RE-2227

wattXplorer Product Manual

Rev. 1.3

KYOKKO ELECTRIC CO.,LTD

2025/9/26

■ Safety Precautions ■

●If you intend to use the product under the following conditions or in the following environments, please take safety precautions and be sure to contact us.

1. Use or diversion under conditions or in environments or outdoors other than those specified in the instruction manual.
2. Use in nuclear, railroad, aviation, vehicle, medical equipment, beverage, food contact equipment, entertainment equipment and safety equipment.
3. Use in applications where significant impact on people or property is anticipated and safety is particularly required.

●Do not use the product under the following conditions.

1. In the presence of corrosive or flammable gases, chemicals, seawater, water, oil, vapor, soluble liquids, and dust or iron powder.
2. Use in places subject to excessive vibration or shock.
3. Use in a place where there is a heat source in the vicinity and where it is exposed to radiant heat.
4. Use in places where products with the potential to explode, such as fireworks and explosives, are manufactured.

●When not in use for a long period of time, store the product to prevent rusting due to rain or dew. Do not leave the product outdoors.

●Do not drop the product or subject it to excessive external force or impact. Do not use the product under such conditions.

●Do not disassemble or modify this product.

●Do not touch this product with wet hands.

●Do not pull on the cable.

●This device must not be used in locations where children may be present.

■ Precautions for use ■

●This product is not a specified measuring instrument that has passed the verification test conducted by the designated organization under the Measurement Law, and therefore cannot be used to prove the amount of electric power.

●Please ensure that all settings are properly configured according to the instructions in the user manual

●Cannot be used to measure DC current.

●Before turning on the power, check that the connectors are properly connected.

●Do not use the current sensor under conditions that exceed its rated current.

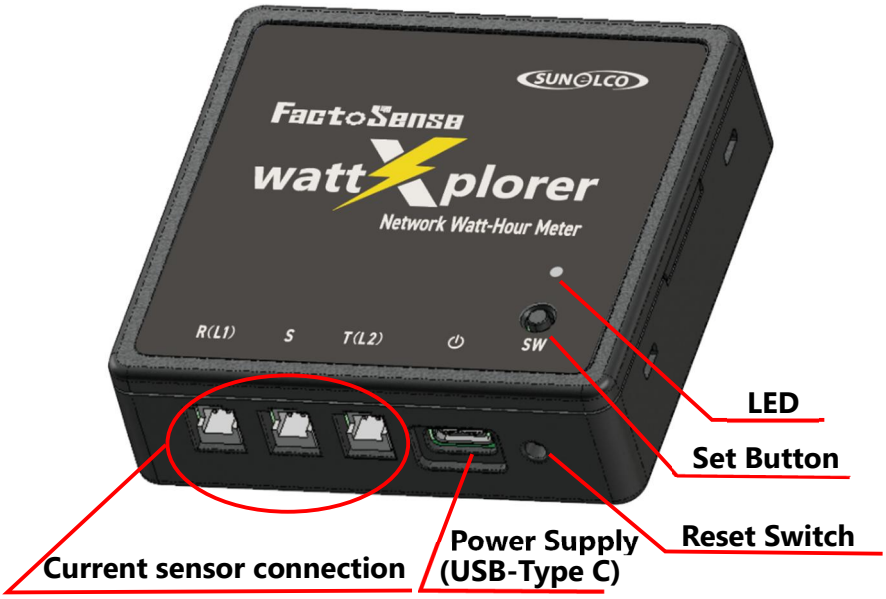
Table of Contents

Table of Contents

Overview

This product is a device that measures current consumption and calculates power consumption.
Measured data is transmitted via Wi-Fi and can be viewed in a browser.
In addition, Modbus/TCP support is also available, enabling linkage with a variety of systems.

Name of Each part



*Thermocouple optional products may differ from the above appearance.

Contents

Main Unit

Current Sensor(※2)

Main Unit
●Model：WX-STD1M2.4USC

What you need to prepare
●USB Hub Adapter ●USB Cable (Type-C)(※1)

※1 USB cable length should be less than 3m.

Current Sensor Model Table

Model	Rating [Arms]
HA-16RS100-33C	100
HA-24RS250-66CK	250
HA-36RS400-66CK	400
HA-36RS600-66CK	600

※2 The model and number of current sensors vary depending on the purchase option.

■About USB hub adapters■

To reduce the risk of fire, electric shock, or malfunction, use only a power supply that meets one of the following requirements:

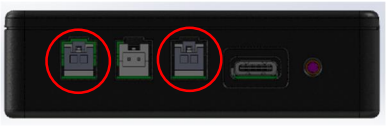
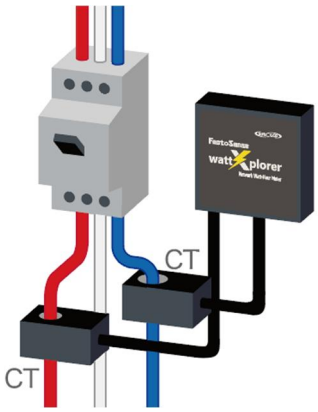
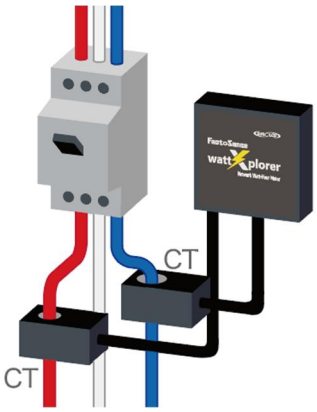
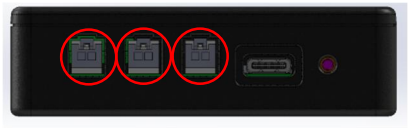
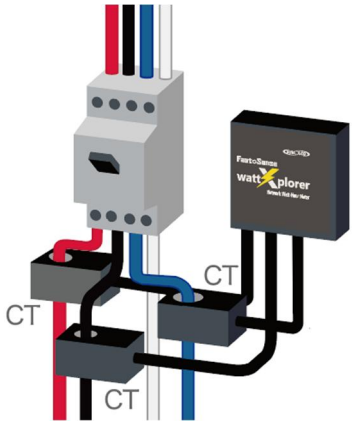
●LPS (Limited Power Source) compliant, IEC 60950-1

●PS2 (Power Source Class 2) classified, IEC 62368-1

In addition, please use a power supply with an output current in the range of 0.5 A to 10 A.

Product Connection

1. Current sensor connection
   Change the connection points according to the wiring method.

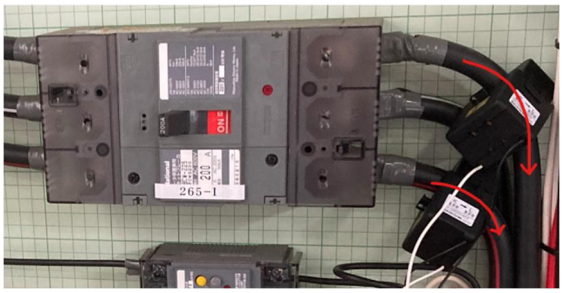
Single-phase two-wire	Single-phase three-wire
 Connected to R(L1) 	 Connected to R(L1) and T(L2) 
Three-phase three-wire system	**Three-phase four-wire system**
 Connected to R(L1) and T(L2) 	 All connected 

Install the current sensor as follows, paying attention to the polarity.

- ●The current sensor connected to R(L1) should be clamped to the R-phase wire.
- ●The current sensor connected to S should be clamped to the S-phase wire.
- ●The current sensor connected to T(L2) should be clamped to the T-phase wire.

Product Connection

The following is an example of a three-phase, three-wire connection. (The polarity of the current sensor must match the direction of the red arrow.)



CAUTION

Connect current sensors with insulated gloves, etc.

Install with caution to avoid electric shock.

2. USB cable connection
Connect the USB cable (Type-C) to the power supply unit.

Precautions for installation

●The installation and wiring of this product must be performed by personnel who hold the required qualifications or sufficient expertise, in accordance with the laws and regulations of each country or region.

●This product is, in principle, recommended to be installed inside the distribution board.

●When working near live parts(※1), turn off the power supply for safety before starting work.

●Make sure the main unit is placed and secured so that it does not come into contact with live parts.

●When installing the main unit at a height exceeding 2 meters, please implement fall-prevention measures, such as securing the USB power cable or the current sensor connection cable.

●Be sure to attach the current sensor to a wire covered with an insulating material (minimum insulation thickness: 0.4 mm or more).

