

HITACHI

User's Manual

Option

J.NET

(LQE540-E)

S10VE

SEE-1-102 (A)

User's Manual

Option

J.NET

(LQE540-E)

S10VE

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Safety Precautions

- Before installation, operation, maintenance, and inspection of this product, you must carefully read through this manual and other related manuals. When using the product, make sure that you are familiar with all the information concerning this product, safety information, and precautions provided in those manuals.
- Keep this manual in a readily accessible place for future reference when using the product.
- Safety precautions in this manual are classified into four levels according to the severity of potential hazards: DANGER, WARNING, CAUTION, and Notice.

Definitions of the safety labels



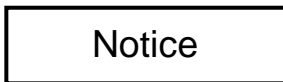
: Indicates a hazardous situation which, if not avoided, will result in death or serious injury.





: Indicates a hazardous situation which, if not avoided, could result in death or serious injury.



: Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



: Indicates a danger (resulting from incorrect use of the product) that can cause property damage or loss not related to personal injury if the safety precautions are not observed.

Failure to observe precautions marked with  or  could also lead to a serious consequence depending on the situation in which the product is used. Therefore, you must observe all of those precautions without fail.

The following are definitions of *serious injury*, *minor or moderate injury*, and *property damage or loss not related to personal injury* used in the safety labels.

Serious injury:

Is an injury that has aftereffects and requires hospitalization for medical treatment or long-term follow-up care.

Examples of serious injuries are as follows: vision loss, burns (caused by dry heat), low-temperature burns, electric-shock injuries, broken bones, and poisoning.

Minor or moderate injury:

Is an injury that does not require either hospitalization for medical treatment or long-term follow-up care. Examples of minor or moderate injuries include burns and electric-shock injuries.

Property damage or loss not related to personal injury:

Is damage other than personal injury. Examples of property damage or loss not related to personal injury are as follows: damage or loss of personal property, failure or damage of the main unit of the product, and loss of data.


The safety precautions stated in this manual are based on the general rules of safety applicable to this product. These safety precautions are a necessary complement to the various safety measures included in this product. Although they have been considered carefully, the safety precautions posted on this product and in the manual do not cover every possible hazard. Common sense and caution must be used when operating this product. For safe operation and maintenance of this product, establish your own safety rules and regulations according to your specific needs. A variety of industry standards are available to aid in establishing such safety rules and regulations.

1. General Safety Guidelines

Before installing, operating, inspecting, or conducting maintenance on this unit, read the following instructions carefully:

Before starting work

- Follow all the instructions and operating procedures provided in this manual and related manuals.
- Pay particular attention to the cautionary notes in the manuals and on the equipment itself, and comply with their stipulations.
Failure to do so could cause personal injury or damage to the machine.
- Do not perform any operation or action that is not described in this manual. When in doubt, contact the relevant store or your sales staff.
- The hazard warnings on the machine and in the manual cannot cover every possible case, as it is impossible to predict and evaluate all circumstances.
You must be alert and use your common sense.
- Do not perform any installation, wiring, handling, or internal customization that is not described in this manual. Hitachi will not be responsible for any damage to Hitachi equipment or peripherals and personal injury resulting from such a practice.
- In case this product fails, configure an emergency stop circuit or interlock circuit outside the product. Failure of this product might damage the machine or cause an accident.
- Maintenance work must be done only by appropriately trained persons who have practical experience and understand the potential hazards (and how to avoid them) during operation.

 During work

- Follow the sequence of steps specific to each procedure.
- Use the relevant tools and instruments for each task as specified in the manual. If no particular tools are specified, use commercially available tools and instruments which fit the purpose.
- Make sure that all measurement instruments and powered tools have been properly calibrated or periodically inspected prior to use.
- Keep the maintenance area neat and tidy.
- Make sure that maintenance parts, materials, and removed parts are not placed in a passageway so they are not tripped on by personnel.
- Wear eye protection if there is a risk of flying debris.
- When using sharp objects or cutting tools, keep fingers and other parts of your body away from the path of the blade bit or point.
- After maintenance work is completed, before turning on power, make sure that all parts removed during maintenance have been installed back in their original positions in the machine. Also make sure that no tool or foreign material remains in the machine.



Prevention of electric shock

- Before starting work, make sure that there is no potential electrical hazard in the maintenance area.
Example: Insufficient grounding line or a wet floor
- Before starting work, check the location of the emergency power-off switches and how to operate them.
- Unless otherwise specifically instructed, isolate the machine from all power sources before starting maintenance. Turn off not only the power switches on the machine but also the switch on the distribution panel.
After turning off the switch on the power distribution panel, attach a notice saying *Do not turn on this switch* on the power distribution panel. If the power distribution panel is equipped with a lockout device, turn off the switch on the power distribution panel, lock the device, and then bring the key with you.
If you are resuming maintenance work performed by someone else, do not assume that the power is off. Make sure that the above-mentioned conditions, such as switches turned off, are satisfied. If necessary, use a measurement tool to ensure that the power is off.
- Some parts in the machine remain charged for a certain time even after the power supply to the machine is disconnected. (Follow the displayed instructions).
- When working on a machine which has a grounding terminal, make sure that the terminal is properly connected to the facility's ground.
- When working near an exposed live electric circuit, do not work alone. Work with another person who can immediately turn off the power.
- To prevent electric shock during work, do not wear any metallic items or an accessory such as a wristwatch with a metallic surface. If you wear eyeglasses with a metallic frame, take care not to let the frame touch an uninsulated surface.
- Make sure that your hands and arms are dry.
- Use only one hand when it is necessary to work near an exposed live electric circuit. This mitigates the risk of current passing through your heart if you accidentally touch the circuit.
- Do not use a dental mirror near an exposed live electric circuit. The mirror surface is conductive and can become hazardous even if the mirror is made of plastic.
- Unless otherwise specifically instructed, do not supply power to any subassembly such as a power supply unit or a motor while it is removed from the machine.



Procedure in an emergency

In the case of electric shock

- Do not panic. Do not become another victim through contact with the injured person.
- First, shut off the electric current passing through the victim by using the emergency power-off switch. If there is no emergency power-off switch, use the normal power-off switch.
If this cannot be done, push the victim away from the source of the electric current by using a nonconductive object such as a dry wooden stick.
- Call an ambulance.
- If the victim is unconscious, artificial respiration may be necessary.
A proper method for performing artificial respiration or resuscitation should be learned beforehand.
If the victim's heart is not beating, cardio-pulmonary resuscitation must be performed by a trained and qualified person.

In the case of fire

- Call the fire department, and then take action to extinguish the fire.
- Shut off power to the machine by using the emergency power-off switch. If there is no emergency power-off switch, use the normal power-off switch.

2. Notes About Warning Indications

The following summarizes the warnings contained in this manual and their locations.

2.1 Notice

Notice

- To avoid damaging the product, protect it with cushioning, and then store it in the environment shown in Table 1-3.

- To avoid damaging the product during transit, protect it with cushioning and handle it as a precision machine.

(See page 1-2.)

- Turn off the power switch of the power supply module before setting the MODU No. setting switch and BIT RATE setting switch. Using these switches while power is applied might cause a malfunction.

- Do not set the MODU No. setting switch to a prohibited number. Such settings might cause a malfunction.

(See page 2-1.)

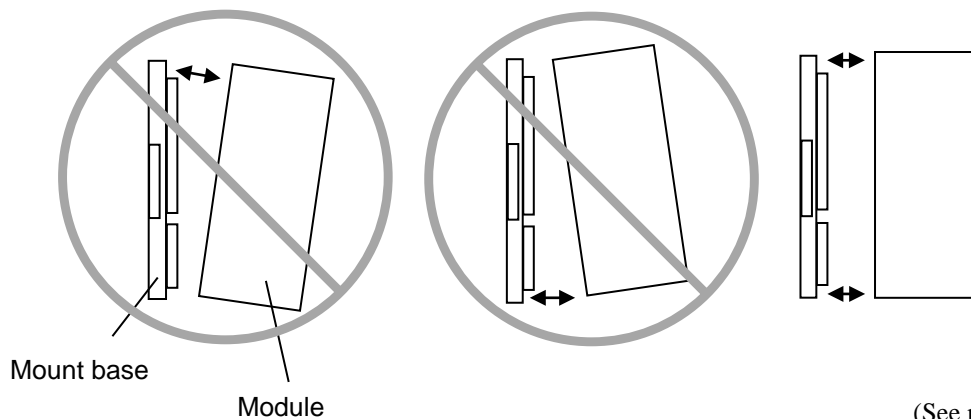
- Poor contact might cause malfunction. Mount the module and connect cabling to the module immediately after the module is unpacked so that dust or other foreign substances do not accumulate on connectors.

- To avoid damaging a module when removing or mounting it, turn off the power switch of the power supply module beforehand.

- To avoid damaging a module, observe the following precautions when mounting or removing the module:
 - Before mounting the module on the mount base connector, check that the connector pins are properly aligned and not bent, broken, or soiled.
 - Connecting or disconnecting a module that is tilted might damage connector pins. When moving the module, hold it vertically parallel to the mount base as shown below.

Bad examples

Good example



(See page 3-2.)

Notice

- Incorrect connection might cause malfunction. Connect the frame ground (FG) terminal to the FG terminal of the power supply module. For details about wiring, see *7.4 Ground wiring* in the *S10VE User's Manual General Description* (manual number SEE-1-001). The two shield ground (SHD) terminals and the FG terminal are commonly connected internally.

(See page 3-4.)

- To install or uninstall J.NET SYSTEM/S10VE, use the administrator account. Using the standard account might result in incorrect installation or uninstallation.
- Before installing J.NET SYSTEM/S10VE, terminate all Windows® programs, including resident programs in the memory (such as virus monitoring software). Installing J.NET SYSTEM/S10VE while any of these programs are running might cause an error. If an error occurs, uninstall the tool being installed, terminate all Windows® programs, and then reinstall the tool. For details about the uninstallation procedure, see *4.1.3 Uninstallation*.
- Do not specify, as the J.NET SYSTEM/S10VE installation folder, any of the following folders protected by User Account Control:
 - Program file folder (for example, C:\Program Files)
 - System root folder (for example, C:\Windows)
 - System drive root folder (for example, C:\)
 - Program data folder (for example, C:\ProgramData)

(See page 4-2.)

- J.NET SYSTEM/S10VE cannot be installed on a per-user basis. To install J.NET SYSTEM/S10VE successfully, you must first log on to the system with an administrator account. J.NET SYSTEM/S10VE might not be installed properly in any of the following cases: 1) Administrator permissions are acquired by using User Account Control# from a standard user account, 2) The administrator account was created from a standard user account by using User Account Control. In this case, log on with the administrator account that was first created on your computer, and then reinstall J.NET SYSTEM/S10VE. If you log on with a user account other than that used for installing J.NET SYSTEM/S10VE, the installed program might not appear in the program menu. In this case, log off and log on again with the administrator account that was first created on your computer, uninstall the installed program, and then install the program again. When you want to create a new account, log on with an administrator account without using User Account Control.

#: User Account Control is a Microsoft Windows feature that temporarily grants administrative rights to standard user accounts.

(See page 4-5.)

Notice

- Until the PCs are reset, the parameters written to the CPU modules do not take effect. If you do not reset the PCs, or if reset of the PCs fails, manually reset the PCs, or perform a power-on reset.

(See page 4-29.)

- Set the PCs number of the S10VE you want to configure. If the S10VE does not match the PCs number, configuration information that is edited offline cannot be sent by the data transmission/reception function of BASE SYSTEM/S10VE. Setting 9999 as the PCs number enables transmission regardless of the PCs number of the S10VE. However, note that it becomes impossible to check transmission to unintended PCs.

(See page 4-31.)

- Station error information remains even after normal communication is restored. The error information is cleared after the PCs are reset or after a power-on reset is performed.

(See page 4-35.)

Application Conditions

- When using the product explained in this manual (called *this product* hereafter), we ask you to provide a backup or fail-safe system outside the product so that any failure or problem in this product will not cause serious consequences.
- This product is a general-purpose product designed for general industrial applications. This product shall not be used in applications that require a high level of safety or responsibility or special quality assurance. Hitachi assumes no responsibility for any loss or damage arising from the use of this product in such applications. Examples of such applications are as follows:

Applications where a high level of safety is required

Example: Power station control system (nuclear power, thermal power, or hydro power), combustion facility, aviation or space facility, railway facility, lift facility, facility for recreation and amusement, medical facility, safety equipment, on-vehicle equipment, ship facility, traffic light system, and other facilities where death or bodily harm might result in the event of an emergency

Applications where a high level of responsibility is required

Example: Systems that supply gas, water, or electricity, systems requiring round-the-clock operation, system responsible for legal settlement or other purpose of handling rights and properties

Applications under severe conditions or environment

Example: Outdoor facility environment that meets any of the following conditions:
Environment that is chemically contaminated, subject to electromagnetic interference, or subject to constant vibration or shock

However, use of this produce in any of the applications described above can be approved by the decision of Hitachi if the purpose is specifically limited, the customer has responsibility for providing redundancy, or no special quality is required. For details, contact a Hitachi sales representative.

Warranty and Servicing

1. Warranty period and scope

Warranty period

The warranty period of this product shall be one year after the product has been delivered to the specified site. The warranty period of repaired products shall be six months from the date of repair. The warranty period for repaired products takes precedence over the warranty period prior to repair.

Scope

If the product malfunctions during the warranty period described above while using this product as instructed by this manual, the product shall be repaired free of charge.

Repair service

Return repair is supported, and requires the customer to send the malfunctioning product to a designated repair service.

- Fill in the required items in the *Hitachi Programmable Controller S10VE Repair Request Sheet* in *Appendix A* in the *S10VE User's Manual General Description* (manual number SEE-1-001), and then enclose it in the package with the product to be returned for repair.
- The customer must cover the costs for sending the product for repair to Hitachi.
- Hitachi will pay the transport cost for returning the repaired product to the customer.
- Repair is limited to replacement of malfunctioning parts.
- Work other than replacement of malfunctioning parts, such as investigation into the cause of failure, shall be charged even during the warranty period.

2. Exception of warranty obligation

Regardless of the warranty period, Hitachi bears no responsibility in any of the following cases.

The warranty mentioned here means the warranty for the individual product that is delivered. Therefore, we cannot be held responsible for any losses or lost profits that result from operation of this product or from malfunctions of this product. This warranty is valid only in Japan and is not transferable.

- The malfunction was caused by handling or use of the product in a manner not specified in the product specifications.
- The malfunction was caused by a unit other than that which was delivered.
- The malfunction was caused by modifications or repairs made by a vendor other than the vendor that delivered the unit.
- The malfunction was caused by a relay or other consumable which has passed the end of its service life.
- The malfunction was caused by a disaster, natural or otherwise, for which the vendor is not responsible.
- The malfunction was caused by reasons that could not be anticipated, based on conventional technological understanding, at the time of shipment from Hitachi.

3. Range of services

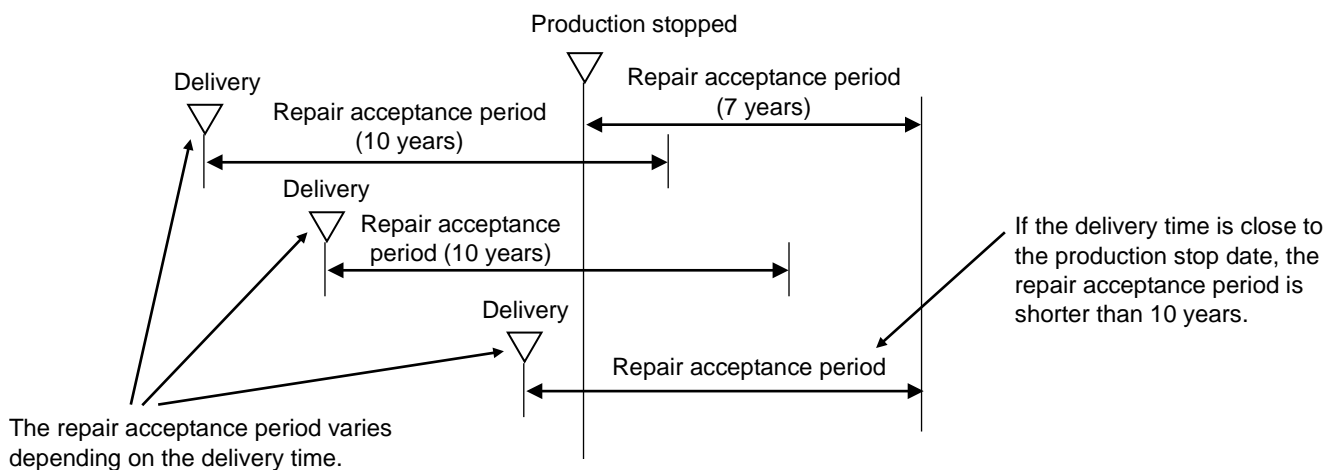
The price of the delivered product does not include on-site servicing fees by engineers. Extra fees will be charged for the following:

- Instruction for installation and adjustments, and witnessing trial operations
- Inspections, maintenance, and adjustments
- Technical instruction, technical training, and training facilities
- Examinations and repairs after the warranty period expires
- Examination of malfunctions caused by reasons outside the scope of the preceding warranty

4. Repair acceptance period

The repair acceptance period of S10VE products is 10 years after the product is delivered to the specified site or 7 years after production of the product is stopped, whichever comes earlier. The standard service life of S10VE is 10 years. We cannot accept repair of products whose designated repair acceptance periods (as described here) have been exceeded.

Payment for any repair after expiration of the warranty is the responsibility of the customer.



5. Service after production of the product is stopped

Products (including spare parts) cannot be supplied after production of those products is stopped.

6. Specification changes

Specifications described in this manual are subject to change without prior notice.

Revision History

Revision No.	History (revision details)	Issue date	Remarks
A	New edition	Oct. 2019	

Preface

Thank you for purchasing the J.NET module, which is an option for use with the S10VE.

This manual *S10VE User's Manual Option J.NET* describes how to use the J.NET module. For proper use of the J.NET module, thoroughly read this manual.

Trademarks

Microsoft® and Windows® are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

Note about storage capacity calculations

- Memory capacities and requirements, file sizes and storage requirements must be calculated according to the formula 2^n . The following examples show the results of such calculations by 2^n (to the right of the equal signs).
 - 1 KB (kilobyte) = 1,024 bytes
 - 1 MB (megabyte) = 1,048,576 bytes
 - 1 GB (gigabyte) = 1,073,741,824 bytes
 - 1 TB (terabyte) = 1,099,511,627,776 bytes
- As for disk capacities, they must be calculated using the formula 10^n . Listed below are the results of calculating the above example capacities using 10^n in place of 2^n .
 - 1 KB (kilobyte) = 1,000 bytes
 - 1 MB (megabyte) = $1,000^2$ bytes
 - 1 GB (gigabyte) = $1,000^3$ bytes
 - 1 TB (terabyte) = $1,000^4$ bytes

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1. Specifications

1.1 Application

By connecting the J.NET module (model: LQE540-E) to a network compliant with the JEMA Level 1 Specifications for Programmable Controller Field Networks, data communication between various station devices can be performed. (Message read/write services are not supported.)

