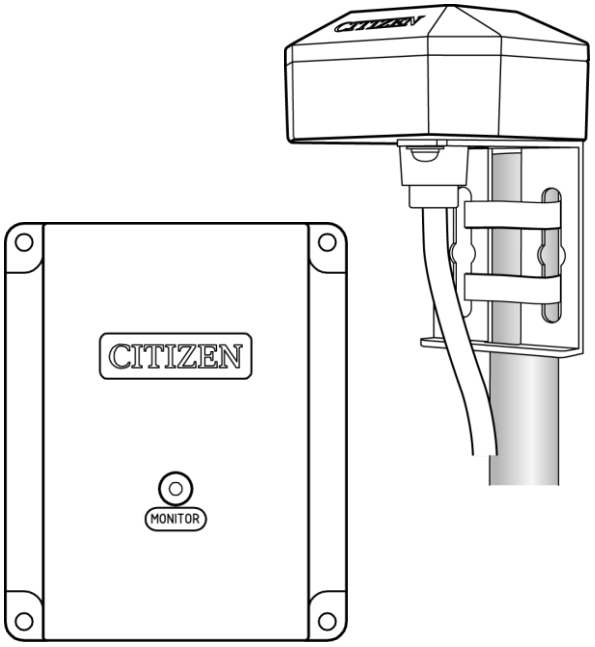
CITIZEN

CITIZEN GPS Time Server

TSV-400GP



Instruction Manual

First Edition

CITIZEN T.I.C. CO., LTD.

http://tic.citizen.co.jp

You can download the English version of this instruction manual from the URL below.

http://tic.citizen.co.jp/timeserver/

■ Introduction

Thank you for purchasing the TSV-400GP GPS Time Server.

This time server uses a GPS antenna to receive high-precision time information.
Devices such as computers or servers that are connected to the network and use the standard time synchronization protocol of NTP or SNTP to communicate with this product can obtain the accurate time.
Also, information about the operating status of the time server can be obtained using a web browser or SNMP.

At the same time as operating as a time server, the TSV-400GP can be used to periodically synchronize the time of various devices by turning on the regular time semiconductor relay output circuit.

The TSV-400GP supports IEEE802.3af compliant PoE (Power over Ethernet) power supply, and can therefore receive power and operate from an Ethernet cable.

■ Check the Accessories

GPS Antenna (with 5m cable)	·····	1
Signal converter (time server)	·····	1
AC adapter	·····	1
Instruction Manual (this manual)	·····	1

Network cables are not provided with this product. Please purchase separately.

Contents

■ Safety Precautions

○Explanation of Symbols

In order to ensure the safe and correct use of this product, please be sure that you have read and fully understand the safety precautions and instructions for this product before use.

 Warning	This symbol indicates warnings which may result in death or serious injury to the user if ignored or if the product is handled incorrectly.
 Caution	This symbol indicates warnings which may result in injury to the user or damage to property if ignored or if the product is handled incorrectly.
 Prohibited	This symbol indicates prohibited acts. Details of the prohibited act are shown next to the symbol.
 Compulsory	This symbol indicates instructions which must be followed by the user. Details of the instructions are shown next to the symbol.

Device Installation	
 Caution	○ When operating this product as a time server, make sure that the network administrator handles the system. Managing the IP addresses inappropriately may prevent devices connected to the network from operating, or cause them to fail. ○ Do not attempt to disassemble, modify or repair this device as doing so may result in electric shock, failure or malfunction. ○ Do not install the device in locations that have high temperatures or humidity. Doing so may cause parts such as connectors to corrode easily. ○ Install the device securely, and avoid installation in locations where it may be subject to vibrations or impact. Doing so may result in the product dropping or becoming damaged. ○ Do not lay cables where people walk. People may trip over the cables by accident. ○ Do not install in a flammable atmosphere (near gasoline, flammable sprays, thinners, lacquers or dusty locations) or in a corrosive atmosphere that contains substances such as acid.

⚠ Caution	Doing so may result in fire, short circuit or failure. ○ Be sure to remove the AC adapter from the socket before installing, removing and cleaning this device. Failure to do so may result in electric shock. ○ If the device malfunctions due to lightening, etc., immediately remove the AC adapter from the socket. Doing so may result in fire or short circuit.

AC Adapter	
⚠ Warning	○ Do not attempt to disassemble, modify or repair this device as doing so may result in electric shock. ○ Do not handle this device with wet hands. (Also, do not handle this device in humid, damp and dusty locations.) ○ Do not pull the cable to remove the AC adapter from the socket.

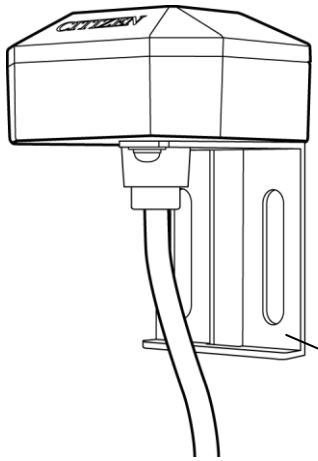
Connections	
❗ Compulsory	○ Always disconnect the power supply before starting wiring work. Failure to do so may result in electric shock or malfunction. ○ Always use the specified AC adapter (provided). Using a different adapter may result in malfunction. ○ Always insert the AC adapter into a 100V - 240V AC (50/60Hz) power supply socket (commercial power supply). Inserting the adapter into a power supply socket that has a different voltage may cause fire. ○ Do not apply overvoltage or overcurrent to the semiconductor relay output terminal. Doing so may result in malfunction or fire. (See P.8)

Product Usage	
⚠ Warning	Do not use with medical device related systems that directly affect human life.

Product Disassembly	
⊘ Prohibited	Do not attempt to disassemble or modify this product. Do not solder this product. Doing so may result in an accident such as fire, injury or electric shock, or a malfunction.

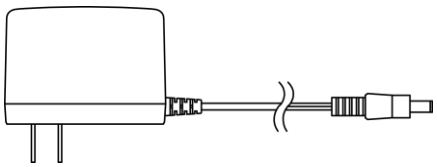
■ Names of Parts

GPS antenna

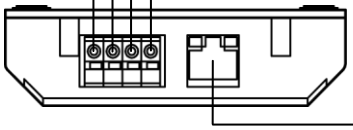


Installation bracket

AC adapter



Signal converter (time server)



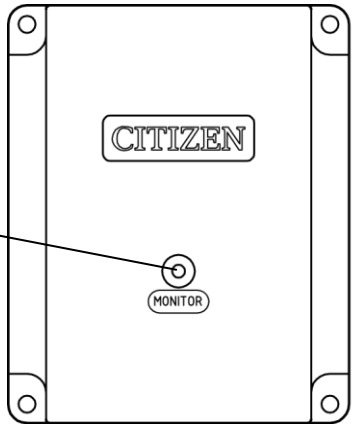
Semiconductor relay output terminal 2-b

Semiconductor relay output terminal 2-a

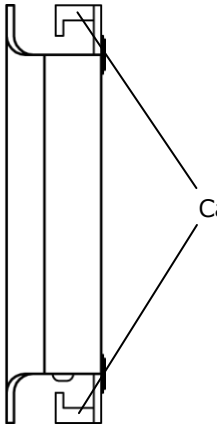
Semiconductor relay output terminal 1-b

Semiconductor relay output terminal 1-a

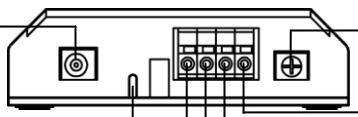
PoE compatible network interface connector (RJ45)



