



SEIKO

Time Server
TS-2540

Instruction Manual
Edition 1.0

Read this manual thoroughly to use the device correctly.
After reading the manual, keep it handy for future reference.

SEIKO PRECISION INC.

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- Handle the product correctly according to this document.

Preface

Thank you for purchasing a SEIKO Precision product.




This document uses the following safety labels and symbols to indicate the items to be observed to prevent injury and property damage.

Understand the definitions of the safety labels and symbols before reading ahead.




Always Follow These Instructions for Safety

Definitions of Safety Labels and Symbols

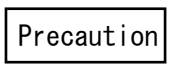
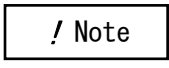
Safety labels used on the device and in this manual

 DANGER	Indicates an imminently hazardous situation which, if not avoided correctly as instructed, will result in death or serious injury.
 WARNING	Indicates a potentially hazardous situation which, if not avoided correctly as instructed, could result in death or serious injury.
 CAUTION	Indicates a potentially hazardous situation which, if not avoided correctly as instructed, may result in minor or moderate injury or in only property damage.

Symbols used on the equipment and in this manual

	Alerts you to a warning (or caution). The warning is described inside or near the triangle Δ .
	Indicates what you must not do (what is prohibited). The prohibition is described inside or near the circle \ominus .
	Indicates what you must do. The instruction is described inside or near the circle \bullet .

Labels and symbols used in some manuals

 Precaution	: Indicates an instruction to be followed not to degrade or disable the performance or functions of the product.
 / Note	: Indicates a tip you should know for your convenience or to prevent an error when using the product.

In no event shall SEIKO Precision Inc. be liable for any claim, damage, or loss of profits arising out of the use of the product (including software) described herein.

The above labels and symbols may not be used depending on the device and manual. For example, some devices and manuals do not carry the "DANGER" and "Precaution" labels.

WARNING

- Neither allows water into <this device> nor let it get wet. Doing it can cause fire or electric shock.
- Never apply any supply voltage other than <100 VAC>. Doing it can cause fire or electric shock.
- Do not use the device where it is exposed to high humidity, such as in a bathroom or near a humidifier. Doing it can cause fire or electric shock.
- Do not plug or unplug any cable with wet hand. Doing it can cause electric shock.
- Do not insert or let fall any foreign matter such as a metal or flammable object into <the device> through its ventilation holes. If a foreign matter is let in, turn off the power first, unplug the power cord from the wall outlet, then contact your local service representative of SEIKO Precision Inc. Continuing to use the device with the foreign matter left inside can cause fire or electric shock.
- Do not put anything heavy on <the device or power cord>. Doing it can damage the internal circuitry, components, or power cord, resulting in fire or electric shock.
- Do not put a vase, flowerpot, glass, cosmetic, container with chemical/water/drink inside, or a small piece of metal on <the device>. Doing it can cause fire or electric shock if such a substance is let in the device.
- Neither disassembles (remove screws and open the housing of) nor modifies <the device>. Doing it can cause fire or electric shock.
- Do not damage, destroy, machine, forcibly bend, strain, or twist <the power cord>. Do not bundle it with any other cord either. Putting anything heavy on or heating <the power cord> may break it, resulting in fire or electric shock. If <the power cord> is damaged, ask your local service representative of SEIKO Precision Inc. for repair.
- Do not plug many cords into one power strip, branch outlet, or plug adapter. Doing it can cause fire or electric shock.
- Continuing to use the device with <the power cord> damaged (with the core exposed or disconnected) can cause fire or electric shock. Turn off the power immediately, unplug the power cord, then ask your local service representative of SEIKO Precision Inc. for repair.
- Continuing to use the device with abnormal noise or with <the main unit or AC adapter> heated can cause fire or electric shock. Turn off the power immediately, unplug the power cord from the outlet, then ask your local service representative of SEIKO Precision Inc. for inspection.
- Continuing to use the device in an abnormal state, for example, with smoke or unusual smell, can cause fire or electric shock. Turn off the power immediately, unplug the power cord from the outlet without fail, make sure that smoke has stopped, then ask your local service representative of SEIKO Precision Inc. for repair. Never attempt to repair the device by yourself as it is dangerous.
- If <the device> has fallen down or broken, turn off the power first, unplug the power cord from the outlet, then contact your local service representative of SEIKO Precision Inc. Continuing to use the device as it is can cause fire or electric shock.
- If water is let in the device, turn off the power first, unplug the power cord from the outlet, then contact your local service representative of SEIKO Precision Inc. Continuing to use the device as it is can cause fire or electric shock.
- If a foreign matter is let in the device, turn off the power first, unplug the power cord from the outlet, then contact your local service representative of SEIKO Precision Inc. Continuing to use the device as it is can cause fire or electric shock.

Using This Manual

- This document is the instruction manual for the TS-2540 Time Server.
- There is “Installation, Maintenance Manual for the TS-2540” other than this manual.

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Chapter1 Overview

The TS-2540 Time Server provides accurate time for personal computers (PCs) and servers connected over a local area network (LAN).

The PCs and servers communicate with the Time Server via the Network Time Protocol (NTP) to adjust their own real-time clocks to the accurate time. The PCs and servers require Simple Network Time Protocol (SNTP) or NTP software running under a variant of the UNIX or Windows operating system.

1.1 TS-2540 Overview

This time server constantly holds highly precise time by correcting time using GPS satellites, provides the accurate time to servers and PCs through the network.