JEMA: The Japan Electrical Manufacturers Association

1.2 Specifications

1.2.1 J.NET module specifications

Table 1-1 J.NET module specifications

Item	Specifications
Model	LQE540-E
Number of networks	2 networks per module
Maximum mountable number of modules	4 modules per CPU unit
Weight	370 g or less
Current consumption	900 mA or less
Hot swapping	Not supported

1.2.2 Communication specifications

Table 1-2 Communication specifications

Item	Specifications	
Transmission method	Serial (bit serial) transmission	
Electrical interface	RS-485	
Number of stations	A maximum of 31 stations per network (62 stations per module)	
Communication cable	Line type	Two pairs of shielded twisted-pair cables Recommended cable: KPEV-SB 2P 0.5mm ² (Hitachi Metals, Ltd)
	Distance	The distance depends on the transmission rate as follows: Transmission rate ≤ 1.0 Mbps: Maximum 240 m Transmission rate ≤ 0.5 Mbps: Maximum 480 m Transmission rate ≤ 0.25 Mbps: Maximum 800 m Transmission rate ≤ 0.125 Mbps: Maximum 1,000 m
	Terminal block	11-point (M3 screw), fixed type

1. Specifications

1.2.3 Environmental specifications

Table 1-3 Environmental specifications

Item	Specifications
Operating ambient temperature	0 to 55°C
Storage ambient temperature	-20 to 75°C
Relative humidity	10 to 90% RH (operating and non-operating) (no condensing)
Vibration resistance	Frequency: 10 to 150 Hz, acceleration: 10 m/s ² Applied direction of vibration: directions X, Y, and Z Sweep time: 8 minutes, number of sweep cycles: 20
Shock resistance	Peak acceleration: 147 m/s ² , half-sine shock time: 11 ms, applied direction of shock: directions X, Y, and Z, three times for each case
Ambient air	Dust: 0.1mg/m ³ or less
Corrosive gas	JEITA IT-1004A Class B (no corrosive gas must exist)

Notice

- To avoid damaging the product, protect it with cushioning, and then store it in the environment shown in Table 1-3.
- To avoid damaging the product during transit, protect it with cushioning and handle it as a precision machine.

1.3 Support specifications for JEMA standard

Table 1-4 lists the communication services of the JEMA standard, and describes the J.NET module communication commands and functions that support these services.

Table 1-4 JEMA standard services

JEMA standard service name	J.NET module command name	Function
Initialization	Issued automatically by the system program	The J.NET module and stations exchange information when they start up. When the J.NET module is reset or when the power switch of the power supply module is turned on, the J.NET module exchanges information automatically according to station information set by the user.
I/O	Issued automatically by the system program	The J.NET module and stations exchange I/O data. Setting up an I/O area of the J.NET module allows I/O communication to run automatically.
Data read	POLLING command	The J.NET module inquires whether there is a request from a station. The J.NET module automatically issues this command during idle times in data communication that occur after exchanging initialization service information with a station.
	PUT command	A station writes data to the J.NET module. After the station has exchanged service information with the J.NET module, the data read service PUT request causes the station to write data to the J.NET module.
	GET command	A station reads data from the J.NET module. After the J.NET module has exchanged service information with a station, the data read service GET request causes the station to read data from the J.NET module.
Data write	Not supported	The J.NET module reads data from and writes data to stations. The J.NET module does not support this communication service.
Reset	Not supported	The J.NET module resets a station to the initial status. The J.NET module does not support this communication service.
Broadcast	Not supported	The J.NET module sends data to all stations connected to the network. The J.NET module does not support this communication service.
Message write	Not supported	The J.NET module writes messages to a station. The J.NET module does not support this communication service.
Message read	Not supported	The J.NET module reads messages from a station. The J.NET module does not support this communication service.

The initialization service, the I/O service, and the data read service automatically run between the J.NET module and stations when the J.NET module is reset or powered on with station information loaded in its internal parameter table.

1. Specifications

1.4 System software specifications

1.4.1 System software overview

To use the J.NET module, you need to register the hardware switch settings and various kinds of software information in the module. The system software (tool) shown in Table 1-5 allows you to register module information in a similar manner to the way you would do so by using a typical Windows®-based application.

Table 1-5 System software (tool)

Package name	Model
J.NET SYSTEM/S10VE	S-7898-27

1.4.2 Required hardware and software

To use the system software of the J.NET module, you need the following hardware and software:

- Personal computer (PC) with a CPU of 1 GHz or faster
- Display with a resolution of 1366 x 768 dots or higher (FWXGA)
- 2 GB (or more) RAM
- Free hard disk capacity of 200 MB or more
- Cable (UTP crossed twisted-pair cable of Category 5e or higher) connected between PC and CPU module
- Microsoft® Windows® 7 (64-bit) operating system, Microsoft® Windows® 10 (64-bit) operating system
- Microsoft .NET Framework 4
- Microsoft Visual C++ 2010 redistributable package (x64)

Users of this product must have a basic knowledge of the Windows® environment and user interfaces. This system complies with the Windows® standard. This manual is intended for users who have mastered a basic knowledge of how to use Windows®.

2. Names and Functions of Parts

2.1 Names and functions of parts

Table 2-1 Names and functions of parts

No.	Name	Function
(1)	MODU No. setting switch	The module number setting switch used to set the number of J.NET modules (maximum of four) to be connected to a CPU unit. For details about settings, see Table 2-2.
(2)	BIT RATE setting switch	Used to set the transmission rate. For details, see Table 2-2.
(3)	Terminal blocks for interface	Connect interface signals. For details, see Table 2-3.
(4)	LEDs for N1	TX (transmission): Lights when data is being sent.
(5)	LEDs for N2	RX (reception): Lights when data is being received. ERR: Lights if a hardware error occurs.

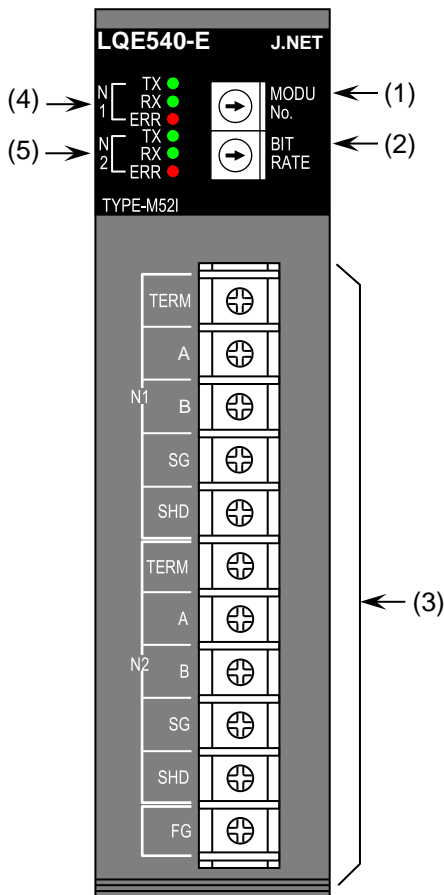


Table 2-2 MODU No. and BIT RATE settings

MODU No. setting switch	Selected module	BIT RATE setting switch	Transmission rate
0	Module 0	0	1.0 Mbps
1	Module 1	1	0.5 Mbps
2	Module 2	2	0.25 Mbps
3	Module 3	3	0.125 Mbps
4 to F	Setting prohibited	4 to F	Setting prohibited

Table 2-3 Signal names and descriptions

Signal name	Description
N1, N2	Network numbers
TERM	Terminal for a terminating resistor. Short-circuit the TERM and A terminals when the J.NET module is used at the end of the network.
A, B	Terminal used to connect a transmission/reception data line
SG	Terminal used to connect the signal ground line
SHD	Terminal used to connect the shield line
FG	Used for wiring with the FG terminal of the power supply module. For details about wiring, see 7.4 <i>Ground wiring</i> in the <i>SIOVE User's Manual General Description</i> (manual number SEE-1-001).

Notice

- Turn off the power switch of the power supply module before setting the MODU No. setting switch and BIT RATE setting switch. Using these switches while power is applied might cause a malfunction.
- Do not set the MODU No. setting switch to a prohibited number. Such settings might cause a malfunction.

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3. Mounting and Wiring

3.1 Mount base

The J.NET module can be mounted in the mount bases shown in Table 3-1.

Table 3-1 Mount base applicable to the J.NET module

Name	Model	Specification
7-slot mount base	HSC-1770	Power supply + RI/O-IF + CPU + 7 I/O slots

3.2 Mounting the modules

Mount the option module in an I/O slot (slot No. 1 to 7) on the mount base (see Figure 3-1).

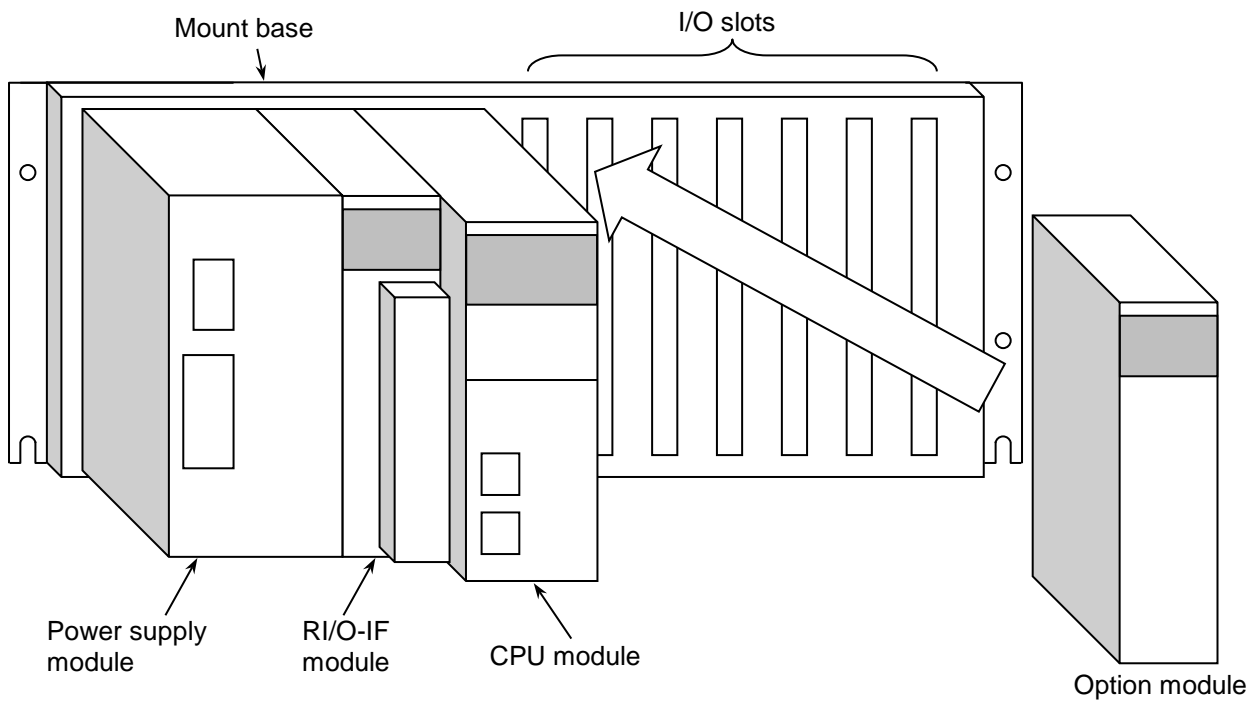


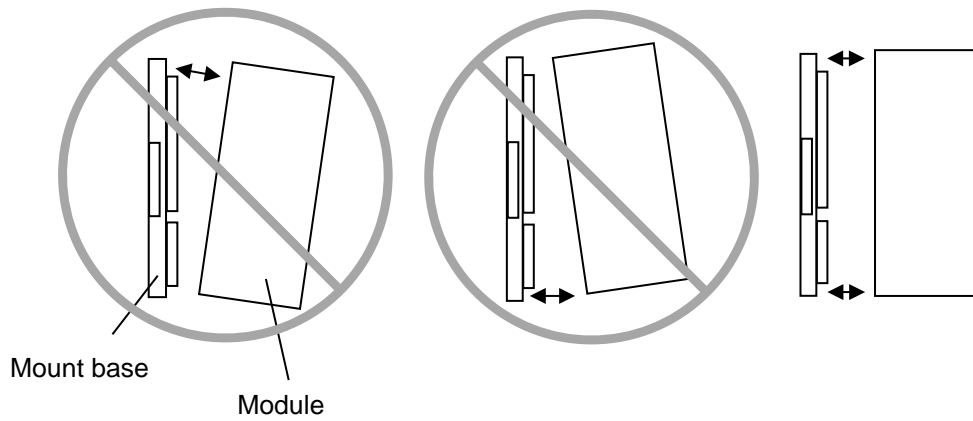
Figure 3-1 Mounting the option module

Notice

- Poor contact might cause malfunction. Mount the module and connect cabling to the module immediately after the module is unpacked so that dust or other foreign substances do not accumulate on connectors.
- To avoid damaging a module when removing or mounting it, turn off the power switch of the power supply module beforehand.
- To avoid damaging a module, observe the following precautions when mounting or removing the module:
 - Before mounting the module on the mount base connector, check that the connector pins are properly aligned and not bent, broken, or soiled.
 - Connecting or disconnecting a module that is tilted might damage connector pins. When moving the module, hold it vertically parallel to the mount base as shown below.

Bad examples

Good example



3.3 External dimensions of the J.NET module

Figure 3-2 shows the external dimensions of the J.NET module.

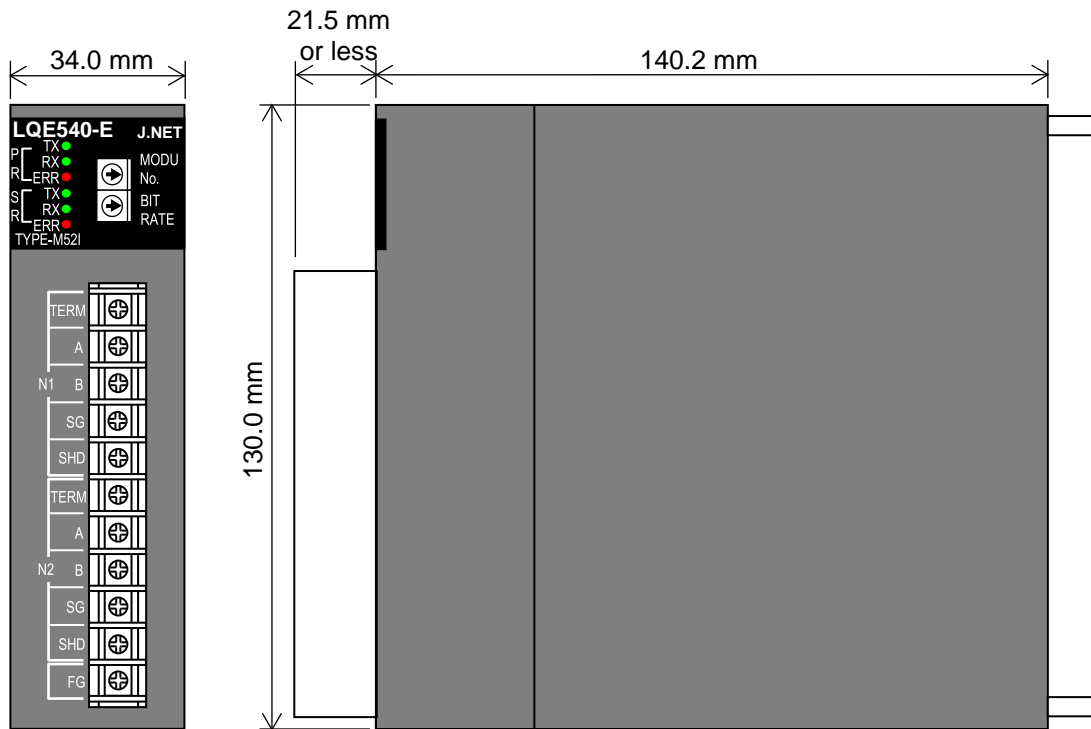


Figure 3-2 External dimensions of the J.NET module

3.4 Wiring

3.4.1 Interface signals and wiring method

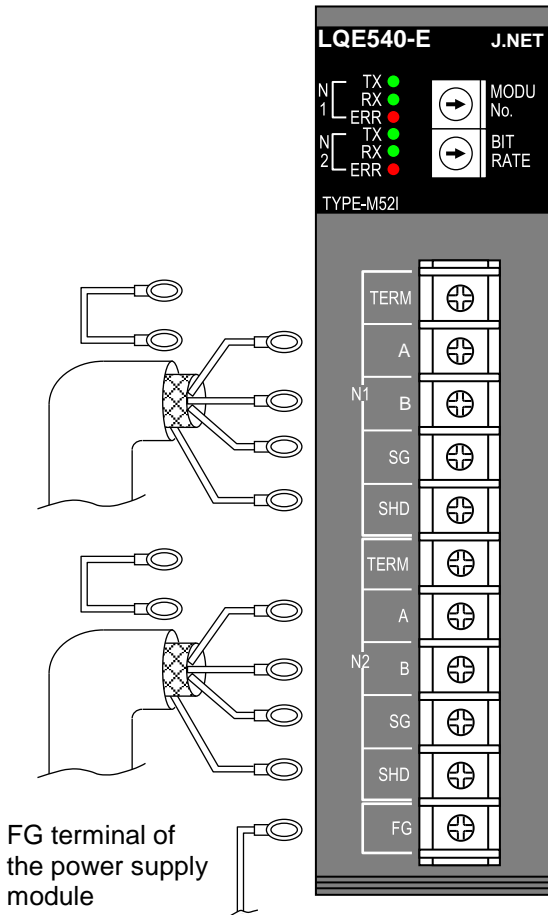


Figure 3-3 Wiring the module

Network 1 (N1), Network 2 (N2)

Signal name	
Acronym	Full name or meaning
A	Send/receive data
B	(Linkage data)
SG	Grounding for signal (Signal Ground)
SHD	Grounding for shield (SHield ground)
TERM	Terminating resistor for transmission/reception (TERMinal resistor)

Others

Signal name	
Acronym	Full name or meaning
FG	Grounding for frame (Frame Ground)

Interface signal voltage levels

Designation	Mark	Space
Interpretation	1/OFF	0/ON
Output condition	-6 to -1.5 V	1.5 to 6 V
Input condition	-0.2 V or less	0.2 V or more

Input condition refers to the electrical potential of A based on the input voltage of B.

Short-circuit the TERM and A terminals when the J.NET module is used at an end of the network.

The terminating resistor (120Ω) is internally connected.

Notice

- Incorrect connection might cause malfunction. Connect the frame ground (FG) terminal to the FG terminal of the power supply module. For details about wiring, see 7.4 *Ground wiring* in the *SIOVE User's Manual General Description* (manual number SEE-1-001). The two shield ground (SHD) terminals and the FG terminal are commonly connected internally.