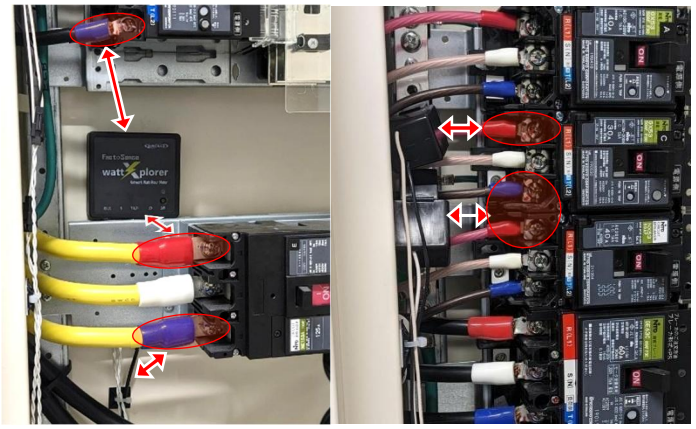
●Install the current sensor according to the following conditions depending on the voltage of the wire to be clamped.

○Ground voltage 300V or less
Insulation withstand voltage performance of electric wires(※2) : 6kV or higher
Distance from live part to installed object(※3) : 6.4mm or more

○Ground voltage 300V or more, 600V or less
Insulation withstand voltage performance of electric wires(※2) : 8kV or higher

※1: Live part: Parts such as metal parts including insulating sleeves to which voltage is applied while energized.

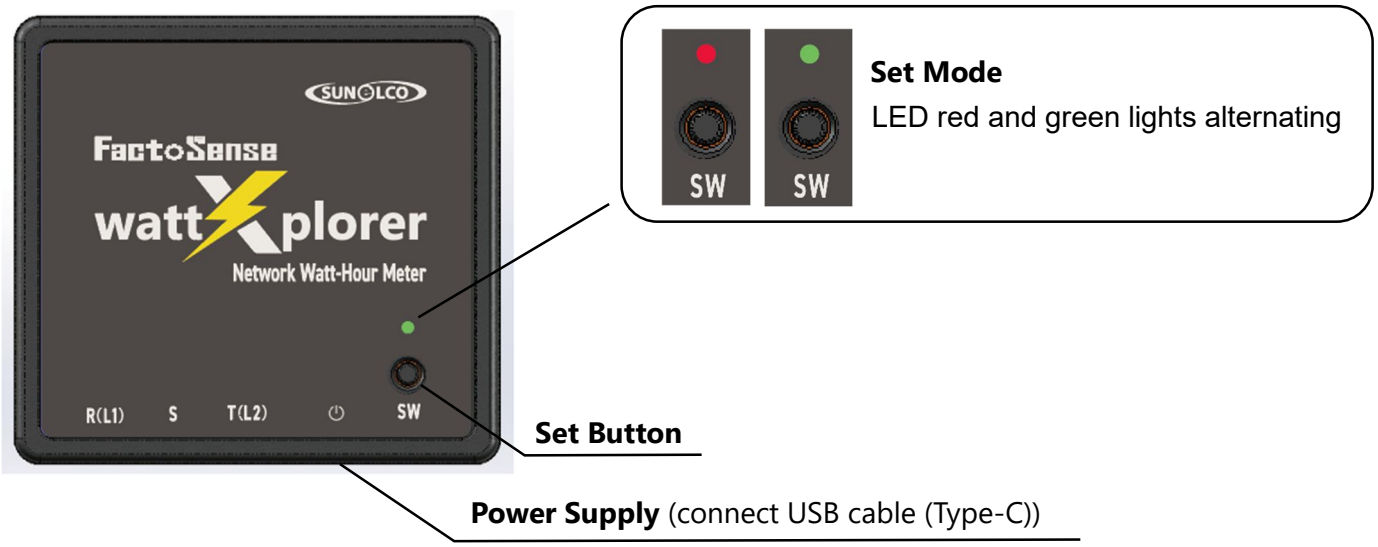
※2: If the insulation withstand voltage rating of the electrical wire is insufficient, wrap the electrical wire completely with insulating tape (3M epoxy film tape Super10) so that there are no gaps, overlapping the tape at least once, and attach and secure a current sensor on top of the insulating tape.



※3: Equipment: wattXplorer main unit, current sensor (including cable), USB cable

Setup Procedure
～Configuration～

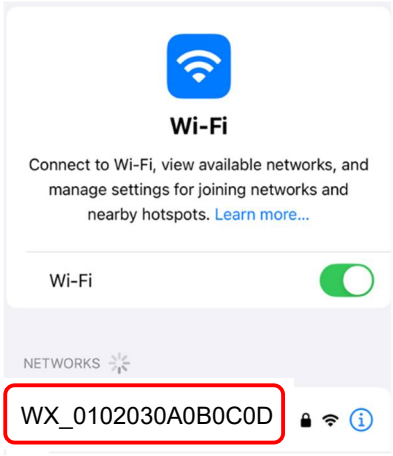
1. Insert the USB cable (Type-C) into the power supply section of the product.
   Immediately after startup, the LEDs will light up in the order of red, then green,
   After confirming that the light is on, press and hold the setting button for 2 seconds.
   The red and green LEDs light up alternately and the product operates in the setting mode.



2. Open the Wi-Fi settings screen on your cell phone or PC and select the following ID from the list of networks.

   SSID

   WX_(Device ID on the back of the product)
   (e.g.) If the device ID is 01:02:03:0A:0B:0C:0D, "WX_0102030A0B0C0D

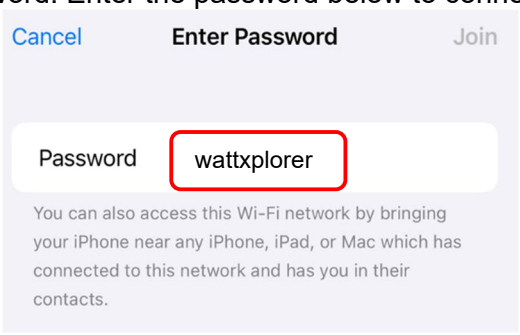


Stated on the back of the product

3. You will be asked for a password. Enter the password below to connect.

   Password

   wattxplorer

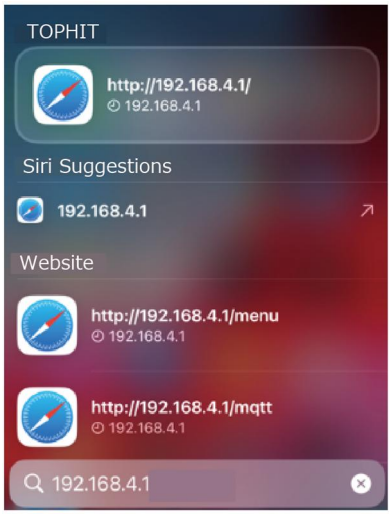


Setup Procedure
～Configuration～

4. After the connection is complete, launch your browser and enter the following IP address in the URL.

IP Address

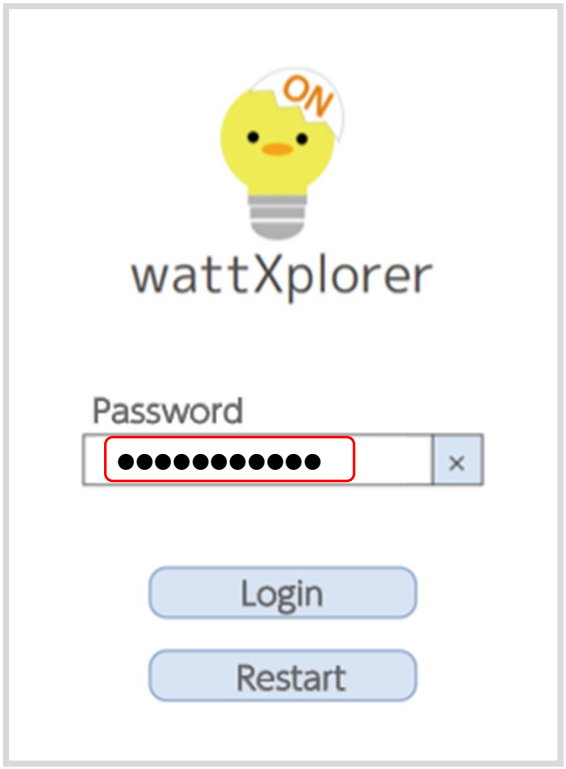
192.168.4.1



5. The login screen will appear. Please enter the following login password.

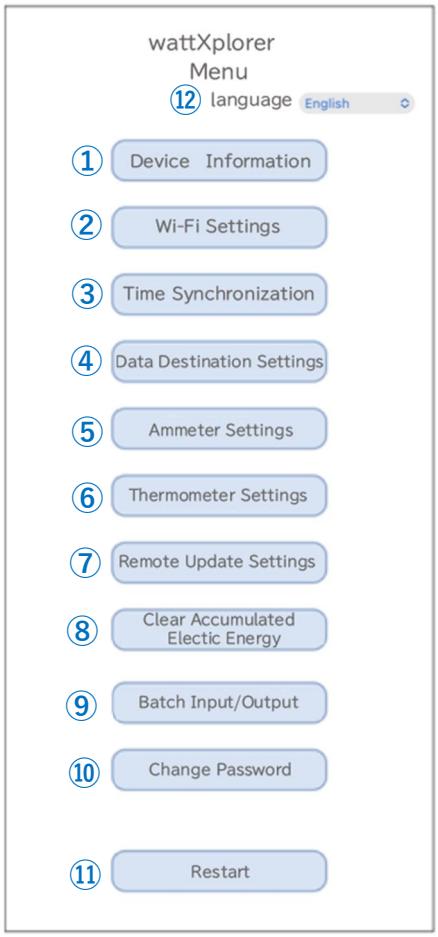
Login Password

wattxplorer



Screen Details
～Menu Screen～

This screen displays the menu.