Reception monitor



Cable support



AC adapter connection jack

Antenna cable shield connection terminal SG

Antenna connection terminal RX-

Initialization button R

Antenna connection terminal RX+

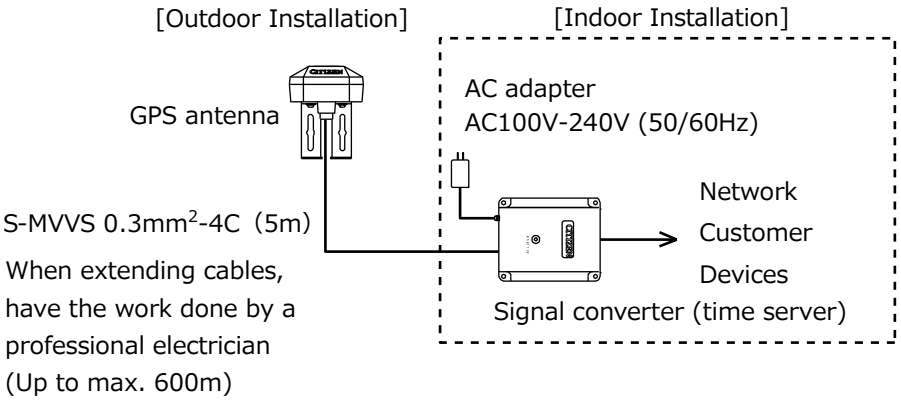
Antenna connection terminal GND

Antenna connection terminal V+

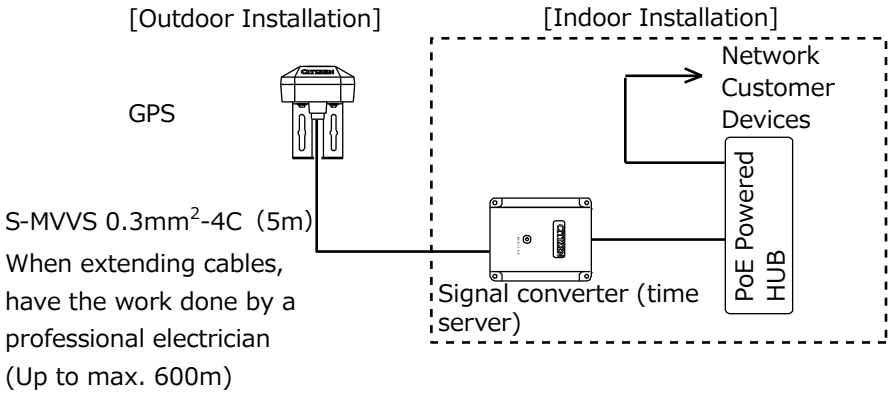
■ Connections

○ System Diagram

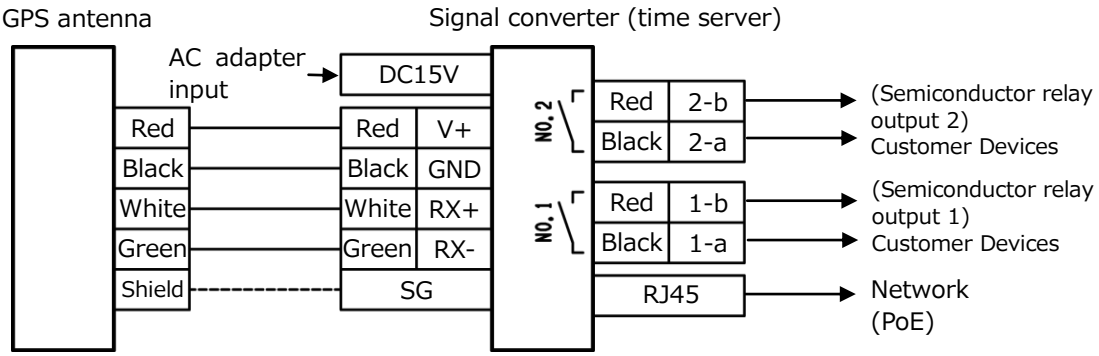
Using the AC Adapter



Using PoE Powered HUB



○ Connection Diagram

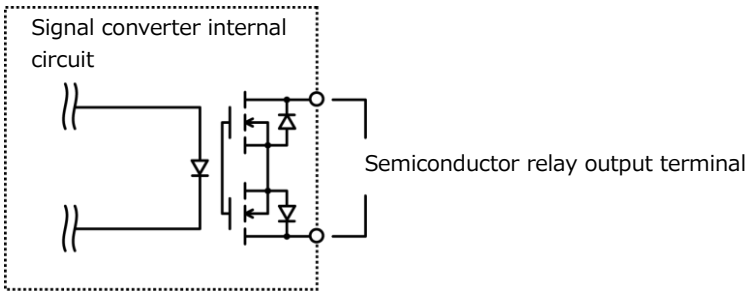


* If there are concerns about the effects of noise when extending the cable, etc., connect the shielding wire to the SG terminal.

○ Semiconductor relay output signal

The semiconductor relay output signal turns the output circuit on for 2 seconds every hour on the hour after the GPS signal is received. (The circuit is an electronic switch that uses the MOS FET relay.)

If the signal cannot be received, output is stopped after more than 24 hours has passed from the last reception. Output resumes when the signal is received again.

Output rating	Applicable voltage: 24V DC or less Maximum current: 200mA Maximum output on resistance: 2Ω
Circuit Structure	
No. of circuits	Dual system
Connectable cables	Single wire: φ0.4mm (AWG26) - φ1.2 (AWG16) Stranded wire: φ0.3mm (AWG22) - φ1.25 (AWG16) Strand diameter: φ0.18mm or over

■ Installation

[GPS Antenna Installation]

○ Selecting the GPS antenna installation location

Install outdoors in a location that has an unobstructed line of sight to the sky.
When installing indoors, install near to a window that has an unobstructed line of sight to the sky.

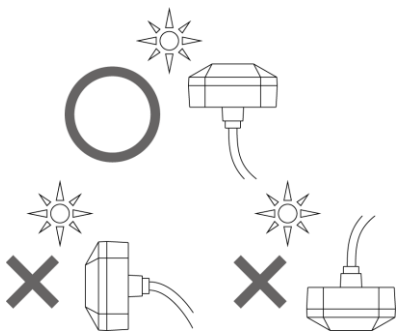
⚠ Caution	Do not install indoors in a location that does not have a line of sight to the sky. Doing so may cause unstable reception or the reception may be affected by ambient noise, resulting in malfunction.

○ Locations unsuitable for reception

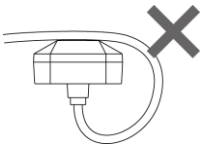
- Locations that do not have a clear line of sight to the sky, irrespective of whether they are inside or outside
- Locations that have an object that reflects or intercepts radio waves near the installation location
- Near wired window glass, window glass with smoke film attached, metallic slide shutters or window blinds
- Locations that have a radio transmitting antenna or lightening conductor nearby
- Locations that have high-voltage wires nearby
- Locations that may become submerged in bad weather conditions
- Locations where the antenna may become covered in snow in winter
- Other locations that may be sheltered from or may have obstructions to radio waves from GPS satellites

○ GPS Antenna Installation Orientation

Install the GPS antenna facing towards the zenith
(highest point in the sky)
(cables pointing downwards).
Installing with the case facing sideways or downwards adversely affects the reception performance of the antenna.



○ GPS Antenna Cable Wiring Precautions

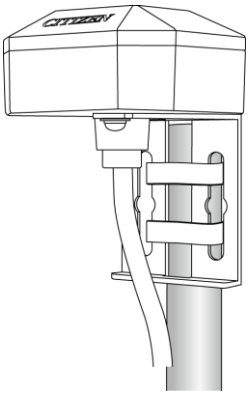


Install so that the cables do not pass over the top of the GPS antenna case. Doing so adversely affects the reception performance.

○ GPS Antenna Fixing Method

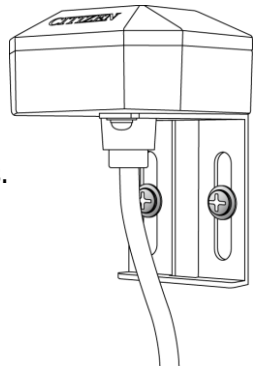
[Wrapping around a pole]

Pass bands through the installation bracket and wrap the bands around the pole to fix in place.



[Installing on a wall]

Fix the installation bracket in place with at least 2 screws. Use screws that are suitable for the installation wall material.