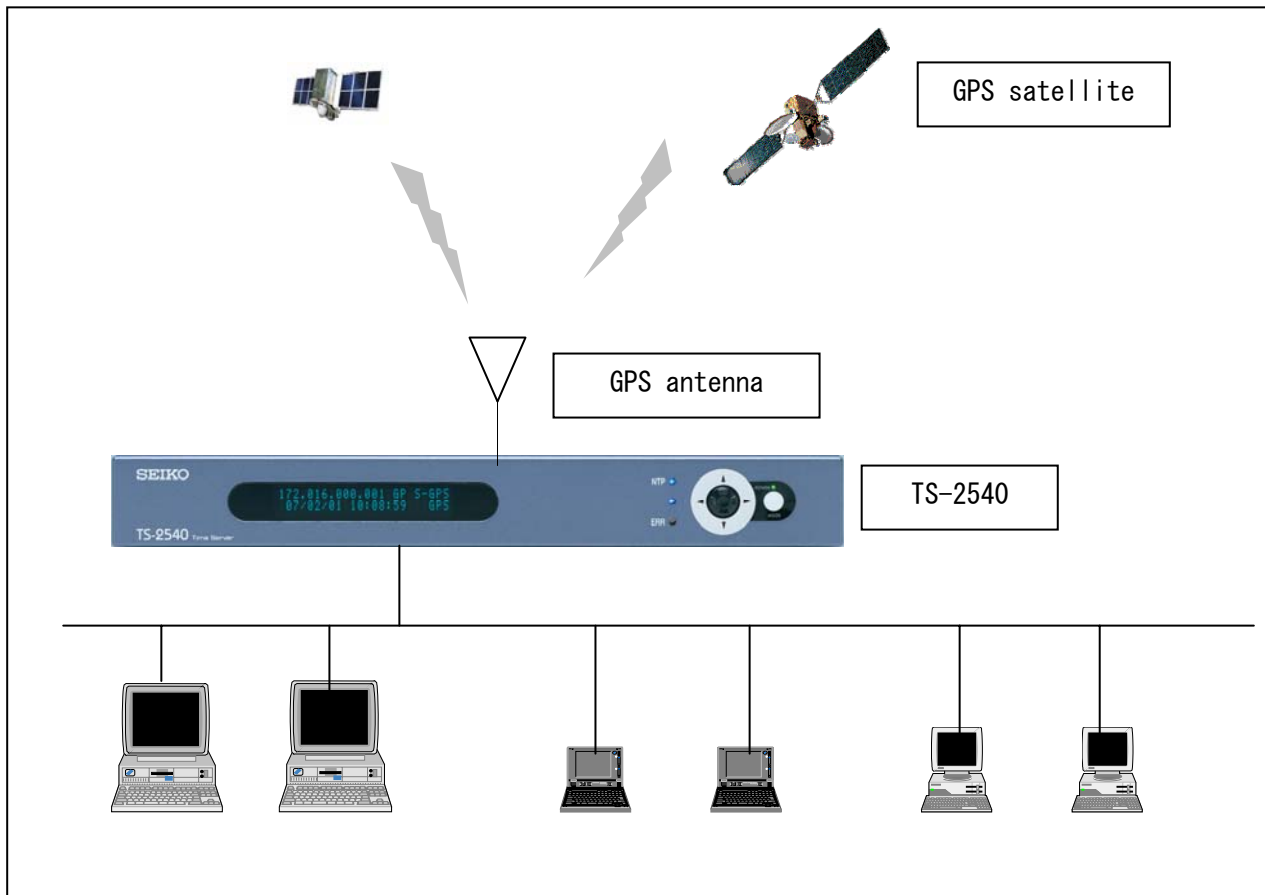


Figure 1.1 Connection Example

1.2 TS-2540 System Configuration Diagram

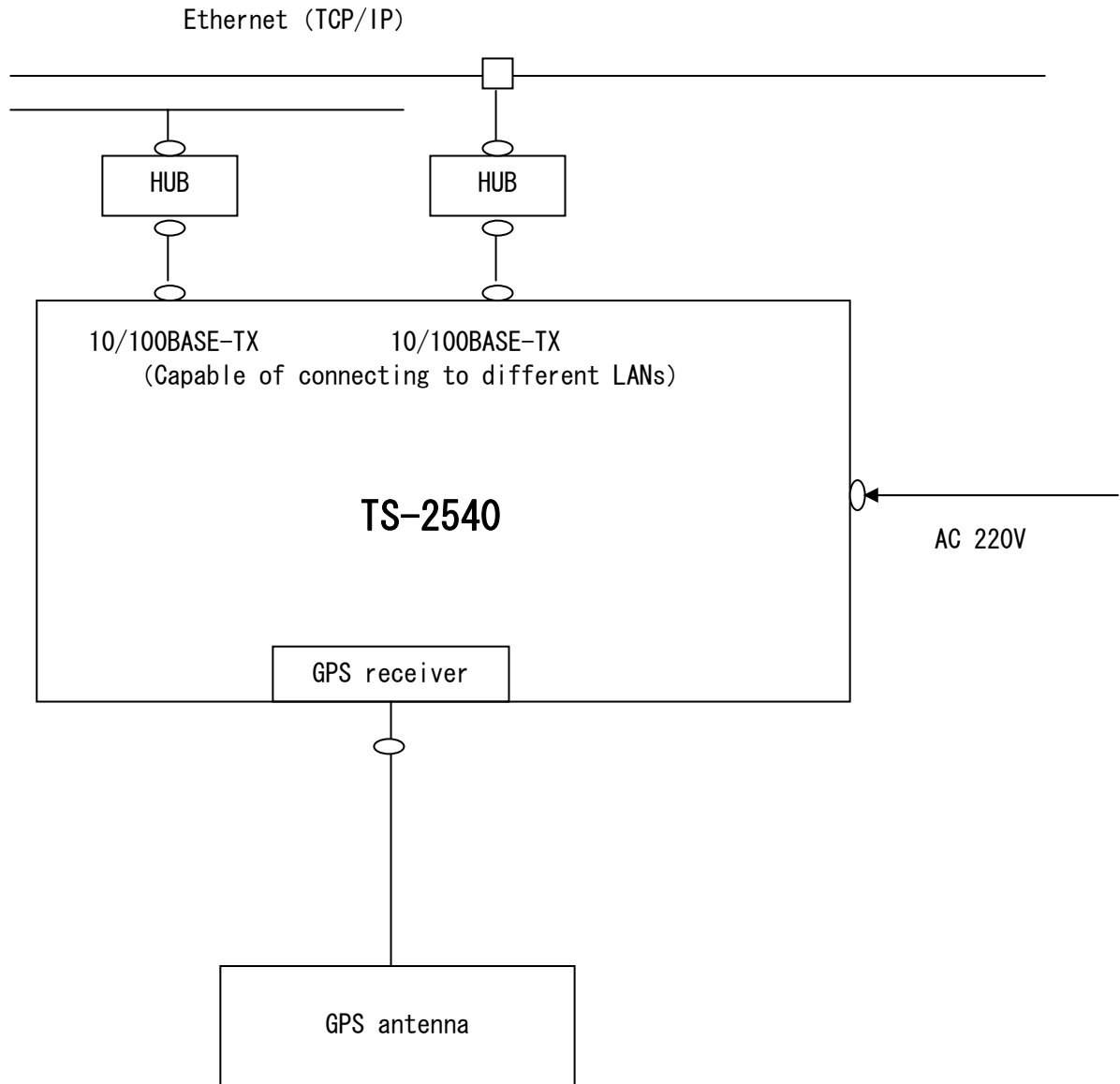


Figure 1.2 TS-2540 System Configuration Diagram

1.3 Internal Configuration and Function Overview

1.3.1 Internal Configuration

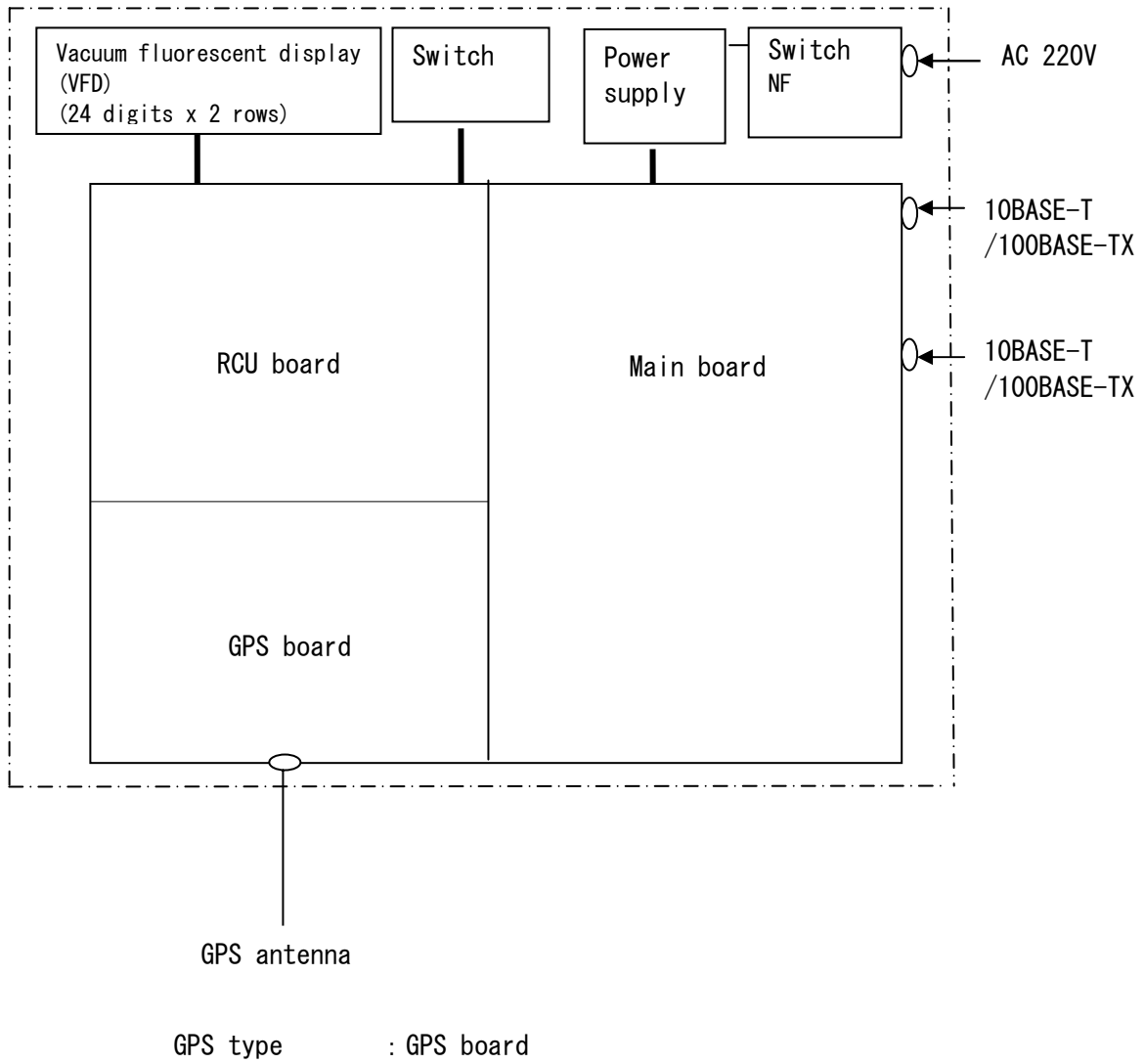


Figure 1.3 Internal Block Diagram

1.3.2 Function Overview

(1) Features

- Using GPS to acquire time.
- Capable of acquiring time even when few satellites are accessible, by using the installation position data configured in advance.
- High-precision crystal oscillator integrated, keeping stable time even when GPS is not available. Crystal tolerance: ± 0.07 seconds/week (at 25 °C)
- Backup facility to operate by acquiring time from another NTP server if accurate time cannot be kept due to GPS receiver failure
- Supports IPv4 and IPv6.
- Using switches and a Web browser to make setting.

(2) Housing

- Designed for desktop installation

(3) Vacuum fluorescent display (VFD) panel (hereafter sometimes called the display panel).

- 24 digits x 2 rows (Alphanumeric-character display)
- Displaying the time, IP address, error status, log, etc.

(4) LEDs

- Displays synchronous status of time and occurrence of errors.