①【Device Information】button..... Moves to the device information screen.

②【Wi-Fi Settings】button..... Moves to the Wi-Fi settings screen.

③【Time Synchronization】button..... Moves to the time synchronization screen.

④【Data Destination Settings】button..... Moves to the data destination settings screen.

⑤【Ammeter Settings】button..... Moves to the ammeter settings screen.

⑥【Thermometer Settings】button※..... Moves to the thermometer settings screen.

⑦【Remote Update Settings】button..... Moves to the Remote Update Settings screen.

⑧【Clear Accumulated Electric Energy】button..... Moves to the Clear accumulated electric energy screen.

⑨【Batch Input/Output】button..... Moves to the batch input/output screen.

⑩【Change Password】button..... Moves to the Change Password screen.

⑪【Restart】button..... Moves to the Restart screen.

⑫【language】button..... Language selection list. Display in the selected language.

- **The menu marked with ※ is only available for thermocouple options.**
- **The contents displayed on the screen may differ depending on the software version.**
- **Red asterisks (*) in each menu item indicate required fields.**

Screen Details
～Device Information Screen～

This screen displays device information.

Menu Screen

Device Information Screen

①Product Name

②Software Version

This is the soft version of the product.

③Device ID

Device ID of the product.

④Manufacturer

⑤【Menu】button

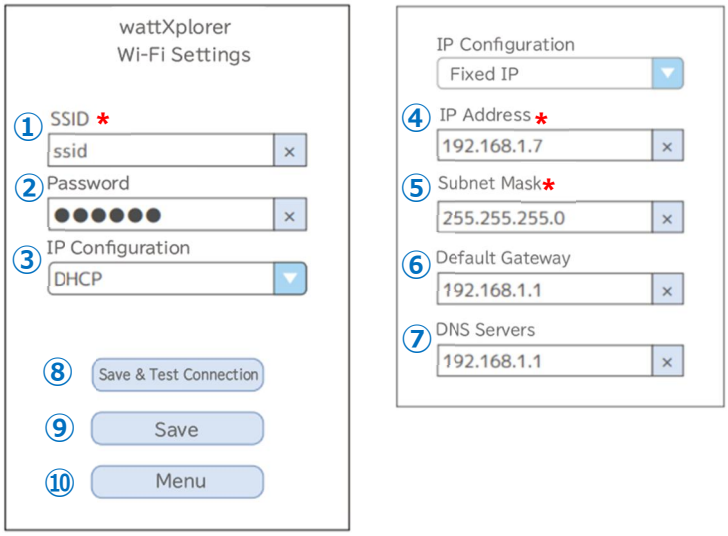
Moves to the menu screen.

Screen Details
～Wi-Fi Settings Screen～

This screen allows you to set the Wi-Fi access point.

Menu Screen

Wi-Fi Settings Screen



①SSID

Enter the SSID of the Wi-Fi access point. (2.4GHz only)

②Password

Enter the password for the Wi-Fi access point.

③IP Configuration

IP configuration (DHCP/fixed IP address) (Default: DHCP)

※**DHCP**→Automatically assigns an IP address when connecting to a network for communication.

Fixed IP address→ Always assigns the same IP address even if you reconnect to the network.

④IP Address

Enter the IP address when selecting a static IP address.

⑤Subnet Mask

Enter the subnet mask for the fixed IP address selection.

⑥Default Gateway

Enter the gateway for the static IP address selection. (Optional)

⑦ DNS Servers

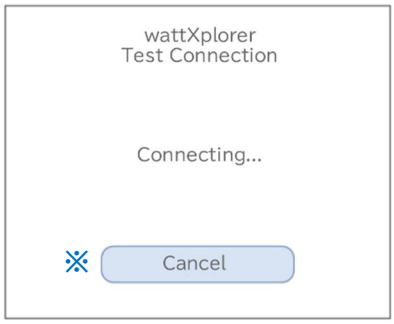
Enter the DNS server for the static IP address selection. (Optional)

Screen Details
～Wi-Fi Settings Screen～

⑧ 【Save & Test Connection】button

Saves the current settings.
The test connection screen is displayed and attempt to connect to the Wi-Fi access point.

Test connection Screen

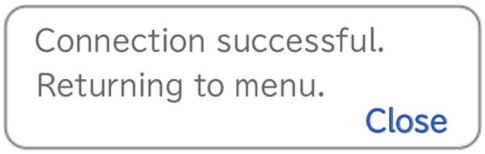


※【Cancel】button

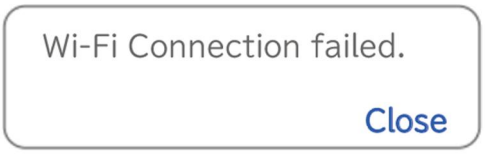
Interrupts the test connection and transitions to the previous screen.

Displays connection results (success/failure) message and moves to the menu screen if the connection is successful.

On successful connection



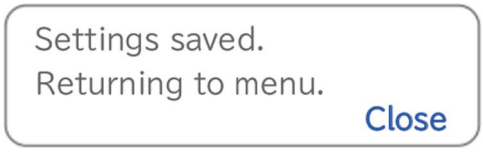
In case of connection failure



⑨【Save】button

Saves the current settings and displays the saved results.

On successful save



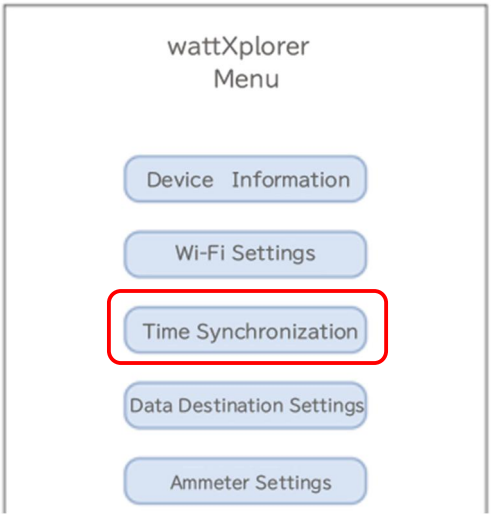
⑩ 【Menu】button

Moves to the menu screen.

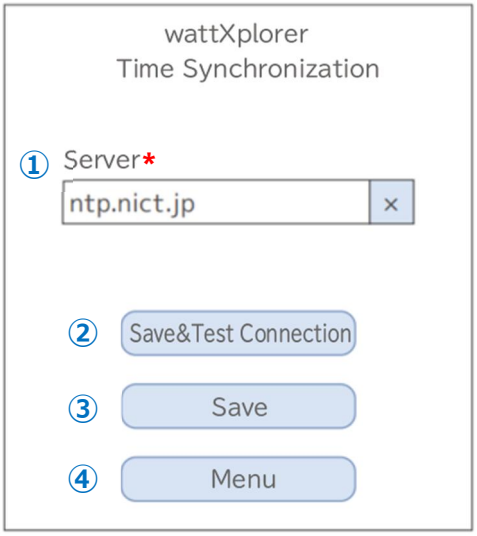
Screen Details
～Time Synchronization Screen～

This screen allows you to set the NTP server to which the time will be synchronized.

Menu Screen



Time Synchronization Screen



① Server

Enter the URL of the NTP server.
If not otherwise specified, enter "ntp.nict.jp".

②【Save & Test Connection】button

Saves the current settings.
Attempts to synchronize time with NTP server and displays connection results (success or failure).

③【Save】button

Saves the current settings and displays the saved results.

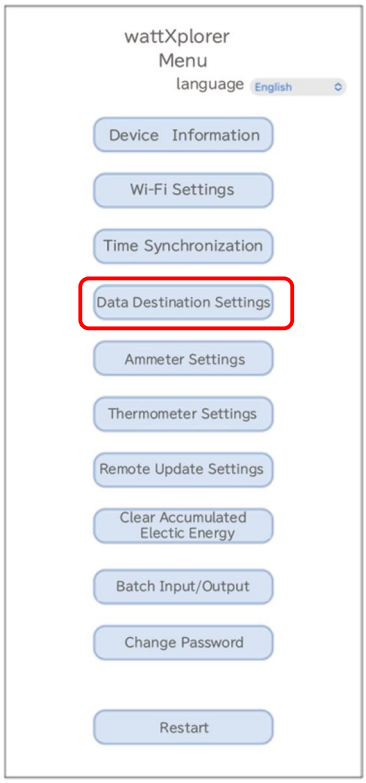
④【Menu】button

Moves to the menu screen.

