

HITACHI

USER'S MANUAL

OPTION

CMU

(LQP520/525/527, LQZ500)

SIOV

Programmable Controller

SVE-1-110(E)

USER'S MANUAL

OPTION

CMU

(LQP520/525/527, LQZ500)

The logo for SIOV, featuring the letters 'SIOV' in a bold, white, sans-serif font. The background is a blue textured rectangle.

Programmable Controller

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SAFETY PRECAUTIONS

- Before installation, operation, maintenance, and/or inspection of this product, be sure to read through carefully this manual and other related manuals. Do not use this product until 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 so that users of this product may easily reach it.
- This manual contains information on potential hazards that is intended as a guide for safe use of this product. The potential hazards listed in the manual are divided into four hazard levels of danger, warning, caution, and notice, according to the level of their severity. The following are definitions of the safety labels containing the corresponding signal words DANGER, WARNING, CAUTION, and NOTICE.



: This safety label identifies precautions that, if not heeded, will result in death or serious injury.





: Identifies precautions that, if not heeded, could result in death or serious injury.



: Identifies precautions that, if not heeded, could result in minor or moderate injury.



: This safety label without a safety alert symbol identifies precautions that, if not heeded, could result in property damage or loss not related to personal injury.

Failure to observe any of the  **CAUTION** and  **NOTICE** statements used in this manual could also lead to a serious consequence, depending on the situation in which this product is used. Therefore, be sure to observe all of those statements without fail.

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

Serious injury: Is an injury that requires hospitalization for medical treatment, has aftereffects, and/or requires long-term follow-up care. Examples of serious injuries are as follows: vision loss, burn (caused by dry heat or extreme cold), electric-shock injury, broken bone, poisoning, etc.

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 are as follows: burn, electric-shock injury, etc.

Property damage or loss not related to personal injury: Is a damage to or loss of personal property. Examples of property damages or losses not related to personal injury are as follows: damage to this product or other equipment or their breakdown, loss of useful data, etc.

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 planned 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 unique needs. A variety of industry standards are available to establish such safety rules and regulations.

1. General Safety Guidelines

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

- Follow all the operating procedures provided in this manual.
- Pay special attention to and follow all the hazard warnings on the machine and in the manual. Failure to do so can cause injury to yourself or damage to the machine.
- Do not perform any operation or action in any way other than as provided in this manual. When in doubt, call the designated field engineer. Keep in mind that the hazard warnings in this manual or on the machine cannot cover every possible case, as it is impossible to predict and evaluate all circumstances beforehand.
Be alert and use your common sense.
- Do not install, wire, handle, modify, or use maintenance parts in any manner not described in this manual. Such a practice may result in breakdown of this equipment or peripherals, injury or even death. Hitachi will not be responsible for any accident or failure resulting from such mishandling.

Read the following safety guidelines carefully and follow them when you conduct maintenance of the machine.

Before starting maintenance

- Maintenance of the machine must be done only by trained and qualified field engineers.
- Read and follow the safety guidelines and procedures in this manual and the related manuals.
- In this manual and on the machine, hazard warnings are provided to aid you in preventing or reducing the risk of death, personal injury, or product damage. Understand and follow these hazard warnings fully.
- Keep in mind that the hazard warnings in this manual or on the machine cannot cover every possible case, as it is impossible to predict and evaluate all circumstances beforehand.
Be alert and use your common sense.

During work

- For each procedure, follow the given sequence of steps.
- Use the special tools and instruments, specified for the work in the manual or commercially available tools and instruments which fit the purpose.
- Use measurement instruments and powered tools which are properly calibrated or periodically inspected.
- Keep the maintenance area neat and tidy.
- Always put away parts, materials or tools when not in use.
- Wear an eye protector where anything may fly about.
- When using sharp objects or cutting tools, make sure that no part of your body lies in the path of the blade bit, or point.
- Before finishing your work, make sure that all parts removed during maintenance have been installed back in their original positions in the machine.
Make sure that no tool or foreign material is left in the machine.

Prevention of electric shocks

- Before starting work, make sure that, unless otherwise specifically instructed, there is no potential electric hazard in the maintenance area such as insufficient grounding or a wet floor.
- Before starting work, note where the emergency power-off switches are located and make sure you know how to operate them.
- Unless otherwise specifically instructed, cut off all power sources to the machine before starting maintenance. Just switching off the machine power supplies is usually not enough.

When power is fed from a wall or floor outlet, unplug the power supply cord, or turn off the switch on the power distribution panel or board. Attach a notice on the panel or board prohibiting the use of the switch.

If the energy isolating device such as the switch on the power distribution panel or board accepts a lockout device, turn off the power, lock out the energy isolating device, and bring the key with you. When you take over the work and the key for the lockout device if applicable, do not assume that the power is off. Make sure yourself that the above-mentioned conditions such as switches are satisfied. If necessary, use a measurement tool to ensure that the power is off.

- Do not touch any uninsulated conductor or surface, where so instructed, which remains charged for a limited time after the external power supply to the machine is disconnected.
- 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 close to a hazardously energized part, do not work alone; work with another person who can immediately turn off the power in an emergency.
- Do not wear any metallic item such as a wrist watch with a metallic surface, or metallic accessories.

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.
- Unless otherwise specifically instructed, use only one hand when it is necessary to work near an exposed live electric circuit.

This prevents the completion of the circuit through your heart even 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 it 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.

Procedures in an emergency

For 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.
Use the emergency power-off switch, if there is one, or, otherwise, a 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.
- Then, 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 should be performed by a trained and qualified person.

For outbreak of fire

- First, shut off all the power from the machine using the emergency power-off switch, if there is one, or the normal power-off switch.
- If the fire continues burning after the power is shut off, take suitable actions including the use of a fire extinguisher or a call for the fire department.

2. Hazard Warning Statements

The following are the hazard warning statements contained in this manual.

2.1 WARNING Statement

(chapter 3, page 3-3)

WARNING

- If the module emits smoke or foreign odor, immediately switch off the power supply and investigate the problem cause.
- Do not perform any installation, wiring, handling, or internal modification procedures other than stated in this manual. In no event will Hitachi be responsible for personal injury or death or any damage to Hitachi's product or peripheral equipment arising out of the use of such an unauthorized procedure.
- While the power is applied, never touch a terminal strip or connector pin. If you touch a terminal strip or connector pin while the power is applied, you may receive an electric shock.

2.2 CAUTION Statements

(chapter 3, page 3-4)

CAUTION

- Observe the installation procedure stated in the manual.
If the module is improperly installed, it may drop, become defective, or malfunction.
- Do not allow wire cuttings or other foreign matter to enter the module.
The entry of foreign matter in the module may result in a fire or cause the module to become defective or malfunction.
- Before installing the module, discharge any static buildup from your body because static electricity may render the module defective.
- Properly tighten the screws. If they are inadequately tightened, malfunction, smoke emission, or combustion may occur.

(chapter 3, page 3-7)



CAUTION

The battery cable must always be wired in a power-on state, so be sure to provide protection against electric shock before you turn on the power to the CMU module.

(chapter 6, page 6-2)



CAUTION

Before replacing the module, switch it off to avoid electrical shock hazards and also to prevent it from being damaged or malfunctioning. (When replacing the battery module, be sure to follow the procedure described under “6.3 Replacing the Battery Module.”)

(chapter 6, page 6-47)



CAUTION

The battery cable has to be wired in a power-on condition, so be sure to provide protection against electric shock before you turn on the power to the CMU module.

(chapter 6, page 6-48)



CAUTION

Handling batteries incorrectly will invite the danger of firing or bursting. Some of used batteries may have a considerable remaining capacity. Observe the general cautions for piling-up, packing, and transportation to forward used batteries to the specialist company of waste disposal safely. Regarding concrete packing and transportation methods, make previous arrangements thoroughly with the person in charge of this specialist company.

2.3 NOTICE Statements

(chapter 1, page 1-7)

NOTICE

- Hitachi will not be responsible for any accident or failure resulting from modification of software provided by Hitachi.
- Hitachi will not be responsible for reliability of software not provided by Hitachi.
- Make it a rule to back up every file. Any trouble on the file unit, power failure during file access or incorrect operation may destroy some of the files you have stored. To prevent data destruction and loss, make file backup a routine task.
- When scrapping this product, use a specialized agent to dispose of it as industrial waste.
- Do not use radio transceivers, cell-phones, and other similar devices near the CMU module. Failure to observe this rule may result in malfunction or a system-down situation due to electromagnetic noise from such devices.
- The CMU module may have part or all of the contents of its memory destroyed in the event of its failure. So, be sure to make a backup copy of your important data stored in the memory.
- Read this manual thoroughly and follow all the safety precautions and instructions given in this manual before operations such as system configuration and program creation.
- Keep this manual handy so that you can refer to it any time you want.
- If you have any question concerning any part of this manual, contact your nearest Hitachi branch office or service engineer.
- Hitachi will not be responsible for any accident or failure resulting from your operation in any manner not described in this manual.
- Construct an emergency stop circuit and an interlock circuit outside this product. Unless they are so constructed, failure of this product may result in machine breakdown or accident.

(chapter 1, page 1-8)

NOTICE

Users of this product must have an adequate knowledge of the Windows® environment and user interface. This system conforms to the Windows® standard, and this manual is prepared for those users who are familiar with the basic Windows® operating procedures.

(chapter 2, page 2-2)

NOTICE

When setting the station number switch, turn off the power switch.

(chapter 2, page 2-3)

NOTICE

When setting the station number switch, turn off the power switch.

(chapter 2, page 2-4)

NOTICE

When setting the station number switch, turn off the power switch.

(chapter 2, page 2-5)

NOTICE

- Be sure to mount this battery module next to the model-LQP525 or LQP527 CMU module on the mount base.
- Never touch the connector of this battery module.

(chapter 3, page 3-2)

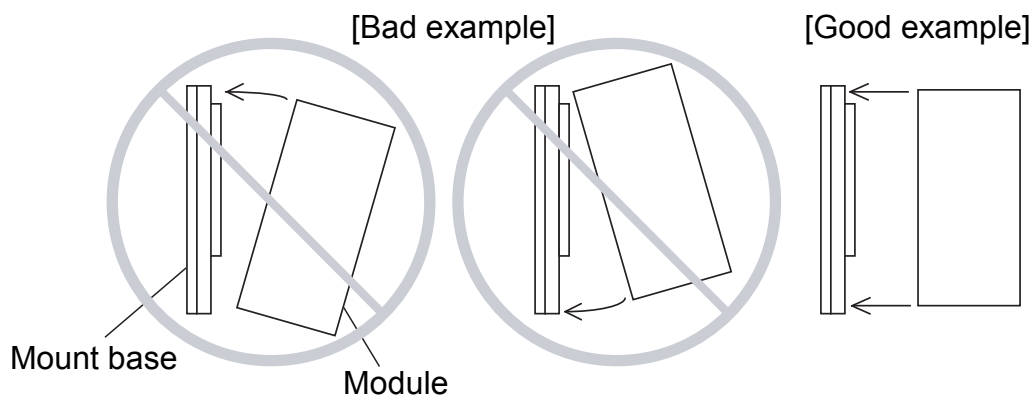
NOTICE

The S10V Series places no limitations on the mounting location and available slots, but certain limitations are imposed depending on the I/O module combination. For more information, refer to “USER’S MANUAL BASIC MODULE (Manual number SVE-1-100).”

(chapter 3, page 3-4)

NOTICE

- Dust or other foreign matter might accumulate on the connector, resulting in poor contact. Immediately after the module is unpacked, perform the mounting and wiring procedures.
- To prevent the module from being damaged, observe the following precautions when you mount or demount the module:
 - Before mounting the module to the mount base connector, check that the connector pins are properly aligned and not bent, broken, or soiled with dirt or the like.
 - Ensure that the module is parallel to the mount base vertical surface as shown below when mounting. If you connect a module to or disconnect it from its connector while it is tilted, the connector pins may become damaged.
 - If the mount base is positioned overhead due to the employed enclosure structure, use a stepladder or the like and mount the module squarely. If you mount the module obliquely, the connector may become damaged.



(chapter 3, page 3-5)

NOTICE

Do not disassemble or modify the module. Failure to observe this precaution may result in a fire or cause the module to become defective or malfunction.

(chapter 3, page 3-6)

NOTICE

- This hardware unit may malfunction if it is connected poorly or has a broken line. After connecting the connector, check whether it is locked.
- Do not touch the connector during power-on. Otherwise, the system may malfunction due to static electricity, etc.

(chapter 3, page 3-8)

NOTICE

- This hardware unit may malfunction if it is connected poorly or has a broken line. After connecting the connector, check whether it is locked.
- Never use a battery module and a battery cable other than supplied as standard. Always use a model-LQZ500 battery module and the battery cable supplied together with that battery module.

(chapter 4, page 4-5)

NOTICE

Before installing the Base System, shut down all Windows® programs running, including those resident in memory, such as a virus checker. If you install the Base System without shutting down these programs, an error might occur while installing it. If an error is encountered, uninstall the Base System once as instructed in “■ Uninstalling” to quit all Windows® programs and then reinstall the S10V Base System.

(chapter 4, page 4-7)

NOTICE

- If the [Remove Shared File?] window is displayed while uninstalling the Base System from Windows®, click the button not to select to delete shared files.
- When you want to reinstall the Base System, uninstall it first before reinstalling it.

(chapter 4, page 4-9)

NOTICE

After setting in the [Communication type] window, a session of communication with the CMU starts to collect [[S10V] S10BASE] window display information. If the CMU is inactive or there is an invalid setting of communications information, the [[S10V] S10BASE] window is displayed in online state after a communication timeout is detected. Depending on the setting of the communication type, the communication timeout may take 2 to 3 minutes to detect.

(chapter 4, page 4-13)

NOTICE

The battery module's remaining life (hours) presented in the [CMU battery information] window is only a rough estimate and does not guarantee its actual remaining life or backup efficacy. The battery module's useful life varies depending the ambient temperature and humidity, so it is recommended that the battery module should be replaced periodically.

(chapter 4, page 4-22)

NOTICE

The functions described in Subsections 4.2.10 through Subsections 4.2.14 are available for CMU and model-LQE720 ET.NET modules, but they are not available for model-LQE520 ET.NET modules.

(chapter 6, page 6-2)

NOTICE

Static electricity may damage the module. Before starting the work, discharge all electrostatic charge from your body.

(chapter 6, page 6-26)

NOTICE

- If the TCP protocol is used over more than 150 ports, no socket information is displayed for the excess ports and the UDP protocol.
- If the TCP protocol is used over more than 80 ports, some of the socket information for the UDP protocol may not be displayed.

(chapter 6, page 6-30)

NOTICE

Any item with CURRENT, MAX, HIGH, and DROP each set equal to 0 is excluded from the displayed list.

(chapter 6, page 6-47)

NOTICE

Be sure to replace the battery cable along with the battery module. The purpose of this is to increase product reliability.

(chapter 6, page 6-47)

NOTICE

This hardware unit may malfunction if it is connected poorly or has a broken line. After connecting the connector, check whether it is locked.

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WARRANTY AND SERVICING

Unless a special warranty contract has been arranged, the following warranty is applicable to this product.

1. Warranty period and scope

Warranty period

The warranty period for this product is for one year after the product has been delivered to the specified delivery site.

Scope

If a malfunction should occur during the above warranty period while using this product under normal product specification conditions as described in this manual, please deliver the malfunctioning part of the product to the dealer or Hitachi Engineering & Services Co., Ltd. The malfunctioning part will be replaced or repaired free of charge. If the malfunctioning is shipped, however, the shipment charge and packaging expenses must be paid for by the customer.

This warranty is not applicable if any of the following are true.

- 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 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 the operation of this product or from malfunctions of this product. This warranty is valid only in Japan and is not transferable.

2. 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 schools.
- Examinations and repairs after the warranty period is concluded.
- Even if the warranty is valid, examination of malfunctions that are caused by reasons outside the above warranty scope.

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This manual provides information on the following hardware and program products:

(SVE-1-110(E))

<Hardware product>

CMU (LQP520/LQP525/LQP527)

Battery module (LQZ500)

<Program products>

S-7895-03, HI-FLOW SYSTEM, 02-10

S-7895-29, ET.NET SYSTEM, 02-04

S-7895-38, BASE SYSTEM, 01-15

Revision record

(1/2)

Revision No.	Revision record (revision details and reason for revision)	Month, Year	Remarks
D	<ul style="list-style-type: none">• Specification information on the model-LQP525 CMU module is added to the description under “1.2 Specifications.”• A description of the differences between the models LQP520 and LQP525 is added as Section 1.3.• Information on parts of the models LQP525 and LQZ500 is added to Section 2.1.• The section entitled “3.4 Battery Cable Wiring” is added.• A description of the rotary switches of the model LQP525 is added as Subsection 4.1.3.• The Battery Information button is added as one of the Base System functions described under “4.2.2 Base System functions.”• The subsection entitled “4.2.7 Battery information” is added.• Memory areas backed up by the model LQP525 are added to the memory map described under “4.3 Memory Map.”• Information on how to run the model LQP525 while disabling the execution of CMU programs is added to the description under “4.4 Disabling CMU Program Operations.”• The section entitled “5.5 S-Register: SW510 (for the LQP525 Only)” is added.• Changes are added to the troubleshooting procedure described in Section 6.2.• LQP525-related error messages are added to the error message list shown in the subsection entitled “6.2.4 CMU error message formats.”• The section entitled “6.3 Replacing the Battery Module” is added.• The section entitled “6.4 Replacing the CMU Module” is added.	May 2006	

Revision No.	Revision record (revision details and reason for revision)	Month, Year	Remarks
E	<ul style="list-style-type: none">• The section entitled “6.4 Replacing the CMU Module” is added.• A new module model numbered LQP527 is additionally made available.• All the safety precautions and instructions in this manual have been reviewed and necessary changes are added to them.• Windows® 7 (32-bit) operating system is newly supported.	November 2012	

In addition to the above changes, all the unclear descriptions and typographical errors found are also corrected without prior notice.

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PREFACE

Thank you for purchasing the CMU module, which is an option for use with the S10V. This manual, named “USER’S MANUAL OPTION CMU,” describes how to use the CMU module. For proper use of the CMU module, it is requested that you thoroughly read this manual.

The S10V product is available in two types: standard model and environmentally resistant model. The environmentally resistant model has thicker platings and coatings than those for the standard model.

The model number of the environmentally resistant model is marked by adding the suffix “-Z” to the model number of the standard model.

(Example) Standard model: LQP520

Environmentally resistant model: LQP520-Z

This manual is applicable to both the standard model and environmentally resistant models. Although the descriptions contained in this manual are based on the standard model, follow the instructions set forth in this manual for proper use of the product even if you use the environmentally resistant model.

Users of the model-LQP525 or LQP527 CMU module must use a HI-FLOW system whose version is listed below. If a HI-FLOW system of any other older version is used, an error may occur in process transfer or edition update.

System name and version
S10V HI-FLOW SYSTEM For Windows®, 01-08 or later
S10V BASE SYSTEM For Windows®, 01-06 or later
S10V BACKUP RESTORE For Windows®, 01-05 or later

<Trademarks>

- Ethernet® is a registered trademark of Xerox Corp.
- Microsoft® Windows® operating system, Microsoft® Windows® 2000 operating system, Microsoft® Windows® XP operating system, Microsoft® Windows® 7 (32-bit) operating system are registered trademarks of Microsoft Corporation in the United States and/or other countries.
- All trademarks are the properties of their respective companies.

<Note for storage capacity calculations>

- Memory capacities and requirements, file sizes and storage requirements, etc. 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 equals signs).

1 KB (kilobyte) = 1024 bytes

1 MB (megabyte) = 1,048,576 bytes

1 GB (gigabyte) = 1,073,741,824 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) = 1000 bytes

1 MB (megabyte) = 1000^2 bytes

1 GB (gigabyte) = 1000^3 bytes

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1 SPECIFICATIONS

1 SPECIFICATIONS

1.1 Use

The CMU module (model LQP520, LQP525 or LQP527) is used in conjunction with an S10V LPU module to speed C mode (C language/HI-FLOW) P-coil processing. As a communications interface, it also supports communication under TCP/IP or the UDP/IP protocols by way of a local area network complying with the IEEE802.3u specifications (100BASE-TX) and IEEE802.3 specifications (10BASE-T).

The model-LQP525 or LQP527 CMU module can be used in the same way as the model-LQP520 CMU module. However, if the former model is used in conjunction with a battery module (model LQZ500), it can back up internal work area in its memory.

1.2 Specifications

1.2.1 General specifications

CMU module's:

Item	Specifications		
	LQP520	LQP525	LQP527
Model	LQP520	LQP525	LQP527
Maximum number of modules that can mount in the mount base (*1)	One	One	
Mass	240 g	200 g	
Battery backup capability	Not provided	Provided	
Battery-backable memory	Program storage memory	Program storage memory and main memory (*2)	
Battery	—	Battery module (model: LQZ500; battery life: one year)	

(*1) For the kinds of mount base in which the module can be mounted, see “3.1 Mount Base.” The reader should note that CMU modules of the three models LQP520, LQP525, and LQP527 cannot be mounted together on a single selected mount base. Only one CMU module of one of the above-mentioned models may be mounted on any single selected mount base.

(*2) This main memory can be battery-backed by connecting a specified battery module to the CMU module.

Battery module's:

Item	Specifications
Model	LQZ500
Maximum number of modules that can mount in the mount base (*)	One
Mass	220 g

(*) For the kinds of mount base in which the module can be mounted, see “3.1 Mount Base.”

1.2.2 Functional specifications

Item		Specifications		
Model		LQP520	LQP525	LQP527
Programming language		HI-FLOW (control flowchart language), C language		
Processor		SH4 processor (SH7751, 160 MHz, 300 MIPS)		
Main memory	Kind	SDRAM		
	Size	32 MB	32 MB (battery-backable)	
	RAS	ECC (Single-bit memory errors corrected automatically)		
Program memory	Kind	Flash memory (nonvolatile memory)		
	Size	32 MB (HI-FLOW: 4 MB, C language: 16 MB, OS and future reserve: 12 MB)		

HI-FLOW and C language tasks run on main memory and are backed up to program memory. Transfers and/or updates from a tool are automatically backed up to program memory. Tasks are automatically loaded from program memory into main memory when the module reboots. The model-LQP525 or LQP527 CMU module is capable of battery-backing its main memory when used in conjunction with a battery module (model LQZ500).

1.2.3 Communications specifications

Item	Specifications
Transmission method	Serial transmission (bit-serial transmission)
Electrical interface	10BASE-T: Conforming to IEEE802.3 (conforming to CSMA/CD) 100BASE-TX: Conforming to IEEE802.3u (conforming to CSMA/CD)
Protocol	TCP/IP or UDP/IP
Maximum number of connectable units	n units per hub (The value of n depends on the hub.)
Maximum number of stations	Up to 1,024 units per network
Data transmission rate	100 Mbps or 10 Mbps
Connection connector	RJ-45 modular connector
Connection cable	10BASE-T/100BASE-TX twisted-pair cable Up to 100 m per segment
Hot swap	Not possible

1 SPECIFICATIONS

1.3 Differences between the Models LQP520, LQP525 and LQP527

In addition to the differences mentioned under “1.2 Specifications,” there are additional differences between the models LQP520, LQP525 and LQP527. This section describes these additional differences.

1.3.1 Time duration of writing to the program storage memory

With the model LQP525 or LQP527, the time duration of writing to the program storage memory varies with changes in the load factor. The table below shows the relationships between the load factor of CMU modules and their models. The time values below are those which were found by sending a 16-MB wsvl file to the CMU modules by means of the FD function ([Utility] - [FD]) of the S10V ladder chart system, where the baud rate of the communication line used was 100 Mbps and the CMU modules were connected with the personal computer by cross-cable.

CMU load factor	LQP520	LQP525 or LQP527
0 to 60%	Approx. 6 minutes	Approx. 3 minutes
80%		Approx. 5 minutes
100%		Approx. 11 minutes

The user should note that the above time values vary depending on the content (and storage location) of the wsvl file, and should use them only for reference.

1.3.2 The time when writing to the program storage memory ends

Where the model LQP520 is used, any write to the program storage memory ends when the user has finished all necessary interaction with the software tool they are using. With the model LQP525 or LQP527, however, such a write may not end even when the user has finished all such interaction. In this case, the user can learn the progress of the write process from a blinking state of the USER LED. As a general rule, if the write process is in progress, the user must not turn off the power to the CMU module, reset the LPU module by operating the reset switch, or remote-reset it from the software tool while the USER LED is blinking.

As another rule, users of two or more PCs must not write data simultaneously to the same program storage memory in a single model-LQP525 or LQP527 CMU module, or the user of one single PC must not operate two or more software tools to write data simultaneously to the same model-LQP525 or LQP527 CMU module.

The table below is a list of the software tools available for writing to the program storage memory (flash memory) in a model-LQP525 or LQP527 CMU module and of the option selections required for that purpose.

A List of the Software Tools Available and Option Selections Required for Writing to the Program Storage Memory in a Model-LQP525 or LQP527 CMU Module

No.	Tool type	Required option selection	Whether a write to the program memory may be in progress or not when all necessary interaction with the selected software tool has been finished
1	Ladder chart system	[Utility] - [FD] - [Send] when transmitting a file containing the CMU area's content to the destination.	—
2	Backup restore system	[Restore]	—
3		[Load user application]	—
4	CPMS debugger system	[Initialize the task]	—
5		[Loading and register of task], [Delete task]	√
6	RPDP/S10V system	[svrpl]	—
7		[svdebug] - [ld]	√
8	NX/Tools-S10V system	[Transfer system program]	—
9		Following DF editing, [OK] when transmitting all settings to the destination	—
10	HI-FLOW system	[Mode] - [Online] - [Send] - [All processes / Designated process]	—
11		[Utility] - {PCs} - [Delete process of PCs] - [Exchange all processes and system]	—
12		[Utility] - [PCs] - [Delete process of PCs] - [Specify the process range]	—
13		[Utility] - [PCs] - [System edition]	—
14		[Mode] - [Rewrite] - [Step] or - [Process]	—
15		[Mode] - [Debug] - [Trace] - [Starting condition] and - [Terminating condition]	—
16		[Mode] - [Debug] - [Time monitor] - [Start measuring]	—
17		[Utility] - [PCs] - [Layout system bits]	—
18	PIOP system	[Setup system parameters]	—

√: It may be in progress.

—: It may not be in progress.

1 SPECIFICATIONS

1.3.3 BATT.SET switch and LED

Any model-LQP525 or LQP527 CMU module is equipped with a BATT.SET switch (battery replacement switch) and a BATT.SET LED indicator. The BATT.SET switch is used to initialize a count of the number of hours of use (battery life) that is maintained in the CMU module's main memory. When the BATT.SET switch is pushed, the date and time of the pushing is recorded in the CMU module's program storage memory. This switch is used when you first use the CMU module or when you replace the battery module (model LQZ500) connected to the CMU module. When you first use the CMU module, perform the following procedure:

- ① Mount the CMU and the battery module on the S10V mount base.
- ② Power up the S10V controller.
- ③ Connect the battery cable to both the CMU and the battery module. Be sure to connect this cable in a power-on state.
- ④ Push and hold the BATT.SET switch until the BATT.SET LED comes on. As soon as the BATT.SET switch is pushed, the USER LED starts flashing (this is no error), indicating that the date and time of the pushing (battery replacement) is being recorded in the flash memory.
- ⑤ When the BATT.SET LED is lit, release the BATT.SET switch. This procedure ends when the BATT.SET and the USER LED both go out.

For information on how to replace the battery module, see the description under “6.3.1 Replacement procedure.”

NOTICE

- Hitachi will not be responsible for any accident or failure resulting from modification of software provided by Hitachi.
- Hitachi will not be responsible for reliability of software not provided by Hitachi.
- Make it a rule to back up every file. Any trouble on the file unit, power failure during file access or incorrect operation may destroy some of the files you have stored. To prevent data destruction and loss, make file backup a routine task.
- When scrapping this product, use a specialized agent to dispose of it as industrial waste.
- Do not use radio transceivers, cell-phones, and other similar devices near the CMU module. Failure to observe this rule may result in malfunction or a system-down situation due to electromagnetic noise from such devices.
- The CMU module may have part or all of the contents of its memory destroyed in the event of its failure. So, be sure to make a backup copy of your important data stored in the memory.
- Read this manual thoroughly and follow all the safety precautions and instructions given in this manual before operations such as system configuration and program creation.
- Keep this manual handy so that you can refer to it any time you want.
- If you have any question concerning any part of this manual, contact your nearest Hitachi branch office or service engineer.
- Hitachi will not be responsible for any accident or failure resulting from your operation in any manner not described in this manual.
- Construct an emergency stop circuit and an interlock circuit outside this product. Unless they are so constructed, failure of this product may result in machine breakdown or accident.

1 SPECIFICATIONS

1.4 System Software Specifications

1.4.1 System Overview

Successful use of the CMU module requires prior storage of module information in that module. To accomplish this, the system software listed below is available, which is often called the tool (or setup tool) in this manual. This tool allows you to do your job on a Windows platform -- it runs as an application on Windows.

Table 1-1 Types of System Software (Tools)

Package name	Model	Distribution media
BASE SYSTEM	S-7895-38	Optional

1.4.2 Required hardware and software

The following hardware and software items are required for the use of the CMU module system software:

- Personal computer (main unit) containing a Pentium 300 MHz or faster CPU, or a 1 GHz or faster CPU (when Windows® 7 (32-bit version) is used)
- Display having a resolution of 800 × 600 dots (SVGA) or higher
- Microsoft® Windows® 2000 operating system, Microsoft® Windows® XP operating system or Microsoft® Windows® 7 (32-bit) operating system
- At least 64 MB of RAM (when Windows® 2000 is used)
- At least 128 MB of RAM (when Windows® XP is used)
- At least 1 GB of RAM (when Windows® 7 (32-bit) is used)
- At least 10 MB of free hard disk space
- Cable for connecting the personal computer to the LPU unit (RS-232C cross cable with D-sub 9-pin connectors) or cable for connecting the personal computer to the CMU or ET.NET module (10BASE-T or 100BASE-T twisted pair cross cable with RJ-45 modular connectors)

NOTICE

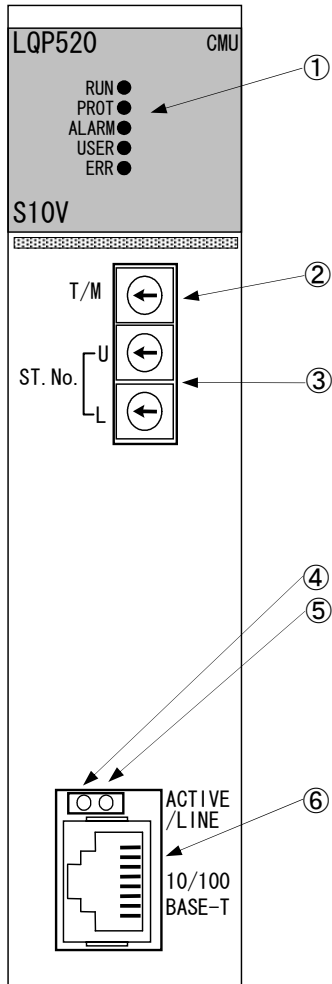
Users of this product must have an adequate knowledge of the Windows® environment and user interface. This system conforms to the Windows® standard, and this manual is prepared for those users who are familiar with the basic Windows® operating procedures.

2 NAMES AND FUNCTIONS OF EACH PART

2 NAMES AND FUNCTIONS OF EACH PART

2.1 Names and Functions of Each Part

(1) LQP520

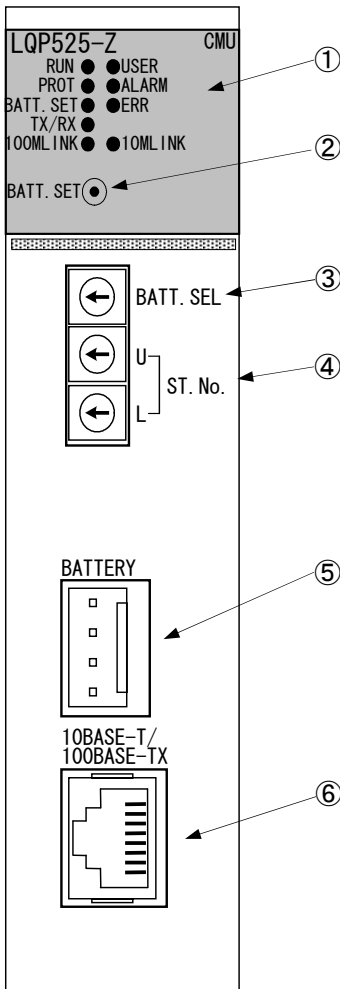


No.	Name	Function
①	LED indicators	Indicate the operating status of the CMU module. RUN (green): The C-mode program is running. PROT (green): Writing from a task to SEQ RAM is disabled. ALARM: Glows to indicate that an error that is not serious enough to disrupt CMU module operations is detected. USER: Glows to indicate an invalid user setting. ERR: Glows to indicate that a hardware error, serious fault or any other problem that is serious enough to disrupt CMU module operations is detected.
②	T/M switch	0: Normal mode of operation A: CMU program operations disabled F: Test mode (Do not set this position.) Any other value is reserved for maintenance purposes and should not be set.
③	Station number switches	0, 0: The CMU operates at the set IP address. F, F: The CMU operates at IP address 192.192.192.1. Any other value should not be set.
④	Ethernet LINE indicator	Glows to indicate that the CMU is connected to an Ethernet line.
⑤	Ethernet ACTIVE indicator	Glows when the CMU is communicating data on Ethernet.
⑥	Ethernet connector	Connector used for 10BASE-T and 100BASE-TX communication.

NOTICE

When setting the station number switch, turn off the power switch.