○ Extending the GPS Antenna Cable

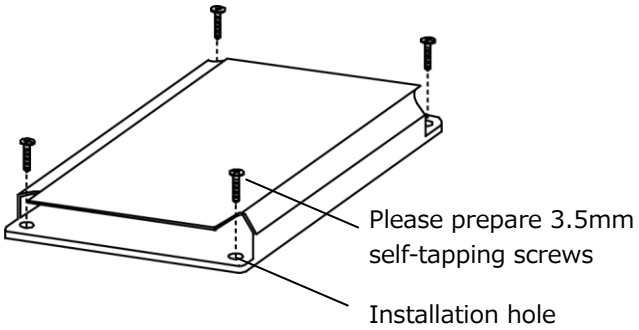
Recommended cable	S-MVVS 0.3mm^2-4C Black (considering weather resistance)
Extension length	Up to 600m

When extending the cable, be sure to use the appropriate methods to waterproof connections, such as by applying vinyl tape and self-adhesive tape.

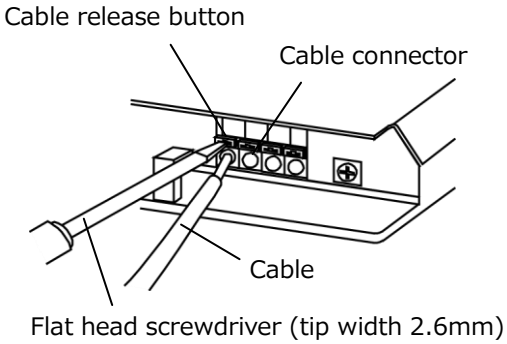
[Signal converter (time server) installation]

Install the signal converter (time server) indoors. The back of this unit is fitted with a non-slip material, and can be installed in flat locations without the need for fixing in place. Be sure to fix in place if installing on a wall or unstable location.

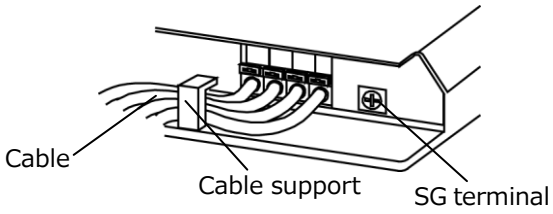
○ When fixing the signal converter
Fix the signal converter in place using self-tapping screws.
Self-tapping screws are not provided.



○ Cable connections
Use a flat head screwdriver to press and hold the cable release button and insert the cable into the cable connector.
After inserting the cable, release the cable release button and check that the cable cannot easily be pulled out.



○ Cable support
Hook the cables and AC adapter onto the cable support hook. This is to prevent cables from coming out.



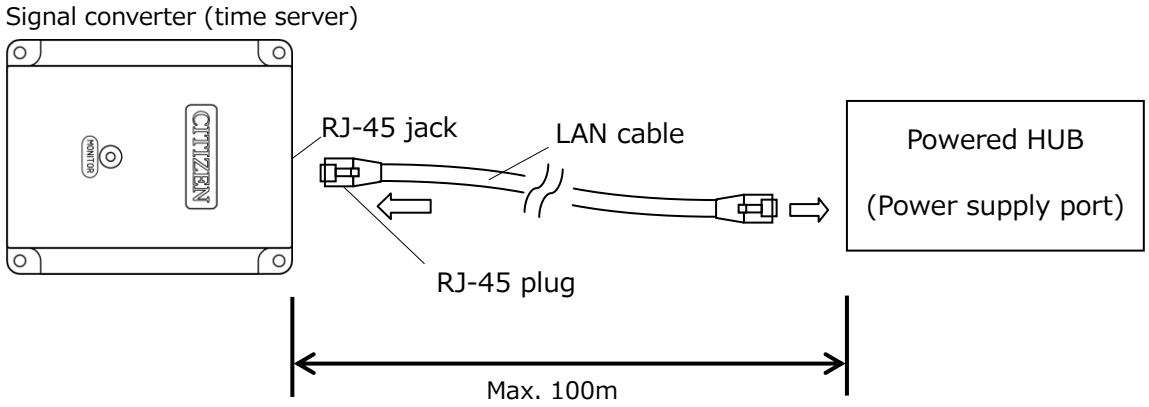
○ Connecting shielding wires
In cases where cables are extended or there are concerns about the effects of noise when cables are wired in parallel, connect shielding wire to the SG terminal.

○ Connecting to a Powered HUB

Warning	Install the powered HUB in a location where the power supply can be cut immediately in an emergency.

Compulsory	Be sure to use the powered HUB within the permitted power supply range. The electrical power consumption of this device is 2.2W. This product may not operate correctly if it is not supplied with power due to the combination of devices connected to the powered HUB.

Compulsory	Use a category 5e or higher 4 pair UTP/STP cable. Using other types of cables may result in malfunction. The maximum cable length is 100m.



[Turning on the Power Supply]

Connect the GPS antenna and signal converter, then connect the AC adapter when the installation is complete to turn on the power.

When connected to PoE, connect the LAN cables and then turn on the power supply to the PoE powered HUB.

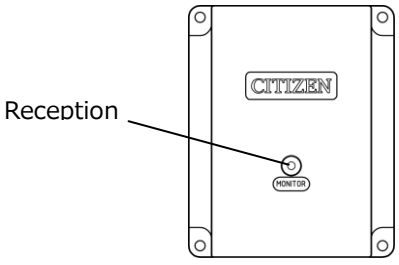
■ Operating Specifications

○ When power is on

Operation	Reception monitor
Checking cable wiring after power is turned on	Lights orange
Confirmed cable connections are normal (In some cases it may immediately flash green when reception starts)	Lights green
Cable misconnection (approx. 30 seconds after turning power on)	Lights red
Starts receiving GPS satellite transmission	Flashes green once per second (one second lit, one second off)
Syncing with GPS satellite (during reception)	Flashes green once per second (0.5 seconds lit, 0.5 seconds off)
Signal has been received (Depending on the reception environment, it may take 5 to 25 minutes after switching the power on for the lamp to flash every 2 seconds.)	Flashes green every 2 seconds (flashes on a 2-second cycle)

○ Normal times

Operation	Reception monitor
Reception complete (during sync with GPS satellite)	Flashes green every 2 seconds (flashes on a 2-second cycle)



○ Semiconductor relay output signal

The semiconductor relay output signal turns the output circuit on for 2 seconds every hour on the hour.

Output stops if there is no reception for more than 24 hours.

○ Network interface

Time can be synchronized via NTP/SNTP when signals are being received successfully.

The operating status of the time server can be checked using a web browser on a computer connected to the network.

■ Time Server Function

The GPS antenna needs to have a stable reception to enable the time server to operate.

○ Relationship Between Reception Condition and Time Server Operation

GPS Reception Condition	Time Server Function
Power on - before reception is confirmed	No function
Successful reception (during GPS sync) (Reception monitor flashes green every 2 seconds)	OK
24 hours passed since the last reception (Reception monitor flashes red every 2 seconds)	No function

To check whether or not this device is operating as a time server, use a web browser to check the System Information screen. (See P.17) The SNTP Server Status is Running.

○ Syncing Time with the Time Server

Connect the devices that you want to sync to this device using network cables. The devices to be synced must support NTP (Network Time Protocol) or SNTP (Simple Network Time Protocol). (Either version 3 or 4)

Set the time server (this device) IP address as the reference location for time syncing on the device to be synced. The initial setting is 192.168.0.200. This enables periodic time syncing. For details, see the instruction manuals of each of the connected devices.

○ NTP Year 2036 Problem

In NTP (Network Time Protocol), the number of seconds from the base point of 00:00:00 (UTC) on 1 January 1900 is calculated in 32-bit integers, and as a result integer overflow will occur from 06:28:15 (UTC) on 6 February 2036 causing erroneous calculations. This device will not malfunction after 2036 because it references sign bits from internal processing, and therefore this problem will occur in the NTP/SNTP client software and operating system processing, not on the time server side. As some devices are not supported, it is necessary to check each device in the usage environment.