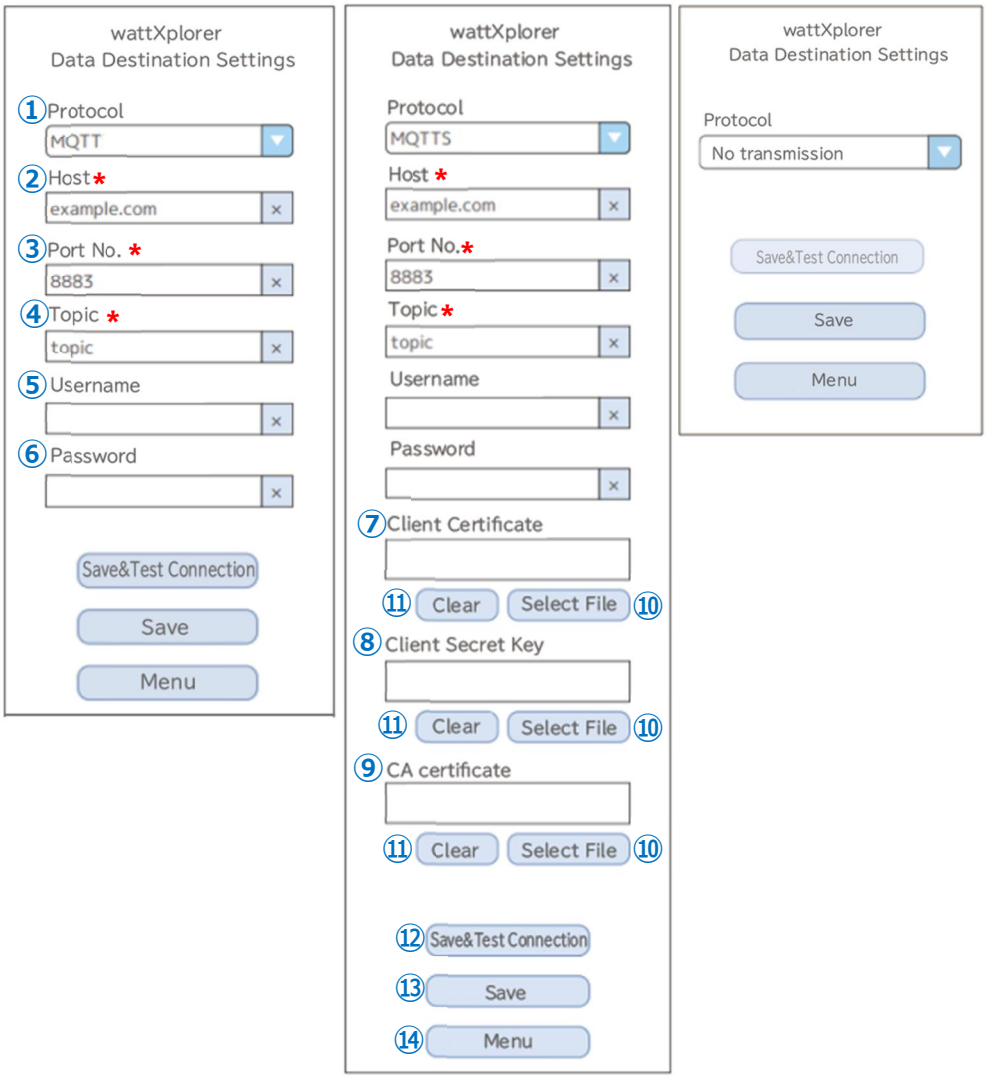
Screen Details
～Data Destination Settings Screen～

This screen allows you to set the destination of data.

Menu Screen



Data Destination Settings Screen



Screen Details
～Data Destination Settings Screen～

①Protocol

Select the protocol. (Default: MQTTS)

Protocol ※	Contents
No transmission	No MQTT transmission
MQTT	TCP connection
MQTTS	SSL/TLS connection

※If only Modbus/TCP is used ,set to “No transmission”.

②Host

Enter the hostname of the MQTT broker.

③Port No.

Enter the port number of the MQTT broker. (Default: 8883)

④Topic

Please enter an MQTT topic. (1 to 256 characters, only alphanumeric characters and the following half-width symbols(_ - / .) are allowed.(Default: kyokko/gx/watt/v1)

⑤Username

Please enter your username for password authentication. (optional)

⑥Password

Please enter your password for password authentication. (optional)

⑦Client Certificate

Enter the client certificate (*.crt / *.pem) for SSL/TLS connection. (Only when MQTTS is selected)

⑧Client Secret Key

Enter the client private key (*.key / *.pem) for SSL/TLS connection. (Only when MQTTS is selected)

⑨CA Certificate

Enter the CA certificate (*.crt /*.cer / *.pem) for SSL/TLS connection. (Only when MQTTS is selected)

⑩【Select File】button

You will be redirected to the file selection screen for each certificate.

⑪【Clear】button

Clears the contents of the target certificate file.

Screen Details
～Data Destination Settings Screen～

⑫【Save & Test Connection】button

Saves the current settings.
Attempts to connect to the MQTT broker and displays connection results (success/failure).

⑬【Save】button

Saves the current settings and displays the saved results.

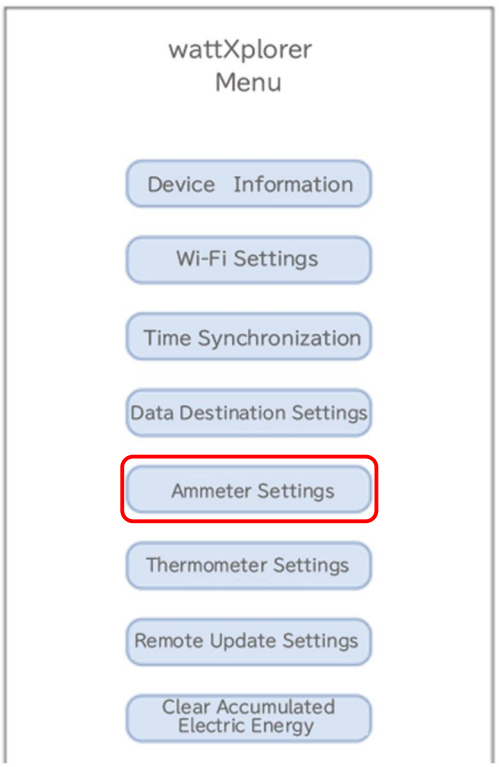
⑭【Menu】button

Moves to the menu screen.

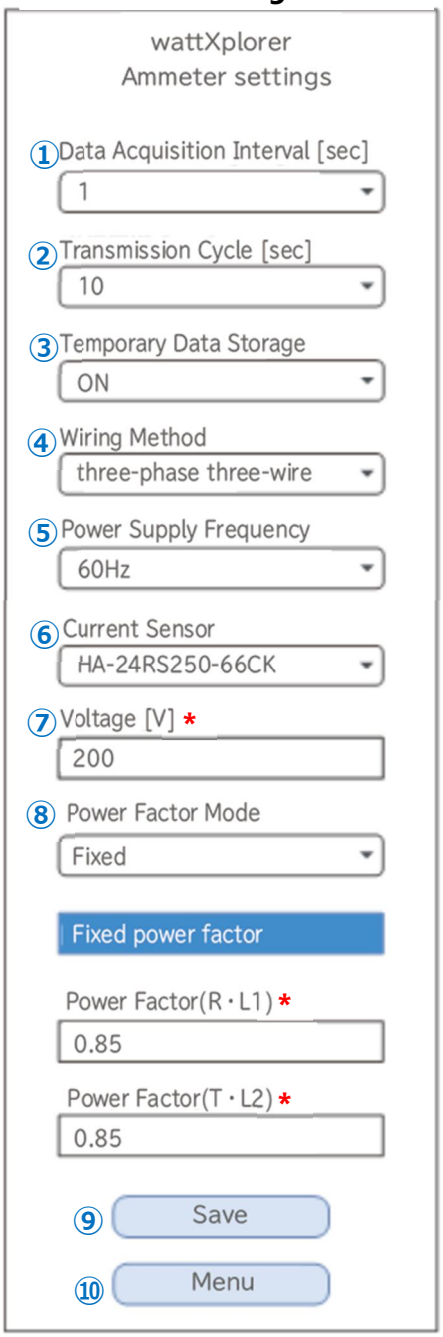
Screen Details
～Ammeter Settings Screen～

This screen is used to set current measurement information.

Menu Screen



Ammeter Settings Screen



①Data Acquisition Interval

Sets the aggregation interval for current measurement and power calculation.
(1/10/30/60sec) (default: 1)
If 10 is set, acquisition data for 10 seconds is combined into one and data is updated every 10 seconds.

