OMRON

NB-series Programmable Terminals SETUP MANUAL

Cat.No. **V107-E1-01**

Notice

OMRON products are manufactured for use according to proper procedures by a qualified operator and only for the purposes described in this manual.
The following conventions are used to indicate and classify precautions in this manual. Always heed the information provided with them. Failure to heed precautions can result in injury to people or damage to property.

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

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

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

OMRON Product References

All OMRON products are capitalized in this manual. The word “Unit” is also capitalized when it refers to an OMRON product, regardless of whether or not it appears in the proper name of the product.
The abbreviation “Ch,” which appears in some displays and on some OMRON products, often means “word” and is abbreviated “Wd” in documentation in this sense. The abbreviation “PLC” means Programmable Controller.
The abbreviation “host” means a controller, such as an IBM PC/AT or compatible computer, that controls a PT (Programmable Terminal).

Visual Aids

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

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

Reference Indicates supplementary information on related topics that may be of interest to the users.

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

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

Contents

About this Manual

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.

Section 5 Maintenance and Troubleshooting

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

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

Related Manuals

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 (This manual)	V107
	NB Series Host Connection Manual	V108
	NB Series Startup Guide	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 CQM1H Operation Manual	W363
	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	W314
	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
External Tool	CX-Programmer Ver.9.□Operation Manual	W446

Terminology

The following terminology is used in this manual.

- About the terminology

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 in the OMRON CP, CS/CJ, or SYSMAC C Series of Programmable Controllers.
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 or CQM1H 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.

Introduction

- **Intended Audience**

  This manual is intended for the following personnel, who must also have knowledge of electrical systems (an electrical engineer or the equivalent).
  - Personnel in charge of introducing FA systems into production facilities.
  - Personnel in charge of designing FA systems.
  - Personnel in charge of installing and connecting FA 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.

Safety Precautions

- Notation Used for Safety Information

  The following notation is used in this manual to provide precautions required to ensure safe usage of the product. The safety precautions that are provided are extremely important to safety. Always read and heed the information provided in all safety precautions.

  The following notation is used.

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

Precautions for Safe Use

Indicates the points that should be practiced or avoided for safe usage of the products.

Precautions for Correct Use

Indicates the points that should be practiced or avoided in order to prevent the product from failure to function, malfunctions or negative impacts on its performance and functionality.

- Symbols

	● Prohibition Indicates a general prohibition.
	● Disassembling prohibition Any attempts to disassemble the product may result in electric shock or other injuries. DO NOT DISASSEMBLE!
	● Caution Indicates general cautionary, warning, or danger level information.

- Warning notation

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.	
Do not touch any internal parts 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, check carefully for any external scratches or other damage. 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 to 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.
- 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.
- Don’t press the touch panel with a force greater than 30 N.
- Do not use a screwdriver or any other tool to press the touch panel.
- 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 that the PT has detected the input of a touch switch before pressing any other touch switch.
- 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 set- tings.
- Before initializing screen data, confirm that existing data is backed up at the NB-Designer.
- When changing the password with the system menu, 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.
- 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 downloading or uploading 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.
- Periodically check the installation conditions in applications where the PT is subject to contact with oil or water.

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

Conformance to EC Directives

NB-series Programmable Terminals are EMC compliant.

1 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

2 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.

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 Consideration

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.

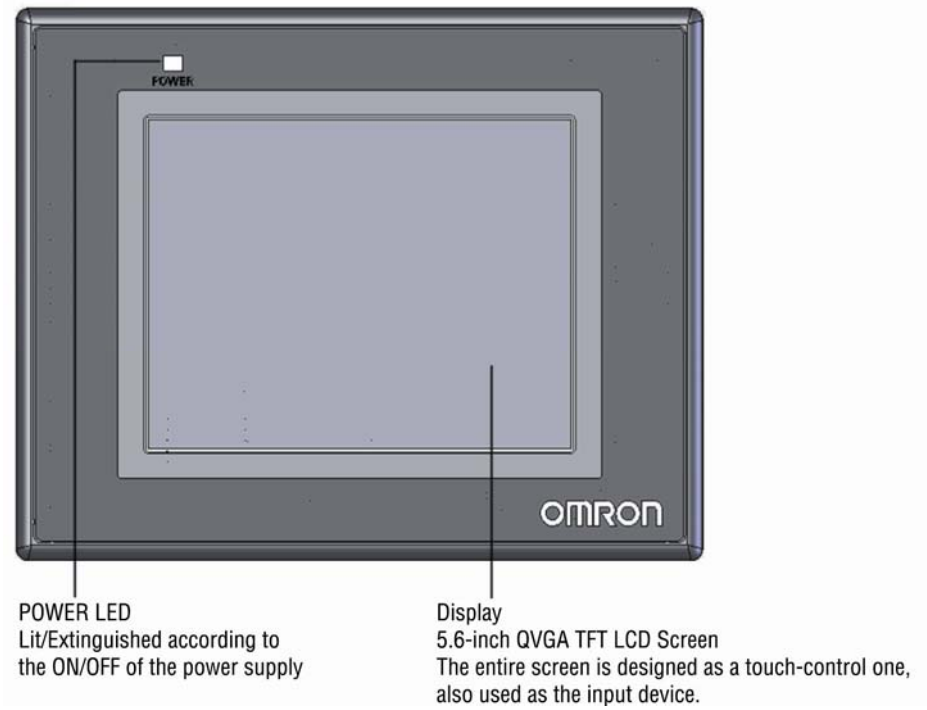
Section 1 Part Names and Functions

This section describes the names and functions of the various parts of an NB Unit.

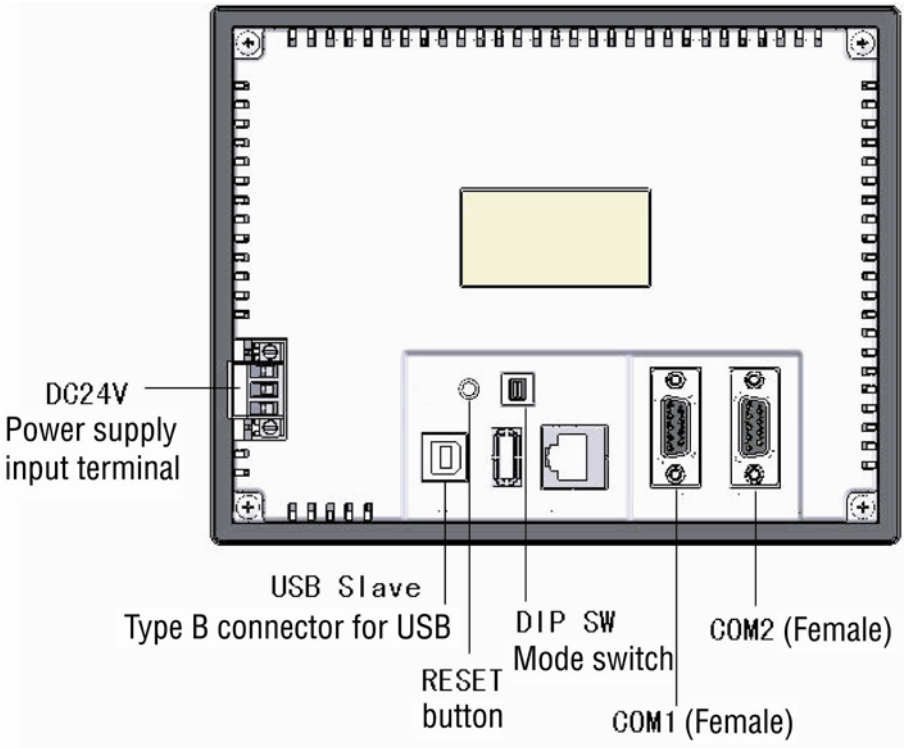
1-1 Part Names

- NB5Q-TW00B model

  Front view



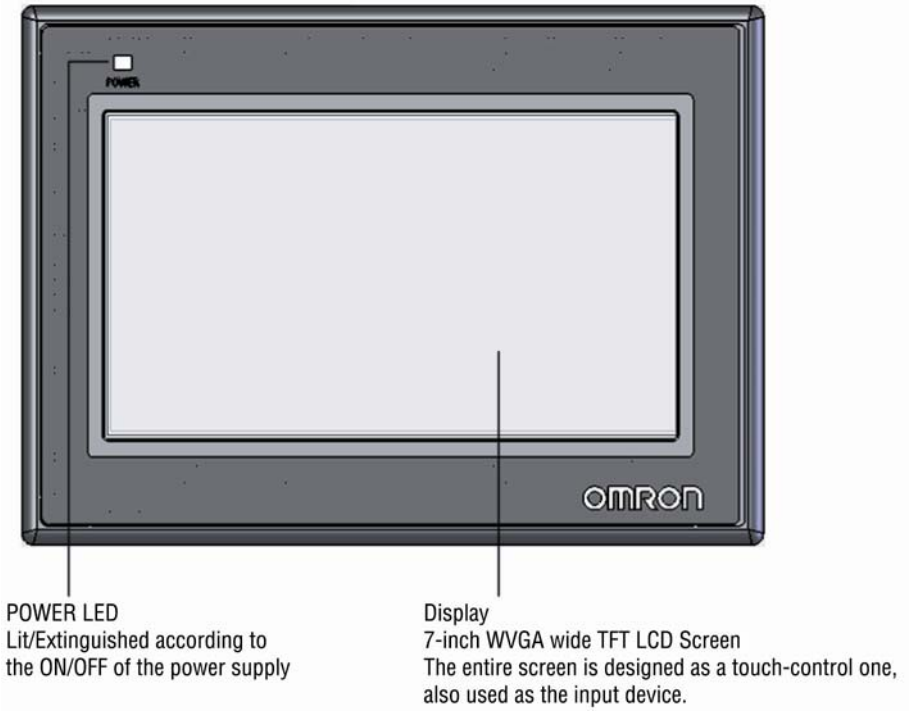
  Back view



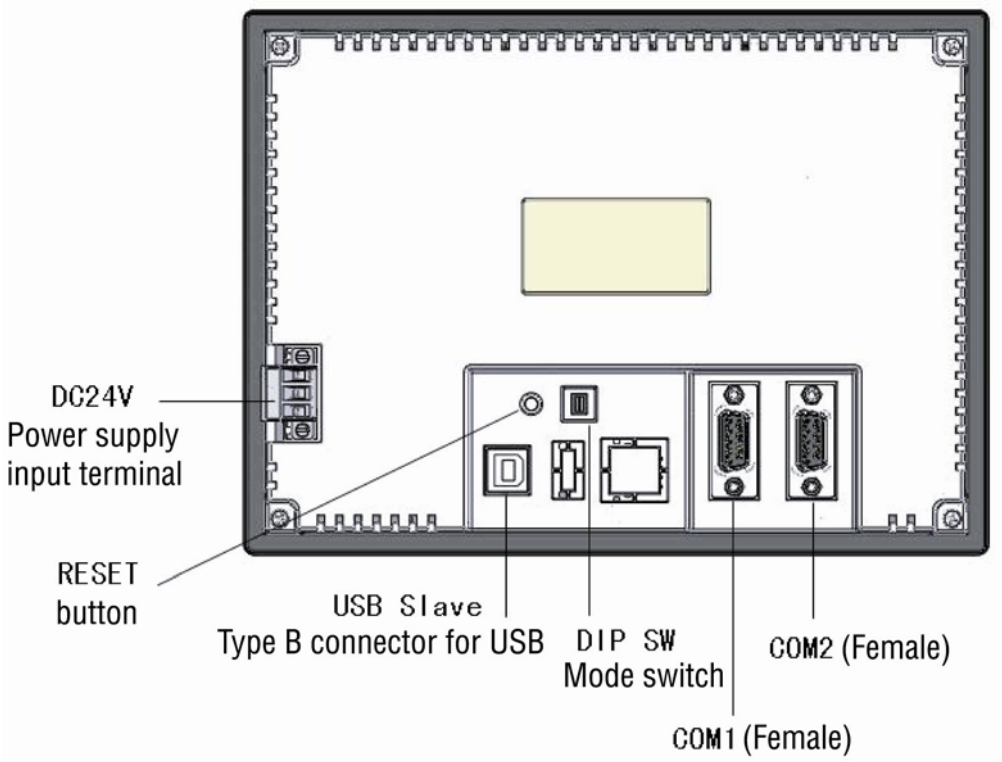
Caution	When turning ON or OFF the power supply, confirm the safety of the system before operation.

- NB7W-TW00B model

Front view



Back view



Caution	When turning ON or OFF the power supply, confirm the safety of the system before operation.

1-2 Part Specifications

- Touch Panel

Input operation can be carried out by means of the touch panel. By pressing the touch panel, the screens can be switched, and the contact information can be transmitted to the host.

WARNING

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.

Precautions for Safe Use

- Don't press a touch switch with a force greater than 30N.
- Do not accidentally press the touch panel when the backlight is not lit or when the display does not appear.
- Confirm the safety of the system before pressing the touch panel.
- Do not use a screwdriver or any other tool to press the touch panel.
- Signals from the touch switches may not be input if the switches are pressed consecutively at high speed. Confirm each input before proceeding to the next one.
- Deterioration over time can cause the touch points to move. Calibrate the touch panel periodically.

- Serial Port COM1

Take the NB5Q-TW00B and NB7W-TW00B products as examples here.
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 (with a maximum of 250mA)
7	NC	-	-
8	NC	-	-
9	SG	-	Signal ground

* Pins 4 and 5 of NB5Q-TW00B and NB7W-TW00B 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.

- Serial Port COM2

Take the NB5Q-TW00B and NB7W-TW00B as examples here.
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		

- DIP Switch

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.

- Reset Switch

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

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.

2-1 Installing the NB Unit

This section describes the methods used to mount the NB Unit onto an operation panel and connect the power supply.

2-1-1 Installation environment

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 product 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

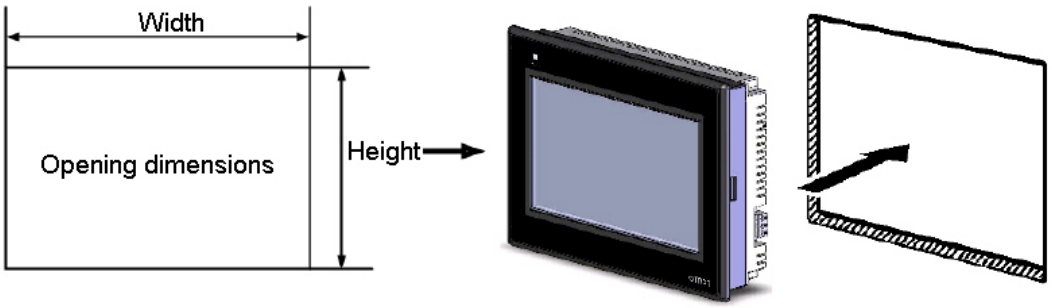
Precautions for Safe Use

When unpacking the Units, check carefully for any external scratches or other damage. Also, shake the Units gently and check for any abnormal sound.

2-1-2 Installation onto the Operation Panel

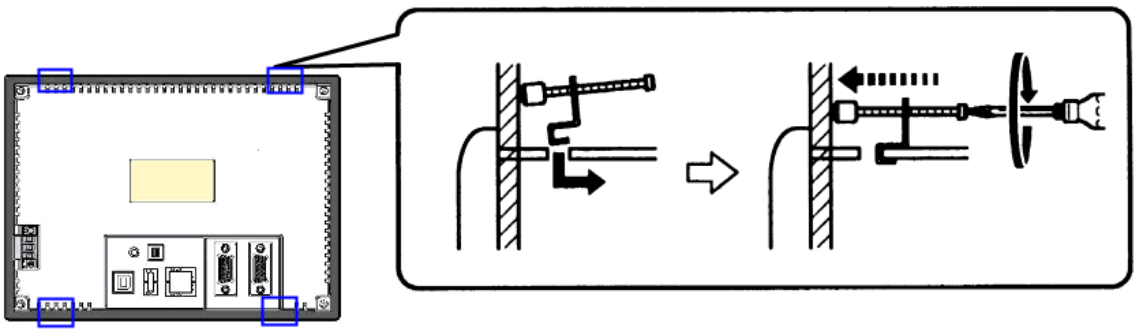
Install the NB Unit by embedding it into the operation panel.
Use the metal kit and tool (a crosshead screwdriver) supplied with the Unit for installation.
Proceed the installation following the procedures below.

1. Slot the panel with dimensions shown below, and fit the NB Unit into the panel from the front side.



Models	Opening Dimension (W×H mm)
NB5Q-TW00B	172.4(+0.5/−0)×131.0(+0.5/−0)
NB7W-TW00B	191.0(+0.5/−0)×137.0(+0.5/−0)

2. As follows, insert panel fixators at the four locations on the top and bottom from 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.



Caution

- When operating on the operation panel, make sure to keep metal particles from entering the Unit.
- The mounting panel must be between 1.6 and 4.8 mm thick. The NB Unit must be installed in a control panel.
- For the sake of waterproof and dustproof, all the fixators must be evenly tightened to a torque of 0.5~0.6 N·m. If the tightening torque exceeds the specified value, or the tightening is not even, deformation of the front panel may occur.
- Make sure that the operation panel is clean, unbent, and strong enough for the installation process.

2-1-3 Connecting the Power Supply

Charge the power input terminals with a DC 24V power supply.

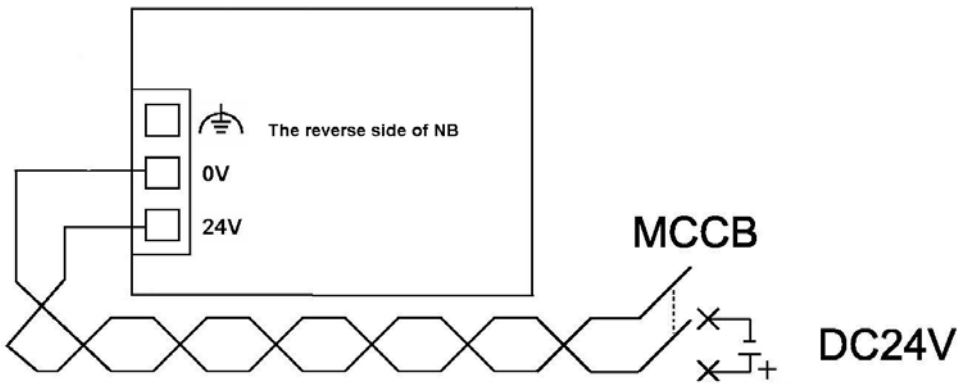
Precautions for Safe Use

- Do not connect an AC power supply to the DC power terminals.
- Use a DC power supply with a minimal voltage fluctuations.
- Use a DC power supply that provides a stable output (even if the power supply input is interrupted for 10 ms) with reinforced insulation or double insulation.

- Power Supply

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
NB5Q-TW00B	DC24V	DC 20.4～27.6V	6W
NB7W-TW00B	DC24V	DC 20.4～27.6V	7W



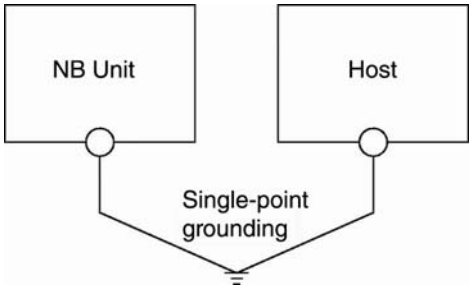
Precautions for Safe Use

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

2-1-4 Grounding Wiring

The NB Unit has a functional grounding terminal (⏚).
Arrange the wiring according to the following conditions.

1. When a potential difference occurs between the NB Unit and the host, arrange the grounding as illustrated. If the distance is too long to realize a single-point grounding, do not ground the ⏚ of the NB Unit.
2. When the NB Unit, and noise source equipment such as motors and inverters, etc. are installed on the same panel, do not ground the ⏚ of the NB Unit.



Precautions for Safe Use

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

2-2 Start of NB Series

Confirm the hardware are all correctly connected, turn on the power supply, and start the NB-Series.
This part describes the operations of the NB Series when it starts.

- When starting the NB Unit for the first time
  ① Confirm that the DIP switches SW1 and SW2 on the back side are both ON.
  ② Turn on the power supply of the NB Unit, and with the POWER LED on the front side turning green, the NB Unit starts, entering into the System Setting Mode.
  ③ Through the System Setup screen, the system time, starting window No., screen saving time, buzzer and the screen brightness can be set. When the setup is finished, turn OFF the power supply, turn OFF both of the DIP switches, SW1 and SW2, and then switch on the power supply again.

