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azbil

No. CP-SP-1422

Network Instrumentation Modules Smart Device Gateway

Model NX-SVG

User's Manual

Thank you for purchasing an Azbil Corporation product.

This manual contains information for ensuring the correct use of this product.

Those designing or maintaining equipment that uses this product should first read and understand this manual.

Be sure to keep this manual nearby for handy reference.

Azbil Corporation

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NOTICE

Be sure that the user receives this manual before the product is used.

Copying or duplicating this user's manual in part or in whole is forbidden. The information and specifications in this manual are subject to change without notice.

Considerable effort has been made to ensure that this manual is free from inaccuracies and omissions. If you should find an error or omission, please contact the azbil Group.

In no event is Azbil Corporation liable to anyone for any indirect, special or consequential damages as a result of using this product.

Conventions Used in This Manual

④ The safety precautions explained in the following section aim to prevent injury to the operator and others, and to prevent property damage.

⚠WARNING	**Warnings are indicated when mishandling this product might result in death or serious injury.**
⚠CAUTION	**Cautions are indicated when mishandling this product might result in minor injury to the user, or only physical damage to the product.**

④ In describing the product, this manual uses the icons and conventions listed below.


Use caution when handling the product.


The indicated action is prohibited.


Be sure to follow the indicated instructions.

Handling Precautions:
Handling Precautions indicate items that the user should pay attention to when handling this device.

Note: Notes indicate information that might benefit the user.

☞: This indicates the item or page that the user is requested to refer to.

[Next] button, [Configuration file], [Settings] window — Square brackets indicate a message or button shown on the PC screen.

Ctrl key, S key — Indicates a key on the PC.

Ctrl + S key — Refers to the operation of pressing the S key while holding down the Ctrl key.

>>: Indicates the result of an operation, or the status after the operation.

Safety Precautions

⚠WARNING

Before removing, mounting, or wiring this device, be sure to turn off the power to this device and all connected devices. Otherwise, there is a danger of electric shock.
Be sure to check that this device has been correctly wired before turning on the power. Incorrect wiring of this device may lead to hazardous conditions or device failure.

⚠CAUTION

Install or remove the DIN rail locking tab using a tool such as a screwdriver. Otherwise, you might be injured.
Do not disassemble this device. There is a danger of device failure.
Do not block the ventilation holes. There is a danger of fire or device failure.
Do not allow wire clippings, metal shavings, water, and so on to enter the case of this device. There is a danger of fire or device failure.
Do not touch live parts such as the power terminals. There is a danger of electric shock.
Before wiring this device, except when connecting network cables, be sure to turn off the power. Otherwise there is a danger of device failure.
Wire this device correctly by using the wiring method, power, and installation method specified in this user's manual. Otherwise there is a danger of fire, electric shock, or device failure.
Make sure that there are no loose connections. Failure to do so may cause overheating or equipment failure.
The total power consumption of all linked modules should be no more than 70 W. Otherwise there is a danger of fire or device failure.
Do not supply power to the connected modules from multiple power sources. There is a danger of fire or device failure.
Do not use unused terminals as relay terminals. There is a danger of fire, electric shock, or device failure.
Firmly tighten the terminal screws to the torque listed in the specifications. Insufficient tightening may cause fire.
If there is a risk of a power surge caused by lightning, use a surge absorber (surge protector) Otherwise, there is a danger of fire or device failure.
Use this device within the operating ranges given in the specifications (for temperature, humidity, voltage, vibration, shock, mounting direction, atmosphere, etc.). Otherwise there is a danger of fire or device failure.
This device should be handled by a specialist with expertise in electrical safety. There is a danger of electric shock.

⚠CAUTION

This device should be handled by a specialist with expertise in electrical safety.
If this device is used in the manner not specified by the manufacturer, the protective function of the device may be impaired.
To remove dirt from this device, wipe it with a soft dry cloth.
When removing dirt from this device, never use an organic solvent such as thinner or benzene, or a detergent. There is a danger of device failure.
Make sure that the devices or equipment connected to this device have reinforced insulation suitable for the maximum operating voltages of the power source and input/output components of this device. Otherwise there is a danger of fire, electric shock, or device failure.
Use a battery that meets the specifications given in this document. Otherwise there is a danger of fire or device failure.

Cautions Regarding Network Security

④ Cautions on Communication Lines

This product cannot be directly connected to the communication lines (including public wireless LANs) of telecommunications carriers (mobile communication companies, fixed-line communication companies, Internet providers, etc.).

④ Tips for Avoiding Malware and Hacker Cyberattacks

If this product or a computer on the network that is connected to this product becomes infected with malware* or is the target of a cyberattack, this product may malfunction or stop functioning altogether. Please be aware that the normal warranty does not cover restoration work or damage incurred by a malfunction of this product due to malware or a cyberattack. Also, Azbil Corporation will not be liable for compensation to the customer for any loss or damage caused by malware or a cyberattack, including opportunity loss, profit loss, business disruptions, data loss, etc.

To reduce the chances of being infected with malware or being the victim of a cyberattack, please implement measures such as those listed below.

- Before using this product, take security measures such as disconnecting this product or the network to which this product is connected from the business network, or restricting communication with a firewall or the like.
- When you temporarily connect a computer for engineering to this product, confirm that it is not infected with malware using antivirus software or some other means before connection.
- Physically block any unnecessary USB and LAN ports to prevent portable devices from being connected without the security administrator's permission.
- As a part of maintenance, regularly check for security vulnerabilities such as unnecessary connected equipment that was not included at the design stage or user accounts that are no longer needed.
- Holding IT security training for operators and instrument engineers is beneficial. Regular implementation is recommended.

* A general term used to describe unauthorized and harmful programs that perform operations that are not intended by the user of the computer.

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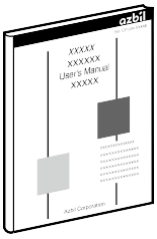
The Role of This Manual

A total of two different manuals are available for the NX-SVG. Read them as necessary for your specific requirements. If a manual you require is not available, contact the azbil Group or its dealer.



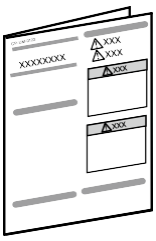
Network Instrumentation Modules
Smart Device Gateway Model NX-SVG
User's Manual

Document No. CP-SP-1422E

This manual.

Personnel who are using the NX-SVG for the first time or who are in charge of hardware design and/or maintenance of a control panel incorporating this product should first read this manual thoroughly.

This manual describes the hardware, gives an overview of the product and other products used with it, explains installation, wiring, and troubleshooting, and gives hardware specifications.



Network Instrumentation Modules
Smart Device Gateway Model NX-SVG
Installation Manual

Document No. CP-UM-5928JE

This manual is supplied with the product.

Those designing or manufacturing equipment that uses the NX-SVG should read this manual thoroughly. The manual covers safety precautions, installation, wiring, and main specifications of the product.

For further information about operation, refer to the user's manual above (CP-SP-1422E).

Organization of This User's Manual

This manual is organized as shown below.

Chapter 1. Overview

Device overview, model number selection, names of parts, and functions of this device

Chapter 2. Installation

Operating environment and installation procedures

Chapter 3. Wiring

Wiring procedures and precautions, and connection examples

Chapter 4. Functions

Detailed description of functions

Chapter 5. Smart Loader Package, Model SLP-SVG

Operation of the Smart Loader Package, which is required to use this device

Chapter 6. Configuration

Settings required to operate this device

Chapter 7. Communication Settings for Connected Devices

Communication settings of devices connected to this device

Chapter 8. Specifications

General specifications

Chapter 9. Troubleshooting

How to determine the cause of problems that may occur, and corrective actions for the problems

Chapter 10. Disposal

How to dispose of this device

Chapter 11. Open Source Software

The open source software included in this device

Appendix

This section describes the functions added and the specifications changed for each version of the SLP-SVG.

Contents

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Chapter1. Overview

1-1 Overview and Features

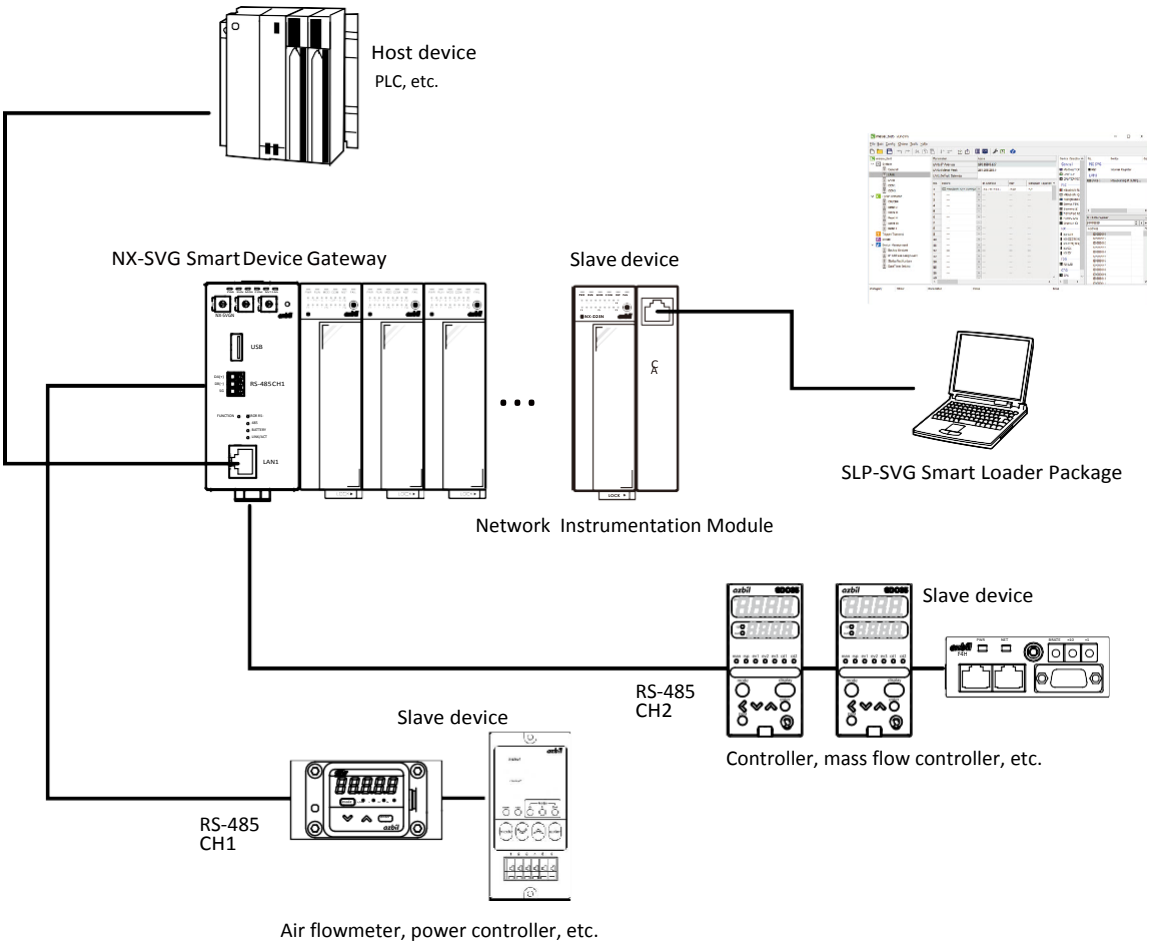
④ Overview

The NX-SVG Smart Device Gateway (hereafter “this device”) transmits data between host and slave devices without the need to create communication programs.

A host device, such as a PLC, is a device that controls peripheral devices. Slave devices receive commands from the host device. They may include Azbil’s Network Instrumentation Modules and controllers and compact digital mass flow controllers that are connected using RS-485.

Various types of devices can be connected to two Ethernet channels (by the LAN 1 and LAN2 connectors) and to two RS-485 channels (by the RS-485 CH1 connector and RS-485 CH2 terminal).
Up to 100 devices can be connected to each Ethernet channel (128 devices in total for two channels) and up to 31 devices can be connected to each RS-485 channel.

This device can be configured using the Smart Loader Package model SLP-SVG (hereafter “the loader”) that is connected via Ethernet.



④ Features

- Easy introduction and management
  With easy parameter setting using the loader, the user can quickly begin operation. It is not necessary to create communication programs.

- Easy setup
  Because the loader provides a list of parameters for Azbil-made devices, communication settings can be easily configured using parameter names.

- Flexible setup
  Data for connected devices can be assigned freely to PLC registers.

- Two RS-485 communication channels
  RS-485 communications are supported in addition to Ethernet communications, so this device can exchange data with RS-485- and Ethernet-capable devices.

- Easy management of connected devices
  This device can back up and restore settings for Azbil's Network Instrumentation Modules, which reduces the work required for initial setup in manufacturing equipment and facilitates the replacement of connected devices when doing maintenance.

- Debugging at operation startup
  As a solution to onsite problems caused by wrong wiring or incorrect parameter settings, the loader monitors the status of communication between this device and connected devices, records communication history, etc.

1-2 Model Selection

④ Model NX-SVG

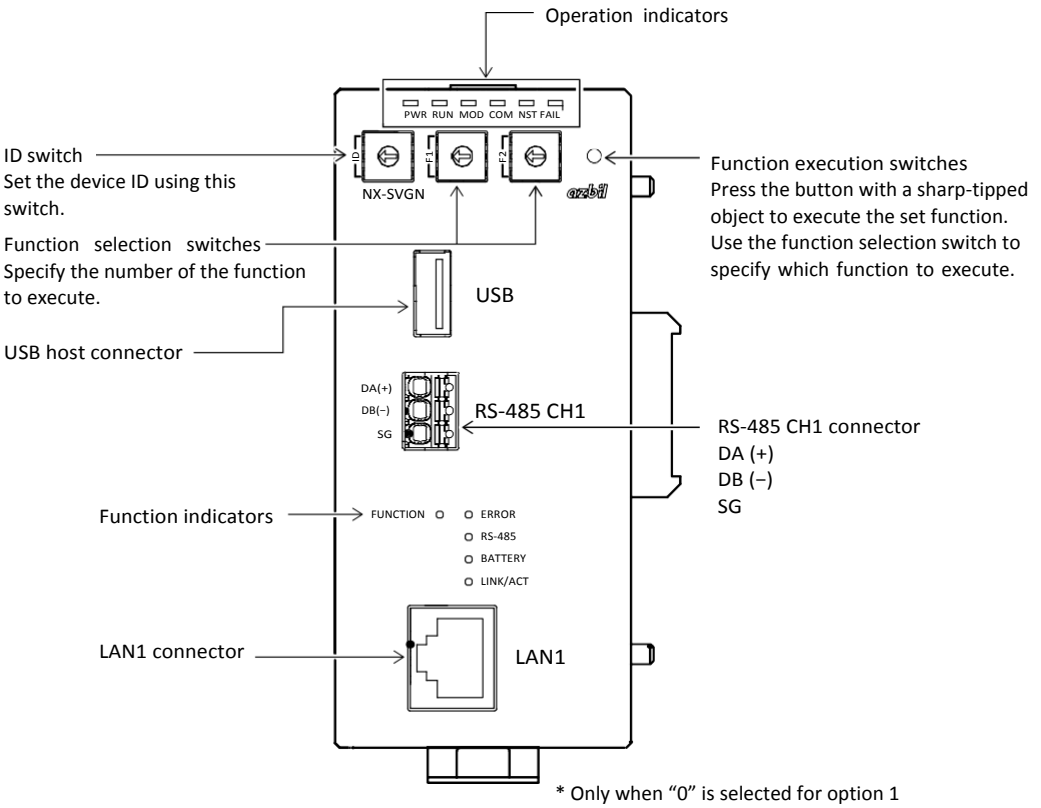
Basic model No.	Type	Ring connection	Option 1	Option 2	Option 3	Option 4	Add'l proc.	Description
NX-								Network Instrumentation Module
	SVG							Smart Device Gateway
		N						Non-ring communications
		R						Ring communications
			0					With USB connector
			1					Without USB connector
				0				None
					0			None
						0		None
							0	None
							K	Anti-sulfuration treatment

④ Separately sold product

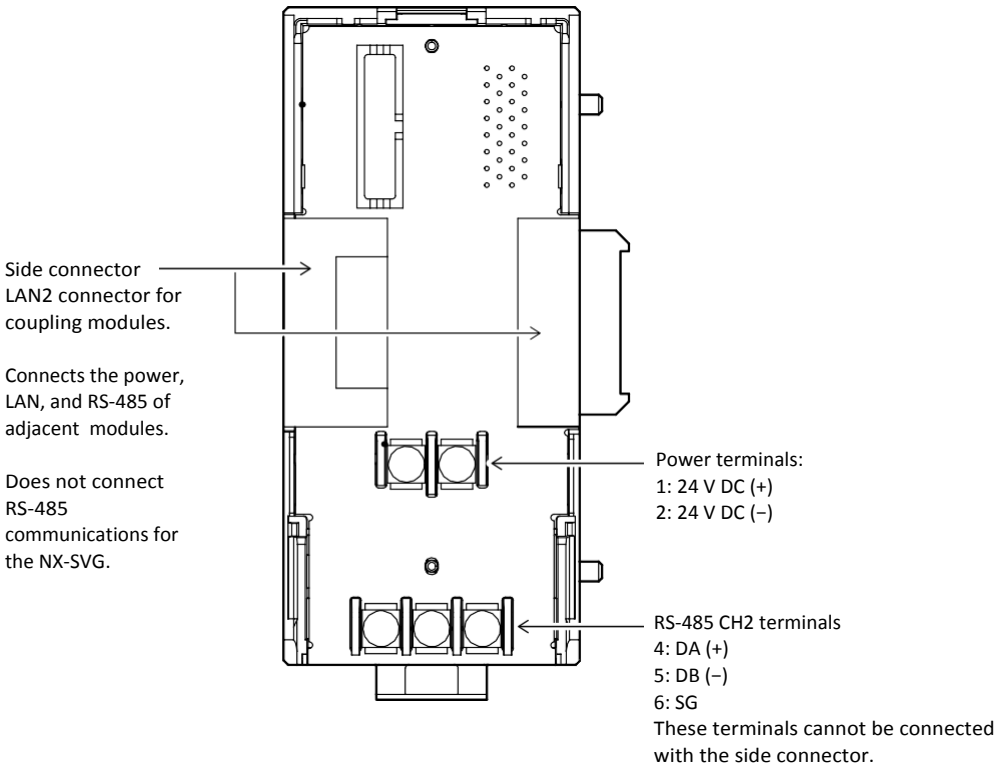
Name and specifications	Model No.	Note
Smart Loader Package	SLP-SVGJ91	PC tool

1-3 Names and Functions of Parts

④ Main unit



④ Base unit



④ Indicators

●Operationindicators

PWR RUN MOD COM NST FAIL

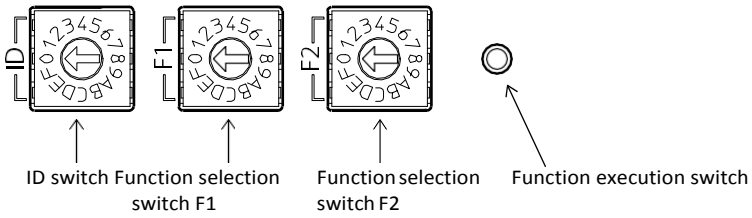
LED name	Color	LED state	Operation state
PWR	Green	Lit	Power is on
		Off	Power is off
RUN	Green	Lit	System is operating
		Off	System is not operating
MOD	Orange	Lit	Program is running
		Off	System error
		Blinking	Initializing / checking connected device operation / stopped
COM	Green	Lit	LAN2: Ethernet packets for the module are being received.
		Off	LAN2: Ethernet packets for the module are not being received.
NST	Orange	Lit	LAN2: Non-ring communication by chain-connected devices
		Fast blinking	LAN2: Chain connection ring is disconnected (a disconnection somewhere in the ring)
		Slow blinking	LAN2: Chain connection ring is disconnected (no ring communication with local or adjacent node)
		Off	LAN2: Ring communication by chain-connected devices
FAIL	Red	Lit	Hard failure
		Fast blinking	Soft failure (base-main unit model No. mismatch, configuration error)
		Off	No errors

● Functionindicators

FUNCTION ○ ○ ERROR
○ RS-485
○ BATTERY
○ LINK/ACT

LED name	Color	LED state	Operation state
FUNCTION	Green	Blinking	The set function is being executed.
		Off	The set function is not being executed.
ERROR	Red	Lit	Communication error
		Blinking	An error occurred during execution of the set function.
		Off	No errors
RS-485	Orange	Blinking	Data is being transmitted via RS-485 CH1 or CH2.
		Off	Data is not being transmitted via RS-485 CH1 or CH2.
BATTERY	Red	Lit	No battery or low battery
		Off	Battery voltage is normal.
LINK/ ACT	Orange	Lit	LAN1 is connected.
		Blinking	Data is being transmitted via LAN1.
		Off	LAN1 is not connected.

④ Switches



●ID switch

The leftmost rotary switch is used to specify the last digit of an IP address. By viewing this switch, the user can learn the IP address of this device.

● Function selection switches

The two rotary switches on the right are the F1 and F2 function selection switches. The number of the function that is executed when the function execution switch is pressed can bespecified.

The types of function are as follows.

Function name	F1	F2	Description
Reset	0	0	Resets this device.
Write settings from USB flash drive	0	4	Copies the configuration file from a USB flash drive to this device and restarts the application.
Connected device setup	0	8	Assigns an IP address to a connected device and restores its backed-up settings. This function can be used for Network Instrumentation Modules.

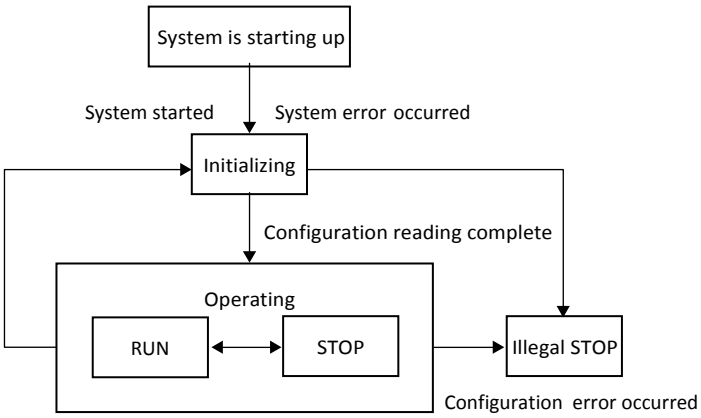
●Function execution switch

Press the switch with a pointed object for at least 3 seconds to execute the function selected by the function selection switches.

1-4 Operation Mode

④ Operation mode

The following shows transitions of the state of this device.



System startup: After power-on, the system is starting up.

Initializing: After system startup, the settings are being loaded.

STOP: This device has stopped communicating with other devices.

RUN: This device is in communication with other devices.

Illegal STOP: The system is not running due to system errors or configuration errors.

●RUN→STOP transition: Occurs when one of the following operations was executed by the loader.

- Backup Device Config (NX-SVG ← device)
- Restore Device Config (NX-SVG → device)
- Assign IP Address
- Write Gateway Config (PC → NX-SVG)
- Write Setup Data (NX-SVG → device)

●STOP→RUN transmission: This device's status changed from Initializing to Operating, or the following operations from the loader were completed.

- Backup Device Config (NX-SVG ← device)
- Restore Device Config (NX-SVG → device)
- Assign IP Address

●Operating →Initializing transition: The following operations were executed from the loader.

- Write Gateway Config (PC → NX-SVG)
- Write Setup Data (NX-SVG → device)
- Reset gateway program

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-MEMO-

Chapter2. Installation

⚠WARNING

Before removing, mounting, or wiring this device, be sure to turn off the power to this device and all connected devices. Otherwise, there is a danger of electric shock.

⚠CAUTION

Install or remove the DIN rail locking tab using a tool such as a screwdriver. Otherwise, you might be injured.

Do not block the ventilation holes.

There is a danger of fire or device failure.

Do not allow wire clippings, metal shavings, water, etc., to enter the case.

There is a danger of fire or device failure.

If this device is used in the manner not specified by the manufacturer, the protective function of the device may be impaired.

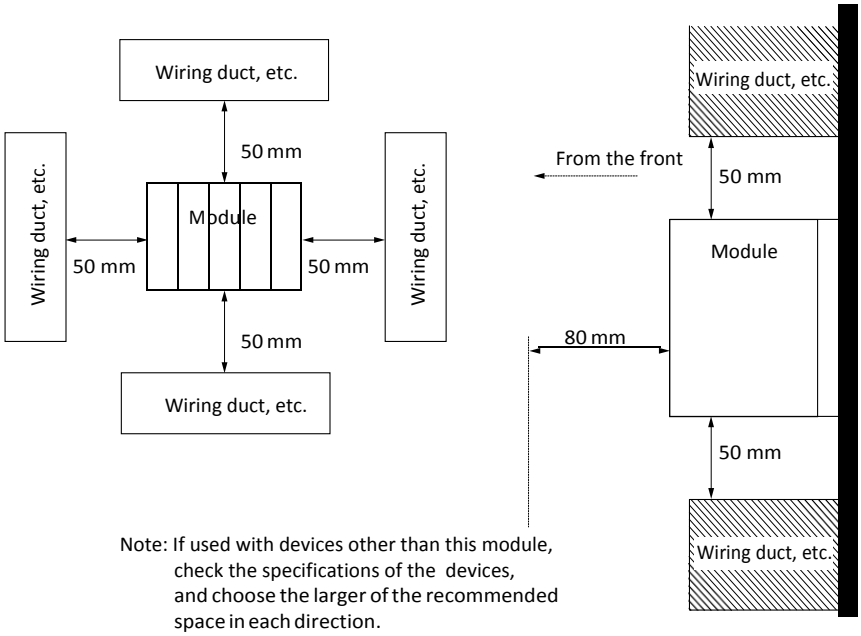
④ Installation location

Install this device indoors.

Leave at least 50 mm above and below, and on the left and right of this device, and 80 mm in front of it as space for air intake, removal, wiring, and maintenance.

This device should be at least 100 mm away from other devices or rows of other NX-SVG devices.

Do not install this device above heat-generating objects such as electric devices.



Note: If used with devices other than this module, check the specifications of the devices, and choose the larger of the recommended space in each direction.

Do not install this product in a place with any of the following characteristics:

- Temperature or humidity outside the specified high and low limits
- Corrosive gases such as sulfide gas
- Dust or soot
- Direct sunlight, wind, or rain
- Mechanical vibration or shock outside the range of the specifications
- Proximity to high-voltage lines, welding machines, or other sources of electrical noise
- Within 15 m of a high-voltage ignition device for a boiler, etc.
- Strong magnetic fields
- Flammable liquid or gas
- Outdoors
- I/O common mode voltage to the ground is greater than 30 Vrms, 42.4 V peak, and 60 V DC.

④ Module connection

The left and right side connectors on the base unit provide power, LAN access, and RS-485 communication for the connected modules. The RS-485 communication of the modules on the left and right is separate from the RS-485 communication of this device.

When connected, modules share the power and Ethernet communication lines, eliminating the need for wiring.

Up to 16 modules can be linked per group.

In a distributed layout, if the horizontal length is too long, or if it is necessary to connect more than 16 modules, divide the modules into two or more groups and connect the groups with communication adapters.

Note

- In counting the number of linked modules, the following are not included.
  - Communication adapter
  - Terminal adapter

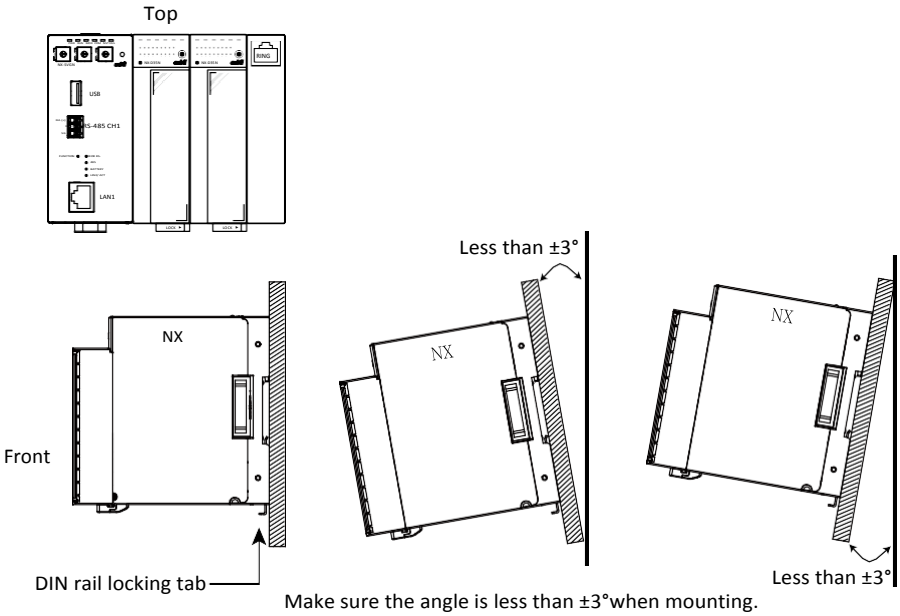
④ Installation method

Install this device on a DIN rail before use.

After installing the DIN rail, pull the locking tab out fully and hook the base of this device onto the DIN rail. Then push the locking tab upwards until it clicks into place.

Handling Precautions

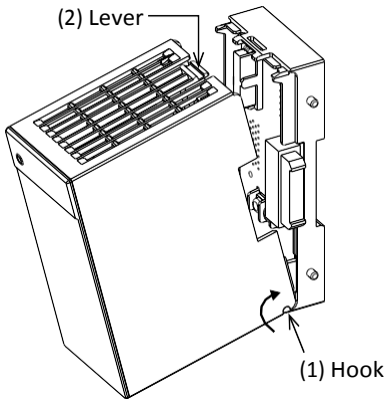
- Connect this device to other modules before mounting them on the DIN rail.
- Install this device so that it is vertical, with the DIN rail locking tab at the bottom.



④ Attaching the main unit on the base

(1) Fit the hook on the main unit into the base.

(2) Push the main unit onto the base until the lever clicks.

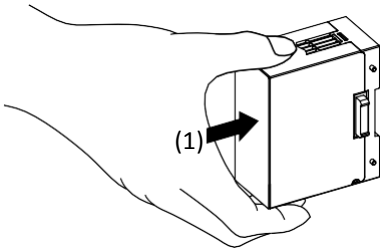


Handling Precautions

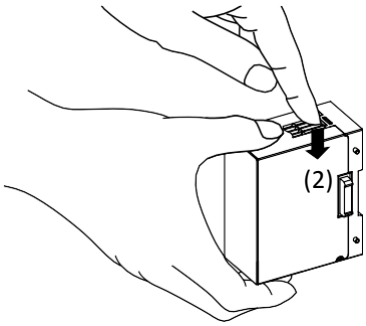
- The included base and body must be used as a pair.
- Be sure to fit the hook on the main unit into the base first. Failure to do so may damage the hook.

④ Removing the main unit from the base

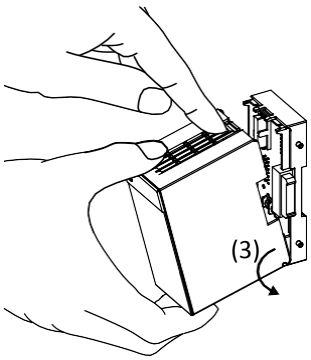
(1) Push the main unit in toward the base.



(2) While pushing, press the tip of the lever on the top of the main unit.

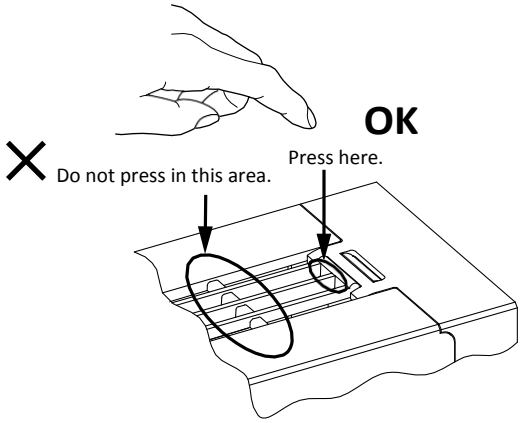


(3) While pressing the tip of the lever, rotate the main unit down to remove it.



! Handling Precautions

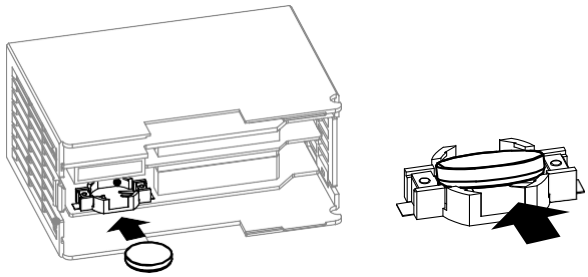
- Do not press the tip of the lever down more than 2 mm. Doing so may break the lever.



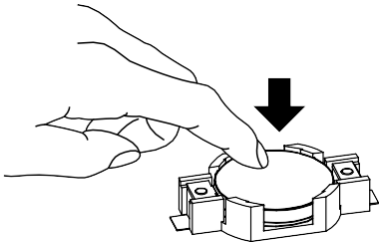
④ Installing the battery

No battery is included with this device. Purchase a UL 1642–compliant CR1632 battery if needed. Install or replace the battery while the power is off.

(1) Remove the main unit from its base. Insert the battery into the battery holder on the back of this device.



(2) Press the battery with your finger to set it in place on the battery holder.

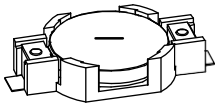


(3) Attach the main unit to the base.

(4) Set the date and time using the loader.

Handling Precautions

- Install the battery with the positive side facing up.



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-MEMO-

Chapter3. Wiring

3-1 Wiring Precautions

WARNING	
	Before removing, mounting, or wiring this device, be sure to turn off the power to this device and all connected devices. Otherwise, there is a danger of electric shock.
	Be sure to check that the device has been correctly wired before turning on the power. Incorrect wiring of the device may lead to hazardous conditions or device failure.

CAUTION	
	Do not disassemble this device. There is a danger of device failure.
	Do not allow wire clippings, metal shavings, water, etc., to enter the case. There is a danger of fire or device failure.
	Do not touch live parts such as the power terminals. There is a danger of electric shock.
	Before wiring this device, except when connecting network cables, be sure to turn off the power. Otherwise there is a danger of device failure.
	Wire this device correctly by using the wiring method, power, and installation method specified in this user's manual. Otherwise there is a danger of fire, electric shock, or device failure.
	Make sure that there are no loose connections. Failure to do so may cause overheating or equipment failure.
	Do not use unused terminals as relay terminals. There is a danger of fire, electric shock, or device failure.
	Firmly tighten the terminal screws to the torque listed in the specifications. Insufficient tightening may cause fire.
	If there is a risk of a power surge caused by lightning, use a surge absorber (surge protector) Otherwise, there is a danger of fire or device failure.
	This device does not start to operate for about 30 seconds after power-on. Be careful if the output from this device is used as an interlock signal.
	This device should be handled by a specialist with expertise in electrical safety. There is a danger of electric shock.
	If this device is used in the manner not specified by the manufacturer, the protective function of the device may be impaired.
	Make sure that the devices or equipment connected to this device have reinforced insulation suitable for the maximum operating voltages of the power source and input/output components of this device. Otherwise there is a danger of fire, electric shock, or device failure.

④ Wiring precautions

- When wiring this device, observe local electrotechnical standards.
- Do not run wires outdoors. Doing so may damage the device in the event of a lightning strike.
- Use crimp terminal lugs with insulating sleeves for the power terminals.
- Use crimp terminal lugs compatible with M3 screws for wiring of the power terminals and RS-485 CH2 terminals.
- Be careful not to allow crimp terminal lugs to touch adjacent terminals.
- The signal wires and power lines of this device should be at least 60 cm away from other power lines. Also, do not put these two types of wire in the same conduit or duct.
- Before connecting this device to other instruments in parallel, check their conditions for connection carefully.
- After wiring, check that there are no wiring mistakes before turning the power on.
- To ensure stable operation, this device does not start to operate for about 30 seconds after power-on.

3-2 Cables

Use JCS 4364 cables for low-power instruments (twisted shielded cable for instruments) or the equivalent for RS-485 communications.

Functions	Cable	Cross-sectional area	Length*1
Power	CVV, IV (600 V PVC-insulated cable, IEC 60227-3)	1.25 mm^2 (16 AWG)	30 m max.
LAN1	UTP cable (4P) Cat 5e min.(straight; both ends ANSI/TIA/EIA-568-B)	–	*2
RS-485 CH1	IPEV-S 2P*3, KPEV-S 2P*3, CVV-S 3C, MVVS 3C	0.25 to 0.75 mm^2	500 m max.
RS-485 CH2	IPEV-S 2P*3, KPEV-S 2P*3, CVV-S 3C, MVVS 3C	0.9 mm^2 1.25 mm^2	500 m max.

*1. The effect of external electrical noise is not taken into consideration.

*2. ☞ *Network Instrumentation Module User's Manual Network Design Version* (CP-SP-1313E)

*3. Connect one pair of wires to the DA and DB terminals. Connecting one or both wires of the other pair to the signal ground (SG) terminal is recommended.

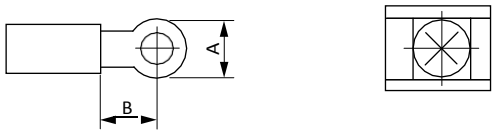
3-3 Connecting Terminals

WARNING
Firmly tighten the terminal screws to the torque listed in the specifications. **Insufficient tightening may cause electric shock or fire.**
Do not use unused terminals as relay terminals. **There is a danger of fire, electric shock, or device failure.**
Do not short the output components. **There is a danger of device failure.**

The method of connecting terminals of this device is explained below.

④ Recommended crimp terminal lugs (for RS-485 CH2 and power)

When wiring this device, use crimp terminal lugs compatible with M3 screws.



Compatible screw	A	B	Recommended crimp terminal lugs (for reference)
M3	5.8 mm max.	5.5 mm min.	Manufacturer: J.S.T. Mfg. Co., Ltd. Ring tongue terminal (vinyl-insulated) V1.25-MS3

Handling Precautions

- If this device is installed where there is considerable vibration or shock, be sure to use round crimp terminal lugs to prevent wires from coming off the terminals.
- Be careful not to allow crimp terminal lugs to touch adjacent terminals.
- The terminal screw tightening torque is 0.5 to 0.7 N•m.
- By placing crimp terminal lugs back to back, two terminal lugs can be connected to one terminal block.

④ Recommended ferrules (for RS-485 CH1)

To improve the reliability of the wiring, it is recommended that ferrules be crimped to signal wires.

For details about the types and sizes of ferrules, see the table below.

Manufacturer: Phoenix Contact

Crimp tool: CRIMPFOX 6

Recommended ferrules (for RS-485 CH1)

Type	Order No.	Wire diameter (mm^2)	Notes
AI 0,25-8 YE	3203037	0.25	With insulating sleeves
AI 0,34-8-TQ	3203066	0.34	With insulating sleeves
AI 0,5-8 WH	3200014	0.50	With insulating sleeves
AI 0,75-8 GY	3200519	0.75	With insulating sleeves
A1-8	3202517	1.00	Without insulating sleeves Used to crimp two JKPEV-S-2P, each 0.5 mm^2 (in cross-sectional area), together.
A1,5-7	3200263	1.50	Without insulating sleeves Used to crimp two JKPEV-S-2P, each 0.5 mm^2 (in cross-sectional area), together.
AI-TWIN 2X0,5-8 WH	3200933	0.50	With insulating sleeves, twin
AI-TWIN 2X0,75-8 GY	3200807	0.75	With insulating sleeves, twin

3-4 Connecting the Power

④ Connecting the power

WARNING

Before removing, mounting, or wiring this device, be sure to turn off the power to this device and all connected devices. Otherwise, there is a danger of electric shock.

CAUTION

The total power consumption of all connected modules should be no more than 70 W. Otherwise fire or device failure may result.

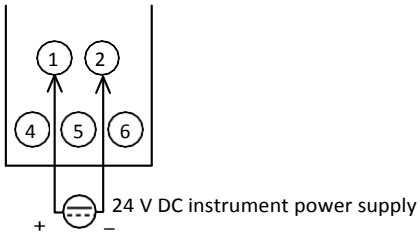
Do not supply power to a group of connected modules from multiple power sources. There is a danger of fire or device failure.

Wire this device correctly by using the wiring method, power, and installation method specified in this user's manual. Otherwise there is a danger of fire, electric shock, or device failure.

Make sure that there are no loose connections. Failure to do so may cause overheating or equipment failure.

Make sure that devices or equipment connected to this device have reinforced insulation suitable for the maximum voltages of this device's power supply and input/output components. Otherwise there is a danger of fire, electric shock, or device failure.

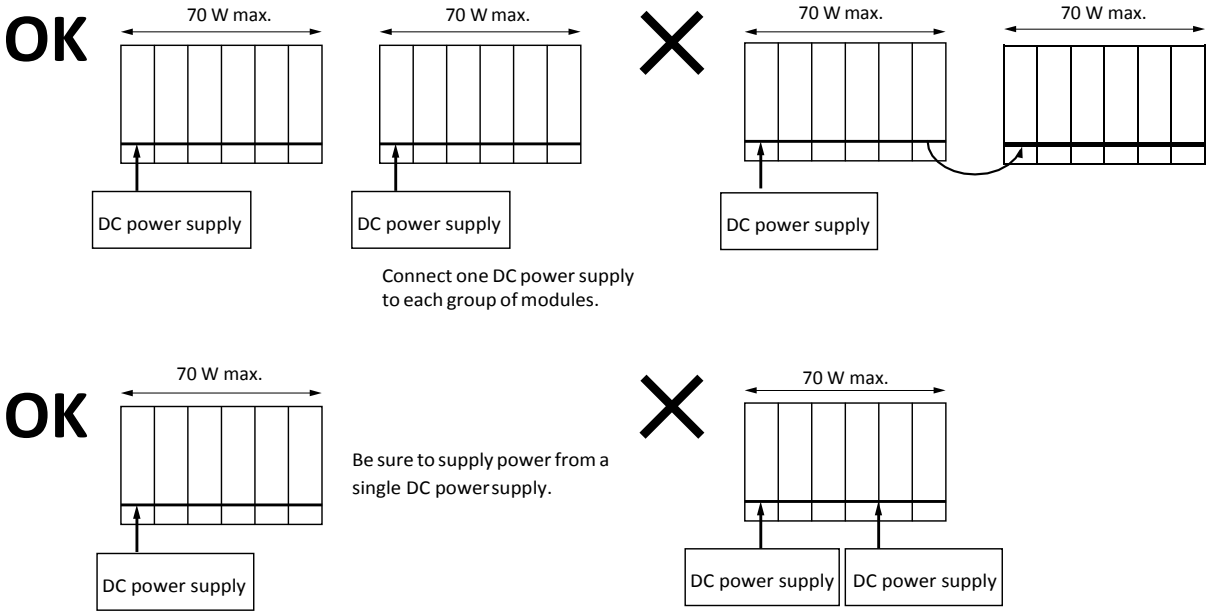
Connect the power supply to the power terminals as shown below.



For the instrument power, use a Class 2 circuit with double insulation or reinforced insulation from the main power supply, or a limited-energy circuit.

Handling Precautions

- Power is passed from module to module when the modules are connected. Supply power to any one of the connected modules.
- Use a power supply that is sufficient for the total power consumption of connected modules. The total power consumption of all connected modules should be no more than 70 W.
- If there are multiple wires to the power supply and wiring is difficult, add a relay terminal or the like.
- If power for the I/O of another modules is required, connect the power line from the power supply directly to it. Do not connect the power line from the base unit of this device.



④ Noise suppression measures

Minimize the effect of electrical noise from the power supply.

If there is a large amount of electrical noise from the power supply, use an isolation transformer and a line filter.

(Azbil Corporation's line filter model No.: 81442557-001)

Use a CR filter for quick-rising noise.

(Azbil Corporation's CR filter model No.: 81446365-001)

! Handling Precautions

- After anti-noise measures have been taken, do not bundle primary and secondary power lines of the isolation transformer together, and do not put them in the same conduit or duct.

④ Power supply design

The required power supply capacity depends on the system configuration.

It is necessary to calculate and determine the required power supply capacity.

Design the power supply using the following procedure:

(1) Calculate the total power consumption of the modules that are used.

(2) Determine the power supply capacity required, considering inrush current and derating.

How to design the power supply is described in detail on the next page.

• Calculating the power consumption

The power (24 V DC) for each module comes from other modules via the side connectors.

The power consumption for each type of module is shown in the table below.

Module	Type (model No.)	Power consumption (W)	Power-on inrush current	Remarks
Smart Device Gateway	NX-SVG	6 W max.	10 A max.	Under operating conditions
Controller module	NX-D15, NX-D25, NX-D35	4 W max.	20 A max.	Under operating conditions
Digital input module	NX-DX1	4 W max.	20 A max.	Under operating conditions
Pulse input module	NX-DX2	4 W max.	20 A max.	Under operating conditions
Digital output module	NX-DY1, NX-DY2	4 W max.	20 A max.	Under operating conditions
Digital pulse input module	NX-DX1, NX-DX2	4 W max.	20 A max.	Under operating conditions
Digital output module	NX-DY1, NX-DY2	4 W max.	20 A max.	Under operating conditions
Supervisor module	NX-S11, NX-S12, NX-S21	4 W max.	12 A max.	Under operating conditions
Communication box	NX-CB2	4 W max.	10 A max.	Under operating conditions
	NX-CB2 (option 1)	5 W max.	10 A max.	Under operating conditions
Industrial switching hub	SWA	4 W max.	10 A max.	Under operating conditions
	SWA (option 1)	5 W max.	10 A max.	Under operating conditions
Communication adapter	NX-CL1, NX-CR1	–	–	Power supply not required
Terminal adapter	NX-TL1, NX-TR1	–	–	Power supply not required

Calculate the total power consumption based on the number of modules that are used.

• Determining the required power supply capacity

Calculate the required power from the table above, derate the calculation according to the ambient temperature and the load factor, and determine the power supply capacity.

! Handling Precautions

- Select a power supply that is sufficient for the power-on inrush current (under operating conditions).
- If derating according to the load reduction factor or ambient temperature is not done, the service life of the power supply may be shortened.
  For details, contact the manufacturer of your power supply.

3-5 Ethernet Communication Connections

The LAN1 port is on the front of the main unit. Connect a cable with an RJ-45 connector to the port. 10BASE-T or 100BASE-TX Ethernet can be connected to this device.

Connect the LAN2 port by connecting a side connector on the base unit. To connect a cable with an RJ-45 connector to the side connector, use a communication adapter.

Note

- ☞ Section 1-3, "Explanation of Module Features," and chapter 2, "Configuration of Ethernet Communications," in *Network Instrumentation Module User's Manual: Network Design Version* (CP-SP-1313E) (for Ethernet communication connections)

The LAN1 port can have multiple IP addresses, and 192.168.255.253 is preset. This IP address can be used for connecting the loader.

The initial IP address of each port is as follows.

Name	Initial IP address
LAN1 port	192.168.0.127 192.168.255.253
LAN2 port	192.168.4.127

● Specifying the IP address using the rotary switch

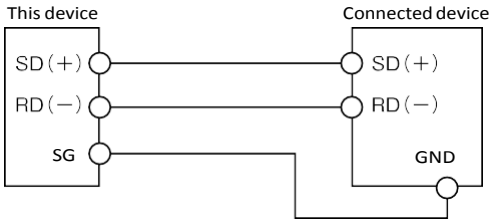
The IP address for the loader connection is preset for the LAN1 port. The user can set an additional address using the ID switch on the front of the main unit. This function is useful when multiple NX-SVG devices are connected to the network.

ID switch position	LAN1 multiple IP addresses
0	192.168.0.127 192.168.255.253
1	192.168.0.127 192.168.255.253 192.168.255.1
2	192.168.0.127 192.168.255.253 192.168.255.2
3	192.168.0.127 192.168.255.253 192.168.255.3
⋮	
E	192.168.0.127 192.168.255.253 192.168.255.14
F	192.168.0.127 192.168.255.253 192.168.255.15

3-6 RS-485 Communication Connections

Handling Precautions

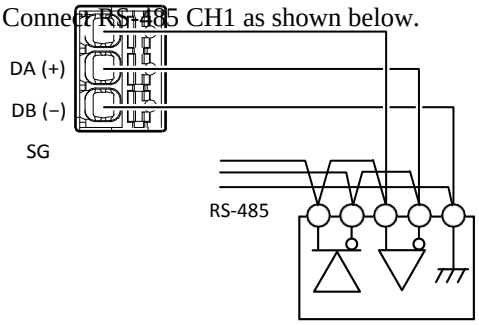
- Terminating resistors are not built into the NX-SVG.
- Attach terminating resistors (150 Ω ±5 %, 1/2 W min.) to both ends of the transmission line.
  However, if a device that does not allow a terminating resistor is connected to the same communications line, follow the specifications for that device.
- Use twisted pair cables for communication wiring.
- Connect the signal ground (SG) terminal so that the common mode potential is the same between the connected devices and the RS-485 logic circuit. Otherwise, communication may be unreliable.
  The RS-485 logic circuit of this device is isolated from the power supply unit. When connecting to a device without an SG terminal when the RS-485 logic circuit is not isolated from a DC power supply, connect the DC input ground (GND) of the device to the SG terminal of the NX-SVG.



When connecting to a device without an SG terminal, follow the wiring instructions of that device.

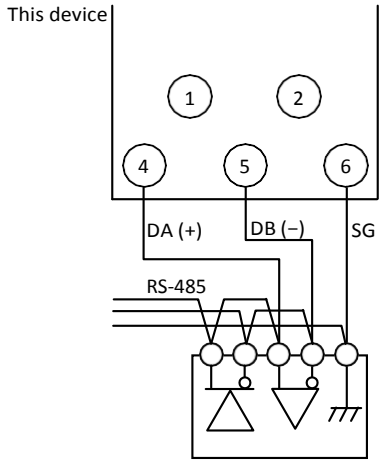
④ RS-485 CH1 connection

Connect RS-485 CH1 as shown below.

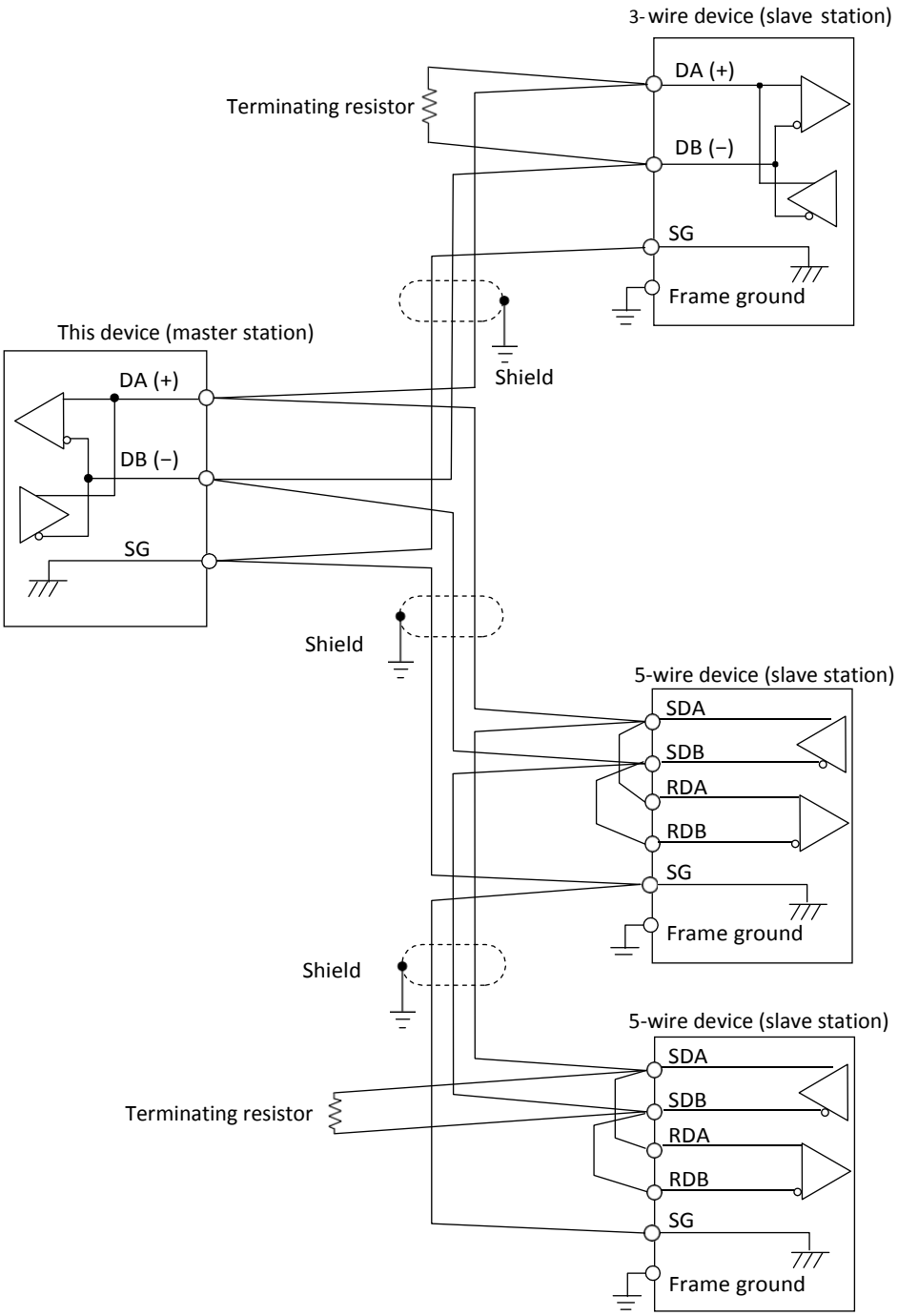


④ RS-485 CH2 connection

Connect RS-485 CH2 as shown below.



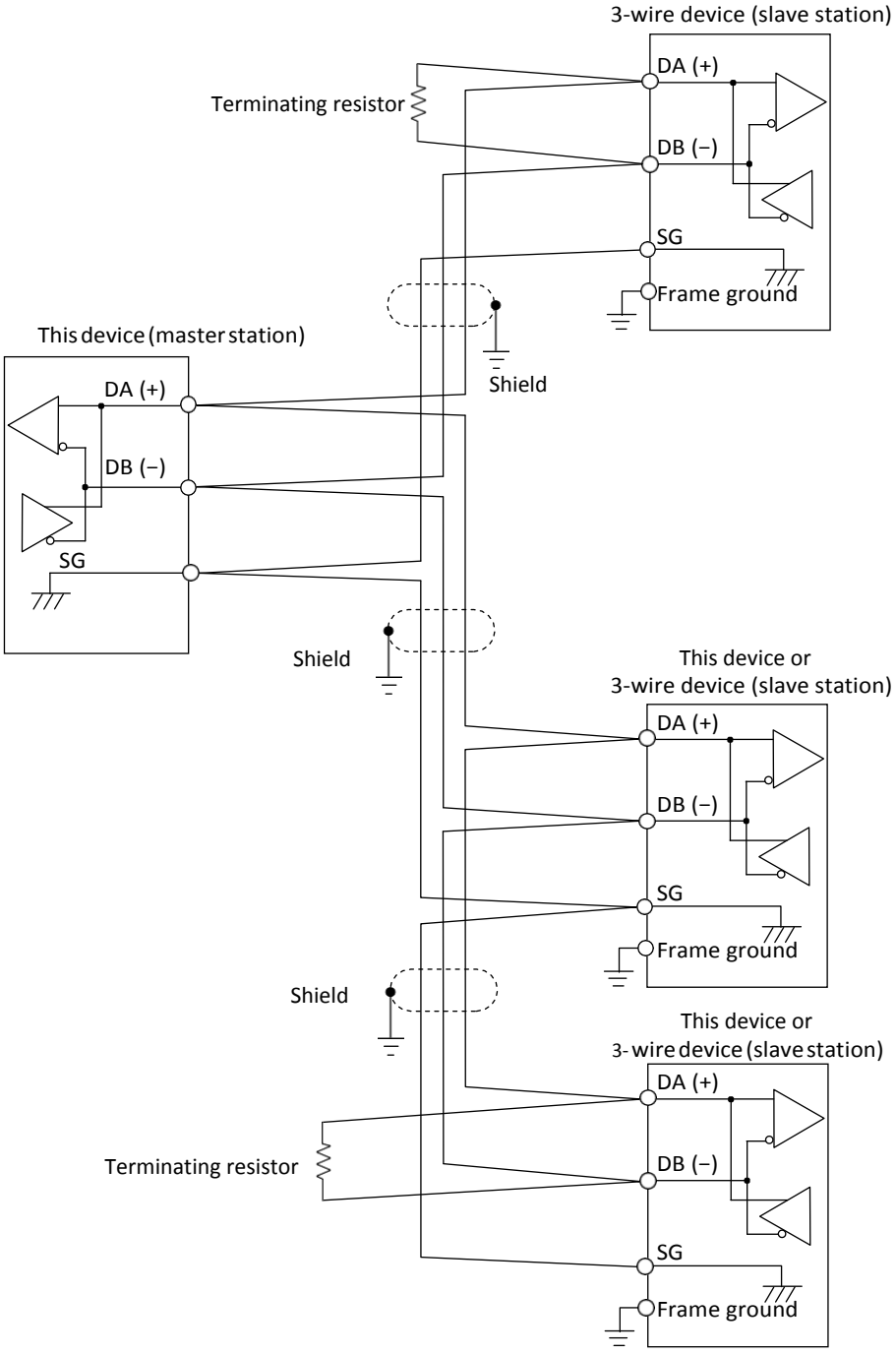
•If the system includes 5-wire devices



! Handling Precautions

- If the transmission line includes a device to which terminating resistors should not be connected (Azbil's model SDC15/25/26/35/36, DMC10, etc.), do not connect any terminating resistor to the communication lines of this device.
- This device does not have a frame ground (FG) terminal.

• If the system includes 3-wire devices only



! Handling Precautions

- If the transmission line includes a device to which terminating resistors should not be connected (Azbil's model SDC15/25/26/35/36, DMC10, etc.), do not connect any terminating resistor to the communication lines of this device.
- This device does not have a frame ground (FG) terminal.

3-7 USB Host Connector

Connect a USB flash drive to this connector to save or load data.

Do not connect a device other than a USB flash drive.

3-8 Electrical Noise Sources and Countermeasures

The following are typical sources of electrical noise:

- Relays and contacts
- Solenoid coils and solenoid valves
- Power lines (especially 90 V AC or higher)
- Inductive loads
- Motor commutators
- Phase angle control SCRs
- Radio communication devices
- Welding machines
- High-voltage ignition devices

The following are effective countermeasures for electrical noise.

- CR filter for quick-rising noise

  Recommended CR filter: Azbil's model No. 81446365-001

- Varistor for noise with high peak values

  Recommended varistor: Azbil's model No. 81446366-001 (for 100 V),
  81446367-001 (for 200 V)

Handling Precautions

- Take great care when using a varistor because it causes a short circuit if it is faulty.

3-9 Input/Output Isolation

The solid line indicates isolation from other circuits.

The dotted line indicates functional isolation*1 from other circuits.

<table>
<tr><td colspan="2">Power supply (including the side connectors)*1</td></tr>
<tr><td>Logic circuit, display (LED, switch, etc.)
USB host communication</td><td>RS-485 CH2 communication*2
LAN2 Ethernet communication*1</td></tr>
<tr><td colspan="2">RS-485 CH1 communication</td></tr>
<tr><td colspan="2">LAN1 Ethernet communication</td></tr>
</table>

—— Isolated
..... Functionally isolated*3

*1. The power and LAN2 Ethernet communication circuits that are connected to the side connector are isolated from each other.

*2. RS-485 CH2 communication circuit is not connected to the side connector.

*3. Dielectric strength is not specified for functionally isolated circuits. The main purpose of this type of isolation is to improve noise protection.

3-10 System Configuration

The configuration of a system that includes this device is explained below.

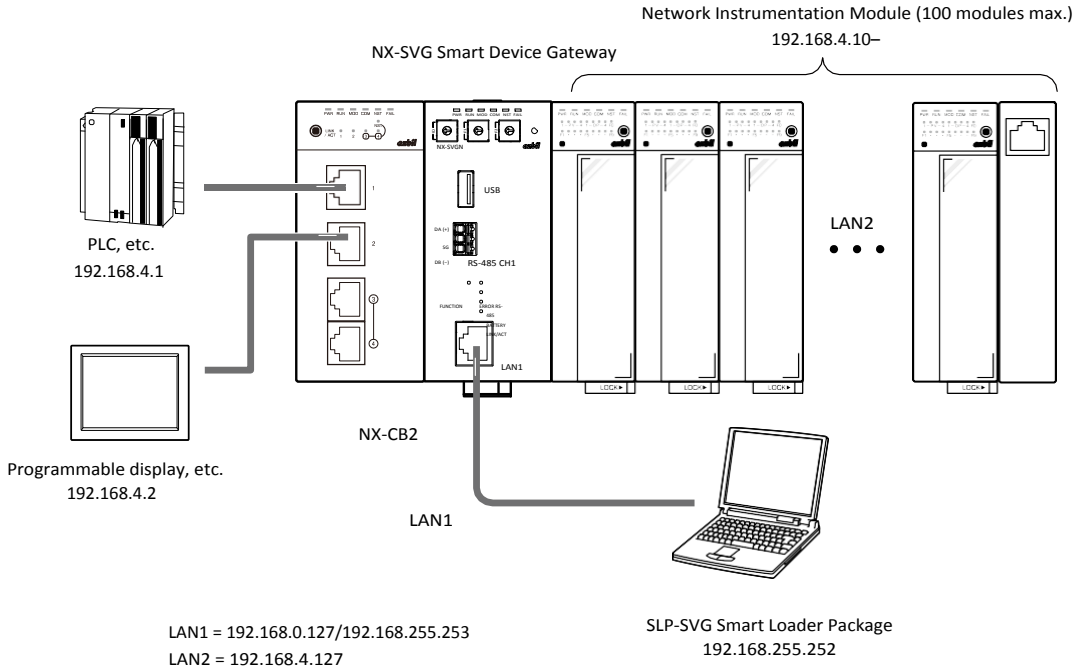
④ When connecting the host and slave devices to the same network segment

Connect the host (PLC) and slave (Network Instrumentation Module) devices using only the LAN2 port of this device.

Connect this device, the PLC, Network Instrumentation Modules, programmable display, etc., to the LAN2 network. Set the network segment of LAN2 for the IP address of each device. Connect the loader to the LAN1 network.

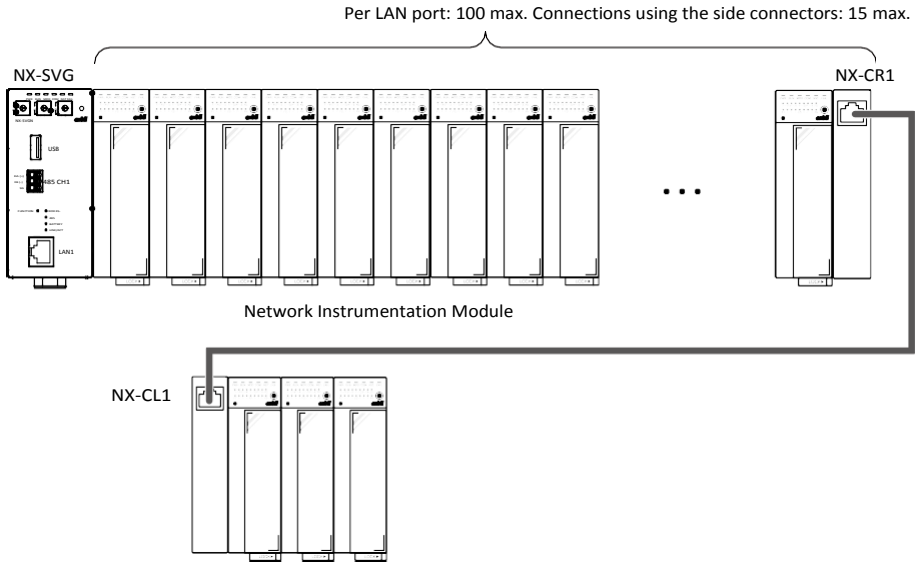
Note

To connect the loader PC directly to the LAN1 port of this device, use a LAN cable and set the network segment of the LAN1 port for the IP address of the loader.



④ When connecting 16 or more devices to one NX-SVG

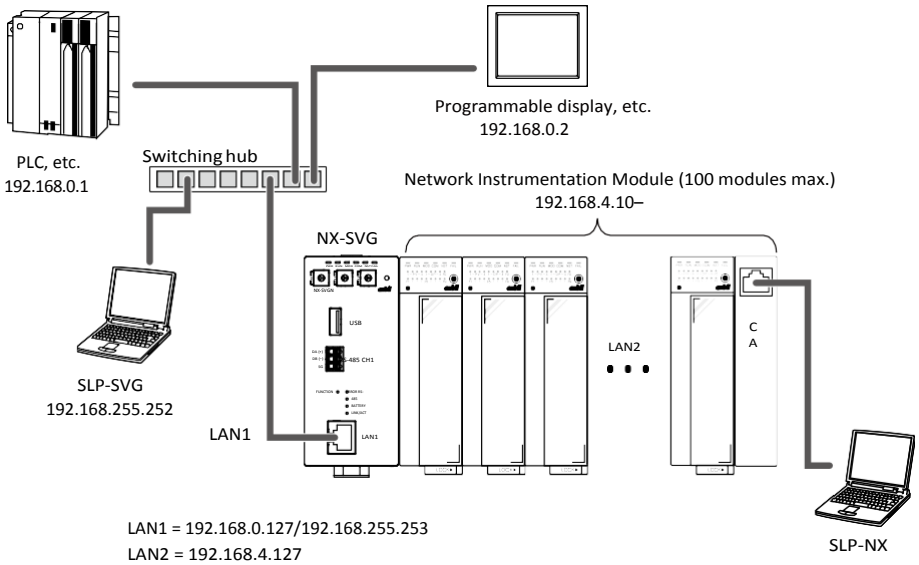
Up to 100 Network Instrumentation Modules can be connected to each LAN port of this device. Up to 15 Network Instrumentation Modules can be directly connected using the side connector. To connect more than 15 modules in a chain, use NX-CL1 and NX-CR1 communication adapters.



④ When connecting the host and slave devices to different network segments

Connect the host (PLC, etc.) and slave (Network Instrumentation Module) devices using the LAN1 and LAN2 ports of this device.

Connect Network Instrumentation Modules to the LAN2 port and the PLC to the LAN1 port. Set the network segment of LAN2 for the IP address of Network Instrumentation Modules. Set the network segment of LAN1 for the IP address of the PLC.



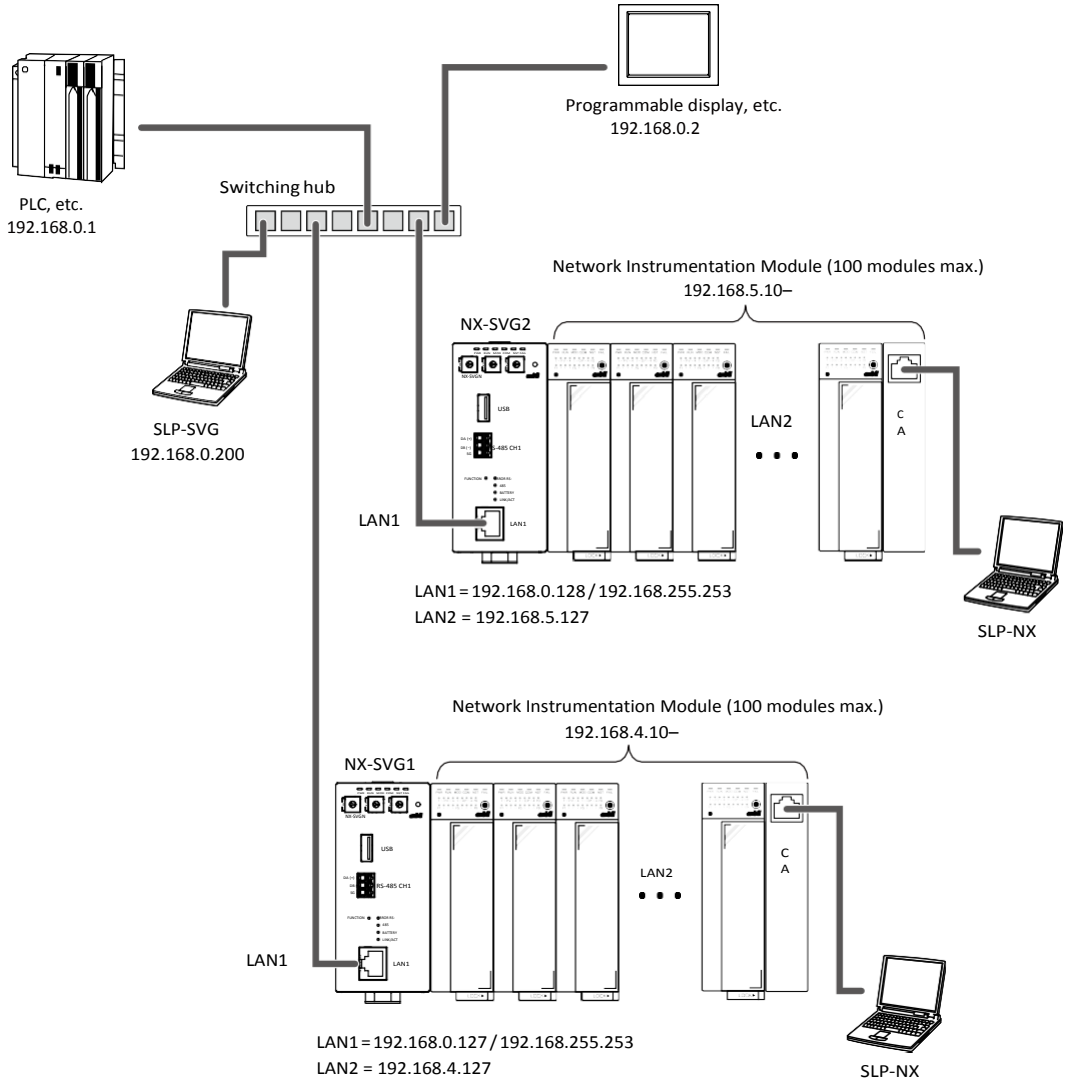
④ When connecting more than 128 slave devices to the system

When connecting more than 128 Network Instrumentation Modules, use two or more NX-SVG devices.

Set the network segment of the PLC for the LAN1 port of each NX-SVG device. The LAN1 port of each NX-SVG should have different IP addresses. The LAN2 port of NX-SVG devices is used for communication with the connected Network Instrumentation Modules.