3.4.2 Cable specifications

The J.NET module requires two pairs of shielded twisted-pair cables.

We recommend polyethylene-insulated vinyl sheath cables that meet the specifications shown in Table 3-2.

Table 3-2 Recommended cable specifications

Item	Specifications
Maximum conductor resistance (20°C)	34.0Ω per km
Withstand voltage	1000 VAC per minute
Minimum insulation resistance (20°C)	2500 MΩ•km
Capacitance (1 kHz)	60 pF per m
Characteristic impedance (1 MHz)	110Ω

Note: The preceding table shows a characteristic impedance of 110Ω at 1 MHz. However, the J.NET module has 120Ω internal terminating resistors in consideration of other transmission rates.

3. Mounting and Wiring

3.4.3 Wiring examples

Configure the terminating resistors for both devices connected to the ends of the line. The J.NET module supports two independent networks (N1 and N2), each of which must be wired as a totally discrete network. Figures 3-4 and 3-5 show wiring examples of N1. The same configuration applies for N2.

- Wiring for a J.NET module that is at the end of the N1 line

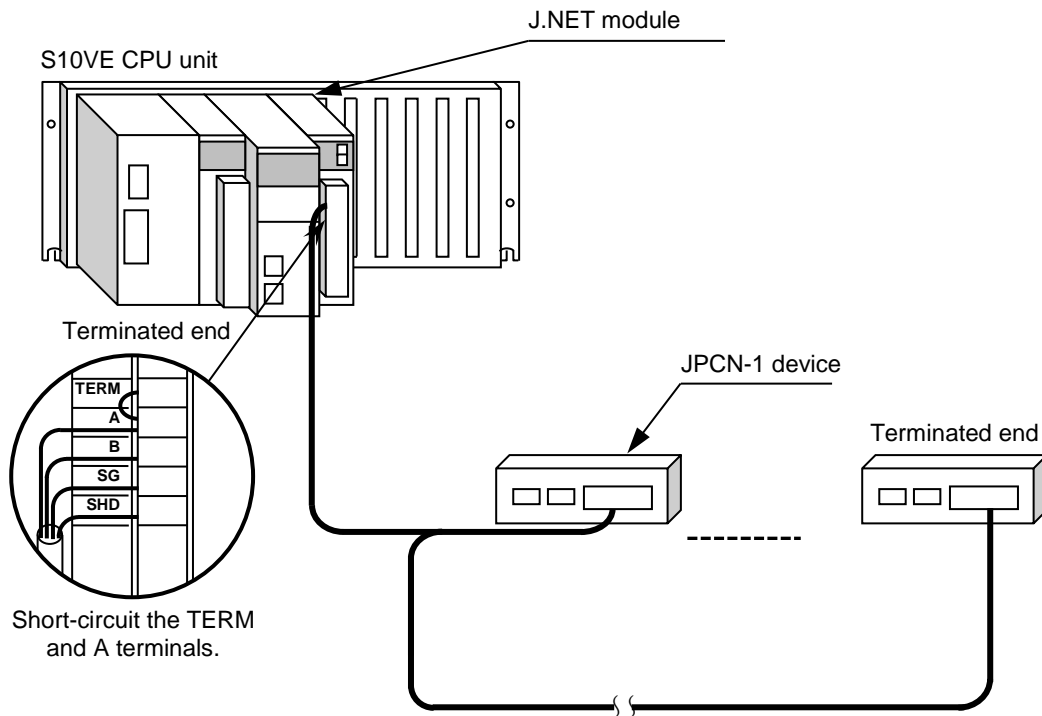
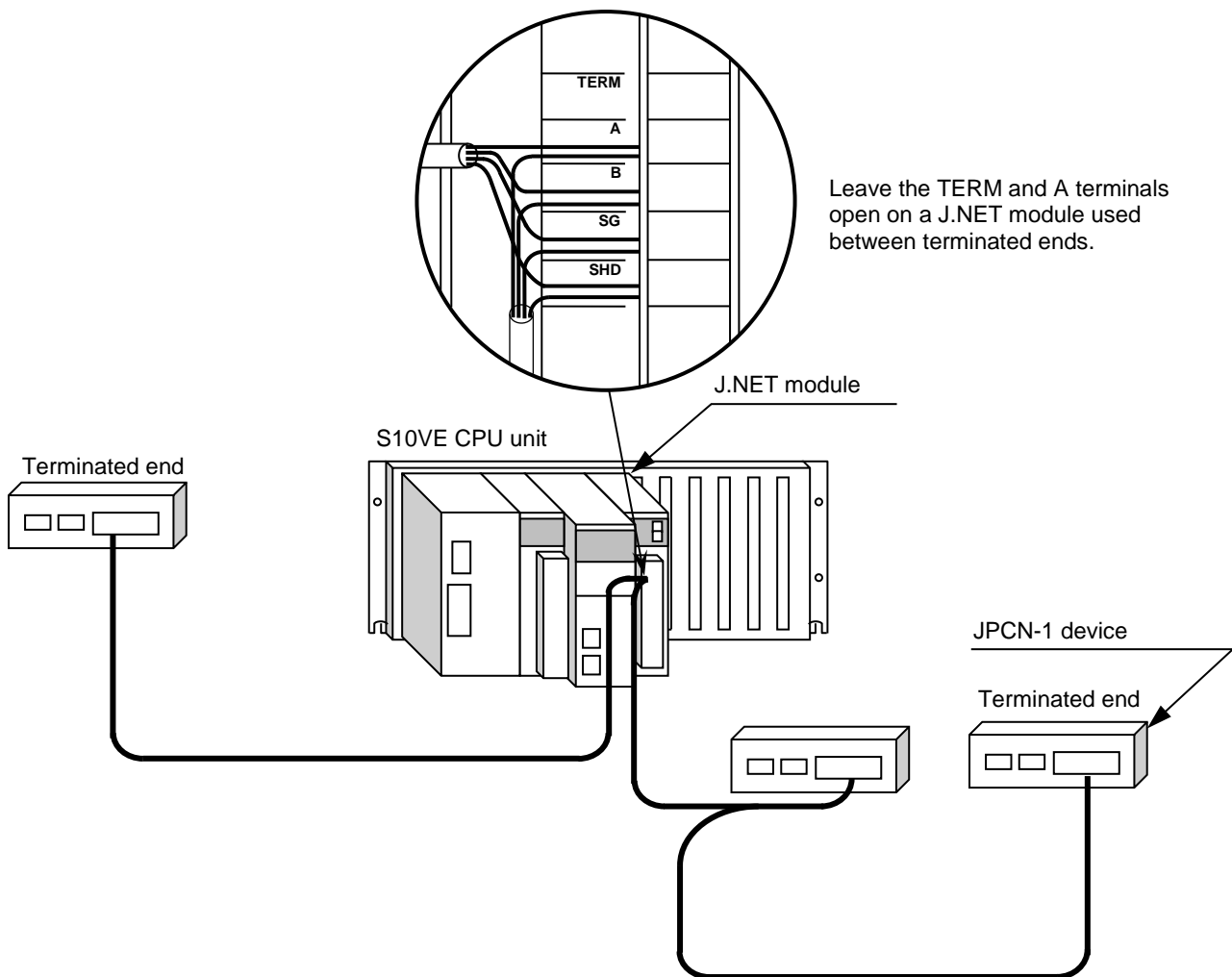


Figure 3-4 Network wiring example (1)

- Wiring for a J.NET module that is not at the end of the N1 line



Leave the TERM and A terminals open on a J.NET module used between terminated ends.

Figure 3-5 Network wiring example (2)

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4. Operation

4.1 Installing and starting up the system

4.1.1 Notes on installation

J.NET SYSTEM/S10VE supports the Microsoft® Windows® 7 (64-bit) operating system and Microsoft® Windows® 10 (64-bit) operating system.

J.NET SYSTEM/S10VE must be installed from the CD of BASE SET/S10VE. The Microsoft Visual C++ 2010 redistributable package (x64) is a prerequisite program for operating BASE SET/S10VE. If you double-click `SETUP.exe` (in BASE SET/S10VE) with this program not installed, the following message appears and installation fails: *The program can't start because MSVCR110.dll is missing from your computer. Try reinstalling the program to fix this problem.* Install the Microsoft Visual C++ 2010 redistributable package (x64) in advance from the Microsoft download center. Before you attempt to install J.NET SYSTEM/S10VE, make sure that BASE SYSTEM/S10VE (software product model: S-7898-38) has been installed. If BASE SYSTEM/S10VE has not been installed, install it. J.NET SYSTEM/S10VE cannot be installed if BASE SYSTEM/S10VE has not been installed.

If you attempt to start BASE SET/S10VE with the Microsoft Visual C++ 2010 redistributable package (x64) not installed, the following error message appears during startup: *The program can't start because MSVCR110.dll is missing from your computer. Try reinstalling the program to fix this problem.* Then, BASE SET/S10VE terminates abnormally.

Notice

- To install or uninstall J.NET SYSTEM/S10VE, use the administrator account. Using the standard account might result in incorrect installation or uninstallation.
- Before installing J.NET SYSTEM/S10VE, terminate all Windows® programs, including resident programs in the memory (such as virus monitoring software). Installing J.NET SYSTEM/S10VE while any of these programs are running might cause an error. If an error occurs, uninstall the tool being installed, terminate all Windows® programs, and then reinstall the tool. For details about the uninstallation procedure, see *4.1.3 Uninstallation*.
- Do not specify, as the J.NET SYSTEM/S10VE installation folder, any of the following folders protected by User Account Control:
 - Program file folder (for example, C:\Program Files)
 - System root folder (for example, C:\Windows)
 - System drive root folder (for example, C:\)
 - Program data folder (for example, C:\ProgramData)

4.1.2 Installation

This subsection describes how to install J.NET SYSTEM/S10VE.

Before starting installation, log on to the system with an administrator account.

- (1) To install J.NET SYSTEM/S10VE, double-click `setup.exe` stored in the CD (BASE SET/S10VE).
- (2) After double-clicking `SETUP.exe`, the following message (Figure 4-1) might be displayed. Click the **Yes** button to start setup.

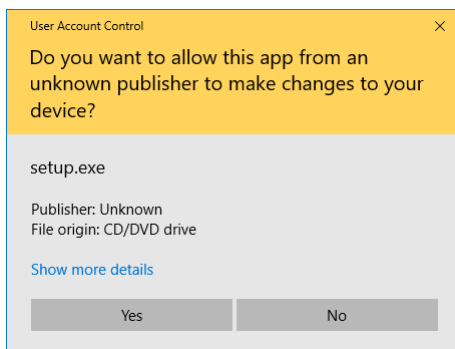


Figure 4-1 User Account Control message

- (3) In the SETUP window that appears (Figure 4-2), select J .NET SYSTEM/S10VE and then click the **Install** button.

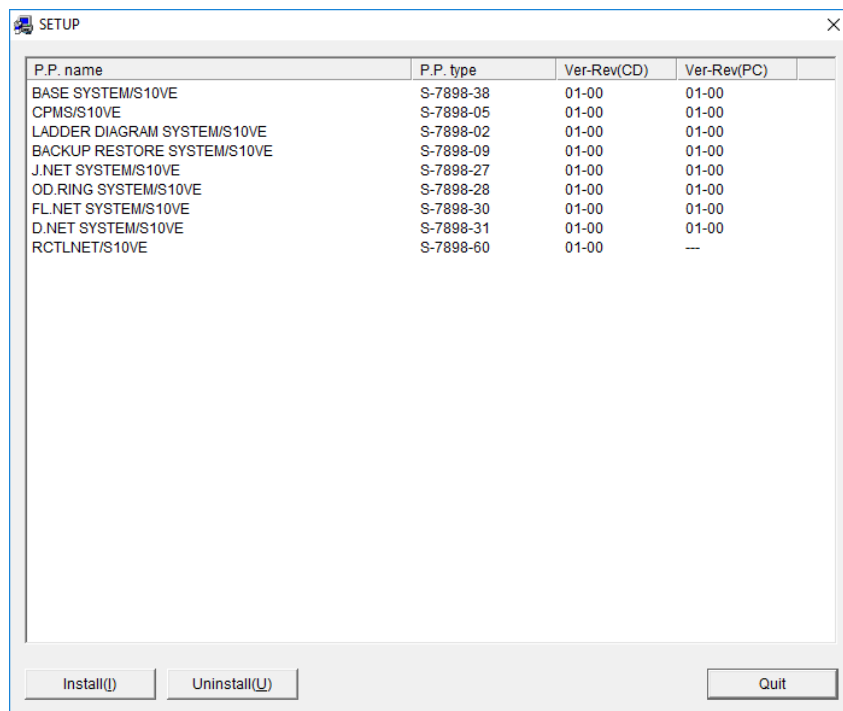


Figure 4-2 SETUP window

4. Operation

- (4) The J.NET SYSTEM/S10VE InstallShield Wizard window (Figure 4-3) appears. Click the **Next** button.

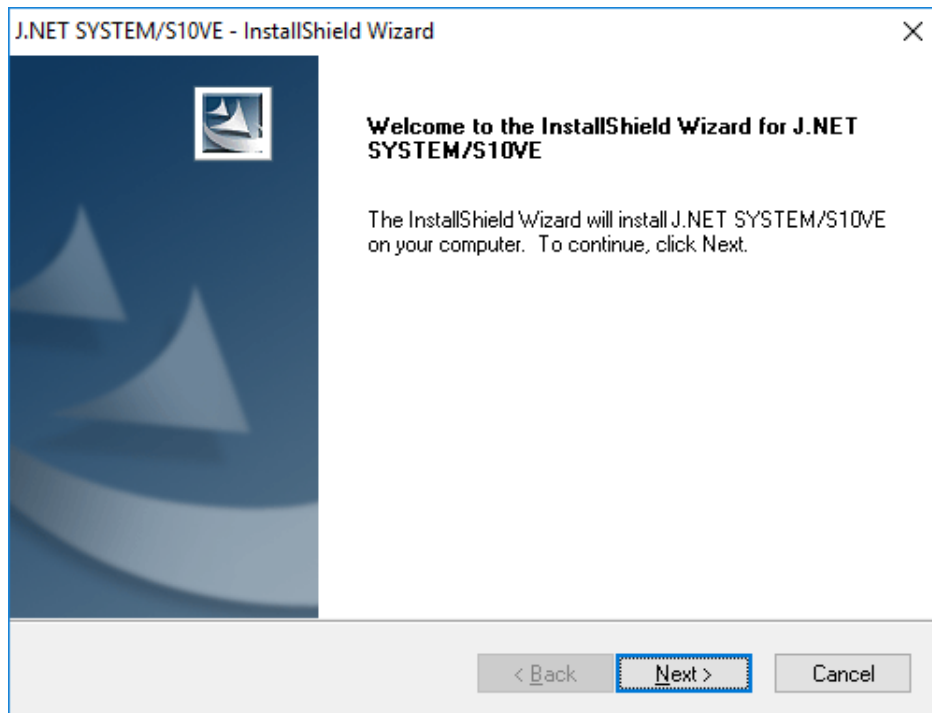


Figure 4-3 J.NET SYSTEM/S10VE InstallShield Wizard window

If you click the **Cancel** button, a message appears, asking whether you want to cancel setup. Click the **Yes** or **No** button.

Yes: Cancels installation of J.NET SYSTEM/S10VE.

In the InstallShield Wizard Completed window, click the **Complete** button.

No: Restarts installation of J.NET SYSTEM/S10VE.

- (5) The **Choose Destination Location** window appears. If necessary, change the installation folder, and then click the **Next** button.
- (6) The Setup Status window appears.
- (7) When the installation is complete, the InstallShield Wizard Completed window appears. Click the **Complete** button.

Notice

- J.NET SYSTEM/S10VE cannot be installed on a per-user basis. To install J.NET SYSTEM/S10VE successfully, you must first log on to the system with an administrator account.
J.NET SYSTEM/S10VE might not be installed properly in any of the following cases: 1) Administrator permissions are acquired by using User Account Control[#] from a standard user account, 2) The administrator account was created from a standard user account by using User Account Control. In this case, log on with the administrator account that was first created on your computer, and then reinstall J.NET SYSTEM/S10VE.
If you log on with a user account other than that used for installing J.NET SYSTEM/S10VE, the installed program might not appear in the program menu. In this case, log off and log on again with the administrator account that was first created on your computer, uninstall the installed program, and then install the program again.
When you want to create a new account, log on with an administrator account without using User Account Control.

[#]: User Account Control is a Microsoft Windows feature that temporarily grants administrative rights to standard user accounts.

4. Operation

4.1.3 Uninstallation

This subsection describes how to uninstall J.NET SYSTEM/S10VE.

Before starting uninstallation, log on to the system with the administrator account.

- (1) Click the **Start** button, and then open **Control Panel**. Click **Uninstall a program**, and then double-click J.NET SYSTEM/S10VE.

A confirmation message for uninstallation of J.NET SYSTEM/S10VE (Figure 4-4) appears. Click the **Yes** or **No** button.

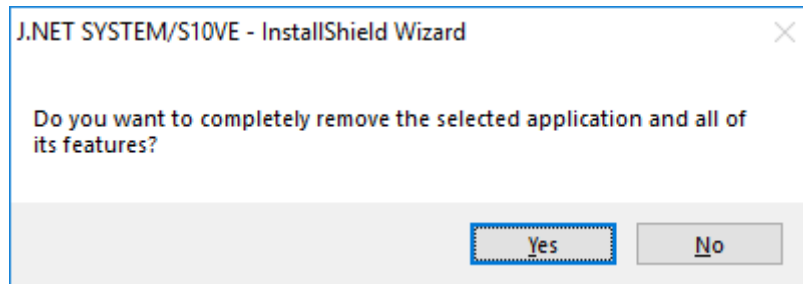


Figure 4-4 Confirmation message for uninstallation of J.NET SYSTEM/S10VE

Yes: Starts uninstallation.

No: Cancels uninstallation.

- (2) When the uninstallation is complete, a message indicating completion of uninstallation appears. Click the **Complete** button.

4.1.4 Reinstallation

To reinstall J.NET SYSTEM/S10VE, you must uninstall it, and then install it again. For details about the uninstallation procedure, see *4.1.3 Uninstallation*. For details about the installation procedure, see *4.1.2 Installation*.

4.1.5 Starting up the system

This subsection describes how to start up J.NET SYSTEM/S10VE.

(1) Starting up BASE SYSTEM/S10VE

Start up BASE SYSTEM/S10VE, and then create or select the target project. For details about how to start up BASE SYSTEM/S10VE and create or select a project, see the *S10VE User's Manual General Description* (manual number SEE-1-001).

(2) Selecting the command

From the **Program** menu of BASE SYSTEM/S10VE, click **Setting Tool**. The Setting Tool window (Figure 4-5) appears.