(5) Switches

- Five-position switch
- Mode switch

(6) Power supply

- 220 VAC

(7) RCU board

- Processes input from the switches.
- Controls display panel and LEDs.
- Maintains and controls the time information.

(8) GPS board

- Calculates accurate time based on data received from satellites.

(9) Main board

- Equipped with two 10BASE-T/100BASE-TX ports for external connections.

(10) Network protocols

- UDP/IP
- TCP/IP
- ICMP

(11) Time information protocols

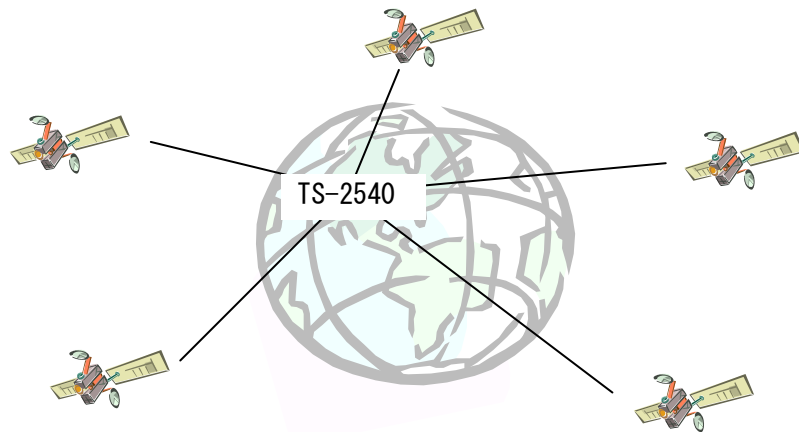
- NTP v3 (RFC1305)
- NTP v4 (IETF Draft Standard)
- Time Protocol (RFC868)
- Daytime Protocol (RFC867)

Provides standard time for NTP/SNTP clients conforming to the above protocols.

1.4 GPS System Configuration and Function Overview

GPS (Global Positioning System) is a navigational system using orbiting satellites to determine locations on the Earth, made fully operational since 1993.

The GPS satellites are equipped with high-precision atomic clocks. Each GPS receiver measures the propagation delay of the radio signal transmitted from a satellite to obtain the distance to the satellite. The receiver locates (or positions) itself by means of triangulation based on the distances to multiple satellites and their coordinates.



