

HITACHI

User's Manual

Option

ET.NET

(LQE260-E)

S10VE

SEE-1-105 (A)

User's Manual

Option

ET.NET

(LQE260-E)

SIOVE

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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.



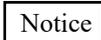
: Indicates a hazardous situation which, if not avoided, could result in death or serious injury.



: 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 WARNING

WARNING

- Turn off the power switch of the power supply module before replacing any module. This is to avoid the risk of electrical shock, and to prevent damage and malfunction.

(See page 7-1.)

2.2 Notice

Notice

- The ET.NET module (model: LQE260-E) supports the auto-negotiation setting only.
Specify auto-negotiation in the port settings of the switching hub.

(See page 1-2.)
- 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 1-3.)
- The module is prone to malfunction or damage by static electricity. You must turn off the module and discharge any static electricity in your body before touching the module (such as setting up switches, connecting or disconnecting cables, or inserting or removing connectors).
- Turn off the power switch of the power supply module before setting the MAIN/SUB setting switch and ST.No. setting switch. Using these switches while power is applied might cause a malfunction.

(See page 2-2.)

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

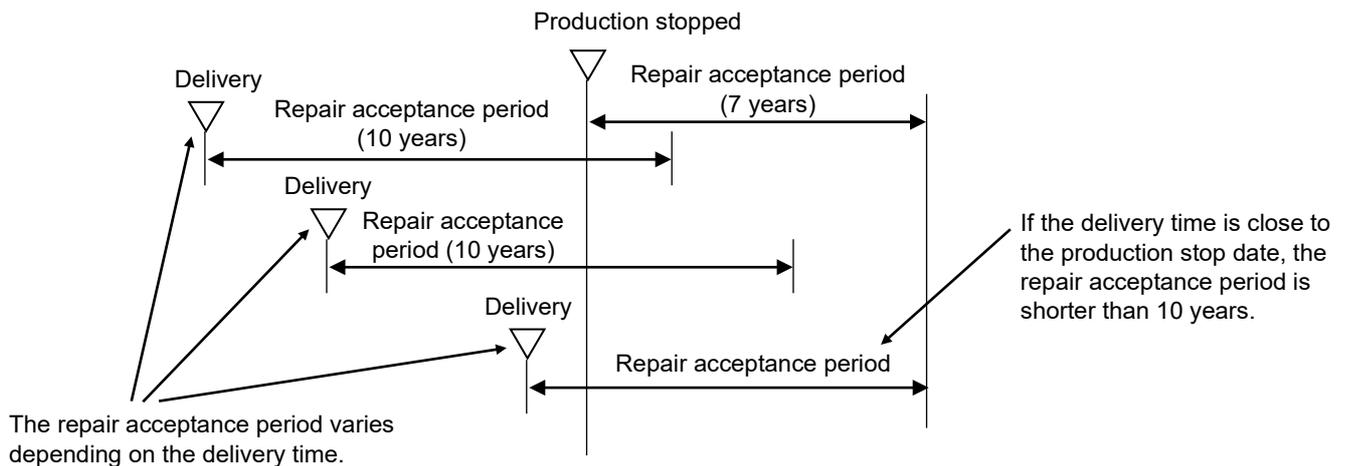
The price of the delivered product does not include on-site servicing fees by engineers. Extra fees will be charged for the following:

- 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 ET.NET module, which is an option for use with the S10VE.

This manual *S10VE User's Manual Option ET.NET* describes how to use the ET.NET module. For proper use of the ET.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.
- Ethernet® is a product name of Xerox Corp.

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

The ET.NET module (model: LQE260-E) conforms to the IEEE802.3i specifications (10BASE-T) or IEEE802.3u specifications (100BASE-TX), and performs communication based on TCP/IP or UDP/IP protocol.

1.2 Specifications

1.2.1 ET.NET module specifications

Table 1-1 ET.NET module specifications

Item	Specifications
Model	LQE260-E
Maximum mountable number of modules	2 modules per CPU unit
Number of networks	2 networks per module
Weight	380 g or less
Hot swap	Not possible
Current consumption	1,300 mA or less
Hot swapping	Not supported

1. Specifications

1.2.2 Communication specifications

Table 1-2 Communication specifications

Item	Specifications
Transmission method	Serial (bit serial) transmission
Electrical interface	Conforming to IEEE802.3 (conforming to CSMA/CD)
Coding system	Manchester coding system
Protocol	TCP/IP or UDP/IP
Number of connected devices	n devices per hub (n depends on the hub.)
Number of stations	A maximum of 1,024 stations per network
Communication cable	Twisted-pair cable of category 5e or higher The maximum length is 100 m per segment. Recommended cable: NETSTAR-C5E (Hitachi Metals, Ltd)
Data transfer speed	10 Mbps or 100 Mbps (auto-negotiation)
Communication connector	RJ45 connector
H-7338 communication (tool) [#]	4 ports per module 1 client per port
H-7338 communication (indicator) [#]	1 port per module 16 clients per port
Socket communication (TCP and UDP) [#]	Total of 96 sockets (TCP and UDP) per module

[#]: Indicates the sum total of two channels.