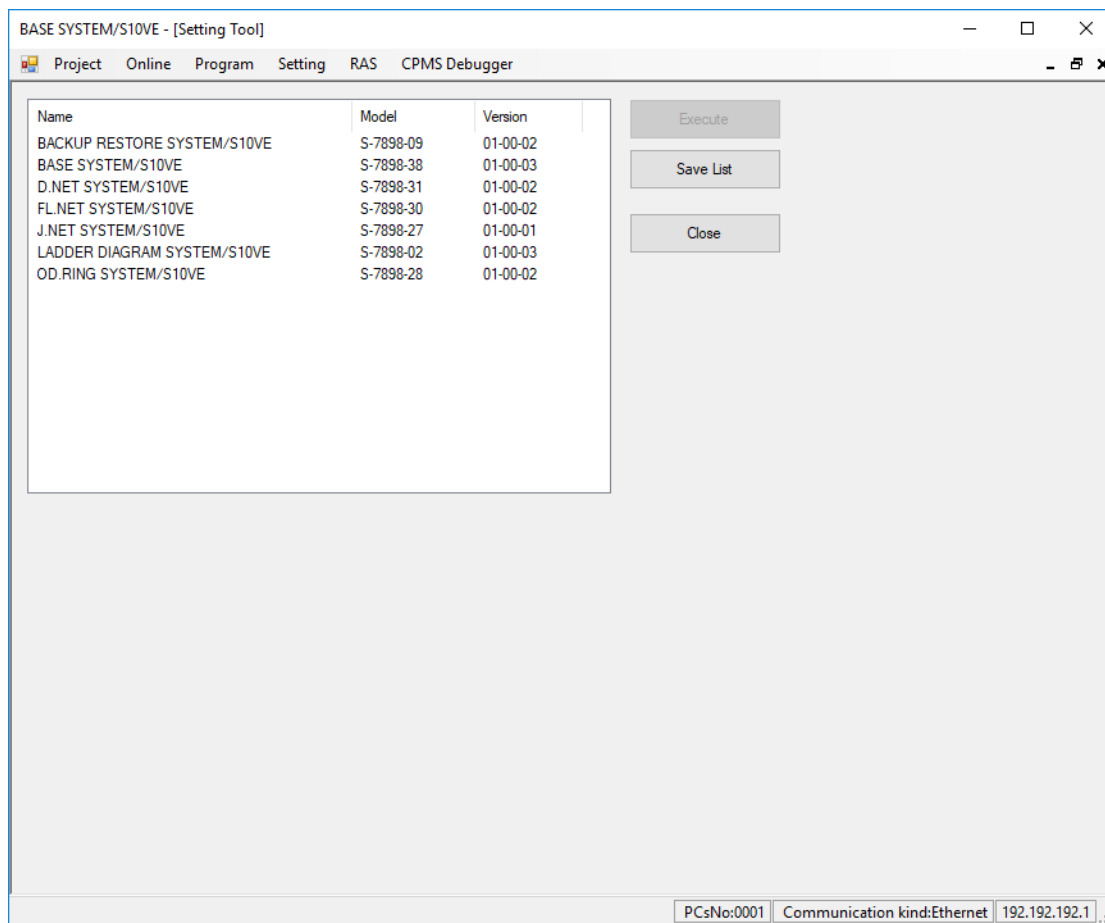


Figure 4-5 Setting Tool window of BASE SYSTEM/S10VE

4. Operation

(3) Starting up J.NET SYSTEM/S10VE

In the Tool Execute window (Figure 4-5), from the list box, select J .NET SYSTEM/S10VE, and then click the **Execute** button. The main window (Figure 4-6) appears.

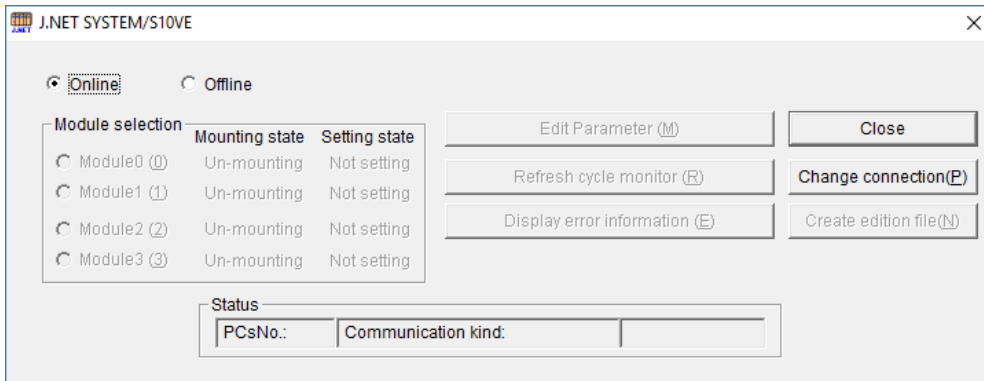


Figure 4-6 Main window (initial display)

In this state, PCs are not connected yet. To connect to PCs and then reference J.NET module settings or RAS information, see (4) *Startup in online state*. To create or edit a J.NET module configuration information file without connecting to PCs, see (5) *Startup in offline state*.

(4) Startup in online state

(a) In the main window (Figure 4-6), select the **Online** radio button, and then click the **Change connection** button. The Communication type window (Figure 4-7) appears. Specify the IP address of the connection destination, and then click the **OK** button. (For details about how to select the communication type, see 4.1.6 *Changing connections*.)

The default communication type is the one last set by using the **Change connection** option of BASE SYSTEM/S10VE.

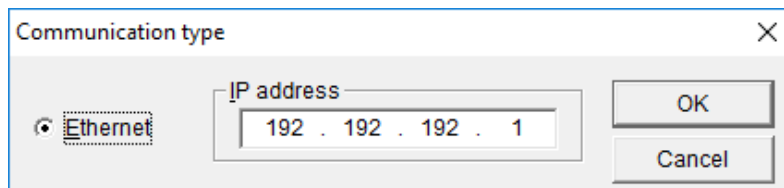


Figure 4-7 Communication type window

(b) The display returns to the main window (Figure 4-8) in which module selection is possible.

If a J.NET module is mounted or parameters are set for the CPU module, the module number (0 to 3) is displayed in gray or black.

Information about the selected J.NET module is displayed in black. For unselected modules, information is displayed in gray.

Modules that are neither mounted nor set are dimmed and cannot be selected.

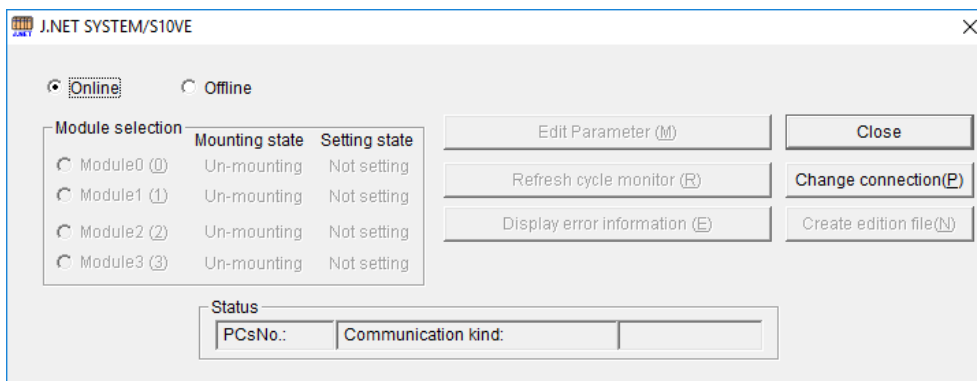


Figure 4-8 Main window (online status)

Select a valid module number, and then click one of the following buttons:

Edit Parameter:

Use this button to read, edit, and reconfigure parameters set to the CPU module or J.NET module. For details, see *4.2.3 Editing parameters*.

Refresh cycle monitor:

Use this button to display and monitor the current refresh cycle value. For details, see *4.2.7 Refresh cycle monitor*.

Display error information:

Use this button to check error information. For details, see *4.2.8 Displaying error information*.

4. Operation

(5) Startup in offline state

In offline state, you can edit an existing configuration information file of a J.NET module or create a new one even if there is no actual machine. Use such a configuration information file to send configuration information through the data transmission/reception function of BASE SYSTEM/S10VE.

(a) In the main window (Figure 4-6), select the **Offline** radio button.

The **Change connection** button changes to the **Edition file select** button.

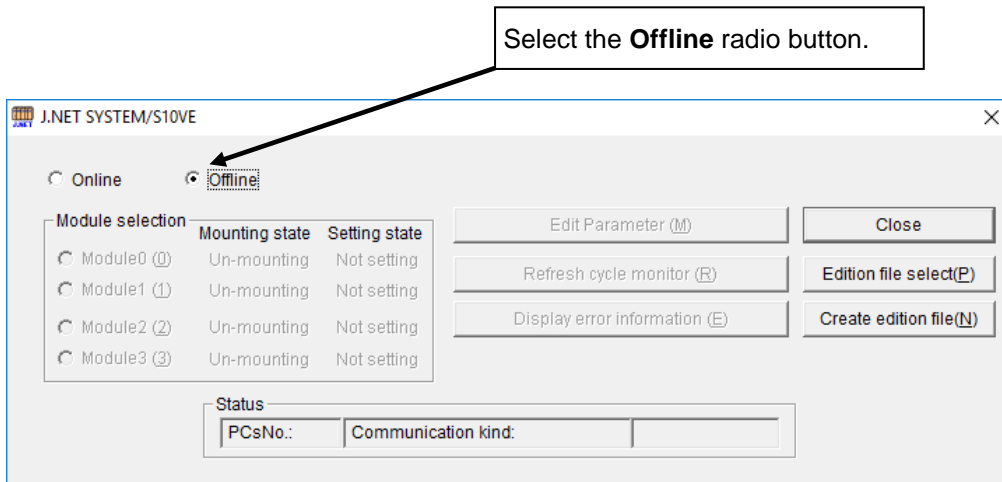


Figure 4-9 Main window ([Offline] radio button selected)

Click one of the following buttons:

Edition file select:

Use this button to edit an existing configuration information file.

For details, see *4.1.7 Selecting an edition file*.

Create edition file:

Use this button to create a new configuration information file.

For details, see *4.1.8 Creating an edition file*.

4.1.6 Changing connections

Function: Sets the PCs-to-personal computer communication type.

Operation: The following describes the operation procedure.

- (1) In the main window (Figure 4-6), click the **Change connection** button.
- (2) The Communication type window (Figure 4-10) appears.

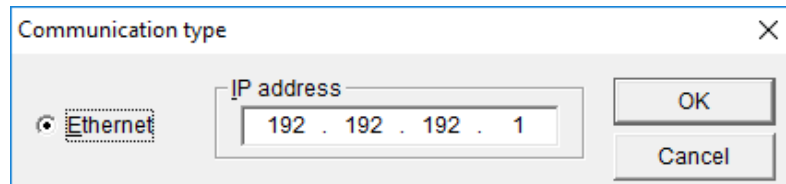


Figure 4-10 Communication type window (initial display)

- (3) Enter the IP address of the connection destination.
- (4) Click the **OK** button. The module information (mounting state and setting state) read from the PCs based on the IP address entered in step (3) is applied to the main window.

If you click the **Cancel** button, the module information read from the PCs based on the IP address prior to step (3) is applied to the main window.

4. Operation

4.1.7 Selecting an edition file

Function: Selects an existing J.NET configuration information file to be edited. This function works in the offline state.

Operation: The following describes the operation procedure.

- (1) In the main window (Figure 4-6), select the **Offline** radio button.
- (2) Click the **Edition file select** button.

The Open window (Figure 4-11) appears.

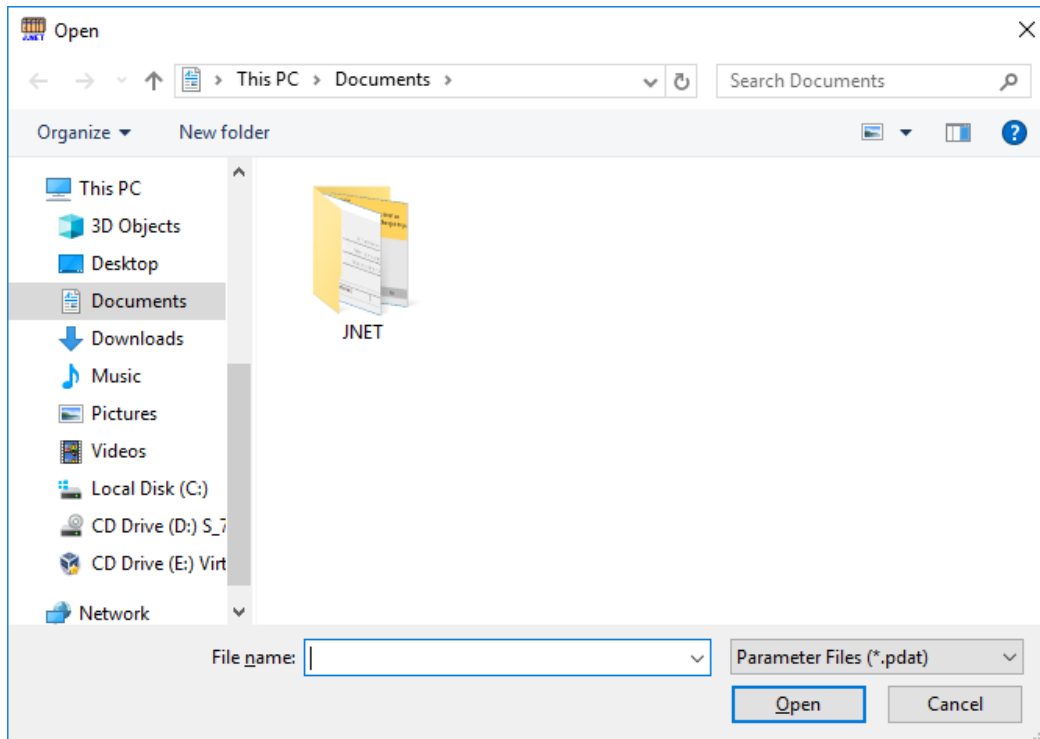


Figure 4-11 Open window

- (3) In the Open window, select a file to be edited, and then click the **Open** button.
When the Select File window (Figure 4-12) appears, click the **Select File** button.

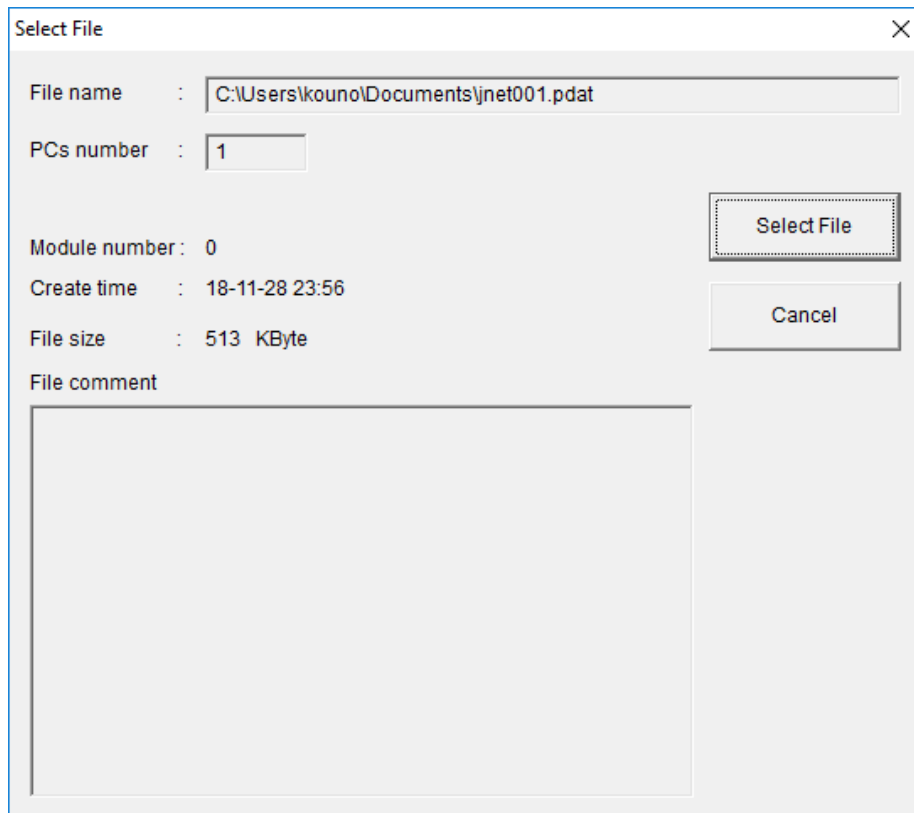


Figure 4-12 Select File window

For details about subsequent operations, see *4.2 Commands*.

4. Operation

4.1.8 Creating an edition file

Function: Creates a new J.NET module configuration information file. This function works in the offline state.

Operation: The following describes the operation procedure.

- (1) In the main window (Figure 4-6), select the **Offline** radio button.
- (2) Click the **Create edition file** button.

The Save As window (Figure 4-13) appears.

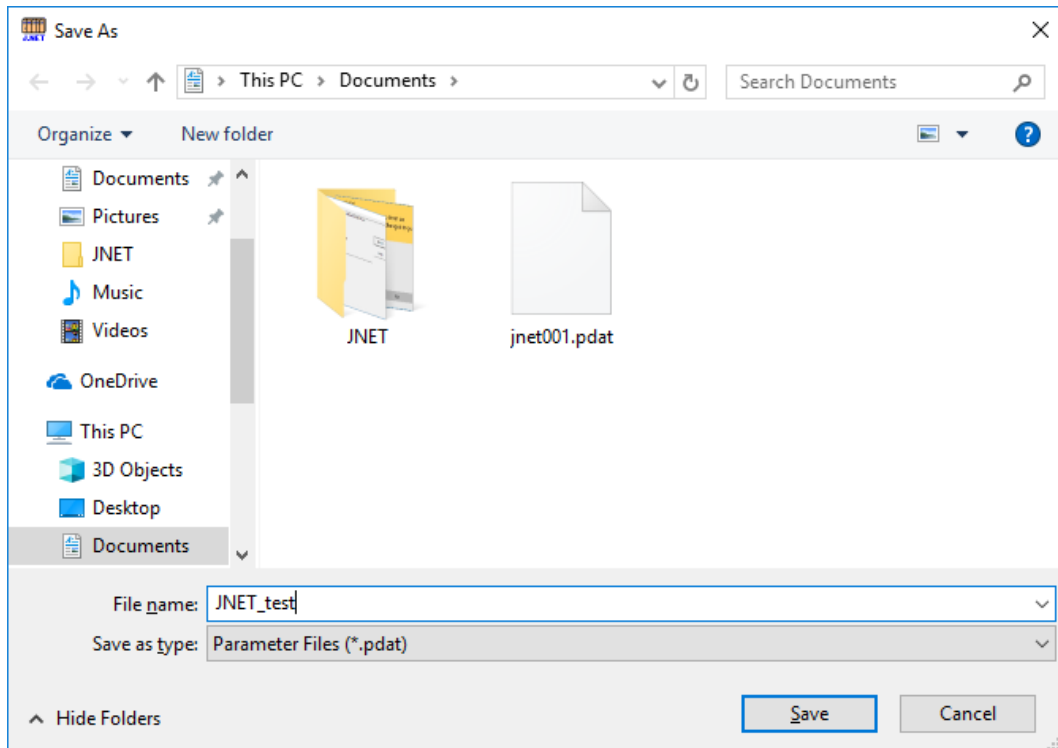


Figure 4-13 Save As window

- (3) Enter a name for the new file, and then click the **Save** button.