(2) LQP525



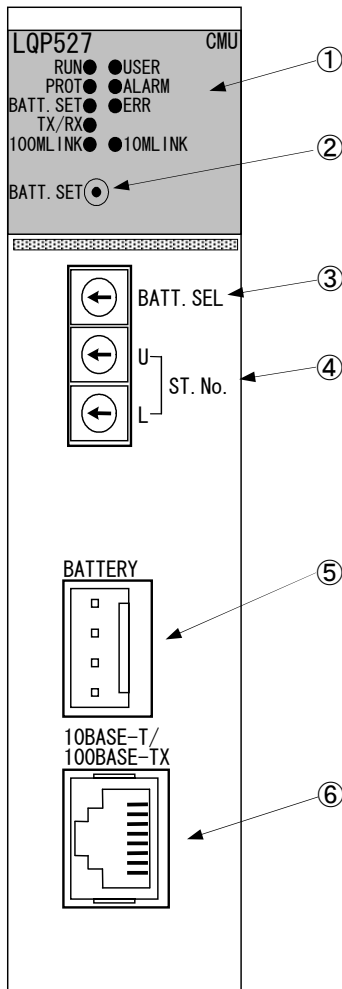
No.	Name	Function
①	LED indicators	<p>Indicate the operating status of the CMU module.</p> <p>RUN (green): The C-mode program is running.</p> <p>PROT (green): Writing from a task to SEQ RAM is disabled.</p> <p>BATT.SET(green): Comes on when the battery replacement switch is pushed.</p> <p>USER (red): Glows to indicate an invalid user setting. It keeps on flashing during a write to the program storage memory.</p> <p>ALARM (red): If switch ③ is set in “0” position, comes on when the battery is found not connected to this CMU module or when a “battery low” condition is detected. This LED starts flashing when the battery life exceeds one year.</p> <p>ERR(red): Glows to indicate that a hardware error, serious fault or any other problem that is serious enough to disrupt CMU module operations is detected.</p> <p>TX/RX (green): Glows to indicate that data communication is in progress over the Ethernet network.</p> <p>100MLINK (green): Glows to indicate that a 100-Mbps link is established to the Ethernet network.</p> <p>10MLINK (green): Glows to indicate that a 10-Mbps link is established to the Ethernet network.</p>
②	Battery replacement switch	Used when you first use this CMU module or when you replace the battery module connected to it.
③	Battery backup / TM setting switch	<p>0: Selects the “battery connected” setting.</p> <p>1: Selects the “battery not connected” setting, which disables the backup of the main memory.</p> <p>A: CMU program operations disabled</p> <p>F: Test mode (Do not set this position.)</p> <p>Any other value is reserved for maintenance purposes and should not be set.</p>
④	Station number switches	<p>0, 0: The CMU operates at the set IP address.</p> <p>F, F: The CMU operates at IP address 192.192.192.1.</p> <p>Any other value should not be set.</p>
⑤	Battery connector	Used when connecting this CMU module and the battery module together.
⑥	Ethernet connector	Connector used for 10BASE-T and 100BASE-TX communication.

NOTICE

When setting the station number switch, turn off the power switch.

2 NAMES AND FUNCTIONS OF EACH PART

(3) LQP527

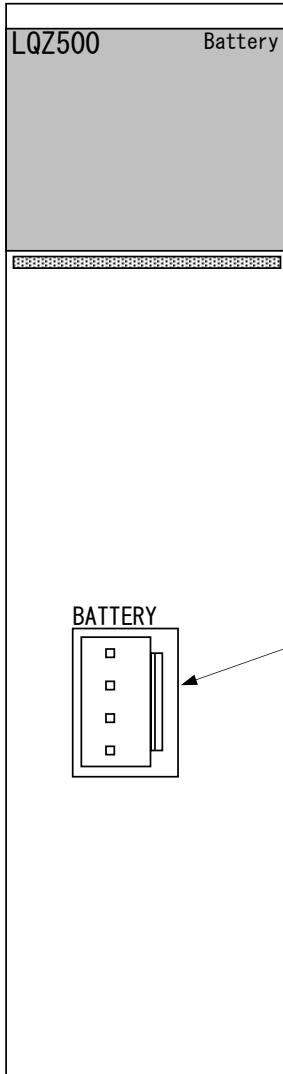


No.	Name	Function
①	LED indicators	<p>Indicate the operating status of the CMU module.</p> <p>RUN (green): The C-mode program is running.</p> <p>PROT (green): Writing from a task to SEQ RAM is disabled.</p> <p>BATT.SET(green): Comes on when the battery replacement switch is pushed.</p> <p>USER (red): Glows to indicate an invalid user setting. It keeps on flashing during a write to the program storage memory.</p> <p>ALARM (red): If switch ③ is set in “0” position, comes on when the battery is found not connected to this CMU module or when a “battery low” condition is detected. This LED starts flashing when the battery life exceeds one year.</p> <p>ERR(red): Glows to indicate that a hardware error, serious fault or any other problem that is serious enough to disrupt CMU module operations is detected.</p> <p>TX/RX (green): Glows to indicate that data communication is in progress over the Ethernet network.</p> <p>100MLINK (green): Glows to indicate that a 100-Mbps link is established to the Ethernet network.</p> <p>10MLINK (green): Glows to indicate that a 10-Mbps link is established to the Ethernet network.</p>
②	Battery replacement switch	Used when you first use this CMU module or when you replace the battery module connected to it.
③	Battery backup / TM setting switch	<p>0: Selects the “battery connected” setting.</p> <p>1: Selects the “battery not connected” setting, which disables the backup of the main memory.</p> <p>A: CMU program operations disabled</p> <p>F: Test mode (Do not set this position.)</p> <p>Any other value is reserved for maintenance purposes and should not be set.</p>
④	Station number switches	<p>0, 0: The CMU operates at the set IP address.</p> <p>F, F: The CMU operates at IP address 192.192.192.1.</p> <p>Any other value should not be set.</p>
⑤	Battery connector	Used when connecting this CMU module and the battery module together.
⑥	Ethernet connector	Connector used for 10BASE-T and 100BASE-TX communication.

NOTICE

When setting the station number switch, turn off the power switch.

(4) LQZ500



No.	Name	Function
①	Battery connector	Used when connecting this battery module and a model-LQP525 or LQP527 CMU module together.

NOTICE

- Be sure to mount this battery module next to the model-LQP525 or LQP527 CMU module on the mount base.
- Never touch the connector of this battery module.

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3 MOUNTING AND WIRING

3.1 Mount Base

The CMU module is mounted on the mount base for use. The table below lists the kinds of mount base on which the CMU module can be mounted.

Series	Name	Model
S10V	4-slot LPU mount base	HSC-1540
	8-slot LPU mount base	HSC-1580

3.2 Mounting the Module

3.2.1 Mounting the CMU module

Mount the CMU module in option slots (slot numbers 0 through 7) on the mount base as shown below.

NOTICE

The S10V Series places no limitations on the mounting location and available slots, but certain limitations are imposed depending on the I/O module combination. For more information, refer to “USER’S MANUAL BASIC MODULE (Manual number SVE-1-100).”

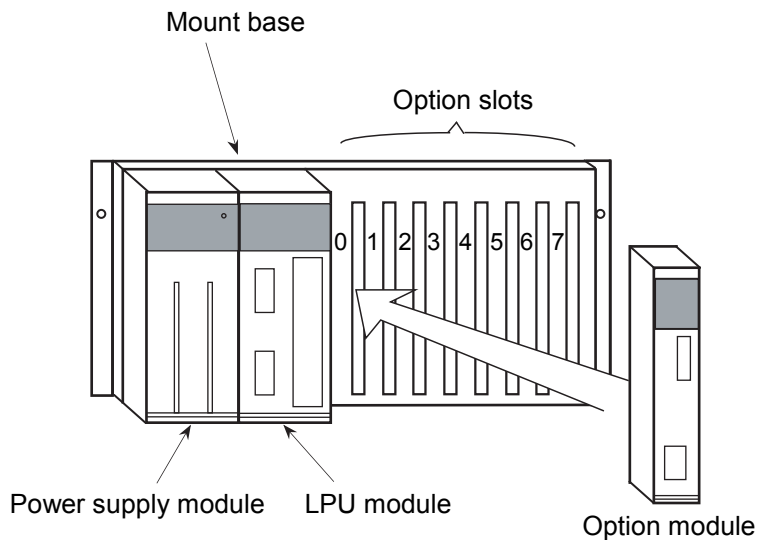


Figure 3-1 Mounting Option Module

3.2.2 Mounting the battery module

The battery module (model LQZ500) must always be mounted next to a model-LQP525 or LQP527 CMU module on the mount base. Its mounting position may be either the left or right to that CMU module.

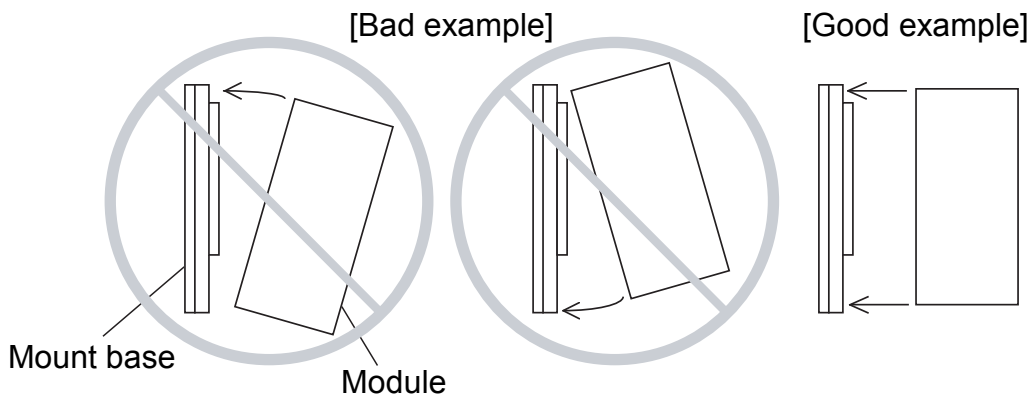


WARNING

- If the module emits smoke or foreign odor, immediately switch off the power supply and investigate the problem cause.
- Do not perform any installation, wiring, handling, or internal modification procedures other than stated in this manual. In no event will Hitachi be responsible for personal injury or death or any damage to Hitachi's product or peripheral equipment arising out of the use of such an unauthorized procedure.
- While the power is applied, never touch a terminal strip or connector pin. If you touch a terminal strip or connector pin while the power is applied, you may receive an electric shock.

NOTICE

- Dust or other foreign matter might accumulate on the connector, resulting in poor contact. Immediately after the module is unpacked, perform the mounting and wiring procedures.
- To prevent the module from being damaged, observe the following precautions when you mount or demount the module:
 - Before mounting the module to the mount base connector, check that the connector pins are properly aligned and not bent, broken, or soiled with dirt or the like.
 - Ensure that the module is parallel to the mount base vertical surface as shown below when mounting. If you connect a module to or disconnect it from its connector while it is tilted, the connector pins may become damaged.
 - If the mount base is positioned overhead due to the employed enclosure structure, use a stepladder or the like and mount the module squarely. If you mount the module obliquely, the connector may become damaged.



 **CAUTION**

- Observe the installation procedure stated in the manual. If the module is improperly installed, it may drop, become defective, or malfunction.
- Do not allow wire cuttings or other foreign matter to enter the module. The entry of foreign matter in the module may result in a fire or cause the module to become defective or malfunction.
- Before installing the module, discharge any static buildup from your body because static electricity may render the module defective.
- Properly tighten the screws. If they are inadequately tightened, malfunction, smoke emission, or combustion may occur.

NOTICE

Do not disassemble or modify the module. Failure to observe this precaution may result in a fire or cause the module to become defective or malfunction.

3.3 Communications Wiring

(1) 10BASE-T and 10BASE-TX communications cabling

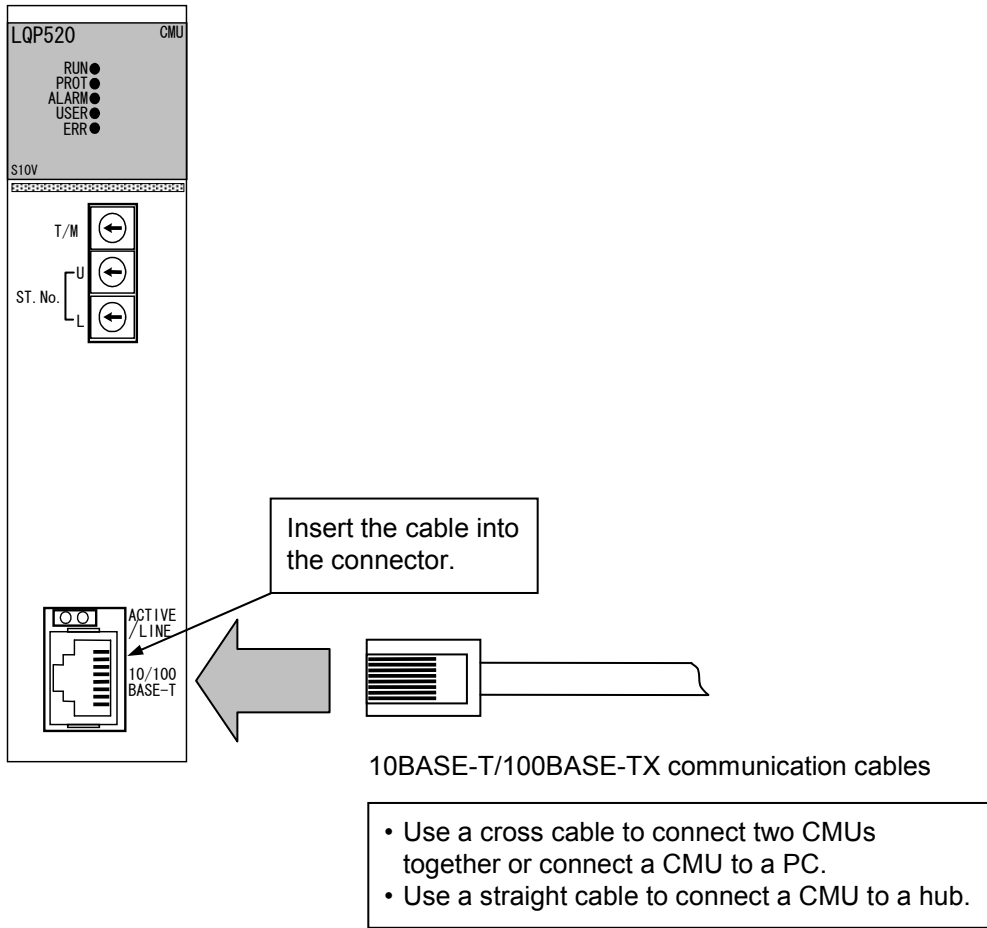


Figure 3-2 Wiring 10BASE-T/100BASE-TX Communication Cables

NOTICE

- This hardware unit may malfunction if it is connected poorly or has a broken line. After connecting the connector, check whether it is locked.
- Do not touch the connector during power-on. Otherwise, the system may malfunction due to static electricity, etc.

3.4 Battery Cable Wiring

(1) Battery cable wiring

The battery cable supplied must always be connected to the battery and CMU modules in their power-on state.

The following is an example of cable wiring between the battery and a model LQP525 CMU module. Cable wiring between the battery and a model-LQP527 CMU module can be accomplished in the same way as shown below.

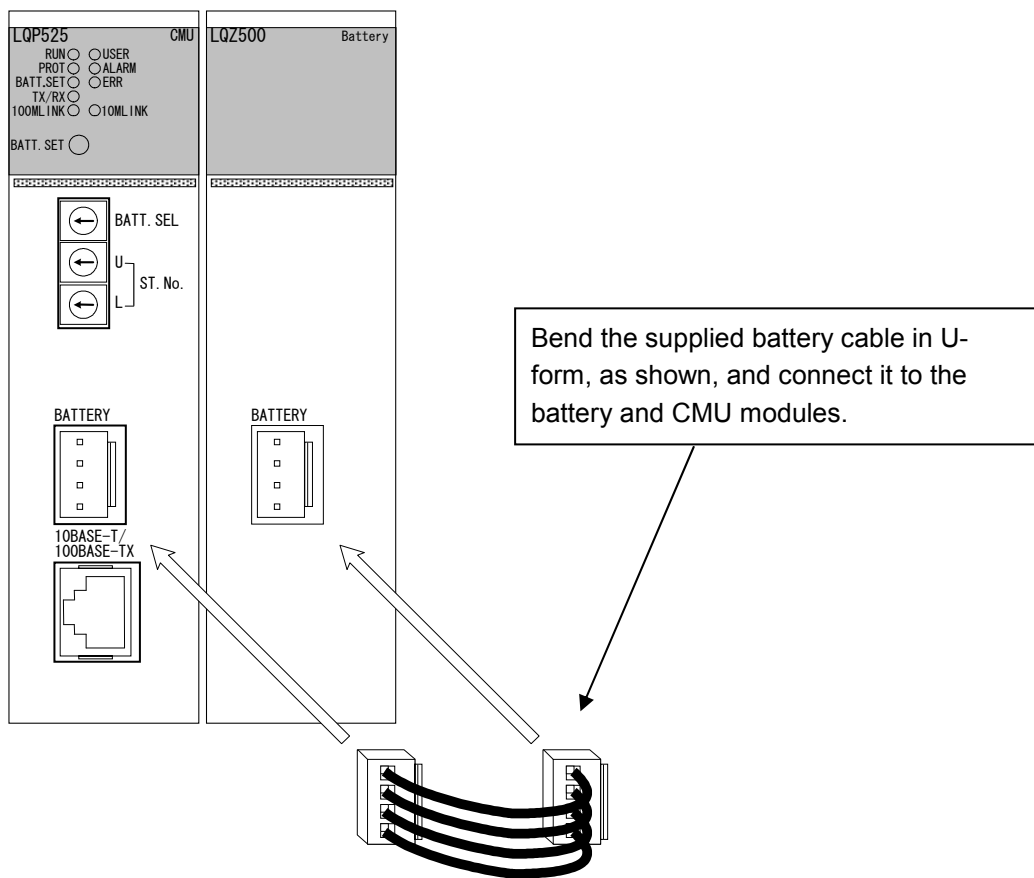


Figure 3-3 Battery Cable Wiring



CAUTION

The battery cable must always be wired in a power-on state, so be sure to provide protection against electric shock before you turn on the power to the CMU module.

NOTICE

- This hardware unit may malfunction if it is connected poorly or has a broken line. After connecting the connector, check whether it is locked.
- Never use a battery module and a battery cable other than supplied as standard. Always use a model-LQZ500 battery module and the battery cable supplied together with that battery module.

4 OPERATION

4 OPERATION

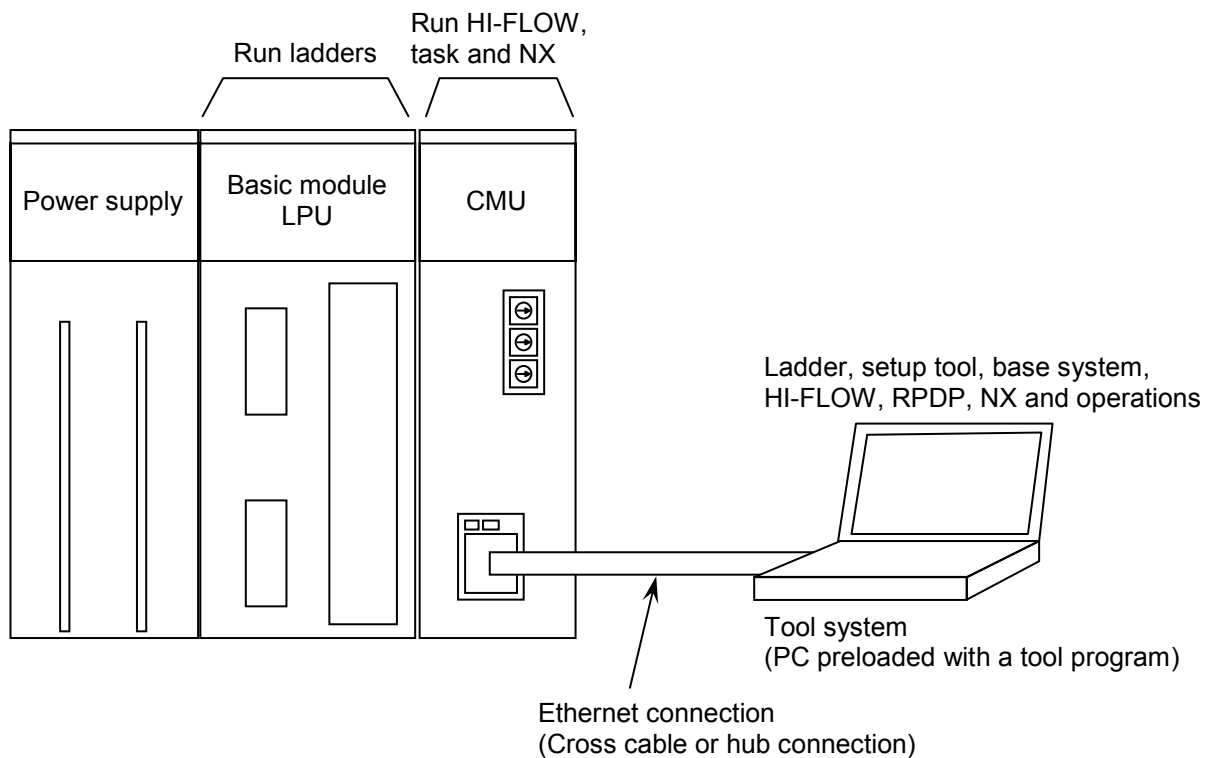
4.1 CMU Operations

Connect the CMU and a tool system on Ethernet to manipulate ladders, HI-FLOW, RPDP, NX, the Base System, and individual tools. (With the exception of HI-FLOW, RPDP and NX, CPMS debugger, ladders, the Base System, and tools can be manipulated from the basic module.) This section describes how to connect the CMU and a tool system.

4.1.1 Connecting the CMU and a tool system

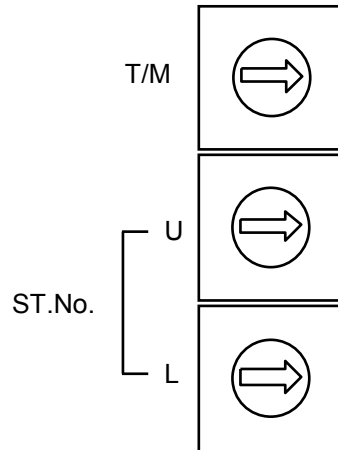
Connect the CMU to a tool system by way of Ethernet.

The CMU can be connected with a tool system in a one-to-one correspondence using a cross cable or in a 1-to-N correspondence by way of a hub.



4.1.2 CMU mounting rotary switches (for LQP520)

The LQP520 has three rotary switches - the T/M switch, and the ST.No. U and L switches. These three rotary switches are described below.



T/M

0: Use the CMU normally with this switch setting.

A: Disable CMU program (HI-FLOW, task and NX) operations. For more information, see “4.4 Disabling CMU Program Operations.”

F: Let the CMU operate in test mode. (Do not set this position.)

ST.No. U/L

0, 0: The CMU operates at the IP address that has previously been set by the S10V Base System of the tool system.

No communication can be established if the IP address is not set.

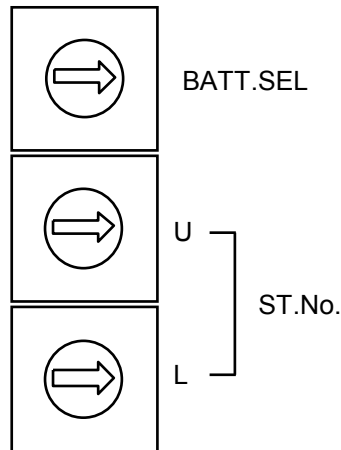
F, F: The CMU operates at IP address 192.192.192.1.

4 OPERATION

4.1.3 CMU mounting rotary switches (for LQP525 and LQP527)

The LQP525 and LQP527 has three rotary switches - the BATT.SEL switch, and the ST.No. U and L switches.

These three rotary switches are described below.



BATT.SEL

0: Selects the “battery connected” setting. With this setting selected, the contents of the CMU’s memory are retained in the event of a reset or power-on reset as long as the battery module is connected to that CMU. Further, if the battery module is not connected to it, an alarm is issued in such an event (i.e., the ALARM LED is lit).

1: Selects the “battery not connected” setting. With this setting selected, the contents of the CMU’s memory are lost in the event of a reset or power-on reset, and no alarm is issued.

A: Disable CMU program (HI-FLOW, task and NX) operations. For more information, see “4.4 Disabling CMU Program Operations.”

With this setting selected, the battery-backed contents of the CMU’s main memory are lost in the event of a reset or power-on reset, so save the contents to a backup file in the PC beforehand or take any other appropriate measure to prevent the loss of the contents.

F: Let the CMU operate in test mode. (Do not set this position.)

ST.No.U/L

0, 0: The CMU operates at the IP address that has previously been set by the S10V Base System of the tool system.

No communication can be established if the IP address is not set.

F, F: The CMU operates at IP address 192.192.192.1.

4.2 Using the Base System

This section provides instructions on using the Base System for the CMU.

4.2.1 Installing and starting up the system

■ Installing

To install the Base System, you must execute the setup program that is stored in the Base System DISK1 folder on the CD.

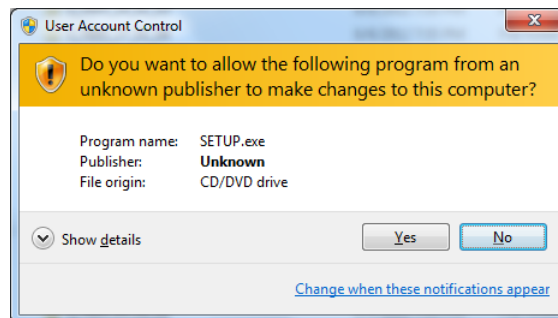
Double-click “setup.exe” that is stored in the DISK1 folder on the Base System CD. Since no window opens upon completion of installation, attach a shortcut to the desktop as needed. Click the button and choose [(All) Programs] – [Hitachi S10V] – [S10V BASE SYSTEM] – [S10V BASE SYSTEM] from the [Start] menu on the Windows® screen. Click and hold the right mouse button on the [S10V BASE SYSTEM] and move the pointer to the desktop. Then, choose [Copy Here] from the pop-up menu.

NOTICE

Before installing the Base System, shut down all Windows® programs running, including those resident in memory, such as a virus checker. If you install the Base System without shutting down these programs, an error might occur while installing it. If an error is encountered, uninstall the Base System once as instructed in “■ Uninstalling” to quit all Windows® programs and then reinstall the S10V Base System.

<Notes on installing in Windows® 7 (32-bit)>

Installing the Base System in Windows® 7 (32-bit) operating system requires prior logging onto the operating system with an appropriate Administrator account, which is the Administrator account first created in the initial condition of your personal computer. When you have so logged on, you can then double-click “setup.exe” that is stored in the DISK 1 folder on the Base System CD. When “setup.exe” is started, the dialog box as shown below will appear. Click the button to continue the execution of the setup program.



The Base System cannot be installed on a per-user basis. To install the Base System successfully, the user must first log onto the operating system with an appropriate Administrator account, which is the Administrator account first created in the initial condition of your personal computer.

The Base System may not be installed properly in any of the following cases: 1) administrator permission is acquired by using User Account Control(*) with a standard user account and 2) logon is made with an Administrator account that has been created using User Account Control with a standard user account.

If you make a logon with a user account that is different from the one you have used for the installation of the Base System, the installed program may be missing from the program menu displayed. In this case, you should perform the following series of steps: 1) make a logon again with the Administrator account first created in the initial condition of your personal computer; 2) uninstall the installed program; and 3) install the program again.

When you want to create a new account, be sure to make a logon with an Administrator account. Do not use User Account Control at that time.

(*) User Account Control is a Microsoft Windows feature that temporarily grants administrative rights to standard user accounts.

A message reporting a read-only file detected may be displayed during the reinstallation of the Base System. In this case, click the button to set off overwriting.

■ Uninstalling

The existing Base System needs to be uninstalled when, for instance, you want to upgrade it.

The procedure required for uninstalling it is as follows:

(1) Uninstalling from Windows® 2000

Click on button on your Windows desktop and choose [Settings] – [Control Panel]. When the Control Panel opens, double-click on [Add/Remove Programs].

Then, choose “S10V BASE SYSTEM” in the [Change or Remove Programs] tab and click the button. When the [Confirm File Deletion] dialog box appears, click the button.

(2) Uninstalling from Windows® XP

Click on button on your Windows desktop and choose ([Settings] –) [Control Panel]. When the Control Panel opens, double-click on [Add/Remove Programs].

Then, choose “S10V BASE SYSTEM” in the [Change or Remove Programs] tab and click the button. When the [Confirm File Deletion] dialog box appears, click the button.

(3) Uninstalling from Windows® 7 (32-bit)

Click on button on your Windows desktop and choose [Control Panel]. When the Control Panel opens, click [Programs and features]. Then, select “S10V BASE SYSTEM” and click button. When the [Confirm File Deletion] dialog box appears, click the button.

NOTICE

- If the [Remove Shared File?] window is displayed while uninstalling the Base System from Windows®, click the button not to select to delete shared files.
- When you want to reinstall the Base System, uninstall it first before reinstalling it.

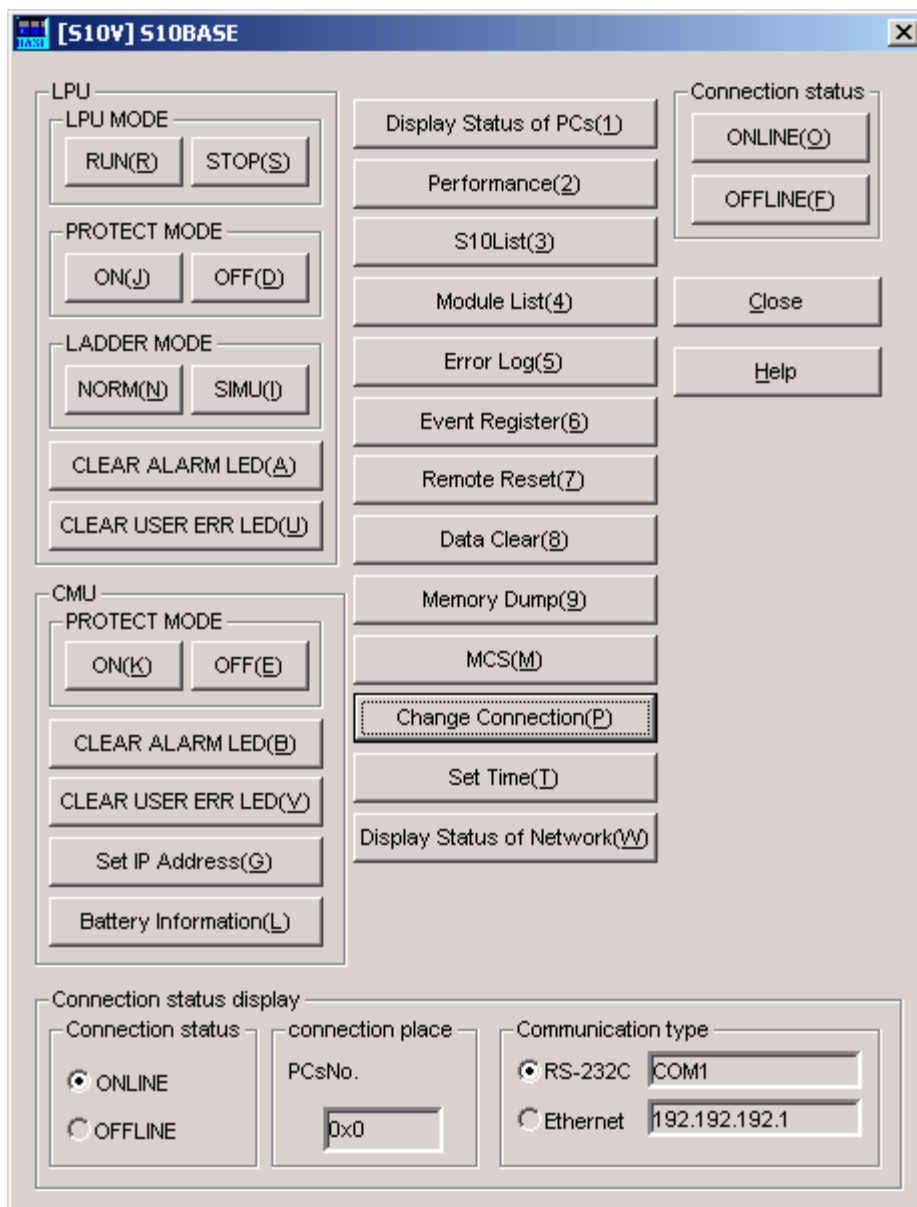
4 OPERATION

■ Starting the system

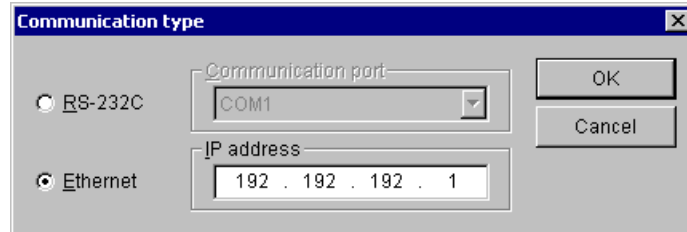
To start the Base System, follow these steps:

- (1) Double-click the “S10V BASE SYSTEM” icon in the Windows® screen. Or select **Start** button – [(All) Programs] – [Hitachi S10V] – [S10V BASE SYSTEM] – [S10V BASE SYSTEM].
- (2) The [[S10V] S10BASE] window is displayed.

At startup, the “Connection status” is set to “OFFLINE” so that the available functionality is limited.



- (3) To change the “Connection status” to ONLINE, click the **Change Connection** button to open the [Communication type] window, specify the connection destination, and then click the **OK** button.



To make a connection using the CMU, click the [Ethernet] and enter an IP address. When a both ST.No.U/L rotary switches have been set to F, the default IP address “192.192.192.1” is used.