Notice

- The ET.NET module (model: LQE260-E) supports the auto-negotiation setting only.
Specify auto-negotiation in the port settings of the switching hub.

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

- | |
|---|
| <ul style="list-style-type: none"> ● 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. Specifications

1.3 System software specifications

1.3.1 System overview

To use the ET.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 1-4 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 1-4 System software (tool)

Category	Package name	Model
Basic system	BASE SYSTEM/S10VE	S-7898-38

1.3.2 Required hardware and software

To use the system software of the ET.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)
- 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 to 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

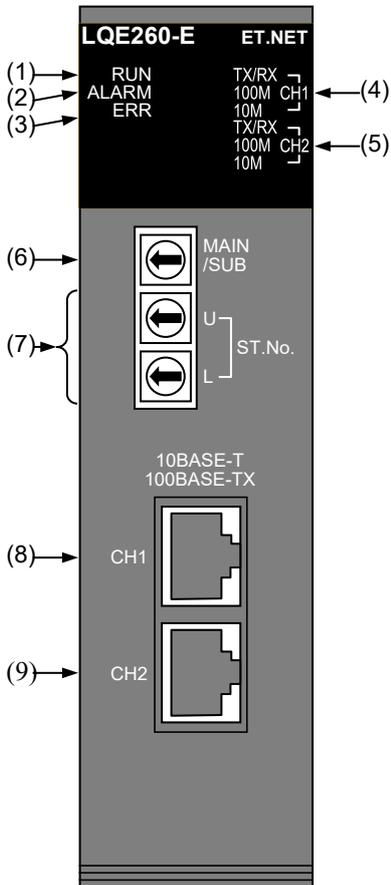


Table 2-1 Names and functions of parts

No.	Name	Function
(1)	RUN LED	This LED is lit when the module has started successfully.
(2)	ALARM LED	This LED is lit if an incorrect setting, such as a missing IP address, is detected.
(3)	ERR LED	This LED is lit if a hardware error occurs.
(4)	Communication status LED (Channel 1)	TX/RX LED: This LED blinks when data is being sent or received.
(5)	Communication status LED (Channel 2)	100M LED: This LED is lit when a communication line is connected at 100 Mbps. 10M LED: This LED is lit when a communication line is connected at 10 Mbps.
(6)	MAIN/SUB setting switch	This switch is used to define the module as the main module or submodule. For details about setting values, see Table 2-2.
(7)	ST.No. setting switch	This switch is used to set an IP address. For details about setting values, see Table 2-3.
(8)	Communication connector (Channel 1)	These connectors are used to connect the module to hubs or routers.
(9)	Communication connector (Channel 2)	

Table 2-2 Settings of the MAIN/SUB setting switch

Setting value	Description
0	Main setting (normal mode) ^{#1}
1	Sub setting (normal mode) ^{#1}
2	Main setting (port open mode) ^{#2}
3	Sub setting (port open mode) ^{#2}
4 to B	Setting prohibited
C to F	Setting prohibited (for maintenance only)

#1: Make sure that a main setting and a sub setting are not specified together in the same unit.

#2: This mode opens port 5000 and subsequent ports.
If this mode is set, the ET.NET module cannot establish a connection by using a tool.

Table 2-3 Combination settings of the ST.No. setting switch

Setting value		Description
U	L	
0	0	The module operates using the IP addresses you have set.
F	F	The module operates using the following fixed IP addresses: CH1: 192.192.192.1 CH2: 192.192.193.1
Other than the above		Setting prohibited

Notice

- The module is prone to malfunction or damage by static electricity. You must turn off the module and discharge any static electricity in your body before touching the module (such as setting up switches, connecting or disconnecting cables, or inserting or removing connectors).
- Turn off the power switch of the power supply module before setting the MAIN/SUB setting switch and ST.No. setting switch. Using these switches while power is applied might cause a malfunction.

3. Mounting and Wiring

3.1 Mount base

The ET.NET module can be mounted in the mount base shown in Table 3-1.

Table 3-1 Mount base applicable to the ET.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).