When the Creation confirmation window appears, specify a PCs number, select a module (module number), enter a file comment, and then click the **Save File** button.

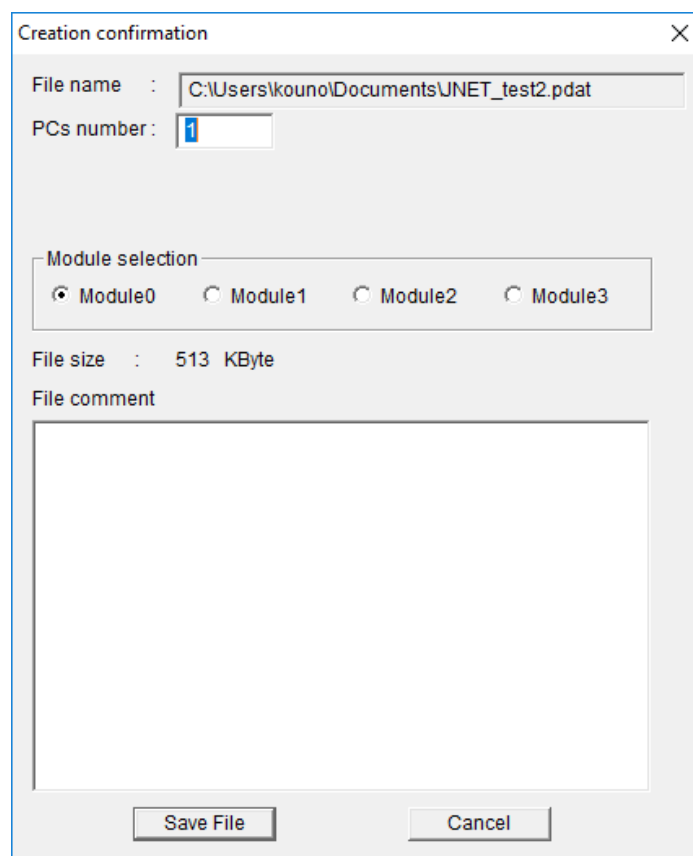


Figure 4-14 Creation confirmation window

- PCs number

Specify the PCs number. By default, the PCs number of the project selected by BASE SYSTEM/S10VE is displayed.

Setting range	0 to 9999
---------------	-----------

- Module selection

Select a J.NET module number. Select one of the radio buttons, **Module 0** to **Module 3**.

4. Operation

- **File comment**

You can enter any comment about the file by using a maximum of 512 characters.

For details about subsequent operations, see *4.2 Commands*.

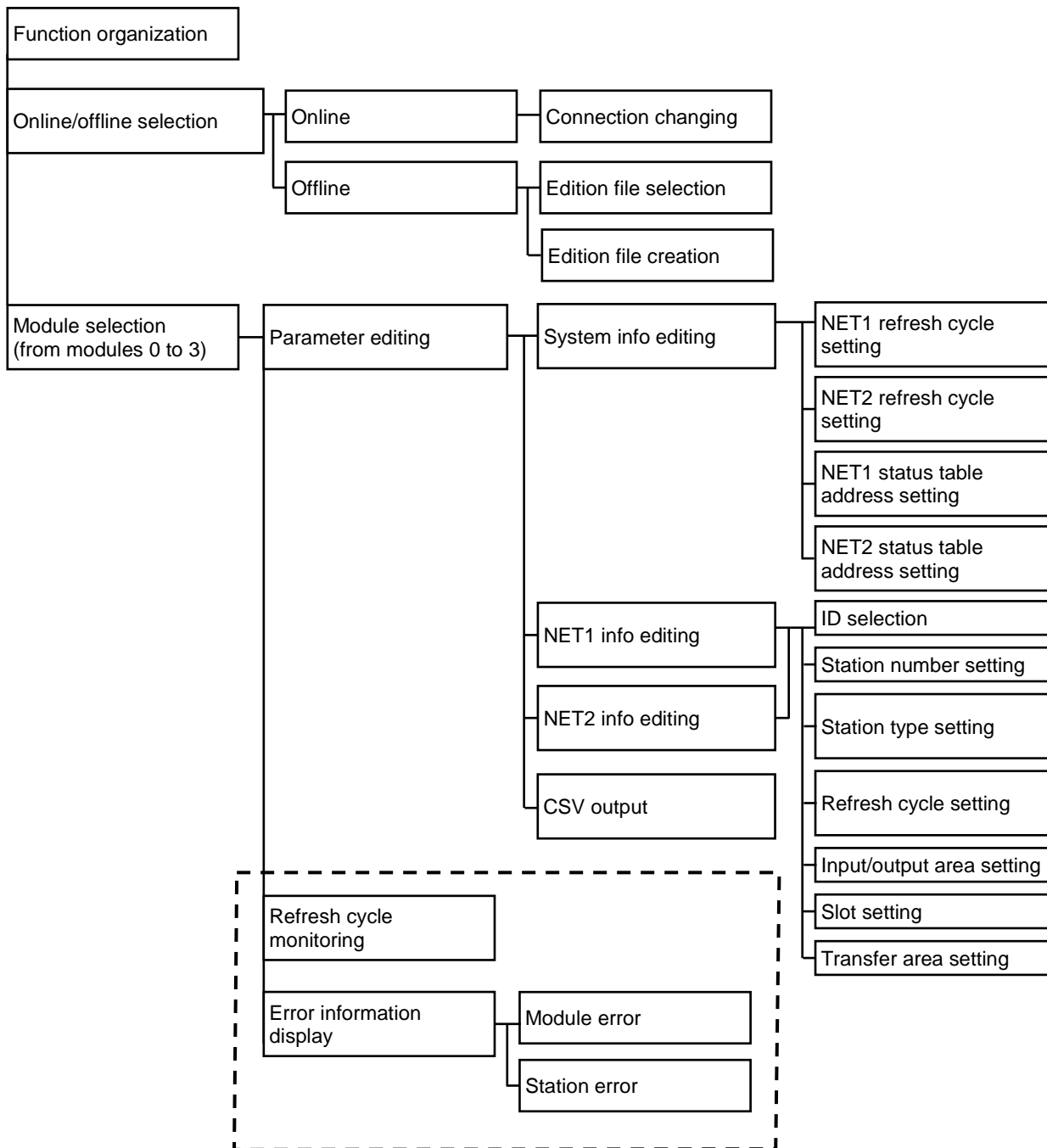
4.1.9 Closing the system

In the main window (Figure 4-6), click the **Close** button.

4.2 Commands

4.2.1 Organization of J.NET SYSTEM/S10VE functions

Figure 4-15 shows the organization of J.NET SYSTEM/S10VE functions.



┌──┐: Indicates that the functions enclosed can be used only when J.NET SYSTEM/S10VE is running in online mode.

Figure 4-15 Organization of J.NET SYSTEM/S10VE functions

4. Operation

4.2.2 J.NET SYSTEM/S10VE main window

The following describes the contents of the main window (Figure 4-16).

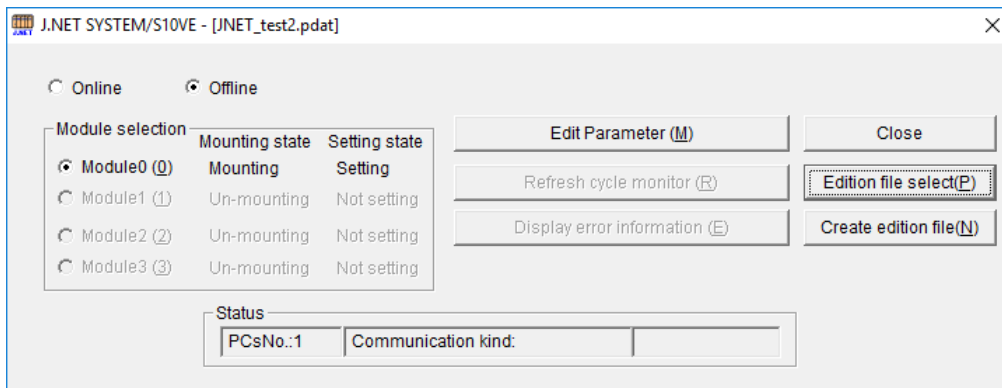


Figure 4-16 Main window

- Status display

In the **Status** area, information shown in *Table 4-1 Status display* is displayed.

Table 4-1 Status display

No.	Item	Not connected/not selected#	Offline state	Online state
1	PCsNo.	Blank	File information	Actual machine information
2	Communication kind	Blank	Blank	Ethernet and IP address

#: When **Online** is selected, the S10VE is not connected. When **Offline** is selected, no edition file is selected.

- Mounting state and Setting state display (online mode)

Table 4-2 shows the information displayed for **Mounting state** and **Setting state** in the **Module selection** area.

Table 4-2 Mounting state and setting state display in online mode

No.	J.NET module mounted?	CPU module parameters set?	Mounting state display	Setting state display	Receiving source
1	Yes	Yes	Mounting	Setting	Selected from the Receiving agency selection dialog box
2		No		Not setting	J.NET module
3	No	Yes	Non-mounting	Setting	CPU module
4		Not		Not setting	Reception not possible

Receiving agency indicates the module from which parameters to be edited are read.

- Mounting status and Setting status display (offline mode)

Mounting state displays **Mounting**, and **Setting state** displays **Setting**.

4. Operation

4.2.3 Editing parameters

Function: Chooses editing of the module system information, editing NET1 information, or editing NET2 information.

Operation: The following describes the operation procedure.

- (1) In the main window (Figure 4-8), select the desired module from the **Module selection** area, and then click the **Edit Parameter** button.

In online mode, if a J.NET module is mounted and CPU module parameters are set, the Receiving agency selection window (Figure 4-17) appears.

In this window, select the CPU module or option (J.NET module) from which parameters are to be read, and then click the **OK** button. If a J.NET module is not mounted or if CPU module parameters are not set, the Receiving agency selection window does not appear. In this case, parameters will be read from the J.NET module or CPU module that is automatically selected.

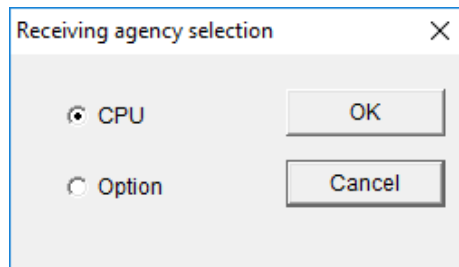


Figure 4-17 Receiving agency selection window

- (2) The Edit window (Figure 4-18) appears.

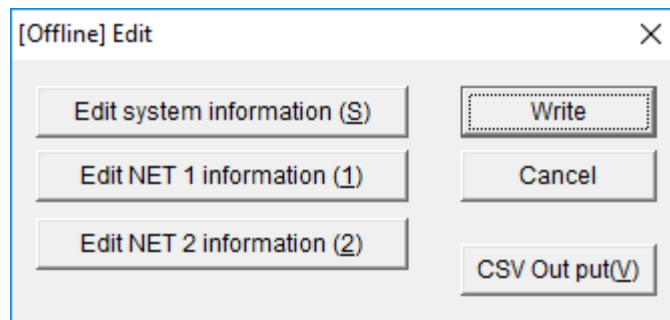


Figure 4-18 Edit window

<Note>

The radio buttons in the **Module selection** area can be selected only when a module is mounted or a parameter of the appropriate module is set to the CPU module.

If no module is mounted and the CPU module is not set with any parameter, you cannot edit parameters online. Editing parameters online is enabled when a module is mounted or after a parameter that is edited offline is sent by using the data transmission/reception function of BASE SYSTEM/S10VE.

4.2.4 Editing system information

Function: Edits system information of the module.

Operation: The following describes the operation procedure.

- (1) In the Edit window (Figure 4-18), click the **Edit system information** button.
- (2) The Edit system information window (Figure 4-19) appears.

Figure 4-19 Edit system information window

- Setting a NET1 (NET2) refresh cycle

Set a refresh cycle for the I/O service. (If a sequence cycle is selected, the I/O service is refreshed in synchronization with the sequence cycle.)

Do not set the refresh cycle to a duration shorter than the communication time calculated in section 6.2.

Setting range	3 to 3000	Unit: ms
---------------	-----------	----------

- Setting the NET1 (NET2) status table

Set the starting address of the NET status table. Set the address listed in *Table 4-3 NET status table addresses that can be set*, by using the PI/O register format.

Table 4-3 NET status table addresses that can be set

No.	Address that can be set	
	PI/O register setting range	Address setting range
1	X0000 to XFFFF	H700000 to H71FFFE
2	J000 to JFFF	H0A2000 to H0A3FFE
3	Y0000 to YFFFF	H700000 to H73FFFE
4	Q0000 to QFFFF	H740000 to H75FFFE
5	G000 to GFFF	H0A8000 to H0A9FFE
6	R000 to RFFF	H0AC000 to H0ADFFE
7	M0000 to MFFFF	H760000 to H77FFFE
8	E0400 to EFFFF	H780800 to H79FFFE
9	LB0000 to LBFFFF	H220000 to H23FFFE

4. Operation

- (3) When the setting is complete, click the **OK** button.
To cancel the setting, click the **Cancel** button.

4.2.5 Editing NET1 information (or NET2 information)

Function: Edits NET1 information (NET2 information) of the module.

Operation: The following describes the operation procedure.

- (1) In the Edit window (Figure 4-18), click the **Edit NET1 information** or **Edit NET2 information** button.
- (2) The Edit information window (Figure 4-20) appears. Click the ID (station ID) to be edited, and then click the **Edit** button.

Setting range	H01 to H1F
---------------	------------

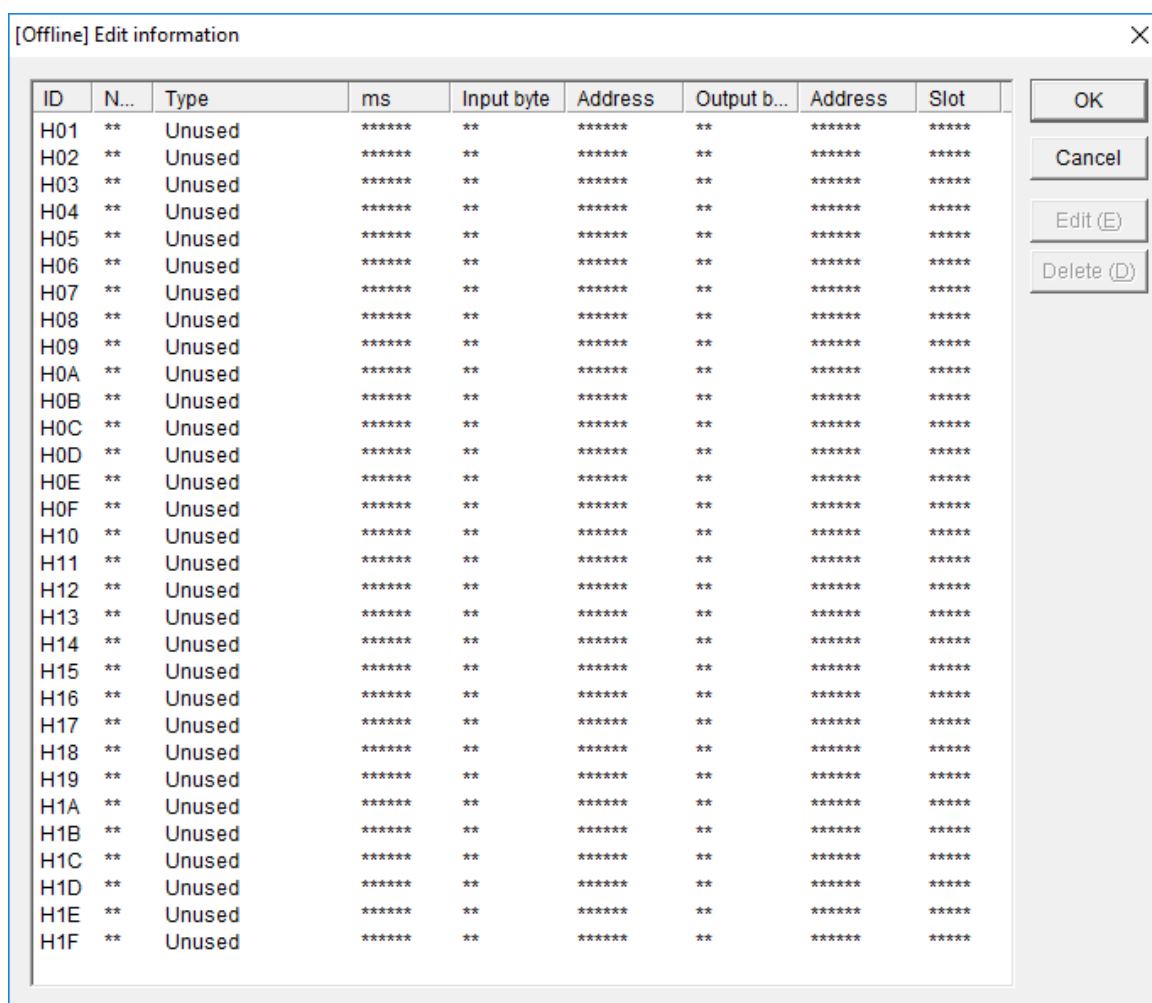


Figure 4-20 Edit information window

4. Operation

(3) The Edit window (Figure 4-21) appears. Set a station number, a station type, and a station timeout time.

The 'Edit' window contains the following fields and sections:

- Station number (N):** H 00
- Station type (T):** [Dropdown menu]
- Timeout time of station (C):** 0 [*10ms]
- I/O area:**
 - Input byte (W): H 000
 - Input address (A): 000000
 - Output byte (O): H 000
 - Output address (D): 000000
- Transfer area:**
 - Transfer byte (R): H []
 - Transfer address (S): H []
- Slot:**

Slot num...	I/O type	Transfer...	Transfer a...
H0	****	**	*****
H1	****	**	*****
H2	****	**	*****
H3	****	**	*****
H4	****	**	*****
H5	****	**	*****
...	****	**	*****

Figure 4-21 Edit window

- Station number

Set the station number to be assigned to the substation.

Setting range	H01 to H7F
---------------	------------

- Station type

Select the station type that best suits the substation specifications. (Select from among the station types in Table 4-4.)

Note: Do not select J . STATION (EXTENDED) or J . STATION (STANDARD) .