②Transmission Cycle

Sets the cycle for sending (Publish) measurements to the MQTT broker.
(10/20/30/60sec) (default: 10)

Screen Details
～Ammeter Settings Screen～

③Temporary Data Storage

Enable or disable offline data buffering. (ON/OFF) (Default: ON)

④Wiring Method

Select the wiring method. (Single-phase two-wire / single-phase three-wire / three-phase three-wire / three-phase four-wire)
(Default : three-phase, three-wire)

⑤Power Supply Frequency

Set the power supply frequency. (50/60Hz) (Default: 60Hz)

⑥Current Sensor

Select the current sensor to be used. (Default: HA-24RS250-66CK)
Incorrect selections will result in incorrect measurements.

Current Sensor	Current ratio
HA-16RS100-33C	3000
HA-24RS250-66CK	3750
HA-36RS400-66CK	6000
HA-36RS600-66CK	9000

⑦Voltage

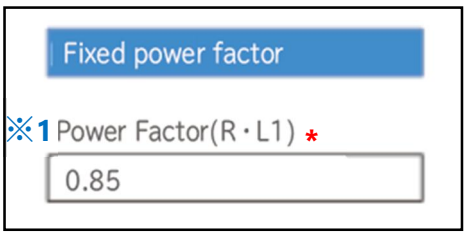
Enter voltage (60 to 600V) (default: 200)
This value is used to calculate power.

⑧Power Factor Mode

(Display differs depending on power factor mode)
Select the power factor mode. (Fixed/Learning) (Default: Fixed)
Learning mode is an optional feature that requires pre-measurement.

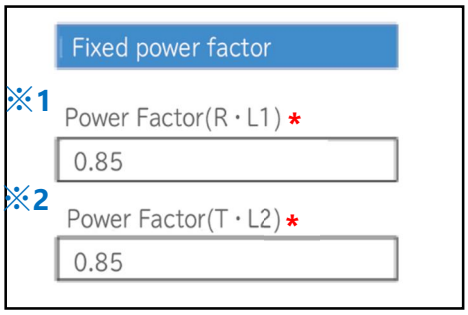
Enter the power factor when "Power Factor Mode = Fixed" is selected.
The power factor display for each phase switches depending on the wiring method.

Screen when wiring method= single-phase two-wire

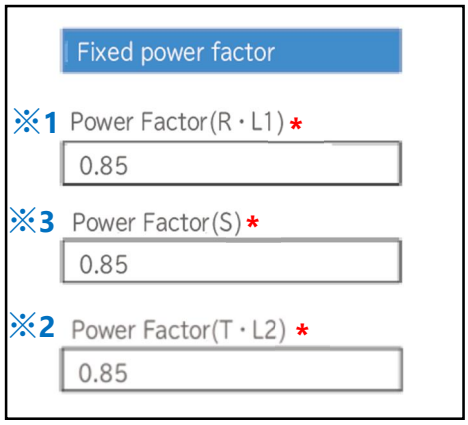


Screen Details
～Ammeter Settings Screen～

Screen when wiring method= single-phase three-wire/ three-phase three-wire



Screen when wiring method= three-phase four-wire



※1 Power Factor(R・L1)

Power factor of phase R (0.00~1.00) (default: 0.85)

※2 Power Factor(T・L2)

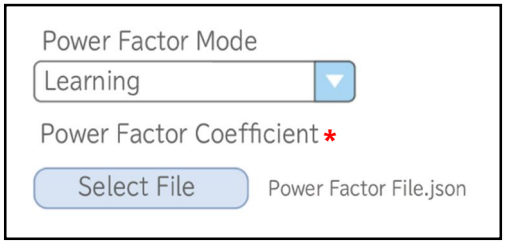
Power factor of phase T when selecting wiring method. (single-phase three-wire/ three-phase three-wire/ three-phase four-wire)
(0.00~1.00) (default: 0.85)

※3 Power Factor(S)

Power factor of phase S when selecting three-phase four-wire (0.00~1.00) (default: 0.85)

When "Power Factor Mode = Learning" is selected, please select the file generated by the optional function. (*.json)

Screen when power factor mode = learn is selected



Screen Details
～Ammeter Settings Screen～

⑨【Save】button

Saves the current settings and displays the saved results.

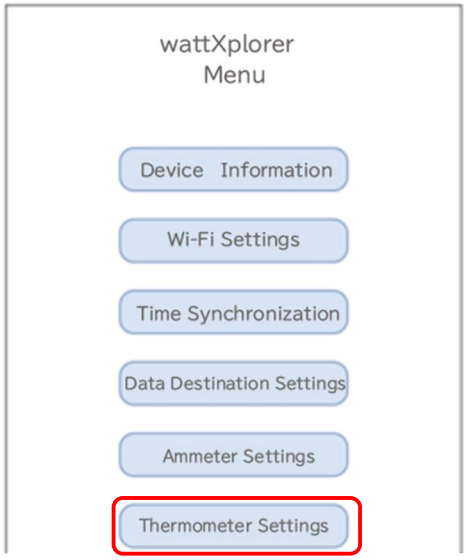
⑩【Menu】button

Moves to the menu screen.

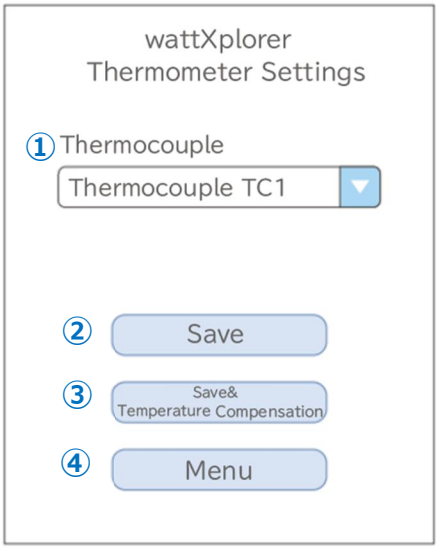
Screen Details
～Thermometer Settings Screen※～

This screen is for setting thermometer information.
This is a setting screen exclusively for optional products.

Menu Screen



Thermometer Settings Screen



①Thermocouple

Select the thermocouple channel to be measured.
Compatible only with K thermocouples. (Default: None)
※K thermocouples length should be less than 30m.

Value	Description
None	No temperature measurement using thermocouples
Thermocouple TC1	Temperature measurement with thermocouple TC1
Thermocouple TC1&TC2	Temperature measurement with thermocouples TC1 and TC2

②【Save】button

Saves the current settings and displays the saved results.

③【Save & Temperature Compensation】button

Saves the settings and moves to the thermometer calibration screen.

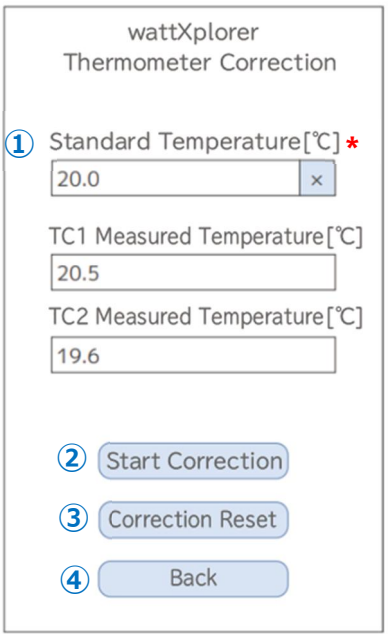
④【Menu】button

Moves to the menu screen.

Screen Details
～Thermometer Correction Screen※～

This screen is used to correct the thermocouple measurement temperature with respect to the reference thermometer.
The thermocouple selected on the thermometer setting screen is the target of correction.

Thermometer Correction Screen



① Standard Temperature

Enter the temperature of the reference thermometer. [°C].
TC1 (TC2) measured temperature [°C] displays the temperature currently being measured.

②【Start Correction】button

A confirmation message will be displayed. Perform temperature compensation as necessary.
When temperature compensation is completed, the corrected measured temperature is displayed.

③【Correction reset】button

A confirmation message will appear. Reset the temperature compensation value if necessary.

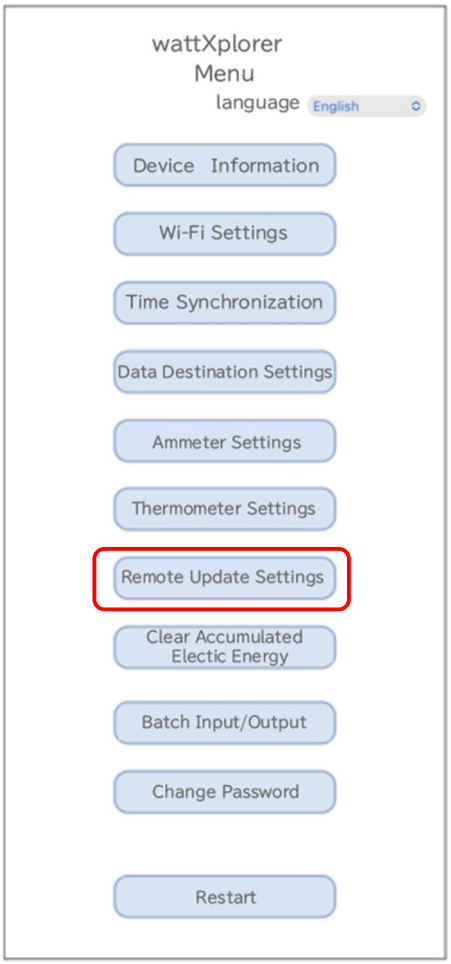
④【Back】button

Moves to the thermometer setting screen.