1.4.1 Operation Modes

(1) Position measurement mode

This operation mode assumes that the antenna is installed, for example, on the roof of an open-view building. When receiving radio signals from more than three satellites, the Time Server synchronizes its clock through positioning. This operation mode is effective to locate the installation position of the antenna. It is advisable to save the computed position and to use the Time Server in position input mode.

(2) Position input mode

This operation mode assumes that the antenna is installed on top of a building with closed-view or by a window. Input the installation position (latitude, longitude, and altitude) in advance, so that the Time Server synchronizes its clock even when it can receive radio signals from only one to three satellites.

(3) Auto-switching mode

This operation mode assumes that the antenna is installed in a relatively open-view place. When using more than four satellites, the Time Server operates in position measurement mode. When only four satellites or less are available, the Time Server uses the latest position data and operates in position input mode.

! Note

Even when the Time Server can easily catch satellites, time synchronization may fail depending on the geometric arrangement to the satellites.

1.4.2 Time Correction Overview

- Tolerance in time correction when positioned: Within ± 1 ms (of the entire Time Server)
- If the Time Server becomes unable to receive radio signals from satellites (when not positioned), it synchronizes its clock with the internal high-precision crystal oscillator within a tolerance of ± 10 ms (per day).
- The Time Server receives time information from GPS satellites and corrects its own clock.
 - Year/month/date information
 - hour/minute/second information
 - Leap-second information

1.5 Specifications

Internal crystal tolerance (at 25°C)	Average weekly deviation ± 0.07 second
Correction tolerance	Within ± 1 ms
Accumulative error (25°C) ※1	In case of out of sync. ± 11 ms
Leap second support	Set automatically/ Set manually
Daylight saving time	Set manually.
Time synchronization methods	Position measurement: Time synchronization with at least 4 satellites Position input: Time synchronization with at least 1 satellite Auto-switching: Time synchronization in automatically selected position measurement/input mode
1PPS Output ※2	TTL Level Leading edge synchronization Impedance 50 Ω Pulse width 10ms
1PPS Accuracy	$\pm 50 \mu$ sec. ※3

※1 Internal crystal accuracy+Correction accuracy

※2 It is outputted only when a GPS type is in a time synchronous state.
(GPS synchronization or an internal clock synchronization)

When the time synchronization with GPS cannot be taken for a long time, an output stops.
(Change by setup is possible. Standard 24 hours)

※3 The difference over a GPS Satellite clock. When SA=OFF.

! Note

Since GPS is a positioning system which the U.S. manages and employs, the positioning performance and time accuracy which can be guaranteed depending on the employment state of a satellite may deteriorate remarkably.

In this case, the correction accuracy of this machine may worsen.

! Note

The accuracy of internal crystal changes with aging.

Please carry out periodical calibration, in order to maintain the above-mentioned accuracy.

Please consult with our sales person about calibration of device.

1.6 Technical Specifications

Rated voltage	220 VAC \pm 10%
Power consumption	15W
Calorific value	54kJ/h
Operating temperature range	0 to 40°C
Operating humidity range	20 to 80% RH (No condensation)
Installation form	Desktop
Major dimensions	Width 364 x Depth 257 x Height 44 mm (Excluding protrusions)
Weight	About 3.1 kg
VCCI conformance	VCCI-A compliant
Safety standards	Conforming to the in-house safety standards
Battery	Life: About 3.5 years with power left off About 5 years with power on for 8 hours a day
Power Consumption(stand-by)	5W

Precaution

The battery has a limited life. It is advisable to replace the battery at fixed intervals of three to five years to avoid unnecessary problems such as loss of setup information. Other consumables include the power supply and the fan and the vacuum fluorescent display (VFD), which should also be replaced periodically to use the Time Server comfortably.

Parts such as the battery are replaced by SEIKO PRECISION INC. For replacement of those parts, consult your local sales representative or maintenance engineer of SEIKO PRECISION INC.

Setup information can be lost when the battery runs out or if a fault or failure occurs. Whenever you have made changes to settings, therefore, you should save them and keep the backup in case of loss of setup information so that you can smoothly set up the Time Server again.

1.7 External Resources

Power supply	100 VAC, 3P parallel (Ground the power supply by Class-D grounding.)
Connection cable	Twisted-pair cable (for 10/100BASE-TX)

1.8 Package Contents

- TS-2540 Time Server (main unit)
- Instruction Manual
- Installation guide of antenna
- CD-ROM (Manuals)
- Warranty
- Rubber pads (4)