■ Initial Settings

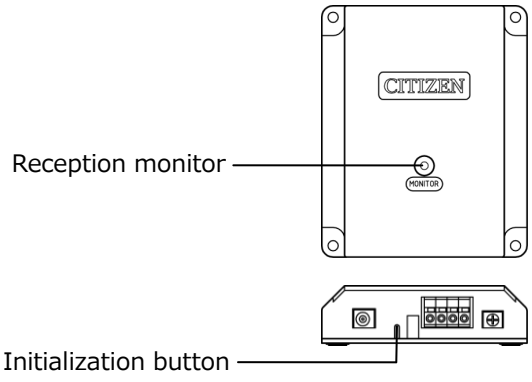
The initial settings are shown below.
Changes to the IP address, subnet mask and default gateway are performed using the Web browser. For details on how to change the settings, see the section in this manual on connecting via a web browser.

IP address	192.168.0.200
Subnet mask	255.255.255.0
Default gateway	0.0.0.0
Webpage User Name	admin
Webpage Password	admin

You can check the operating status of the time server and configure the SNMP settings using the web browser (such as Internet Explorer) of a computer connected to the network. SNMP (Simple Network Management Protocol) is a protocol for monitoring devices on a network, and is useful for discovering operation errors in the time server.

○ Returning Settings to Default Values After Changing Settings
Remove all of the wires and then plug in the AC adapter of the signal converter to turn the power on. Next, use a thin flat head screwdriver or pointed stick to press and hold the initialization button for at least 5 seconds. Initialization is complete when the reception monitor flashes quickly in orange. Release the initialization button.

⚠ Caution	When initializing the settings, be sure to first remove the AC adapter to switch off the power before disconnecting all connected cables to the device. Initializing with cables connected may result in malfunction or damage.



■ Connecting with a Web Browser

Use a web browser on a computer connected to the network, and enter the IP address that is set for the time server (signal converter) as the URL. The initial setting is 192.168.0.200.

For the initial settings,

http://192.168.0.200

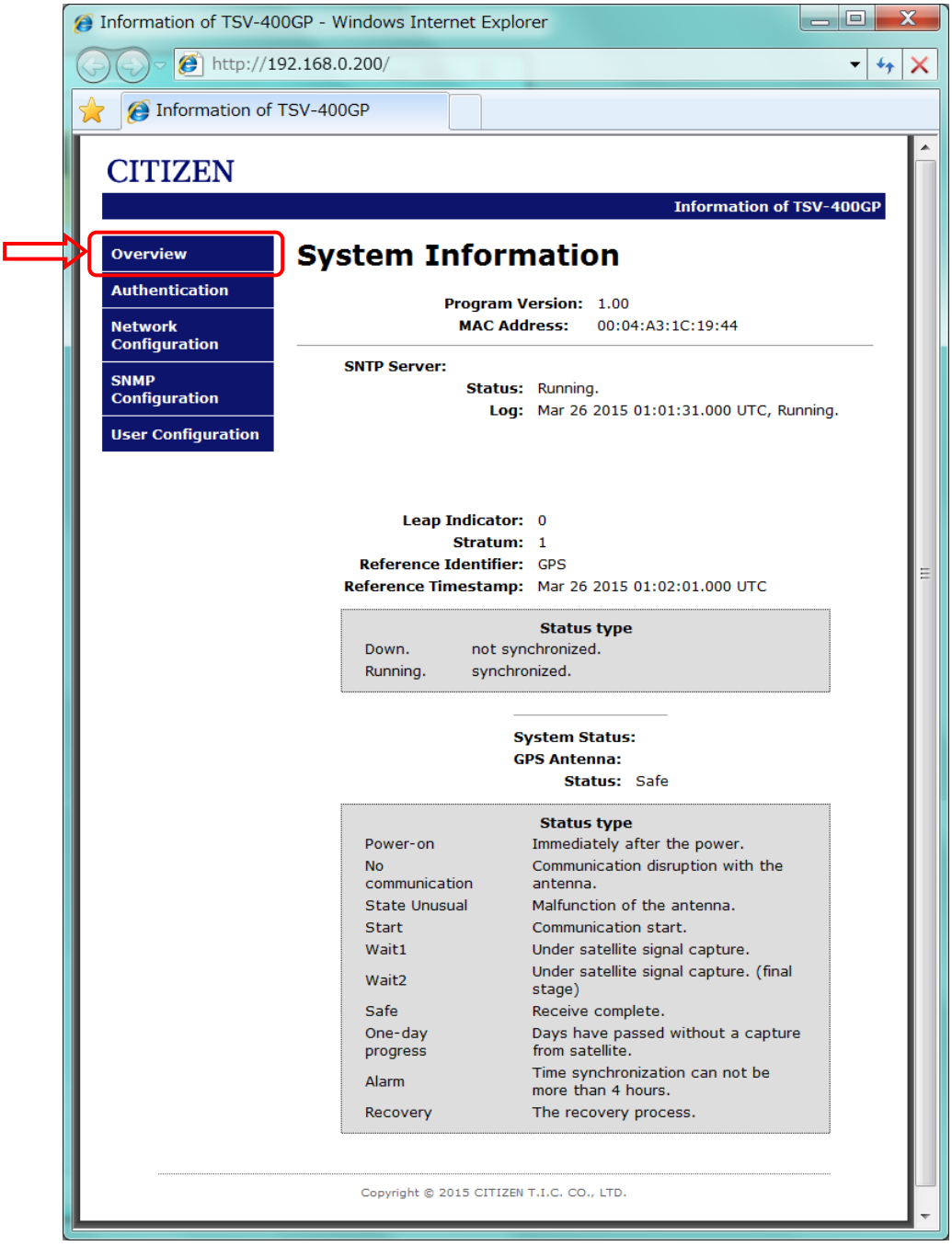
enter.

The System Information screen is displayed.

> If an error or other problem occurs and the screen does not open, check the relationship between the IP address of the time server and the IP address

■ System Information

You can check the system information by clicking Overview in the top left menu.



SNTP Server

Status	Operating status Running:　Operating, Down: Stopped
Log	Operation log
Leap Indicator	Leap second indicator (stopped or not displayed)
Stratum	Stratum level (stopped or not displayed)
Reference Identifier	Source of time synchronization (stopped or not displayed)
Reference Timestamp	Time of time synchronization (stopped or not displayed)

System Status

GPS Antenna

Status	Antenna operating status Power-on: Immediately after power is turned on No communication: Communication failure with GPS antenna State Unusual: Malfunction of GPS antenna Start: Communication with GPS antenna is successful, starting to receive signal Wait1: Acquiring GPS satellite signal Wait2: Acquiring GPS satellite signal (final stage) Safe: Signal has been received One-day progress: 24 hours have elapsed since a signal was last received Alarm:　4 hours or more have elapsed since a signal was last received Recovery:　Initialization processing is in progress

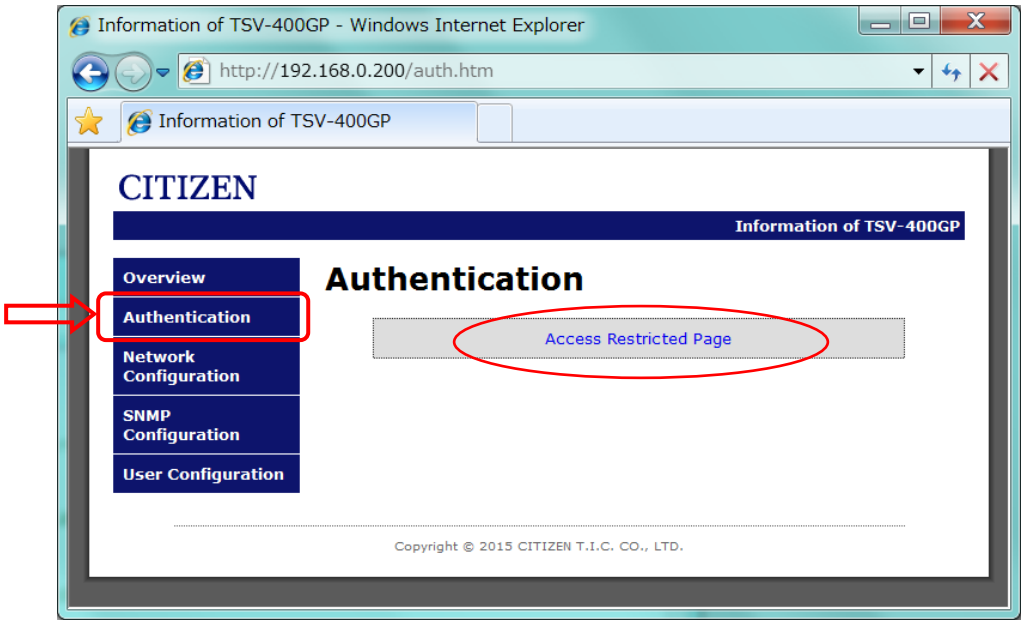
The displayed information is correct as of the time the screen was opened. To display the latest information, press the Refresh button in your web browser to refresh the screen.