- When starting the NB Unit after downloading the screen data to it.
  ① Confirm that the DIP switches SW1 and SW2 on the back side are both OFF.
  ② Turn on the power supply of the NB Unit, and with the POWER LED on the front side turning green, the NB Unit starts.
  ③ The starting screen of the screen data downloaded to the NB Unit will be shown.

- Entering into Calibrate Mode
  ① Confirm that the DIP switches SW1 and SW2 on the back side are respectively OFF and ON.
  ② Turn on the power supply of the NB Unit, and with the POWER LED on the front side turning green, the NB Unit starts.
  ③ When the user touches the panel, a symbol “+” will pop up on the screen, with which the touch control precision level can be calibrated.

Precautions for Safe Use

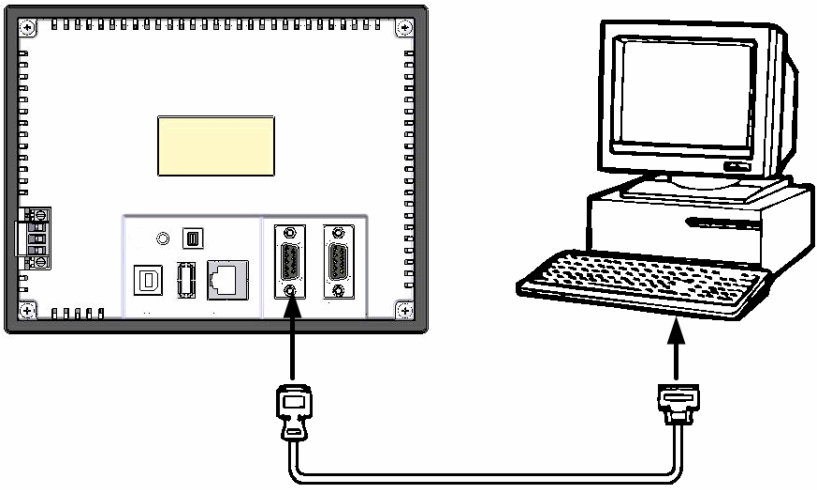
When turning ON or OFF the power supply, confirm the safety of the system before operation.

2-3 Connection to NB-Designer

In order to transmit the screen data established by the NB-Designer to the NB Unit, the NB Unit needs to be connected to a PC with a RS-232C or USB cable.

2-3-1 Connecting by RS-232C

Connect the RS-232C cable at the PC side to the serial port COM1 of the NB Unit.

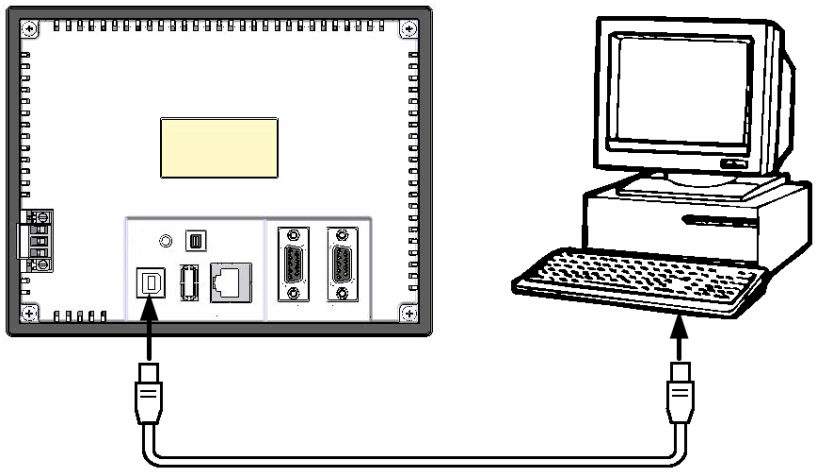


Communication conditions
Select the downloader mode through the tool menu of the NB-Designer. For details, refer to the NB-Designer User Manual [3-15 Download].

Communication cable
Users can make connection cables by themselves. For details, refer to [Appendix-4 Fabrication of the Connection Cable].

2-3-2 Connecting by USB

Connect the USB port at the PC side and the USB slave connector of the NB Unit. As to the USB connection, there are some preparations and restrictions that need to be done or heeded. Refer to the following content to ensure a correct connection.



- USB driver for the NB-Designer

A USB driver needs to be installed in the PC for the purpose of transmitting screen data through USB. The USB driver will be automatically installed at the first time when connecting the NB Unit to a PC.

Precautions for Safe Use

- Market 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.
- Do not connect a USB connector to any device that is not applicable.
- Before connecting a USB connector to a device, make sure that the device is free of damage.
- Market available USB cables can be used to carry out the connection. Use a cable with a maximum length of 5m.

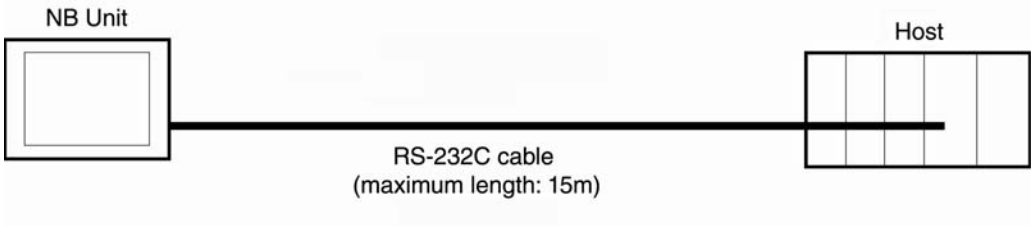
2-4 Communication Connections

2-4-1 Host Link Connection Method

Host Link is a connection method in which one PLC is connected to one NB Unit. There are 2 kinds of connection methods: RS-232C and RS-422A.

- The RS-232C connection method using serial ports COM1/COM2

This is the simplest and most feasible method.

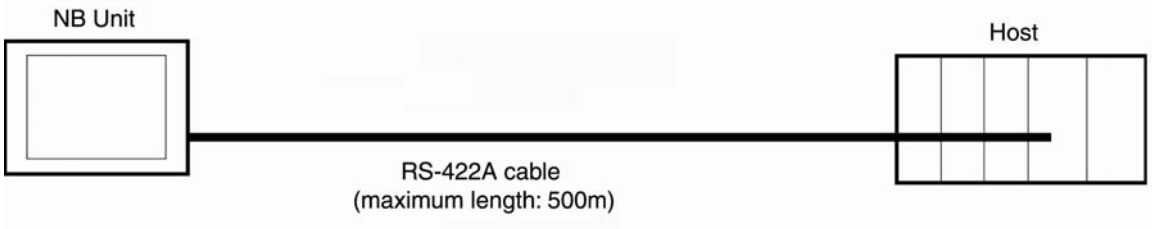


The following cables are recommended.

XW2Z-200T (Cable length: 2m) by OMRON
XW2Z-500T (Cable length: 5m) by OMRON

- The RS-422A connection method using the serial port COM2.

With this method, the communication distance can be extended to a maximum of 500m.



- Connectable Units at the host side

When using OMRON PLCs, the Units with built-in Host Link function vary depending on models and series. There is also the CPU Unit connected in a Host Link method through adding the serial communication board or communication board.

When connecting, confirm the connected PLC's series, model and the models of the installed circuit board/Unit.

As to the Units at the host side which can be connected to NB series Unit by RS-232C or RS-422A through a Host Link, refer to [Appendix-5 List of Models].

● Communication setting

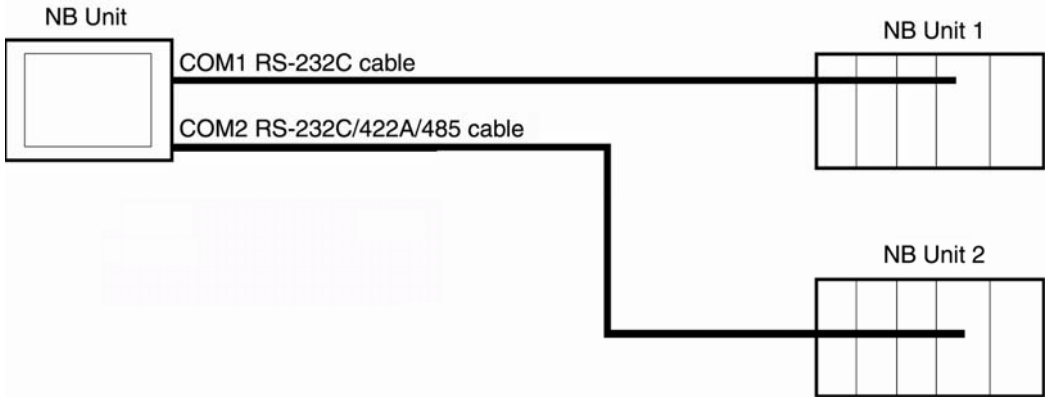
The communication settings need to be set as following values before carrying out communications in the Use Host link.

Items	Settings
Data bit	7bit
Stop bit	2bit
Parity check	Even
Communication speed	Any value, but the values for the NB Unit and the host must be the same.
Connected Unit No.	00

At the NB Unit side, these settings are made through the PT menu of the NB-Designer. For details, refer to the NB-Designer User Manual [3-10-8 Serial Port Settings].
For communication settings at the host side, refer to the related PLC manuals as needed.

2-4-2 Connecting more than one PLC

Select the RS-232C method for COM1, and one from RS-232C, RS-422A and RS-485 for COM2. When both of them are used, 2 hosts either from one manufacturer or from two different manufacturers are feasible. (Note: At a certain time, only one from RS-232C, RS-422A and RS-485 can be designated for COM2 to perform communications.)



Precautions for Safe Use

- Make sure to keep the connector screws firmly tightened after the communication cable is connected.
- The maximum tensile load for cables is 30N.
- Do not apply loads greater than 30N.
- The communication cables of the COM1 and COM2 connectors are not interchangeable. Confirm the pins of the ports before carrying out communications.

2-4-3 Settings for each Unit

The settings for each Unit are as follows:

■ When connecting to CP-Series Units

CP1L-L14/L20/M30/M40/M60 models
CP1H-X40/XA40/Y20 models
CP1E-N14/N20 models
CP1E-N30/N40/N60/NA20 models

- PLC System Settings Area

Write settings directly into the [PLC System Settings Area] with a peripheral tool (CX-Programmer, etc.) based on the model and port of the host.

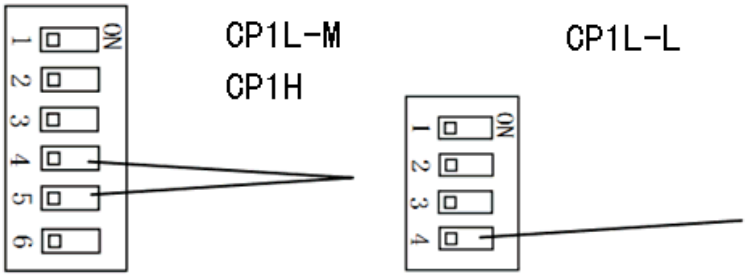
Host model and Port No.	Channel No. (*1)	Write Value	Setting
CP1L-M30/M40/M60 models, serial port 1 CP1H-X40/XA40/Y20 models, serial port 1	144	8000	Use Host Link
	145	0000~000A(*2)	Communication speed
	150	0000	Unit No. 00
CP1L-L14/L20 models, serial port 1 CP1L-M30/M40/M60 models, serial port 2 CP1H-X40/XA40/Y20 models, serial port 2	160	8000	Use Host Link
	161	0000~000A(*2)	Communication speed
	166	0000	Unit No. 00

Host model and Port No.	Channel No.	Write Value	Setting
CP1E-N14/N20 models, serial port 1 CP1E-N30/N40/N60/NA20 models, serial port 1	A617.15~12	0	Use Host Link
	A617.11~08	0，3~A(*2)	Communication speed
	A617.07~00	00	7 data bits, 2 stop bits, Even
CP1E-N30/N40/N60/NA20 models, serial port 2	A618.15~12	0	Use Host Link
	A618.11~08	0，3~A(*2)	Communication speed
	A618.07~00	00	7 data bits, 2 stop bits, Even

*1：The channel No. of CP1L/H is PLC Setup area.
*2: The communication speed should be set to the same value as that of the NB Unit.

- Settings for the front-side DIP Switches

Set the front-side DIP switches so as to validate the settings for [PLC System Settings Area].
Set the SW4 to OFF when serial port 1 is used, set SW5 to OFF when serial port 2 is used. As the CP1L-L has only one serial port, it has no DIP switch SW5.



■ When connecting to C-Series CPU Units

C200HX/HG/HE(-Z)、CPM1*、CPM2*、CQM1H type CPU Units

- Connection Methods

The connection methods for the CPU Units of different PLC models.

PLC Models	RS-232C connection	RS-422A connection
C200HX/HG/HE (-Z)	• Connect to the RS-232C port built in the CPU Unit • Connect to the RS-232C port (Ports A, B) of the serial communication board	• Connect to the RS-422A port (port A) of the serial communication board
CPM1A	• Connect to the peripheral port with a dedicated RS-232C adaptor (CPM1-CIF01).	• Connect to the peripheral port with a dedicated RS-422A adaptor (CPM1-CIF11 type).
CPM2A	• Connect to the RS-232C port built in the CPU Unit • Connect to the peripheral port with a dedicated RS-232C adaptor	• Connect to the peripheral port with a dedicated RS-422A adaptor (CPM1-CIF11 type).
CPM2C	• Connect to the RS-232C port built in the CPU Unit or the peripheral port with a dedicated conversion cable (CPM2C-CN111 type, CS1W-CN118 type and CS1W-CN114 type) (CPM2C-CN111 type is a cable that divides the Unit port into the RS-232C port built in the CPU Unit and the peripheral port. When connecting to the peripheral port, a RS-232C adaptor (CPM1-CIF01 type) is also needed to be	• Connect to the peripheral port with a dedicated conversion cable (CPM2C-CN111 type or CS1W-CN114 type) and a RS-422A adaptor (CPM1-CIF11 type) (CPM2C-CN111 type is a cable that divides the Unit port into the RS-232C port built in the CPU Unit and the peripheral port).
CQM1H	• Connect to the RS-232C port built in the CPU Unit • Connect to the peripheral port with a conversion cable (CS1W-CN118 type) • Connect to the RS-232C port (Port 1) of the serial communication board	• Connect to the RS-422A port (Port 2) of the serial communication board

- PLC System Settings Area

Write settings directly into the [PLC System Settings Area] (Data memory) with a peripheral tool (CX-Programmer, etc.) based on the model and port of the host.

For RS-232C

Host Model	Channel No.	Write Value	Setting
The RS-232C port built in C200HX/HG/HE(-Z)、CPM2A、CPM2C、CQM1H	DM6645	0001	Use Host Link
	DM6646	03□□(*3)	Communication conditions are standard settings. (*4)
	DM6648	0000	Unit No. 00
CPM1A	DM6650	0001	Use Host Link
	DM6651	03□□(*3)	Communication conditions are standard settings. (*4)
	DM6653	0000	Unit No. 00
Port A of C200HX/HG/HE(-Z) (*1) Port 1 of CQM1H (*2)	DM6555	0001	Use Host Link
	DM6556	03□□(*3)	Communication conditions are standard settings. (*4)
	DM6558	0000	Unit No. 00
Port B of C200HX/HG/HE(-Z) (*1)	DM6550	0001	Use Host Link
	DM6551	03□□(*3)	Communication conditions are standard settings. (*4)
	DM6553	0000	Unit No. 00

*1: The RS-232C port of the Communication Board.
*2: The RS-232C port of the Serial Communication Board.
*3: □□ is the set value of the communication speed. Set the communication speed to the same value as that of the NB Unit.
*4: Standard settings of the Communication conditions are as follows:
Start bit: 1 bit, Data bit: 7 bit, Stop bit: 2 bit, parity check: even

For RS-422A

Host Model	Channel No.	Write Value	Setting
Port A of C200HX/HG/HE(-Z) (*1)	DM6555	0001	Use Host Link
	DM6556	03□□(*3)	Communication conditions are standard settings. (*4)
	DM6558	0000	Unit No. 00
Port 2 of CQM1H (*2)	DM6650	0001	Use Host Link
	DM6651	03□□(*3)	Communication conditions are standard settings. (*4)
	DM6653	0000	Unit No. 00

*1: The RS-422A port of the Communication Board
*2: The RS-422A port of the Serial Communication Board
*3: □□ is the set value of the communication speed. Set the communication speed to the same value as that of the NB Unit.
*4: Standard settings of the Communication conditions are as follows:
Start bit: 1 bit, Data bit: 7 bit, Stop bit: 2 bit, parity check: even

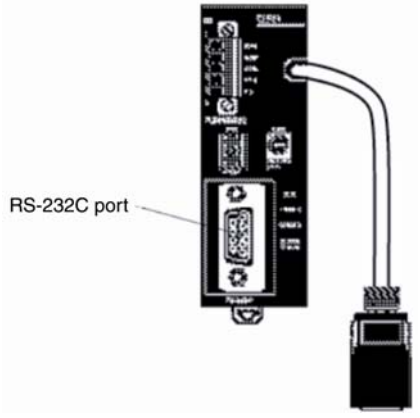
For operations on [PLC System Settings Area], refer to the manual of the PLC employed.

- Connection methods for CPM2C

CPM2C only has a connector with the same shape of the CS-Series' peripheral port, but the signal cables inside are classified as used for the RS-232C port built in the CPU Unit and for the peripheral port. Therefore, when using CPM2C, differentiate between the settings for the RS-232C port built in the CPU and for the peripheral port based on the conversion cable and port employed to ensure correct use. Besides, when using a simple communication device (CPM2C-CIF21 type), connect to the RS-232C port. For details, refer to the User Manuals (W356) for CPM2C.
Use a self-made connection cable to connect the NB Unit and CPM2C. Connect to CPM2C's built-in RS-232C port instead of the peripheral port.

Port connected to the PT	PLC System Settings
CS1W-CN118 type port(D-Sub 9-pin)	Carry out settings for the built-in RS-232C port

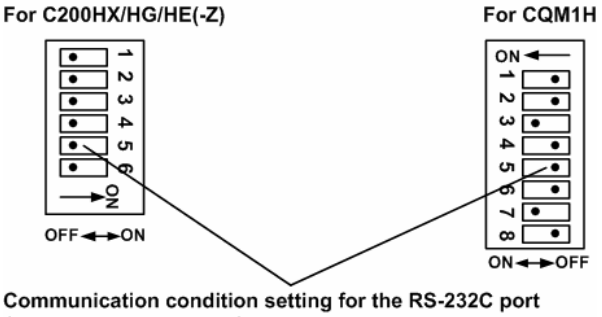
When using a simple communication device (CPM2C-CIF21 type), connect to the RS-232C port directly.



- Settings for the front-side DIP Switches

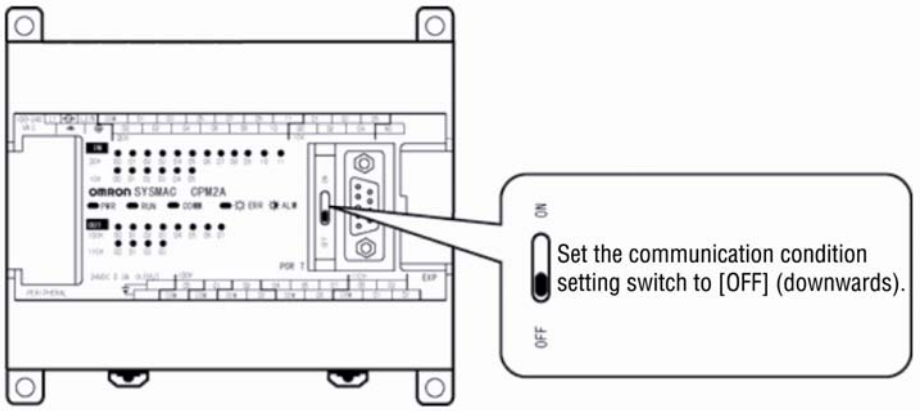
To activate the settings of [PLC System Settings Area] (Data memory), set as follows according to the PLC:

- For C200HX/HG/HE (-Z) and RS-232C of CQM1H

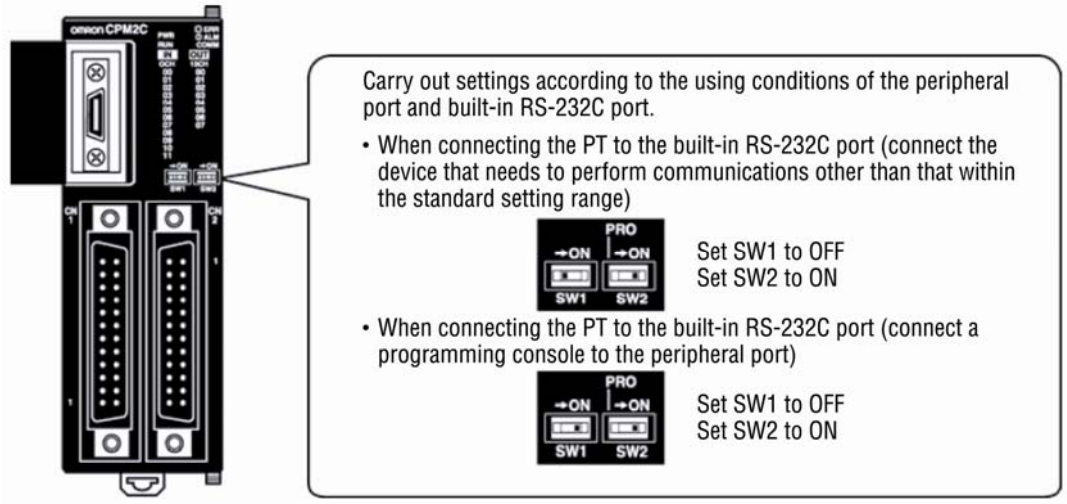


Communication condition setting for the RS-232C port
Set the DIP switch 5 to OF, and activate the "settings" in PLC system settings.