1.9 External View

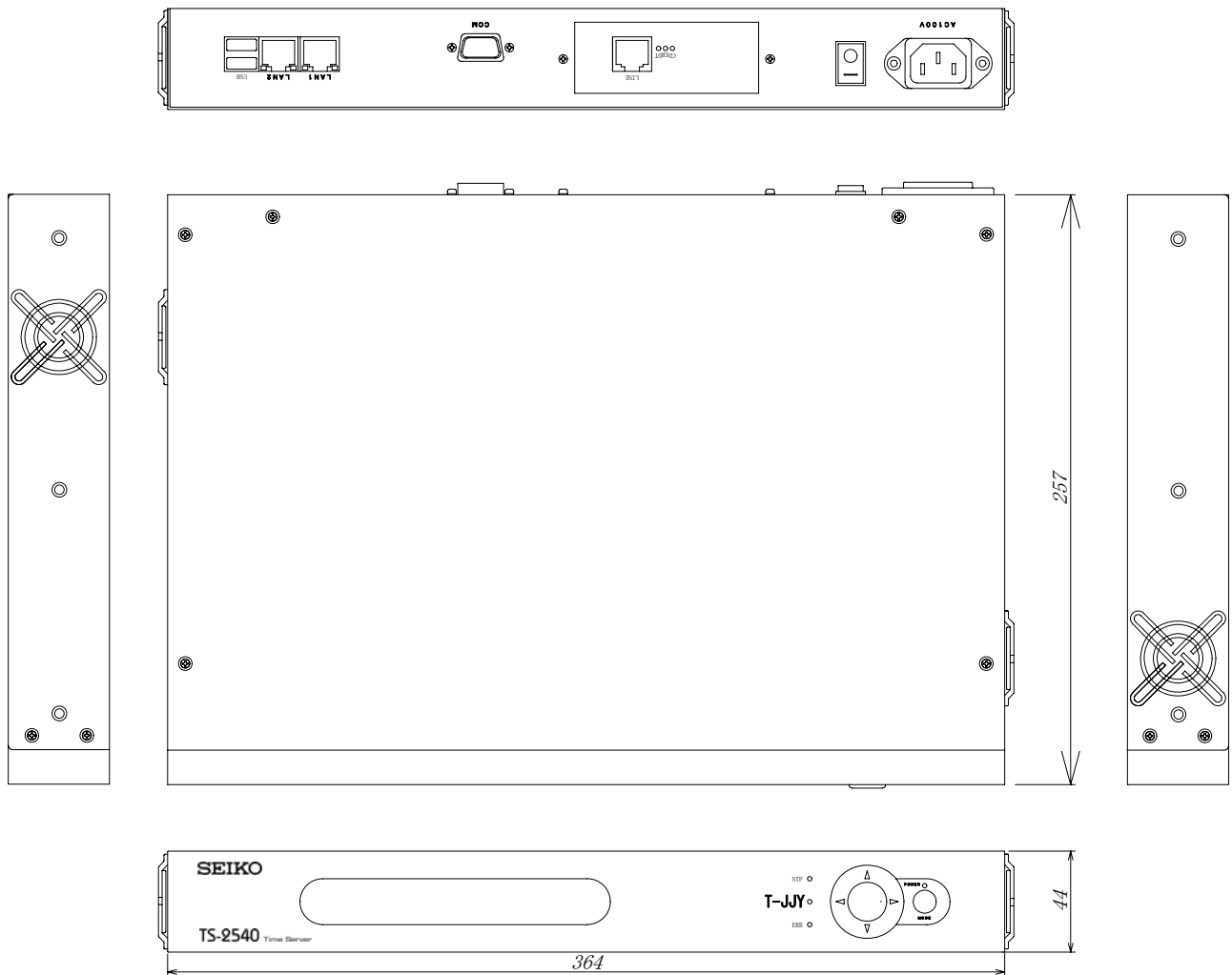


Figure 1.4 External View

Chapter2 Names and Function of Major Parts

2.1 Front Panel

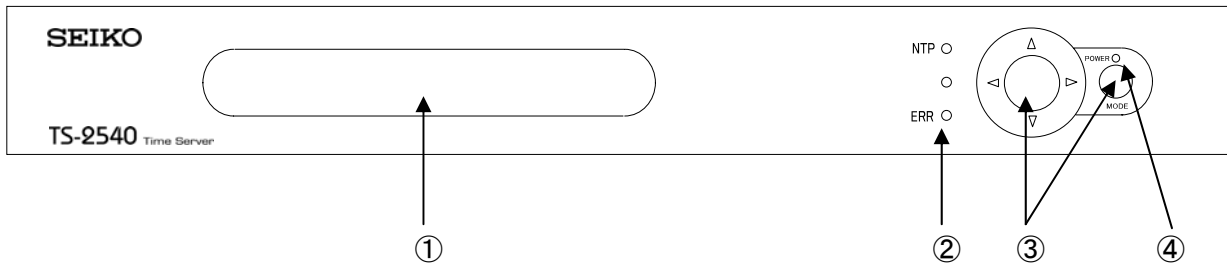


Figure 2.1 Front Panel

① Vacuum fluorescent display (VFD) panel

- Liquid crystal display capable of displaying up to 24 digits by 2 rows, used to display the TS-2530 status, IP address, time, error status, etc.

② LED

Three LED(s) are prepared. The light is switched on as follows with a type.

NTP	blue	on	synchronized (L I = 0 0、0 1、1 0)
		off	asynchronized (L I = 1 1)
Time Source	blue	on	GPS synchronization
		flicker	Local clock synchronization
		off	Out of synchronization
ERR	red	off	Normally operating
		on	Error occurs

③ Switches

- The following two switches are provided for their respective purposes and functions:
 - Five-position switch : Up/down/left/right push switch
 - MODE switch : Mode select/cancel switch, Resume from stand-by state.

! Note

When you handle the five-position switch, be careful not to press the switches at a time. If two switches are pressed at a time, they might not be identified.

④ Indicator

- POWER : Red : Power switch on the rear panel is on. Stand-by.
Green: The time server is operating.
Off : Power switch on the rear panel is off.

2.2 Rear Panel

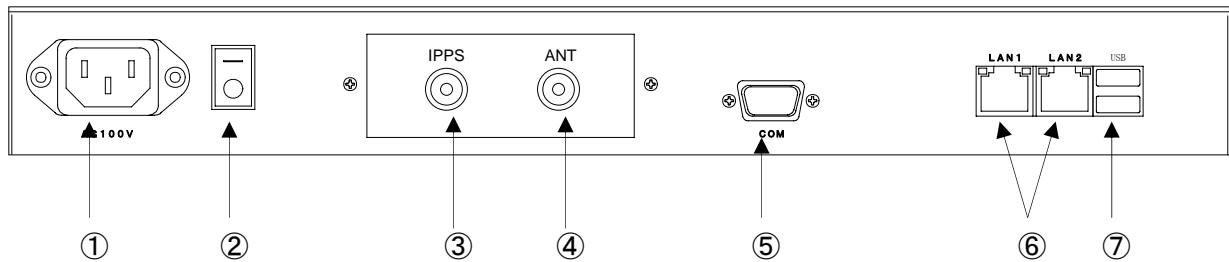


Figure 2.2 Rear Panel


- ① Receptacle
Accepts the attached power cable.
- ② Power switch
- ③ IPPS
IPPS OUT
- ④ ANT
GPS Antenna IN
- ⑤ COM connector
Not used on this device.
- ⑥ LAN connectors
10BASE-T/100BASE-TX (Auto negotiation)
The connectors have the following LEDs up above:
 - Yellow : Remains on during 100BASE-TX operation or off during 10BASE-T operation.
 - Green : Remains on during link established or off during data transmission.
- ⑦ USB connectors
Not used on this device.


Chapter3 Preparations for Installation


This chapter describes the conditions (installation environment, maintenance area, and power supply) to be checked before installation of the TS-2540.


3.1 Checking the Installation Environment


Read the following warnings and cautions:


 WARNING	Neither allows water into <this device> nor let it get wet. Doing it can cause fire or electric shock.
--	---


 WARNING	Do not use the device where it is exposed to high humidity, such as in a bathroom or near a humidifier. Doing it can cause fire or electric shock.
--	---


 WARNING	Do not put anything heavy on <the device or power cord>. Doing it can damage the internal circuitry, components, or power cord, resulting in fire or electric shock.
--	---


 WARNING	Do not insert or let fall any foreign matter such as a metal or flammable object into <the device> through its ventilation holes. If a foreign matter is let in, turn off the power first, unplug the power cord from the wall outlet, then contact your local service representative of SEIKO Precision Inc. Continuing to use the device with the foreign matter left inside can cause fire or electric shock.
---	--

 CAUTION	Do not put the device or power cord close to any thermal appliance. Doings so may cause the internal circuitry, components, or power cord sheath to melt, resulting in fire or electric shock.
--	---

 CAUTION	Do not use the device where it is exposed to a spray of oil or much dust. Doings so can cause fire or electric shock.
--	--

 CAUTION	Do not use the device where it is exposed to a highly corrosive substance such as an acid or to a strong magnetic field. Doing it can cause fire or electric shock.
--	---

 CAUTION	Neither uses the device on an automobile nor places it at a place subject to strong vibration. Doings so can cause fire or electric shock.
--	--

 CAUTION	Do not place the device where it is exposed to direct sunlight or high humidity. Do not block the ventilation holes on both sides of the device. Doing either may raise the internal temperature, resulting in fire.
--	--

Determine the installation place taking account of the above warnings and cautions and the following conditions as well:

Temperature range	0 to 40 °C
Humidity range	20 to 80% RH (No condensation is allowed.)
Installation conditions	Allow clearance behind the rear panel so that cables can be connected without excessive force. The device cannot be stacked together with any other object.