- (4) Click the **ONLINE** button to connect to the PCs.

NOTICE

After setting in the [Communication type] window, a session of communication with the CMU starts to collect [[S10V] S10BASE] window display information. If the CMU is inactive or there is an invalid setting of communications information, the [[S10V] S10BASE] window is displayed in online state after a communication timeout is detected. Depending on the setting of the communication type, the communication timeout may take 2 to 3 minutes to detect.

Then, click the button corresponding to the function of your choosing.

■ Closing the system

Click **×** or the **Close** button in the [[S10V] S10BASE] window.

4.2.2 Base System functions

■ Base System function list

A listing of the Base System functions pertaining to the CMU can be found in Table 4-1, “Base System Function List.” For information on additional functions, refer to “USER’S MANUAL BASIC MODULE (Manual number SVE-1-100).”

The correspondence between the [[S10V] S10BASE] window (Figure 4-1) and the Base System function list (Table 4-1) is given on the next page.

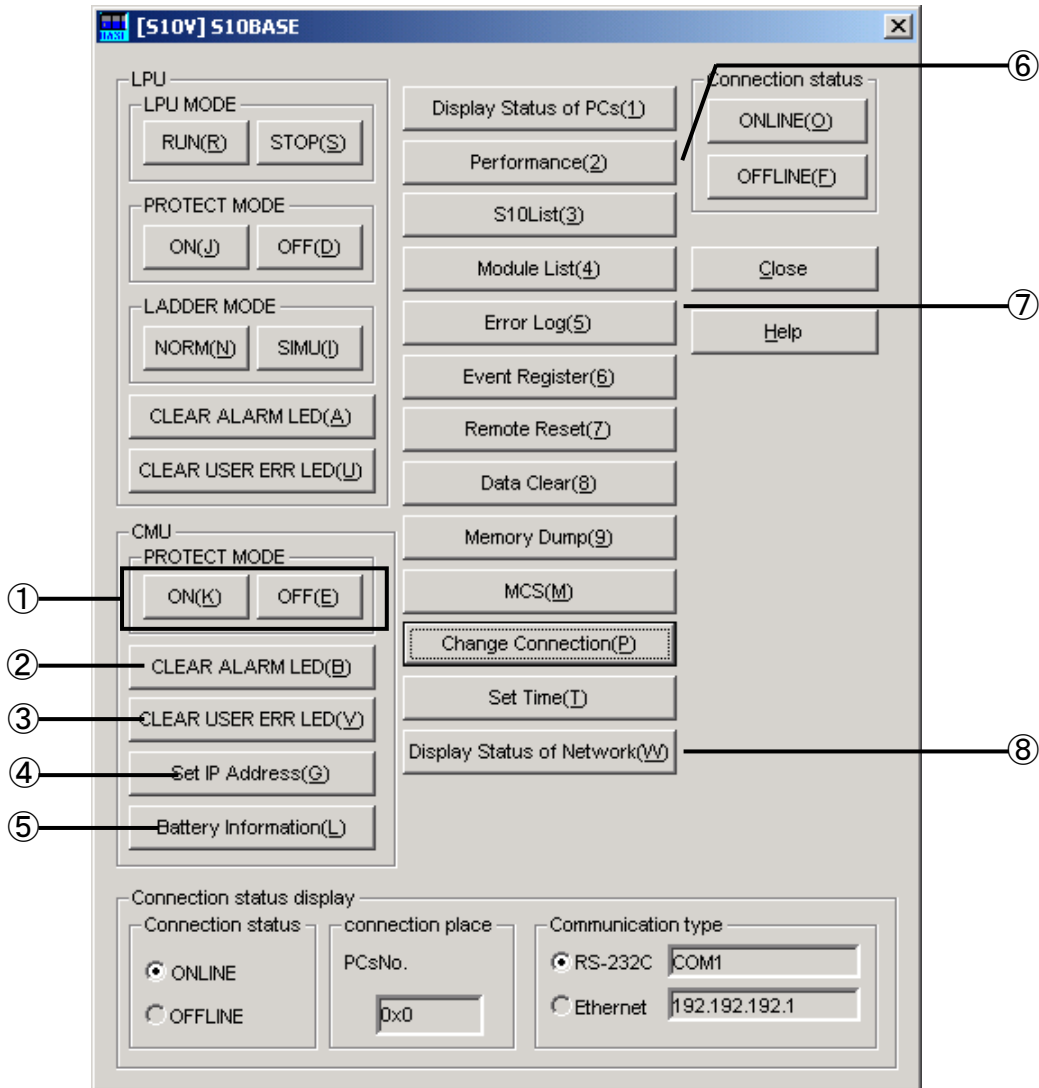


Figure 4-1 [[S10V] S10BASE] Window

Table 4-1 Base System Function List

No.	Button		Description
1	CMU	PROTECT MODE	Sets CMU protect mode on or off.
2		CLEAR ALARM LED	Clears the CMU ALARM LED.
3		CLEAR USER ERR LED	Clears the CMU USER LED.
4		Set IP Address	Sets a CMU IP address.
5		Battery Information	Displays the battery info currently maintained internally or sets new battery info.
6	Performance		Indicates the LPU processing time and CMU load percentage.
7	Error Log		Displays a log of errors that occurred in various modules.
8	Display Status of Network		Displays the RAS information of CMU/ET.NET.

4.2.3 CMU PROTECT MODE setting

Set whether to run the task in protection mode or not.

Writing from the task to SEQ-RAM is disabled while the task is running in protection mode.

Click the button to let the task run in protection mode.

Click the button to let the task run in non-protection mode.

4.2.4 CMU ALARM LED clear

Clears the CMU module's ALARM LED, which starts glowing when an error that is not serious enough to disrupt the CMU module's operation is detected or when a "battery not connected" or a "battery low" condition is detected in the presence of the "battery connected" setting selected.

4.2.5 CMU USER ERR LED clear

Clears the CMU module USER LED, which glows when an invalid user setting is detected.

4.2.6 CMU IP address setting

(1) [Set CMU IP Address] window

The [Set CMU IP Address] window opens, prompting you to set the IP address, subnet mask, broadcast address, and route for the CMU's built-in Ethernet device. To validate the information setup, restart the PCs. You must also make sure that the CMU rotary switches are both set to "0".

- "IP Address" box
Specifies the IP address.
- "Subnet Mask" box
Specifies the subnet mask.
- "Broadcast Address" box

4 OPERATION

Specifies the broadcast address.

- button
Accepts the newly entered IP address, subnet mask, broadcast address, and route, and closes the [Set CMU IP Address] window.
- button
Discards the newly entered IP address, subnet mask, broadcast address, and route, and closes the [Set CMU IP Address] window.
- button
Opens the [Route] window for routing table setup.

(2) [Route] window

Sets the communication point address and gateway IP address.

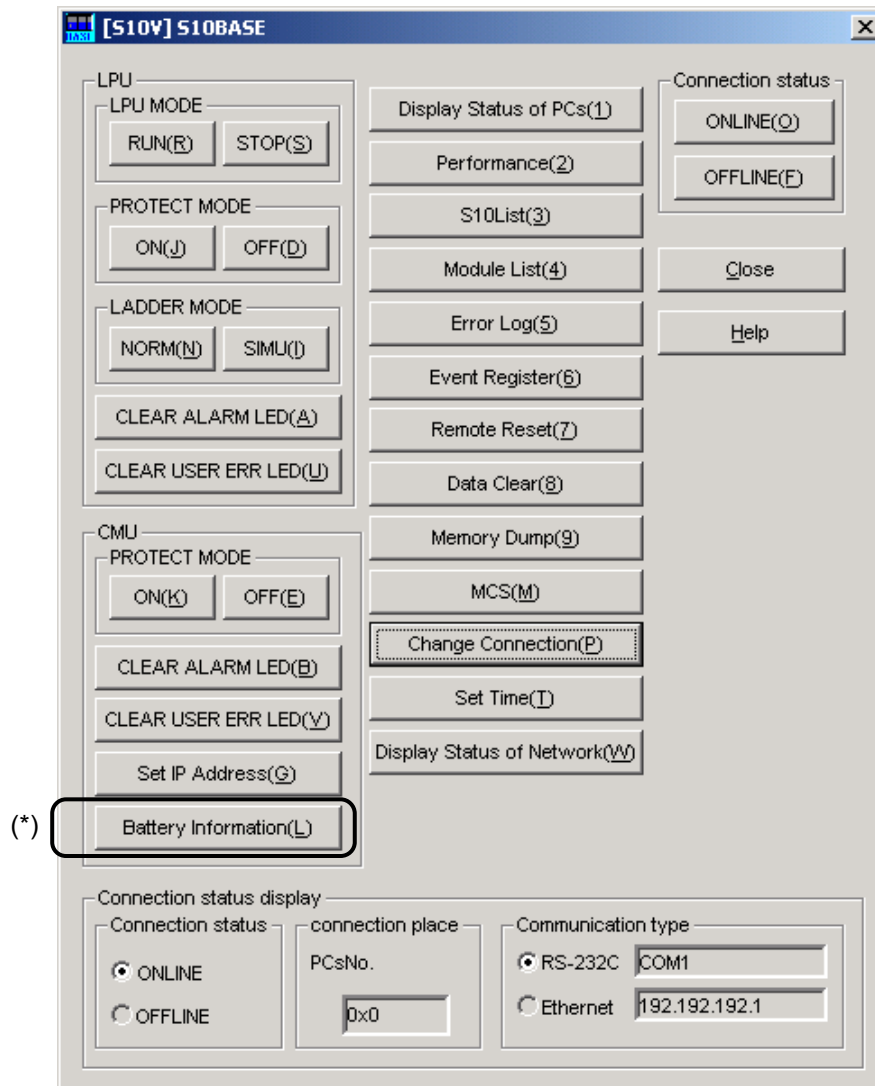
	Communication point address	Gateway
Route1	0 . 0 . 0 . 0	0 . 0 . 0 . 0
Route2	0 . 0 . 0 . 0	0 . 0 . 0 . 0
Route3	0 . 0 . 0 . 0	0 . 0 . 0 . 0
Route4	0 . 0 . 0 . 0	0 . 0 . 0 . 0
Route5	0 . 0 . 0 . 0	0 . 0 . 0 . 0
Route6	0 . 0 . 0 . 0	0 . 0 . 0 . 0
Route7	0 . 0 . 0 . 0	0 . 0 . 0 . 0
Route8	0 . 0 . 0 . 0	0 . 0 . 0 . 0
Route9	0 . 0 . 0 . 0	0 . 0 . 0 . 0

- “Communication point address” box
Specifies the communication point network address or IP address.
- “Gateway” box
Specifies the gateway IP address. When the box reads “0.0.0.0”, it means that no IP address is entered.
- button
Accepts the newly entered information and closes the [Route] window. The accepted information is written into the PCs when you click the button in the [Set CMU IP Address] window.
- button
Discards the newly entered information and closes the [Route] window.

4.2.7 Battery information

Battery information is presented in the [CMU battery information] window displayed. This information provides a rough estimate of when to replace the battery module. The instructions given below show how to display battery information on screen and add changes to it.

- (1) Start the S10V Base System and click the **Battery Information** button in the following menu:



- (*) This button is effective only when the following two conditions are met: 1) the CMU module used is of model LQP525 or LQP527 and 2) the “battery connected” setting is selected (by setting the CMU module’s BATT.SEL switch in “0” position).

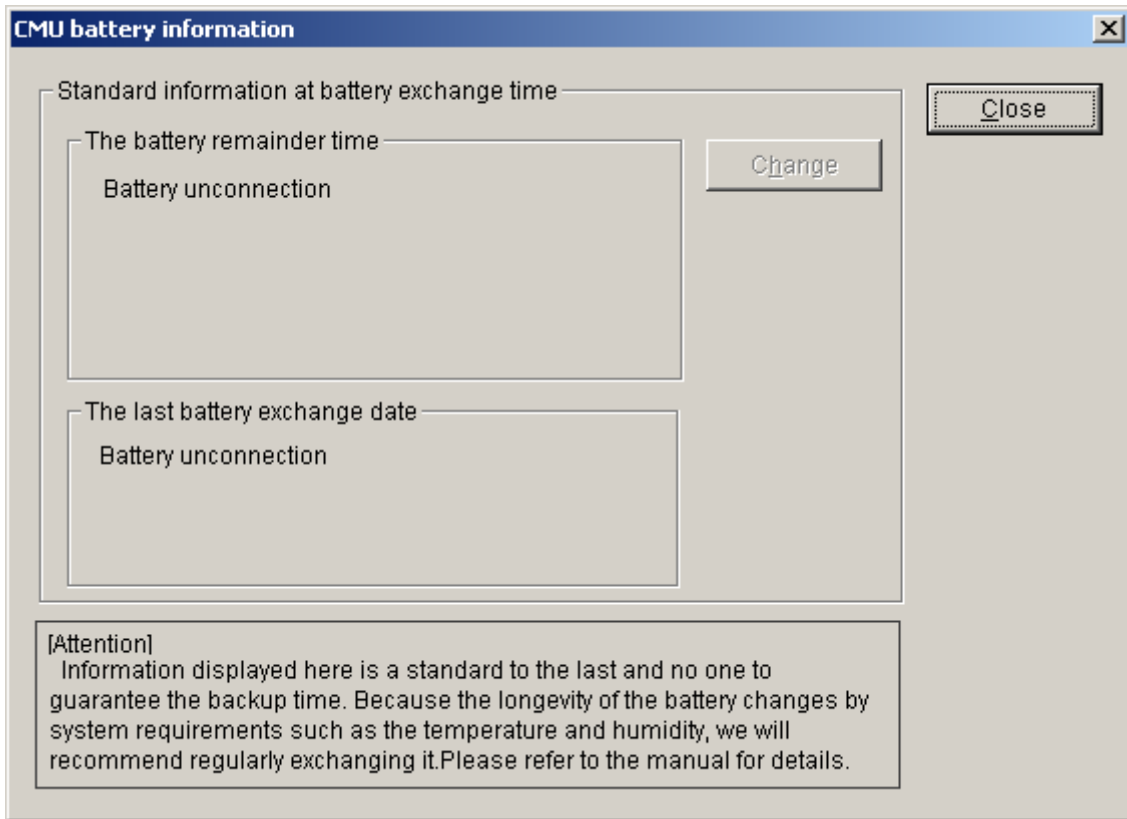
NOTICE

The battery module’s remaining life (hours) presented in the [CMU battery information] window is only a rough estimate and does not guarantee its actual remaining life or backup efficacy. The battery module’s useful life varies depending the ambient temperature and humidity, so it is recommended that the battery module should be replaced periodically.

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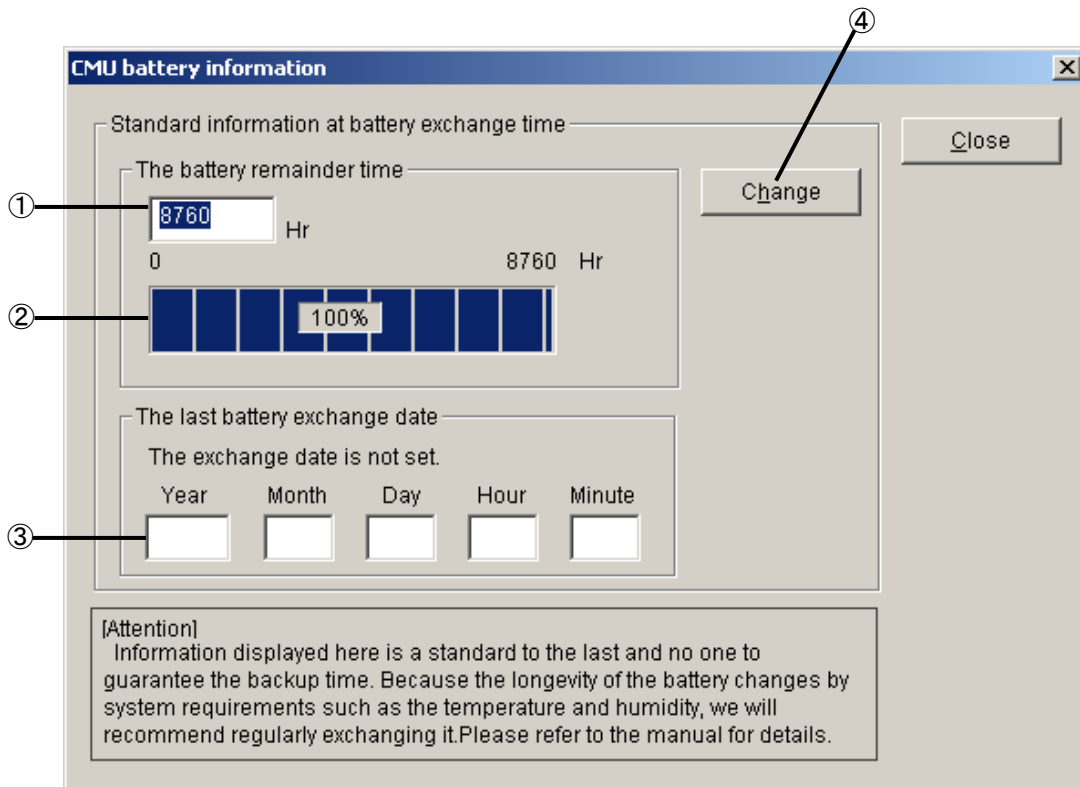
- (2) One of the following [CMU battery information] windows is displayed depending on whether the battery module is connected to the CMU module or not.

<Display when the battery is not connected>



<Display when the battery is connected>

As shown below, the [CMU battery information] window displayed in this case presents the battery module's remaining life time and the date and time of the last battery replacement that was made. It also allows you to add changes to the displayed battery information.



① The battery remainder time

This piece of battery information indicates the battery module's remaining life time (see the asterisk (*) note on the next page). Where the battery module is not connected to the CMU module, the text "Battery unconnection" is displayed in place of the remaining life. If you want to replace the battery module, follow the procedure described under "6.3 Replacing the Battery Module."

If you want to replace the CMU module, follow the procedure described under "6.4 Replacing the CMU Module."

② The battery remainder time indicator bar graph

This bar graph shows the battery module's remaining life time in percent (%) of the maximum possible life time. This piece of battery information is not displayed where the battery module is not connected to the CMU module.

③ The last battery exchange date

This piece of battery information indicates the date and time the battery module was replaced last time. It is read from the CMU module and displayed on screen.

The time of pushing the CMU module's BATT.SET switch is recorded in the CMU module's internal memory. If no such information is recorded in the CMU module, the text "The exchange date is not set" is displayed instead.

If the CMU module is replaced before the battery module is replaced, enter the date and time of the replacement and click the button to correct the current date and time.

4 OPERATION

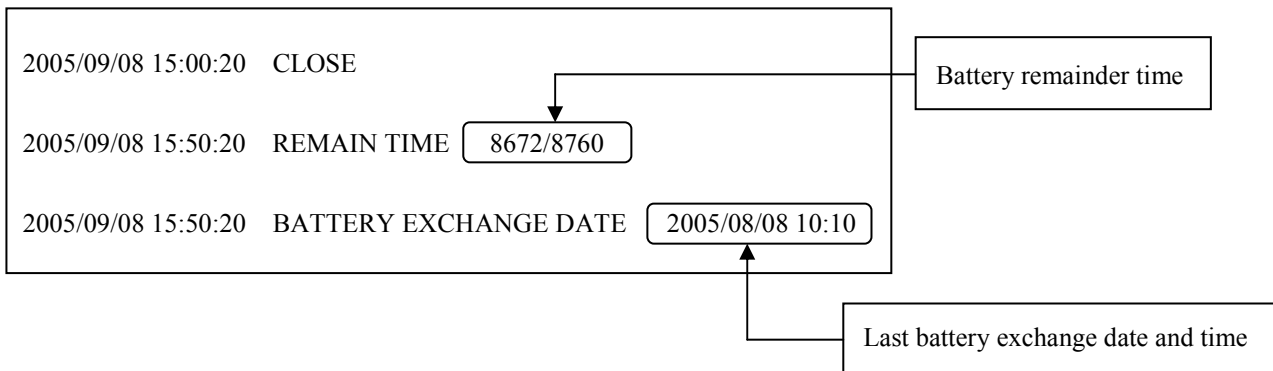
④ Change

Use this button when you want to set the battery remainder time and the last battery exchange date and time to the desired values without using the CMU module's BATT.SET switch.

The battery remainder time (*) and last battery exchange date and time are recorded in the CMU module. If only the CMU module is replaced, this makes it impossible to compute the correct battery remainder time. To solve this problem, set the battery remainder time to the correct value by using the button.

Clicking the button causes the specified battery remainder time and last battery exchange date and time to be recorded in the S10V Base System's operation history, which is stored in the file 'S10log.txt' in the same folder in which the Base System is installed.

<S10log.txt>



(*) The battery remainder time is computed as follows:

Battery remainder time = useful battery life time - accumulated power failure time
where the useful battery life time is 365 days times 24 hours, and the accumulated power failure time is one that is recorded in the CMU module's internal memory. The battery remainder time is computed by software tools using those values.

4.2.8 Performance displaying

(1) [Performance] window

The performance displaying function first displays the [Performance] window as shown below that presents information on the sequence cycle and CMU Load percentage.

The screenshot shows a window titled "Performance" with two main sections: "Sequence Cycle" and "CMU Load percentage".

- Sequence Cycle:**
 - Current value: 1 (ms)
 - Maximum value: 1 (ms)
 - Minimum value: 1 (ms)
 - Setting value: 30 (ms)
 - Clear button
- CMU Load percentage:**
 - Current value: 3 (%)
 - Maximum value: 3 (%)
 - Minimum value: 1 (%)
 - Measurement time: 1 (Sec)
 - Change Time button
 - Clear button

On the right side of the window, there are three buttons: "OK", "Refresh", and "Start Monitoring".

The items of information presented by this window have the following meanings:

Table 4-2 Items Presented by the [Performance] Window

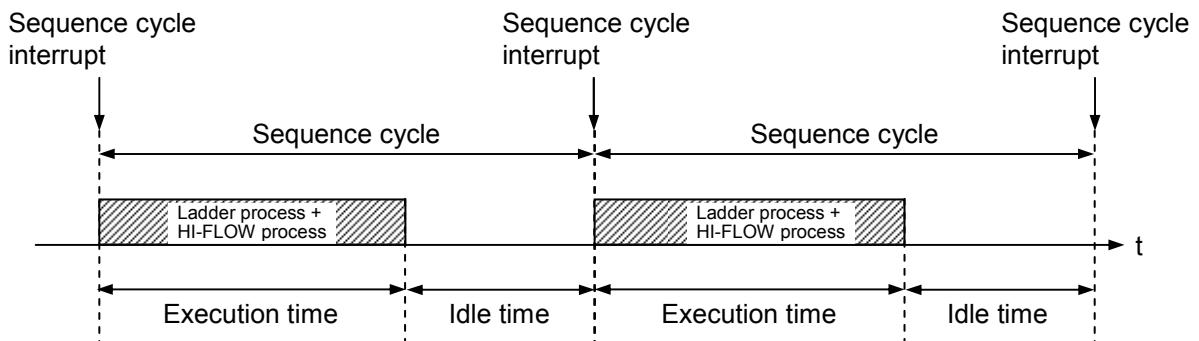
Group	Item	Unit	Description
Sequence Cycle	Current value	ms	Current value of the total time required for execution of ladder programs and HI-FLOW processes. (*)
	Maximum value	ms	Maximum value of the total time required for execution of ladder programs and HI-FLOW processes. (*)
	Minimum value	ms	Minimum value of the total time required for execution of ladder programs and HI-FLOW processes. (*)
	Setting value	ms	Set value of the sequence cycle timer.
CMU Load percentage	Current value	%	Current value of the CMU load percentage.
	Maximum value	%	Maximum value of the CMU load percentage.
	Minimum value	%	Minimum value of the CMU load percentage.
	Measurement time	sec	Measurement time of the CMU load percentage.

- **Clear** button (sequence cycle)
Clears the sequence cycle current value, maximum value, and minimum value, and restarts a measurement process. After the values are cleared, the current value, maximum value, and minimum value fields in the Sequence Cycle area read "0".
- **Clear** button (CMU load percentage)
Clears the CMU load percentage current value, maximum value, and minimum value, and restarts a measurement process. After the values are cleared, the current value, maximum value, and minimum value fields in the CMU Load percentage area read "0".

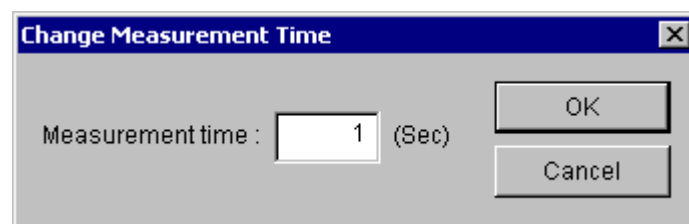
4 OPERATION

- **Change time** button
Opens the [Change Measurement Time] window, which allows you to change the measurement time. The measurement time setting entered from the [Change Measurement Time] window appears in the “Measurement time” box in the [Performance] window.
This button also clears the current value, maximum value, and minimum value from the “CMU Load percentage” area, and starts a CMU load percentage measurement process at the changed measurement time setting.
- **OK** button
Closes the [Performance] window.
- **Refresh** button
Displays the current values.
- **Start Monitoring** button
Starts monitoring the sequence cycle and CMU load factor.
- **Stop Monitoring** button
Stops monitoring the sequence cycle and CMU load factor.

(*) The total time required for execution of ladder programs and HI-FLOW processes is shown shaded in the figure below.



- (2) [Change Measurement Time] window
Changes the CMU load percentage measurement time.



- “Measurement time” box
Changes the CMU load percentage measurement time setting in 1-second units. The setting range is from 1 to 60 seconds. The default setting is 1 second. When the measurement time setting is changed from the [Change Measurement Time] window, the new setting becomes the default value the next time the window opens.
- **OK** button
Acquires the value in the “Measurement time” box and closes the [Change Measurement Time] window.
- **Cancel** button
Closes the [Change Measurement Time] window without changing the measurement time.

4.2.9 Error log information

- (1) The error log displaying function displays the [Error log information] window as shown below that presents an error log for any errors that have occurred in the modules supported by the S10V product. Up to eight errors that may have occurred in each module in the past are reported in the [Error log information] window. The CMU error log information window shows up to 2 fatal log error events and up to 32 non-fatal log error events. The CMU error log information window shows up to 2 fatal log error events and up to 8 non-fatal log error events.

For details on error codes and error descriptions concerning the CMU, see “6.2.4 CMU error message formats.” For the details concerning the other modules, refer to the respective module manuals.

Module	Mount	Error code	Contents	Date	Time
LPU	Mou...	0x120c	Arithmetic Function Address error	2005/01/12	09:36:27
LPU	Mou...	0x120c	Arithmetic Function Address error	2004/12/17	16:12:32
LPU	Mou...	0x120c	Arithmetic Function Address error	2004/12/06	15:01:48
LPU	Mou...	0x120c	Arithmetic Function Address error	2004/11/30	12:20:37
LPU	Mou...	0x120c	Arithmetic Function Address error	2004/11/26	20:22:37
CMU	Mou...	0x07801512	[W] IPADDR_DUPL (UNO=1,DEV=0x...	2005/01/12	09:36:02
CMU	Mou...	0x07801512	[W] IPADDR_DUPL (UNO=1,DEV=0x...	2004/12/27	20:28:59
CMU	Mou...	0x07801510	[W] IFCONFIG_UP (UNO=1,DEV=0x...	2004/11/26	20:23:37
FL.NET (Main)	Unm...	0x0113	IP address not registered	2005/01/12	09:35:57
FL.NET (Main)	Unm...	0x0113	IP address not registered	2004/12/20	20:37:22
FL.NET (Main)	Unm...	0x0113	IP address not registered	2004/12/17	16:12:02
2ch-D.NET M...	Unm...	0x8181	CAN Transmission Timeout Error.	2004/12/21	17:11:59
2ch-D.NET M...	Unm...	0x8181	CAN Transmission Timeout Error.	2004/12/21	17:11:59
2ch-D.NET M...	Unm...	0x8181	CAN Transmission Timeout Error.	2004/12/21	17:11:59
2ch-D.NET M...	Unm...	0x8181	CAN Transmission Timeout Error.	2004/12/21	17:11:59
2ch-D.NET M...	Unm...	0x5189	Parameter type Mismatch(It is the pa...	2004/12/03	11:18:57

The items of information presented by this [Error log information] window have the following meanings:

Table 4-3 Items Presented by the [Error log information] Window

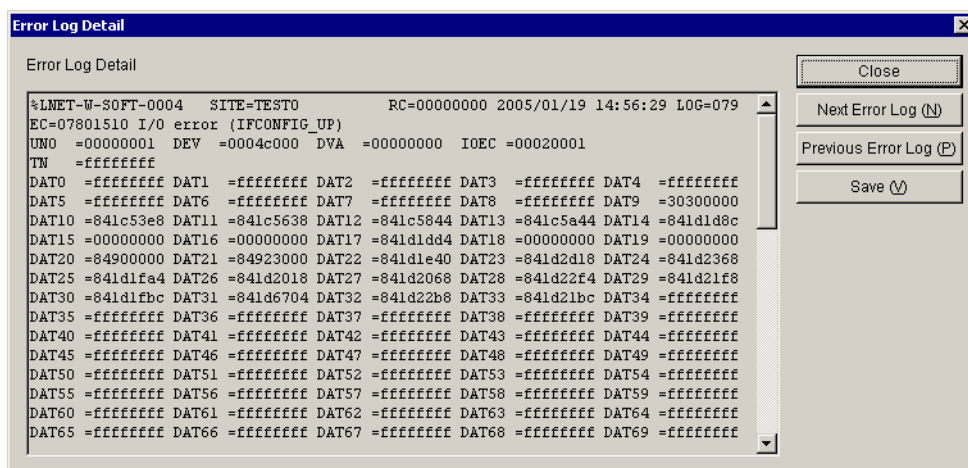
No.	Item	Description
1	Module	Name of an optional module for which error log information is maintained.
2	Mount	Indication of whether an optional module for which error log information is maintained is mounted (Mounted) or not (Unmounted).
3	Error code	Error code for an error that occurred.
4	Contents	Meaning of an error code presented.
5	Date	Date on which an error occurred.
6	Time	Time at which an error occurred.

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- **Close** button
Closes the [Error log information] window.
- **Refresh** button
Displays the latest error log information.
- **Sorting** button
Sorts the displayed error events in chronological order. Whenever you click the **Sorting** button, the order alternates between ascending and descending.
To sorts the events again in the order of modules, click the **Refresh** button.
- **Error Log Delete** button
Deletes the error log information on an individual module basis. From the list box, select the module to be deleted, and then click the **Error Log Delete** button.
- **Error Log All Delete** button
Deletes the entire error log information.
- **Error Log Save** button
Opens the [Save As] window, which allows you to save the error log information in a file.
- **Error Log Detail** button
The [Error Log Detail] window that presents detailed information about the errors in CMU opens.

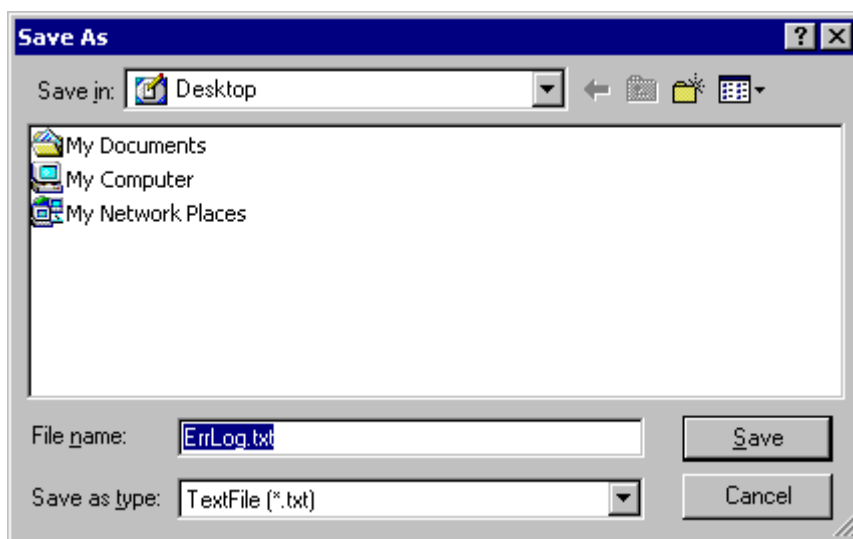
(2) [Error Log Detail] window

The [Error Log Detail] window that presents detailed information about the errors in CMU opens. Refer to “S10V TROUBLESHOOTING MANUAL (Manual number SVE-3-001)” for the details displayed in [Error Log Detail].



- **Next Error Log** button
Displays detailed information for the next error log after the one specified in the [Error Log Information] window.
- **Previous Error Log** button
Displays detailed information for the error log prior to the error log specified in the [Error Log Information] window.
- **Save** button
Opens the [Save As] window, which allows you to save the error log information in a file.

(3) [Save As] window



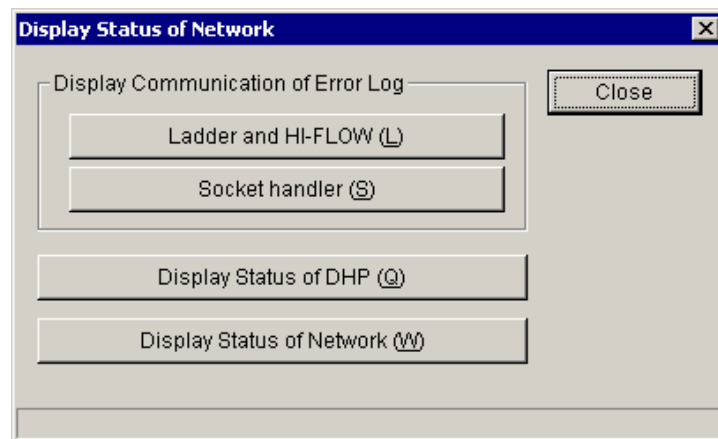
- **Save** button
Saves the error log information in a specified file and then closes the [Save As] window.
- **Cancel** button
Closes the [Save As] window without saving the error log information.