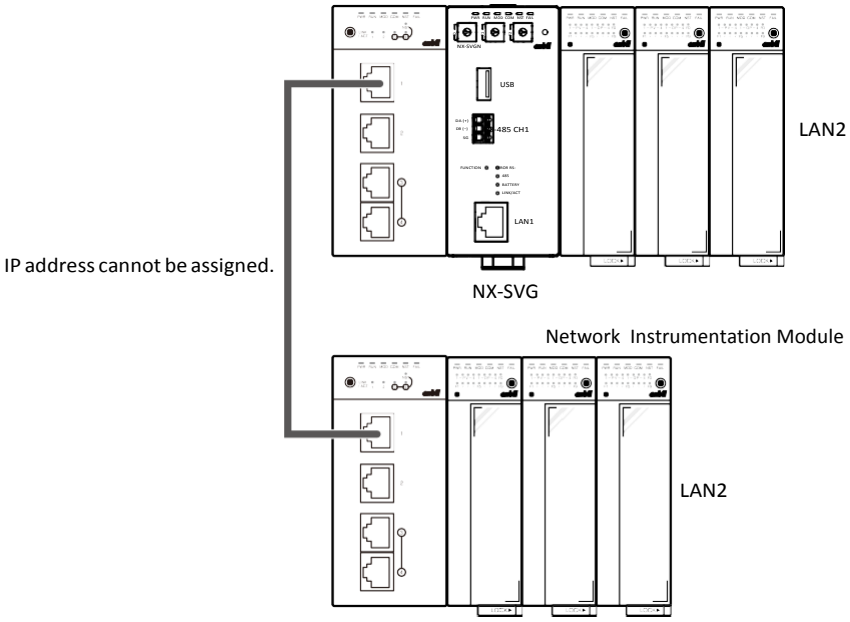
Note

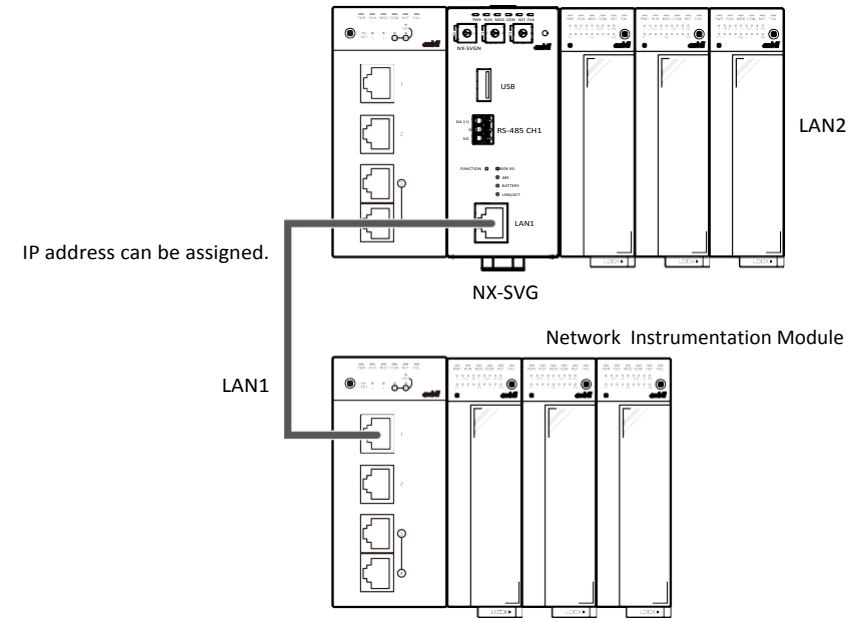
- Because no routing is done between the LAN1 and LAN2 ports of this device, even if the Network Instrumentation Modules connected to the LAN2 port of different NX-SVG devices have the same network segment, the modules will be able to communicate with their NX-SVG.



Handling Precautions

- If Network Instrumentation Modules are connected to this device not in the form of a chain connection using a switching hub such as NX-CB2 (see example below), the IP address assignment function cannot be used.
- It is not possible to connect the Smart Loader Package model SLP-NX, which is for Network Instrumentation Modules, to the LAN1 port of an NX-SVG and connect the SLP-NX to the Network Instrumentation Modules that are connected to the LAN2 port of the same NX-SVG.
- If more than 31 Network Instrumentation Modules are connected to one system, there are precautions for designing the network configuration. For details, refer to *Network Instrumentation Module User's Manual: Network Design Version (CP-SP-1313E).*

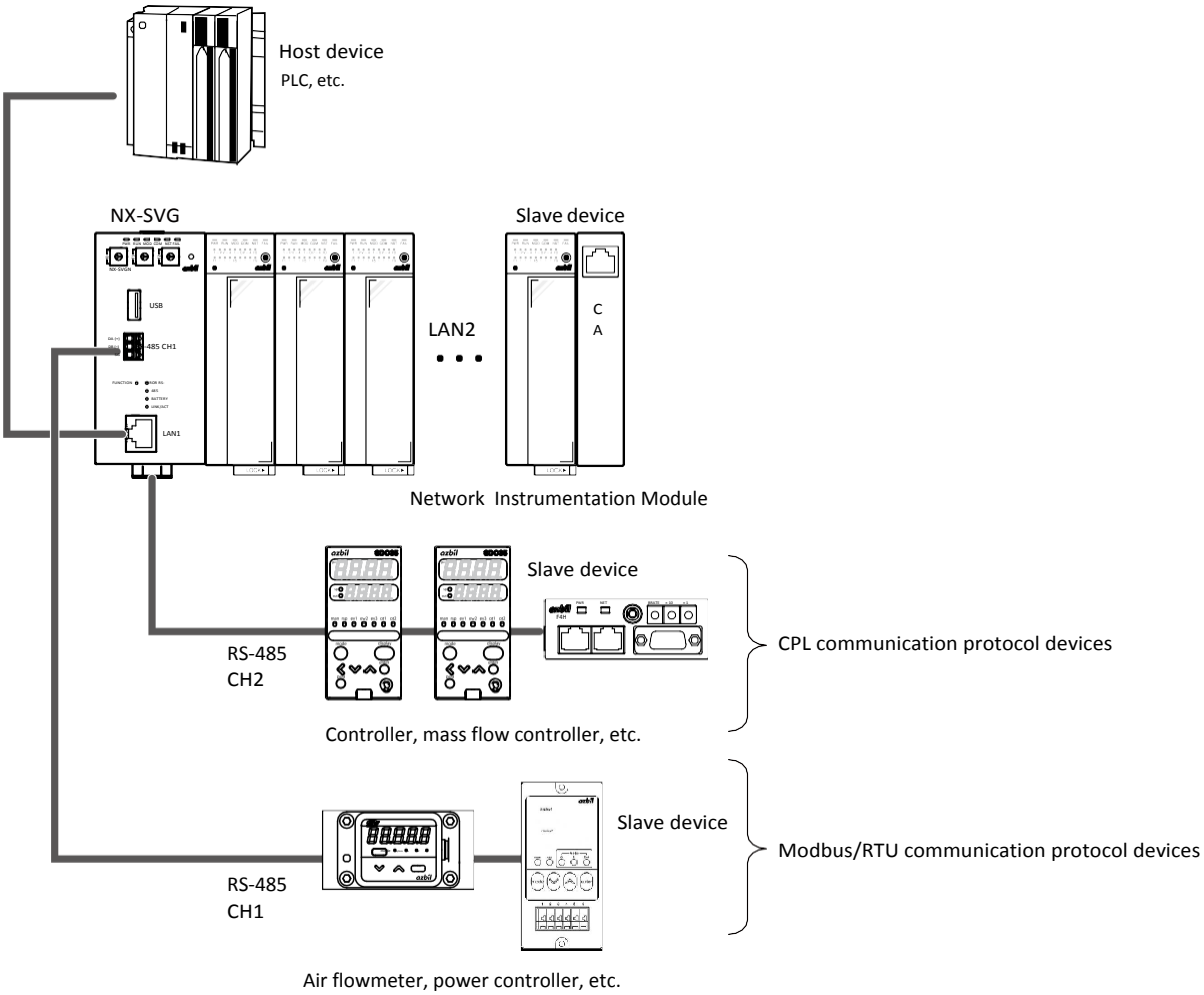




④ When connecting slave devices to RS-485

Slave devices can be connected to the NX-SVG using RS-485 CH1 and CH2.

Up to 31 devices can be connected to each channel. Devices on one channel should use the same communication protocol.



Handling Precautions

- This device can communicate with Network Instrumentation Modules using the Modbus/RTU communication protocol, but in this case, this device cannot assign IP addresses to the modules and cannot back up or restore their parameters.

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-MEMO-

Chapter4. Functions

4-1 Gateway Function

This chapter explains the functions of this device.

The gateway function enables data transmission between a host PLC and slave devices such as Network Instrumentation Modules. The gateway has three types of functions: cyclic data transmission, triggered data transmission, and bit setting. Specify transmission settings using the configuration sheet on the loader.

There is a limit on the number of rows that can be processed by each function, which is different depending on the function. The limits are as follows:

Gateway function	Max. sheets	Max. rows per sheet	Maximum processing per function
Cyclic data transmission	500	500	10000 records
Triggered data transmission	500	500	10000 records
Bit setting	500	500	1000 records

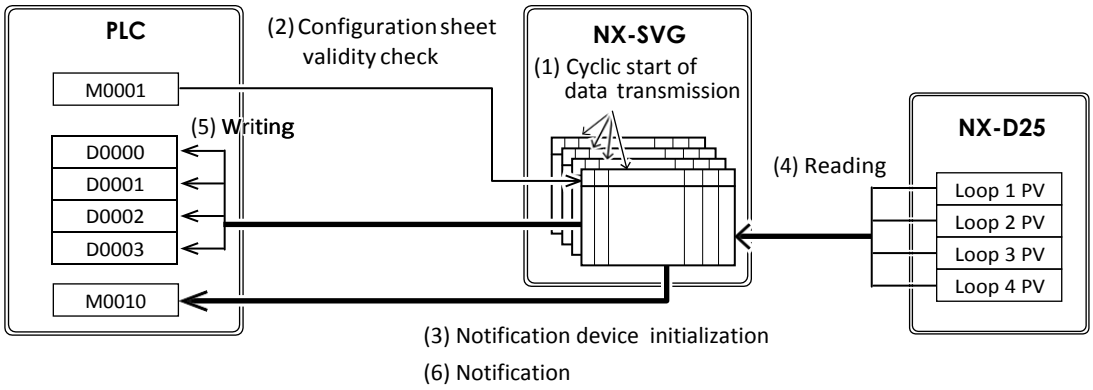
④ Cyclic data transmission

Data from a slave device is transmitted to the host device periodically. It is also possible to transmit host data to slave devices.

Main purposes:

- Saving slave device information to the PLC
- Monitoring slave device information using the PLC in order to manage equipment

The NX-SVG transmits data periodically as shown below.



(1) At the time specified by the cycle setting, the NX-SVG starts data transmission processing according to the configuration sheet.

(2) If [Enabled Switch] is set to [Enabled at ON] or [Enabled at OFF], the NX-SVG reads the value of [Enabled Switch Device]. The NX-SVG determines that the configuration sheet is valid if [Enabled Switch Device] is set to something other than "0" (when [Enabled at ON] is set) or "0" (when [Enabled at OFF] is set), and executes cyclic data transmission.

If an error occurs

If reading of [Enabled Switch Device] fails, the NX-SVG records the error in the communication history, but error notification does not take place. Cyclic data transmission is not executed and processing ends.

(3) If [General] → [Common: Init Notify Device] is set to [Enabled], the NX-SVG writes “0” to the specified completion notification device and error notification device in order to initialize them. If completion and error notification devices are not set, initialization is not executed.

If an error occurs

If initialization of the notification devices fails, the NX-SVG records the error in the communication history, but error notification does not take place and processing continues.

(4) The NX-SVG reads data from the source device.

If an error occurs
If a communication error occurs in data reading, the NX-SVG records the error in the communication history and stops processing the row on the sheet.

(5) The NX-SVG writes the data that has been read to the destination device.

If an error occurs
If a communication error occurs in data writing, the NX-SVG records the error in the communication history but continues writing for the remaining rows on the sheet.

(6) When transmission of data on the sheet is complete, if there is an error in the processing results and if an error notification device is set on the sheet, the NX-SVG writes “1” to that device. If a completion notification device is set on the sheet, the NX-SVG writes “1” to that device.

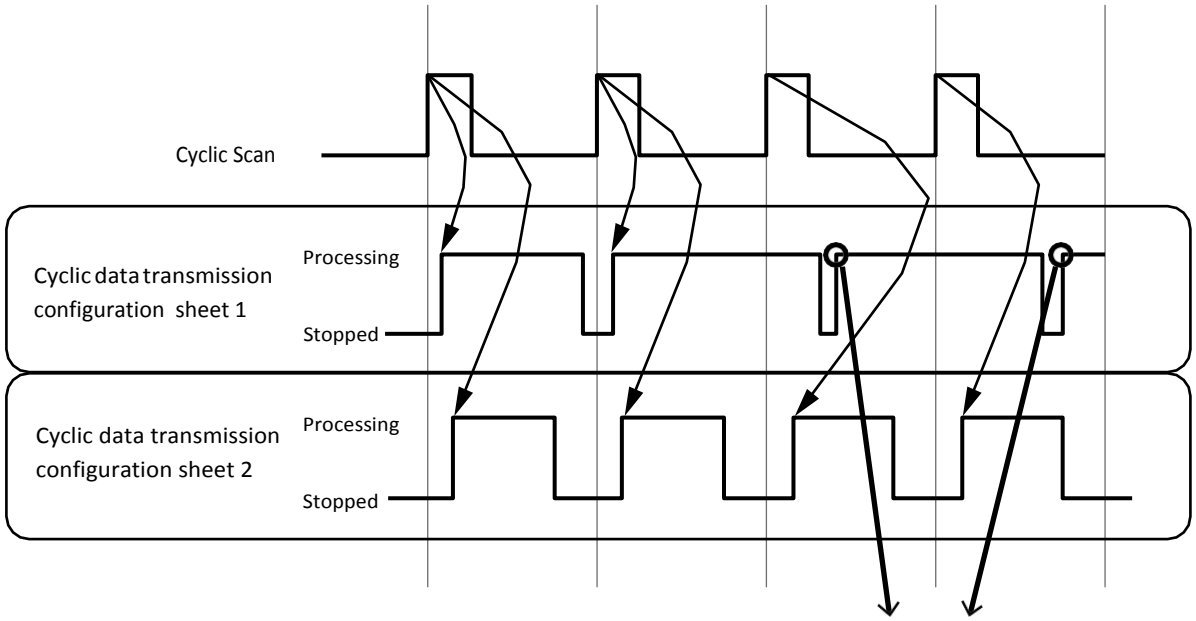
If an error occurs
If writing to the notification device fails, the NX-SVG records the error in the communication history and continues with the rest of the processing.

Note

- If data that is read from a word device is written to a bit device:
  If “0” is the setting of the word device, “0” is written to the bit device.
  If the word device is set to a value other than “0,” “1” is written to the bit device.

The operation of cyclic scan and cyclic data transmission are as follows.

In each cycle, data transmission is executed for all sheets whose data has not been transmitted. For a sheet whose data could not be fully transmitted in one cycle, transmission begins again immediately after the current cycle ends. If the completion of data transmission for a sheet continues to be delayed, data is transmitted continuously with no interval.



If completion of data transmission continues to be delayed, transmission is executed consecutively with no pause.

Handling Precautions

- If the scan cycle is too short for the amount of data to be transmitted, the cyclic data transmission process may be continuously delayed, resulting in all sheets being executed continuously without intervals. This means that data is transmitted on a cycle longer than the specified scan cycle.

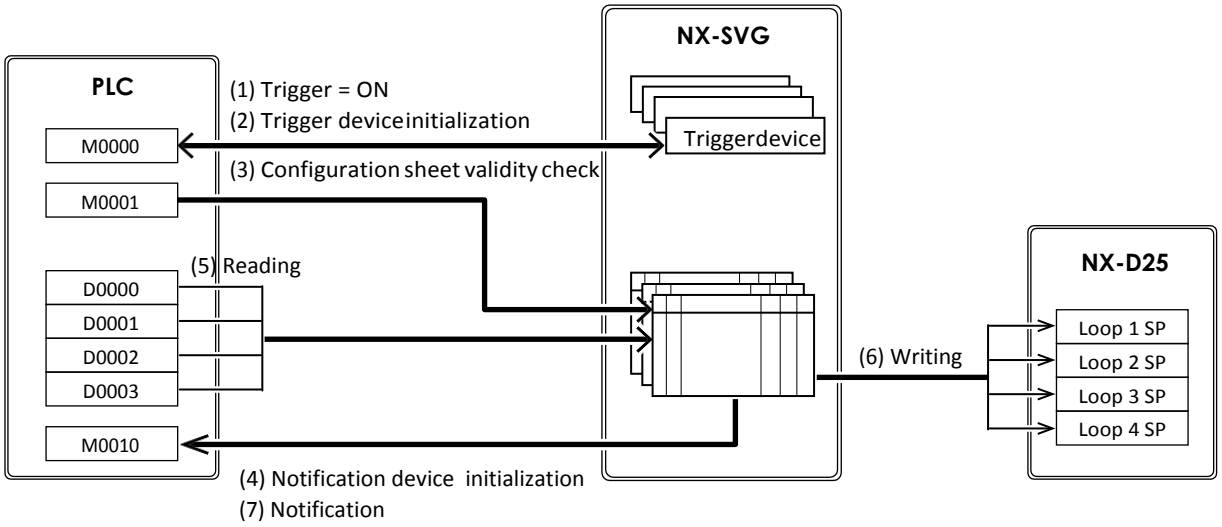
④ Triggered data transmission

Data from a slave device is transmitted to the host device when the trigger device is detected turning from OFF to ON (or ON to OFF). Data can also be transmitted from the host device to the slave device.

Main purposes:

- Changing a slave device's settings (SP, PID settings, etc.) from the PLC
- Changing the operation of the slave device (RUN/READY mode selection, etc.) from the PLC

The NX-SVG executes triggered data transmission as shown below.



(1) According to the cycle set by [Common: Trigger Scan], the NX-SVG reads the trigger device on the PLC to monitor whether the trigger turns from OFF to ON or from ON to OFF. When the trigger device turns ON, triggered data transmission starts.

If an error occurs
If reading of the trigger device fails, the NX-SVG records the error in the communication history but error notification does not take place. Data transmission is not executed and processing ends.

(2) If [General] → [Common: Init Trigger Device] is set to [Enabled], the NX-SVG initializes the trigger device. The NX-SVG writes "0" for ON edge (OFF → ON) and "1" for OFF edge (ON → OFF).

If an error occurs
If initialization of the trigger device fails, the NX-SVG records the error in the communication history, but error notification does not take place and processing continues.

(3) If [Enabled Switch] is set to [Enabled at ON] or [Enabled at OFF], the NX-SVG reads the value of [Enabled Switch Device]. The NX-SVG determines that the configuration sheet is valid if [Enabled Switch Device] is set to something other than "0" (when [Enabled at ON]) or "0" (when [Enabled at OFF]), and executes triggered data transmission.

If an error occurs
If reading of [Enabled Switch Device] fails, the NX-SVG records the error in the communication history, but error notification does not take place. Data transmission is not executed and processing ends.

(4) If [General] → [Common: Init Notify Device] is set to [Enabled], the NX-SVG writes "0" to the specified completion notification device and error notification device in order to initialize them. If completion and error notification devices are not set, initialization is not executed.

If an error occurs
If initialization of the notification devices fails, the NX-SVG records the error in the communication history, but error notification does not take place and processing continues.

(5) The NX-SVG reads data from the source device.

If an error occurs
If a communication error occurs in data reading, the NX-SVG records the error in the communication history and stops processing the row on the sheet.

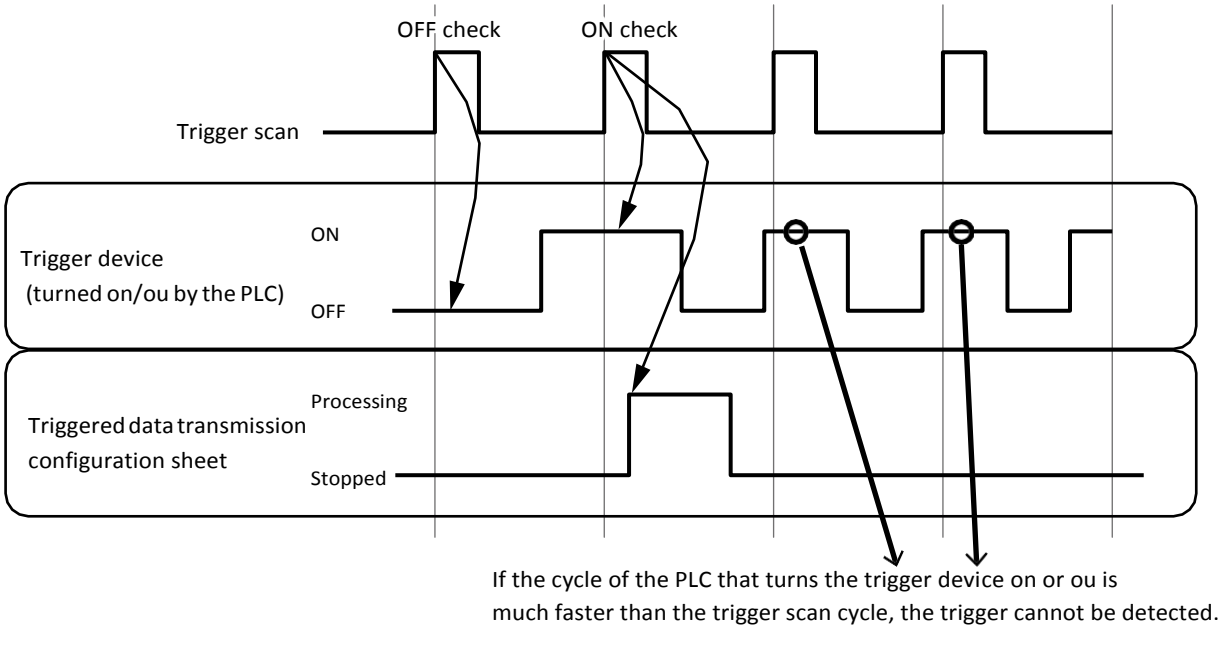
(6) The NX-SVG writes the data that has been read to the destination device.

If an error occurs
If a communication error occurs in data writing, the NX-SVG records the error in the communication history but continues writing for the remaining rows on the sheet.

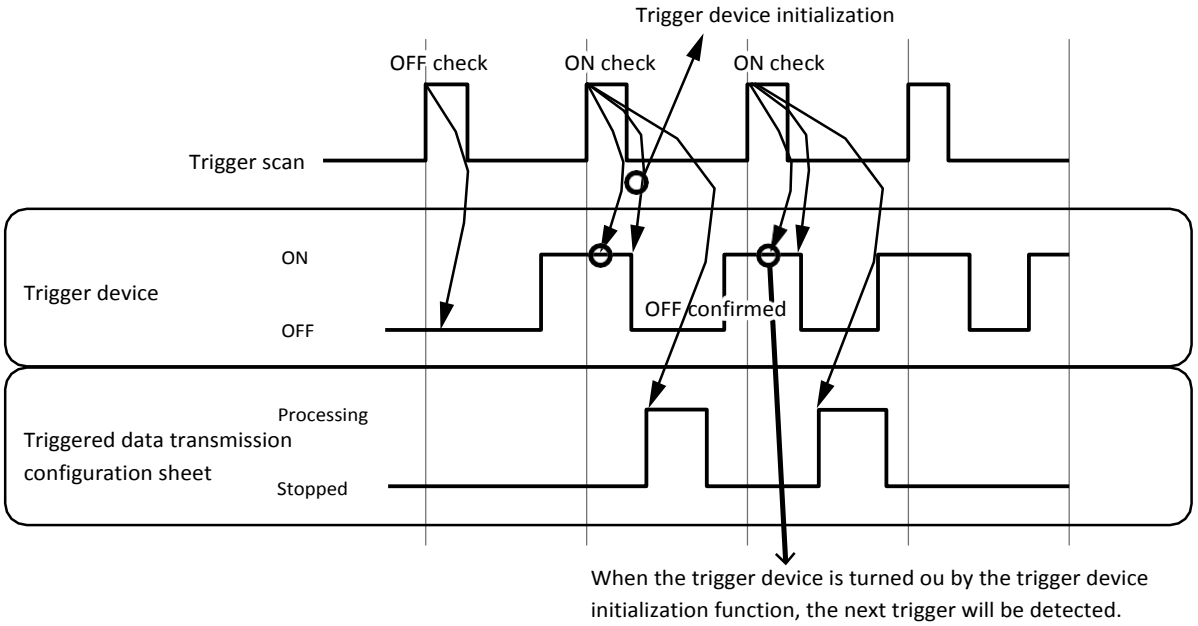
(7) When transmission of data on the sheet is complete, if there is an error in the processing results and if an error notification device is set on the sheet, the NX-SVG writes "1" to that device. If a completion notification device is set on the sheet, the NX-SVG writes "1" to that device.

If an error occurs
If writing to a notification device fails, the NX-SVG records the error in the communication history and continues with the rest of the processing.

Trigger device scan and triggered data transmission are executed as shown below. Data transmission is started for all sheets whose trigger device is ON.



If [Common: Init Trigger Device] is set to [Enabled] and [Trigger Edge] is [ON Edge(OFF→ON)], the NX-SVG writes "0" to the trigger device to turn it off immediately after detecting the trigger. If the trigger device is turned off by the trigger device initialization function, its status is the same as when the NX-SVG confirms that the trigger device is off. Therefore if the trigger device is turned on, it is detected in the next trigger device scan.



Note

- If data that is read from a word device is written to a bit device:
  If “0” is set for the word device, “0” is written to the bit device.
  If the word device is set to a value other than “0,” “1” is written to the bit device.
- If this device is started when the trigger device is turned on (or turned off), the startup conditions will be satisfied and the trigger data transfer will start.

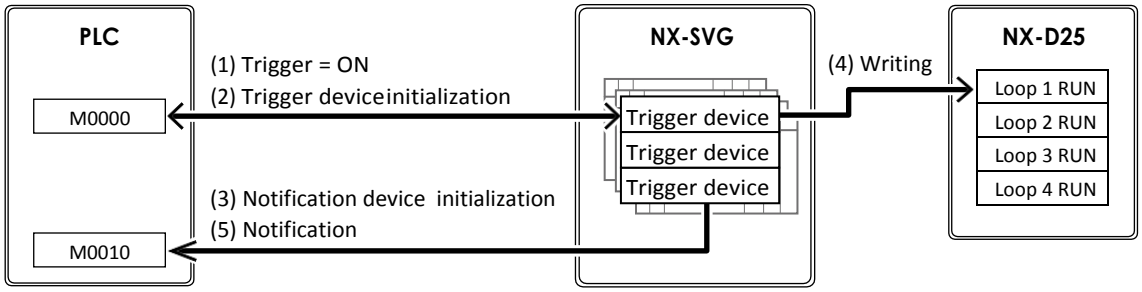
④ Bitsetting

When the Trigger(Write OFF) device or Trigger(Write ON) device is detected turning from OFF to ON, the NX-SVG writes “0” or “1” to the slave device. When Trigger(Write ON) is detected, “1” is written. When Trigger(Write OFF) is detected, “0” is written.

Main purposes:

- Changing the operation of the slave device (RUN/READY mode selection, etc.) from the PLC

The NX-SVG sets a bit as shown below.



(1) According to the cycle set by [Common: Trigger Scan], the NX-SVG reads the Trigger(Write OFF) and Trigger(Write ON) devices set in the rows on the configuration sheet to monitor whether they turn from OFF to ON. When the trigger device turns on, the NX-SVG starts to process bit setting. The trigger device scan cycle and trigger detection timing are the same as for triggered data transmission.

If an error occurs
If reading of the trigger device fails, the NX-SVG records the error in the communication history but error notification does not take place. Bit setting is not executed and processing ends.

(2) If [General] → [Common: Init Trigger Device] is set to [Enabled], the NX-SVG writes "0" to the trigger device in order to initialize it.

If an error occurs
If initialization of the trigger device fails, the NX-SVG records the error in the communication history, but error notification does not take place and processing continues.

(3) If [General] → [Common: Init Notify Device] is set to [Enabled], the NX-SVG writes "0" to the specified completion notification device and error notification device in order to initialize them. If completion and error notification devices are not set, initialization is not executed.

If an error occurs
If initialization of the notification devices fails, the NX-SVG records the error in the communication history, but error notification does not take place and processing continues.

(4) The NX-SVG writes "1" to the destination device if Trigger(Write ON) is detected and "0" if Trigger(Write OFF) is detected.

(5) When transmission of data on the sheet is complete, if there is an error in the processing results and if an error notification device is set on the sheet, the NX-SVG writes "1" to that device. If a completion notification device is set on the sheet, the NX-SVG writes "1" to that device.

If an error occurs
If writing to the notification devices fails, the NX-SVG records the error in the communication history and continues with the rest of the processing.

Handling Precautions

- If Trigger(Write ON) and Trigger(Write OFF) are detected at the same time in one trigger device scan, the NX-SVG writes "0" first and, in the next processing timing, it writes "1."

4-2 Device Management Function

The device management function is used for maintaining and managing the connected devices. There are four types of device management function: configuration backup and restoration, IP address assignment, status notification, and time setting.

Specify device management settings using the configuration sheet on the loader.

Handling Precautions

- Configuration backup and restoration, and IP address assignment for slave devices, are available only for Azbil-made Network Instrumentation Modules.

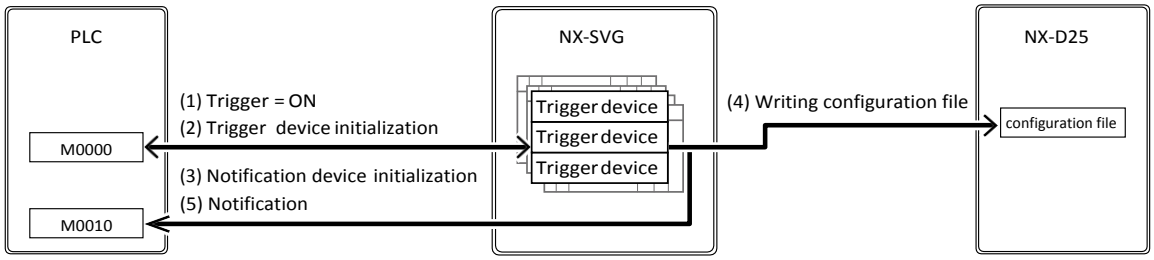
④ Configuration backup and restoration

When the configuration backup trigger device is detected turning from OFF to ON, the configuration file of the slave device is read and saved to the NX-SVG.

When the configuration restoration trigger device is detected turning from OFF to ON, the configuration file in the NX-SVG is written to the slave device.

If the restore trigger and backup trigger are detected at the same time, restoration of the configuration is executed first.

The NX-SVG restores configuration as shown below.



(1) According to the cycle set by [Common: Trigger Scan], the NX-SVG reads the configuration restoration trigger device set in the rows on the configuration sheet to monitor whether it turns from OFF to ON. When a trigger device is turned on, the NX-SVG starts configuration restoration. The trigger device scan cycle and trigger detection timing are the same as for triggered data transmission.

If an error occurs
If reading of the trigger device fails, the NX-SVG records the error in the communication history but error notification does not take place. Configuration restoration is not executed and processing ends.

(2) If [General] → [Common: Init Trigger Device] is set to [Enabled], the NX-SVG writes "0" to the configuration restoration trigger device in order to initialize it.

If an error occurs
If initialization of the trigger device fails, the NX-SVG records the error in the communication history, but error notification does not take place and processing continues.

(3) If [General] → [Common: Init Notify Device] is set to [Enabled], the NX-SVG writes "0" to the specified completion notification device and error notification device in order to initialize them. If completion and error notification devices are not set, initialization is not executed.

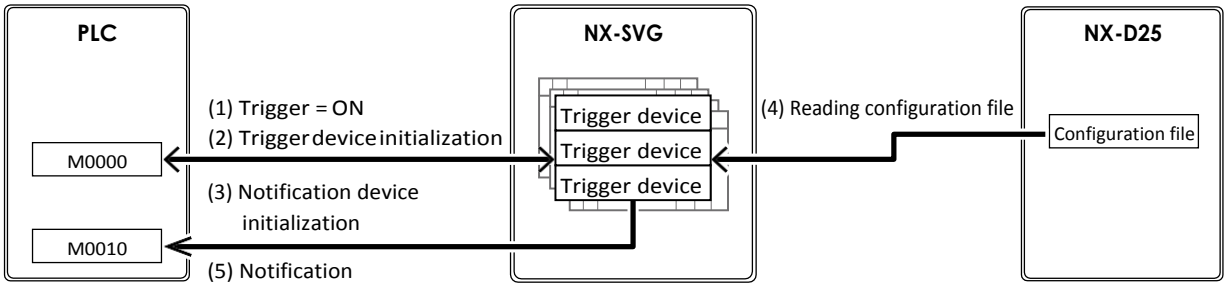
If an error occurs
If initialization of the notification devices fails, the NX-SVG records the error in the communication history, but error notification does not take place and processing continues.

(4) The NX-SVG writes the configuration file to the destination device.

(5) When restoration of each row of the configuration file is complete, if [Notify Result] is set for the target device, the NX-SVG writes a result code to that result notification device. If there is an error in the processing and if an error notification device is set, the NX-SVG writes "1" to that device. If a completion notification device is set, the NX-SVG writes "1" to that device.

If an error occurs
If writing to the notification devices fails, the NX-SVG records the error in the communication history and continues with the rest of the processing.

The NX-SVG backs up configuration as shown below.



(1) According to the cycle set by [Common: Trigger Scan], the NX-SVG reads the configuration backup trigger device set in the rows on the configuration sheet to monitor whether the device turns from OFF to ON. When the trigger device is turned on, the NX-SVG starts configuration backup. The trigger device scan cycle and trigger detection timing are the same as for triggered data transmission.

If an error occurs
If reading of the trigger device fails, the NX-SVG records the error in the communication history but error notification does not take place. Configuration backup is not executed and processing ends.

(2) If [General] → [Common: Init Trigger Device] is set to [Enabled], the NX-SVG writes "0" to the configuration backup trigger device in order to initialize it.

If an error occurs
If initialization of the trigger device fails, the NX-SVG records the error in the communication history, but error notification does not take place and processing continues.

(3) If [General] → [Common: Init Notify Device] is set to [Enabled], the NX-SVG writes "0" to the specified completion notification device and error notification device in order to initialize them. If completion and error notification devices are not set, initialization is not executed.

If an error occurs
If initialization of the notification devices fails, the NX-SVG records the error in the communication history, but error notification does not take place and processing continues.

(4) The NX-SVG reads the configuration file from the source device and saves it.

(5) When backup of one row of the configuration file is complete, if [Notify Result] is set for the target device, the NX-SVG writes a result code to that result notification device. If there is an error in the processing and if an error notification device is set, the NX-SVG writes "1" to that device. If a completion notification device is set, the NX-SVG writes "1" to that device.

If an error occurs
If writing to the notification devices fails, the NX-SVG records the error in the communication history and continues with the rest of the processing.

One of the following result codes is written to [Notify Result]. If a bit device is set for [Notify Result], "0" is written when the result code is "0" and "1" is written when the result code is something other than "0."

Function	Result code	Description
Used for both backup and restoration	0	The process succeeded.
	86	The file is corrupted.
	87	The device version could not be obtained.
	88	There is a discrepancy in the model number.
	89	The version of the device is not supported.
	90	The file could not be read.
	91	The device could not be connected.
	92	There is an error in communication with the device.
	93	The file could not be received.
Backup	94	The file could not be saved.
Restoration	94	The NX-SVG received an error response from the device.
	95	The backup file is too large.

Handling Precautions

- If the NX-SVG does not have a saved configuration file for the device, restoration fails.

④ Batch configuration backup and restoration

If [Backup All Trigger] or [Restore All Trigger] is set, the configuration of all specified devices can be backed up or restored.

This process does not take place for devices for which [Enabled Switch] is set to [Disabled].

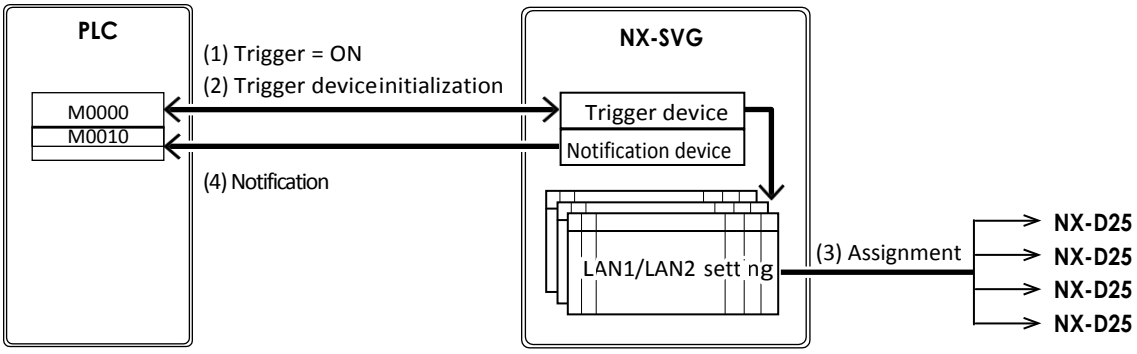
When batch configuration backup or restoration is complete, if the [Notify Result], [Notify Complete], or [Notify Error] device is set in the rows on the configuration sheet, a value is written to these devices as applicable. Then, after all the rows are done, if [Notify All Complete Device] or [Notify All Error Device] is set, a value is written to these devices as applicable.

④ IP address assignment

When the IP address assignment trigger device is detected turning from OFF to ON, IP addresses are assigned to slave devices according to the setting.

IP addresses can be assigned to up to 128 Network Instrumentation Modules (ports LAN1 and LAN2 combined) that are chain-connected.

The NX-SVG assigns IP addresses as follows.



(1) According to the cycle set by [Common: Trigger Scan], the NX-SVG reads the IP address assignment trigger device set on the configuration sheet and monitors the device to monitor whether it turns from OFF to ON. When the trigger device is turned on, the NX-SVG starts IP address assignment. The trigger device scan cycle and trigger detection timing are the same as for triggered data transmission.

If an error occurs
If reading of the trigger device fails, the NX-SVG records the error in the communication history but error notification does not take place. IP address assignment is not executed and processing ends.

(2) If [General] → [Common: Init Trigger Device] is set to [Enabled], the NX-SVG writes "0" to the configuration backup trigger device in order to initialize it.

If an error occurs
If initialization of the trigger device fails, the NX-SVG records the error in the communication history, but error notification does not take place and processing continues.

(3) The NX-SVG assigns IP addresses according to the LAN1 and LAN2 configuration sheets.

(4) When the IP address assignment is complete, the NX-SVG writes the result to [Notify Result]. If there is an error in the processing results and if an error notification device is set on the sheet, the NX-SVG writes "1" to that device. If a completion notification device is set on the sheet, the NX-SVG writes "1" to that device.

If an error occurs
If writing to the notification devices fails, the NX-SVG records the error in the communication history and continues with the rest of the processing.

One of the following result codes is written to [Notify Result]. If a bit device is set for [Notify Result], "0" is written when the result code is "0" and "1" is written when the result code is something other than "0."

Result code	Description
0	The process succeeded.
87	There is a discrepancy in the local IP address.
88	A socket error occurred.
89	The process was canceled.
90	The IP address is invalid.
91	There is a discrepancy in the number of devices.
92	Information on the connected device could not be obtained.
93	There is a discrepancy in the number of devices (IP address verification).

Handling Precautions

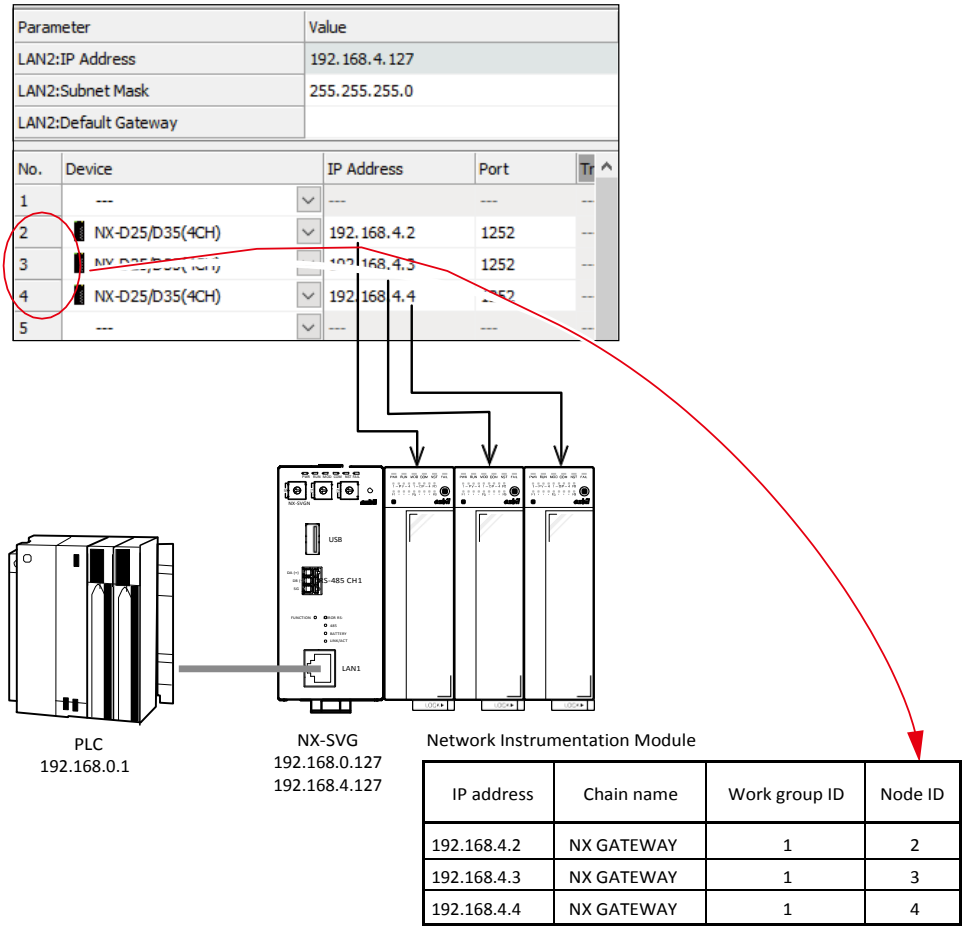
- The NX-SVG cannot assign IP addresses to Network Instrumentation Modules that are connected to the NX-SVG via routers. Assign IP addresses to these modules using the Smart Loader Package model SLP-NX for Network Instrumentation Modules.

Note

- The IP address assignment function sets an IP address, subnet mask, default gateway, chain name, workgroup ID, and node ID for Network Instrumentation Modules. The settings for RS-485 and ports are not changed.
- The IP address assignment function sets the subnet mask and default gateway for each Network Instrumentation Module to the same values as the LAN to which the NX-SVG is connected.
- With the IP address assignment function, the following chain name, workgroup ID, and node ID are set for Network Instrumentation Modules.
  - Chain name: NX GATEWAY
  - Workgroup ID: 1
  - Node ID: The assigned number

The relationship between the system configuration and the loader screen layout is as shown below.

IP addresses are assigned to the Network Instrumentation Modules, from left to right, that are connected to the NX-SVG.



IP address	Chain name	Work group ID	Node ID
192.168.4.2	NX GATEWAY	1	2
192.168.4.3	NX GATEWAY	1	3
192.168.4.4	NX GATEWAY	1	4

④ State notification

The host device receives notification of the operating state of the NX-SVG.

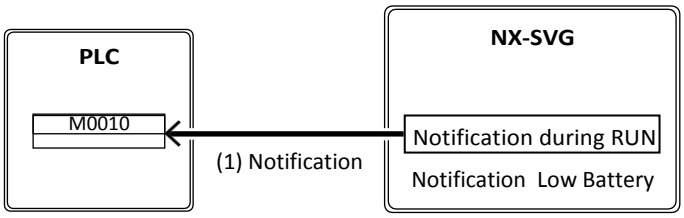
The types of state notifications are as follows.

State notification type	Description
Notification During RUN	Notifies the host device that the NX-SVG is operating.
Notification Low Battery	If a battery is mounted on the NX-SVG, the NX-SVG notifies the host device of low battery.
Notification Connected Status	Notifies the host device that a slave device is connected or disconnected.

! Handling Precautions

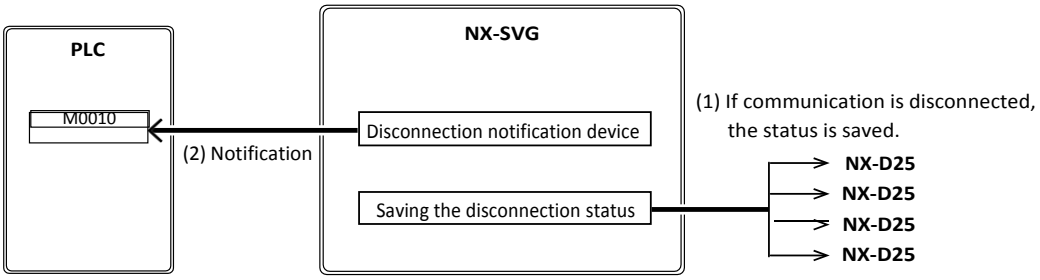
- If there is no battery in the NX-SVG, do not use [Notification Low Battery]. If it is used, notifications will be issued continuously.

The NX-SVG notifies the host device that it is operating or that the battery is low as shown below.



(1) According to the cycle set by [Notification Interval], the NX-SVG writes "1" to the [Notification during RUN] or [Notification Low Battery] device.

The NX-SVG notifies the host device of the connection status as shown below.



(1) If communication with slave devices (using the gateway function, etc.) is disconnected, the NX-SVG saves the status.

(2) According to the cycle set by [Notification Interval], the NX-SVG writes the status of slave device connection ("ON" when disconnected, "OFF" when connected) to the disconnection notification device. If [Notification Connected Status] is set to [Notify Word], the value is written to the bit specified by [Notify Bit].

Note

- If [Notification Connected Status] is set to [Notify Word], the same disconnection notification device can be set for multiple slave devices. In the following example, if NX-D15 Nos.1-1 and 1-3 are disconnected, the value at 0005h (hexadecimal) is written to D000000 of the host device as the state of the devices.

No.	Connected Device	Notify Disconnect	Bit position
1-1	NX-D15 (disconnected)	D000000	0
1-2	NX-D15	D000000	1
1-3	NX-D15 (disconnected)	D000000	2
1-4	NX-D15	D000000	3

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
D000000																

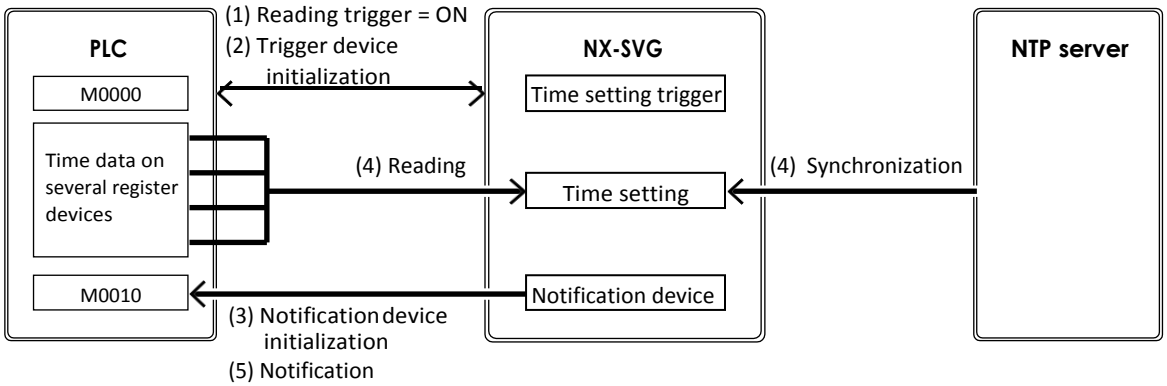
④ Time setting

The time on the NX-SVG can be set by an external device. By setting the time, it is possible to check the events in the communication history and operation history with the actual time.

If [Startup execution] is set to [Enabled], the time is set every time the power is turned on, so it is not necessary to have a battery in the NX-SVG.

As an external device, an NTP server or PLC can be used.

The time is set on the NX-SVG as shown below.



(1) According to the cycle set by [Common: Trigger Scan], the NX-SVG reads the time setting trigger device to monitor whether the device turns from OFF to ON. When the trigger device is turned on, time setting starts. The trigger device scan cycle and trigger detection timing are the same as for triggered data transmission.
If [Startup execution] is set to [Enabled], setting of the time starts when the NX-SVG is started up.
If an error occurs
If reading of the trigger device fails, the NX-SVG records the error in the communication history but error notification does not take place.

(2) If [General] → [Common: Init Trigger Device] is set to [Enabled], the NX-SVG writes "0" to the time setting trigger device in order to initialize it.
If an error occurs
If initialization of the trigger device fails, the NX-SVG records the error in the communication history, but error notification does not take place and processing continues.

(3) If [General] → [Common: Init Notify Device] is set to [Enabled], the NX-SVG writes "0" to the specified completion notification device and error notification device in order to initialize them. If completion and error notification devices are not set, initialization is not executed.

If an error occurs
If initialization of the notification devices fails, the NX-SVG records the error in the communication history, but error notification does not take place and processing continues.

(4) Based on the setting, the NX-SVG updates its clock by synchronizing it with the time on the NTP server or by obtaining time data from register devices on the PLC.

(5) When time synchronization is complete, the NX-SVG records a time setting event in the operation history. If there is an error in the processing results and if an error notification device is set on the sheet, the NX-SVG writes "1" to that device. If a completion notification device is set on the sheet, the NX-SVG writes "1" to that device.

If an error occurs

If writing to the notification device fails, the NX-SVG records the error in the communication history and continues with the rest of the processing.

Handling Precautions

- If time is set by reading PLC registers, a time after 3:14:07 (UTC) on January 19, 2038 cannot be set.
- If time is set using the NTP server, a time after 6:28:15 (UTC) on February 7, 2036 cannot be set.

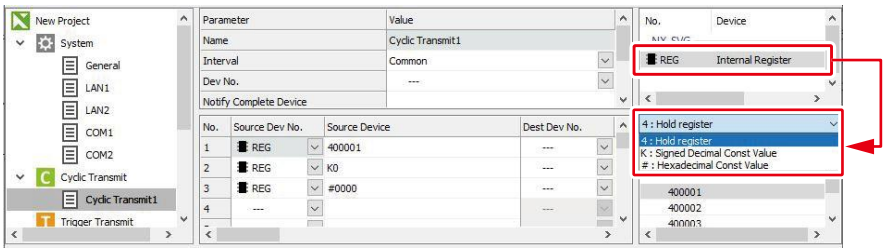
4-3 Internal Register

This device has a built-in data register.

To specify the data register area built into this device, select “REG” in [Device Info.] and select the register.

The following types can be selected from “REG: Internal Register.”

- 4: Holding register — The internal register built into this device
- K: Signed Decimal Const — Specification of the signed decimal constant (-2147483648 to 2147483647)
- #: Hexadecimal Const — Specification of the hexadecimal constant (00000000 to FFFFFFFF)

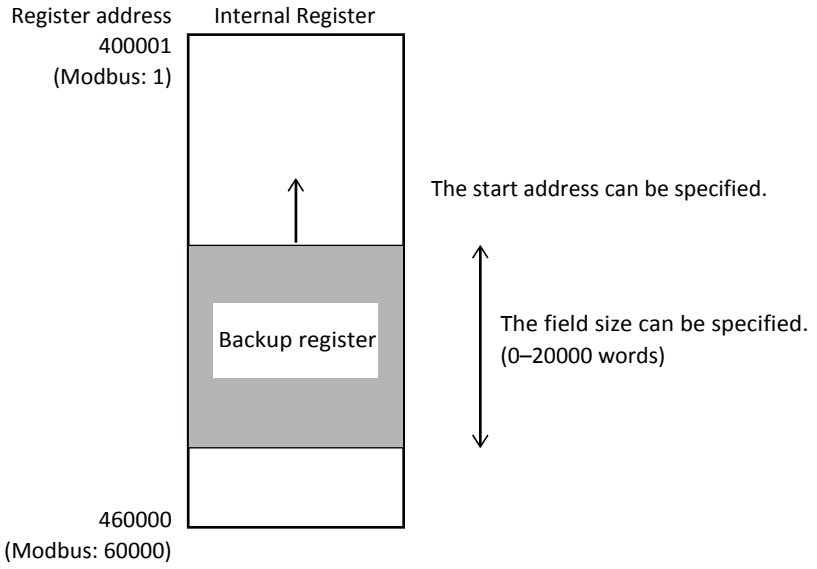


④ Holding register

Data that has been read from external devices can be saved in the holding register area. The data can then be read with the server function.

Part of the holding register can be used as a backup register.

The holding register of this device has the following structure.



1 word = 16 bits.

In the register, each word has an address, which ranges from 400001 to 460000.

Values in the holding register, except backup register values, are reset to “0” when the power is turned on.

Values in the backup register are retained even when the power is turned off.

The user can specify the area used as a backup register in Backup Register: Top Address and Backup Register: Area Size under “General.”

The following values can be set for the backup register:

Item	Setting range	Initial value
Backup Register: Top Address	400001– 460000	450001
Backup Register: Area Size	0–20000	10000

Handling Precautions

- When the setting of the backup register is changed, all values in the backup register are reset to "0.”
- It is not possible to read and save register data to a PC or write it back to this device. Data that must be retained should be transferred to other devices via communications.

Note

- Because backup register data is backed up in the FRAM area of the main unit, the data is retained even when the power is turned off regardless of whether a battery is used.

④ Constants

For a device that performs cyclic data transmission or triggered data transmission, the constants, instead of the register of the connected device, can be set.

The setting range for the constants is as follows.

Type	Size	Setting range	Remarks
Signed Decimal Constant	1	K-32768 ~ K32767	“K” is added at the beginning as the symbol representing a signed decimal constant.
	2	K-2147483648 ~ K2147483647	
Hexadecimal Constant	1	#0000 ~ #FFFF	“#” is added at the beginning as the symbol representing a hexadecimal constant.
	2	#00000000 ~ #FFFFFFFF	

To set the constant, select [REG] for Source Dev No. and set a constant for the Source Device.

No.	Source Dev No.	Source Device	Dest Dev No.	Dest Device	Size
1	REG	K0	LAN1-1	D0000000	1
2	REG	K10	LAN1-1	D0000001	1
3	REG	K32767	LAN1-1	D0000002	1
4	REG	K32768	LAN1-1	D0000003	2
5	REG	K2147483627	LAN1-1	D0000005	2
6	REG	K-1	LAN1-1	D0000007	1
7	REG	K-32768	LAN1-1	D0000008	1
8	REG	K-32769	LAN1-1	D0000009	2
9	REG	K-2147483648	LAN1-1	D0000011	2
10	REG	#0000	LAN1-1	D0000013	1
11	REG	#FFFF	LAN1-1	D0000014	1
12	REG	#FFFFFFFF	LAN1-1	D0000015	2
13	---		---	---	---

4-4 Server Function

The server function enables external devices to access the internal register of the NX-SVG using the Modbus/TCP protocol. To run the server function, set [Server: Enabled/Disabled] to [Enabled].

The settings for the server function are shown below.

Item		Setting range	Initial value
Server	Enabled/Disabled	Enabled/Disabled	Disabled
	Port No.	502 (fixed value)	502
	Connection Max	1–8	4
	Keep-alive time	5 s / 10 s / 30 s / 1 min / 5 min / 10 min / 30 min / 1 hour / 2 hours	5 s
	Keep-alive interval	10 s / 20 s / 30 s / 40 s / 50 s / 1 min	10 s
	Keep-alive retry	0–10	3

④ Connections

The server function of the NX-SVG can establish multiple connections using one receiving port. However, it cannot establish more connections than the number set by [Server: Connection Max].

④ Keep-alive

Keep-alive is a function for monitoring whether Modbus/TCP client devices are still connected. If a network or client device cannot terminate its TCP connection properly for some reason, the NX-SVG might remain connected to it. By using keep-alive, it is possible to disconnect faulty connections to prevent running out of connections.

If a state of no communication continues for [Server: Keep-alive time], the NX-SVG sends a confirmation packet to the client device and waits for a response.

If there is no response after [Server: Keep-alive interval], the NX-SVG repeats transmission of the packet the number of times set for [Server: Keep-alive retry]. If no response is received, the NX-SVG terminates the TCP connection.

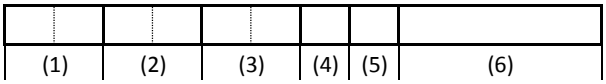
④ Modbus/TCP specification overview

Specifications of Modbus/TCP are as follows.

Item	Specifications	Description
Supported function codes	3 (0x03)	Read Holding Registers (read multiple data records)
	6 (0x06)	Write Single Register (write one data record)
	16 (0x10)	Write Multiple Registers (write multiple data records)
Read Device Max	125	Maximum number of addresses for read frames
Write Device Max	123	Maximum number of addresses for write frames
Address range	1–60000	Register addresses 400001–460000 on this device can be assigned as holding registers.

④ Modbus/TCP message structure

The TCP/IP frame format is used. A Modbus/TCP message is shown in the TCP data section.



No.	Component	Description
(1)	Transaction Identifier (2 bytes)	A request and its response have the same value. This device uses the received value without change for the response. The master station (client) can use the transaction identifier to confirm that the data is the response to the request.
(2)	Protocol Identifier (2 bytes)	0x0000 when the Modbus protocol is used.
(3)	Length (2 bytes)	The number of bytes in (4) to (6)
(4)	Unit Identifier (1 byte)	Either 0xff or 0x00
(5)	Function (1 byte)	The function code
(6)	Data (n bytes)	A data string that depends on the function code

④ Modbus/TCP exception codes

If a response message error occurs, the following exception codes are added to the function code.

Error type	Exception code	Description
ILLEGAL FUNCTION Wrong function code	01 (0x01)	Function code not supported by this device
ILLEGAL DATA ADDRESS Wrong data address	02 (0x02)	An included data address cannot be read or written.
ILLEGAL DATA VALUE Data error	03 (0x03)	The data items to read or write exceeded the maximum number, or the length was wrong
SLAVE DEVICE FAILURE Other errors	04 (0x04)	Other errors

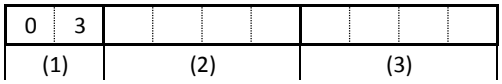
④ Modbus/TCP number of records

The number of data records that can be read or written using a one-frame message is shown below.

Command type (Function code)	Number of data records
3 (0x03) Read Holding Registers (read multiple data records)	125
6 (0x06) Write Single Register (write one data record)	1
16 (0x10) Write Multiple Registers (write multiple data records)	123

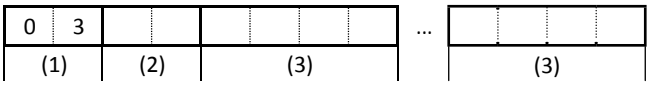
④ Format of a command for reading multiple data records (0x03)

Request



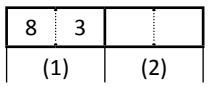
No.	Component	Description
(1)	Function code	Read Holding Registers
(2)	Start data address	–
(3)	Number of data records to read	–

Normal response



No.	Component	Description
(1)	Function code	Read Holding Registers
(2)	Number of bytes	–
(3)	Data that was read	Continuous data that was read for the specified number of data records

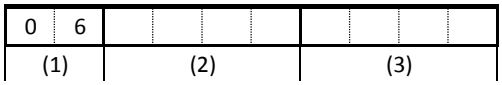
Abnormal response



No.	Component	Description
(1)	Error code	Read Holding Registers
(2)	Exception code	01, 02, 03, 04

④ Format of a command for writing one data record (0x06)

Request



No.	Component	Description
(1)	Function code	Write Single Register
(2)	Write address	–
(3)	Data to write	–

Normal response

0 6		
(1)	(2)	(3)

No.	Component	Description
(1)	Function code	Write Single Register
(2)	Write address	–
(3)	Written data	Echo back

Abnormal response

8 6	
(1)	(2)

No.	Component	Description
(1)	Error code	Write Single Register
(2)	Exception code	01, 02, 03, 04

④ Format of a command for writing multiple data records (0x10)

Request

1 0					...	
(1)	(2)	(3)	(4)	(5)		(5)

No.	Component	Description
(1)	Function code	Write Multiple Registers
(2)	Start data address	–
(3)	Number of data records	–
(4)	Number of bytes	Number of data records × 2
(5)	Data to write	–

Normal response

1 0		
(1)	(2)	(3)

No.	Component	Description
(1)	Function code	Write Single Register
(2)	Start data address	–
(3)	Number of data records	–

Abnormal response

9 0	
(1)	(2)

No.	Component	Description
(1)	Error code	Write Single Register
(2)	Exception code	01, 02, 03, 04

4-5 Settings read-protection function

This function provides password protection for reading of settings from the NX-SVG. The function can be used by writing a project file whose [Protection of setting: Enabled/Disabled] setting is enabled to the NX-SVG.

The items for the settings read-protection function are shown below.

Item		Setting range	Initial value
Protection of setting	Enabled/Disabled	Enabled/Disabled	Disabled
	Password	1 to 64 characters	-

Handling Precautions

- This function is supported by SLP-SVG ver. 1.0.2.0 and later and NX-SVG R01.00.02.00 and later.
- Project files whose [Protection of setting] is enabled cannot be opened from SLP-SVG versions earlier than 1.0.2.0.
- When [Protection of setting] is enabled for the NX-SVG, protected data cannot be read from the NX-SVG by SLP-SVG versions earlier than 1.0.2.0.
- This function provides password protection for reading of settings from the NX-SVG. It does not prevent the writing of project files to the NX-SVG.

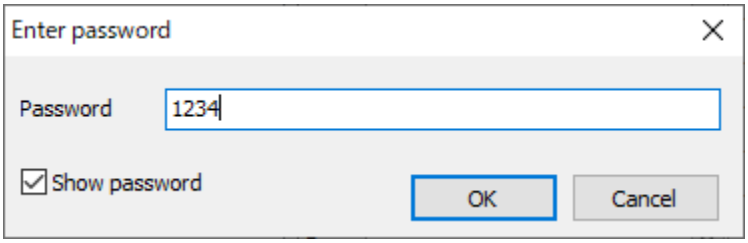
④ Settings read-protection

If [Protection of setting] is enabled, entry of the password will be required for the following operations.

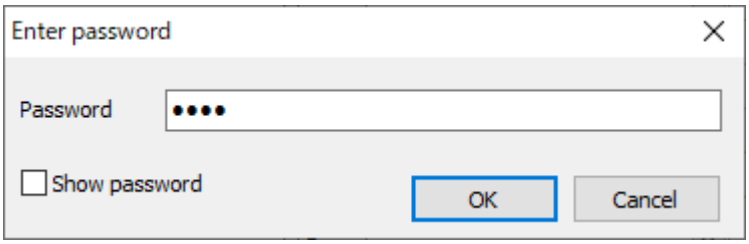
Menu	Operation	Protected data
Communication	[Read gateway config NX-SVG → PC...]	Project file
	[Exec monitor] → clicking the monitor button	Name of data transmission configuration sheet
	[Maintenance manager] → [Read setup data (PC ← NX-SVG)]	Device configuration backup data

●Read gateway config NX-SVG → PC...

If the basic settings retained by the NX-SVG are protected, the user will be prompted to enter the password when attempting to read the gateway configuration.
The gateway configuration cannot be read from the NX-SVG unless the entered password is the same as the one set on the NX-SVG.

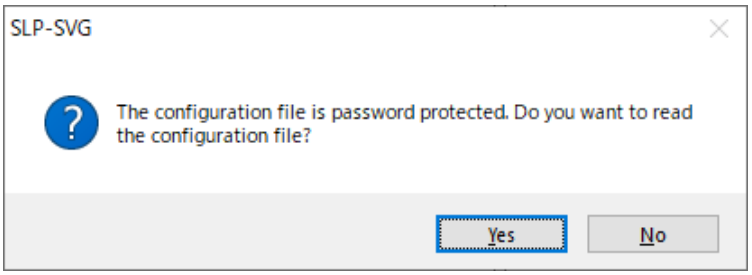


If [Show password] is unchecked, the entered characters will be replaced by "●."

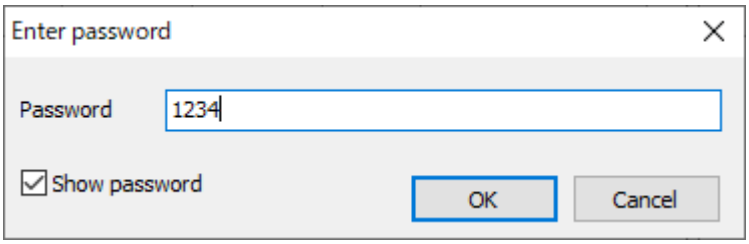


- **[Exec monitor] → clicking the monitor button**

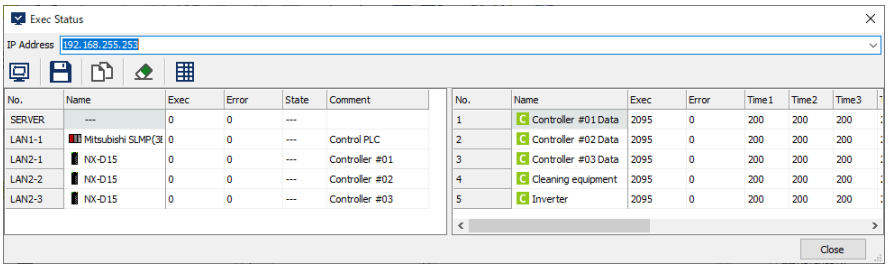
If [Protection of setting] is enabled for the NX-SVG, the following message will be displayed when the monitor button is clicked in the [Exec monitor] window.



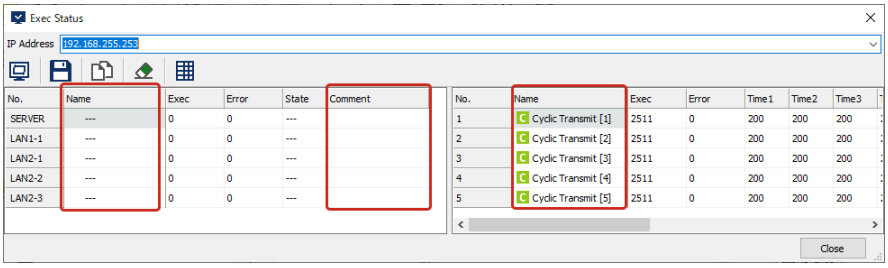
If [Yes] is clicked, the screen for entering the password will be displayed.



Entering the password will start monitoring of execution status.



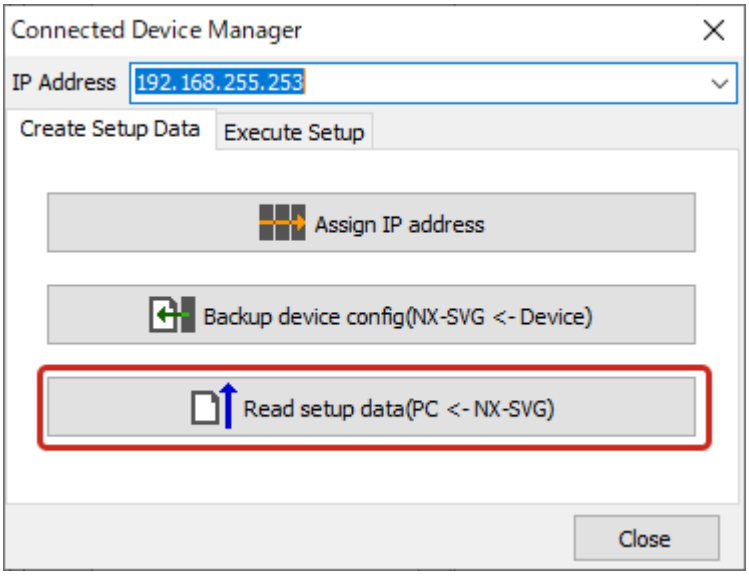
Even if you do not know the password, you can monitor the status of execution by selecting [No]. However, device names and data transmission configuration sheet names specified by the project file will not be displayed.

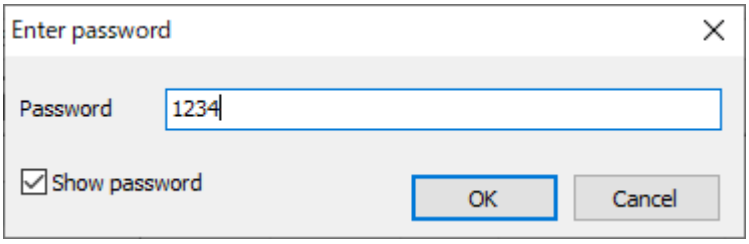


• Maintenance manager: Read setup data (PC ← NX-SVG)

If [Protection of setting] is enabled for the NX-SVG, the user will be prompted to enter the password when executing [Read setup data (PC ← NX-SVG)].

The setup data (device configuration backup data) cannot be read from the NX-SVG unless the entered password is the same as the one set on the NX-SVG.



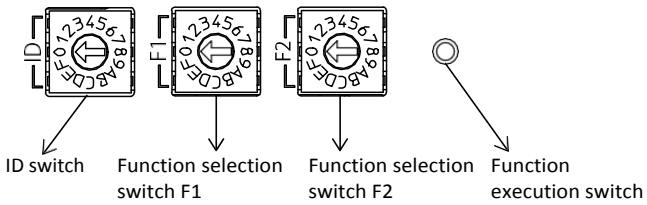


Handling Precautions

- When [Protection of setting] is enabled for the NX-SVG, do not attempt to read setup data using an SLP-SVG version earlier than 1.0.2.0. If attempted, reading will succeed but writing the created settings to the NX-SVG will fail.
- When managing the devices connected to the NX-SVG for which [Protection of setting] is enabled, be sure to use ver. 1.0.2.0 or later of the SLP-SVG Smart Loader Package.

4-6 Switches on the Front of the Main Unit

By using the function selection and execution switches on the front of the main unit, the user can execute several functions without a PC.



The two rotary switches on the right are the F1 and F2 function selection switches. The number of the function that is executed when the function execution switch is pressed can be specified.

The following functions can be set.

Function name	F1	F2	Description
Reset	0	0	Resets this device.
Write settings from USB flash drive	0	4	Copies the configuration file from a USB flash drive to this device and restarts the application.
Connected device setup	0	8	Assigns an IP address to a connected device and restores its backed-up settings.This function can be used for Network Instrumentation Modules.

④ Reset

This function resets this device.

The procedure is as follows.

(1) Set the F1 and F2 function selection switches to “0.”

(2) Press the function execution switch for 3 seconds or longer.

>> The function is executed. During execution, the FUNCTION LED in the function indicators section on the front of this device blinks. When processing is complete, the FUNCTION LED turns off.

④ Write settings from USB flash drive

This function copies a configuration file previously saved on a USB flash drive to this device. If the system file in the file is newer than the one stored in this device, the system is updated and this device is reset. If a system update is not necessary, this device reads the configuration and transits to RUN mode.

The procedure is as follows.

(1) Copy a file with the extension “.nxsvg” or “.snxsvg” to an “nxsvg” (all lower case) folder on the USB flash drive.

(2) Insert the USB flash drive into the USB connector on the front of the main unit.

(3) Set the F1 function selection switch to “0” and the F2 switch to "4.”

(4) Press the function execution switch for 3 seconds or longer.

>> The function is executed. During execution, the FUNCTION LED in the function indicators section on the front of this device blinks. When processing is complete, the FUNCTION LED turns off.

One of the following files can be saved to the USB flash drive.

File	File contents	How to create
Setup file (extension: .snxsvg)	• A configuration file that was backed up from a connected Network Instrumentation Module • The settings for the NX-SVG • The system file for the NX-SVG	In the loader, execute [Online] → [Maintenance manager] → [Create Setup Data] tab → Read setup data (PC → NX-SVG).
Configuration file (extension: .nxsvg)	• The settings for the NX-SVG • The system file for the NX-SVG	In the loader, execute [File] → [Save project].

Handling Precautions

- When this function is executed, this device transits to STOP mode and the gateway function stops.
- Create an nxsvg folder on the USB flash drive using only lowercase letters for the name. A folder name that includes uppercase letters will not be recognized.
- Only a single file with the extension ".nxsvg" or ".snxsvg" should be saved in the nxsvg folder. If there are several files in the USB flash drive, the function will not work.
- With the configuration file from a connected device, which is included in the setup file with the extension .snxsvg, the NX-SVG copies and stores the settings but does not restore the settings.
  ☞"Connected device setup" in the next section (for restoration of the settings)

Note

- Proper operation of the following USB flash drives has been confirmed. A USB flash drive with security such as password input or fingerprint authentication can be used. A USB flash drive that will start up software and unlock security cannot be used.

Manufacturer	Model No.	Security function
M Commerce Co., Ltd.	HKISP-08-1X	Fingerprint authentication
Hagiwara Solutions Co., Ltd.	HUD-PUTK3xxGA1	Password input with numeric keypad
Hagiwara Solutions Co., Ltd.	USA3-xxxGH	None
Hagiwara Solutions Co., Ltd.	UBA2-xxxGSRB	None

④ Connected device setup

This function assigns an IP address to the Network Instrumentation Module set as [Connected Device] and restores its settings.

The procedure is as follows.

(1) Set the F1 function selection switch to “0” and the F2 switch to "8.”

(2) Press the function execution switch for 3 seconds or longer.

>> The function is executed. During execution, the FUNCTION LED in the function indicators section on the front of this device blinks.
When processing is complete, the FUNCTION LED turns off.

Handling Precautions

- While this function is being executed, this device transits to STOP mode and the gateway function stops.

Chapter5. Smart Loader Package, Model SLP-SVG

5-1 Overview of Model SLP-SVG

④ Functions

The Smart Loader Package model SLP-SVG can write or read settings to/from the NX-SVG, manage connected devices, check the current state of the system, and save data.