- For CPM2A

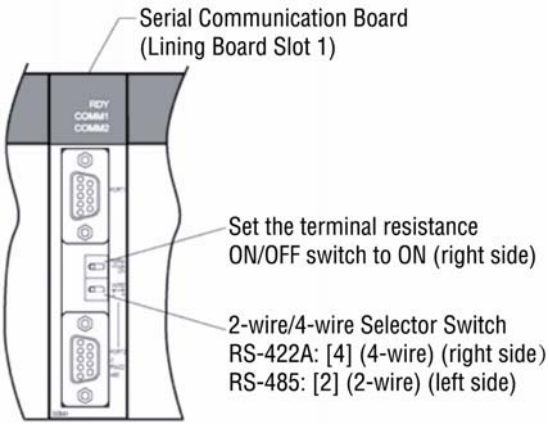


- For CPM2C (Only the RS-232C port can be connected)

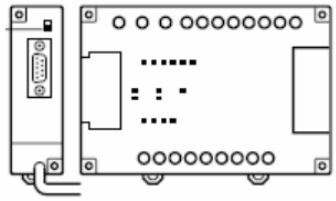


- Setting methods for communication board switches (For RS-422A)
  - For C200HX/HG/HE (-Z)
    Switch 1: 4 Side (4-wire = RS-422A)
    Switch 2: ON side (terminal resistance ON = Terminal resistance activated)

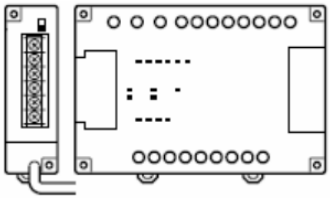
  - For CQM1H
    2-wire/4-wire switch (WIRE): 4 side (4 wire = RS-422A)
    Terminal resistance ON/OFF switch (TERM): ON side (terminal resistance ON = Terminal resistance activated)



- Settings for the communication adaptor switch
  - For RS-232C adaptor (CPM1-CIF01 type)
    Set the mode setting switch to [HOST] (Up side).



  - For RS-422A adaptor (CPM1-CIF11 type)
    Set the terminal resistance switch to ON (Up side)



■ When connecting to CS-Series CPU Units

For CS1G/H-CPU□□ (-V1) types and CS1G/H-CPU□□H types

- Connection Methods

Connect to the RS-232C port built in the CPU Unit or the RS-232C port of the communication board. When connecting to the peripheral port, a connection cable dedicated for the peripheral port is needed (CS1W-CN118 type).
Only RS-232C can be used for connection.

- PLC System Settings Area

When connecting to CS-Series CPU Unit, refer to the following table and set the communication conditions as follows in [PLC System Settings] based on the communication port in use.

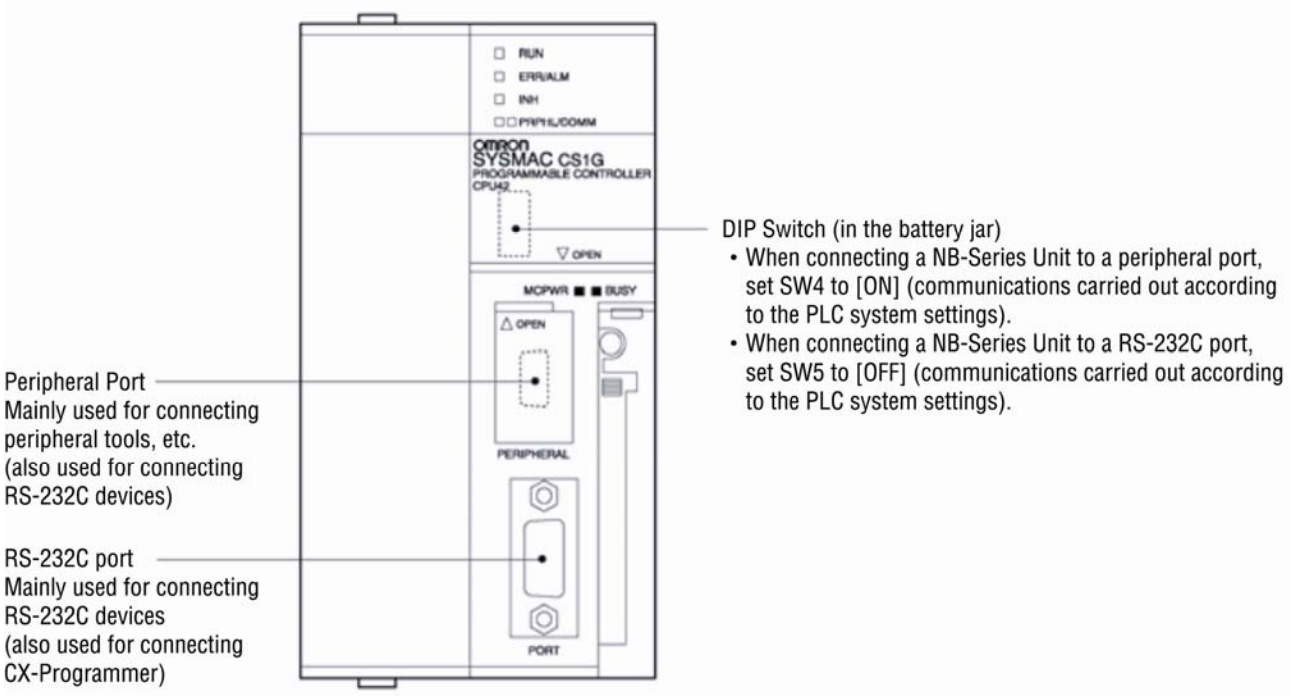
Connection Methods	Channel No.	Write Value	Setting
Use the RS-232C port built in CS1G/H, CS1G/H-H	160	8000	Use Host Link
	161	0000~000A(*1)	Communication speed
	163	0000	Unit No. 00
Use the peripheral port of CS1G/H, CS1G/H-H	144	8000	Use Host Link
	145	0000~000A(*1)	Communication speed
	147	0000	Unit No. 00

*1：The communication speed should be set to the same value as that of the NB Unit.

[PLC System Settings] can be directly set with a peripheral tool (programming console), or it can be set by transmitting the [PLC System Settings] set up by a peripheral tool (CX-Programmer) to the CPU Unit.
For details about the [PLC System Settings], refer to [SYSMAC CS Series User Manual] (W339).

- Settings for the front-side Switches

Set the DIP switches 4 or 5 as follows according to the NB-Series' port connected.



■ When connecting to CJ1-Series CPU Units

For CJ1G-CPU□□ type, CJ1G/H-CPU□□H types and CJ1M-CPU□□ type

- Connection Methods

Connect to the RS-232C port built in the CPU Unit or the RS-232C port of the communication board. When connecting to the peripheral port, a connection cable dedicated for the peripheral port is needed (CS1W-CN118 type). Only RS-232C can be used for connection.

- PLC System Settings Area (for RS-232C)

When connecting to the CJ-Series CPU Unit, refer to the following table and set the communication conditions as follows in [PLC System Settings] based on the communication port in use.

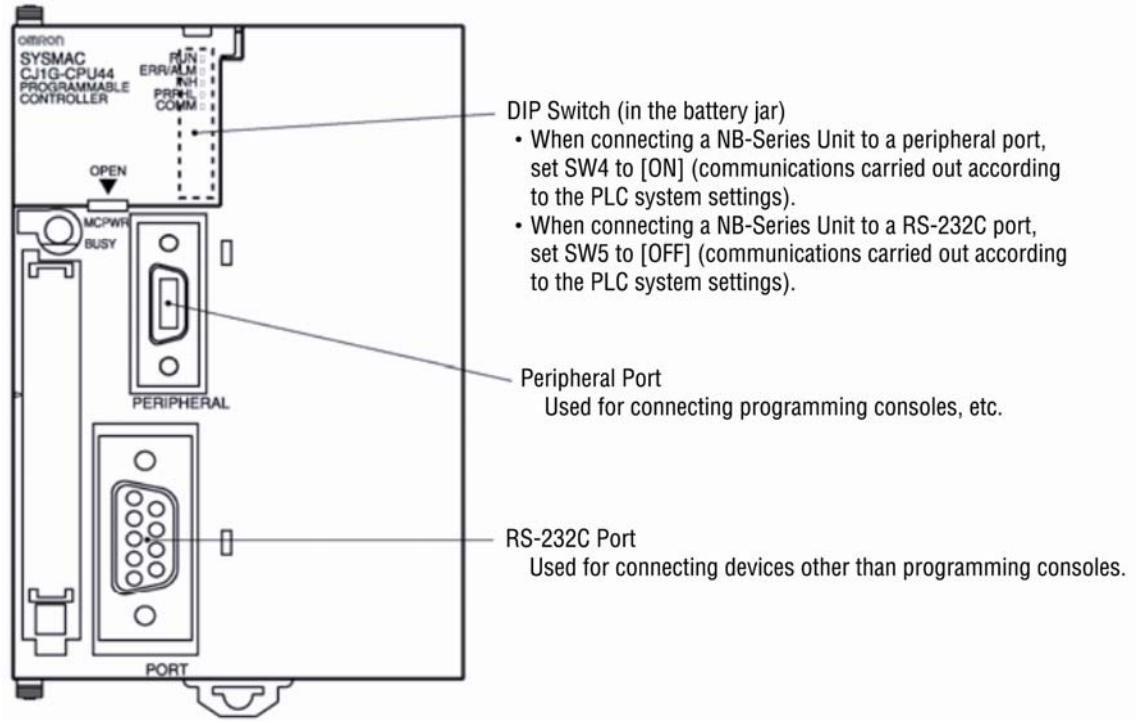
Connection Methods	Channel No.	Write Value	Setting
Use the RS-232C port built in CJ1G-CPU□□ type, CJ1G/H-CPU□□H types, CJ1M-CPU□□ types	160	8000	Use Host Link
	161	0000~000A(*1)	Communication speed
	163	0000	Unit No. 00
Use the peripheral port of CJ1G-CPU□□ type, CJ1G/H-CPU□□H types, CJ1M-CPU□□ type	144	8000	Use Host Link
	145	0000~000A(*1)	Communication speed
	147	0000	Unit No. 00

*1: The communication speed should be set to the same value as that of the NB Unit.

[PLC System Settings] can be directly set with a peripheral tool (Programming console), or it can be set by transmitting the [PLC System Settings] set up by a peripheral tool (CX-Programmer) to the CPU Unit.
For details about the [PLC System Settings], refer to [SYSMAC CJ Series User Manual] (W393).

- Settings for the front-side Switches

Set the DIP switches 4 or 5 as follows according to the NB-Series' port connected.



■ When connecting to CJ2-Series CPU Units

For CJ2M-CPU3□ type, CJ2M-CPU1□ type and CJ2H-CPU6□(-EIP) type

- Connection Methods

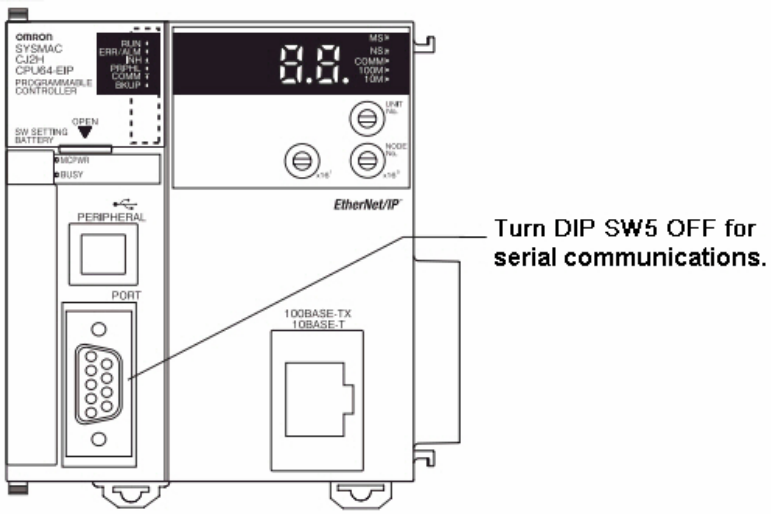
Connect to the RS-232C port built in the CPU Unit or the RS-232C port of the communication board.

- PLC System Settings Area (for RS-232C)

Carry out setting by transmitting the [PLC System Settings] set up by a peripheral tool (CX-Programmer) to the CPU Unit. On the [Serial Port] options page of [PLC System Settings], set the connection mode to Host Link: 7 Data Bits, 2 Stop Bits, Even. And set the communication speed to the same as that of the NB Unit.
For details about the [PLC System Settings], refer to [SYSMAC CJ2 Series Software User Manual] (W473).

- Settings for the front-side Switches

Set the DIP switch 5 of the CPU Unit as follows according to the NB-Series' port connected.

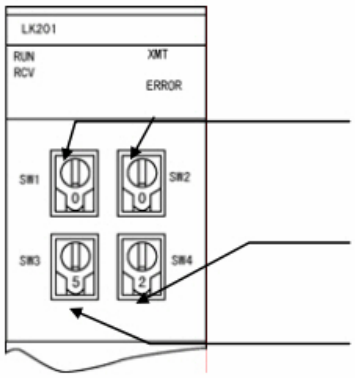


■ When connecting to Host Link Units of C-Series

Base-mounted type for C200HE(-Z) / C200HG(-Z) / C200HX(-Z) models
C200H-LK201/LK202-V1 model

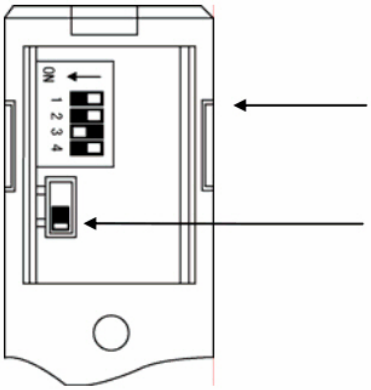
- Settings for the Switches
  - For C200H-LK201-V1 (RS-232C)

[front-side switches]
Each switch is a rotary switch. Use a straight screwdriver set the switches as follows to display the numbers and symbols shown in the table.



- **Set unit number (SW1, SW2)**
  SW1 and SW2 set to [0]
- **Command level, parity check,**
  transmit code setting (SW4)
  SW4 set to [2]
- **Communication speed setting (SW3)**
  4,800 Bit/s: Set SW3 to [4]
  9,600 Bit/s: Set SW3 to [5]
  19,200 Bit/s: Set SW3 to [6]

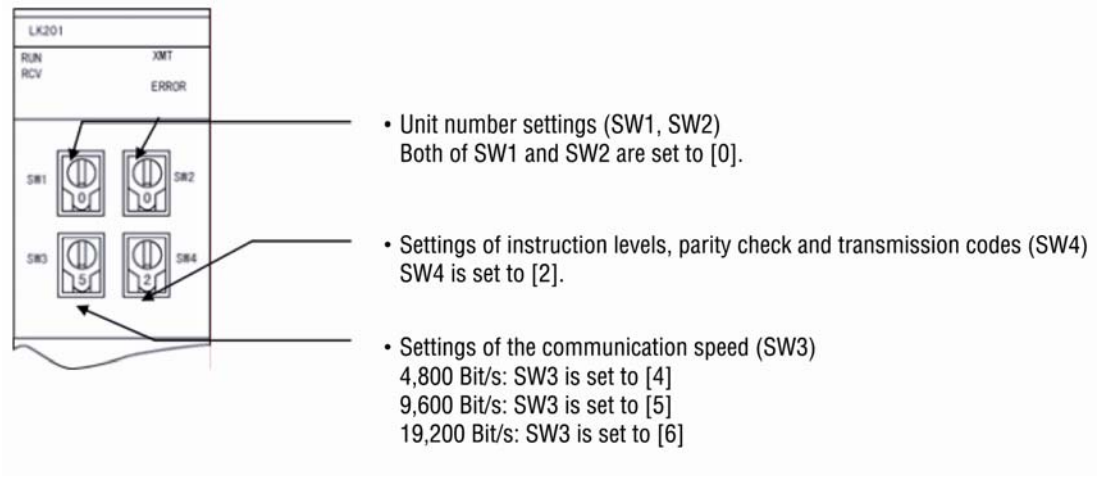
[Back-side switches]



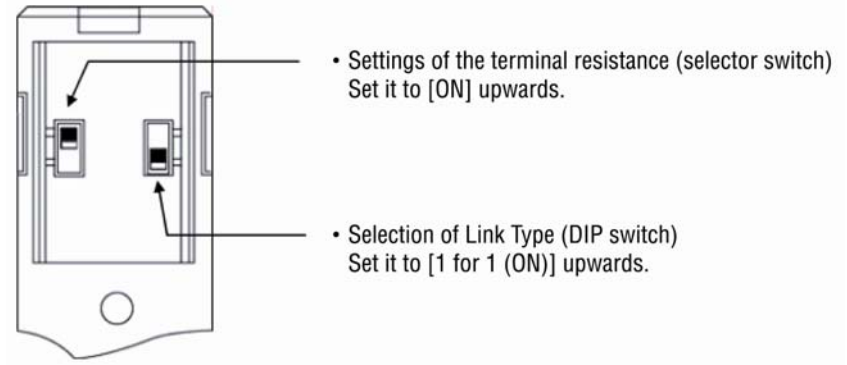
- Link Type switch
  Set SW3 to [ON] "1 to1"
- CTS switch setting
  Default set to [0V] (ON)

- For C200H-LK202-V1(RS-422A)

[front-side switches]
Each switch is a rotary switch. Use a straight screwdriver set the switches as follows to display the numbers and symbols shown in the table.



[Back-side switches]



■ When connecting to a CS-Series Serial Communication Board

For CS1W-SCB21 type (Both of port 1 and 2 are RS-232C ports)
For CS1W-SCB41 type (Port 1 is RS-232C port and Port 2 is RS-422A/485 port.)
(Serial Communication Board for CS-Series CPU Units with RS-232C port, RS-422A port.)

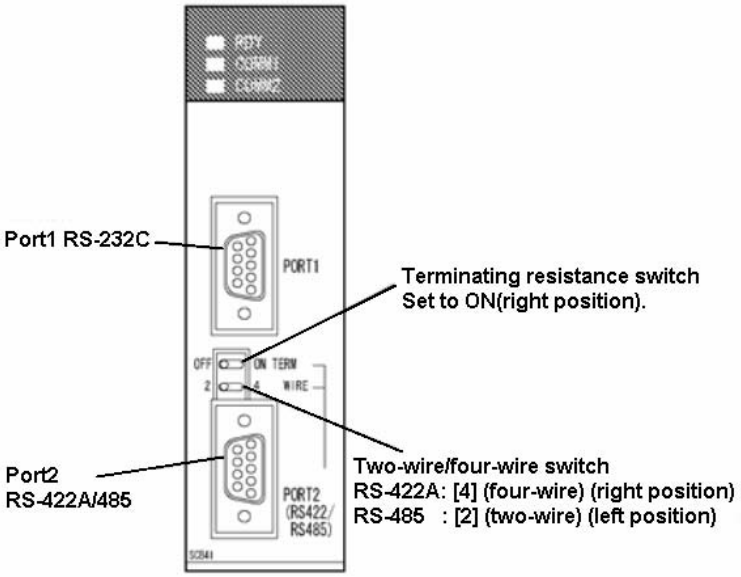
- Settings for the DM Fixed Allocation Area of the CPU Unit

Write settings directly to the [DM Fixed Allocation Area] of the CPU Unit (System Settings Area) with a peripheral tool (programming console or CX-Programmer). After finishing the write-in, the settings can be activated through any of the methods of reconnecting the power supply, restarting the Unit, reactivating the communication port, executing the STUP instruction.
The followings are the Channel Nos. and settings of the DM Fixed Allocation Area.
It is the same when using RS-232C, RS-422A (port 2 of the CS1W-SCB41 type).