NOTICE

The functions described in Subsections 4.2.10 through Subsections 4.2.14 are available for CMU and model-LQE720 ET.NET modules, but they are not available for model-LQE520 ET.NET modules.

4.2.10 Display Status of Network (Menu)

- (1) The [Display Status of Network] window that presents the RAS information of CMU/ET.NET opens.

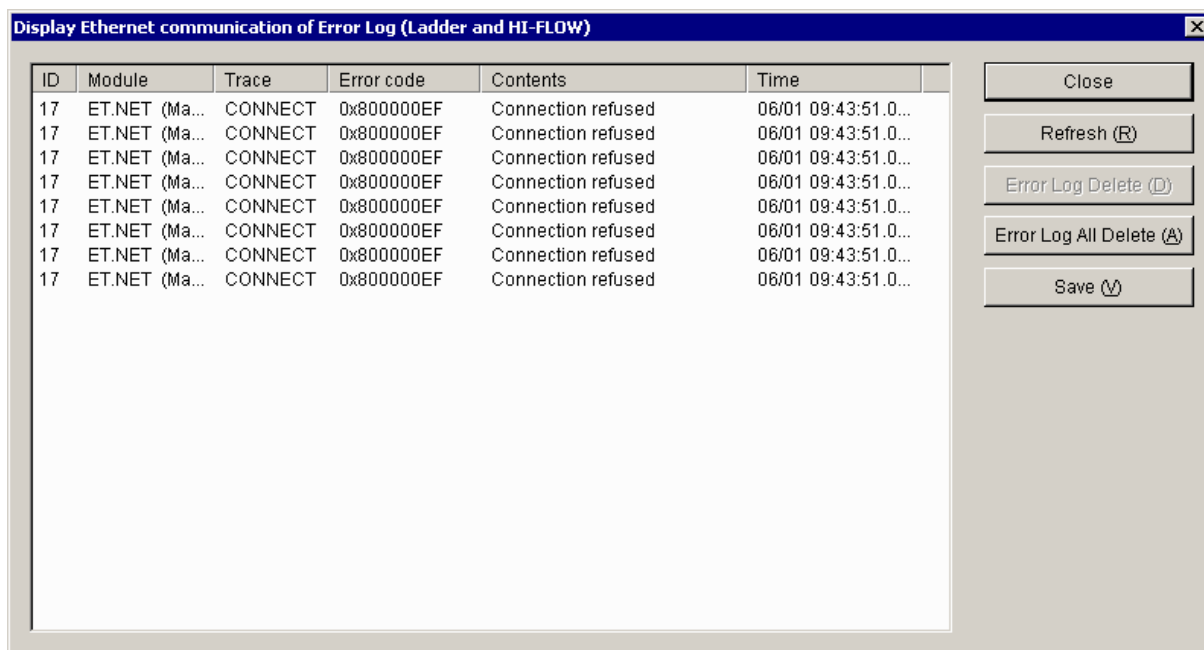


- (2) Click the **Ladder and HI-FLOW** button to display the error log information of the errors that occurred in the Ethernet communication of the Ladder and HI-FLOW. Click the **Socket handler** button to display the error log information of the errors that occurred in the Ethernet communication of the Socket handler.
- (3) Click the **Display Status of DHP** button to display the current DHP logging mode or DHP trace.
- (4) Click the **Display Status of Network** button to the display network status and the [addition] of CMU/ET.NET.

4.2.11 Display Ethernet communication of Error Log (Ladder and HI-FLOW)

(1) [Display Ethernet communication of Error Log (Ladder and HI-FLOW)] window

The [Display Ethernet communication of Error Log (Ladder and HI-FLOW)] window that presents the trace logs of errors that occurred in the Ethernet communication of the Ladder and HI-FLOW opens.



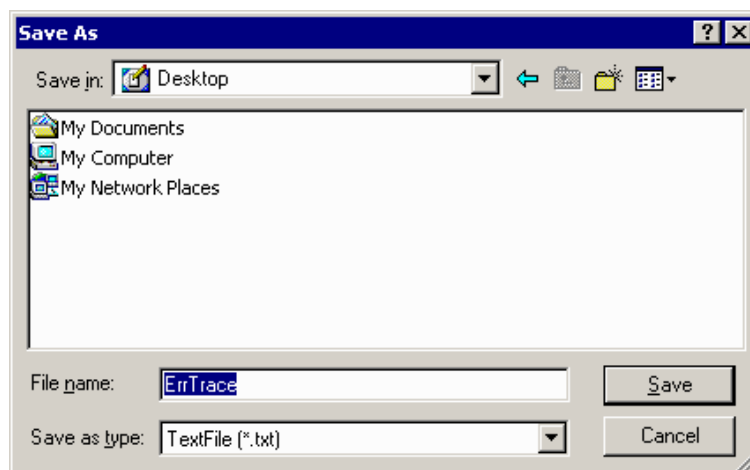
The content of the error log displayed is as follows:

Item	Content
ID	Table number of Ladder and HI-FLOW Ethernet communications management table
Module	Module name
Trace	Meaning of trace code in trace information
Error code	Error code for the error detected
Contents	Meaning of error code for the error detected
Time	Time the error occurred

4 OPERATION

- **Refresh** button
Displays the latest error log information in the Ethernet communication of the Ladder and HI-FLOW.
- **Error Log Delete** button
Deletes the error log information in the Ethernet communication of the Ladder and HI-FLOW on an individual module basis. From the list box, select the ID of the module to be deleted, then click the **Error Log Delete** button.
- **Error Log All Delete** button.
Deletes the entire error log information in the Ethernet communication of the Ladder and HI-FLOW.
- **Save** button
- Opens the [Save As] window, which allows you to save the error log information in the Ethernet communication of the Ladder and HI-FLOW in a file.

(2) [Save As] window



- **Save** button
Saves the error log information in the Ethernet communication of the Ladder and HI-FLOW as a specified file and closes the [Save As] window.
- **Cancel** button
Closes the [Save As] window without saving the error log information.

4.2.12 Display Ethernet communication of Error Log (Socket handler)

(1) Display Ethernet communication of Error Log (Socket handler) window

The [Display Ethernet communication of Error Log (Socket handler)] window that presents the trace logs of errors that occurred in the Ethernet communication of the Socket handler opens.

ID	Module	Socket handler	Error c...	Trace	Details of erro...	Contents	Time
/20	ET.NET (Ma...	UDP_SEND	0xFFFE	SENDTO	0x000000E5	Invalid control block	07/13 18:37:14.6...
/20	ET.NET (Ma...	UDP_SEND	0xFFFD	SENDTO	0x000000E5	Invalid argument	07/13 18:13:52.9...
/21	ET.NET (Ma...	UDP_OPEN	0xFFFD	BIND	0x000000E2	Duplicate socket	07/13 18:17:10.1...
/21	ET.NET (Ma...	UDP_OPEN	0xFFFD	BIND	0x000000E2	Duplicate socket	07/13 18:17:10.2...
/21	ET.NET (Ma...	UDP_OPEN	0xFFFD	BIND	0x000000E2	Duplicate socket	07/13 18:17:10.3...
/21	ET.NET (Ma...	UDP_OPEN	0xFFFD	BIND	0x000000E2	Duplicate socket	07/13 18:17:10.5...
/21	ET.NET (Ma...	UDP_OPEN	0xFFFD	BIND	0x000000E2	Duplicate socket	07/13 18:17:10.6...
/21	ET.NET (Ma...	UDP_OPEN	0xFFFD	BIND	0x000000E2	Duplicate socket	07/13 18:17:10.7...
/21	ET.NET (Ma...	UDP_OPEN	0xFFFD	BIND	0x000000E2	Duplicate socket	07/13 18:17:10.8...
/21	ET.NET (Ma...	UDP_OPEN	0xFFFD	BIND	0x000000E2	Duplicate socket	07/13 18:17:11.0...

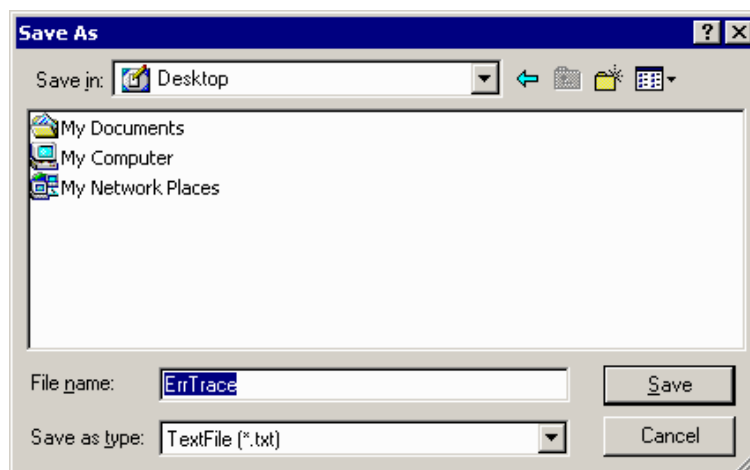
The content of the error log displayed is as follows:

Item	Content
ID	Socket ID of socket handler
Module	Module name
Socket handler	Name of socket handler
Error code	Error code from socket handler
Trace	Place at which the error was detected.
Details of error code	Details of error code when the error was detected.
Contents	Meaning of error code for the error detected
Time	Time the error occurred

4 OPERATION

- **Refresh** button
Displays the latest error log information in the Ethernet communication of the Socket handler.
- **Sorting** button
Sorts the displayed error log information in chronological order. When you click the **Sorting** button, the order of the information alternates between ascending and descending.
- **Error Log All Delete** button
Deletes the entire error log information in the Ethernet communication of the Socket handler.
- **Save** button
Opens the [Save As] window, which allows you to save the error log information in the Ethernet communication of the Socket handler in a file.

(2) [Save As] window

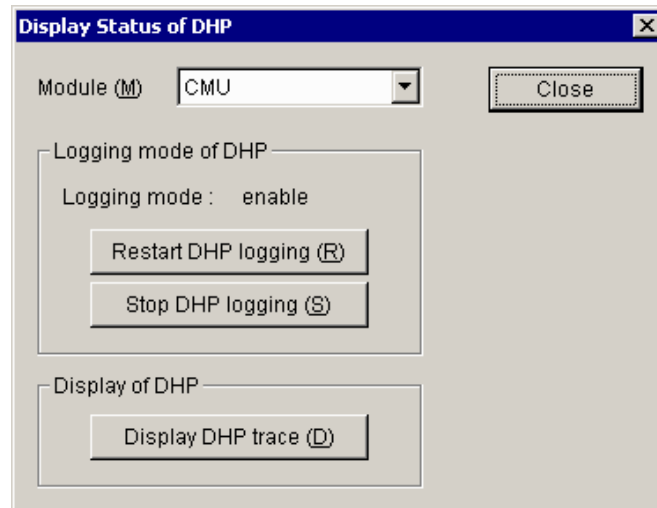


- **Save** button
Saves the error log information in the Ethernet communication of the Socket handler as a specified file and closes the [Save As] window.
- **Cancel** button
Closes the [Save As] window without saving the error log information.

4.2.13 Display Status of DHP

(1) [Display Status of DHP] window

The [Display Status of DHP] window to specify the logging mode of DHP opens.

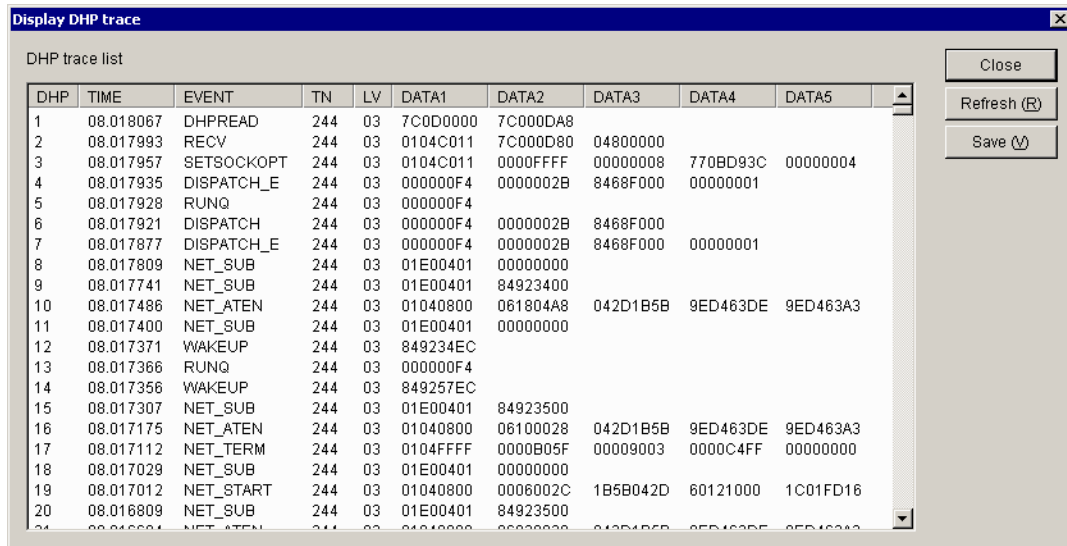


- [Module] box
Displays the name of the modules of CMU/ET.NET (LQE720) mounted in PCs. Select the module to display or specify the status of DHP.
- [Logging mode]
Displays the logging mode of DHP.
- button.
The logging mode of DHP will be changed to “enable”.
- button
The logging mode of DHP will be changed to “disable”.
- button
The [Display DHP trace] window that presents the DHP trace opens.

4 OPERATION

(2) [DHP trace] window

The [Display DHP trace] window that presents DHP trace opens. See “6.2.6 Meanings of DHP trace information items” for the details that are displayed in the window.

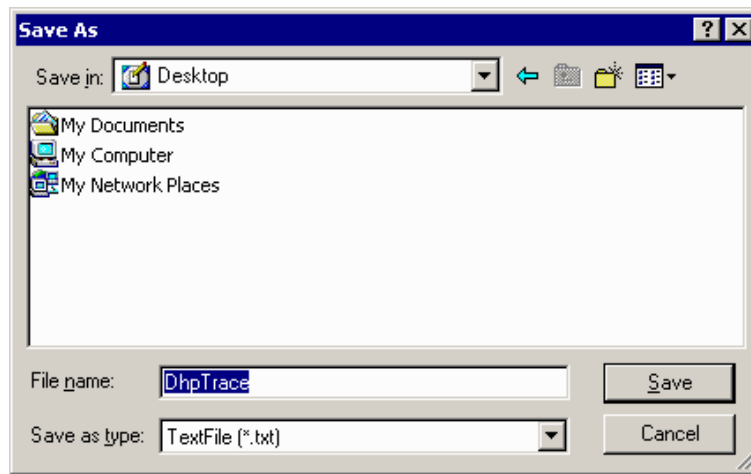


The items displayed in the [Display DHP trace] window are described below.

Item	Content
DHP	DHP trace number displayed
TIME	Time the tracing was made: <u>tt.tttttt</u> where tt is seconds and tttttt microseconds.
EVENT	Type of trace point
TN	Task number
LV	Priority level
DATA1 to DATA5	Each is a piece of trace data (output in hexadecimal format).

- **Refresh** button
Displays the Latest DHP trace.
- **Save** button
Opens the [Save As] window, which allows you to save the DHP trace in a file.

(3) [Save As] window



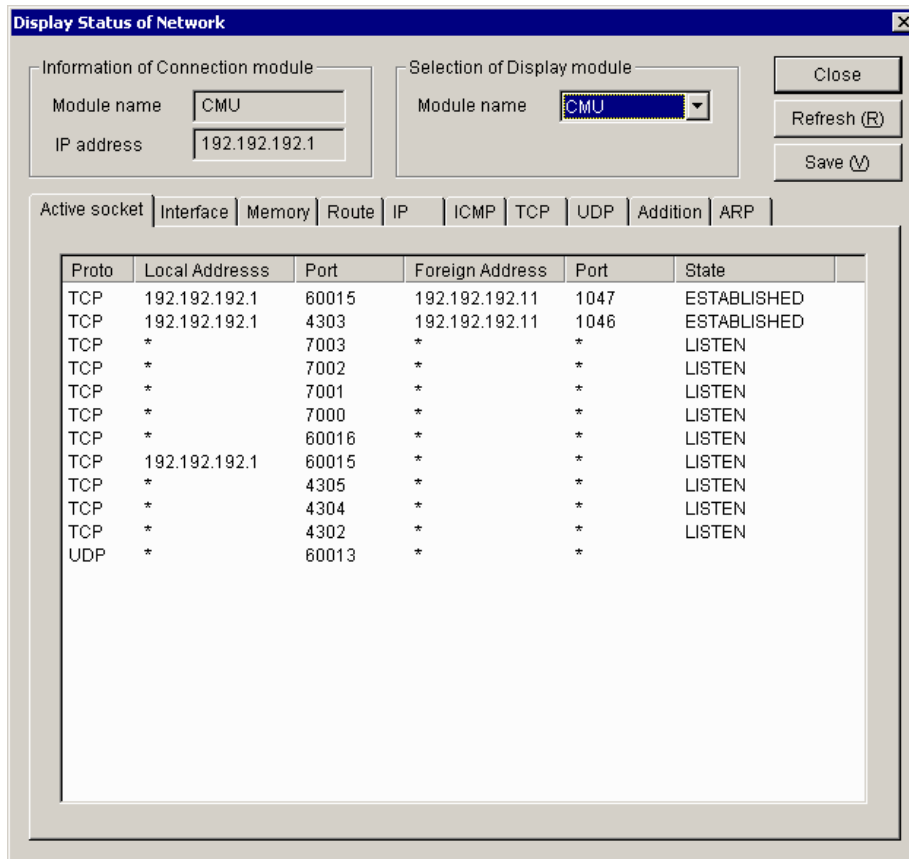
- **Save** button
Saves the DHP trace as a specified file and closes the [Save As] window.
- **Cancel** button
Closes the [Save As] window without saving the DHP trace.

4 OPERATION

4.2.14 Display Status of Network

(1) [Display Status of Network] window

The [Display Status of Network] window that presents the status of the network of CMU and ET.NET (LQE720) opens. See “6.2.8 Details of the Status of Network” for details displayed in the window.

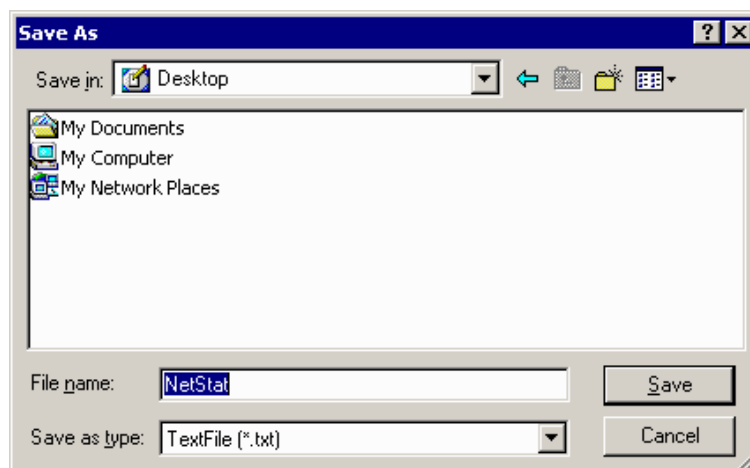


The items displayed in the [Display Status of Network] window are described below.

Item	Type of information displayed
Active socket	Socket information
Interface	Currently running network interfaces information
Memory	Send/receive buffer management information
Route	Routing information
IP	IP protocol statistics
ICMP	ICMP protocol statistics
TCP	TCP protocol statistics
UDP	UDP protocol statistics
Addition	Interface cumulative information
ARP	ARP table information

- Information for Connection module
 - [Module name] box
Displays the name of the modules connected to PCs.
 - [IP address]
Displays the IP address of the modules connected to PCs.
- Selection of Display module
 - [Module name] box
Displays the name of the modules of CMU/ET.NET (LQE720) installed in PCs. Select the module to display or specify the status of the network.
- button
Displays the latest status of the network.
- button
Opens the [Save As] window, which allows you to save the network status in a file.

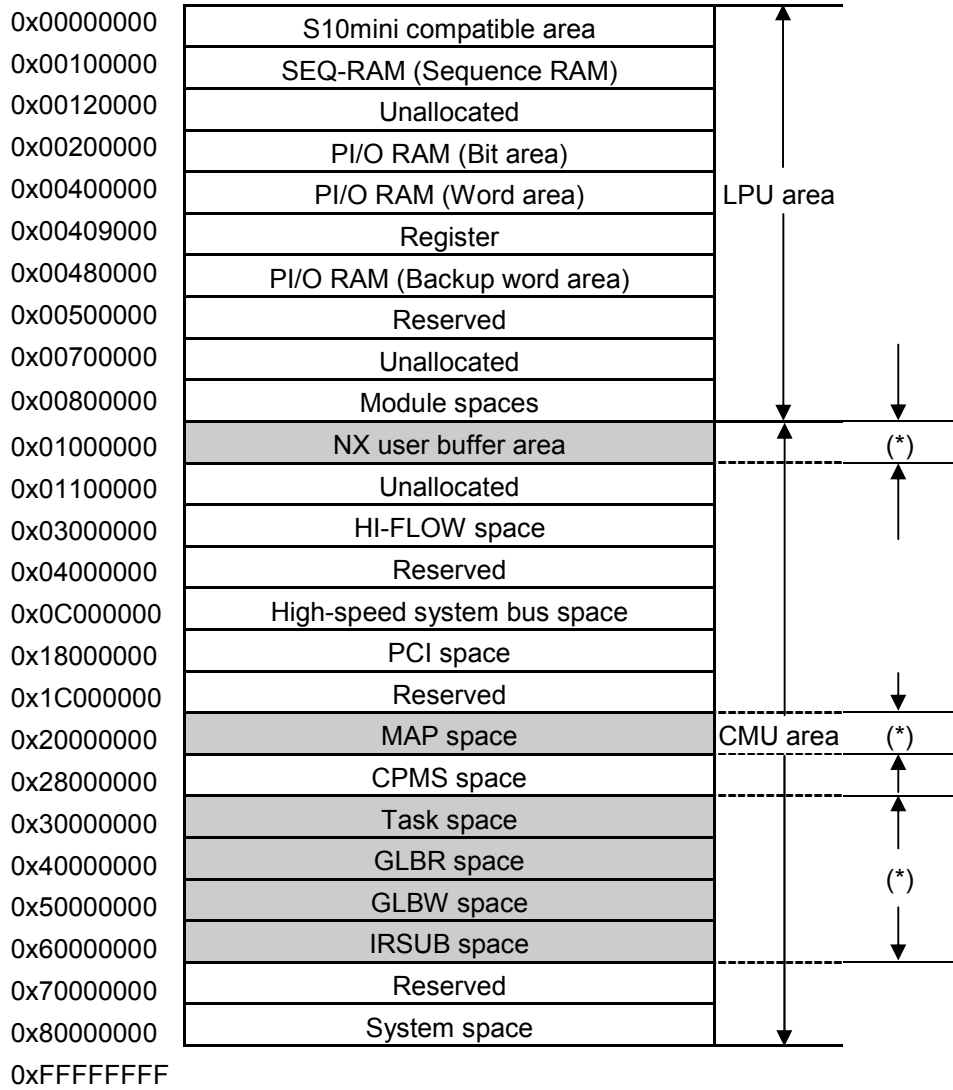
(2) [Save As] window



- button
Saves the status of the network as a specified file and closes the [Save As] window.
- button
Closes the [Save As] window without saving the status of network.

4.3 Memory Map

A CMU memory map is shown below.



(*) This section of memory is battery-backed in cases where a model-LQP525 or LQP527 CMU module is used in conjunction with a battery module.

Figure 4-2 CMU Memory Map

4.4 Disabling CMU Program Operations

The CMU may malfunction due to a faulty HI-FLOW program or task (e.g., NX) stored in the flash memory. In this case, by setting the T/M switch (for the model LQP520) or BATT.SEL switch (for the model LQP525 and LQP527) in “A” position and then powering on the CMU, you can start up and run that CMU without loading in the faulty HI-FLOW program or task from the flash memory. After startup is achieved in this manner, use various tools as needed to change the HI-FLOW program or task.

In the case of the models LQP525 and LQP527, when the CMU is started up with the BATT.SEL switch set in “A” position, its main memory is cleared. To prevent the loss of the main memory’s contents, back them up in files with the ladder chart system’s FD function or other similar facility before you set the BATT.SEL switch in “A” position.

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5 USER GUIDE

5.1 Recommended Network Components

CMU Ethernet is a standard product made to comply with the international standard IEEE802.3. It may not operate properly, however, when used in conjunction with other equipment made to the same standard. To avoid this inconvenience, use the kinds of network components recommended in Table 5-1 below.

Two versions of Ethernet specifications are available: IEEE802.3 and original Ethernet. Equipment made to the original Ethernet specifications cannot be connected to the CMU.

Table 5-1 Network Component List

Description	Manufacturer	Model	Remarks
Hub	Hitachi Information Technology Co., Ltd.	With IT-GS1	Switching hub
Twisted pair cable	Hitachi Cable, Ltd.	HUTP-CAT5-4P-xxx	xxx denotes the length. Up to 100 m
Transceiver	Hitachi Cable, Ltd.	HLT-200TB HBN200TZ HBN200TD	Tap-type
		HLT-200	Connector-type
Repeater	Hitachi Cable, Ltd.	HLR-200H	Repeater for extending transmission distance of coaxial cable.
Coaxial cable	Hitachi Cable, Ltd.	HBN-CX-100	Indoor use
Coaxial connector	Hitachi Cable, Ltd.	HBN-N-PC	For coaxial cable
Transceiver cable	Hitachi Cable, Ltd.	HBN-TC-100	With male and female D-sub 15-pin connector, up to 50 m
Terminator (terminating resistor)	Hitachi Cable, Ltd.	HBN-T-NJ	J type
		HBN-T-NP	P type

5.2 System Configuration

Connecting the hub (multi-port repeater) to a transceiver through a transceiver cable (AUI cables) connecting multiple stations to the hub, as shown in Figure 5-1. For connecting station to the hub, use twisted-pair cables.

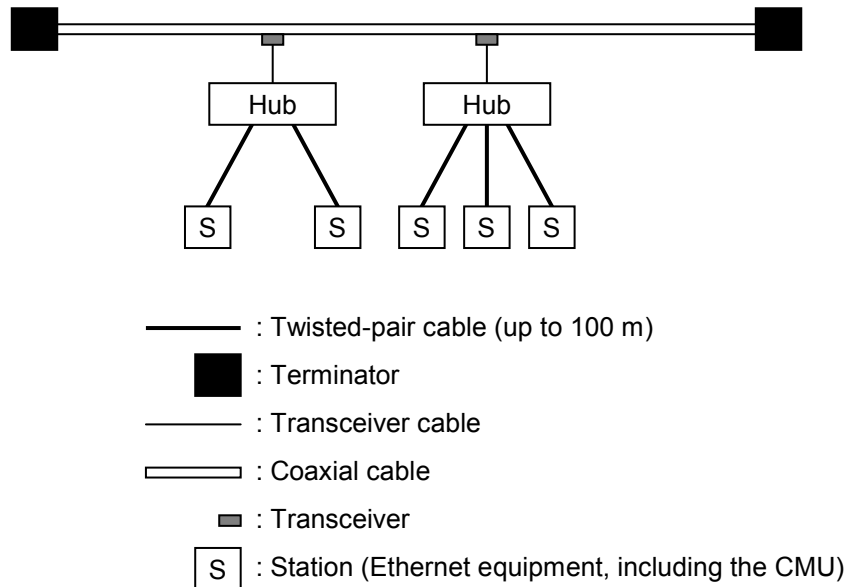


Figure 5-1 Typical System Configuration

When the distance between stations is relatively short, each station can be connected directly to the hub through twisted-pair cables without using any coaxial cable or transceiver, as shown in Figure 5-2.

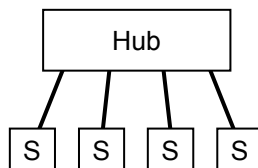


Figure 5-2 Typical Hub-based Configuration

■ Constraints on multi-hub connection

When a multistage connection of hubs is used, the following limitations are placed on the number of intervening hubs and the number of segments in any path from one station to another:

Item	10BASE-T	Specification
Number of hubs	Up to 4	Up to 2
Number of segments	Up to 5	Up to 3
Segment length	Up to 100 m	Up to 100 m
Maximum network length	Up to 500 m	Up to 205 m (5 m or less between hubs)

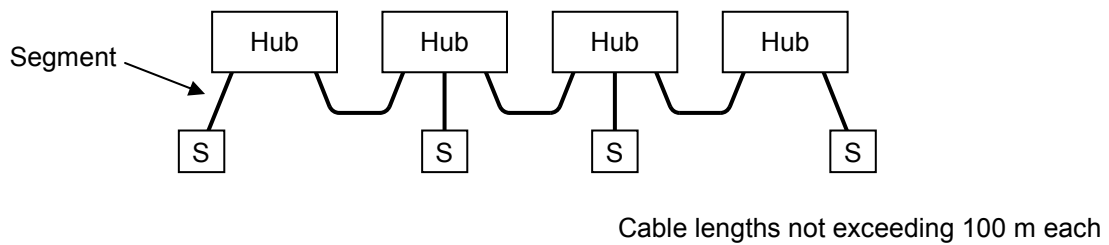


Figure 5-3 Typical 10BASE-T-based Configuration

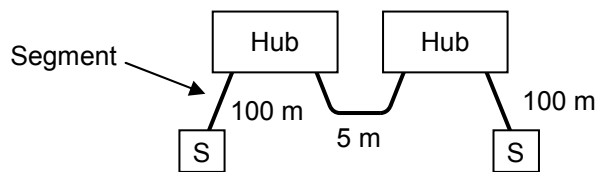


Figure 5-4 Typical 100BASE-TX-based Configuration

5.3 Installing, Wiring, and Setting Up Network Components

5.3.1 Wiring hubs, and hubs to repeaters

(1) Tips on laying coaxial cables

- Allow a bending radius of at least 250 mm when both laying and finally clamping coaxials

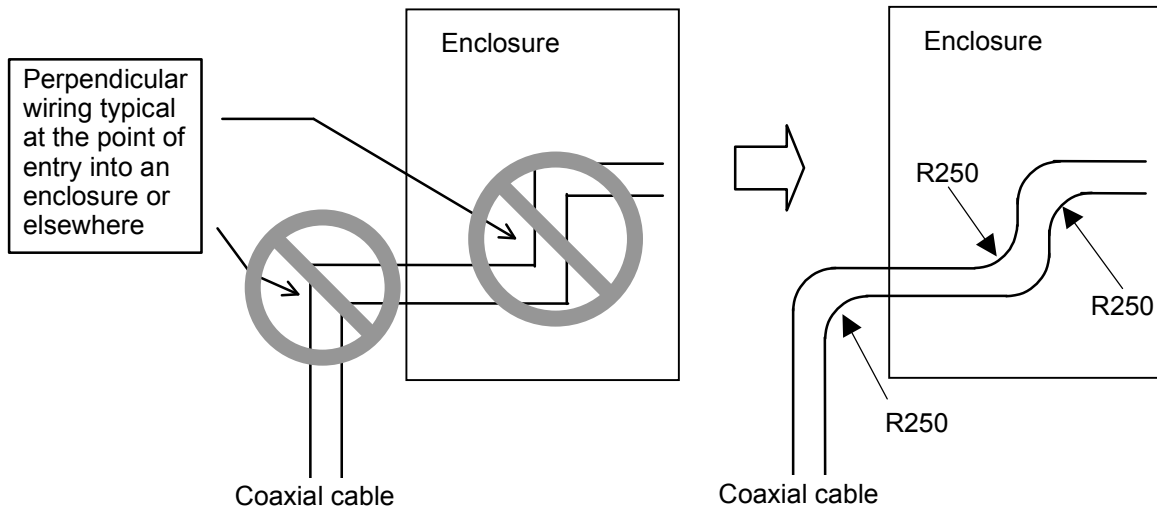


Figure 5-5 Coaxial Cable Bending Radius

- Do not bend coaxial cables at or near transceiver location or near terminator location.
⇒ The transceiver or terminator connector would be stressed to cause defective contact.

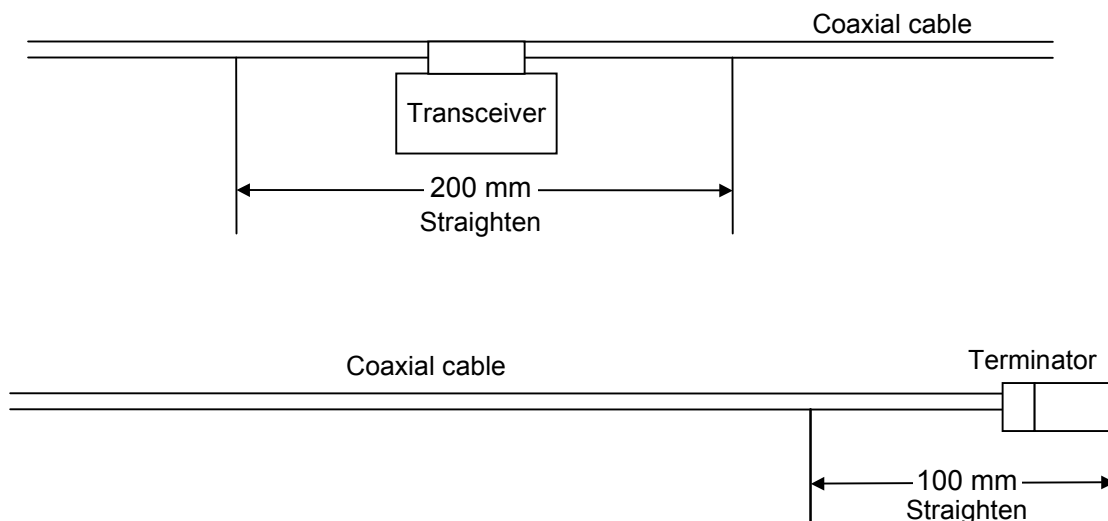


Figure 5-6 Transceiver Installation (1)

- After a transceiver or terminator has been installed, do not twist the coaxial cable or pull the clamp.
 - ⇒ As the cable is twisted or pulled, the pin could grind the coaxial cable conductor, causing defective contact upon vibration.