- **System requirements**

OS*1 *2	Windows 7 (32-bit or 64-bit version) Windows 8 or 8.1 (32-bit or 64-bit version) Windows 10 (32-bit or 64-bit version) Windows 11
Language	Japanese, English*3
CPU	800 MHz or higher
Memory	RAM of 512 MB or more
Hard disk	Free space of 128 MB or more
Display	Super VGA (800 × 600) or better resolution
CD-ROM drive	Required when installing the loader from the CD-ROM
Keyboard	Required
Mouse	Required
LAN port	A wired LAN port is required for connection to the NX-SVG.

*1. Windows XP, Windows Vista, and server operating systems are not supported.

*2. Use an OS with the latest service pack and updates.

*3. If the loader is started in a language environment other than Japanese, menus and other user interface elements will be in English.

5-2 Installation

④ Installing the loader

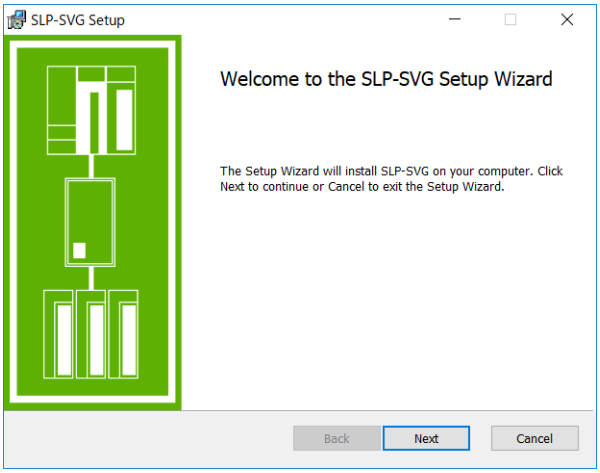
Use the following steps to install the loader. (The following description is for Windows 10.)

(1) Right-click the icon for the drive containing the CD-ROM and select [Open] from the context menu.

>> The contents of the CD-ROM are displayed.

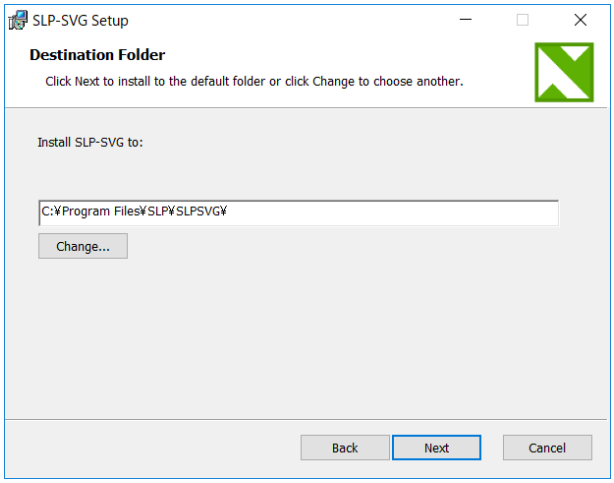
(2) Double-click [setup_slpsvg.msi].

>> The setup wizard opens. Click the [Next] button.



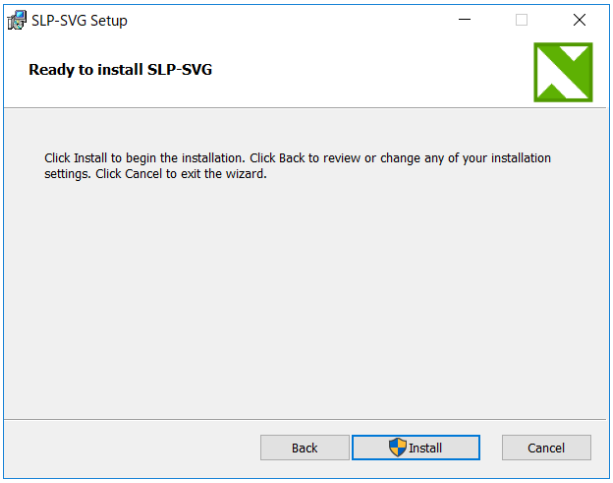
(3) During the installation process, the End-User License Agreement window will be displayed. Check the terms of the agreement. If you accept the software license agreement and wish to install the software, check the [I accept the terms in the License Agreement] check box and click the [Next] button.
If you do not accept the agreement, click the [Cancel] button to cancel installation.

(4) If necessary, change the destination folder.

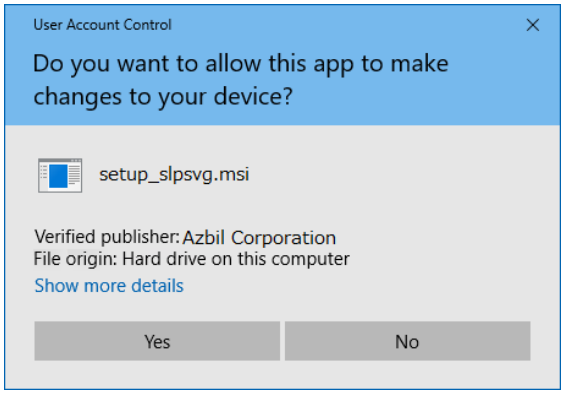


(5) You are now ready to install the software. Click the [Install] button.

>> Installation starts.

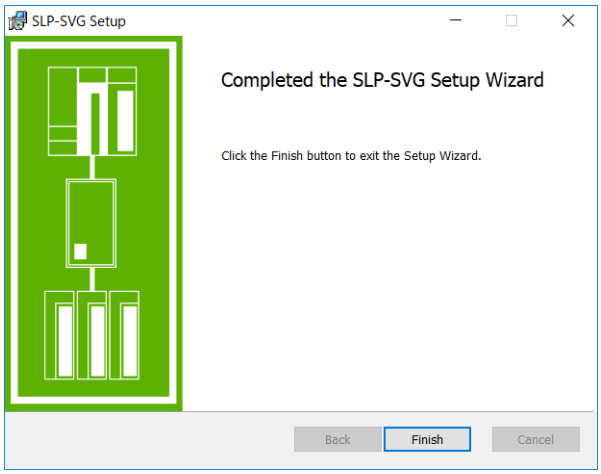


(6) The [User Account Control] window may be displayed. Click the [Yes] button.



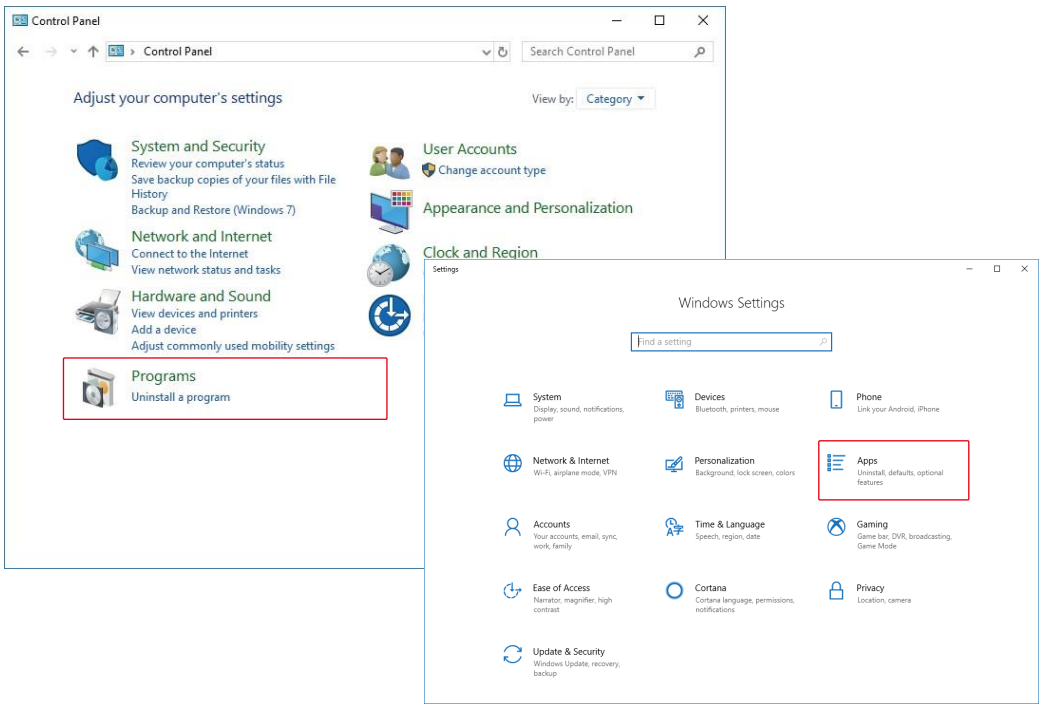
>> Installation begins.

(7) When installation is complete, click the [Finish] button to close the window.



④ Uninstalling the loader

(1) Click [Control Panel] and then double-click [Programs] or [Uninstall a program].
For Windows 10, click [Settings] → [Apps].



(2) Select [SLP-SVG] and click [Uninstall].

>> The loader will be deleted.

Note

- Configuration files created by the user will not be deleted.

④ Loader upgrade and maintenance

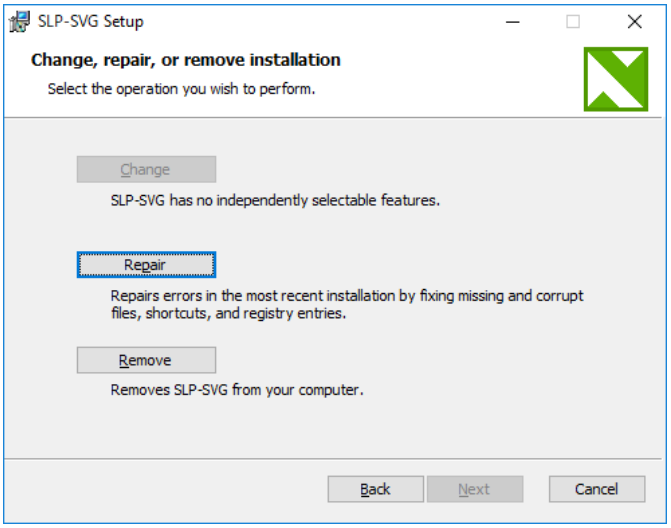
If the setup_slpsvg.msi file for loader installation is executed when the loader is already installed on the PC, the following operations will be done instead of normal installation.

●Upgrade

If a later version of setup_slpsvg.msi is executed, the existing loader will be deleted and the new version will be installed.

●Maintenance

If the same version of setup_slpsvg.msi is executed, the loader enters maintenance installation mode.



Repair: If an executable file was deleted by mistake, for example, select this option to restore the loader to the state immediately after a new installation.

Remove: Deletes loader executable files. Project files saved by the user are not deleted.

5-3 Starting and Exiting the Loader

④ Starting the loader

From the Start menu, select [SLP] → [SLP-SVG].
For Windows 8, select [Start] → [All Apps]→ [SLP-SVG].

>>The loader starts up and the main window is displayed.

Note

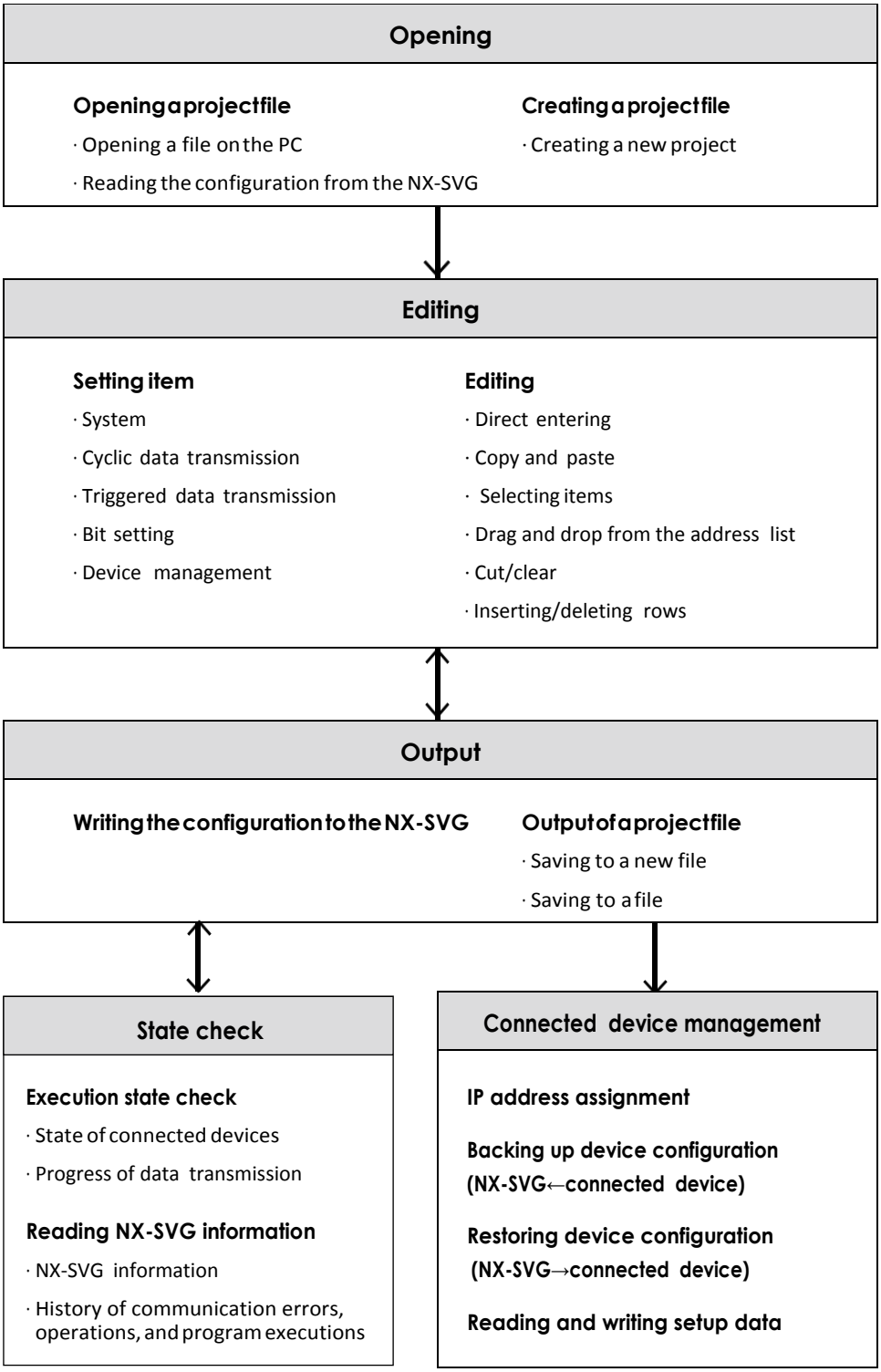
• If the loader is started again from the [Start] menu under these circumstances, another instance of the loader program starts up. (Up to two instances of the loader can run at the same time.)
With two instances of the loader running, editing data and copying and pasting is easy.

④ Exiting the loader

Click the [×] (close) button on the title bar. To exit the loader from the menu, select [File] → [Exit].

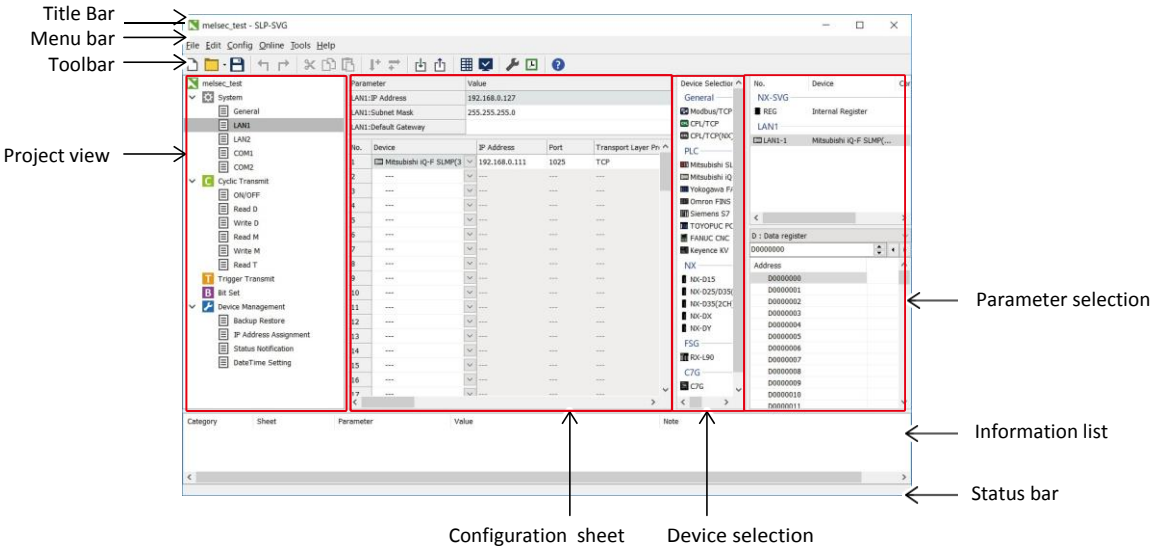
>> The loader will shut down.

5-4 Operation Flowchart



5-5 Main Window

④ Screen components



●Title Bar

Displays the configuration file name and program name.

- If no configuration file is open, "SLP-SVG" is displayed.
- If a configuration file is open, the file name and "- SLP-SVG" are displayed.
- If a configuration file has been opened for the first time, "New Project - SLP-SVG" is displayed.

●Menu bar

Displays available menus.

●Toolbar

Displays buttons associated with items in the menus.

●Project view

Displays setting items for this device's functions in tree view format.

●Configuration sheet

Displays settings for each function.

●Device selection

This pane is displayed if LAN1, LAN2, COM1, or COM2 is selected in the project view. This is for selection of devices to connect to the communication interfaces. Devices to be connected can be easily specified by dragging their icons and dropping them into the [Device] column of the configuration sheet.

●Parameter selection

When a connected device is selected in the upper pane, a list of addresses is displayed in the lower pane to facilitate address entry.

By dragging an address from the list and dropping it into the parameter pane of the configuration sheet, the user can easily specify the address.

●Information list

Displays errors in the settings, if any.

●Status bar

Displays information related to the setting that is selected.

④ Menu bar and toolbar

Operations that can be done with the loader are displayed on the menu bar and toolbar.

Icons and menus are displayed as follows.

Icon	Icons representing functions are displayed for easy access. The functions whose icons are displayed on the toolbar can be executed by clicking the icons.
Menu name	The names of the menus are displayed on the menu bar.
X (underline)	An accelerator key*1
Ctrl+X	A keyboard shortcut.*2 Not displayed if no shortcut keys are available.

*1. Press the underlined key while holding down the Alt key to access the menu easily. For example, pressing the F key while holding down the Alt key will display the File menu in a pull-down list.

*2. A menu item can be executed directly by pressing the indicated key while holding down the Ctrl (or Shift) key. For example, pressing the C key while holding down the Ctrl key will execute "Copy" in the menu.

④ Menu list

● File menu items

Menu	Icon	Submenu	Description	Shortcut keys
File		Create new project...	Creates a new project.	Ctrl + N
		Open project...	Opens a saved project file (.nxsvg).	Ctrl + O
	–	Re-open project	Reopens up to 10 files with paths. Selecting a project file will open the file.	–
		Save project	Saves the open project to a file.	Ctrl + S
	–	Save project as...	Saves the open project with a new file name.	–
	–	Close project	Closes the open project file.	–
	–	Export...	Outputs the settings of the open project file to a CSV file.	–
	–	Exit...	Exits the loader.	–

•Edit menu items

Menu	Icon	Submenu	Description	Shortcut keys
Edit		Undo	Undoes the changes in the displayed configuration sheet.	Ctrl + Z
		Redo	Redoes the changes in the displayed configuration sheet.	Ctrl + Y
		Cut	Transfers the data in the cell selected on the configuration sheet to the clipboard and deletes the data from the source cell.	Ctrl + X
		Copy	Transfers the data in the cell selected on the configuration sheet to the clipboard.	Ctrl + C
		Paste	Pastes the data on the clipboard to the cell selected on the configuration sheet.	Ctrl + V
	–	Clear	Deletes the data in the cell selected on the configuration sheet.	
	–	Select All	Selects all the cells on the configuration sheet.	Ctrl + A
		Increment vert	Pastes the value in the cell selected on the configuration sheet to the cells below, incrementing the values.	
		Increment horz	Pastes the value in the cell selected on the configuration sheet to the cells on the right, incrementing the values.	
		Insert line	Inserts a blank row in the selected position. The selected row shifts downward.	Ctrl + Ins
		Delete line	Deletes the selected row. The rows below the deleted row shift upward to fill the space created by deletion.	Ctrl + Del
		Move up	Moves the selected item to the cell above.	Ctrl + ↑
		Move down	Moves the selected item to the cell below.	Ctrl + ↓
	–	Swap transmit device	Swaps the transmission source and destination devices on the configuration sheet.	
		Search	Displays a palette for searching for character strings (i.e., text).	Ctrl + F
	–	Replace	Displays a palette for searching and replacing character strings.	Ctrl + H

•Configuration menu items

Menu	Icon	Submenu		Description	Shortcut keys
Config	C	Add cyclic data transmit		Adds a new configuration sheet to the open project.	–
	T	Add trigger data transmit		Adds a new configuration sheet to the open project.	–
	B	Add bit set		Adds a new configuration sheet to the open project.	–
	–	Delete config sheet		Deletes the configuration sheet that is selected in the project view.	–
		System config	Swap LAN port	Swaps the settings of LAN1 and LAN2.	–
			Swap COM port	Swaps the settings of COM1 and COM2.	–

•Online menu items

Menu	Icon	Submenu	Description	Shortcut keys
Online		Write gateway config PC→NX-SVG...	Writes the gateway configuration to the NX-SVG.	–
		Read gateway config NX-SVG→PC...	Reads the gateway configuration from the NX-SVG.	–
		NX-SVG Information...	Reads NX-SVG information (version, history, etc.) from the NX-SVG.	–
		Exec monitor...	Displays a window for monitoring data transmission status.	–
		Maintenance manager...	Displays a window for managing connected devices.	–
		Set datetime...	Sets the time on the NX-SVG.	–
	–	Reset NX-SVG...	Stops any current communication. The NX-SVG enters initializing mode.	–

•Tools menu items

Menu	Icon	Submenu	Description	Shortcut keys
Tools		Edit my list...	Customizes, edits, and saves MyList.	–
		Environment...	Configures settings for communication between the SLP-SVG Smart Loader Package and the NX-SVG.	
	–	Update system on NX-SVG...	Updates the NX-SVG system when an IP address is specified.	–

• Help menu items

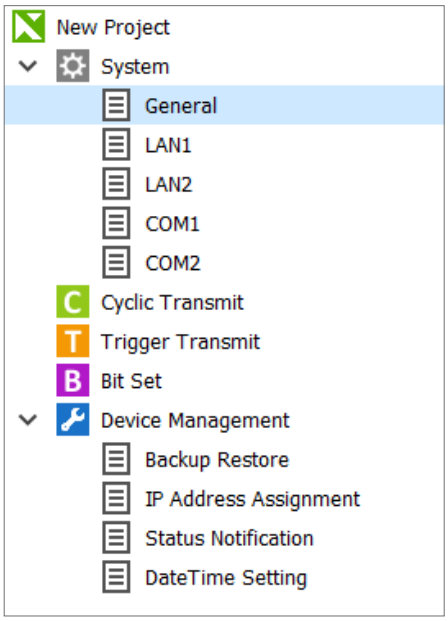
Menu	Icon	Submenu	Description	Shortcut keys
Help	–	Help...	Displays the user's manual (a PDF file).	–
	–	Version...	Displays the version of the loader.	–

④ Project view

This pane displays setting items related to the functions of this device in tree view format.

Each function can be accessed from the project view.

- **Screen components**



Project

This is the top item shown for a project.

The project name is displayed.

If no project file has been created, “New Project” is displayed.

System

Settings for the NX-SVG system can be specified.

- General: Settings for the overall operation of the NX-SVG
- LAN1: Settings for devices connected to the LAN1 connector
- LAN2: Settings for devices connected to the LAN2 connector
- COM1: Settings for devices connected to the RS-485 CH1 connector
- COM2: Settings for devices connected to the RS-485 CH2 terminal

Cyclic Transmit

Setting items for cyclic data transmission are displayed.

Trigger Transmit

Setting items for triggered data transmission are displayed.

Bit Set

Setting items for bit setting are displayed.

Device Management

Setting items for device management are displayed.

- Backup Restore: This setting is for backup and restoration of the configuration file for the connected device.
- IP Address Assignment: This setting is for assigning an IP address to the connected device.
- Status Notification: This setting is for notifying the state of the NX-SVG to the host device.
- DateTime Setting: This setting is for setting the time on the NX-SVG's internal clock.

●Creating a new configuration sheet

New configuration sheets can be created from pop-up menus in the project view. To display a pop-up menu, right-click a function name.

(8) In the project view, right-click the desired function or configuration sheet category.

(9) From the displayed pop-up menu, select [Create config sheet].

A new configuration sheet can also be created from the menu on the menu bar.

(1) Select the [Config] menu.

(2) Select the desired function.

●Editing a configuration sheet

To edit a configuration sheet (cut, copy, or paste data; delete or move a sheet), right-click the sheet in the project view to display a pop-up menu, and execute [Edit]. [Edit] can also be executed from the menu bar.

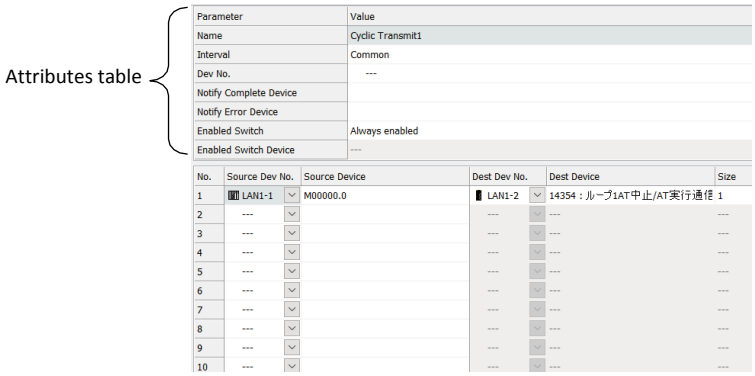
Note

- It is not possible to select multiple configuration sheets simultaneously. Select and edit one by one.

④ Configuration sheet

A configuration sheet consists of tables for configuration of various functions. The configuration sheet that is selected in the project view is displayed.

● Screen components



Attributes table

A table of basic settings for the selected function (device No., notification process, etc.) is displayed.

Items that can be specified vary depending on the function.

☞ Chapter 6 “Configuration”

Process configuration table

A table of settings for the process that is executed based on the configuration sheet is displayed.

Items that can be specified vary depending on the function.

☞ Chapter 6 “Configuration”

●Copy and paste

The user can copy and paste the data in the cells selected on the configuration sheet. Being able to paste data in units of rows or columns is convenient for batch entry. Also, the copied data can be pasted onto a spreadsheet to create a document, etc.

To copy and paste a large amount of data, use shortcut keys (Ctrl + C, Ctrl + V) for efficiency.

Multiple cells can be selected by using any of the following methods:

·Selecting all cells: Select the cell in the top left corner of the configuration sheet.

·Selecting a row: Select the leftmost cell of the row.

·Selecting a column: Select the cell at the top of the row.

●Editing rows

To edit rows (clear, insert, delete, move up or down) in the attributes table or process configuration table, select multiple rows in the table to display a pop-up menu, and execute [Edit]. [Edit] can also be executed from the menu bar.

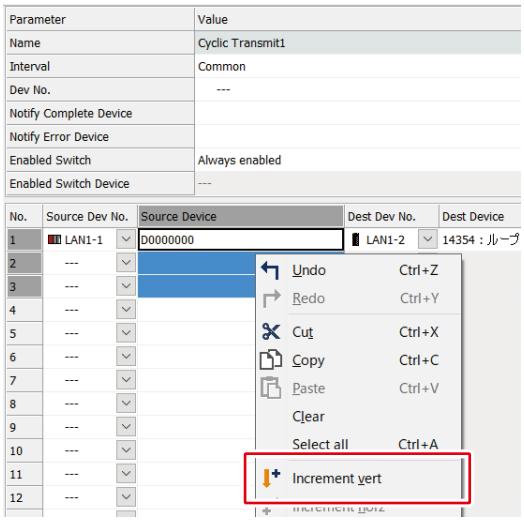
●Incremental copy

Using the following procedure, the value in a cell can be copied and incremented.

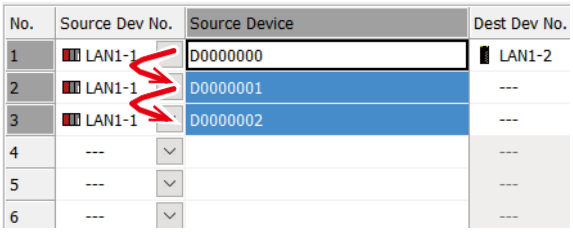
(1) Select a cell to copy.

(2) Select consecutive destination cells. In the example shown in the following figure, the value in the cell selected in step 1 will be copied to two cells that are below the cell.

(3) Right-click on the cells and select [Increment vert] from the pull-down menu.



>> The value is incremented and copied to the destination cells.



●Searching

Using the following procedure, character strings in the process configuration table can be searched for.

(1) On the menu bar, select [Edit] → [Search].

>> The search palette is displayed below the process configuration table.

(2) Enter the character string to search for.

(3) To search downward, click the [Next] button or press the F3 key.

(4) To search upward, click the [Prev] button or press the Shift + F3 keys.

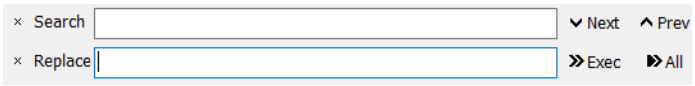
(5) To end searching and close the pallet, click the [×] button.

● Replacement

Using the following procedure, characters in the process configuration table can be replaced with other characters.

(1) On the menu bar, select [Edit] → [Replace].

>> The palettes for searching and replacing are displayed below the process configuration table.



(2) Enter the character string to search for.

(3) Enter the replacement character string.

(4) Click the [>>Exec] button or press the Alt + R keys to move to the first cell with the searched-for character string.

(5) Click the [>>Exec] button or press the Alt + R keys again to replace the characters and move to the next cell with the searched-for character string.

(6) If the [>All] button is clicked or the Alt + A keys are pressed, all the characters in the process configuration table that meet the search condition will be replaced.

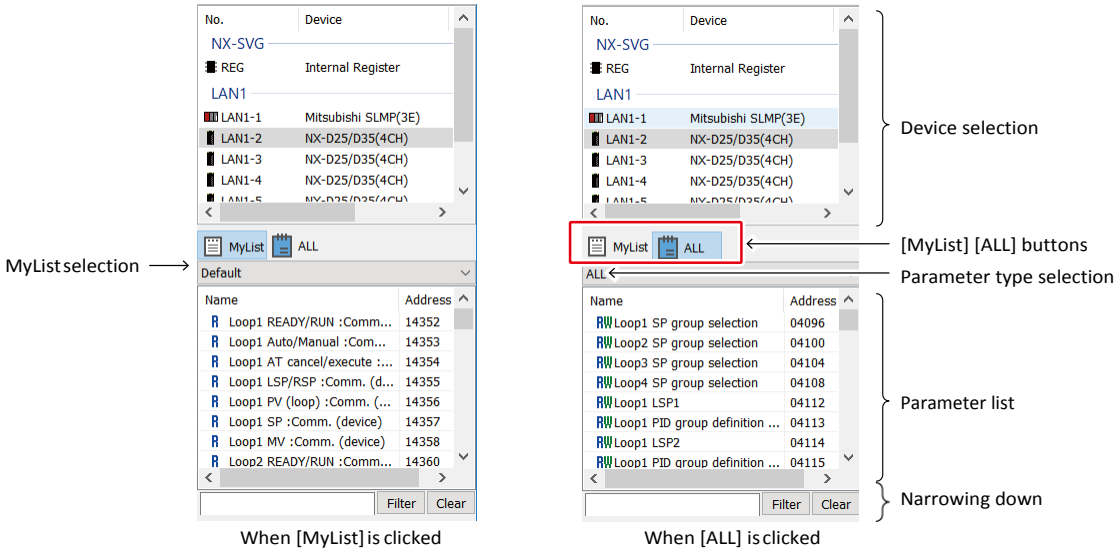
(7) To end replacement and close the palette, click the [×] button.

④ Parameter selection

This pane displays devices that are connected by the system and parameters for them.

● Screen components (when an Azbil product other than the C7G is selected)

Pressing the [MyList] or [ALL] button changes the screen as follows. If [MyList] is clicked, a list of frequently used parameters (like bookmarks in a book) is displayed. Clicking [ALL] displays all parameters.



Device selection

This pane displays connected devices in a tree view. Multiple devices can be selected.

[MyList] [ALL] buttons

If [MyList] is clicked, the MyList selection field is displayed, and the parameter list shows the parameters in the selected MyList.

If [ALL] is clicked, the parameter type selection field is displayed, and the parameter list shows all parameters of the selected device.

MyList selection

This field is displayed only when [MyList] is clicked. Select a MyList from the drop-down list.

Parameter type selection

This field is displayed only when [ALL] is clicked. Select a parameter type from the drop-down list. The types of parameter displayed in this field differ depending on the type of device.

Narrowing down

It is possible to display only the parameters whose name includes specified characters.

Parameter list

A list of parameters of the slave device selected in the device selection pane is displayed.

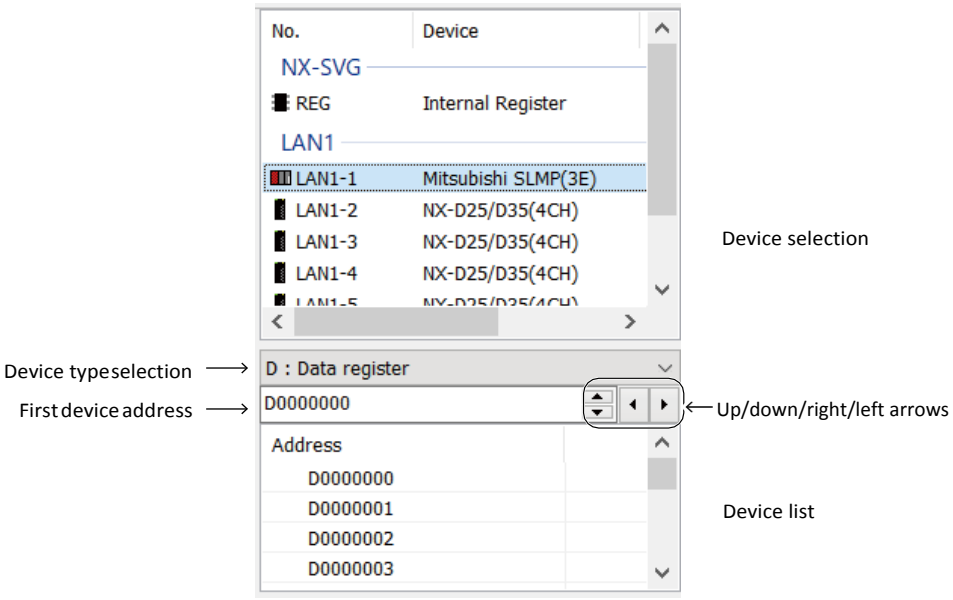
The following icons are displayed on the left of the parameters.

- RW : Parameter data that can be read and written
- R : Parameter data that can be read
- W : Parameter data that can be written

Handling Precautions

- Some devices such as temperature controllers allow the user to select writing to RAM or ROM (EEPROM). Please refer to the user's manual for the device. Values written to ROM are saved even if the power is turned off, but the number of times values can be written to ROM is limited. For some devices, [EEPROM] is displayed at the top row of the parameter list of the device.

●Screen components (when a PLC, etc., is selected)



Device type selection

Allows selection of the type of device displayed in the device list.

First device address

Specifies the device address that is displayed at the top of the device list.

Device list

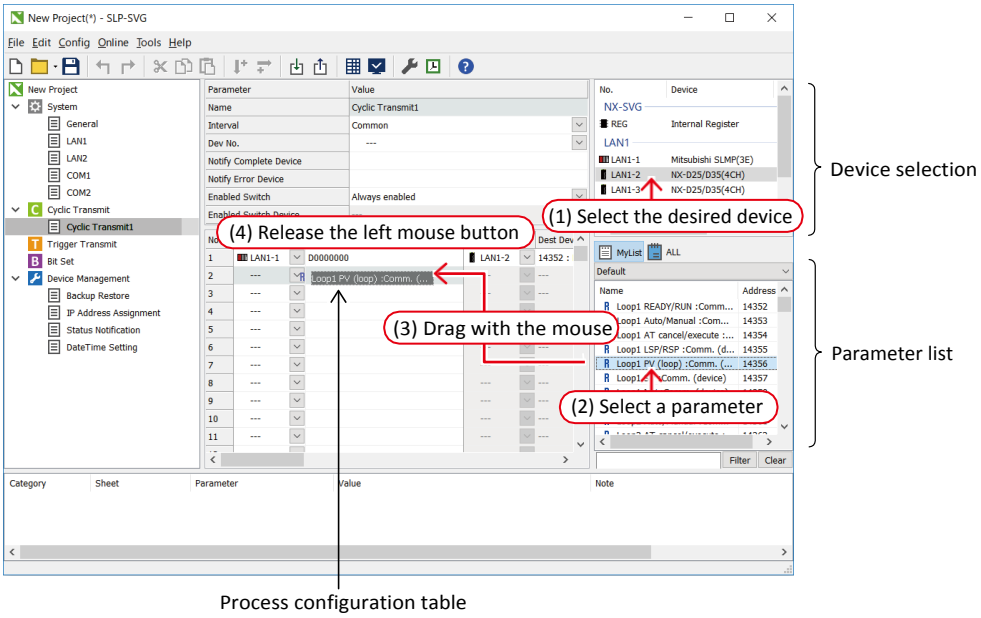
Device addresses for the host device selected in the device selection pane are displayed (100 addresses at a time).

Up/down/right/left arrows

When the right or left arrow is clicked, the next or previous 100 addresses are displayed. When the up or down arrow is clicked, the addresses are scrolled up or down by one address.

●Drag and drop

By dragging an item from the parameter list and dropping it onto the configuration sheet, the address of the parameter can be easily set.



(1) In the device selection pane, select the device whose parameter should be set.

(2) In the parameter list pane, select the parameter to be set.

(3) Drag the parameter to the desired position in the process configuration table.

(4) Release the left button of the mouse.

●Copy and paste

Parameters in the parameter list can be copied and pasted to the configuration sheet.

(1) In the device selection pane, select the device whose parameter should be set.

(2) In the parameter list pane, select the parameter to be set.

(3) Select [Copy] from the pop-up menu or from the [Edit] menu on the menu bar.

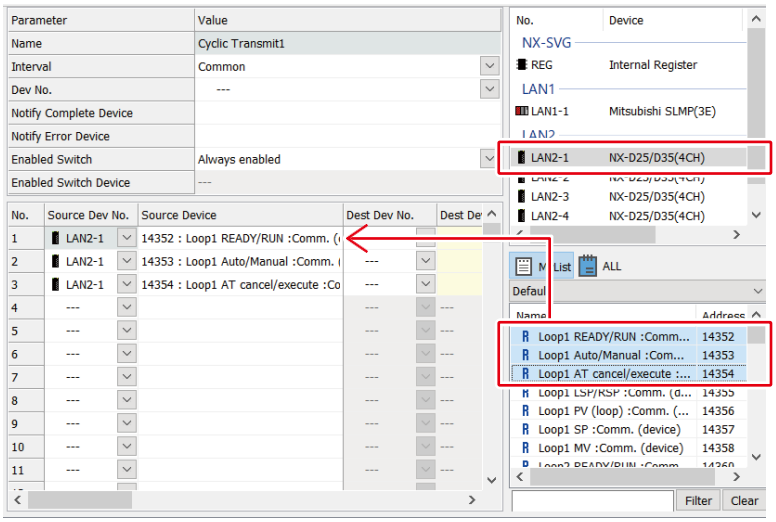
(4) Select [Paste] from the pop-up menu for the desired cell of the configuration sheet, or select [Paste] from the [Edit] menu on the menu bar.

•Copy and paste of multiple items

It is possible to copy multiple items and paste them onto the configuration sheet at once.

• Selecting multiple parameters

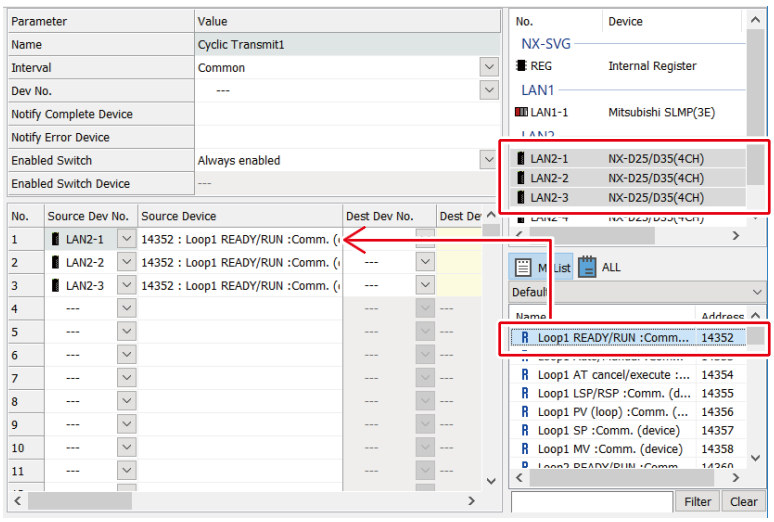
Ex.: An NX-D25 device (No. LAN2-1 in LAN 2) is selected in the device selection pane and parameter addresses 14352, 14353, and 14354 are selected in the parameter list pane



Device No.	Device parameters
LAN2-1	14352: Loop 1 READY/RUN
LAN2-1	14353: Loop 1 Auto/Manual
LAN2-1	14354: Loop 1 AT cancel/execute

• Selecting multiple devices

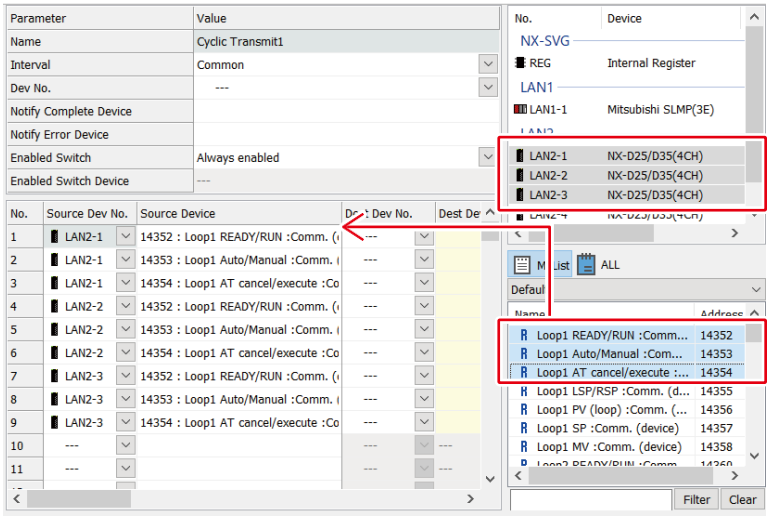
Ex.: NX-D25 devices (Nos. LAN2-1, LAN2-2, and LAN2-3 in LAN 2) are selected in the device selection pane and parameter address 14352 is selected in the parameter list pane



Device No.	Device parameters
LAN2-1	14352: Loop 1 READY/RUN
LAN2-2	14352: Loop 1 READY/RUN
LAN2-3	14352: Loop 1 READY/RUN

- **Selecting multiple parameters of multiple devices**

Ex.: NX-D25 devices (Nos. LAN2-1, LAN2-2, and LAN2-3 in LAN 2) are selected in the device selection pane, and parameter addresses 14352, 14353, and 14354 are selected in the parameter list pane



Device No.	Device parameters
LAN2-1	14352: Loop 1 READY/RUN
LAN2-1	14353: Loop 1 Auto/Manual
LAN2-1	14354: Loop 1 AT cancel/execute
LAN2-2	14352: Loop 1 READY/RUN
LAN2-2	14353: Loop 1 Auto/Manual
LAN2-2	14354: Loop 1 AT cancel/execute
LAN2-3	14352: Loop 1 READY/RUN
LAN2-3	14353: Loop 1 Auto/Manual
LAN2-3	14354: Loop 1 AT cancel/execute

- **Swapping LAN ports**

The devices set for LAN1 and LAN 2 can be swapped. Values in the [Dev No.] column of all configuration sheets are also swapped.

(1) From the [Config] menu, select [System config] → [Swap LAN port].

>> A confirmation message is displayed.

(2) Click the [OK] button.

>> Items are swapped.

● Swapping COM ports

The devices set for COM1 and COM2 can be swapped. Values in the [Dev No.] column of all configuration sheets are also swapped.

(1) From the [Config] menu, select [System config] → [Swap COM port].

>> A confirmation message is displayed.

(2) Click the [OK] button.

>> Items are swapped.

④ Information list

If there is an error in the settings on the configuration sheet, the error is displayed in the information list.

The following information on errors is displayed.

- Category: Cyclic Transmit, Trigger Transmit, Bit Set, Device Management, etc.
- Sheet: The name of the sheet with an error
- Parameter: The name of the parameter with an error
- Value: If there is a problem with the input value, the value is displayed.
- Note: Error details

The following configuration error messages will be displayed:

Message	Type	Description
Upper bounds of the number of operations were exceeded.	Error	The maximum number of rows that can be processed by the function was exceeded. The maximum number of rows is 10,000 for cyclic and triggered data transmission, and 1,000 for bit setting.
Invalid value.	Error	The notation is illegal.
Upper bounds of the number of operations were exceeded.	Error	The maximum number of “SYNC” settings (9) that can be set for data transmission was exceeded.
Over the range.	Error	A value that is outside the range was specified.
It is not possible to set the fixed number.	Error	A constant (K1, #1, etc.) was input for an item which cannot be a constant.
Not configured.	Error	An item that has not been set up (connected device, etc.) was selected.
Empty...	Warning	An item that must be specified was left blank.
Different from the network address of the NX-SVG.	Error	The IP address of a connected device includes a network address that is different from the network address of LAN1 or LAN2.
Upper bounds of the length of text were exceeded.	Error	A character string exceeding the maximum number of characters (64) was specified as a sheet name or as the password for the settings read-protection function
This value is used as an IP address for loader communication.	Error	An address that is reserved for communication with the loader was specified.
Upper bounds of the sum of connections were exceeded.	Error	The maximum number of connected devices (128) that can be set for the LAN ports was exceeded.
The IP address of connected device overlaps the address of NX-SVG.	Error	The same IP address was set for the connected device and the NX-SVG.

Message	Type	Description
The network address of each NIC of NX-SVG overlaps.	Error	The same network address was set for LAN1 and LAN2.
It is not possible to set the loopback address.	Error	The loopback address (127.0.0.1) was set as an IP address.
It is not possible to set the broadcast address.	Error	All bits of the host part of the IP address were set to“1.”
It is not possible to set the multicast address.	Error	A multicast address (class D address) was set as an IP address.
It is not possible to set the host address to 0.	Error	All bits of the host part of the IP address were set to“0.”
It is not possible to set multiple default gateways.	Error	The default gateway was set for both LAN1 and LAN 2
It is not possible to set the same network address for both LANs.	Error	A default gateway is set for the system, and the LAN2 network address was set for a device connected to LAN1 (and vice versa).
IP address assignment for this device is not executed.	Information	A Network Instrumentation Module in another network that is connected via the default gateway is set as a connected device. The NX-SVG cannot assign an IP address to a device in another network.
It is not possible to set a device that uses a different communication protocol.	Error	Devices with different communication protocols are connected to the same COM port.
Trigger type setting conflicts.	Error	With [Common: Init Trigger Device] set to [Enabled], OFF→ON and ON→OFF are specified for the same trigger device.

If there is an error in the configuration, the data cannot be transmitted to the NX-SVG.

To show the illegal setting, double-click the message, or select the message and press the Enter key. The configuration sheet with the error is displayed and the cell with the illegal setting has the focus.

5-6 Connecting to Model NX-SVG

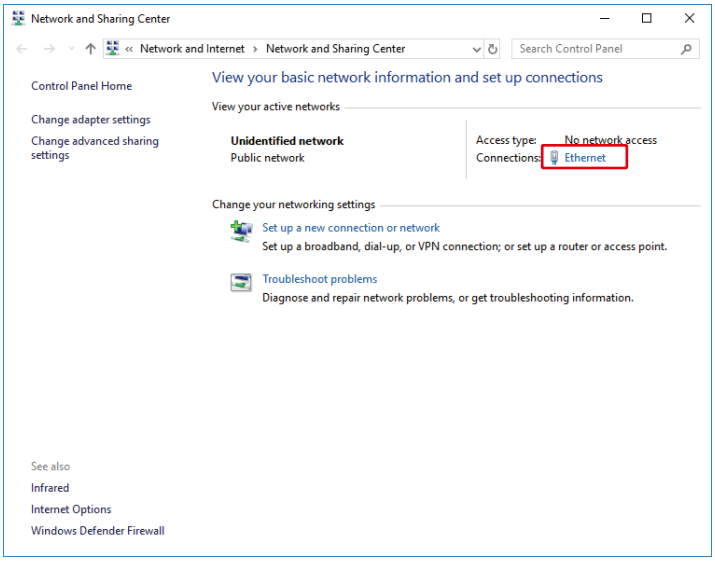
④ Communication settings for the PC

- **Procedure**

This procedure changes the IP address of the PC so that it can be connected to this device. The LAN1 port of this device can have multiple IP addresses, and 192.168.255.253 is preset for the loader connection. The example below explains the setting procedure for connecting the LAN1 port with the IP address for loader connection.

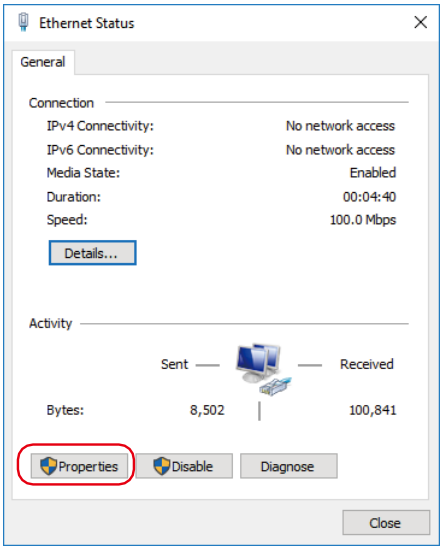
(10) Select [Control Panel] (Display method → Category) → [Network and Internet] → [View network status and tasks].
For Windows 10, click [Settings] → [Network and Internet] → [Status] → [Network and Sharing Center].

>> The [Network and Sharing Center] window is displayed.



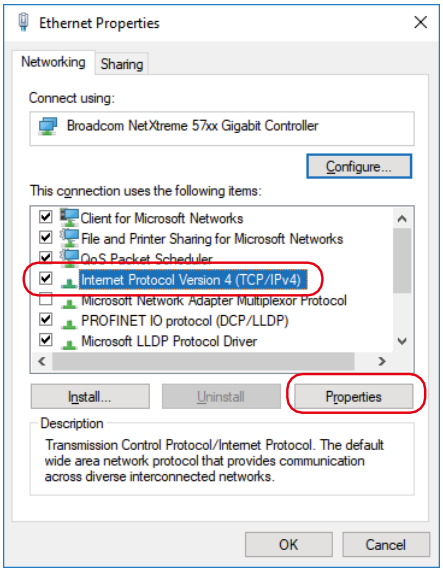
(11) Click the character string on the right of the network connection for this device. In a normal case, the characters string will be [Ethernet] or [Local Area Connection].

>> The [Ethernet Status] window is displayed.



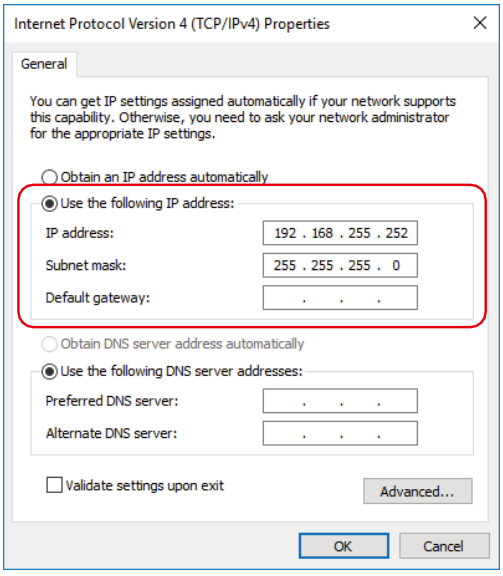
(12) Click the [Properties] button.

>> The [Ethernet Properties] window is displayed.



(13) Select [Internet Protocol Version 4 (TCP/IPv4)] and click the [Properties] button.

>> The [Internet Protocol Version 4 (TCP/IPv4) Properties] window is displayed.

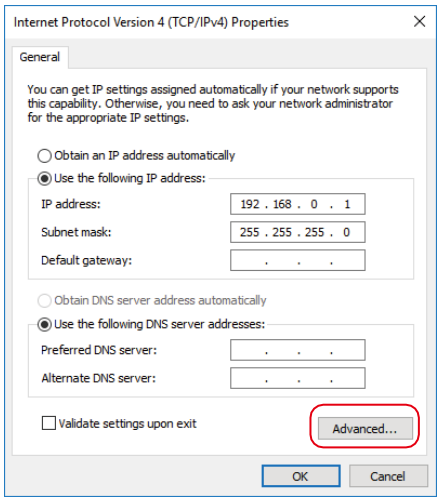


(14) Select [Use the following IP address:] and set the following values for the IP address and subnet mask. If the PC is connected directly to this device, it is not necessary to set the default gateway.

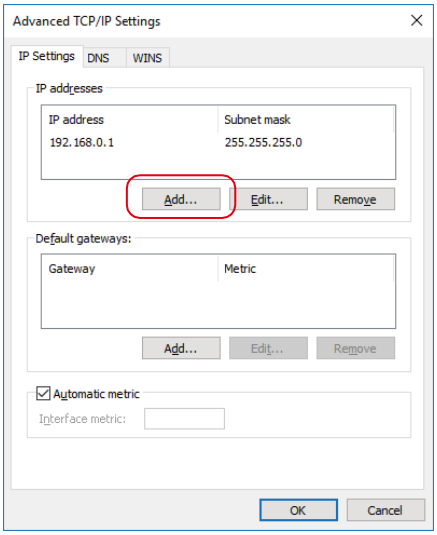
IP address: 192.168.255.252

Subnet mask: 255.255.255.0

(15) If the PC is already communicating with other devices with the preset IP, click the [Advanced...] button.

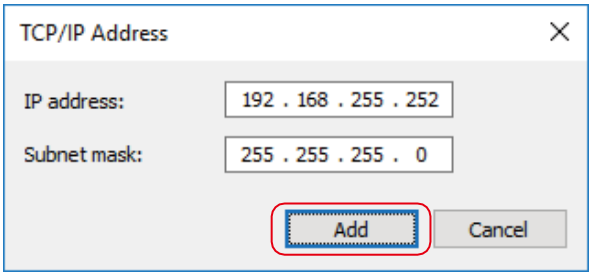


>> The [Advanced TCP/IP Settings] window is displayed.



(16) Click the [Add...] button.

>> The [TCP/IP Address] window is displayed.



(17) Set the following values for the IP address and subnet mask, and then click the [Add] button.

IP address: 192.168.255.252

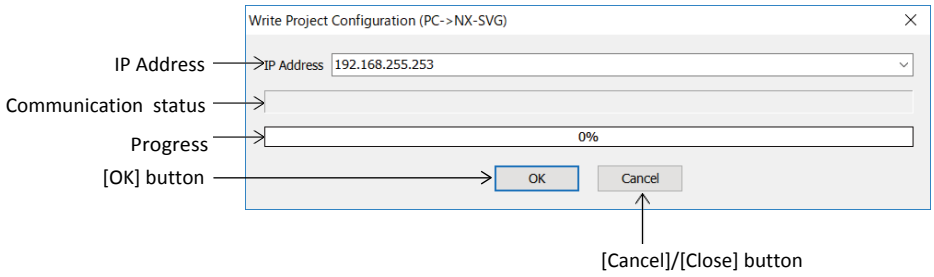
Subnet mask: 255.255.255.0

(18) Click the [OK] button.

>> The [Internet Protocol Version 4 (TCP/IPv4)] window closes.

④ Communication status

The window that is displayed when the configuration of a project is being written to the NX-SVG, etc., is explained below.



IP address setting

Specifies the IP address of the NX-SVG that is connected to the PC.

Communication status

Displays the status of the current communication.

Progress

Displays the progress of communication with a bar graph and a percentage.

[OK] button

Use this button when executing the following two processes.

·Write gateway config PC→NX-SVG

·Read gateway config NX-SVG→PC

Clicking the [OK] button will start the process.

[Cancel]/[Close] button

Clicking the [Cancel] button will cancel any communication that is in progress.

If the communication process is interrupted (canceled or aborted), the [Close] button will be displayed.

Check the status and click the [Close] button to close the window.

④ Writing the gateway configuration

●Procedure

(1) On the menu bar, select [Online] → [Write gateway config PC → NX-SVG...].

>> The communication status window is displayed.

(2) Specify the IP address of the NX-SVG that is connected to the PC.

(3) Clicking the [OK] button will start the writing of gateway configuration.

>> If the communication is completed properly, the communication status window closes.

●Description

- If a project file is open, the configuration of the project is written to the NX-SVG.
- If there is an error in the project configuration, an error message is displayed. In this case, the configuration file is not downloaded.
  The version of the system file on the NX-SVG and PC is compared. If the NX-SVG has an older system file, a confirmation message for system update is displayed.
  ☞ 5-9 Updating the System of Model NX-SVG (p. 5-46)
- A confirmation message saying that the NX-SVG will enter STOP mode is displayed. If the [OK] button is clicked, the NX-SVG enters STOP mode and starts writing the configuration file. If the [Cancel] button is clicked, the configuration file is not written.
- When writing of the configuration file is complete, the gateway program automatically restarts and the NX-SVG enters RUN mode.

④ Reading the gateway settings

●Procedure

(1) On the menu bar, select [Online] → [Read gateway config NX-SVG→PC].

>> The window for saving the project is displayed.

(2) Select the project file whose configuration you wish to save.

(3) Click the [OK] button.

>> The window for saving the project closes and the communication status window is displayed.

(4) Specify the IP address of the NX-SVG that is connected to the PC.

(5) Clicking the [OK] button will start the reading of gateway configuration file.

>> If the communication is completed properly, the communication status window closes.

●Description

While the gateway configuration file is being read, the mode will not change.

④ Checking execution status

●Procedure

(1) On the menu bar, select [Online] → [Exec monitor].

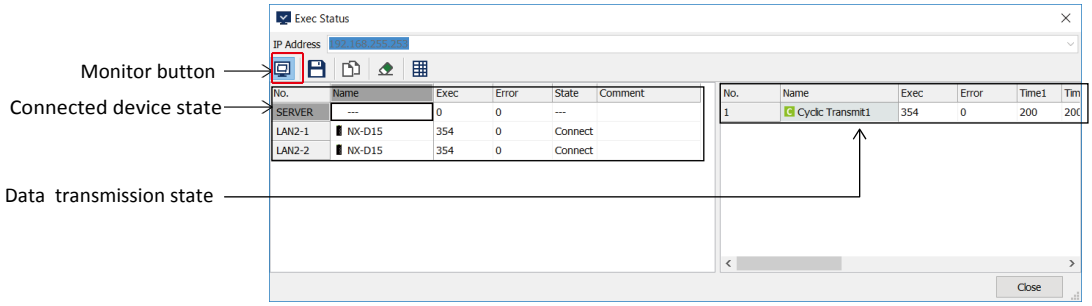
>> The [Exec Status] window is displayed.

(2) Click the monitor button .

>> The screen is updated periodically.

(3) To stop updating, click the monitor button again.

(4) To close the window, click the [Close] button.



Monitor button

Starts or stops monitoring of the state of connected devices and data transmission.

Save button

Saves the data that was read to a CSV file.

Copy button

Transfers the value in a cell to the clipboard.

Clear button

Deletes monitor information (various counters, execution time).

NX-SVG information button

Displays the [NX-SVG Information] window.

State of connected devices

Displays the connection state of connected devices and the number of executed communication processes and errors. The comment column displays any comments that were entered for the devices.

Data transmission state

Displays the number of executed data transmissions and errors, and the last 10 processing times (for cycles, the actual cycle times) for each sheet.

④ Reading model NX-SVG information

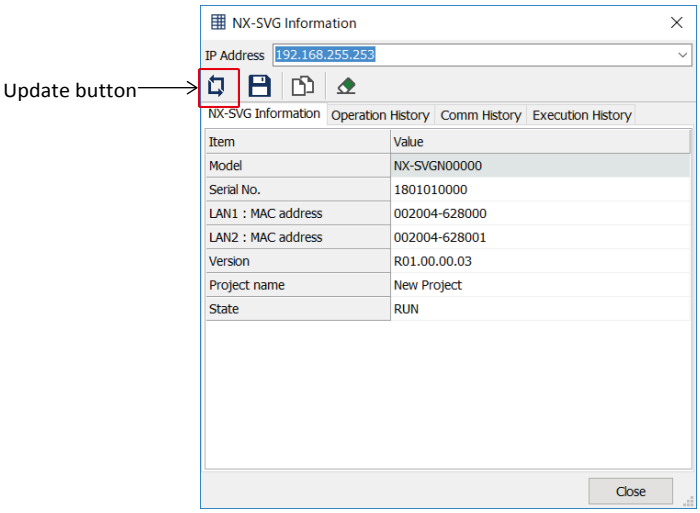
●Procedure

(1) On the menu bar, select [Online] → [NX-SVG Information].

>> The [NX-SVG Information] windows is displayed.

(2) Click the update button.

>> The screen is updated.



Update button

Reads and displays NX-SVG information and the history of communication errors, operations, and executions.

Save button

Saves the data that was read to a CSV file.

Copy button

Transfers the value in a cell to the clipboard.

Clear button

Deletes NX-SVG information and history, and deletes the information displayed in the window.

Handling Precautions

- If the same communication error occurs consecutively, only the first one is recorded. Once communication returns to normal, a recovery history is recorded. If consecutive errors occur again, the first one is recorded.
- Note that if the history is deleted using the Clear button when there are consecutive errors, it will seem that there were no errors, because not all errors are recorded, as explained above.

●Model NX-SVG information

Model

Displays the model number of the NX-SVG.

Serial No.

Displays the serial number of the NX-SVG.

LAN1: MAC address

Displays the MAC address for LAN1 of the NX-SVG.

LAN2: MAC address

Displays the MAC address for LAN2 of the NX-SVG.

Version

Displays the version of the NX-SVG.

Project name

Displays the name of the configuration file that was written to the NX-SVG.

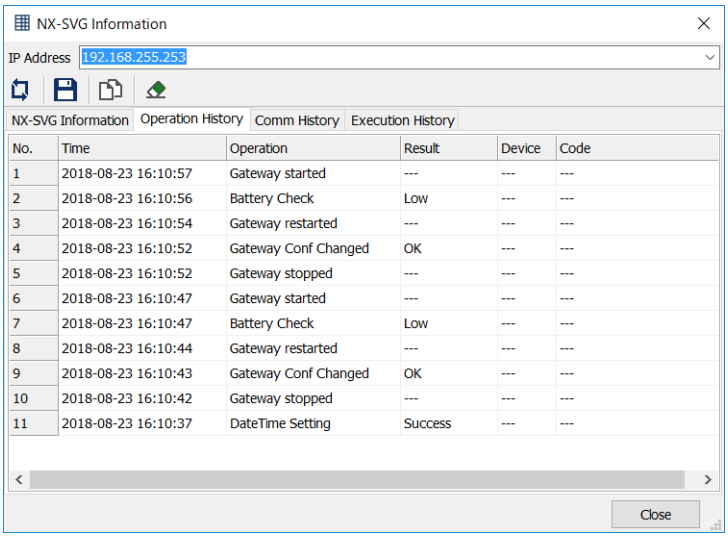
State

Displays the state of the NX-SVG. There are the following types of state.

- Initializing
- Judging connected devices
- RUN
- STOP
- Illegal STOP

● Operation history

Timestamps are displayed with the history of operations. Relative time since power-on is displayed. By expanding the window, all items can be checked.



No.	Time	Operation	Result	Device	Code
1	2018-08-23 16:10:57	Gateway started	---	---	---
2	2018-08-23 16:10:56	Battery Check	Low	---	---
3	2018-08-23 16:10:54	Gateway restarted	---	---	---
4	2018-08-23 16:10:52	Gateway Conf Changed	OK	---	---
5	2018-08-23 16:10:52	Gateway stopped	---	---	---
6	2018-08-23 16:10:47	Gateway started	---	---	---
7	2018-08-23 16:10:47	Battery Check	Low	---	---
8	2018-08-23 16:10:44	Gateway restarted	---	---	---
9	2018-08-23 16:10:43	Gateway Conf Changed	OK	---	---
10	2018-08-23 16:10:42	Gateway stopped	---	---	---
11	2018-08-23 16:10:37	DateTime Setting	Success	---	---

Time

Displays the time of execution.

If the time on this device was set after power-on or if a battery is used, the actual time is displayed. If the time was not set, the time relative to 9:00 on January 1, 2000, which is set as the time of power-on, is recorded.

Operation, Result, Device, Code

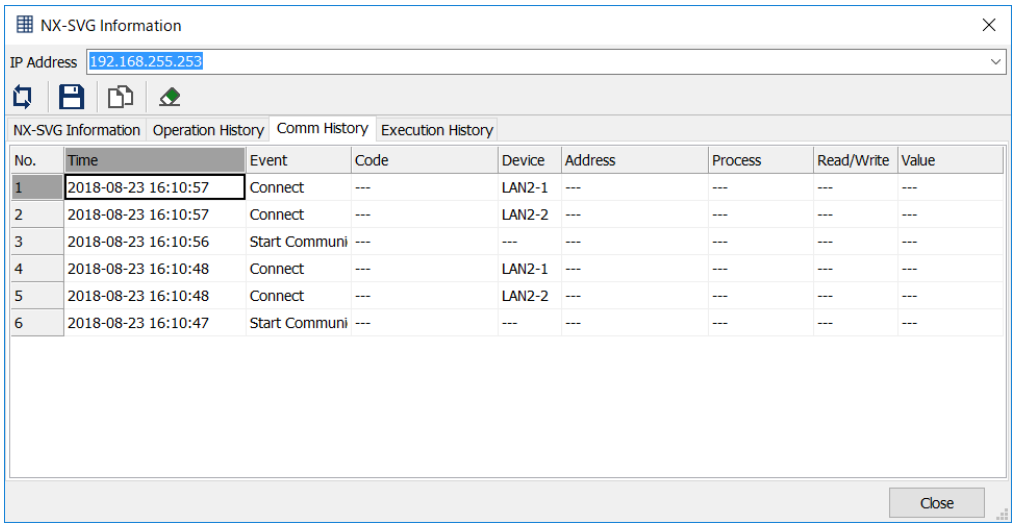
The following information is displayed in the history.

Operation	Result	Device	Code
Update system	OK/Failure	–	–
System started	–	–	–
Gateway restarted	–	–	–
System reset	–	–	–
Gateway Config. Changed	OK/Failure	–	–
Device Conf Changed	–	–	–
Comm Driver Changed	–	–	–
Maintenance Tool Changed	–	–	–
Gateway started	–	–	–
Gateway stopped	–	–	–
Backup Device Config	Success/ Failure	The number of the device with the failure.	File corrupted. Get module version failure. Model number mismatch. Unsupported version Cannot read file. Connect failure Request send/recv error. Recv error, File save error.
Restore Device Config	Success/ Failure	The number of the device with the failure.	File corrupted. Get module version failure. Model number mismatch. Unsupported version Cannot read file. Connect failure Request send/recv error. Recv error, Error response. Backup file is too big.
Assign IP Address	Success/ Failure	The number of the device with the failure.	Too many devices. Local IP not match. Socket error. Canceled. Invalid IP Address. Node count unmatch. SetupNodeIndex or SetupIniBody failure. Verify failure.
DateTime Setting	Success/ Failure	–	–
Operation: Exec. non-support ID	–	–	–
Operation: Exec. error	–	–	–

Operation	Result	Device	Code
Operation: Stop application	–	–	–
Internal temperature (°C)		–	–
Memory error	–	–	–
Internal error	–	–	–
Base-body model No. mismatch	–	–	–
Configuration Error	–	–	–
Gateway error stopped		–	–

•Communication history

The time (relative time from power-on) at which a communication error event occurred is displayed. By expanding the window, all items can be checked.



No.	Time	Event	Code	Device	Address	Process	Read/Write	Value
1	2018-08-23 16:10:57	Connect	---	LAN2-1	---	---	---	---
2	2018-08-23 16:10:57	Connect	---	LAN2-2	---	---	---	---
3	2018-08-23 16:10:56	Start Communi	---	---	---	---	---	---
4	2018-08-23 16:10:48	Connect	---	LAN2-1	---	---	---	---
5	2018-08-23 16:10:48	Connect	---	LAN2-2	---	---	---	---
6	2018-08-23 16:10:47	Start Communi	---	---	---	---	---	---

Time

Displays the time at which the event occurred.

If the time on this device was set after power-on or if a battery is used, the actual time is displayed. If the time was not set, the time relative to 9:00 on January 1, 2000, which is set as the time of power-on, is recorded.

Event

Displays the name of the event.

Code

Displays the error code in the error response from the connected device.

! Handling Precautions

- For details on error codes, refer to the user's manual for the connected device.

Device

The number of the device which had or which recovered from the communication error is displayed.

Address

The address of the device which had or which recovered from the communication error is displayed.

Process

The name of the process which had or which recovered from the communication error is displayed. The process name includes:

- Data transmit
- Bit Set
- Constitution
- Read trigger
- Initialize trigger
- Notification
- Initialize notification

Read/Write

Indicates whether the communication error occurred in data reading or writing.

Value

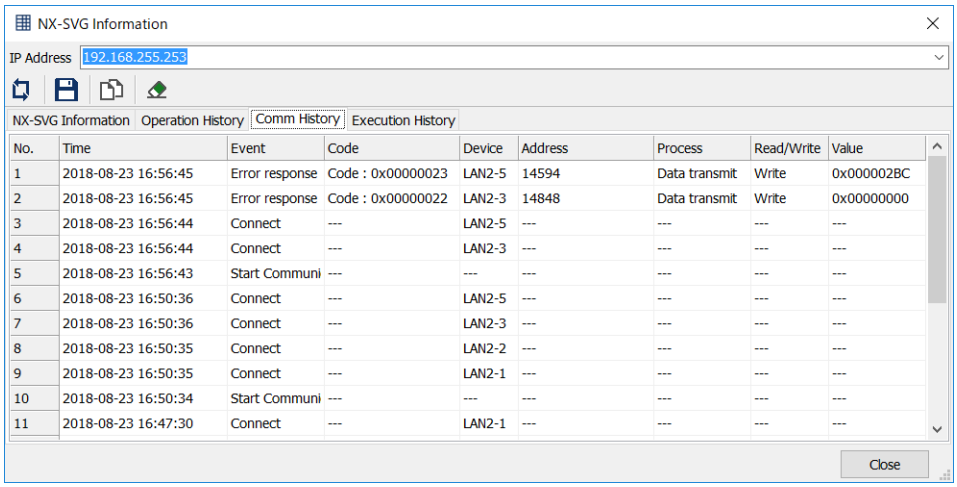
Displays the written value that should be recovered.

The following information is displayed in the history.

Event	Code	Device	Address	Process	Read/Write	Value
Connect	–	Device No.	–	–	–	–
Disconnect	Timeout Connection error	Device No.	–	–	–	–
Start Communication	–	–	–	–	–	–
Recover	Code: 0xXXXXXXXX	Device No.	–	–	–	–
Error response	Code: 0xXXXXXXXX	Device No.	Target data address	Process name	Read Write	– Written value
Conf error	–	–	Target data address	–	Read Write	– Written value
Connection	Server Connection	Reg. No.	IP address: Port No.	–	–	–
Disconnect	Server Connection	Reg. No.	IP address: Port No.	–	–	–
Access error	Illegal address	Reg. No.	Target data address (IP address: Port No.)	–	Read Write	– Written value

Note

- When an error occurs in communication with connected devices, the user can infer the cause of the error by checking the communication history.
  The following example shows an error in communication with the Network Instrumentation Modules connected with LAN2.