■ Authentication

You can open the Authentication page by clicking Authentication in the top left menu.

Advance authentication is required for changing the settings.

Click Access Restricted Page.



Enter the user name and password, and click OK.

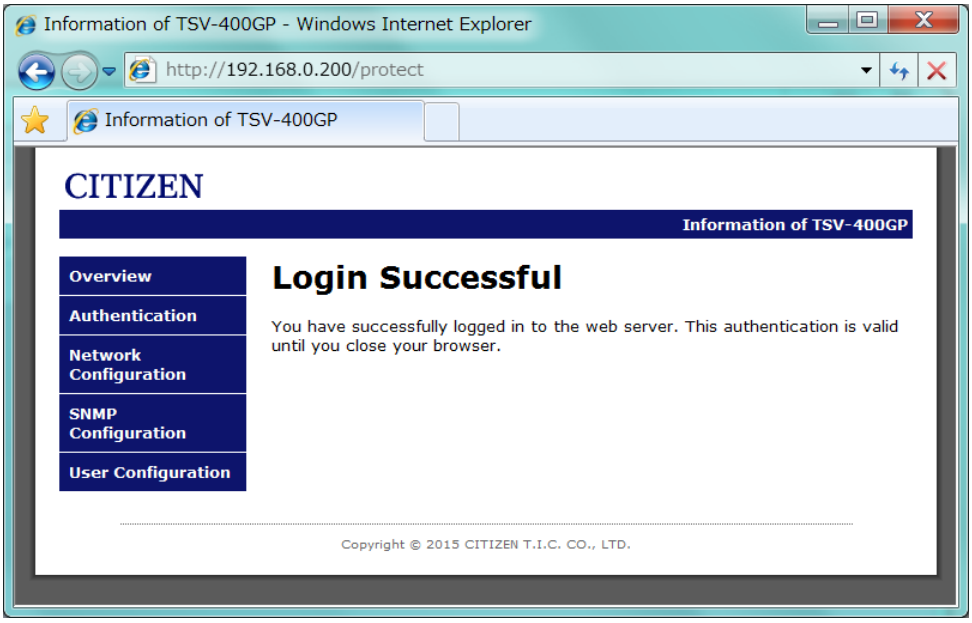
Initial Settings

User Name : admin

Password : admin

are: These can be changed in the User Configuration screen. (See P.28)

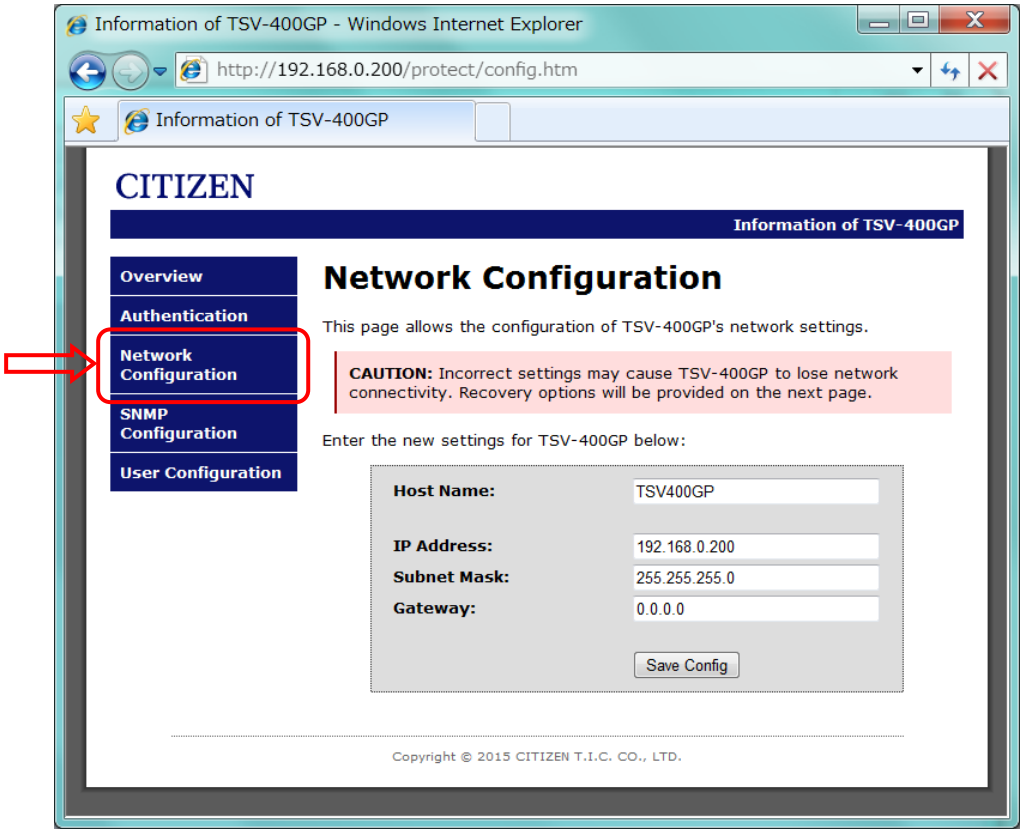
If the login is successful, the Login Successful screen opens.



If you are prompted to enter the information again, authentication has failed. Check the user name and password.

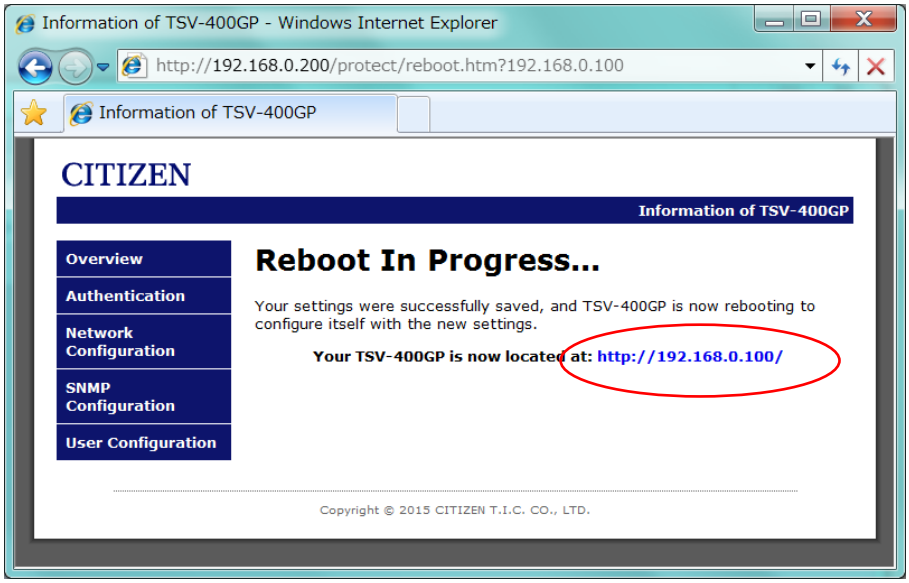
■ Network Configuration

You can open the Network Configuration screen by clicking Network Configuration in the top left menu.