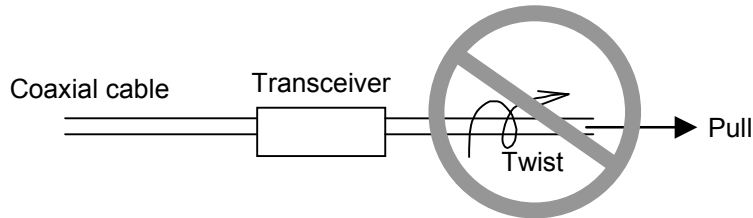


Figure 5-7 Transceiver Installation (2)

(2) Tips on clamping coaxial cable connectors

For more information, refer to the manual pertaining to the coaxial cable.

- Tighten coaxial cable connectors firmly. Only about one-fourth turn of looseness could result in defective contact after extended periods of vibration.
- Tighten terminator connectors firmly. Remember to check the connectors for tightness and then retighten them.

⇒ Slightest looseness could result in defective contact.

Instructions on retightening terminator connectors are given below.

<Retightening procedure>

- ① Remove the rubber boot and connector cap.
 - ② Holding the coaxial connector securely by one hand, clamp the terminator with the other hand and turn it firmly until it won't go any more.
 - ③ Finally, give additional tightening to the connector and check it for tightness.
 - ④ After tightening, reattach the rubber boot and connector cap.
- Tighten cable joints (relay connectors) firmly. Remember to check the joints for tightness and then retighten them.

⇒ Slightest looseness could result in defective contact.

Instructions on retightening cable joints are given below.

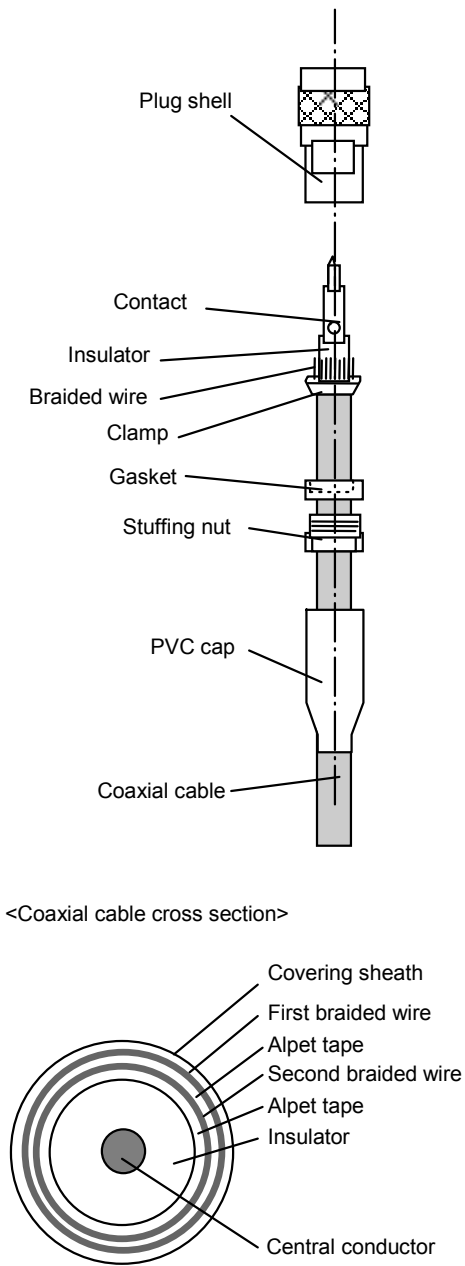
<Retightening procedure>

- ① Remove the connector cap.
- ② Turn the connector ring firmly clockwise to clamp.
- ③ Finally, give additional tightening to the connector and check it for tightness.
- ④ After tightening, reattach the connector cap.

(3) Tips on attaching coaxial cable connectors

Take notice of these instructions when attaching connectors to coaxial cables. Figure 5-8 shows the process of attaching coaxial cable connectors.

- Make sure that the shield chips do not enter the connector when attaching it. (Figure 5-8, Nos. 3 to 10)
 - ⇒ Residual shield chips in the connector could cause a short circuit to occur.
- Observe the length of the male pin (contact) when attaching the connector. (Figure 5-8, No. 13)
 - ⇒ Because the male pin at the terminal attachment is longer than standard, it could give a crack to the female pin of the terminal connector. If the male pin at the terminal attachment appears protruding when the terminal attachment is removed and the end of the coaxial cable is viewed from sideways, the connector has been worked improperly.
- Be careful not to leave the male pin of the connector unsoldered when attaching it. (Figure 5-8, Nos. 11 and 12)
 - ⇒ Failure to solder the connector male pin could result in defective contact.



<Coaxial cable cross section>

No.	Task	Sketch
1	Insert the PVC cap, stuffing nut and gasket into the cable.	
2	Remove the covering from the coaxial cable.	
3	Disentangle the first braided wire.	
4	Cut off the alpet tape at the base.	
5	Disentangle the second braided wire.	
6	Cut off the alpet tape at the base.	
7	Cut off the insulator at the tip.	
8	Extend the braided wires and insert the clamp.	
9	Fold back the braided wires uniformly on the circumference of the clamp, cutting out excess lengths.	
10	Remove the insulator from the end of the clamp and then cut off the central conductor.	
11	Put the contact in the insulating plate insert thread solder in it.	
12	Heating the contact with a soldering gun, allow the solder inside to melt. Then, insert a preliminarily soldered central conductor deep into the base.	
13	Insert the plug shell and tighten it with a torque wrench before tightening the nut.	
14	Give a coat of Reich Lock to prevent loosening.	
15	Cover with the PVC cap to the tip of the plug shell.	

Figure 5-8 Coaxial Cable Connector Attachment Process

(4) Tips on installing transceivers

- Be careful when driving transceiver pins not to let in coaxial cable shield chips.
 - ⇒ Coaxial cable shield chips could the shield and conductor to be short-circuited to each other.
- Drive tap type transceiver pins straight.
 - ⇒ If transceiver pins are driven slantwise, coaxial cable shield chips could the shield and conductor to be short-circuited to each other. Further, the insulator at the pin tip might crack causing a short circuit between the shield and conductor.
- Do not install a transceiver at a bent section of a coaxial cable. Be sure to install one at a straight section of a coaxial cable.
 - ⇒ Obliquely driven pins could bring about phenomena similar to those described above.

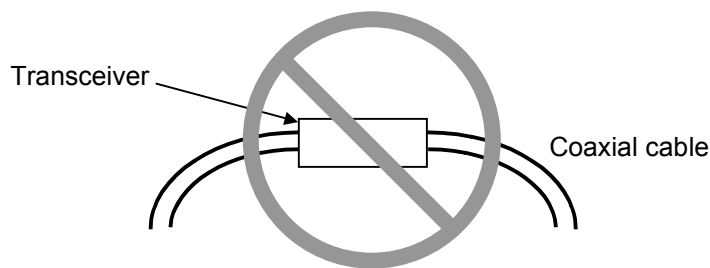


Figure 5-9 Transceiver Installation (3)

- When using a flame-retardant coaxial cable, use a connector type transceiver as a rule.
 - ⇒ Flame-retardant coaxial cables more susceptible to the effects of external torsion than regular standard coaxial cables because such force cause their internal conductor to rotate slightly.
 - When using a flame-retardant coaxial cable for a tap type transceiver, camp the coaxial and transceiver in the enclosure or else to protect the cable from external forces imparted in rotating direction.
- (5) Tips on laying transceiver cables
- Before connecting or disconnecting a transceiver cable to or from a unit, switch it off.
 - Allow a bending radius of at least 80 mm when both laying and finally clamping transceiver cables.
 - Pay special attention to the bending of the connector attachment.

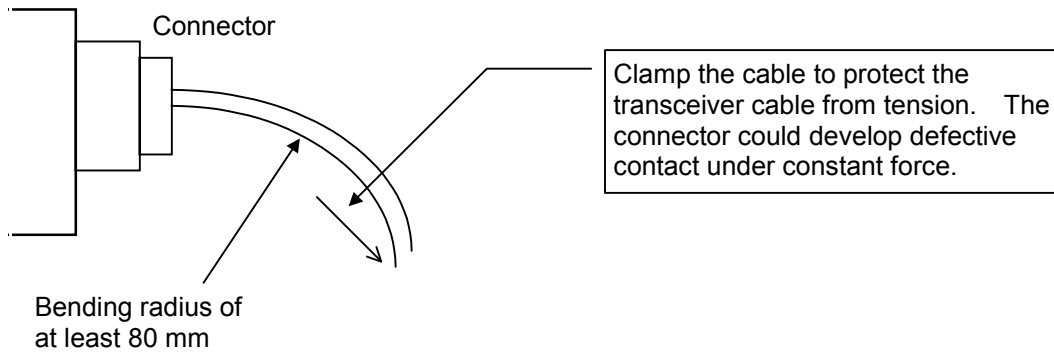


Figure 5-10 Laying Transceiver Cables

- Check the connector retainer lock. After the connector retainer is locked, pull the connector lightly to make sure that it is firmly locked.

(6) Tips on laying twisted-pair cables

Use twisted-pair cables on a 10BASE-T system.

- Do not overbend twisted-pair cables (suggested bending radius: at least four times the cable outside diameter).
- Do not overpull twisted-pair cables (tensile strength: 11 kg or less).
- Do not overtighten twisted-pair cables (when securing the cables with clamps, SK bands or the like, do not tighten to such extent that the covering is deformed).
- When attaching a connector to an equipment port, click it into position.

(7) Common tips on laying cables

If the cables are laid together with a high-power cable or network power cable, the current flowing through the high-power cable/network power cable may act as a noise source to induce a noise voltage within the cables, thereby causing a malfunction. To avoid this problem, lay the cables at a proper distance from high-power cables and network power cables as suggested in the table below:

Table 5-2 Network Power Cable Ratings and Distances

Network power cable rating	Distance
2 kVA or less	127 mm or more
2 to 5 kVA or less	305 mm or more
5 kVA or more	610 mm or more

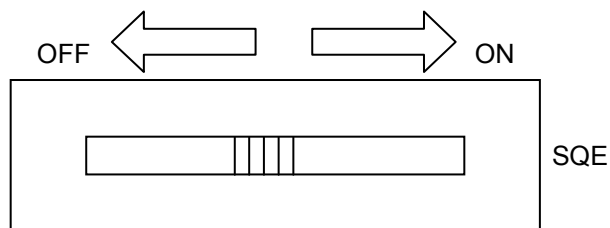
5.3.2 Setting Single-port Transceiver

Single-port transceivers have an SQE switch. Set the SQE switch according to the destination unit to which the transceiver connects.

Table 5-3 SQE Switch Settings

Connected device	CMU controller	Multi-port transceiver	Repeater
SQE switch setting	ON	OFF	OFF

For the single transceivers HLT-200 and HLT-200TB, the SQE switch is contained in the case. When changing the setting, open the case to do the work. The switch is set to ON by turning it to the “SQE” side of silk printing on the board.



5.4 System Definition Information

Set the following ② and ③ information for CMU (LQP520). Do not set ② in duplicate with another station. Item ③ needs to have a consistent value throughout one single subnetwork.

- ① Physical address: An original number is set for each CMU.
- ② IP address: Define these items for each CMU by using the Base System too.
- ③ Subnetwork mask: Define these items for each CMU by using the Base System too.

5.4.1 Physical address

A 48-bit physical address is assigned to each CMU. This is a unique address; the user cannot change it.

5.4.2 IP address

The IP address used for TCP/IP and UDP/IP is a 32-bit logical address. An IP address consists of a network number and a host number. There are three types of address assignment depending on the number of hosts.

- (i) Class A (The high-order one bit of the network number is set to 0.)

Network number (8 bits)	Host number (24 bits)
----------------------------	-----------------------

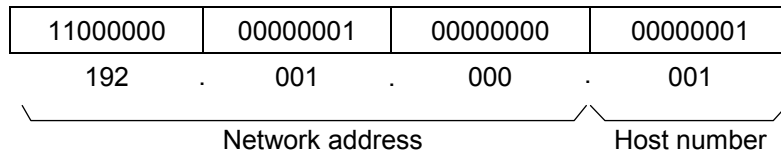
- (ii) Class B (The high-order two bits of the network number are set to 10 in binary.)

Network number (16 bits)	Host number (16 bits)
-----------------------------	-----------------------

- (iii) Class C (The high-order three bits of the network number are set to 110 in binary.)

Network number (24 bits)	Host number (8 bits)
-----------------------------	----------------------

An IP address is represented in decimal; the eight-bit values are delimited from each other by a period (“.”). For example, an IP address of class C is represented as shown below.



A network is determined by a network number. Define a unique host number for each host in the network. If the number of hosts in a network is 200 or less, select class C. For example, if (192.001.000) is set as a network number and five hosts are connected to the network, set the IP address of each station as follows:

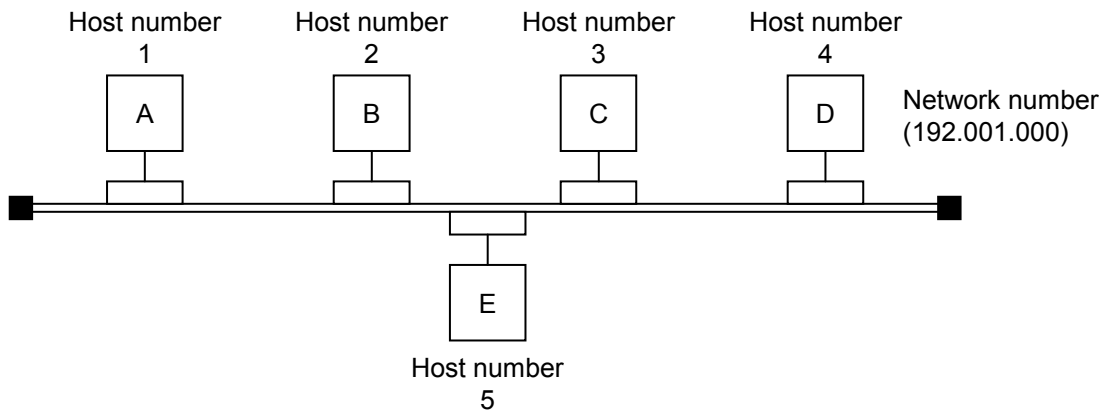
Station A: 192.001.000.001

Station B: 192.001.000.002

Station C: 192.001.000.003

Station D: 192.001.000.004

Station E: 192.001.000.005



There are two special IP addresses: one indicates the entire network by setting all bits of host number of 0, and the other is the broadcast address in which all bits of host number are set to 1. The broadcast address is used when data is sent to all stations belonging to the network. (In this case, send data by UDP/IP communication.)

5.4.3 Subnetwork mask

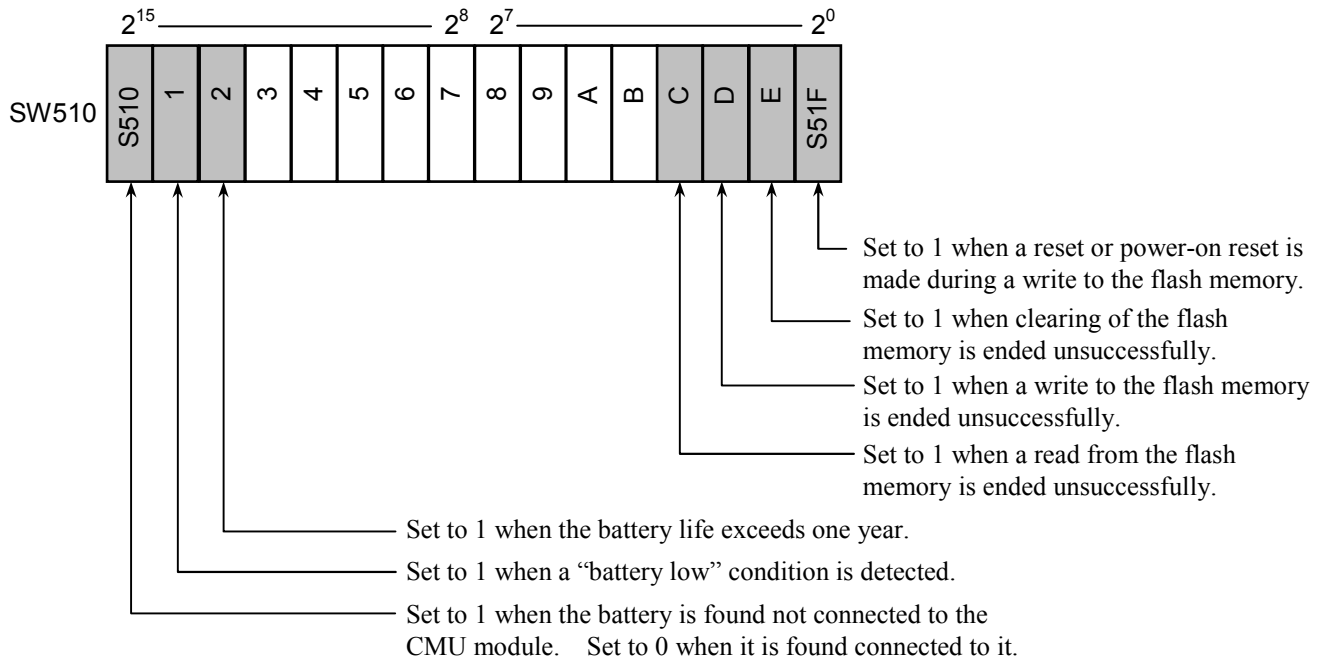
When splitting an IP address into subnetworks, define the boundary between subnetwork number and local host number by a subnetwork mask. If a subnetwork mask is used with other than the default value, the address is the broadcast address as shown in the example below.

Example: For class B:

IP address	Subnetwork mask	Broadcast address
128.123.000.001	255.255.000.000	128.123.255.255
128.123.001.001	255.255.255.000	128.123.001.255

5.5 S-Register: SW510 (for the LQP525 or LQP527)

The S-register SW510 is a register in which to store LQP525/LQP527-specific information. This register can be referenced in ladder programs and is not provided in model-LQP520 CMU modules.



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6 MAINTENANCE

6.1 Maintenance and Inspection

To keep the module running in optimal condition, it requires checks. Make checks daily or periodically (twice a year or more often).

Table 6-1 Maintenance and Inspection Items

Item	Point to check
Module appearance	Check the module case for cracks, flaws and other defects. Such defects can be a sign of breakage in the internal circuitry, causing the system to malfunction.
LED	Check to see if the module ERR LED has not glowed.
Looseness of mounting screws and terminal base screws	Check the module and communications cable mounting screws for tightness. Give additional tightening to screws found loose. Loose screws could cause the system to malfunction and lead to burnouts after heating.
Cable sheath condition	Check cable coverings for defects. A cable covering out of position could cause the system to malfunction, incur electrical shock hazards, or develop short circuits, resulting in burnouts.
Dust sticking condition	Check to see if the module has not caught dust. If dust is noticed, remove it with a vacuum cleaner or other apparatus. Dust could cause short circuits in its internal circuitry, resulting in burnouts.
Module replacement	Replacing the module without switching it off could cause damage to its hardware and software. Before replacing the module, switch it off first.
Connector condition	Connectors might have their characteristics degraded to cause failures if their contacts catch dust or foreign matter. Cover connectors out of use with the protective cap supplied.

 CAUTION
Before replacing the module, switch it off to avoid electrical shock hazards and also to prevent it from being damaged or malfunctioning. (When replacing the battery module, be sure to follow the procedure described under “6.3 Replacing the Battery Module.”)

NOTICE
Static electricity may damage the module. Before starting the work, discharge all electrostatic charge from your body.

6.2 Troubleshooting

6.2.1 Procedure

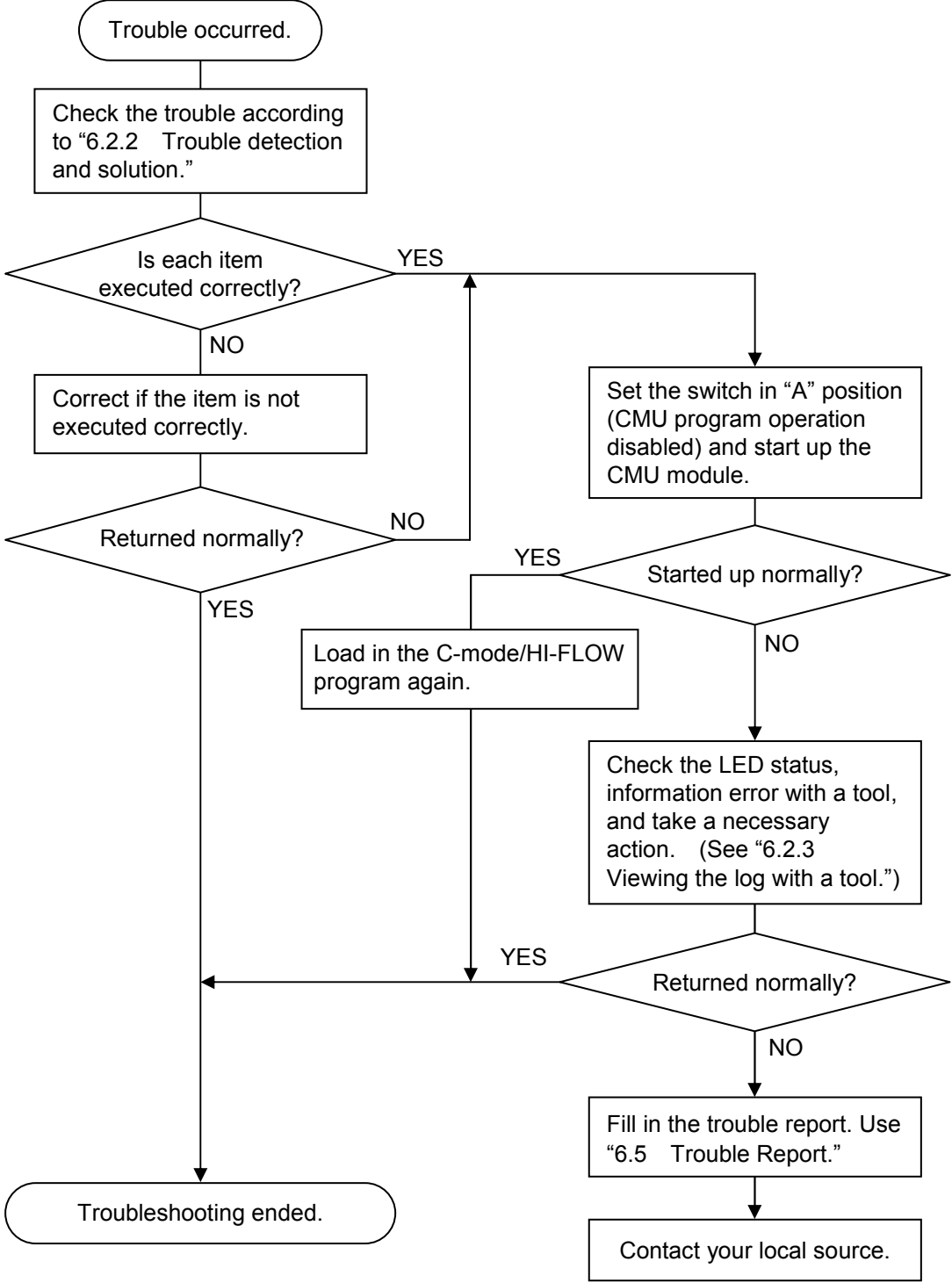


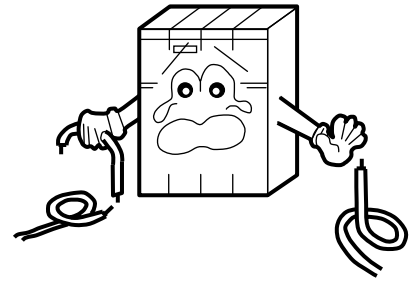
Figure 6-1 Troubleshooting Flow

6 MAINTENANCE

6.2.2 Trouble detection and solution

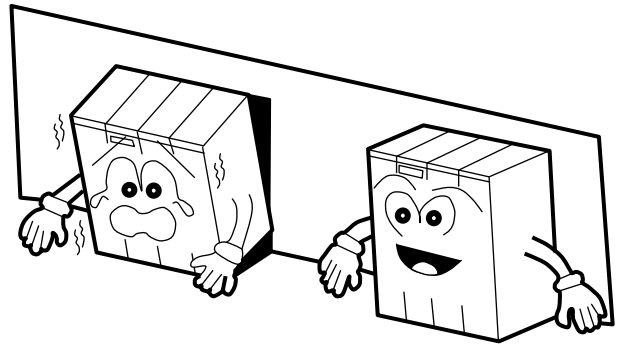
(1) Is the cabling correctly?

Check cables for disconnection or incorrect connection.



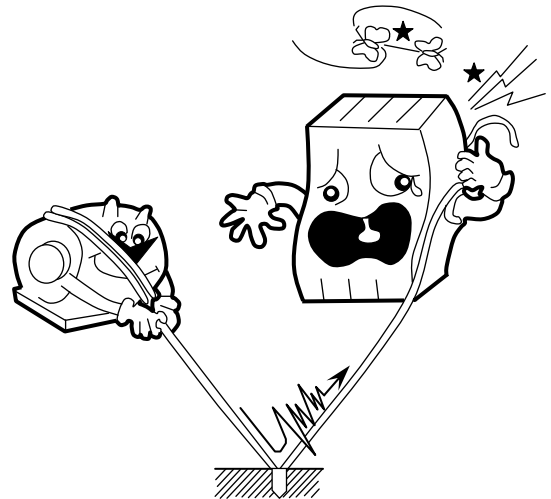
(2) Are the modules mounted correctly?

Check that no set screws loosen.



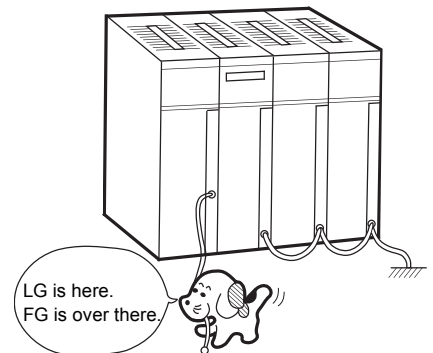
(3) Is grounding done properly?

- Do not ground the CMU module in the same place where high-voltage equipment is grounded. They must be grounded in separate places.
- Perform grounding work conforming to Class D grounding or higher.



(4) Are LG and FG separated?

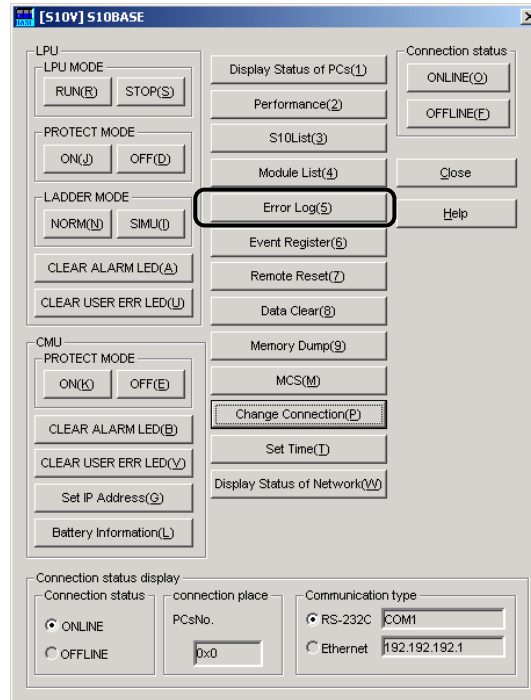
- Be sure to separate the LG from the FG or vice versa because power noise enters the FG via the LG. Failure to observe this rule may result in an equipment malfunction.
- Ground the LG at the power supply side.



6.2.3 Viewing the log with a tool

For the tool connection and tool startup procedures, see “4 OPERATION.”

Start the Base System and then click the **Error Log** button.



The [Error log information] window opens. “Module”, “Mount”, “Error code”, “Contents”, “Date”, and “Time” with the error will be displayed on the list.

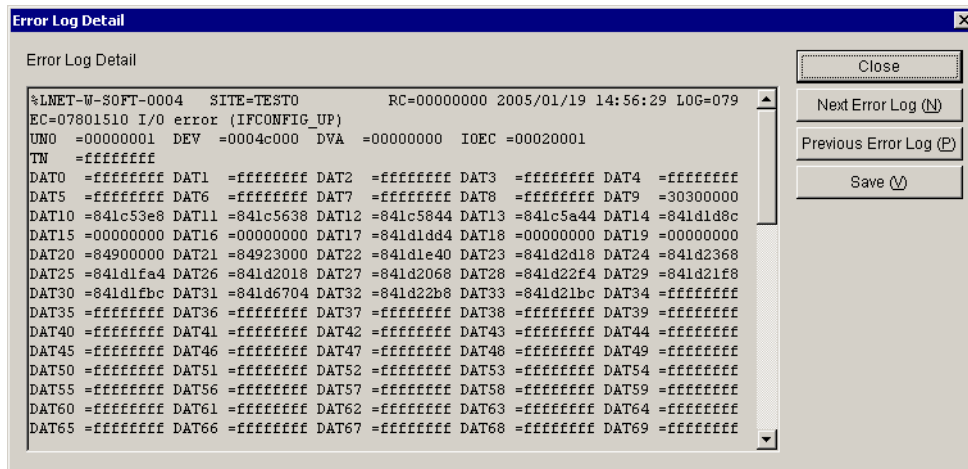
For details on the information displayed under “Contents,” see the description under “6.2.4 CMU error message formats.”

Module	Mount	Error code	Contents	Date	Time
LPU	Mou...	0x120c	Arithmetic Function Address error	2005/01/12	09:36:27
LPU	Mou...	0x120c	Arithmetic Function Address error	2004/12/17	16:12:32
LPU	Mou...	0x120c	Arithmetic Function Address error	2004/12/06	15:01:48
LPU	Mou...	0x120c	Arithmetic Function Address error	2004/11/30	12:20:37
LPU	Mou...	0x120c	Arithmetic Function Address error	2004/11/26	20:22:37
CMU	Mou...	0x07801512	[M] IPADDR_DUPL (UNO=1,DEV=0x...	2005/01/12	09:36:02
CMU	Mou...	0x07801512	[M] IPADDR_DUPL (UNO=1,DEV=0x...	2004/12/27	20:28:59
CMU	Mou...	0x07801510	[M] IFCONFIG_UP (UNO=1,DEV=0x...	2004/11/26	20:23:37
FL.NET (Main)	Unm...	0x0113	IP address not registered	2005/01/12	09:35:57
FL.NET (Main)	Unm...	0x0113	IP address not registered	2004/12/20	20:37:22
FL.NET (Main)	Unm...	0x0113	IP address not registered	2004/12/17	16:12:02
2ch-D.NET M...	Unm...	0x8181	CAN Transmission Timeout Error.	2004/12/21	17:11:59
2ch-D.NET M...	Unm...	0x8181	CAN Transmission Timeout Error.	2004/12/21	17:11:59
2ch-D.NET M...	Unm...	0x8181	CAN Transmission Timeout Error.	2004/12/21	17:11:59
2ch-D.NET M...	Unm...	0x8181	CAN Transmission Timeout Error.	2004/12/21	17:11:59
2ch-D.NET M...	Unm...	0x5189	Parameter type Mismatch(It is the pa...	2004/12/03	11:18:57

Click the “Error code” you wish to deal with and click **Error Log Detail** button.

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The [Error Log Detail] window opens. The details of the error log selected in the [Error log information] window will be displayed.



Analyze the cause of the error using the information displayed in the [Error Log Detail] window. Refer to “S10V TROUBLESHOOTING MANUAL (Manual number SVE-3-001)” for details displayed in the [Error Log Detail] window.

6.2.4 CMU error message formats

The CMU errors within the [Error log information] window are displayed in the following formats:

<Fatal log>

[*] ***** (PC=0x*****,FADR=0x*****)
 ① ② ③ ④

Table 6-2 Fatal Log Error Message Format List

Format type	Error message format
System failure (system error)	① + ② + ③ + ④
System failure (built-in sub-error)	① + ② + ③ + ④

① Fault severity classification

[F]: Fatal error

[FU]: Built-in sub-error

② Error message

See Table 6-6. For error codes that are not enumerated in the error message list, the following default error messages appear:

Table 6-3 Fatal Log Default Error Message List

Format type	Error message
System failure (system error)	System down
System failure (built-in sub-error)	System down

③ Program counter

④ Fault Address

<Non-fatal log>

(Pattern 1)

[*] ***** (UNO=**,DEV=0x*****) (TN=***) (SLOT=**)
 ① ② ③ ④ ⑤

Table 6-4 Non-Fatal Log Error Message Format List

Format type	Error message format
Program error	① + ② + ④
Macro parameter check error	① + ② + ④
PI/O error	① + ② + ④ + ⑤
I/O error	① + ② + ③
WDT timeout error	① + ②
Module error	① + ② + ⑤
Kernel warning	① + ② + ④
Kernel information	① + ② + ④
System failure (kernel trap)	① + ②
System failure (built-in sub-stop)	① + ②
ADT error	① + ② + ④
Memory error	① + ② + ④
System bus error	① + ② + ⑤
Message frame error	① + ②
Buffer status report	① + ②
Socket error	① + ②
Transfer area duplication error	① + ②

① Fault severity classification

[F]: Fatal error [W]: Warning

[E]: Error [I]: Information

② Error message

See Table 6-6, and refer to “SOFTWARE MANUAL OPERATION NX/ACP-S10V (Manual number SVE-3-134).” For error codes that are not enumerated in the error message list, the default error messages shown in Table 6-5 appear.