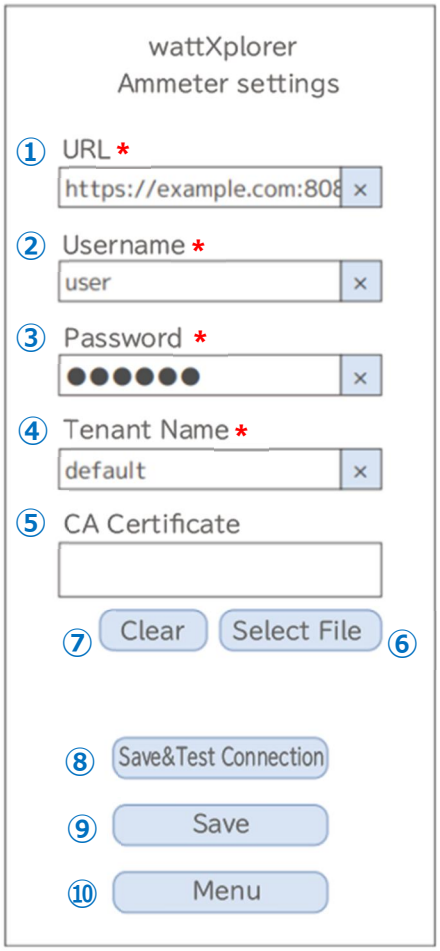
Screen Details
～Remote Update Settings Screen～

This screen is used to configure the update server settings. This product can automatically update software by placing the latest software on the designated update server.

Menu Screen



Remote Update Settings Screen



①URL

Enter the URL of the update server. (optional)
(e.g.) https://example.com:8080

②Username

Enter the login username for the update server. (optional)

③Password

Enter the login password for the update server. (optional)

④Tenant Name

Enter a tenant name. (default: default) (optional)

Screen Details
～Remote Update Settings Screen～

⑤CA Certificate

Enter the CA certificate for the update server. (optional)

⑥【Select File】button

Displays the file selection screen (*.crt /*.cer /*.pem).
If a file is selected, the contents of the file are displayed.

⑦【Clear】button

Clear the contents of the certificate.

⑧【Save & Test Connection】button

Saves the current settings.
Attempts to connect to the update server and displays the connection result (success or failure).

⑨【Save】button

Saves the current settings and displays the saved results.

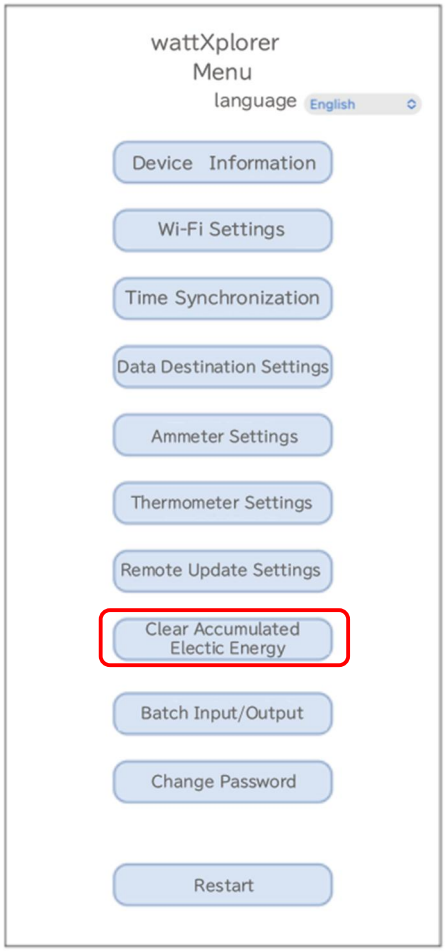
⑩【Menu】button

Moves to the menu screen.

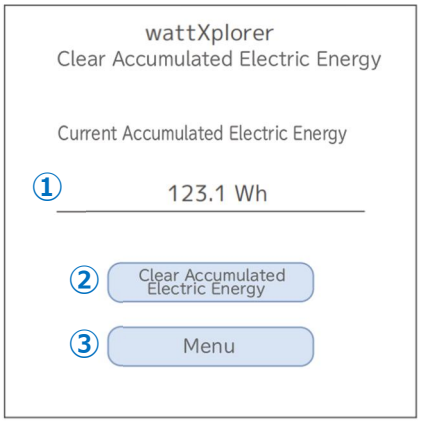
Screen Details
～Clear Accumulated Electric Energy Screen～

This screen allows you to clear the accumulated electric energy.

Menu Screen



Clear Accumulated Electric Energy Screen



①Current Accumulated Electric Energy

②【Clear accumulated Electric Energy】button

A confirmation message will be displayed, so please clear the accumulated electric energy if necessary.

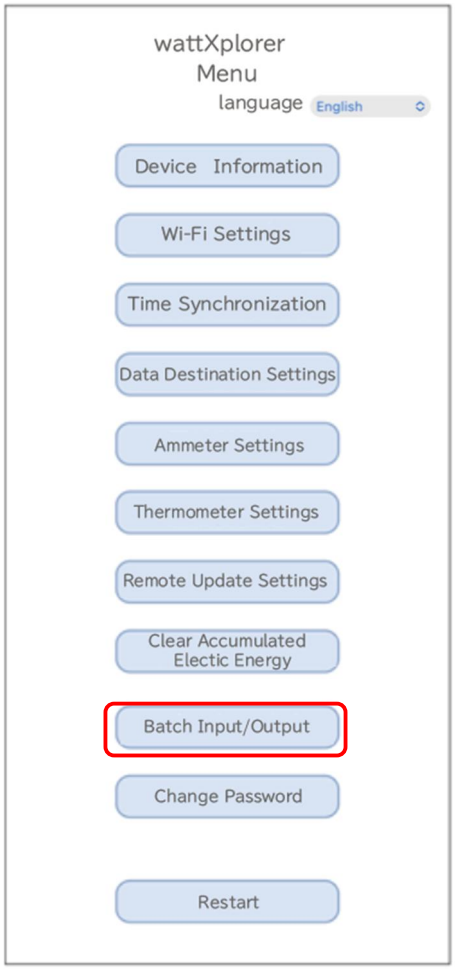
③【Menu】button

Moves to the menu screen.

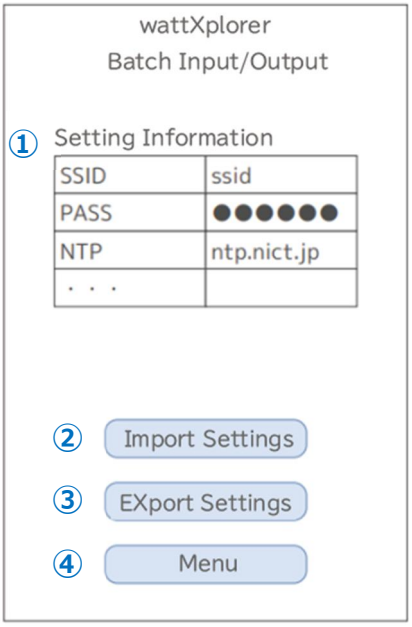
Screen Details
～Batch Input/Output Screen～

Import/export configuration information screen.
The information configured in the first unit can be saved as a file by pressing the "Export Settings" button.
For the second and subsequent devices, the same settings can be immediately applied by " Import Settings", greatly reducing setup time.

Menu Screen



Batch Input/Output Screen



①Setting Information

Information on the current settings is displayed.
- ・SSID of Wi-Fi access point
- ・Wi-Fi access point password
- ・NTP server URL
- ・URL to connect to MQTT
- ・Power measurement aggregation interval
- ・Transmission cycle of measured values
- ・Wiring method
- ・Power supply frequency
- ・Current sensor
- ・Voltage
- ・Power factor (power factor/power factor coefficient file name)
- ・Thermocouple mode

Screen Details
～Batch Input/Output Screen～

②【Import Settings】button

Displays the file selection screen (*.json).
If a file is selected, the contents of the file are imported and the results are displayed.