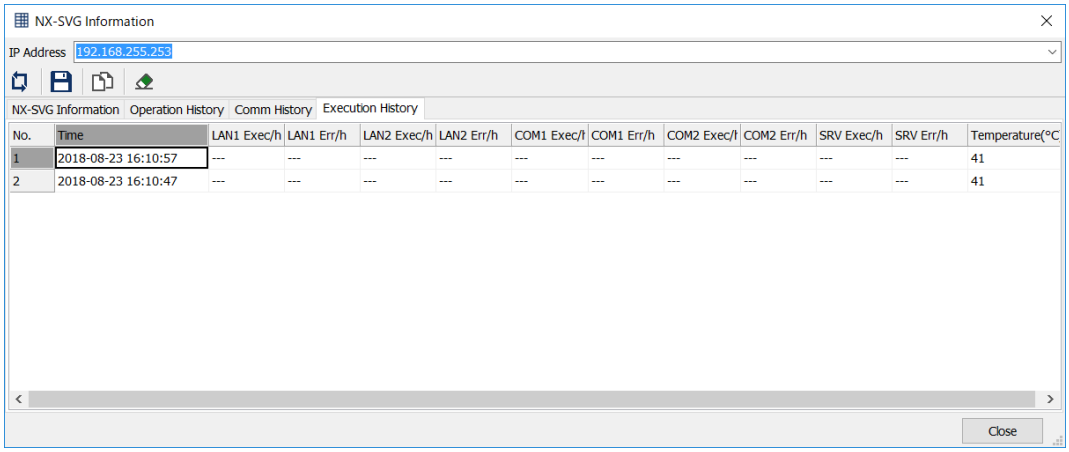
No.	Time	Event	Code	Device	Address	Process	Read/Write	Value
1	2018-08-23 16:56:45	Error response	Code : 0x00000023	LAN2-5	14594	Data transmit	Write	0x000002BC
2	2018-08-23 16:56:45	Error response	Code : 0x00000022	LAN2-3	14848	Data transmit	Write	0x00000000
3	2018-08-23 16:56:44	Connect	---	LAN2-5	---	---	---	---
4	2018-08-23 16:56:44	Connect	---	LAN2-3	---	---	---	---
5	2018-08-23 16:56:43	Start Communi	---	---	---	---	---	---
6	2018-08-23 16:50:36	Connect	---	LAN2-5	---	---	---	---
7	2018-08-23 16:50:36	Connect	---	LAN2-3	---	---	---	---
8	2018-08-23 16:50:35	Connect	---	LAN2-2	---	---	---	---
9	2018-08-23 16:50:35	Connect	---	LAN2-1	---	---	---	---
10	2018-08-23 16:50:34	Start Communi	---	---	---	---	---	---
11	2018-08-23 16:47:30	Connect	---	LAN2-1	---	---	---	---

History entry No. 1 shows that writing of 0x000002BC (700) to address 14594 (loop 1 manual MV) of the Network Instrumentation Module assigned to LAN2-5 was executed, but the NX-SVG received a response of error code 0x00000023 from the module, which indicates that an error occurred.
Error code 23 indicates that the value was not written due to the instrumentation's condition. The MV cannot be written to a Network Instrumentation Module when it is in AUTO mode, so there is a possibility that data writing was attempted when the module was in AUTO mode.

History entry No. 2 shows that writing of 0x00000000 (0) to address 14848 (loop 1 current proportional band) of the Network Instrumentation Module assigned to LAN2-3 was attempted, but the NX-SVG received a response of error code 0x00000022 from the module, which indicates that an error occurred.
Error code 22 indicates that the data was outside the range. The data range for the proportional band of the Network Instrumentation Module is 1–32000. It can be assumed that writing of "0"(which is outside the range) was attempted, resulting in an error.

- **Execution History**

The number of times communication frames are sent and received in one hour by LAN1, LAN2, COM1, COM2, and the server function, and the error count. By expanding the window, all items can be checked.



Time

Displays the time at which the execution history record was written. The history is recorded once every hour.

If the time on this device was set after power-on or if a battery is used, the actual time is displayed. If the time was not set, the time relative to 9:00 on January 1, 2000, which is set as the time of power-on, is recorded.

LAN1 Exec/h, LAN2 Exec/h, COM1 Exec/h, COM2 Exec/h

Displays the number of times communication frames are sent and received in one hour.

LAN1 Err/h, LAN2 Err/h, COM1 Err/h, COM2 Err/h

Displays the number of errors that occurred in one hour.

SRV Exec/h

Displays the number of times communication frames were processed by the server function in one hour.

SRV Err/h

Displays the number of errors that occurred in one hour for the server function.

Temperature (°C)

Displays the CPU's internal temperature (in °C) when the execution history was recorded.

④ Managing connected devices

Handling Precautions

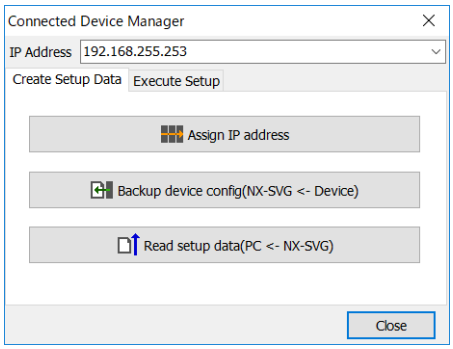
- Configuration backup and restoration, and IP address assignment for slave devices, are available only for Azbil-made Network Instrumentation Modules.
- When [Protection of setting] is enabled for the NX-SVG, do not attempt to read setup data using an SLP-SVG version earlier than 1.0.2.0. If attempted, reading will succeed but writing the created settings to the NX-SVG will fail.
- When managing the devices connected to the NX-SVG for which [Protection of setting] is enabled, be sure to use ver. 1.0.2.0 or later of the SLP-SVG Smart Loader Package.

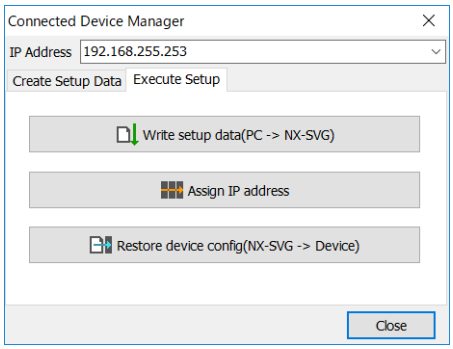
●Procedure

(1) On the menu bar, select [Online] →[Maintenance manager].

>> The [Connected Device Manager] window is displayed.

(2) Click the button for the desired function.





Note

- When a function is executed, a confirmation message saying that the NX-SVG will enter STOP mode is displayed. If the [OK] button is clicked, the NX-SVG enters STOP mode and starts executing the function. If the [Cancel] button is clicked, the function is not executed.
- When processing of the function is complete, the gateway program automatically restarts and the NX-SVG enters RUN mode.

●Assign IP Address

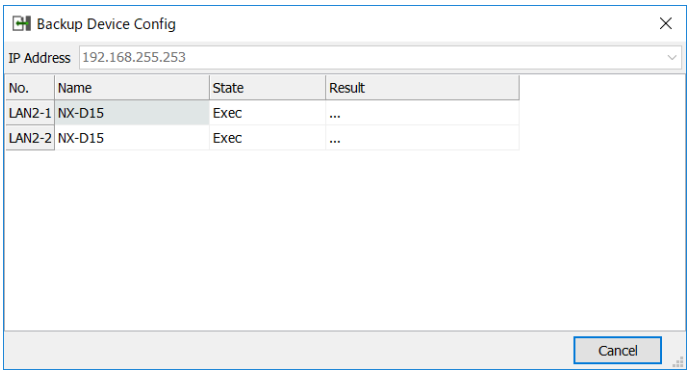
Based on the configuration written to the NX-SVG, the IP address is assigned. During execution, the gateway program is in the STOP state. When the process is complete, the gateway program returns to the RUN state.

●Backup device config (NX-SVG ← Device)

Based on the configuration written to the NX-SVG, the configuration of the connected device is backed up. The backed-up configuration file for the connected device is saved on the NX-SVG.

During execution, the gateway program is in the STOP state.

When the process is complete, the gateway program returns to the RUN state.



No.

Displays the device No.

Name

Displays the name of the device.

State

Displays the state of the processing.

Result

Displays the result of the processing.

[Cancel]/[Close] button

Clicking the [Cancel] button will cancel any communication that is in progress.

If the communication process is interrupted (canceled or aborted), the [Close] button will be displayed.

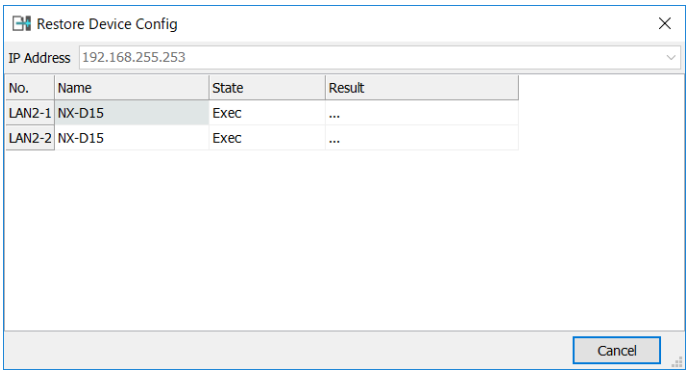
Check the status and click the [Close] button to close the window.

• Restore device config (NX-SVG → Device)

Based on the configuration written to the NX-SVG, the configuration of the connected device is restored.

During execution, the gateway program is in the STOP state.

When the process is complete, the gateway program returns to the RUN state.



• Read setup data (PC ← NX - SVG)

The gateway settings and the backed-up configuration file of the connected device are read from the NX-SVG and saved to a file on the PC. A setup file with extension .snxsvg is created on the PC.

• Write setup data (PC → NX - SVG)

The gateway settings and the backed-up configuration file, which are in the setup file with extension .snxsvg created by "Read setup data (PC ← NX - SVG)," is written to the NX-SVG. During execution, the gateway program is in the STOP state. When the process is complete, the gateway program returns to the RUN state.

! Handling Precautions

- With this function, the NX-SVG copies the configuration file for the connected device that is included in the setup file (extension: .snxsvg) to its memory, but it does not restore the settings to the connected device. To restore the settings to the connected device, execute "Restore device config (NX-SVG → Device)."

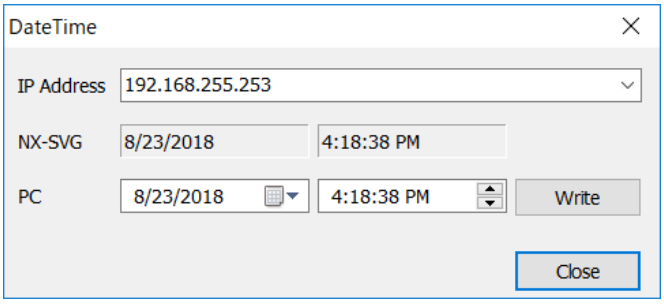
④ Setting the time on the NX-SVG

The NX-SVG's internal clock can be set to the desired time using communications. The time is used for history data that is displayed in the [NX-SVG Information] window.

● Procedure

(1) Select [Online] → [DateTime Setting].

>> The [DateTime] window is displayed.



(2) Change the values in each field for the [PC]. If no change is made, the time on the PC will be set.

(3) Click the [Write] button.

>> The time on the NX-SVG is set.

! Handling Precautions

- If no battery is installed, when the power is turned off, the time will be reset instead of being retained. To automatically set the time every time the power is turned on, use the time setting function of the NX-SVG, which obtains the time from an external device (NTP server or PLC).
- A time after 3:14:07 (UTC) on January 19, 2038 cannot be set.
- Set the time when the PC is connected to the NX-SVG.
  When the [DateTime] window is displayed, the time set on the NX-SVG is read.

④ Resetting the NX-SVG

The NX-SVG can be reset using communications. The configuration data for the NX-SVG will not be deleted.

● Procedure

(1) Select [Online] → [Reset NX-SVG].

>> The communication status window is displayed.

(2) Click the [OK] button.

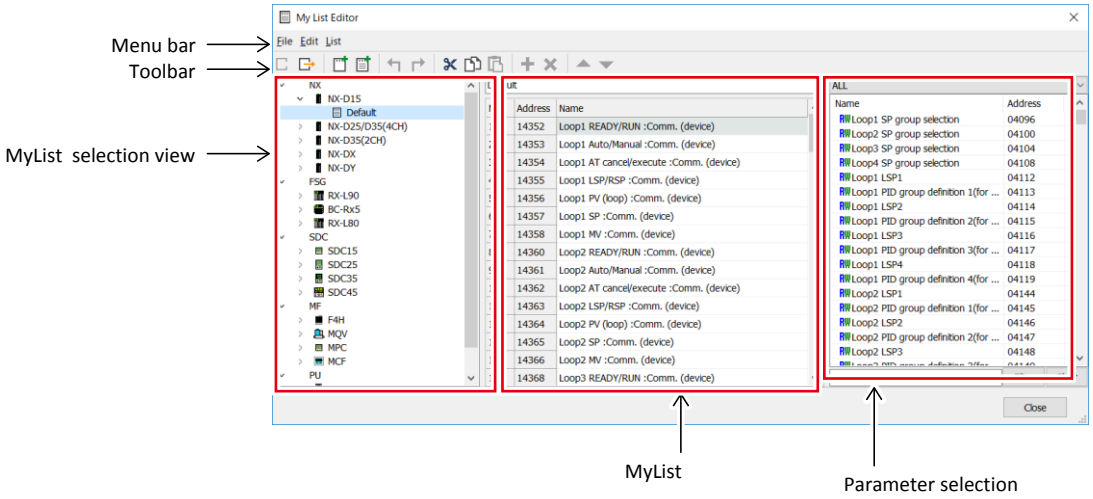
>> The communication status window closes and the NX-SVG is reset.

5-7 Editing MyList

MyList is a function for creating a list of parameters that are frequently used by the user for devices displayed in the MyList selection view.

This list enables quick selection of parameters when the user sets gateway functions.

④ Screen components



•Menu

Displays available menus.

•Toolbar

Displays buttons associated with items in the menus.

•MyList selection view

Displays MyLists for devices in tree view format.

•MyList

Displays parameters in MyList selected in the MyList selection view.

•Parameter selection

Displays a list of parameters that are available for the device selected in the MyList selection view.

By dragging a parameter from the selection and dropping it into MyList, the parameter can be added to it.

④ Menu list

●File menu items

Menu	Icon	Submenu	Description	Shortcut keys
File		Import	Reads a parameter list file (*.nxsvgul) and adds the list to MyList for the selected device.	–
		Export...	Saves some or all of the MyLists for the selected device to a parameter list file (*.nxsvgul).	–
	–	Exit...	Closes the MyList Editor.	–

●Edit menu items

Menu	Icon	Submenu	Description	Shortcut keys
Edit		Undo	Undoes the changes in the displayed MyList.	Ctrl + Z
		Redo	Redoes the changes in the displayed MyList.	Ctrl + Y
		Cut	Transfers the data in the cell selected in MyList to the clipboard and deletes the data from the source cell.	Ctrl + X
		Copy	Transfers the data in the cell selected in MyList to the clipboard.	Ctrl + C
		Paste	Pastes the data on the clipboard to the cell selected in MyList.	Ctrl + V
	–	Select All	Selects all cells in MyList.	Ctrl + A
		Add selected items to list	Adds the items selected in parameter selection to MyList.	–
		Delete selected items from list	Deletes the items selected in MyList.	–
		Copy addresses to clipboard	Transfers the address in the cell selected in MyList to the clipboard.	Shift + Ctrl + C
		Add addresses from clipboard	Adds the address on the clipboard to MyList.	Shift + Ctrl + V
		Move up	Moves the selected item to the cell above.	Ctrl + ↑
		Move down	Moves the selected item to the cell below.	Ctrl + ↓

●List menu items

Menu	Icon	Submenu	Description	Shortcut keys
Config		Add new list	Adds a blank MyList to the device selected in the MyList selection view.	–
		Add default list	Adds a MyList of default items to the device selected in the MyList selection view.	–
		Delete list	Deletes the MyList selected in the MyList selection view.	Ctrl + Del
	–	Rename...(G)	Changes the name of MyList selected in the MyList selection view.	F2

④ Adding/deleting MyList

●Creating a new MyList

(1) In the MyList selection view, select the device whose MyList you wish to create (or select the MyList level above the level where you wish to create the new MyList).

(2) Right-click the selected item and select [Add new list] from the context menu (or from [List] on the menu bar).

To add a MyList of default items, select [Add default list] from the pop-up menu (or from [List] on the menu bar).

● Editing a MyList

To edit (cut, copy, paste, delete, move, rename) a MyList that already exists, select it in the MyList selection view to display a pop-up menu, and execute [Edit]. [Edit] can also be executed from the menu bar.

Note

- It is not possible to select multiple MyLists simultaneously. Select and edit one by one.

④ Editing a MyList

●Rename

By double-clicking a cell (or pressing the F2 key), the name in the cell can be edited. It is also possible to enter characters directly to change the name.

The user can copy and paste the data in a selected cell.

●Adding parameters to a MyList

In the parameter selection pane, select the parameters to add and select [Add selected items to list] from the pop-up menu (or from [Edit] on the menu bar). The selected parameters will be added to the end of the MyList.

Parameters can be also added by dragging an item from the parameter selection pane and dropping it onto the MyList.

●Copying an address to the clipboard

On MyList, select the rows of the device address to send to the clipboard, and select [Copy addresses to clipboard] from the pop-up menu (or from [Edit] on the menu bar). This will send the device addresses in the selected rows to the clipboard as text items delimited by newline characters.

•Adding an address from the clipboard

On MyList, select [Add addresses from clipboard] from the pop-up menu (or from [Edit] on the menu bar). This will add the device address to MyList via the clipboard as text items delimited by newline characters.

An address that is already in MyList or that is not displayed in the parameter selection pane will not be added to MyList.

•Deleting parameters from MyList

On MyList, select parameters to delete and select [Delete selected items from list] from the pop-up menu (or from [Edit] on the menu bar). The selected parameters are deleted from MyList.

④ Exporting and importing MyList

In order to use MyList on another PC, it can be saved to a file and imported to the other PC using the loader's MyList Editor on the PC.

•Export

In the MyList selection view, select MyList or the device to output to a file, and select [Export...] from the pop-up menu (or from [File] on the menu bar). The [Save As] window is displayed. Enter the file name and press the [Save] button. A MyList file with the extension .nxsvgul will be created on the PC.

•Import

In the MyList selection view, select the device to which MyList will be imported, and select [Import...] from the pop-up menu (or from [File] on the menu bar). The [Open] window is displayed. Select the .nxsvgul file to import and click the [Open] button.

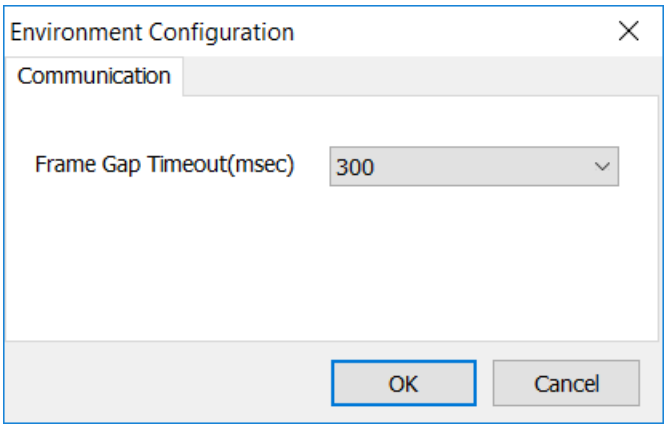
Note

- If importing MyList for a different model is attempted, an error message saying that there is no valid definition will be displayed, and the import will be canceled.

5-8 Environment Configuration

④ Communication

Communication between the SLP-SVG Smart Loader Package and the NX-SVG can be configured from the screen below.



●Frame Gap Timeout (msec)

Specifies the maximum frame transmission interval for monitoring the communication between the SLP-SVG and the NX-SVG. When a packet is transmitted divided into frames, if the frames arrive at an interval longer than the specified time, a communication error will occur. Select “300” or “10000” (msec). The initial value is “300” (msec).

! Handling precautions

- In an environment where a PC and the NX-SVG communicate via a wireless LAN or wide area network (WAN), communication errors may occur if [Frame Gap Timeout] is set to “300.” In this case, set “10000.”
- This function is supported by the SLP-SVG ver. 1.0.1.0 or later.

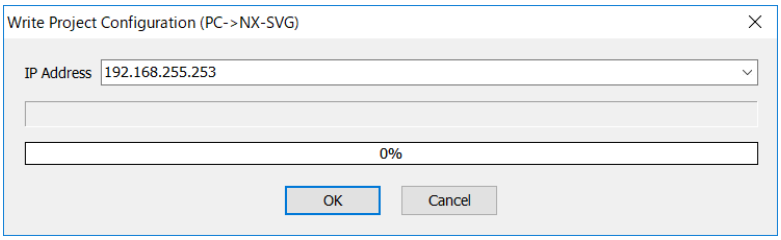
5-9 Updating the System of Model NX-SVG

④ Executing system update when writing the configuration

(19) Open the project whose configuration you wish to write to the NX-SVG.

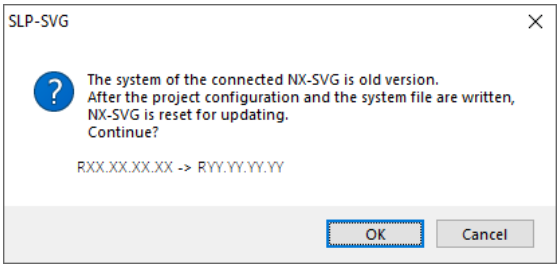
(20) Select [Online] → [Write gateway config PC→NX-SVG].

>> The communication status window is displayed.



(21) Click the [OK] button.

>> The version of the system file on the NX-SVG and PC is compared. If the NX-SVG has an older system file, a confirmation message for system update is displayed.



[OK]: The system of the NX-SVG will be updated and the configuration file will be written.

[Cancel]: Processing will be canceled.

If the version is the same or if the NX-SVG has a newer system file, the confirmation message will not be displayed.

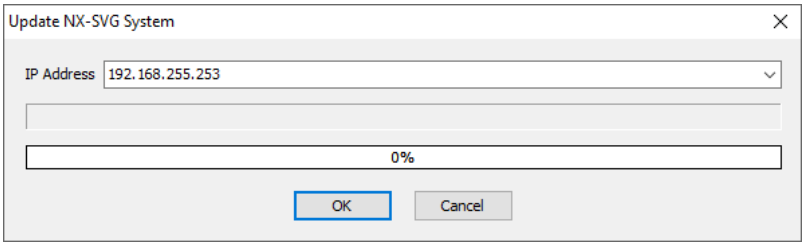
(22) To update the system, click the [OK] button.

>> The system update file and the project file are written and the NX-SVG restarts.

④ Executing system update only

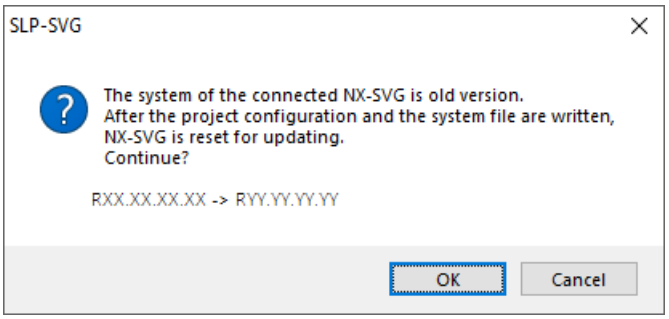
(1) Select [Tools] → [Update system on NX-SVG].

>> The communication status window is displayed.



(2) Click the [OK] button.

>> The version of the system file on the NX-SVG and the PC is compared. If the NX-SVG has an older system file, a confirmation message for system update is displayed.



[OK]: The system of the NX-SVG will be updated and the configuration will be written.

[Cancel]: Processing will be canceled.

If the version is the same or if the NX-SVG has a newer system file, a message saying "The system on NX-SVG is already the latest version." is displayed.

(3) To update the system, click the [OK] button.

>> The system update file and the project file are written and the NX-SVG restarts.

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-MEMO-

Chapter6. Configuration

6-1 Creating a Project File

④ Project file

The following type of file is created by the loader.

Icon	Extension	Description
	.nxsvg	A project file with the extension shown on the left is created by the loader.

●Creating a new project file

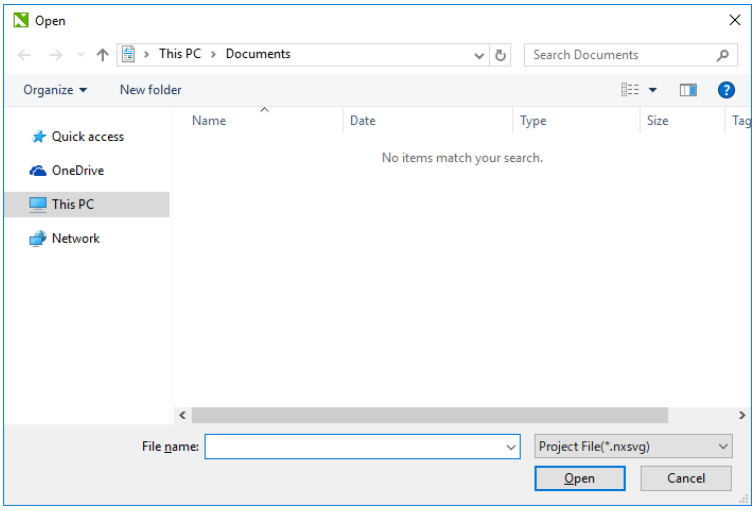
(1) Select [File] → [Create new project].

>> A new project file is created and the project view is displayed.

●Opening a project file

(1) Select [File] → [Open project].

>> The [Open] window is displayed.



(2) Select the file to open. To specify the file by entering its name, enter the name in [File name:].

(3) Click the [Open] button.

>> The specified project file opens.

Note

- The “Documents” folder is displayed by default when the loader is started for the first time. Thereafter, the folder selected the last time is displayed by default.

●Reopening a project file

(1) Select [File] → [Re-open project].

>> A list of project files that were opened in the past is displayed.

(2) Select the file to open.

>> The specified project file opens.

●Saving a project file

(1) Select [File] → [Save project].

>> The project is saved to a file.

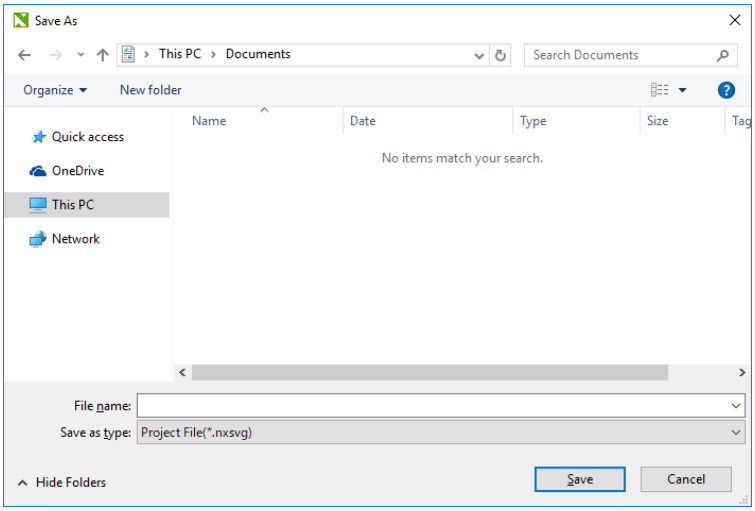
Note

When a project is saved to a file for the first time, the [Save As] window is displayed.

● Saving a project file with a new name

(1) Select [File] → [Save project as].

>> The [Save As] window is displayed.



(2) Specify the destination folder and enter the name of the file. (To overwrite an existing file, select the file.)

(3) Click the [Save] button.

>> The project is saved with the specified file name.

Note

• The “Documents” folder is displayed by default when the loader is started for the first time. Thereafter, the folder selected the last time is displayed by default.

● Closing a project

(1) Select [File] → [Close project].

>> The current project is closed.
If closing of a project that is being edited is attempted before saving it, a warning message is displayed.

6-2 Configuration Sheet Details

Details on the configuration sheet are described below. In the attributes table, parameters are arranged vertically. In the process configuration table, parameters are arranged horizontally. ☞ Configuration sheet (p. 5-14))

④ System–General

This section covers settings that affect the overall operation of this device.

•Setting item

Parameter name	Description
Delay-time (sec)	Communication start wait time after startup
Battery Alarm	Setting to enable or disable the LED battery alarm indicator on the front of the main unit and the function for sending low battery notification to the PLC.
Time Zone	The time zone of the time set on this device (difference from Coordinated Universal Time)
Common: Cyclic Scan	The cycle on which cyclic data transmission is executed
Common: Trigger Scan	The cycle on which the value of the trigger device is checked for triggered data transmission, etc.
Common: Sync Wait Time	The time between execution of a row with a “SYNC” setting and the execution of the next row
Common: Init Trigger Device	Setting to turn on or off the trigger device after trigger detection
Common: Init Notify Device	Setting to turn off notification devices set on a sheet before starting processing of that sheet
Server: Enabled/Disabled	Setting to enable or disable the server function (Modbus/TCP)
Server: Port No.	The number of the port which waits for Modbus/TCP communication (server function)
Server: Connection Max	The maximum number of connections that can be established simultaneously (server function)
Server: Keep-alive time	The amount of time with no communication before a keep-alive packet is sent (server function)
Server: Keep-alive interval	The amount of time before a keep-alive packet is resent (server function)
Server: Keep-alive retry	The number of retries for sending a keep-alive packet (server function)
Backup Register: Top Address	The start address of the backup register area of the internal register
Backup Register: Area Size	The size of the backup register area of the internal register
Protection of setting: Enabled/Disabled*	Setting to enable or disable the settings read-protection function
Protection of setting: Password*	Password for the settings read-protection function

* The settings read-protection function is supported by SLP-SVG ver. 1.0.2.0 and later and NX-SVG R01.00.02.00 and later.

Each parameter is explained below.

• Delay-time (sec)

Sets the wait time before starting communications after startup of this device is complete. Set this parameter if, when the equipment is powered on, the connected devices will not be ready to communicate by the time the startup of this device is complete.

- Range (unit: seconds): 0–60
- Default value: 0

Note

- It takes about 30 seconds for this device to be ready to communicate after power-on. For [Delay-time (sec)], specify the wait time before starting communications after this device becomes ready to communicate.

• Battery Alarm

Enables or disables the LED battery alarm indicator on the front of the main unit. If no battery is used, disable this function so that the LED is not turned on. If disabled, the function for sending Notification Low Battery to the PLC is also disabled.

- Range: Enabled, Disabled
- Default value: Enabled

• Time Zone

Sets the time zone of the time set on this device. Set how many hours this device is behind (minus) or ahead (plus) of Coordinated Universal Time. Less than one hour cannot be specified.

- Range: UTC−12 to UTC+14
- Default value: UTC+9

•Common: Cyclic Scan

Sets the cycle on which cyclic data transmission is executed. According to the cycle specified by this parameter, this device starts processing cyclic data transmission sheets that have not been executed. To transmit data on a slow cycle exceeding 1 second, set [Interval] for each sheet.

- Range: 100 ms to 1 second (select in units of 100 ms)
- Default value: 200 ms

•Common: Trigger Scan

The cycle on which the value of the trigger device is checked for triggered data transmission, etc. According to the cycle specified by this parameter, this device starts checking the state of the trigger device for triggered data transmission sheets that have not been executed.

- Range: 100 ms to 1 second (select in units of 100 ms)
- Default value: 200 ms

•Common: Sync Wait Time

Sets the time between execution of a row with a “SYNC” setting on the sheet and execution of the next row. For example, if “SYNC” is set so that data is read after completion of data writing, and if there are some devices that take time to write, set a longer time. “SYNC” (synchronization) can be set up to 9 times on one sheet.

- Range: 0 to 1 second (select in units of 100 ms)
- Default value: 500 ms

•Common: Init Trigger Device

For triggered data transmission, bit setting, batch configuration backup and restoration, IP address assignment, and time setting, specify whether to initialize the trigger device after trigger detection.

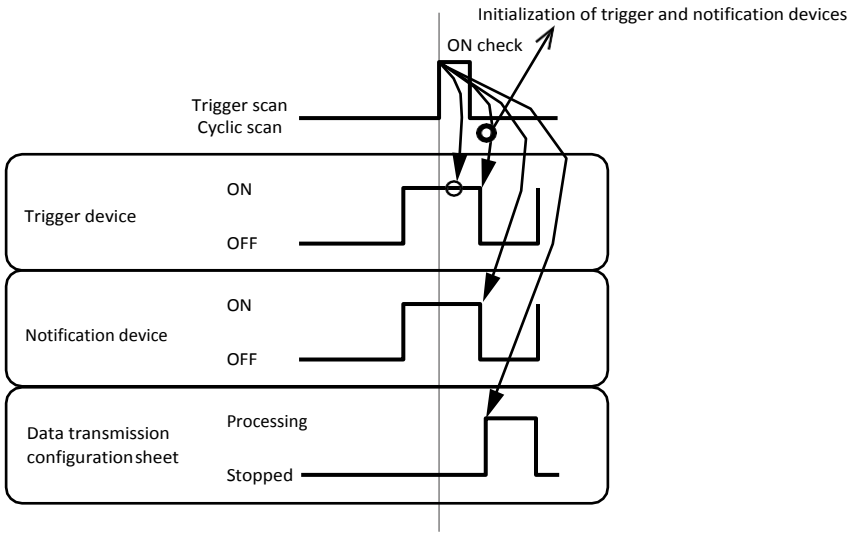
- Range: Enabled, Disabled
- Default value: Enabled

•Common: Init Notify Device

Sets whether to initialize the completion, error, and result notification devices before starting to process a sheet.

- Range: Enabled, Disabled
- Default value: Disabled

The trigger and notification devices are initialized at the timing shown in the following figure. (For cyclic data transmission, the trigger device is not checked or initialized.)



! Handling Precautions

- Even if initialization of the trigger and notification devices fails due to a communication error, processing of sheets continues.

●Server: Enabled/Disabled

Enables or disables Modbus/TCP communications for the server function. Set "Disabled" if the server function is not necessary.

- Range: Enabled, Disabled
- Default value: Disabled

●Server: Port No.

Sets the number of the port that waits for Modbus/TCP data with the server function.

- Range: 502 (fixed value)
- Default value: 502

●Server: Connection Max

Sets the maximum number of Modbus/TCP connections that can be established simultaneously with the server function.

- Range: 1 to 8
- Default value: 4

●Server: Keep-alive time

Sets the amount of time with no communication before a keep-alive packet is sent by the server function.

Ex.: If 5 seconds is set, and if no Modbus/TCP communication packets are received for 5 seconds even though there is a TCP connection, a keep-alive packet is sent to check that the partner device is still connected.

- Range: 5 s / 10 s / 30 s / 1 min / 5 min / 10 min / 30 min / 1 hr / 2 hr
- Default value: 5 s

●Server: Keep-alive interval

Sets the time until resending a keep-alive packet with the server function.

Ex.: If it is set to "10 s," and if no response is received for 10 seconds after a keep-alive packet has been sent, the packet is resent.

- Range: 10 s / 20 s / 30 s / 40 s / 50 s / 1min
- Default value: 10 s

●Server: Keep-alive retry

Sets the number of retries for sending a keep-alive packet with the server function.

Ex.: If it is set to "3," the keep-alive packet is resent three times if there is no response. If the connected device does not respond, the connection is disconnected.

- Range (unit: times): 0 to 10
- Default value: 3

•Backup Register: Top Address

A part of the internal register can be used as a backup register. Set the start address of the backup register area of the internal register.

- Range: 400001 to 460000
- Default value: 450001

•Backup Register: Area Size

Sets the size of the backup register area of the internal register. If it is set to 0, there is no backup register.

- Range: 0 to 20000
- Default value: 10000

•Protection of setting: Enabled/Disabled

Enables or disables the settings read-protection function. Projects with this function enabled are subject to the following restrictions:

- Entry of the password is required when reading the configuration of the gateway.
- Entry of the password is required when monitoring the execution status. If the password is not entered, device names and data transmission configuration sheet names specified by the project file will not be displayed.
- Entry of the password is required when reading the setup data from the [Connected Device Manager] window.
- Project files whose [Protection of setting] is enabled cannot be opened using the SLP-SVG that does not support the settings read-protection function (versions earlier than 1.0.2.0) . If the settings read-protection function is not necessary, disable the function.
  - Range: Enabled, Disabled
  - Default value: Disabled

•Protection of setting: Password

Specify the password for the settings read-protection function.

- Range: 64 characters max.
- Default value: none

④ System –LAN1/LAN2

Sets the devices to communicate via the LAN1 and LAN2 ports of this device.

•Attributes table

The attributes table of the configuration sheet includes the following parameters.

Parameter name	Description
IP Address	The IP address of the LAN1 and LAN2 ports of this device.
Subnet Mask	The subnet mask of the network connected to the LAN1 and LAN2 ports of this device.
Default Gateway	The default gateway for the network connected to the LAN1 and LAN2 ports of this device.

Each parameter is explained below.

•IP Address

Sets the IP address of this device. Set a different value for the LAN1 and LAN2 ports.

- Range: 1.0.0.1 to 223.255.255.255 (excluding 127._ _ _._ _ _._ _ _)
- Default value: 192.168.0.127 (LAN1)
  192.168.4.127 (LAN2)

! Handling Precautions

- Do not set the same network address for LAN1 and LAN2.
- The LAN1 port can have multiple IP addresses, and 192.168.255.253 is preset for loader connection. Also, 192.168.255.252 is preset for the IP address of the loader PC. It is not possible to set 192.168.255.253 or 192.168.255.252 for LAN port devices.
- If 192.168.255._ is set for LAN2, LAN2 cannot be used for the following (use LAN1).
  - Communication between the NX-SVG and the SLP-SVG (loader communication)
  - Communication between a server function–enabled NX-SVG and an external Modbus/TCP server
  - Communication between the NX-SVG and the NTP server

•Subnet Mask

Sets the subnet mask for the IP address of this device. Set a different value for the LAN1 and LAN2 ports.

- Range: 128.0.0.0 to 255.255.255.252
- Default value: 255.255.255.0

! Handling Precautions

- If a supernet is set for the subnet mask (e.g., setting the class B subnet mask 255.255.254.0 for a class C network) and IP addresses are assigned to Network Instrumentation Modules, the modules cannot be set up using the Smart loader Package model SLP-NX for Network

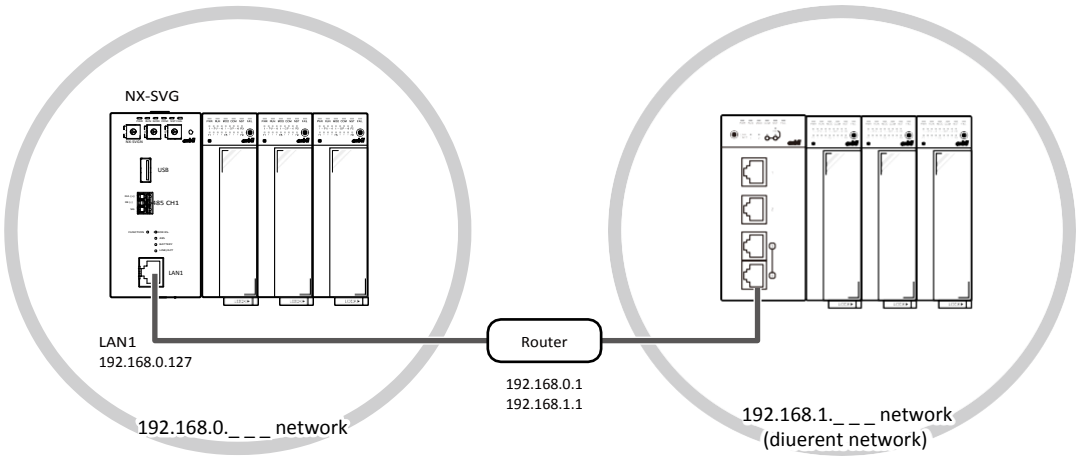
Instrumentation Modules.

- **Default gateway**

Sets the default gateway for the IP address of this device. Set the value for either the LAN1 port or the LAN2 port. If no value is set, there is no default gateway. If the default gateway is set, this device can communicate with devices that are connected beyond the router and belong to different segments.

- Range: Blank or 1.0.0.1 to 223.255.255.255 (excluding 127._ _ _._ _ _._ _ _)
- Default value: Blank

If a router with address 192.168.0.1 is set as the default gateway for LAN1, as shown in the following example, devices in a different network (e.g.,192.168.1._ _ _) can be added as connected devices on the configuration sheet for LAN1.



Handling Precautions

- To communicate with devices that are connected beyond the router and belong to different networks, add the devices to the configuration sheet for the LAN port for which the default gateway is set. These devices cannot be added to the LAN port for which a default gateway is not set.
- It is not possible to set 192.168.255.253 or 192.168.255.252 for the default gateway.

●Process configuration table

The process configuration table on the configuration sheet includes the following parameters.

Parameter name	Description
Device	Connected device
IP Address	IP address of the connected device
Port	The number of the connected device's port that receives data
Transport Layer Protocol	TCP or UDP
Connections	The number of connections that can be established simultaneously
Option 1	Optional setting for communication
Option 2	Optional setting for communication
Read Device Max	The number of data items that can be requested for reading by one communication frame
Write Device Max	The number of data items that can be requested for writing by one communication frame
Send Delay Time	Wait time before starting a transmission
Timeout-time(msec)	Time before determining that there is no response
Retry-count	Number of retransmissions when there is no response
Enabled Switch	Setting of whether to use the configuration for the connected device set by [Device]
Dev No.	The No. of the host device whose [Enabled Switch Device] is read if [Enabled Switch] is set to [Start-up judging]
Enabled Switch Device	The device for checking configuration sheet validity whose value is read at NX-SVG startup if [Enabled Switch] is set to [Start-up judging]
Comment	Explanatory comments on the device

Each parameter is explained below.

●Device

Sets the type of the device to connect. Settings in one row apply to the device set by this parameter. If the target device is not included in the device selection, select a general-purpose device using a communication protocol such as Modbus/TCP or CPL/TCP.

- Range: Mitubishi SLMP (3E)
  Mitubishi iQ-F SLMP (3E)
  Yokogawa FA-M3
  Omron FINS
  Siemens S7
  TOYOPUC PC10 (TCP)
  FANUC CNC
  Keyence KV
  Fuji MICREX-SX
  NX-15, NX-25/D35 (4CH), NX-35 (2CH), NX-DX, NX-DY
  RX-L90
  C7G
  Modbus/TCP
  CPL/TCP, CPL/TCP (NX)
  HNU, etc. (other devices will be added in the future)
- Default value: –

●IP Address

Sets the IP address of the connected device set by [Device].

- Range: Blank or 1.0.0.1 to 223.255.255.255 (excluding 127._ _ _._ _ _._ _ _)
- Default value: Blank

! Handling Precautions

- The LAN1 port can have multiple IP addresses, and 192.168.255.253 is preset for loader connection. Also, 192.168.255.252 is preset for the IP address of the loader PC. It is not possible to set 192.168.255.253 or 192.168.255.252.
- Set a unique IP address for every device and the loader PC.
- If no default gateway is set, set an IP address belonging to the same subnet of the connected LAN port.

●Port

Sets the port No. of the connected device set by [Device]. This device is the client and the connected device is the server. This device sends data to the port specified by this parameter. To access multiple ports of a single device at the same, add two devices with the same IP address and different port numbers.

- Range: 0 to 65535
- Default value: Depends on the device

●Transport Layer Protocol

Select the protocol of the communication transport layer for the connected device set by [Device]. Use the protocol set for the connected device. The value is fixed for some devices and cannot be selected.

- Range: TCP, UDP
- Default value: Depends on the device

●Connections

For a device whose transport layer protocol is TCP, set the number of connections that can be established simultaneously at the communication port set by [Port]. The value is fixed for some devices and cannot be selected.

- Range: 1 to 8
- Default value: 1

● Option 1 / Option 2

These parameters are for optional settings for communication. For some devices, these parameters cannot be specified.

- Range: Depends on the device
- Default value: Depends on the device

• Read Device Max

Sets the number of data items that can be requested for reading by one communication frame. The value depends on the communication protocol and the specifications of the device. The value is fixed for some devices and cannot be selected.

- Range: 2 to 512
- Default value: Depends on the device

• Write Device Max

Sets the number of data items that can be requested for writing by one communication frame. The value depends on the communication protocol and the specifications of the device. The value is fixed for some devices and cannot be selected.

- Range: 2 to 512
- Default value: Depends on the device

• Send Delay Time

Sets the time this device waits before starting each transmission. With a heavy communication load, if some data is missed because the connected devices cannot communicate in time or if controllability deteriorates, adjustment can be made with this parameter.

- Range (unit: ms): 0 to 1000
- Default value: Depends on the device

• Timeout-time(msec)

Sets the timeout value for the connected device set by [Device]. When the set time elapses, this device determines that the connected device is not responding.

- Range (unit: ms): 100 to 60000
- Default value: Depends on the device

• Retry-count

Sets the number of retries for sending data to the connected device set by [Device]. “Retry” means resending data to a connected device. If this device cannot receive a response from the connected device (if there is no response), this device tries again to send the data.

- Range (unit: times): 0 to 10
- Default value: 3

• Enabled Switch

Sets whether to use the configuration for the connected device set by [Device]. If [Disabled] is set, the gateway and device management functions are not executed even if communication with the connected device is configured. If [Start-up judging] is selected, the value of [Enabled Switch Device] is read at NX-SVG startup to check if the configuration sheet is valid.

- Range: Enabled, Disabled, Start-up judging
- Default value: Enabled

●Dev No.

If [Enabled Switch] is set to [Start-up judging], [Enabled Switch Device] of the device set by this parameter is read.

- Range: Select from the preset connected devices
- Default value: –

●Enabled Switch Device

Sets the device for checking configuration sheet validity. The value of the device is read at NX-SVG startup if [Enabled Switch] is set to [Start-up judging].

- Range: Depends on the device
- Default value: Blank

●Comment

Any character string can be entered. This does not affect operation. You can use it as a note to describe the device.

- Range: 20 characters
- Default value: Blank

④ System –COM1/COM2

Sets the devices to communicate via the COM1 and COM2 ports of this device.

●Attributes table

The attributes table of the configuration sheet includes the following parameters.

Parameter name	Description
Baudrate	The baudrate for serial communication via the COM1 and COM2 ports of this device
Data Length	The data length for serial communication via the COM1 and COM2 ports of this device
Parity	The parity bit type for serial communication via the COM1 and COM2 ports of this device
Stop Bit	The number of stop bits for serial communication via the COM1 and COM2 ports of this device

Each parameter is explained below.

●Baudrate

Sets the baudrate for serial communication of this device. Set the value for the COM1 and COM2 ports individually.

- Range: 4800/9600/19200/38400/57600/115200 bps
- Default value: 19200 bps

●Data Length

Sets the data length for serial communication of this device. Set the value for the COM1 and COM2 ports individually.

- Range: 8 bits, 7 bits
- Default value: 8 bits

●Parity

Sets the parity bit type for serial communication of this device. Set the value for the COM1 and COM2 ports individually.

- Range: Even, Odd, None
- Default value: Even

●Stop Bit

Sets the number of stop bits for serial communication of this device. Set the value for the COM1 and COM2 ports individually.

- Range: 1 bit, 2 bits
- Default value: 1 bit

•Process configuration table

The process configuration table on the configuration sheet includes the following parameters.

Parameter name	Description
Device	Connected device
Device ID	Station No. of the connected device
Option 1	Optional setting for communication
Option 2	Optional setting for communication
Read Device Max	The number of data items that can be requested for reading by one communication frame
Write Device Max	The number of data items that can be requested for writing by one communication frame
Send Delay Time	Wait time before starting a transmission
Timeout-time (msec)	Time before determining that there is no response
Retry-count	Number of retransmissions when there is no response
Enabled Switch	Setting of whether to use the configuration for the connected device set by [Device]
Dev No.	The No. of the host device whose [Enabled Switch Device] is read if [Enabled Switch] is set to [Start-up judging]
Enabled Switch Device	The device for checking configuration sheet validity whose value is read at NX-SVG startup if [Enabled Switch] is set to [Start-up judging]
Comment	Explanatory comments on the device

Each parameter is explained below.

•Device

Sets the type of the device to connect. Settings in one row apply to the device set by this parameter. If the target device is not included in the device selection, select a general-purpose device using a communication protocol such as Modbus/RTU or CPL/Serial.

- Range: SDC15, SDC25, SDC35, SDC45, C1M
  BC-Rx5, AUR255, AUR355, AUR455, RX-L80
  F4H, F4Q, MQV, MPC, MCF
  Modbus/RTU, CPL/Serial
  etc. (other types of device will be added in the future)
- Default value: –

•Device ID

Sets the node address (station No.) of the connected device set by [Device].

- Range: 0 to 255
- Default value: Blank

•Option 1 / Option 2

These parameters are for optional settings for communication. For some devices, these parameters cannot be specified.

- Range: Depends on the device
- Default value: Depends on the device

• Read Device Max

Sets the number of data items that can be requested for reading by one communication frame. The value depends on the communication protocol and the specifications of the device. The value is fixed for some devices and cannot be selected.

- Range: 2 to 512
- Default value: Depends on the device

•Write Device Max

Sets the number of data items that can be requested for writing by one communication frame. The value depends on the communication protocol and the specifications of the device. The value is fixed for some devices and cannot be selected.

- Range: 2 to 512
- Default value: Depends on the device

•Send Delay Time

Sets the time this device waits before starting a transmission. With a heavy communication load, if some data is missed because the connected devices cannot communicate in time or if controllability deteriorates, adjustments can be made with this parameter.

- Range (unit: ms): 10 to 1000
- Default value: Depends on the device

•Timeout-time(msec)

Sets the timeout value for the connected device set by [Device]. When the set time elapses, this device determines that the connected device is not responding.

- Range (unit: ms): 100 to 60000
- Default value: 2000

•Retry-count

Sets the number of retries for sending data to the connected device set by [Device]. “Retry” means resending data to a connected device. If this device cannot receive a response from the connected device (if there is no response), this device tries again to send the data.

- Range (unit: times): 0 to 10
- Default value: 3

●Enabled Switch

Sets whether to use the configuration for the connected device set by [Device]. If [Disabled] is set, the gateway and device management functions are not executed even if communication with the connected device is configured. If [Start-up judging] is selected, the value of [Enabled Switch Device] is read at NX-SVG startup to check if the configuration sheet is valid.

- Range: Enabled, Disabled, Start-up judging
- Default value: Enabled

● Dev No.

If [Enabled Switch] is set to [Start-up judging], [Enabled Switch Device] of the device set by this parameter is read.

- Range: Select from the preset connected devices
- Default value: –

●Enabled Switch Device

Sets the device for checking configuration sheet validity. The value of the device is read at NX-SVG startup if [Enabled Switch] is set to [Start-up judging].

- Range: Depends on the device
- Default value: Blank

●Comment

Any character string can be entered. This does not affect operation. You can use it as a note to describe the device.

- Range: 20 characters
- Default value: Blank

④ Cyclic Transmit

Configure the function for transmitting data on a specified cycle.

•Attributes table

The attributes table of the configuration sheet includes the following parameters.

Parameter name	Description
Name	The name of the sheet
Interval	Data transmission execution cycle
Device No.	The No. of the device whose [Notify Complete Device] and [Notify Error Device] are written with a value and whose [Enabled Switch Device] is read
Notify Complete Device	The register device to be turned on when data transmission set on the sheet is complete
Notify Error Device	The register device to be turned on when data transmission set on the sheet ends with an error
Enabled Switch	Selection of how to check configuration sheet validity
Enabled Switch Device	The device for checking configuration sheet validity that is read from the device set by [Device No.] if [Enabled Switch] is set to [Enabled at ON] or [Enabled at OFF]

Each parameter is explained below.

•Name

Sets the name of the configuration sheet. The name is displayed in the project view.

- Range: 64 characters
- Default value: Cyclic Transmit 1

•Interval

Sets the cycle on which transmission of data on the sheet is executed. If [Common] is selected, transmission is executed on the cycle set by [Common: Cyclic Scan] ([System] → [General]). To transmit data on a slow cycle exceeding 1 second, set this parameter for each sheet.

- Range: Common, 1/2/3/4/5/6/7/8/9/10/20/30/60 s
- Default value: Common

•Dev No.

Sets the No. of the device whose [Notify Complete Device] and [Notify Error Device] are written with a value and whose [Enabled Switch Device] is read.

- Range: Select from the preset connected devices
- Default value: –

●Notify Complete Device

Sets the register device to be turned on when the data transmission set on the sheet is complete. If no device is set, no completion notification is sent.

- Range: Depends on the device
- Default value: Blank

●Notify Error Device

Sets the register device to be turned on when the data transmission set on the sheet ends with an error. If no device is set, no error notification is sent.

- Range: Depends on the device
- Default value: Blank

●Enabled Switch

Select how to check configuration sheet validity. If [Enabled at ON] or [Enabled at OFF] is set, this device reads the value of [Enabled Switch Device] to check if the configuration sheet is valid.

- Range: Always enabled, Enabled at ON, Enabled at OFF
- Default value: Always enabled

●Enabled Switch Device

Sets the device for checking validity of the configuration sheet. This parameter can be set if [Enabled Switch] is set to [Enabled at ON] or [Enabled at OFF].

- Range: Depends on the device
- Default value: Blank

●Process configuration table

The process configuration table on the configuration sheet includes the following parameters.

Parameter name	Description
Source Dev No.	The device from which data is read
Source Device	The address of the register in the source device
Dest Dev No.	The device to which data is written
Dest Device	The address of the register in the destination device
Size*	The length of data to be transmitted. If “2” or greater value is set, data at the specified number of register addresses is transmitted in a single message.
Comment	Comments on the data transmission

* Specification of a value greater than “2” is supported by the SLP-SVG ver. 1.0.2.0 or later.

Each parameter is explained below.

● Source Dev No.

Sets the device from which data is read.

- Range: Connected device, internal register, or SYNC
- Default value: –

Note

- If “SYNC” is set, the row will not be processed until the processing of the preceding row is completed. In the following cases, set “SYNC” to communicate data in a desired order:
  ·Mode change is required after configuration is written.
  ·Configuration should be written in a specific order.
  ·Reading should be executed after all writing processes are completed.

● Source Device

Sets the address of the register in the device from which data is read.

- Range: Depends on the device
- Default value: Blank

● Dest Dev No.

Sets the device to which data is written.

- Range: Select from the preset connected devices
- Default value: –

● Dest Device

Sets the address of the register in the device to which data is written.

- Range: Depends on the device
- Default value: Blank

●Size

Sets the number of data items to transmit. If "1" is set, data at one address is transmitted. If "2" or greater value is set, data at the specified number of register addresses is transmitted in a single message.

The second and later register addresses are consecutive addresses that follow the address set by [Source Device] and [Dest Device].

- Range: Depends on the device
  The maximum number of register addresses specifiable for one communication frame, which differs depending on the source and destination devices, can be set.
  Note that [Read Device Max] set for the source device and [Write Device Max] set for the destination device are compared, and the smaller one is the high limit for this item.
  If [Read Device Max] or [Write Device Max] cannot be specified, or if a constant is set for [Source Device], "2" is the high limit.
- Default value: 1

Note

- ☞ Chapter 7. Communication Settings for Connected Devices ④ List of connected device types (p. 7-2) (for the maximum number of register addresses specifiable for one communication frame)

●Comment

Explanatory comments on the data transmission. This does not affect operation.

- Range: 32 characters
- Default value: Blank

④ Trigger Transmit

Configure the function for transmitting data based on the state of the trigger device.

●Attributes table

The attributes table of the configuration sheet includes the following parameters.

Parameter name	Description
Name	The name of the sheet
Trigger Edge	Trigger type : ON edge, OFF edge
Dev No.	The device to connect for sheet data transmission
Trigger Device	The trigger device for executing sheet data transmission (executed when ON)
Notify Complete Device	The register device to be turned on when data transmission set on the sheet is complete
Notify Error Device	The register device to be turned on when data transmission set on the sheet ends with an error
Enabled Switch	Selection of how to check configuration sheet validity
Enabled Switch Device	The device for checking configuration sheet validity that is read from the device set by [Device No.] if [Enabled Switch] is set to [Enabled at ON] or [Enabled at OFF]

Each parameter is explained below.

●Description

Sets the name of the configuration sheet. The name is displayed in the project view.

- Range: 64 characters
- Default value: Trigger Transmit 1

●Trigger Edge

Sets the state of the trigger device that triggers data transmission.
If [Trigger Edge] is set to ON edge (OFF → ON) and if the trigger device is ON when this device is started, the trigger condition is satisfied. If [Trigger Edge] is set to OFF edge (ON → OFF) and if the trigger device is OFF when this device is started, the trigger condition is not satisfied.

- Range: ON Edge (OFF→ON), OFF Edge (ON→OFF)
- Default value: ON Edge (OFF→ON)

● Dev No.

Sets the No. of the device whose [Trigger Device] is read and whose [Notify Complete Device] and [Notify Error Device] are written with a value.

- Range: Select from the preset connected devices
- Default value: –

● Trigger Device

Sets the trigger device for executing a configuration sheet for triggered data transmission.

- Range: Depends on the device
- Default value: Blank

●Notify Complete Device

Sets the register device to be turned on when the data transmission set on the sheet is complete. If no device is set, no completion notification is sent.

- Range: Depends on the device
- Default value: Blank

●Notify Error Device

Sets the register device to be turned on when the data transmission set on the sheet ends with an error. If no device is set, no error notification is sent.

- Range: Depends on the device
- Default value: Blank

●Enabled Switch

Select how to check configuration sheet validity. If [Enabled at ON] or [Enabled at OFF] is set, this device reads the value of [Enabled Switch Device] to check if the configuration sheet is valid.

- Range: Always enabled, Enabled at ON, Enabled at OFF
- Default value: Always enabled

●Enabled Switch Device

Sets the device for checking validity of the configuration sheet. This parameter can be set if [Enabled Switch] is set to [Enabled at ON] or [Enabled at OFF].

- Range: Depends on the device
- Default value: Blank

● Process configuration table

The process configuration table on the configuration sheet includes the following parameters.

Parameter name	Description
Source Dev No.	The device from which data is read
Source Device	The address of the register in the source device
Dest Dev No.	The device to which data is written
Dest Device	The address of the register in the destination device
Size*	The length of data to be transmitted. If “2” or greater value is set, data at the specified number of register addresses is transmitted in a single message.
Comment	Comments on the data transmission

* Specification of a value greater than “2” is supported by the SLP-SVG ver. 1.0.2.0 or later.

Each parameter is explained below.

● Source Dev No.

Sets the device from which data is read.

- Range: Connected device, internal register, or SYNC
- Default value: –

Note

- If “SYNC” is set, the row will not be processed until the processing of the preceding row is completed. In the following cases, set “SYNC” to communicate data in a desired order:
  ·Mode change is required after configuration is written.
  ·Configuration should be written in a specific order.
  ·Reading should be executed after all writing processes are completed.

● Source Device

Sets the address of the register in the device from which data is read.

- Range: Depends on the device
- Default value: Blank

● Dest Dev No.

Sets the device to which data is written.

- Range: Select from the preset connected devices
- Default value: –

● Dest Device

Sets the address of the register in the device to which data is written.

- Range: Depends on the device
- Default value: Blank

●Size

Sets the number of data items to transmit. If "1" is set, data at one address is transmitted. If "2" or greater value is set, data at the specified number of register addresses is transmitted in a single message.

The second and later register addresses are consecutive addresses that follow the address set by [Source Device] and [Dest Device].

- Range: Depends on the device
  The maximum number of register addresses specifiable for one communication frame, which differs depending on the source and destination devices, can be set.
  Note that [Read Device Max] set for the source device and [Write Device Max] set for the destination device are compared, and the smaller one is the high limit for this item.
  If [Read Device Max] or [Write Device Max] cannot be specified, or if a constant is set for [Source Device], "2" is the high limit.
- Default value: 1

Note

- ☞ Chapter 7. Communication Settings for Connected Devices ④ List of connected device types (p. 7-2) (for the maximum number of register addresses specifiable for one communication frame)

●Comment

Explanatory comments on the data transmission. This does not affect operation.

- Range: 32 characters
- Default value: Blank

④ Bit Set

Configure the function for writing 1-bit data based on the state of the trigger device.

●Attributes table

The attributes table of the configuration sheet includes the following parameters.

Parameter name	Description
Name	The name of the sheet

● Name

Sets the name of the configuration sheet. The name is displayed in the project view.

- Range: 64 characters
- Default value: Bit Set 1

●Process configuration table

The process configuration table on the configuration sheet includes the following parameters.

Parameter name	Description
Target Dev No.	The device to which 1-bit data is written
Target Device	The register device of the device to which 1-bit data is written
Dev No.	The device from which bit setting trigger is read and to which notification is written
Trigger (Write ON)	The trigger device for executing bit setting When this trigger is turned on, [Target Device] is turned on.
Trigger (Write OFF)	The trigger device for executing bit setting When this trigger is turned on, [Target Device] is turned off.
Notify Complete	The register device to be turned on when bit setting for the module is complete
Notify Error	The register device to be turned on when bit setting for the module ends with an error
Comment	Explanatory comments on the bit setting

Each parameter is explained below.

● Target Dev No.

Sets the device to which 1-bit data is written.

- Range: Connected device, internal register
- Default value: –

●Target Device

Sets the address of the register device of the slave device to which 1-bit data is written.

- Range: Depends on the device
- Default value: Blank

● Dev No.

Sets the device whose [Trigger (Write ON)] and [Trigger (Write OFF)] for executing bit setting are read and whose [Notify Complete Device] and [Notify Error Device] are written with a value.

- Range: Connected device, internal register
- Default value: –

●Trigger (Write ON)

Sets the trigger device for writing ON to the address of [Target Device].

- Range: Depends on the device
- Default value: Blank

●Trigger (Write OFF)

Sets the trigger device for writing OFF to the address of [Target Device].

- Range: Depends on the device
- Default value: Blank

●Notify Complete Device

Sets the register device to be turned on when bit setting for the module is complete If no device is set, no completion notification is sent.

- Range: Depends on the device
- Default value: Blank

●Notify Error Device

Sets the register device to be turned on when bit setting for the module ends with an error. If no device is set, no error notification is sent.

- Range: Depends on the device
- Default value: Blank Comment

Explanatory comments on the bit setting This does not affect operation. It is useful for checking configuration.
Range: 32 characters
Default value: Blank

●Comment

Explanatory comments on the bit setting This does not affect operation.

- Range: 32 characters
- Default value: Blank

④ Device Management – Backup Restore

Configure the backup function for saving the configuration of the connected Network Instrumentation Module and the restoration function for writing the saved configuration to the Network Instrumentation Module.

●Attributes table

The attributes table of the configuration sheet includes the following parameters.

Parameter name	Description
Dev No.	The device whose trigger device is read and to which notification is written
Backup All Trigger	The trigger device for backing up the configuration of all connected devices (executed when ON)
Restore All Trigger	The trigger device for restoring the configuration of all connected devices (executed when ON)
Notify All Complete Device	The register device to be turned on when backup or restoration of the configuration of all connected devices set on a sheet is complete
Notify All Error Device	The register device to be turned on when backup or restoration of the configuration of all connected devices set on a sheet ends with an error

Note

- The configuration of the devices for which [Enabled Switch] is set to [Disabled] is not backed up or restored.

Each parameter is explained below.

●Dev No.

Sets the device whose [Backup All Trigger] and [Restore All Trigger] (for backing up or restoring the configuration of all devices set on a sheet) are read and whose [Notify All Complete Device] and [Notify All Error Device] are written with a value. Trigger reading and notification writing that are set in rows of the process configuration table are also done for register devices of the module set by this parameter.

- Range: Connected device, internal register
- Default value: –

●Backup All Trigger

Sets the trigger device for backing up the configuration of all connected devices on the sheet.

- Range: Depends on the device
- Default value: Blank

●Restore All Trigger

Sets the trigger device for restoring the configuration of all connected devices on the sheet.

- Range: Depends on the device
- Default value: Blank

●Notify All Complete Device

Sets the register device to be turned on when backup or restoration of all connected devices set on the sheet is complete. If no device is set, no completion notification is sent.

- Range: Depends on the device
- Default value: Blank

●Notify All Error Device

Sets the register device to be turned on when backup or restoration of all connected devices set on the sheet ends with an error. If no device is set, no error notification is sent.

- Range: Depends on the device
- Default value: Blank

●Process configuration table

The process configuration table on the configuration sheet includes the following parameters.

Parameter name	Description
Target Device	The device whose configuration is backed up or restored is displayed (not changeable).
Restore Target	The items to be restored in the configuration file of the device.
Backup Trigger	The trigger device for backing up the configuration of devices individually (executed when ON)
Restore Trigger	The trigger device for restoring the configuration of slave devices individually (executed when ON)
Notify Result	The register device to which the result code of device configuration backup or restoration is sent "0" is sent for a success and a failure code is sent for a failure. ☞ Chapter 9. Troubleshooting (for details about failure codes)
Notify Complete	The register device to be turned on when device configuration backup or restoration is complete
Notify Error	The register device to be turned on when device configuration backup or restoration ends with an error

Each parameter is explained below.

●Target Device

The Network Instrumentation Modules set for [LAN1] or [LAN2] of [System] are displayed. The connected device setting cannot be changed by this parameter.

- Range: Connected device
- Default value: –

●Restore Target

Sets the items in the configuration file that should be restored.

- Range: Parameter
  Parameter + mode
  Parameter + user definition
  Parameter + mode + user definition
- Default value: Parameter

Note

- The restored parameter data is the same as the data read or written by the SLP-NX.

●Backup Trigger

Sets the trigger device for backing up the configuration of the devices on the sheet individually. Set the register device of the device set for [Dev No.] in the attributes table.

- Range: Depends on the host device
- Default value: Blank

●Restore Trigger

Sets the trigger device for restoring the configuration of the devices on the sheet individually. Set the register device of the device set for [Dev No.] in the attributes table.

- Range: Depends on the host device
- Default value: Blank

●Notify Result

Sets the register device to which the result of device configuration backup or restoration is sent. Set the register device of the device set for [Dev No.] in the attributes table. The result of batch backup or restoration is also sent to this register device. If no device is set, the result is not sent.

- Range: Depends on the host device
- Default value: Blank

●Notify Complete

Sets the register device to be turned on when configuration backup or restoration is complete. Set the register device of the device set for [Dev No.] in the attributes table. A completion notification of batch backup or restoration is also sent to this register device. If no device is set, no completion notification is sent.

- Range: Depends on the host device
- Default value: Blank

●Notify Error

Sets the register device to be turned on when configuration backup or restoration ends with an error. Set the register device of the device set for [Dev No.] in the attributes table. An error notification of batch backup or restoration is also sent to this register device. If no device is set, no error notification is sent.

- Range: Depends on the host device
- Default value: Blank

④ Device Management–IP Address Assignment

Configure the function for assigning IP addresses to all Network Instrumentation Modules set for [LAN1] or [LAN2] of [System].

●Attributes table

The attributes table of the configuration sheet includes the following parameters.

Parameter name	Description
Dev No.	The device whose trigger device is read and to which notification is written
IP Address Assignment Trigger	The trigger device for assigning an IP address to connected devices (executed when ON)
Notify Result	The register device to which the result code of IP assignment of connected devices is sent "0" is sent for a success and a failure code is sent for a failure. ☞ Chapter 9. Troubleshooting (for details about failure codes)
Notify Complete	The register device to be turned on when IP assignment of connected devices is complete
Notify Error	The register device to be turned on when IP assignment of connected devices ends with an error

Note

- IP address is not assigned to the devices for which [Enabled Switch] is set to [Disabled].

Each parameter is explained below.

●Dev No.

Sets the device whose [IP Address Assignment Trigger] is read and whose [Notify Complete Device] and [Notify Error Device] are written with a value.

- Range: Connected device, internal register
- Default value: –

●IP Address Assignment Trigger

Sets the trigger device for executing IP address assignment. If no device is set, IP address assignment is not executed.

- Range: Depends on the host device
- Default value: Blank

●Notify Result

Sets the register device to which the result of IP address assignment is sent. If no device is set, the result is not sent.

- Range: Depends on the host device
- Default value: Blank

●Notify Complete

Sets the register device to be turned on when IP address assignment is complete.

- Range: Depends on the host device
- Default value: Blank

●Notify Error

Sets the register device to be turned on when IP address assignment ends with an error.

- Range: Depends on the host device
- Default value: Blank

④ Device Management–Status Notification

Configure the function for notifying the status of this device or connected devices.

●Attributes table

The attributes table of the configuration sheet includes the following parameters.

Parameter name	Description
Notification Interval	The cycle on which a value is written to [Notification during RUN], [Notification Low Battery], and [Notification Connected Status]
Dev No.	The device to which notification is written
Notification during RUN	The register device that is turned on according to the cycle set by [Notification Interval] to send notification that this device is operating
Notification Low Battery	The register device that is turned on according to the cycle set by [Notification Interval] to send notification that the battery is low
Notification Connected Status	Setting of whether a status notification is sent to a bit device or a specific bit of a word device

Each parameter is explained below.

●Notification Interval

Sets the cycle on which a value is written to [Notification during RUN], [Notification Low Battery], and [Notification Connected Status]. Each function is executed on the same cycle.

- Range (unit: seconds): 1 s to 10 s
- Default value: 5 s

●Dev No.

Sets the device to whose [Notification during RUN], [Notification Low Battery], and [Notification Connected Status] devices are written with a value.

- Range: Connected device, internal register
- Default value: –

•Notification during RUN

This function notifies the host device that this device is operating. Set the register device that is turned on when this device is operating. If no device is set, the status is not notified.

- Range: Depends on the host device
- Default value: Blank

•Notification Low Battery

This function notifies the host device that the battery is low. Set the register device that is turned on when the battery is low. If no device is set, the status is not notified.

- Range: Depends on the host device
- Default value: Blank

Note

- The low battery status is also indicated by the BATTERY LED in the function indicators selection on the front of this device. If no battery is used, not using this function and setting [Disabled] for [Battery Alarm] ([System] → [General]) is recommended.

•Notification Connected Status

This function notifies the host device whether slave devices are connected. Set whether to send a status notification to a bit device or a specific bit of a word device.

- Range: Notify Bit, Notify Word
- Default value: Notify Bit

•Process configuration table

The process configuration table on the configuration sheet includes the following parameters.

Parameter name	Description
Connected Device	Slave devices connected to LAN1, LAN2, COM1, and COM2 are displayed (not changeable).
Notify Disconnect	The register device of the host device that is turned on or off depending on the connection status of slave devices
Bit Position	The bit position reckoned from the least significant bit (LSB) of the word device (set this parameter when [Notification Connected Status] is set to [Notify Word])

Each parameter is explained below.

●Connected Device

Devices set for [LAN1], [LAN2], [COM1], or [COM2] of [System] are displayed. The connected device setting cannot be changed by this parameter.

- Range: Connected device
- Default value: –

● Notify Disconnect

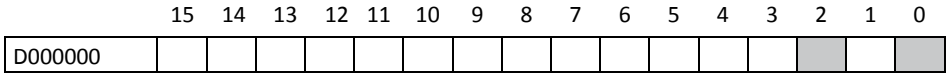
Set the register device that is turned on or off depending on the connection status. ON is written when communication with the slave device is disconnected, and OFF is written when it is connected. If no device is set, the status is not notified.

- Range: Depends on the host device
- Default value: Blank

Note

- If [Notification Connected Status] is set to [Notify Word], the same disconnection notification device can be set for multiple slave devices. In the following example, if NX-D15 Nos.1-1 and 1-3 are disconnected, the value at 0005h (hexadecimal) is written to D000000 of the host device as the state of the devices.

No.	Connected Device	Notify Disconnect	Bit Position
1-1	NX-D15 (disconnected)	D000000	0
1-2	NX-D15	D000000	1
1-3	NX-D15 (disconnected)	D000000	2
1-4	NX-D15	D000000	3



● Bit Position

If [Notification Connected Status] in the attribute table is set to [Notify Word], set the bit of the word device to be turned on. The LSB is 0 and MSB is 15.

- Range: 0 to 15
- Default value: 0

④ Device Management – DateTime Setting

Configure the function for setting the time of the internal clock of this device.
The time can be set by obtaining time data from register devices in the PLC or by synchronization with the time on an NTP server.