Table 6-5 Non-Fatal Log Default Error Message List

Format type	Error message
Program error	Program error
Macro parameter check error	Macro parameter error
PI/O error	PI/O error
I/O error	I/O error
WDT timeout error	WDT timeout error
Module error	Module Error
Kernel warning	Kernel Warning
Kernel information	Kernel Information
System failure (kernel trap)	System down
System failure (built-in sub-stop)	System down
ADT error	Program error
Memory error	Memory error
System bus error	System Bus Error
Message frame error	Message frame error
Buffer status report	Buffer status
Socket error	Socket error
Transfer area duplication error	Transfer memory address error

- ③ Unit number and device number
Unit range: 1 to 24
Device range: 0x00000000 to 0xFFFFFFFF
- ④ Task number
Task range: 1 to 255
- ⑤ Slot number
Slot range: 0 to 7

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(Pattern 2)

Errors other than fatal log errors and Pattern 1 non-fatal log errors are displayed in the following format:

%****_*****_****
① ② ③ ④

- ① System where an error is detected
 - CPMS: CPMS (basic OS)
 - LNET: RCTLNET (network driver)
 - TSlib-R600 (communication server support library)
 - NX: NXACP (autonomous distributed platform)
 - MSxx: Middleware (xx: 01 to 16)
 - USxx: Application software
- ② Fault severity classification
 - F: Fatal error E: Error
 - W: Warning I: Information
 - ?: Other fault
- ③ Fault type
 - HARD: Hardware
 - CPMS: CPMS
 - SOFT: Software other than CPMS
 - ????: Other
- ④ Code
 - A 4-digit hexadecimal code appears to indicate a format type.

Table 6-6 Error Message List (1/3)

No.	Error code	Error message	Error description	Fault category	Fault location	Termination	Recovery
1	03620000	Program error (Invalid Data Access)	Data access error	Software	TASK	TASK ABORT	Program correction
2	03660000	Program error (Data Access Protection)	Data access protect error	Software	TASK	TASK ABORT	Program correction
3	03600000	Program error (Data Page Fault)	Data access page fault	Software	TASK	TASK ABORT	Program correction
4	03420000	Program error (Invalid Inst. Access)	Instruction access error	Software	TASK	TASK ABORT	Program correction
5	03460000	Program error (Inst. Access Protection)	Instruction access protect error	Software	TASK	TASK ABORT	Program correction
6	03400000	Program error (Instruction Page Fault)	Instruction access page fault	Software	TASK	TASK ABORT	Program correction
7	03030000	Program error (Inst. Alignment Error)	Instruction alignment error	Software	TASK	TASK ABORT	Program correction
8	03080000	Program error (Privileged Instruction)	Privileged instruction error	Software	TASK	TASK ABORT	Program correction
9	03040000	Program error (Illegal Instruction)	Illegal instruction error	Software	TASK	TASK ABORT	Program correction
10	03390000	Program error (FP Program Error)	Floating-point calculation error	Software	TASK	TASK ABORT	Program correction
11	03470000	Program error (Data Alignment Error)	Data alignment error	Software	TASK	TASK ABORT	Program correction
12	05130000	Invalid macro	Undefined-macro issuance	Software	TASK	TASK ABORT	Program correction
13	05110000	Macro parameter error	Macro parameter abnormal	Software	TASK	TASK ABORT	Program correction
14	07xxxxxx	I/O error (Error detail message)	Network I/O error	Hardware	I/O	-	(*1)
15	05C70000	WDT timeout error	Watchdog timer timeout	Software	TASK	-	Program correction
16	03B70000	Module error (Bus Target Abort)	Bus target abort	Hardware	I/O	-	Hardware replacement or program correction (*2)
17	05000000	Module error (Invalid Interrupt)	Invalid interrupt	Hardware	CMU	-	Hardware replacement
18	05000001	Module error (Undefined Invalid Interrupt)	Undefined invalid interrupt	Hardware	CMU	-	Hardware replacement
19	05000002	Module error (INTEVT Invalid Interrupt)	INTEVT invalid interrupt	Hardware	CMU	-	Battery replacement
20	0500F001	Module error (HERST Invalid Interrupt)	Serious fault invalid interrupt	Hardware	CMU	-	Battery replacement
21	0500F002	Module error (HERST2 Invalid Interrupt)	Serious fault invalid interrupt 2	Hardware	CMU	-	Hardware replacement
22	0500F003	Module error (BUERRSTAT Invalid Interrupt)	Bus error serious fault interrupt status invalid	Hardware	CMU	-	Hardware replacement
23	0500F006	Module error (MHPMCLG Invalid Interrupt)	Memory serious fault interrupt status invalid	Hardware	CMU	-	Hardware replacement
24	0500F007	Module error (ECC 2bit Master Invalid Interrupt)	Memory ECC 2-bit error serious fault status invalid	Hardware	CMU	-	Hardware replacement
25	0500F008	Module error (RERRMST Invalid Interrupt)	RERR interrupt status invalid	Hardware	CMU	-	Hardware replacement
26	0500C001	Module error (NINTR Invalid Interrupt)	NINT status invalid	Hardware	CMU	-	Hardware replacement
27	0500B001	Module error (PUINTR Invalid Interrupt)	PUINT status invalid	Hardware	CMU	-	Hardware replacement
28	05005001	Module error (RINTR Invalid Interrupt)	RINT status invalid	Hardware	CMU	-	Hardware replacement
29	05003001	Module error (LV3 INTST Invalid Interrupt)	Level 3 interrupt status invalid	Hardware	CMU	-	Hardware replacement
30	05003002	Module error (RQ16 INF Invalid Interrupt)	RQ16 status invalid	Hardware	CMU	-	Hardware replacement
31	05001001	Module error (RQ13 INT Invalid Interrupt)	RQ13 status invalid	Hardware	CMU	-	Hardware replacement
32	05001002	Module error (RQ13 Link Invalid Interrupt)	RQ13 link status invalid	Hardware	CMU	-	Hardware replacement
33	05001003	Module error (RQ13 Module Invalid Interrupt)	RQ13 module status invalid	Hardware	CMU	-	Hardware replacement
34	0D010000	Module error (Memory Alarm)	Memory 1-bit error (solid)	Hardware	CMU	-	Hardware replacement
35	0D310000	Module error (Memory Backup Failure)	Battery backup failure	Hardware	Battery	-	Battery replacement
36	0D320000	Module error (Memory Error)	Memory error	Hardware	CMU, I/O	-	Hardware replacement
37	0D330000	Module error (Hardware WDT Timeout)	Hardware WDT timeout	Hardware	CMU, I/O	-	Hardware replacement
38	0D340000	Module error (Software WDT Timeout)	Software WDT timeout	Hardware	CMU, I/O	-	Hardware replacement or program correction
39	0D350000	Module error (RAM Sum Check Error)	RAM checksum error	Hardware	CMU, I/O	-	Hardware replacement or program correction
40	0D360000	Module error (ROM Sum Check Error)	ROM checksum error	Hardware	CMU, I/O	-	Hardware replacement
41	0D370000	Module error (Clock Stop Error)	Clock stop error	Hardware	CMU, I/O	-	Hardware replacement
42	0D380000	Module error (OS Clear Error)	OS clear error	Hardware	CMU, I/O	-	Program load
43	0D800000	Module error (TOD Error)	Backup clock error	Hardware	CMU, LPU	-	Hardware replacement
44	05A00000	Kernel warning	Kernel warning	Software	-	-	-
45	05D00000	Kernel information	Kernel information	Software	-	-	-
46	0D810000	System down (BPU Error)	BPU error	Hardware	CMU	CMU STOP	Hardware replacement
47	03820000	System down (Memory Error)	Memory error	Hardware	CMU	CMU STOP	Hardware replacement
48	038A0000	System down (Memory Access Error)	Memory access error	Hardware	CMU	CMU STOP	Hardware replacement
49	038B0000	System down (Internal Bus Parity)	Internal bus parity error	Hardware	CMU	CMU STOP	Hardware replacement
50	038C0000	System down (System Bus Parity)	System bus parity error	Hardware	CMU	CMU STOP	Hardware replacement

(*1) For details, refer to the following manuals: USER'S MANUAL, OPTION R70 NCP-F (LQE780-Z) (Manual number SVE-1-126); USER'S MANUAL, OPTION LANCP (LQE790-Z/LQE796-Z) (Manual number SVE-1-127); and USER'S MANUAL, OPTION R70 NCP-E (LQE761-Z) (Manual number SVE-1-151).

(*2) This message also appears when the target module is stopped or being initialized. In such a case, the message does not indicate a fault.

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Table 6-6 Error Message List (2/3)

No.	Error code	Error message	Error description	Fault category	Fault location	Termination	Recovery
51	038F0000	System down (Undefined Machine Check)	Undefined-machine check error	Hardware	CMU	CMU STOP	Hardware replacement
52	07394720	System down (Invalid Interrupt Panic)	Detected series of invalid interrupt (10 times)	Hardware	DPIO IFX	CMU STOP	Replace DPIO IFX module
53	03620000	System down (Invalid Data Access)	Data access error	Software	CPMS	CMU STOP	Program correction
54	03660000	System down (Data Access Protection)	Data access protect error	Software	CPMS	CMU STOP	Program correction
55	03600000	System down (Data Page Fault)	Data access page fault	Software	CPMS	CMU STOP	Program correction
56	03420000	System down (Invalid Inst. Access)	Instruction access error	Software	CPMS	CMU STOP	Program correction
57	03460000	System down (Inst. Access Protection)	Instruction access protect error	Software	CPMS	CMU STOP	Program correction
58	03400000	System down (Instruction Page Fault)	Instruction access page fault	Software	CPMS	CMU STOP	Program correction
59	03030000	System down (Inst. Alignment Error)	Instruction alignment error	Software	CPMS	CMU STOP	Program correction
60	03040000	System down (Illegal Instruction)	Illegal instruction error	Software	CPMS	CMU STOP	Program correction
61	03380000	System down (FP Unavailable)	Floating-point unavailable exception	Software	CPMS	CMU STOP	Program correction
62	03390000	System down (FP System Down)	Floating-point calculation error	Software	CPMS	CMU STOP	Program correction
63	03470000	System down (Data Alignment Error)	Data alignment error	Software	CPMS	CMU STOP	Program correction
64	030F0000	System down (Illegal Exception)	Illegal exception	Software	CPMS	CMU STOP	Program correction
65	05700000	System down (System Error)	System failure (system error)	Software	CPMS	CMU STOP	Program correction
66	05800000	System down (Kernel Trap)	System failure (kernel trap)	Software	CPMS	CMU STOP	Program correction
67	03620000	ULSUB down (Invalid Data Access)	Data access error	Software	ULSUB	CMU STOP	Program correction
68	03660000	ULSUB down (Data Access Protection)	Data access protect error	Software	ULSUB	CMU STOP	Program correction
69	03600000	ULSUB down (Data Page Fault)	Data access page default	Software	ULSUB	CMU STOP	Program correction
70	03420000	ULSUB down (Invalid Inst. Access)	Instruction access error	Software	ULSUB	CMU STOP	Program correction
71	03460000	ULSUB down (Inst. Access Protection)	Instruction access protect error	Software	ULSUB	CMU STOP	Program correction
72	03400000	ULSUB down (Instruction Page Fault)	Instruction access page fault	Software	ULSUB	CMU STOP	Program correction
73	03030000	ULSUB down (Inst. Alignment Error)	Instruction alignment error	Software	ULSUB	CMU STOP	Program correction
74	03080000	ULSUB down (Privileged Instruction)	Privileged instruction error	Software	ULSUB	CMU STOP	Program correction
75	03040000	ULSUB down (Illegal Instruction)	Illegal instruction error	Software	ULSUB	CMU STOP	Program correction
76	03380000	ULSUB down (FP Unavailable)	Floating-point unavailable exception	Software	ULSUB	CMU STOP	Program correction
77	03390000	ULSUB down (FP System down)	Floating-point calculation error	Software	ULSUB	CMU STOP	Program correction
78	03470000	ULSUB down (Data Alignment Error)	Data alignment error	Software	ULSUB	CMU STOP	Program correction
79	030F0000	ULSUB down (Illegal Exception)	Illegal exception	Software	ULSUB	CMU STOP	Program correction
80	05140000	System down (ULSUB Stop)	System failure (built-in sub-stop)	Software	ULSUB	CMU STOP	Program correction
81	05F00000	Program error (ADT Error)	Memory access detection	Software	TASK	Log	Program correction
82	00000201	Message frame error	Message frame error	Software	NXACP	-	-
83	00000401	Buffer status	Buffer status report	Software	NXACP	-	-
84	00000501	Socket error	Socket error	Software	NXACP	-	-
85	00000601	Transfer memory address error	Transfer area duplication error	Software	TASK	-	Program correction
86	08xxxxxx	Msoft log01	Middleware report	Software	Middleware dependent	-	-
87	08xxxxxx	Msoft log02	Middleware report	Software	Middleware dependent	-	-
88	08xxxxxx	Msoft log03	Middleware report	Software	Middleware dependent	-	-
89	08xxxxxx	Msoft log04	Middleware report	Software	Middleware dependent	-	-
90	08xxxxxx	Msoft log05	Middleware report	Software	Middleware dependent	-	-
91	08xxxxxx	Msoft log06	Middleware report	Software	Middleware dependent	-	-
92	08xxxxxx	Msoft log07	Middleware report	Software	Middleware dependent	-	-
93	08xxxxxx	Msoft log08	Middleware report	Software	Middleware dependent	-	-
94	08xxxxxx	Msoft log09	Middleware report	Software	Middleware dependent	-	-
95	08xxxxxx	Msoft log10	Middleware report	Software	Middleware dependent	-	-
96	08xxxxxx	Msoft log11	Middleware report	Software	Middleware dependent	-	-
97	08xxxxxx	Msoft log12	Middleware report	Software	Middleware dependent	-	-
98	08xxxxxx	Msoft log13	Middleware report	Software	Middleware dependent	-	-
99	08xxxxxx	Msoft log14	Middleware report	Software	Middleware dependent	-	-
100	08xxxxxx	Msoft log15	Middleware report	Software	Middleware dependent	-	-
101	08xxxxxx	Msoft log16	Middleware report	Software	Middleware dependent	-	-
102	09xxxxxx	User log01	Application software report	Software	Middleware dependent	-	-
103	09xxxxxx	User log02	Application software report	Software	Middleware dependent	-	-
104	09xxxxxx	User log03	Application software report	Software	Middleware dependent	-	-

Table 6-6 Error Message List (3/3)

No.	Error code	Error message	Error description	Fault category	Fault location	Termination	Recovery
105	09xxxxxx	User log04	Application software report	Software	Middleware dependent	—	—
106	09xxxxxx	User log05	Application software report	Software	Middleware dependent	—	—
107	09xxxxxx	User log06	Application software report	Software	Middleware dependent	—	—
108	09xxxxxx	User log07	Application software report	Software	Middleware dependent	—	—
109	09xxxxxx	User log08	Application software report	Software	Middleware dependent	—	—
110	09xxxxxx	User log09	Application software report	Software	Middleware dependent	—	—
111	09xxxxxx	User log10	Application software report	Software	Middleware dependent	—	—
112	09xxxxxx	User log11	Application software report	Software	Middleware dependent	—	—
113	09xxxxxx	User log12	Application software report	Software	Middleware dependent	—	—
114	09xxxxxx	User log13	Application software report	Software	Middleware dependent	—	—
115	09xxxxxx	User log14	Application software report	Software	Middleware dependent	—	—
116	09xxxxxx	User log15	Application software report	Software	Middleware dependent	—	—
117	09xxxxxx	User log16	Application software report	Software	Middleware dependent	—	—
118	07D10001	Module error (Battery Alarm)	The battery life (rough estimate) is found exceeding one year. (*3)	Hardware	Battery	—	Battery replacement
119	07D10002	Module error (Battery Not Connected)	Battery not connected	Hardware	Battery	—	Connect the battery cable to both modules.
120	07D10003	Module error (Battery Low)	“Battery low” condition detected	Hardware	Battery	—	Battery replacement
121	07D11001	Module error (PS off/Reset during writing Flash memory)	A power-off condition or reset occurred during a write to the flash memory.	—	—	—	Load in the user program again. (*3)
122	07D11002	Module error (Flash memory Erase Error)	Clearing of the flash memory failed.	Hardware	CMU's internal flash memory	—	Hardware replacement
123	07D11003	Module error (Flash memory Write Error)	A write to the flash memory failed.	Hardware	CMU's internal flash memory	—	Hardware replacement
124	07D11004	Module error (Flash memory Read Error)	A read from the flash memory failed.	Hardware	CMU's internal flash memory	—	Hardware replacement
125	00000201	Message frame error	NX message frame abnormality detected	Software	NX header of the NX message frame sent from the communication source	Abnormal frame discarded and processing continued	Check the NX message frame's NX header.

(*3) This error is logged when one year has elapsed since the initial connection of the LQZ500 module to the CMU module or its last replacement (clearing the battery life time retained in the LQP525 or LQP527 module by operating the BATT.SET switch). In addition to this error logging, the ALARM LED also starts blinking at that time. It should be noted that the above-mentioned elapsed time does not reflect the actual remaining life of the LQZ500 module. This is because it is measured in the LQZ500 module by using its internal clock. Therefore, use the elapsed time only as a rough estimate.

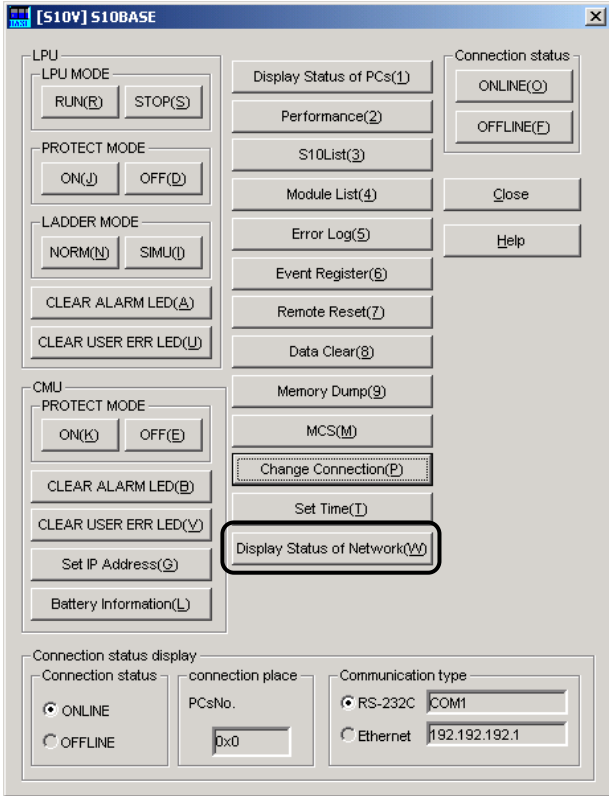
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(*4) This recovery action varies depending on which software tool was in use at the occurrence of the power-off condition or reset. The table of the following page shows the recovery actions required for each available software tool and option selection used.

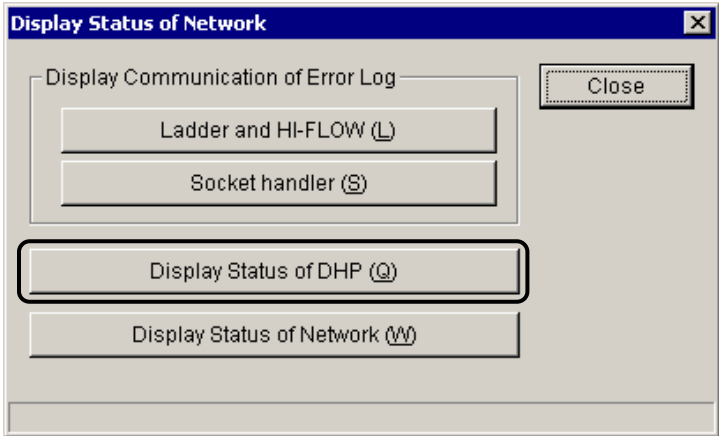
No.	Tool type	Option selection	Recovery
1	Backup restore system	Required action	Retry this option.
2		Load user application	Retry this option.
3	RPDP-S10V system	svrpl (send all tasks at a time)	Retry this option.
4		ld (send one task at a time)	Send all the necessary tasks to the destination at a time by using the svrpl option.
5	HI-FLOW system	[Send] - [All processes]	Retry this option.
6		[Send] - [Designated process]	Send all the necessary processes to the destination at a time.
7		[Delete process of PCs] - [Exchange all process and system]	Retry this option.
8		[Delete process of PCs] - [Specify the process range]	Delete all the existing processes, send all the necessary processes to the destination, and then retry this option.
9		Change system edition	Delete all the existing processes, send all the necessary processes to the destination, and then retry this option.
10	CPMS debugger system	Initialize the task	Retry this option.
11		Loading and register of task / Delete task	Initialize the task storage area in the CMU module's memory by using task environment initialization and then load all the necessary tasks into that area.
12	NX/Tools-S10V system	Transfer system program	Retry this option.
13		Change DF setup	Transfer the system programs to the destination and then retry this option.
14	PIOP system	Setup system parameters	Retry this option.

6.2.5 Viewing the DHP trace with a tool system

For the tool system connection and setup procedures, see “4 OPERATION.” Start the basic system and then click the **Display Status of Network** button.



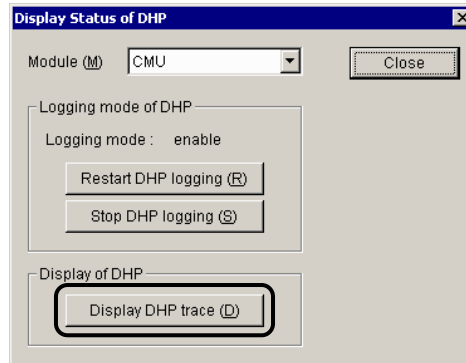
The [Display Status of Network] window opens. Click **Display Status of DHP** button.



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The [Display Status of DHP] window opens. The name of the modules of CMU/ET.NET mounted in PCs will be displayed in the “Module” box. Select the module for which you wish to display the status of DHP from the “Module” box.

Click Display DHP trace button after selecting the module.



The [Display DHP trace] window that presents the DHP trace selected in the [Display Status of DHP] window opens.

The screenshot shows a window titled "Display DHP trace" containing a table of DHP trace data. The table has the following columns: DHP, TIME, EVENT, TN, LV, DATA1, DATA2, DATA3, DATA4, and DATA5. The data is as follows:

DHP	TIME	EVENT	TN	LV	DATA1	DATA2	DATA3	DATA4	DATA5
1	08.018067	DHPREAD	244	03	7C0D0000	7C000DA8			
2	08.017993	RECV	244	03	0104C011	7C000D80	04800000		
3	08.017957	SETSOCKOPT	244	03	0104C011	0000FFFF	00000008	770BD93C	00000004
4	08.017935	DISPATCH_E	244	03	000000F4	0000002B	8468F000	00000001	
5	08.017928	RUNQ	244	03	000000F4				
6	08.017921	DISPATCH	244	03	000000F4	0000002B	8468F000		
7	08.017877	DISPATCH_E	244	03	000000F4	0000002B	8468F000	00000001	
8	08.017809	NET_SUB	244	03	01E00401	00000000			
9	08.017741	NET_SUB	244	03	01E00401	84923400			
10	08.017486	NET_ATEN	244	03	01040800	061804A8	042D1B5B	9ED463DE	9ED463A3
11	08.017400	NET_SUB	244	03	01E00401	00000000			
12	08.017371	WAKEUP	244	03	849234EC				
13	08.017366	RUNQ	244	03	000000F4				
14	08.017356	WAKEUP	244	03	849257EC				
15	08.017307	NET_SUB	244	03	01E00401	84923500			
16	08.017175	NET_ATEN	244	03	01040800	06100028	042D1B5B	9ED463DE	9ED463A3
17	08.017112	NET_TERM	244	03	0104FFFF	0000B05F	00009003	0000C4FF	00000000
18	08.017029	NET_SUB	244	03	01E00401	00000000			
19	08.017012	NET_START	244	03	01040800	0006002C	1B5B042D	60121000	1C01FD16
20	08.016809	NET_SUB	244	03	01E00401	84923500			

Analyze the behavior of the task using the DHP trace and find a way to deal with it.

6.2.6 Meanings of DHP trace information items

DHP trace information is displayed in the following way:

- It is displayed in a backward chronological order.
- It is classified into three groups of task, idle, and OS, where each group of information begins with the event DISPATCH_E.
- The DISPATCH_E line presents numbers in the range 0x00000001 to 0x0000012C in the DATA1 field. These numbers are the task numbers of tasks.
- The time is expressed in seconds and microseconds as a real value with six digits after the decimal point.
- The DHP events and data displayed have the relationships shown in Table 6-7.

<DHP information display example>

The following is an example of a DHP trace information display, which is shown along with a brief explanation of which task was executed and of the operation of the operating system (OS) which took place at the time of task switching.

									Explanation
New ↑	165	40.901912	TASK_PRI	112	10	00000071	00000032		Task 112 was executed.
	166	40.901901	RLEAS	112	10	00000071			
	167	40.901883	DISPATCH_E	112	10	00000070	00000032	84DB2000 00000002	Aborting task 111, the OS switched to task 112.
	168	40.901868	DISPATCH	111	10	0000006F	00000032	84DAF000	
	169	40.901832	DISPATCH_E	111	10	0000006F	00000032	84DAF000 00000002	
	170	40.901815	RUNQ	112	10	00000070			
	171	40.901810	DISPATCH	112	10	00000070	00000032	84DB2000	Task 112 was executed.
	172	40.901796	RUNQ	112	10	0000006F			
	173	40.901785	WAKEUP	112	10	F0000000			
	174	40.901771	ABORT	112	10	0000006F			
	175	40.901748	GFACT	112	10	00000003			
	176	40.901727	DISPATCH_E	112	10	00000070	00000032	84DB2000 00000002	
	177	40.901703	DISPATCH	111	10	0000006F	0000001C	84DAF000	
	178	40.901691	TASK_PRI	111	10	0000006F	0000001C	00000000	Delaying task 111, the OS switched to task 112.
	179	40.901611	DELAY	111	10	00000BB8			
	180	40.901600	RUNQ	111	10	00000070			Task 111 was executed.
	181	40.901590	QUEUE	111	10	00000070	00000003		
	182	40.901579	TASK_PRI	111	10	00000070	00000032		
	183	40.901568	RLEAS	111	10	00000070			
	184	40.901546	GFACT	111	10	00000002			
185	40.901525	DISPATCH_E	111	10	0000006F	00000032	84DAF000 00000002	Placing task 110 into wait state, the OS switched to task 111.	
186	40.901507	DISPATCH	110	10	0000006E	00000032	84DAC000		
187	40.901493	SLEEP	110	10	841C982C	00000032			
188	40.901483	WAIT	110	10	5004502C			Task 110 was executed.	
189	40.901471	RUNQ	110	10	0000006F				
190	40.901459	QUEUE	110	10	0000006F	00000002			
191	40.901446	TASK_PRI	110	10	0000006F	00000032			
192	40.901434	RLEAS	110	10	0000006F				
193	40.901408	DISPATCH_E	110	10	0000006E	00000032	84DAC000 00000001	Terminating task 119, the OS switched to task 110.	
194	40.901399	RUNQ	110	10	0000006E				
195	40.901393	DISPATCH	110	10	0000006E	00000032	84DAC000		
196	40.901373	DISPATCH_E	110	10	0000006E	00000032	84DAC000 00000002		
197	40.901348	DISPATCH	119	10	00000077	00000032	84DC7000		
198	40.901323	EXIT	119	10				Task 119 was executed.	
199	40.901311	RUNQ	119	10	0000006E				
200	40.901300	WAKEUP	119	10	841C982C				
201	40.901288	POST	119	10	5004502C	00001234			
Old ↓									

Table 6-7 DHP Codes (1/4)

● Processing by CPMS (tracing)						
Code value	DHP-displayed name	Trace point	DATA1	DATA2	DATA3	DATA5
0x010001	TRACE_ON	Start of tracing				
0x010002	TRACE_OFF	End of tracing				
0x010003	TRACE_TBU	Time recording	old_tbu (Time Base Upper)	new_tbu (Time Base Upper)		

● Processing by CPMS (scheduling)						
Code value	DHP-displayed name	Trace point	DATA1	DATA2	DATA3	DATA5
0x020001	WAKEUP	WAKEUP process	WAKEUP address			
0x020002	SLEEP	SLEEP event	SLEEP address	pri (priority level)		
0x020003	DISPATCH	Before thread_invoke process	tn (task number)	pri (priority level)	cont (CPMS stack information)	
0x020003	DISPATCH_E	After thread_invoke process	tn (task number)	pri (priority level)	cont (CPMS stack information)	
0x020004	RUNQ	RUNQ connection	tn (task number)			
0x020005	IDLE	IDLE process				
0x020006	TASK_PRI	Priority level control	tn (task number)	pri (priority level)		

● Processing by CPMS (error logging, built-in subroutine processing)						
Code value	DHP-displayed name	Trace point	DATA1	DATA2	DATA3	DATA5
0x030001	ULSUBLN	Embedded subroutine before link	Built-in subroutine nest count			
0x030001	ULSUBLN-E	Embedded subroutine after link	Built-in subroutine nest count			
0x030002	ELSETK	else process	Error type	Error class	Error format	Error code
0x030003	IOERR	I/O error handling	uno (unit number)	Device number	Device address	Detailed error code
0x030004	PRGERR	Program error handling	tn (task number)	Fault address	Program counter	Program counter
0x030005	WDIERR	WDI error handling	time			
0x030006	PIOFERR	PI/O error handling	slot			
0x030007	MODERR	Module error handling	Error code	Slot number	HERST register	INTST register
0x030008	KERN_PANIC	Fatal handling	tn (task number)	Fault address	Program counter	Extension error code
0x030009	ULSUB_ERR	Embedded subroutine error process	Built-in subroutine point number			
0x03000a	ASSERT	Assertion fatal handling	Place where the error occurred	Error line	Test conditions	
0x03000b	CPUSTOP	CPU termination process	Built-in subroutine nest count	Built-in subroutine point number	Built-in subroutine return value	

● Processing by CPMS (startup/termination)						
Code value	DHP-displayed name	Trace point	DATA1	DATA2	DATA3	DATA5
0x040001	SETUP_MAIN	Startup process				
0x040002	HDUTL_STOP	Termination process	! (fixed)			
0x040003	HDUTL_RSUM	Restart process				
0x040004	HDUTL_ERR	ERROR handling				

● Processing by CPMS (exception handling)						
Code value	DHP-displayed name	Trace point	DATA1	DATA2	DATA3	DATA5
0x050001	EXCEPTION	Exception handling	Type of exception			
0x050002	SLIH_SRES	System reset exception	NMI factor register	Program counter		
0x050005	SLIH_SM	System management interrupt exception	MSW register			
0x050007	SLIH_HERR	Serious-error interrupt handling	Serious-error cause register			

Table 6-7 DHP Codes (2/4)

● Processing by CPMS (macro processing)

Code value	DHP-displayed name	Trace point	DATA1	DATA2	DATA3	DATA4	DATA5
0x100000	NOSYS	Issuing of undefined macro					
0x100001	QUEUE	Issuing of queue	tn (task number)	fact (initiation factor)			
0x100002	REAS	Issuing of releas	tn (task number)				
0x100003	SFACT	Issuing of sfact	tn (task number)	fact (initiation factor)			
0x100004	ABORT	Issuing of abort	tn (task number)				
0x100005	SUSP	Issuing of susp	tn (task number)				
0x100006	RSUM	Issuing of rsum	tn (task number)				
0x100007	CTIME	Issuing of ctime		fact (initiation factor)			
0x100008	WAIT	Issuing of wait	ebc (ECB address)				
0x100009	POST	Issuing of post	ebc (ECB address)	pcode (post code)			
0x10000a	TIMER	Issuing of timer	id (event type)	tn (task number)	fact (initiation factor)	t (time period/point in time)	cyt (cycle time)
0x10000b	DELAY	Issuing of delay	t (milliseconds)				
0x10000c	STIME	Issuing of stime	year (year)	month (month)	day (day)	msec (milliseconds)	
0x10000d	CHAP	Issuing of chap	tn (task number)	chgp (priority level)			
0x10000e	RSERV	Issuing of rserv	tn (number of shared resources)	para 1	para 2	para 3	para 4
0x10000f	FREE	Issuing of free	tn (number of shared resources)	para 1	para 2	para 3	para 4
0x100010	PRSERV	Issuing of prserv	tn (number of shared resources)	para 1	para 2	para 3	para 4
0x100011	PFREE	Issuing of pfree	tn (number of shared resources)	para 1	para 2	para 3	para 4
0x100012	GFACT	Before/After issuing of gfact	fact (initiation factor)				
0x100013	GTIME	Issuing of gtime	time (time_t address)				
0x100014	EXIT	Issuing of exit					
0x100015	ASUSP	Issuing of asusp					
0x100016	ARSUM	Issuing of arsum					
0x10001e	DHPCTL	Issuing of dhpctl	cmd (command)	id (trace range)		Trace output address	
0x10001f	DHPREAD	Issuing of dhpread	Logical address	size			
0x100023	CHML	Issuing of chml	Logical address	para 1	para 2	para 3	para 4
0x100056	CFREAD	Flash memory read	Sector number	Size	Buffer address		
0x100057	CFWRITE	Flash memory write	Sector number	Size	Buffer address		

● Processing by CPMS (RPDP processing)

