFF the power supply, or pressing the reset button.

● NB10W-TW01B model

Front view



Back view



Precautions for Safe Use

Confirm the safety of the system before turning ON or OFF the power supply, or pressing the reset button.

Serial Port COM1

- NB5Q/NB7W/NB10W-TW□□B

Serial port COM1 is a 9-pin D-type socket port. This port supports RS-232C communication function, making it connectable to a controller which features RS-232C function, and it can also be used for downloading programs or debugging for the product.

The pins are defined as follows:

Pins	Signals	I/O	Functions
1	NC	-	-
2	SD	O	Sending data
3	RD	I	Receiving data
4	RS(RTS)	O	Request to send*
5	CS(CTS)	I	Clear to send*
6	DC+5V	-	DC+5V output (Max. current: 250mA)
7	NC	-	-
8	NC	-	-
9	SG	-	Signal ground

* Pins 4 and 5 are not used, thus not compliant with RS or CS functions.

Precautions for Safe Use

When using the No. 6 pin of the serial communications port COM1 connector for a voltage of DC+5V, make sure the supply equipment's current capacity is below 250 mA before using it. The DC+5V voltage output of the NB Unit is +5V±5%, and the maximum current is 250 mA.

- NB3Q-TW□□B

NB3Q-TW□□B has only 1 serial port COM1, and this port supports communication based on RS-232C, RS-422 and RS-485, of which only 1 connection mode can be applied at one time. By means of the RS-232C mode (PIN 2~5), it can be connected to a controller based on RS-232C, and can also be used for downloading programs, as well as debugging for the product (connected to a PC). While with the RS-422 or the RS-485 mode (PIN 1, PIN 6~8), only a PLC can be connected.

The pins are defined as follows:

Pins	Signals	I/O	Functions		
			RS-232C	RS-485	RS-422A
1	SDB+	I/O	-	-	Sending data(+)
2	SD	O	PLC Sending data	-	-
3	RD	I	PLC Receiving data	-	-
4	RS(RTS)	O	Request to send*	-	-
5	CS(CTS)	I	Clear to send*	-	-
6	RDB+	I/O	-	RS485B Send/Receive data(+)	Receiving data(+)
7	SDA-	I/O	-	-	Sending data(-)
8	RDA-	I/O	-	RS485A Send/Receive data(-)	Receiving data(-)
9	SG	-	Signal ground		

* Pins 4 and 5 are not used, thus not compliant with RS or CS functions.

● Serial Port COM2

- NB5Q/NB7W/NB10W-TW□□B

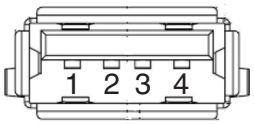
Serial port COM2 is a 9-pin D-type socket port. This port supports RS-232C/RS-485/RS-422A communication function.

The pins are defined as follows:

Pins	Signals	I/O	Functions		
			RS-232C	RS-485	RS-422A
1	SDB+	I/O	-	-	Sending data(+)
2	SD	O	Sending data	-	-
3	RD	I	Receiving data	-	-
4	Terminal R1	-	-	Terminal resistor 1	
5	Terminal R2	-	-	Terminal resistor 2	
6	RDB+	I/O	-	Send/Receive data(+)	Receiving data(+)
7	SDA-	I/O	-	-	Sending data(-)
8	RDA-	I/O	-	Send/Receive data(-)	Receiving data(-)
9	SG	-	Signal ground		

● USB HOST

NB□□-TW01B is equipped with USB HOST port, which is USB A-type port. Through this port, USB memory can be connected to perform uploading, downloading, project operation and storage of related data. And its pins are defined as follows:



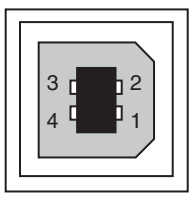
Pins	Signals	Functions
1	Vbus	USB +5V power supply output (Max. current: 150mA)
2	D-	Data -
3	D+	Data +
4	GND	USB power supply ground

Precautions for Safe Use

When connecting the equipment with the USB HOST connector, make sure the supply equipment's current capacity is below 150mA before using it. The DC+5V voltage output of the NB Unit is +5V±5%, and the maximum current is 150mA.

● USB SLAVE

USB SLAVE port is USB B-type port, which can connect the USB port on PC side to perform the uploading, downloading and debugging of the programs for the product. And its pins are defined as follows:

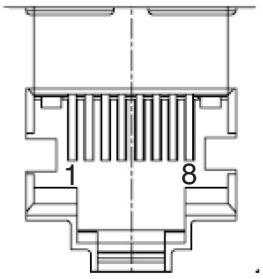


Pins	Signals	Functions
1	Vbus	USB +5V power supply output
2	D-	Data -
3	D+	Data +
4	GND	USB power supply ground

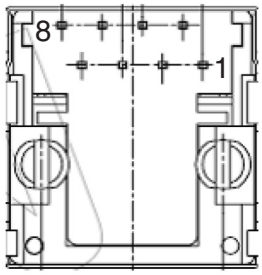
● Ethernet Interface

NB□□-TW01B is equipped with Ethernet Interface, which is adaptive RJ-45 type interface with the transmission rate of 10M / 100M. It can be connected with PC to perform the uploading and downloading of the programs and the system refreshing, and can also be used to realize the communication with the controller supporting the Ethernet communication. And its pins are defined as follows:

TOP



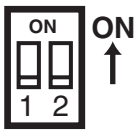
Bottom



Pins	Signals	Functions
1	TD+	Sending data +
2	TD-	Sending data -
3	RD+	Receiving data +
4	---	Not used
5	---	Not used
6	RD-	Receiving data -
7	---	Not used
8	---	Not used

● DIP Switch

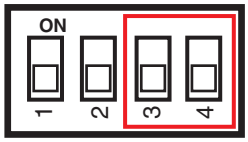
NB5Q/NB7W only has 2 switches SW1 and SW2, while for the NB3Q and NB10W, there are totally 4 DIP switches, and for all models, SW1 and SW2 feature the same functions. The settings and corresponding operating modes are as follows:



SW1	SW2	Operating modes
ON	ON	System Setting Mode
OFF	ON	Calibrate Mode
ON	OFF	Downloader Mode
OFF	OFF	User Project Mode

- System Setting Mode: The PT will be launched into a built-in system setup screen, and is subject to the user for brightness, system time and buzzer settings.
- Calibrate Mode: When the user touches the panel, a symbol “+” will pop up on the screen, with which the touch control precision level can be calibrated.
- Downloader Mode: This is used for basic operations such as updating the firmware, downloading and uploading the user’s engineering documents, etc. and this mode is not intended for general users.
- User Project Mode: This is the User Project Mode of NB-Series PTs. The PT will display the startup screen of the project already downloaded.

As mentioned above, the settings and corresponding operating modes of the switches SW1 and SW2 of NB3Q and NB10W are the same as those of NB5Q/NB7W (see the table above), and the functions of SW3 and SW4 of NB3Q and NB10W are stated as below:



Switch No. (corresponding model(s))	Status	Descriptions of Function
SW3 (NB3Q)	ON	Terminal resistance ON
	OFF	Terminal resistance OFF
SW3 (NB10W)	Reserved	
SW4 (NB3Q/NB10W)	Reserved	

● Reset Switch

When pressing the reset switch located on the back side of the PT, the system will be rebooted.

2

System Design

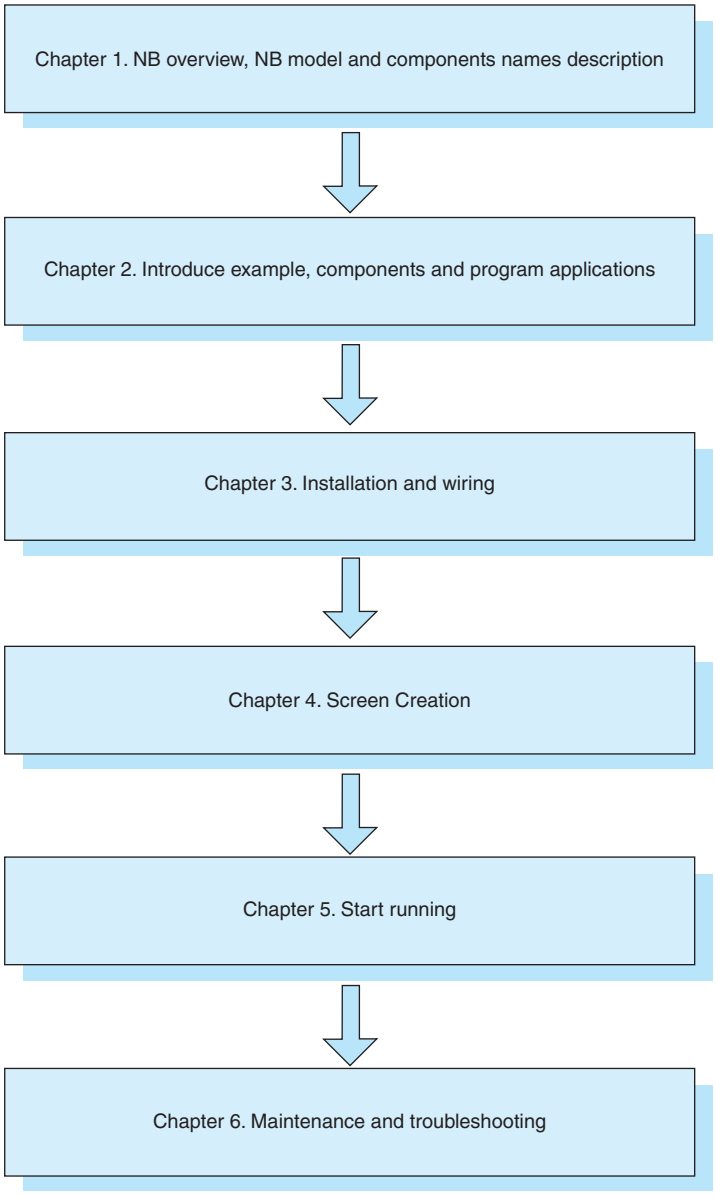
This section describes the manual structure, takes NB7W as an example to introduce the operation procedures of the NB system.

2-1 About this Manual

This section describes the manual structure and operation procedures of the NB7W system.

● Manual Structure

The structure of the NB system (Take NB7W as an example) is described in the following sequence in this manual:



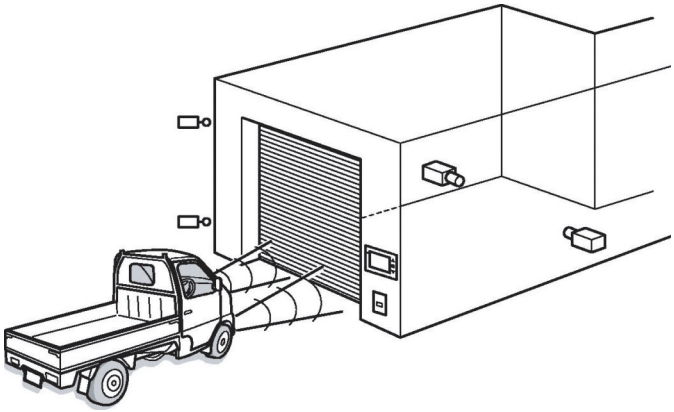
The examples of circuit configuration, wiring and applications are used for reference only. Be sure to refer to the relevant manuals for the specifications, performance and safety of each component when configuring practical systems.

2-2 Demonstration System

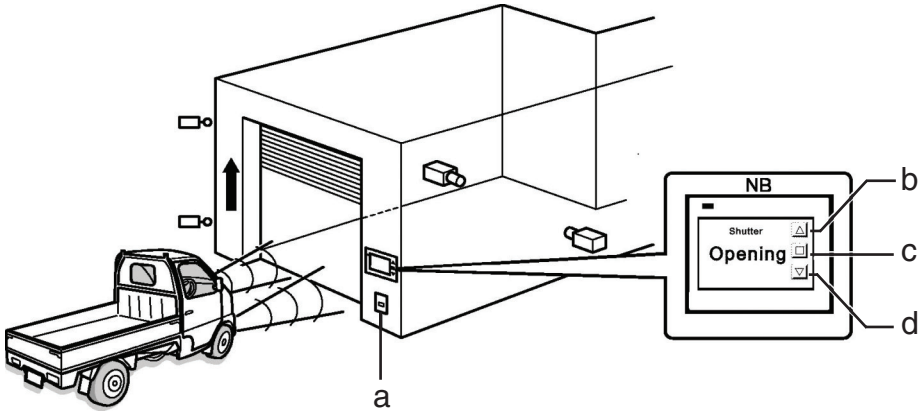
This section takes garage door control as a demonstration system. After NB-Designer is installed, the project file of this demonstration system will be shown in the Start Menu. Click [Sample Screen(NB7)] in the [Start]-[All Programs]-[OMRON]-[NB-Designer]-[Screen Data] to open the demonstration project. Please note that the demonstration project includes macro files, so it can only be edited by running as an administrator in Vista or Win7 systems. Run the NB-Designer as the administrator, and then open the demonstration project in the [project]-[DemoProject_NB7W] file of NB-Designer's installation directory.

● Operation

The demonstration system opens/closes the garage door according to inputs from NB7W and the sensors.

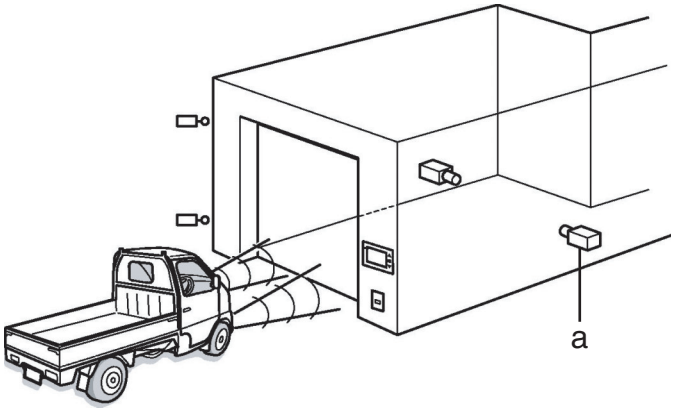


- The garage door opens when the sensors detect three times of flash of headlights within 10 seconds.



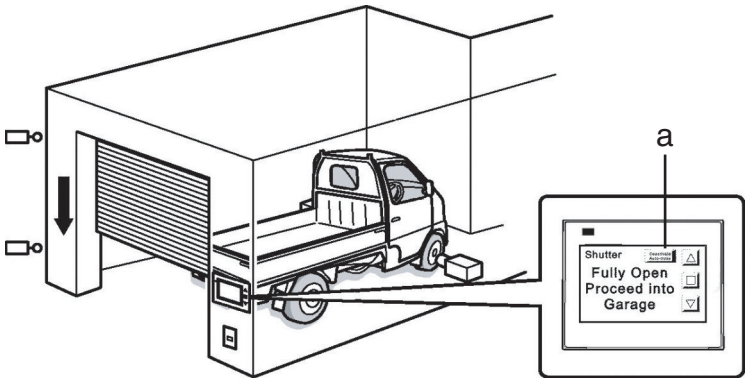
a Light sensor b OPEN switch
c STOP switch d CLOSE switch

- The state of garage door is displayed on NB7W. The open, close or stop operations of garage door can also be controlled by related switches on display device.



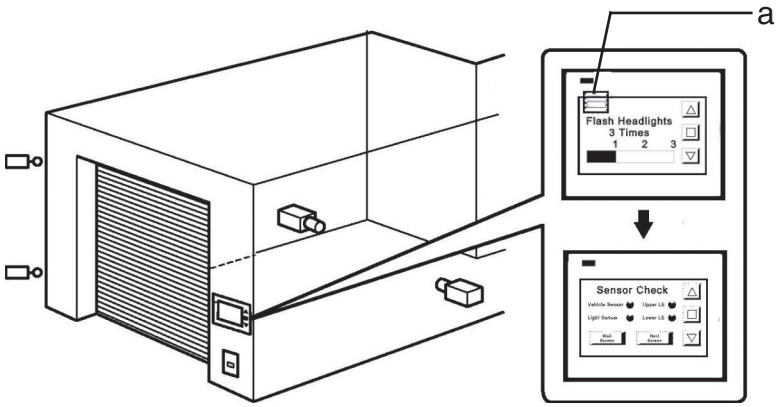
a Vehicle sensor

- The garage door will not be closed before the CLOSE switch is pressed or the vehicle sensor is ON after being fully opened.



a [Deactivate Auto-close] button

- The garage door will be closed when the sensors detect that the entire vehicle is in the garage.
- If [Deactivate Auto-close] button is pressed, the garage door will not be closed even if the vehicle sensor is ON.
- Please control the garage door using related switches on the display device when the vehicle is being driven out of the garage.



a Maintenance button

- NB7W will display maintenance screen for checking input devices when the maintenance button is pressed.

System Components

The following components are used in the garage door control system:

Display device

- NB7W-TW□□B
- XW2Z-200T(PT-PLC connecting cable: 2m)
- XW2Z-500T(PT-PLC connecting cable: 5m)

PLC

- CP1E-N20D□-□ (20-dot I/O type)

Programming device and software

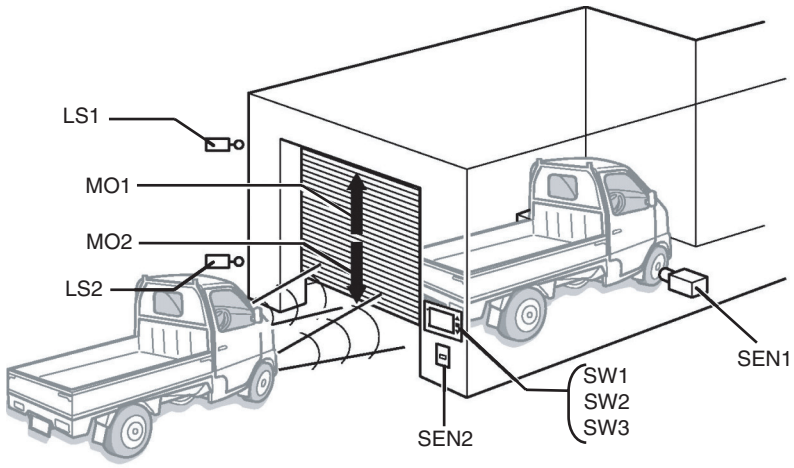
- Personal computer
- USB cable (A-type connector(male) - B-type connector(female))
- NB-Designer Ver1.1X (screen programming tool for NB series)
- CX-Programmer (PLC programming tool)

Input

- OPEN / STOP / CLOSE switches;
  SW1 / SW2 / SW3 (Function Keys on the NB7W screen)
- Vehicle sensor: SEN1
- Light sensor: SEN2
- Limit switch, being ON when the garage door is fully opened: LS1
- Limit switch, being ON when the garage door is fully closed: LS2

Output

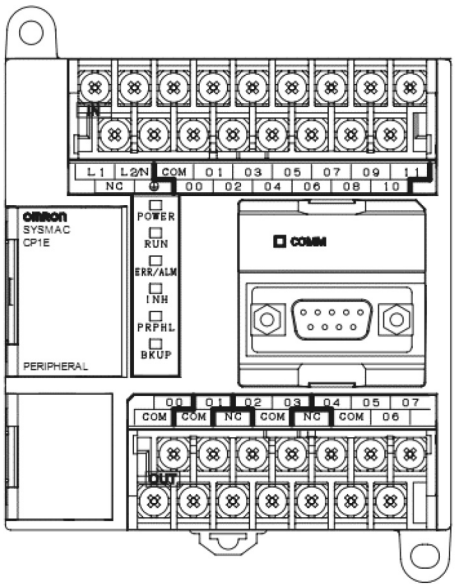
- The contact for activating the motor controlling the door opening: M01
- The contact for activating the motor controlling the door closing: M02



● CP1E

The CP1E is an economical PLC with high performance, which can be ideally used for small-scale manufacturing machines and control systems.

The CP1E-N20D□-□ is shown below:



Please refer to the SYSMAC CP series CP1E CPU Unit User Manual for details on CP1E.

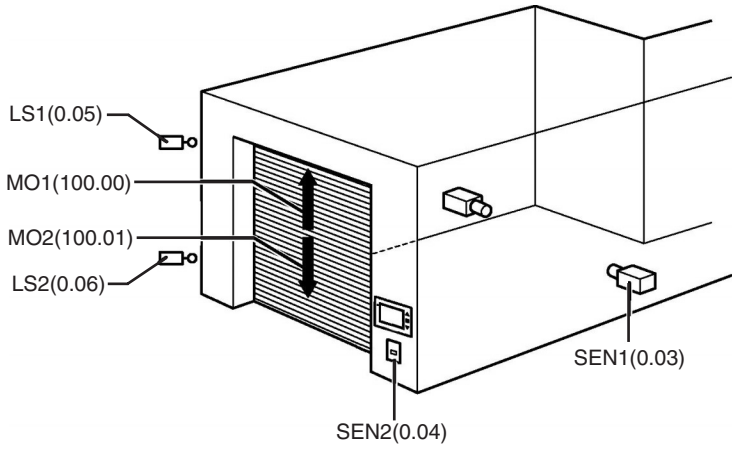
System addresses allocation table

Memory allocation table

Addresses	Function	Component Name	Corresponding Screen
W_bit 0.01	Automatically close (disabled)	Bit State Setting	Fully Open
W_bit 0.02	Start the maintenance screen	Bit State Setting	Wait
W_bit 1.00	Open	Bit State Setting/ Bit State Lamp	All Screens/Check 2
W_bit 1.01	Stop	Bit State Setting/ Bit State Lamp	All Screens/Check 2
W_bit 1.02	Close	Bit State Setting/ Bit State Lamp	All Screens/Check 2
LW.B 10.0	Texts on screen flash	Bit State Lamp	Stop
C_word 0	Counter address	Bar Picture, Number Display	Wait, Check 3
T_word 0	Timer address	Number Display	Check 3
D_word 0	Switch window	PLC Control	-
D_word 11	Output window No.	PLC Control	-
CIO_bit 0.03~0.06	(See the following table)	Bit State Lamp	Check 1

The I/O relays of the PLC are allocated as follows.

Equipments	Contactors	Addresses
Vehicle sensor	SEN1	0.03
Light sensor	SEN2	0.04
Upper limit LS	LS1	0.05
Lower limit LS	LS2	0.06
Motor for opening control (Rise motor)	MO1	100.00
Motor for closing control (Down motor)	MO2	100.01

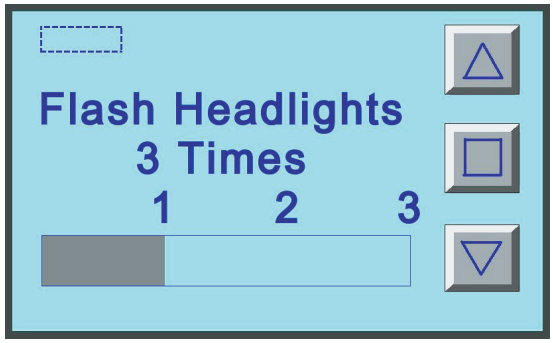


● NB7W Screen

The screens below will be displayed on NB7W.

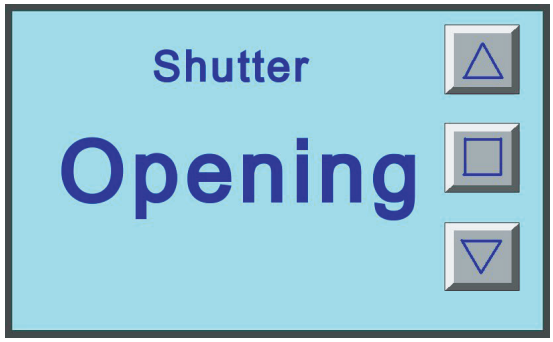
(1) WAIT

The screen will be displayed when the garage door is fully closed. The number of flash of headlights is indicated in the form of Bar Picture. The transparent button on the upper left corner is used for switching to the maintenance screen.



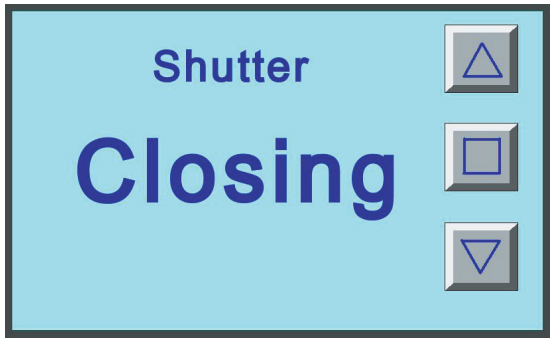
(2) OPEN

The screen will be displayed when the motor for opening control is activated.



(3) CLOSE

The screen will be displayed when the motor for closing control is activated.

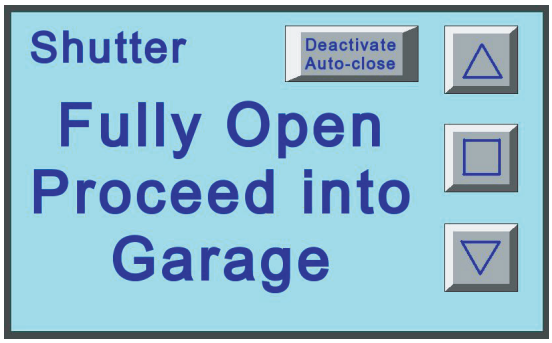


(4) STOP

The screen will be displayed when the STOP switch is pressed.

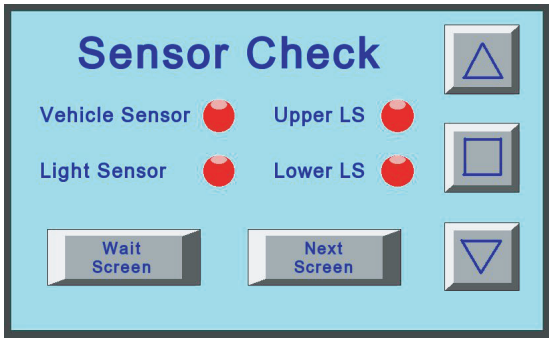
(5) FULLY OPEN

The screen will be displayed when the garage door is fully opened. There is a button for keeping the garage door open.



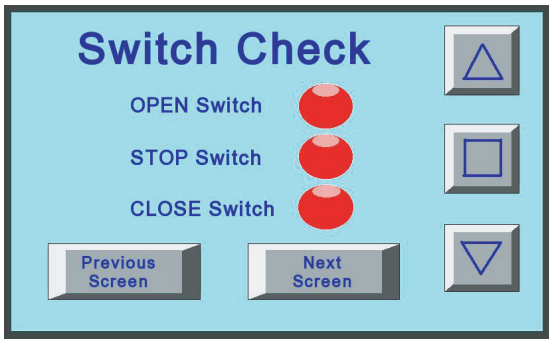
(6) CHECK 1

This screen is used for maintenance by displaying the input states of the sensors. The screen will be displayed when the maintenance button on [1 WAIT] screen is pressed.



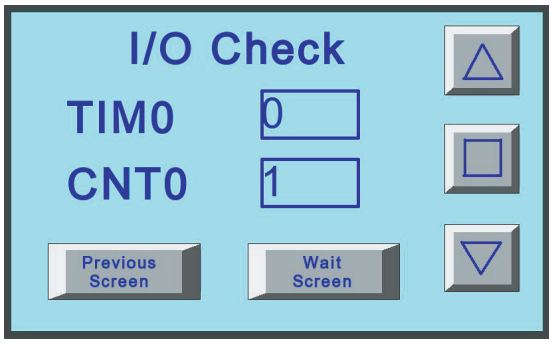
(7) CHECK 2

This maintenance screen can check the operation through displaying the input states of Function Keys.

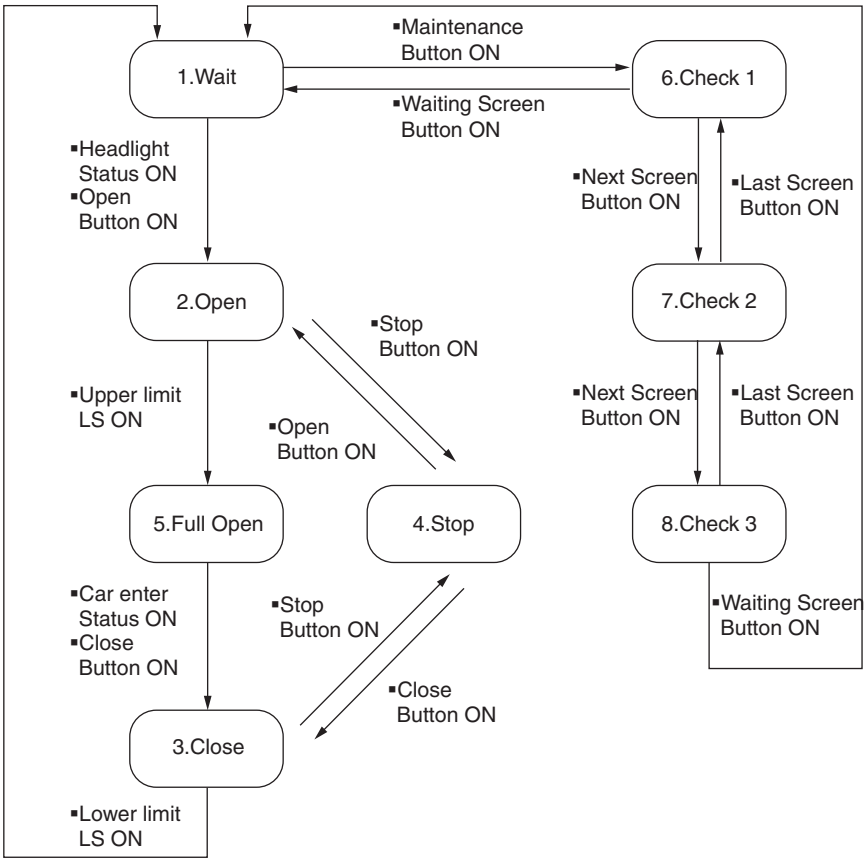


(8) CHECK 3

The current values of the timer and counter (used for counting flash times of headlights)are displayed on this screen which is used for maintenance.



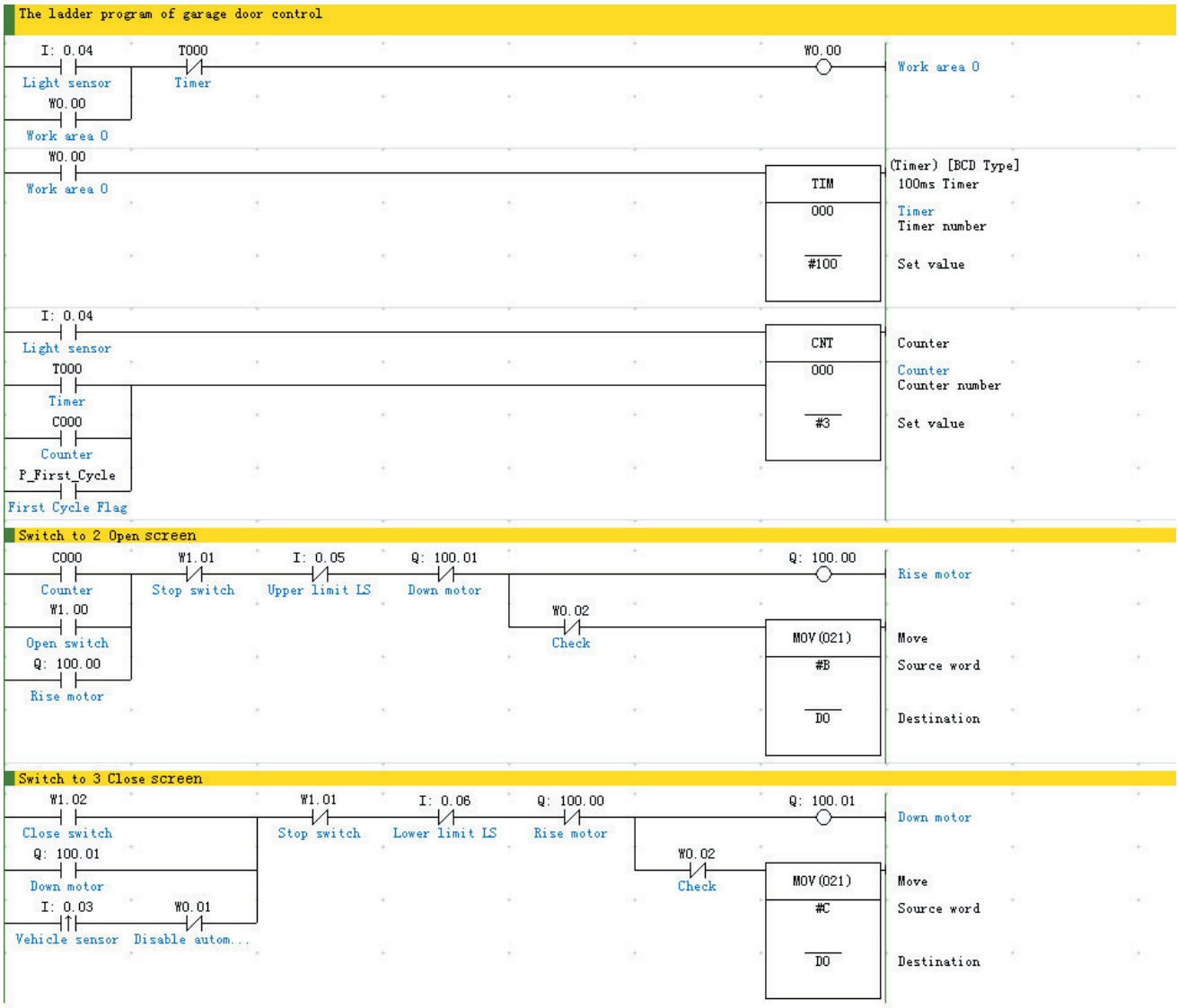
The screen switch flow chart is shown below.