●Attributes table

The attributes table of the configuration sheet includes the following parameters.

Parameter name	Description
Time setting kind	Selection of time setting method
Startup execution	Setting of whether to set time at every startup
Dev No.	The device whose [Adjust Time Trigger] and time data is read and whose [Notify Complete Device] and [Notify Error Device] are written with a value
Adjust Time Trigger	The trigger device for executing bit setting (executed when ON)
Notify Complete Device	The register device to be turned on when time setting is complete
Notify Error Device	The register device to be turned on when time setting ends with an error
NTP server IP Address	The IP address of the NTP server (set when [Time setting kind] is set to [NTP Server])
Port	The UDP port No. of the NTP server (set when [Time setting kind] is set to [NTP Server])
Year Device	The year data device (set when [Time setting kind] is set to [PLC Register])
Month Device	The month data device (set when [Time setting kind] is set to [PLC Register])
Day Device	The day data device (set when [Time setting kind] is set to [PLC Register])
Hour Device	The hour data device (set when [Time setting kind] is set to [PLC Register])
Minute Device	The minute data device (set when [Time setting kind] is set to [PLC Register])
Second Device	The second data device (set when [Time setting kind] is set to [PLC Register])

Each parameter is explained below.

●Time settingkind

Selects the method of setting the time. Setting items depend on the type.

- Range: Disabled
  NTP Server
  PLC Register
- Default value: Disabled

• Startup execution

Sets whether to set the time at every startup. By setting [Enabled], the time is set every time the power is turned on, so it is not necessary to put a battery in this device.

- Range: Disabled
  Enabled
- Default value: Disabled

•Dev No.

Sets the device whose [Adjust Time Trigger] and time data is read and whose [Notify Complete Device] and [Notify Error Device] are written with a value.

- Range: Connected device, internal register
- Default value: –

•AdjustTimeTrigger

Sets the trigger device for obtaining time data from register devices in the PLC or for synchronizing with the time on an NTP server.

- Range: Depends on the device
- Default value: Blank

•Notify Complete Device

Sets the register device to be turned on when time setting is complete. If no device is set, no completion notification is sent.

- Range: Depends on the device
- Default value: Blank

•Notify Error Device

Sets the register device to be turned on when time setting ends with an error. If no device is set, no error notification is sent.

- Range: Depends on the device
- Default value: Blank

•NTP server IP Address

Sets the IP address of the NTP server.

- Range: 1.0.0.1 to 223.255.255.255 (excluding 127._ _ _._ _ _._ _ _)
- Default value: Blank

•Port

Sets the UDP port number of the NTP server.

- Range: 0 to 65535
- Default value: Depends on the device

•Year/Month/Day/Hour/Minute/Second Device

Sets the devices of the PLC from which time data is obtained. Sets the year, month, day, hour, minute, and second.

- Range: Depends on the device
- Default value: Blank

Set the time data on the PLC in decimal format.

- Year: 2000–2038
- Month: 1–12
- Day: 1–31
- Hour: 0–23
- Minute: 0–59
- Second: 0–59

Handling Precautions

- Time after 3:14:07 (UTC) on January 19, 2038 cannot be set.

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-MEMO-

Chapter7. Communication Settings for Connected Devices

When communicating with a PLC or a controller made by Azbil, this device serves as the master station of communication and transmits communication messages according to the communication protocol of the devices whose connection to LAN1, LAN2, COM1, or COM2 was set up by the loader.
The host and slave devices return a response according to the communication message sent by this device.

This chapter describes communication settings for these devices.

7-1 Types of Connected Device

④ List of connected device types

● Ethernet connection

Devices that can be connected to LAN1 or LAN2 of this device are shown in the table below.

Company name	Product name	Protocol	Transport layer protocol	Displayed model name
Azbil Corporation	Network Instrumentation Module	CPL/TCP	TCP	NX-D15 NX-D25 NX-D35 NX-DX NX-DY
	Multi-loop controller with multifunction display, model C7G	Modbus/TCP Binary	TCP	C7G
	RX-L burner interlock module	Modbus/TCP Binary	TCP	RX-L90
	HD-HNU002 HART communication–compatible unit	Special protocol	UDP	HNU
Mitsubishi Electric Corporation	MELSEC iQ-R MELSEC Q MELSEC L	SLMP (3E) Binary	TCP/UDP	Mitsubishi SLMP (3E)
	MELSEC iQ-F	SLMP (3E) Binary	TCP/UDP	Mitsubishi iQ-F SLMP (3E)
Yokogawa Electric Corporation	FA-M3	PC link Binary	TCP/UDP	Yokogawa FA-M3
Omron Corporation	NJ series CJ/CS *1	FINS	TCP/UDP	Omron FINS
Siemens Corporation	S7-1500 S7-1200 S7-300 S7-400 S7-200 SMART	S7 communication	COTP	Siemens S7
JTEKT Corporation	PC10	Computer link PC 10 mode	TCP	TOYOPUC PC10 (TCP)
FANUC Corporation	CNC	Modbus/TCP Binary	TCP	FANUC CNC
Keyence Corporation	KV-7000 series KV-5000/3000 series *2 KV Nano series	SLMP (3E) Binary	TCP/UDP	Keyence KV
Fuji Electric Co., Ltd.	SPH2000	Loader command	TCP	Fuji MICREX-SX
General purpose	General-purpose Modbus/TCP device	Modbus/TCP Binary	TCP	Modbus/TCP
	General-purpose CPL/TCP device	CPL/TCP	TCP	CPL/TCP CPL/TCP (NX)

*1. The NX-SVG cannot be connected to the CS1W-ETN01, CS1W-ETN11, and CJ1W-ETN11.

*2. The NX-SVG cannot be connected to models KV-1000 and KV-700.

●RS-485 connection

Devices that can be connected to COM1 or COM2 of this device are shown in the table below.

Company name	Product name	Model	Protocol	Displayed model name
Azbil Corporation	Single loop controller	C1M	CPL	C1M
		C15	CPL	SDC15
		C25/26	CPL	SDC25
		C35/36	CPL	SDC35
		C45/46	CPL	SDC45
	Burner controller	Model BC-R15/25/35	CPL	BC-R_5
		AUR255	CPL	AUR255
	Flame monitor	AUR355	CPL	AUR355
	Dynamic self-checking burner controller	AUR455	CPL	AUR455
	Burner interlock module	RX-L80	CPL	RX-L80
	Mass flow controller	F4H	CPL	F4H
		F4Q	CPL	F4Q
		MQV	CPL	MQV
		MPC	CPL	MPC
	Air flowmeter	MCF	Modbus/RTU	MCF
	Power controller	PU21	Modbus/RTU	PU21
		PU23	Modbus/RTU	PU23
General purpose	General-purpose Modbus/RTU device	–	Modbus/RTU	Modbus/RTU
	General-purpose CPL device	–	CPL	CPL

④ Maximum number of register addresses specifiable for one communication frame

● Ethernet connection

Company name	Displayed model name	Max. number of register addresses specifiable for one communication frame	
		Read	Write
Azbil Corporation	NX-D15	-	-
	NX-D25/D35 (4CH)	-	-
	NX-D35 (2CH)	-	-
	NX-DX	-	-
	NX-DY	-	-
	C7G	-	-
	RX-L90	-	-
Mitsubishi Electric Corporation	Mitsubishi SLMP (3E)	192	160
	Mitsubishi iQ-F SLMP (3E)	192	160
Yokogawa Electric Corporation	Yokogawa FA-M3	32	32
Omron Corporation	Omron FINS	167	167
Siemens Corporation	Siemens S7	-	-
JTEKT Corporation	TOYOPUC PC10 (TCP)	-	-
FANUC Corporation	FANUC CNC	125	123
Keyence Corporation	Keyence KV	192	160
Fuji Electric Co., Ltd.	Fuji MICREX-SX	243	243
General purpose	Modbus/TCP	125	123
	CPL/TCP	-	-
	CPL/TCP (NX)	-	-

Note: Where "-" is indicated, the number of addresses differs depending on communication with the connected device.

●RS-485 connection

Company name	Displayed model name	Max. number of register addresses specifiable for one communication frame	
		Read	Write
Azbil Corporation	C1M	-	-
	SDC15	-	-
	SDC25	-	-
	SDC35	-	-
	SDC45	-	-
	BC-Rx5	-	-
	AUR255	-	-
	AUR355	-	-
	AUR455	-	-
	RX-L80	-	-
	F4H	-	-
	F4Q	-	-
	MQV	-	-
	MPC	-	-
	MCF	-	-
	PU21	-	-
	PU23	-	-
General purpose	Modbus/RTU	125	123
	CPL/Serial	-	-

Note: Where "-" is indicated, the number of addresses differs depending on communication with the connected device.

④ Available devices

The address range of a device (data) that can be set for each product are as follows.

For available device (data) addresses, refer to the user's manual for the product.

- **Azbil**

Model	Protocol	Device type	Address range
NX-D15 NX-D25 NX-D35 NX-DX NX-DY	CPL/TCP	Bit device	0.0 to 65535.F
		Word device	0 to 65535
C7G RX-L90	Modbus/TCP	Word device	0 to 65535
C1M C15 C25/26 C35/36 C45/46 BC-R15/25/35 AUR255 AUR355 AUR455 RX-L80 F4H, F4Q MQV, MPC	CPL	Bit device	0.0 to 65535.F
		Word device	0 to 65535
MCF	Modbus/RTU	Word device	0 to 65535
PU21/23	Modbus/RTU	Digital setting	000001 to 065536
		Digital input	100001 to 165536
		Analog input	300001 to 365536
		Analog setting	400001 to 465536

● Mitsubishi Electric, SLMP

For data reading and writing with a Mitsubishi Electric's PLC, random access communication is supported. It is not necessary to worry about assigning source and destination devices to consecutive fields.

Device type	Address range
Input relay	X000000 to X00FFFF
Output relay	Y000000 to Y00FFFF
Internal relay	M0000000 to M2147483647
Special relay	SM0000000 to SM0032767
Link special relay	SB000000 to SB7FFFFFFF
Edge relay	V0000000 to V0032767
Latch relay	L0000000 to L0032767
Link relay	B000000 to B7FFFFFF
Annunciator	F0000000 to F0032767
Timer (contact)	TS0000000 to TS2147483647
Timer (coil)	TC0000000 to TC2147483647
Estimate timer (contact)	SS0000000 to SS2147483647
Estimate timer (coil)	SC0000000 to SC2147483647
Counter (contact)	CS0000000 to CS2147483647
Counter (coil)	CC0000000 to CC2147483647
Data register	D0000000 to D2147483647
Link register	W000000 to W7FFFFFFF
Index register	Z0000000 to Z0000032
File register (R)	R0000000 to R0032767
File register (R)	ZR0000000 to ZR2147483647
Special register	SD0000000 to SD0032767
Link special register	SW000000 to SW7FFFFFFF
Timer current value	TN0000000 to TN2147483647
Estimate timer current value	SN0000000 to SN2147483647
Counter current value	CN0000000 to CN2147483647

● Mitsubishi Electric, iQ-F SLMP

For data reading and writing with a Mitsubishi Electric's PLC, random access communication is supported. It is not necessary to worry about assigning source and destination devices to consecutive fields.

Device type	Address range
Input relay	X000000 to X177777
Output relay	Y000000 to Y177777
Internal relay	M0000000 to M2147483647
Special relay	SM0000000 to SM0032767
Link special relay	SB000000 to SB7FFFFFFF
Latch relay	L0000000 to L0032767
Link relay	B000000 to B7FFFFFF
Annunciator	F0000000 to F0032767
Timer (contact)	TS0000000 to TS2147483647
Timer (coil)	TC0000000 to TC2147483647
Estimate timer (contact)	SS0000000 to SS2147483647
Estimate timer (coil)	SC0000000 to SC2147483647
Counter (contact)	CS0000000 to CS2147483647
Counter (coil)	CC0000000 to CC2147483647
Data register	D0000000 to D2147483647
Link register	W000000 to W7FFFFFFF
Index register	Z0000000 to Z0000032
File register (R)	R0000000 to R0032767
Special register	SD0000000 to SD0032767
Link special register	SW000000 to SW7FFFFFF
Timer current value	TN0000000 to TN2147483647
Estimate timer current value	SN0000000 to SN2147483647
Counter current value	CN0000000 to CN2147483647

● Yokogawa Electric

For data reading and writing with a Yokogawa Electric's PLC, random access communication is supported. It is not necessary to worry about assigning source and destination devices to consecutive fields.

Device type	Address range
Input relay	Xlmmnn I: Unit No. (0 to 7) mm: Slot position (1 to 16) nn: terminal No. (1 to 64)
Output relay	Ylmmnn I: Unit No. (0 to 7) mm: Slot position (1 to 16) nn: terminal No. (1 to 64)
Internal relay	I000001 to I065536
Common relay	E000001 to E065536
Link relay	L00001 to L65536
Special relay	M000001 to M065536
Timer	TU000001 to TU009999
Counter	CU000001 to CU009999
Data register	D000001 to D065536
Common register	R000001 to R065536
Index register	V000001 to V065536
Link register	W00001 to W65536
Special register	Z000001 to Z065536
File register	B000001 to B065536
Cache register	F000001 to F065536
Timer set value	TS000001 to TS009999
Timer current value	TP000001 to TP009999
Timer current value (count up)	TI000001 to TI009999
Counter set value	CS000001 to CS009999
Counter current value	CP000001 to CP009999
Counter current value (count up)	CI000001 to CI009999

●Omron

For Omron's PLC, assign data transmission destination devices to consecutive fields as much as possible.

Commands to write data in consecutive fields are supported, so assigning destination devices to consecutive fields makes communication efficient.

For reading data, random access communication is supported, so it is not necessary to worry about assigning source devices to consecutive fields.

Device type	Address range
Channel I/O bit	0000.00 to 6143.15
Internal auxiliary relay bit	W0000.00 to W0511.15
Retaining relay bit	H0000.00 to H1535.15
Special auxiliary relay bit	A0000.00 to A1471.15
Timer (up flag)	T00000 to T04095
Counter (up flag)	C00000 to C04095
Channel I/O	00000 to 06143
Timer (current value)	TN00000 to TN04095
Counter (current value)	CN00000 to CN04095
Data memory	D00000 to D32767
Extended data memory bank 0	E0_00000 to E0_32767
⋮	⋮
Extended data memory bank F	EF_00000 to EF_32767
Extended data memory bank 10	E10_00000 to E10_32767
⋮	⋮
Extended data memory bank 18	E18_00000 to E18_32767
Extended data memory current	E00000 to E32767

● Siemens

For Siemens's PLC, assign data transmission destination word devices to consecutive fields as much as possible.

Commands to write data to word devices in consecutive fields are supported, so assigning destination devices to consecutive fields makes communication efficient. If bit devices are specified as destinations, data is written bit by bit. Therefore, for data that is written frequently, it is better to specify word devices.

For reading data, random access communication is supported, so it is not necessary to worry about assigning source devices to consecutive fields.

Device type	Address range
Input bit	I00000.0 to I65534.7
Output bit	Q00000.0 to Q65534.7
Internal bit	M00000.0 to M65534.7
Data bit	DB00001.DBX00000.0 to DB00001.DBX65534.7
	DB00002.DBX00000.0 to DB00002.DBX65534.7
	⋮
	DB60000.DBX00000.0 to DB60000.DBX65534.7
Input word	IW00000 to IW65534
Output word	QW00000 to QW65534
Internal word	MW00000 to MW65534
Data word	DB00001.DBW00000 to DB00001.DBW65534
	DB00002.DBW00000 to DB00002.DBW65534
	⋮
	DB60000.DBW00000 to DB60000.DBW65534

To write/read data to/from the [V] and [VW] data type fields of the Siemens S7-200 SMART, set a device address of DB00001.DBX for [V] (bit memory) and DB00001. DBW for [VW] (word memory) with the loader.

Ex.: V00000.0 → DB00001.DBX00000.0
VW00000 → DB00001.DBW00000

●JTEKT

For data reading and writing with a JTEKT 's PLC, random access communication is supported. It is not necessary to worry about assigning source and destination devices to consecutive fields.

Device type	Address range
Keep relay	Pn-K0000 to Pn-K02FF
Link relay	Pn-L0000 to Pn-L07FF
	Pn-L1000 to Pn-L2FFF
Internal relay	Pn-M0000 to Pn-M07FF
	Pn-M1000 to Pn-M17FF
Edge	Pn-P0000 to Pn-P01FF
	Pn-P1000 to Pn-P17FF
Timer	Pn-T0000 to Pn-T01FF
	Pn-T1000 to Pn-T17FF
Counter	Pn-C0000 to Pn-C01FF
	Pn-C1000 to Pn-C17FF
Special relay	Pn-V0000 to Pn-V00FF
	Pn-V1000 to Pn-V17FF
Input relay	Pn-X0000 to Pn-X07FF
Output relay	Pn-Y0000 to Pn-Y07FF
Extended edge	EP0000 to EP0FFF
Extended keep relay	EK0000 to EK0FFF
Extended special relay	EV0000 to EV0FFF
Extended timer	ET0000 to ET07FF
Extended counter	EC0000 to EC07FF
Extended link relay	EL0000 to EL1FFF
Extended input	EX0000 to EX07FF
Extended output	EY0000 to EY07FF
Extended internal relay	EM0000 to EM1FFF
Extended I/O	GX0000 to GXFFFF
Extended I/O	GY0000 to GXFFFF
Extended internal relay	GM0000 to GXFFFF
Data register	Pn-D0000 to Pn-D2FFF
Timer/counter current value	Pn-N0000 to Pn-N01FF
	Pn-N1000 to Pn-N17FF
Link register	Pn-R0000 to Pn-R07FF
Special register	Pn-S0000 to Pn-S03FF
	Pn-S1000 to Pn-S13FF
Extended special register	ES000 to ES07FF
Extended current value register	EN0000 to EN07FF
Extended set value register	H0000 to H07FF
Extended data register	U00000 to U1FFFF
Extended buffer register	EB00000 to EB3FFFF
Flash register	FR000000 to FR1FFFFF

• FANUC

For FANUC's CNC, assign source and destination devices to consecutive fields as much as possible.

For Modbus communication with FANUC's CNC, commands to write or read data in consecutive fields are supported, so assigning devices to consecutive fields makes communication efficient.

Device type	Address range
Retaining register	400001 to 465536

Note: Three consecutive Modbus fields to which PMC fields are assigned can be used as device fields for reading/writing data from/to a FANUC's CNC.

• Keyence

For data reading and writing with a Keyence's PLC, random access communication is supported. It is not necessary to worry about assigning source and destination devices to consecutive fields.

Device type	Address range
Relay	R000000 to R099915
Internal auxiliary relay	MR000000 to MR399915
Latch relay	LR000000 to LR099915
Data memory	DM00000 to DM65534
Extended data memory	EM00000 to EM65534
File register	FM00000 to FM32767
File register	ZF00000 to ZF524287
Link relay	B0000 to B7FFF
Link register	W0000 to W7FFF
Control relay	CR000000 to CR008915
Control memory	CM00000 to CM08999

●Fuji Electric

For Fuji Electric's PLC, assign data transmission source and destination devices to consecutive fields as much as possible. Commands to read or write data in consecutive fields are supported, so assigning source and destination devices to consecutive fields makes communication efficient.

There are two programming support tools for Fuji Electric's PLC, SX-Programmer Expert (D300win) and SX-Programmer Standard, and the PLC device notation differs depending on the programming support tool used. The SLP-SVG uses the device notation used in SX-Programmer Expert (D300win). If you are using SX-Programmer Standard, change the device notation to that of SX Programmer Expert (D300win) and enter it.

Device type	Address range	
	SX-Programmer Expert (D300win)	SX-Programmer Standard
Standard memory	%MW1.0000000 to %MW1.1703935	WM0 to WM1703935
Retain memory	%MW3.0000000 to %MW3. 0262143	WL0 to WL 262143
System memory	%MW10.0000000 to %MW10.0000511	WSM0 to WSM511
Standard memory (bit)	%MX1.0000000.00 to %MX1.1703935.15	M0 to M1703935F
Retain memory (bit)	%MX3.0000000.00 to %MX3. 0262143.15	L0 to L 262143F
System memory (bit)	%MX10.0000000.00 to %MX10.0000511.15	SM0 to SM511F

●Modbus

For devices using Modbus communications, assign source and destination devices to consecutive fields as much as possible.

Commands to write or read data in consecutive fields are supported, so assigning devices to consecutive fields makes communication efficient.

Device type	Address range
Coil	000001 to 065536
Input relay	100001 to 165536
Input register	300001 to 365536
Retaining register	400001 to 465536

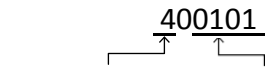
Change the Modbus address used by the loader in accordance with the address expression used for the connected Modbus device.

The address expression in the Modbus protocol and the loader is as follows.

Device type	Modbus communication Protocol		SLP-SVG
	Function code	Address range	Address range
Coil	1 (0x01) 5 (0x05) 15 (0x0F)	0000	000001
		0001	000002
		to	to
		FFFF	065536
Input relay	2 (0x02)	0000	100001
		0001	100002
		to	to
		FFFF	165536
Input register	4 (0x04)	0000	300001
		0001	300002
		to	to
		FFFF	365536
Retaining register	3 (0x03) 6 (0x06) 16 (0x10)	0000	400001
		0001	400002
		to	to
		FFFF	465536

In the Modbus communication protocol, a function number is added to an address in order to indicate the device type. In the loader, the type is expressed by the value (0, 1, 3, 4) at the beginning of an address.

Also, the address used by the loader is the Modbus protocol address + 1, as shown in the above example of “000001” to “065536."



Device type
0: Coil
1: Input relay
3: Input register
4: Retaining register

Modbus communication address + 1
(decimal address)

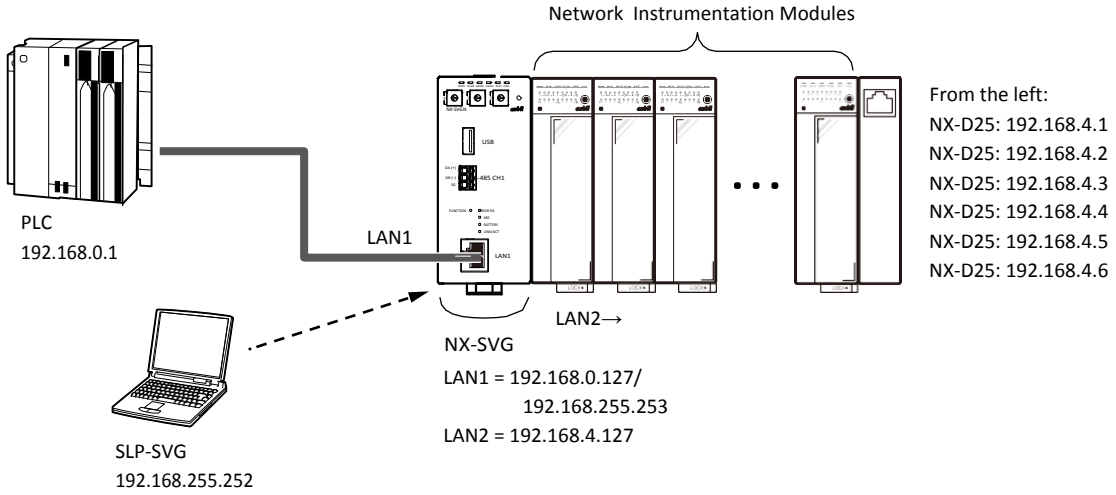
7-2 Azbil Products

④ Network Instrumentation Modules

An application example of the following device is given below.

Network Instrumentation Module	NX-D25
Communication interface	Ethernet
Communication protocol	CPL/TCP

●System configuration



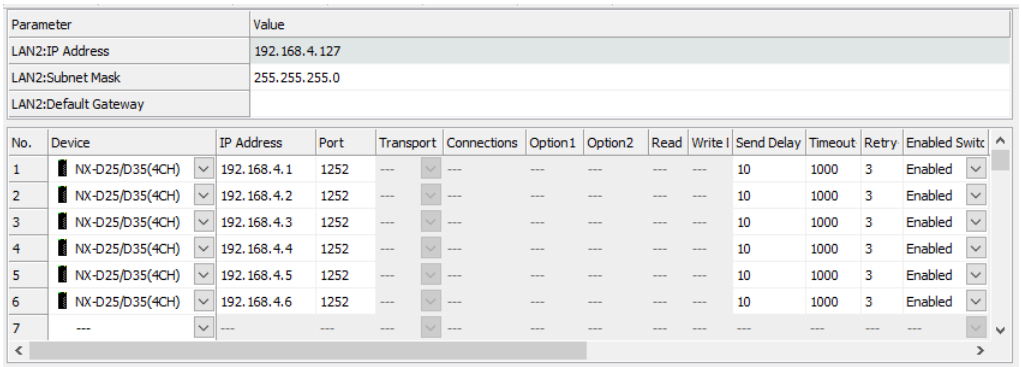
Note

• ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

● Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the connected PLC.

(2) Specify LAN2 settings according to the configuration of the connected Network Instrumentation Module.
Do not change the default values of the ports.



Parameter	Value
LAN2:IP Address	192.168.4.127
LAN2:Subnet Mask	255.255.255.0
LAN2:Default Gateway	

No.	Device	IP Address	Port	Transport	Connections	Option1	Option2	Read	Write I	Send Delay	Timeout	Retry	Enabled Switc
1	NX-D25/D35(4CH)	192.168.4.1	1252	---	---	---	---	---	---	10	1000	3	Enabled
2	NX-D25/D35(4CH)	192.168.4.2	1252	---	---	---	---	---	---	10	1000	3	Enabled
3	NX-D25/D35(4CH)	192.168.4.3	1252	---	---	---	---	---	---	10	1000	3	Enabled
4	NX-D25/D35(4CH)	192.168.4.4	1252	---	---	---	---	---	---	10	1000	3	Enabled
5	NX-D25/D35(4CH)	192.168.4.5	1252	---	---	---	---	---	---	10	1000	3	Enabled
6	NX-D25/D35(4CH)	192.168.4.6	1252	---	---	---	---	---	---	10	1000	3	Enabled
7	---	---	---	---	---	---	---	---	---	---	---	---	---

Device	IP Address	Port	Send Delay Time	Timeout-time (msec)	Retry-count	Enabled Switch
NX-D25/D35 (4CH)	192.168.4.1	1252	10	1000	3	Enabled
NX-D25/D35 (4CH)	192.168.4.2	1252	10	1000	3	Enabled
NX-D25/D35 (4CH)	192.168.4.3	1252	10	1000	3	Enabled
NX-D25/D35 (4CH)	192.168.4.4	1252	10	1000	3	Enabled
NX-D25/D35 (4CH)	192.168.4.5	1252	10	1000	3	Enabled
NX-D25/D35 (4CH)	192.168.4.6	1252	10	1000	3	Enabled

●Device setup

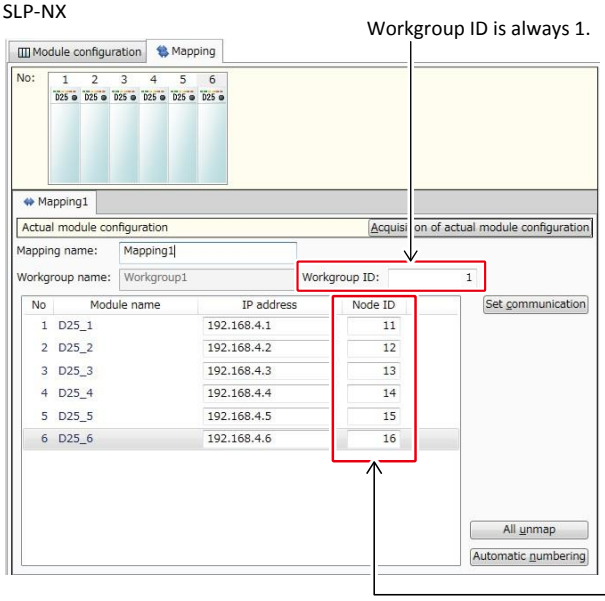
Assign IP addresses using the Smart Loader Package model SLP-NX for Network Instrumentation Modules or the Smart Loader Package model SLP-SVG for this device.

! Handling Precautions

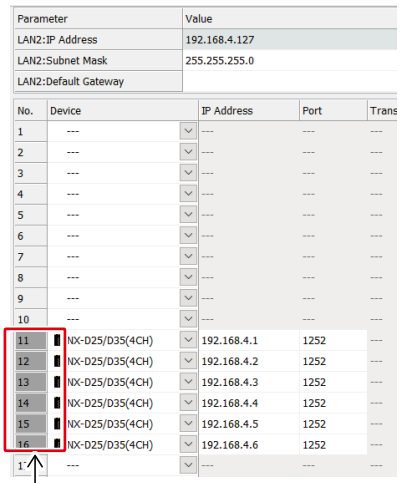
- If the supervisor module of the Network Instrumentation Modules is included in the system, or if the inter-module data transmission function is enabled for the modules, the module's IP address that is changed after configuration backup by this device will not be restored correctly. Set the new IP address for the configuration file of the module using the SLP-NX Smart Loader Package for Network Instrumentation Modules, and back up the configuration again.
- If a supernet is set for the subnet mask of LAN ports (e.g., setting the class B subnet mask 255.255.0.0 for a class C network) and IP addresses are assigned to Network Instrumentation Modules, the modules cannot be set up using the SLP-NX.
- This device does not back up mapping information for Network Instrumentation Modules. Therefore, during IP address assignment, a fixed chain name, workgroup ID, and node ID are set for the modules.
- Workgroup ID and node ID are used for the inter-module data transmission function of Network Instrumentation Modules. If these values are changed, the function does not work correctly. Therefore, in module mapping, which utilizes the inter-module data transmission function, be sure to specify values set by this device during IP address assignment, as shown below.

  Workgroup ID: 1
  Node ID: Assigned No.

SLP-NX



SLP-SVG



In the mapping table of the SLP-NX, set the device numbers assigned by the SLP-SVG for the node IDs of the Network Instrumentation Modules.

Note

- Typical errors that might occur in communication with Network Instrumentation Modules include the following.

Error response code	Description
0x00000021	Data address error
0x00000022	Data range error
0x00000023	Writing is prohibited due to the instrument conditions.

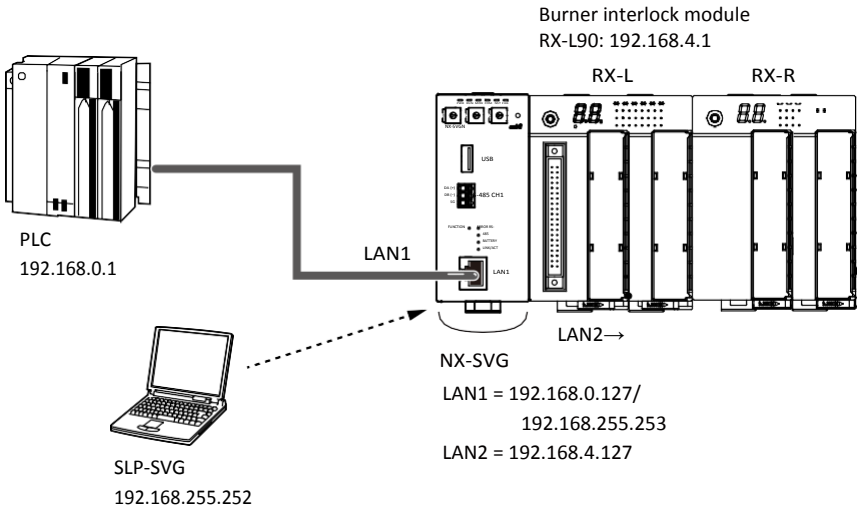
Note: For details on errors, refer to the manual for the device.

④ Burner interlock module, model RX-L90

An application example of the following device is given below.

Burner interlock module	Model RX-L90
Communication interface	Ethernet
Communication protocol	Modbus/TCP

●System configuration



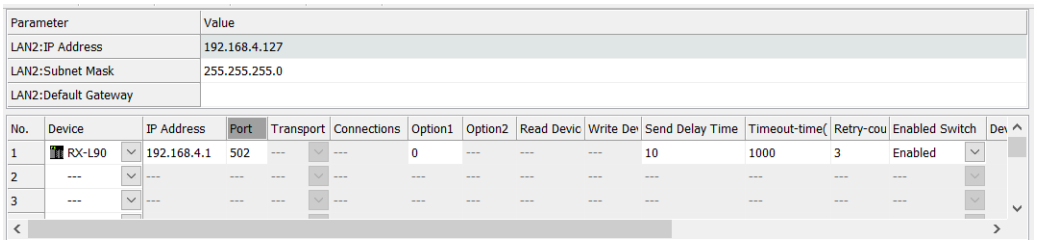
Note

• ☞ 5-6 Connecting to Model NX-SVG (p. 5-24)(for details on PC settings)

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the connected PLC.

(2) Specify LAN2 settings according to the configuration of the connected RX-L90. Do not change the default value of Option1.

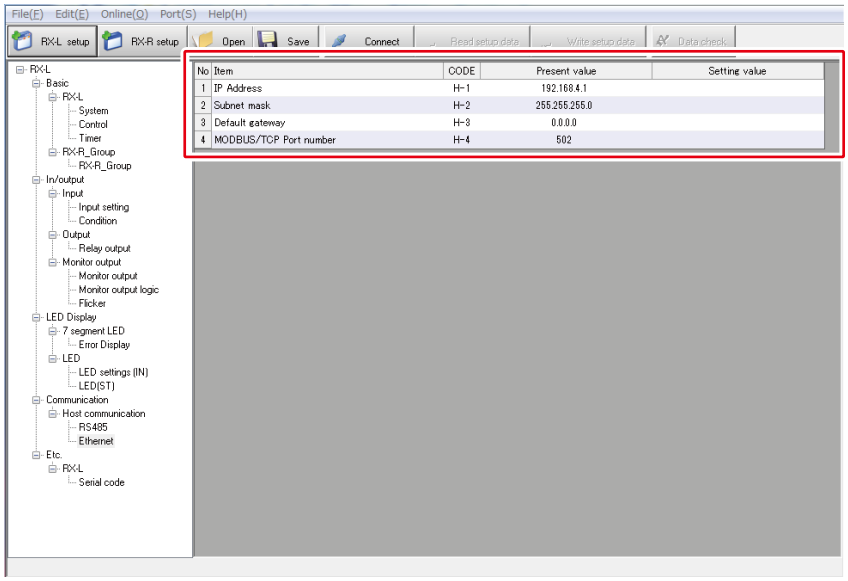


Device	IP address	Port	Option1*	Send Delay Time	Timeout-time (msec)	Retry-count	Enabled Switch
RX-L90	192.168.4.1	502	0	10	1000	3	Enabled

* Unit Identifier

●Device setup

Specify the Ethernet settings for the RX-L90 using the SLP-RX Smart Loader Package.



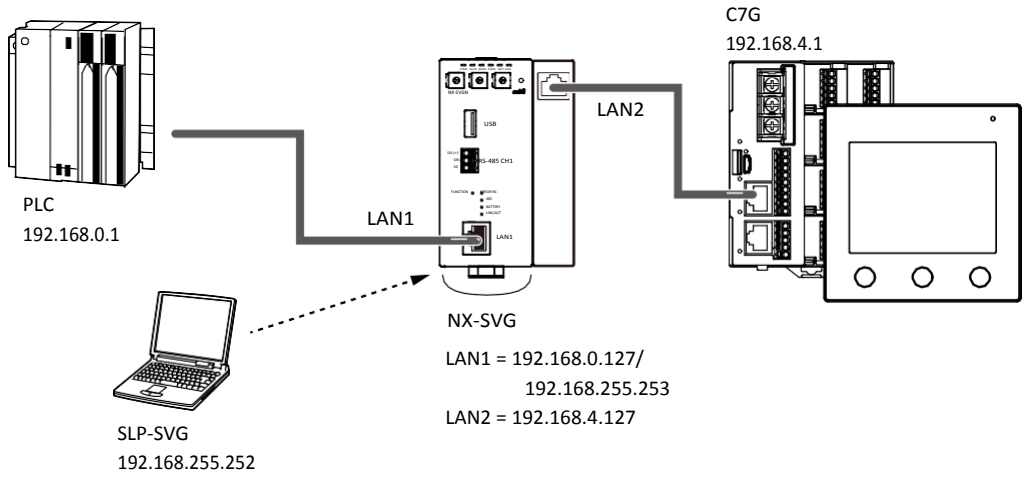
Setting item	CODE	Settings
IP address	H-1	192.168.4.1
Subnet mask	H-2	255.255.255.0
Modbus/TCP communication port No.	H-4	502

④ Multi-loop controller with multifunction display, model C7G

An application example of the following device is given below.

Multi-loop controller with multifunction display	Model C7G
Communication interface	Ethernet
Communication protocol	Modbus/TCP

●System configuration



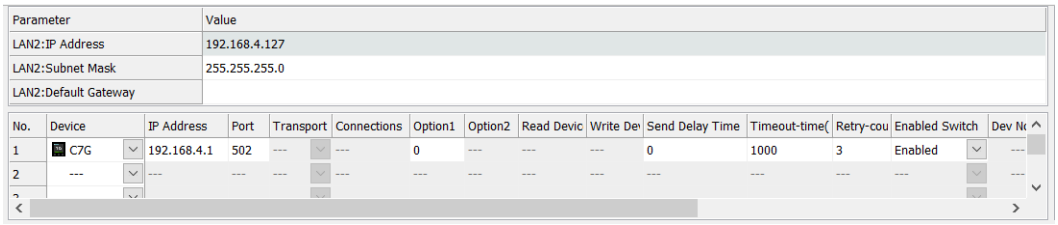
Note

- ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the connected PLC.

(2) Specify LAN2 settings according to the configuration of the connected C7G. Do not change the default value of Option1.



Device	IP address	Port	Option1*	Send Delay Time	Timeout-time (msec)	Retry-count	Enabled Switch
C7G	192.168.4.1	502	0	10	1000	3	Enabled

* Unit Identifier

●Configuration using model C7G

Specify the Ethernet settings using the buttons on the C7G.

(1) Press the [MENU] key to display the parameter bank menu screen.

(2) Press the [∧] or [∨] key to display the [ETHERNET] option.

(3) Touch [ETHERNET] and set the Modbus/TCP port number.

(4) Press the [×] button to return to the parameter bank menu screen.

(5) Touch [IP ADDRESS] and set the IP address and subnet mask.

(6) Press the [ENTER] button to return to the parameter bank menu screen.

(7) Press the home button to return to the home screen.

(8) Turn the power back on.

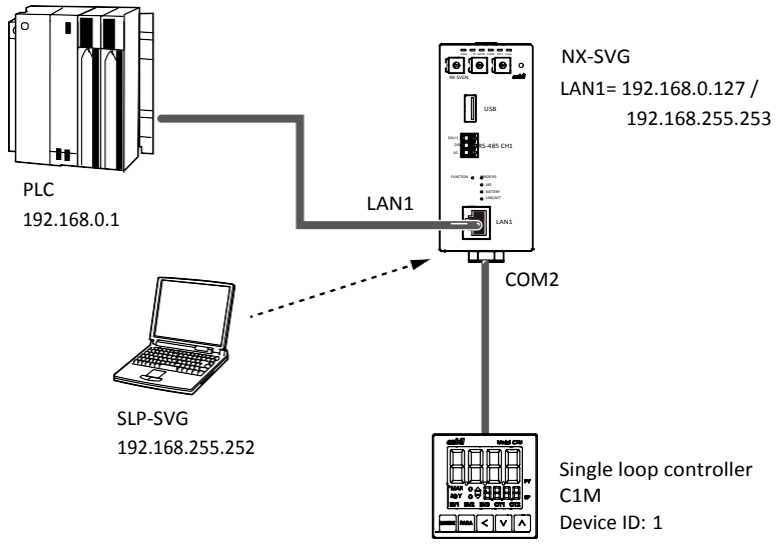
Parameter bank	Parameter item	Settings
ETHERNET	Modbus/TCP port number	502
IP ADDRESS	IP address	192.168.4.1
	Subnet mask	255.255.255.0

④ Model C1M single loop controller

An application example for the following device is given below.

Single loop controller	C1M
Communication interface	RS-485
Communication protocol	CPL

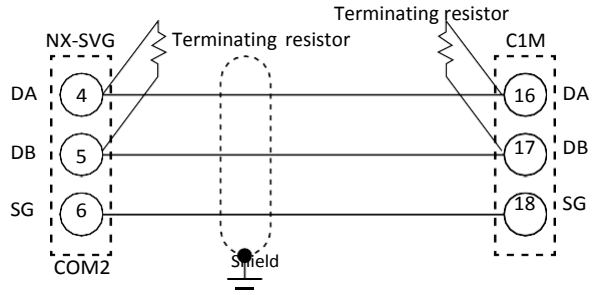
●System configuration



Note

- 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Wiring diagram



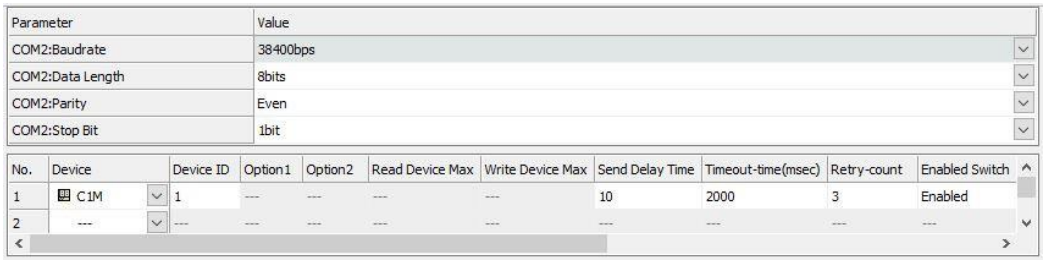
Handling Precautions

- Connect a terminating resistor (120Ω, 1/2 W or more recommended) to both ends of the transmission line.
- For details on wiring, refer to the user's manual for the connected device.

●SLP-SVG settings

(1) Specify LAN1 settings according to the configuration of the connected PLC.

(2) Specify COM2 settings according to the configuration of the connected C1M.



Parameter	Setting
COM2: Baud rate	38400 bps
COM2: Data length	8 bits
COM2: Parity	Even
COM2: Stop bits	1

Device	Device ID	Send delay time	Timeout time (ms)	Retries	Enabled switch
C1M	1	10	2000	3	Enabled

●Configuration using model C1M

(1) Press the [para] key for 2 seconds or longer. The device enters the parameter setting display mode.

(2) Press the [para] key for 2 seconds or longer again. [*C0 1*] is displayed and the device enters the setup setting display mode.

(3) Press the [para] key several times until [*C64*] is displayed.

(4) Select “0” (CPL) for [CPL/MODBUS] using the [∧] or [∨] key.

(5) If 2 seconds or more elapse without any keys being pressed, the blinking value becomes steadily lit, which means that the selected value has been set.

(6) Change to other items using the [para] key and change the settings of the other items as shown in the following table using the [∧] or [∨] key.

Item	Display	Setting
Communication type	*C64*	0: CPL
Station address	*C65*	1 (device ID)
Transmission speed	*C66*	3: 38400 bps
Data length	*C67*	1: 8 bits
Parity	*C68*	0: Even
Stop bits	*C69*	0: 1

Note

- Typical errors that might occur in communication with the SDC include the following.

Error response code	Description
0x00000022	The read data is out of range. The value of the written data is out of range.
0x00000023	Writing is prohibited due to the instrument setting conditions or instrument external conditions. Writing/reading is prohibited due to communication in progress or the loader being locked.
0x00000041	The word address is out of range.

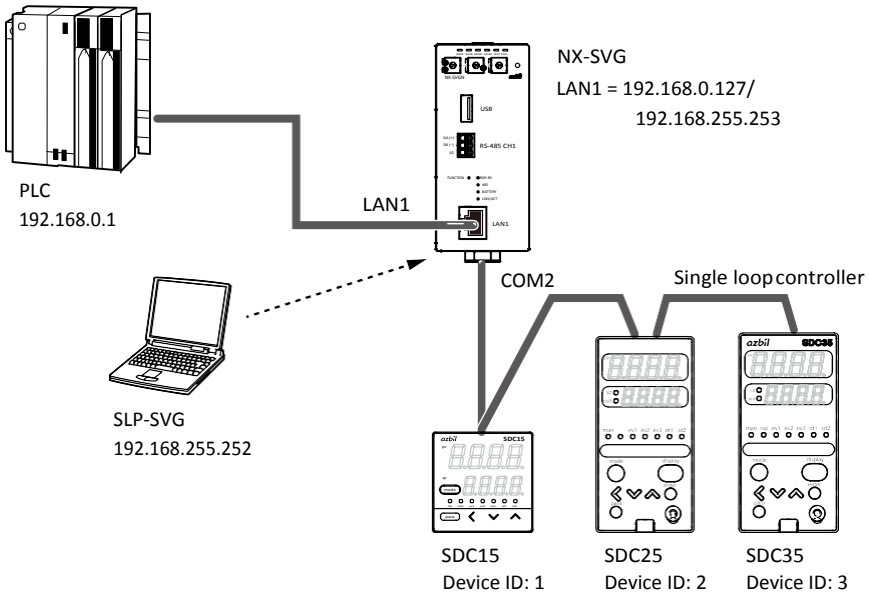
Note: For details on errors, refer to the manual for the device.

④ Single loop controller, model C15/25/26/35/36

An application example of the following device is given below.

Single loop controller	Model C15/25/35
Communication interface	RS-485
Communication protocol	CPL

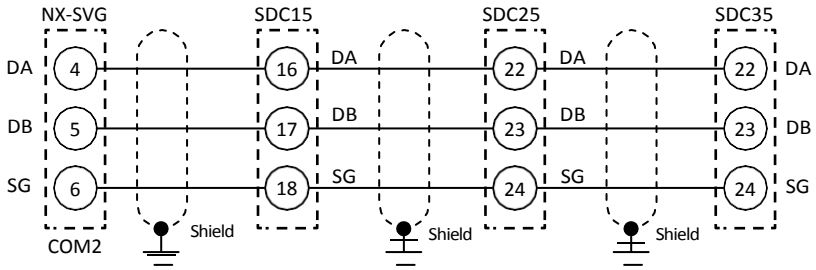
●System configuration



Note

- 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Wiring diagram



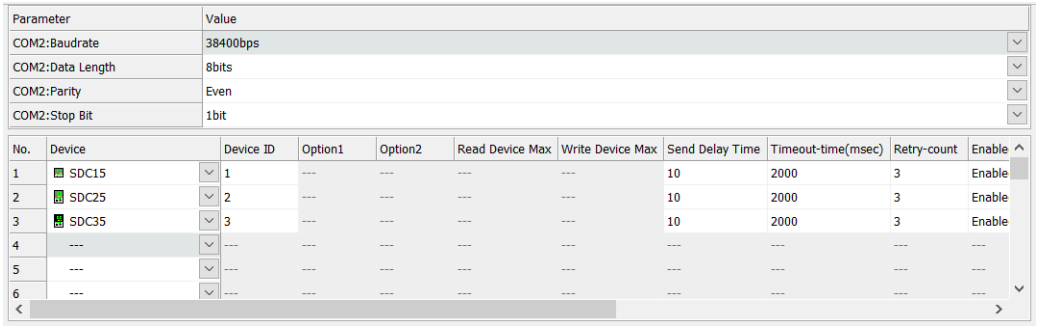
Handling Precautions

- Do not connect a terminating resistor to the ends of the transmission line.
- For details on wiring, refer to the user's manual for the connected device.

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the connected PLC.

(2) Specify COM2 settings according to the configuration of the connected single loop controller.



Parameter	Value
COM2:Baudrate	38400bps
COM2:Data Length	8bits
COM2:Parity	Even
COM2:Stop Bit	1bit

No.	Device	Device ID	Option1	Option2	Read Device Max	Write Device Max	Send Delay Time	Timeout-time(msec)	Retry-count	Enable
1	SDC15	1	---	---	---	---	10	2000	3	Enable
2	SDC25	2	---	---	---	---	10	2000	3	Enable
3	SDC35	3	---	---	---	---	10	2000	3	Enable
4	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---

Parameter	Settings
COM2: Baudrate	38400 bps
COM2: Data Length	8 bits
COM2: Parity	Even
COM2: Stop Bit	1 bit

Device	Device ID	Send Delay Time	Timeout-time (msec)	Retry-count	Enabled Switch
SDC15	1	10	2000	3	Enabled
SDC25	2	10	2000	3	Enabled
SDC35	3	10	2000	3	Enabled

●Configuration using model C15

(1) Press the [para] key for 2 seconds or longer. The device enters the parameter mode.

(2) Press the [para] key for 2 seconds or longer again. [*C0 1*] is displayed and setup mode starts.

(3) Press the [para] key several times until [*C64*] is displayed.

(4) Select "0" (CPL) for [CPL/Modbus] using the [∧] or [∨] key.

(5) If 2 seconds or more elapse without any keys being pressed, the blinking value becomes steadily lit, which means that the selected value has been set.
Change to other items using the [para] key and change the settings of the other items as shown in the following table using the [∧] or [∨] key.

Setting item	Display	Settings
CPL/Modbus	*C65*	0: CPL
Station address	*C66*	1 (device ID)
Transmission speed	*C67*	3: 38400 bps
Data length	*C68*	1: 8 bits
Parity	*C69*	0: Even parity
Stop bit	*C70*	0: 1 bit

●Configuration using model C25

(1) Press the [para] key for 2 seconds or longer. The screen for selecting a bank is displayed.

(2) Press the [para] key several times to select the setup bank, until [*t.UP*] is displayed.

(3) Press the [enter] key to display [*C0 1*].

(4) Press the [para] key several times or press the [∧], [∨], or [<] key until [*C54*] is displayed.

(5) Press the [enter] key to enter input mode, select “0” (CPL) for [CPL/Modbus] using the [∧] or [ ]key, and press the [enter] key again to set the selected value.

(6) Set the other items as shown in the following table using the [∧] or [∨] key.

Setting item	Display	Settings
CPL/Modbus	*C54*	0: CPL
Station address	*C55*	2 (device ID)
Transmission speed	*C56*	3: 38400 bps
Data length	*C57*	1: 8 bits
Parity	*C58*	0: Even parity
Stop bits	*C59*	0: 1 stop bit

●Configuration using model C35

(1) Press the [para] key for 2 seconds or longer. The screen for selecting a bank is displayed.

(2) Press the [para] key several times to select the setup bank, until [*t.UP*] is displayed.

(3) Press the [enter] key to display [*C0 1*].

(4) Press the [para] key several times or press the [∧], [∨], or [<] key until [*C54*] is displayed.

(5) Press the [enter] key to enter input mode, select “0” (CPL) for [CPL/Modbus] using the [∧] or [ ]key, and press the [enter] key again to set the selected value.

(6) Set the other items as shown in the following table using the [∧] or [∨] key.

Setting item	Display	Settings
CPL/Modbus	*C54*	0: CPL
Station address	*C55*	3 (device ID)
Transmission speed	*C56*	3: 38400 bps
Data length	*C57*	1: 8 bits
Parity	*C58*	0: Even parity
Stop bits	*C59*	0: 1 stop bit

Note

• Typical errors that might occur in communication with the single loop controller include thefollowing.

Error response code	Description
0x00000022	The value of written data is out of range.
0x00000023	Writing is prohibited due to the instrument conditions.
0x00000041	The specified address is out of range.

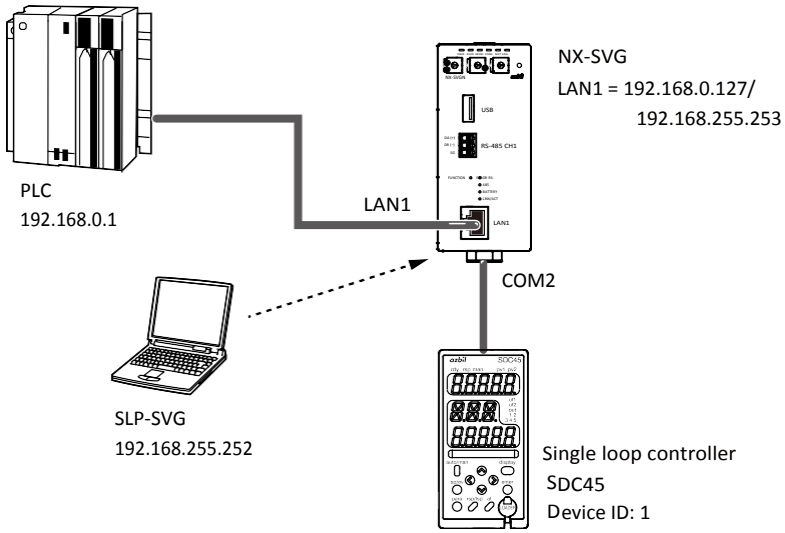
Note: For details on errors, refer to the manual for the device.

④ Single loop controller, model C45/46

An application example of the following device is given below.

Single loop controller	Model C45
Communication interface	RS-485
Communication protocol	CPL

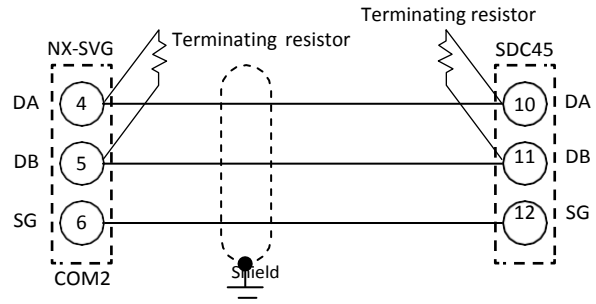
• System configuration



Note

• ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

•Wiring diagram



Handling Precautions

• Attach terminating resistors (150 Ω ±5 %, 1/2 W min.) to both ends of the transmission line.

• For details on wiring, refer to the user's manual for the connected device.

•Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the connected PLC.

(2) Specify COM2 settings according to the configuration of the connected SDC45.

Parameter	Value
COM2:Baudrate	38400bps
COM2:Data Length	8bits
COM2:Parity	Even
COM2:Stop Bit	1bit

No.	Device	Device ID	Option1	Option2	Read Device Max	Write Device Max	Send Delay Time	Timeout-time(msec)	Retry-count	Enable
1	SDC45	1	---	---	---	---	10	2000	3	Enable
2	---	---	---	---	---	---	---	---	---	---

Parameter	Settings
COM2: Baudrate	38400 bps
COM2: Data Length	8 bits
COM2: Parity	Even
COM2: Stop Bit	1 bit

Device	Device ID	Send Delay Time	Timeout-time (msec)	Retry-count	Enabled Switch
SDC45	1	10	2000	3	Enabled

•Configuration using model C45

(1) Press the [display] key to return to the operation display.

(2) To select a bank, press the [para] key for 2 seconds.

(3) To display a bank to be set, press the [para], [∧], or [∨] key.

(4) When the RS-485 communication bank (*r5485*) is displayed, press the [enter] key.

(5) To display an item to be set, press the [para], [∧], [∨], [<], or [>] key.

(6) When a desired item is displayed, press the [enter] key.

(7) Change the setting with the [∧], [∨], [<], or [>] key.

(8) To finalize the new setting, press the [enter] key.

(9) Change items using the [para] key and set the other items using the [∧], [∨], [<], or [>] key as shown in the following table.

Setting item	Display	Settings
CPL/Modbus	*G. n.01*	0: CPL
Station address	*G.n02*	1 (device ID)
Transmission speed	*G.n03*	3: 38400 bps
Data format (data length)	*G. n.04*	1: 8 bits
Data format (Parity)	*G.n05*	0: Even parity
Data format (stop bit)	*G.n06*	0: 1 stop bit

Note

• Typical errors that might occur in communication with the SDC45/46 include the following.

Error response code	Description
0x00000021	Data address error
0x00000022	Data range error
0x00000023	Writing is prohibited due to the instrument conditions.

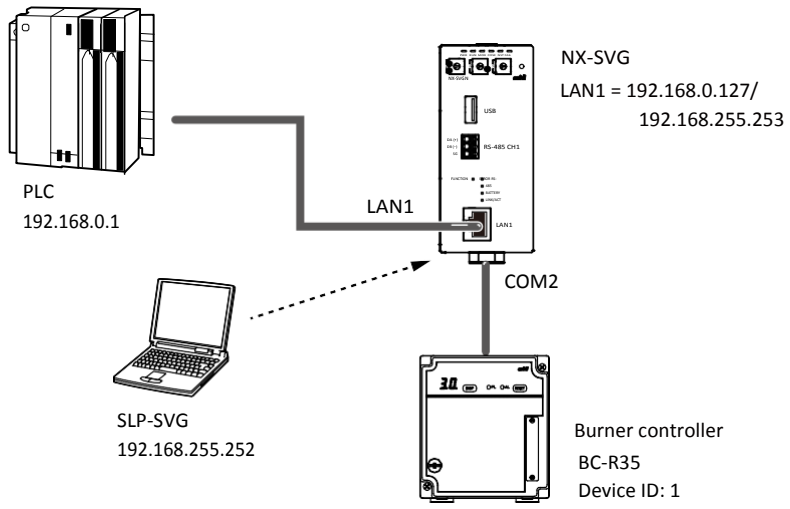
Note: For details on errors, refer to the manual for the device.

④ Burner controller, model BC-R15/25/35

An application example of the following device is given below.

Burner controller	Model BC-R35
Communication interface	RS-485
Communication protocol	CPL

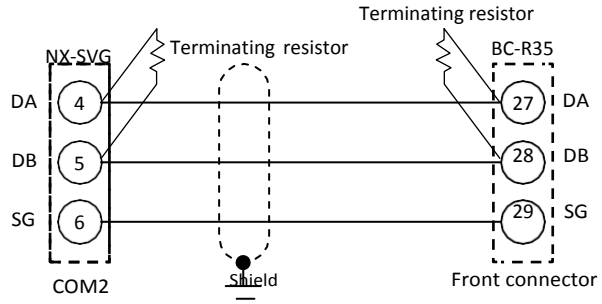
●System configuration



Note

- 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Wiring diagram



Handling Precautions

- Attach terminating resistors (150 Ω ±5 %, 1/2 W min.) to both ends of the transmission line.
- For details on wiring, refer to the user's manual for the connected device.

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the connected PLC.

(2) Specify COM2 settings according to the configuration of the connected BC-R35.

Parameter	Value
COM2:Baudrate	19200bps
COM2:Data Length	8bits
COM2:Parity	Even
COM2:Stop Bit	1bit

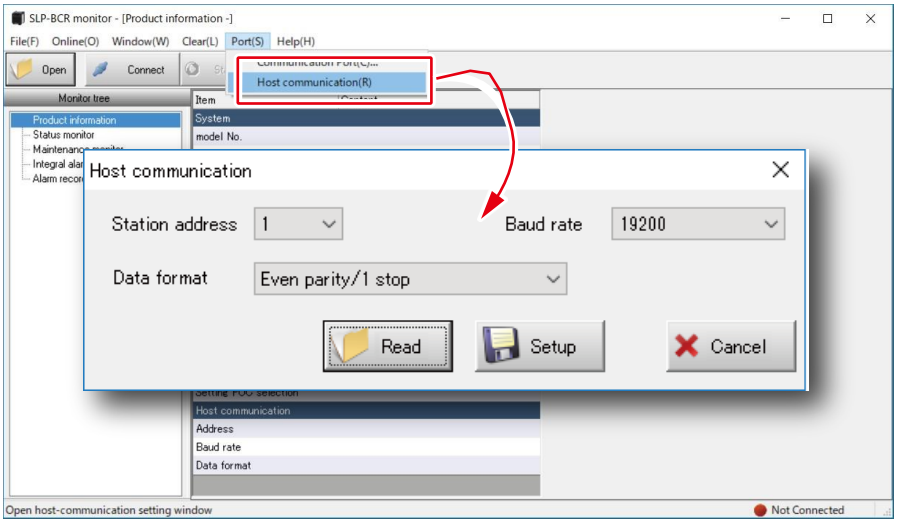
No.	Device	Device ID	Option1	Option2	Read Device Max	Write Device Max	Send Delay Time	Timeout-time(msec)	Retry-count	Enable
1	BC-Rx5	1	---	---	---	---	10	2000	3	Enable
2	---	---	---	---	---	---	---	---	---	---

Parameter	Settings
COM2: Baudrate	19200 bps
COM2: Data Length	8 bits
COM2: Parity	Even
COM2: Stop Bit	1 bit

Device	Device ID	Send Delay Time	Timeout-time (msec)	Retry-count	Enabled Switch
BC-Rx5	1	10	2000	3	Enabled

•Configuration using model BC-R35

Specify the host communication setting for the BC-R35 using the SLP-BCR Smart Loader Package.



Setting item	Settings
Station address	1 (device ID)
Baudrate	19200
Data format	Even parity/ 1 stop

Note

- Typical errors that might occur in communication with the BC-R include the following.

Error response code	Description
0x00000022	Invalid write data
0x00000023	Writing is prohibited.
0x00000041	Data address error

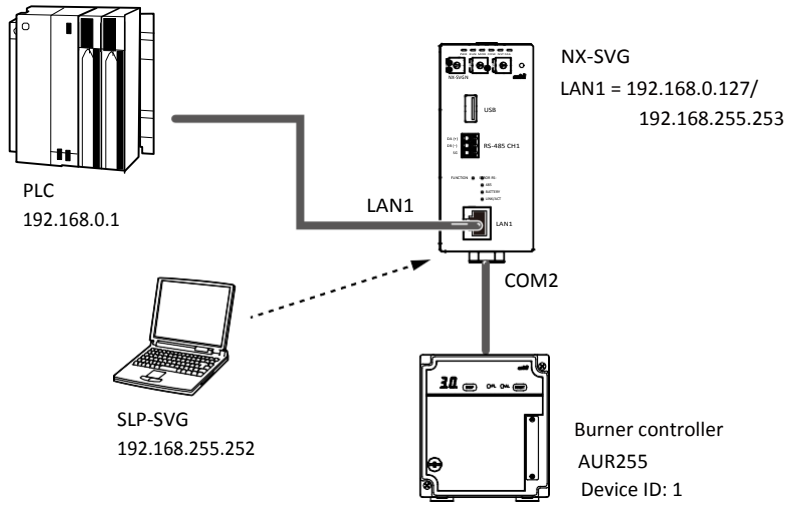
Note: For details on errors, refer to the manual for the device.

④ Burner controller, model AUR255

An application example of the following device is given below.

Burner controller	AUR255
Communication interface	RS-485
Communication protocol	CPL

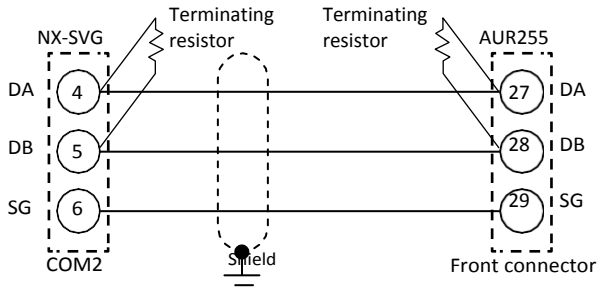
●System configuration



Note

- ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Wiring diagram



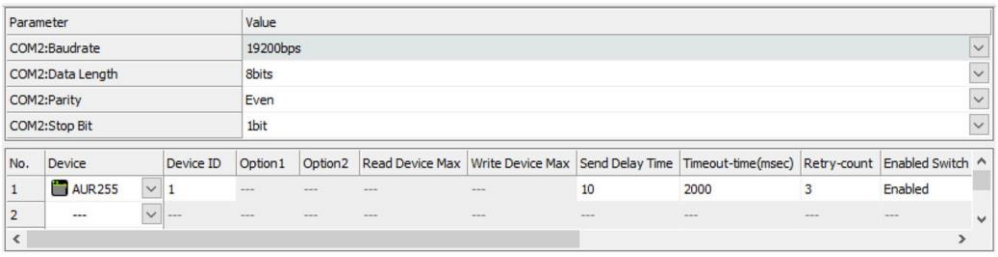
Handling Precautions

- Attach terminating resistors (150 Ω ±5 %, 1/2 W min.) to both ends of the transmission line.
- For details on wiring, refer to the user's manual for the connected device.

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the connected PLC.

(2) Specify COM2 settings according to the configuration of the connected AUR255.



Parameter	Settings
COM2: Baudrate	19200 bps
COM2: Data Length	8 bits
COM2: Parity	Even
COM2: Stop Bit	1 bit

Device	Device ID	Send Delay Time	Timeout-time (msec)	Retry-count	Enabled Switch
AUR255	1	10	2000	3	Enabled

●Configuration using model AUR255

(1) When the sequence stage is "- -" (when the start switch is OFF), press and hold the DISP switch for 5 seconds or longer.
On the 7-segment display, [C1] is lit, the mode switches to pilot turn-down test & communication setting mode.
The central dot of the 7-segment display starts blinking. (on a 1-second cycle).

(2) Press the DISP switch to select the parameter to be set. Select [H1] (communications address setting).

(3) Press the RESET switch to enter address selection mode, and select a communications address by pressing the DISP switch.

(4) Press the RESET switch to finalize the setting.

(5) Set the other items as shown in the table below.

(6) Press and hold the DISP switch for 5 seconds or longer to end pilot turn-down test & communication setting mode.

(7) After specifying the communication settings, turn off the power of this device and then turn it back on.

Setting item	Display	Settings
Communications address setting	H1	1 (device ID)
Baud rate setting	H2	3: 19200 bps
Communications format setting	H3	1: Even parity, 1 stop bit

Note

- Typical errors that might occur in communication with the AUR255 include the following.

Error response code	Description
0x00000041	Data address error
0x00000043	Writing is prohibited.

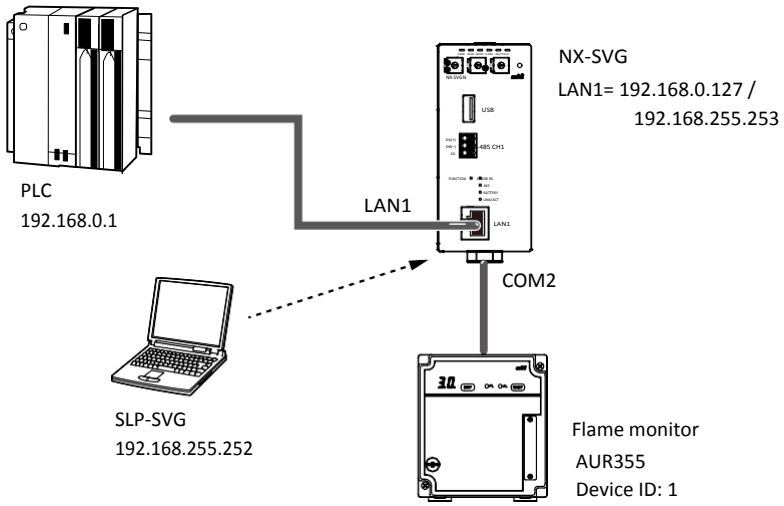
Note: For details on errors, refer to the user's manual for the device.

④ Flame monitor, model AUR355

An application example of the following device is given below.

Flame monitor	AUR355
Communication interface	RS-485
Communication protocol	CPL

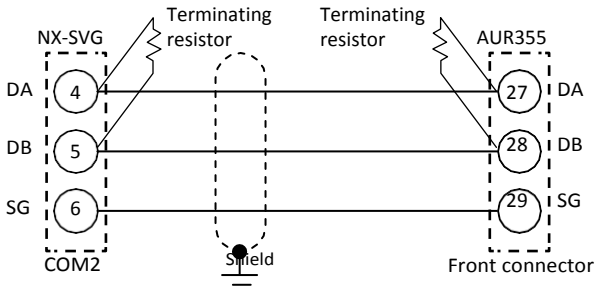
●System configuration



Note

- ☞ 5 - 6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Wiring diagram



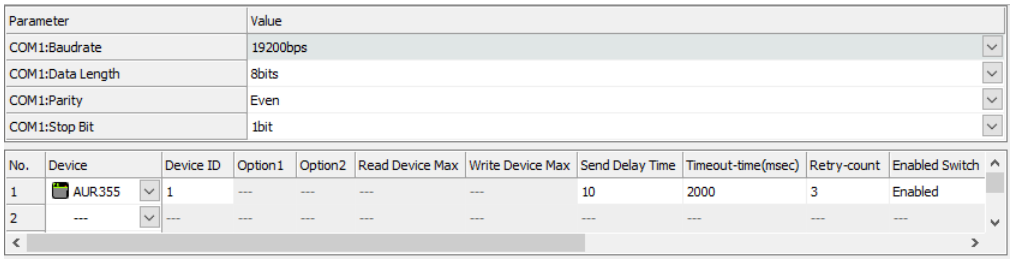
Handling Precautions

- Attach terminating resistors (150 Ω ±5%, ½ W min.) to both ends of the transmission line.
- For details on wiring, refer to the user's manual for the connected device.

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the connected PLC.

(2) Specify COM2 settings according to the configuration of the connected AUR355.



Parameter	Settings
COM2: Baudrate	19200 bps
COM2: Data Length	8 bits
COM2: Parity	Even
COM2: Stop bits	1 bit

Device	Device ID	Send Delay Time	Timeout-time (msec)	Retry-count	Enabled Switch
AUR355	1	10	2000	3	Enabled

●Configuration using model AUR355

(1) When the 7-segment display shows operating status code "--" (controller is shut down, start switch is OFF), press and hold the DISP switch for 5 seconds or longer.
On the 7-segment display, [H1] is lit, the mode switches to communication setting mode, and the central dot of the 7-segment display starts blinking (on a 1-second cycle).

(2) Press the DISP switch to select the parameter to be set. Select [H1] (communications address setting).

(3) Press the RESET switch to enter address selection mode, and select a communications address by pressing the DISP switch.

(4) Press the RESET switch to finalize the setting.

(5) Set the other items as shown in the table below.

(6) Press and hold the DISP switch for 5 seconds or longer to end communication setting mode.

(7) After specifying the communication settings, turn off the power of this device and then turn it back on.

Setting item	Display	Settings
Communications address setting	H1	1 (device ID)
Baud rate setting	H2	3: 19200 bps
Communications format setting	H3	1: Even parity, 1 stop bit

Note

- Typical errors that might occur in communication with the AUR355 include the following.

Error response code	Description
0x00000041	Data address error
0x00000042	Data range error
0x00000043	Writing is prohibited.

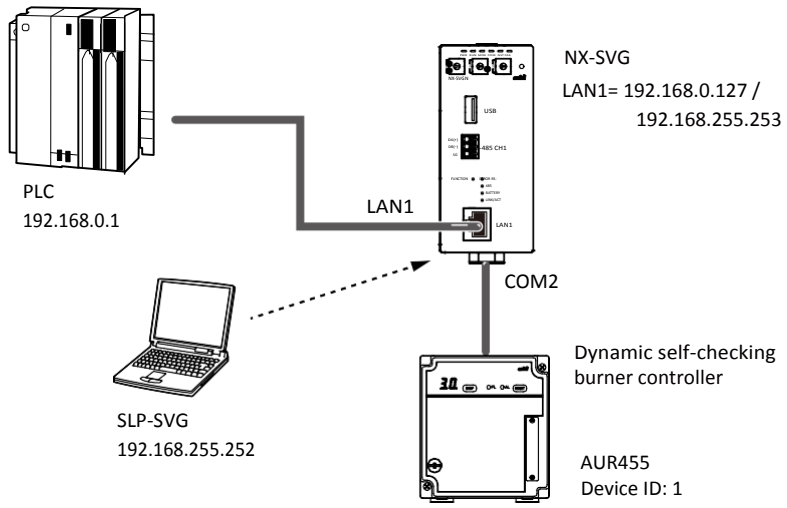
Note: For details on errors, refer to the user's manual for the device.

④ Dynamic self-checking burner controller, model AUR455

An application example of the following device is given below.