3.2 Reserving Maintenance Spaces

When installing the device, allow clearance for maintenance as illustrated below.

When installed on a desk or table, the device requires the following spaces:

- Work space for maintenance personnel
- TS-2540 replacement space

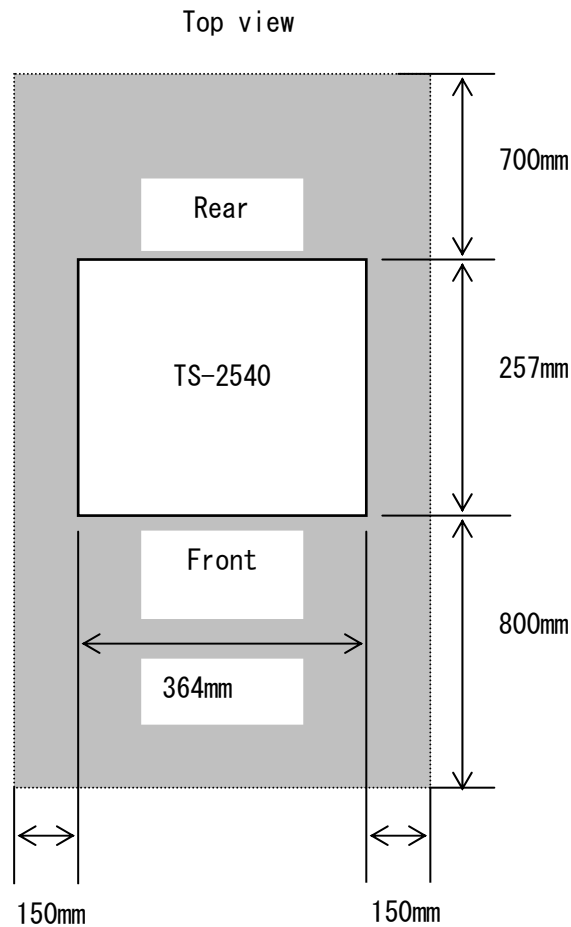


Figure 3.1 Installation Drawing

3.3 Checking the Power Supply

- Check the power supply (supply voltage and wall outlet type).
- Use "Class-D grounding".

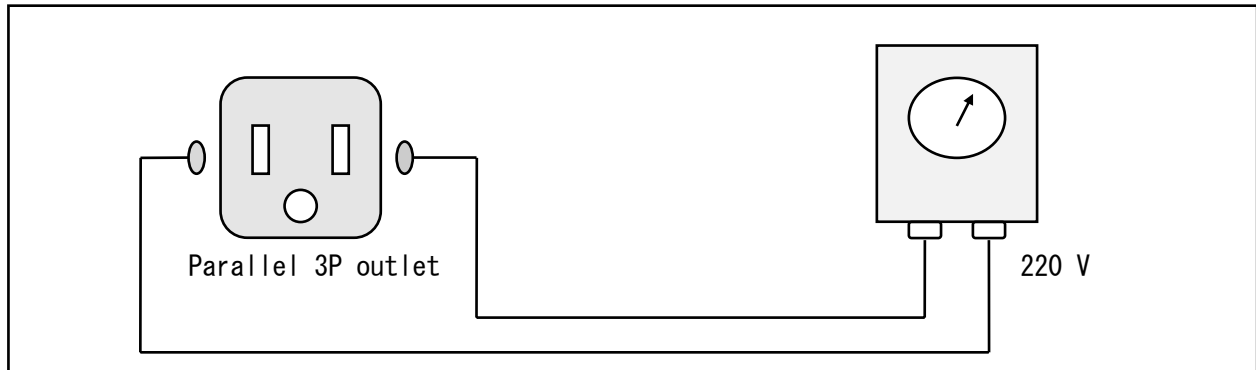


Figure 3.2 Checking the Power Supply



WARNING

Never use the device at any supply voltage other than <100 VAC>. Doing it can cause fire or electric shock.



WARNING

Continuing to use the device with <the power cord> damaged (with the core exposed or disconnected) can cause fire or electric shock. Turn off the power immediately, unplug the power cord, then ask your local service representative of SEIKO Precision Inc. for repair.




CAUTION


Ground the power supply not to a water pipe or gas pipe but to a Class-D grounding earth. Failure to do so can cause fire, electric shock, or malfunction.


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Chapter4 Installation


This chapter describes the items to follow and operations to perform for installation of the TS-2540.


 WARNING	Do not put a vase, flowerpot, glass, cosmetic, container with chemical/water/drink inside, or a small piece of metal on <the device>. Doing it can cause fire or electric shock if such a substance is let in the device.
--	---

 WARNING	Neither disassembles (remove screws and open the housing of) nor modifies <the device>. Doing it can cause fire or electric shock.
--	--

 WARNING	Do not damage, destroy, machine, forcibly bend, strain, or twist <the power cord>. Do not bundle it with any other cord either. Putting anything heavy on or heating <the power cord> may break it, resulting in fire or electric shock. If <the power cord> is damaged, ask your local service representative of SEIKO Precision Inc. for repair.
--	--

 CAUTION	Do not lay the device upside down or on its side. Doing it may block the ventilation holes to cause heat buildup, resulting in fire or electric shock.
--	--

 CAUTION	Do not step on or put anything heavy on the device. Doing it may let you fall down or break the object and/or device, resulting in injury.
--	--

 CAUTION	Setting wrong values may induce failures in the device or network.
--	--

4.1 Unpacking

- Open your TS-2540 package and check that it is complete. (See Section 1.9 “Package Contents”.)
- When removing the device from its packaging, be sure to hold the device with both hands.
- Lay the device at a fixed, stable place (such as on a desk) which is neither slippery nor tilted.

Precaution	Turn the power off before plugging or unplugging any cable. Each cable to be used must be the one designated by SEIKO Precision Inc.
-------------------	---

4.2 Installation Methods

Pay attention to the following when installing the device:



Do not plug or unplug any cable with wet hand. Doing it can cause electric shock.
--



Do not plug many cords into one power strip, branch outlet, or plug adapter. Doing it can cause fire or electric shock.
--



When unplugging a cable from an outlet, be sure to hold the plug. Hold and pull the power cord can damage it, resulting in fire or electric shock.
--



Before the device will remain unused for an extended period of time, be sure to unplug the power cord from the outlet for safety.