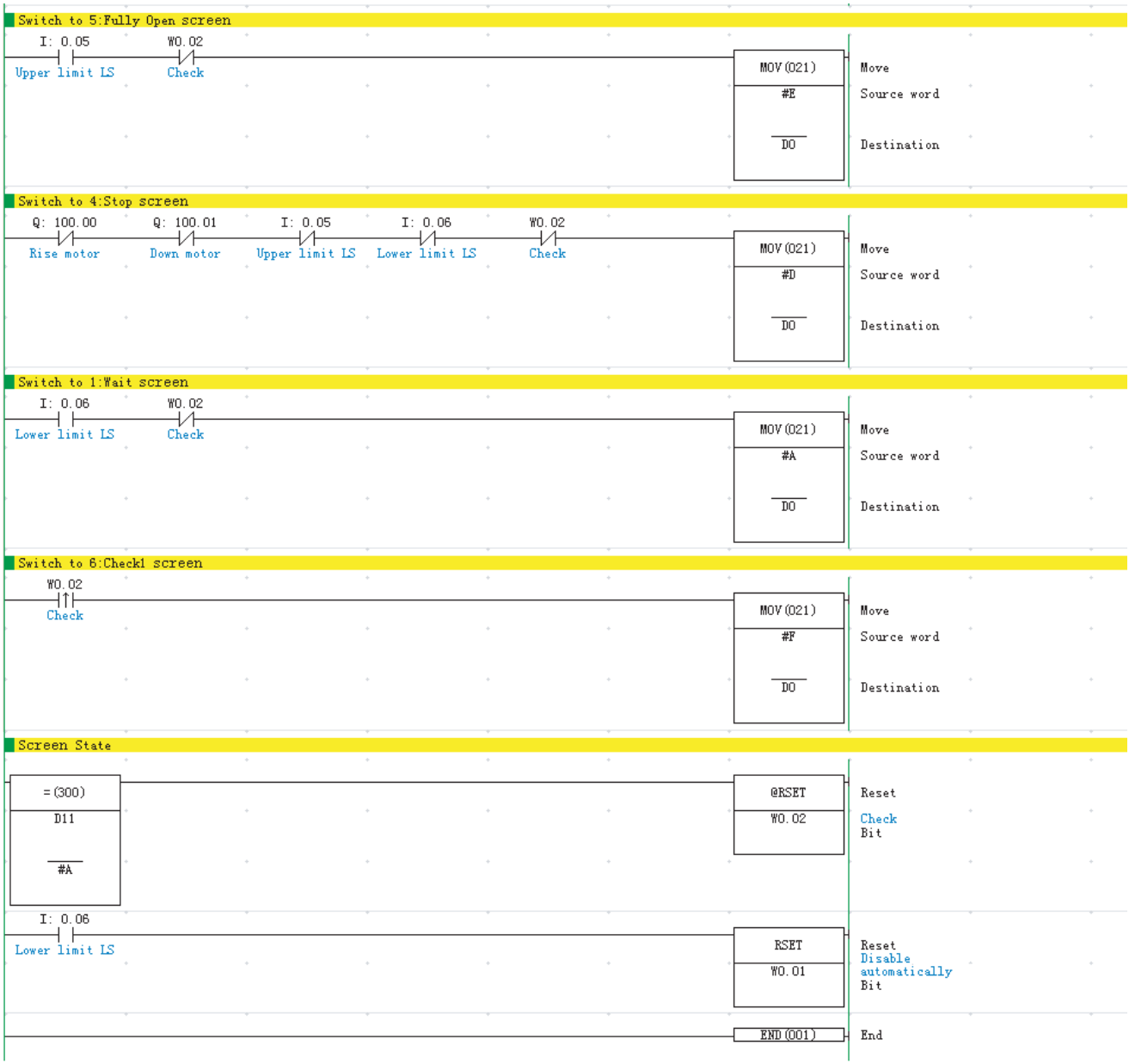


Ladder programs

The ladder program examples are shown below.

Refer to the SYSMAC CP series CP1E Software Manual and SYSMAC CX-Programmer Operation Manual for details on creating ladder programs.




Switch to 5:Fully Open screen
I: 0.05
Upper limit LS
W0.02
Check
MOV(021)
#E
DO
Move
Source word
Destination
Switch to 4:Stop screen
Q: 100.00
Rise motor
Q: 100.01
Down motor
I: 0.05
Upper limit LS
I: 0.06
Lower limit LS
W0.02
Check
MOV(021)
#D
DO
Move
Source word
Destination
Switch to 1:Wait screen
I: 0.06
Lower limit LS
W0.02
Check
MOV(021)
#A
DO
Move
Source word
Destination
Switch to 6:Check1 screen
W0.02
Check
MOV(021)
#F
DO
Move
Source word
Destination
Screen State
=(300)
D11
#A
@RSET
W0.02
Reset
Check
Bit
I: 0.06
Lower limit LS
RSET
W0.01
Reset
Disable
automatically
Bit
END(001)
End

3

Installation and Wiring

This section describes how to install and wire the NB Unit.

3-1 Installation

This section describes the installation environment of the NB Unit and how to mount the NB Unit to the control panel.

When mounting the NB unit onto the operation panel, pay attention to the following precautions.

⚠ WARNING

Always ensure that the personnel in charge confirm that installation, inspection, and maintenance were properly performed for the NB Unit.
"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.

Precautions for Correct Use

- Do not install the Unit 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 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

  Locations subject to splashing oil or chemicals

- Take appropriate and sufficient countermeasures when the product is used in the following locations:

  Locations subject to static electricity or other forms of noise

  Locations subject to strong electric field or magnetic field

  Locations close to power supply lines

  Locations subject to possible exposure to radioactivity

Precautions for Safe Use

When unpacking the NB Units and the peripheral devices, check carefully for any external scratches or other damages. Also, shake the Unit gently and check for any abnormal sound.

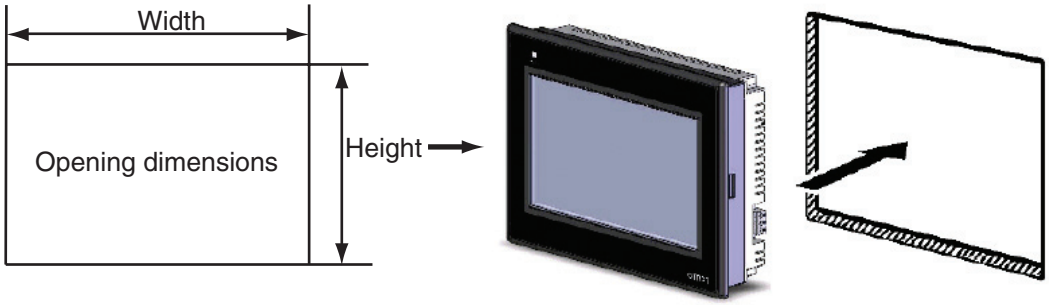
● Mounting NB Unit to Control Panel

Install the NB Unit by embedding it into the operation panel.

Use the panel mounting brackets and Phillips screwdriver installation.

Proceed the installation following the procedures below.

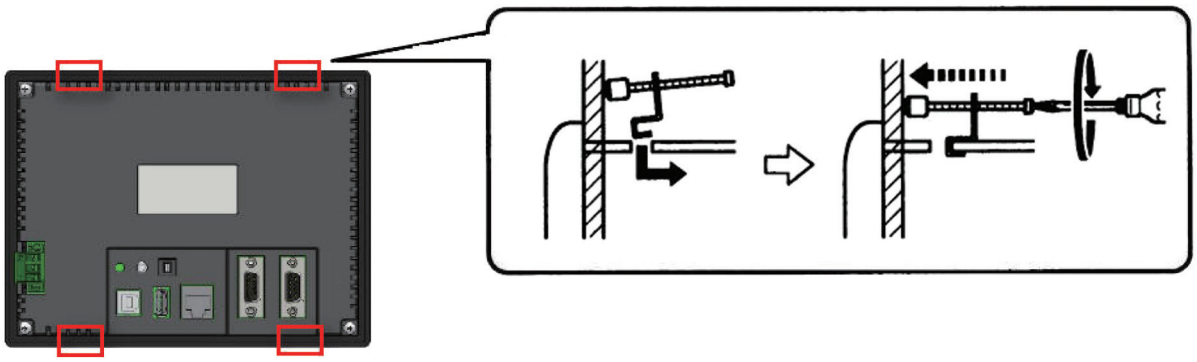
1 Panel cutout with dimensions is shown below. Fit the NB Unit into the panel from the front side.



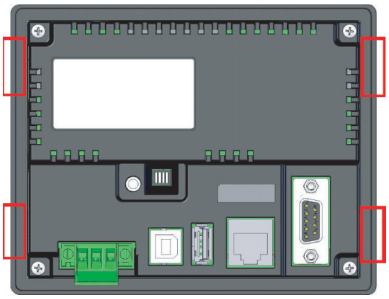
Models	Opening Dimension (W×H mm)
NB3Q-TW00B/TW01B	119.0(+0.5/-0)×93.0(+0.5/-0)
NB5Q-TW00B/TW01B	172.4(+0.5/-0)×131.0(+0.5/-0)
NB7W-TW00B/TW01B	191.0(+0.5/-0)×137.0(+0.5/-0)
NB10W-TW01B	258.0(+0.5/-0)×200.0(+0.5/-0)

2 As follows, insert the panel mounting brackets at the locations indicated by red box around the back of the NB Unit. Insert the hooks of positioners into the square holes on the Unit to hold the fixators properly, and tighten the screws firmly with the screwdriver.

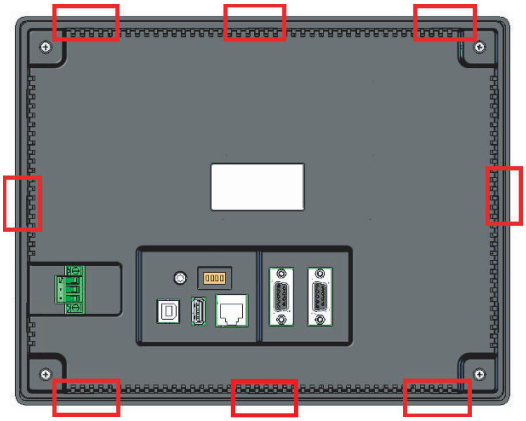
● NB5Q/NB7W-TW□□B



● The insert positions on the body of NB3Q-TW□□B/NB10W-TW01B (same fixing method as above)



NB3Q -TW□□B



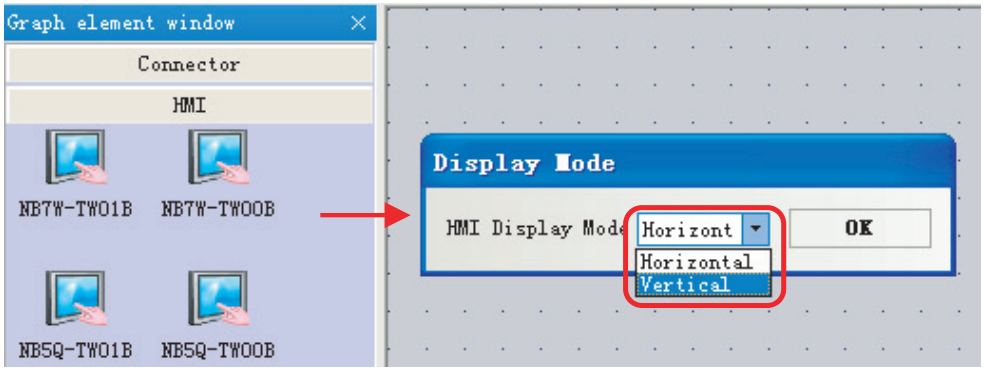
NB10W -TW□□B

Precautions for Safe Use

- Do not let metal particles enter the Units when preparing the panel.
- The mounting panel must be between 1.6 and 4.8 mm thick. Tighten the Mounting Brackets evenly to a torque of between 0.5 and 0.6 N·m to maintain water and dust resistance. If the tightening torque exceeds the specified value, or the tightening is not even, deformation of the front panel may occur. What is more, make sure the panel is not dirty or warped and that it is strong enough to hold the Units.

● Display Mode of NB Series touch panel

NB Series touch panel has 2 display modes: horizontal and vertical.
The display mode can be selected when dragging a HMI from the Graph element window into the Construct Window.



Horizontal display

Vertical display

3-2 Equipment Wiring

This section describes the wiring of the NB Unit and CP1E.

Power Supply

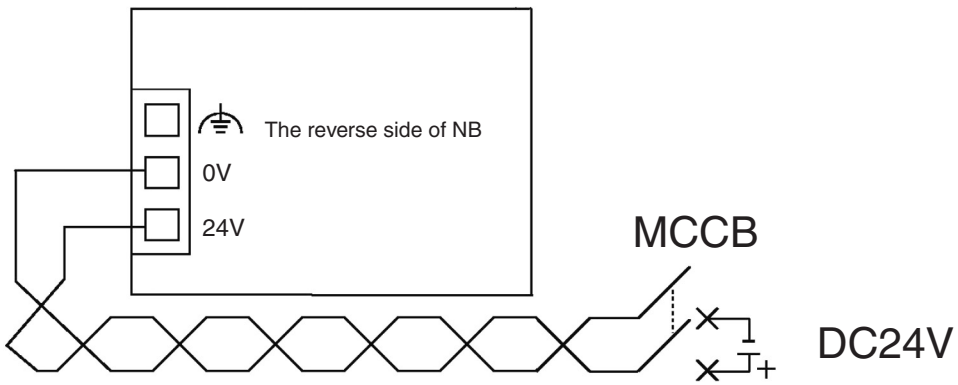
Precautions for Safe Use

- Do not connect an AC power supply to the DC power terminals.
- Use a DC power with a slight voltage fluctuation and that will provide a stable output even if the input is momentarily interrupted for 10 ms.
  Rated Power Supply Voltage: DC 24 V (Allowable range DC 20.4 ~ 27.6 V)

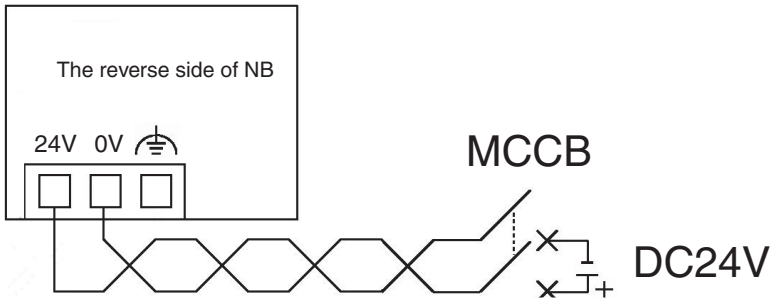
The connectable power supply specifications are as follows: figure out a suitable power supply specification so as to satisfy the requirement for power supply capacity.

Models	Rated Voltage	Allowable Voltage Range	Power
NB3Q-TW00B	DC24V	DC20.4V to 27.6V	5W
NB3Q-TW01B			9W
NB5Q-TW00B			6W
NB5Q-TW01B			10W
NB7W-TW00B			7W
NB7W-TW01B			11W
NB10W-TW01B			14W

- **NB5Q/NB7W/NB10W-TW□□B**



- **NB3Q -TW□□B**



Precautions for Safe Use

- Making the connection by using terminal screws crimping on a twisted-pair cable with a crimping range of 12~26 AWG, and only 6.5 mm of insulation peel of the cable needs to be peeled off. Tighten the terminal screws at a torque of between 0.3 and 0.5 N·m. Make sure the screws are properly tightened.

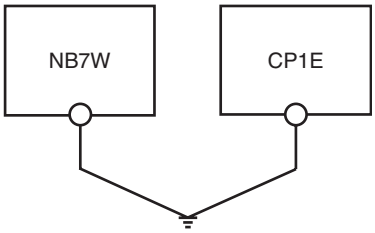
Grounding

The NB unit has a functional earthing terminal (⏚).

Arrange the wiring according to the following conditions.

1 When a potential difference occurs between the NB Unit and the host, arrange the earthing as illustrated. If the distance is too long to realize a single-point earthing, do not ground the earthing terminal of the NB Unit.

2 When the NB Unit, and noise source equipments such as motors and inverters, etc. are installed on the same panel, do not ground the earthing terminal of the NB unit.



Precautions for Safe Use

To prevent malfunctions caused by noise, ground the Unit correctly.

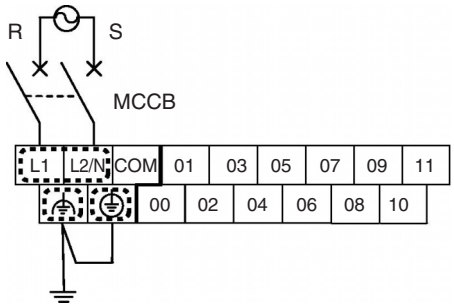
CP1E Wiring

This section provides a CP1E grounding example.

Please refer to the SYSMAC CP series CP1E CPU Unit User Manual for details on CP1E.

● Power Connection and Grounding

Connect power and ground wires to terminal blocks.

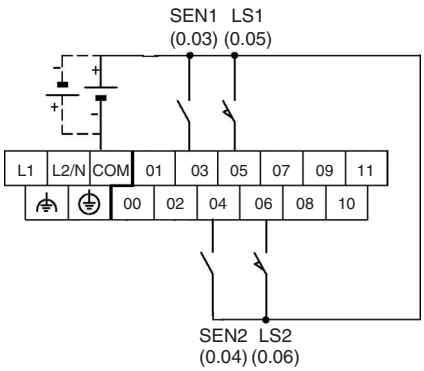


Note Tighten the AC power cable to the terminal block at a torque of between 0.3 and 0.5 N·m. Loose screws may occasionally result in fire or failure.

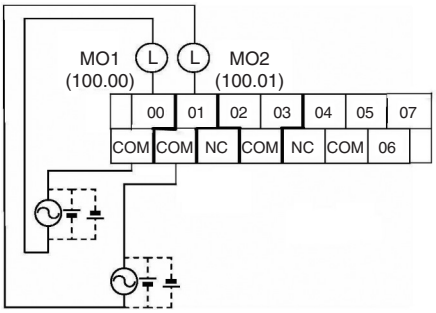
● Connecting I/O Devices

Connect I/O devices to the terminal block.

Input



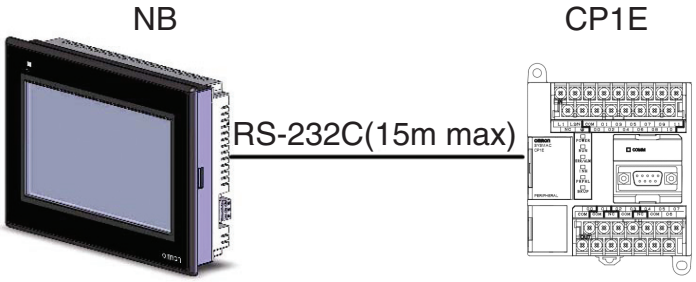
Output



Connecting NB Unit and CP1E

Execute One-to-one connection between the Host (PLC) and the NB Unit.

Connect CP1E and NB7W with a PT-PLC connecting cable (XW2Z-200T).



Note Please use OMRON PT-PLC connecting cable. Using other cables may result in failure.

Precautions for Safe Use

- Always keep the connector screws firmly tightened after the communication cable is connected.
- The maximum tensile load for cables is 30 N. Do not apply loads greater than this.
- Turn OFF the power supply before connecting or disconnecting cables.

4

Screen Creation

This section describes how to create a demonstration project through NB-Designer.

4-1 Starting NB-Designer

This section describes how to start NB-Designer.

NB-Designer is a programming tool (software) for creating screens displayed on NB7W.

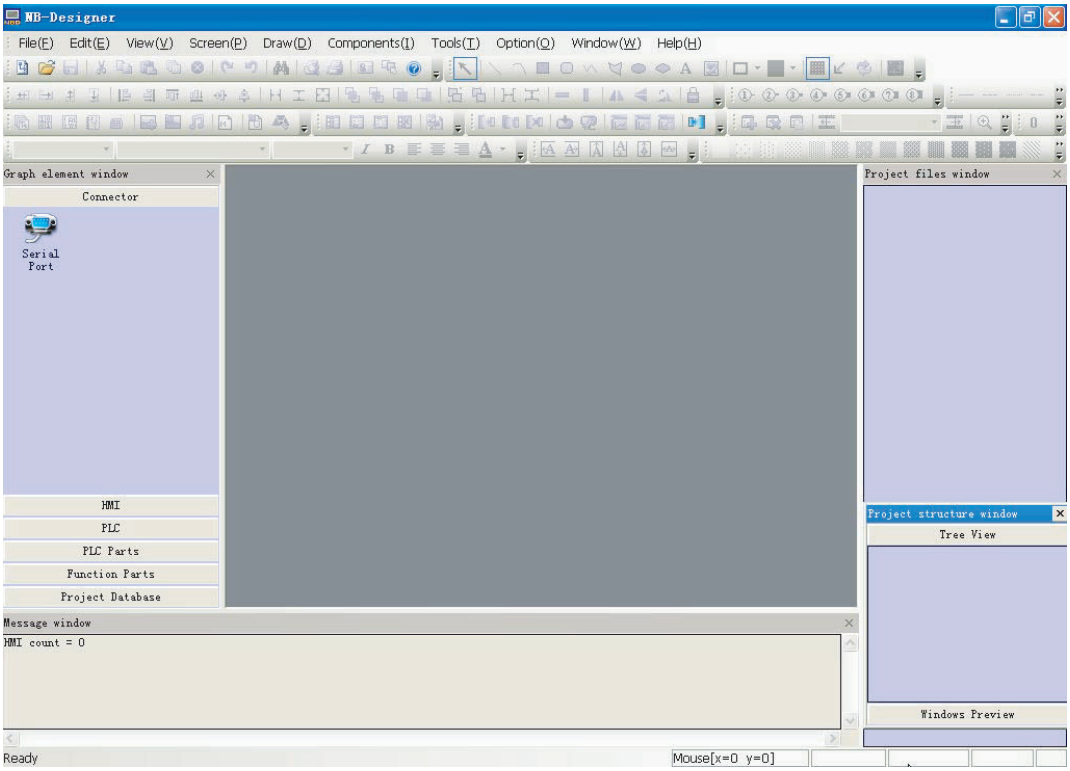
Select [Start]-[All Programs]-[OMRON]-[NB-Designer_enu]-[NB-Designer_enu].

Starting NB-Designer.

The startup can also be realized by clicking the shortcut icon  on the desktop.

(Note: When using Vista/Win7 systems, run the NB-Designer as an administrator.)

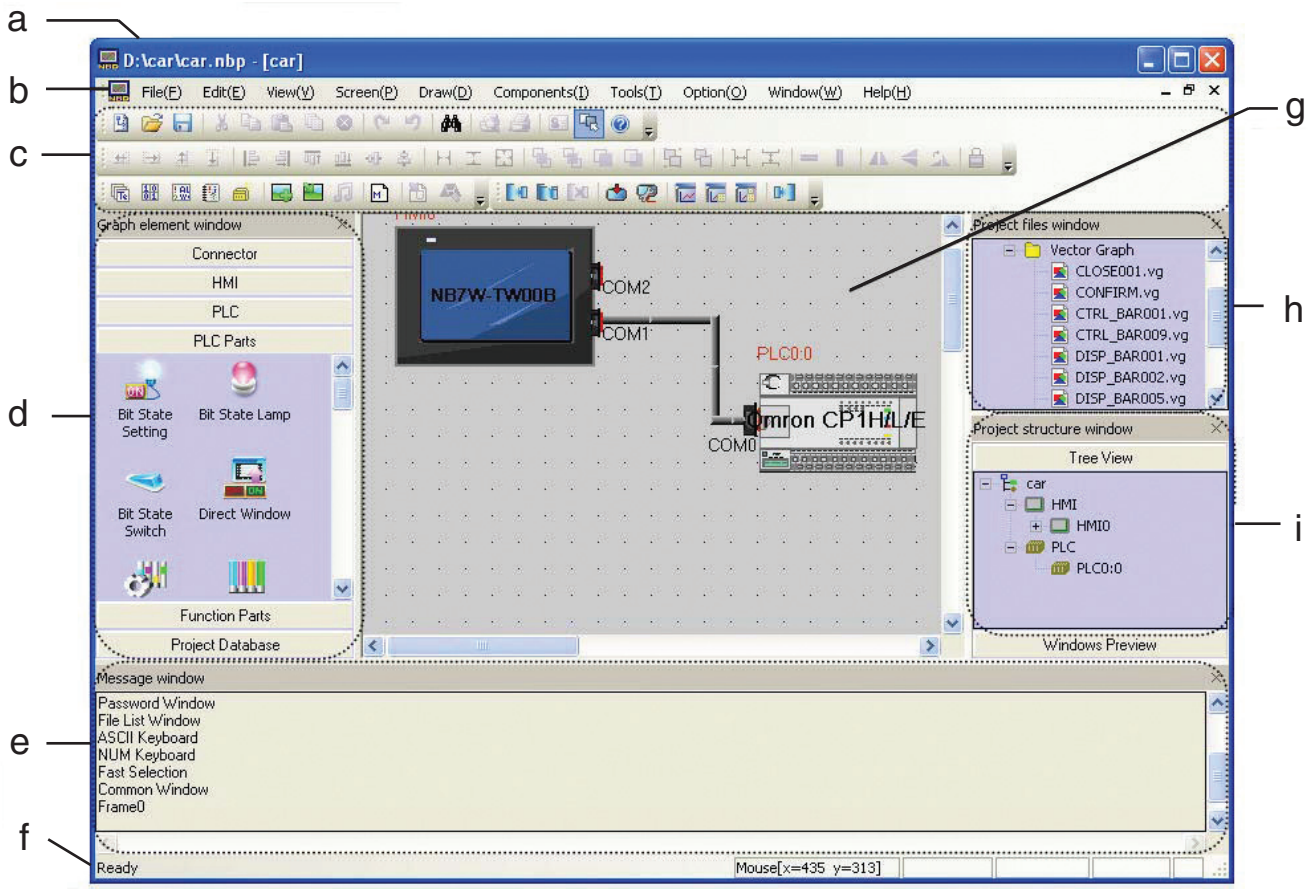
The main window will be displayed after starting NB-Designer completely.



Note Please refer to the NB-Designer Operation Manual for details of NB-Designer, such as the operating environment, installation and operation.

4-2 Main Window of NB-Designer

This section describes the functions of each part of the main window of NB-Designer.



(a) Title Bar

Indicating the names of applications.

(b) Menu Bar

Classifying the functions of NB-Designer in groups. Grouping functions are indicated in the form of pull-down menu.

(c) Toolbar

Displaying icons for common functions. The function names will be indicated when the cursor is put on related icons. The toolbar contains sub-toolbars for basic functions, such as drawing, position, system, page up/down, database, compilation and debugging, etc.

(d) Graph Element Window

The Graph Element Window contains: Communication Connection, HMI, PLC, PLC Parts, Function Parts and Project Database.

(e) Message Window

Displaying the compilation process of a project and providing compilation error information.

(f) State Bar

Displaying information such as the current cursor position, the width/height of the target object and the editing state, etc.

(g) Design Window

The window is used for designing images and setting the communication method between the HMI and PLC.

(h) Project Files Window

The Window adopts a tree structure to show the correlations between the project-related touch panel and macro files & BMP files.

(i) Project Structure Window

The Window adopts a tree structure chart to show the relations of the PLC, HMI, internal windows and components of the HMI in the whole project.

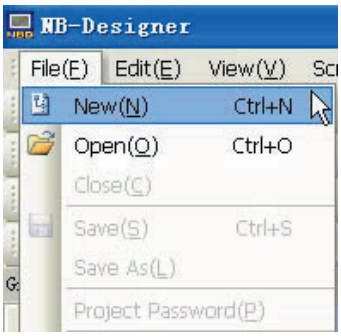
4-3 Creating Project

This section describes how to configure settings of NB7W operations and create targets effectively. The date created through NB-Designer are regarded as “Project”.

Creating New Project

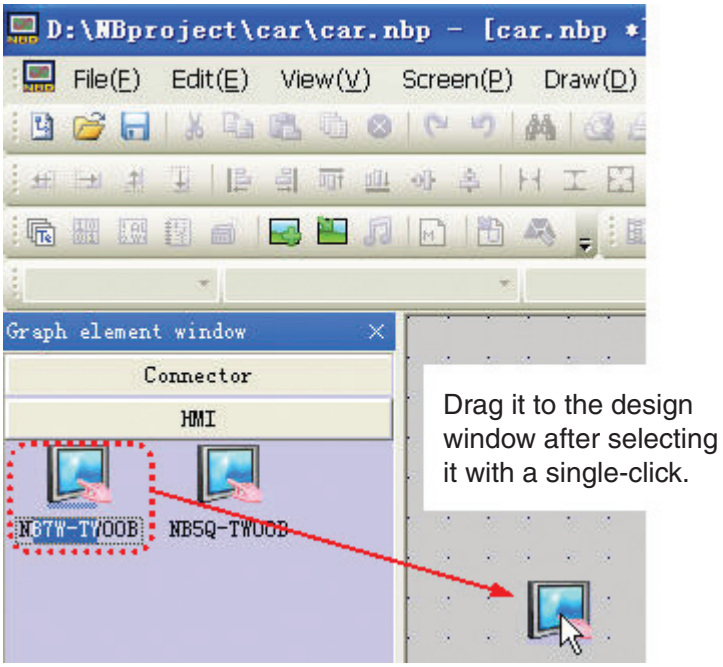
Project creation should be started with setting the configuration plan when using NB-Designer the first time.