DM Fixed Allocation Area (CH)		Write Value	Setting
Port 1	Port 2		
DM32000	DM32010	8000	Use Host Link
DM32001	DM32011	0000~000A (*1)	Communication speed
DM32003	DM32013	0000	Unit No. 00

*1: The communication speed should be set to the same value as that of the NB Unit.

- Settings for front-side switches (For RS-422A)



■ When connecting to a CS-Series Serial Communication Board

For CS1W-SCU21 type (Both of port 1 and 2 are RS-232C ports)

- Settings for the DM Fixed Allocation Area of the CPU Unit

Write settings directly to the [DM Fixed Allocation Area] of the CPU Unit (System Settings Area) with a peripheral tool (programming console or CX-Programmer). After finishing the write-in, the settings can be activated through any of the methods of reconnecting the power supply, restarting the Unit, reactivating the communication port, executing the STUP instruction.

The followings are the Channel Nos. and settings of the DM Fixed Allocation Area.

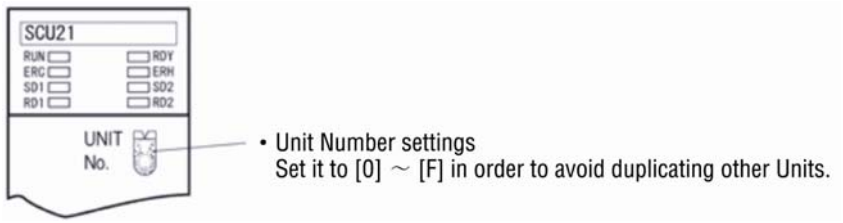
m = DM30000 + 100 × Unit No. (CH)

DM Fixed Allocation Area (CH)		Write Value	Setting
Port 1	Port 2		
m	m＋10	8000	Use Host Link
m＋1	m＋11	0000~000A (*1)	Communication speed
m＋3	m＋13	0000	Unit No. 00

*1：The communication speed should be set to the same value as that of the NB Unit.

- Settings for the front-side Switches

Set the Unit No. of the serial communication Unit by the rotary switch on the front side of the Unit. Use a straight screwdriver set the switches as follows to display the numbers and symbols shown in the table.



■ When connecting to a CJ1-Series Serial Communication Unit

For CJ1W-SCU41 type (Port 1 is RS-422A/485 port and Port 2 is RS-232C port.)

- Settings for the DM Fixed Allocation Area of the CPU Unit

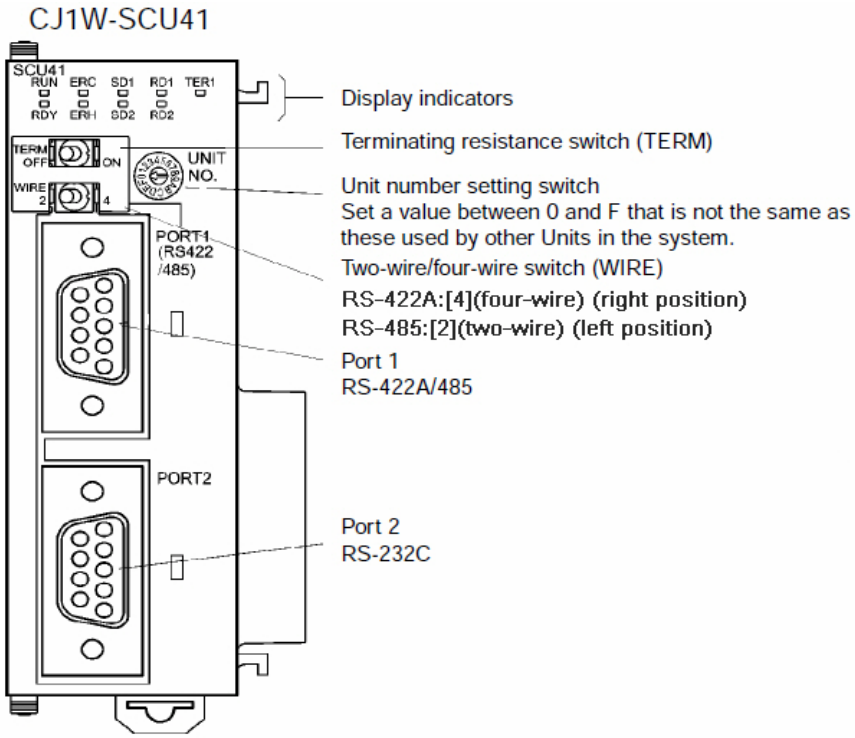
Write settings directly to the [DM Fixed Allocation Area] of the CPU Unit (System Settings Area) with a peripheral tool (programming console or CX-Programmer). After finishing the write-in, the settings can be activated through any of the methods of reconnecting the power supply, restarting the Unit, reactivating the communication port, executing the STUP instruction.
The followings are the Channel Nos. and settings of the DM Fixed Allocation Area.
It is the same when using RS-232C, RS-422A.

m = DM30000 + 100 × Unit No. (CH)

DM Fixed Allocation Area (CH)		Write Value	Setting
Port 1	Port 2		
m	m＋10	8000	Use Host Link
m＋1	m＋11	0000~000A (*1)	Communication speed
m＋3	m＋13	0000	Unit No. 00

*1：The communication speed should be set to the same value as that of the NB Unit.

- Settings for the front-side Switches



Section 3 System Setting Mode

This section describes the System Setting Mode

3-1 The display method of System Setting Mode

Enter the System Setting Mode following the procedures below.

① Set both the DIP switches SW1 and SW2 on the back side to ON.

② Press the Reset switch, restart the NB Unit, and then it enters into the System Setting Mode.

3-2 Functions of System Setting Mode

The following items can be set in System Setting Mode:

① Time calibration: check whether the year, month, day, hour, minute and second are the current time values, and if not, rectify them manually.

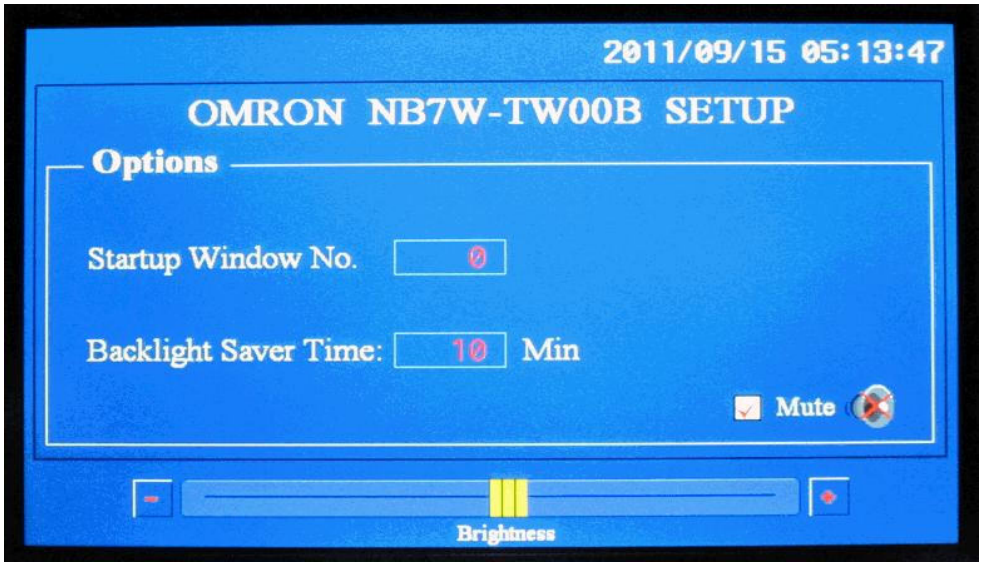
② Startup Window No.: the window displayed after launching the NB Unit. The default is window 0.

③ Backlight Saver Time：time to activate the screen saver, and the Unit is minute. The default is 10 minutes. The screen saver is not brought into effect when the set value is 0.

④ Mute Enabled/Disabled: ON/OFF of the buzzer.

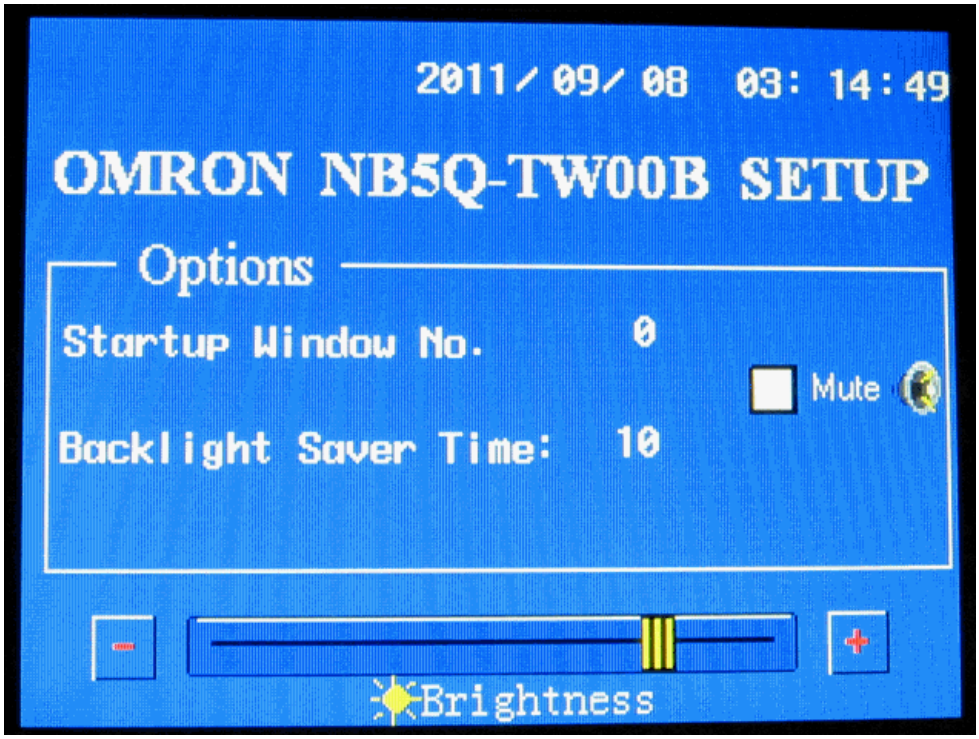
⑤ Brightness Up/Down: with this, brightness of the screen can be adjusted, bringing the screen to its best visual effect.

The System Setting Mode screen of the NB7W-TW00B is as follows:



If you want to change the month, click where the month is (eg. 09), and a digit input keyboard will pop up. Input the month value, and click the Enter button to confirm the change.

The System Setting Mode screen of NB5Q-TW00B is as follows:



Section 4 Calibrate Mode

This section describes the Calibrate Mode.

4-1 The display method of Calibrate Mode

There are 2 methods for entering into Calibrate Mode.

① Set the DIP switches SW1 and SW2 on the back side respectively to OFF and ON.
Press the Reset switch, restart the NB Unit, and then it enters into the Calibrate Mode.

② Place a “Function Key” component in the window, and set its function to “Touch Calibration”.
Click this icon to start Calibrate Mode.

4-2 Functions of Calibrate Mode

Procedures to carry out Calibrate Mode:
Track and touch the “+” displayed on the screen and you will hear a “click”. Carry on with this, until the “+” disappear followed by a "TP Adjust Success!” turning up on the screen. Set both of the DIP switches SW1 and SW2 to OFF, press the Reset switch again.

4-3 On-line Touch-control Calibration Function

Besides using the DIP switches, Touch-control Calibration can also be achieved with a function key while the software is running, thus sparing the time of equipment adjustment and the trouble of opening the control panel. For details, refer to the NB-Designer User Manual [3-7-2 Function Keys].

Section 5 Maintenance and Troubleshooting

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

5-1 Maintenance

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.

● Backing Up Project Data

When the PT needs to be repaired or the Unit needs to be replaced for any fault, always backup the project data and save it properly.

● Standby Unit

Have a standby Unit at hand so that when the currently employed PT fails, or the screen becomes blurry because of running out of its backlight lifetime, the system can be restored quickly.

5-2 Troubleshooting

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

5-2-1 Software Trouble

1. The condition of the USB driver for the HMI

   If NB5Q/NB7W can not 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.

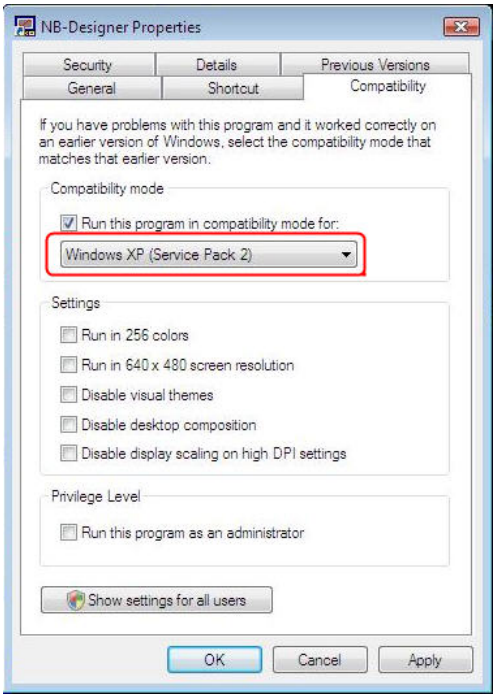
2. The NB-Designer software can run in XP/Vista/Win7 systems.

   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.

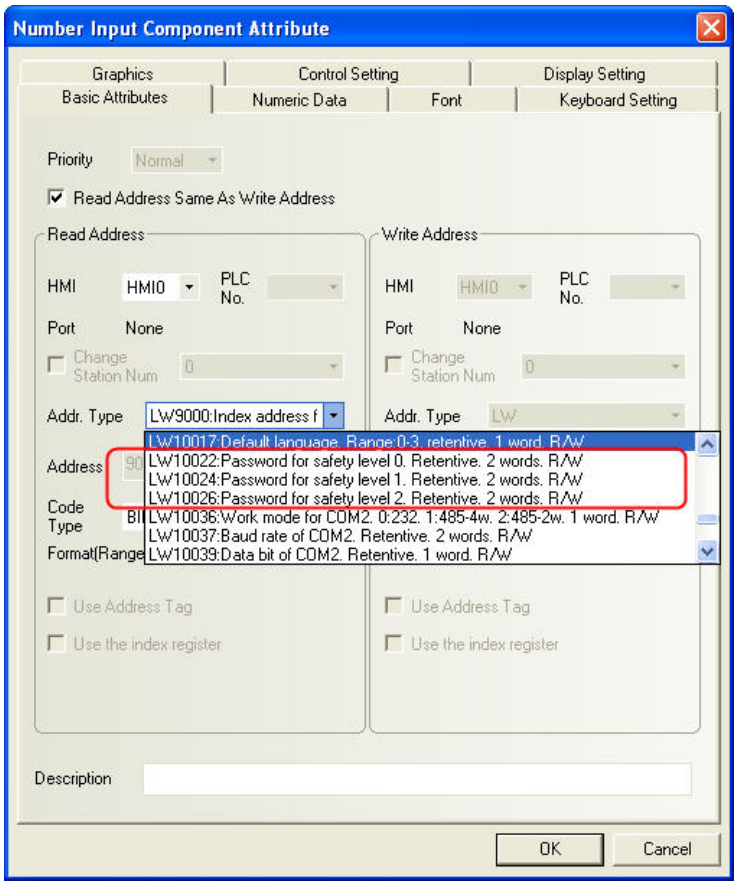
   B When running the NB-Designer, right-click the mouse on the icon "NB-Designer.exe" to select "Compatible with XP".



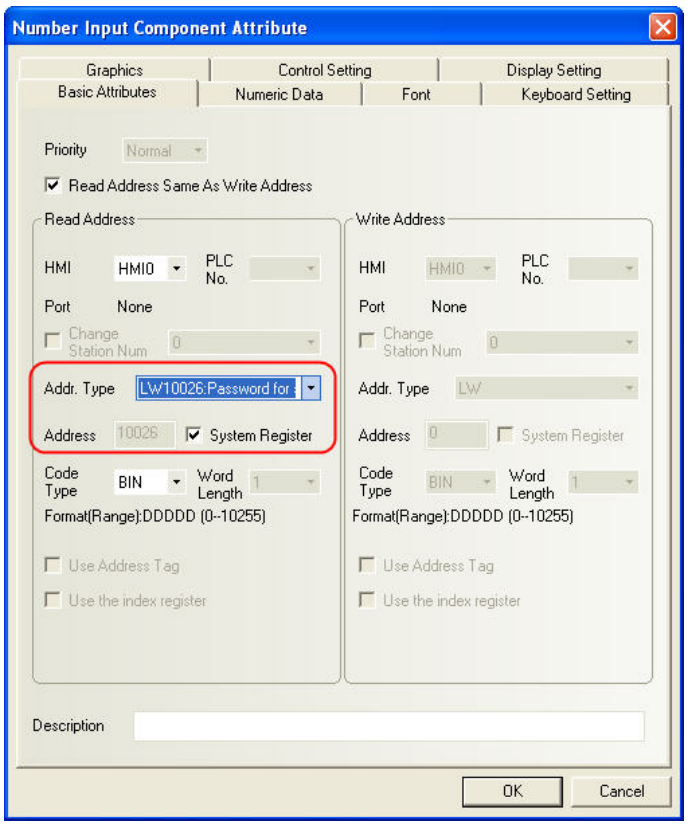
   C When running the NB-Designer for the first time, right-click the mouse on the icon "NB-Designer.exe" to select "Run as Administrator". And then, run the software directly.

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

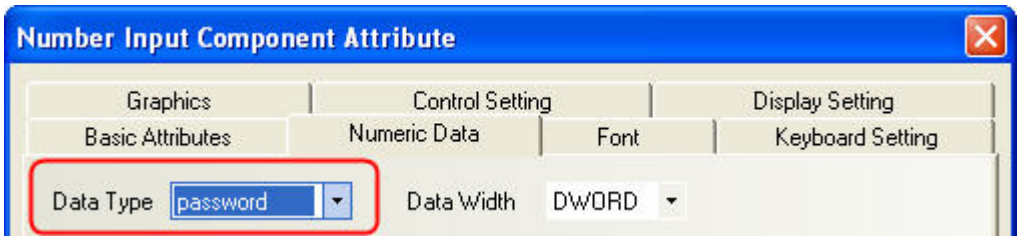
These are all controlled by the local special register. These system parameters can be found by double-clicking the component attributes, and selecting [System register].



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 has nothing to do with the window password.

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

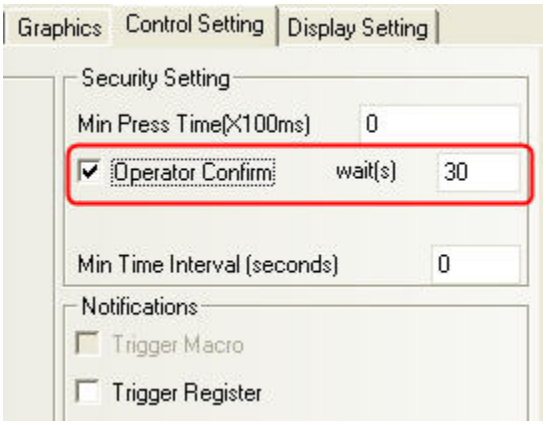
If the uploading password of HMI is lost, data can't be uploaded, and the only solution is to download the project again to overwrite the original one.
Similarly, if the online change password is lost, it also requires to download the project again and set a new password.
Thus, in order to guarantee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

6. Why can't the system time be changed during offline simulation?

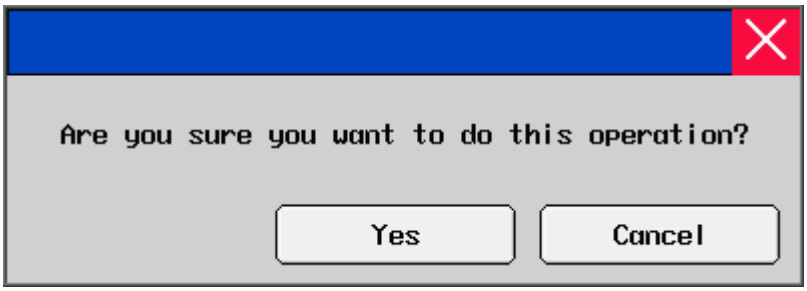
Offline simulation uses the PC's clock, therefore the time can't be changed. It can only be changed when downloaded to the HMI.