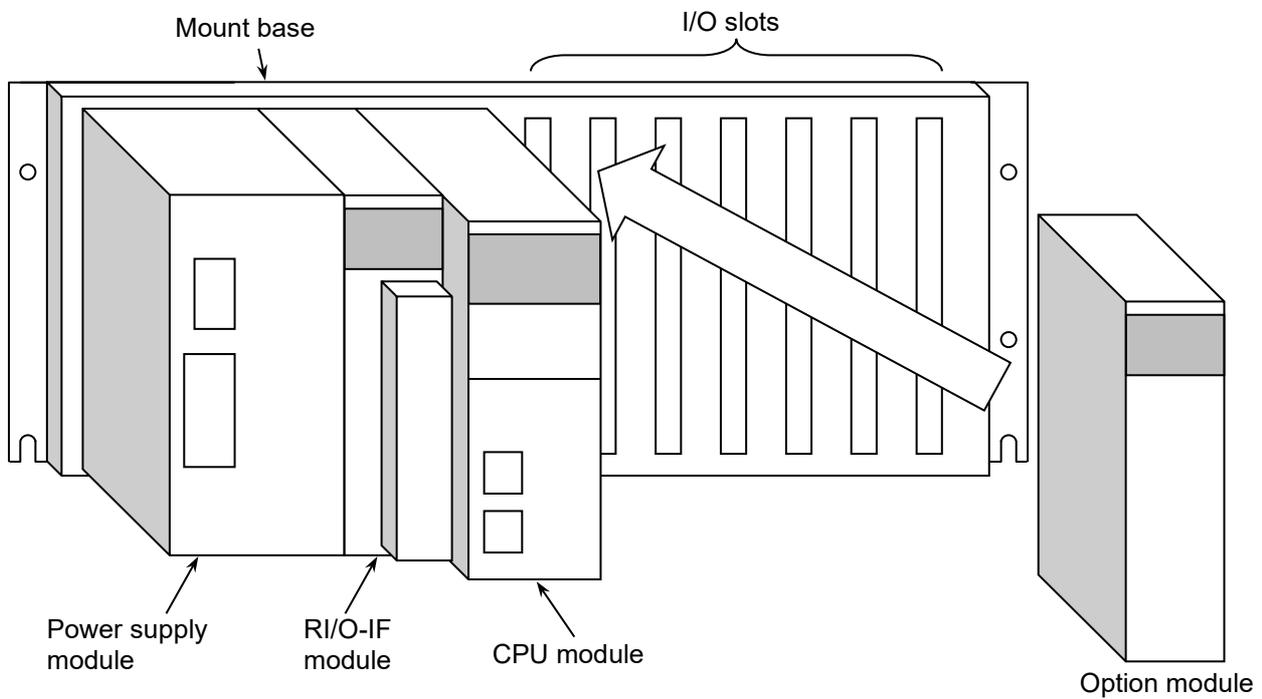


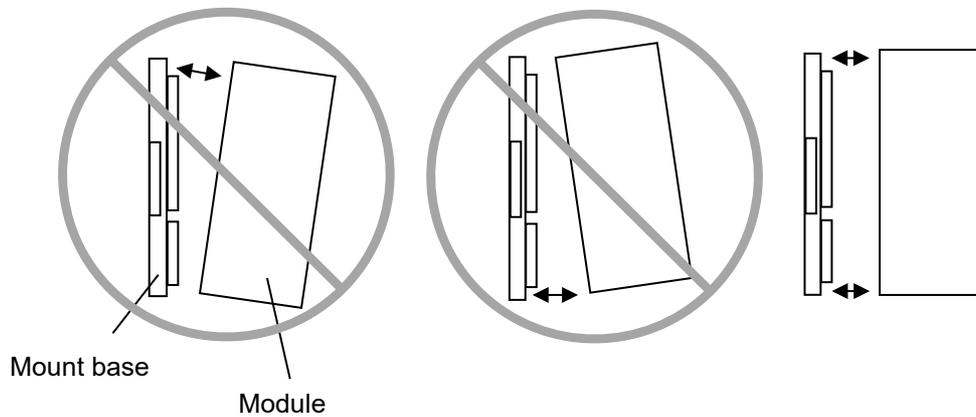
Figure 3-1 Mounting the option module

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 ET.NET module

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

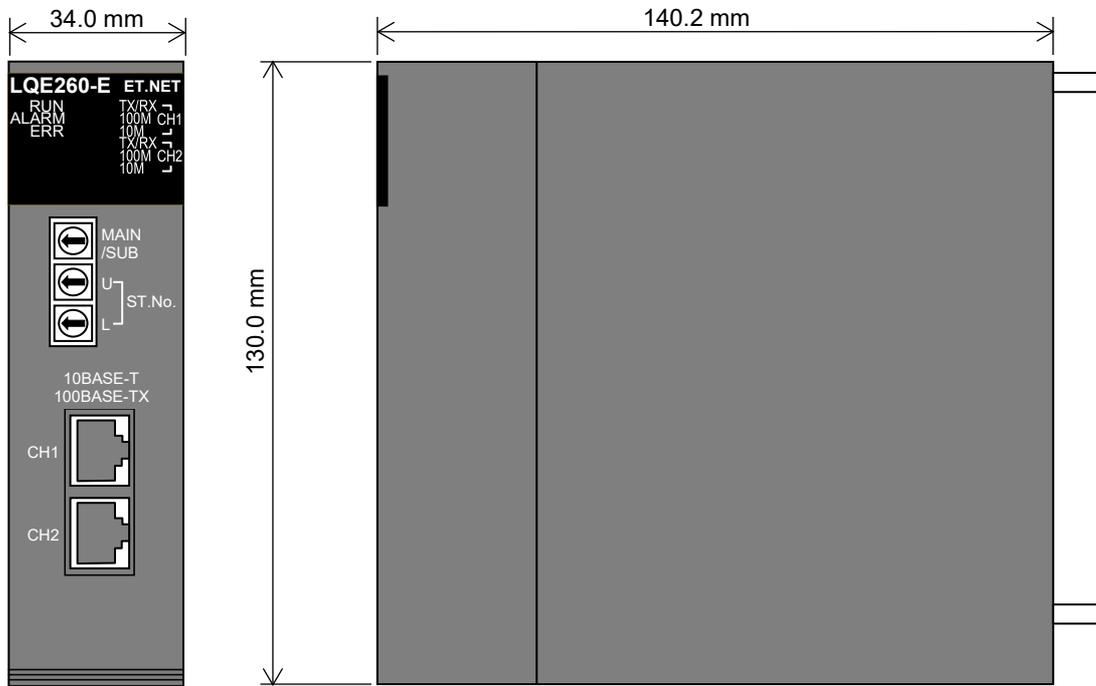


Figure 3-2 External dimensions of the ET.NET module

3.4 Wiring

3.4.1 Wiring by using a communication cable

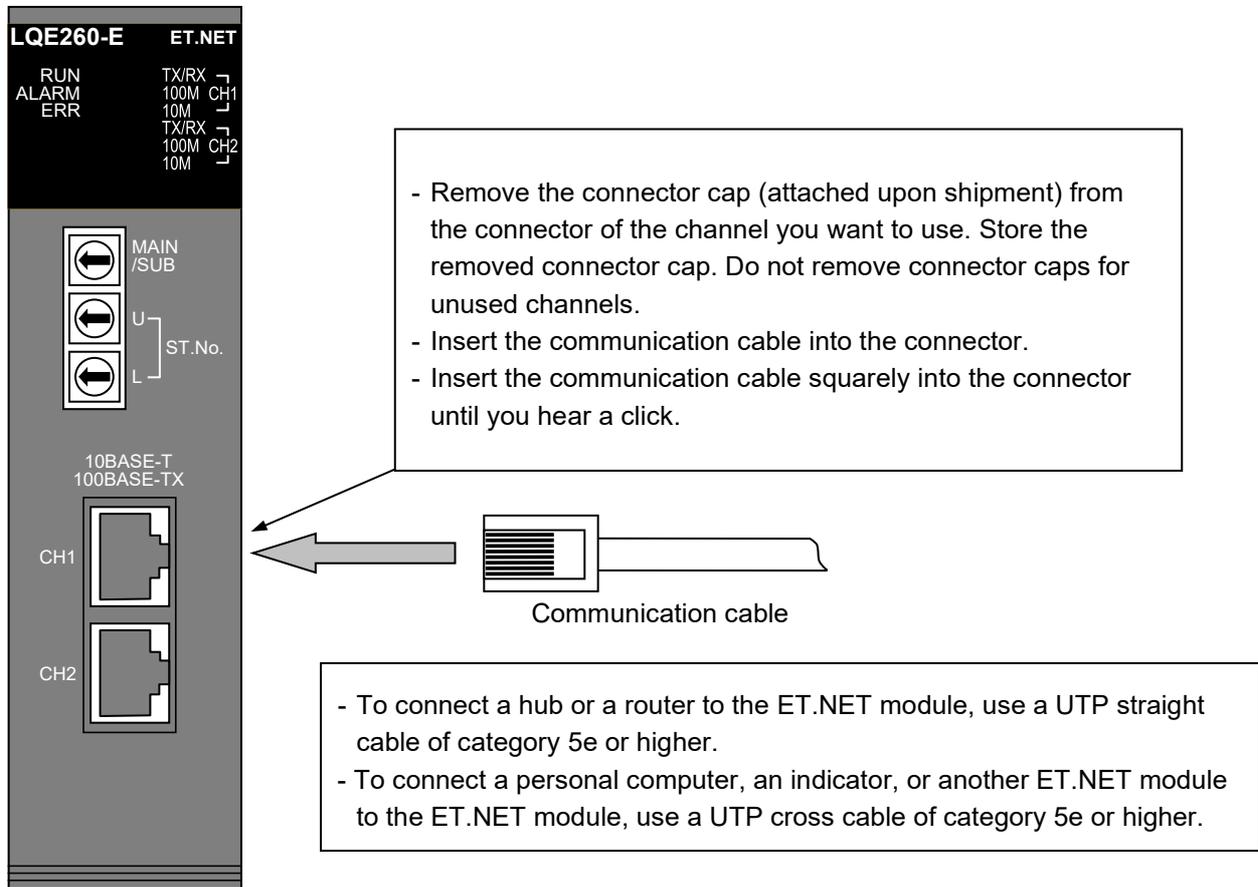


Figure 3-3 Wiring by using a communication cable

Notice