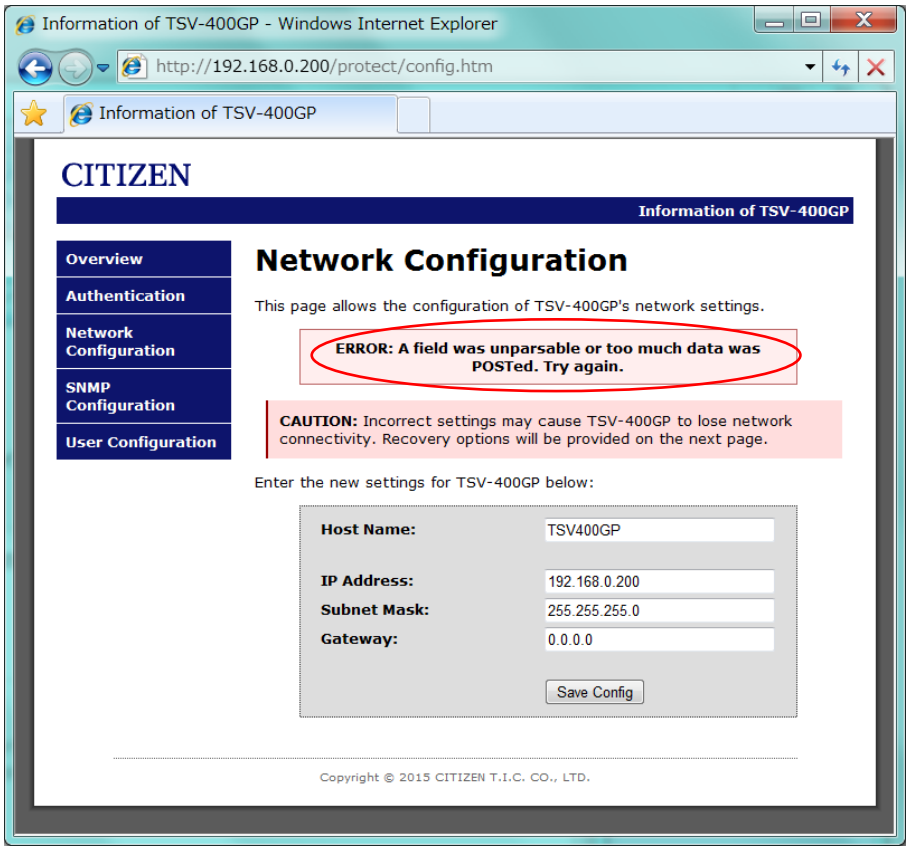


Host Name	Unique device name (single-byte alphanumerics, maximum 15 characters)
IP Address	IP address
Subnet Mask	Subnet mask
Gateway	Default gateway

To change the settings, click Save Config.
Reboot In Progress... is displayed, and the settings are saved. If the IP address has been changed, select the IP address that was changed, open the screen again and confirm the change.



If ERROR is displayed, there is a problem in the input.
Check again the characters and number of characters that you used, and enter them correctly.
When an IP address segment is changed, the address of the configured PC needs to be changed accordingly.



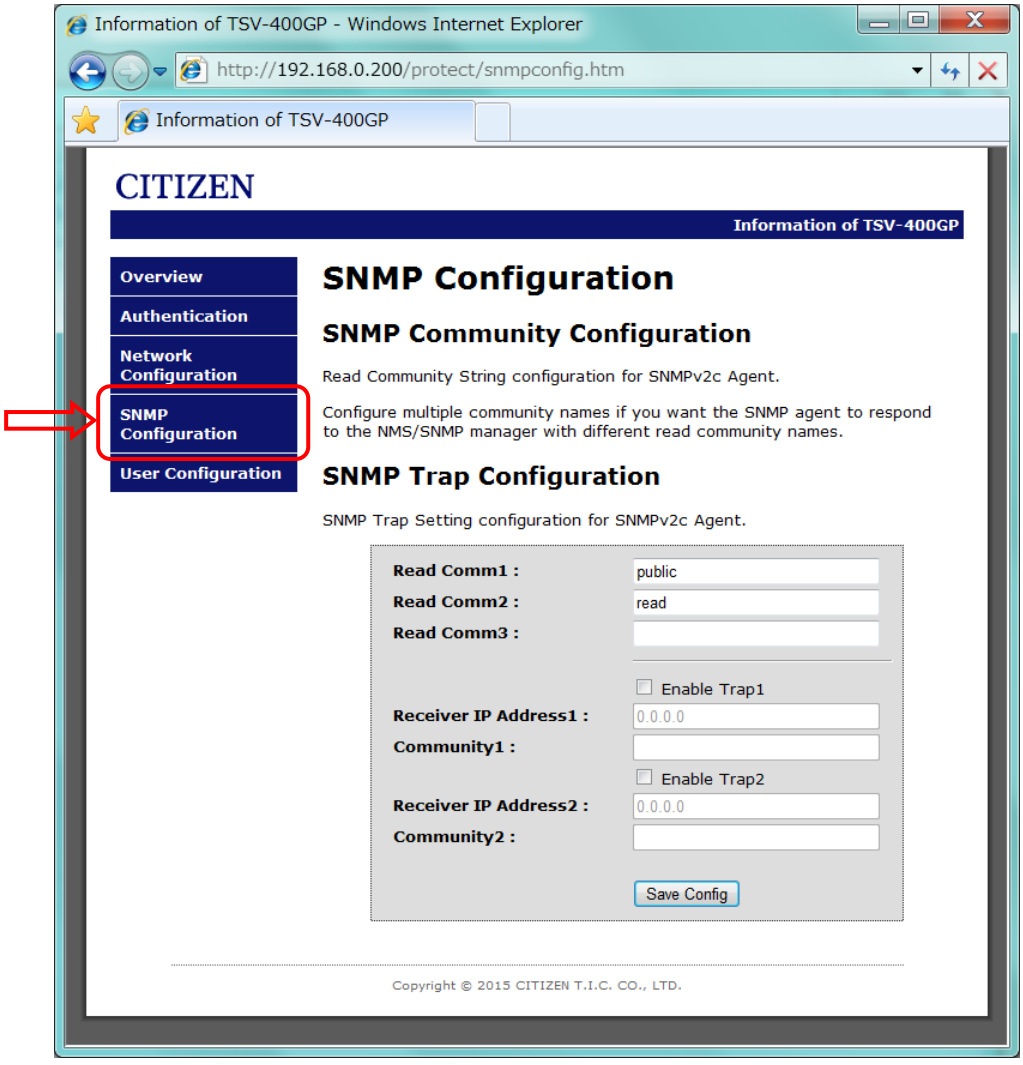
■ SNMP Configuration

You can open the SNMP Configuration screen by clicking SNMP Configuration in the top left menu.

You can access using SNMPv1 or SNMPv2. You can obtain information about the operating status of the time server using SNMP.

When SNMP Trap is set, a warning notification is sent to the IP address that you set in advance if an error occurs in the time server.

Trap uses the notification definition (NOTIFICATION-TYPE, SNMPv2-CONF).



SNMP Community Settings

Read Comm1	Read community name 1 (single-byte alphabetic characters, maximum 12 characters)	Default setting: public
Read Comm2	Read community name 2 (single-byte alphabetic characters, maximum 12 characters)	Default setting: read
Read Comm3	Read community name 3 (single-byte alphabetic characters, maximum 12 characters)	Default setting: (Blank)

SNMP Trap

Conditions for Trap Generation

The power is turned on.
Communication with the GPS antenna is not possible
24 hours have elapsed since the GPS antenna last received a signal, and the time server has stopped operating

SNMP Trap Settings

□ Enable Trap1	Trap 1 enabled (check box selected)/disabled (check box cleared)	Default setting: Disabled
Receiver IP Address1	Notification destination IP address 1	Default setting: 0.0.0.0
Community1	Community name 1 (single-byte alphabetic characters, maximum 12 characters)	Default setting: (Blank)
□ Enable Trap2	Trap 2 enabled (check box selected)/disabled (check box cleared)	Default setting: Disabled
Receiver IP Address2	Notification destination IP address 2	Default setting: 0.0.0.0
Community2	Community name 2 (single-byte alphabetic characters, maximum 12 characters)	Default setting: (Blank)

To change the settings, click Save Config.

Reboot In Progress... is displayed, and the settings are saved. Open the screen again by selecting SNMP Configuration in the menu, and check that the settings were changed.
If ERROR is displayed, there is a problem in the input. Check again the characters and number of characters that you used, and enter them correctly.