③【Export Settings】button

Saves the current settings to a file. (Default file name: settings.json)

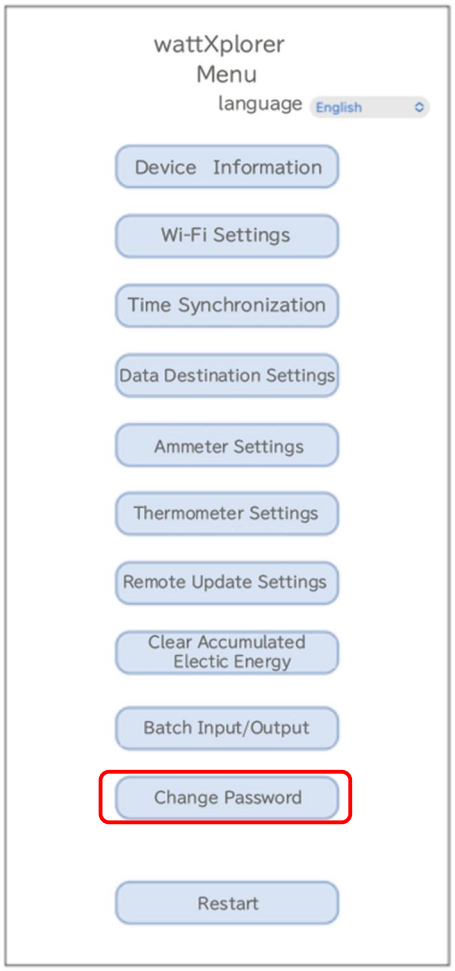
④【Menu】button

Moves to the menu screen.

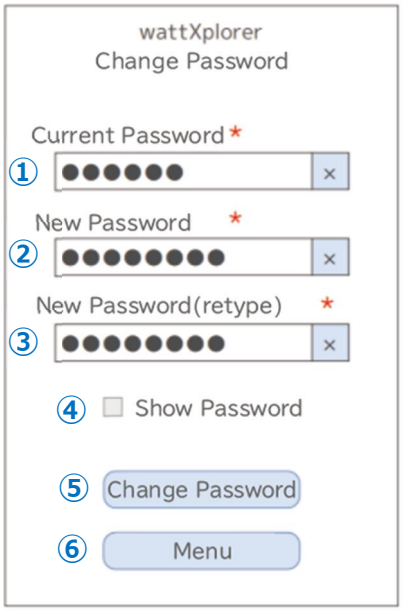
Screen Details
～Change Password Screen～

This screen allows you to change your login password.

Menu Screen



Change Password Screen



①Current Password

Please enter your current login password.

②New Password

Please enter your new login password. (8-32 characters)

Characters that can be used in passwords

Characters	Description
Upper-case alphabetics	【A-Z】 (26characters)
Alphabetic	【a-z】 (26characters)
Numbers	【0-9】(10 characters)
Symbols	! # $ % ( ) , * + - . / < = > ? @ [ ] ^ _ { } | ~ (25characters)

③New password (retype)

Please enter your new login password.

Screen Details
～Change Password Screen～

④【Show Password】check box

If checked, the password is displayed.

⑤【Change Password】button

Change the login password to the new password.
It is not possible to change the password to the same password as the current one.

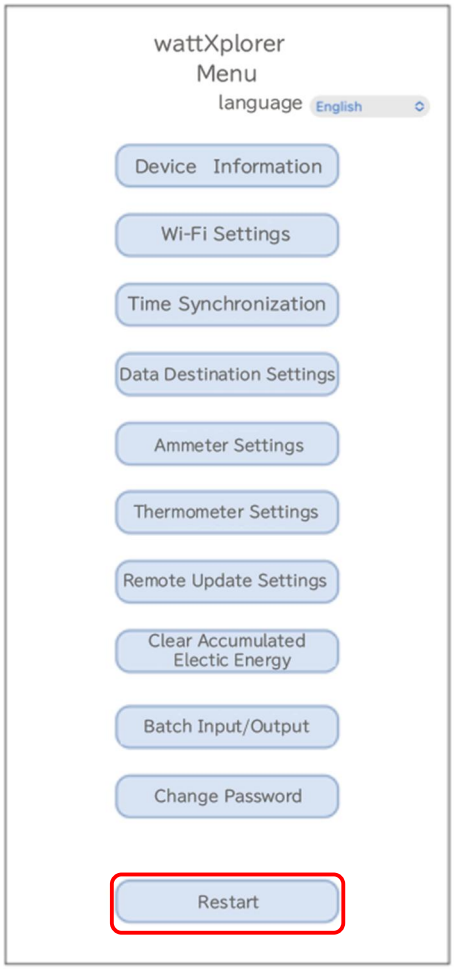
⑥【Menu】button

Moves to the menu screen.

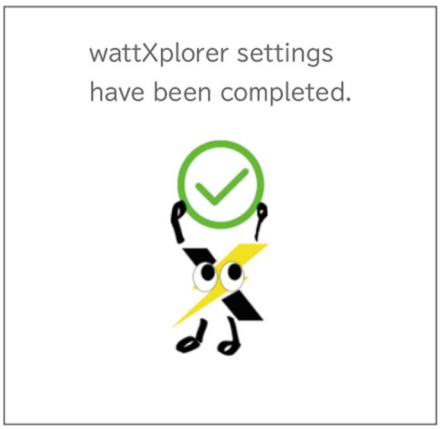
Screen Details
～Restart Screen～

This screen is for stopping the web server and self-resetting the device.

Menu Screen



Restart Screen



Feature
～MQTT Transmission～

MQTT transmission (publish) of measured power at each data transmission cycle.

●If communication with the MQTT broker is interrupted, it will automatically attempt to reconnect.

●In the event of a network error or other failure to send data, a maximum of 300 items (for 5 minutes at a data acquisition interval of 1 second) will be sent.
Holds data to be sent and sends them sequentially as soon as they are ready to be sent.

Feature
～LED Lighting Operation～

The green LED blinks when the power is turned on with various settings for Wi-Fi, NTP, and MQTT.
When the green LED is blinking, a network connection is being attempted.
Switches to green light status when network connection is successfully established. (※1)

LED output	Condition	Remarks
Red → Green Flashing	Immediately after startup	Only once immediately after startup
Flashing green(※2) (0.5 second cycle)	wireless connection attempt	Attempting Wi-Fi, NTP, and MQTT connections
Lights green (※1)	normal operation	
Flashing red	error	Various settings are not set
Flashing green/red alternately (0.5 second cycle)	Setup mode	
Flashing green (0.25 second cycle)	Software update	Remote software update in progress
Flashing green/red alternately (0.25 second cycle)	factory reset Standby.	

※1. Green LED is turned off for 250ms when sending MQTT
※2. The light blinks green when any of the settings have been made and no connection has been made. If the setting is not made, it will blink red, which is an error condition.

Feature
～Modbus/TCP Server～

Running a Modbus/TCP server to provide readout functions such as accumulated power.
(See attached "wattXplorer Communication Specifications")

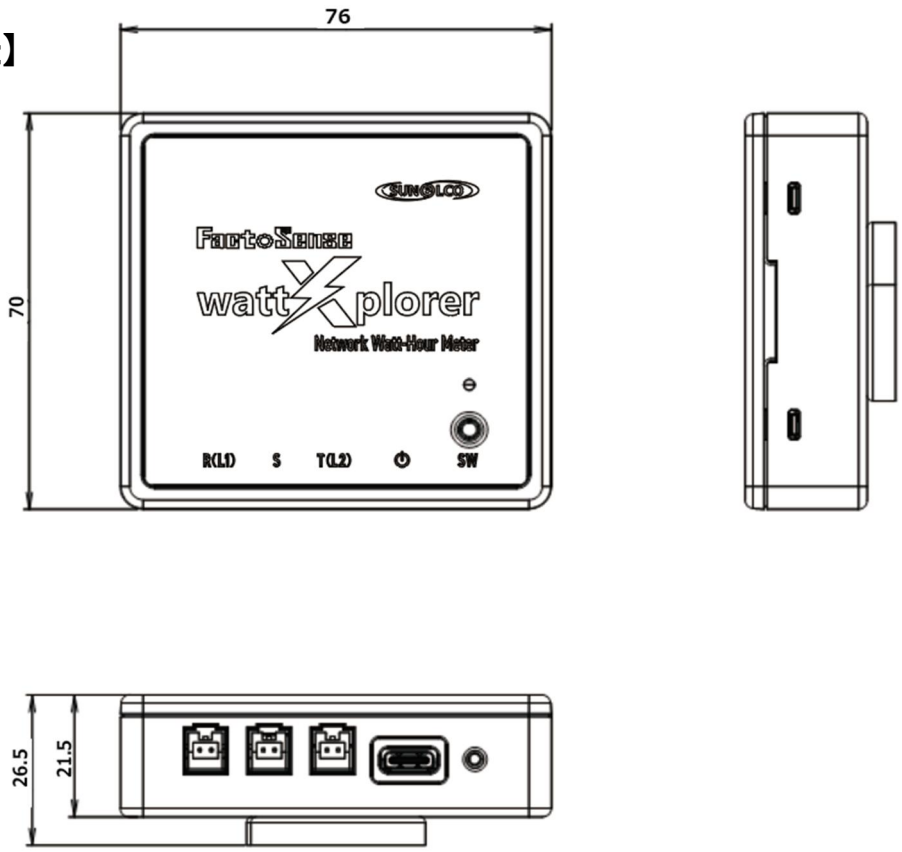
Feature
～Factory Reset～

Initializes various settings and accumulated power and returns to factory defaults.