Table 4-4 Station type list

No.	Station type	Specification	Required operation		
			I/O area configuration	Transfer area configuration	Slot information setting
1	AUTO	I/O, unspecified I/O transfer, and polled PUT/GET	Required	--	--
2	I/O	I/O and specified I/O transfer	--	--	Required
3	I/O+DR/DW	I/O, specified I/O transfer, and polled PUT/GET	--	--	Required
4	DR/DW	Polled PUT/GET only	--	--	--

- Timeout time of station

Set the length of time for which the station monitors the refresh cycle of the J.NET module. This refresh cycle must be at least five times longer than the NET1 (NET2) refresh cycle setting. If a substation registered with the same network cannot communicate properly due to, for example, power failure or disconnection, the refresh cycle of the J.NET module is prolonged. This might cause a communication error in another substation that is communicating normally. To prevent this communication error, set the value calculated by using the formula indicated in *Table 4-5 Station timeout calculation formula for different communication speeds*.

Table 4-5 Station timeout calculation formula for different communication speeds

No.	Communication speed	Setting (N denotes the number of stations registered)
1	125 kbps	$\{(N-1) \times 128[\text{ms}] + (\text{NET1}(\text{NET2}) \text{ refresh cycle time } [\text{ms}])\} \times 5 \text{ or more}$
2	250 kbps	$\{(N-1) \times 64[\text{ms}] + (\text{NET1}(\text{NET2}) \text{ refresh cycle time } [\text{ms}])\} \times 5 \text{ or more}$
3	500 kbps	$\{(N-1) \times 32[\text{ms}] + (\text{NET1}(\text{NET2}) \text{ refresh cycle time } [\text{ms}])\} \times 5 \text{ or more}$
4	1 Mbps	$\{(N-1) \times 16[\text{ms}] + (\text{NET1}(\text{NET2}) \text{ refresh cycle time } [\text{ms}])\} \times 5 \text{ or more}$

Setting range	0 to 65535	(1 unit = [10 ms])
---------------	------------	--------------------

If you set 0, refresh cycle monitoring is suppressed.

4. Operation

(4) Selecting the slot number

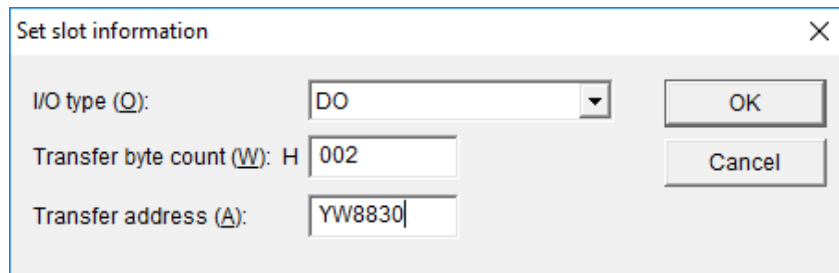
Select the number of the I/O slot in which you want to mount the module.

Setting range	H0 to HF
---------------	----------

When I/O or I/O+DR/DW is selected as a station type, slot setting is enabled.

Click any slot number, and then click the **Set slot** button.

In the Set slot information window (Figure 4-22) that appears, fill in the items. When the setting is complete, click the **OK** button. To cancel the setting, click the **Cancel** button.



The screenshot shows a dialog box titled "Set slot information" with a close button (X) in the top right corner. It contains three input fields: "I/O type (Q):" with a dropdown menu showing "DO", "Transfer byte count (W): H" with a text box containing "002", and "Transfer address (A):" with a text box containing "YW8830". There are "OK" and "Cancel" buttons on the right side.

Figure 4-22 Set slot information window

- I/O type

Select the I/O module to be mounted in the I/O slot. *Table 4-6 I/O types* lists the items that can be selected for I/O modules.

Table 4-6 I/O types

No.	Choice	Remarks
1	Delete	Default
2	DI	
3	DO	
4	AI	
5	AO	

- **Transfer byte count**

Enter a hexadecimal number as the transfer bytes of each slot.

Setting range	H01 to H100
---------------	-------------

- **Transfer address**

Enter the starting address to be assigned to each slot, by using the PI/O register format. *Table 4-7 List of transfer addresses that can be set* lists the transfer addresses that can be set.

Table 4-7 List of transfer addresses that can be set

No.	Addresses that can be set	
	PI/O register setting range	Address setting range
1	XW0000 to XWFFF0	H441000 to H442FFE
2	JW0000 to JWFFF0	H0E0200 to H0E03FE
3	YW0000 to YWFFF0	H443000 to H444FFE
4	QW0000 to QWFFF0	H445000 to H446FFE
5	GW0000 to GWFFF0	H0E0800 to H0E09FE
6	RW0000 to RWFFF0	H0E0C00 to H0E0DFE
7	MW0000 to MWFFF0	H447000 to H448FFE
8	EW0400 to EWFFF0	H449080 to H44AFFE
9	FW0000 to FWBFF	H0E2000 to H0E37FE
10	LBW0000 to LBWFFF0	H412000 to H413FFE
11	LWW0000 to LWWFFFF	H450000 to H46FFFE
12	LXW0000 to LXW3FFF	H4A0000 to H4A7FFE

(5) When the settings are complete, click the **OK** button.

If you do not want to save the settings, click the **Cancel** button.

4. Operation

4.2.6 Writing editing results

To write the editing results, click the **Write** button in the Edit window.

- Online mode: Editing results are written to the PCs.
- Offline mode: Editing results are written to a configuration information file.

- Online writing (write to PCs)

(1) In the Edit window (Figure 4-18), click the **Write** button.

The Option module parameter setup list window (Figure 4-23) appears.

This window displays option modules set in the CPU module. If **NONE** (*module-ID*, *module-number*) is displayed for **Module Name**, the setup tool for the option module identified by the module ID and number is not installed. Install the setup tool.

In the **No.** column, click the number for which you want to write parameters, and then click the **OK** button. To cancel the write operation, click the **Cancel** button.

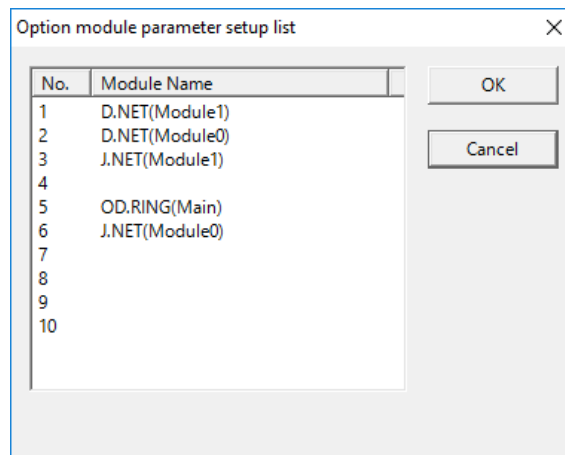


Figure 4-23 Option module parameter setup list window

(2) When the parameters have been written, a confirmation message (Figure 4-24) appears, asking you whether you want to reset the PCs.

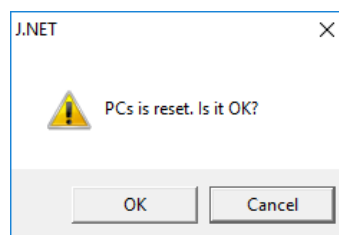


Figure 4-24 Reset confirmation message

To reset the PCs, click the **OK** button. If you do not want to reset the PCs, click the **Cancel** button. In this case, the parameters prior to write are used in communication until the PCs are reset.

- (3) If PCs are reset successfully, the message `PCs reset succeeded.` appears. Then, the J.NET module begins communication by using the written parameters.
- If reset of the PCs fails, the message `PCs reset failed.` appears. In this case, manually reset the PCs or perform a power-on reset. For details about how to manually reset the PCs, see 8.4.3.5
- Online menu: Remote reset* in the *SIOVE User's Manual General Description* (manual number SEE-1-001).

Notice

- Until the PCs are reset, the parameters written to the CPU modules do not take effect. If you do not reset the PCs, or if reset of the PCs fails, manually reset the PCs, or perform a power-on reset.

4. Operation

- Offline writing (write to a file)

(1) In the Edit window (Figure 4-18) in offline mode, click the **Write** button.

The Save File window (Figure 4-25) appears.

You can change the **PCs number** and **File comment** settings. After checking the displayed information, click the **Save File** button. To cancel the write operation, click the **Cancel** button.

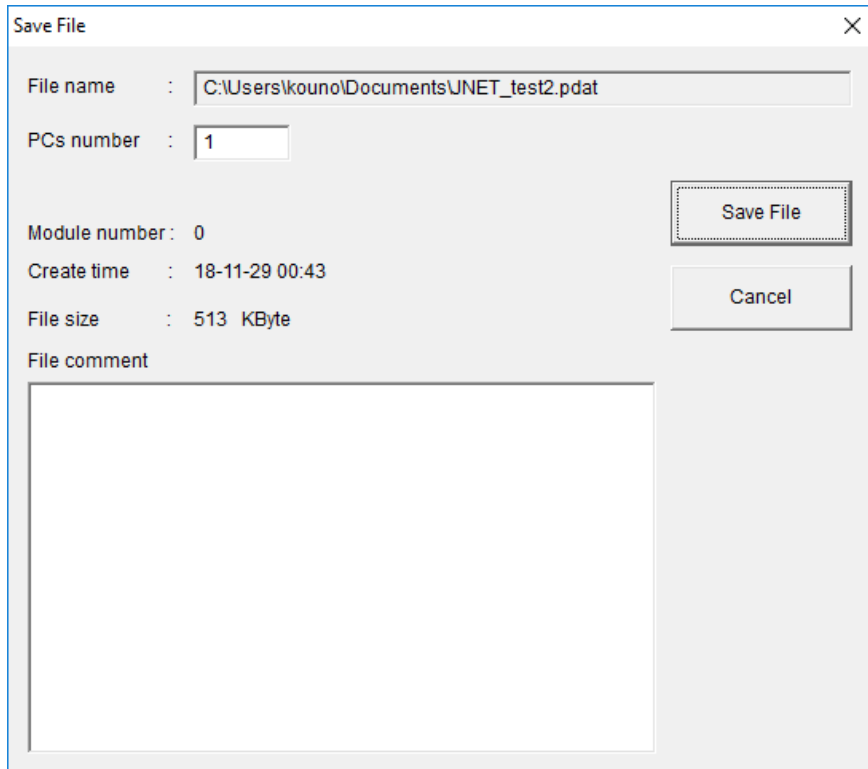


Figure 4-25 Save File window

(2) Clicking the **Save File** button causes the file save completion message (Figure 4-26) to appear, and the save operation is completed.

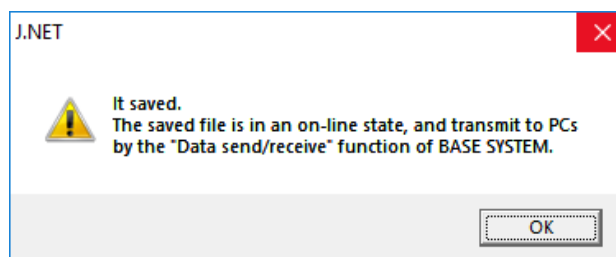


Figure 4-26 File save completion message

Notice

- Set the PCs number of the S10VE you want to configure. If the S10VE does not match the PCs number, configuration information that is edited offline cannot be sent by the data transmission/reception function of BASE SYSTEM/S10VE. Setting 9999 as the PCs number enables transmission regardless of the PCs number of the S10VE. However, note that it becomes impossible to check transmission to unintended PCs.

4. Operation

4.2.7 Refresh cycle monitor

Function: Monitors the refresh cycle.

Operation: The following describes the operation procedure.

- (1) In the main window (Figure 4-8), click the **Refresh cycle monitor** button.
- (2) The Refresh cycle monitor window (Figure 4-27) appears.

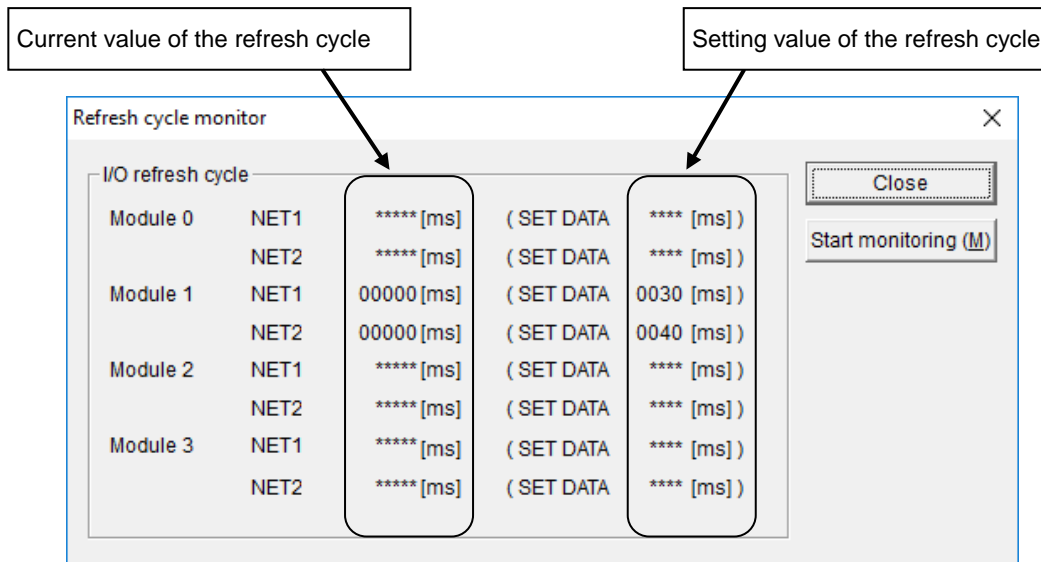


Figure 4-27 Refresh cycle monitor window

The current value of the refresh cycle is displayed as a decimal number (unit: ms). SET DATA indicates the setting value of the refresh cycle as a decimal number (unit: ms). If a module is not mounted, both the current value and setting value are displayed as *****.

- (3) To start monitoring, click the **Start monitoring** button. After monitoring starts, the **Start monitoring** button changes to the **Stop monitoring** button.
- (4) To stop monitoring in the monitoring status, click the **Stop monitoring** button. After monitoring stops, the **Stop monitoring** button changes to the **Start monitoring** button.
- (5) To close the Refresh cycle monitor window, click the **Close** button.

4.2.8 Displaying error information

Function: Selects **Module error** or **Station error** to display error information for the module.

Operation: The following describes the operation procedure.

- (1) In the main window (Figure 4-8), select the module in the module selection area, and then click the **Display error information** button.
- (2) The Error information window (Figure 4-28) appears.

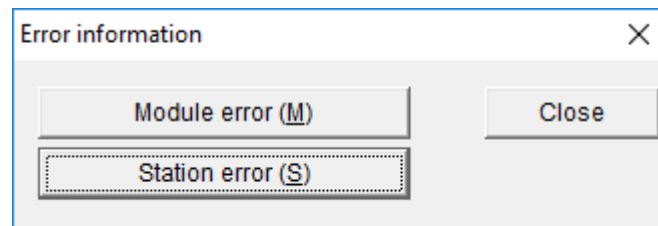


Figure 4-28 Error information window

To display module error information, click the **Module error** button (see 4.2.9 *Module error*).

To display station error information, click the **Station error** button (see 4.2.10 *Station error*).

4. Operation

4.2.9 Module error

Function: Displays error information for the module.

Operation: The following describes the operation procedure.

- (1) In the Error information window (Figure 4-28), click the **Module error** button. If the module is normal, the message The module is normal appears. If the module contains an error, the Module error window (Figure 4-29) appears.

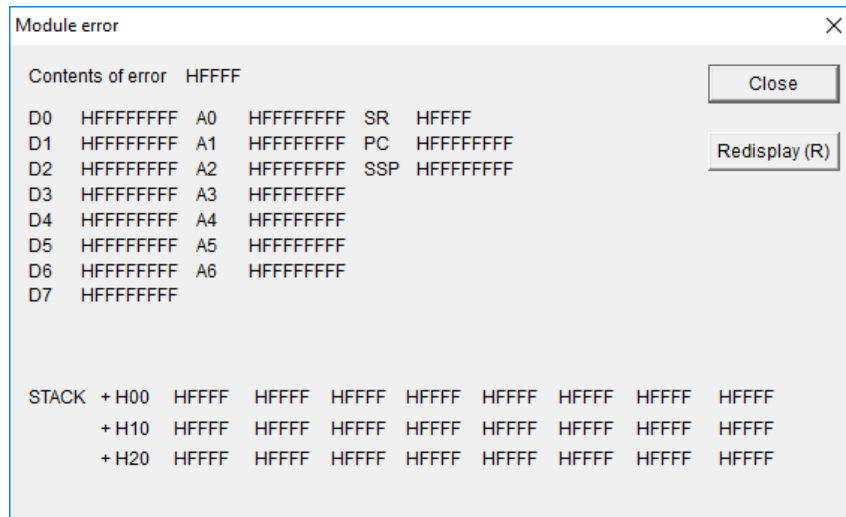


Figure 4-29 Module error window

- (2) Click the **Redisplay** button to display the latest error information.
To close the Module error window, click the **Close** button.

4.2.10 Station error

Function: Displays station error information for the module.

Operation: The following describes the operation procedure.

- (1) In the Error information window (Figure 4-28), click the **Station error** button. The Station error window (Figure 4-30) appears.

For details about the NET1 error codes (NET1 EC) and NET2 error codes (NET2 EC), see 13.2.2.2

J.NET module troubleshooting in the *S10VE User's Manual General Description* (manual number SEE-1-001).

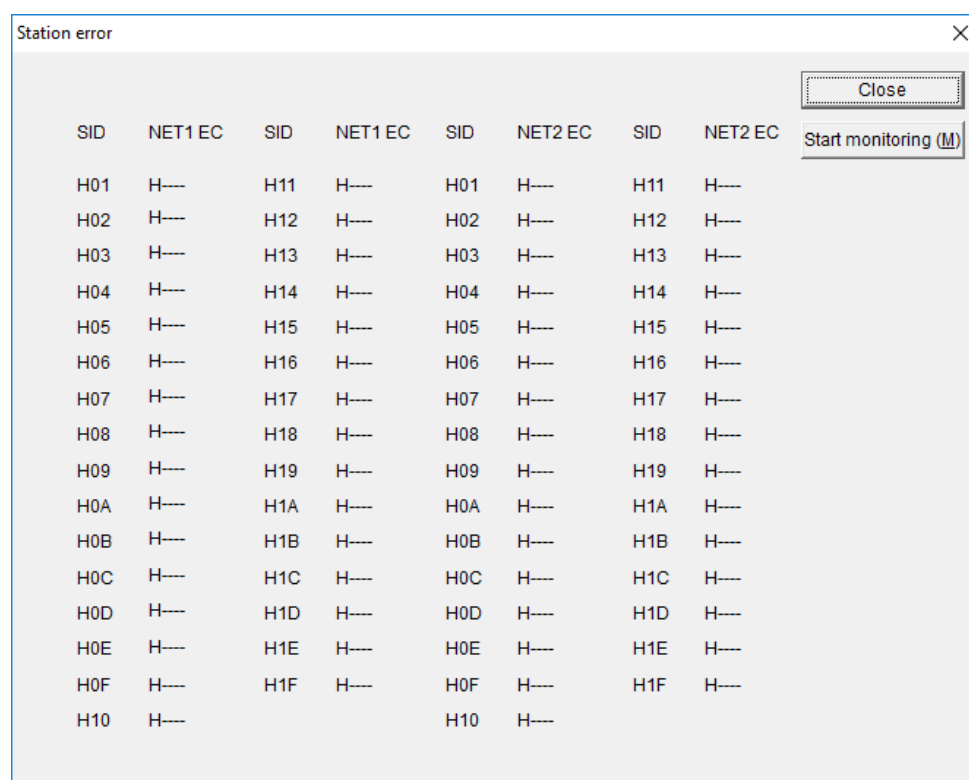


Figure 4-30 Station error window

- (2) To start monitoring, click the **Start monitoring** button. After monitoring starts, the **Start monitoring** button changes to the **Stop monitoring** button.
- (3) To stop monitoring, click the **Stop monitoring** button. After monitoring stops, the **Stop monitoring** button changes to the **Start monitoring** button.
- (4) To close the Station error window, click the **Close** button.