- A loose connection might cause a malfunction. Do not use communication cables that have any broken cable lock pins. After inserting a connector, confirm that it is locked.
- Do not touch the connectors when the system is powered on, as doing so might cause a malfunction.

4. Operation

4.1 Startup procedure

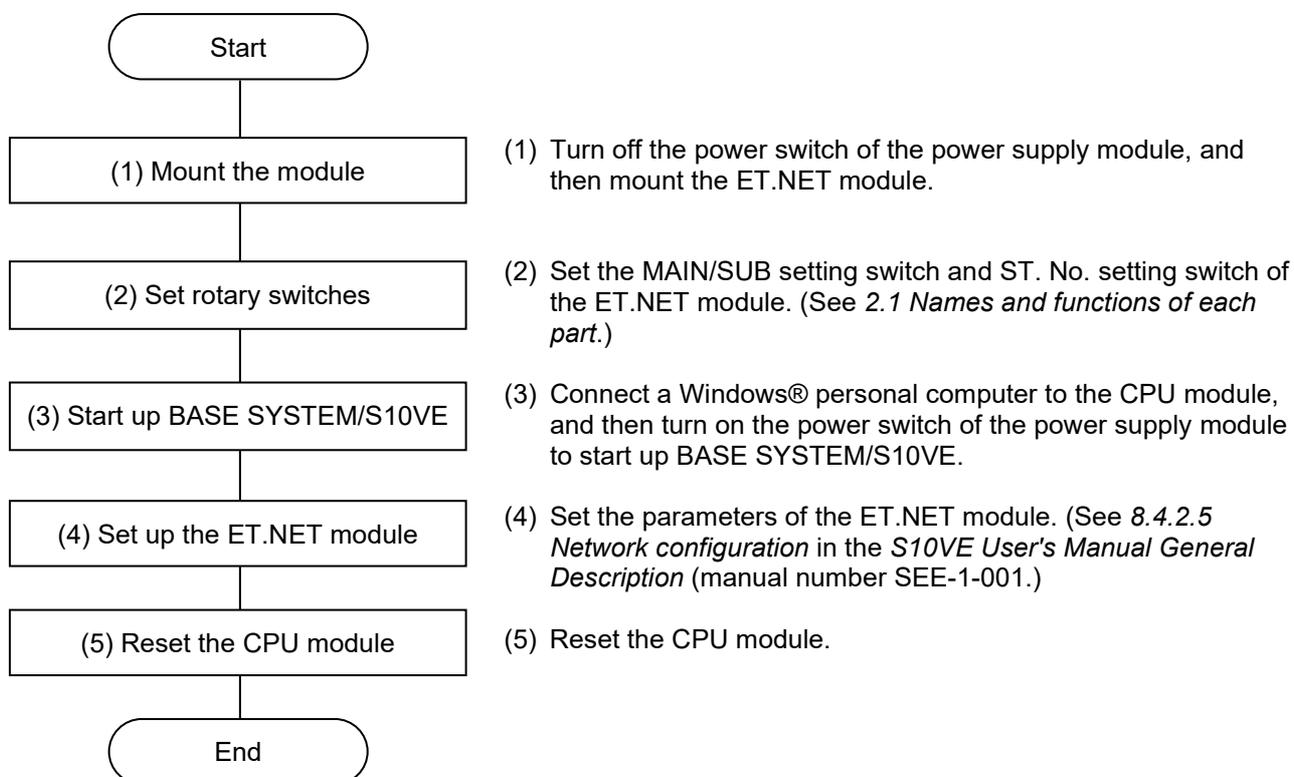


Figure 4-1 Startup procedure

4.2 Parameter settings and RAS information

The ET.NET module allows the user to set parameters and reference RAS information by using BASE SYSTEM/S10VE. For details about BASE SYSTEM/S10VE operation, see the *S10VE User's Manual General Description* (manual number SEE-1-001). Table 4-1 lists the reference sections.

Table 4-1 Reference sections for ET.NET module functions

No.	Reference sections in the S10VE User's Manual General Description
1	<i>8.4.2.5 Network configuration</i>
2	<i>8.4.6.2 RAS menu: Error Log Display</i>
3	<i>8.4.6.7 RAS menu: Network Information</i>
4	<i>8.4.6.8 RAS menu: Ethernet Communication of Trace Log</i>
5	<i>8.4.6.9 RAS menu: DHP information</i>

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5. Programming

5.1 Socket handler communication

Table 5-1 lists the socket handlers and their functions.