1 Select [File]-[New] from the main menu. The [New Project] dialogue border will pop up.



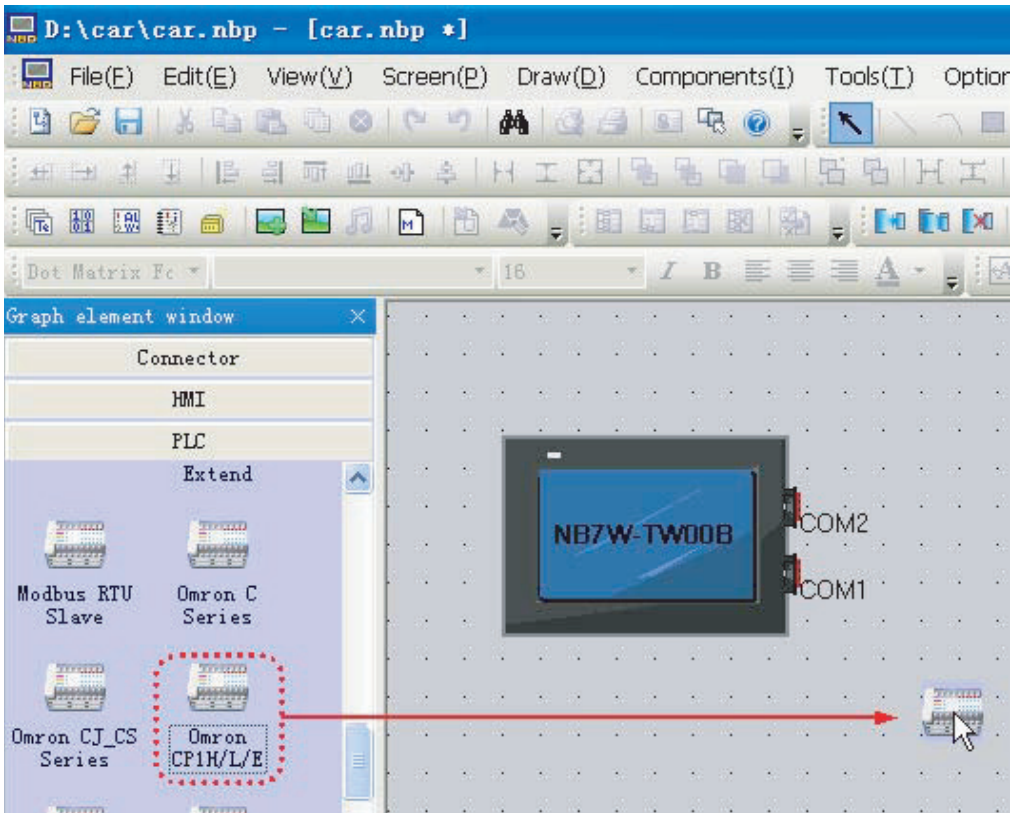
2 Select [NB7W-TW00B] from [HMI] Element Library, drag HMI to the design window after selecting it with a single-click.

Select “horizontal” for HMI display Mode.

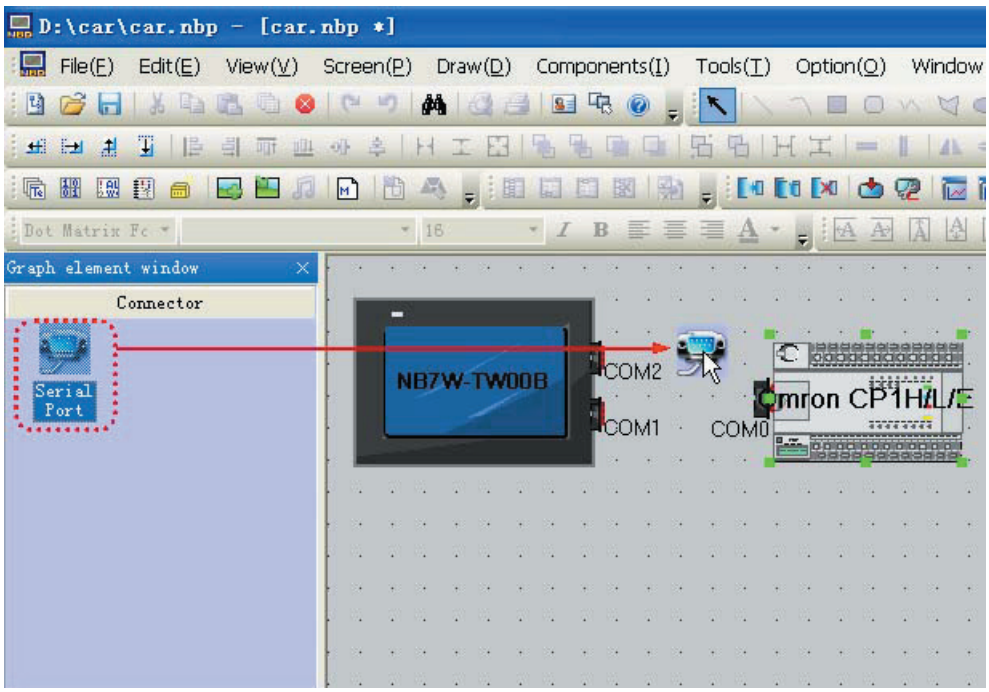


Note This project can also be made by using HMI of NB7W-TW01B with the same method used for NB7W-TW00B.

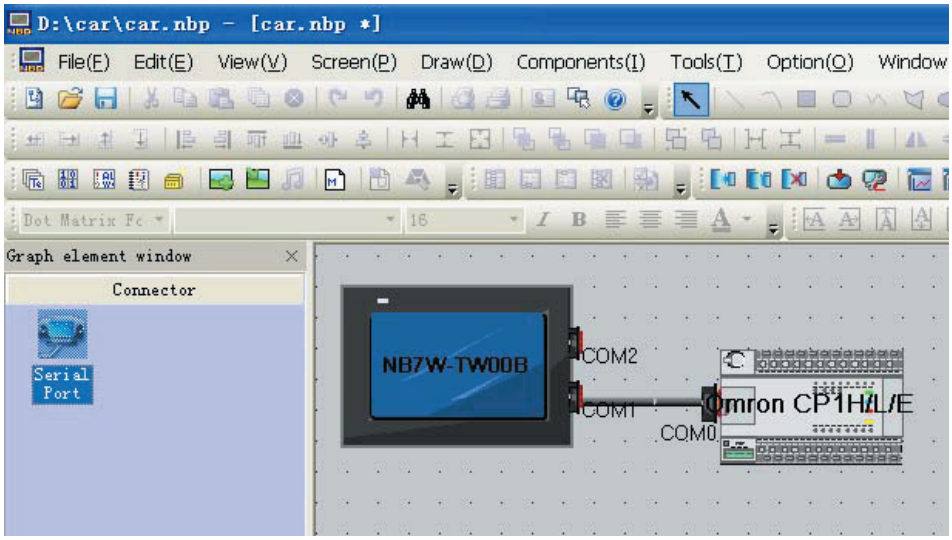
3 Select [Omron CP1H/L/E] from [PLC] Element Library, drag PLC to the design window after selecting it with a single-click.



4 Select [Serial Port] from [Connector], drag it to the design window after selecting it with a single-click.

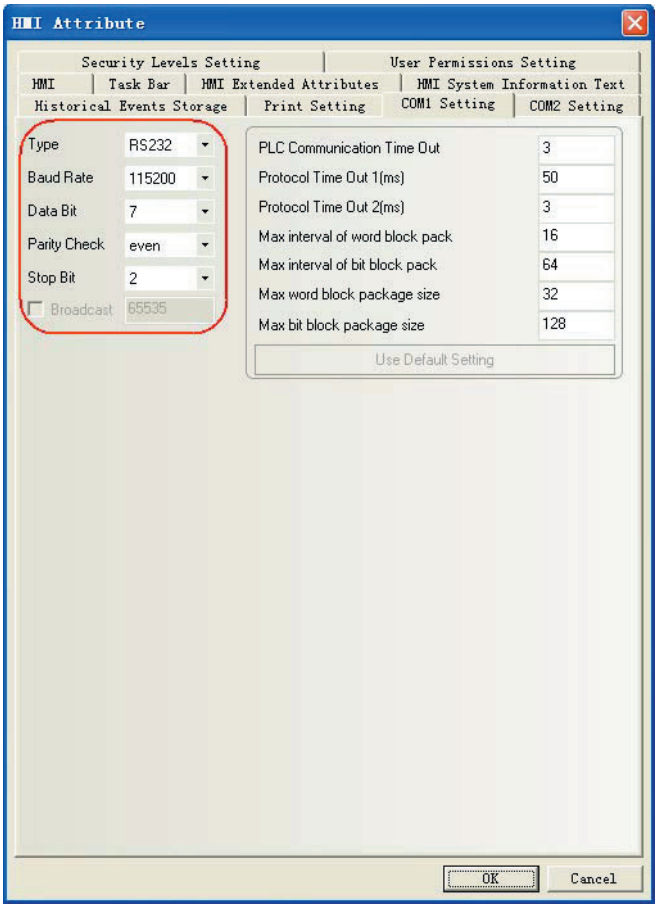


5 Adjust the positions of HMI and PLC on the design window to connect serial communication cables to COM1 of HMI and COM0 of PLC.

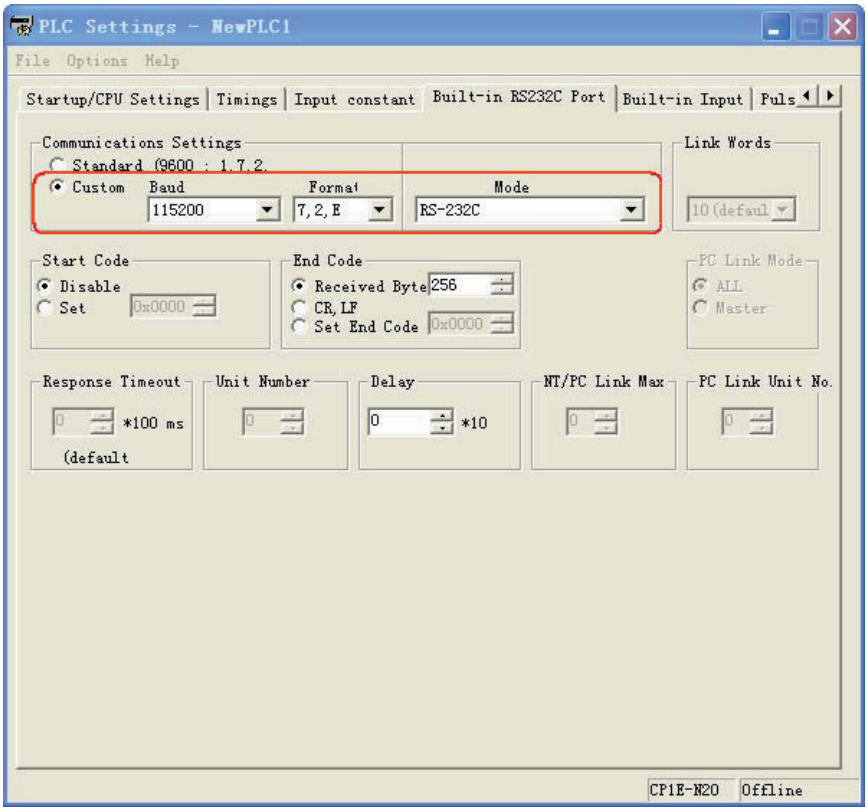


Communication Setting

1 Click the project name on the project structure window and the connecting diagram of HMI and PLC appears. Then double-click the HMI and “HMI Attribute” window pops up, select “COM1 Setting” page and set the communication mode to “RS232, 115200, 7, Even Parity Check, 2”. Click OK button and the settings of the communication mode of HMI COM1 are completed.



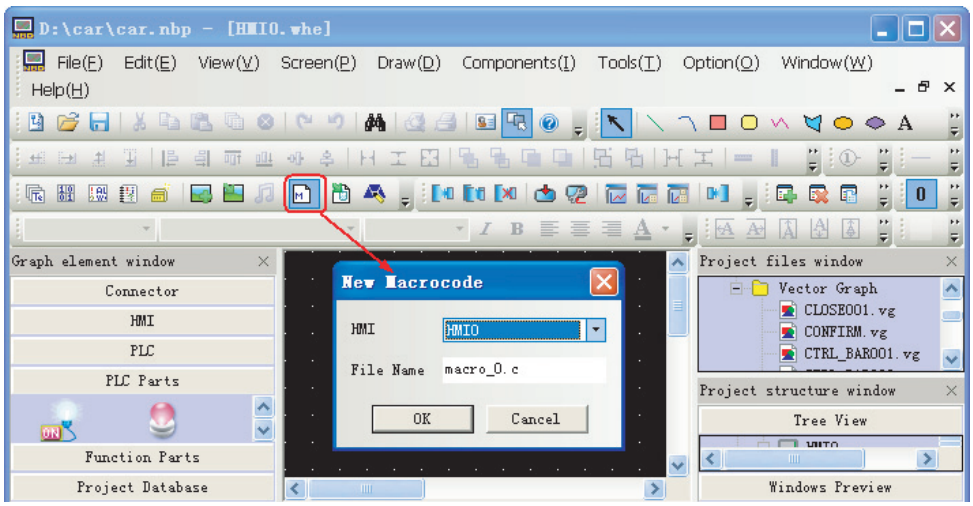
2 To setting the PLC: In “CX-Programmer” open the project, in project workspace select [PLC Settings]. Be sure to set the communication mode of PLC [Built-in RS232C Port] to “RS232C, 115200, 7, Even Parity Check, 2”.



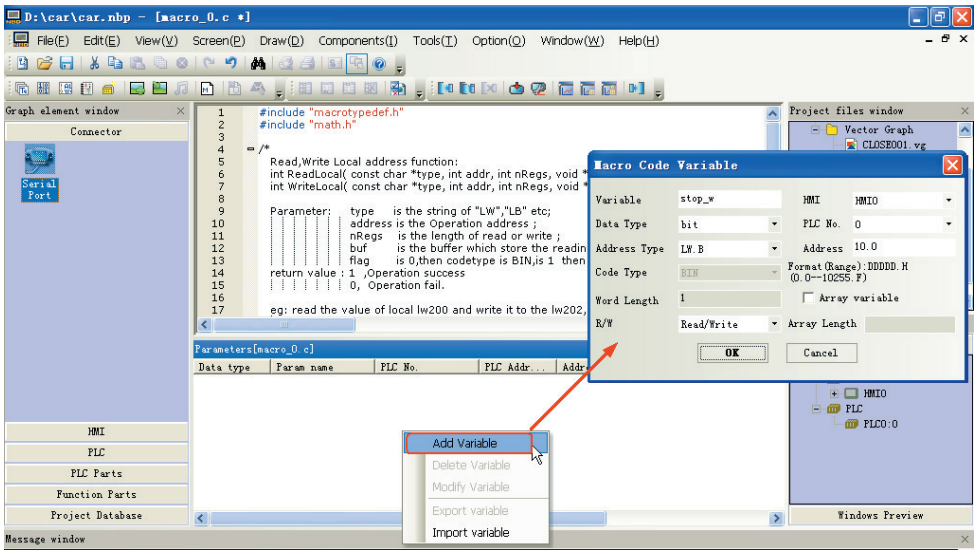
Creating Macro

This project uses Macro files to initialize the addresses of LW.B 10.0 to 1, thus initializing the Bit State Lamp on the [Stop] screen.

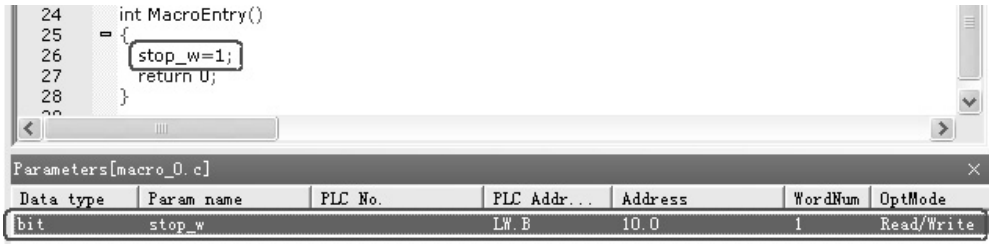
1 User could establish a macro file with the icon through the menus or toolbar.



2 Then a macro code edit window will appear, use single right click in the “Parameters” window, select “Add Variable”, a “Macro Code Variable” window will open, user can define variable parameter with it.



3 After click “OK” there is a new parameter added in the “Parameters” window, it can be used in macro program as a defined variable.

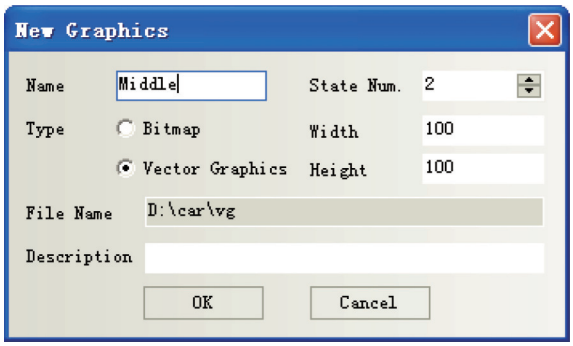


Please refer to *3-9 Macro Function* in the *NB-Designer Operation Manual* for details.

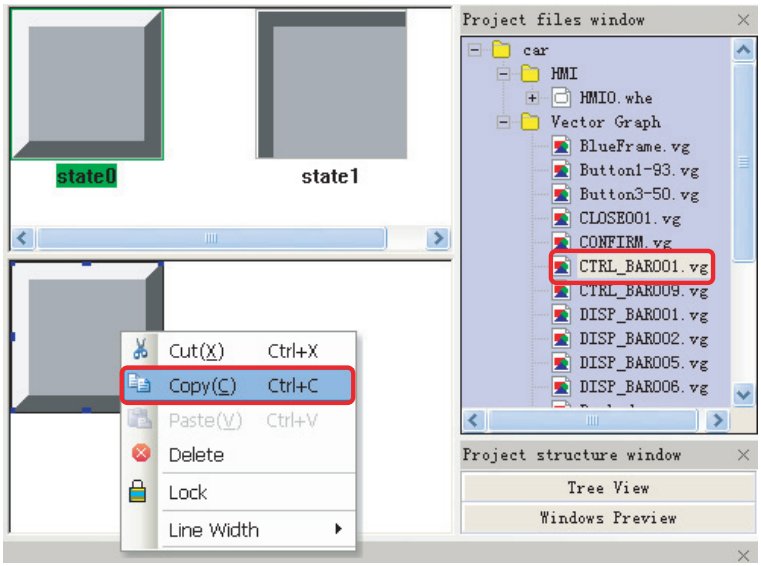
Creating Vector Graphics

With powerful vector graphics and bitmap libraries function in NB-Designer, users can create any graphics such as switches, lights or tubes at will. Each vector graphic or bitmap contains 256 states. Users can make the vector graphics in the system as templates, copy them into the new created vector graphics, and then add lines, boxes, words etc. for them to generate the new vector graphics.

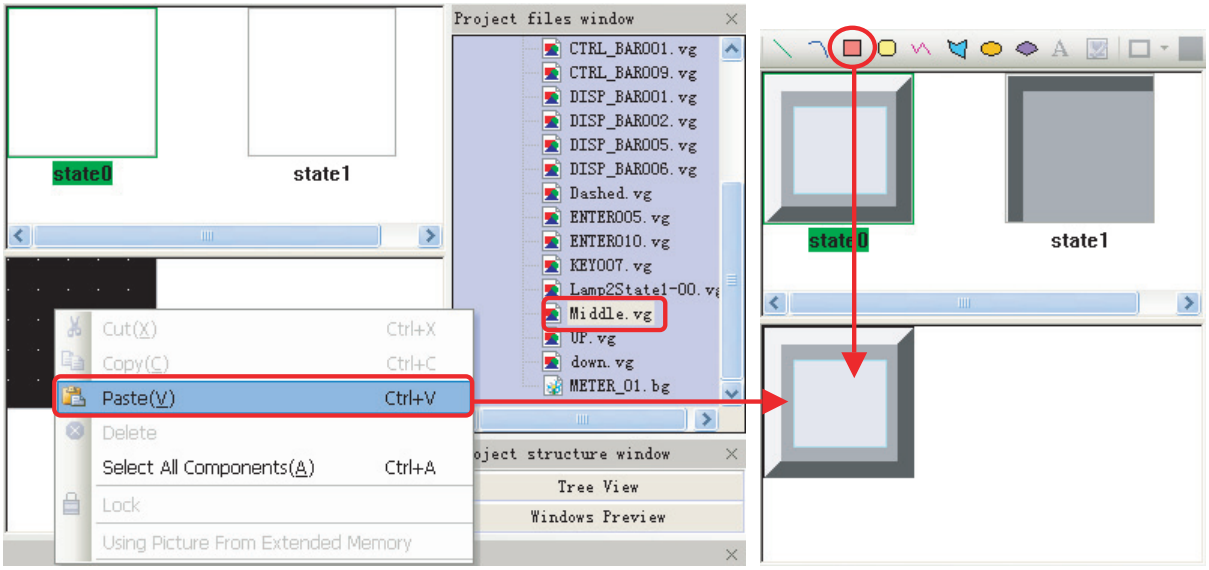
1 Select [Draw]-[New Graphics] from the main menu. The [New Graphics] window will appear.



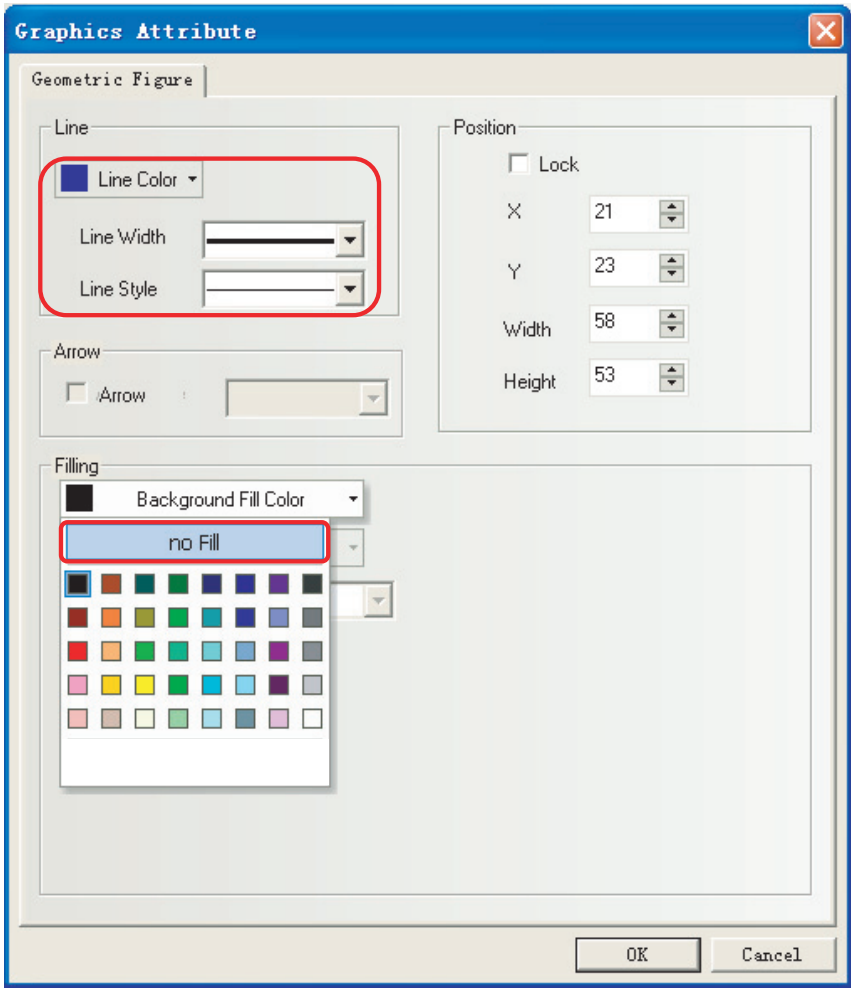
2 After create a new graphic, select “CTRL_BAR001.vg” in the project files window, select “state0” and right single click graph below and select “Copy”.



3 Then select “Middle.vg” graphics, and copy the graphics to be copied into it. Copy the “state1” into the graphics by the same method, and then select “Rectangle” in the toolbar to draw it into the graphics.

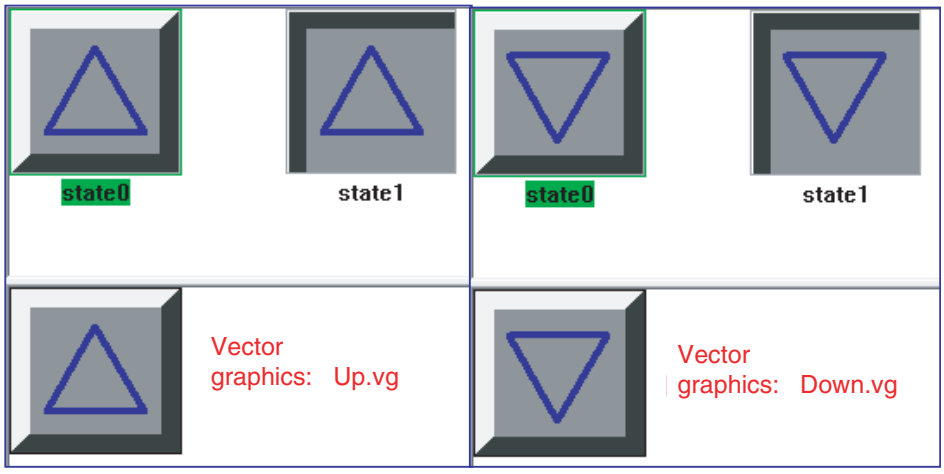


4 Then make the settings in the “Graphics Attribute” dialog box to the geometric figures, as shown below:

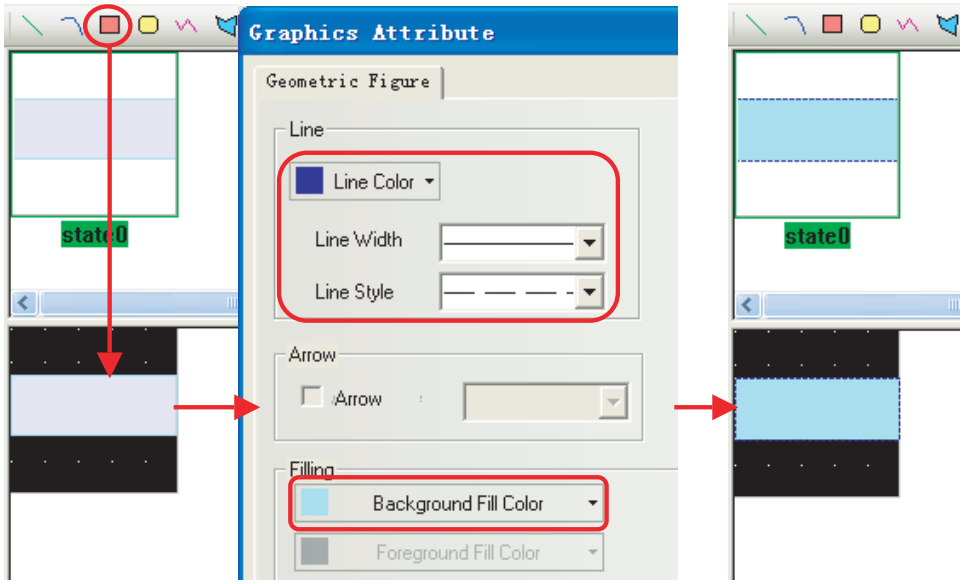


Note Please save the project after the completing the creation of vector graphics.

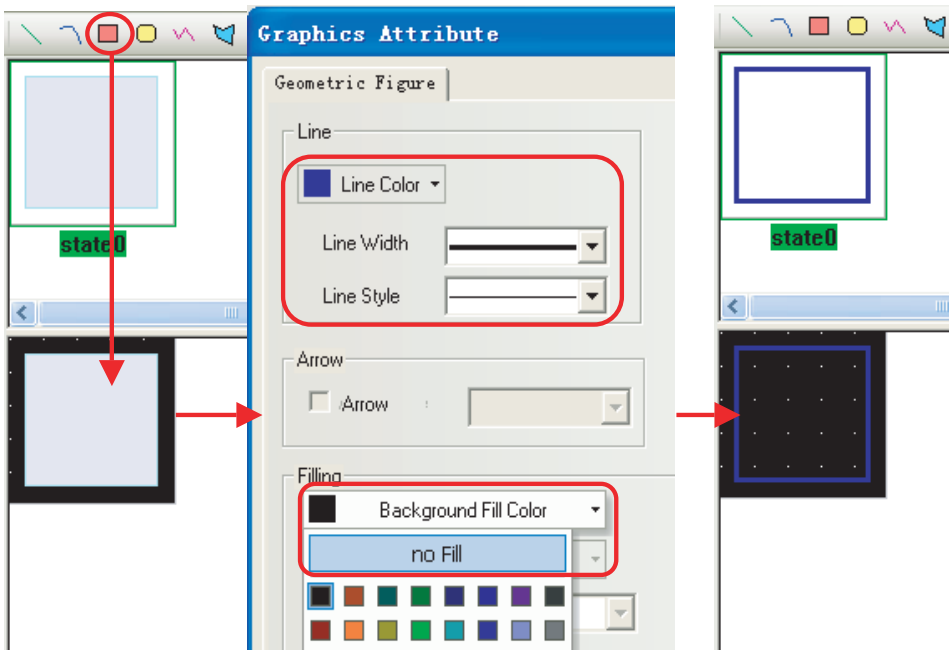
5 Please create the vector graphics “Up.vg” (an upward hollow triangle) and “Down.vg” (a downward hollow triangle) referring to the above-mentioned method.



6 Create a vector graphics “Dashed.vg”: first add a light cyan rectangle into the graphics, and then make the related settings in the “Graphics Attribute” dialog box, as shown below:



7 Create a vector graphics “BlueFrame.vg”: first add a blue hollow rectangle into the graphics, and then make the related settings in the “Graphics Attribute” dialog box, as shown below:



4-4 Screen Creation

This part describes how to create screens displayed on NB7W.

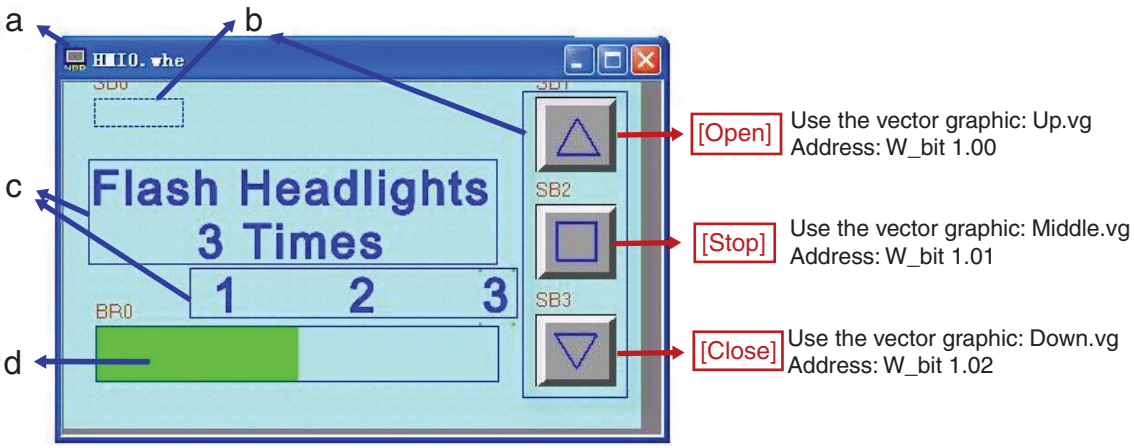
[1 Wait]

[1 Wait] is the first display screen in the garage door control system. The screen will be displayed with the lower limit LS ON.

Configure functions below:

- Bar Picture component, indicating numbers of flash of headlights detected in forms of graphics.
- Bit State Setting components, allocated to [Open], [Stop] and [Close] garage door operations respectively.
- Bit State Setting component, for accessing the maintenance screen. The component turns ON when the button is pressed for 3 seconds.

The whole screen is shown below. The following objects must be created and configured:

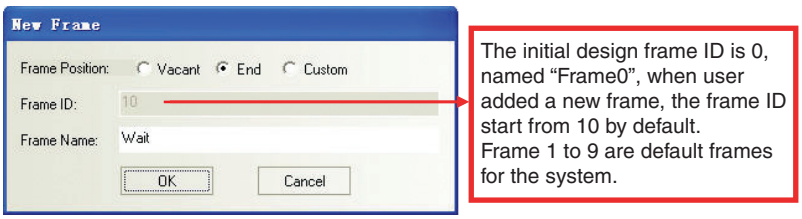


a Screen b Bit State Setting components c Texts d Bar Picture component

● Screen

Start the following procedures after the NB7W operation is set.