Notice

- Station error information remains even after normal communication is restored. The error information is cleared after the PCs are reset or after a power-on reset is performed.

4. Operation

4.2.11 CSV output

Function: Outputs configuration information for a module to a file in CSV format. In online mode, the configuration information for the actual target machine is output. In offline mode, configuration information contained in a selected file is output.

Operation: The following describes the operation procedure.

- (1) In online mode, establish a connection between the J.NET system and the PCs (see *4.1.6 Changing connections*). In offline mode, select an edition file (see *4.1.7 Selecting an edition file*).
- (2) In the main window (Figure 4-8), click the **Edit Parameter** button. The Edit window appears (see *4.2.3 Editing parameters*).
- (3) In the Edit window (Figure 4-18), click the **CSV Output** button.
- (4) The Save As window (Figure 4-31) appears. Specify the desired folder and file to which you want to output the configuration information, and then click the **Save** button.

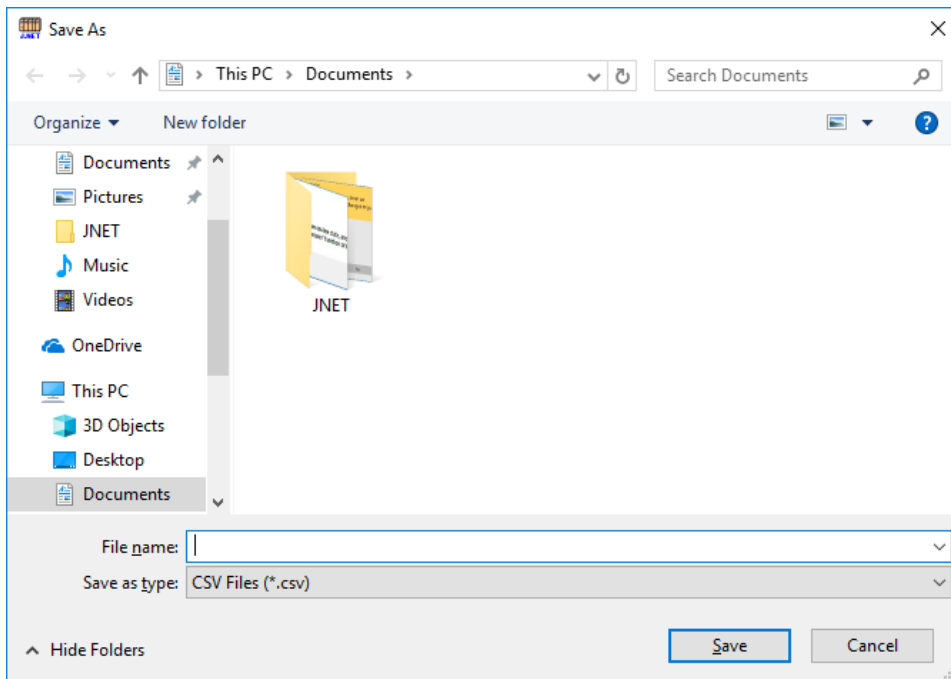


Figure 4-31 Save As window

CSV file output example

```
J.NET      2018/01/15   21:38:02
File name = C:\temp\Settings\JN_m3.pdat
PCs number: 123
```

In online mode, the communication type is displayed.
Example: Ethernet (192.192.192.1)

```
***** NET1 information *****
```

```
System information
```

```
Refresh cycle,3[ms]
```

```
Status table address,R100
```

```
Station information
```

```
ID,Station number,Station type,Station timeout time,Input bytes,Input  
address,Output bytes,Output address,Slot
```

```
H01,H01,AUTO,000110,H04,FW100,H04,FW200,VALID,
```

```
H06,H06,J.STATION (EXT.),000200,**,*****,**,*****,*****,
```

```
ID H01
```

```
Slot information
```

```
Slot number,I/O type,Transfer bytes,Transfer address,
```

```
H0,DI,H04,FW100,
```

```
H1,DO,H04,FW200,
```

```
H2,****,**,*****,
```

```
H3,****,**,*****,
```

```
H4,****,**,*****,
```

```
H5,****,**,*****,
```

```
H6,****,**,*****,
```

```
H7,****,**,*****,
```

```
H8,****,**,*****,
```

```
H9,****,**,*****,
```

```
HA,****,**,*****,
```

```
HB,****,**,*****,
```

```
HC,****,**,*****,
```

```
HD,****,**,*****,
```

```
HE,****,**,*****,
```

```
HF,****,**,*****,
```

```
***** NET2 information *****
```

```
System information
```

```
Refresh cycle,Sequence cycle
```

```
Status table address,Unused
```

```
Station information
```

```
ID,Station number,Station type,Station timeout time,Input byte,Input  
address,Output bytes,Output address,Slot
```

Subsequent information is the same as NET1.

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5. Programming

5.1 Software configuration of the J.NET module

The following shows the software configuration of the J.NET module.

The communication control program is a ROM program and does not need to be loaded.

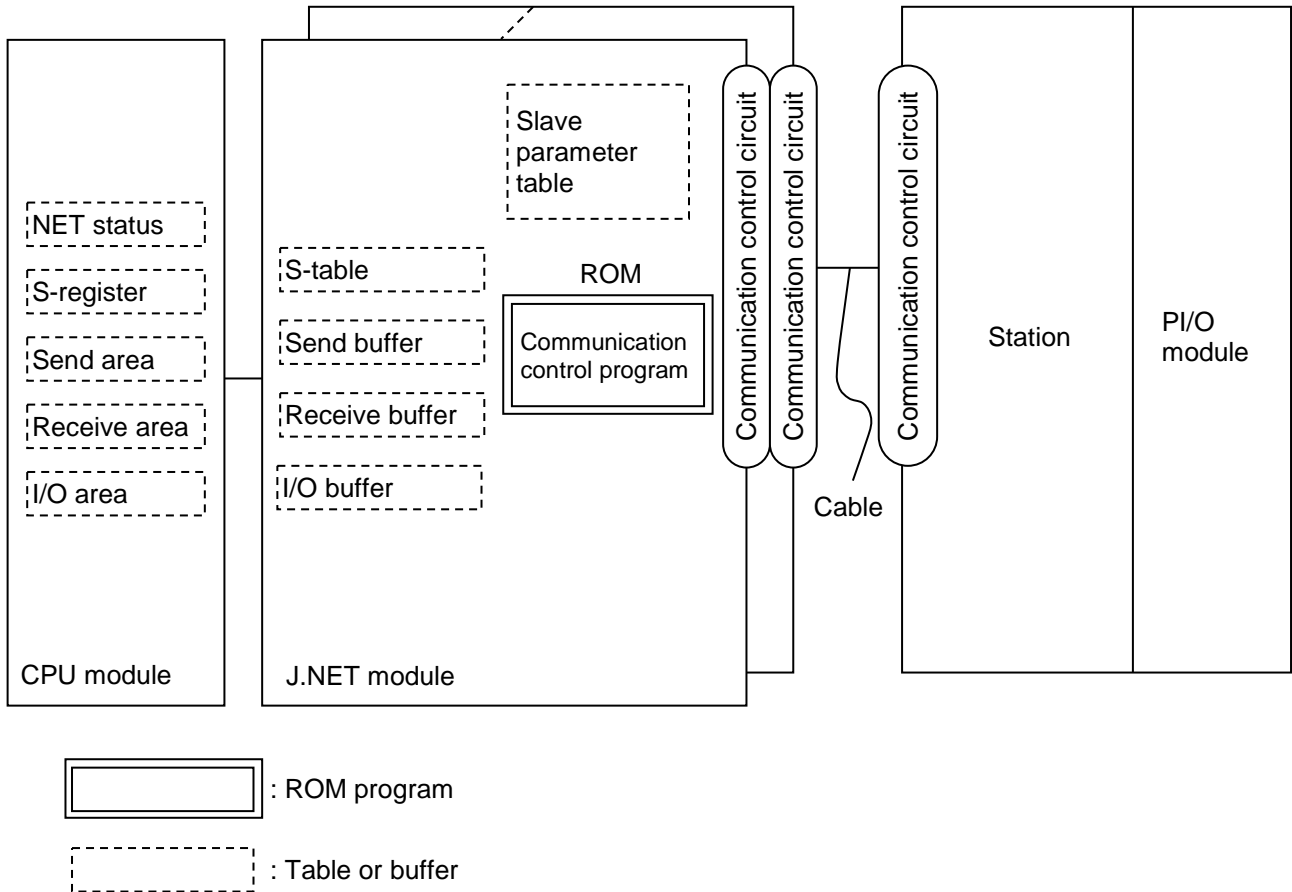


Figure 5-1 Software configuration of the J.NET module

5. Programming

- Communication control program

- This program performs I/O communication between the PI/O unit and the CPU module.

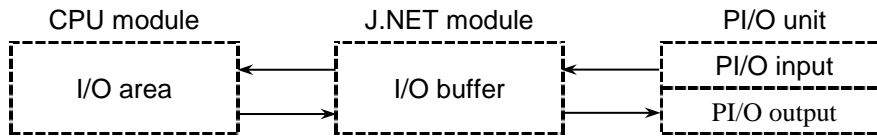


Figure 5-2 Flow of communication data of the communication control program

- NET status, S-register, and S-table

These tables and register contain data transmission/reception information and error information set by the communication control program. User programs reference this information to transmit and receive information and handle errors.

- I/O area

Table 5-1 lists I/O areas that permit I/O communication.

Table 5-1 I/O areas

Name	Symbol range	Number of points
External input	XW0000 (X0000) to XWFFF0 (XFFFF)	4,096 words (65,536 points)
External output	YW0000 (Y0000) to YWFFF0 (YFFFF)	4,096 words (65,536 points)
Internal register	RW000 (R000) to RWFF0 (RFFF)	256 words (4,096 points)
Global link register	GW000 (G000) to GWFF0 (GFFF)	256 words (4,096 points)
Transfer register	JW000 (J000) to JWFF0 (JFFF)	256 words (4,096 points)
Receive register	QW0000 (Q0000) to QWFFF0 (QFFFF)	4,096 words (65,536 points)
Event register	EW0400 (E0400) to EWFFF0 (EFFFF)	3,072 words (49,152 points)
Extended internal register	MW0000 (M0000) to MWFFF0 (MFFFF)	4,096 words (65,536 points)
Function work register	FW000 to FWBFF	3,072 words
Work register	LBW0000 to LBWFFF0	8,192 words (131,072 points)
Word work register	LWW0000 to LWWFFFF	65,536 words
Word work register	LXW0000 to LXW3FFF	16,384 words

5.2 NET status

The NET status table stores the communication information of each station.

The user must register the starting address of the NET status table from the following bit areas by using the tool system. Table 5-2 shows the configuration of the NET status table.

The following nine types of areas can be registered:

X0000 to XFFFF

Y0000 to YFFFF

J000 to JFFF

Q0000 to QFFFF

G000 to GFFF

R000 to RFFF

E0400 to EFFFF

M0000 to MFFFF

LB0000 to LBFFFF

A NET status table with a capacity of 128 consecutive points needs to be registered for N1 and N2 respectively. For example, if a NET status table starting at X0500 is specified, it would take up X0500 to X057F. In this case, X05 is displayed in $\Delta\Delta\Delta$ in Table 5-2.

Table 5-2 NET status table configuration

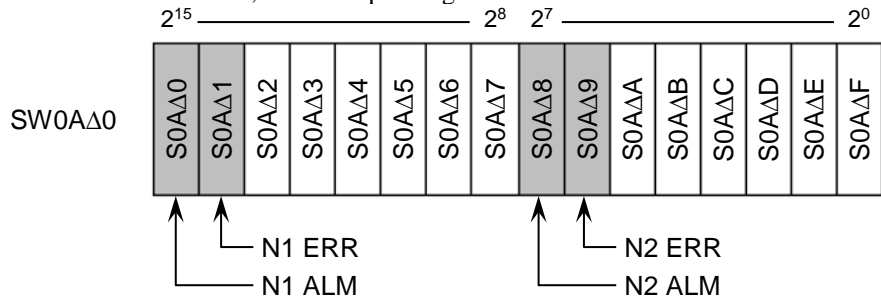
$\Delta\Delta\Delta$ denotes a registered symbol.

Station ID	Send enable flag	Data receive flag	Response receive flag	Error flag
Free	--	--	--	--
1	$\Delta\Delta\Delta 01$	$\Delta\Delta\Delta 21$	$\Delta\Delta\Delta 41$	$\Delta\Delta\Delta 61$
2	$\Delta\Delta\Delta 02$	$\Delta\Delta\Delta 22$	$\Delta\Delta\Delta 42$	$\Delta\Delta\Delta 62$
\int	\int	\int	\int	\int
30	$\Delta\Delta\Delta 1E$	$\Delta\Delta\Delta 3E$	$\Delta\Delta\Delta 5E$	$\Delta\Delta\Delta 7E$
31	$\Delta\Delta\Delta 1F$	$\Delta\Delta\Delta 3F$	$\Delta\Delta\Delta 5F$	$\Delta\Delta\Delta F$

Bit	0	Transmitting	No data received	No response received	No error
	1	Transmission enabled	Data received	Response received	Error

5.3 S-register

The S-register stores error information for N1 and N2 respectively. If an error occurs in any one of the stations (substations) connected to N1 or N2, the corresponding bit is set to 1.



(Note) ALM: Communication error
 ERR: Hardware error
 Δ : = 0: Main module
 = 8: Sub module
 = A: Sub2 module
 = C: Sub3 module

Symbol	Bit	Description
S0A Δ 0	0	Communication over NET1 is proceeding normally.
	1	A communication error occurred in NET1.
S0A Δ 1	0	NET1 is running normally.
	1	A hardware error occurred in NET1.
S0A Δ 8	0	Communication over NET2 is proceeding normally.
	1	A communication error occurred in NET2.
S0A Δ 9	0	NET2 is running normally.
	1	A hardware error occurred in NET2.

Note: Other bits cannot be used.

Figure 5-3 S-register

5.4 S-table

The S-table holds addresses at which the number of bytes in received data, the number of bytes in received responses, and error codes generated during communication are stored. For details about error codes, see the *SIOVE User's Manual General Description* (manual number SEE-1-001).

Table 5-3 S-table allocation (main module)

Network number	Station ID	Main module		
		Number of bytes in received data	Number of bytes in received responses	Error code
N1	(255)	/A40000	/A40040	/A40080
	1	/A40002	/A40042	/A40082
	2	/A40004	/A40044	/A40084
	:	:	:	:
	30	/A4003C	/A4007C	/A400BC
	31	/A4003E	/A4007E	/A400BE
N2	(255)	/A40100	/A40140	/A40180
	1	/A40102	/A40142	/A40182
	2	/A40104	/A40144	/A40184
	:	:	:	:
	30	/A4013C	/A4017C	/A401BC
	31	/A4013E	/A4017E	/A401BE

Table 5-4 S-table allocation (sub module)

Network number	Station ID	Sub module		
		Number of bytes in received data	Number of bytes in received responses	Error code
N1	(255)	/AC0000	/AC0040	/AC0080
	1	/AC0002	/AC0042	/AC0082
	2	/AC0004	/AC0044	/AC0084
	:	:	:	:
	30	/AC003C	/AC007C	/AC00BC
	31	/AC003E	/AC007E	/AC00BE
N2	(255)	/AC0100	/AC0140	/AC0180
	1	/AC0102	/AC0142	/AC0182
	2	/AC0104	/AC0144	/AC0184
	:	:	:	:
	30	/AC013C	/AC017C	/AC01BC
	31	/AC013E	/AC017E	/AC01BE

Table 5-5 S-table allocation (sub2 module)

Network number	Station ID	Sub2 module		
		Number of bytes of received data	Number of bytes of received responses	Error codes
N1	(255)	/C40000	/C40040	/C40080
	1	/C40002	/C40042	/C40082
	2	/C40004	/C40044	/C40084
	:	:	:	:
	30	/C4003C	/C4007C	/C400BC
	31	/C4003E	/C4007E	/C400BE
N2	(255)	/C40100	/C40140	/C40180
	1	/C40102	/C40142	/C40182
	2	/C40104	/C40144	/C40184
	:	:	:	:
	30	/C4013C	/C4017C	/C401BC
	31	/C4013E	/C4017E	/C401BE

Table 5-6 S-table allocation (sub3 module)

Network number	Station ID	Sub3 module		
		Number of bytes in received data	Number of bytes in received responses	Error codes
N1	(255)	/CC0000	/CC0040	/CC0080
	1	/CC0002	/CC0042	/CC0082
	2	/CC0004	/CC0044	/CC0084
	:	:	:	:
	30	/CC003C	/CC007C	/CC00BC
	31	/CC003E	/CC007E	/CC00BE
N2	(255)	/CC0100	/CC0140	/CC0180
	1	/CC0102	/CC0142	/CC0182
	2	/CC0104	/CC0144	/CC0184
	:	:	:	:
	30	/CC013C	/CC017C	/CC01BC
	31	/CC013E	/CC017E	/CC01BE

6. User's Guide

6.1 JEMA standard compliance

For details, see *1.3 Support specifications for JEMA standard*.

6.2 Communication times

For option modules including a J.NET module, each module updates its corresponding I/O data periodically according to the communication time of each module. The CPU module prepares the I/O data updated by the option module, and then uses the ladder program to control the option module. Because the ladder program runs repeatedly at each constant cycle (sequence cycle) to avoid missing I/O data, the communication time of each option module must be set to 1/2 of the sequence cycle.

The communication time of an option module depends on the communication word count setting of each option module and the number of option modules mounted on the CPU unit. To calculate the communication time of a J.NET module, use the following method. For details about how to calculate the communication time of an option module other than a J.NET module, see the manual of the relevant option module.