Code value	DHP-displayed name	Trace point	DATA1	DATA2	DATA3	DATA4	DATA5
0x200004	SETTCB	Issuing of settcbr	Task table number to be registered	Number of tasks to be registered	Task management table address		
0x200005	CLRTCB	Issuing of clrtcb	tn (task number)				
0x200006	ADTSET	Issuing of adtset	ADT mode (1: setup, 2: delete)	Channel set	Address set	Address mask pattern	Mode (1: read, 2: write, 3: read/write)
0x200007	ADTREAD	Issuing of adtread	Register storage area address	ADTB storage area address			
0x200008	SETBRK	Issuing of setbrk	Mode (1: setup, 2: delete)	Breakpoint address	Operation code address		
0x200009	GETBRK	Issuing of getbrk	Mode (0: ordinary read, 1: break decision read)	Breakpoint reading address			
0x20000a	GOTASK	Issuing of gotask					
0x20000c	REGSET	Task register setting	Register	Data address			

Table 6-7 DHP Codes (3/4)

● Processing by RCTLNET (network driver)

Code value	DHP-displayed name	Trace point	DATA1	DATA2	DATA3	DATA4	DATA5
0x300001	SOCKET	Issuing of SOCKET	uno (unit number)	Type	Protocol	Work data	Work data
0x300002	BIND	Issuing of BIND	Socket ID	Port number	IP address	Work data	Work data
0x300003	LISTEN	Issuing of LISTEN	Socket ID	Maximum number of connection requests that can wait for a connection to be established	Work data	Work data	Work data
0x300004	ACCEPT	Issuing of ACCEPT	Socket ID	Address information pointer	Address information length	Work data	Work data
0x300005	CONNECT	Issuing of CONNECT	Socket ID	Port number	IP address	Work data	Work data
0x300006	SEND	Issuing of SEND	Socket ID	Buffer address	High-order word: Data length Low-order word: Transmission flag	Work data	Work data
0x300007	SENDTO	Issuing of SENDTO	Socket ID	High-order word: Data length Low-order word: Transmission flag	Port number	IP address	Internal task information
0x300008	RCV	Issuing of RCV	Socket ID	Buffer address	High-order word: Data length Low-order word: Reception flag	Work data	Work data
0x300009	RCVFROM	Issuing of RCVFROM	Socket ID	Buffer address	High-order word: Data length Low-order word: Reception flag	Address information pointer	Address information length
0x30000a	SETSOCKOPT	Issuing of SETSOCKOPT	Socket ID	Level	Option	Option information address	Option information length
0x30000b	GETSOCKOPT	Issuing of GETSOCKOPT	Socket ID	Level	Option	Option information address	Option information length
0x30000c	SHUTDOWN	Issuing of SHUTDOWN	Socket ID	Socket shutdown method	Work data	Work data	Work data
0x30000d	NET_END	Abnormal end of macro	Socket ID	Error number	Work data	Work data	Work data
0x300010	NET_CTLR	Issuing of IOCCTL	Unit number plus slot number	Control information	Control information	Control information	Control information
0x300010	NET_CTLR	Acceptance of remote CPU control request	Station number plus command number	Frame length plus transmission number	Target type plus data length	Data address	Work data
0x300011	NET_START	Start of NCP-F I/O	Socket ID	Task information	Command code plus socket status	Initiation information 1	Initiation information 2
0x300011	NET_START	Transmission by built-in LANCE or LANCP	Socket ID plus ETHER_TYPE	Packet header information			
0x300012	NET_TERM	NCP-F termination interrupt	Socket ID	Task information	Response information	Status code	Interrupt information
0x300012	NET_TERM	Built-in LANCE/LANCP termination interrupt	Socket ID plus FFFF	LANCE descriptor information (TMD0, TMD1, TMD2, TMD3)			
0x300013	NET_ATen	NCP-F attention interrupt	Socket ID	Task information	Response information	Status code	Interrupt information
0x300013	NET_ATen	Reception by built-in LANCE or LANCP	Socket ID plus ETHER_TYPE	Packet header information			
0x300014	NET_STO	Software timeout	Socket ID	Task information	Initiation information	Initiation information	Initiation information
0x300015	NET_SUB	Error detection	Error type	Error information	Error information	Error information	Error information
0x300018	NET_ABORT_S	Start of socket closing process in task abort	Task number	Type (0: Ether, 1: NCP)			
0x300019	NET_ABORT_E	End of socket closing process in task abort	Task number	Type (0: Ether, 1: NCP)			
0x300030	CYC_CHK_S	Start of activeness monitoring using memory transfer over μ2NETWORK-1000	Activeness-monitoring CM address				
0x300031	CYC_CHK_E	End of activeness monitoring using memory transfer over μ2NETWORK-1000	Number of detections of a node's activeness made	Number of steycm re-issues detected	Number of detections of a node's inactiveness made	Cache purge flag	Activeness-monitoring block count
0x300032	NET_UDP_RCV	UDP receive-data received by NCP-E	IP address of sender	Sender port no. and receiver port no.	Receive-data length	Address info size	Reception info

Table 6-7 DHP Codes (4/4)

● CPMS library process

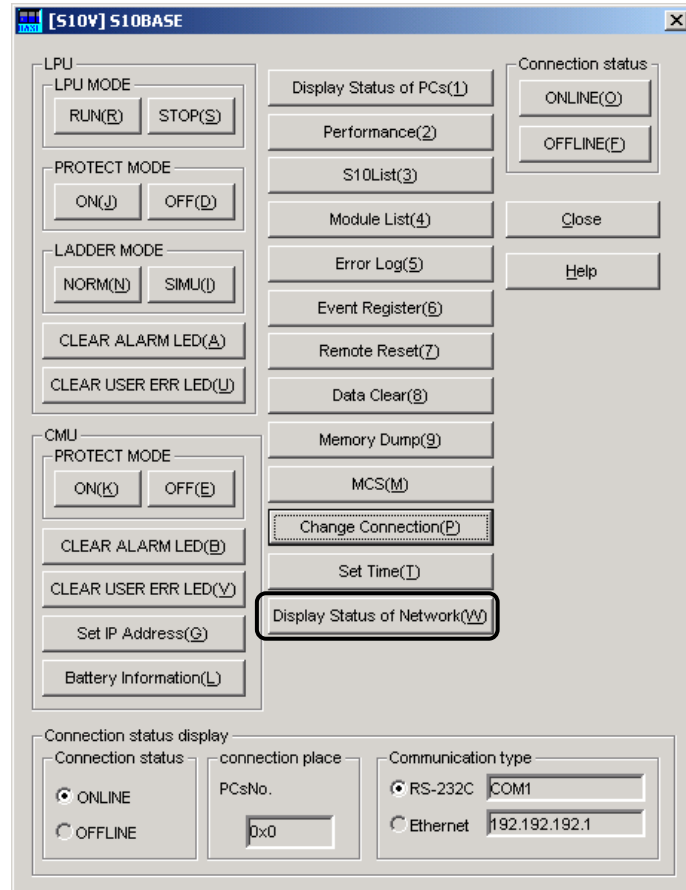
Code value	DHP-displayed name	Trace point	DATA1	DATA2	DATA3	DATA4	DATA5
0x500028	WDTSET	Issuing wdset	Watchdog timer monitoring time				
0x500032	WR TMEM	Issuing wrmem	Address of the transfer source	Address of the transfer destination	Transfer size (byte)		

● For user

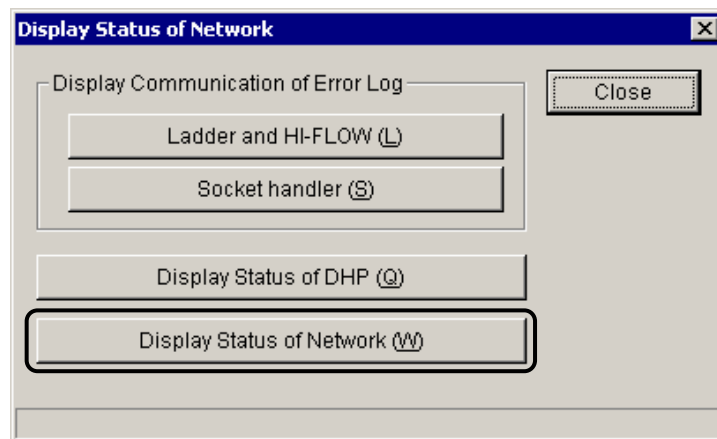
Code value	DHP-displayed name	Trace point	DATA1	DATA2	DATA3	DATA4	DATA5
0x600000	USR0	User definition					
0x600001	USR1	User definition					
0x600002	USR2	User definition					
0x600003	USR3	User definition					
0x600004	USR4	User definition					
0x600005	USR5	User definition					
0x600006	USR6	User definition					
0x600007	USR7	User definition					

6.2.7 Viewing the status of the network with a tool system

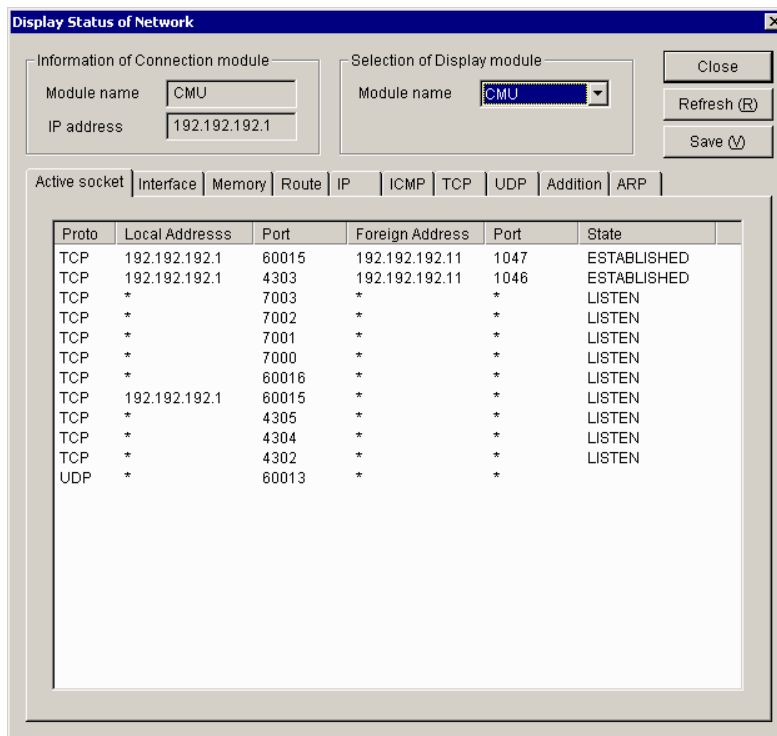
For the tool system connection and setup procedures, see “4 OPERATION.” Start the basic tool and then click the **Display Status of Network** button.



The [Display Status of Network] window opens. Click the **Display Status of Network** button.



The [Display Status of Network] window opens.



Select the module for which you wish to display the status of the network from the [Module name] in the Selection of Display module, and select the type of status of the network by clicking the tab.

There are the following types of status of the network.

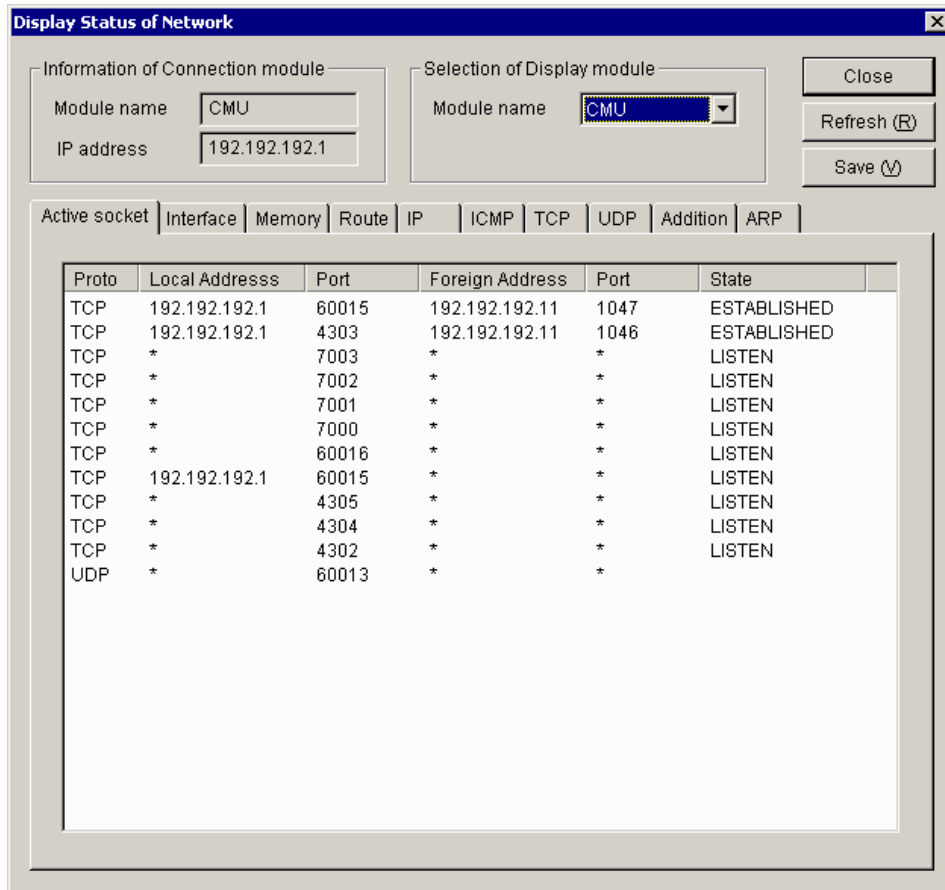
Item	Type of information displayed
Active socket	Socket information
Interface	Currently running network interfaces information
Memory	Send/receive buffer management information
Route	Routing information
IP	IP protocol statistics
ICMP	ICMP protocol statistics
TCP	TCP protocol statistics
UDP	UDP protocol statistics
Addition	Interface cumulative information
ARP	ARP table information

The specified type of status of network will be displayed by clicking the **Refresh** button after selecting the tab. See “6.2.8 Details of the Status of Network” for details displayed in the tab.

6.2.8 Details of the Status of Network

(1) Socket information

The socket information displayed as shown below is a list of the currently existing network connections.



where:

- Protocol
The name of the protocol used over the connection.
- Local Address
The IP address of the local host (source of connection). If the IP address is not bound with a socket, an asterisk (“*”) is displayed instead.
- Port
The port number of the local host (source of connection).
- Foreign Address
The IP address of the remote host (destination of connection). If the IP address is not bound with a socket, an asterisk (“*”) is displayed instead.

- Port

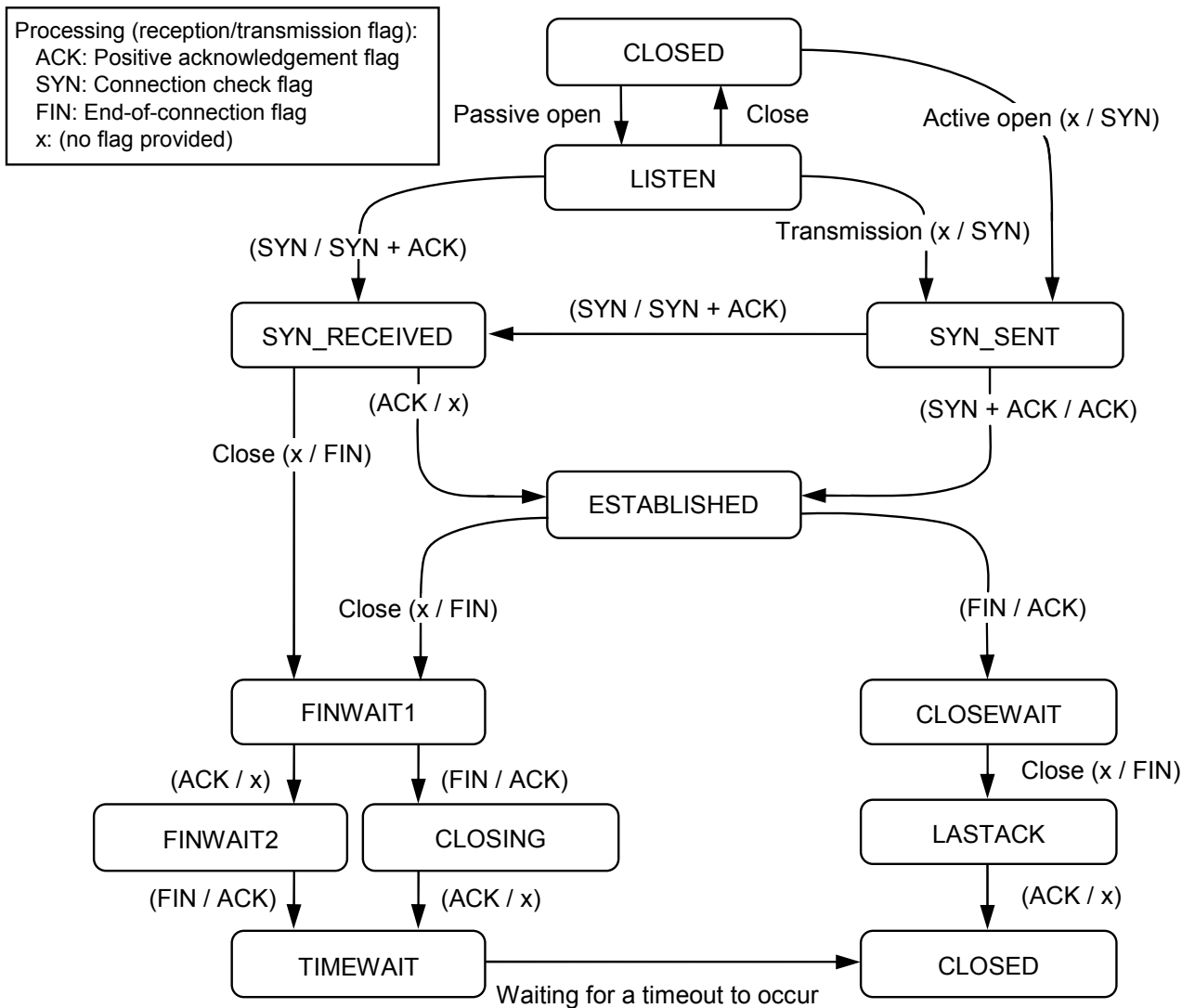
The port number of the remote host (destination of connection). If the IP address is not bound with a socket, an asterisk (“*”) is displayed instead.

- State

The connection status of the TCP protocol. The connection state is one of the following 11 states:

Displayed symbol	Meaning
CLOSED	Currently not in use.
LISTEN	Waiting for a port to become available.
SYN_SENT	Although it issued a connect (SYN) request to the server, has not received a response (ACK) from it.
SYN_RECEIVED	Has just received a connect (SYN) request from a client.
ESTABLISHED	Currently performing data communication using an established TCP connection.
FINWAIT1	Server has sent out a FIN.
FINWAIT2	Has received an ACK.
CLOSEWAIT	Has received a FIN from the server.
LASTACK	Waiting for an ACK response to be sent out to the FIN.
CLOSING	Has received a FIN and is closing the connection.
TIMEWAIT	Waiting for the connection to be terminated.

All possible state transitions between the connection states are as follows:

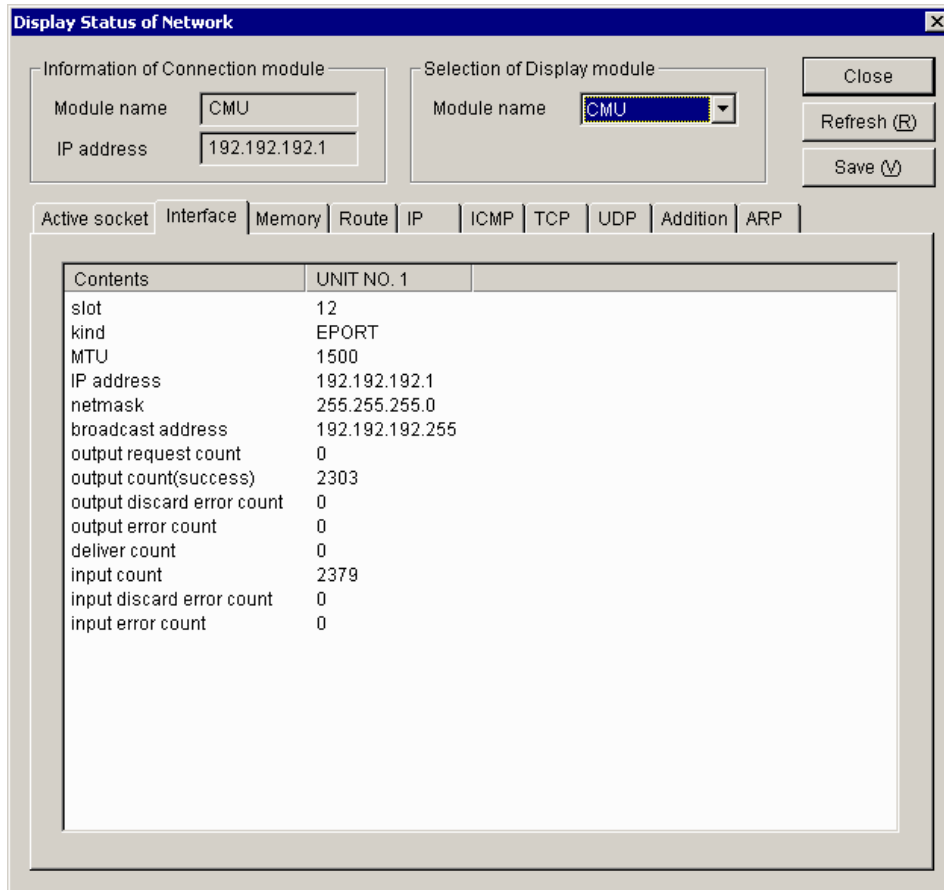


NOTICE

- If the TCP protocol is used over more than 150 ports, no socket information is displayed for the excess ports and the UDP protocol.
- If the TCP protocol is used over more than 80 ports, some of the socket information for the UDP protocol may not be displayed.

(2) Interface information

The interface information displayed as shown below is concerning the network interfaces currently in operation and includes input/output packet cumulative information.



where:

① slot

The slot number of the slot in which a module subjected to this display process is mounted.

② kind

Always the string "EPORT" is displayed as this item.

③ MTU

The maximum transmission unit (MTU) that refers to the maximum size of data blocks into which a set of data is divided and that is transmittable by a single transfer.

④ IP address

IP address used.

⑤ netmask

Subnet mask used.

- ⑥ broadcast address
Broadcast address used.
- ⑦ output request count
The number of send requests that were accepted for message transmission.
- ⑧ output count (success)
The number of message transmissions that were done successfully.
- ⑨ output discard error count
The number of message transmissions that failed due to memory shortage.
- ⑩ output error count
The number of message transmission failure reports that were made by hardware following a send request issued by the driver to the hardware.
- ⑪ deliver count
The number of received-message deliveries that were made to users.
- ⑫ input count
The number of message reception reports that were made by hardware.
- ⑬ input discard error count
The number of message receptions that failed due to memory shortage.
- ⑭ input error count
The number of message reception failure reports that were made by hardware following a “get message” request issued by the driver to the hardware.

(3) Memory information

The memory information displayed as shown below is management information for send/receive buffers (memory).

Cluster top address : 0x84923000

Contents	CURRENT	MAX	HIGH	DROP
mbufs in use	40/48	32/48	48	0/0
data	1	1	7	0
packet headers	2	0	3	0
socket structures	12	10	12	0
protocol control blocks	23	19	23	0
routing table entries	1	1	1	0
socket names and addresses	0	0	1	0
socket options	0	0	1	0
interface addresses	1	1	1	0
Kbytes allocated	6/1060	10/1060	10	0/0
mbufs	6	6	6	0
clusters	0	4	4	0

where:

- CURRENT: The current state of mbuf.
- MAX: The status of mbuf at its maximum utilization.
- HIGH: Peak value for each item.
- DROP: The status of mbuf in the event of an overflow.

① Cluster top address

The starting address of the cluster memory.

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② mbufs in use

The number of mbufs currently in use, and the total number of allocated mbufs. The following table shows details of the mbufs currently in use.

Item	Description
data	The number of mbufs in which communication data is stored.
packet headers	The number of mbufs in which a packet header is stored.
socket structures	The number of mbufs in which a socket structure is stored.
protocol control blocks	The number of mbufs in which a protocol control block is stored.
routing table entries	The number of mbufs in which routing table entries are stored.
IP reassembly-awaiting data	The number of mbufs in which IP reassembly-awaiting data is stored.
socket addresses	The number of mbufs in which a socket address is stored.
socket options	The number of mbufs in which a socket option is stored.
interface addresses	The number of mbufs in which the address of a network interface is stored.

③ Kbytes allocated

The size of the cluster memory or mbufs currently in use, and the total size of the memory allocated to clusters. For details on the size of the cluster memory currently in use, see the following items:

Item	Description
mbufs	The size of the memory used as mbufs.
clusters	The size of the memory used as clusters.

④ mbuf/cluster allocation failures count

The number of mbuf/cluster allocation failures due to a “cluster full” condition.

⑤ cluster request count

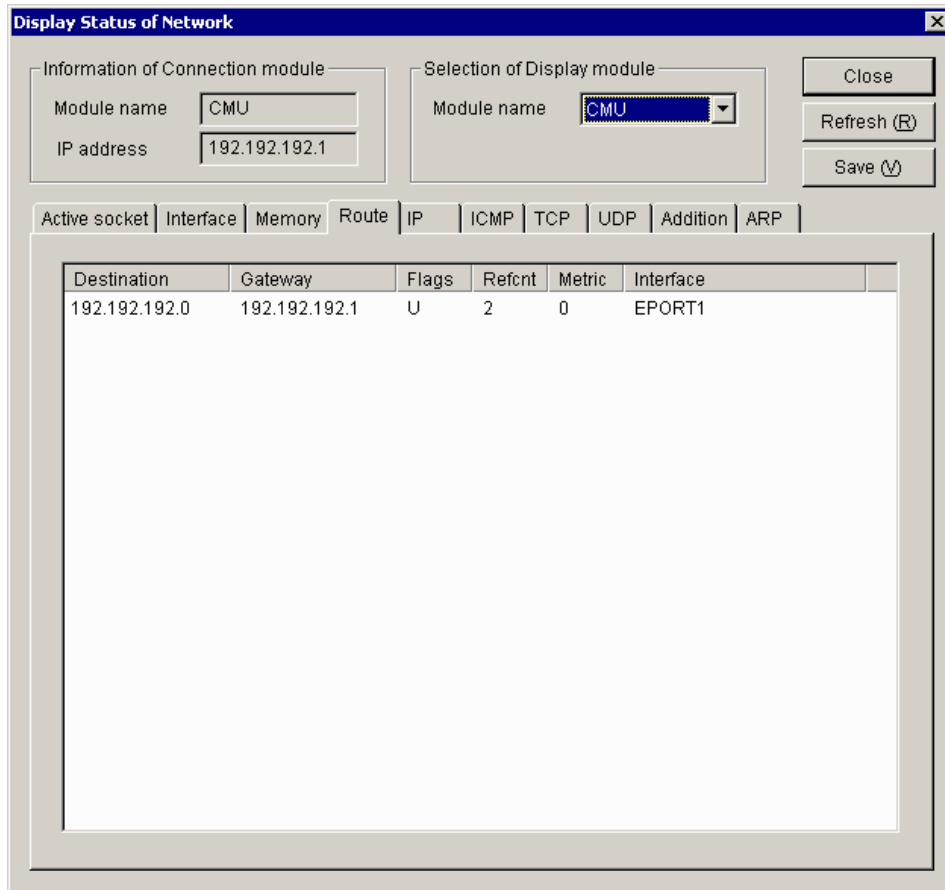
The number of cluster requests issued after the number of clusters used reached the upper limit.

NOTICE

Any item with CURRENT, MAX, HIGH, and DROP each set equal to 0 is excluded from the displayed list.

(4) Routing information

The routing information displayed as shown below is concerning the routes registered in the CMU and ET.NET modules.



① Destination

The network address of the destination. In the case of virtual network addresses, an asterisk (“*”) is appended to the end of the address value.

② Gateway

The IP address of the gateway associated with the destination.

③ Flags

Information indicating the status of the route. These flags are classified into the following three types:

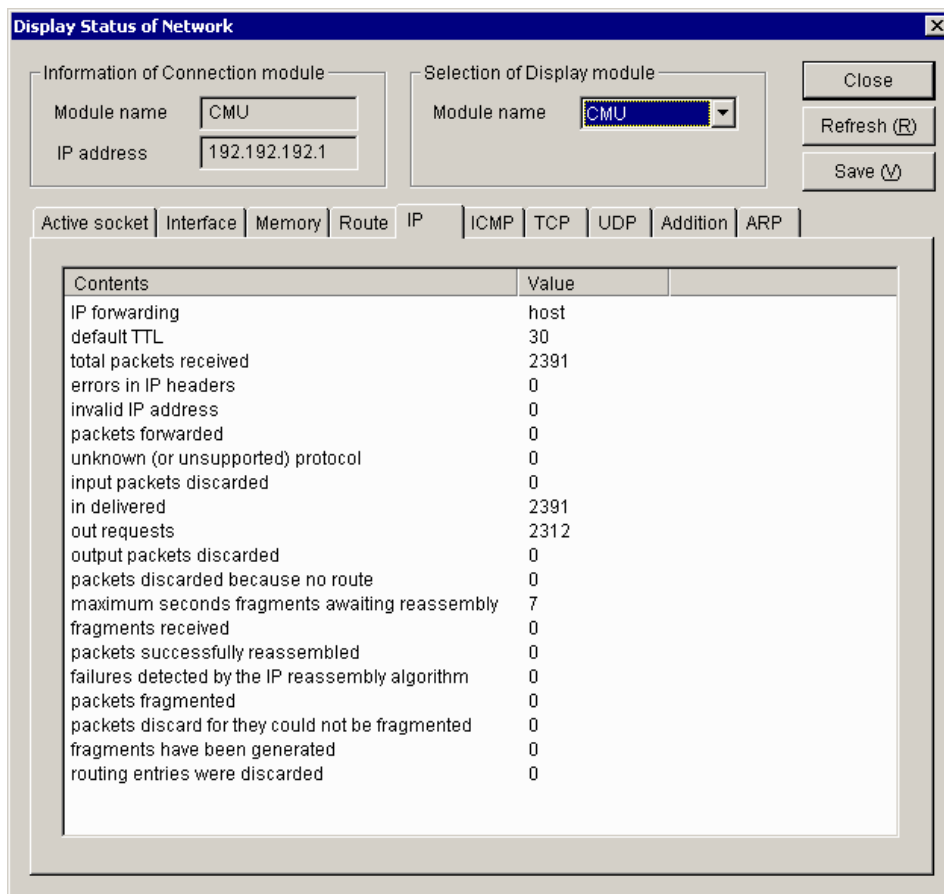
Flag symbol	Description
U	Indicates that the route is currently in operation.
G	Indicates that the routing is to a gateway.
H	Indicates that the routing is to a host.

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- ④ Refcnt
The number of users who are using the route.
- ⑤ Metric
The number of gateways that are present in the route to the destination.
- ⑥ Interface
Always the string “EPORT” is displayed as this item.

(5) IP protocol statistics

The statistics displayed as shown below is statistical information concerning the IP protocol.



① IP forwarding

Since forwarding is not supported, the string “host” is displayed as this item. If it was supported, an indication would be displayed which indicates whether it is operating as a forwarding gateway.

② default TTL

The default value of TTL (Time To Live) that determines the maximum number of hops.

③ total packets received

The total number of IP packets that were received from all existing network interfaces.

④ errors in IP headers

The total number of IP packets that were discarded because of an error, such as a checksum or version error in the IP header.

⑤ invalid IP address

The total number of IP packets that were discarded because the destination IP address was incorrect.

- ⑥ packets forwarded
The total number of IP packets that were forwarded (or routed to another interface).
- ⑦ unknown (or unsupported) protocol
The total number of IP packets whose IP header contained a specification of an undefined higher-level protocol.
- ⑧ input packets discarded
The total number of IP packets that were received but discarded without being delivered to a higher-level protocol because of a buffer area shortage, or that the higher-level protocol refused to receive.
- ⑨ in delivered
The total number of IP packets that were delivered to a higher-level protocol, such as TCP or UDP.
- ⑩ out request
The total number of IP packets for which a send request was issued by a higher-level protocol.
- ⑪ output packets discarded
The total number of IP packets that were discarded because of a buffer shortage or some other cause.
- ⑫ packets discarded because no route
The total number of IP packets that were discarded because they could not be routed due to a routing information setting error or some other cause.
- ⑬ maximum seconds fragments awaiting reassembly
The maximum number of seconds during which a fragment awaiting reassembly may be placed in hold state.
- ⑭ fragment received
The total number of fragment packets that were received.
- ⑮ packets successfully reassembled
The number of fragments that were reassembled successfully.
- ⑯ failures detected by the IP reassembly algorithm
The number of failures in fragment reassembly that were caused by a timeout, resource shortage, or some other cause.
- ⑰ packets fragmented
The total number of transmission IP packets that were fragmented at transmission time because they exceeded the MTU size.
- ⑱ packets discard for they could not be fragmented
The total number of transmission IP packets that could not be fragmented because of a resource shortage or some other cause.