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:

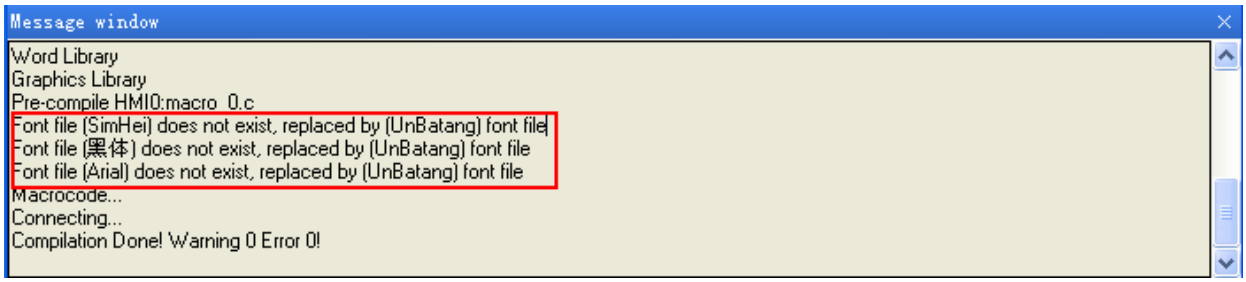


A dialog box as follows will pop up once this option is checked:



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

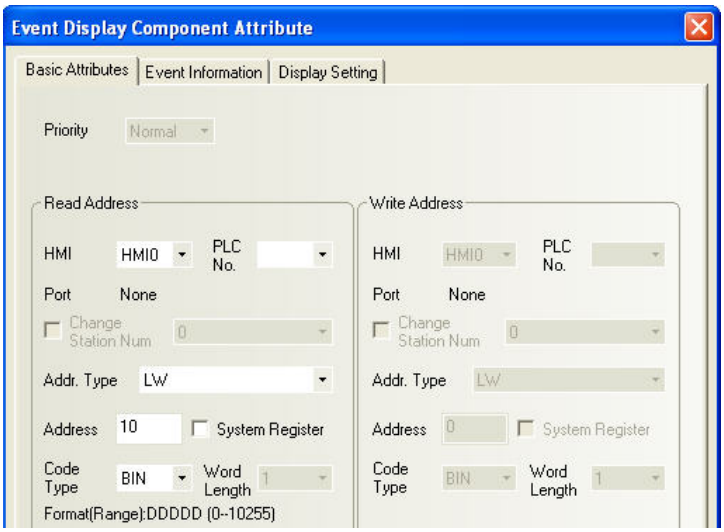
For example: if attempting to open a project involving 黑体 in a PC that doesn't incorporate 黑体, a prompt [黑体 doesn't exist] will pop up, as follows:



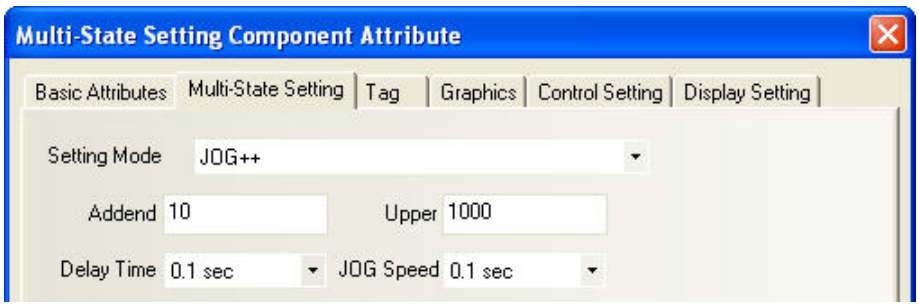
If this font issue is ignored, 黑体 will be replaced with a font that exists in the system, eg. UnBatang.

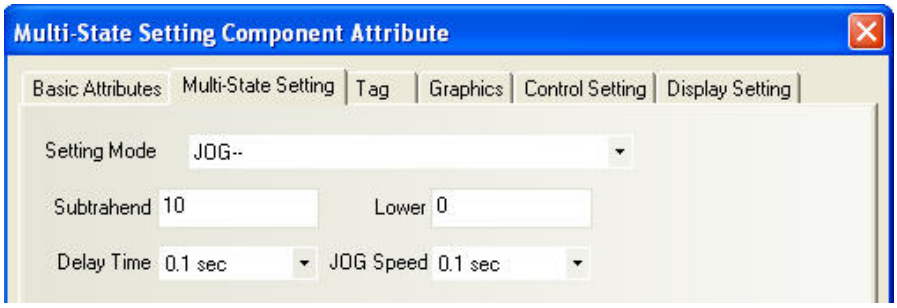
9. How to set the addresses of the component for displaying warnings and events, and how to inquire warnings and events?

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].

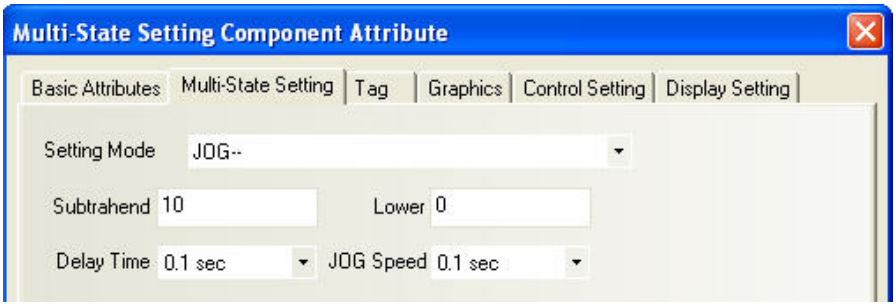




Note: Incremental upper limit is determined by how many events the customer wants to record, while the decremental lower limit is recommended to be set to 0.

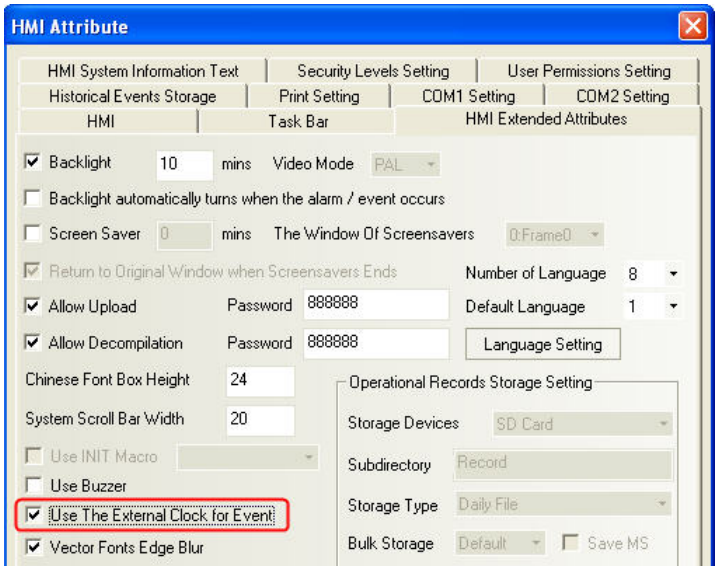
10. Why is there one event inquiring record less?

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:

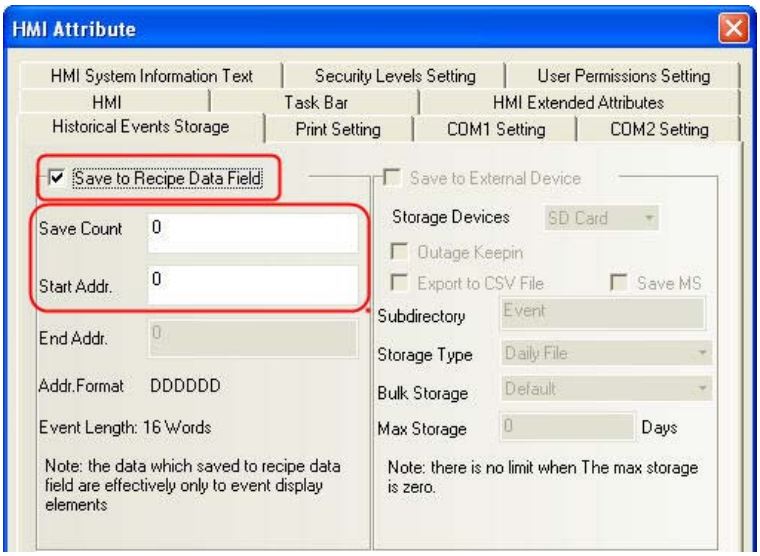


Meanwhile, clock register data inside the PLC is also needed to be transmitted to the local register LW9010-9017. For details, refer to the NB-Designer User Manual [3-10-3 HMI Extended Attributes].

LW9010:(Local time)second. Range:0-59. 1 word R
LW9011:(Local time)minute. Range:0-59. 1 word R
LW9012:(Local time)hour. Range:0-23. 1 word R
LW9013:(Local time)day. Range:1-31. word R
LW9014:(Local time)month. Range:0-11 1 word R
LW9015:(Local time)year. Range:0-9999. 1 word R
LW9016:(Local time)week. Range:0-6. 1 word R
LW9017:(Local time)millisecond. Range:0-999 1 word R

12. Why can't 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 a PLC, why can't the screen being set up be accessed repeatedly?

    It's likely because the value of the PLC address through which screen switching is set doesn't change. When switching the screen and leaving it in other ways (eg. by screen switching button), as the value of the PLC address doesn't change, the screen can't 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 doesn't 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. won't 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?

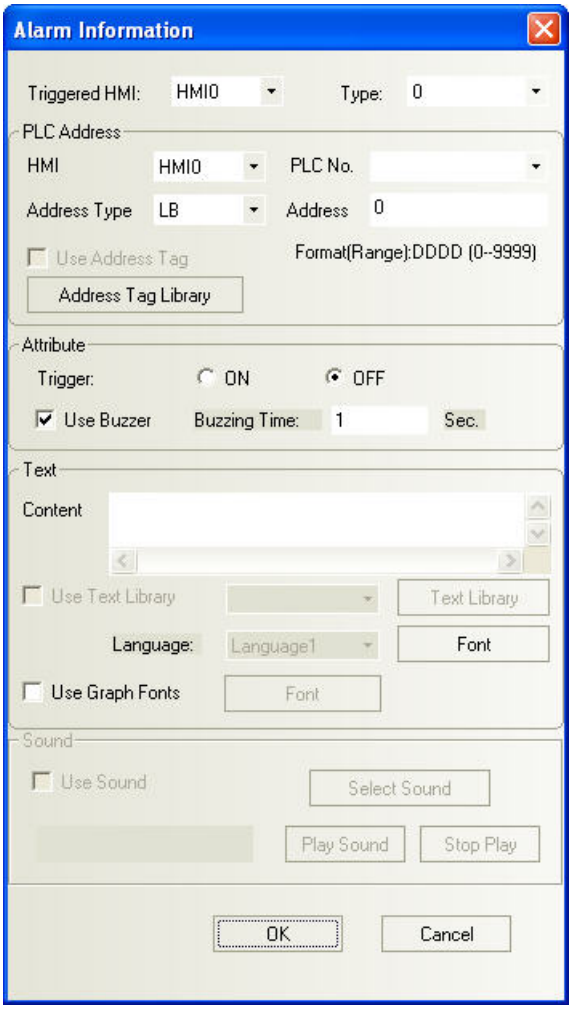
There are two ways to restart it without interrupting the power supply:

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.

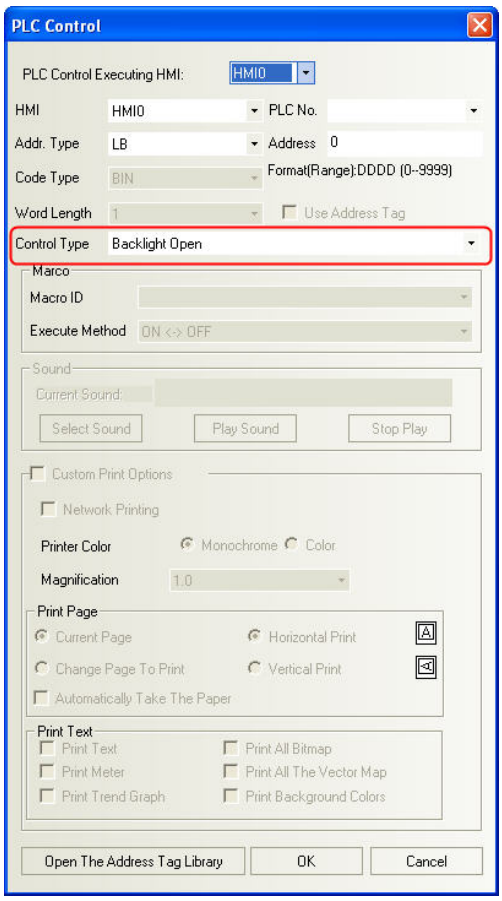
19. How to make the HMI's buzzer sound when a warning occurs?

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



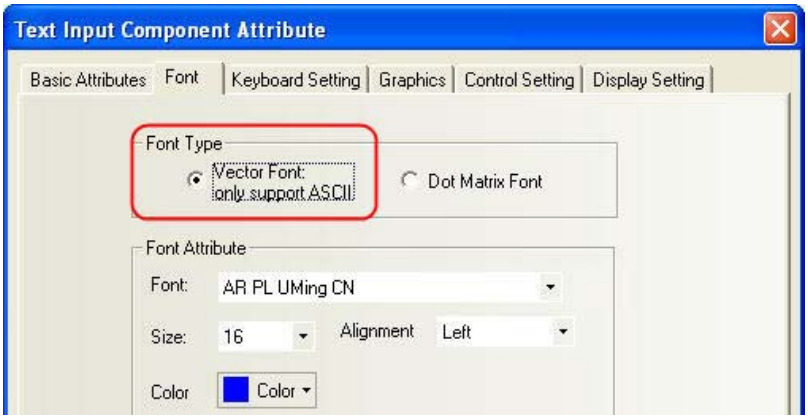
20. When the backlight is dimmed, how to light it up by means of the PLC addresses?

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



21. Why does the characters 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:



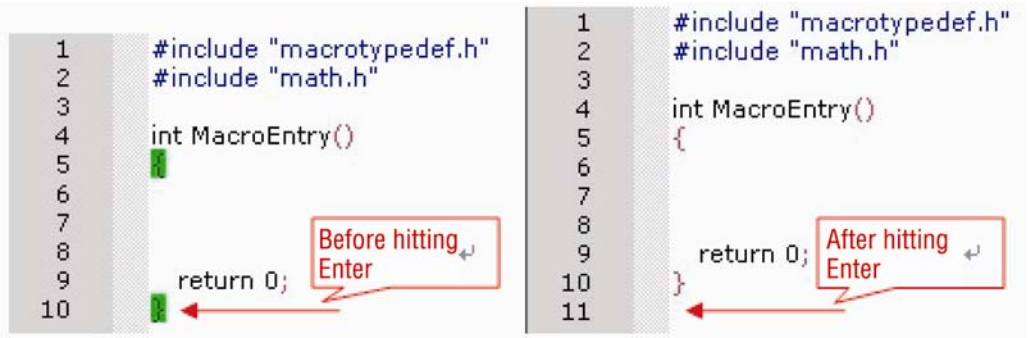
22. How to skip to the target screen after inputting the password correctly?

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 Cash: SegV” appear after calling a macro program?

The likely causes are as follows:

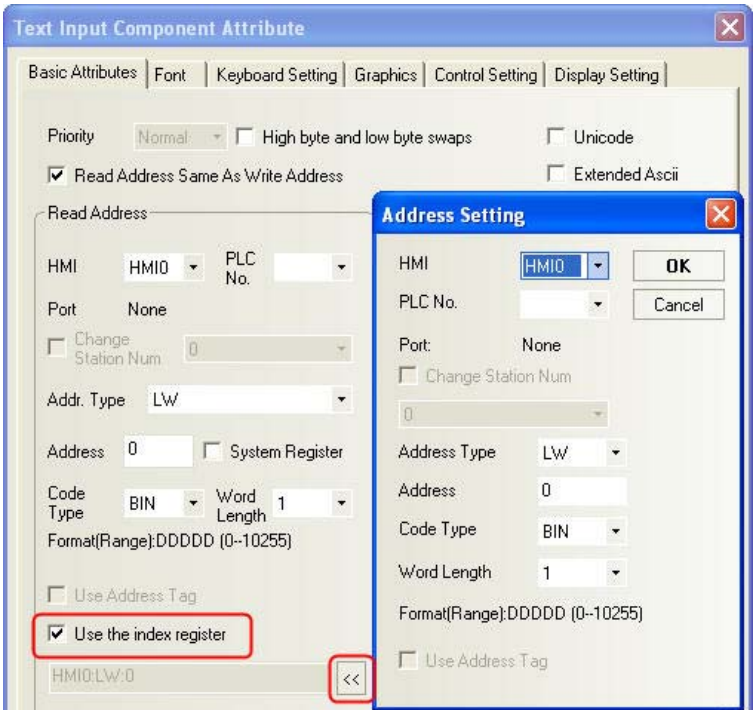
A The address range specified in the macro instruction exceeds the actual address
B When using array data, the array data range exceeds limits. For example: when defining int array [10], if array [10] is used, there will be an issue of array exceeding limits.
C When proceeding division operation, the denominator is 0, and no judgment is made.
D An endless loop forms in the macro.

25. Why can’t a project edited recently be renamed after closing the NB-Designer?

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

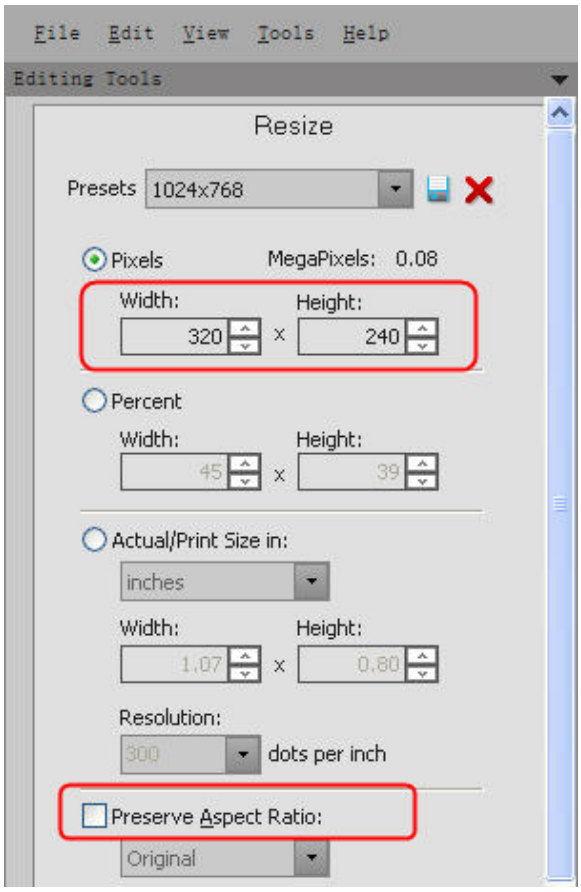
26. How to achieve indirect addressing with an index register?

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?

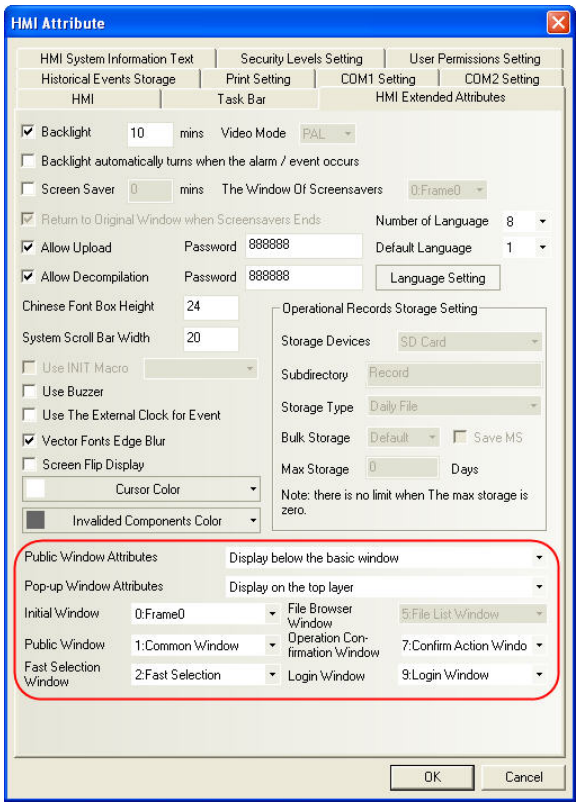
It's better not to delete or alter the windows coming with the system, especially for new users, because each window plays a specific role.