- Communication time of a J.NET module

The communication time of a J.NET module is the sum of each slave device's communication time indicated in the following formula. In other words, if slave devices connected to the J.NET module are assumed as slave device 1, slave device 2, ... slave device n , the communication time is calculated as follows:

$$\begin{aligned} \text{Communication time} = & \text{Communication time of slave device 1} \\ & + \text{Communication time of slave device 2} \\ & \quad \vdots \\ & + \text{Communication time of slave device } n \end{aligned}$$

- If the module is connected to J.STATION

The communication time for one J.STATION depends on the transmission speed and the number of I/O points assigned to the J.STATION. Use the following table to calculate the communication time.

Table 6-1 J.STATION communication time

Formula to find the communication time for one J.STATION N : Number of I/O points assigned to J.STATION)	Communication time = $1.85 + 0.0031 N$ [ms] (transmission speed 1 Mbps)
	Communication time = $2.35 + 0.0054 N$ [ms] (transmission speed 0.5 Mbps)
	Communication time = $3.45 + 0.0092 N$ [ms] (transmission speed 0.25 Mbps)
	Communication time = $4.85 + 0.0176 N$ [ms] (transmission speed 0.125 Mbps)

- If the module is connected to a device other than J.STATION

For details about the communication time of devices other than J.STATION, see the instruction manual of your device.

- Example of communication time calculation

Calculate the communication time for the configuration shown in Figure 6-1.

The communication time is the sum of the communication time of J.STATION (1), J.STATION (2) and J.STATION (3). In the following calculation, the communication time is 11.1 ms.

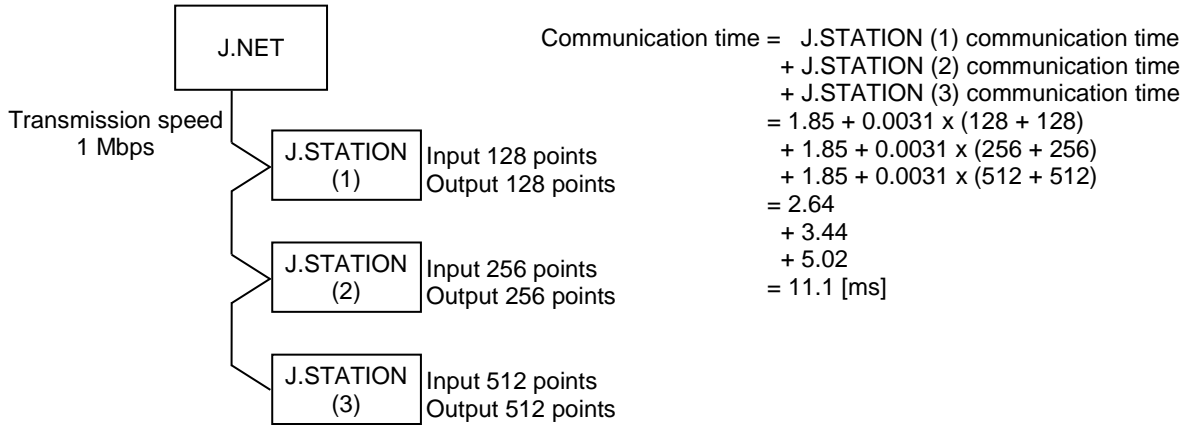


Figure 6-1 Example of calculating communication time when J.STATIONS are connected

7. Maintenance

7.1 Maintenance and inspection

To use J.NET modules under optimum conditions, perform the inspections shown in Table 7-1 periodically (at least twice a year).

Table 7-1 Maintenance and inspection items

Item	Description	Frequency
Unit cleaning	Turn off all the power supplies and then vacuum the interior of the J.NET module through the slits in its casing. Do not scatter dust during cleaning.	At least twice a year
Mechanical check	Check J.NET module mounting screws and communication cable mounting screws for looseness and damage. Tighten any loose screws and replace any damaged ones.	At least twice a year

7.2 Replacing or adding the module

For details about how to replace or add the J.NET module, see *Chapter 14. Replacing or Adding Modules* in the *SIOVE User's Manual General Description* (manual number SEE-1-001).

7.3 Troubleshooting

As a guide for troubleshooting a J.NET module, use the indicator of the CPU module and LED indicators (ERR LED, TX LED, and RX LED) of the J.NET module.

For details about how to perform troubleshooting, see *Chapter 13. Troubleshooting* in the *SIOVE User's Manual General Description* (manual number SEE-1-001).

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8. Test and Maintenance Diagnosis

8.1 Details of Test and Maintenance diagnosis

Table 8-1 describes details of Test and Maintenance diagnosis for a J.NET module. You can select between four types of Test and Maintenance by using the MODU No. and BIT RATE setting switches on the J.NET module. For details about how to start Test and Maintenance, see 8.3 *Starting Test and Maintenance*.

Table 8-1 Details of Test and Maintenance diagnosis for J.NET modules

No.	Test item	Diagnosis	Wiring required?
1	T/M1 Internal loopback check	Use this function to perform loopback between NET1 and NET2 internally to confirm that data can be transmitted and received normally.	No
2	T/M2 Internal memory compare check	Use long word, word, and byte accordingly as the unit to compare with the internal memory of the J.NET module, and check for consistency.	No
3	T/M3 CPU memory compare check	From the J.NET module, use word as the unit to compare with the internal memory of the CPU module, and check for consistency.	No
4	T/M4 External loopback check	Use this function to perform loopback between NET1 and NET2 externally (by wiring NET1 and NET2 together) to confirm that data can be transmitted and received normally.	Yes

Note: To enable the diagnosis result of a test item with wiring necessity being *Yes*, perform wiring according to 8.2 *Wiring method*, and then start Test and Maintenance.

8.2 Wiring method

- Wiring required for external loopback check (No. 4)

Figure 8-1 shows the wiring required for external loopback check.

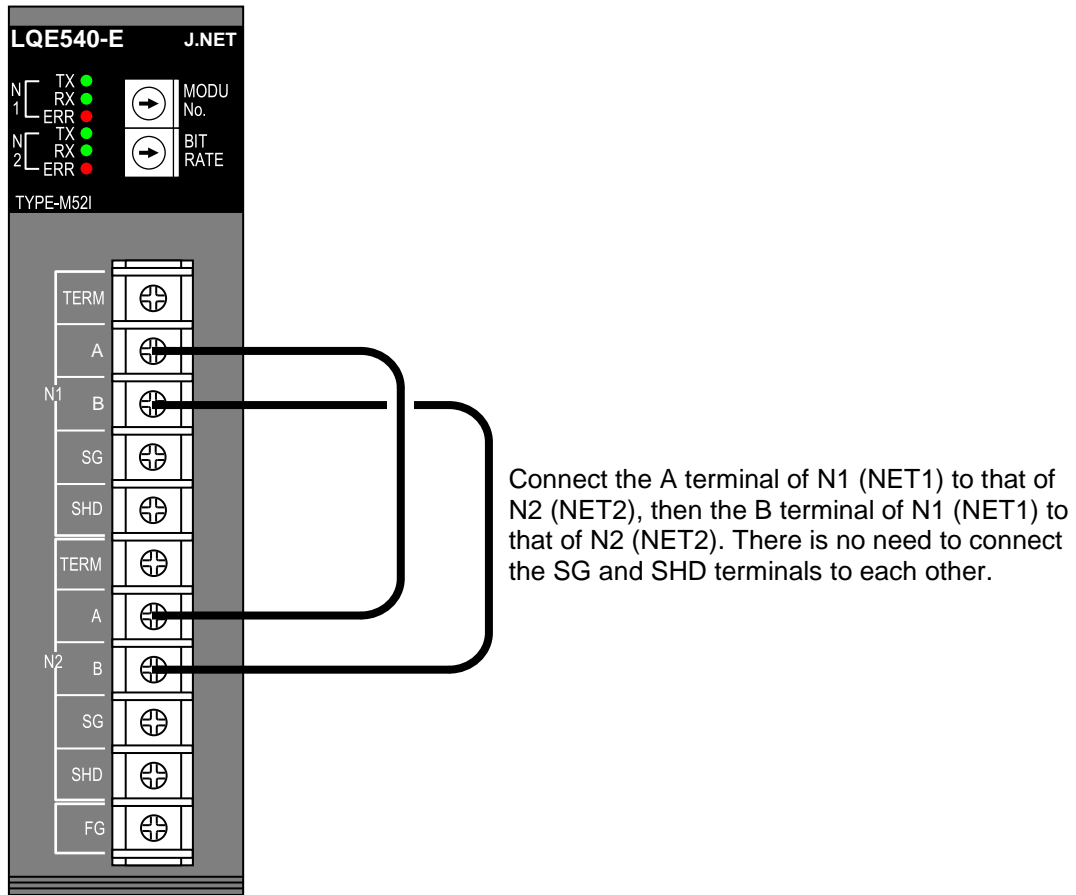


Figure 8-1 Wiring required for external loopback check

8.3 Starting Test and Maintenance

Observe the following and perform Test and Maintenance by using steps (1) to (6):

- Do not perform Test and Maintenance for other modules at the same time.
- Before starting Test and Maintenance, record the settings of the LADDER RUN/STOP switch of the CPU module, and the MODU. No. setting switch and BIT RATE setting switch of the J.NET module. This ensures that the original settings can be restored after Test and Maintenance is completed.
- Back up data.
- Turn off the power switch of the power supply module.

- (1) If necessary, perform wiring as shown in 8.2 *Wiring method*.
- (2) Select the test item and module type by using the MODU No. and BIT RATE setting switches of the J.NET module. Table 8-2 shows the correlation between test items, module types and switch settings of the CPU module required to start Test and Maintenance.

Table 8-2 Test item and module type selected by the setting switches

Switch settings of the J.NET module		Test item	Module type	Switch settings of the CPU module				
MODU No.	BIT RATE			CPU RUN/STOP	LADDER RUN/STOP			
8	8	T/M1	Module 0	RUN	RUN			
9			Module 1					
8	9	T/M2	Module 0					
9			Module 1					
8	A	T/M3	Module 0					
9			Module 1					
8	B	Do not use this switch setting.	Module 0			--	--	
9			Module 1			--	--	
8	C		Module 0			--	--	
9			Module 1			--	--	
8	D		T/M4			Module 0	RUN	RUN
9						Module 1		
8	E	Do not use this switch setting.	Module 0	--	--			
9			Module 1	--	--			
8	F		Module 0	--	--			
9			Module 1	--	--			

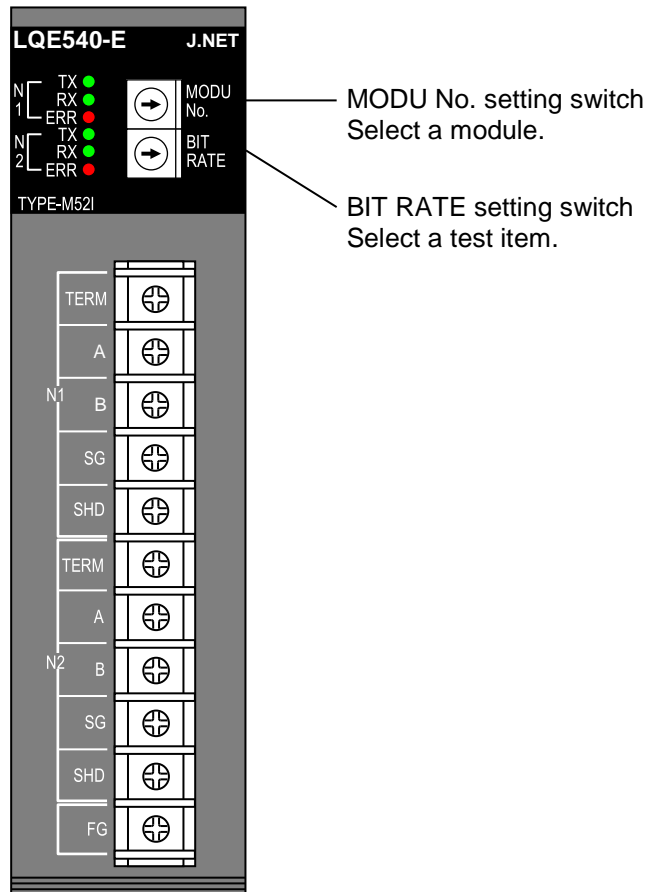


Figure 8-2 Switch settings of the J.NET module

- (3) Set the CPU RUN/STOP switch and LADDER RUN/STOP switch of the CPU module to RUN.
- (4) Turn on the power switch of the power supply module. This starts the Test and Maintenance operation. During the Test and Maintenance operation, the TX LED and RX LED are either on or blinking. Table 8-3 shows the LED states during the Test and Maintenance operation.

Table 8-3 LED states during the Test and Maintenance operation

Test item	N1 (NET1)			N2 (NET2)		
	TX LED	RX LED	ERR LED	TX LED	RX LED	ERR LED
T/M1	On	On	#	On	On	#
T/M2	Off	Blinking	#	Off	Blinking	#
T/M3	Off	On	#	Off	On	#
T/M4	On	On	#	On	On	#

#: The ERR LED (N1 and N2) turns on only when an error occurs.
For details, see 8.4 *Checking errors*.

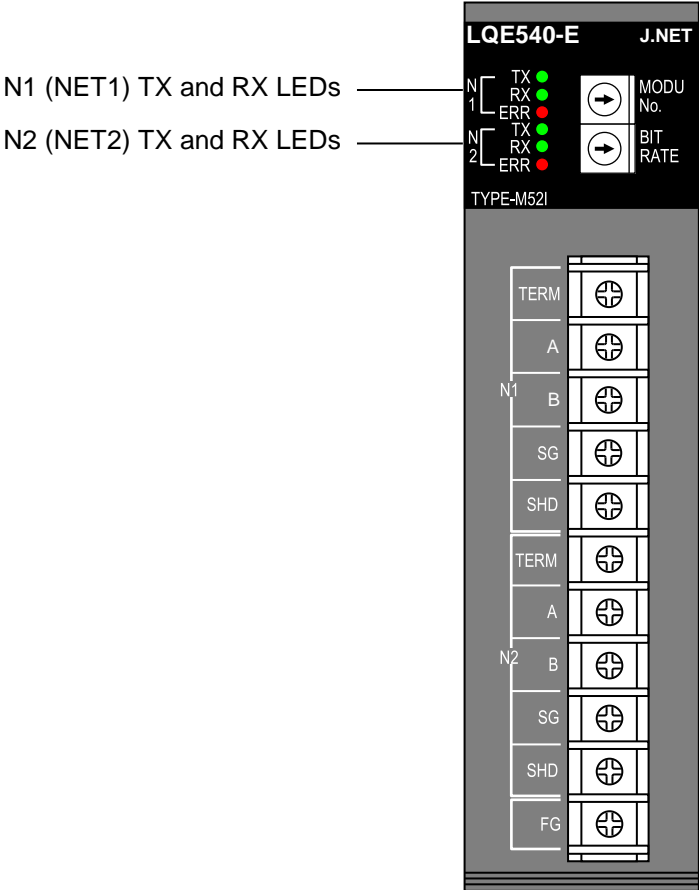


Figure 8-3 TX and RX LEDs of the J.NET module

- (5) To stop the Test and Maintenance operation, turn off the power switch of the power supply module.
- (6) To return to normal operation, reset the switches to their states before performing Test and Maintenance, and then restore backup data.

8.4 Checking errors

If an error is detected during the Test and Maintenance operation, the ERR LED of the J.NET module turns on. If the Test and Maintenance operation results in the ERR LED turning on, the J.NET module or the CPU module might have failed. Replace the module if it has failed. The method of determining which module has failed differs depending on the test item implemented. See Table 8-4. To check more details, connect the tool to the CPU unit, and then check the address indicated in Table 8-5.

For details about the tool, see the *SIOVE User's Manual General Description* (manual number SEE-1-001).

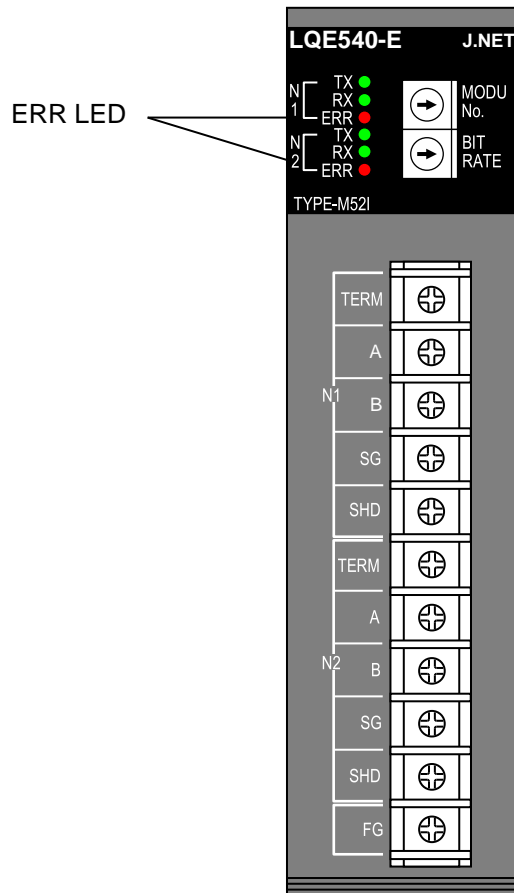


Figure 8-4 ERR LEDs of the J.NET module

Table 8-4 Location of problem for lighting ERR LED, and corrective actions

Test item	Possible problem location	Corrective action
T/M1 and T/M2	J.NET module error	Replace the J.NET module.
T/M3	J.NET module error CPU module error	Replace the J.NET module. Replace the CPU module.
T/M4	J.NET module error Improper wiring	Replace the J.NET module. Correct the wiring.

Table 8-5 Viewing detailed error information by using the tool

Reference address		Detailed error information as read
Main module	Sub module	
/00A40E34	/00AC0E34	NET1 transmission error count (T/M1 or T/M4)
/00A40E38	/00AC0E38	NET2 transmission error count (T/M1 or T/M4)
/00A40E3C	/00AC0E3C	NET1 reception error count (T/M1 or T/M4)
/00A40E40	/00AC0E40	NET2 reception error count (T/M1 or T/M4)
/00A40E44	/00AC0E44	NET1 transmission error status (T/M1 or T/M4)
/00A40E46	/00AC0E46	NET2 transmission error status (T/M1 or T/M4)
/00A40E48	/00AC0E48	NET1 reception error status (T/M1 or T/M4)
/00A40E4A	/00AC0E4A	NET2 reception error status (T/M1 or T/M4)
/00A40E4C	/00AC0E4C	Long-word access check error count in internal RAM (T/M2)
/00A40E50	/00AC0E50	Word access check error count in internal RAM (T/M2)
/00A40E54	/00AC0E54	Byte access check error count in internal RAM (T/M2)
/00A40E58	/00AC0E58	Long-word access write data in internal RAM (T/M2)
/00A40E5C	/00AC0E5C	Word access write data in internal RAM (T/M2)
/00A40E5E	/00AC0E5E	Byte access write data in internal RAM (T/M2)
/00A40E62	/00AC0E62	Word access check error count in CPU memory (T/M3)
/00A40E64	/00AC0E64	Word access write data in CPU memory (T/M3)

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