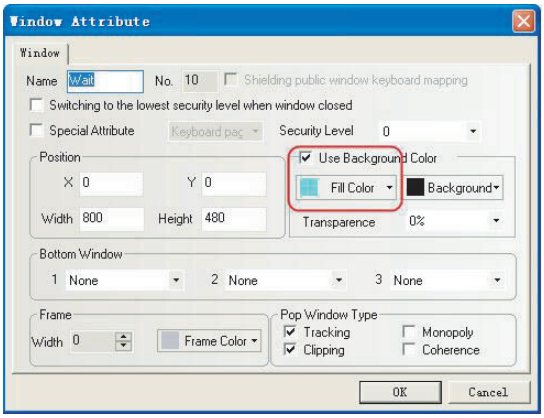
1 Select [Add Window]  from the toolbar. Input “Wait” at the window name area.



User should use this method to create totally 7 frames for this project, the frames ID and names are listed as below:

Frame ID	Frame Name
10	Wait
11	Open
12	Close
13	Stop
14	Fully Open
15	Check1
16	Check2
17	Check3

2 Double-click “Wait” window to eject [Window Attribute], select “User Background Color” and set “Fill Color” to “lightCyan”.



● Bit State Setting Component

1 Bit State Setting component for switching to the maintenance screen

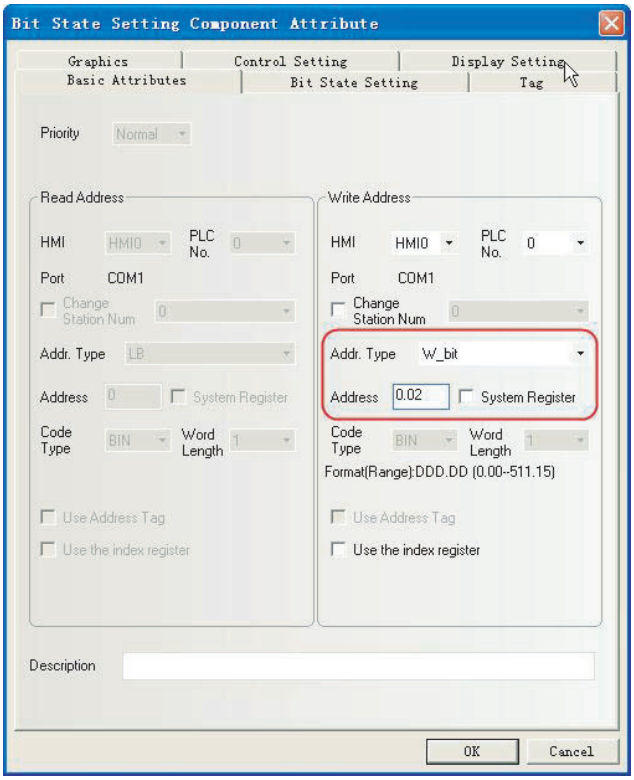
The Bit State Setting component on the upper left corner is used for switching to the maintenance screen ([6 Check 1] screen).

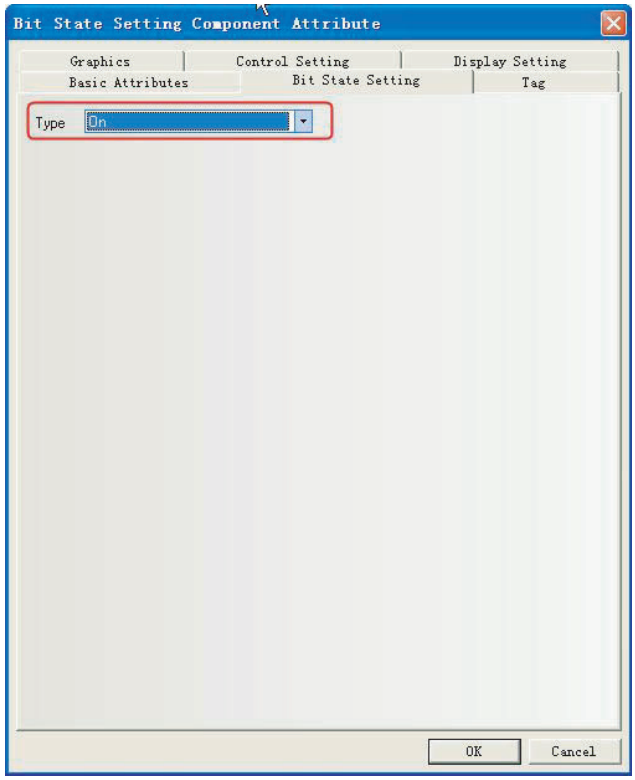
Function: The ladder programs of CP1E will switch the screen to [6 Check 1] after pressing it to set W0.02 to be ON. The Function Key is set transparent and will not function until being pressed for 3 seconds for the purpose of avoiding being pressed accidentally.

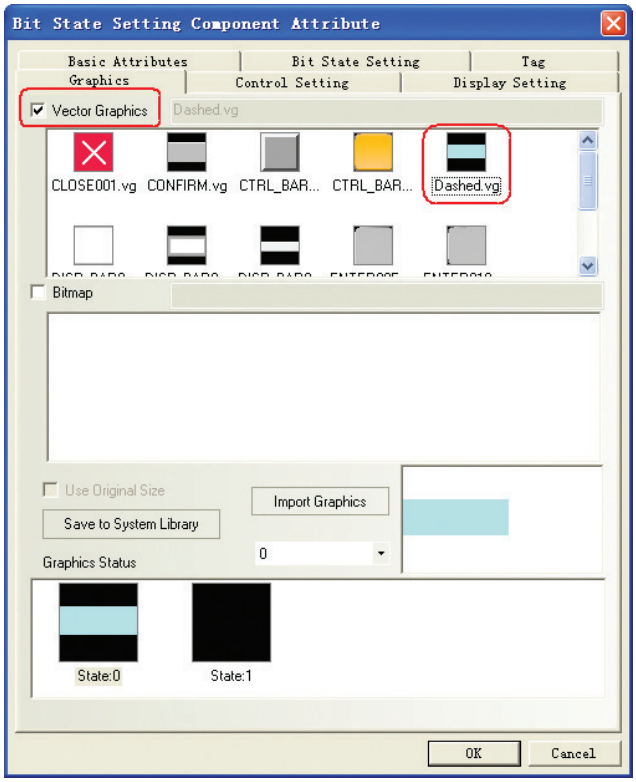
Select [Bit State Setting component] from [PLC Parts], drag it to the design window after selecting it with a single-click.

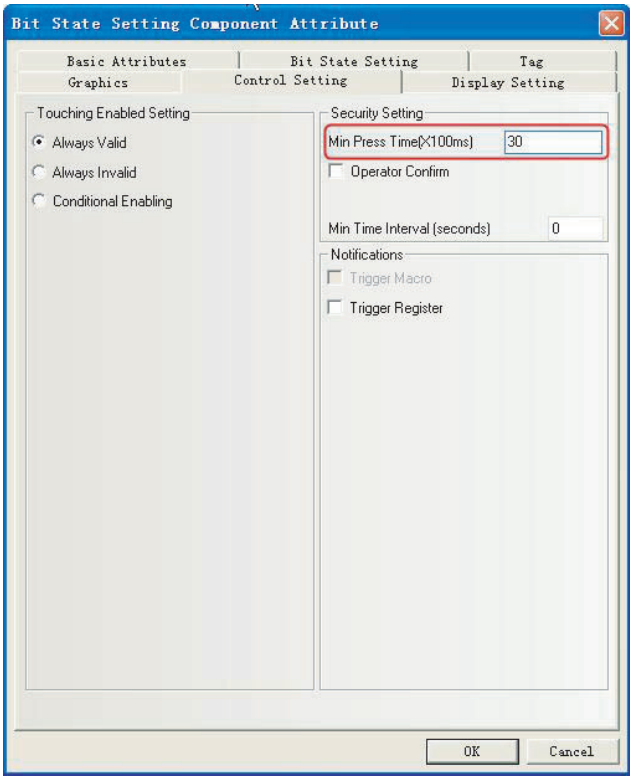
The attribute settings are:

Write Address	W0.02
Bit State Setting Types	On
Graphics	Use the vector graphic: Dashed.vg (A vector graphic created by user, which is a light cyan rectangle)
Control Setting (Security Setting)	Minimum press time 3s


Bit State Setting Component Attribute
Graphics
Control Setting
Display Setting
Basic Attributes
Bit State Setting
Tag
Priority
Normal
Read Address
HMI
HMI0
PLC No.
0
Port
COM1
Change Station Num
Addr. Type
LB
Address
System Register
Code Type
BIN
Word Length
Use Address Tag
Use the index register
Write Address
HMI
HMI0
PLC No.
0
Port
COM1
Change Station Num
Addr. Type
W_bit
Address
0.02
System Register
Code Type
BIN
Word Length
Format(Range):DDD.DD (0.00--511.15)
Use Address Tag
Use the index register
Description
OK
Cancel


Bit State Setting Component Attribute
Graphics
Control Setting
Display Setting
Basic Attributes
Bit State Setting
Tag
Type
On
OK
Cancel


Bit State Setting Component Attribute
Basic Attributes
Bit State Setting
Tag
Graphics
Control Setting
Display Setting
Vector Graphics
Dashed.vg
CLOSE001.vg
CONFIRM.vg
CTRL_BAR...
CTRL_BAR...
Dashed.vg
Bitmap
Use Original Size
Import Graphics
Save to System Library
Graphics Status
0
State:0
State:1
OK
Cancel


Bit State Setting Component Attribute
Basic Attributes
Bit State Setting
Tag
Graphics
Control Setting
Display Setting
Touching Enabled Setting
Always Valid
Always Invalid
Conditional Enabling
Security Setting
Min Press Time(X100ms)
30
Operator Confirm
Min Time Interval (seconds)
0
Notifications
Trigger Macro
Trigger Register
OK
Cancel

2 Bit State Setting component for Open/Stop/Close

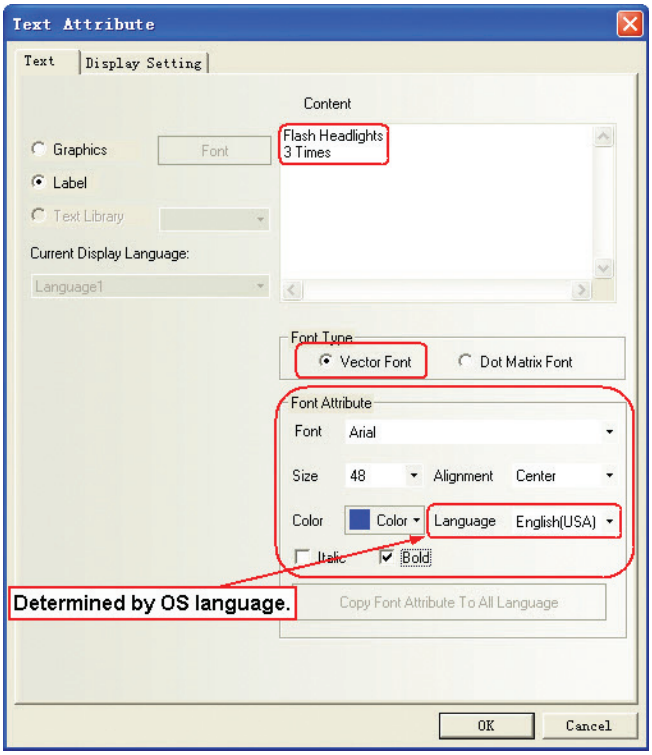
Function: After the component is pressed, the bits for address switch (i.e. W_bit 1.00 (Open switch) / W_bit 1.01 (Stop switch) / W_bit 1.02 (Close switch)) will be reset after being set to 1.

The attribute settings are:

Component Name	Open	Stop	Close
Write Address	W_bit 1.00	W_bit 1.01	W_bit 1.02
Bit State Setting Type	Reset switch		
Graphics	Use the vector graphic: Up.vg (A vector graphic created by user, which is an upward arrow)	Use the vector graphic: Middle.vg (A vector graphic created by user, which is a square)	Use the vector graphic: Down.vg (A vector graphic created by user, which is an downward arrow)

● Fixed Text

Select the “Text” button on the drawing toolbar and set the attribute of fixed text.



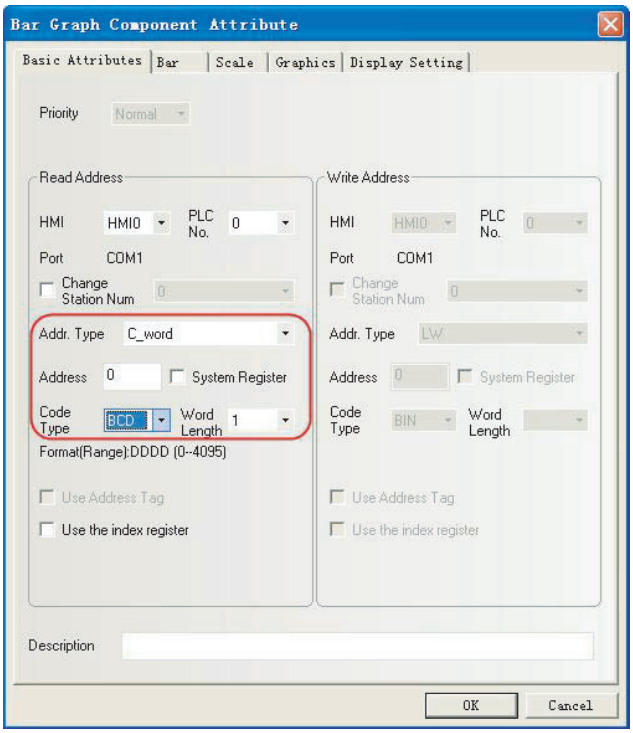
● Bar Picture Component

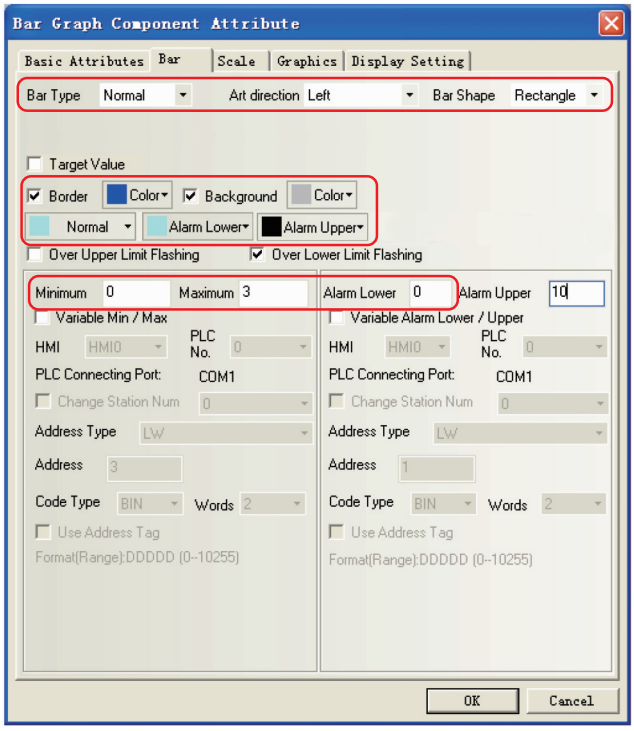
The function of the Bar Picture Component is to indicate numbers of flash of headlights detected. The times of flash are related to the current value of the ladder program counter. Up to 3 times of flash can be counted when the maximum value of the Bar Picture is set to “3”.Put fixed texts [1], [2] and [3] above the Bar Picture as the scale to indicate times of flash.

Select [Bar Picture] from [PLC Parts], drag it to the design window after selecting it with a single-click.

The attribute settings are:

Read Address	C_word 0
Bar Type	Standard
Art Direction	Left
Bar Shape	Rectangle
Border Color	Blue
Background Color	Light grey
Normal Color	Light cyan
Alarm Lower Color	Light cyan
Min. / Max. Value	0/3
Alarm Lower Value	0





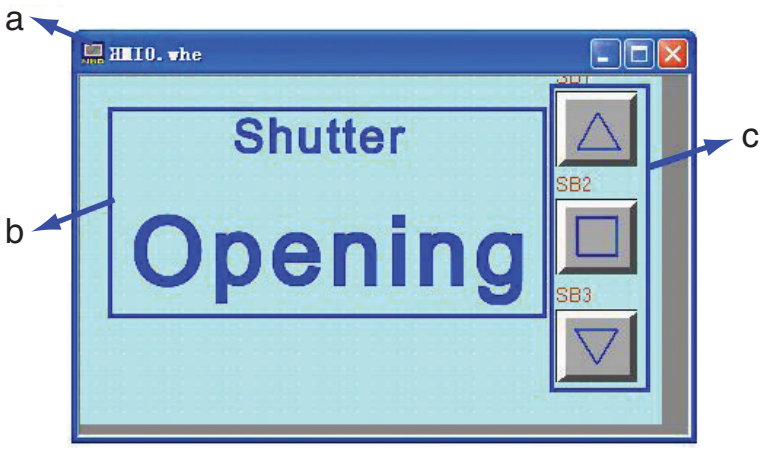
[2 Open]

The [2 Open] screen will be displayed when the motor for garage door opening control is activated.

Configure functions below:

- Fixed text indicating the garage door state.
- Bit State Setting components, allocated to [Open], [Stop] and [Close] garage door operations respectively.

The whole screen is shown below. The creating method is the same as that of [1 Wait].



a Screen b Fixed Text c Bit State Setting components

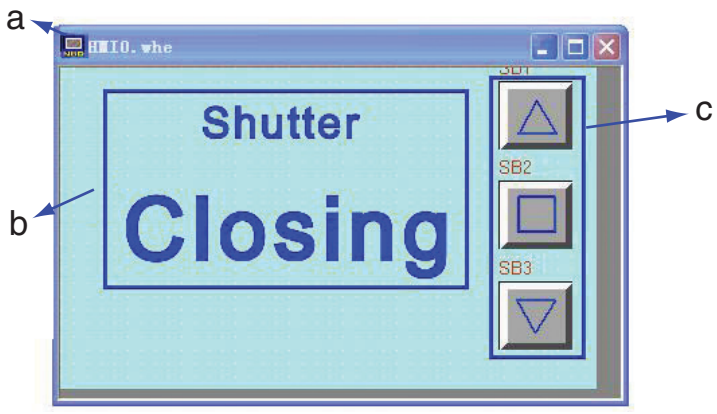
[3 Close]

The [3 Close] screen will be displayed when the motor for garage door closing control is activated.

Configure functions below:

- Fixed text indicating the garage door state.
- Bit State Setting components, allocated to [Open], [Stop] and [Close] garage door operations respectively.

The whole screen is shown below. The creating method is the same as that of [1 Wait].



a Screen b Fixed Text c Bit State Setting components

[4 Stop]

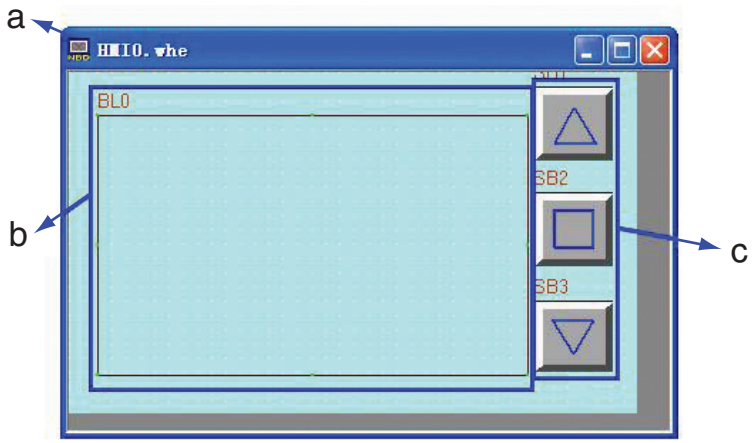
The [4 Stop] screen will be displayed when all the conditions below are satisfied.

- The opening and closing motors are not activated.
- The upper limit LS and lower limit LS are OFF.
- The Maintenance button is OFF.

Configure functions below:

- Bit State Lamp showing the garage door state. To make the whole screen flash to draw attention.
- Bit State Setting components, allocated to [Open], [Stop] and [Close] garage door operations respectively.

The whole screen is shown below.



a Screen b Bit State Lamp c Bit State Setting components

The configuration of the Bit State Lamp is shown below. The creating method of the Bit State Setting components is the same as that of [1 Wait].

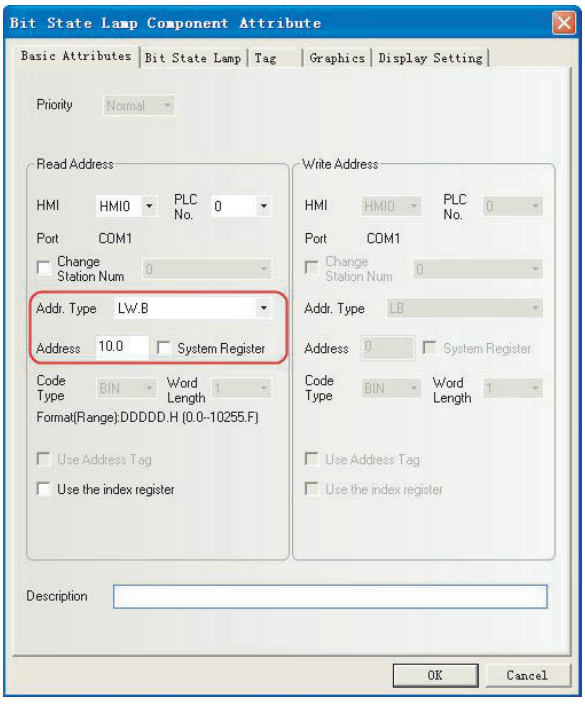
● Bit State Lamp

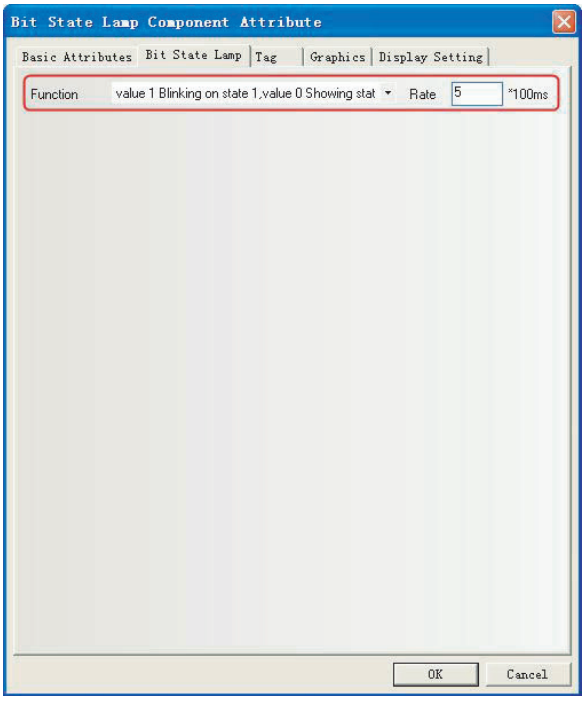
The Bit State Lamp and macro file are used in this project to flash the prompt information.

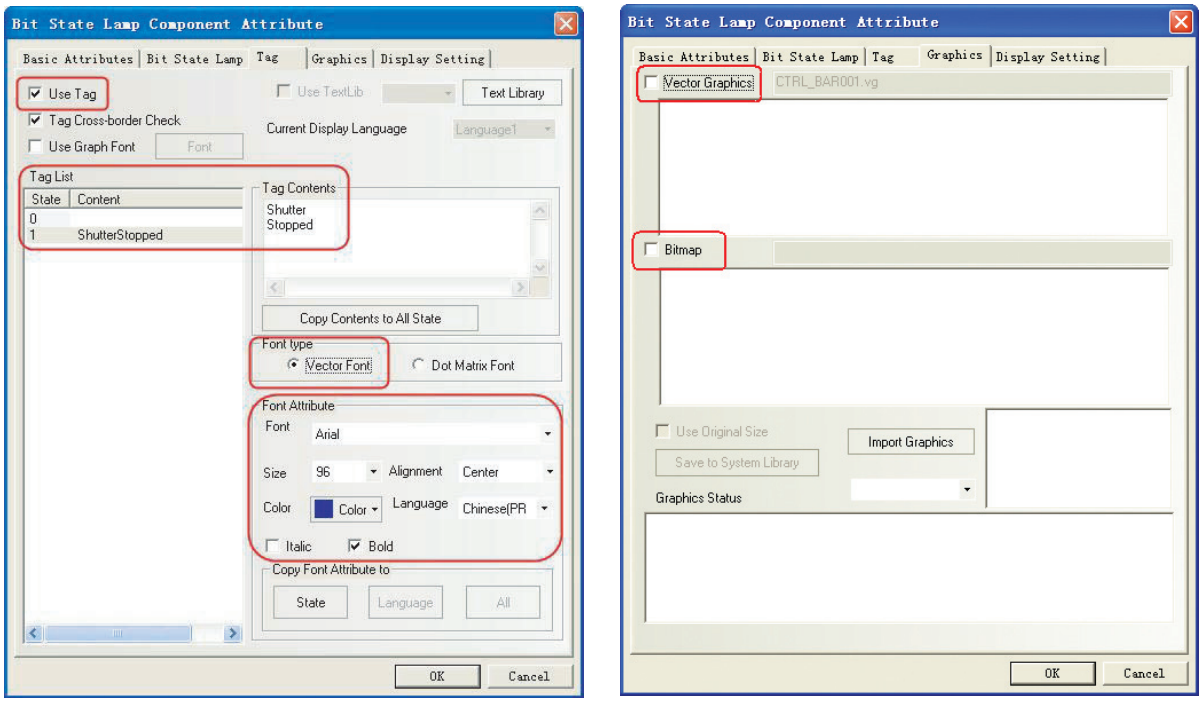
1 Select [Bit State Lamp] from [PLC Parts], drag it to the design window after selecting it with a single-click.

The attribute settings for the Bit State Lamp are:

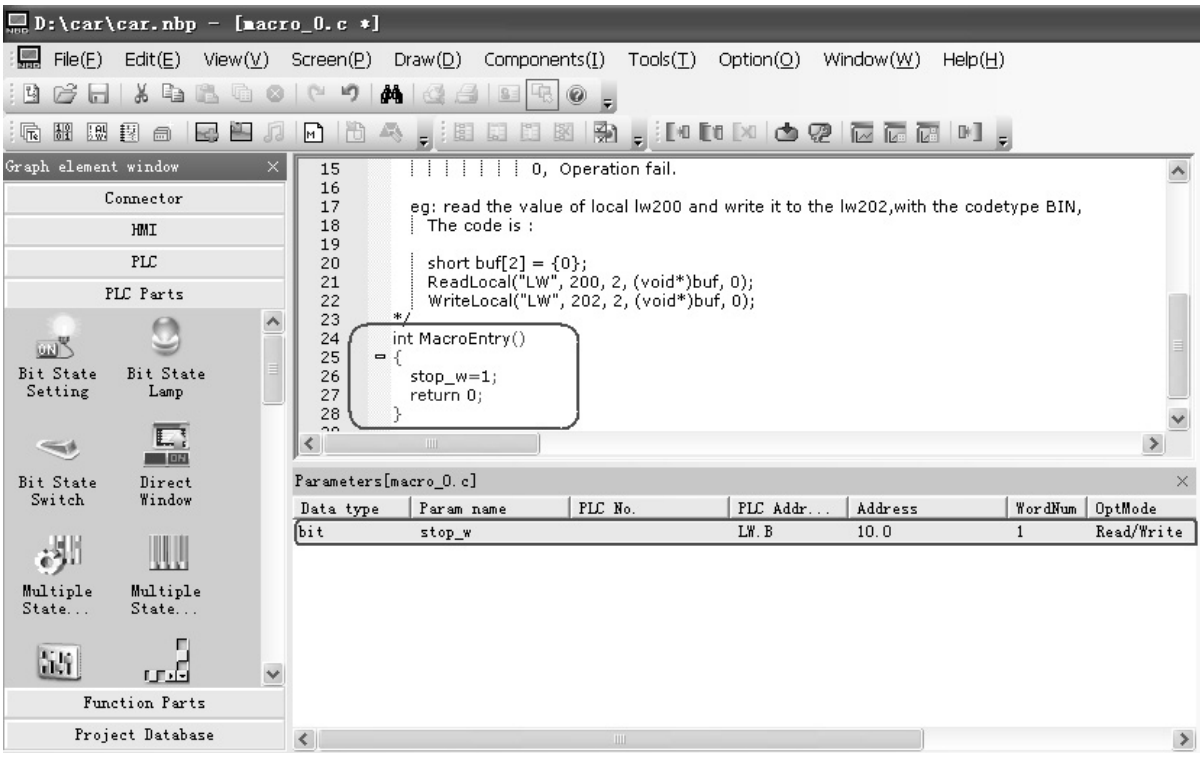
Read Address	LW.B 10.0
Function	Value 1 Blinking state 1, value 0 Showing state 0
Rate	5*100 ms
Tag	Use 0: blank 1: Shutter Stopped







2 To keep the Bit State Lamp in the Stop screen flashing together with the value of LW.B10.0 set to 1, we can initialize its values by creating the Macro file. The defining method for Macro has been described in [Creating Project] part. After the project is downloaded into HMI, initialization by using the Macro is required, i.e. selecting “macro_0.c” option after checking “Use INIT Macro” in HMI Extended Attributes tab in HMI Attribute screen is required to perform the initialization (Refer to *4-5 HMI Attribute* for the setting method).



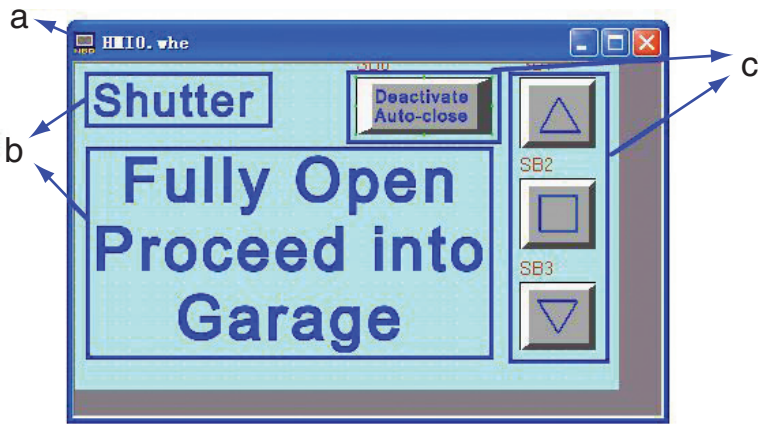
[5 Fully Open]

The [5 Fully Open] screen will be displayed with the lower limit LS ON.

Configure functions below:

- Fixed text indicating the garage door state.
- Bit State Setting components for blocking inputs from vehicle sensors to prevent the garage door from closing automatically.
- Bit State Setting components, allocated to [Open], [Stop] and [Close] garage door operations respectively.

The whole screen is shown below. The creating methods for fixed text and Bit State Setting components for [Open], [Stop] and [Close] garage door operations are the same as that of [1 Wait].



a Screen b Fixed Texts c Bit State Setting components

● Bit State Setting Components

Function: Block inputs from vehicle sensors. W0.01 turns ON and the input 0.03 from vehicle sensors is blocked after the component is pressed. Herein, the garage door is to be closed through manual operations on Function Keys. W0.01 will turn OFF when the garage door is closed and the lower limit LS turns ON.