Dynamic self-checking burner controller	AUR455
Communication interface	RS-485
Communication protocol	CPL

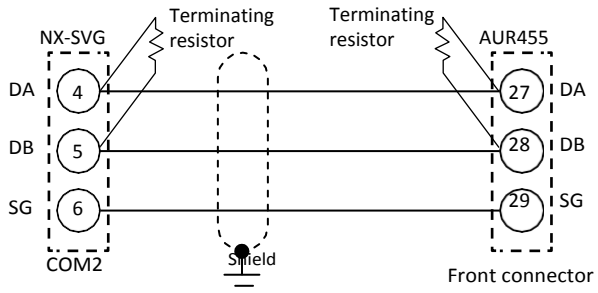
●System configuration



Note

- ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Wiring diagram



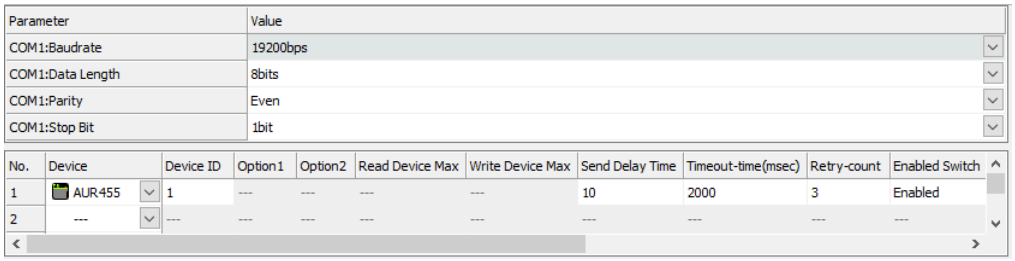
Handling Precautions

- Attach terminating resistors (150 Ω ±5%, 1/2 W min.) to both ends of the transmission line.
- For details on wiring, refer to the user's manual for the connected device.

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the connected PLC.

(2) Specify COM2 settings according to the configuration of the connected AUR455.



Parameter	Settings
COM2: Baudrate	19200 bps
COM2: Data Length	8 bits
COM2: Parity	Even
COM2: Stop bits	1 bit

Device	Device ID	Send Delay Time	Timeout-time (msec)	Retry-count	Enabled Switch
AUR455	1	10	2000	3	Enabled

●Configuration using model AUR455

(1) When the operating status is “controlled shutdown” (when the start switch is OFF), press and hold the DISP switch for 5 seconds or longer. On the 7-segment display, [C1] is lit, the mode switches to pilot turn-down test & communication setting mode, and the central dot of the 7-segment display starts blinking (on a 1-second cycle).

(2) Press the DISP switch to select the parameter to set. Select [H1] (communications address setting).

(3) Press the RESET switch to enter address selection mode, and select communications address by pressing the DISP switch.

(4) Press the RESET switch to finalize the setting.

(5) Set the other items as shown in the table below.

(6) Press and hold the DISP switch for 5 seconds or longer to end communication setting mode.

(7) After specifying the communication settings, turn off the power of this device and then turn it back on.

Setting item	Display	Settings
Communications address setting	H1	1 (device ID)
Baud rate setting	H2	3: 19200 bps
Communications format setting	H3	1: Even parity, 1 stop bit

Note

- Typical errors that might occur in communication with the AUR455 include the following.

Error response code	Description
0x00000041	Data address error
0x00000042	Data range error
0x00000043	Writing is prohibited.

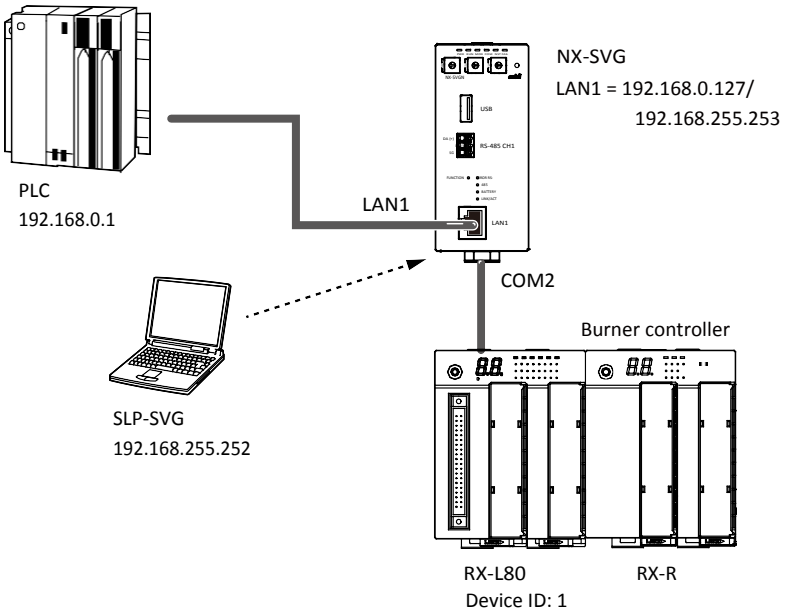
Note: For details on errors, refer to the user's manual for the device.

④ Burner interlock module, model RX-L80

An application example of the following device is given below.

Burner interlock module	Model RX-L80
Communication interface	RS-485
Communication protocol	CPL

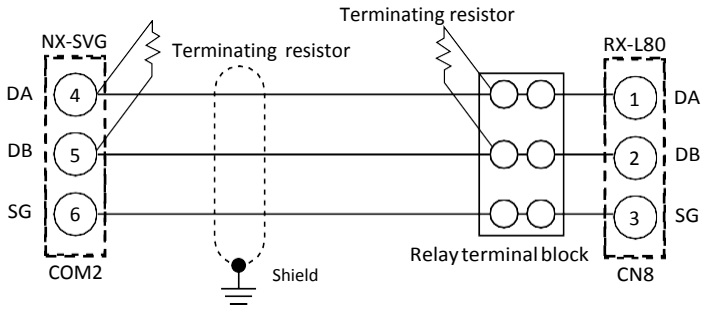
●System configuration



Note

- ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Wiring diagram



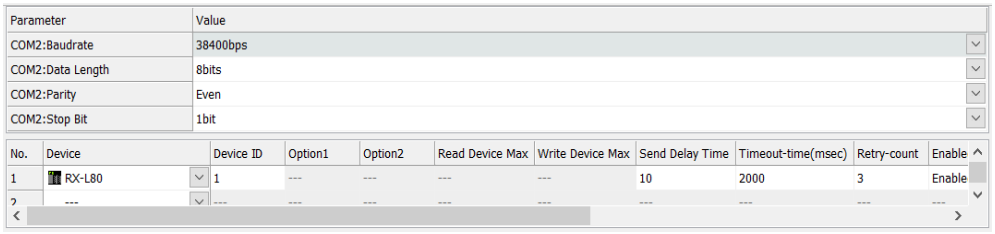
Handling Precautions

- Attach terminating resistors (150 Ω ±5 %, ½ W min.) to both ends of the transmission line.
- For details on wiring, refer to the user's manual for the connected device.

•Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the connected PLC.

(2) Specify COM2 settings according to the configuration of the connected RX-L80.

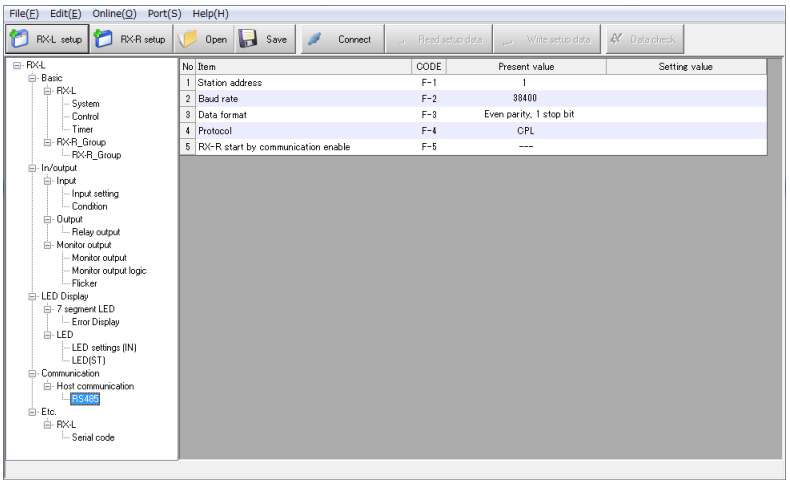


Parameter	Settings
COM2: Baudrate	38400 bps
COM2: Data Length	8 bits
COM2: Parity	Even
COM2: Stop Bit	1 bit

Device	Device ID	Send Delay Time	Timeout-time (msec)	Retry-count	Enabled Switch
RX-L80	1	10	2000	3	Enabled

•Configuration using model RX-L80

Specify the host communication setting for the RX-L80 using the SLP-RX Smart Loader Package.



Setting item	CODE	Settings
Station address	F-1	1 (device ID)
Baudrate	F-2	38400
Data format	F-3	Even parity, 1 stop bit
Protocol	F-4	CPL

Note

- Typical errors that might occur in communication with the RX-L80 include the following.

Error response code	Description
0x00000041	Word address error
0x00000023	Writing is prohibited.

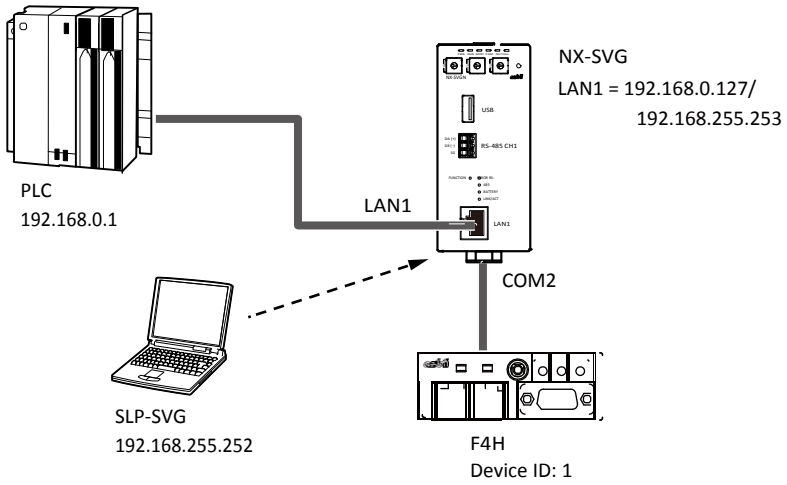
Note: For details on errors, refer to the manual for the device.

④ Compact digital mass flow controller, model F4H

An application example of the following device is given below.

Mass flow controller	Model F4H
Communication interface	RS-485
Communication protocol	CPL

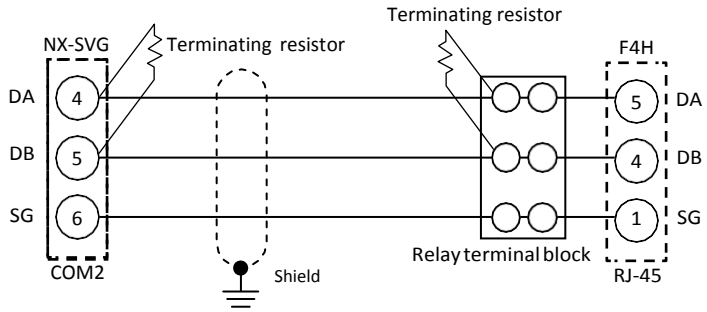
●System configuration



Note

- 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Wiring diagram



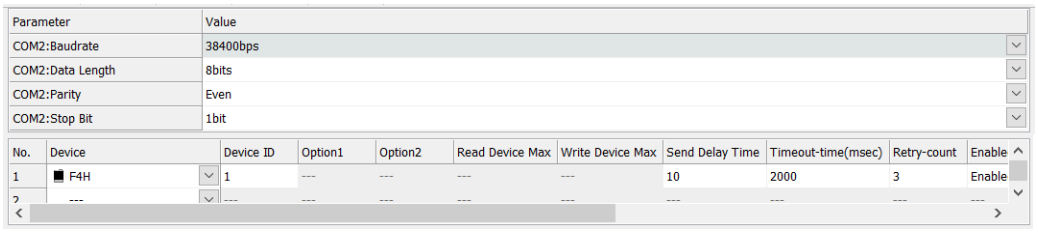
Handling Precautions

- Attach terminating resistors (150 Ω ±5 %, ½ W min.) to both ends of the transmission line.
- For details on wiring, refer to the user's manual for the connected device.

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the connected PLC.

(2) Specify COM2 settings according to the configuration of the connected F4H.



Parameter	Settings
COM2: Baudrate	38400 bps
COM2: Data Length	8 bits
COM2: Parity	Even
COM2: Stop Bit	1 bit

Device	Device ID	Send Delay Time	Timeout-time (msec)	Retry-count	Enabled Switch
F4H	1	10	2000	3	Enabled

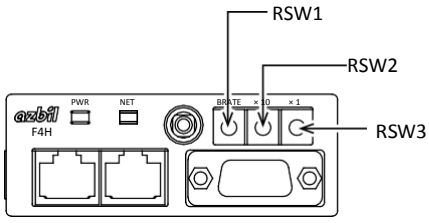
•Configuration using model F4H

With the rotary switches on the top panel of the F4H, configure the RS-485 communication function.

(1) With the RSW1 rotary switch (for communication parameters) on the top panel of the F4H, select the communication speed and other communication parameters.

(2) With the RSW2 and RSW3 rotary switches (for communication address)on the top panel of the F4H, select the stationaddress.

(3) Turn off the power of the F4H and then turn it back on again.



Setting item	RSW	Settings
Communication speed and conditions	RSW1	1: 38400 bps, even parity,1 stop bit
Station address (upper digit)	RSW2	0: Station address, decimal, tens place
Station address (lower digit)	RSW3	1: Station address, decimal, ones place

Note

- Typical errors that might occur in communication with the F4H include the following.

Error response code	Description
0x00000046	Address error
0x00000048	Write data error

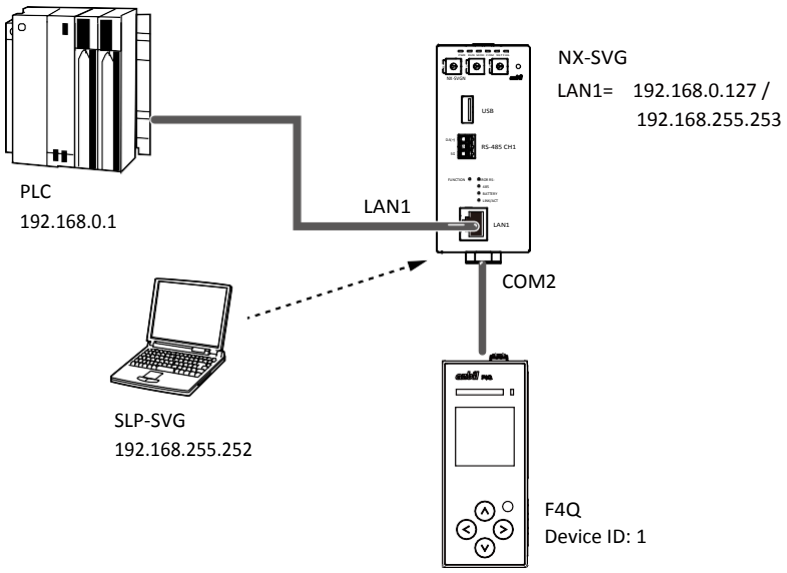
Note: For details on errors, refer to the manual for the device.

④ Digital mass flow controller, model F4Q

An application example of the following device is given below.

Mass flow controller	Model F4Q
Communication interface	RS-485
Communication protocol	CPL

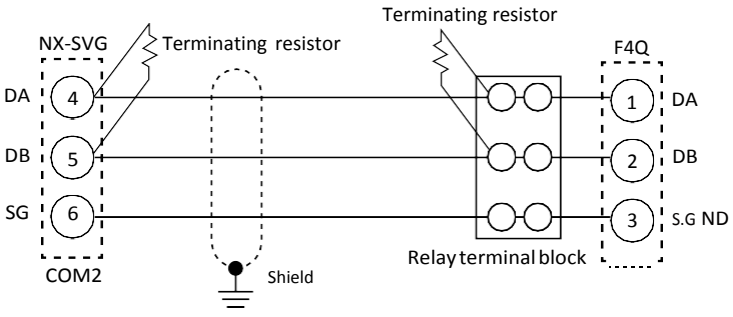
●System configuration



Note

- ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Wiring diagram



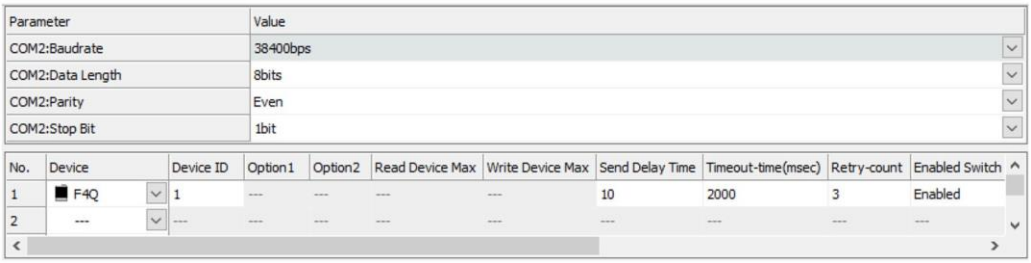
Handling Precautions

- Attach terminating resistors (150 Ω ±5 %, ½ W min.) to both ends of the transmission line.
- For details on wiring, refer to the user's manual for the connected device.

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the connected PLC.

(2) Specify COM2 settings according to the configuration of the connected F4Q.



Parameter	Settings
COM2: Baudrate	38400 bps
COM2: Data Length	8 bits
COM2: Parity	Even
COM2: Stop Bit	1 bit

Device	Device ID	Send Delay Time	Timeout-time (msec)	Retry-count	Enabled Switch
F4Q	1	10	2000	3	Enabled

●Configuration using model F4Q

With the keys on the top panel of the F4Q, configure the RS485 communication function.

(1) Press the [>] key with the main screen displayed

>> The menu screen is displayed.

(2) Press the [∧] or [∨] key to select [2. FUNCTION], and then press the [>] key.

>> The function setting screen is displayed.

(3) Press the [∧] or [∨] key to select the desired item and then press the [>] key.

>> The settings editing screen is displayed.

(4) Use the [>] key to select the digit to edit, and press the [ ]∧or [ ]∨key to specify the desired value.

(5) Press and hold the [>] key to finalize the setting.

>> The setting is saved at this time. Afterward, the function setting screen is shown again.

(6) If there is another setting to change, return to step 3. If not, proceed to step 7.

(7) Press the [<] key twice.

>> The display returns to the main screen.

(8) If the setting of *C-33* (communication protocol) is changed, the F4Q must be restarted in order to apply the new setting.

Setting item	RSW	Settings
Device address	C30	1 (device ID)
Transmission speed	C31	0: 38400 bps
Data format	C32	8-bit data, even parity, 1 stop bit
Communication protocol	C33	1: CPL

* Do not set the device address to“0.”

Note

- Typical errors that might occur in communication with the F4Q include the following.

Error response code	Description
0x00000010	Error in the data address or the number of data records
0x00000013	Error in execution

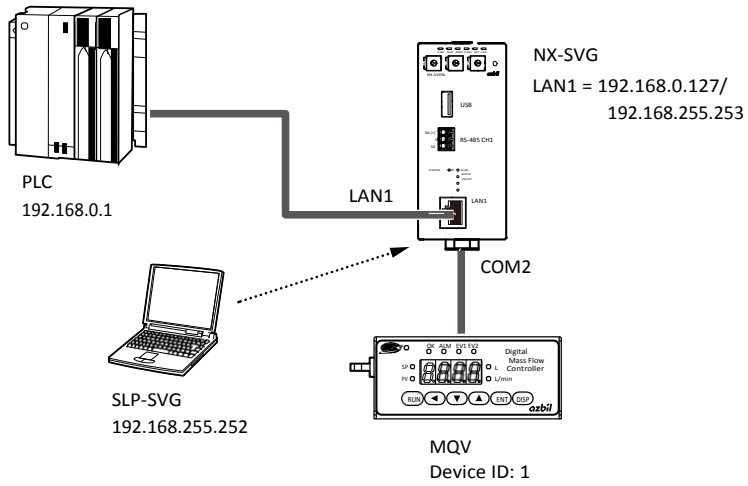
Note: For details on errors, refer to the manual for the device.

④ Digital mass flow controller, model MQV

An application example of the following device is given below.

Mass flow controller	Model MQV
Communication interface	RS-485
Communication protocol	CPL

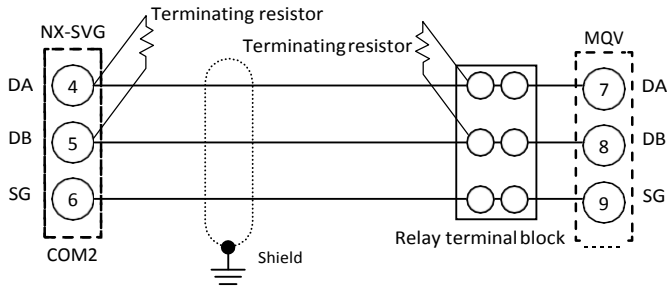
●System configuration



Note

- 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Wiring diagram



Handling Precautions

- Attach terminating resistors (150 Ω ±5 %, ½ W min.) to both ends of the transmission line.
- For details on wiring, refer to the user's manual for the connected device.

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the connected PLC.

(2) Specify COM2 settings according to the configuration of the connected MQV.

Parameter	Value
COM2:Baudrate	38400bps
COM2:Data Length	8bits
COM2:Parity	Even
COM2:Stop Bit	1bit

No.	Device	Device ID	Option1	Option2	Read Device Max	Write Device Max	Send Delay Time	Timeout-time(msec)	Retry-count	Enable
1	MQV	1	---	---	---	---	10	2000	3	Enable
2	---	---	---	---	---	---	---	---	---	---

Parameter	Settings
COM2: Baudrate	38400 bps
COM2: Data Length	8 bits
COM2: Parity	Even
COM2: Stop Bit	1 bit

Device	Device ID	Send Delay Time	Timeout-time (msec)	Retry-count	Enabled Switch
MQV	1	10	2000	3	Enabled

•Configuration using model MQV

With the keys on the MQV, configure the RS-485 communication function.

(1) Press the [DISP] key to display the instantaneous flow rate.

>> The PV and L/min (mL/min for MQV9200) indicators light up.

(2) Hold down the [∨] and [ENT] keys simultaneously for 3 seconds.

>> *C-0 1* is shown on the 7-segment display, indicating that the device is in function setup mode.

(3) Press the [∧] or [∨] key to select the desired setting item number and then press the [ENT] key.

>> The selected item number blinks on the 7-segment display.

(4) Press the [∧] or [∨] key to select the desired setting.

(5) Press the [ENT] key to finalize the setting.

>> The setting is saved at this time. (After about 1 second, the item number is displayed again.)

(6) If there is another item to set up, return to step 3. If not, proceed to step 7.

(7) Press the [DISP] key to end function setup mode and display the instantaneous flow rate.

Setting item	Display	Settings
Station address	*C30*	1 (device ID)
Transmission speed	*C31*	0: 38400 bps
Data format	*C32*	8-bit data, even parity, 1 stop bit

Note

• Typical errors that might occur in communication with the MQV include the following.

Error response code	Description
0x00000046	Address error
0x00000048	Write data error

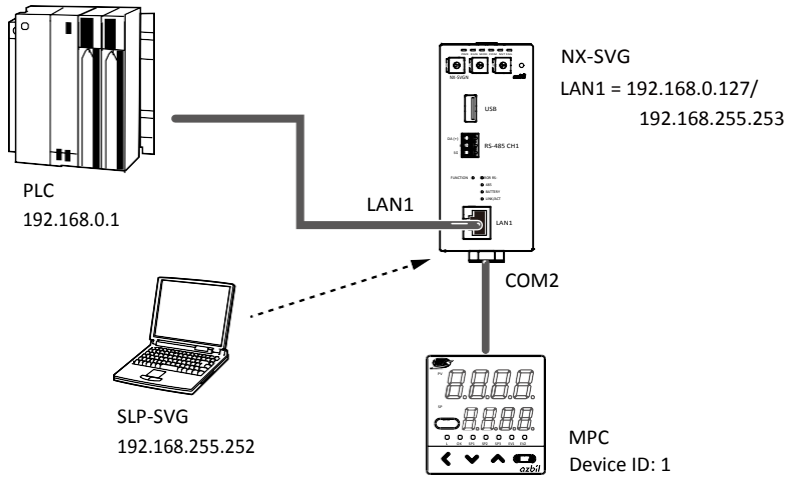
Note: For details on errors, refer to the manual for the device.

④ Panel mount mass flow controller, model MPC

An application example of the following device is given below.

Mass flow controller	Model MPC
Communication interface	RS-485
Communication protocol	CPL

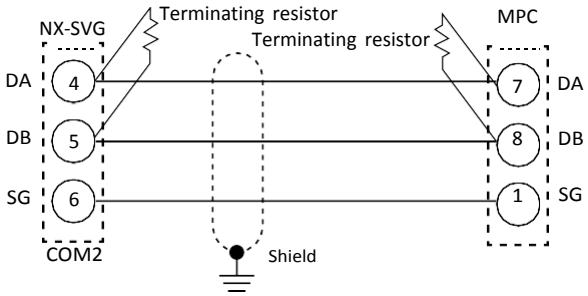
●System configuration



Note

- ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Wiring diagram



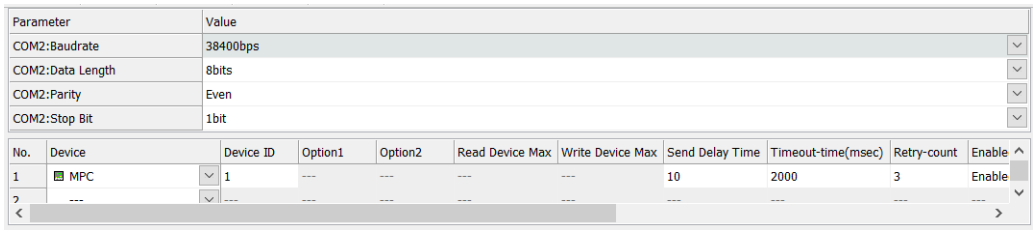
Handling Precautions

- Attach terminating resistors (150 Ω ±5 %, ½ W min.) to both ends of the transmission line.
- For details on wiring, refer to the user's manual for the connected device.

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the connected PLC.

(2) Specify COM2 settings according to the configuration of the connected MPC.



Parameter	Settings
COM2: Baudrate	38400 bps
COM2: Data Length	8 bits
COM2: Parity	Even
COM2: Stop Bit	1 bit

Device	Device ID	Send Delay Time	Timeout-time (msec)	Retry-count	Enabled Switch
MPC	1	10	2000	3	Enabled

●Configuration using model MPC

With the keys on the MPC, configure the RS-485 communication function.

(1) Press the [DISP] key to display the instantaneous flow rate.

>> The L indicator is lit.

(2) Hold down the [<] key for 3 seconds.

>> *0.rM5* is shown on the upper display, indicating that the device is in parameter setting mode.

(3) Keep the [<] key pressed for 3 seconds.

>> Item number *C-0 1* is shown on the upper display, indicating that the device is in function setup mode.

(4) Press the [∧] or [∨] key to select the desired setting item number.

(5) Press the [ENT] key.

>> The current setting blinks on the lower display.

(6) Press the [∧] or [∨] key to select the desired setting.

(7) Press the [ENT] key.

>> The new setting is saved and set.

(8) If there is another item to set up, return to step 4.
If not, proceed to step 9.

(9) Press the [DISP] key.

>> The function setup mode ends and the instantaneous flow rate is displayed.

Setting item	Display	Settings
Station address	*C-30*	1 (device ID)
Transmission speed selection	*C-31*	0: 38400 bps
Communications condition	*C-32*	0: 8-bit data, even parity, 1 stop bit

Note

- Typical errors that might occur in communication with the MPC include the following.

Error response code	Description
0x00000046	Address error
0x00000048	Write data error

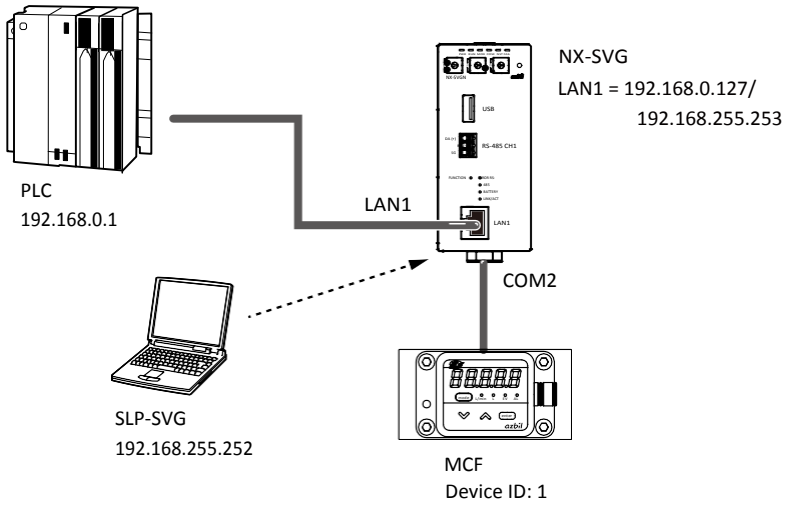
Note: For details on errors, refer to the manual for the device.

④ Air flowmeter, model MCF

An application example of the following device is given below.

Air flowmeter	Model MCF
Communication interface	RS-485
Communication protocol	Modbus/RTU

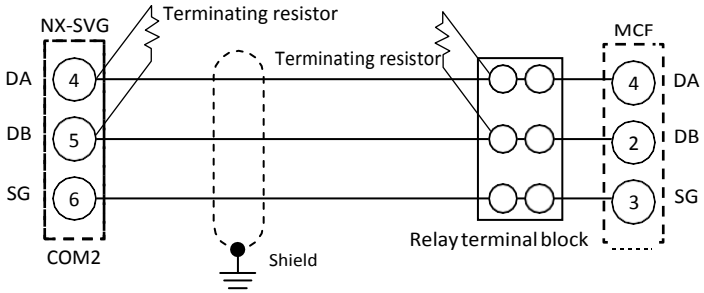
●System configuration



Note

• ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Wiring diagram



Handling Precautions

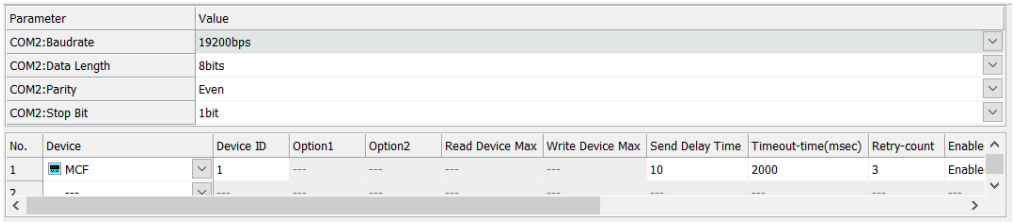
• Attach terminating resistors (150 Ω ±5 %, ½ W min.) to both ends of the transmission line.

• For details on wiring, refer to the user's manual for the connected device.

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the connected PLC.

(2) Specify COM2 settings according to the configuration of the connected MCF.



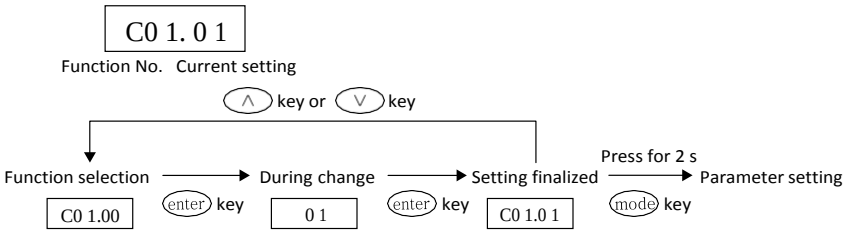
Parameter	Settings
COM2: Baudrate	19200 bps
COM2: Data Length	8 bits
COM2: Parity	Even
COM2: Stop Bit	1 bit

Device	Device ID	Send Delay Time	Timeout-time (msec)	Retry-count	Enabled Switch
MCF	1	10	2000	3	Enabled

●Configuration using model MCF

With the keys on the MCF, configure the RS-485 communication function.

(1) In normal indication mode, hold down the [mode] key for 2 seconds.
The function number is indicated in the first 3 digits and the current setting is displayed in the last 2 digits.



(2) Press the [∧] or [∨] key to select the desired function number and then press the [enter] key.

(3) The function number turns off and only the current setting is indicated in the last 2 digits.

(4) Press the [∧] or [∨] key to select the desired setting and then press the [enter] key.
(If the [mode] key is pressed, the selected setting is not saved and the function number is displayed again.)

>> The selected setting is saved, and the function number and the new setting are displayed.

(5) If there are other items to set up, repeat 2 to 4.

(6) To end function selection, hold down the [mode] key for 2 seconds to shift to parameter setting mode, and then hold down the [mode] key for another 2 seconds to return to normal indication mode.

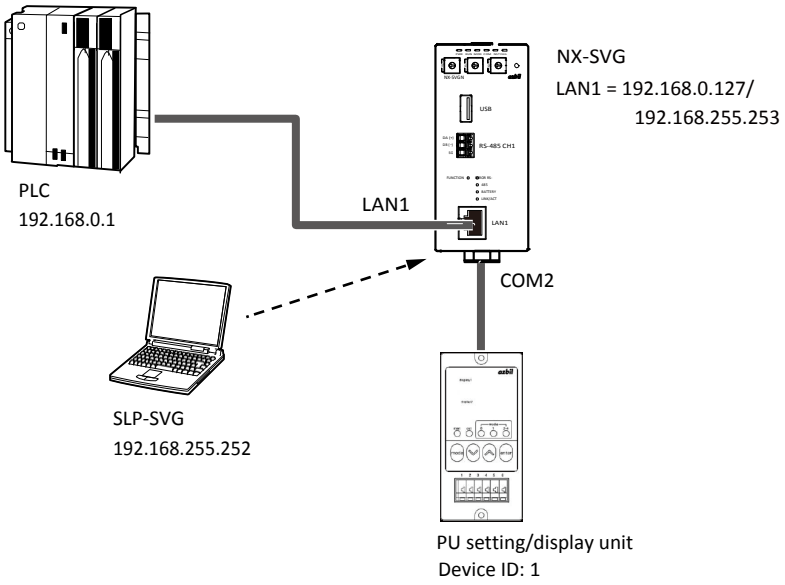
Setting item	Display	Settings
Station address	C30	01 (device ID)
Transmission speed	C31	01: 19200 bps
Data format	C32	00: 8-bit data, even parity, 1 stop bit (RTU)

④ Power controller, model PU21/23

An application example of the following device is given below.

Single-phase power controller	Model PU21
Communication interface	RS-485
Communication protocol	Modbus/RTU

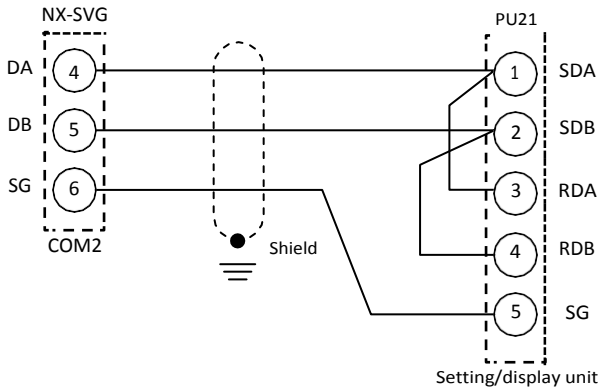
●System configuration



Note

- 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Wiring diagram



Handling Precautions

- No terminating resistor is required for the communication line.
- For details on wiring, refer to the user's manual for the connected device.

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the connected PLC.

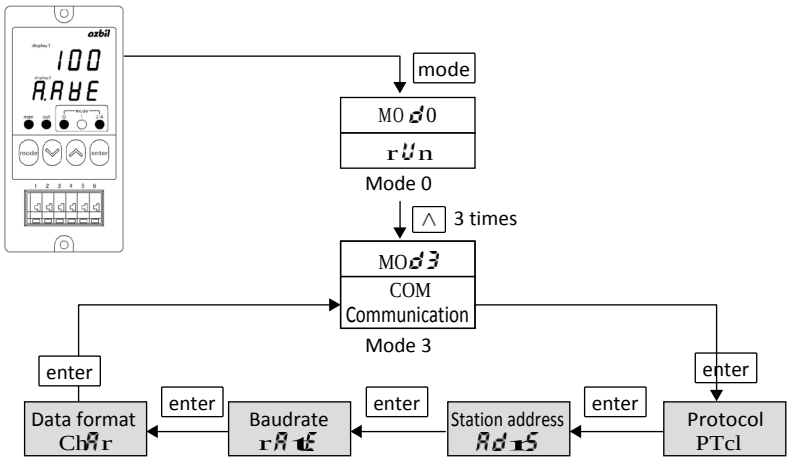
(2) Specify COM2 settings according to the configuration of the connected PU21. Do not change the default value of [Send Delay Time].

Parameter	Settings
COM2: Baudrate	19200 bps
COM2: Data Length	8 bits
COM2: Parity	Even
COM2: Stop Bit	1 bit

Device	Device ID	Send Delay Time	Timeout-time (msec)	Retry-count	Enabled Switch
PU21	1	50	2000	3	Enabled

●Configuration using model PU21

With the setting/display unit, configure the RS-485 communication function.



(1) Press the [mode] and [∧] keys to select mode 3 (COM).

(2) Press the [enter] key to display [*PtCL*] on display 2.

(3) Select protocol [ ] with the [ ] or [ ] key, and press the [enter] key to set.

(4) Press the [enter] key to display [ ] on display 2.

(5) Select station address [01] with the [∧] or [ ] key, and press the [enter] key to set.

(6) Press the [enter] key to display [ ] on display 2.

(7) Select transmission speed [19200] with the [∧] or [∨] key, and press the [enter] key to finalize the setting.

(8) Press the [enter] key to display [CHAr] on display 2.

(9) Select data format [8E1] with the [∧] or [ ]key, and press the [enter] key to finalize the setting.

Setting item	Display	Settings
Protocol	PtCL	RtU: Modbus/RTU
Station address	Adr S	01 (device ID)
Transmission speed	rAtE	19200
Data format	CHAr	8E1: 8-bit data, even parity, 1 stop bit

7-3 Mitsubishi PLC

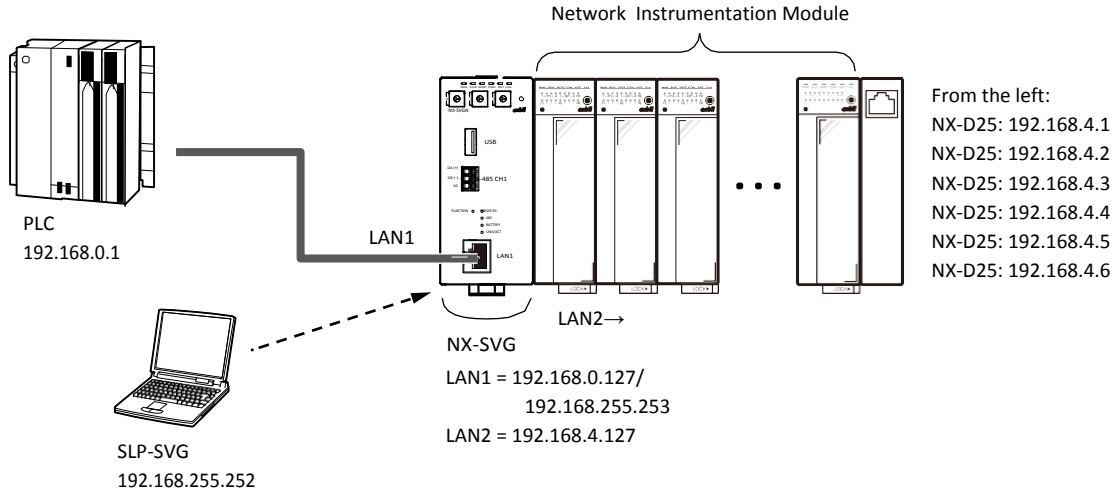
This section describes communication settings of PLCs made by Mitsubishi.

④ iQ-R series CPU direct connection

An application example of the following device is given below.

PLC	R04CPU
Communication interface	CPU module Ethernet port
Communication protocol	TCP/IP, SLMP (3E), binary code

●System configuration

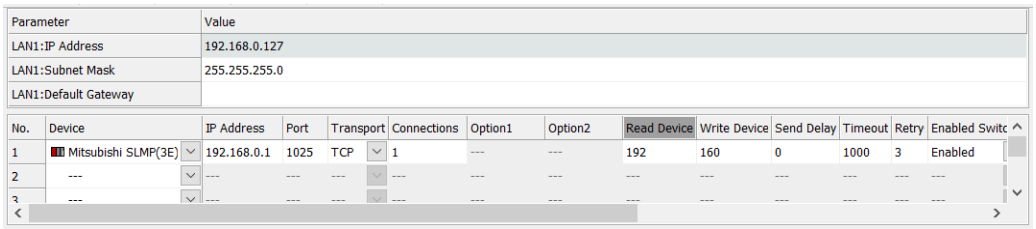


Note

- 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Configuration using model SLP-SVG

(3) Specify LAN1 settings according to the configuration of the Mitsubishi PLC. Do not change the default value of [Connections], [Read Device Max], or [Write Device Max].



Parameter	Value
LAN1:IP Address	192.168.0.127
LAN1:Subnet Mask	255.255.255.0
LAN1:Default Gateway	

No.	Device	IP Address	Port	Transport	Connections	Option1	Option2	Read Device	Write Device	Send Delay	Timeout	Retry	Enabled Switc
1	Mitsubishi SLMP(3E)	192.168.0.1	1025	TCP	1	---	---	192	160	0	1000	3	Enabled
2	---	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---	---

Device	IP address	Port	Transport Layer Protocol	Connections	Read Device Max	Write Device Max	Timeout-time (msec)*	Enabled Switch
Mitsubishi SLMP (3E)	192.168.0.1	1025	TCP	1	192	160	1000	Enabled

* The timeout-time is 1000 ms even if a value smaller than “1000” is specified.

(4) Specify LAN2 settings according to the configuration of the connected devices.

●Device setup

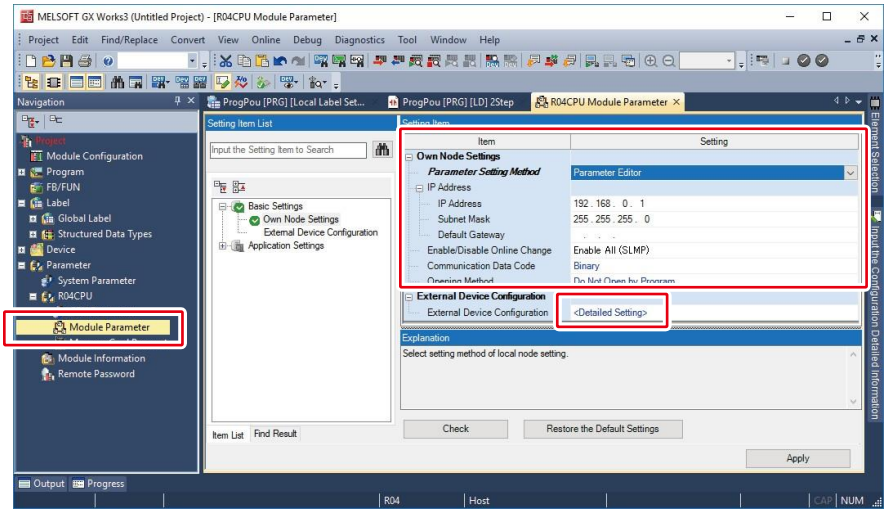
Using GX-Works3, change the settings as shown below.

(1) Go to Project > New and create a new project, with "RCPU" set for the series and "R04" for the type.

(2) Double-click [Module Parameter] of "Parameter."

>> The [R04CPU Module Parameter] window is displayed.

(3) Select [Basic Settings] and set the items under [Own Node Settings].



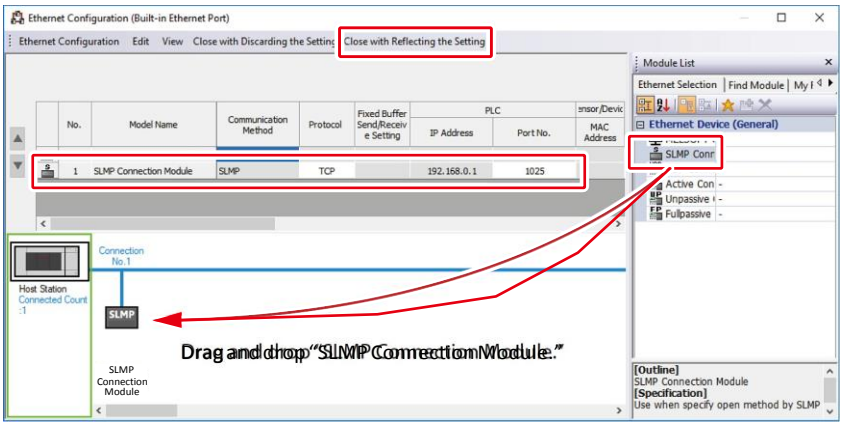
Setting item		Settings
IP Address	IP address	192.168.0.1
	Subnet Mask	255.255.255.0
Enable/Disable Online Change		Enable All (SLMP)
Communication Data Code		Binary
Opening Method		Do Not Open by Program

(4) Click "Detailed Setting" of [External Device Configuration].

>> The [Ethernet Configuration (Built-in Ethernet Port] window is displayed.

(5) Select "SLMP Connection Module" from [Module List], and drag and drop it.

>> The selected SLMP module is added to the first row. Configure the module settings, and click the [Close with Reflecting the Setting] button.



Setting item	Settings
Model Name	SLMP Connection Module
Protocol	TCP
PLC: Port No.	1025

Multiple NX-SVG units cannot be connected to one PLC port.
If multiple NX-SVG units are connected, repeat the procedure to set up all the units.

(6) Click the [Apply] button to close the window.

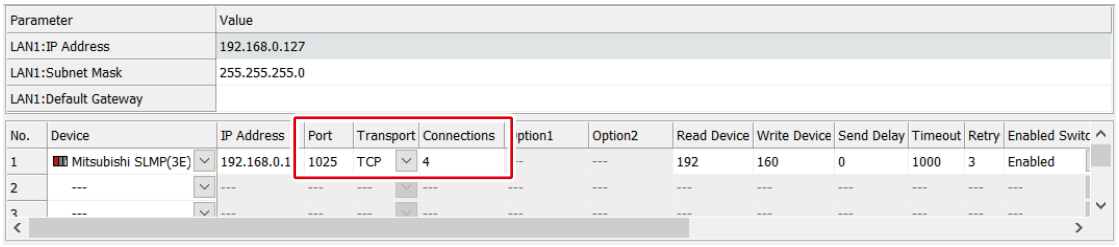
●Setting the number of connections

When the number of connections with the PLC is set to "2" or more, ports for those connections should be set in the [Ethernet Configuration (Built-in Ethernet Port)] window of the PLC.

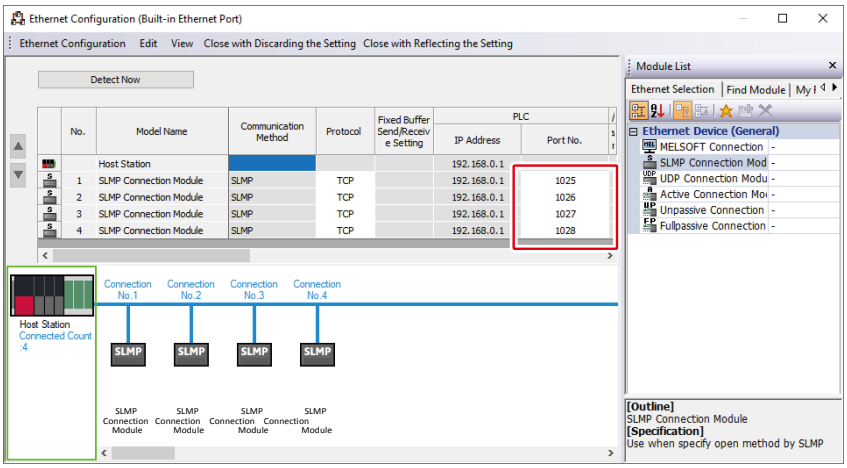
Set consecutive port numbers, starting with the port number set by this device, for all the connections.

●When connecting this device using the 4 ports of the PLC

(1) In the connected device configuration window of the loader, set [Connections] with the Mitsubishi's PLC to "4."



(2) In the [Ethernet Configuration (Built-in Ethernet Port)] window of the PLC, set 4 consecutive port numbers, starting with the port number set by the loader.



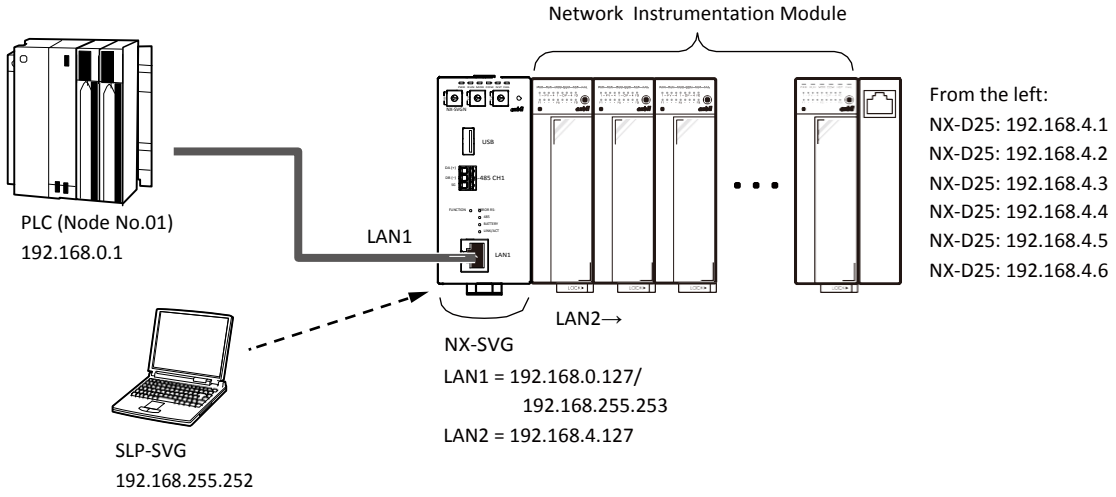
Setting item		Settings
Model Name		SLMP Connection Module
Protocol		TCP
1	PLC: Port No.	1025
2	PLC: Port No.	1026
3	PLC: Port No.	1027
4	PLC: Port No.	1028

④ iQ-R series, Ethernet interface module

An application example of the following device is given below.

PLC	R04CPU
Communication interface	RJ71EN71
Communication protocol	TCP/IP, SLMP (3E), binary code

●System configuration

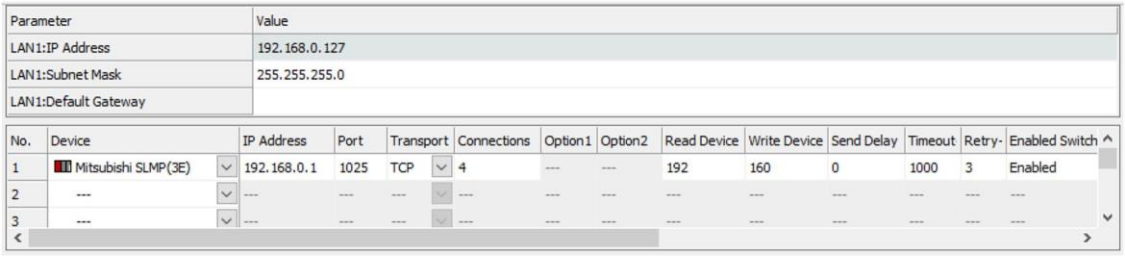


Note

• 5 - 6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the Mitsubishi PLC. Do not change the default value of [Connections], [Read Device Max], or [Write Device Max].



Parameter	Value
LAN1:IP Address	192.168.0.127
LAN1:Subnet Mask	255.255.255.0
LAN1:Default Gateway	

No.	Device	IP Address	Port	Transport	Connections	Option1	Option2	Read Device	Write Device	Send Delay	Timeout	Retry-	Enabled Switch
1	Mitsubishi SLMP(3E)	192.168.0.1	1025	TCP	4	---	---	192	160	0	1000	3	Enabled
2	---	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---	---

Device	IP address	Port	Transport Layer Protocol	Connections	Read Device Max	Write Device Max	Timeout-time (msec)*	Enabled Switch
Mitsubishi SLMP (3E)	192.168.0.1	1025	TCP	1	192	160	1000	Enabled

* The timeout-time is 1000 ms even if a value smaller than “1000” is specified.

(2) Specify LAN2 settings according to the configuration of the connected devices.

●Device setup

Using GX-Works3, change the settings as shown below.

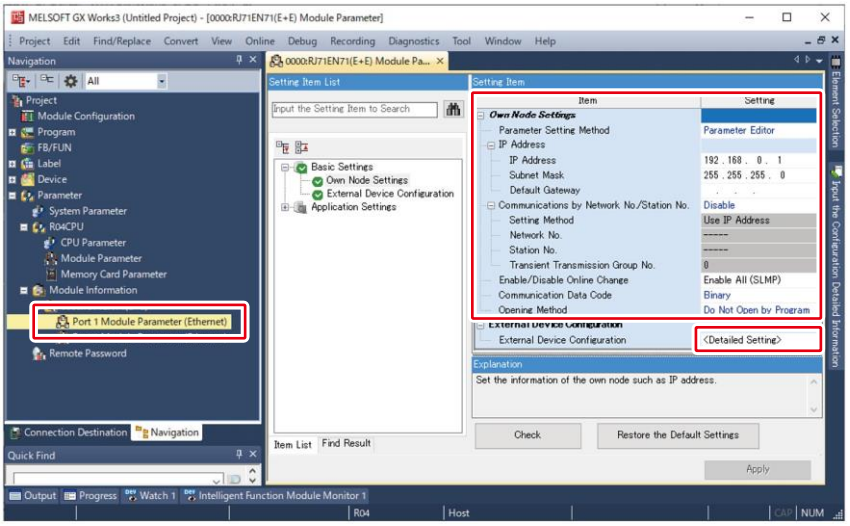
(1) Go to Project > New and create a new project, with “RCPU” set for the series.

(2) Double-click [Module Configuration] and assign the module configuration that will be used. The Ethernet, CC-Link IE Control, or CC-Link IE Field function can be assigned to each port of the RJ71EN7 information module. Select a module connected to a port whose network type is Ethernet and to which the NX-SVG is connected.

(3) Select [Parameter] > [Module Information] > [RJ71EN71], and double-click the module parameter (Etnernet) of the port to connect to the NX-SVG.

>> The window for specifying parameters of module RJ71EN71 is displayed.

(4) Select [Basic Settings] and set the items under [Own Node Settings].



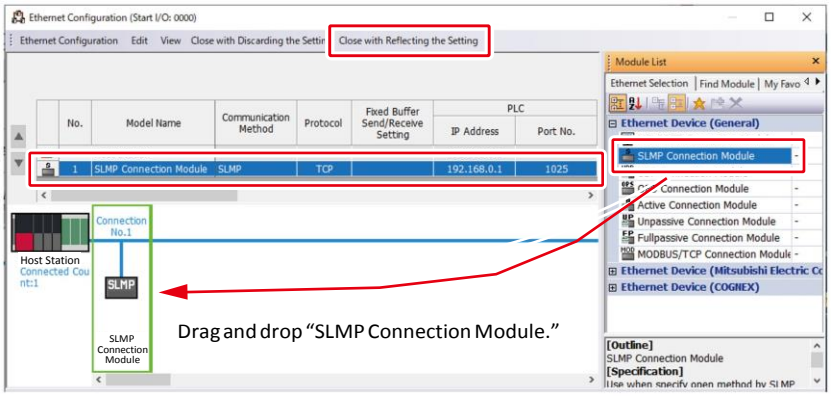
Setting item		Settings
IP Address	IP address	192.168.0.1
	Subnet Mask	255.255.255.0
Communications by Network No./Station No.		Disable
Enable/Disable Online Change		Enable All (SMLP)
Communication Data Code		Binary
Opening Method		Do Not Open by Program

(5) Click “Detailed Setting” of [External Device Configuration].

>> The [Ethernet Configuration] window is displayed.

(6) Select “SMLP Connection Module” from [Module List], and drag and drop it.

>> The selected SMLP module is added to the first row. Configure the module settings, and click the [Close with Reflecting the Setting] button.



Setting item	Settings
Model Name	SLMP Connection Module
Protocol	TCP
PLC: Port No.	1025

Multiple NX-SVG units cannot be connected to one PLC port.
If multiple NX-SVG units are connected, repeat the procedure to set up all the units.

(7) Click the [Apply] button to close the window.

●Setting the number of connections

When the number of connections with the PLC is set to “2” or more, ports for those connections should be set in the [Ethernet Configuration (Built-in Ethernet Port)] window.

Set consecutive port numbers, starting with the port number set by the NX-SVG, for all the connections.

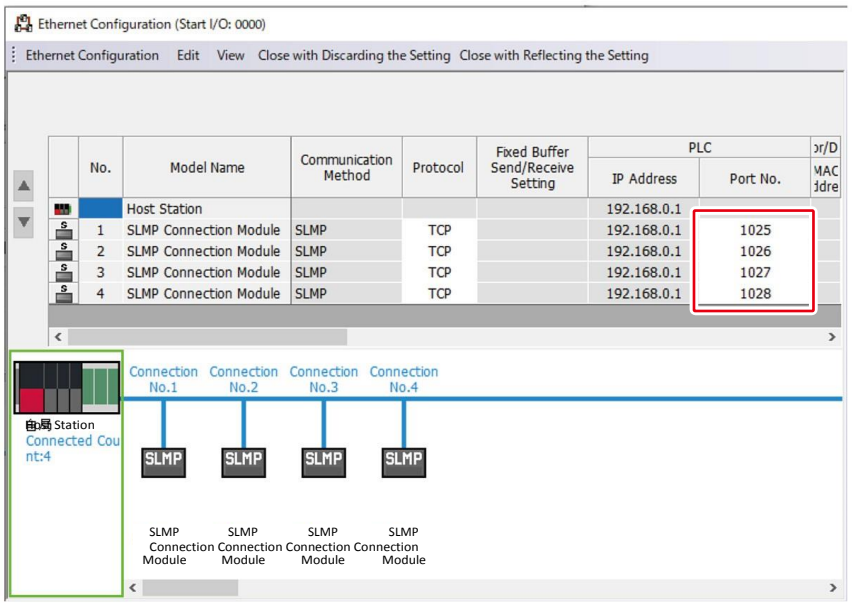
●When connecting this device using the 4 ports of the PLC:

(1) In the SLP-SVG, set [Connections] with the Mitsubishi’s PLC to “4.”

Parameter	Value
LAN1:IP Address	192.168.0.127
LAN1:Subnet Mask	255.255.255.0
LAN1:Default Gateway	

No.	Device	IP Address	Port	Transport	Connections	Option1	Option2	Read Device	Write Device	Send Delay	Timeout	Retry-	Enabled Switch
1	Mitsubishi SLMP(3E)	192.168.0.1	1025	TCP	4	---	---	192	160	0	1000	3	Enabled
2	---	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---	---

(2) In the [Ethernet Configuration (Built-in Ethernet Port)] window of the PLC, set 4 consecutive port numbers, starting with the port number set by the SLP-SVG.



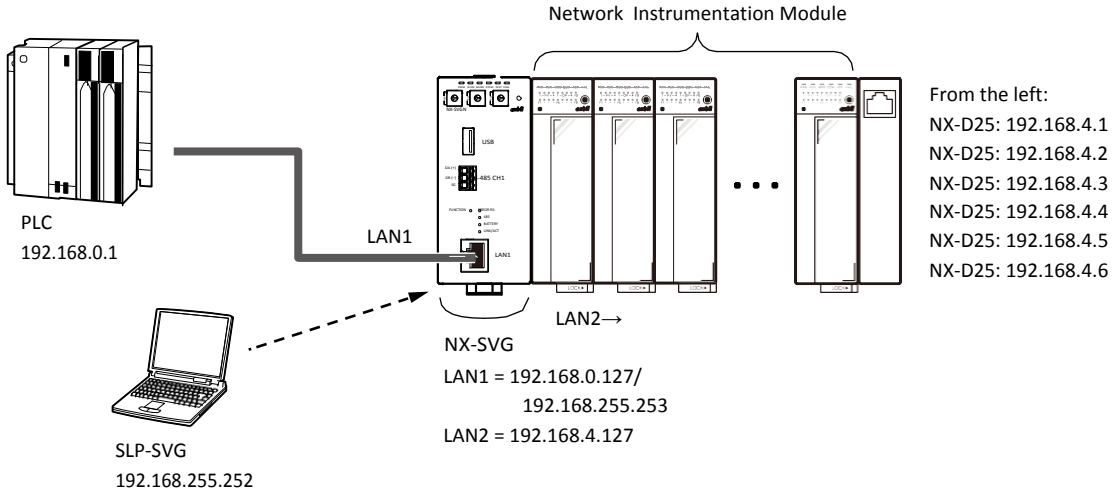
Setting item		Settings
Model Name		SLMP Connection Module
Protocol		TCP
1	PLC: Port No.	1025
2	PLC: Port No.	1026
3	PLC: Port No.	1027
4	PLC: Port No.	1028

④ Q series CPU direct connection

An application example of the following device is given below.

PLC	Q04UDEHCPU
Communication interface	CPU module Ethernet port
Communication protocol	TCP/IP, SLMP (3E), binary code

●System configuration

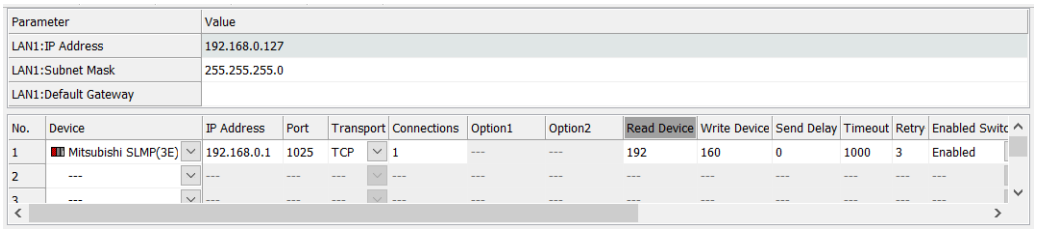


Note

- 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the Mitsubishi PLC. Do not change the default value of [Connections], [Read Device Max], or [Write Device Max].



Parameter	Value
LAN1:IP Address	192.168.0.127
LAN1:Subnet Mask	255.255.255.0
LAN1:Default Gateway	

No.	Device	IP Address	Port	Transport	Connections	Option1	Option2	Read Device	Write Device	Send Delay	Timeout	Retry	Enabled Switc
1	Mitsubishi SLMP(3E)	192.168.0.1	1025	TCP	1	---	---	192	160	0	1000	3	Enabled
2	---	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---	---

Device	IP address	Port	Transport Layer Protocol	Connections	Read Device Max	Write Device Max	Timeout-time (msec)*	Enabled Switch
Mitsubishi SLMP (3E)	192.168.0.1	1025	TCP	1	192	160	1000	Enabled

* The timeout-time is 1000 ms even if a value smaller than “1000” is specified.

(2) Specify LAN2 settings according to the configuration of the connected devices.

●Device setup

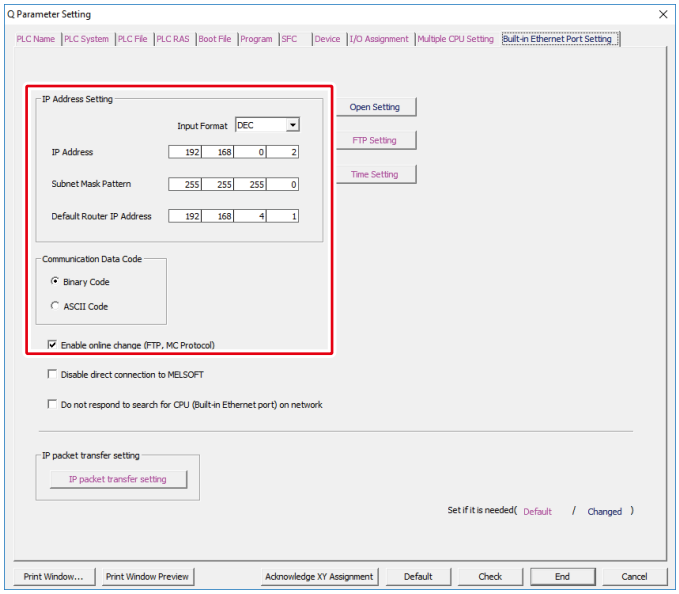
Using GX-Developer, change the settings as shown below.

(1) Go to "Project" > "New" and create a new project, with "Q04UDEHCPU" set for the CPU type.

(2) Double-click the PC parameter.

>> The [Q Parameter Setting] window is displayed.

(3) Select the [Built-in Ethernet Port Setting] tab and set the items.

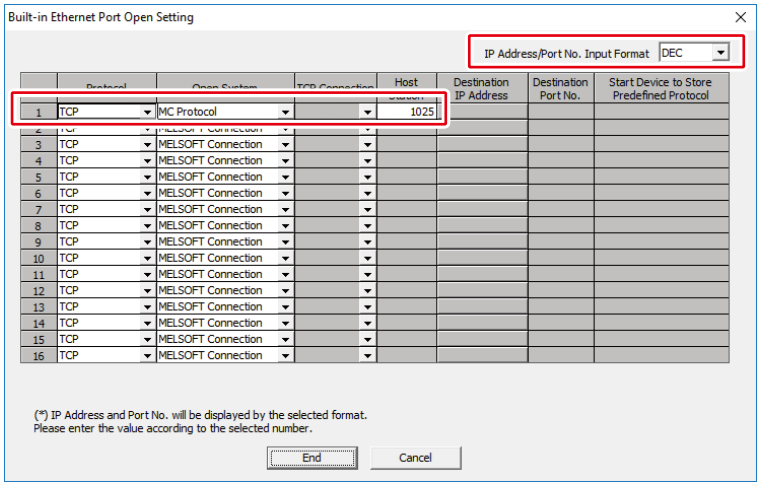


Setting item	Settings
IP address	192.168.0.1
Subnet Mask Pattern	255.255.255.0
Default Router IP Address	Set the default router IP address.
Communication Data Code	Binary Code
Enable online change	Check the checkbox.

(4) Click the [Open Setting] button.

>> The [Built-in Ethernet Port Open Setting] window is displayed.

(5) Configure the settings of the port on the first row, and click the [End] button.



Setting item	Settings
Port No. Input Format	DEC
Protocol	TCP
Open system	MC Protocol
Host Port No.	1025

Multiple NX-SVG units cannot be connected to one PLC port.
If multiple NX-SVG units are connected, repeat the procedure to set up all the units.

(6) Click the [End] button to close the window.

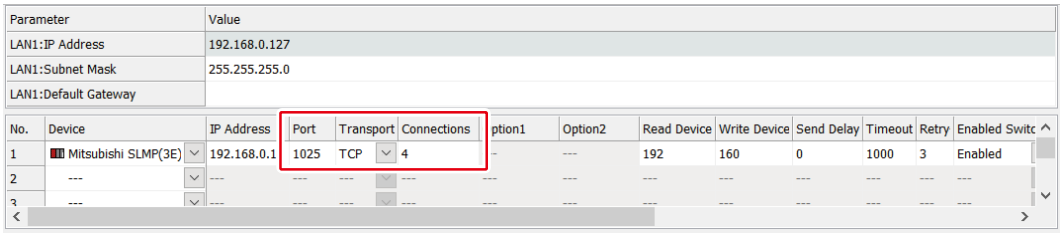
●Setting the number of connections

When the number of connections with the Mitsubishi PLC is set to "2" or more, ports for those connections should be set in the [Ethernet Configuration (Built-in Ethernet Port)] window of the PLC.

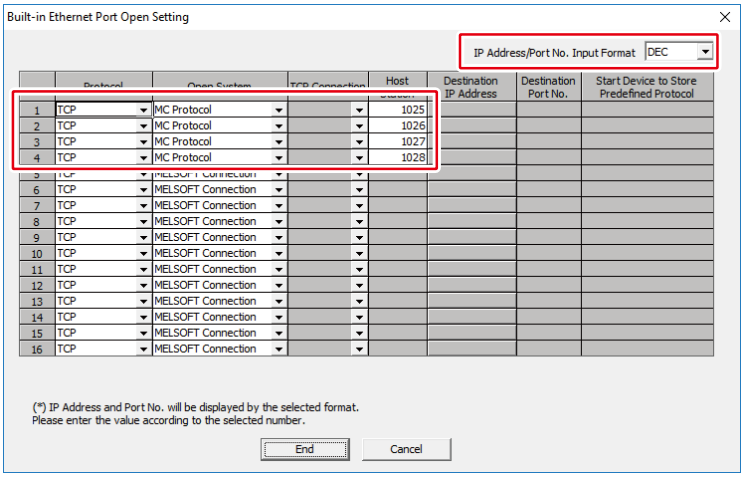
Set consecutive port numbers, starting with the port number set by this device, for all the connections.

●When connecting this device using the 4 ports of the PLC

(1) In the connected device configuration window of the loader, set [Connections] with the Mitsubishi's PLC to "4."



(2) In the [Built-in Ethernet Port Open Setting] window of the PLC, set 4 consecutive port numbers, starting with the port number set by the loader.



Setting item		Settings
Port No. Input Format		DEC
Protocol		TCP
Open system		MC Protocol
1	Host Port No.	1025
2	Host Port No.	1026
3	Host Port No.	1027
4	Host Port No.	1028

④ Q series, Ethernet interface module

An application example of the following device is given below.

PLC	Q04UDEHCPU
Communication interface	Ethernet interface module QJ71E71-100
Communication protocol	TCP/IP, SLMP (3E), binary code

●Device setup

Using GX-Developer, change the settings as shown below.

(1) Go to Project > New and create a new project, with "Q04UDEHCPU" set for the CPU type.

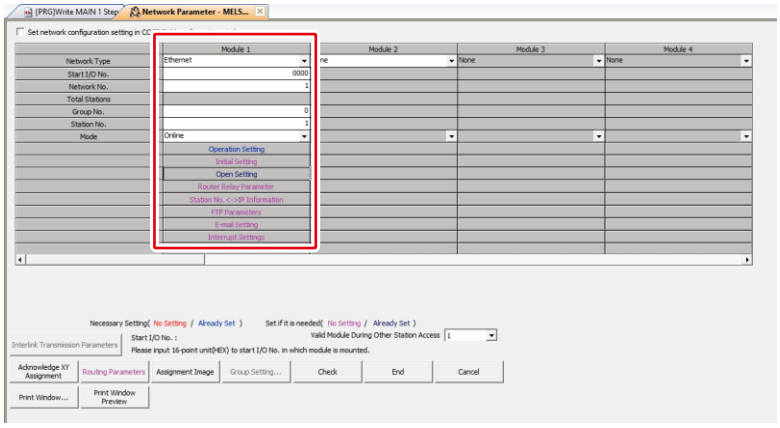
(2) Double-click “Network Parameter.”

>> The network parameter selection window is displayed.

(3) Click the [Ethernet/CC IE/MELSECNET] button.

>> The [Network Parameter Ethernet/CC IE/MELSECNET Sheet Quantity Setting] window is displayed.

(4) Set [Start I/O No.], [Network No.] and [Station No.] according to the system configuration.



(5) Click the [Operation Setting] button in the table.

>> The [Ethernet Operation Setting] window is displayed.

(6) Set the setting items and click the [END] button.

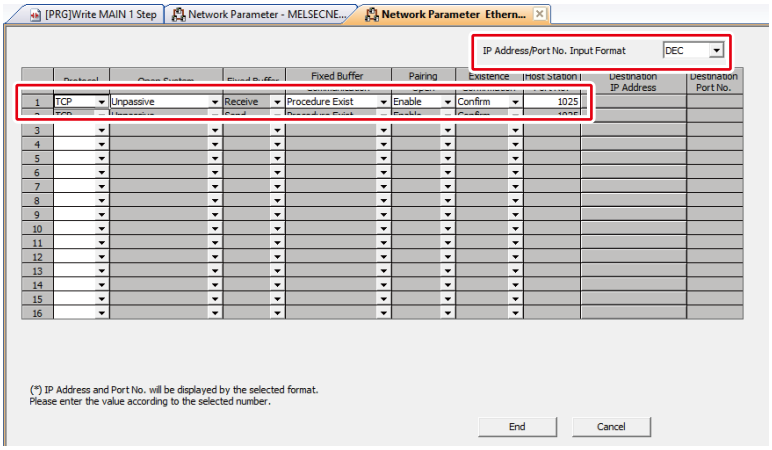
Setting item	Settings
Communication Data Code	Binary Code
Initial Timing	Always wait for OPEN (Communication possible at STOP time)
Input Format	Decimal
IP address	192.168.0.2
Send Frame Setting	Ethernet (V2.0)
TCP Existence Check Setting	Use the KeepAlive
Enable online change	Check the checkbox.