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.

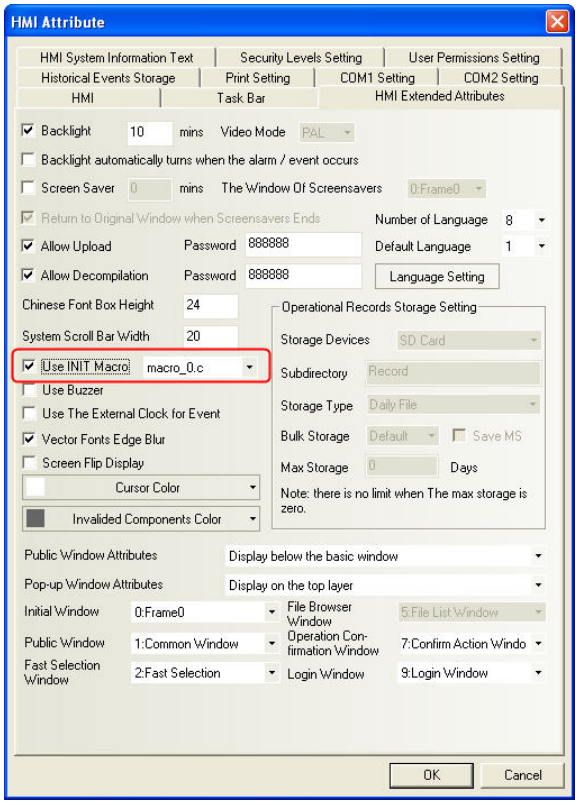
Windows coming with the system also include:

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:

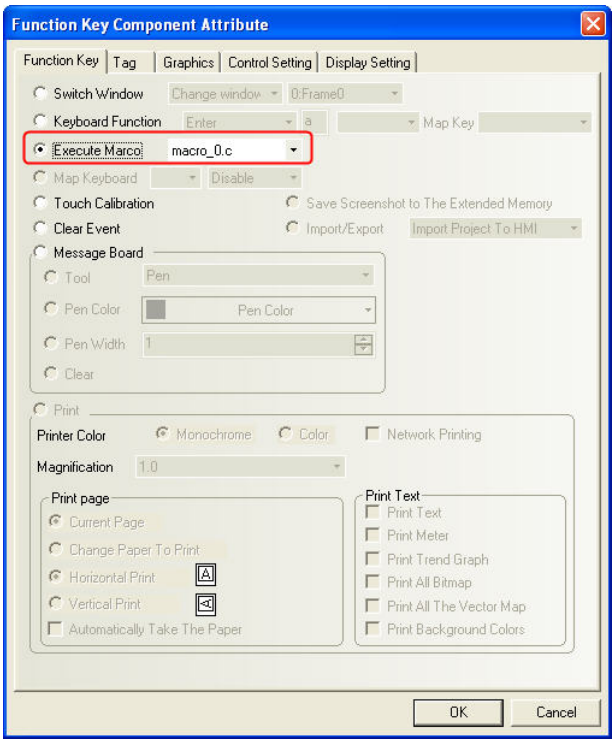


29. What methods are there for triggering (executing) macro programs

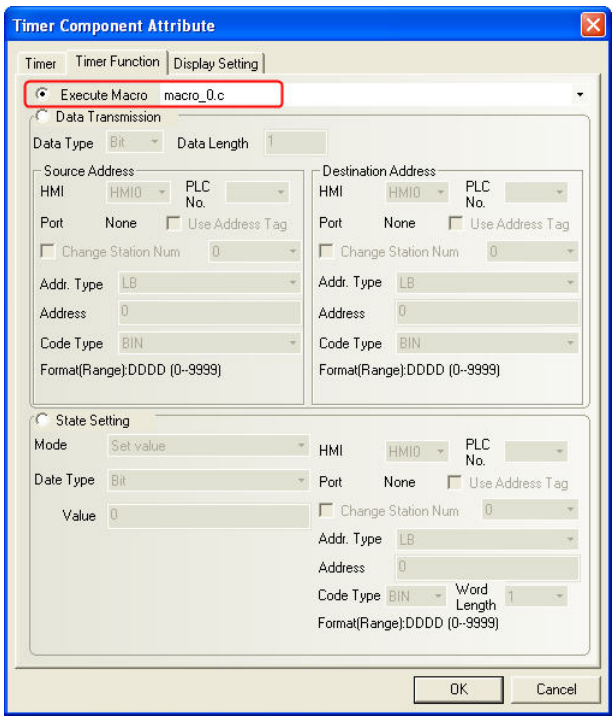
There are 5 kinds of triggering methods for macro instructions, from which users can choose the triggering methods they need.
Method 1: [HMI Attribute] —> [HMI Extended Attributes] —> [Use INIT Macro]: When the HMI is energized and started, the set macro program is executed once, as shown below:



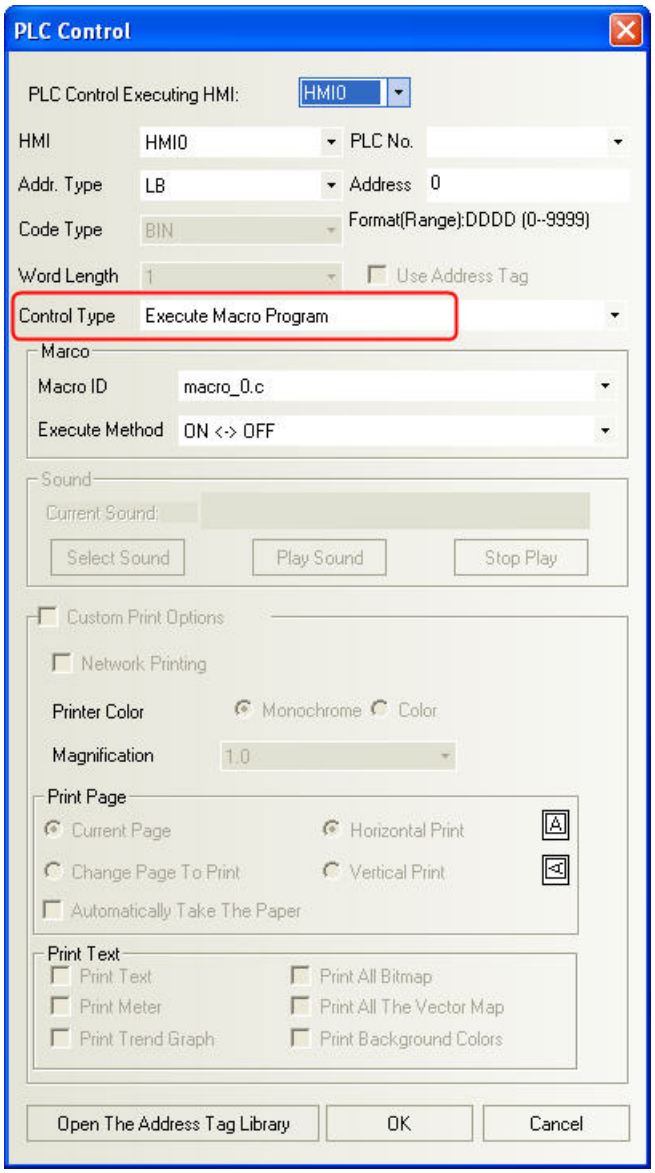
Method 2: [Function Key] —> [Execute Macro]: each time the Function Key is clicked, the macro program is executed once, as shown below:



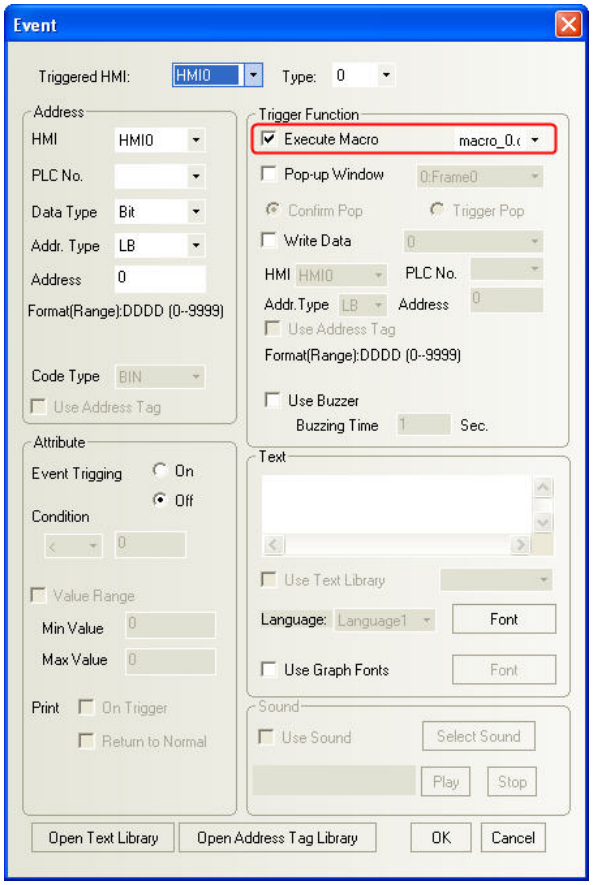
Method 3: [Timer] —> [Execute Macro]: The triggering and execution of the macro program is controlled by time.



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.

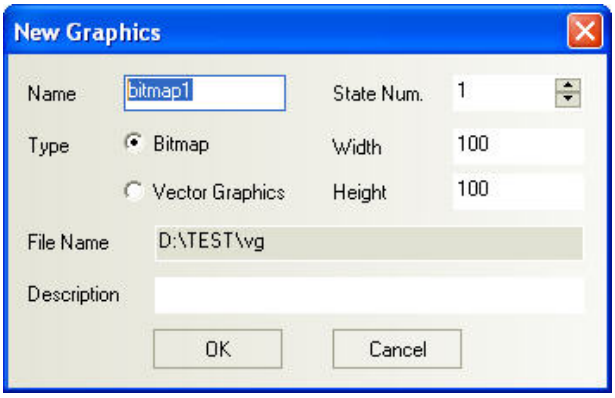


30. What formats of pictures does NB-Designer support, and how to import these pictures?

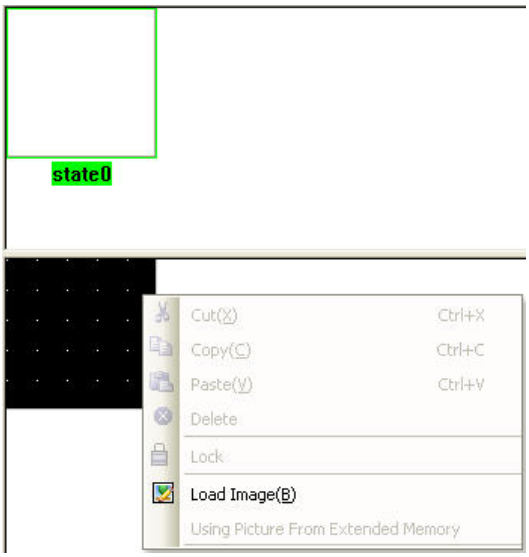
The formats of pictures that can be imported include: “.JPG”, “.GIF”, “.BMP” and “.PNG”.

Import method:

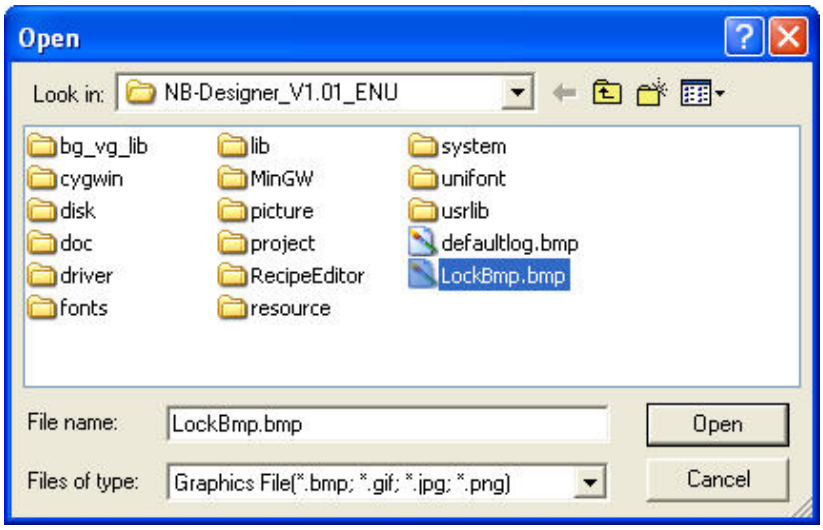
A Create a new figure, and select “Bitmap”



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 can't 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 can't 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

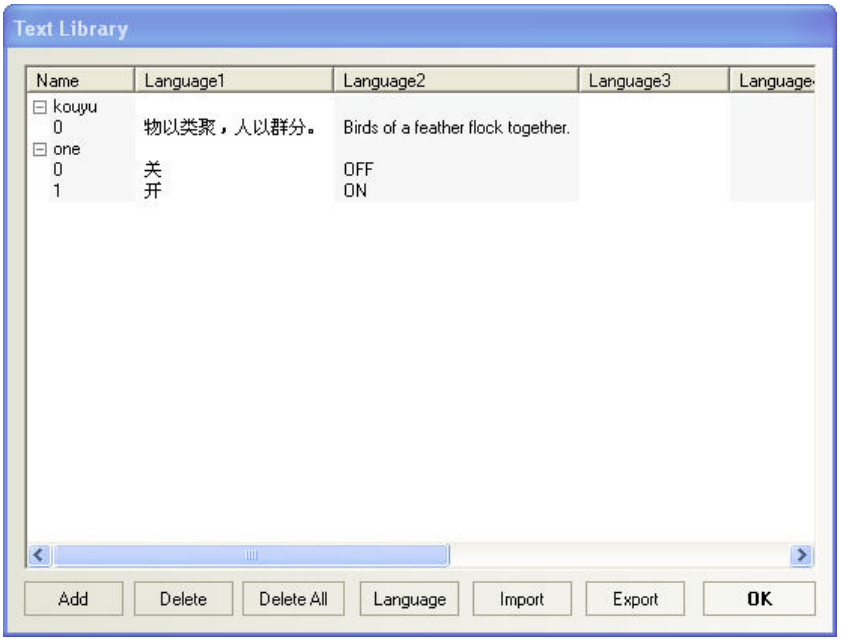
Place a [Bit State Setting Component] in the Common Window, with the address being LW.B 9296.2 and the setting type being [Set On when Window Open].

33. How to mask system alarm information - Socket Connect Error

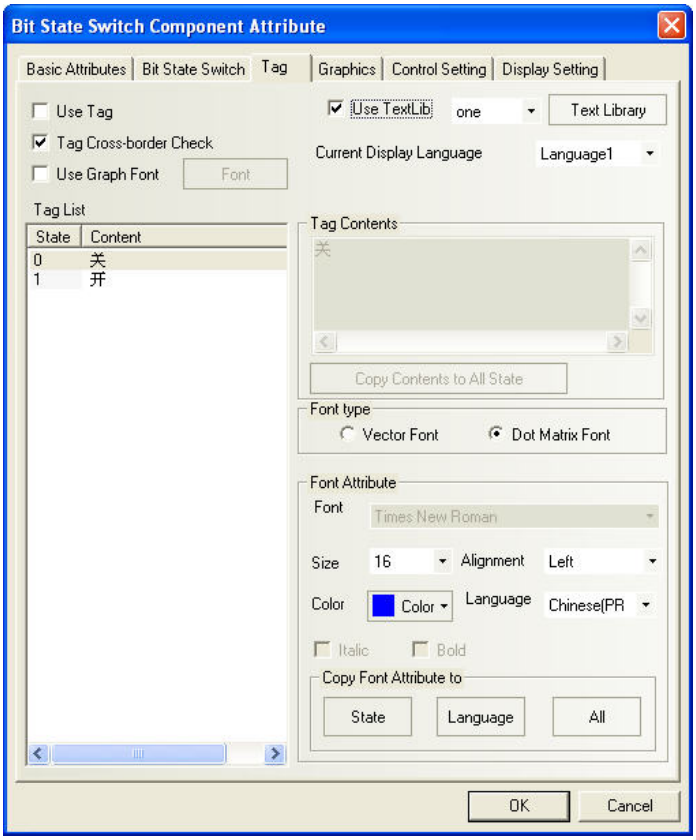
Place a [Bit State Setting Component] in the Common Window, with the address being LW.B 9296.4 and the setting type being [Set On when Window Open].

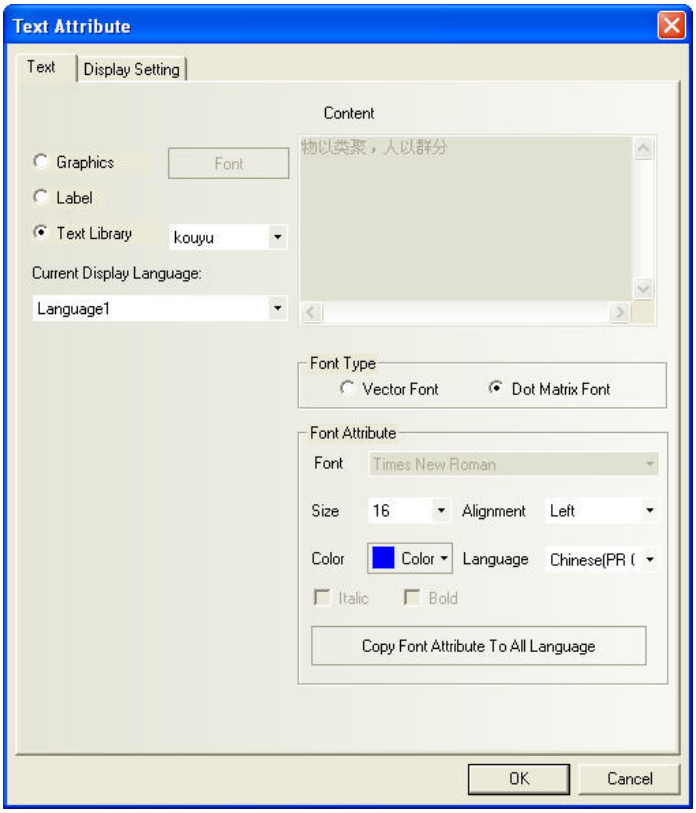
34. How to achieve multi-language switch

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
1. Create a text in the text library, as shown below:

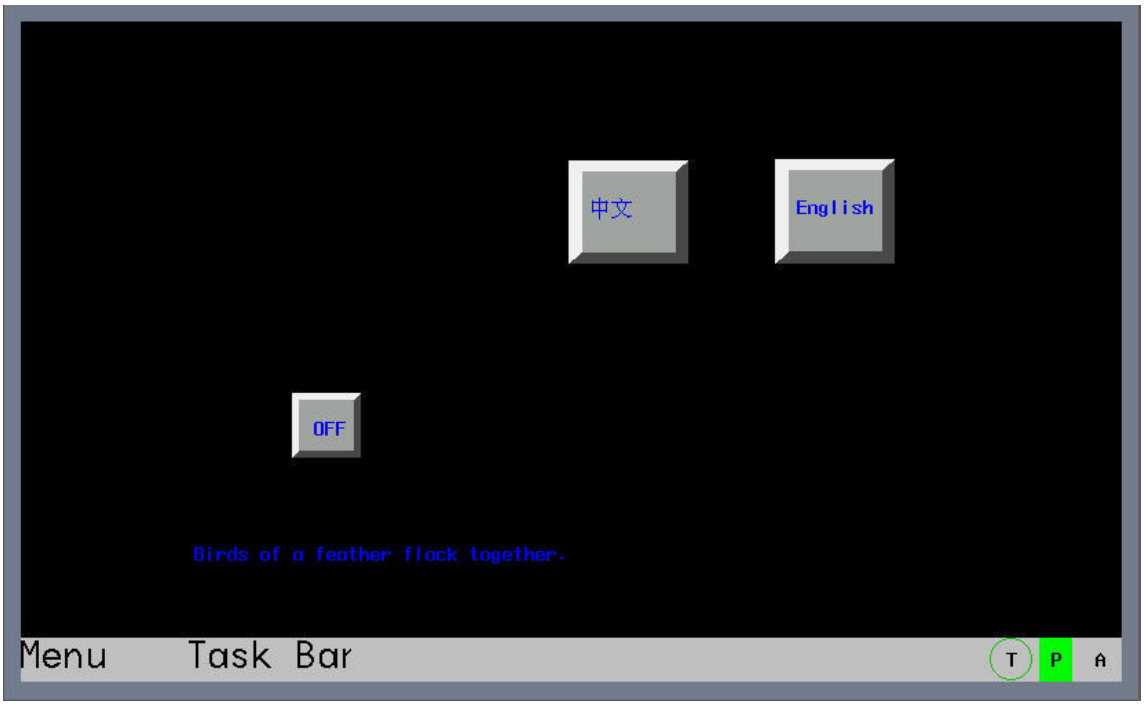


2. Add a [Bit State Switch] and a static text on the screen, with the “Use TextLib” selected for tags, as shown below:





3. 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.
4. 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:



5-2-2 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 If all turn right following the above procedures, but communications still won't work, please contact the supplier.