When it thunders, you should turn off the device and unplug the power cord from the outlet to stop using it. The device may cause fire or electric shock depending on the thunderbolt.
--



This device contains a lithium battery. When disposing of the device, therefore, consult with your local service representative of SEIKO Precision Inc. or follow the relevant laws and regulations of your local government.

4.2.1 Removing Obstacles

Do not place objects above the device or near its ventilation holes.

4.2.2 Attaching Rubber Pads

Attach bundled rubber pads to the bottom of the device as required according to the marks on the bottom.

Precaution

Do not attach rubber pads if you use the EIA rack-mount kit available as an option.

4.2.3 Connecting the Power Supply

Plug the power cord from the device to a wall outlet.

4.3 Installing and Connecting the GPS Antenna

4.3.1 Installing the GPS Antenna

(1) Installing the antenna outdoors

- ① Install the GPS antenna with as wide-open a space above as possible.
- ② Install the GPS antenna to be perpendicular to the ground.
- ③ Prepare an aluminum pole, secure it to a wall with brackets, and fasten the antenna to the pole, for example, using hose clamps.

* The antenna holder bundled with the TS-2540 is intended for indoor use. The antenna holder may rust if installed outdoors.

(2) Installing the antenna indoors

- ① Install the antenna as near a window as possible, which provides a good view not blocked by a building. (The window should not be located on the north side.)
- ② Near the GPS antenna, do not place an apparatus which generates high-frequency radiated noise, such as a personal computer.
- ③ When using the bundled antenna holder, screw the antenna into the holder and install it vertically.

※ Refer to the “Installation Guide of antenna” .

! Note

If you install the antenna indoors, be sure to use the device in position input mode.

! Note

If installed indoors, the antenna may fail to receive GPS signals during specific hours. In this case, the device operates while correcting the time with the internal crystal.

4.3.2 Connecting the GPS antenna to the TS-2540

Connect the GPS antenna to the BNC connector (labeled 'ANT') on the rear panel.

※ Refer to the “Installation Guide of antenna” . Also, contact with our sales representatives

4.4 Turning the TS-2540 On

4.4.1 Startup with No Configuration Data

When the power is turned on, the display panel reads as follows:

```
S Y S T E M   B O O T   P R O C E D U R E
```

About ten seconds later, the display panel starts blinking as follows:

```
S Y S T E M   B O O T   P R O C E D U R E
```

The display panel blinks as above during the system startup process. It takes about one minute for the device to get started after the power is turned on. Upon completion of startup, the display panel changes as follows:

```
[ 1 - 1 . S e t   I P A D D R E S S  
  1 - 2 . S e t   N E T M A S K ]
```

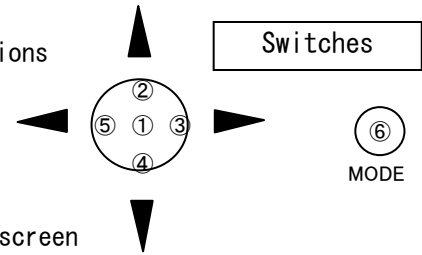
Figure 4.1

Precaution

It takes about one minute for the device to get started after the power is turned on. Do not turn off the power switch with the display panel showing the startup process.

4.4.2 Setting the IP Address and Netmask

In the sketch on the right, ① to ⑤ indicate the positions at which to press the five-position switch.



Pressing the five-position switch at ① changes the screen as shown below.

```
S E T   I P A D D R E S S
 1 2 7 . 0 0 0 . 0 0 0 . 0 0 1
```

The cursor (blinking) is positioned at the first octet of the IP address.

Key operations

Pressing the five-position switch at ② increases the value.

Pressing the switch at ④ decreases the value.

Pressing the switch at ③ moves the cursor to the right.

Pressing the switch at ⑤ moves the cursor to the fourth octet of the IP address.

Using the five-position key as above, set the IP address of TS-2540.

```
S E T   I P A D D R E S S
 1 7 2 . 0 1 6 . 1 2 3 . 0 0 1
```

After setting the IP address, press the switch at ①.

The screen changes as follows:

```
[ 1 - 1 . S e t   I P A D D R E S S
  1 - 2 . S e t   N E T M A S K ]
```

! Note

This device requires an IPv4 address.

Press the switch at ④, and the screen changes to select the NETMASK setting.

```
[ 1 - 2 . S e t   N E T M A S K
  1 - 3 . S e t   G A T E W A Y ]
```

Press the switch at (1), and the screen changes as follows. Set the netmask in the same way.

```
S E T   N E T M A S K ]  
2 5 5 . 2 5 5 . 0 0 0 . 0 0 0
```

! Note

The NETMASK value is initialized when the IP address is input.

```
S E T   N E T M A S K ]  
2 5 5 . 2 5 5 . 0 0 0 . 0 0 0
```

Confirm the setting and press the switch at ① to return to the select menu.

```
[ 1 - 2 . S e t   N E T M A S K ]  
1 - 3 . S e t   G A T E W A Y
```

After setting the IP address and netmask, press the MODE switch (6) to reboot the device.

```
S y s t e m   R e b o o t   ?  
Y e s   ( N o )
```

Press the switch (5) (Yes), and press the switch(1) to start rebooting.

Precaution

If you press the MODE switch with the menu screen displayed after entering the IP address, the device is rebooted. Do not turn off the power switch while the startup process is being displayed.

※ For other setting items, refer to “TS-2540 installation maintenance Manual”

4.4.3 Startup with Configuration Data

When the power is turned on, the display panel reads as follows:

```
S Y S T E M   B O O T   P R O C E D U R E
```

About ten seconds later, the display panel starts blinking as follows:

```
S Y S T E M   B O O T   P R O C E D U R E
```

The display panel blinks as above during the system startup process. It takes about one minute for the device to get started.

Upon completion of startup, the display panel changes as follows:

4.5 Connecting the LAN Cable

For the first installation, set the IP address, reboot it, and then connect the LAN cable. The TS-2530 has a pair of LAN ports. Plug the LAN cable into the LAN1 port.