Socket handlers, which are called from a user task as C functions, control the ET.NET module.

For details, see *1.6 ET.NET socket handlers* in *Part 2* in the *SIOVE Software Manual CPMS General Description and Macro Specifications* (manual number SEE-3-201).

Table 5-1 Socket handler list

Name	Function	Communication type
tcp_open()	Actively opens a TCP connection.	TCP/IP
tcp_popen()	Passively opens a TCP connection.	TCP/IP
tcp_accept()	Accepts a TCP connection request.	TCP/IP
tcp_close()	Closes the TCP connection.	TCP/IP
tcp_abort()	Aborts the TCP connection.	TCP/IP
tcp_getaddr()	Reads TCP socket information.	TCP/IP
tcp_stat()	Reads the TCP connection state.	TCP/IP
tcp_send()	Sends TCP data.	TCP/IP
tcp_receive()	Receives TCP data.	TCP/IP
udp_open()	Opens a UDP socket.	UDP/IP
udp_close()	Closes the UDP socket.	UDP/IP
udp_send()	Sends UDP data.	UDP/IP
udp_receive()	Receives UDP data.	UDP/IP
route_list()	Reads route information.	TCP/IP and UDP/IP
route_del()	Deletes route information.	TCP/IP and UDP/IP
route_add()	Registers route information.	TCP/IP and UDP/IP
arp_list()	Reads ARP information.	TCP/IP and UDP/IP
arp_del()	Deletes ARP information.	TCP/IP and UDP/IP
arp_add()	Registers ARP information.	TCP/IP and UDP/IP
getconfig()	Reads configuration information.	TCP/IP and UDP/IP
set_so_abort()	Issues a socket close instruction when a task is aborted.	TCP/IP and UDP/IP

5.2 Ladder communication

5.2.1 List of instructions

The interfaces listed in Table 5-2 are supported as arithmetic functions of the ladder chart system.

Table 5-2 List of ladder communication instructions

Instruction	Function
TOP	Opens a TCP client.
TPOP	Opens a TCP server.
TCLO	Closes the TCP connection.
TRCV	Receives TCP data.
TSND	Sends TCP data.
UOP	Opens a UDP socket.
UCLO	Closes the UDP socket.
URCV	Receives UDP data.
USND	Sends UDP data.

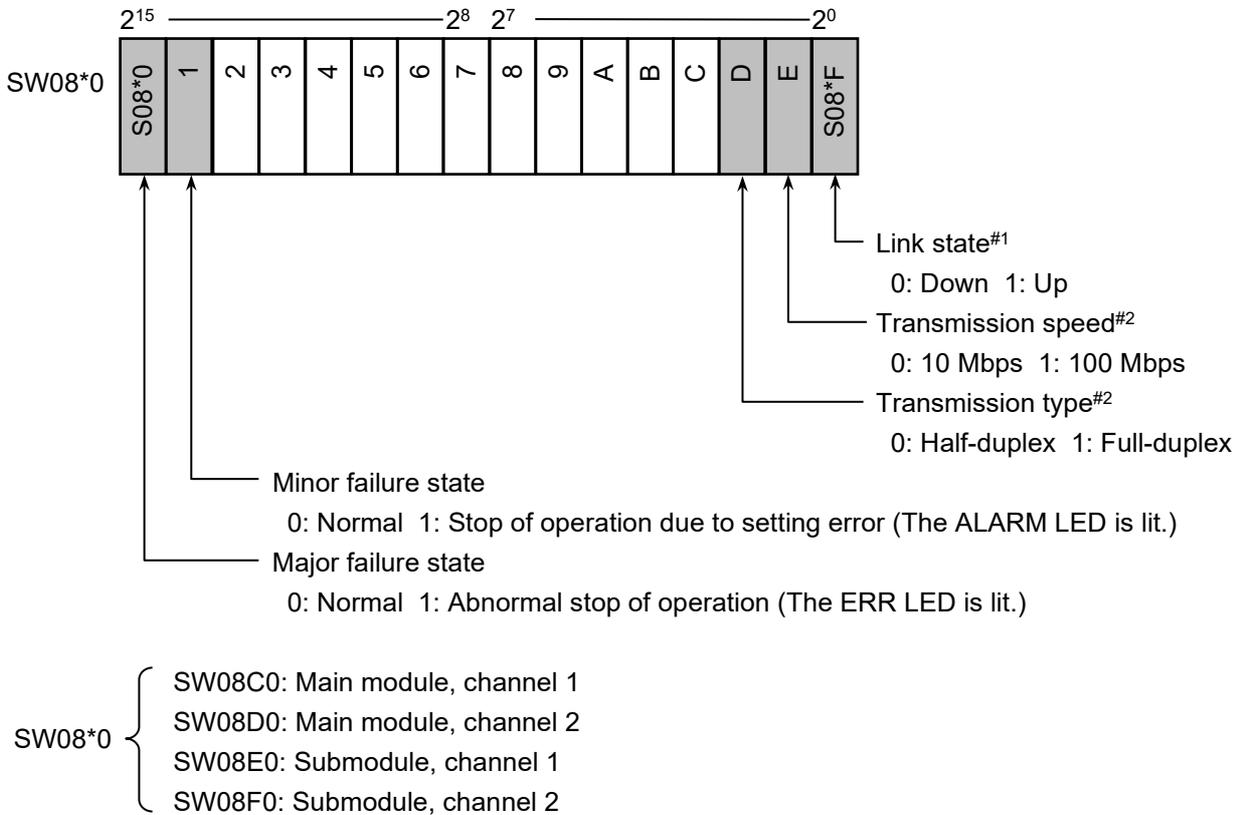
To perform ladder communication, you must set parameter information.