>> The [Network Parameter Ethernet/CC IE/MELSECNET Sheet Quantity Setting] window is displayed.

(7) Click the [Open Setting] button in the table.

>> The [Network Parameter Ethernet Port Open Setting] window is displayed.

(8) Configure the settings of the port in the first row.



Setting item	Settings
Port No. Input Format	DEC
Protocol	TCP
Open system	Unpassive
Fixed Buffer Communication	Procedure Exist
Host Station Port No.	1025

Multiple NX-SVG units cannot be connected to one port.
If multiple NX-SVG units are connected, repeat the procedure to set up all the units.

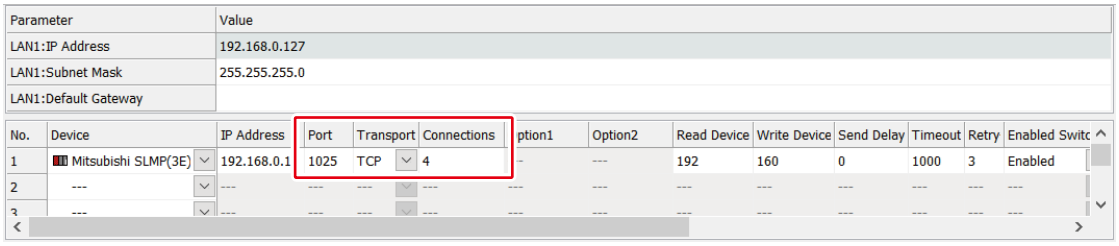
●Setting the number of connections

When the number of connections with the Mitsubishi PLC is set to "2" or more, ports for those connections should be set in the [Network Parameter Ethernet Open Setting] window of the PLC.

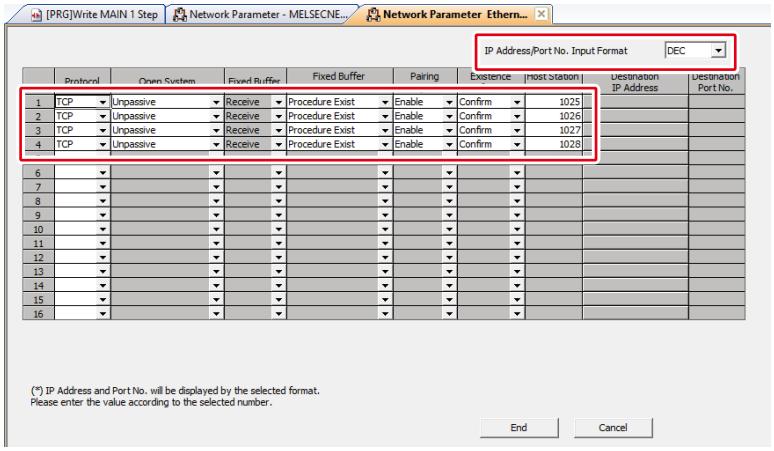
Set consecutive port numbers, starting with the port number set by this device, for all the connections.

●When connecting this device using the 4 ports of the PLC

(1) In the connected device configuration window of the loader, set [Connections] with the Mitsubishi's PLC to “4.”



(2) In the [Network Parameter Ethernet Open Setting] window of the PLC, set 4 consecutive port numbers, starting with the port number set by the loader.



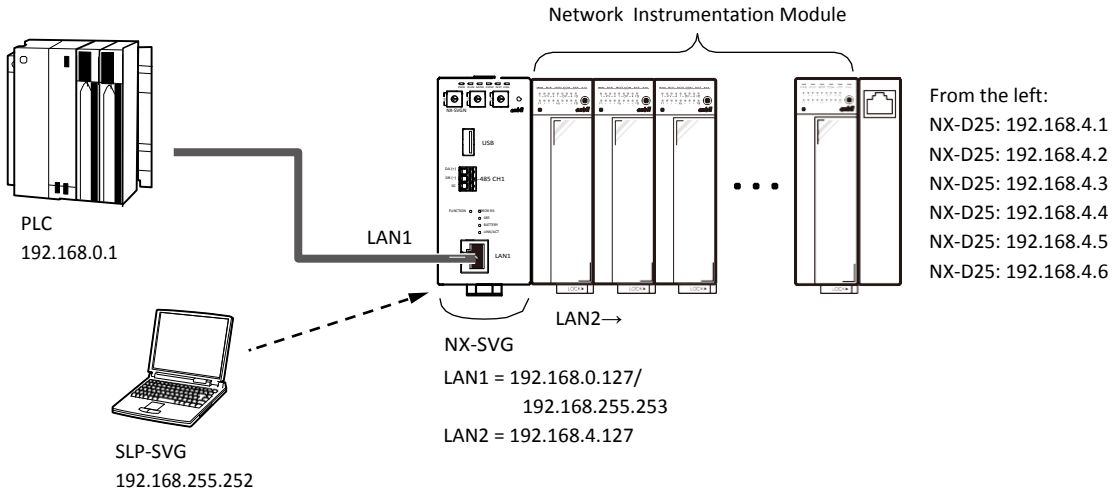
Setting item		Settings
Port No. Input Format		DEC
Protocol		TCP
Open system		Unpassive
Fixed Buffer Communication		Procedure Exist
1	Host Station Port No.	1025
2	Host Station Port No.	1026
3	Host Station Port No.	1027
4	Host Station Port No.	1028

④ iQ-Fseries,CPUdirectconnection

An application example of the following device is given below.

PLC	FX-5UCPU
Communication interface	CPU module Ethernet port
Communication protocol	TCP/IP, SLMP (3E), binary code

● System configuration



Note

- 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

● Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the Mitsubishi PLC. Do not change the default value of [Connections], [Read Device Max], or [Write Device Max].

Parameter	Value
LAN1:IP Address	192.168.0.127
LAN1:Subnet Mask	255.255.255.0
LAN1:Default Gateway	

No.	Device	IP Address	Port	Transport	Connections	Option1	Option2	Read Device	Write Device	Send Delay	Timeout	Retry	Enabled Switc
1	Mitsubishi iQ-F SLMI	192.168.0.1	1025	TCP	1	---	---	192	160	0	1000	3	Enabled
2	---	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---	---

Device	IP address	Port	Transport Layer Protocol	Connections	Read Device Max	Write Device Max	Timeout-time (msec)*	Enabled Switch
Mitsubishi iQ-F SLMP (3E)	192.168.0.1	1025	TCP	1	192	160	1000	Enabled

* The timeout-time is 1000 ms even if a value smaller than “1000” is specified.

(2) Specify LAN2 settings according to the configuration of the connected devices.

●Device setup

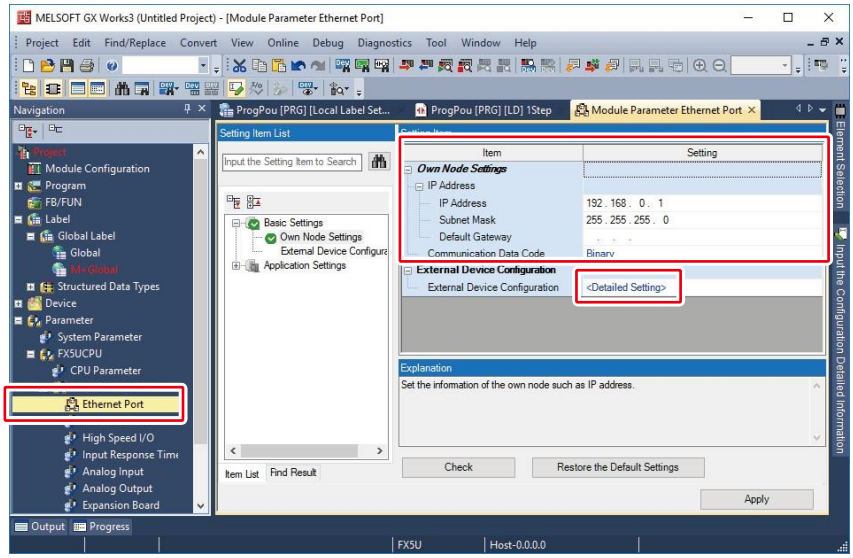
Using GX-Works3, change the settings as shown below.

(1) Go to Project > New and create a new project, with "FX5CPU" set for the series and "FX5U" set for the type. Double-click [Module Parameter] of "Parameter."

(2) Double-click "Ethernet Port" of "Parameter."

>> The [Module Parameter Ethernet Port] window is displayed.

(3) Select [Basic Settings] and set the items under [Own Node Settings].



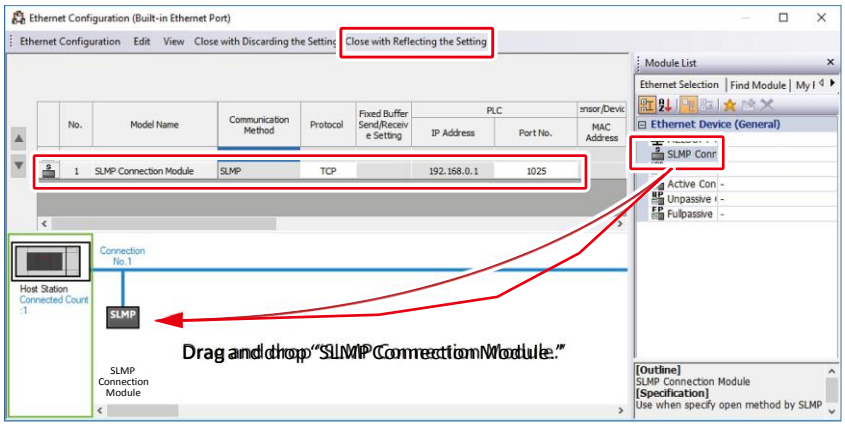
Setting item		Settings
IP Address	IP address	192.168.0.1
	Subnet Mask	255.255.255.0
Communication Data Code		Binary

(4) Click "Detailed Setting" of [External Device Configuration].

>> The [Ethernet Configuration (Built-in Ethernet Port] window is displayed.

(5) Select "SLMP Connection Module" from [Module List], and drag and drop it.

>> The selected SLMP module is added to the first row. Configure the module settings, and click the [Close with Reflecting the Setting] button.



Setting item	Settings
Model Name	SLMP Connection Module
Protocol	TCP
PLC: Port No.	1025

Multiple NX-SVG units cannot be connected to one PLC port.
If multiple NX-SVG units are connected, repeat the procedure to set up all the units.

(6) Click the [Apply] button to close the window.

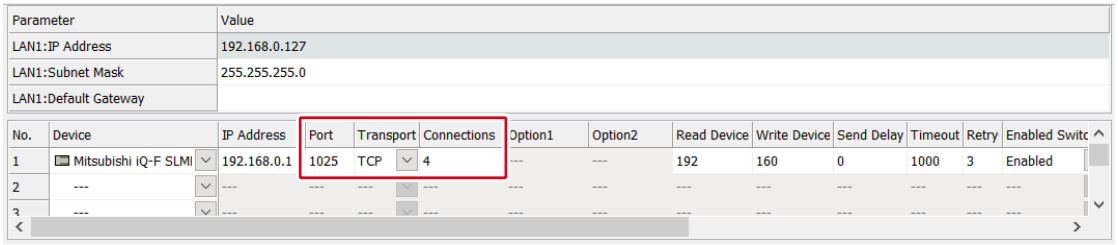
●Setting the number of connections

When the number of connections with the PLC is set to "2" or more, ports for those connections should be set in the [Ethernet Configuration (Built-in Ethernet Port)] window of the PLC.

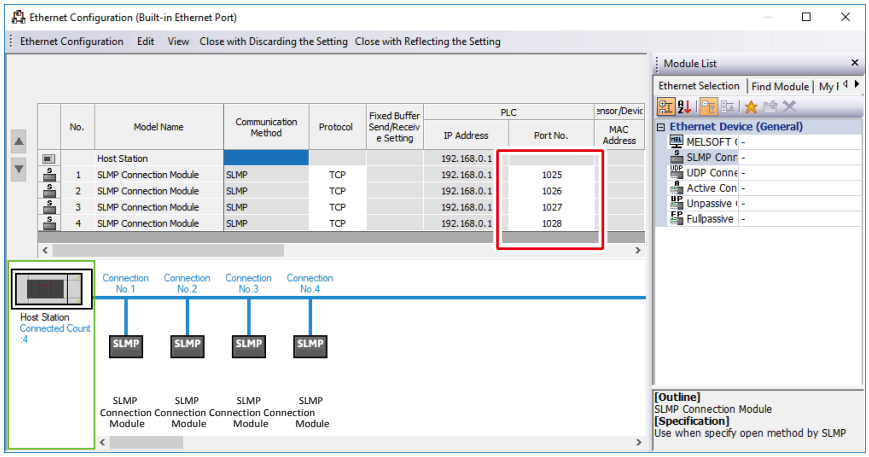
Set consecutive port numbers, starting with the port number set by this device, for all the connections.

●When connecting this device using the 4 ports of the PLC

(1) In the connected device configuration window of the loader, set [Connections] with the Mitsubishi's PLC to "4."



(2) In the [Ethernet Configuration (Built-in Ethernet Port)] window of the PLC, set 4 consecutive port numbers, starting with the port number set by the loader.



Setting item		Settings
Model Name		SLMP Connection Module
Protocol		TCP
1	PLC: Port No.	1025
2	PLC: Port No.	1026
3	PLC: Port No.	1027
4	PLC: Port No.	1028

7-4 Yokogawa Electric PLC

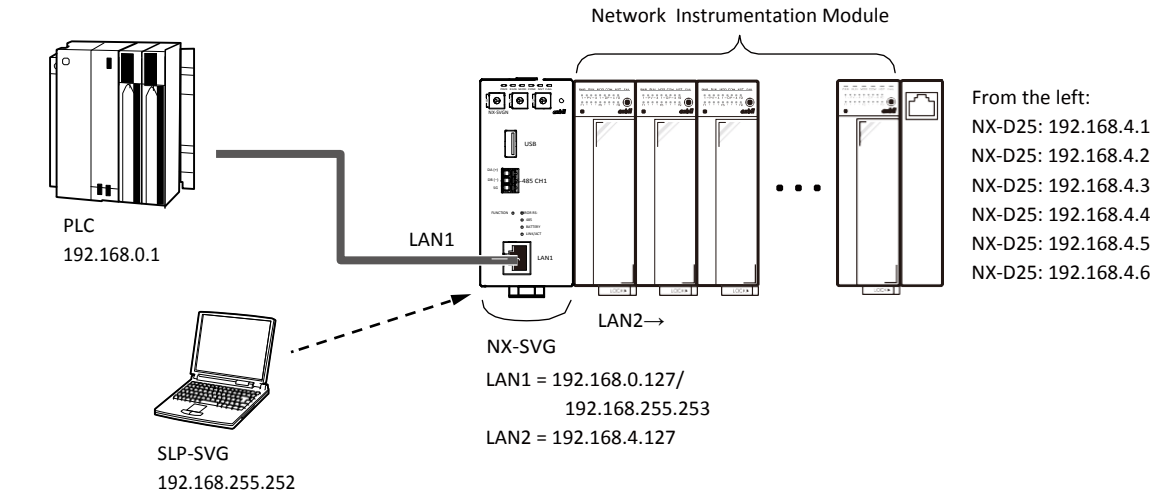
This section describes communication settings of the FA-M3 series made by Yokogawa Electric.

④ CPU direct connection

An application example of the following device is given below.

PLC	F3SP71-4S
Communication interface	Ethernet port built in the CPU module
Communication protocol	TCP/IP, binary format

●System configuration



Note

- ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

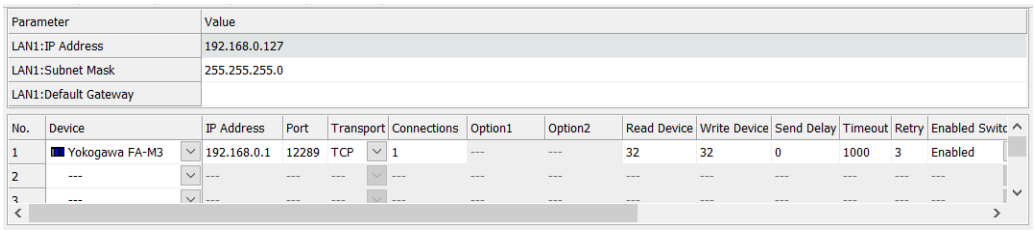
●Setting the number of connections

For the FA-M3, multiple connections can be established for one port.

It is not necessary to change the PLC's parameter settings according to the number of connections.

●Configuration using model SLP-SVG

(5) Specify LAN1 settings according to the configuration of the Yokogawa PLC. Do not change the default value of [Port], [Read Device Max], or [Write Device Max].



Device	IP address	Port	Transport Layer Protocol	Connections	Read Device Max	Write Device Max	Enabled Switch
Yokogawa FA-M3	192.168.0.1	12289	TCP	1	32	32	Enabled

Note: It is not necessary to change the PLC's parameter settings according to the number of connections.

(6) Specify LAN2 settings according to the configuration of the connected devices.

●Device setup

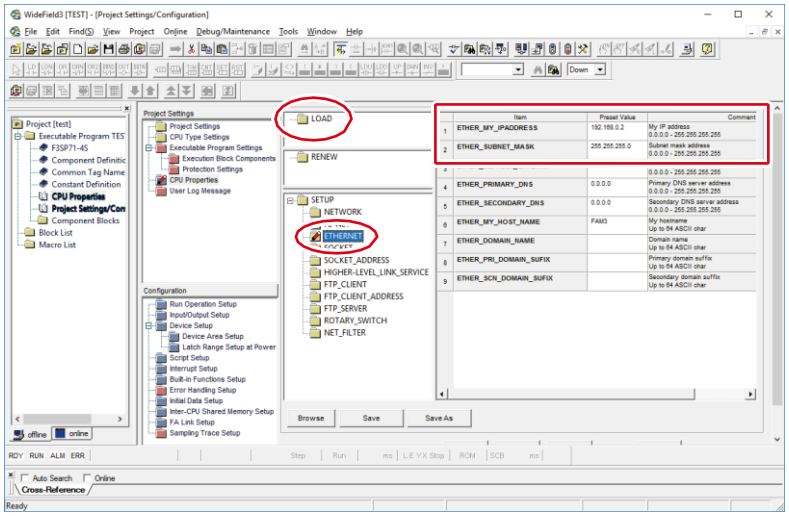
Using WideField3, change the settings as shown below.

(1) Go to "Project" > "New" and create a new project, with "F3SP71-4S" set for the CPU type.

(2) Select the f3sp71-4s.yprp file from “CPU Properties.”

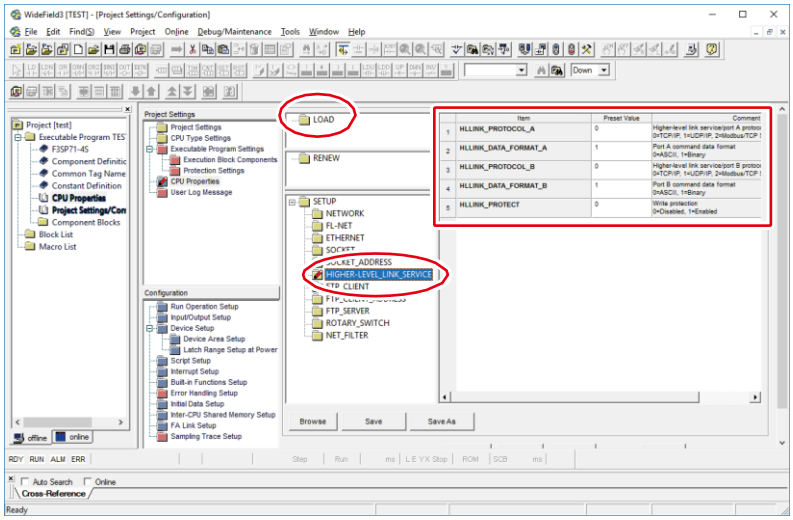
>> First, the settings of [LOAD] are displayed in the frame on the right. Do not change the default values of [LOAD].

(3) Select [ETHERNET] and set the IP address.



Item	Preset Value
ETHER_MY_IPADDRESS	192.168.0.1
ETHER_SUBNET_MASK	255.255.255.0

(4) Select [HIGHER-LEVEL_LINK_SERVICE] and set the command data format.



Item	Preset Value
HLLINK_PROTOCOL_A	0 (TCP/IP)
HLLINK_DATA_FORMAT_A	1 (binary format)
HLLINK_PROTECT	0 (writing is allowed)

Note

- The port number of FA-M3 port A is 12289. The port number of port B is 12291.

7-5 Omron PLC

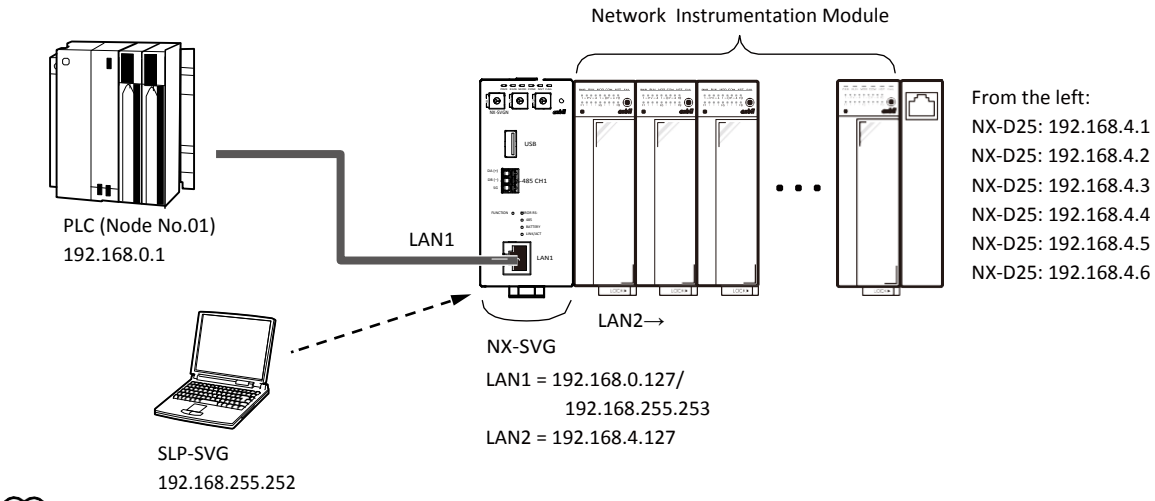
This section describes the communication settings of the NJ/CJ series made by Omron.

④ NJseries,CPUdirectconnection(FINS/TCPconnection)

An application example of the following device is given below.

PLC	NJ101-9000
Communication interface	Ethernet/IP port built in the CPU module
Communication protocol	FINS/TCP

●System configuration

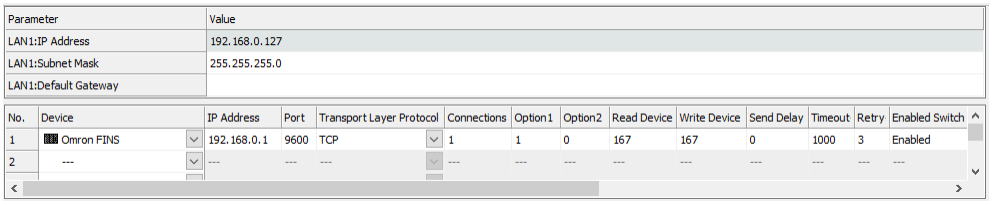


Note

- 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Configuration using model SLP-SVG

(7) Specify LAN1 settings according to the configuration of the Omron PLC. Do not change the default value of [Option2], [Read Device Max], or [Write Device Max].



Parameter	Value
LAN1:IP Address	192.168.0.127
LAN1:Subnet Mask	255.255.255.0
LAN1:Default Gateway	

No.	Device	IP Address	Port	Transport Layer Protocol	Connections	Option1	Option2	Read Device	Write Device	Send Delay	Timeout	Retry	Enabled Switch
1	Omron FINS	192.168.0.1	9600	TCP	1	1	0	167	167	0	1000	3	Enabled
2	---	---	---	---	---	---	---	---	---	---	---	---	---

Device	IP address	Port	Transport Layer Protocol	Connections *1	Option1 *2	Option2 *3	Read Device Max	Write Device Max	Enabled Switch
Omron FINS	192.168.0.1	9600	TCP	1	1	0	167	167	Enabled

*1. It is not necessary to change the PLC's parameter settings according to the number of connections.

*2. The FINS node number for the PLC

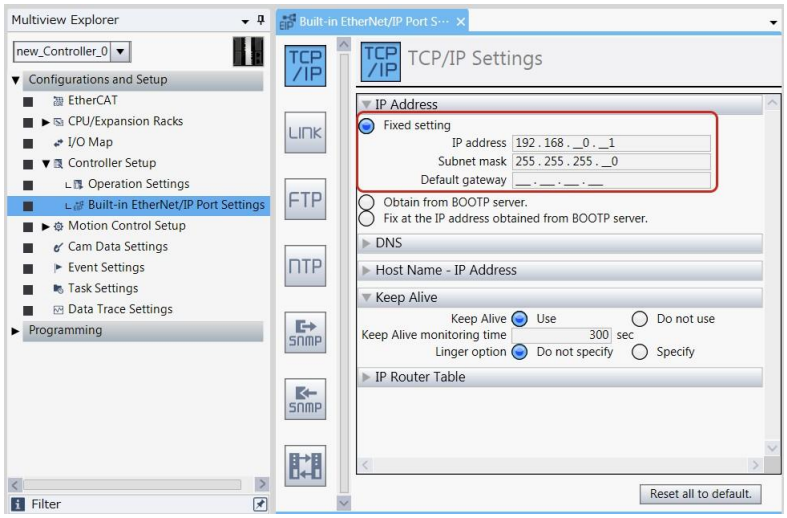
*3. The FINS node number for this device. When set to"0," the PLC assigns the number automatically.

(8) Specify LAN2 settings according to the configuration of the connected devices.

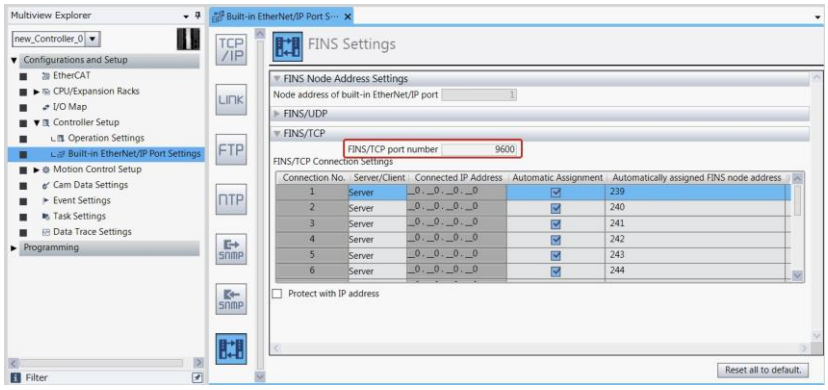
●Device setup

Using Sysmac Studio, configure the settings as shown below.

(1) On the [Multiview Explorer] screen, double-click [Built-in EtherNet/IP Port Settings] under [Controller Setup] to display the [TCP/IP Settings] window. Specify the IP address settings.

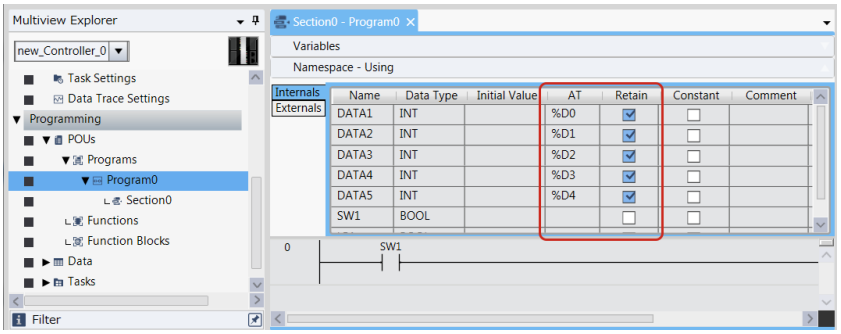


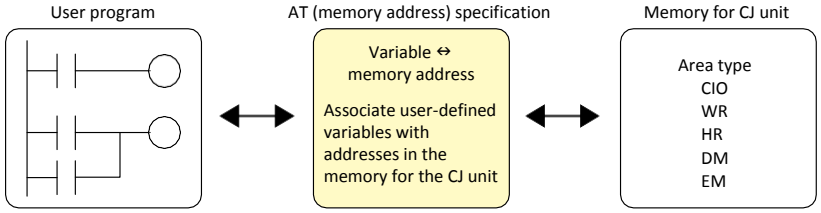
(2) Click the FINS settings icon.
Specify the FINS/TCP settings.



Item	Setting item	Settings
IP address settings	IP address	192.168.0.1 (fixed setting)
	Subnet mask	255.255.255.0 (fixed setting)
FINS settings	Node address of built-in EtherNet/IP port	1 (The least significant digit of the IP address is the FINS node address)
	FINS/TCP port number	9600

(3) Associate user-defined variables with addresses in the memory for the CJ unit (AT specification). This device accesses the memory for the CJ unit in the CPU module of the NJ series PLC. Therefore, in order to access the memory for the CJ unit using the user program for the CPU module, it is necessary to associate user-defined variables with addresses in the memory for the CJ unit (AT specification).





Addresses in the memory for the CJ unit of the NJ series PLC are shown below.

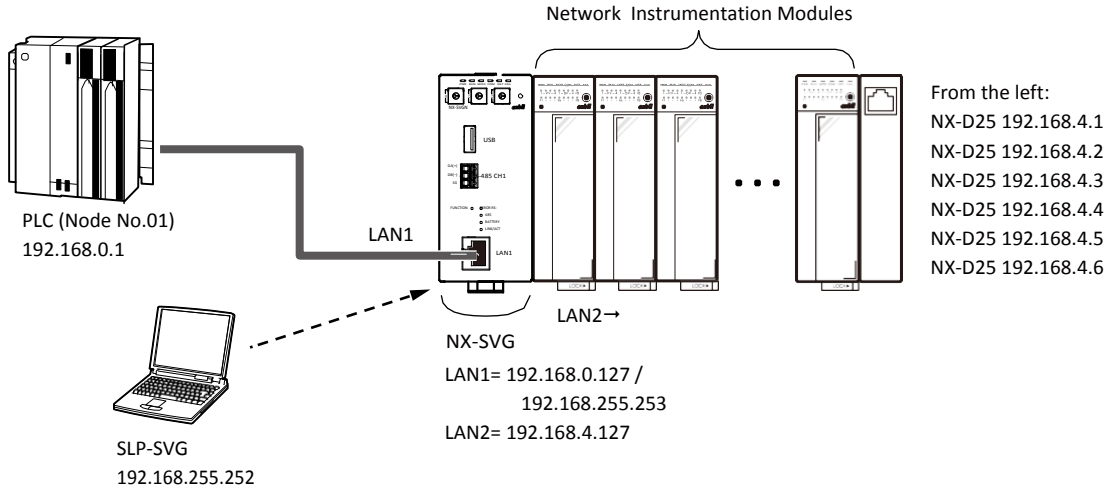
Data type	Area type	Memory for CJ unit	AT (memory address) specification
Channel I/O bit	CIO	0.0 to 6143.15	%0.0 to %6143.15
Channel I/O word	CIO	0 to 6143	%0 to %6143
W: Internal auxiliary relay	WR	W0.0 to W511.15	%W0.0 to %W511.15
H: Retaining relay	HR	H0.0 to H1535.15	%H0.0 to %H1535.15
D: Data	DM	D0 to D32767	%D0 to %D32767
E: Extension	EM	E0_0 to E18_32767	%E0_0 to %E18_32767

④ NJ series, CPU direct connection (FINS/UDP connection)

An application example of the following device is given below.

PLC	NJ101-9000
Communication interface	Ethernet/IP port built in the CPU module
Communication protocol	FINS/UDP

●System configuration



Note

- ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the Omron PLC. Do not change the default value of [Read Device Max] or [Write Device Max].

Parameter	Value
LAN1:IP Address	192.168.0.127
LAN1:Subnet Mask	255.255.255.0
LAN1:Default Gateway	

No.	Device	IP Address	Port	Transport Layer Protocol	Connections	Option1	Option2	Read Device	Write Device	Send Delay	Timeout	Retry	Enabled Switch
1	Omron FINS	192.168.0.1	9600	UDP	---	1	127	167	167	0	1000	3	Enabled
2	---	---	---	---	---	---	---	---	---	---	---	---	---

Device	IP address	Port	Transport Layer Protocol	Option1 *2	Option2 *3	Read Device Max	Write Device Max	Enabled Switch
Omron FINS	192.168.0.1	9600	UDP	1	127	167	167	Enabled

*1. The FINS node number for the PLC

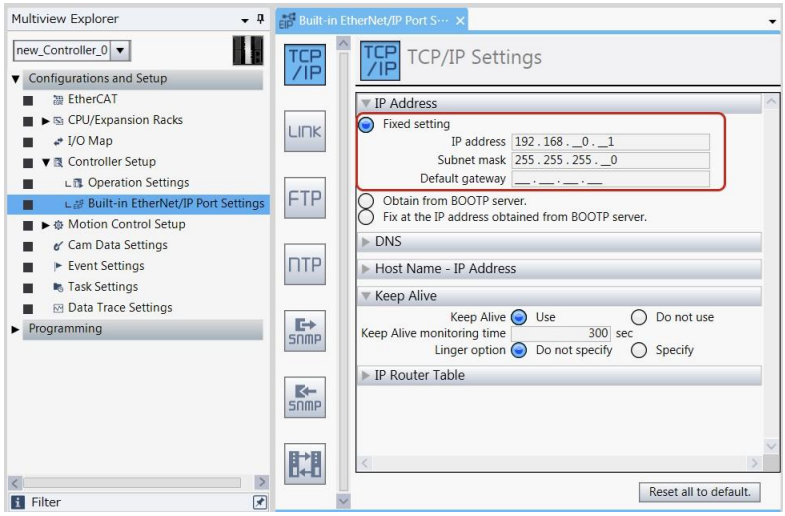
*2. The FINS node number for the NX-SVG. Set a node number that is not “0” and is not the same as the PLC's number.

(2) Specify LAN2 settings according to the configuration of the connected devices.

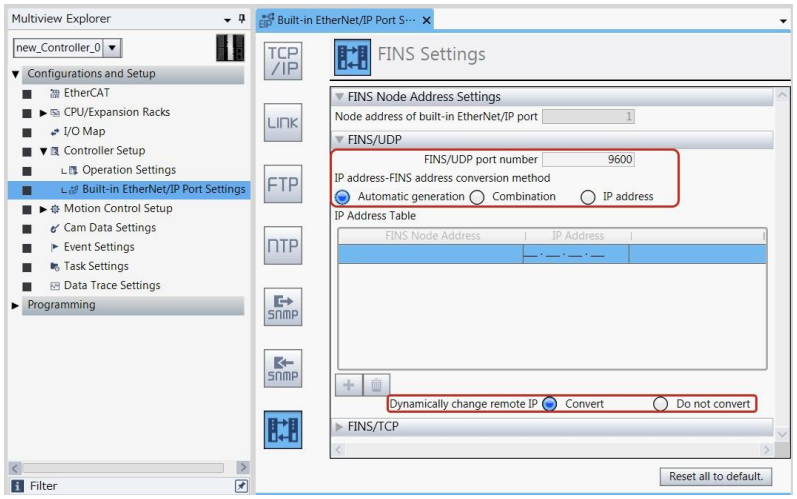
●Device setup

Using Sysmac Studio, configure the settings as shown below.

(1) On the [Multiview Explorer] screen, double-click [Built-in EtherNet/IP Port Settings] under [Controller Setup] to display the [TCP/IP Settings] window. Specify the IP address settings.

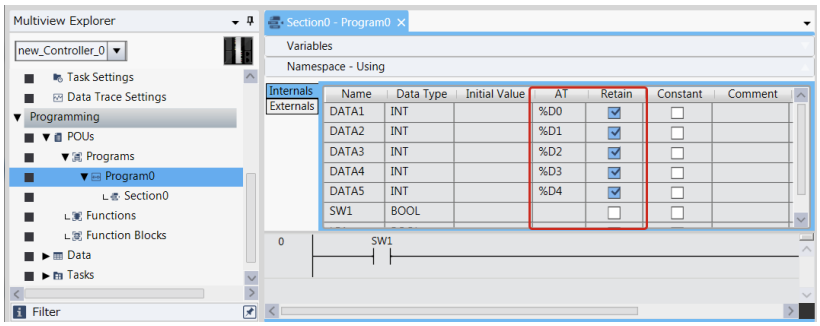


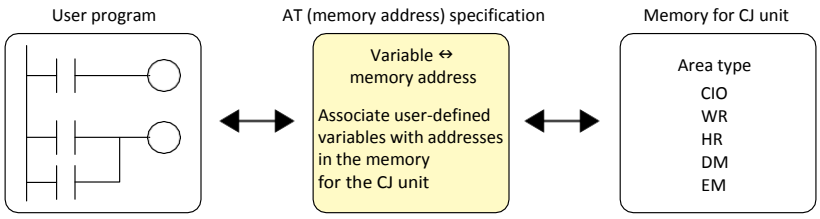
(2) Click the FINS settings icon.
Specify the FINS/UDP settings.



Item	Setting item	Settings
IP address settings	IP address	192.168.0.1 (fixed setting)
	Subnet mask	255.255.255.0 (fixed setting)
FINS settings	Node address of built-in EtherNet/IP port	1 (The least significant digit of the IP address is the FINS node address)
	FINS/UDP port number	9600
	IP address ⇔ FINS address conversion method	Automatic generation
	Dynamically change remote IP	Convert

(3) Associate user-defined variables with addresses in the memory for the CJ unit (AT specification). This device accesses the memory for the CJ unit in the CPU module of the NJ series PLC. Therefore, in order to access the memory for the CJ unit using the user program for the CPU module, it is necessary to associate user-defined variables with addresses in the memory for the CJ unit (AT specification).





Addresses in the memory for the CJ unit of the NJ series PLC are shown below.

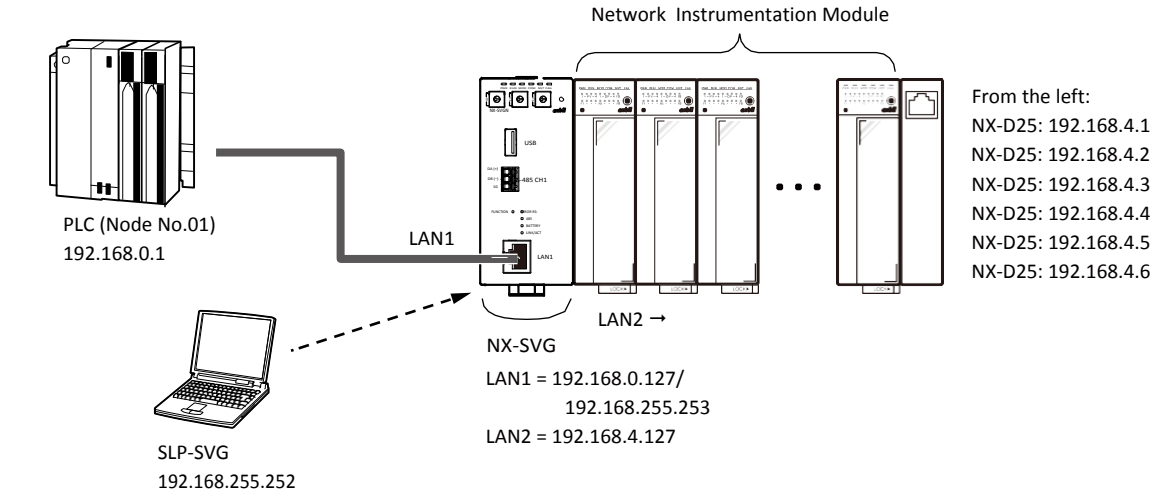
Data type	Area type	Memory for CJ unit	AT (memory address) specification
Channel I/O bit	CIO	0.0 to 6143.15	%0.0 to %6143.15
Channel I/O word	CIO	0 to 6143	%0 to %6143
W: Internal auxiliary relay	WR	W0.0 to W511.15	%W0.0 to %W511.15
H: Retaining relay	HR	H0.0 to H1535.15	%H0.0 to %H1535.15
D: Data	DM	D0 to D32767	%D0 to %D32767
E: Extension	EM	E0_0 to E18_32767	%E0_0 to %E18_32767

④ CJ series, CPU direct connection (FINS/TCP connection)

An application example of the following device is given below.

PLC	CJ2H-EIP
Communication interface	CPU module Ethernet port
Communication protocol	FINS/TCP

●System configuration

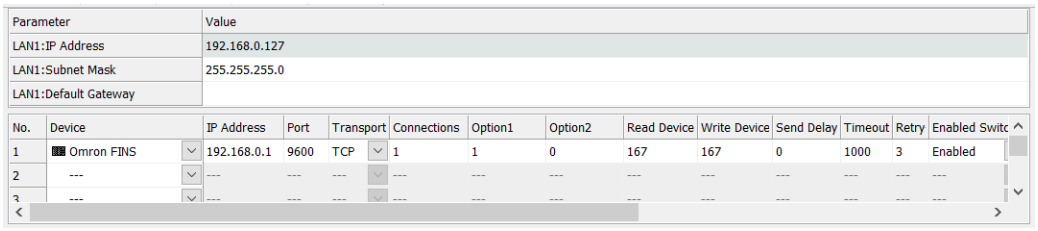


Note

- 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Configuration using model SLP-SVG

(4) Specify LAN1 settings according to the configuration of the Omron PLC. Do not change the default value of [Option2], [Read Device Max], or [Write Device Max].



Device	IP address	Port	Transport Layer Protocol	Connections*1	Option1*2	Option2*3	Read Device Max	Write Device Max	Enabled Switch
Omron FINS	192.168.0.1	9600	TCP	1	1	0	167	167	Enabled

*1. It is not necessary to change the PLC's parameter settings according to the number of connections.

*2. The FINS node number for the PLC

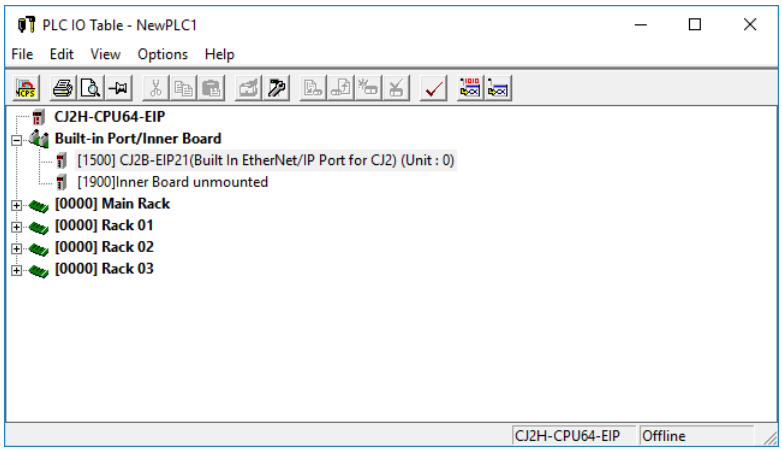
*3. The FINS node number for this device. When set to"0," the PLC assigns the number automatically.

(5) Specify LAN2 settings according to the configuration of the connected devices.

●Device setup

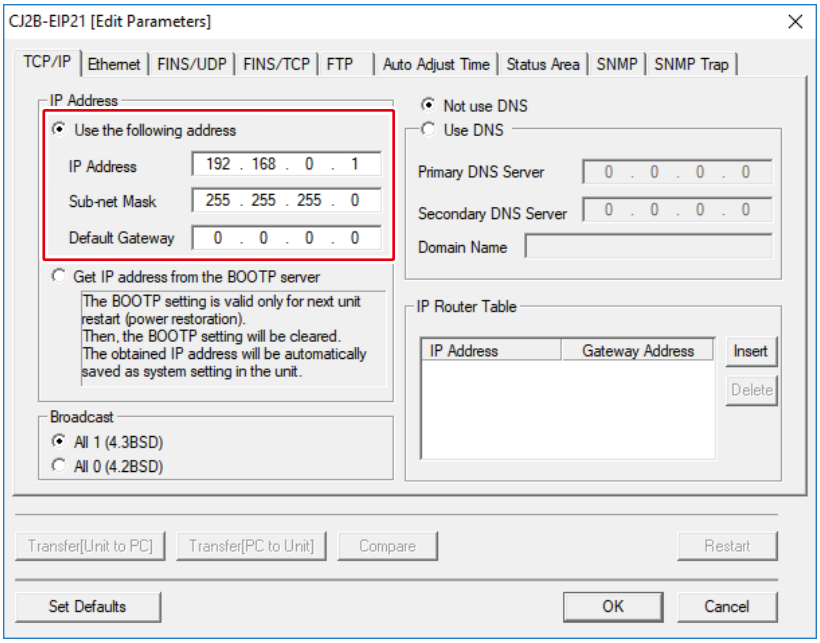
Using CX-Programmer, change the settings as shown below.

(1) From the Project screen, select [PLC IOTable].



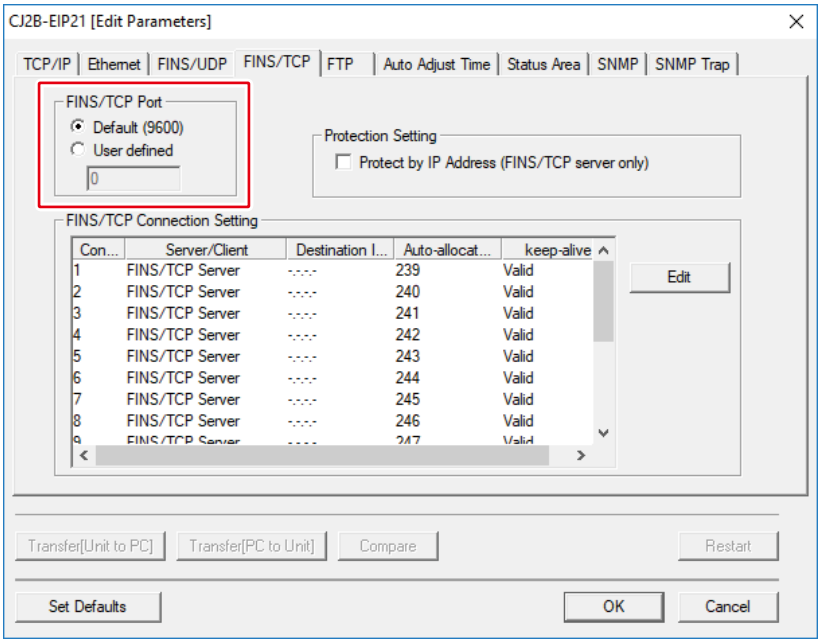
(2) Double-click “CJ2B-EIP21 (Built in EtherNet IP/Port for CJ2).”

>> The TCP/IP setting window of [CJ2B-EIP21 [Edit Parameters]] is displayed.



(3) Select the [FINS/TCP] tab.

>> The FINS/TCP port setting window is displayed.



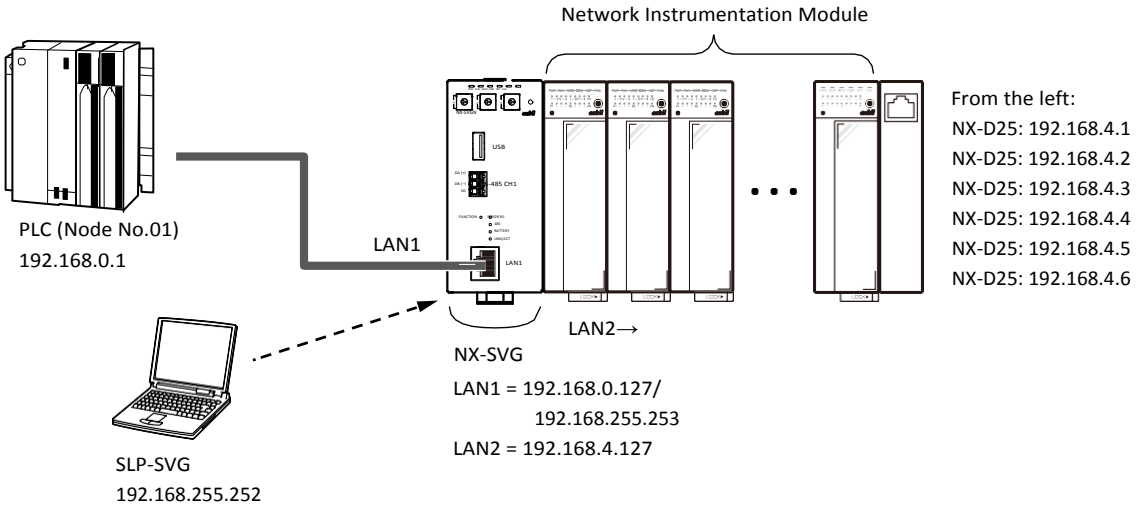
Setting item	Settings
IP address	192.168.0.1
Subnet Mask	255.255.255.0
FINS/TCP Port	Default (9600)
Node No.	1 (set the number using the rotary switch on the CPU module)

④ CJseries,Ethernetmoduleconnection(FINS/TCPconnection)

An application example of the following device is given below.

PLC	CJ2H
Communication interface	Ethernet module (CJ1W-ETN21)
Communication protocol	FINS/TCP

●System configuration

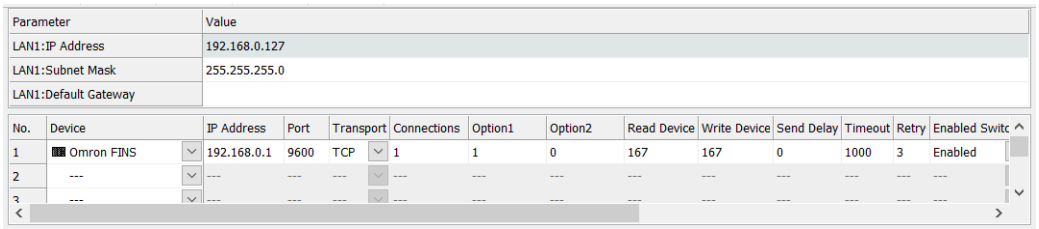


Note

• ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the Omron PLC. Do not change the default value of [Option2], [Read Device Max], or [Write Device Max].



Parameter	Value
LAN1:IP Address	192.168.0.127
LAN1:Subnet Mask	255.255.255.0
LAN1:Default Gateway	

No.	Device	IP Address	Port	Transport	Connections	Option1	Option2	Read Device	Write Device	Send Delay	Timeout	Retry	Enabled Switc
1	Omron FINS	192.168.0.1	9600	TCP	1	1	0	167	167	0	1000	3	Enabled
2	---	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---	---

Device	IP address	Port	Transport Layer Protocol	Connections*1	Option1*2	Option2*3	Read Device Max	Write Device Max	Enabled Switch
Omron FINS	192.168.0.1	9600	TCP	1	1	0	167	167	Enabled

*1. It is not necessary to change the PLC's parameter settings according to the number of connections.

*2. The FINS node number for the PLC

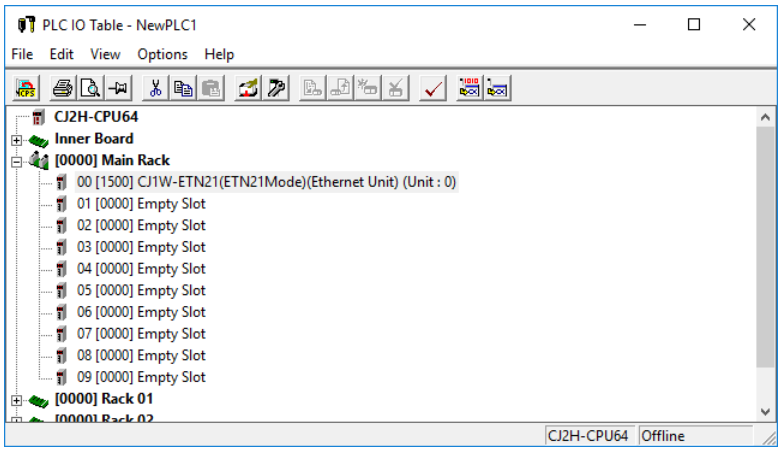
*3. The FINS node number for this device. When set to"0," the PLC assigns the number automatically.

(2) Specify LAN2 settings according to the configuration of the connected devices.

●Device setup

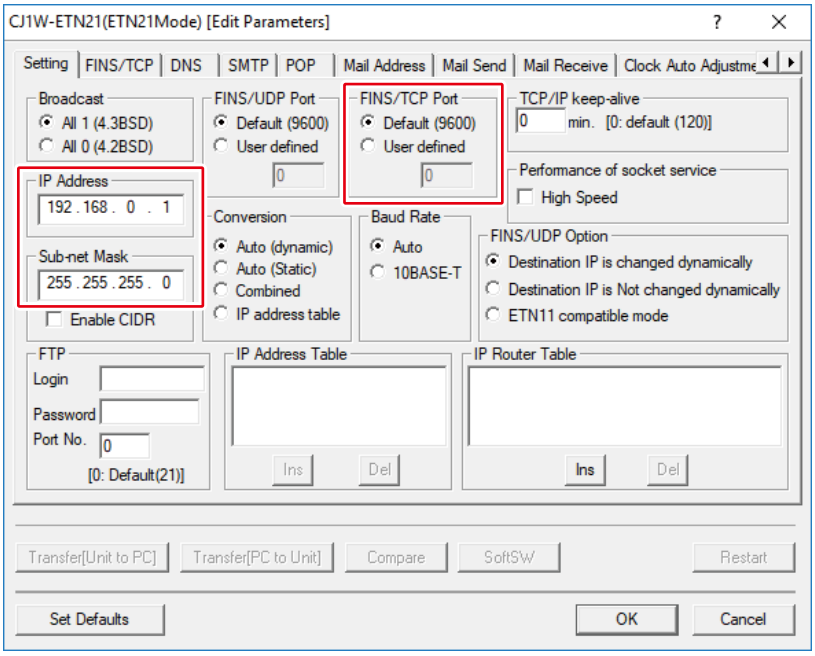
Using CX-Programmer, change the settings as shown below.

(1) From the Project screen, select [PLC IOTable].



(2) Double-click the Ethernet module.

>> The Ethernet module setting window is displayed.



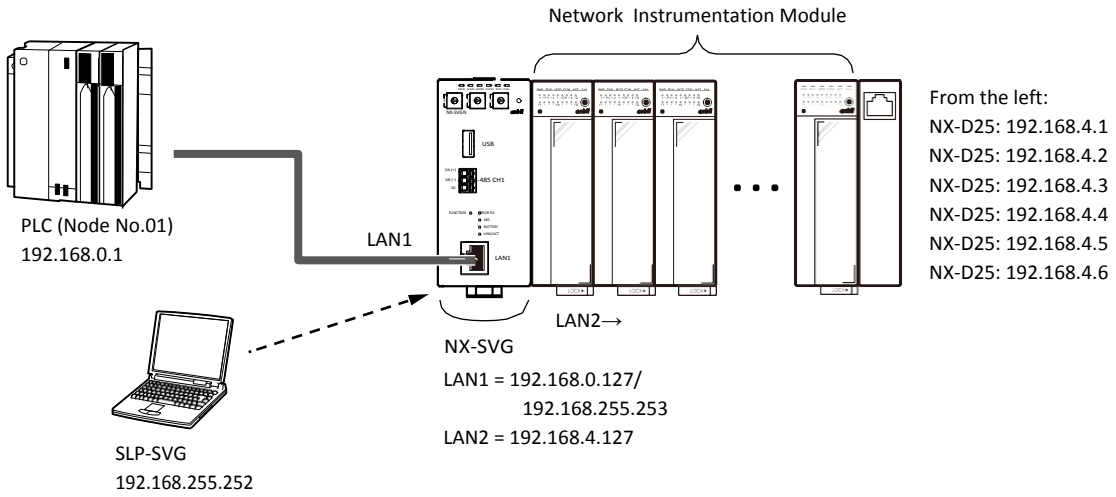
Setting item	Settings
IP Address	192.168.0.1
Subnet Mask	255.255.255.0
FINS/TCP Port	Default (9600)
Node No.	1 (set the number using the rotary switch on the Ethernet module)

④ CJseries,CPUdirectconnection(FINS/UDPconnection)

An application example of the following device is given below.

PLC	CJ2H-EIP
Communication interface	CPU module Ethernet port
Communication protocol	FINS/UDP

●System configuration

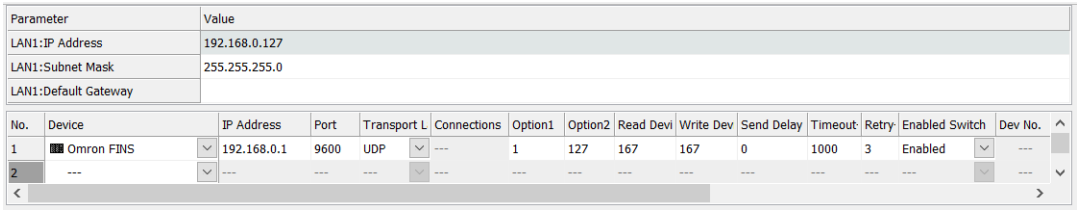


Note

• ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the Omron PLC.
Do not change the default value of [Read Device Max] or [Write Device Max].



Device	IP address	Port	Transport Layer Protocol	Option1*1	Option2*2	Read Device Max	Write Device Max	Enabled Switch
Omron FINS	192.168.0.1	9600	UDP	1	127	167	167	Enabled

*1. The FINS node number for the PLC

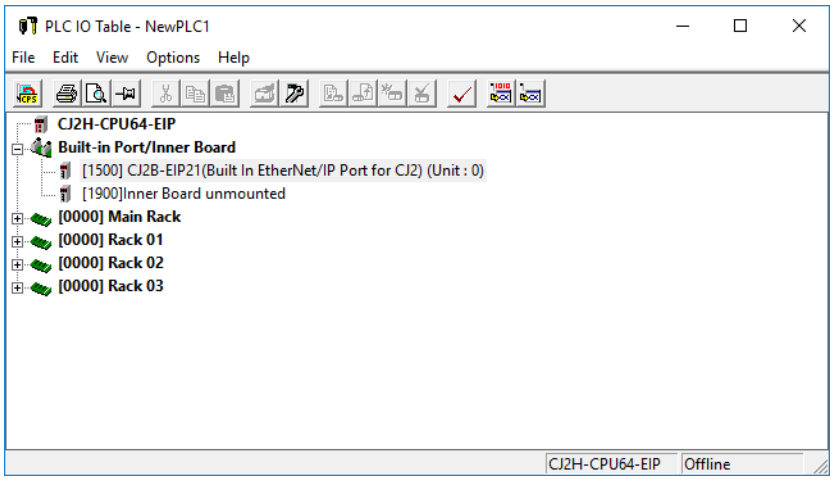
*2. The FINS node number for the NX-SVG. Set a node number that is not “0” and is not the same as the PLC's number.

(2) Specify LAN2 settings according to the configuration of the connected devices.

●Device setup

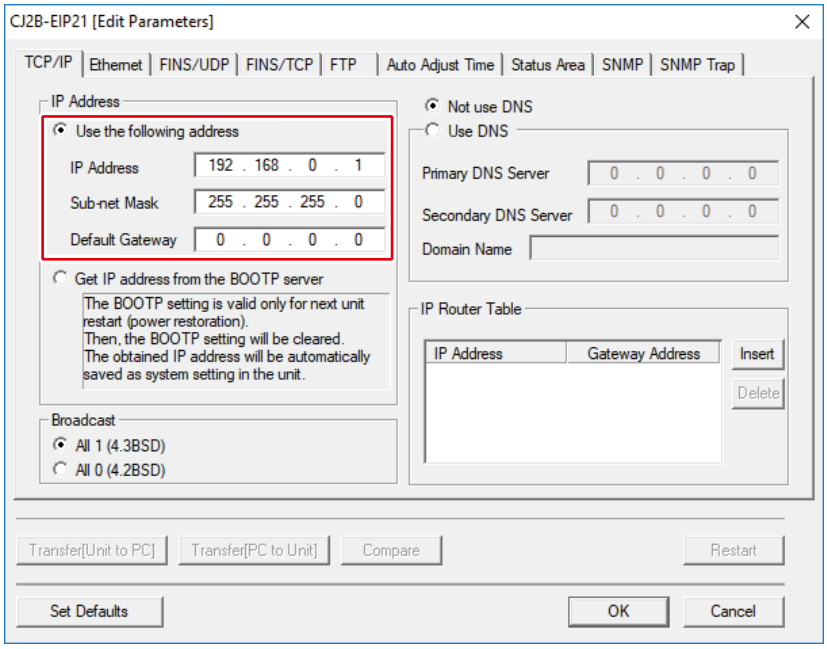
Using CX-Programmer, configure the settings as shown below.

(1) From the Project screen, select [PLC IOTable].



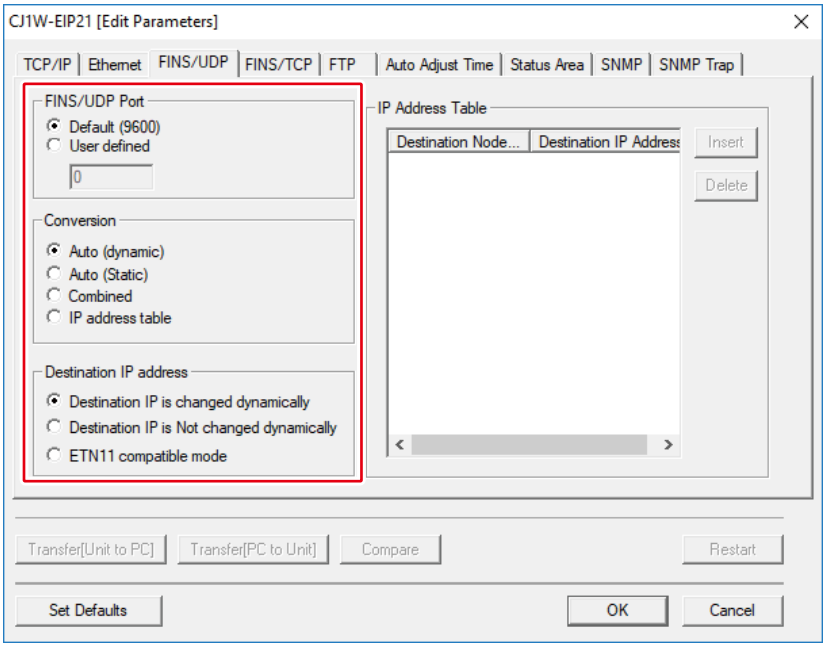
(2) Double-click “CJ2B-EIP21 (Built-in EtherNet IP/Port for CJ2).”

>> The TCP/IP setting window of [CJ2B-EIP21 [Edit Parameters]] is displayed.



(3) Select the [FINS/UDP] tab.

>> The FINS/UDP port setting window is displayed.



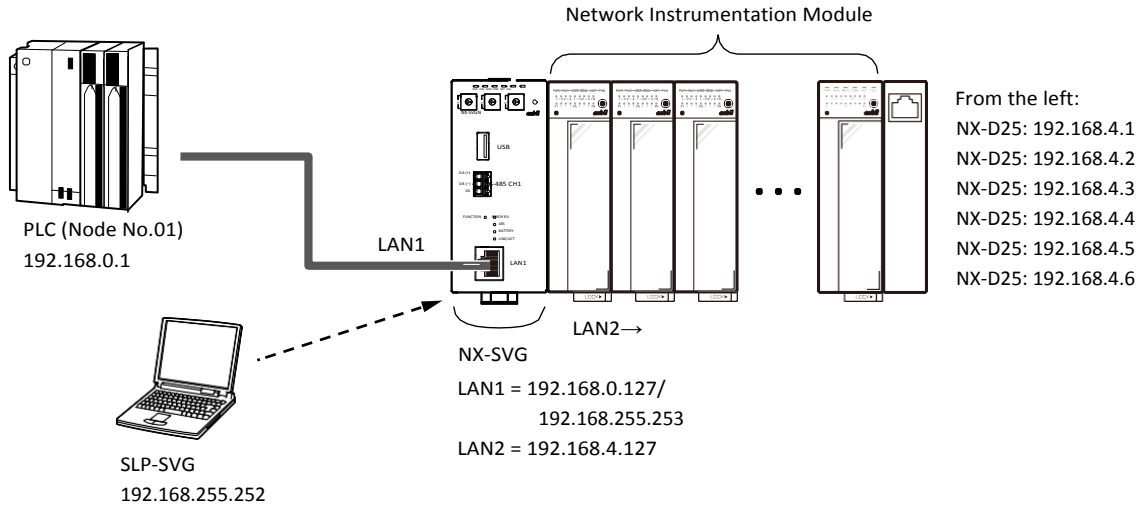
Setting item	Settings
IP Address	192.168.0.1
Subnet Mask	255.255.255.0
FINS/UDP Port	Default (9600)
Conversion	Auto (dynamic)
Destination IP address	Destination IP is changed dynamically
Node No.	1 (set the number using the rotary switch on the CPU module)

④ CJseries,Ethernetmoduleconnection(FINS/UDPconnection)

An application example of the following device is given below.

PLC	CJ2H
Communication interface	Ethernet module (CJ1W-ETN21)
Communication protocol	FINS/UDP

●System configuration

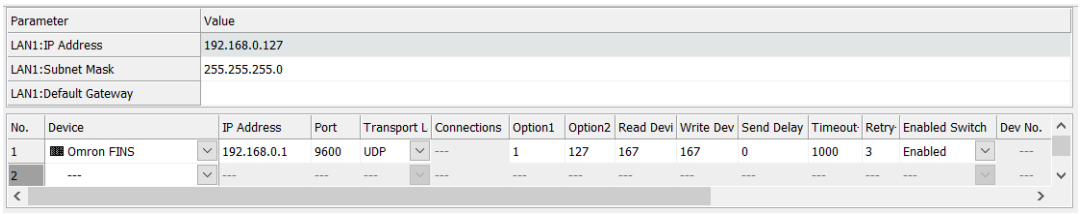


Note

- ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the Omron PLC.
Do not change the default value of [Read Device Max] or [Write Device Max].



Device	IP Address	Port	Transport Layer Protocol	Option1*1	Option2*2	Read Device Max	Write Device Max	Enabled Switch
Omron FINS	192.168.0.1	9600	UDP	1	127	167	167	Enabled

*1. The FINS node number for the PLC

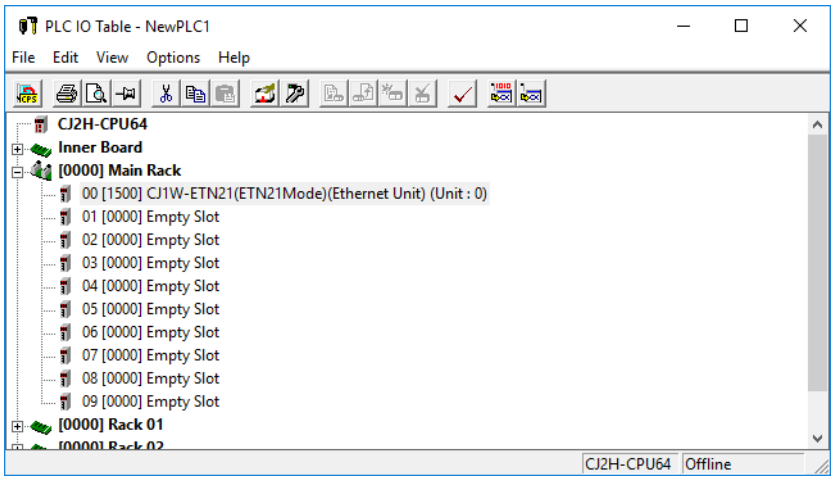
*2. The FINS node number for the NX-SVG. Set a node number that is not “0” and is not the same as the PLC's number.

(2) Specify LAN2 settings according to the configuration of the connected devices.

●Device setup

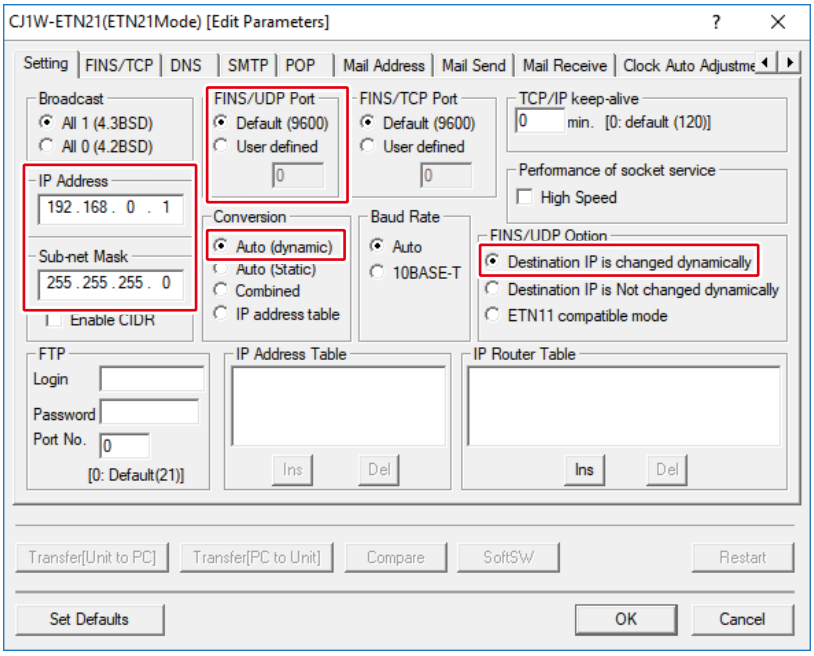
Using CX-Programmer, configure the settings as shown below.

(1) From the Project screen, select [PLC IOTable].



(2) Double-click the Ethernet module.

>> The Ethernet module settings window is displayed.



Setting item	Settings
IP Address	192.168.0.1
Subnet Mask	255.255.255.0
FINS/UDP Port	Default (9600)
Conversion	Auto (dynamic)
Destination IP address	Destination IP is changed dynamically
Node No.	1 (set the number using the rotary switch on the Ethernet module)

7-6 Siemens PLC

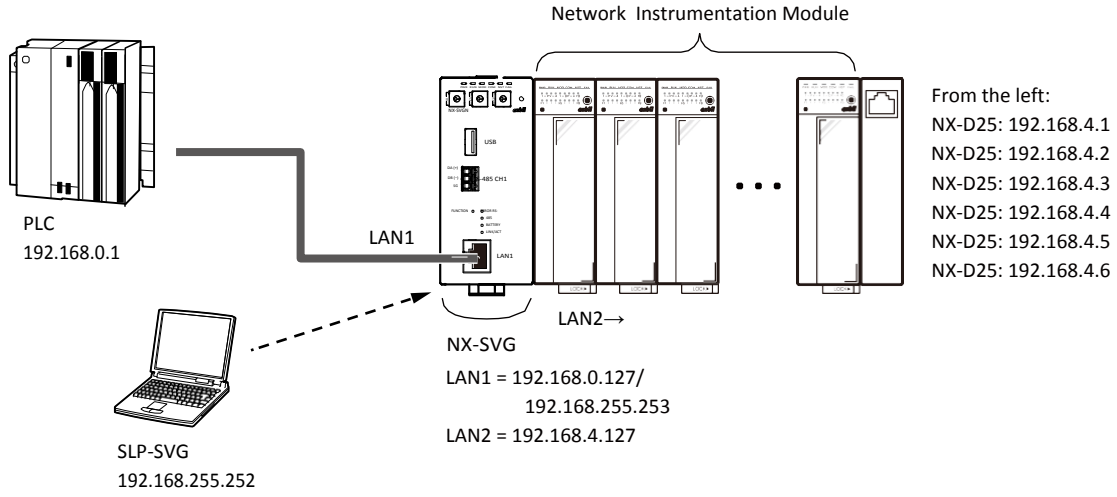
This section describes communication settings of the S7 series made by Siemens.

④ CPU direct connection

An application example of the following device is given below.