The attribute settings are:

Write Address	W0.01
Bit State Setting Type	On
Tag	Use 0: Deactivate Auto-close 1: Deactivate Auto-close
Graphics	Use the vector graphic: CTRL_BAR001.vg

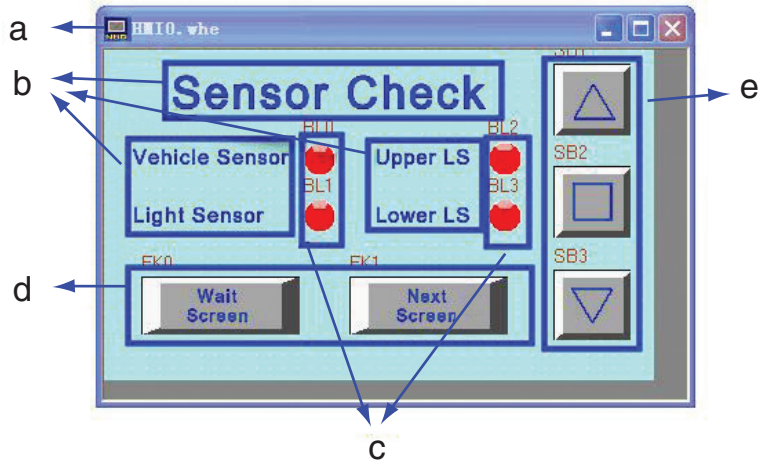
[6 Check 1]

The [6 Check 1] screen will be displayed when the maintenance button on [1 WAIT] screen is pressed.

Configure functions below:

- Fixed text indicating the garage door state.
- The Bit State Lamp components activating relevant lamp when the vehicle sensor, light sensor, upper limit LS or lower limit LS turns ON.
- Function Key components, buttons for switching to [1 Wait] and [7 Check 2] screens.
- Bit State Setting components, allocated to [Open], [Stop] and [Close] garage door operations respectively.

The whole screen is shown below. The creating methods for fixed text and Bit State Setting components for [Open], [Stop] and [Close] garage door operations are the same as that of [1 Wait].



a Screen b Fixed Texts c Bit State Lamp d Function Keys e Bit State Setting components

● Bit State Lamp

The states of the vehicle sensor, light sensor, upper LS and lower LS are shown by the lamp.

The attribute settings for the Bit State Lamp are:

Corresponding Name	Vehicle Sensor	Light Sensor	Upper LS	Lower LS
Read Address	CIO 0.03	CIO 0.04	CIO 0.05	CIO 0.06
Function	Normal			
Tag	Do not use			
Graphics	Use the vector graphic: Lamp2State1-00.vg			

● Function Key Components

These are used for switching to [1 Wait] and [7 Check 2] screens.

The attribute settings of the Function Key components are:

Screen Name	Wait Screen	Next Screen
Function Key	Switch to base window [1 Wait]	Switch to base window [7 Check 2]
Tag	Use tags: 0: Wait Screen 1: Wait Screen	Use tags: 0: Next Screen 1: Next Screen
Graphics	Use the vector graphic: CTRL_BAR001.vg	

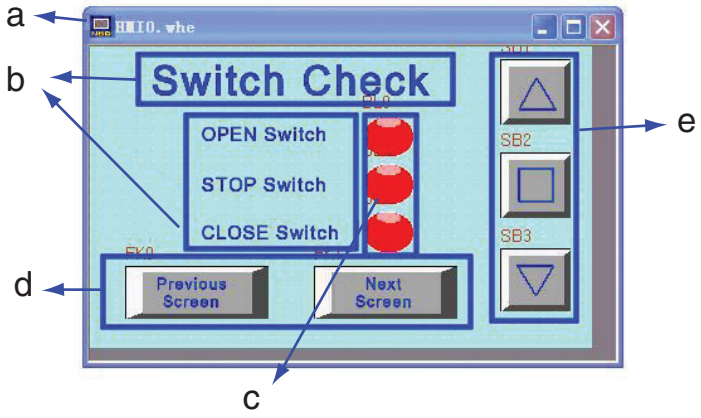
[7 Check 2]

The [7 Check 2] screen will appear after the screen-switching button on [6 Check 1] or [8 Check 3] screen is pressed.

Configure functions below:

- Fixed text indicating the garage door state.
- Bit State Lamp components activating relevant lamp to check operations when the [OPEN], [STOP] or [CLOSE] Function Key turns ON.
- Function Key component, a button for switching to [6 Check 1] and [8 Check 3] screens.
- Bit State Setting components, allocated to [Open], [Stop] and [Close] garage door operations respectively.

The whole screen is shown below. The creating methods for fixed text and Bit State Setting components for [Open], [Stop] and [Close] garage door operations are the same as that of [1 Wait].



a Screen b Fixed Texts c Bit State Lamp d Function Keys e Bit State Setting components

● Bit State Lamp

The states of the [OPEN], [STOP] and [CLOSE] switches are shown by the lamp.

The attribute settings for Bit State Lamp are:

Corresponding Name	OPEN Switch	STOP Switch	CLOSE Switch
Read Address	W_bit 1.00	W_bit 1.01	W_bit 1.02
Function	Normal		
Tag	Use tags: 0: blank 1: OPEN	Use tags: 0: blank 1: STOP	Use tags: 0: blank 1: CLOSE
Graphics	Use the vector graphic: Lamp2State1-00.vg		

● Function Key Components

These are used for switching to [6 Check 1] and [8 Check 3] screens.

The attribute settings for the Function Key components are:

Screen Name	Previous Screen	Next Screen
Function Key	Change window[6 Check 1]	Change window[8 Check 3]
Tag	Use tags: 0: Previous Screen 1: Previous Screen	Use tags: 0: Next Screen 1: Next Screen
Graphics	Use the vector graphic: CTRL_BAR001.vg	

[8 Check 3]

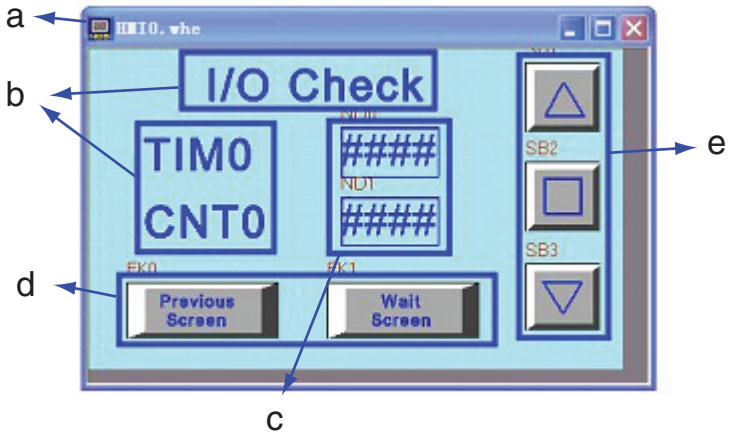
The [8 Check 3] screen will be displayed when the screen-switching button on the

[7 Check 2] screen is pressed.

Configure functions below:

- Fixed text indicating the garage door state.
- Number Display components displaying the current values of TIM000 and CNT000 used in the ladder program.
- Function Key components, buttons for switching to [7 Check 2] and [1 Wait] screens.
- Bit State Setting components, allocated to [Open], [Stop] and [Close] garage door operations respectively.

The whole screen is shown below. The creating methods for fixed text and Bit State Setting components for [Open], [Stop] and [Close] garage door operations are the same as that of [1 Wait].



a Screen b Fixed Texts c Number Display components d Function Keys e Bit State Setting components

● Number Display Components

The states of the [OPEN], [STOP] and [CLOSE] switches are shown by the lamp.

The attribute settings for the Bit State Lamp are:

Corresponding Name	TIM0	CNT0
Read Address	T_word 0	C_word 0
Numeric Data Type	Unsigned int	
Graphics	Use the vector graphic: BlueFrame.vg (A vector graphic coming with user created, which consists of a Number Display component plus a blue border)	

● Function Key Components

These are used for switching to [1 Wait] and [7 Check 2] screens.

The attribute settings for the Function Key components are:

Screen Name	Previous Screen	Wait Screen
Function Key	Change window[7 Check 2]	Change window[1 Wait]
Tag	Use tags: 0: Previous Screen 1: Previous Screen	Use tags: 0: Wait Screen 1: Wait Screen
Graphics	Use the vector graphic: CTRL_BAR001.vg	

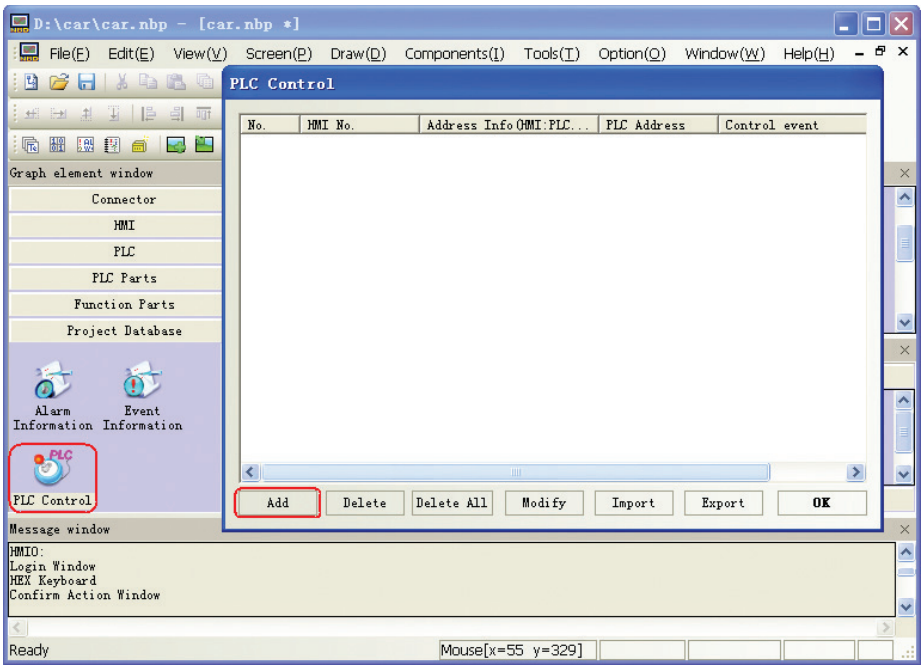
PLC Control Setting

In this project, the window is controlled by PLC, to realize this function, the PLC Control component should be used.

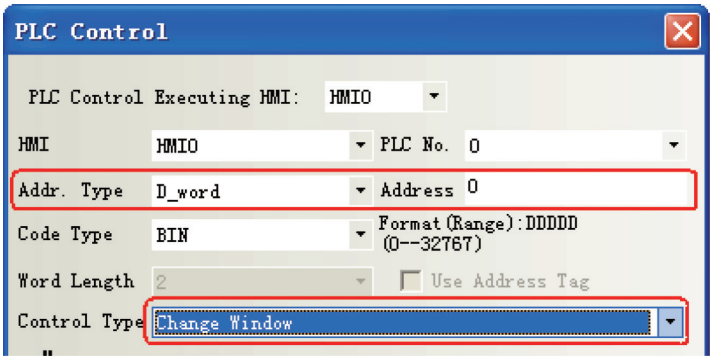
Change Window and Write Data to PLC (Current Base Window) functions can be realized by using this component. In this case, the default Word Length for the specified register is 2, and when this value is changed to a value corresponding to a valid Window No., the system will automatically make the screen switch to the screen corresponding to this valid Window No.. It can be known from the ladder program that D_word 0 is used as the value of corresponding screen number and D_word 11 as the address of output window number in this project.

● Change Window

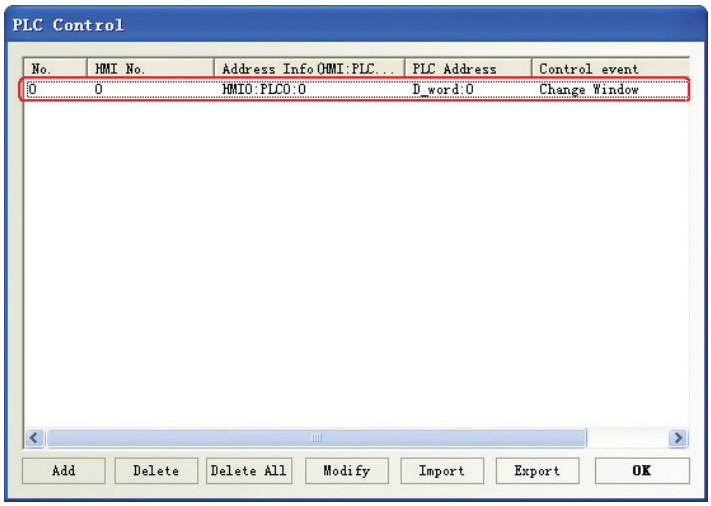
Select [PLC Control] from [Project Database].



After clicking the Add button, make the settings in the PLC Control dialog box as shown below.

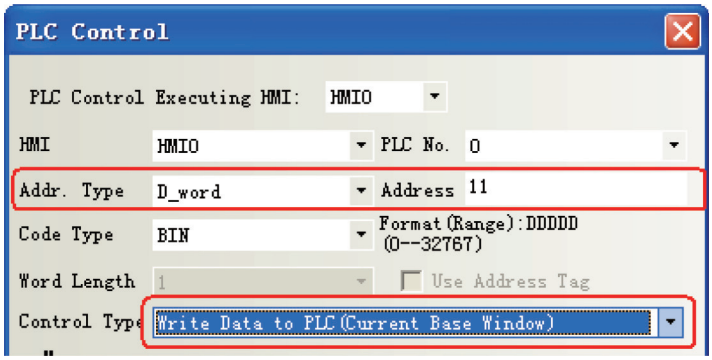


After click [OK], there is a new event added in the control list.

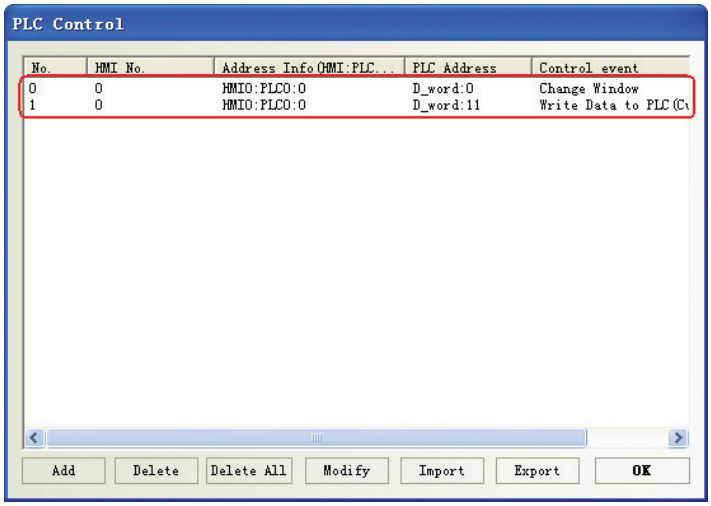


● Write Data to PLC (Current Base Window)

Add another control event by the same method to make the current Window No. output from HMI to PLC.



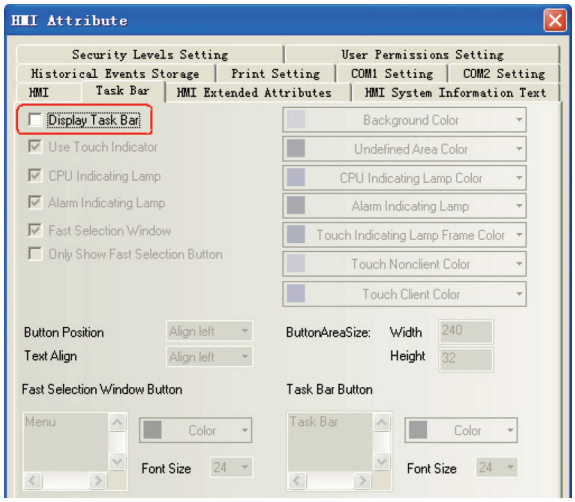
Then the PLC control setting has been done.



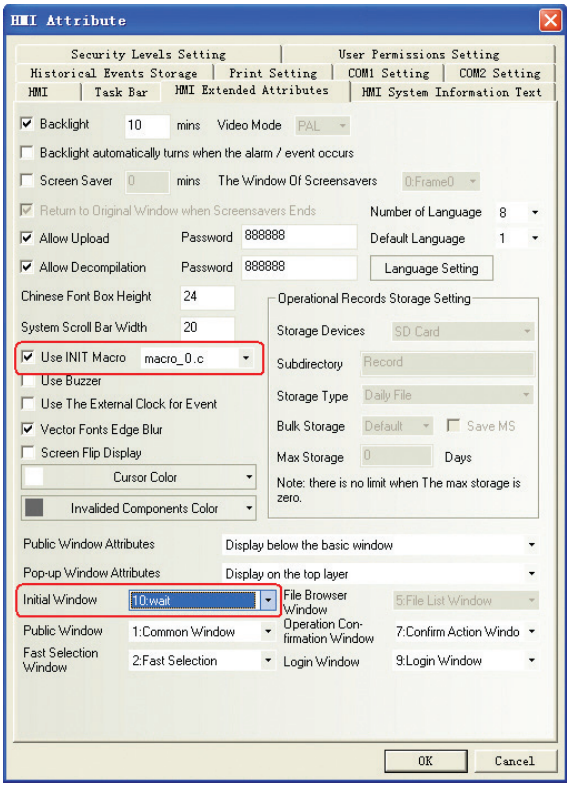
Refer to *3-8-5 PLC Control* of *NB-Designer Operation Manual* for details on PLC control.

4-5 HMI Attribute

1 Select “Task Bar” page on “HMI Attribute” window and in this project example, the “Display Task Bar” is not checked. Click OK button to save the settings.



2 Select “HMI Extended Attributes” page in “HMI Attribute” window and in this project example, the “Use INIT Macro” item is selected and the “Initial Window” is set to “[10 Wait] screen”. Click OK button to save the settings.



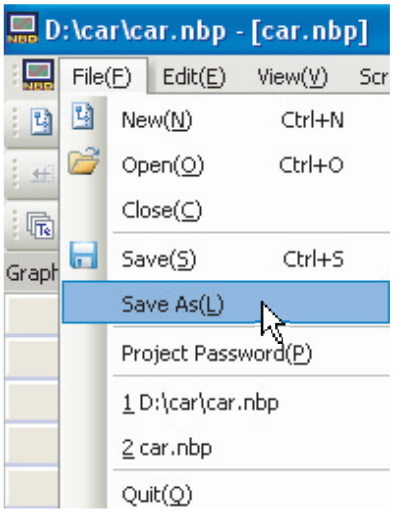
The default “Initial Window” is “0: Frame0” when HMI has not created a window screen. The serial number and name of the window will appear in the pull-down menu of “Initial Window” after the user establishes the window screen.

4-6 Save and Load Project

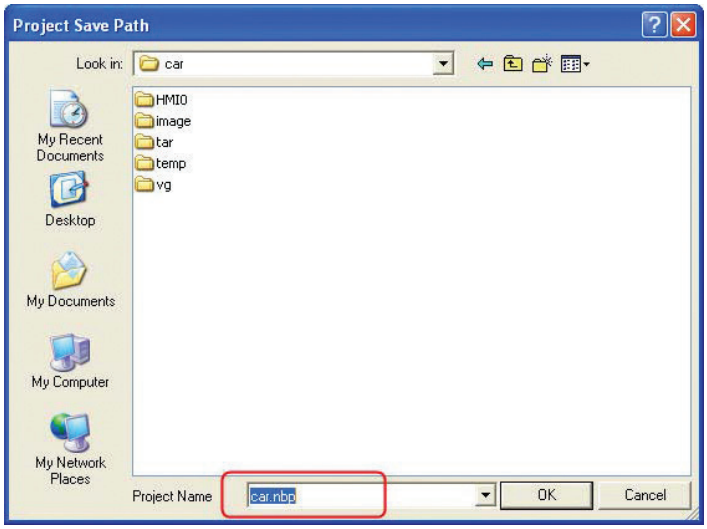
This part describes how to save and open data created. And it also introduces the plan testing function and PLC programming console function.

● Save Project

1 Select [File]-[Save As] from the main menu. The [Project Save Path] dialogue border will pop up.

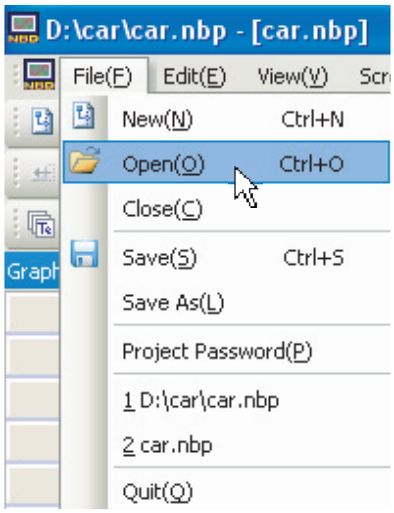


2 Designate [Save File] location and input the file name. Click OK. The NB-Designer project file is saved.

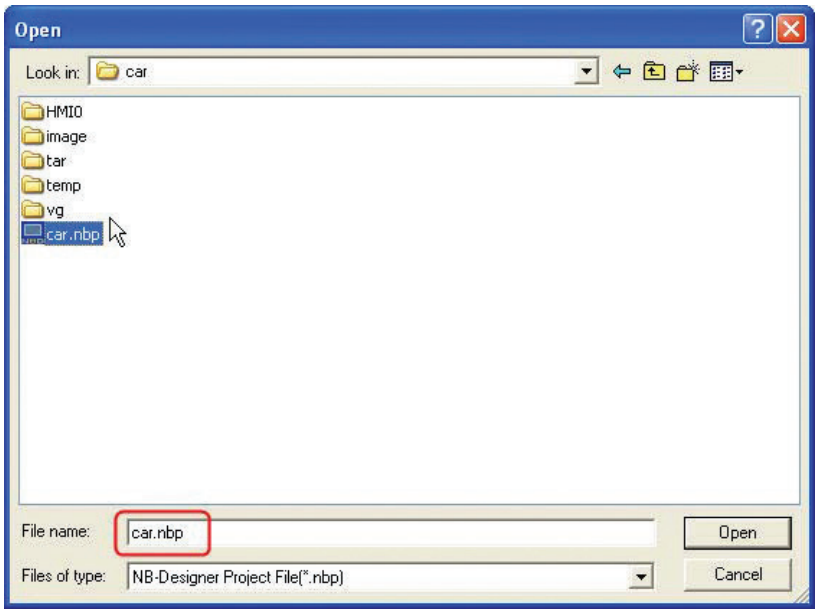


● Open Projects

1 Select [File]-[Open] from the main menu. The [Open] dialogue border will pop up.



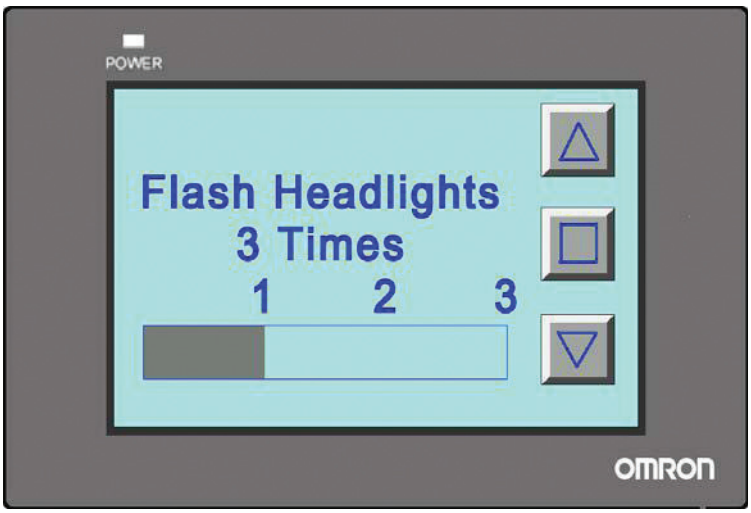
2 Designate the [Look in] location and select the file name. Single-click [Open]. Open the NB-Designer project file.



Test function

The display effect of the created screen can be checked by the NB-Designer itself through the offline simulation without need to connect it to the PLC. Select [Tools] - [Compile] from the main menu. After the successful compilation, select [Tools] - [Offline Simulation] and then right-click the mouse to select “close” to exit from the simulation. Please note that it needs to be recompiled and then simulated each time when the setting or project is changed.

The offline simulation is convenient for users to preview the screen effect visually without need to download programs to the HMI, thus enhancing the programming efficiency substantially, but the offline simulation can only show the display effect of the project screen. Because this project involves the data sampling and input/output control of PLC, the actual operating effect can be seen only after the edited project being downloaded into HMI for operation and the communication with PLC being established. If the user just wants to see the created screen effect, it needs to place one Number Input component in the Common Window with the address of LW0 (for example), and then add the same address into the PLC Control component with the Control Type of “Change Window” in the PLC Control dialog box. In this case, each created window can be seen after the number of 10 to 17 input into the Number Input component during the offline simulation. Later, it just needs to delete the Number Input component and the added control conditions after the correct confirmation.



Please refer to *3-14 Simulation* in the *NB-Designer Operation Manual* for details on simulation.

5

Run

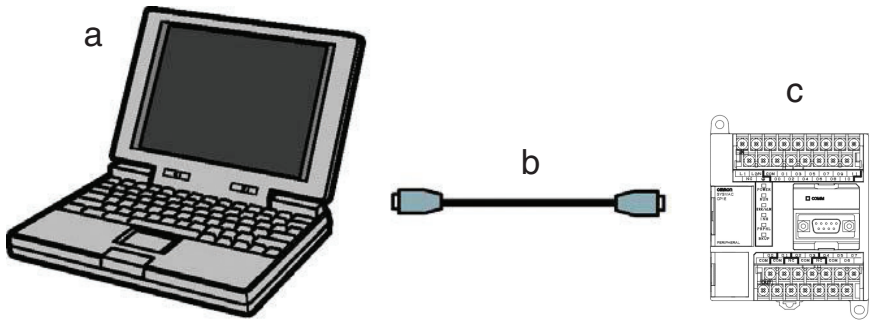
This section describes how to start running at the Host side and prepare to send screen data to NB7W.

5-1 Preparations

This part describes how to start running at the Host side (CP1E) and prepare to send screen data to NB7W.

Connect CP1E and PC

Use a USB cable to connect CP1E and a PC.



a. PC b. USB Cable c. CP1E

Note USB driver is needed to be installed when CP1E is connected to a PC the first time. Refer to the SYSMAC CP series CP1E CPU Unit Operation Manual for details on installing USB driver.

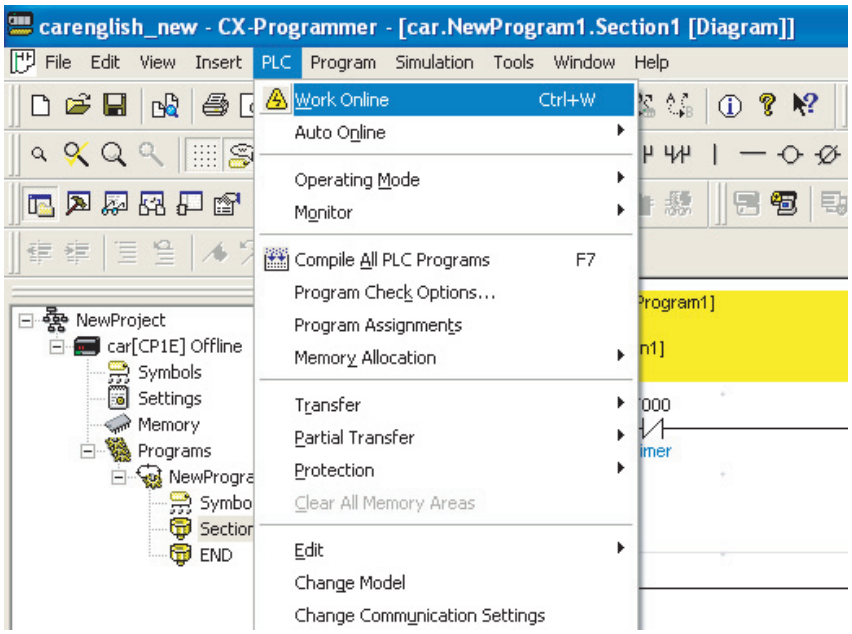
Connect CP1E

CX-Programmer is a programming tool [software] for creating ladder programs executed by CP1E. Aside from the programming function, it also provides functions for setting and operating CP1E, such as debugging program addresses, indication of current values, monitoring function, PLC settings and remote programming and monitoring through the internet, etc. Please refer to the SYSMAC CX-Programmer Operation Manual for details on CX-Programmer.

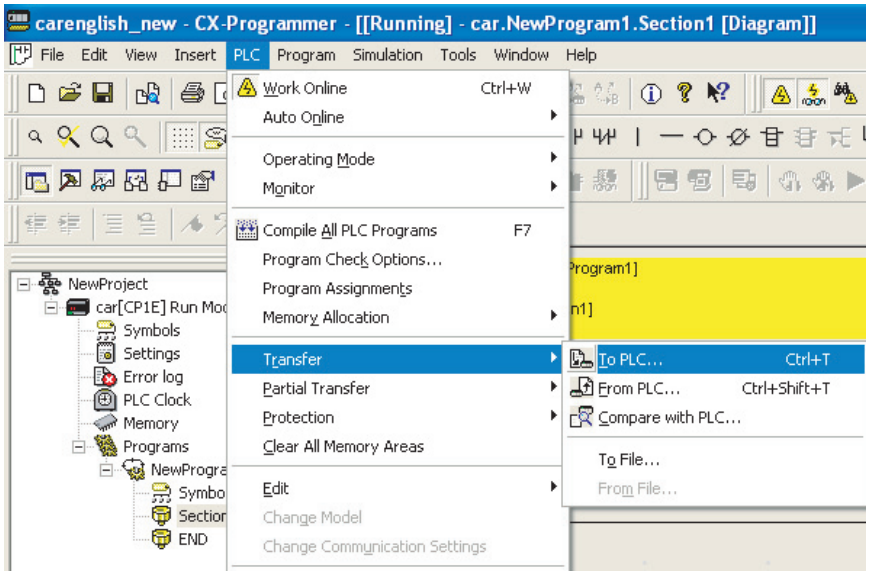
Run CP1E after sending programs to CP1E. Create CP1E programs using CX-Programmer.

1 Start CX-Programmer and open the created program.

2 Select [PLC]-[Work Online] from the main menu of CX-Programmer.

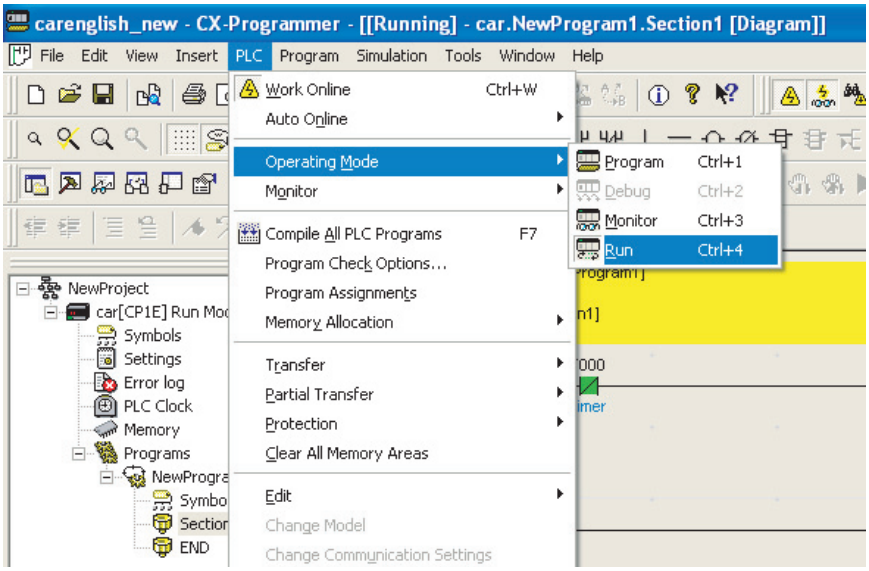


3 Select [PLC] - [Transfer] - [To PLC] from the main menu.



4 Send data according to the procedures described on the screen.

5 Select [PLC]-[Operating Mode]-[Run] from the main menu.
CP1E starts running.

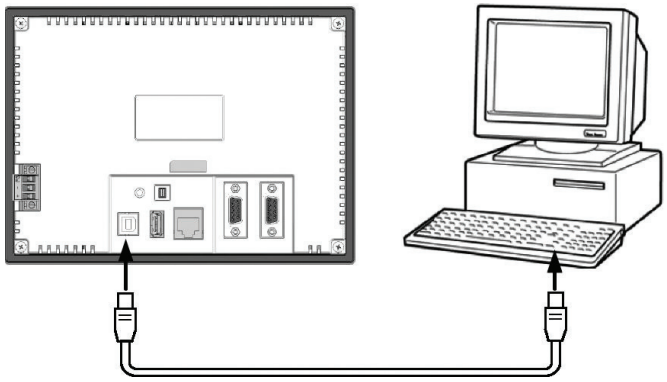


Connect NB7W and PC

● Using a USB cable to connect NB7W and a PC

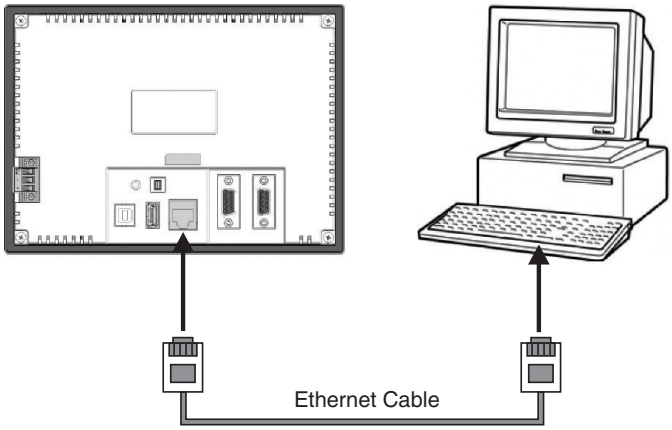
The screen programs created by NB-Designer can be sent to NB7W.