For details about ladder communication interfaces and how to set parameter information, see the following:

2.7 Ethernet communication instructions in the *SIOVE Software Manual Programming Ladder Diagram System for Windows®* (manual number SEE-3-121), and *4.7.17 Ethernet communication settings (parameter information settings)* in the *SIOVE Software Manual Operation Ladder Diagram System for Windows®* (manual number SEE-3-131)

5.3 S-register

The S-register stores the error information and link state for each module.



#1: The current link state is applied at 1-second intervals.

#2: If the link state is Up, the current states of transmission speed and transmission type are applied at 1-second intervals. (If the link state is Down, the states immediately before the link state changed from Up to Down are retained.)

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6. User's Guide

6.1 System setting information

You need to set up the following IP address and subnet mask information in the ET.NET module. To connect the ET.NET module to other networks via routers, you also need to set route information. Make sure that you set a unique IP address for each station, and assign the same value to the subnet masks within the subnet.

For details about how to set the necessary information, see *8.4.2.5 Network configuration* in the *S10VE User's Manual General Description* (manual number SEE-1-001).

IP address: Set an IP address for each channel of the ET.NET module by using BASE SYSTEM/S10VE. You can set classes from A to C for the IP address. You cannot set a class D IP address.

Subnet mask: Set a subnet mask for each channel of the ET.NET module by using BASE SYSTEM/S10VE.

Route information: To connect the ET.NET module to other networks by using routers, set the route information for each channel of the ET.NET module by using BASE SYSTEM/S10VE.

6.2 Restrictions on communication settings

There are two restrictions on ET.NET module communication settings.

- (1) Restriction on IP address settings: CH1 and CH2 of the same module cannot be set in the same network.
- (2) Restriction on route information settings: Only network addresses can be set for route information destination addresses. Host addresses must be set to zero.

The following describes details.

6.2.1 Restriction on IP address settings

When setting IP addresses, CH1 and CH2 of the same module cannot be set in the same network.

Figure 6-1 shows this restriction.

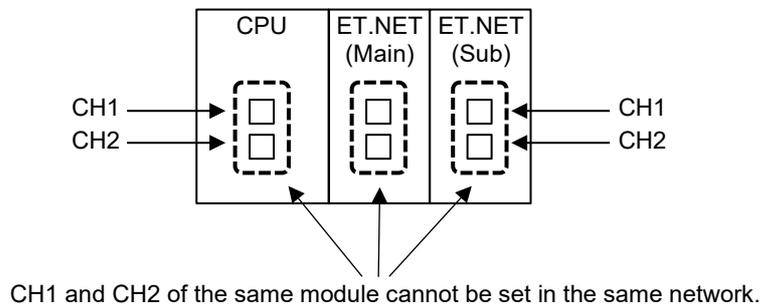


Figure 6-1 Restriction on IP address settings

6.2.2 Restriction on route information settings

To perform communication by using a router, set the route information as network information for the ET.NET module. A destination address must be paired with a router IP address in the route information setting.

You can set only network addresses for route information destination addresses. Set zero for host addresses. Any host address specified for a destination address will be invalidated by a natural subnet mask.

The following shows an example of host addresses that are inadvertently set for destination addresses:

Route 1 Destination address 158.212.1.1 Router IP address 192.168.10.254

Route 2 Destination address 158.212.1.2 Router IP address 192.168.10.253

The preceding route settings are intended for accesses indicated by dotted lines in Figure 6-2.