PLC	S7-1200
Communication interface	Ethernet port built in the CPU module
Communication protocol	S7 protocol (TCP/IP)

●System configuration

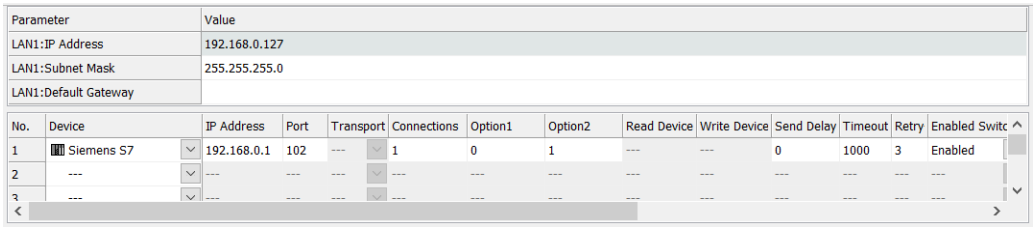


Note

- 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Configuration using model SLP-SVG

(9) Specify LAN1 settings according to the configuration of the Siemens PLC. Do not change the default value of [Port], [Option1], or [Option2].



Device	IP address	Port	Connections*1	Option1*2	Option2*3	Enabled Switch
Siemens S7	192.168.0.1	102	1	0	1	Enabled

*1. It is not necessary to change the PLC's parameter settings according to the number of connections.

*2. CPU rack No.

*3. CPU slot No.

(10) Specify LAN2 settings according to the configuration of the connected devices.

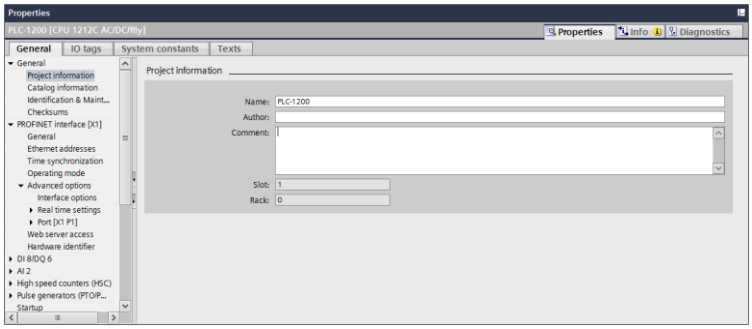
●Device setup

Using STEP7 (Totally Integrated Automation Portal), change the settings as shown below.

(1) Go to Project > New and create a new project for S7-1200.

(2) Select "Project information" in the [Properties] window.

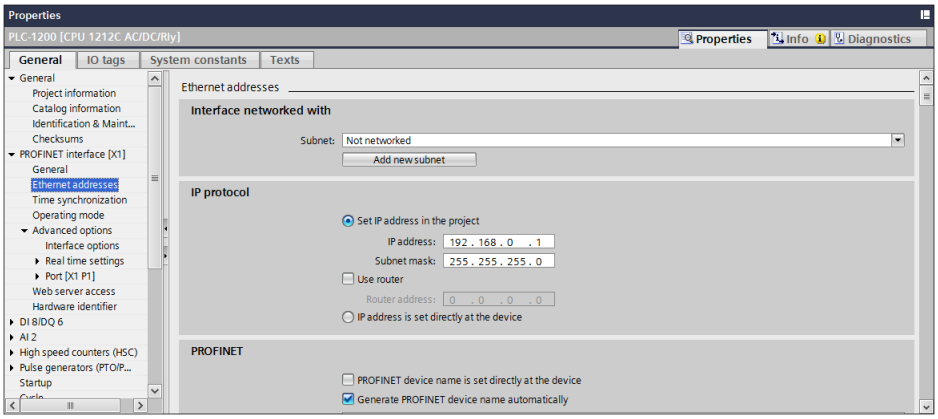
>> Check the information shown on the right.
Set the values displayed for "Rack" and "Slot" for [Option1] and [Option2].



(3) Select "Ethernet addresses" in the [Properties] window.

>> Settings are displayed on the right.

(4) Set [IP protocol].



(5) Select "Connection mechanisms" in the [Properties] window.

>> Settings are displayed on the right.

(6) Check the [Permit access with PUT/GET communication from remote partner (PLC, HMI, OPC, ...)] checkbox.

Setting item	Settings
IP address	192.168.0.1
Subnet Mask	255.255.255.0
Connection mechanisms	Permit access with PUT/GET communication from remote partner (PLC, HMI, OPC, ...)

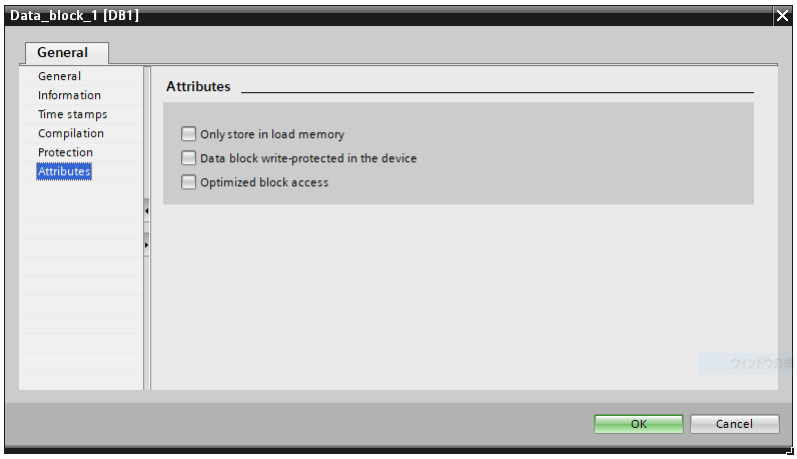
Note

- Typical errors that might occur in communication with the S7 series PLC made by Siemens include the following.

Error response code	Description	Countermeasure
0x00000003	Access to a data block for which writing is not permitted was attempted.	Check whether writing is prohibited by attribute of the specified data block.
0x00000005	An out-of-range address was accessed. Access to a data block whose [Optimized block access] is enabled was attempted.	Check the range of the specified address. Check whether [Optimized block access] is enabled in the attribute setting of the specified data block.
0x0000000A	Access to a data block that does not exist was attempted.	Check whether the specified data block exists.
0x00008104	Protocol error	Check the [Permit access with PUT/GET communication from remote partner (PLC, HMI, OPC, ...)] checkbox under “Connection mechanisms” in the [Properties] window.

Note: For details on errors, refer to the manual for the device.

- To access data blocks, when creating a new data block, always set [Type] to [Global DB]. Then, from [Properties] > [Attributes], uncheck [Optimized block access]. In addition, to write data, uncheck [Data block write-protected in the device].



7-7 JTEKT PLC

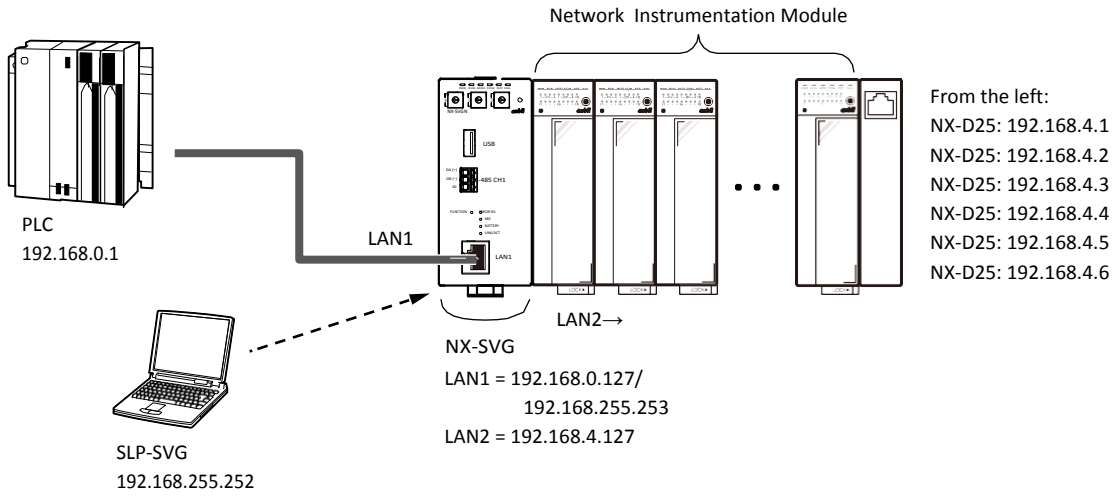
This section describes communication settings of the PC10 series made by JTEKT.

④ CPU direct connection

An application example of the following device is given below.

PLC	PC10G
Communication interface	Ethernet port built in the CPU module
Communication protocol	Computer link PC10 mode

●System configuration

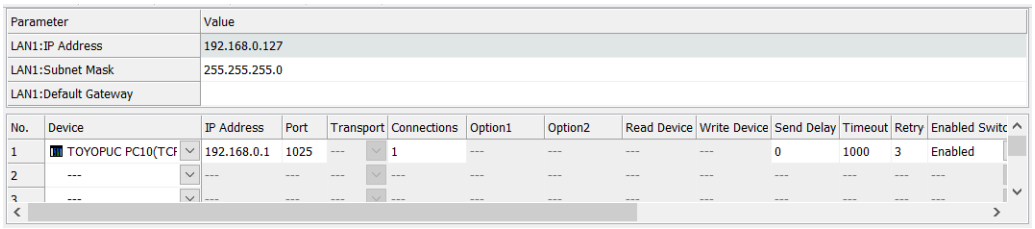


Note

- ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Configuration using model SLP-SVG

(11) Specify LAN1 settings according to the configuration of the JTEKT PLC. Do not change the default value of [Connections].



Device	IP address	Port	Connections	Send Delay Time	Timeout-time (msec)	Retry-count	Enabled Switch
TOYOPUC PC10 (TCP)	192.168.0.1	1025	1	0	1000	3	Enabled

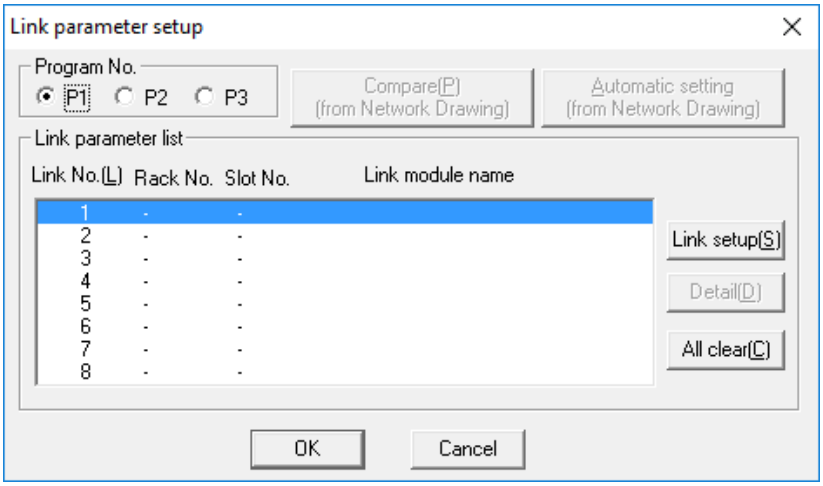
(12) Specify LAN2 settings according to the configuration of the connected devices.

●Device setup

Using PCwin, change the settings as shown below.

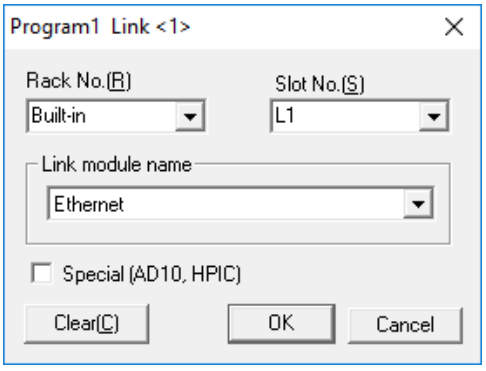
(1) From the Project screen, select [Parameter] → [Link parameter].

>> The [Link parameter setup] window is displayed.

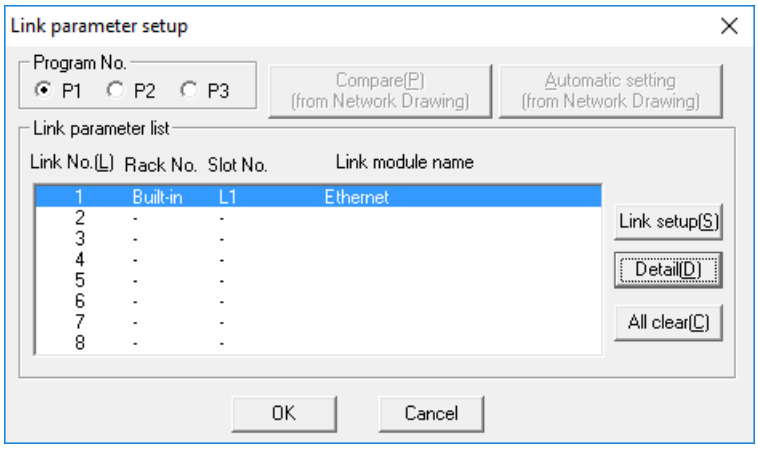


(2) Click the [Link setup (S)] button.

>> The link setup window is displayed.

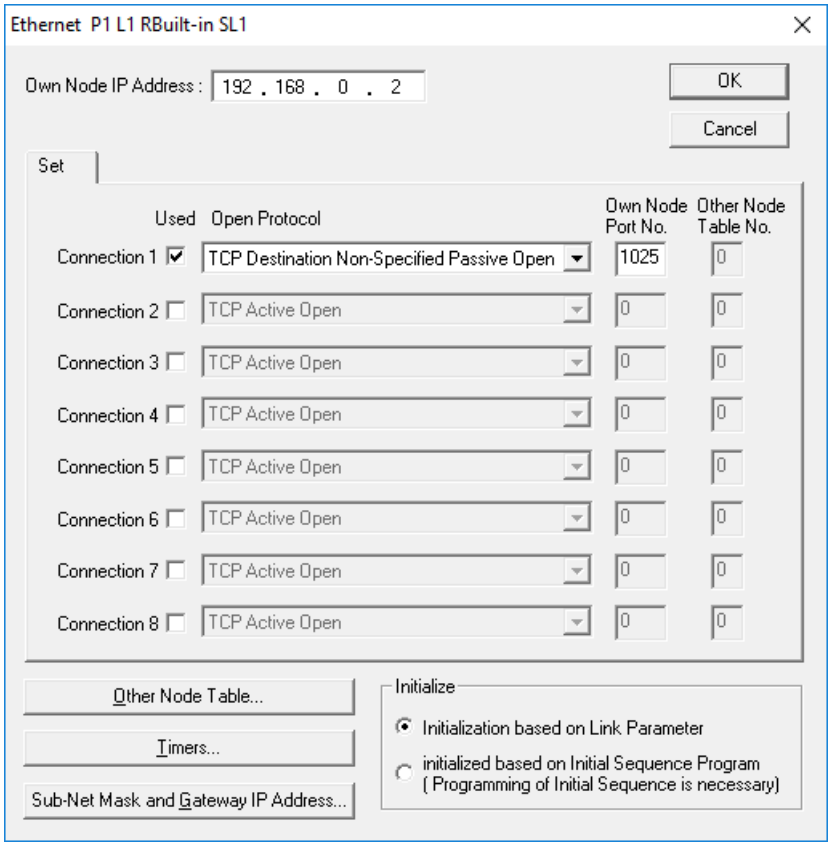


(3) Set the settings of the link module.



(4) In the [Link parameter setup] window, click the [Detail (D)] button.

>> The Ethernet setting window is displayed.



Setting item	Settings
IP address	192.168.0.2
Open Protocol	TCP Destination Non-Specified Passive Open
Own Node Port No.	1025
Initialize	Initialization based on Link Parameter

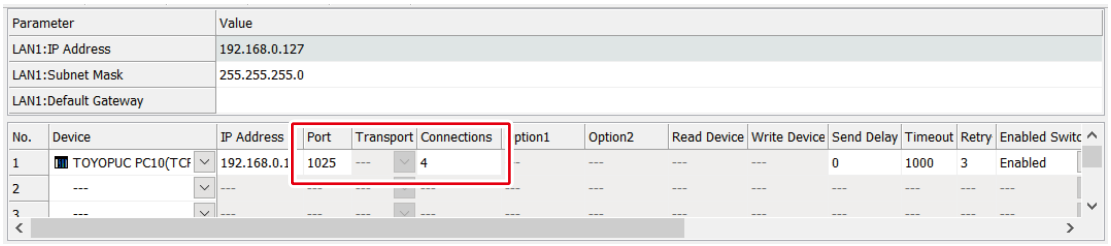
●Setting the number of connections

When the number of connections with the TOYOPUC PLC is set to "2" or more, ports for those connections should be set in the network setting window of the PLC.

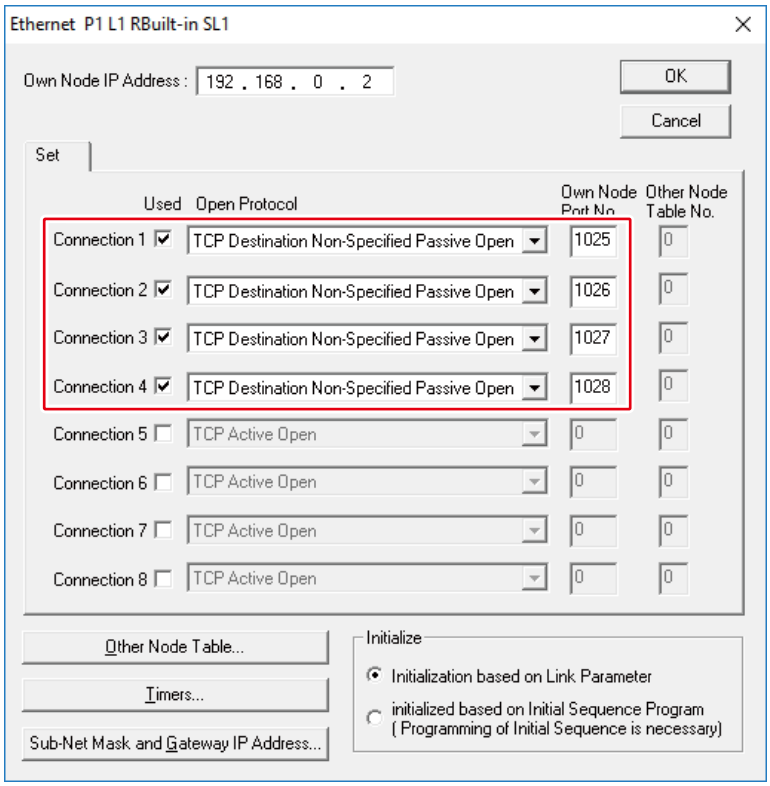
Set consecutive port numbers, starting with the port number set by this device, for all the connections.

●When connecting this device using the 4 ports of the PLC

(1) In the connected device configuration window of the loader, set [Connections] with the TOYOPUC PLC to "4."



(2) In the Ethernet setting window of the PLC, set 4 consecutive port numbers, starting with the port number set by the loader.



Setting item		Settings
Own Node IP Address		192.168.0.2
Connection 1	Open Protocol	TCP Destination Non-Specified Passive Open
	Own Node Port No.	1025
Connection 2	Open Protocol	TCP Destination Non-Specified Passive Open
	Own Node Port No.	1026
Connection 3	Open Protocol	TCP Destination Non-Specified Passive Open
	Own Node Port No.	1027
Connection 4	Open Protocol	TCP Destination Non-Specified Passive Open
	Own Node Port No.	1028
Initialize		Initialization based on Link Parameter

7-8 FANUC CNC

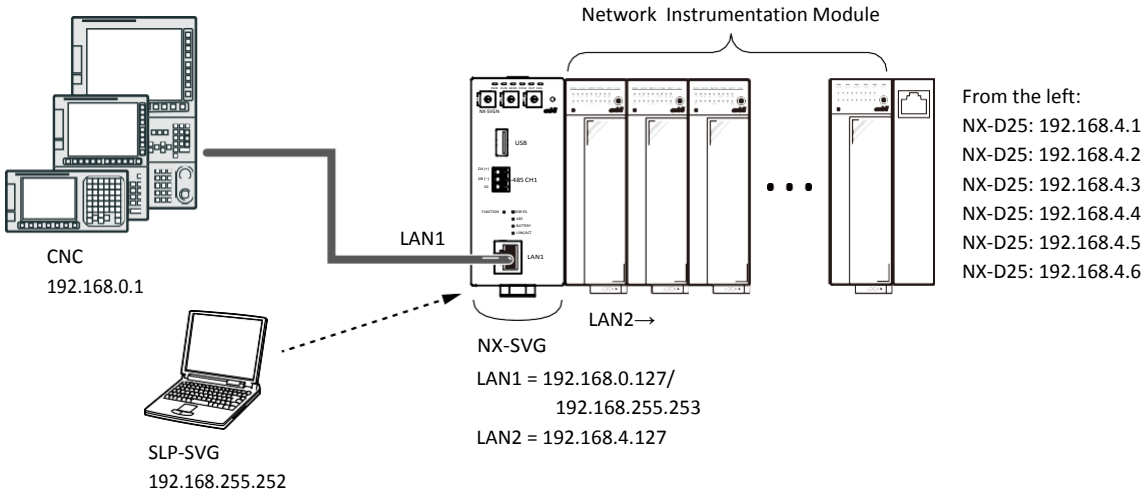
This section describes communication settings of CNCs made by FANUC.

④ Modbus/TCP

An example of application that uses Modbus/TCP, an industrial-use Ethernet, is given below.

CNC	Series 0i-F
Communication interface	Built-in Ethernet port
Communication protocol	Modbus/TCP

●System configuration



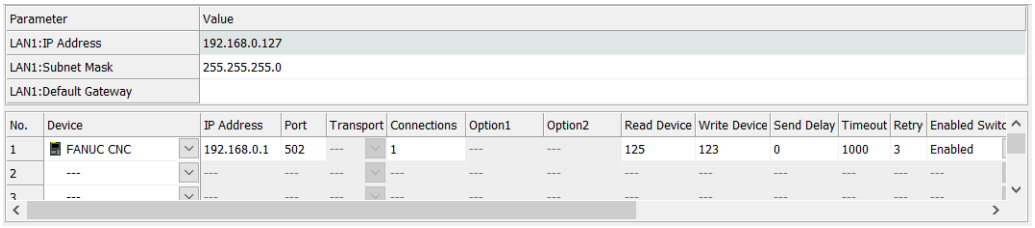
Note

- ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Configuration using model SLP-SVG

(13) Specify LAN1 settings according to the configuration of the connected devices.
Do not change the default value of [Connections].
Set [Port], [Read Device Max], and [Write Device Max] according to the specifications of the connected devices.

(14) Specify LAN2 settings according to the configuration of the connected devices.



Device	IP address	Port	Connections*	Read Device Max	Write Device Max	Enabled Switch
FANUC CNC	192.168.0.1	502	1	125	123	Enabled

* The maximum number of connections is "3."
It is not necessary to change the CNC's parameter settings according to the number of connections.

●Device setup

Set the Modbus/TCP server function that uses the built-in Ethernet port.

(1) Press the [SYSTEM] function key.

>> The [Built-in port] software key is displayed.
If the key is not displayed, press the [Continue] key.

(2) Press the [Built-in port] software key.

>> The Ethernet setting window is displayed.

(3) Press the [Common] software key.

>> The general Ethernet setting window is displayed.

(4) Set the IP address and subnet mask.

Setting item	Settings
IP address	192.168.0.1
Subnet Mask	255.255.255.0

(5) Press the [Modbus setting] software key.

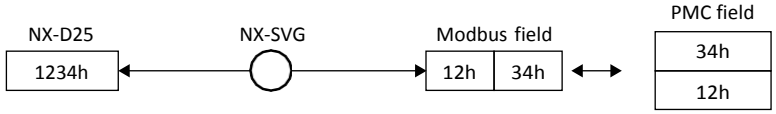
>> The Modbus/TCP server function setting window is displayed.

(6) Set TCP port No, option 1, and fields.

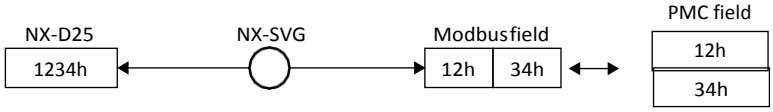
Setting item		Setting
TCP port No.		502
Option 1	RSV	0: Fixed
	BCE*	0: Little endian
Field 1	Data Modbus address	Modbus field start address
	Data PMC address	PMC field start address
	Data size (word)	Data size of field 1
Field 2	Data Modbus address	Modbus field start address
	Data PMC address	PMC field start address
	Data size (word)	Data size of field 2
Field 3	Data Modbus address	Modbus field start address
	Data PMC address	PMC field start address
	Data size (word)	Data size of field 3

* Set the order of Modbus fields.

BCE[0]: When the order of bytes in the Modbus field is little endian

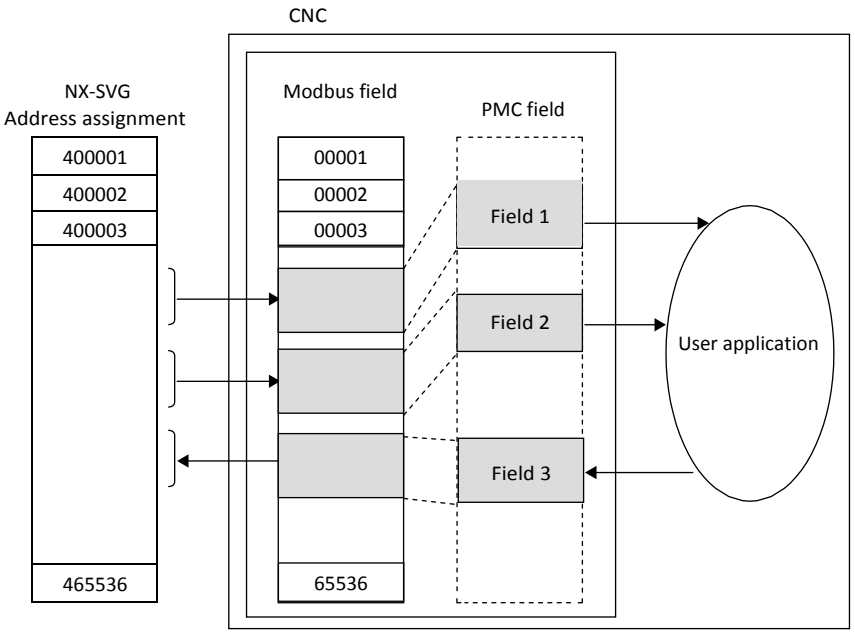


BCE[1]: When the order of bytes in the Modbus field is big endian



Note

- Field setting
  Using the Modbus/TCP server function, three PMC fields can be assigned to Modbus fields.
  By this assignment, the data written to Modbus fields by this device is written to PMC fields, which can be accessed by a user application. Also, this device can access the data that the user application wrote in Modbus fields through PMC fields.



  - Specify a different address for each field.
  - This device can access only the Modbus field to which a PMC field is assigned. If a Modbus field to which a PMC field is not assigned is accessed, the [0x0002] error occurs.

(7) To enable the specified parameter settings, restart the CNC.

7-9 Keyence PLC

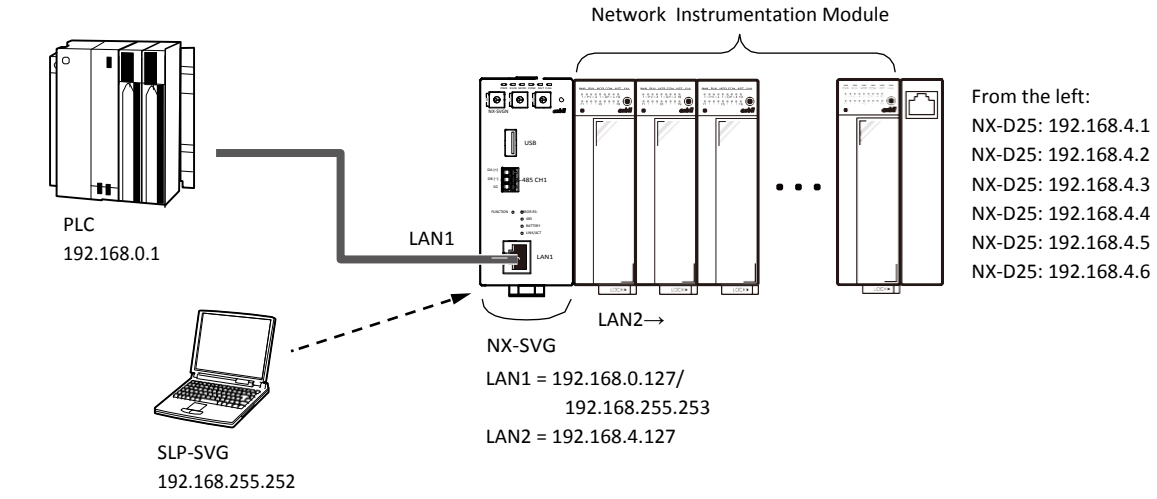
This section describes communication settings of the KV series made by Keyence.

④ CPU direct connection

An application example of the following device is given below.

PLC	KV7500
Communication interface	Ethernet port built in the CPU module
Communication protocol	MC Protocol

●System configuration

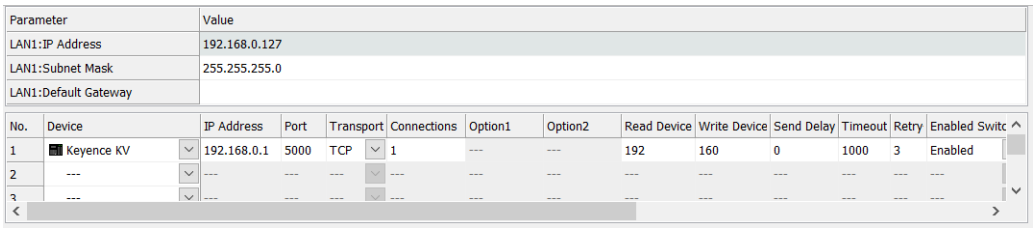


Note

- ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Configuration using model SLP-SVG

(15) Specify LAN1 settings according to the configuration of the Keyence PLC. Do not change the default value of [Port], [Read Device Max], or [Write Device Max].



Device	IP address	Port	Transport Layer Protocol	Connections*	Read Device Max	Write Device Max	Enabled Switch
Keyence KV	192.168.0.1	5000	TCP	1	192	160	Enabled

* It is not necessary to change the PLC's parameter settings according to the number of connections.

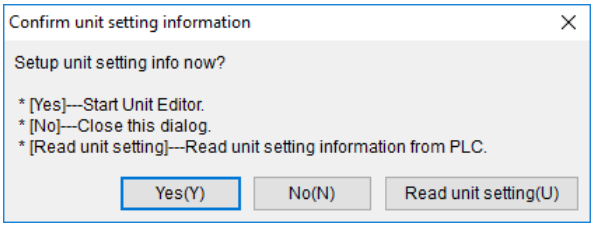
(16) Specify LAN2 settings according to the configuration of the connected devices.

●Device setup

Using KV STUDIO, change the settings as shown below.

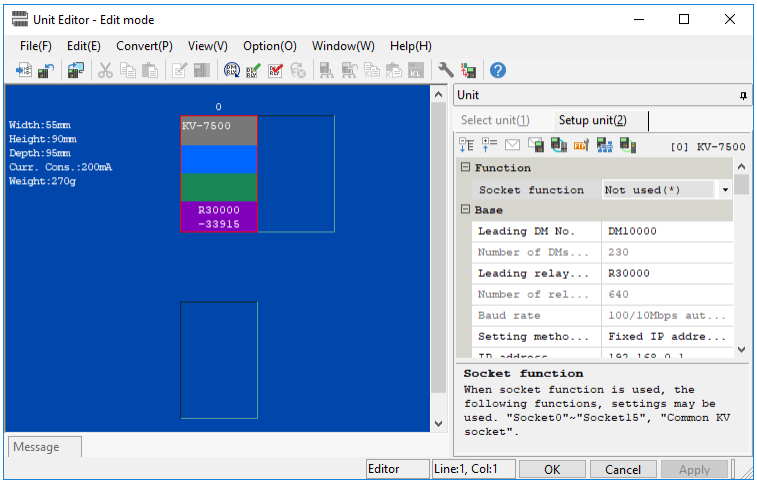
(1) Go to Project > New and create a new project, with "KV7500" set for the type.

>> A confirmation message about unit configuration settings is displayed.

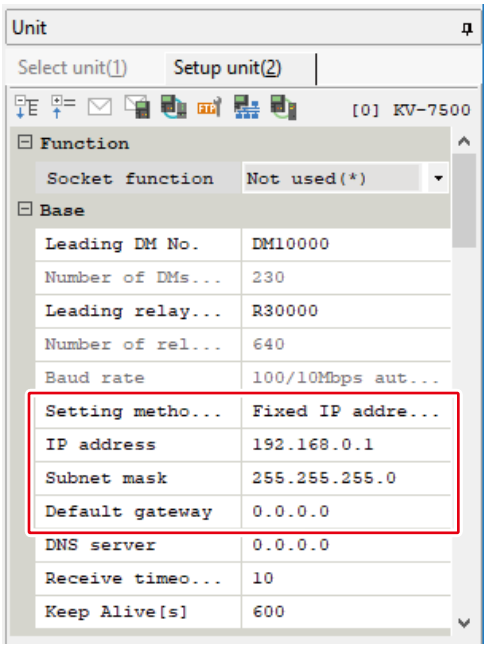


(2) Select [Yes (Y)] to start Unit Editor.

>> The [Unit Editor – Edit mode] screen is displayed.

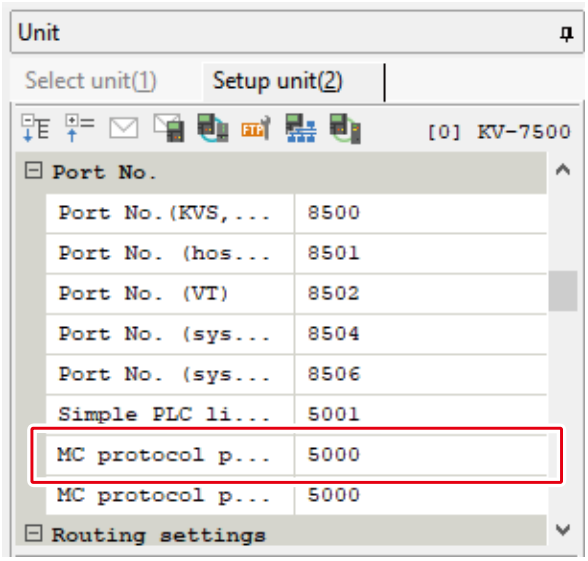


(3) Set the IP address of the PLC in the [Base] field on the [Setup unit] tab.



Setting item	Settings
Setting method of IP address	Fixed IP address
IP address	192.168.0.1
Subnet mask	255.255.255.0

(4) Set the port No. in the [Port No.] field on the [Setup unit] tab.



Setting item	Settings
MC protocol port No.	5000

7-10 Fuji Electric PLC

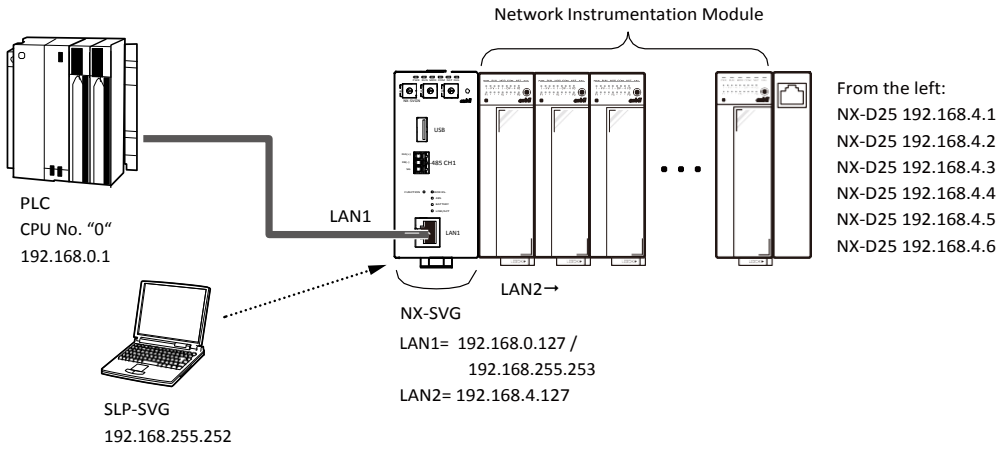
This section describes the communication settings of PLCs made by Fuji Electric.

④ MICREX-SX SPH2000 series, CPU direct connection

An application example of the following device is given below.

PLC	SPH2000-48E
Communication interface	Ethernet port built in the CPU module
Communication protocol	Loader command

●System configuration

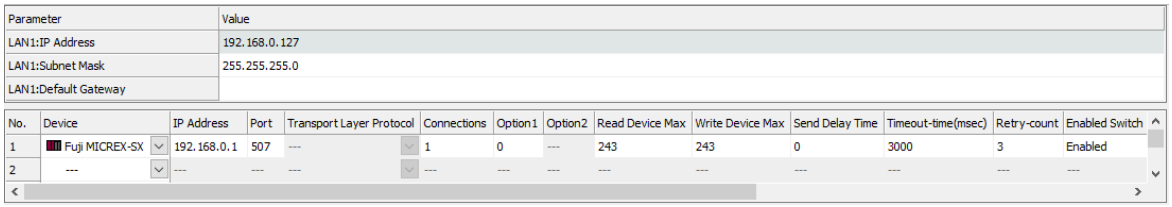


Note

- 5-6 Connecting to Model NX-SVG (p. 5-24)

●Configuration using model SLP-SVG

(17) Specify LAN1 settings according to the configuration of the Fuji Electric PLC. Do not change the default value of [Read Device Max], [Write Device Max], or [Timeout-time].



Device	IP Address	Port*1	Connections*2	Option1*3	Read Device Max	Write Device Max	Timeout-time (msec)	Enabled Switch
Fuji MICREX-SX	192.168.0.1	507	1	0	243	243	3000	Enabled

*1. The value obtained by adding 251 to the value set as [Self port standard No.] for the PLC is the No. of the loader command communication port. If the value set for [Self port standard No.] is 256 (the initial value), set 507 (256 + 251) as the PLC connection port.

*2. It is not necessary to change the PLC's parameter settings according to the number of connections.

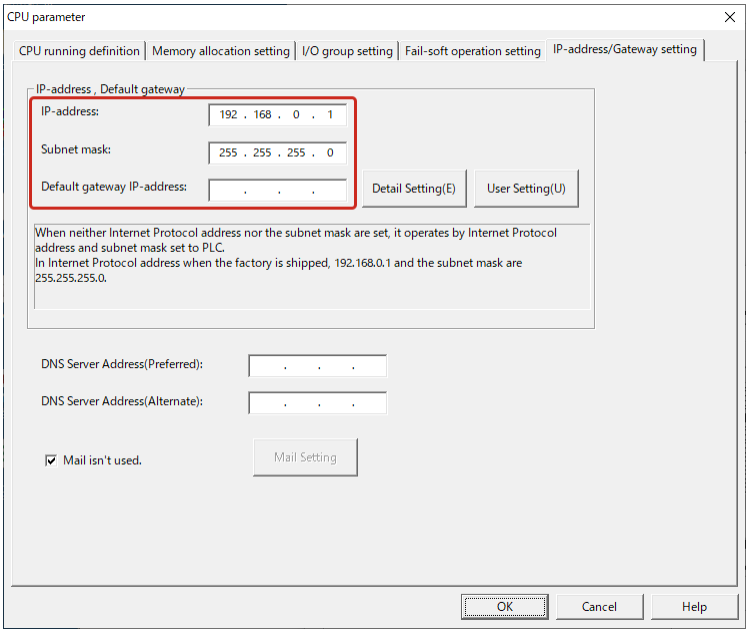
*3. Set the CPU No. (0 to 7) of the PLC to be connected.

(18) Specify LAN2 settings according to the configuration of the connected devices.

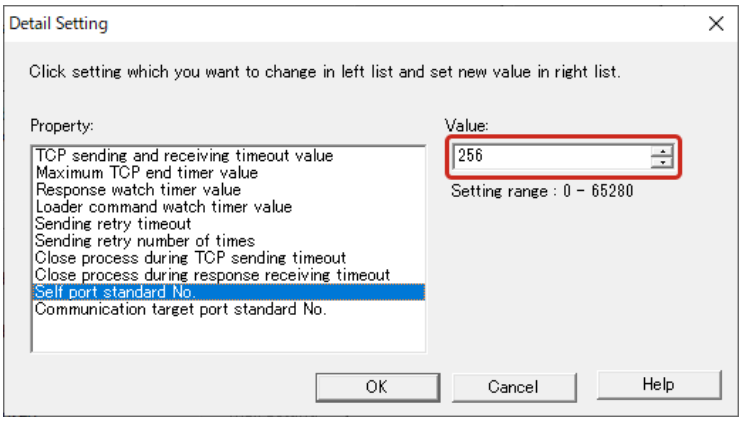
●Device setup

Using SX-Programmer Expert (D300win), change the settings as shown below.

(1) On the [CPU parameter] screen, select the [IP-address/Gateway setting] tab.
Specify the items in the [IP-address, Default gateway] field.



(2) Click the [Detail Setting] button in the [IP-address, Default gateway] field.
Set the value for [Self port standard No.].
The value obtained by adding 251 to the value set for [Self port standard No.] is the port No. for communication with the NX-SVG.



Item	Setting item	Setting value
IP-address, Default gateway	IP-address	192.168.0.1
	Subnet mask	255.255.255.0
Detail Setting	Self port standard No.	256 The value obtained by adding 251 to the value set for [Self port standard No.] is the No. of the loader command communication port.

Note

- Typical errors that might occur in communication with the MICREX-SX series PLC made by Fuji Electric include the following.

Error response code	Description	Countermeasure
0x00000044	Memory address error The specified address is outside the valid range.	Check the memory assignment setting of the PLC.
0x00000045	Memory size exceeded Address + read/write words is outside the valid range.	Check that the register device for which the gateway is set is within the memory address range specified by [AT].
0x000000A0	Command destination error No module exists at the specified destination station.	Check whether the CPU No. of the PLC is the same as the CPU No. set in [Option 1].

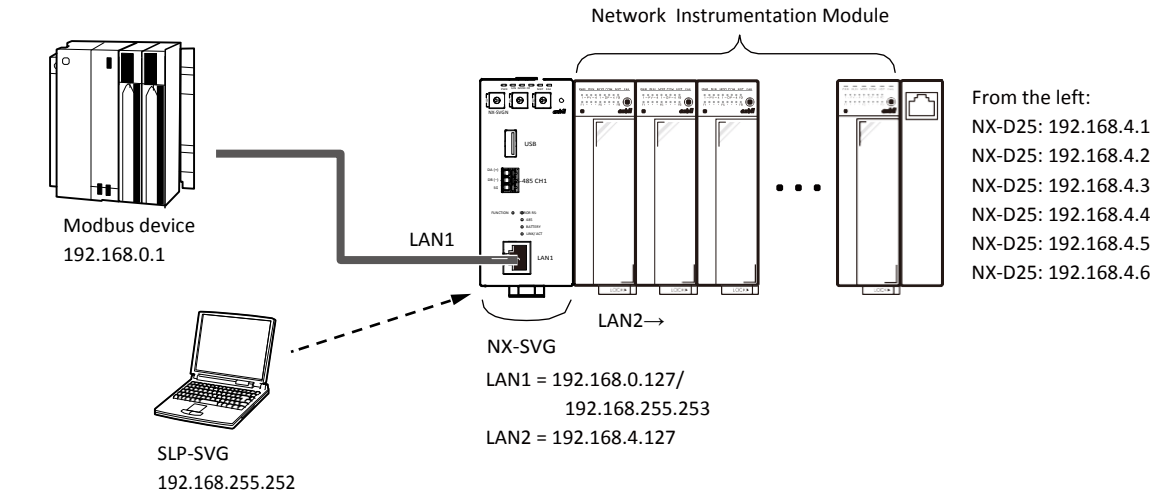
7-11 Modbus

This section describes communication settings of a Modbus device.

④ Modbus/TCP

An application example of a Modbus/TCP device is given below.

●System configuration



Note

- ☞ 5-6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Configuration using model SLP-SVG

(19) Specify LAN1 settings according to the configuration of the Modbus device.
Do not change the default value of [Connections].
Set the unit ID of the connected Modbus device for [Option1].
Set the function code for the connected Modbus device for [Option2].
Set the number of addresses supported by the connected Modbus device for [Read Device Max] and [Write Device Max].

(20) Specify LAN2 settings according to the configuration of the connected devices.

Parameter	Value
LAN1:IP Address	192.168.0.127
LAN1:Subnet Mask	255.255.255.0
LAN1:Default Gateway	

No.	Device	IP Address	Port	Transport	Connections	Option1	Option2	Read Device	Write Device	Send Delay	Timeout	Retry	Enabled Switc
1	Modbus/TCP	192.168.0.1	502	---	1	0	0	125	123	0	1000	3	Enabled
2	---	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---	---

Chapter7. CommunicationSettingsforConnectedDevices

Device	IP address	Port	Connections*1	Option1*2	Option2*3	Read Device Max	Write Device Max	Enabled Switch
Modbus/TCP	192.168.0.1	502	1	0	0	125	123	Enabled

*1. Check the specifications of the connected device for the number of connections that can be set.
If [Connections] is set to "2" for a device that allows a single connection only, a communication error will occur.

*2. Set the Unit Identifier of the Modbus device.
Default value: 0
Range: 0 to 255

*3. Specify the function code used for writing.

Default value: 0
Range: 0 to 3

0: Use function codes 15 (0x0F) and 16 (0x10) (write data to multiple addresses of a coil and a general-purpose register)

1: Use function codes 5 (0x05) and 16 (0x10) (write data to a single address of a coil)

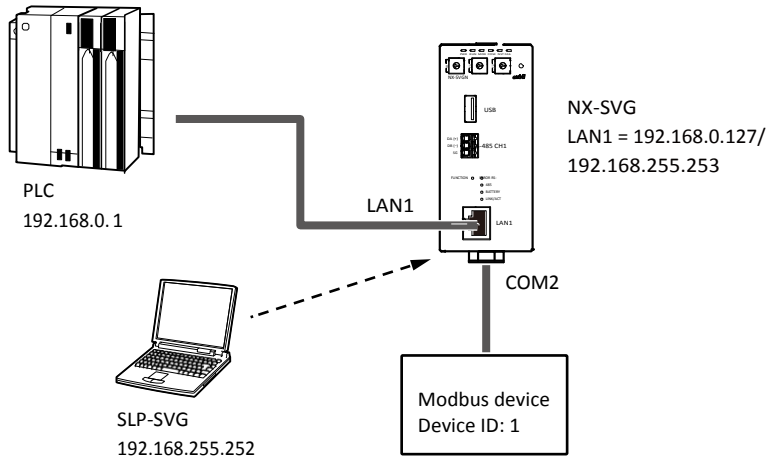
2: Use function codes 15 (0x0F) and 6 (0x06) (write data to 1 word of a general-purpose register)

3: Use function codes 5 (0x05) and 6 (0x06) (write data to a single address of a coil and a general-purpose register)

④ Modbus/RTU

An application example of a Modbus/RTU device is given below.

●System configuration



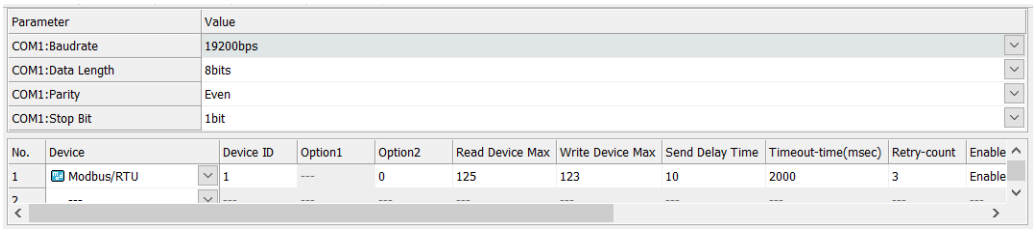
Note

- ☞ 5 - 6 Connecting to Model NX-SVG (p. 5-24) (for details on PC settings)

●Configuration using model SLP-SVG

(1) Specify LAN1 settings according to the configuration of the connected PLC.

(2) Specify COM2 settings according to the configuration of the Modbus device.
Set the function code for the connected Modbus device for [Option2].
Set the number of addresses supported by the connected Modbus device for [Read Device Max] and [Write Device Max].



Parameter	Value
COM1:Baudrate	19200bps
COM1:Data Length	8bits
COM1:Parity	Even
COM1:Stop Bit	1bit

No.	Device	Device ID	Option1	Option2	Read Device Max	Write Device Max	Send Delay Time	Timeout-time(msec)	Retry-count	Enable
1	Modbus/RTU	1	---	0	125	123	10	2000	3	Enable
2	---	---	---	---	---	---	---	---	---	---

Device	Device ID	Option2*	Read Device Max	Write Device Max	Enabled Switch
Modbus/RTU	1	0	125	123	Enabled

* Specify the function code used for writing.

Default value: 0

Range: 0 to 3

0: Use function codes 15 (0x0F) and 16 (0x10) (write data to multiple addresses of a coil and a general-purpose register)

1: Use function codes 5 (0x05) and 16 (0x10) (write data to a single address of a coil)

2: Use function codes 15 (0x0F) and 6 (0x06) (write data to 1 word of a general-purpose register)

3: Use function codes 5 (0x05) and 6 (0x06) (write data to a single address of a coil and a general-purpose register)

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Chapter8. Specifications

④ Hardware specifications

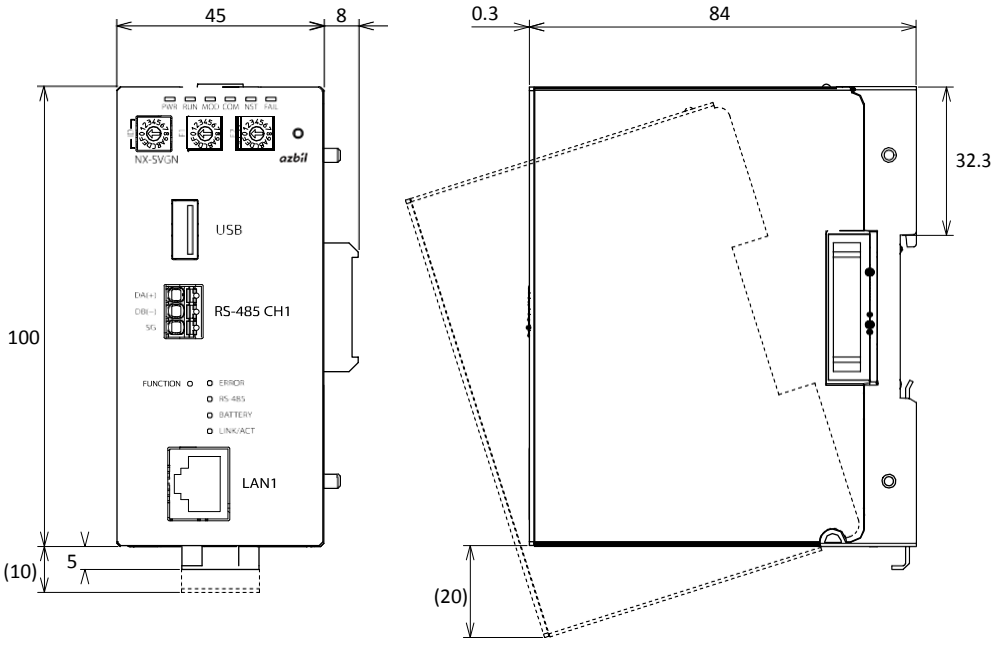
Item		Specifications
Standard conditions	Ambient temperature	23 ± 2 °C
	Ambient humidity	60 ± 5 % RH (without condensation)
	Rated voltage	24 V DC
	Vibration	0 m/s²
	Shock	0 m/s²
	Mounting angle	Reference plane ±3 °
Operating conditions	Ambient temperature	0 to 50 °C (below the installed NX-SVG)
	Ambient humidity	10 to 90 % RH (without condensation)
	Allowable operating voltage	21.6 to 26.4 V DC
	Vibration	0 to 3.2 m/s² (10 to 150 Hz for 2 h each in X, Y, and Z directions)
	Shock	0 to 9.8 m/s²
	Mounting angle	Reference plane ±3°
	Dust	0.3 mg/m³ max.
	Corrosive gas	None
	Elevation	2000 m max.
	Pollution degree	2 (equivalent to a normal office environment)
Transport and storage conditions	Ambient temperature	-20 to +70 °C
	Ambient humidity	5 to 95 % RH (without condensation)
	Vibration	0 to 9.8 m/s² (10 to 150 Hz for 2 h each in X, Y, and Z directions)
	Shock	0 to 300 m/s² (vertically 3 times while on DIN rail)
	Package drop test	Drop height 60 cm (free fall on 1 corner, 3 edges, 6 sides)
Other	Insulation resistance	500 V DC, 20 MΩ min. (between power terminals 1 and 2 and I/O terminals isolated from the power terminals)
	Dielectric strength	500 V AC for 1 min (between power terminals 1 and 2 and I/O terminals isolated from the power terminals)
	Power consumption	6 W max.
	Power-on inrush current	10 A max. (under operating conditions)
	Power-on behavior	Reset time: approx. 30 s (time until normal operation, under standard conditions)
	Case material, color	Modified PPO resin, black
	Mounting method	Mounting on a DIN rail
	Terminal screw tightening torque	0.6 ±0.1 N·m
	Weight	300 g max.
	Standards compliance	EN61326-1 (For use in industrial locations), UL61010-1
LAN interface communication specifications	Number of ports	2 (LAN1, LAN2)
	Transmission line type	IEEE 802.3 10BASE-T/100BASE-TX (with auto-negotiation and Auto-MDI/MDI-X)
	Connector	RJ-45
	Cable	100BASE-TX cable UTP cable (4P) Cat 5e min. (straight) (ANSI/TIA/EIA-568B both ends), 100 max.

Item		Specifications
RS-485 interface communication specifications	Number of ports	2 (RS-485 channels 1 and 2)
	Network	Multidrop (up to 31 slave stations for 1 host station)
	Signal level	RS-485-compliant
	Communications/ synchronization type	Full-duplex, start-stop synchronization (protocol: half-duplex)
	Maximum cable length	500 m
	No. of communication wires	3-wire system
	Terminating resistor	External (150 Ω ½ W or more)
	Transmission speed	Selectable from 4800, 9600, 19200, 38400, 57600 and 115200 bps
	Bit length	7 or 8 bits
	Stop bits	1 or 2
	Parity bit	Even parity, odd parity, or no parity
Battery*	Model	CR1632 (Panasonic, Maxell)
	Application	Clock IC backup No battery is needed if the function for time setting at power-on is used. No battery is needed if inaccurate time in the history data can be tolerated. (Backup registers are backed up in the FRAM area.)
Separately sold product	Smart Loader Package, model SLP-SVG	

* Not included with the product. Please purchase a commercially available battery that complies with UL 1642.

④ External dimensions

Unit: mm



Chapter9. Troubleshooting

④ Diagnosis based on the LEDs

Errors of this device can be identified by the state of the LEDs.

Type	State	Description	Countermeasures
FAIL	Lit	Main unit failure	If the error is not cleared after turning the power back on, replace the device.
	Fast blinking	Configuration error	The device stopped operating due to a configuration error. The configuration file may be corrupted. Rewrite the settings from the loader.
		Base/main unit model No. mismatch	The main unit is mounted on an incorrect base unit. Mount the main unit on the base unit of this device. (The first 7 characters of the model number are checked.)
ERROR	Lit	Communication error occurred	A communication error occurred. Connect the loader and execute [Exec Status] to identify the device with that error. In addition, execute [NX-SVG Information] and check [Comm History].
	Fast blinking	Error when the switches on the main unit were used	An error occurred when the switches on the main unit were used. Connect the loader, execute [NX-SVG Information], and check [Operation History].

④ Diagnosis from the result code of the executed function

After execution of the following functions, the result code can be written to a PLC, etc. Codes and the indicated diagnoses are as follows.

Function	Result code	Description	Countermeasures
Used for both backup and restoration	86	The file is corrupted.	The backed-up file is corrupted. Please back up the data again.
	87	The device version could not be obtained.	The version of the connected Network Instrumentation Module is not supported by the configuration backup and restoration function. Please check the version of the module.
	88	There is discrepancy in the model number.	The model number of the connected Network Instrumentation Module is different from the number specified by the loader. Please check the system configuration.
	89	The version of the device is not supported.	The version of the connected Network Instrumentation Module is not supported by the configuration backup and restoration function. Please check the version of the module.
	90	The file could not be read.	There is no backup file. Please back up the data again.
	91	The device could not be connected.	A communication error occurred. Please check the wiring and system configuration.
	92	There is an error in communication with the device.	
	93	The file could not be received.	

Function	Result code	Description	Countermeasures
Backup	94	The file could not be saved.	The file could not be saved. The hardware may be faulty. Please replace the NX-SVG.
Restoration	94	The NX-SVG received an error response from the device.	A communication error occurred. Please check the wiring and system configuration.
	95	The backup file is too large.	Some of the connected Network Instrumentation Modules might be faulty. Please check the system configuration.
IP address assignment	87	There is a discrepancy in the local IP address.	There is a discrepancy in the segment setting of the IP addresses of Network Instrumentation Modules specified by the loader. Please check the settings.
	88	A socket error occurred.	An internal error occurred. Turn the power of the NX-SVG back on.
	89	The process was canceled.	The process was canceled by the user. Please execute the process again.
	91	There is a discrepancy in the number of devices.	The number of Network Instrumentation Modules set by the loader is different from the actual number of connected modules. Please check the settings.
	92	Information on the connected device could not be obtained.	A communication error occurred. Please check the wiring and system configuration.
	93	There is a discrepancy in the number of devices (IP address verification).	In a check after IP address assignment, an IP address mismatch was found. Some of the connected Network Instrumentation Modules might be faulty. Please check the system configuration.

④ Diagnosis from events in the communication history

Event	Code	Description	Countermeasures
Disconnect	Timeout	No response from the connected device for a request from this device.	Check the wiring and communication setting of the connected device.
	Connection error	When an Ethernet connection is established, the connected device does not respond to a command from this device.	Check the wiring and communication setting of the connected device.
	Server connection	The connection was disconnected from the host device by the server function.	
Error response	Code: 0xXXXXXXXX	An error response was received from the connected device for a request from this device.	Refer to the user's manual for the connected device to check the error code details and address the error accordingly.
Access error	Illegal address	The host device accessed an address that is out of the range of the device built into this device by an illegal address server function.	Check the communication command from the host device.

Chapter 10. Disposal

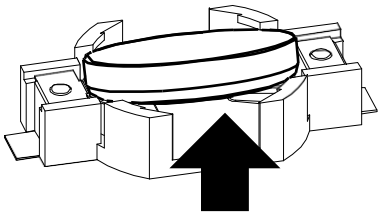
④ Disposal of this device

When discarding this device, remove the internal battery and dispose of this device appropriately in accordance with local laws.

④ Disposal of the battery

●Removal

(1) Remove the main unit from its base. Insert a nonmetallic object with a flat tip between the battery and the battery holder on the back of this device to pry the battery up from the holder.



(2) Grab the battery and remove it.

●Disposal

Dispose of the battery appropriately in accordance with local laws and regulations.

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Chapter 11. Open Source Software

This device uses the following open source software. For the license statement of this software, please download *Open Source Software License (CP-SP-1438E)* from [Software download] on Azbil's Compo Club website.

The source code of each piece of software may be reproduced, distributed or modified in accordance with the conditions stipulated in the license terms of the software. The source code can be downloaded from [Software download] on Azbil's Compo Club website. The copyright of each piece of software belongs to the copyright holder described in the source code.

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The disclaimer for open source software is as described in its license, but it does not affect the warranty terms of this product. In addition, we cannot answer questions about the content and handling of source code.

Software name	Version	License
u-boot	2016.05	GPLv2
Linux	4.4	GPLv2
binutils	2.25.1	GPLv2
bison	3.0.4	GPLv3
busybox	1.25.1	GPLv2
db	4.7.25	BSD
dropbear	2017.75	MIT
expat	2.2.0	BSD
flex	2.6.0	BSD
gcc	4.9.4	GPLv2
gdbserver	7.10.1	GPLv3
glibc	2.19	GPLv2
gmock	1.4.0	BSD
gmp	6.1.1	GPLv3
gtest	1.4.0	BSD
iproute2	3.18.0	GPLv2
iptables	1.6.1	GPLv2
libelf	0.8.13	LGPL
libxml2	2.9.4	MIT
lighttpd	1.4.44	BSD
m4	1.4.17	GPLv2
mmc-utils	20160623-a3d3331	GPLv2
mpc	1.0.3	LGPLv3
mpfr	3.1.3	LGPLv3
ncurses	6.0	MIT
openssl	1.0.2k	OpenSSL
pam	1.3.0	GPLv2/BSD
pcre	8.39	BSD
php	5.6.30	PHP License, version 3.01
sqlite3	3140200	Public Domain
stressapptest	1.0.8	Apache License 2.0
tzdata	2016e	Public Domain, LGP
zlib	1.2.8	BSD
zip	3.0	BSD

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This product includes PHP software, freely available from <http://www.php.net/software/>

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/)

This product includes cryptographic software written by Eric Young (eay@cryptsoft.com)

Appendix

④ Model SLP-SVG version history

This section describes the functions added and the specifications changed for each version of the SLP-SVG.

SLP-SVG version	Firmware version	Description
Ver 1.0.4.0	R01.00.04.00	• Added the C1M address list. • Added support for Windows 11.
Ver 1.0.3.0	R01.00.03.00	• Added the AUR255 address list. • Added the F4Q address list. • Added the communication driver for the HNU. • Changed the minimum timeout-time of the communication driver for Mitsubishi SLMP from 100 ms to 1000 ms.
Ver 1.0.2.0	R01.00.02.00	• Added the communication driver for Fuji Electric MICREX. • Added the function for requiring a password to read the settings (password protection). • Added the AUR355 and AUR455 address lists. • Added the function for transferring data between blocks.
Ver 1.0.1.0	R01.00.01.00	Improved SLP-SVG communication.
Ver 1.0.0.6	R01.00.00.06	Added English version user's manual. Restored the NX-S01 configuration.
Ver 1.0.0.5	R01.00.00.05	Added models that support the CPL communication driver.
Ver 1.0.0.3	R01.00.00.03	Added Japanese version user's manual.
Ver 1.0.0.1	R01.00.00.01	Initial version

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Revision History of CP-SP-1422E

Date	Rev.	Revised pages	Description
Feb. 2019	1		
Mar. 2021	2		Overall revision
Oct. 2021	3	3-10 6-8 6-10 6-15 7-2 7-3, 7-5 7-6 7-30–7-32 7-33– 7-34 7-43–7-45 7-46– 7-56, 7-63, 7-69 7-58,7-65,7-67,7-71 7-59–7-62 7-63– App.-1	Handling Precautions: the description was changed. Handling Precautions: the description was changed. ●Device: “HNU” was added. ●Device: the description was changed. ④ List of connected device types: the table was changed. ●RS-485 connection: the table was changed. ●Azbil: the table was changed. ④ “Burner controller, model AUR255” was added. 7-30– in the old revision ●Configuration using model AUR355: the description was changed. ④ “Digital mass flow controller, model F4Q” was added. 7-40– in the old revision. ●Configuration using model SLP-SVG: the table was changed. The description was changed. ④ “iQ-R series, Ethernet interface module” was added. 7-53– in the old revision. “Appendix” was added.
Apr. 2022	4	3-10 3-14 3-20 4-6 4-10 4-13 4-18, 4-19, 4-20 5-1 6-15 7-3, 7-5 7-6 7-23 – 7-25 9-2 App.-1	“Handling Precautions” in section 3-6, “RS-485 Communication Connections,” was changed. USB dust cover: part of the description was deleted. Handling Precautions: the description was changed. ④ Trigger data transfer: “Note” and the description were added. IP address assignment: a description was added. ④ IP address assignment: the screen and IP address under “Note” were changed. Section 4-3 Internal Register were changed. ●Windows 11 was added to the system requirements. The C1M was included in the range of devices. ●RS-485 connection: “C1M” was added to the table. ●Azbil: “C1M” was added to the table. ④ “Single loop controller, model C1M” was added. ④ “Diagnosis from events in the communication history” was added. ④ Model SLP-SVG version history: Ver 1.0.4.0 was added.

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Terms and Conditions

We would like to express our appreciation for your purchase and use of Azbil Corporation's products.

You are required to acknowledge and agree upon the following terms and conditions for your purchase of Azbil Corporation's products (system products, field instruments, control valves, and control products), unless otherwise stated in any separate document, including, without limitation, estimation sheets, written agreements, catalogs, specifications and instruction manuals.

1. Warranty period and warranty scope

1.1 Warranty period

Azbil Corporation's products shall be warranted for one (1) year from the date of your purchase of the said products or the delivery of the said products to a place designated by you.

1.2 Warranty scope

In the event that Azbil Corporation's product has any failure attributable to azbil during the aforementioned warranty period, Azbil Corporation shall, without charge, deliver a replacement for the said product to the place where you purchased, or repair the said product and deliver it to the aforementioned place. Notwithstanding the foregoing, any failure falling under one of the following shall not be covered under this warranty:

(1) Failure caused by your improper use of azbil product (noncompliance with conditions, environment of use, precautions, etc. set forth in catalogs, specifications, instruction manuals, etc.);
(2) Failure caused for other reasons than Azbil Corporation's product;
(3) Failure caused by any modification or repair made by any person other than Azbil Corporation or Azbil Corporation's subcontractors;
(4) Failure caused by your use of Azbil Corporation's product in a manner not conforming to the intended usage of that product;
(5) Failure that the state-of-the-art at the time of Azbil Corporation's shipment did not allow Azbil Corporation to predict; or
(6) Failure that arose from any reason not attributable to Azbil Corporation, including, without limitation, acts of God, disasters, and actions taken by a third party.

Please note that the term"warranty" as used herein refers to equipment-only-warranty, and Azbil Corporation shall not be liable for any damages, including direct, indirect, special, incidental or consequential damages in connection with or arising out of Azbil Corporation's products.

2. Ascertainment of suitability

You are required to ascertain the suitability of Azbil Corporation's product in case of your use of the same with your machinery, equipment, etc. (hereinafter referred to as "Equipment") on your own responsibility, taking the following matters into consideration:

(1) Regulations and standards or laws that your Equipment is to comply with.
(2) Examples of application described in any documents provided by Azbil Corporation are for your reference purpose only, and you are required to check the functions and safety of your Equipment prior to your use.
(3) Measures to be taken to secure the required level of the reliability and safety of your Equipment in your use
Although azbil is constantly making efforts to improve the quality and reliability of Azbil Corporation's products, there exists a possibility that parts and machinery may break down. You are required to provide your Equipment with safety design such as fool-proof design,*1 and fail-safe design*2 (anti-flame propagation design, etc.), whereby preventing any occurrence of physical injuries, fires, significant damage, and so forth. Furthermore, fault avoidance,*3 fault tolerance,*4 or the like should be incorporated so that the said Equipment can satisfy the level of reliability and safety required for your use.

*1. A design that is safe even if the user makes an error.
*2. A design that is safe even if the device fails.
*3. Avoidance of device failure by using highly reliable components, etc.
*4. The use of redundancy.

3. Precautions and restrictions on application

3.1 Restrictions on application

Please follow the table below for use in nuclear power or radiation-related equipment.

	Nuclear power quality*5 required	Nuclear power quality*5 not required
Within a radiation controlled area*6	Cannot be used (except for limit switches for nuclear power*7)	Cannot be used (except for limit switches for nuclear power*7)
Outside a radiation controlled area*6	Cannot be used (except for limit switches for nuclear power*7)	Can be used

*5. Nuclear power quality: compliance with JEAG 4121 required
*6. Radiation controlled area: an area governed by the requirements of article 3 of "Rules on the Prevention of Harm from Ionizing Radiation," article 2 2 4 of "Regulations on Installation and Operation of Nuclear Reactors for Practical Power Generation," article 4 of "Determining the Quantity, etc., of Radiation-Emitting Isotopes,"etc.
*7. Limit switch for nuclear power: a limit switch designed, manufactured and sold according to IEEE 382 and JEAG 4121.

Any Azbil Corporation's products shall not be used for/with medical equipment.

The products are for industrial use. Do not allow general consumers to install or use any Azbil Corporation's product. However, azbil products can be incorporated into products used by general consumers. If you intend to use a product for that purpose, please contact one of our sales representatives.

3.2 Precautions on application

you are required to conduct a consultation with our sales representative and understand detail specifications, cautions for operation, and so forth by reference to catalogs, specifications, instruction manual, etc. in case that you intend to use azbil product for any purposes specified in (1) through (6) below. Moreover, you are required to provide your Equipment with fool-proof design, fail-safe design, anti- flame propagation design, fault avoidance, fault tolerance, and other kinds of protection/safety circuit design on your own responsibility to ensure reliability and safety, whereby preventing problems caused by failure or nonconformity.

(1) For use under such conditions or in such environments as not stated in technical documents, including catalogs, specification, and instruction manuals
(2) For use of specific purposes, such as:
    * Nuclear energy/radiation related facilities
      [When used outside a radiation controlled area and where nuclear power quality is not required]
      [When the limit switch for nuclear power is used]
    * Machinery or equipment for space/sea bottom
    * Transportation equipment
      [Railway, aircraft, vessels, vehicle equipment, etc.]
    * Antidisaster/crime-prevention equipment
    * Burning appliances
    * Electrothermal equipment
    * Amusement facilities
    * Facilities/applications associated directly with billing
(3) Supply systems such as electricity/gas/water supply systems, large-scale communication systems, and traffic/air traffic control systems requiring high reliability
(4) Facilities that are to comply with regulations of governmental/public agencies or specific industries
(5) Machinery or equipment that may affect human lives, human bodies or properties
(6) Other machinery or equipment equivalent to those set forth in items (1) to (5) above which require high reliability and safety

4. Precautions against long-term use

Use of Azbil Corporation's products, including switches, which contain electronic components, over a prolonged period may degrade insulation or increase contact-resistance and may result in heat generation or any other similar problem causing such product or switch to develop safety hazards such as smoking, ignition, and electrification. Although acceleration of the above situation varies depending on the conditions or environment of use of the products, you are required not to use any Azbil Corporation's products for a period exceeding ten (10) years unless otherwise stated in specifications or instruction manuals.

5. Recommendation for renewal

Mechanical components, such as relays and switches, used for Azbil Corporation's products will reach the end of their life due to wear by repetitious open/close operations.

In addition, electronic components such as electrolytic capacitors will reach the end of their life due to aged deterioration based on the conditions or environment in which such electronic components are used. Although acceleration of the above situation varies depending on the conditions or environment of use, the number of open/close operations of relays, etc. as prescribed in specifications or instruction manuals, or depending on the design margin of your machine or equipment, you are required to renew any Azbil Corporation's products every 5 to 10 years unless otherwise specified in specifications or instruction manuals. System products, field instruments (sensors such as pressure/flow/level sensors, regulating valves, etc.) will reach the end of their life due to aged deterioration of parts. For those parts that will reach the end of their life due to aged deterioration, recommended replacement cycles are prescribed. You are required to replace parts based on such recommended replacement cycles.

6. Other precautions

Prior to your use of Azbil Corporation's products, you are required to understand and comply with specifications (e.g., conditions and environment of use), precautions, warnings/cautions/notices as set forth in the technical documents prepared for individual Azbil Corporation's products, such as catalogs, specifications, and instruction manuals to ensure the quality, reliability, and safety of those products.

7. Changes to specifications

Please note that the descriptions contained in any documents provided by azbil are subject to change without notice for improvement or for any other reason. For inquires or information on specifications as you may need to check, please contact our branch offices or sales offices, or your local sales agents.

8. Discontinuance of the supply of products/parts

Please note that the production of any Azbil Corporation's product may be discontinued without notice. After manufacturing is discontinued, we may not be able to provide replacement products even within the warranty period.

For repairable products, we will, in principle, undertake repairs for five (5) years after the discontinuance of those products. In some cases, however, we cannot undertake such repairs for reasons, such as the absence of repair parts. For system products, field instruments, we may not be able to undertake parts replacement for similar reasons.

9. Scope of services

Prices of Azbil Corporation's products do not include any charges for services such as engineer dispatch service. Accordingly, a separate fee will be charged in any of the following cases:

(1) Installation, adjustment, guidance, and attendance at a test run
(2) Maintenance, inspection, adjustment, and repair
(3) Technical guidance and technical education
(4) Special test or special inspection of a product under the conditions specified by you

Please note that we cannot provide any services as set forth above in a nuclear energy controlled area (radiation controlled area) or at a place where the level of exposure to radiation is equivalent to that in a nuclear energy controlled area.

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