Note
- It is allowed to use USB cables of any standards.
- Use a USB cable with a maximum length of 5 m.



Note USB driver for NB7W must be installed in the PC if USB is used to connect NB7W and the PC. The USB driver should be installed automatically when NB-Designer is run on a PC the first time. Please refer to *2-4 Installation of USB Driver for NB* in the *NB-Designer Operation Manual* for details on the USB driver.

● Using Ethernet to connect NB7W (NB□□-TW01B supporting Ethernet connection) with PC



1 Make Network Setting in the [HMI] tab in [HMI Attribute] dialog box of NB-Designer. (e.g. IP is 192.168.250.1; Subnet Mask is 255.255.255.0 and Default Gateway is 0.0.0.0.)

2 Set the DIP Switch of this HMI to “1 ON” and “2 ON”, and then make the Network Setting: IP, Port, Subnet Mask and Gateway (Network Setting also available for the HMI with Ethernet interface).

3 Make the Network Setting in this mode same as that in the HMI tab of NB-Designer. (e.g. IP is 192.168.250.1 and Subnet Mask is 255.255.255.0.)

4 Restart the HMI, and then check if the IP and Subnet Mask are set successfully.

5 Set the IP address of PC and that of HMI locating in the same network segment with the first 3 parts being same and the last part being different (e.g. IP is 192.168.250.2 and Subnet Mask is 255.255.255.0.).

6 Use the network cable to connect HMI and PC, and then the project can be downloaded immediately.

Note For the details of Ethernet connection, refer to NB-Designer Operation Manual.

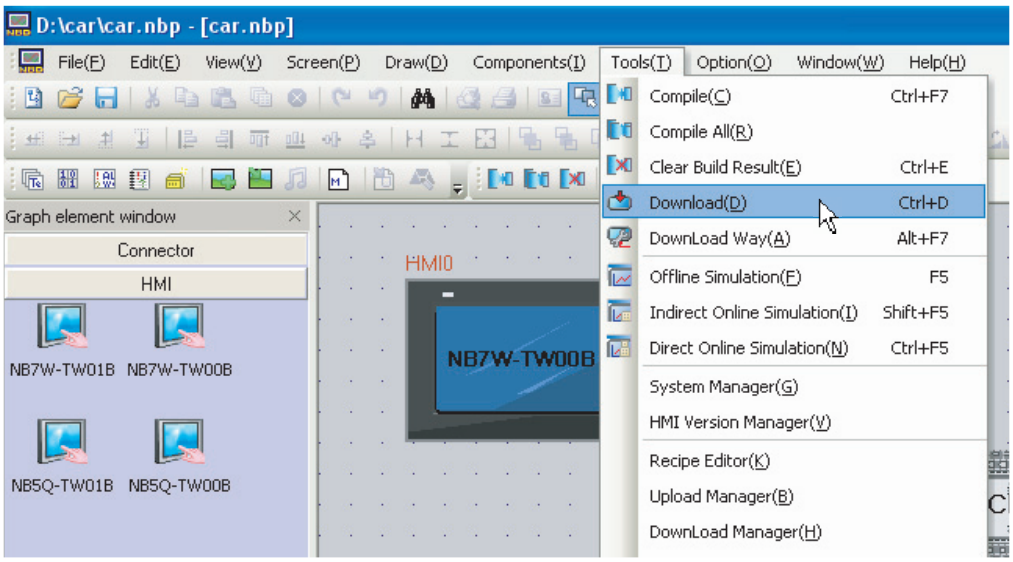
5-2 Run NB7W

This part describes how to send screen programs of NB-Designer to NB7W .

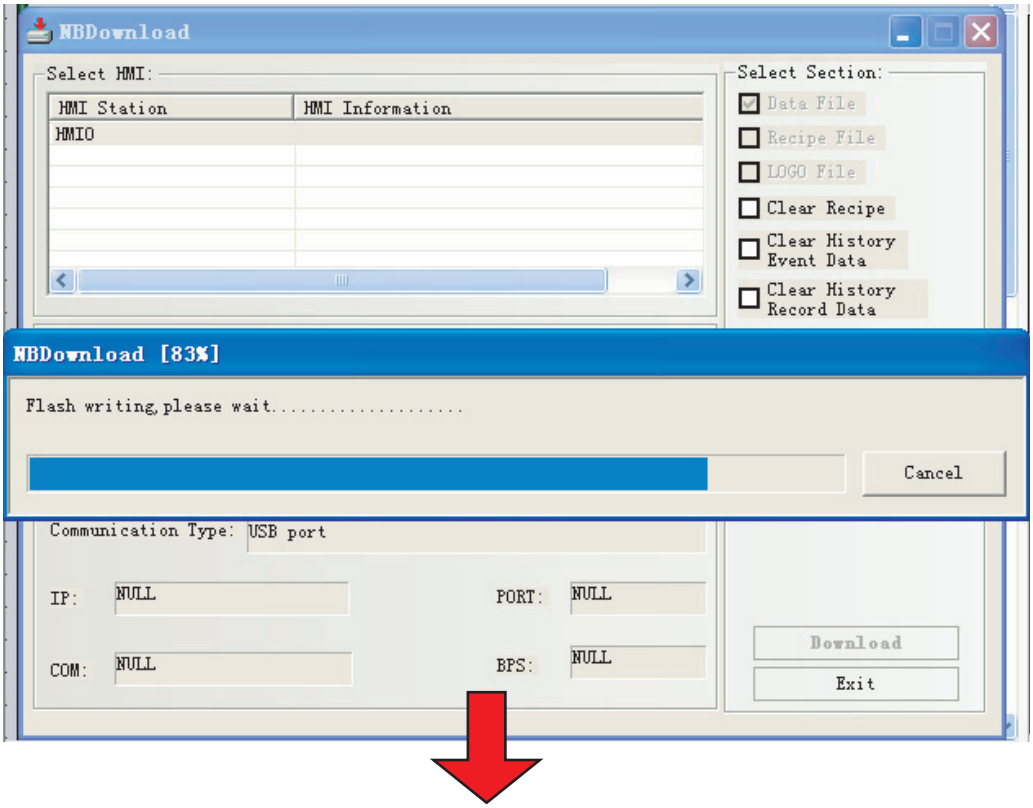
1 Connect NB7W and a PC.

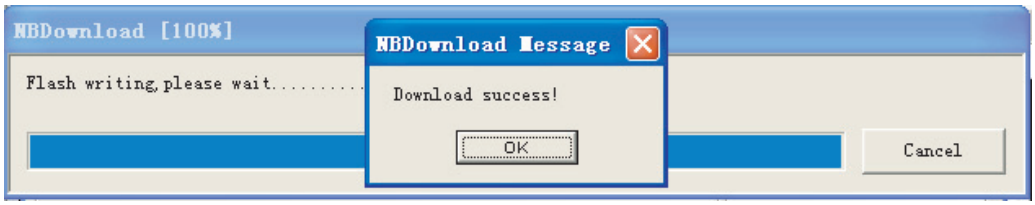
2 Start NB-Designer and open the screen program created.

3 Select [Tool]-[Compile] from the main menu. Select [Tool]-[Download] after compilation is completed.



4 NB7W starts running after data sending is completed.





Note To download the project into USB for operation (NB□□-TW01B supporting this function), refer to *6-1-5 Download to USB1* in *NB-Designer Operation Manual*.

In this case, the exemplary project of garage door control system will work normally after the programs are transferred to CP1E successfully by CX-Programmer and the project are downloaded into HMI successfully by NB-Designer, as well as the NB Unit are connected with CP1E together with other devices according to the requirements.

6

Maintenance and Troubleshooting

This section describes the maintenance and inspection methods for preventing errors occurring, and troubleshooting measures when errors occur.

6-1 Maintenance

This section describes the maintenance methods for preventing errors occurring.

Maintain the PT to keep it in its optimal condition.

⚠ WARNING

Do not attempt to take the product apart and do not touch the product inside while the power is being supplied. Otherwise it may result in electric shock.

Always ensure that the personnel in charge confirm that installation, inspection, and maintenance were properly performed for the NB Unit.

"Personnel in charge" refers to individuals qualified and responsible for ensuring safety during machine design, installation, operation, maintenance, and disposal.

Do not attempt to disassemble, repair, or modify the NB Unit. Otherwise it may impair the safety functions.

● Backup of application

When the unit needs to be repaired due to the occurrence of some faults or to be replaced by the substitute, be sure to make backup of the applications and keep it in a safe location.

● Spare part of Unit

It is recommended to prepare the spare part of NB Unit in advance in order to repair the system when the faults occurred in NB Unit or the screen is not clear due to the backlight life expires.

● Replace of battery

The lithium battery is used for the backup of the non-screen data such as calendar data, clock data etc.

The life of the battery is approximate 5 years at 25 °C (1 year = 365 days ×12 hours /day). If the battery is used at high temperature, its life will be reduced. Please replace the battery after the data backup according to the operating environment.

6-2 Checking and Cleaning

This section describes the inspection and cleaning method for the NB Unit.

Please clean and check the NB Series periodically to ensure the NB Series always in the optimal status.

● Cleaning method

If the display part is dirty, then the screen will hard to see. Please perform cleaning periodically according to the following points:

- During the daily cleaning, please use the dry soft cloth. But if use the dry soft cloth to clean forcefully when it is too dirty, the front panel may be damaged. In this case, use the wet cloth to clean it in advance.
- When the dirt cannot be cleaned by dry cleaning, please dip the cloth into the diluted neutral washing agents (concentration of 2%) completely first, and then perform cleaning after the wet cloth is wringed out.
- Waste, ethylene products or tape sticking to the Unit for a long period will generate dirt. If there is dirt sticking to the Unit, please remove it during the cleaning.

Precautions for Safe Use

Do not use benzene, paint thinner, or other volatile solvents, and do not use chemically treated cloths.

● Checking method

Please perform checking once every 6 months to 1 year. But the frequent checking should be necessary when the Unit is used in the extreme environments such as the environment with high temperature, high humidity or more dust etc.

● Checking items

Please check the following items for the criterion. If the item does not conform to the criterion, please improve the surrounding environment, retighten the screw etc. to make it conform to the criterion.

Checking Items	Checking Contents	Criterion	Checking Method
Supply voltage	Voltage fluctuation at power terminal	Allowable voltage fluctuation range (DC24V, -15% to +15%)	Multimeter
Surrounding environment state	Ambient temperature (temperature inside operation panel)	0°~50°C	Thermometer
	Ambient humidity (humidity inside operation panel)	10%~90% RH(without condensation)	Hygrometer
	Dirt	Without dirt	Visual check
	Oil mist sticking	No oil penetrating into the space between the front panel and Unit box	Visual check

Checking Items	Checking Contents	Criterion	Checking Method
Installation state	Looseness of fixing metal pieces etc.	Specified torque	Phillips screwdrivers
	Connection state of connector for the cable	Inserted fully and without looseness.	Phillips screwdrivers
	Looseness of screw for external wiring	Without looseness	Phillips screwdrivers
	State of external connection cable	Without abnormality such as disconnection etc.	Visual check + multimeter
Object with expected life	Backlight brightness	With enough brightness Backlight life: approx. 50,000 hours (Typ) at room temperature (25 °C) with 40% brightness.	Visual check
	Battery	5 years (at 25 °C)	Replace it every 5 years once.

Precautions for Safe Use

- Customers may not replace the backlight lamp inside the NB Unit. Please contact OMRON's customer service center.
- Deterioration over time can cause the touch points to move. Calibrate the touch panel periodically.
- Water and oil resistance will be lost if the front sheet is torn or is peeling off. Do not use the Unit, if the front sheet is torn or is peeling off.
- Dispose of the Units and batteries according to local ordinances as they apply.
- Periodically check the installation conditions in applications where the PT is subject to contact with oil or water.
- The rubber packing will deteriorate, shrink, or harden depending on the operating environment. Inspect and replace the rubber packing periodically.

6-3 Troubleshooting

This section describes troubleshooting measures when errors occur.

When a problem occurs during operation, refer to the listed problems below for the corresponding solutions.

6-3-1 Software Trouble

1 The condition of the USB driver for the HMI

If HMI cannot perform normal downloading/uploading, it's usually because the USB driver is not set up properly.

Setup Method:

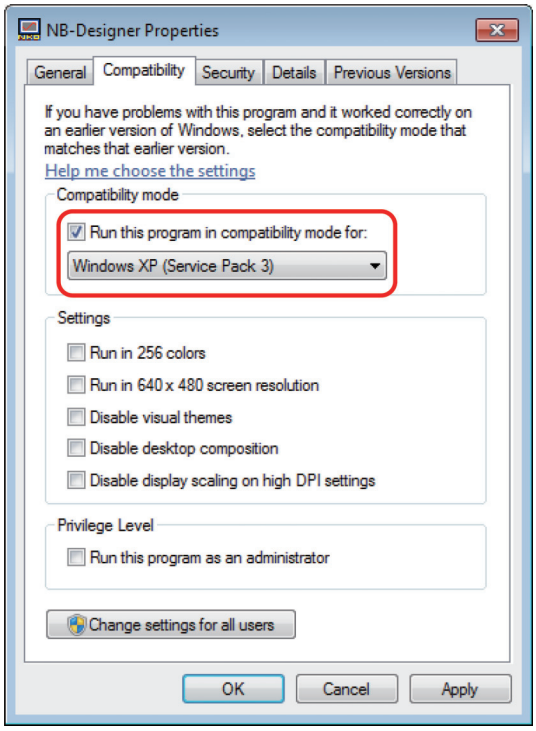
During the process of the software setup, the PC will automatically prompt you to set up the USB driver. You can choose the correct setup method according to the displayed information, click the [Still Proceed] at the final step to complete the process. However, if the automatic setup fails, you can still perform the setup manually. Connect the Unit and the PC with a USB cable, energize the Unit, and a prompt to set up new hardware will pop up at the right bottom corner. Following the displayed information, choose [Install from a list specific location (Advanced)], and find the USB driver in the driver file of NB-Designer's installation directory.

2 The NB-Designer software can run in XP/Vista/Win7 systems

It is compatible with XP, Vista and Win7 operating systems.
Pay attention to the following items when using Windows Vista/7:

(a) You must log in Vista/Win7 operating systems as the administrator.

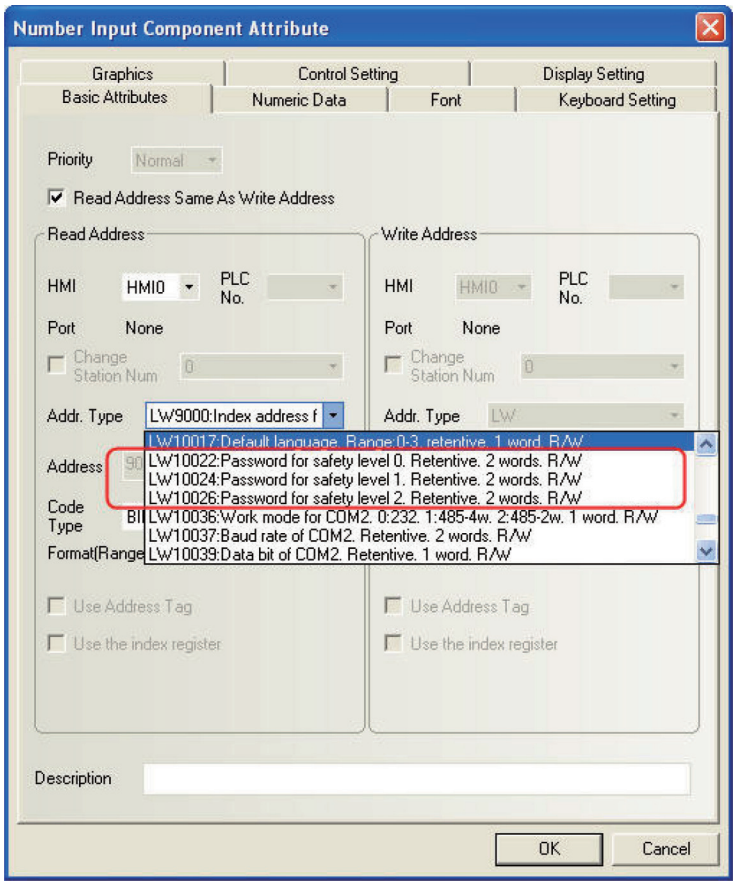
(b) If you have compatibility problems when running the NB-Designer, run the software in compatibility mode. Right-click the mouse on the icon "NB-Designer.exe" to select compatible with Windows XP.



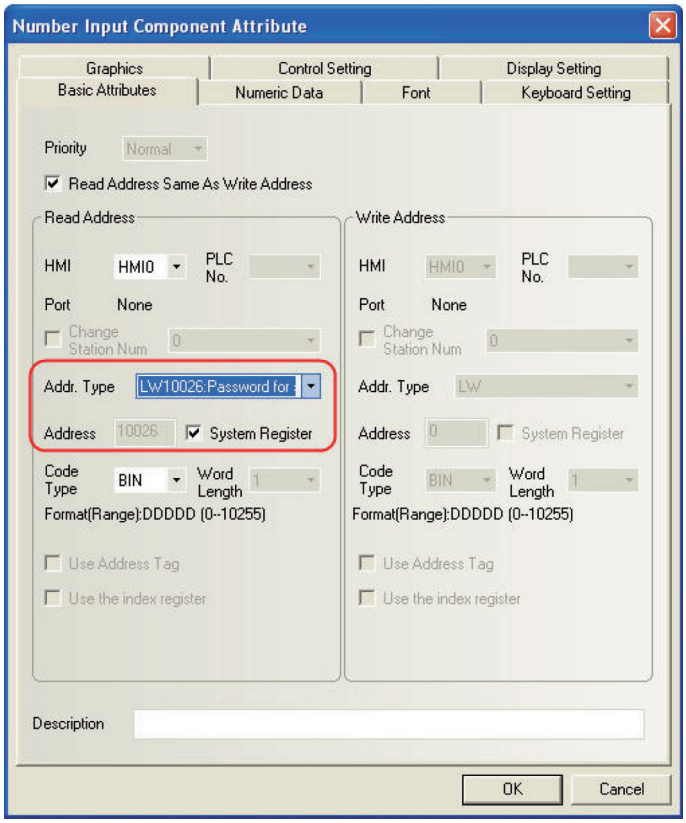
(c) When running the NB-Designer for the first time, right-click the mouse on the icon "NB-Designer.exe" to select "Run this program as an administrator". And then, run the software directly.

3 How to change system parameters like user level passwords and Baud rate

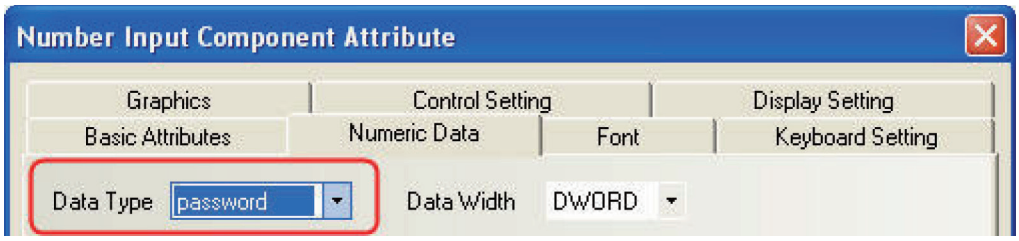
These are all controlled by the local special register. These system parameters can be found by double-clicking the component attributes, and selecting [System register].



For example, the addresses for changing the password online are: LW10022~10023 Password/0 level Occupying a double word; LW10024~10025 Passowrd/1 level Occupying a double word; LW10026~10027 Password/level 2 Occupying a double word; besides, LW10118~10143 Password/level 3~15 Occupying double word * 13. If the level 2 password needs to be changed, set in the software as follows: First, place a Number Input component on window, check [System Register], then select LW10026, as shown below



Select [Password] for the Data Type in the attributes page of [Numeric Data], as follows:



The process is the same for changing other system parameters online. But note that after changing the following system parameters, the HMI needs to be rebooted to validate the changes.

System Parameter Setting: the following addresses will take effect after reboot.

Addresses	Descriptions	comments
10010	Initial Window number	0~65535
10011	Screen saver (backlight saver)	0 (OFF, Constant, Screen saver inactivated) 1~600 minutes (activated)
10013	Common window/Pop-up window	0: Normal 1: Higher than other windows
10014	Common window/attribute	0: Lower than the Base window 1: Higher than the Base window
10015	Storage event number	0~65535
10016	RTC source	0: PLC(Local Word) 1: Internal RTC
10017	Default language	0~3
10018	System reserve	HMI internal use

4 The difference between User permissions and User levels

User levels: there is a difference between high-level users and low-level users - high-level users can access low-level windows, while low-level users can not access high-level windows. Whole windows can be encrypted based on user levels.
User permissions: user permissions are not restricted by user levels. As long as the user's name and password are input correctly, the component which is set limited for access to it can be operated. With the user permission, user accounts can be added or deleted. User permissions only work on components, and have nothing to do with the window password.

5 What if the uploading password or the online change password of the HMI is lost

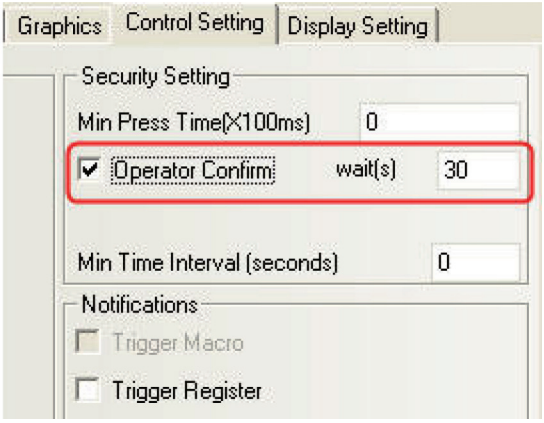
If the uploading password of HMI is lost, data cannot be uploaded, and the only solution is to download the project again to overwrite the original one.
Similarly, if the online change password is lost, it also requires to download the project again and set a new password.
Thus, in order to guarantee the safety of users' projects, please back up the original projects, for decryption is not within our service range.

6 Why cannot the system time be changed during offline simulation

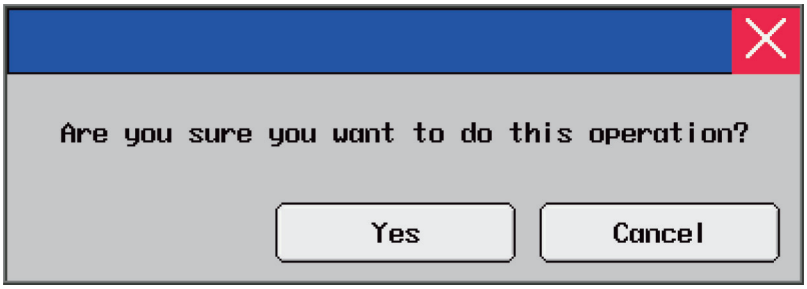
Offline simulation uses the PC's clock, therefore the time cannot be changed. It can only be changed when downloaded to the HMI.

7 How to use the Operator Confirm function

When the user is fabricating a screen, some buttons may require a second confirmation to validate the operation, and at this time, the Operator Confirm function can fit well here. This function can control components. For example, you can check the [Operator Confirm] on the [Control Setting] attributes page of the bit status setting component, as shown below:

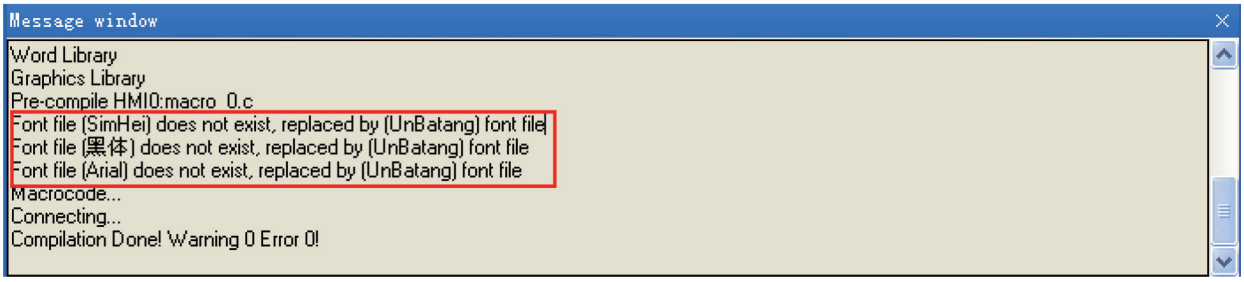


A dialog box as follows will pop up once this option is checked:



8 When opening a project, what if there is a prompt: [Font not existing in the system]

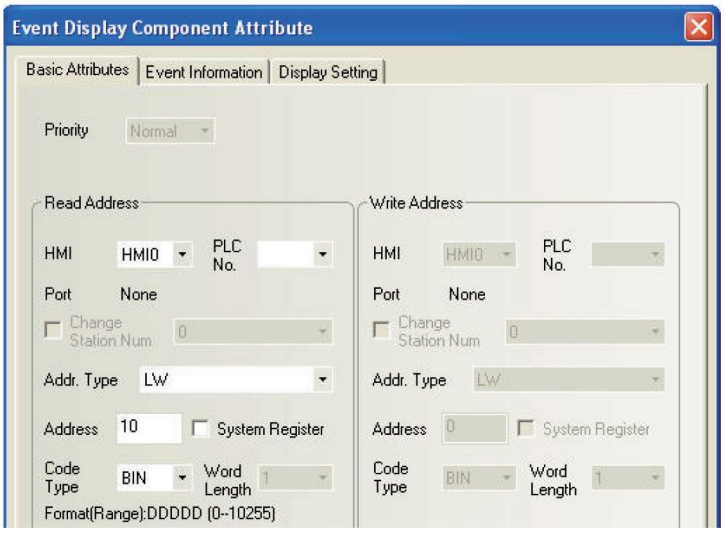
For example: if attempting to open a project involving 黑体 in a PC that does not incorporate 黑体, a prompt [黑体 does not exist] will pop up, as follows:



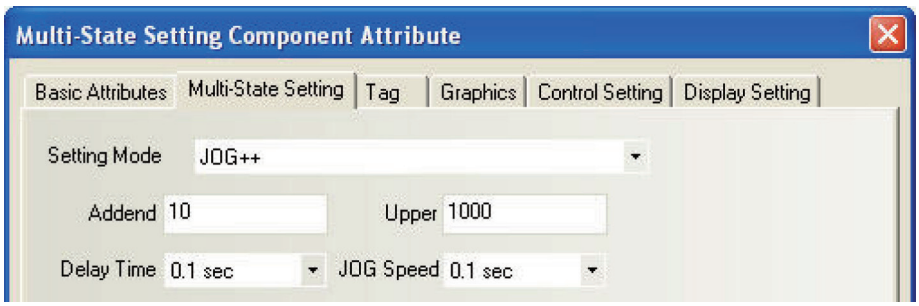
If this font issue is ignored, 黑体 will be replaced with a font that exists in the system, eg. UnBatang.

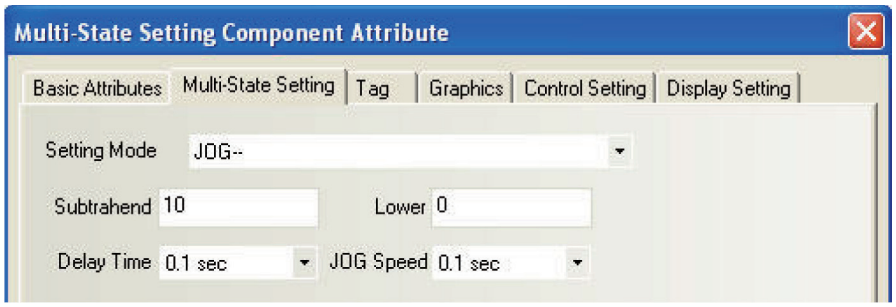
9 How to set the addresses of the component for displaying warnings and events, and how to inquire warnings and events

It's best to use the internal register of the HMI - LW for the address type of the component for displaying warnings and events, and the address can be designated as any of the vacant address in the project. When we record warnings and events on HMI, one page is almost certainly not enough, then turn-page inquiring is needed to be set, thus the address in the attributes of the component for displaying warnings and events takes effect. Take LW10 for an example, as follows:



Use two [Multi-State Setting Component] as the Page Up/Down button, designate the button address the same as the component for display, and set as follows in the attributes page of [Multi-State Setting].

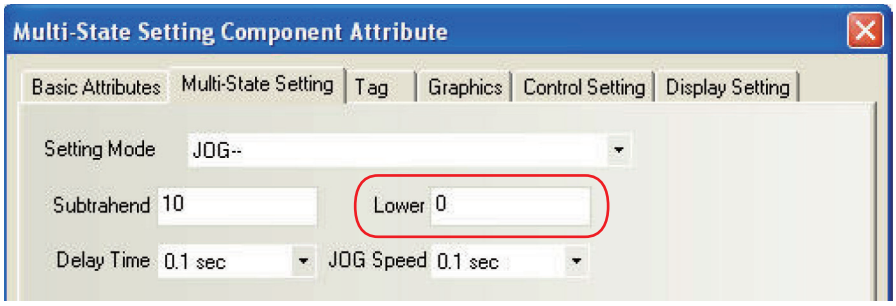




Note Incremental upper limit is determined by how many events the customer wants to record, while the decremental lower limit is recommended to be set to 0.