2. Components can't 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;

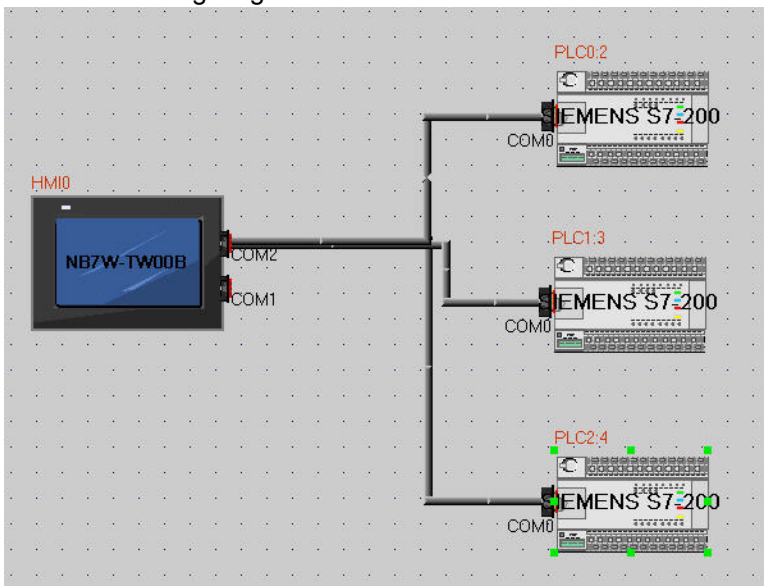
F The serial port of the HMI fails (The serial port does not support hot plug, so take care and avoid man-made damage).

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.

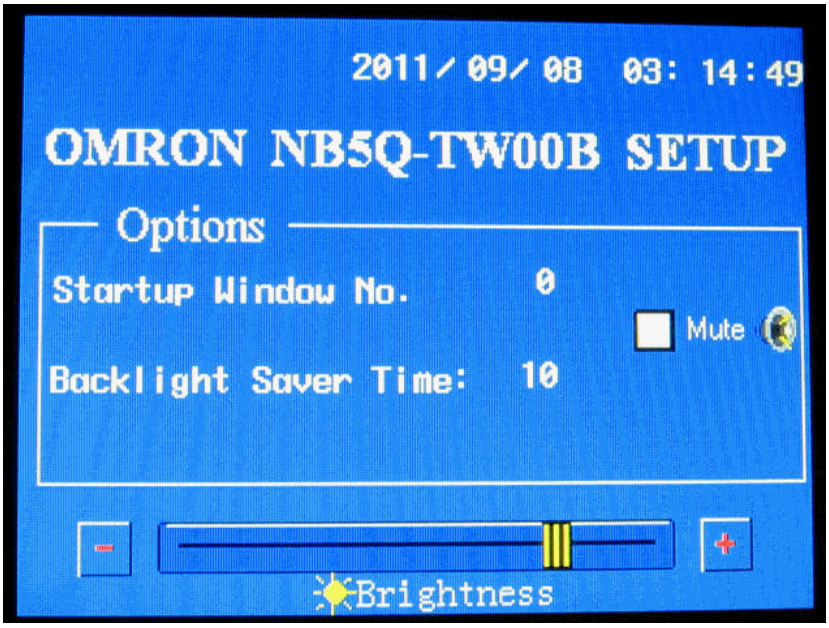
9. When PT communicates with S7-200, why can't the VD address value be displayed

A First check whether the VD in the PLC is a double integer type or a single-precision floating-point number, then set the right data type on the PT;
B The settings on the PT are consistent with the coding format on the PLC. Check whether the BIN format is adopted, while with BCD format, the display will fail.

5-2-3 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 can't be saved or the display is not accurate

If the time can't be saved, the most likely cause is that the battery runs low. When the PT is disconnected from the power supply, the data hold area on the PT and the RTC both need 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 can't be saved or the display is not accurate, therefore requiring the Unit to be sent back to the factory for battery replacement.

3. Why does the data in the PT recipe register disappear after a power interruption

When the PT is disconnected from the power supply, the data hold area on the PT and the RTC both need to be energized by the battery on the PT mainboard. When the battery voltage descends to an unsustainably low level, it may lead to loss of data, therefore requiring the Unit to be sent back to the factory for battery replacement.

4. Why is there no response from touch-control

When operating the touch panel, if clicking a component on the screen doesn't 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 switch 2 on the backside of the PT 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.

5. 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.

6. Why does the PT screen dim or even become black

The screens we normally see on a PT are displayed in liquid crystal. However, the liquid crystal itself doesn't 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 be totally black.
When your PT product dims or becomes totally back, please contact OMRON's customer service center.

7. PT black screen

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;
E 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.

8. 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.

9. 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.

5-2-4 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 can't 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 only for downloading/uploading data and executing functions related to the NB-Designer, and not for communicating with the slave Units. USB Host port can be connected to a USB flash disk, or a USB-interfaced mouse, keyboard, barcode scanner, printer, etc. 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, with a minimum distance of 20 CM, 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.

5-3 Request to change the NB Unit

Follow the following precautions to change the NB Unit, if a fault is detected during the check-up.

● Back up the project data in the NB Unit.

All project data will be deleted when OMRON repairs the NB Unit.

● Prior to replacing the NB Unit, switch off the power supply.

● When obtaining a new PT, check and confirm that the new NB Unit is faultless.

● When sending the faulted NB Unit back to OMRON for repair, provide a file detailing the fault together with the NB Unit to the OMRON representative.

Appendices

Appendix-1 Specifications

Appendix-1-1 General Specifications

Items	Specifications	
	NB5Q-TW00B model	NB7W-TW00B model
Rated power supply voltage	DC24V	
Allowable power supply voltage fluctuation range	DC20.4～27.6V(DC24V −15%～+15%)	
Power consumption	6W	7W
Ambient operating temperature	0°C～50°C	
Ambient storage temperature	−20°C～60°C	
Ambient operating humidity	10%～90% RH (without condensation)	
Ambient storage humidity	10%～90% RH (without condensation)	
Operating environment	No corrosive gases	
Noise Immunity	Compliant with IEC61000-4-4, 2KV (Power cable)	
Vibration resistance (During operation)	10 to 57Hz with a 0.075-mm amplitude, 57 to 150Hz 9.8m/s^2 for 30 min each in X, Y and Z directions	
Shock resistance (During operation)	147m/s^2 for 3 times each in X, Y and Z directions, with each time lasting for 11 ms	
Dimensions	184 (W)×142 (H)×46 (D)mm	202 (W)×148 (H)×46 (D)mm
Panel opening dimension	172.4 (Width)×131.0 (Height) mm Panel thickness range: 1.6～4.8 mm	191.0 (Width)×137.0 (Height) mm Panel thickness range: 1.6～4.8 mm
Weight	620g max.	710g max.
Degree of protection	Front operation part: IP65 (Dust proof and drip proof only from the front of the panel)	
Battery life	5 years (at 25 °C)	
Applicable standards	EC Directives, KC	

Appendix-1-2 Performance Specifications

- Display specifications

Items		Specifications	
		NB5Q-TW00B model	NB7W-TW00B model
Display panel	Display device	5.6 " TFT LCD	7 " TFT LCD
	Pixels	320 horizontal×234 vertical	800 horizontal×480 vertical
	Display color	65536 colors	
	Valid display area	113 (Width)×85 (Height) mm	154 (Width)×86 (Height) mm
Backlight	Life	50,000 hours of operating time at the normal temperature (25 °C) The backlight will be compromised at low temperatures. And the luminous intensity of each LED may decrease by 50%.	
Front-side LED		ON: power connected OFF: power disconnected	

- Operation part specifications

Items	Specifications	
	NB5Q-TW00B model	NB7W-TW00B model
Touch panel	Type: resistance type	
	Resolution: 4096*4096	
	Operation force: 0.8~1.2 N	
	Press endurance: min. 1,000,000 times	

Note: the operation part is of an analog resistive film type. When two or more points on the panel are pressed simultaneously, the switch at the center of the pressed area may act if there is one. Therefore, do not press two or more points on the panel simultaneously.

- External I/F Specifications

Items	Specifications	
	NB5Q-TW00B model	NB7W-TW00B model
USB Slave	1 port (for screen data transmission and connection to a PC)	

- Programmer (a software for making screen data)

Items	Specifications	
	NB5Q-TW00B model	NB7W-TW00B model
Name	NB-Designer	

NB-Designer is free distributed on Omron web site. Please access your local Omron web site and try to download.

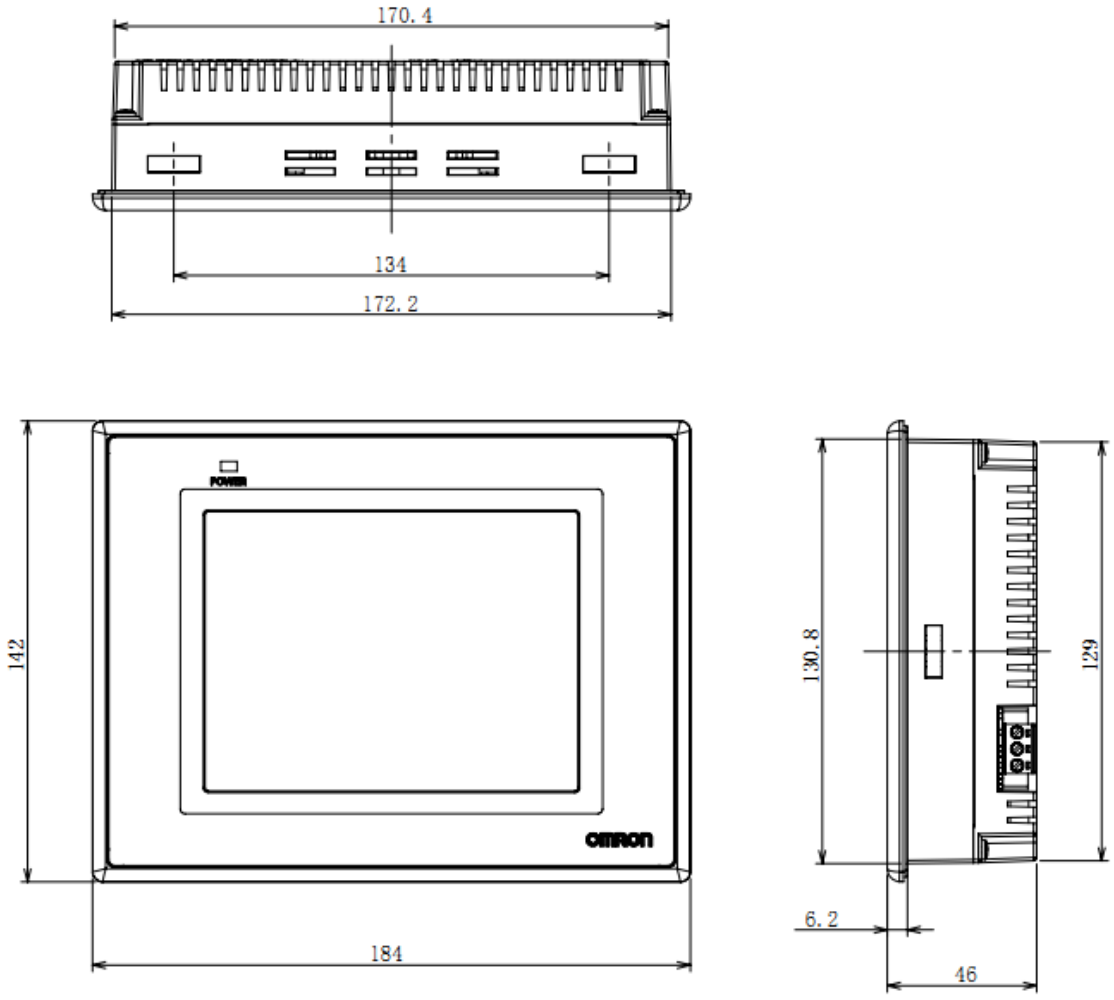
Appendix-1-3 Communication Specifications

- Host Link communication specifications

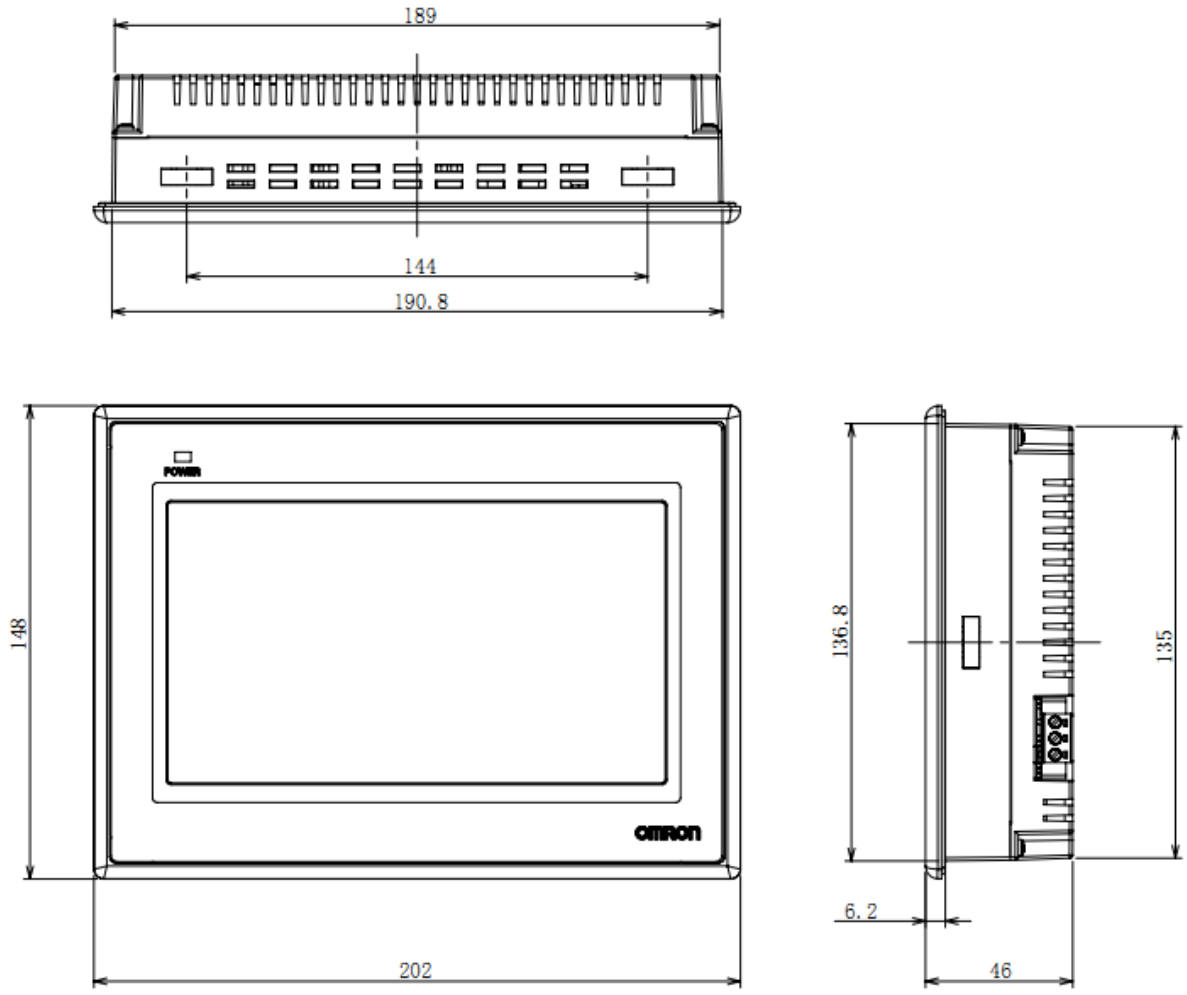
Items	Specifications	
	NB5Q-TW00B model	NB7W-TW00B model
COM1	Compliant with EIA RS-232C D-sub, 9-pin connector socket Pin 6 DC +5V output (Max. 250 mA) Communication cable length: Max.15m	
COM2	Compliant with EIA RS-232C/422A/485 D-sub, 9-pin connector socket At one point, only one from RS-232C, RS-422A and RS-485 can be designated to perform communications Communication cable length: Max.15m (RS-232C) Max. 500m (RS-422A/485)	

Appendix-2 External Dimensions

- NB5Q-TW00B model



- NB7W-TW00B model



Appendix-3 RS-422A/485 Connections

Appendix-3-1 Grounding and Shielding of the Cables

When performing communications using RS-422A/485, carry out the connections, shielding and grounding as follows:

- Grounding wiring

The NB Unit has a functional grounding terminal (⏚).

① Generally, make the grounding according to Fig. (a)
- Connect the grounding terminals (GR) of the devices and the functional grounding terminal (⏚), then make a D-type grounding at point 1 (Max. grounding resistance 100 Ω)
- Short-circuit the LG terminal and GR terminal of the PLC.
- Use a cable with a minimum of 2 mm^2 for the grounding cable.
- For details about the connection methods, refer to the related communication Unit manuals.

② When grounding the Unit with noise source equipments such as motors and inverters, etc. from the same panel, do not ground the NB Unit's functional grounding terminal (⏚) as shown in Fig. (b)

- Shielding of RS-422A/485 Cables

Be sure to shield the RS-422A/485 cables.

Connect the grounding terminals (GR) of the devices and the functional grounding terminals (⏚), and when making a D-type grounding at point 1 (Max. grounding resistance 100 Ω), carry out a single-end shielding according to Fig. (a).
If grounding is not done to the functional grounding terminal (⏚) of the NB Unit, shield both ends as shown in Fig. (b)

Precautions for Safe Use	In order to avoid malfunctions caused by interferences, shield the cables properly.