Checking Operation with SNMP Manager

You can check the operating status by using the tic_tsv400gp.mib file to send a request to the time server with the SNMP manager. (You can download tic_tsv400gp.mib from our website.)

The MIB tree unique to TSV-400GP (under "enterprises") is as follows. All the items are read-only.

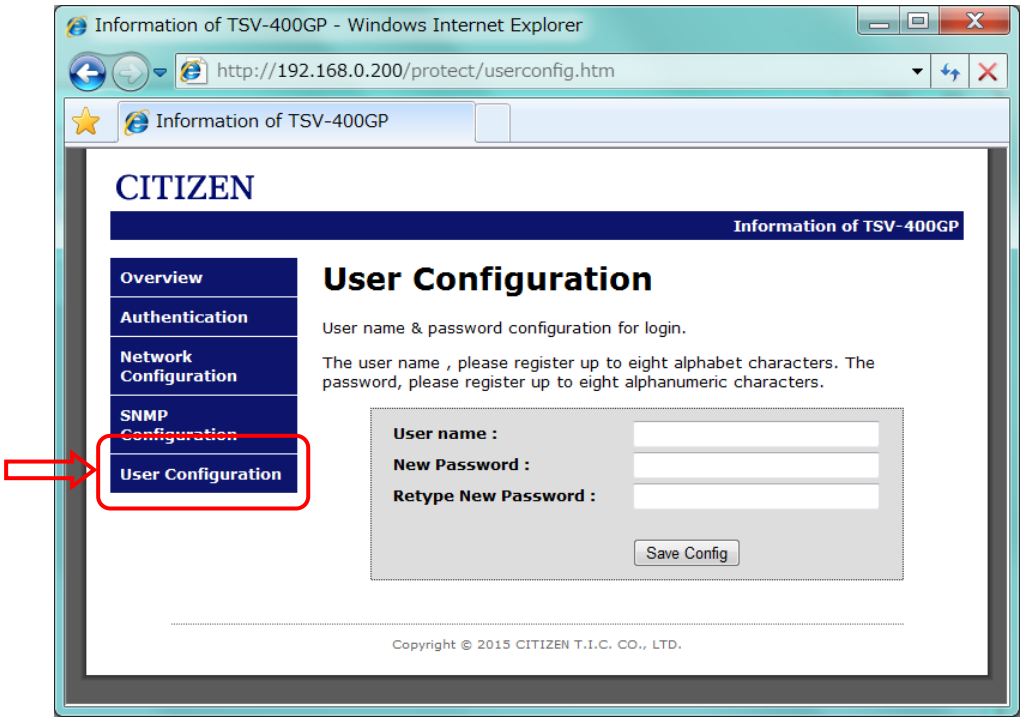
```
/ 20438 (citizen-watch)
 `-- 190 (citizen-tic)
     |-- 1 (product)
     |    |-- 1 (name)
     |    |-- 2 (version)
     |    |-- 3 (date)
     |    |-- 4 (MacAddress)
     |    `-- 6 (GpsAntennaStatus)
     |-- 2 (control)
     |-- 3 (network)
     |    |-- 1 (setting)
     |    |    |-- 1 (IpAddress)
     |    |    |-- 2 (SubnetMask)
     |    |    `-- 3 (DefaultGateway)
     |    `-- 2 (ntp)
     |         `-- 1 (server)
     |              |-- 1 (SntpSvStatus)
     |              |-- 2 (SntpSvLeapIndicator)
     |              |-- 3 (SntpSvStratum)
     |              |-- 4 (SntpSvReferenceIdentifier)
     |              |-- 5 (SntpSvReferenceTimestamp)
     |              `-- 6 (SntpSvReasonOfStop)
     `-- 4 (trap)
          |-- 0 (trapNotifications)
          |    `-- 1 (sntpDown)
          `-- 1 (traps)
               `-- 1 (TrapEntry)
                    |-- 1 (trapReceiverNumber)
                    |-- 2 (trapEnabled)
                    |-- 3 (trapReceiverIPAddress)
                    `-- 4 (trapCommunity)
```

product (1.3.6.1.4.1.20438.190.1): Product information		
name (1.3.6.1.4.1.20438.190.1.1)	OCTET STRING	Product name
version (1.3.6.1.4.1.20438.190.1.2)	OCTET STRING	Version information
date (1.3.6.1.4.1.20438.190.1.3)	OCTET STRING	Creation date
MACAddress (1.3.6.1.4.1.20438.190.1.4)	OCTET STRING	MAC address
GpsAntennaStatus (1.3.6.1.4.1.20438.190.1.6)	INTEGER { PowerOn(0), None(1), Error(2), Start(3), Wait1(4), Wait2(5), Safe(6), 1DayProgress(7), Alarm(8) }	GPS antenna status (0: Power on or reset, 1: No connection, 2: Antenna malfunction, 3: Starting, 4: Acquiring satellite signal, 5: Acquiring GPS satellite signal (final stage), 6: Normal, 7: 24 hours or more have elapsed since synchronization, 8: No synchronization for 4 hours or more)
network (1.3.6.1.4.1.20438.190.3): Network information		
setting (1.3.6.1.4.1.20438.190.3.1)		
IPAddress (1.3.6.1.4.1.20438.190.3.1.1)	IpAddress	IP address
SubnetMask (1.3.6.1.4.1.20438.190.3.1.2)	IpAddress	Subnet mask
DefaultGateway (1.3.6.1.4.1.20438.190.3.1.3)	IpAddress	Default gateway
ntp (1.3.6.1.4.1.20438.190.3.2): NTP information		
server (1.3.6.1.4.1.20438.190.3.2.1): Server information		
SntpSvStatus (1.3.6.1.4.1.20438.190.3.2.1.1)	INTEGER { Disable(0), Down(1), Running(2) }	Server status (0: Disabled, 1: Stopped, 2: Operating)
SntpSvLeapIndicator (1.3.6.1.4.1.20438.190.3.2.1.2)	INTEGER {NoWarning(0), ClockNotSynchronized(3)}	Leap second indicator (0: No warning, 3: Not synchronized)
SntpSvStratum (1.3.6.1.4.1.20438.190.3.2.1.3)	INTEGER {Unavailable(0), GPS(1)}	Stratum level (0: Unavailable, 1: GPS)

SntpSvReferenceIdentifier (1.3.6.1.4.1.20438.190.3.2.1.4)	OCTET STRING	Reference identifier
SntpSvReferenceTimestamp (1.3.6.1.4.1.20438.190.3.2.1.5)	OCTET STRING	Reference timestamp
SntpSvReasonOfStop (1.3.6.1.4.1.20438.190.3.2.1.6)	INTEGER { Disable(0), Running(1), PowerOn(2), ManualOperation(3), TwoDaysPassed(4) , AntennaTimeout(5), AntennaStatusError(6) }	Reason for stopping (0: Invalid, 1: Operating, 2: Power on or reset, 3: Manual operation, 4: 48 hours have elapsed since time correction, 5: Communication timeout with antenna, 6: Antenna status changed)
trap (1.3.6.1.4.1.20438.190.4): Trap		
trapNotifications (1.3.6.1.4.1.20438.190.4.0): Trap notifications		
sntpDown (1.3.6.1.4.1.20438.190.4.0.1): Time server stopped	OBJECTS{ SntpSvStatus,SntpSvReasonOfStop,GPSAntennaStatus}	Server status, reason for stopping, GPS antenna status
traps (1.3.6.1.4.1.20438.190.4.1)		
trapEntry (1.3.6.1.4.1.20438.190.4.1.1)		
trapReceiverNumber (1.3.6.1.4.1.20438.190.4.1.1.1)	INTEGER	Number
trapEnabled (1.3.6.1.4.1.20438.190.4.1.1.2)	INTEGER { Yes(1), No(0) }	1: Enabled, 0: Disabled
trapReceiverIPAddress (1.3.6.1.4.1.20438.190.4.1.1.3)	IpAddress	Notification destination IP address
trapCommunity (1.3.6.1.4.1.20438.190.4.1.1.4)	OCTET STRING	Community name

■ User Configuration

You can open the User Configuration screen by clicking User Configuration in the top left menu.