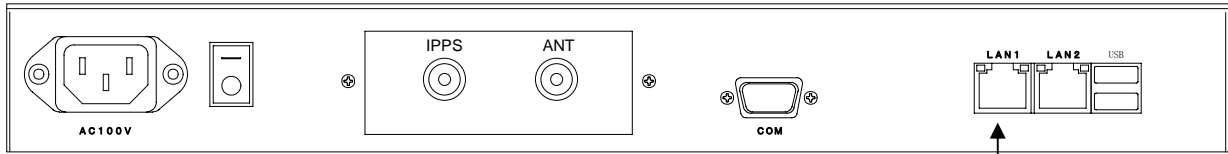


Figure 4.2

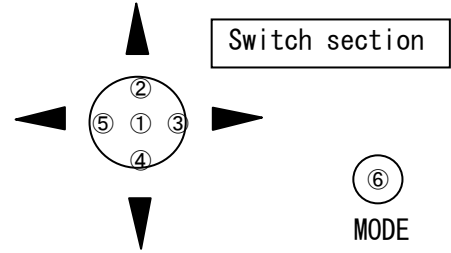
Plug here

- Plug the LAN cable into the LAN port until it clicks
- Secure the LAN cable as apart from the power cable as possible. (Reduce the effect of noise.)
- Pay due attention to the routing and securing of cables.
- Attach identification tags to individual cables. (For easier maintenance)
- Prepare an appropriate cable after checking the pin assignment of the interface connector.

4.6 Turning the Power Off

To turn off the power to the TS-2540, perform the shutdown procedure.

In the sketch on the right, (1) to (5) indicate the positions at which to press the switch.



Press MODE switch (6), then the display panel shows the following screen.

```
[ A . S e t t i n g   M e n u  
  B . L O G   D u m p ]
```

Press the switch at (1) and you get the following screen. You are promoted to enter the password.

```
E n t e r   p a s s w o r d  
[ ? ? ? ? ? ? ]
```

Six digits of the factory default password are entered by pressing six times the five-position switch at (2). Entering the password changes the screen as follows:

```
[ 1 . N e t w o r k   S e t t i n g  
  2 . S e t   B r i g h t n e s s ]
```

Pressing the switch at (4) nine times scrolls the screen and changes it as follows:

```
[ A . S h u t d o w n  
  B . R e b o o t ]
```

Press the switch at (1), then the screen changes as follows:

```
S y s t e m   S h u t d o w n ?  
Y e s   ( N o )
```

Pressing the switch at (5) with (Yes) selected displays the following message to start shutting down the system.

```
S h u t d o w n   p r o c e s s i n g . . .  
W a i t   a   m o m e n t !
```

The message shown below appears after a while.

```
S h u t d o w n   c o m p l e t e d
```

After that, the screen goes out and Power LED turns red.

Do not turn off the power switch till then. Now time server is in the stand-by state, will be booted by keeping pressing the MODE switch for a longer time.

! Note

You will lose the logs if you turn off the power during operation without following the shutdown procedure

If you turn off the power without rebooting or shutting down after making changes to settings, you will also lose the new settings.

When turning off the power, be sure to perform the graceful shutdown procedure.

Precaution

Do not turn off the power to the TS-2530 until the shutdown procedure has been completed. Doing so can result in a fault or failure.


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Chapter5 Troubleshooting


5.1 Check Points


Front panel lamps do not light with the power on.	
[Check items and states]	[Action/Cause]
Power cord	Check if the plug is loose or disconnected.
Power supply	Check the voltage. (See Section 3.3.)
Power switch	Check if it is off.

Front panel display is abnormal with the power on.	
[Check items and states]	[Action/Cause]
Display panel is dark.	Adjust brightness. If the panel is still dark, contact your local service representative of SEIKO Precision.
"Fatal Error" message on the display panel	The device seems to be malfunctioning. Contact your local service representative of SEIKO Precision.
Other abnormal display	Turn the power off and turn it back on later. If the display is still abnormal, contact your local service representative of SEIKO Precision.

 WARNING	Continuing to use the device with abnormal noise or with the main unit heated can cause fire or electric shock. Turn off the power immediately, unplug the power cord from the outlet, then ask your local service representative of SEIKO Precision Inc. for inspection.
--	--

 WARNING	Continuing to use the device in an abnormal state, for example, with smoke or unusual smell, can cause fire or electric shock. Turn off the power immediately, unplug the power cord from the outlet without fail, make sure that smoke has stopped, then ask your local service representative of SEIKO Precision Inc. for repair. Never attempt to repair the device by yourself as it is dangerous.
--	--

 WARNING	If <the device> has fallen down or broken, turn off the power first, unplug the power cord from the outlet, then contact your local service representative of SEIKO Precision Inc. Continuing to use the device as it is can cause fire or electric shock.
--	--

 WARNING	If water is let in the device, turn off the power first, unplug the power cord from the outlet, then contact your local service representative of SEIKO Precision Inc. Continuing to use the device as it is can cause fire or electric shock.
--	--

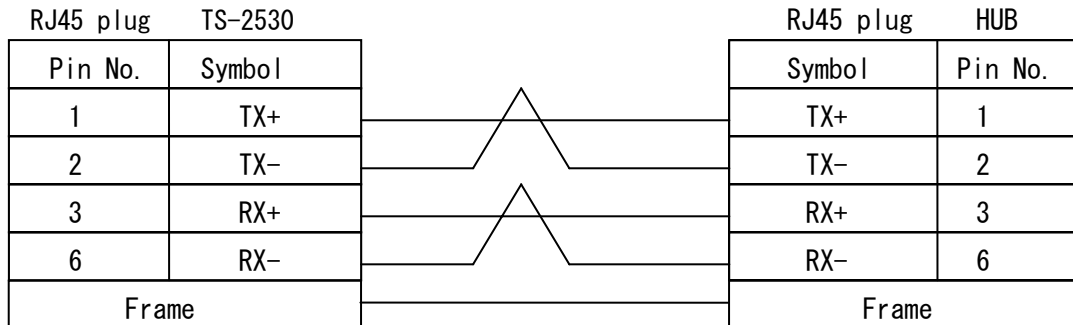


If a foreign matter is let in the device, turn off the power first, unplug the power cord from the outlet, then contact your local service representative of SEIKO Precision Inc. Continuing to use the device as it is can cause fire or electric shock.

Chapter6 Connection Cable Specifications

6.1 LAN Cable

(1) 10/100BASE-TX cable



● Function outline of each signal conductor

Signal Name	Symbol	Pin No.	Signal Direction	Function Outline
Transmit data	TX+	1	TS-2530 → HUB	Data sent to hub
	TX-	2		
Receive data	RX+	3	TS-2530 ← HUB	Data sent from hub
	RX-			

Precaution

LAN cable must be category 5 and above for 100 BASE-TX, category 3 and above for 10 BASE-T.

User's Comment Form

Should you have any opinion, request, or comment on the contents or organization of this manual or on the product, please fill out the following form and either send it to us by fax or pass it to our sales representative.

Please note that your comments and personal information provided will be used to improve the quality of our relevant products, to help develop new products, and to provide information on such products and services.

**SJ212500901-1
TS-2540
Instruction Manual**

Date: _____

Name: _____

Company Name/Section: _____

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[Your Comments and Requests]

<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>

*** Thank you for your cooperation. ***

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Instruction Manual

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