Figure (a)

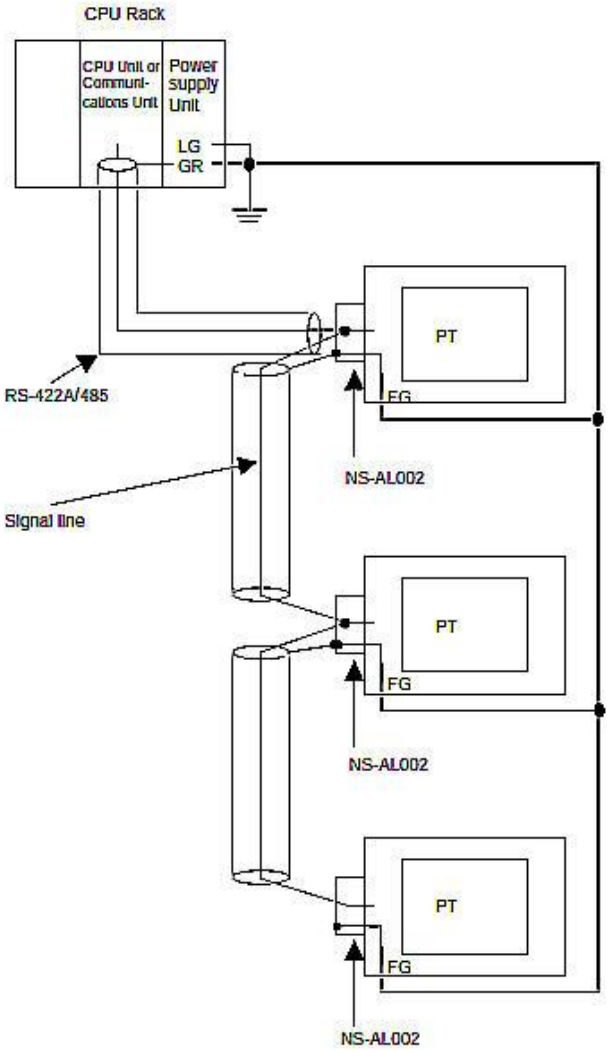
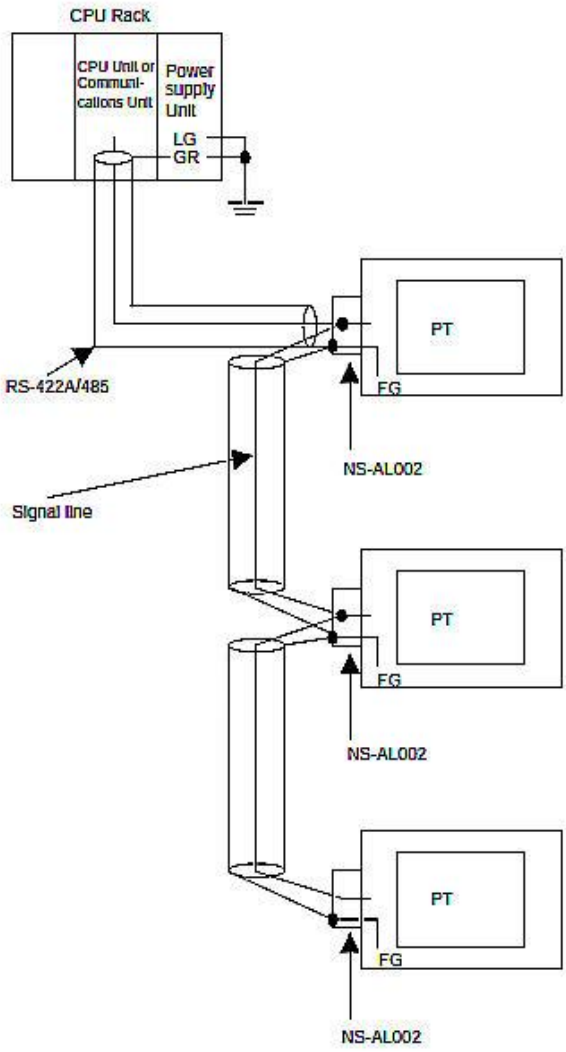


Figure (b)

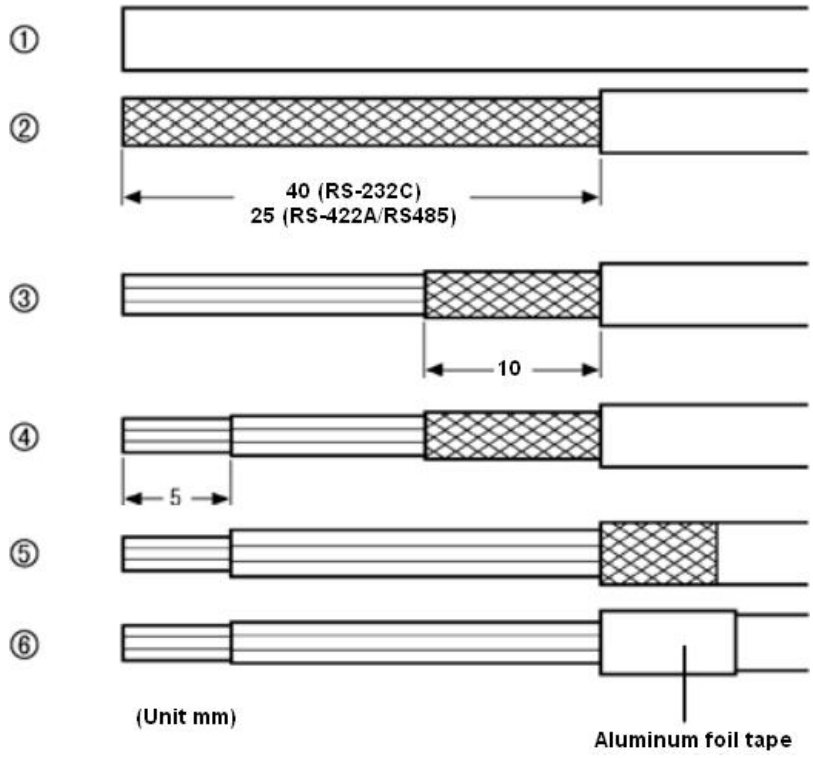


Appendix-4 Fabrication of the Connection Cable

Fabricate the connection cable following the procedures below.

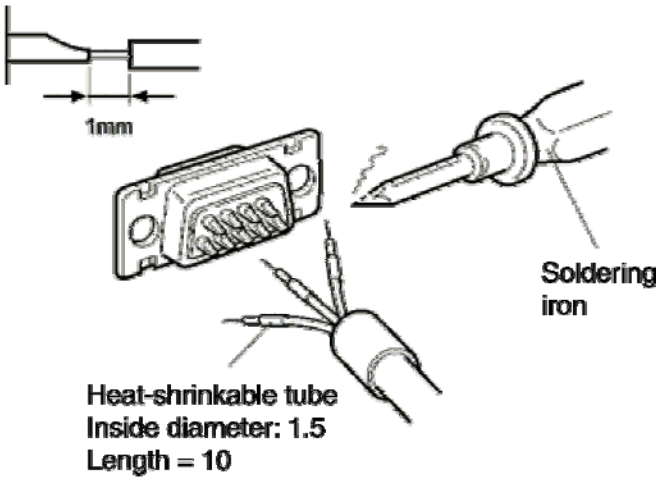
Appendix-4-1 Cable Processing

① Cut the cable to the required length.
② Use a tool like a razor, etc. to cut off the ethylene peel of the cable. Be care not to damage the shielding layer (for grouping purpose)
③ Use a pair of scissors to snip off the shielding layer.
④ Bring out the core of each wire using a wire stripper.
⑤ Fold back the shielding layer.
⑥ Wrap the folded part of the shielding layer with aluminum foil tape.

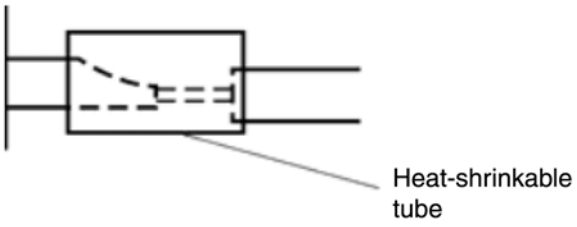


Appendix-4-2 Soldering

① Sheathe each wire with a heat shrinkable tube.
② Place some standby soldering tin on each wire and each pin of the connector.
③ Solder each wire and each pin of the connector.

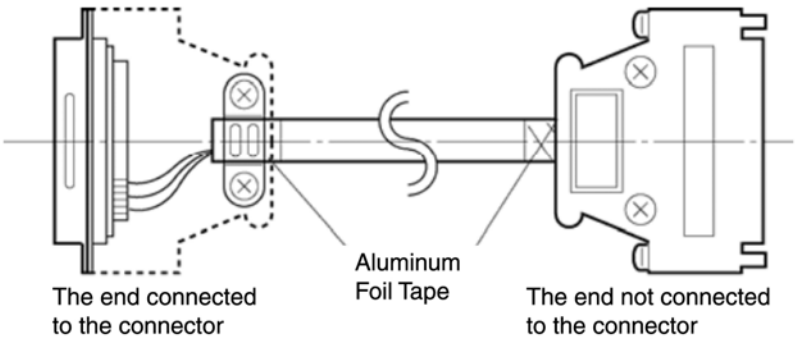


④ Pull the heat shrinkable tubes back to the soldering parts, heat them with a heat shrinking gun to make them shrink.



Appendix-4-3 Shield Assembly

Assemble the connector shield as shown below.



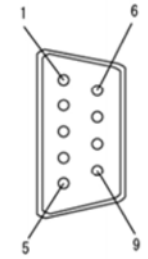
Appendix-4-4 Method for fabricating the cable for connection to OMRON PLC

When fabricating the cable for connecting the NB Unit and OMRON PLC, refer to the following methods:

■ COM1

- The cable for connecting the NB Unit serial port COM1 to OMRON PLC (RS-232C)

COM1 (female) at the NB Unit side



NB Unit side

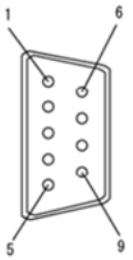
Signal Name	Pin No.
FG	Connector Shield
NC	1
SD	2
RD	3
RS(RTS)	4
CS(CTS)	5
DC+5V	6
NC	7
NC	8
SG	9

Shielded Cable

OMRON PLC side

Pin No.	Signal Name
1	FG
2	SD
3	RD
4	RS
5	CS
6	5V
7	DR
8	ER
9	SG

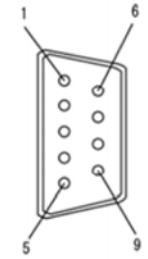
RS232 port at the OMRON PLC side (female)



■ COM2

- The cable for connecting the NB Unit serial port COM2 to OMRON PLC (RS-232C)

COM2 (female) at the NB Unit side



NB Unit side

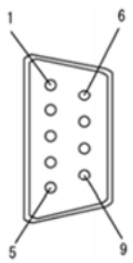
Signal Name	Pin No.
FG	Connector Shield
SDB+	1
SD(TXD)	2
RD(RXD)	3
Terminal 1	4
Terminal 2	5
RDB+	6
SDA-	7
RDA-	8
GND	9

Shielded Cable

OMRON PLC side

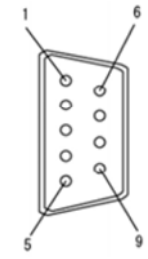
Pin No.	Signal Name
1	FG
2	SD
3	RD
4	RS
5	CS
6	5V
7	DR
8	ER
9	SG

RS232 port at the OMRON PLC side (female)



- The cable for connecting the NB Unit serial port COM2 to OMRON PLC (RS-422A)

COM2 (female) at the NB Unit side



NB Unit side

Signal Name	Pin No.
SDB+	1
SD(TXD)	2
RD(RXD)	3
Terminal 1	4
Terminal 2	5
RDB+	6
SDA-	7
RDA-	8
GND	9
FG	Connector Shield

OMRON PLC side

Pin No.	Signal Name
1	RDA-
2	RDB+
3	SDA-
4	SDB+
5	FG

Shielded Cable

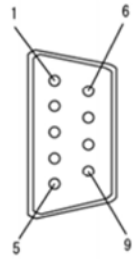
Appendix-4-5 Method for fabricating the cable for connection to PC

When fabricating the cable for connecting with NB-Designer, refer to the following methods:

Depending on the type of the RS-232C connector compatible with PCs according to DOS/V, deploy the wiring as shown below:

- 25-pin Connector

COM1 (female) at the NB Unit side



NB Unit side

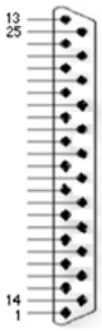
Signal Name	Pin No.
FG	Connector Shield
NC	1
SD	2
RD	3
RS(RTS)	4
CS(CTS)	5
DC+5V	6
NC	7
NC	8
SG	9

Shielded Cable

DB25 Serial Port at the PC side

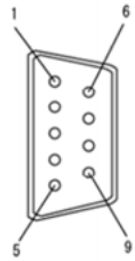
Pin No.	Signal Name
Connector Shield	FG
1	FG
2	SD
3	RD
4	RS
5	CS
6	DR
7	SG
8	CD
20	ER
22	RI

RS232 DB25 (male) at the PC side



- 9-pin Connector

COM1 (female) at the NB Unit side



NB Unit side

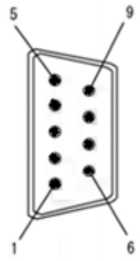
Signal Name	Pin No.
FG	Connector Shield
NC	1
SD	2
RD	3
RS(RTS)	4
CS(CTS)	5
DC+5V	6
NC	7
NC	8
SG	9

Shielded Cable

DB9 Serial Port at the PC side

Pin No.	Signal Name
Connector Shield	FG
1	CD
2	RD
3	SD
4	ER
5	SG
6	DR
7	RS
8	CS
9	RI

RS232 DB9 (male) at the PC side



Appendix-5 List of Models

- NB Unit

Models	LCD Panel			
	Resolution	Size	Type	Display color
NB5Q-TW00B	QVGA 320*234	5.6 inches	TFT	65536 colors
NB7W-TW00B	WVGA 800*480	7 inches	TFT	65536 colors

- Serial Communication Unit

Models	Specifications	Applicable PLCs
CS1W-SCU21	•RS-232C (2 ports) •Pad-mounted type	CS Series CS1G/H, CS1G/H-H
CS1W-SCU41	•RS-232C (1 port) •RS-422A (1 port) •Pad-mounted type	CS Series CS1G/H, CS1G/H-H
CJ1W-SCU41	•RS-232C (1 port) •RS-422A (1 port) •Building block type	CJ1 Series CJ1G/H-H, CJ1M

- PLC Series Connectable to NB Series through Host Link

PLC Series	Specifications
CP Series	Connecting through the RS-232C optional communication board (CP1W-CIF01) with a RS-232C cable
C200HE/HG/HX Series	With a connector for RS-232C connection (switch/9-pin type)
CQM1H Series	With a connector for RS-232C connection (9-pin type)
CPM1A Series	Connecting through the RS-232C adaptor (CP1W-CIF01) with a RS-232C cable
CPM2A Series	With a connector for RS-232C connection (9-pin type)
CPM2C Series	Connect to the branched RS-232C connector through a conversion cable (CPM2C-CN111 type)
CS Series	With a connector for RS-232C connection (9-pin type)
CJ1/CJ2 Series	With a connector for RS-232C connection (9-pin type)

- Units at the host side which can be connected using the serial port of the NB Unit in the RS-232C mode through Host Link

PLC Series	CPU Unit with built-in Host Link function	CPU Unit that can be connected through adding Host Link Units/communication boards	Options required for connection
CP Series	CP1L-L14/L20/M30/M40/M60		CP1W-CIF01
	CP1H-X40/XA40/Y20		CP1W-CIF01
	CP1E-N14/N20		
	CP1E-N30/N40/N60/NA20		CP1W-CIF01
C Series		C200HE-CPU11/32/42 C200HE-CPU11/32/42-Z C200HG-CPU33/43/53/63 C200HG-CPU33/43/53/63-Z C200HX-CPU34/44/54/64 C200HX-CPU34/44/54/64/65/85-Z	C200H-LK201-V1
	C200HE-CPU42 C200HE-CPU42-Z	C200HE-CPU32/42 C200HE-CPU32/42-Z	C200HW-COM02/04/05/06-V1
	C200HG-CPU43/63 C200HG-CPU43/63-Z	C200HG-CPU33/43/53/63 C200HG-CPU33/43/53/63-Z	C200HW-COM02/04/05/06-V1
	C200HX-CPU44/64 C200HX-CPU44/64/65/85-Z	C200HX-CPU34/44/54/64 C200HX-CPU34/44/54/64/65/85-Z	C200HW-COM02/04/05/06-V1
	CPM1-10/20CDR-□ ＋CPM1-CIF01		
	CPM1A-10/20/30/40CD□-□ ＋CPM1-CIF01		
	CPM2A-30/40/60CD□□-□ ＋CPM1-CIF01 (When a peripheral port is connected)		
	CPM2C-10/20□□□□□□-□ (*1)		
	CQM1H-CPU11/21/51/61 (*2)	CQM1H-CPU51/61	CQM1H-SCB41
CS Series	CS1G-CPU42/43/44/45 (-V1) CS1H-CPU63/64/65/66/67 (-V1)	CS1G-CPU42/43/44/45 (-V1) CS1H-CPU63/64/65/66/67 (-V1)	CS1W-SCU21 (-V1) CS1W-SCB21 (-V1) CS1W-SCB41 (-V1)
	CS1G-CPU42H/43H/44H/45H CS1H-CPU63H/64H/65H/66H/67H	CS1G-CPU42H/43H/44H/45H CS1H-CPU63H/64H/65H/66H/67H	CS1W-SCU21 (-V1) CS1W-SCB21 (-V1) CS1W-SCB41 (-V1)
CJ1 Series	CJ1G-CPU44/CPU45	CJ1G-CPU44/CPU45	CJ1W-SCU21/41/-V1
	CJ1G-CPU42H/43H/44H/45H CJ1H-CPU65H/66H/67H	CJ1G-CPU42H/43H/44H/45H CJ1H-CPU65H/66H/67H	CJ1W-SCU21/41/-V1
	CJ1M-CPU11/12/13/21/22/23	CJ1M-CPU11/12/13/21/22/23	CJ1W-SCU21/41/-V1
CJ2 Series	CJ2M-CPU31/32/33/34/35		CP1W-CIF01
	CJ2M-CPU11/12/13/14/15		
	CJ2H-CPU64/65/66/67/68 (-EIP)		

*1：Connect using conversion cables (CPM2C-CN111 type or CS1W-CN114/118 type), the RS-232C adaptor (CPM1-CIF01 type) or the RS-422A adaptor (CPM1-CIF11 type).

*2: The CQM1H-CPU11 model doesn't have the RS-232C port built in the CPU, therefore it requires a peripheral port to be connected to a PT through a conversion cable (CS1W-CN118 type).

- Units at the host side which can be connected using the serial port of the NB Unit in the RS-422A mode through Host Link

PLC Series	CPU Unit with built-in Host Link function	CPU Unit that can be connected through adding Host Link Units/communication boards	Options required for connection
CP Series	CP1L-L14/L20/M30/M40/M60		CP1W-CIF11 CP1W-CIF12
	CP1H-X40/XA40/Y20		CP1W-CIF11 CP1W-CIF12
	CP1E-N30/N40/N60/NA20		CP1W-CIF11 CP1W-CIF12
C Series		C200HE-CPU11/32/42 C200HE-CPU11/32/42-Z C200HG-CPU33/43/53/63 C200HG-CPU33/43/53/63-Z C200HX-CPU34/44/54/64 C200HX-CPU34/44/54/64/65/85-Z	C200H-LK202-V1
		C200HE-CPU32/42 C200HE-CPU32/42-Z	C200HW-COM03/06-V1
		C200HG-CPU33/43/53/63 C200HG-CPU33/43/53/63-Z	C200HW-COM03/06-V1
		C200HX-CPU34/44/54/64 C200HX-CPU34/44/54/64/65/85-Z	C200HW-COM03/06-V1
	CPM1-10/20CDR-□ ＋CPM1-CIF11		
	CPM1A-10/20/30/40CD□-□ ＋CPM1-CIF11		
	CPM2A-30/40/60CD□□-□ ＋CPM1-CIF11 (When a peripheral port is connected)		
	CPM2C-10/20□□□□□□-□ (*1)		
		CQM1H-CPU51/61	CQM1H-SCB41
CS Series		CS1G-CPU42/43/44/45 (-V1) CS1H-CPU63/64/65/66/67 (-V1)	CS1W-SCB41 (-V1)
		CS1G-CPU42H/43H/44H/45H CS1H-CPU63H/64H/65H/66H/67H	CS1W-SCB41 (-V1)
CJ1 Series		CJ1G-CPU44/CPU45	CJ1W-SCU41-V1
		CJ1G-CPU42H/43H/44H/45H CJ1H-CPU65H/CPU66H	CJ1W-SCU41-V1
		CJ1M-CPU11/12/13/21/22/23	CJ1W-SCU41-V1
CJ2 Series	CJ2M-CPU31/32/33/34/35		CP1W-CIF11 CP1W-CIF12
	CJ2M-CPU11/12/13/14/15		
	CJ2H-CPU64/65/66/67/68 (-EIP)		

*1：Connect using conversion cables (CPM2C-CN111 type or CS1W-CN114/118 type), the RS-232C adaptor (CPM1-CIF01 type) or the RS-422A adaptor (CPM1-CIF11 type).

- Software related to the NB Unit

Name	Version	Remarks
NB-Designer	Ver 1.02	OS: Windows XP(SP1 or higher) Windows Vista/Windows 7 The NB-Designer incorporates a transmission program and a standard system program specified for the NB-Series Units 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.

- Related connecting objects

  Cable with connectors (NB Unit <-> OMRON PLC)

Models	Cable Length	Object Unit	Communications methods	Specifications
XW2Z-200T	2m	Units with 9-pin connectors	Host Link (Only for RS-232C)	9-pin <-> 9-pin
XW2Z-500T	5m			

Appendix-6 List of Options

- Anti-reflection Film

  It adheres to the display preventing reflection and also dirt from sticking to the display. It is colorless and transparent, with 1 set containing 5 pieces.

Models	Specifications
NB5Q-KBA04	5 pieces
NB7W-KBA04	

- Installation fittings

Models	Descriptions
NB5Q-ATT01	Only NB5Q-TW00B requires optional installation fittings. When HMI users switch from the NT/NS/NQ Series to HMI of NB Series, due to the difference of the unit size, installation fittings can be utilized to guarantee the process quick and smooth.