User name	User name (single-byte alphabetic characters, maximum 8 characters)
New Password	Password (single-byte alphanumerics, maximum 8 characters)
Retype New Password	Password (single-byte alphanumerics, maximum 8 characters)

To change the settings, click Save Config.

Reboot In Progress... is displayed, and the settings are saved. Select Authentication in the menu, and check that you can log in again with the changed user information.

If ERROR is displayed, there is a problem in the input. Check again the characters and number of characters that you used, and enter them correctly.

■ Troubleshooting

1.1. You cannot access the time server

1.1.1 You do not know the IP address

→ Press the initialization button to reset to the factory default. (See P.15)

1.1.2 You know the IP address

→ Check that the LAN cable is connected properly.

→ Check that access is being performed with an IP address that is within the same segment as the time server.
Connection is not possible unless the network is within the same segment.

1.2. You cannot log in to the webpage

→ Both the user name and password are case sensitive. Check whether "Caps Lock" on the keyboard has been enabled.
If you have forgotten the user name or password, reset the initial settings, and then set them again. (See P.15)

→ Check that access is being performed with an IP address that is within the same segment as the time server.
Connection is not possible unless the network is within the same segment.

1.3. You cannot change the settings on the webpage

→ Check that there are no errors in the characters and number of characters that you entered. (See P.21 and P.28)

1.4. You cannot synchronize the time with the time server

→ The time server must have had its time corrected. Check that the reception monitor of the time server flashes in green every two seconds (flashes in two-second cycles). The system information can be checked on the webpage, or the operating status can be checked with SNMP. It may take up to 25 minutes for this product to receive a signal and correct the time after the power is turned on (if the GPS antenna is installed in an area where a signal can be received).

→ Check whether communication has been blocked by the firewall function. Open UDP port 123 that is used by NTP/SNTP, and open UDP ports 162 and 163 that are used by SNMP.

→ Permission may need to be given to synchronize the time depending on the execution authority settings of the OS (operating system). Check the execution authority settings of your user account.

■ Product Specifications

○ GPS antenna

Case	Polycarbonate resin, light gray
Receivable radio waves	GPS satellite radio waves/quasi-zenith satellite radio waves, L1 band
Receivable frequency	1575.42MHz
Reception sensitivity	-145dBm (during cold start)
Temperature range for use	-20℃ to 60℃
Protection level	Equivalent to IP44
Installation bracket	Stainless steel
Weight	Approx. 0.5kg (including 5m cable)

○ Signal cable (between antenna signal converters, up to 600m)

Cable color	Description
Green	RX-
White	RX+
Black	GND
Red	V+
Shield	SG

○ Signal converter (time server)

Case	AES resin, light gray
Input signal	Serial signal
Output signal	(1) Semiconductor relay output signal: 2 systems The output circuit is turned on for 2 seconds every hour on the hour (2) Network interface: 1 system NTPv3/v4, SNTPv3/v4 RJ45 10BASE-T, 100BASE-TX
Reception status	LED display
Temperature range for use	0 to 40℃
PoE power input	IEEE802.3af compliant
Power consumption	2.2W (maximum)
Weight	Approx. 0.2kg

○ AC adapter

Input voltage	100V-240V 50/60Hz
Output voltage	DC15V 0.4A
Weight	Approx. 0.1kg

○ Hazardous substance regulations

Compliant with the RoHS Directive

■ Warranty and Post-Purchase Service

○ Warranty (See P.33)
Make sure that you receive a warranty from the dealer where you purchased this product, and that information such as the purchase date and dealer name is filled in correctly. Read the warranty carefully and then retain it. The warranty period is one year from the date of purchase.

○ Retention of functional parts for repairs
Citizen T.I.C. will retain functional parts for repairs of this product for five years after production is discontinued. ("Functional parts for repairs" refers to parts that are required in order to maintain the functionality of this product.) However, some functional parts for repairs may be substituted with similar parts with equivalent properties.

○ When requesting repair
If there is a problem that cannot be resolved by following the instructions in this manual, unplug the AC adapter to disconnect the power supply and then contact the dealer where you purchased this product.

Please provide the following information.	
Product name/model	GPS Time Server/TSV-400GP
Purchase date	(year) (month) (date)
Lot number and production date	Please provide if known (can be found on the product plaque on the back of the signal converter)
Description of malfunction	Please describe as specifically as possible

○ Handling of repairs
Citizen T.I.C. will perform the repairs stipulated in the regulations of the warranty within the warranty period. Bring this product and the warranty to the dealer where you purchased this product or to a branch or office of Citizen T.I.C. Citizen T.I.C. will repair or adjust this product free of charge.
Citizen T.I.C. will also repair this product outside the warranty period on request if it is repairable. A fee will be charged for the repair. The repair fee may be high depending on the type of parts that are affected, the difficulty of the repair and the postage charges that are incurred.

■ Inquiries

Please use the following information to contact us if there is anything you are unsure of.

Manufacturer and seller: **CITIZEN T.I.C. CO., LTD.** http://tic.citizen.co.jp

○ Tokyo Branch
Maehara-cho 5-chome 6-12, Koganei City, Tokyo 184-0013, Japan
TEL.042-386-2293 FAX.042-386-2222

・Sapporo Office
TEL.011-398-3350 FAX.011-398-3351

○ Sendai Office
Nishiki-cho 1-chome 1-46, Aoba-ku, Sendai City 980-0012, Japan
TEL.022-796-5347 FAX.022-796-5348

○ Nagoya Branch
Shimo Iida-cho 4-chome 26-2, Kita-ku, Nagoya City 462-0865, Japan
TEL.052-991-8600 FAX.052-991-8603

○ Osaka Branch
Higashi Nakahama 8-chome 3-20, Joto-ku, Osaka City 536-0023, Japan
TEL.06-6961-8663 FAX.06-6961-8680

○ Fukuoka Branch
Kami Kawabata-cho 8-18, Hakata-ku, Fukuoka City 812-0026, Japan
TEL.092-281-0020 FAX.092-281-0112

・Hiroshima Office
TEL.082-229-2501 FAX.082-229-2502

○ Notes on settings

	Initial Settings	Changed by ( ) (year)/ (month)/ (day)
IP address	192. 168. 0. 200	. . .
Subnet mask	255. 255. 255. 0	. . .
Default gateway	0. 0. 0. 0	. . .
Webpage User Name	admin	
Webpage Password	admin	

Warranty

In the unlikely event that a spontaneous fault occurs with this product during normal use as described in the instruction manual within the warranty period, bring this product together with the warranty card to the dealer where you purchased the product or to a branch or office of Citizen T.I.C. for free repairs or adjustment. This warranty is issued by the dealer. Make sure that the dealer fills out the areas marked by a * and then store this warranty carefully.

Product name/model	GPS Time Server/TSV-400GP
Name	Mr./Ms.
Address	Postcode
TEL	( ) –
※ Name and address of dealer TEL	
※ Purchase date	(year) (month) (day)
Warranty period	One year from the purchase date

Please note that personal information that you have filled in may be used to carry out free repairs during the warranty period or for safety inspections performed after repair.

<Warranty Regulations>

1) Free repairs will be carried out if this product malfunctions during the warranty period and if this product was used according to the precautions described in the instruction manual.
2) Repairs will generally incur a fee in the following cases, even if the repair is performed during the warranty period.
   - Malfunctions or damage resulting from a mistake during use or from unauthorized repair or modification.
   - Malfunctions or damage resulting from causes such as a change of installation location, transportation or dropping after purchase.
   - Malfunctions or damage resulting from natural disasters such as fire, earthquakes, water damage or lightning, or from causes such as pollution, salt damage, abnormal voltage or the use of an unspecified power supply (unspecified voltage or frequency).
   - When this warranty is not provided
   - When the date of purchase, customer name or dealer name are not filled out, or if these details have been changed.
   - This warranty is valid only in Japan.
   - Store this warranty carefully as it cannot be reissued.

CITIZEN T.I.C. CO., LTD. Maehara-cho 5-chome 6-12, Koganei City, Tokyo 184-0013, Japan
TEL (042) 386-2379

CITIZEN T.I.C. CO., LTD.

Website address http://tic.citizen.co.jp

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TSV-400GP-4M3-100