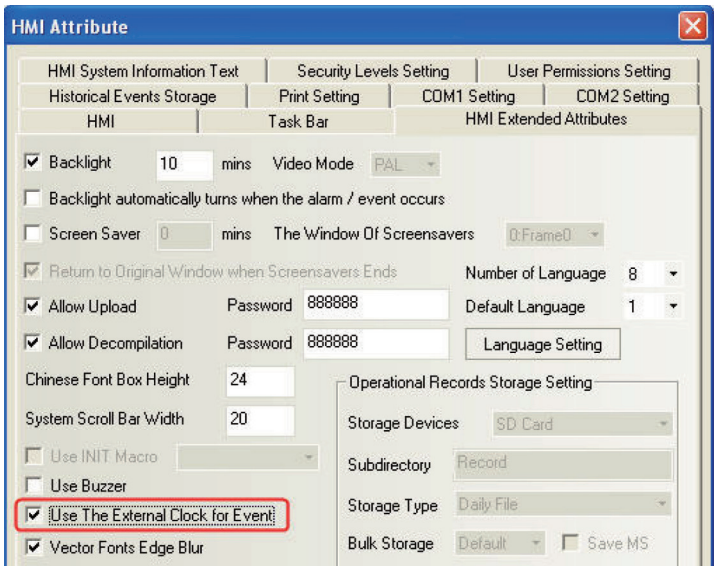
10 Why is there one event inquiring record less

When the customer set the [Multi-State Setting component] for Page Up/Down, the lower limit is set to 1, which will cause the records to be one less. The correct setting is as follows:



11 How to keep the time in the event record and in the PLC synchronized

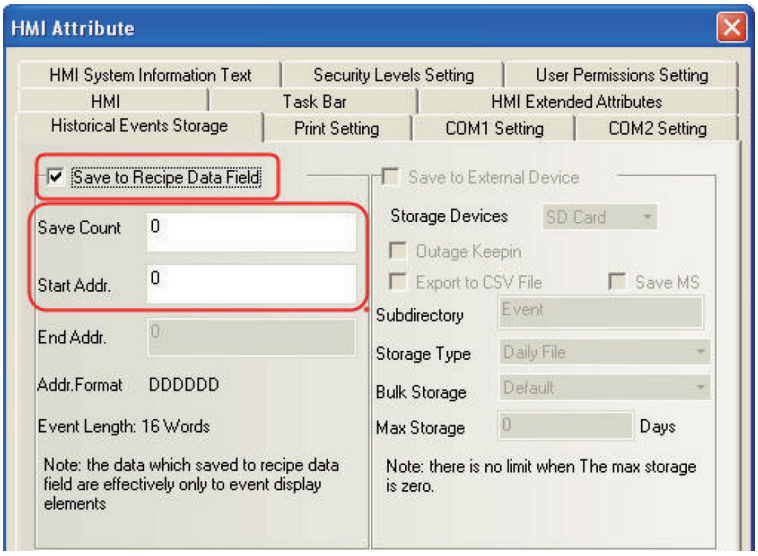
Check [Use The External Clock for Event] in [HMI Attribute] — [HMI Extended Attributes], as follows:



Meanwhile, clock register data inside the PLC is also needed to be transmitted to the local register LW9010-9017. For details, refer to the NB-Designer User Manual [3-10-3 HMI Extended Attributes].

12 Why cannot the history events be saved even if “saving” is selected

In most of this kind of cases, although the customer selects to save them, the No. of events to be saved which is 0 by default is not changed to the No. the customer needs, thus the problem occurs. In this case, just set the No. of events to be saved to make it work. This is done in [HMI Attribute] --- [Historical Events Storage], as follows:



13 The cause of HMI prompting “RTC Device error” and the solution

When HMI prompt “RTC Device error”, it’s probably because the clock chip fails.
If the recipe component or the system time is not used, this notice can be shielded without affecting other operations. The method to shield it is: place a [Bit State Setting Component] in the project’s common window, with the address set to LW.B 9298.0 and the set type to [Set On when Window Open] status.

14 What if there is one digit less when displaying negative numbers, or it displays “****”

When the data type in the software is decimal, the minus sign also occupies a bit, therefore one more integer bit is needed.

15 When switching the screens with PLC control, why cannot the screen being set up be accessed repeatedly

It's likely because the value of the PLC address through which screen switching is set does not change. When switching the screen and leaving it in other ways (eg. by screen switching button), as the value of the PLC address does not change, the screen cannot be accessed repeatedly with PLC control.
Solution: add a [Multi-State Setting component] to the window of leaving designated screen, with the address set to the same as the one in [PLC Control Change Window], and the attribute to [Set at Window Close] (This value can be set as a negative).

16 When calling a screen with a direct window, why does not the target screen show up completely

When calling a target screen with a direct window, the left top corner is taken as the base point. If the size of the direct window component is smaller than then target window, the display may be incomplete. Therefore, when editing the target screen, place the component with the left top corner as the base point and make sure that the size of the target screen is the same as that of the direct window component.

17 Components on the screen such as the indicator, button etc. will not show up properly, while offline simulation still works as normal

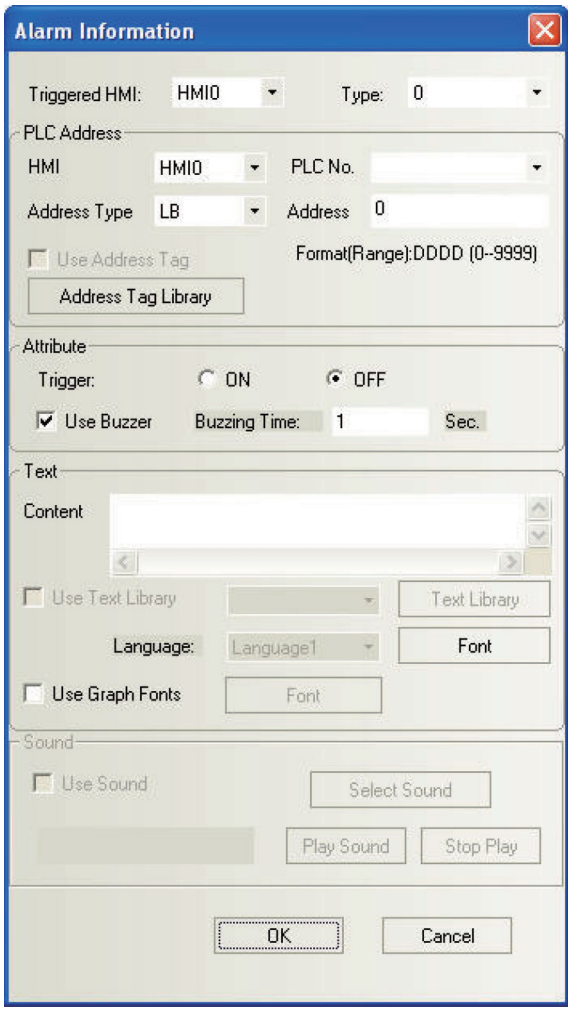
It may be caused by communication disruption between the HMI and the slave. If the communication fails and the component on the screen takes the slave’s address, components like the indicator and buttons will not show up properly. Restoring the communication will solve this problem. With respect to how to restore the disrupted communication, refer to communication-related issues in this manual.

18 Can the HMI be restarted without interrupting the power supply

There are two ways to restart it without interrupting the power supply:
Method 1: Press the RESET button on the back of the panel to restart it.
Method 2: Make a [Bit State Switch] component, with the address as LB9045. When LB9045=1, the HMI will restart.

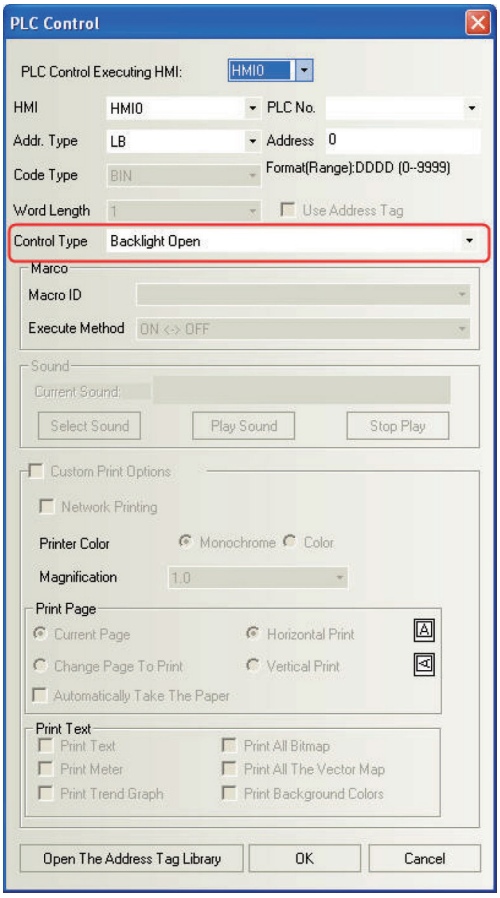
19 How to make the HMI's buzzer sound when a warning occurs

Set Buzzer Warning in the warning settings, and the buzzing time can be set as required, as shown below:



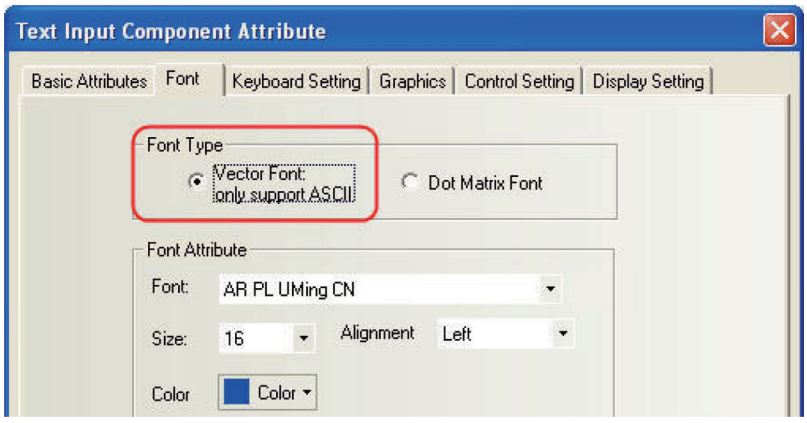
20 When the backlight is dimmed, how to light it up by means of the PLC addresses

Select the PLC control component, then select [Backlight Open], as shown below:



21 Why does the character input as text turn up as messy codes

This may be because the text input Component or the Note Book Component involves vector fonts. When inputting Chinese characters, the text input Component and the Note Book Component do not support vector font, but only support Dot Matrix Font, as shown below:



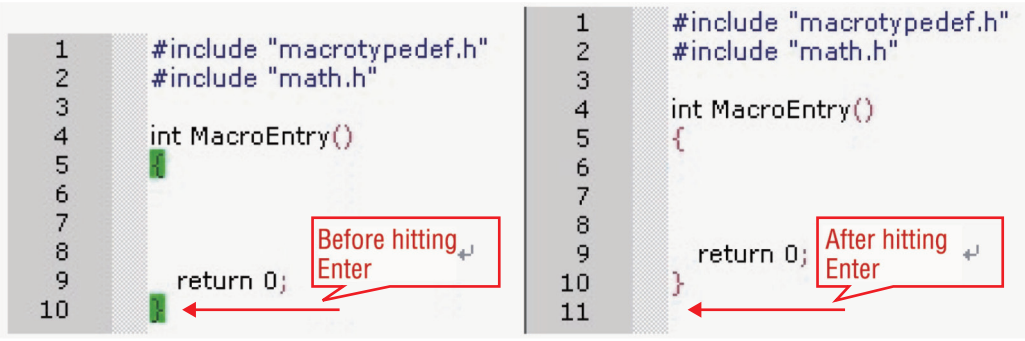
22 How to skip to the target screen after inputting the password correctly

Place a “Function Key” Component on the screen, and overlay it with a “Trigger Touch” component. Assume that the device address of the “Trigger Touch” Component is LB10 and the Trigger Type of it is OFF→ON, then select “Trigger Register” in the control settings of the attributes of the Number Input Component for password input. Cause the LB10 to be turned ON after setting the attribute to “After Written Notice”. When the password is input correctly, it can directly skip to the screen switched by the Function Key.

Note The function of the “Trigger Touch” Component is equivalent to clicking the area covered by the “Trigger Touch”. When the trigger condition is satisfied, the components in this area will be executed.

23 What if a “warning: no newline at end of file” pop up when compiling a macro program

When compiling a program, a macro instruction compiling warning “warning: no newline at end of file” pops up on the Message window. No error is found after check, but the warning persists after compiling. In this situation, input an enter at the last row of the macro instruction, as follows:



24 Why does a “System Crash: SegV” appear after calling a macro program

The likely causes are as follows:

(a) The address range specified in the macro instruction exceeds the actual address

(b) When using array data, the array data range exceeds limits. For example: when defining int array [10], if array [10] is used, there will be an issue of array exceeding limits.

(c) When proceeding division operation, the denominator is 0, and no judgment is made.

(d) An endless loop forms in the macro.

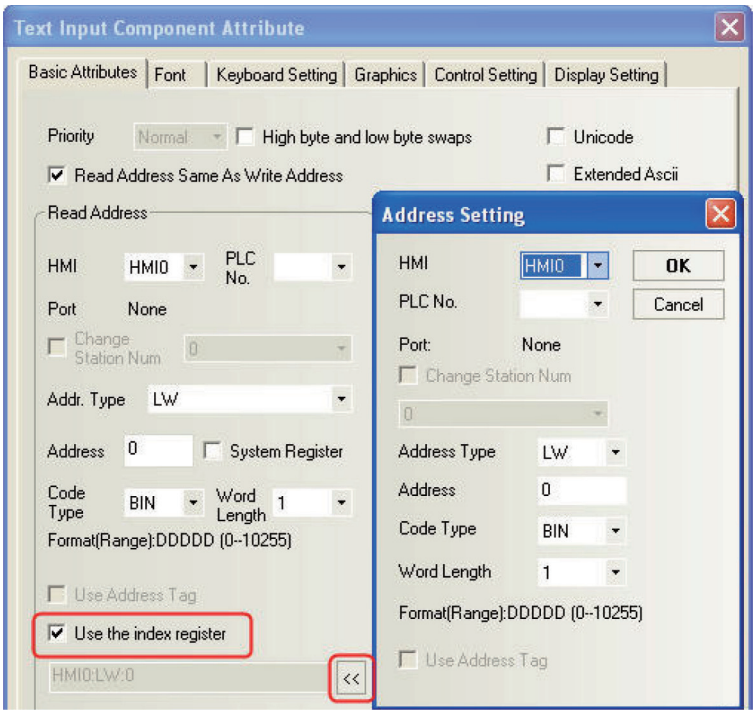
25 Why cannot a project edited recently be renamed after closing the NB-Designer

The project file names cannot be changed directly, and the only way to rename a project is to use the [Save As] option in the [File] menu.

26 How to achieve indirect addressing with an index register

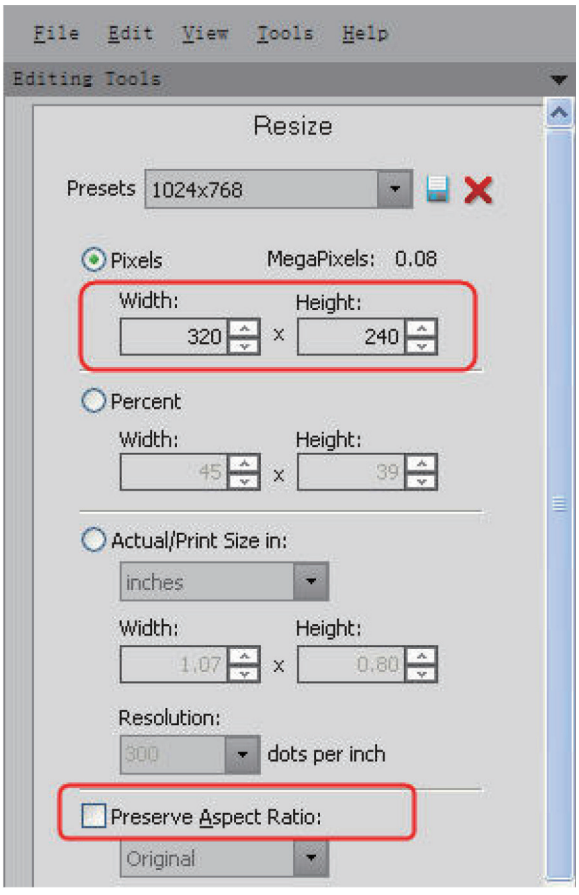
The function of the index register: realizing the indirect addressing mode of the register. The component’s new input/output address = its original input/output address + the word address of the index register.

After checking [Use the index register], click the arrow and a window as follow will turn up.



27 How to make sure that pictures imported are not distorted

Cut the picture with a drawing tool first. For example, if a 320*240 picture is to be fitted on a screen with a resolution of 800*480, use Image Software to set the width at 320 and the height at 240 in Edit→Resize, then import it into the configuration project, as shown below.



28 When a new project is created, what roles do the windows coming with the system play respectively, and can they be deleted

It's better not to delete or alter the windows coming with the system, especially for new users, because each window plays a specific role.

The indications of the windows are as follows:

Window 0: default Startup Window (Frame 0), which can be used for editing the first page.

Window 1: Common Window, in which there are two direct windows used for ejecting the numeric keyboard coming with the system, and what is more, all the components in the Common Window work in any of windows of the project.

Window 2: Fast Selection Window, used for ejecting the taskbar, and users can place a page-turning button in this window.

Windows coming with the system also include:

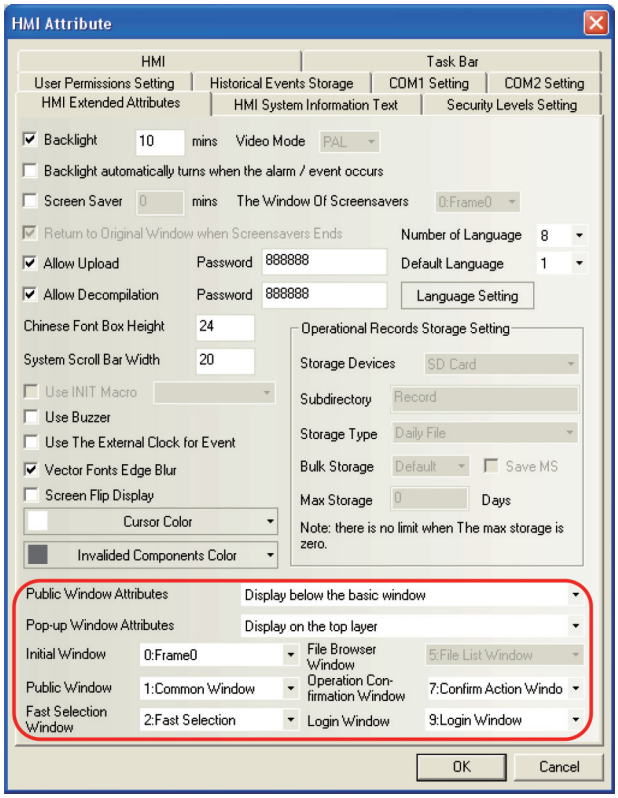
NUM keyboard

ASCII keyboard

HEX Keyboard

Operator Confirm Window: this window is used together with the [Operator Confirm] of the attributes page of [Control Setting].

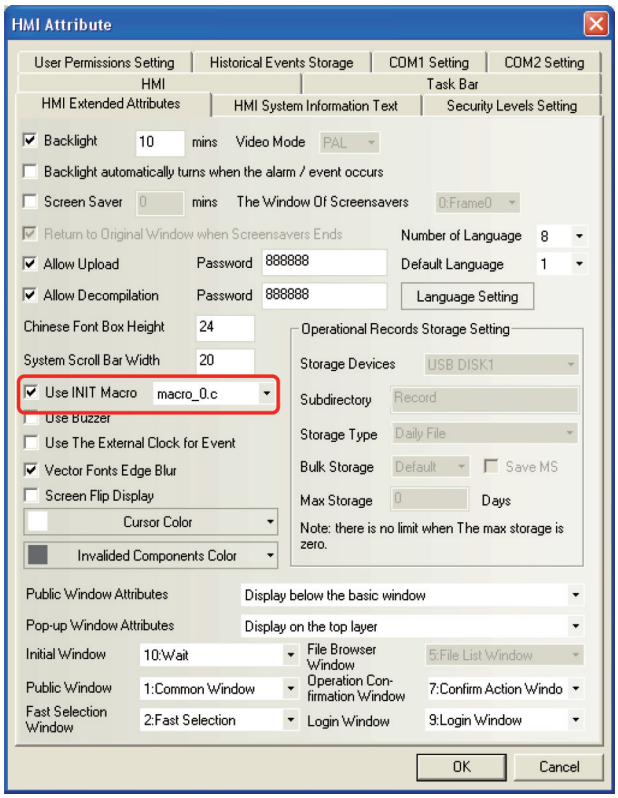
You can change the attributes of the windows coming with the system in [HMI Extended Attributes] of [HMI Attribute], as shown below:



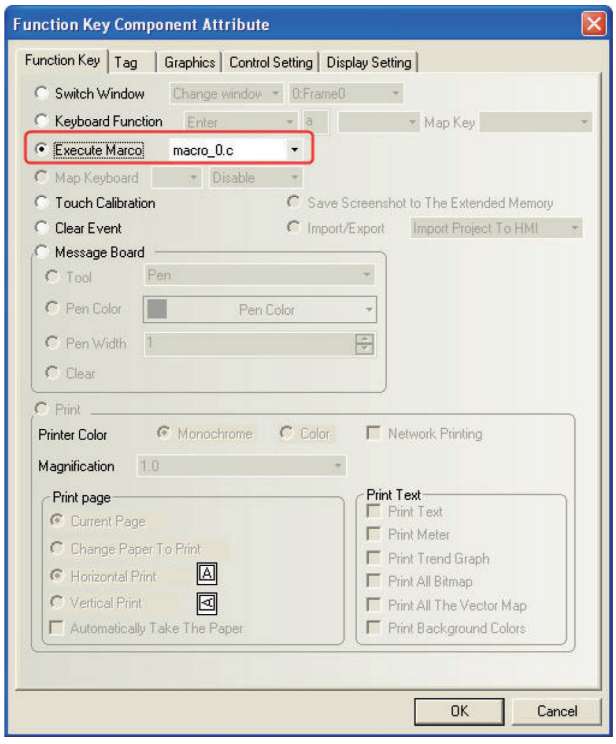
29 What methods are there for triggering (executing) macro programs

There are 5 kinds of triggering methods for macro instructions, from which users can choose the triggering methods they need.

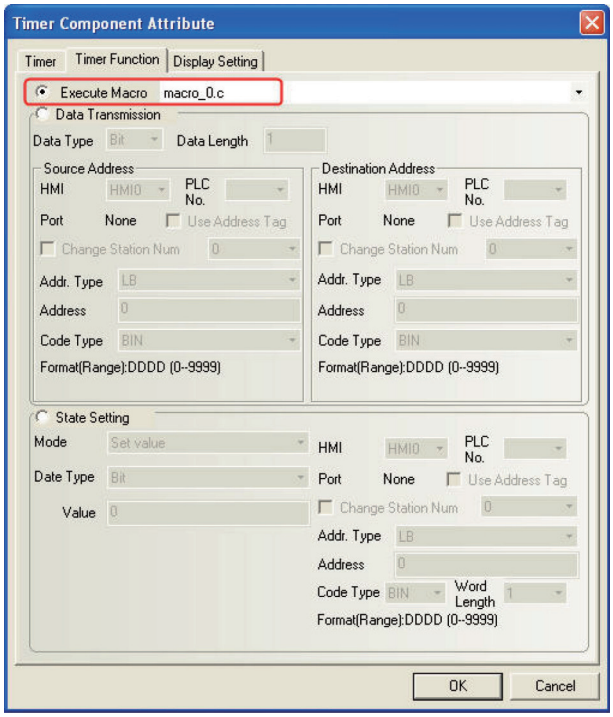
Method 1: [HMI Attribute] → [HMI Extended Attributes] → [Use INIT Macro]: When the HMI is energized and started, the set macro program is executed once, as shown below:



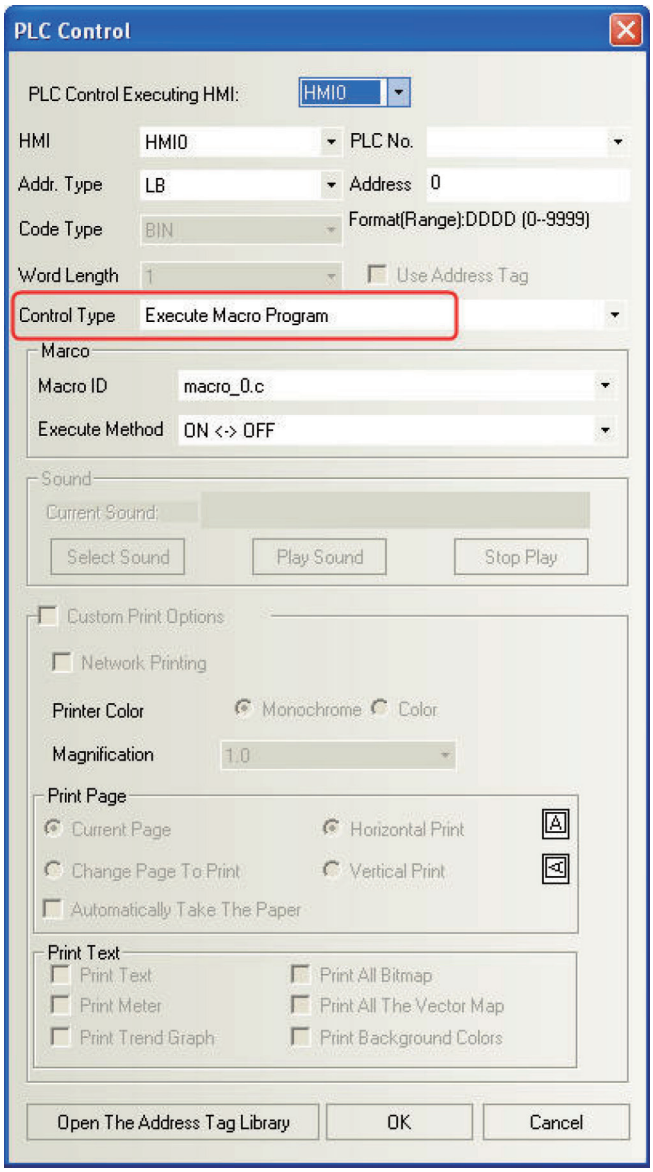
Method 2: [Function Key] → [Execute Macro]: each time the Function Key is clicked, the macro program is executed once, as shown below:



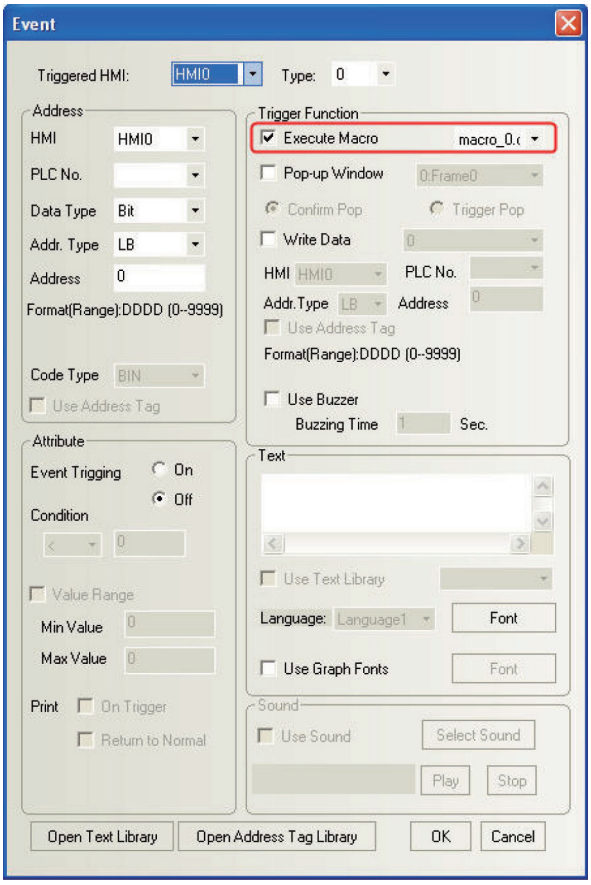
Method 3: [Timer] → [Execute Macro]: The triggering and execution of the macro program is controlled by time.



Method 4: [PLC Control] → [Execute Macro Program]: The execution of the macro program is controlled by the PLC address.



Method 5: [Event Information] → [Execute Macro]: the macro program is triggered and executed by events, and when the set event condition is satisfied, the macro program is executed.

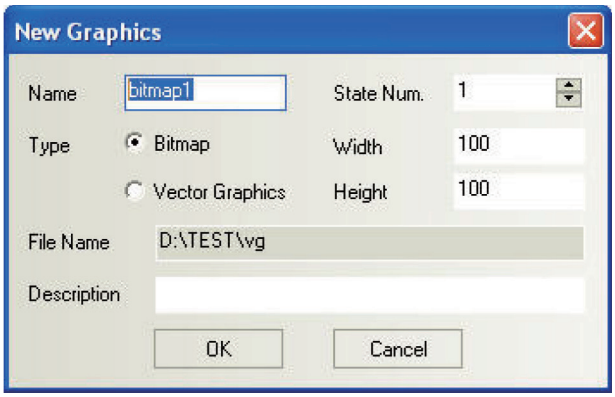


30 What formats of pictures does NB-Designer support, and how to import these pictures

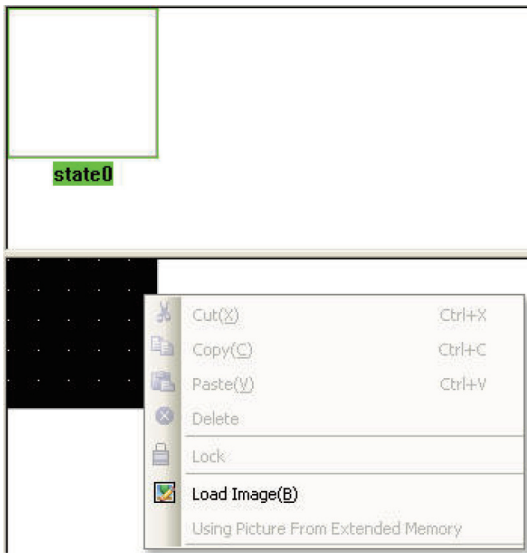
The formats of pictures that can be imported include: ".JPG", ".GIF", ".BMP" and ".PNG".

Import method:

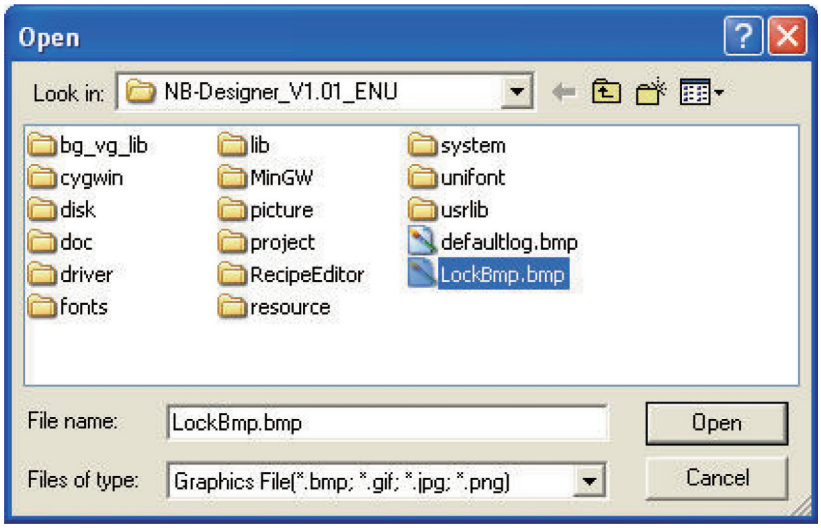
(a) Create a new figure, and select "Bitmap"



(b) In the dialogue box that pops up, right-click “Load Image”.



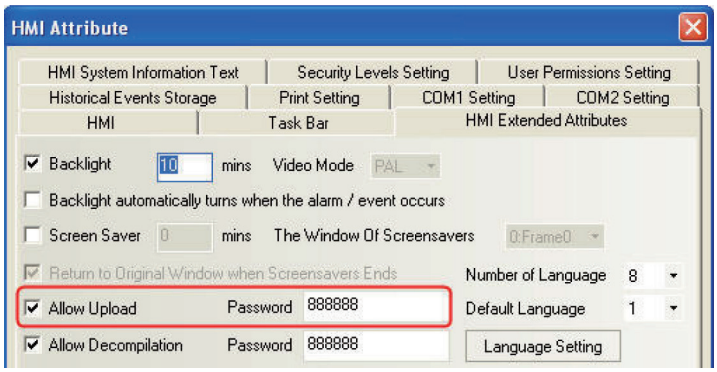
(c) Choose the picture to be imported



(d) After a successful import, the imported picture can be used in programs

31 How to restrict programs in the HMI from being uploaded

In [HMI Attribute] → [HMI Extended Attributes] → [Allow Upload], set a password to achieve this purpose, as shown below:



After a password is set, the password needs to be entered correctly to carry out uploading, or not, the uploading cannot proceed; you can disable uploading completely by deselecting [Allow Upload]. If [Allow Decompilation] is selected and a password is set, the correct password is required to be entered to proceed with decompilation. If [Allow Decompilation] is deselected, decompilation cannot be performed even after a project is uploaded.
Note that if the project is large and decompilation is not required, then decompliation can be deselected to save the storage space of the HMI.