However, these settings are interpreted as follows because only network addresses are valid for route information destination addresses:

Route 1 Destination address 158.212.0.0 Router IP address 192.168.10.254

Route 2 Destination address 158.212.0.0 Router IP address 192.168.10.253

If you send data from CH1 of ET.NET to the target PC (system A) with the preceding settings, the ET.NET module sends data based on the route information (route 2 in Figure 6-2) that was searched first. As a result, the actual send route might be the solid line in Figure 6-2. This is because both target PCs (systems A and B) have the same destination address (network address). (Because route information is managed in a hash table, information items are not searched in the order they were set.)

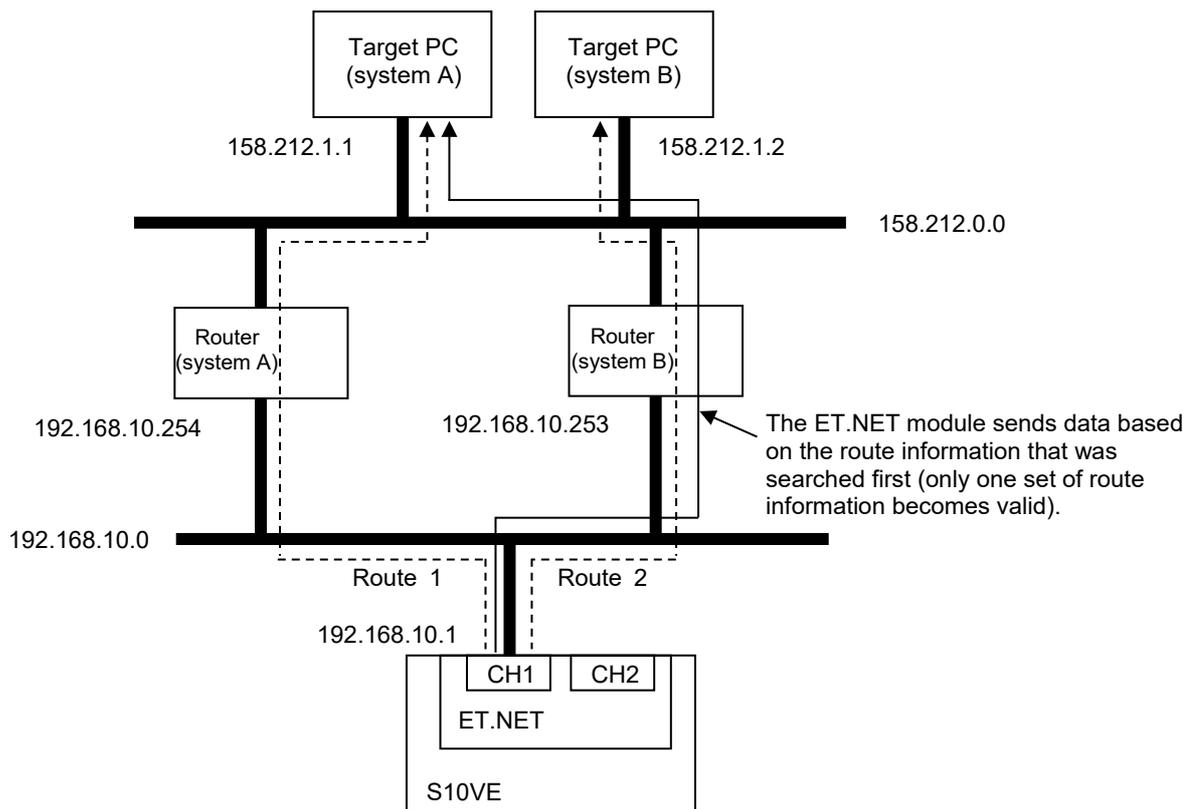


Figure 6-2 Restriction on route information settings

6.3 Performance

The following shows the communication performance of the ET.NET module.

- (1) Communication performance: 250 KB/s or more

Condition: UDP 1472-byte communication

Performance for a single channel when two channels of the ET.NET module operate concurrently

Number of option modules (including the ET.NET module) mountable on a CPU unit: 3 or less

- (2) Communication performance: 200 KB/s or more

Condition: UDP 1472-byte communication

Performance for a single channel when two channels of the ET.NET module operate concurrently

Number of option modules (including the ET.NET module) mountable on a CPU unit: 7

7. Maintenance

7.1 Maintenance and inspection

To use ET.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 ET.NET module through the slits in its casing. Do not scatter dust during cleaning.	At least twice a year
Mechanical check	Check the ET.NET module mounting screws and communication cable locks. Replace any communication cables that have a broken lock.	At least twice a year

WARNING

- Turn off the power switch of the power supply module before replacing any module. This is to avoid the risk of electrical shock, and to prevent damage and malfunction.

Notice

- Static electricity could cause damage to the module. Before handling the module, discharge any static electricity from your body.

7. Maintenance

7.2 Replacing or adding the module

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

7.3 Troubleshooting

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