①9 fragments have been generated

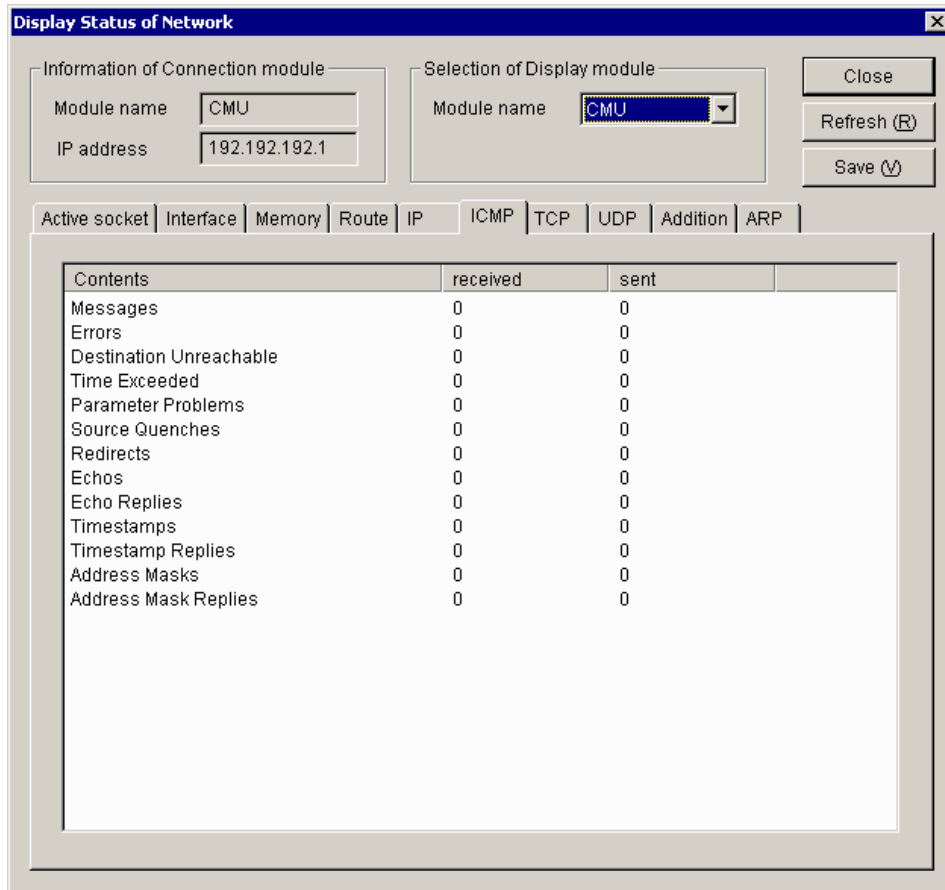
The total number of fragment packets that were created by the fragmentation of transmission IP packets.

②0 routing entries were discarded

The number of routing entries that were discarded.

(6) ICMP protocol statistics

The statistics displayed as shown below is statistical information concerning the ICMP protocol.



① Messages

The total number of ICMP messages that were processed.

② Errors

The total number of ICMP error messages that were processed.

③ Destination Unreachable

The total number of ICMP messages that could not be transmitted to the destination.

④ Time Exceeded

The total number of ICMP messages that were discarded during routing because of a TTL (Time To Live) shortage.

⑤ Parameter Problems

The total number of ICMP messages that reported on a parameter error.

⑥ Source Quenches

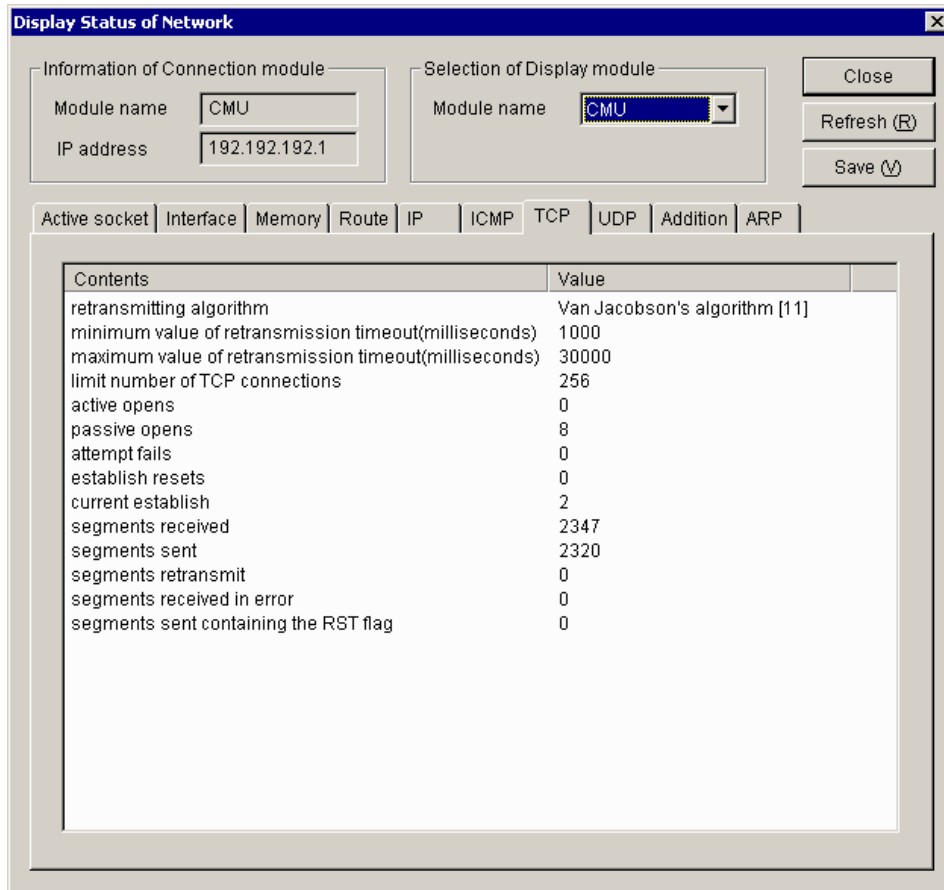
The total number of ICMP messages that requested the control of transmissions because of a resource shortage on the receiving side.

- ⑦ Redirect
The total number of ICMP messages that reported on the existence of a more suitable route to the destination.
- ⑧ Echos
The total number of ICMP messages that were transmitted from the sending side of ping.
- ⑨ Echo Replies
The total number of ICMP messages that were returned from the receiving side of ping.
- ⑩ Timestamps
The total number of ICMP messages that were used as Timestamp requests.
- ⑪ Timestamp Replies
The total number of ICMP messages that were used as responses to Timestamp requests.
- ⑫ Address Masks
The total number of ICMP messages that were used as Address Mask Requests.
- ⑬ Address Mask Replies
The total number of ICMP messages that were used as responses to Address Mask Requests.

6 MAINTENANCE

(7) TCP protocol statistics

The statistics displayed as shown below is statistical information concerning the TCP protocol.



① retransmitting algorithm

Name of the retransmission timeout (RTO) algorithm used.

② minimum value of retransmission timeout (milliseconds)

The minimum value of retransmission timeout period expressed in milliseconds.

③ maximum value of retransmission timeout (milliseconds)

The maximum value of retransmission timeout period expressed in milliseconds.

④ limit number of TCP connections

The maximum number of connections that can be established at a time.

⑤ active opens

The number of connections that were established to satisfy the connect requests issued to the outside.

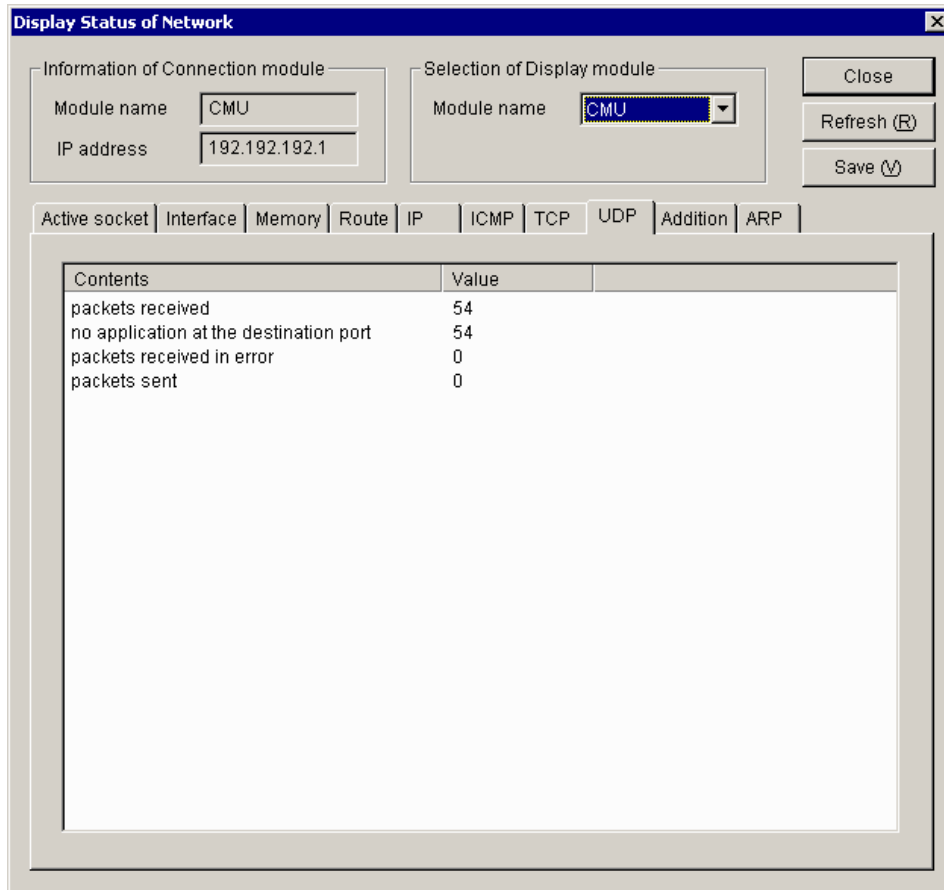
⑥ passive opens

The number of connect requests that were received from the outside.

- ⑦ attempt fails
The number of connect requests whose attempt to connect failed.
- ⑧ establish resets
The number of connect requests that were rejected during their processing.
- ⑨ current establish
The total number of TCP connections currently active.
- ⑩ segments received
The total number of segments (units of data each transmitted by TCP at a time) that were received.
- ⑪ segments sent
The total number of segments that were transmitted.
- ⑫ segments retransmit
The total number of segments that were retransmitted because a reception acknowledgement was received from the destination.
- ⑬ segments received in error
The number of received segments that contained an error.
- ⑭ segments send containing the RST flag
The number of received segments that contained a reset flag.

(8) UDP protocol statistics

The statistics displayed as shown below is statistical information concerning the UDP protocol.



① packets received

The total number of UDP packets that were received.

② no application at the destination port

The number of UDP packets for which no higher-level application (port number) could be found at the destination.

③ packets received in error

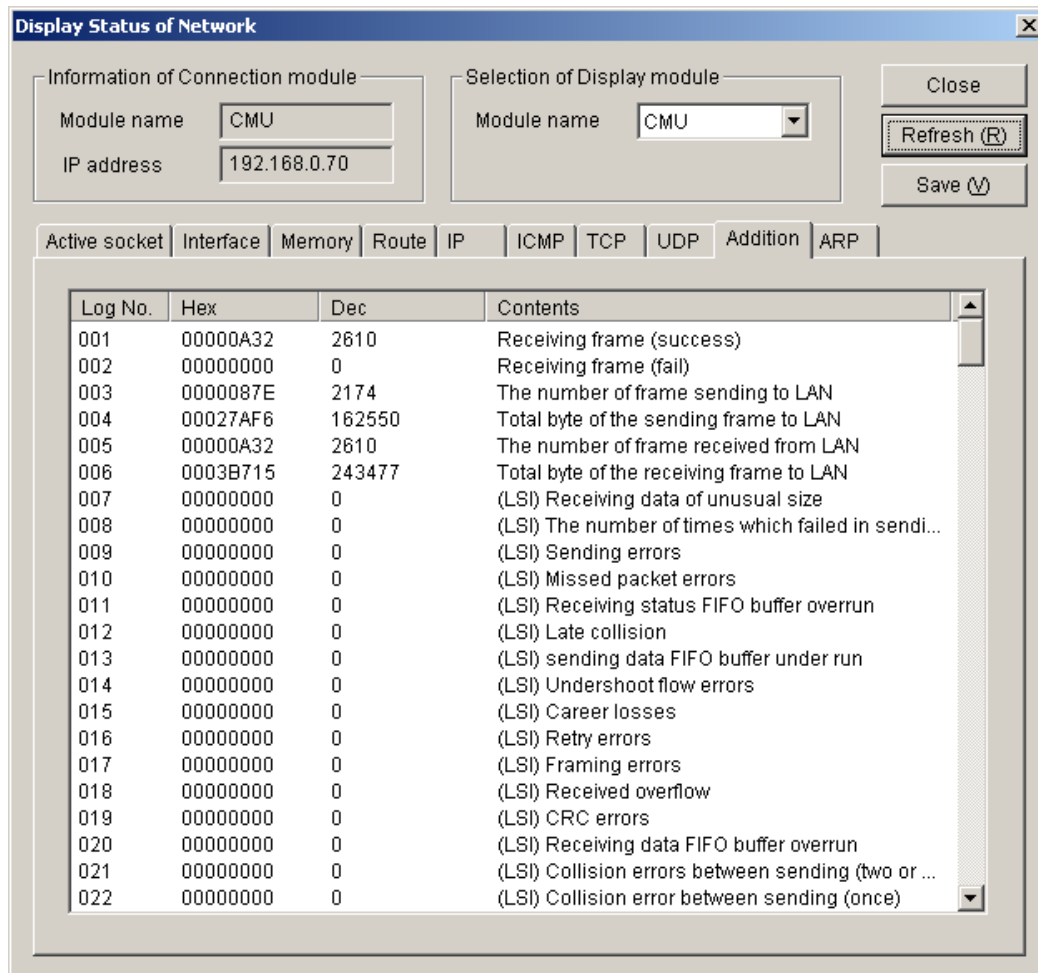
The total number of UDP packets that could not be delivered to higher-level services because of an error or some other cause.

④ packets sent

The total number of UDP packets that were transmitted.

(9) Cumulative information

The information displayed as shown below is cumulative information on the existing interfaces.



<Details of major cumulative info>

The following is a description of the log numbers 001 through 129 displayed as cumulative information. All log numbers other than listed are used as internal information for maintenance purposes.

- Log number 001: Receiving frame (success)
The number of frames that were received normally.
- Log number 002: Receiving frame (fail)
The number of frames that caused an error during reception.
- Log number 003: The number of frame sending to LAN
The number of frames that were sent out to the communication line.
- Log number 004: Total byte of the sending frame to LAN
The total number of bytes of the frames that were sent out to the communication line.

- Log number 005: The number of frame received from LAN
The number of frames that were received from the communication line. This number includes the frames that were received normally or abnormally.
- Log number 006: Total byte of the receiving frame to LAN
The total number of bytes of the frames that were received from the communication line.
- Log number 007: (LSI) Receiving data of unusual size
The number of frames whose frame length was abnormal.
- Log number 008: (LSI) Bubble errors
Unused.
- Log number 009: (LSI) Collision errors
Number of collision errors.
- Log number 010: (LSI) Missed packet errors
The number of packets that were lost during operation because the communication LSI's internal buffer was full.
- Log number 011: (LSI) Memory errors
Number of communication LSI internal memory access errors detected.
- Log number 012: (LSI) Late collision
The number of late collisions (i.e., collisions detected during the transmission of the 64th or subsequent byte of data after the preamble) that occurred during transmission.
- Log number 013: (LSI) Sent buffer errors
The number of times the communication buffer became full.
- Log number 014: (LSI) Undershoot flow error
The number of send-buffer underflow errors that occurred during transmission.
- Log number 015: (LSI) Carrier losses
The number of carrier losses that occurred due to a disconnected cable, a power-off condition of the hub, or some other cause during transmission.
- Log number 016: (LSI) Retry errors
The number of retry errors (i.e., attempts to do more retries than permitted) that occurred during transmission.
- Log number 017: (LSI) Framing errors
The number of framing errors that occurred during reception.
- Log number 018: (LSI) Received overflow
The number of receive-buffer overflows that occurred during reception.
- Log number 019: (LSI) CRC errors
The number of frame CRC errors that occurred during reception.
- Log number 020: (LSI) Buffer errors
The number of times the receiving buffer became full.

- Log number 021: (LSI) Collision errors between sending (two or more)
The number of times more than one collision was detected during transmission.
- Log number 022: (LSI) Collision error between sending (once)
The number of times a single collision was detected during transmission.
- Log number 023: (LSI) Delay between sending
The number of delays that occurred during transmission, where each transmission was terminated normally.
- Log number 024: Frame-send-timeout
The number of frame-send-timeouts that occurred.
- Log number 129: Adapter state (top 2 byte), LINK, 10M/100Mbps, Full duplex / half-double state (bottom 2 byte)

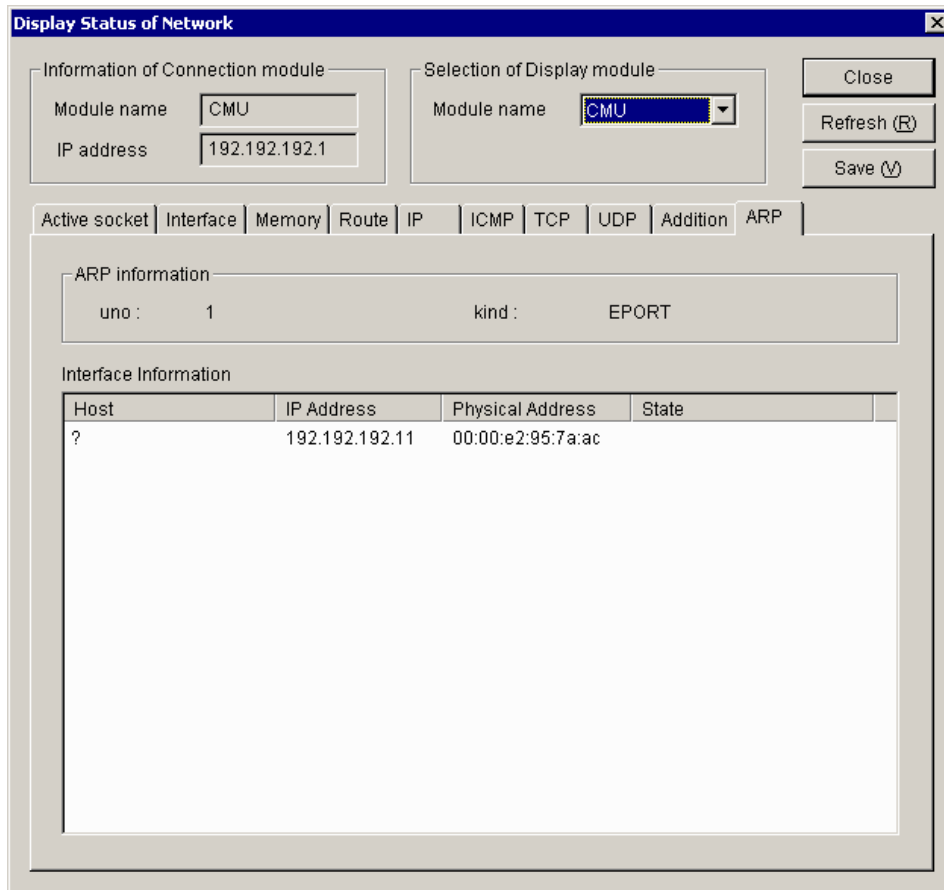
Data communication speed and full-duplex/half-duplex state of the ET.NET module used. Interpret this information according to the following table:

Connection type		Displayed value (*)	
		Hexadecimal	Decimal
10 Mbps	Half-duplex	00000001	1
	Full-duplex	00000005	5
100 Mbps	Half-duplex	00000003	3
	Full-duplex	00000007	7

(*) If a connection is not established over the communication line, the displayed value will be 0 (fixed).

(10) ARP table information

The information displayed as shown below is the contents of the translation table that is used by the ARP (Address Resolution Protocol) for translation of IP addresses to physical addresses.



- ARP information

- ① uno

A value of 1 is always displayed as this item.

- ② kind

The string "EPORT" is always displayed as this item.

- Interface Information

ARP entries that are registered.

- ① Host

The host name associated with the IP address displayed.

The host names displayed under this heading are those which are listed in the "hosts" file in the Tool currently in operation. If no host names are registered in that file, a question mark ("?") is displayed instead.

② IP Address

The IP address of the destination registered in the ARP table.

③ Physical Address

The physical address of the destination registered in the ARP table. If the ARP entry is invalid, the string “(incomplete)” is displayed instead.

④ State

The current state of the ARP entry. The possible states are as follows:

State name displayed	Meaning
permanent	Fixed entry
published	Proxy ARP entry

6.3 Replacing the Battery Module

When the battery module (model LQZ500) is discharged to a predetermined low level, the model-LQP525 or LQP527 CMU module’s ALARM LED is lit. In this case, obtain error log information by using the Base System and check that the “battery low” condition is reported in the displayed error information. If the power to the CMU module is turned off in a “battery low” condition, the contents of its main memory may be lost. To prevent this, back them up in files by using the backup restore system before you turn off the power to the CMU module. The programs in memory are loaded in from the flash memory, so they need not be backed up in files for battery replacement.

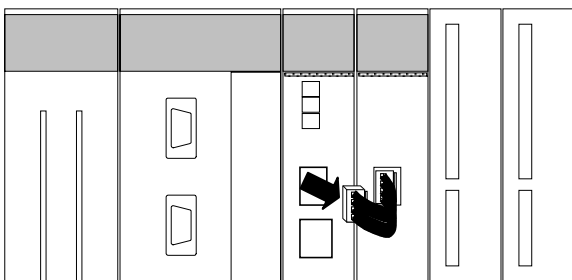
The model LQZ500 can back up the CMU module’s main memory continuously for approximately one year of power-off condition. However, if the LQZ500 is used in a severe environment of high temperature and high humidity, replace it before its useful life reaches one year. Of course, when the ALARM LED is lit before the one-year limit, replace it.

■ Notes on battery replacement

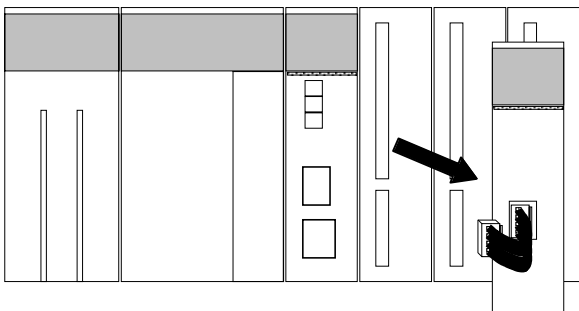
- Replace the LQZ500 module only when the following conditions are met: 1) the LQP525 or LQP527 module’s ALARM LED is lit and 2) the “battery low” condition is reported in the displayed error log information.
- Replace the LQZ500 module only in a power-on condition.
- The internal clock may stop due to the “battery low” condition. Check the system time after you have replaced the LQZ500 module.

6.3.1 Replacement procedure

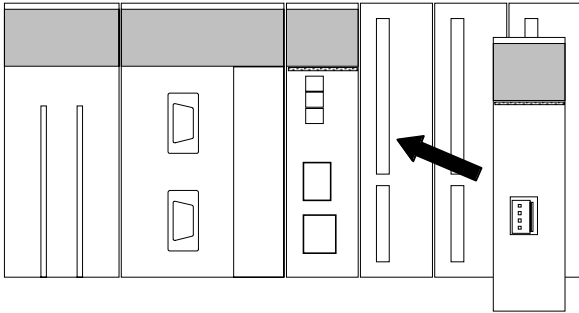
When the LQZ500 module needs to be replaced, the replacement must be done in a power-on condition by performing the following procedure:



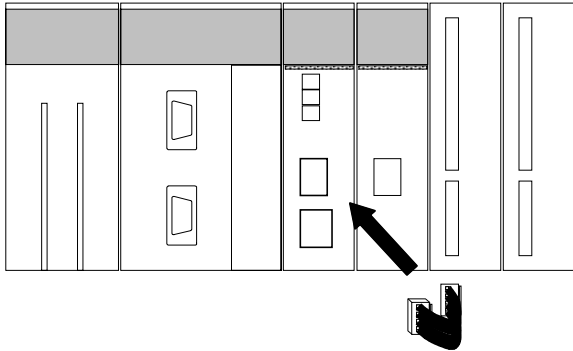
- ① Discharge any static electricity from your body before starting your replacement work.
- ② Disconnect the battery cable from the LQP525 or LQP527 module.



- ③ Remove the battery module from the mount base.



- ④ Mount a new battery module on the mount base.



- ⑤ Connect a new battery cable to the new battery module.

NOTICE

Be sure to replace the battery cable along with the battery module. The purpose of this is to increase product reliability.

- ⑥ Push and hold the BATT.SET switch until the BATT.SET LED comes on. By doing so, you can write the date and time of the battery replacement to the CMU module's program storage memory. During the write, the USER LED continues blinking (this is no error), indicating that the write is in progress.
- ⑦ When the BATT.SET LED comes on, release the BATT.SET switch. This procedure ends when the BATT.SET LED and USER LED are both lit.



CAUTION

The battery cable has to be wired in a power-on condition, so be sure to provide protection against electric shock before you turn on the power to the CMU module.

NOTICE

This hardware unit may malfunction if it is connected poorly or has a broken line. After connecting the connector, check whether it is locked.

6.3.2 Scrapping a used battery

■ General cautions when asking for disposal of a used lithium battery.

1. Pile-up method and pile-up container

Pile up batteries so as not to form a short circuit, charge or overdischarge circuit among the batteries. Pile them up in the following way.

- Use an insulating material for the pile-up container.
- Put batteries in line in good order according to each type and size. When piling up the batteries in multiple steps, insert an insulating material between the steps to completely prevent terminals from making contact with one another.
- Do not mix different types of battery and other metal materials (wires, nails, etc.) when piling up batteries.
- Batteries having an offensive smell are hazardous, being flammable. Do not put such batteries together with other batteries but put each of them in a vinyl bag and then pile it up in good order. As a rule, the batteries having an offensive smell need to be disposed of individually.

2. Pile-up place

- Pile up batteries in a place where no open fire exists nearby.
- Pile up batteries in a place near which there is not any hazardous substance specified in the Fire Service Law.
- Pile up batteries in a place that is not exposed to rain and water.

3. Packing method

- Perform packing by taking a measure to avoid mixing batteries during transportation, for example, by putting cushioning materials in a package.
- Put batteries in pile-up containers and put these containers in a corrugated fiberboard case or wooden case using cushioning materials in a packing unit of 10 kg or less.
- Indicate the following contents on the packing case:
Used lithium battery, battery type (ER), prohibition of mixing with hazardous substances, where to contact in an emergency, prohibition of water leak.

4. Transport method

- Do not mix batteries with the hazardous substances specified in the Fire Service Law.
- Put the goods in such a place as may go to a high temperature, for example, near a radiator.
- Fix the goods against collapse of cargo.
- Take a measure so that the goods may not get wet in the rain or water.

■ Manifest information

Ask the specialist company of industrial waste disposal to dispose of used lithium batteries.



CAUTION

Handling batteries incorrectly will invite the danger of firing or bursting. Some of used batteries may have a considerable remaining capacity. Observe the general cautions for piling-up, packing, and transportation to forward used batteries to the specialist company of waste disposal safely. Regarding concrete packing and transportation methods, make previous arrangements thoroughly with the person in charge of this specialist company.

6.4 Replacing the CMU Module

This section describes how to replace the existing CMU module (one of the models LQP520, LQP525, or LQP527) with a new one (of that same model).

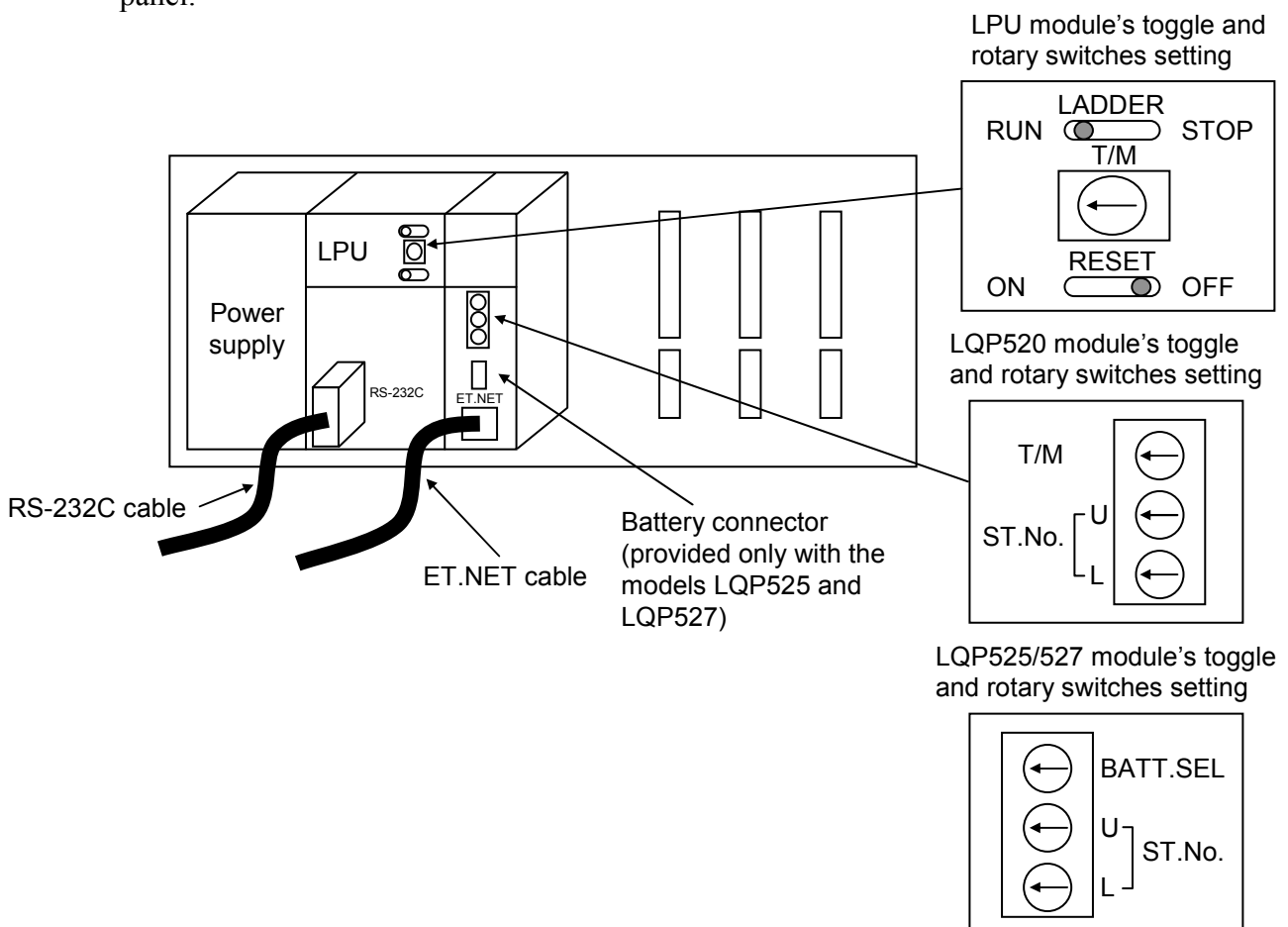
6.4.1 Replacing the module

- What you should get in preparation

- ① Personal computer (with S10V Base System installed in it)
- ② RS-232C cable (used, along with the S10V Base System, for connection to the LPU module's RS-232C interface port)
- ③ CMU module (LQP520/525/527)
- ④ 10BASE-T cross cable (used, along with the S10V Base System, for connection to the CMU module's ET.NET interface port)
- ⑤ Application programs and setup information stored in the CMU module's memory

- Replacement procedure

- ① Take a note of the following switch setting(s) provided on the existing CMU module's front panel: the T/M switch setting if the CMU module is of model LQP520; or the ST No. and BATT.SEL switch settings if it is of model LQP525 or LQP527.
- ② Take a note of the LADDER and T/M switch settings provided on the LPU module's front panel.



- ③ Interconnect the personal computer and the LPU module with the RS-232C cable, start the S10V Base System tool, and then take a note of the CMU module's IP address. (In addition to the IP address, take also a note of the battery remaining time and the date and time of the last replacement of the battery if the CMU module is of model LQP525 or LQP527.)
- ④ Make sure that your entire application system (under control of the S10V controller) is stopped, and then set the LPU module's LADDER switch in STOP position.
- ⑤ Turn off the power supply mounted in the controller unit and remove the communication cable from the CMU module. (If the CMU module is of model LQP525 or LQP527, remove also the battery cable from it.)
- ⑥ Replace the existing CMU module with a new one and then set the new module's T/M (rotary) switch in "A" position. (If the new module is of model LQP525 or LQP527, it is provided with the BATT.SEL switch in place of the T/M switch, so set the BATT.SEL switch in "A" position.)
- ⑦ Turn on the power supply mounted in the controller unit and initialize the task environment. (For details on the initialization procedure, refer to Section 3.23, "Initialize the Task," of the SOFTWARE MANUAL, OPERATION, S10V CPMS DEBUGGER For Windows® (Manual number SVE-3-126).
- ⑧ Use the S10V Base System to check if the IP address of the new CMU module is identical to the one you took a note of in Step ③. If they are not identical to each other, set an identical IP address for the new module. (If the new CMU module is of model LQP525 or LQP527, set also the battery remaining time and the date and time of the last replacement of the battery.)
- ⑨ Interconnect the personal computer and the new CMU module with the 10BASE-T cross cable and then load necessary application programs to the new module. For information on how to interconnect them, see "4.1 CMU Operations."
- ⑩ Turn off the power supply mounted in the controller unit.
- ⑪ Connect to the new CMU module the cable(s) that you removed in Step ⑤.
- ⑫ Remove from the LPU module the RS-232C cable that you connected to it in Step ③.
- ⑬ Set the LPU module's LADDER and T/M switches back in the positions you took a note of in Step ②, and set the new CMU module's T/M switch or ST.No. and BATT.SEL switches to the position(s) you took a note of in Step ①.
- ⑭ Turn on the power supply mounted in the controller unit and check that the new CMU module, as well as the controller, is running normally.

6.5 Trouble Report

Fill out this form and submit it to local source.

Your company name		Person in charge	
Data and time of occurrence		(year / month / day / hour / minute)	
Where to make contact	Address		
	Telephone		
	FAX		
	E-mail		
Model of defective module		LPU model	
OS	Ver.	Rev.	Program name: Ver. Rev.
Support program		Program name: Ver. Rev.	
Symptom of defect			
Connection load	Type		
	Model		
	Wiring state		
System configuration and switch setting			
Space for correspondence			

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