32 How to mask system alarm information - PLC No Response

Place a [Bit State Setting Component] in the Common Window, with the address being LW.B 9296.2 and the setting type being [Set On when Window Open].

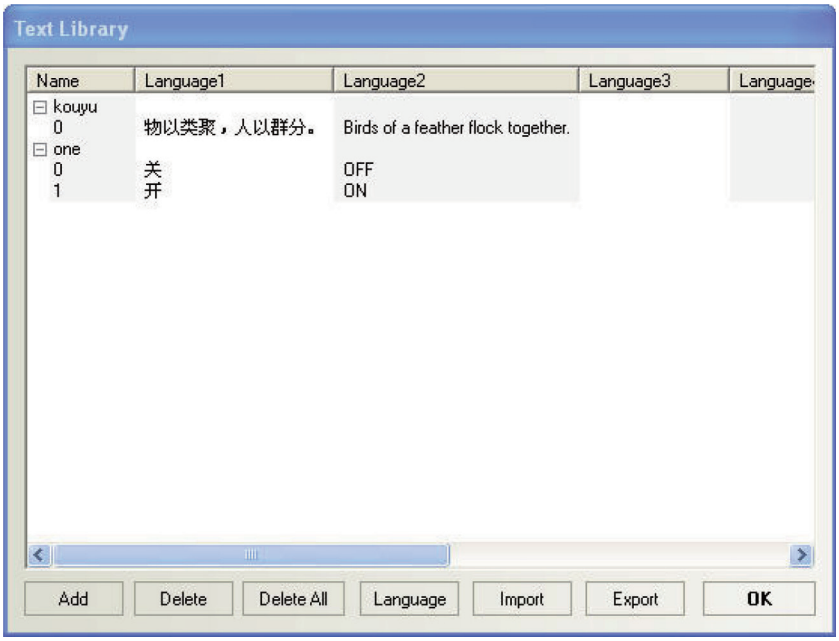
33 How to mask system alarm information - Socket Connect Error

Place a [Bit State Setting Component] in the Common Window, with the address being LW.B 9296.4 and the setting type being [Set On when Window Open].

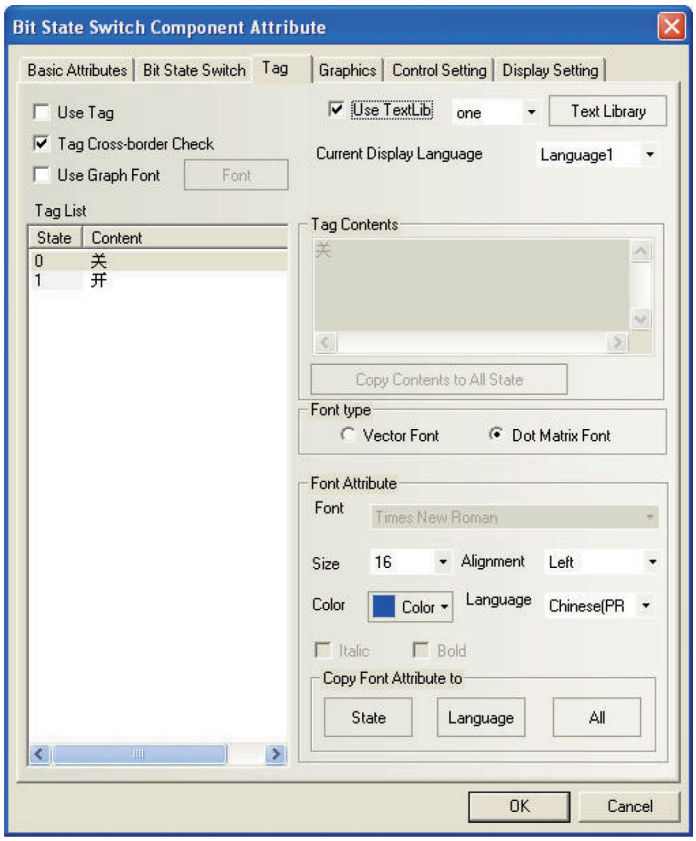
34 How to achieve multi-language switch

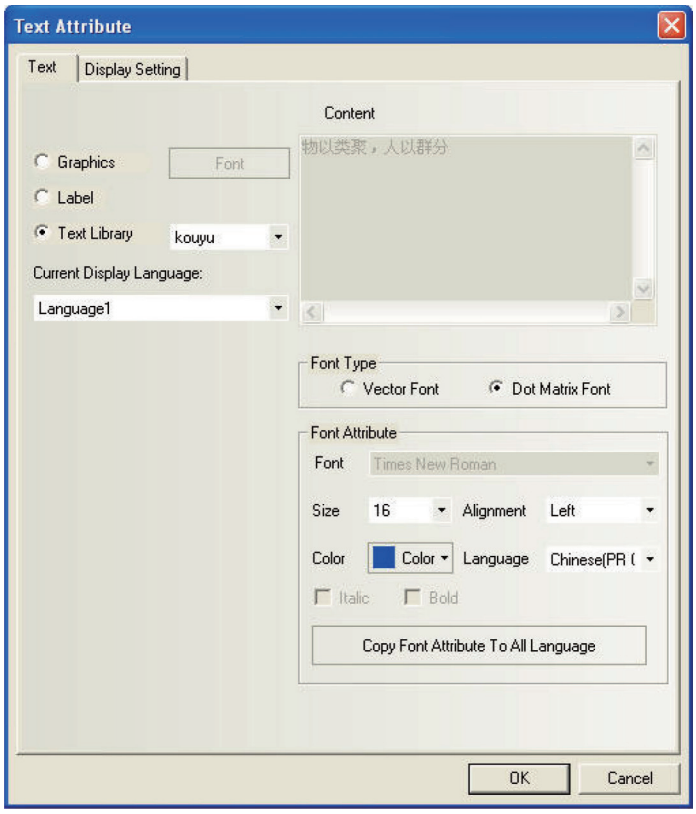
Multi-language switch can be achieved through changing the value of the special register LW9130. The default setting is: LW9130=0, with the corresponding language 1.
NB-Designer supports up to a maximum of 32 languages. The following is an example of Chinese - English switching:
LW9130=0: Language 1→Chinese
LW9130=1: Language 2→English

(a) Create a text in the text library, as shown below:



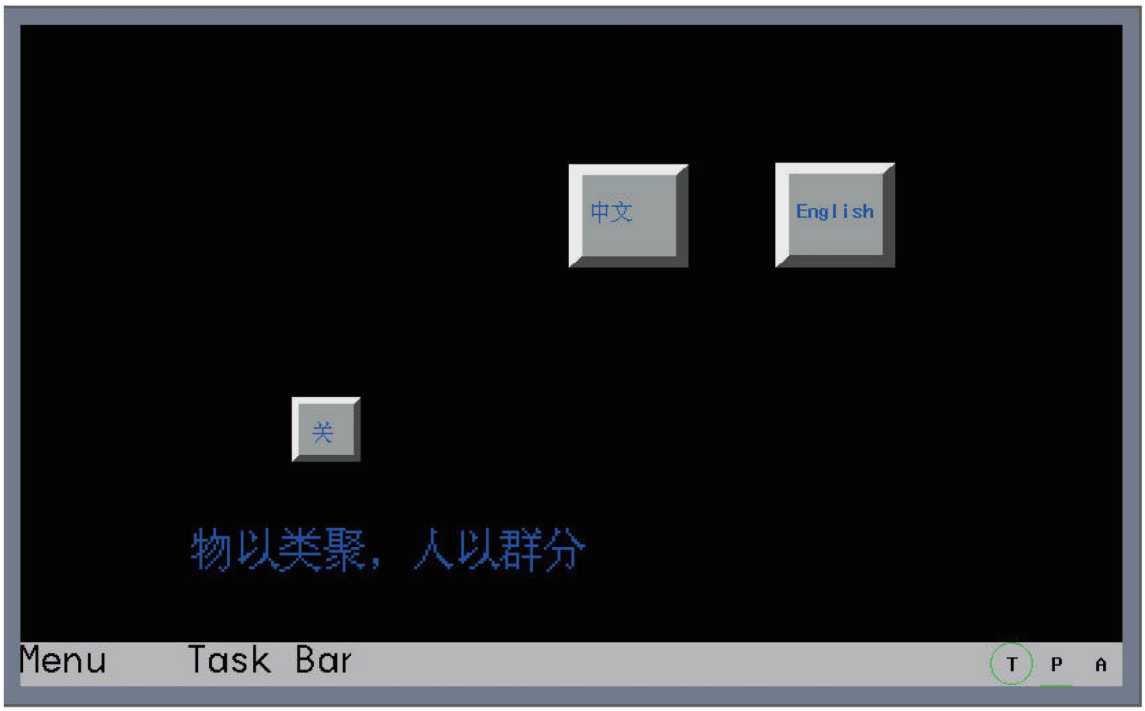
(b) Add a [Bit State Switch] and a static text on the screen, with the “Use TextLib” selected for tags, as shown below:





(c) Add two Multi-State Setting Components on the screen, with both of the addresses being LW9130, the setting Mode being “Set Constant”, the values set to 0 and 1 (0: Chinese display, 1: English display); online language switching can be achieved by changing the value of LW9130.

(d) When activating the “English” button, the screen will be displayed in English, and when activating the “Chinese” button, the screen will be displayed in Chinese, as shown below:



6-3-2 Communication-related Troubles

1 What if the communication between the PLC and HMI fails

Many customers experienced communication problems between the HMI and PLC when they used HMI. As this happens, follow the procedures below to check what is going wrong.

(a) Check whether the hardware connections are correct or not, especially whether the fabrication of the communication cable correct or not;

(b) Check the COM port parameters in the HMI attributes settings are set correctly or not, such as the Baud Rate, Word Length, Efficacy, and PLC Station No., etc. and make sure the HMI serial port communication parameter settings are in consistent with that of the slave Unit;

(c) Is the communication serial port selected correctly, for example, if COM1 is selected in software configuration, but COM2 is used actually, this would be considered wrong;

(d) Use the serial programming cable of the PLC to download PLC programs, and make sure the downloading go smoothly. Exit the downloading mode and use the [Direct Online Simulation] function of the NB-Designer by clicking [Tool] → [Direct Online Simulation]. If the [Direct Online Simulation] communication fails, it is likely because the communication parameters of the HMI and PLC are inconsistent. In this case, check the communication parameter settings of the PLC and HMI;

(e) If the [Direct Online Simulation] functions well, please check the efficacy of the communication cable of the HMI and PLC (If it's the user who make the cable, please check whether the male and female pins are deployed in right correspondence, and whether there is false soldering.);

(f) When the connection is realized by the Ethernet method, please check whether the IP address of HMI and that of PLC are correct.

(g) When the connection is realized by the Ethernet method, please confirm whether PLC supports MODBUS TCP protocol or Fins UDP protocol.

(h) If all turn right following the above procedures, but communications still will not work, please contact the supplier.

2 Components cannot be displayed simultaneously after a page-turn, and in some cases, they turn up after a few seconds

This is probably due to a low communication speed. With respect to the solution, refer to [3. Why is the communication between the HMI and slave Unit slow and how to improve it].

3 Why is the communication between the HMI and slave Unit slow and how to improve it

The possible causes of a slow communication:

(a) There are too many components on a single screen communicating with the slave Unit, and besides, the addresses are not continuous:

(b) The macro program calls too many addresses of the salve Unit directly, and it's not recommended to directly use slave Unit addresses in a macro program;

(c) The Common Window or some other window employs too many timers;

(d) Too many background components such as Trend Curve, XY Plot and historical data are employed, and the background components are running all the time;

(e) Warning and Event Information Registration addresses are too many and not continuous;

(f) Too many PLC control components are used;

(g) On-site Interference;

(h) Too many vector font formats are used, while the font formats featured in a project should be as few as possible;

(i) Too many bitmaps are used;

(j) Too many windows pop up, such as direct windows and indirect windows;

(k) There are too many controllers communicating with the HMI and too many communication addresses.

Solutions:

(a) Components on a single screen communicating with the slave Unit should be as few as possible;

(b) Try to keep the addresses of the components on a single screen communicating with the slave Unit continuous;

(c) Try to use HMI's internal addresses for variables in a macro program. If there is a need for exchanging data between the touch panel and slave Unit communication components, resort to the data transmission function of the timer or data transmission components;

(d) Keep a minimum of number of channels of background components such as Trend Curve, XY plot and historical data display components, etc. and make sampling periods as long as possible;

(e) Try to keep Warning and Event Information Registration addresses continuous;

(f) Do not use too many PLC control components;

(g) Use a shielded cable for the communication cable. Keep it at least 10 CM away from power lines, and make sure the system is grounded properly;

(h) Try to use tag fonts when programming. Try to use less vector fonts, and when using vector fonts, keep font formats as few as possible.

4 PLC No Response: what is the meaning of XX-XX-X

XX-XX-X means: HMI number - PLC station number - HMI serial port number. For example, 00-01-01 means the No.0 HMI using the serial port COM1 loses communication connection to the controller with the station number 1.
The serial port number is defined as: 01/02 represent COM1/COM2.

5 The causes for a project downloading failure

Downloading through USB fails:
Check whether hardware connections are still functioning well or not, then check through the following factors

(a) USB driver is not installed successfully.

(b) USB driver has been damaged. Find the driver at NB-Designer/driver and reinstall it;

(c) The USB downloading cable has been damaged, so replace it;

(d) The USB port of the HMI or the PC fails;

(e) Electromagnetic interference is affecting the USB downloading cable. Make sure the system is grounded properly.

Downloading in the serial mode fails:

(a) [Tool] menu → [Downloading Mode Options]→ Whether [Serial] is selected.

(b) Whether the serial No. of the PC is correct;

(c) The serial port is occupied or problems arise to the PC serial port;

(d) The fabrication of the communication cable is incorrect or the bonding wire falls off;

(e) The downloading cable is plugged incorrectly, and it should be plugged to the COM1 port with the label indicating the NB Unit;

(f) The serial port of the HMI fails (The serial port does not support hot plug, so take care and avoid man-made damage).

Downloading in the network interface mode fails:

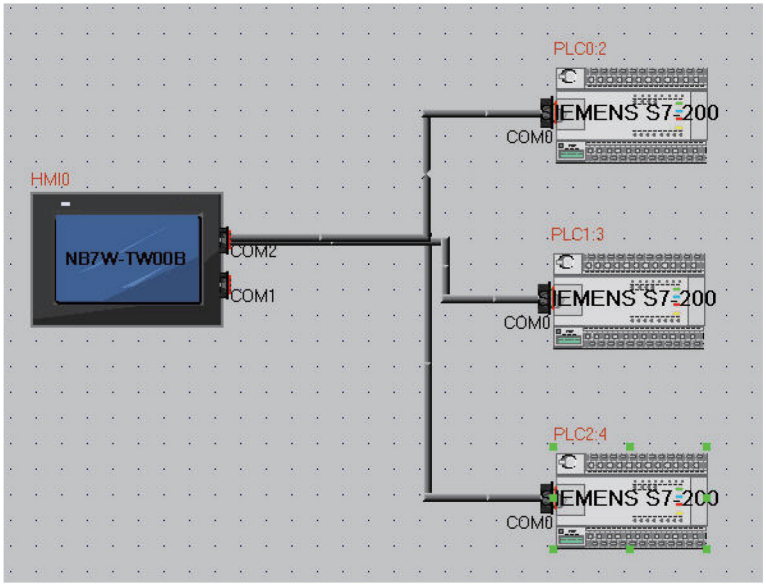
(a) [Tools] menu -> [Download Way] -> Whether [Network Interface] is selected.

(b) [Tools] menu -> [Download Way] -> Whether the IP address and port number are same as that in HMI settings. In HMI System Setting Mode, the network settings for HMI Unit can be viewed. (For the operation method, please refer to *3-1 Installation* in the *NB Series Setup Manual*.)

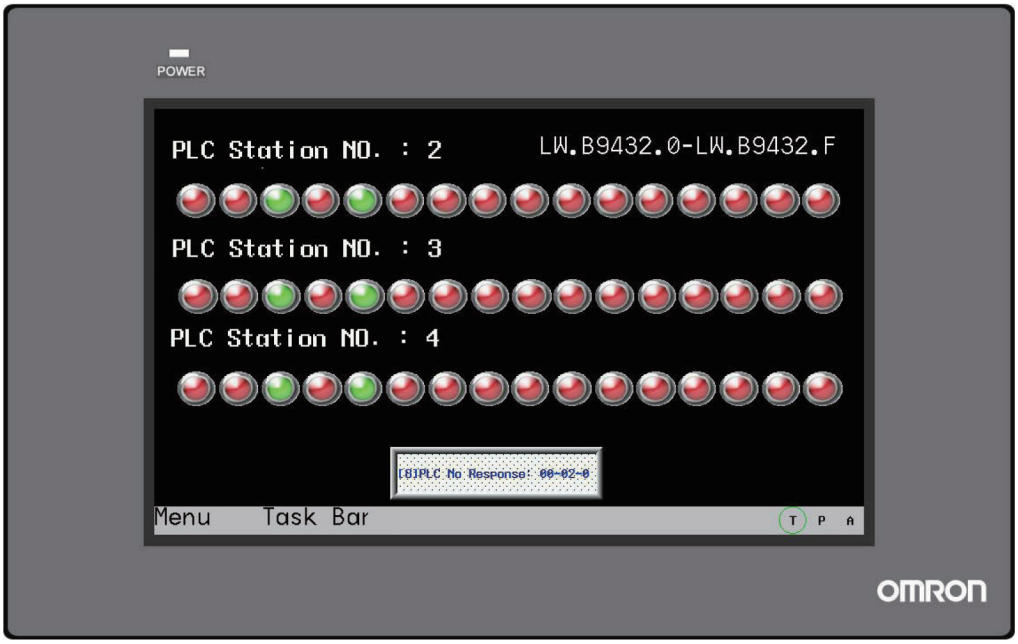
(c) The IP address of PC and that of HMI are not set in the same network segment.

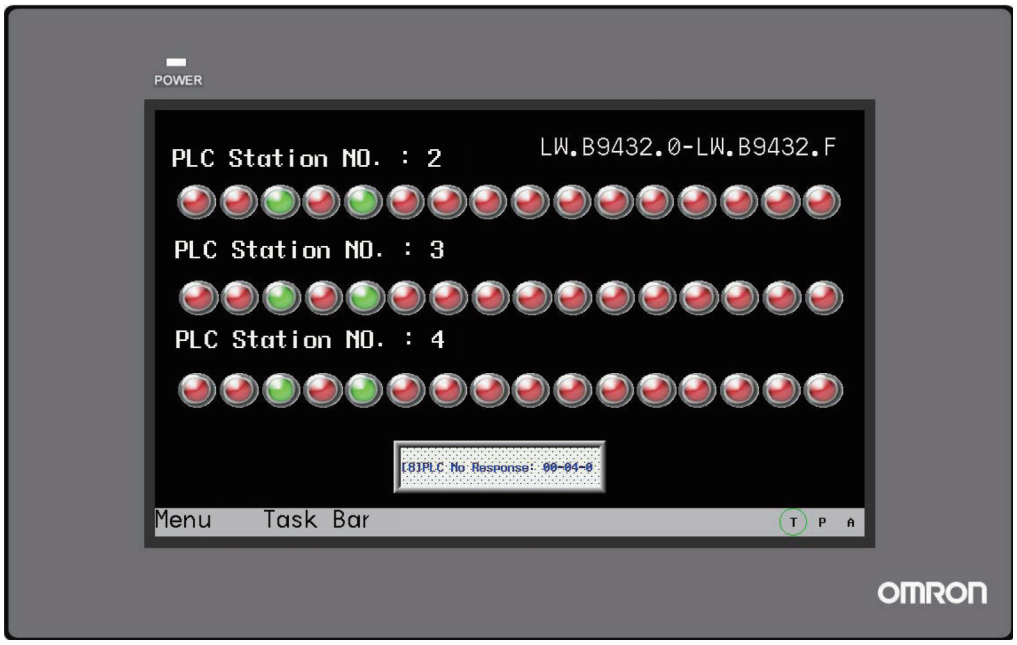
6 How to decide whether communications are normal or not through the internal addresses of the HMI

Decide which station breaks off through a bit;
Serial port 2: LW9432-9447, 16 words are equivalent to 256 bits, with each bit corresponding to a PLC. No response = ON, Normal = OFF.
See the following diagram:



Assume that 3 S7-200 PLCs connect to the COM2 port of NB7W, the station numbers of which are 2, 3, 4 respectively; if the PLCs with the station numbers 2 and 4 fail communication, the internal registers LW.B9432.2 and LW.B9432.4 will turn ON automatically, as shown below:





7 The communications of the PT and PLC are normal, but why are some numeric values are indicated as "****"

When the data coming from registers communicating with the PLC exceeds the setting range of the Number Display or Number Input, "****" will appear. It indicates an overflow of a numeric value. The user can set the integer bit digit number range of the Number Display or Number Input larger through the software to make numeric value display normal. For example, change the integer bit digit number from 3 to 4.

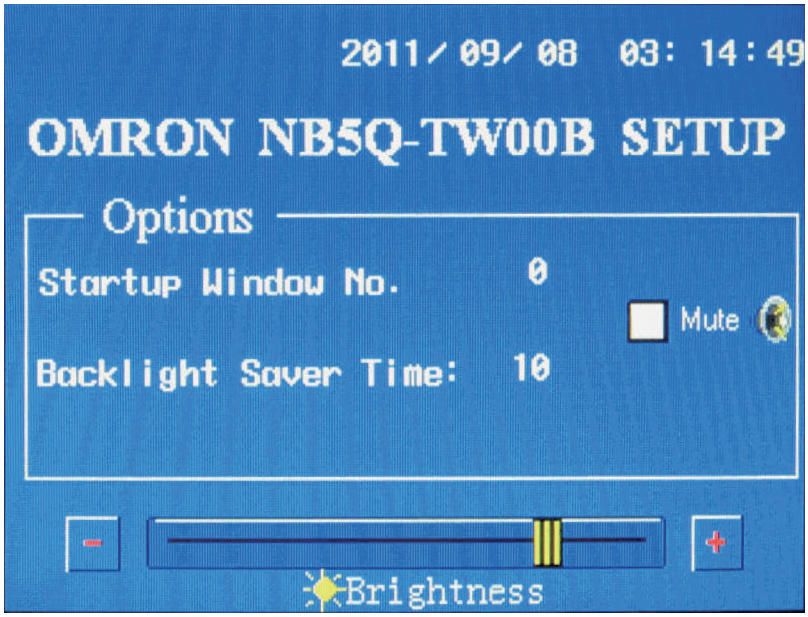
8 Why is the window-switching speed of the PT becoming slow after macro instructions are used

When writing macro-code programs, if a large of number of address variables of the PLC or slave Unit are defined, the execution speed of the PT may suffer. When executing a macro program, the processor picks up the variable addresses defined first, executes macro operation, then carries out output. If the macro program is executed at a high frequency, a large amount of time is used to perform communication with the slave Unit, thus affecting the execution speed of the PT as a whole.

6-3-3 Hardware Troubles

1 How to calibrate the system time of the PT

There are 2 methods to calibrate the time:
Method 1: there are 2 DIP switches on the backside of the PT. Tweak both of the DIP switches 1 and 2 to ON, reboot the PT, then the Setup Screen turns up, as shown below: (take NB5Q-TW00B as an example)



Click the time component, input the current time.
Method 2: Create a new project, and place 7 Number Input components on the screen, with each of the addresses LW10000~LW10006 respectively corresponding to the Second, Minute, Hour, Day, Month, Year and Week The time can thus be calibrated through changing the values of these 6 Number Input components.

2 The time cannot be saved or the display is not accurate

If the time cannot be saved, the most likely cause is that the battery runs low. When the PT is disconnected from the power supply, the RTC needs to be energized by the battery on the PT mainboard. When the battery voltage descends to an unsustainably low level, it may cause that the time cannot be saved or the display is not accurate, therefore requiring the Unit to be sent back to replace.

3 Why is there no response from touch-control

When operating the touch panel, if clicking a component on the screen does not receive a proper response, the first thing you have to do is to make sure that this button is indeed operable. If it is confirmed, the problem may result from a touch-control shift. The touch panel is a panel of 4-wire precision resistors, and because the resistors are subject to impacts from temperature, humidity and also their own characteristics, it's recommended that touch-control calibration be carried out yearly.
Calibration method: tweak the DIP switches on the backside of the PT, SW1 to OFF, SW2 to ON, and restart the PT. A "+" will appear on the screen. Click it, the "+" will shift after the PT responds. You have to click again and after a total of 5 consecutive clicks, the PT will prompt you whether the calibration is a success. If it is a success, the PT will skip to the user program screen, while if it is not a success, the "+" will pop up again, requiring another round of calibration.

Note After a successful calibration, the DIP switch 2 needs to be set back to OFF, or not, the system will prompt you for a calibration every time you turn on the power supply.

4 Why is the PT touch-control not responding or insensitive

The likely causes are as follows:

(a) The communications are abnormal, and when this happens, the touch-control may not respond;

(b) The touch-control shifts, and change of the operation environment or the touch panel characteristics may cause the touch-control to be unable to respond;

(c) The touch panel is damaged or the touch-control circuit suffers a poor contact;

Solutions:

(a) Resolve the communication problem;

(b) Try out a touch-control calibration;

(c) Send it back to the factory for tests.

5 Why does the PT screen dim or without backlight

The screens we normally see on a PT are displayed in liquid crystal. However, the liquid crystal itself does not give out light, so it is usually used together with a light source, and so far, the most commonly used light-emitting equipments for industrial PT products are of CCFL or LED backlight. The NB-Series touch panel employs LED backlight.
LED backlight: LED, (i.e. Lighting Emitting Diode), is a kind of semiconductor solid light-emitting device. It uses solid semiconductor chips as the light-emitting material. Surplus energy breaks out during the process of combination of charge carriers in the semiconductor, triggering photon emissions, and this is used to display various kinds of information, such as characters, graphics, images, animations, quotations, videos and video signals on display panels. The generally used LED backlight is made up of an array, e.g. an array of 3×4 with a total of 12 LEDs, and if one or even more LEDs are not working normally, the screen will dim. When none of the LEDs is working normally, the screen will have no backlight.

The possible causes for a black screen are as follows:

(a) The power supply to the PT is abnormal;

(b) The PT enters the screen saver (backlight saver) mode;

(c) Control backlight OFF is set through the PLC Control Component;

(d) Backlight broken or the LCD panel is damaged.

Solutions:

(a) Check the power supply to the PT, use a multimeter to measure whether the voltage is within the normal range or whether the output power is too low;

(b) Click the PT screen to exit the screen saver mode;

(c) Check whether control backlight OFF is set through the PLC Control Component in the PT program;

(d) Please contact OMRON's customer service center.

6 PT white screen and flickering screen

The causes of a white screen or a flickering screen: the ambient temperature exceeds the range specified on the PT nameplate, or the liquid crystal is damaged.
Solutions: Check the ambient temperature and compare it with that specified on the PT, or contact OMRON's customer service center.

7 The serial port gets heated when the PT communicates with other devices

Check the grounding of the PT and other communication devices. If the grounding is not shared, there is a possible significant voltage difference between the devices, leading to a heavy current, thus causing a heated serial port.

6-3-4 Problems about FINS/UDP

1 What consequences will occur if the same IP address is used for two PLCs

The user should avoid such kind of setting. If it occurs, NB may receive the information from one PLC at a moment while receive the information from the other PLC at the next moment.

2 What consequences will occur if the same Node ID is used for two PLCs

The user should avoid such kind of setting.
If two PLCs have the same Node ID but different IP address, NB can only connect with the one that is set in the NB-Designer.
If two PLCs have the same Node ID and IP address, NB may receive the information from one PLC at a moment while receive the information from the other PLC at the next moment.

3 What will happen if the NB is connected with PLCs more than 32 units

No error will occur in NB, but NB will not respond to the PLC which is not set because NB only supports the FINS client protocol.

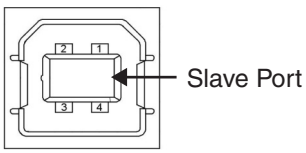
6-3-5 Other Troubles

1 During Direct Online Simulation, the internal data of the PLC is readable, but not alterable

Check whether the internal storage addresses of the PLC is writable or not. If the address property is Read only, the data cannot be changed; then check whether the communication cable is normal or not.

2 What is the difference between the USB Host and Slave ports

USB Slave port is used for downloading/uploading data, executing functions related to the NB-Designer and connecting printers using pictBridge protocol, and not for communicating with the slave Units. USB Host port can be connected with a USB flash disk to perform the uploading, downloading, project operation and storage of related data. According to the appearance, the Slave port is customarily called [Square port], while like the USB port on a PC, the Host port is customarily called [Flat port]. The USB Slave port is as shown below:



3 What influences do on-site interferences have on the PT, and what are the countermeasures

On an industrial site, various kinds of interferences will be encountered inevitably. Interferences may cause the following troubles for the touch panel.

(a) A small information window displaying “PLC NO RESPONSE” appears intermittently;
(b) Communications with the PT breaks off, whenever an inverter, motor, transformer or some other equipment alike starts;
(c) The PT crashes;
(d) The touch-control of the PT becomes insensitive.

The interference issue is a rather complicated one, and the commonly used methods for handling this issue include:

(a) Anti-strong-electricity-interference - Keep weak electricity cables such as communication cables, signal cables and control cables away from strong electricity, and do not lay them parallel with strong electricity cables. If possible, wire them through iron tubes, and if the cable duct is multilayered, lay the weak electricity cables below the strong electricity ones.

(b) Anti-inner-cabinet-interference - It's recommended that the alternating current cables and the direct current cables be laid in separate channels, and if laid in the same channel, the weak electricity cables and the strong electricity ones need to be bundled separately, and be kept as far away as possible.

(c) Signal cable anti-interference - Employ STP cables, and ground the shielding layer at one side or add a magnetic ring.

(d) Anti-inverter-interference - Connect a filter to the power-supply side of the inverter, and shroud it with a metal casing.

(e) Every equipment needs to be grounded properly.

(f) Use a separate switching power supply for the PT.

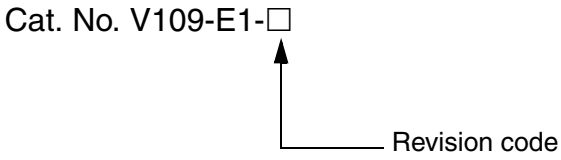
6-4 Unit Replacement Precautions

When the Unit should be replaced for the defectiveness found during the checking, please pay attentions to the following points:

- Perform backup of the screen data of NB Unit in advance.
- The screen data may be deleted when the Unit is repaired by OMORN.
- Be sure to turn OFF the power supply before the replacement.
- After the replacement, please confirm whether the abnormality still exists or not.
- When the defect device is returned for repair, please attach the paper with the detailed description of the problem to the Unit, and then deliver it to the subsidiaries or offices of OMRON.

Revision History

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



Revision code	Date	Revised content
01	October 2011	Original production
02	February 2012	• Added PLC settings in [communication setting] of [4-3 Creating Project]. • Added create macro detail in [creating macro] of [4-3 Creating Project]. • Added create vector graph detail in [creating vector graphics] of [4-3 Creating Project]. • Modify contents of [4-4 Screen creation] • Modify illustration of [HMI Attribute] • Modify contents of [4-6 Save and Load Project]
03	April 2012	• Added the descriptions of NB5Q/NB7W-TW01B. • Added the descriptions of Ethernet connection and the storage of USB disk.
04	August 2012	• Added the descriptions of NB3Q-TW00B/TW01B and NB10W-TW01B.

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