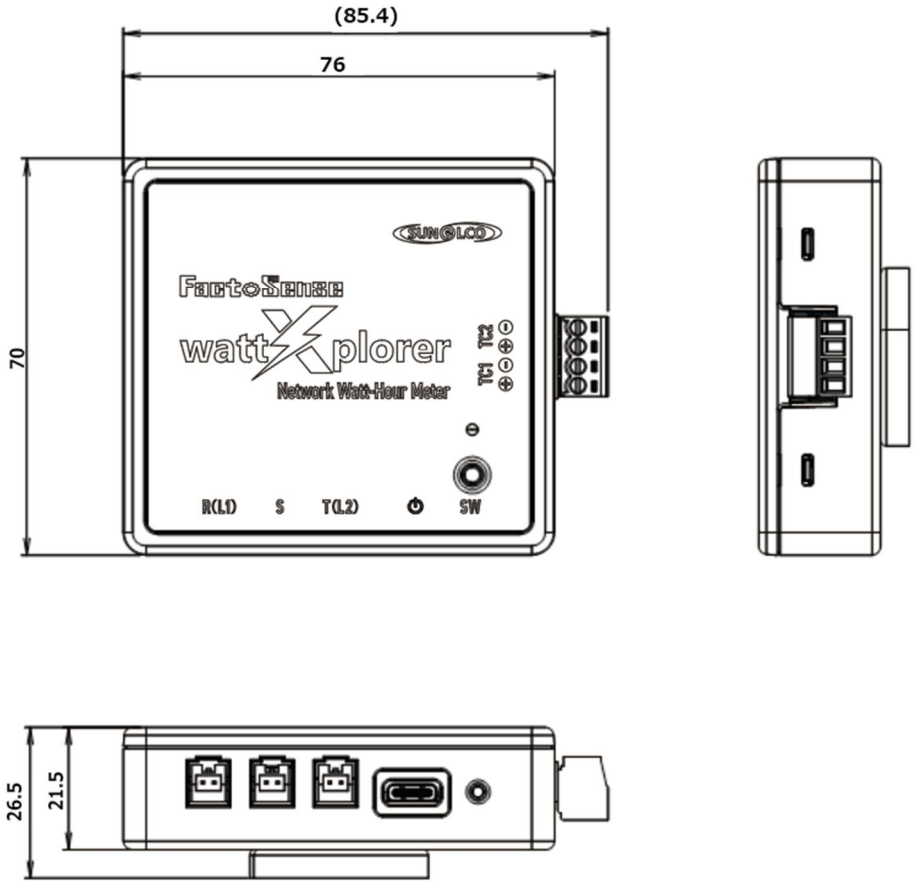
●When the USB Type-C is inserted with the setting button pressed, the LED turns red.
If the setting button is held down for more than 5 seconds, the LED will start blinking alternately in green and red.
Releasing the setting button in this state will execute a factory reset.

External Dimensions

【Main Unit】 (mm)

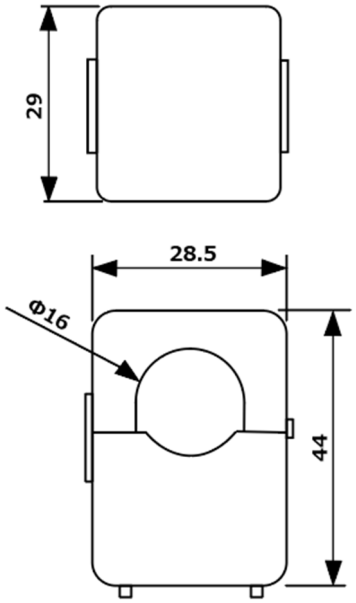


【Main Unit (optional thermocouple)】

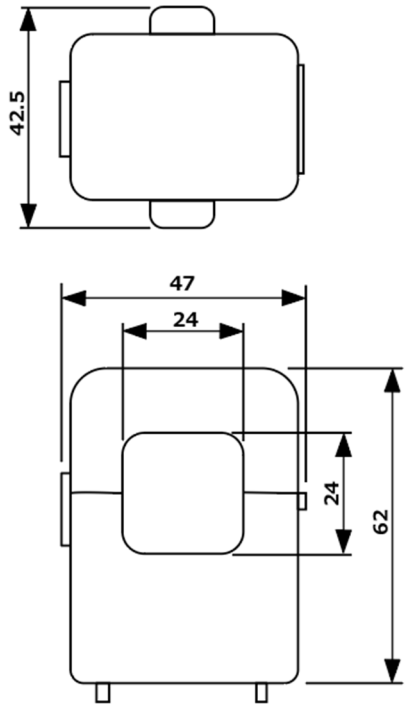


External Dimensions

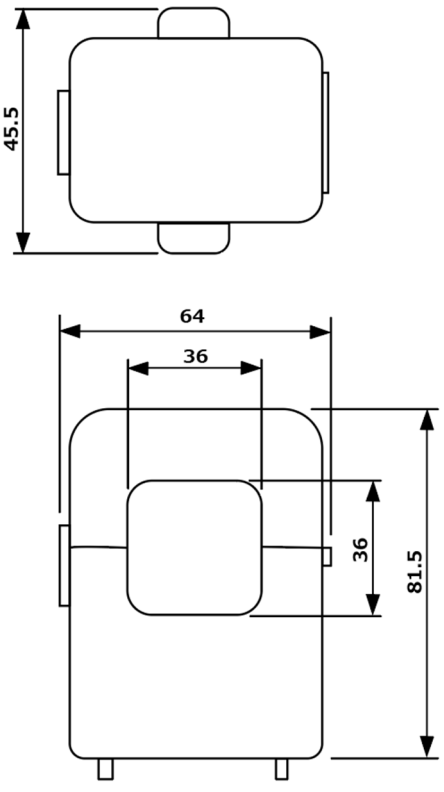
【Current Sensor】 (mm)



HA-16RS100-33C



HA-24RS250-66CK



HA-36RS600-66CK
HA-36RS400-66CK

Product Specifications

■Specifications & Performance

Power (button on TV, etc.)	5V (USB-Type C)
Measurable Current	0.1 to 600Arms 50Hz/60Hz
Operating Temperature and Humidity	-10 to +55°C Up to 85% RH, no condensation
Location of Use	Indoors
Correspondence Connection	1P2W, 1P3W, 3P3W, 3P4W
Object of Measurement	Alternating Current
Current Measurement Error	±1%F.S.± 1digit at 25°C (excluding current sensor error)
Communication Interface	Wi-Fi (IEEE 802.11 b/g/n 2.4GHz) 2.402 ~ 2.482GHz +19.5dBm(typical, in 802.11b mode,1Mbps~11Mbps) +18.0dBm(typical, in 802.11g mode, 6Mbps) +14.0dBm(typical, in 802.11g mode, 14Mbps) +18.0dBm(typical, in 802.11n mode, HT20,MCS0) +13.0dBm(typical, in 802.11n mode, HT20,MCS7) +18.0dBm(typical, in 802.11n mode, HT40,MCS0) +13.0dBm(typical, in 802.11n mode, HT40,MCS7)
Communication Protocol	MQTT QoS1, Modbus/TCP
Data Acquisition Interval	1 / 10 / 30 / 60 sec.
Data Transmission Interval	10 / 20 / 30 / 60 sec.
Power Consumption	1.0W or less
Mass	90 g (main unit only)
Mounting Method	Magnet
Display and Operation Methods	LED, setting switch, reset switch
Vibration Resistance	Constant amplitude: 3.5mm, constant acceleration: 9.8m/s^2 Sweep,1 octave/min 10 sweep cycles in each of the 3 axes
Electromagnetic Environment	JIS C 61000-4-2, JIS C 61000-4-3 JIS C 61000-4-4, JIS C 61000-4-6 JIS C 61000-4-8, CISPR32

Model used in the test (for reference)
Cable: MPA-AC30NWH
USB adapter: ACA-IP70W,A1385

Warranty

■Warranty conditions

●Warranty period is 1 year after purchase.
●If a fault occurs within the warranty period due to our responsibility, we will replace or repair the faulty part at our discretion, free of charge.
However, this does not include installation costs, construction costs, or other costs not related to this product.

■Disclaimer of Warranty

●The warranty the does not cover following cases
1. When used outside of product specifications.
2. When the failure is caused by reasons other than this product.
3. When the product has been modified or repaired by a party other than our Company.
4. In the event of a natural disaster, etc.
5. When the failure or damage is caused by relocation, transportation, dropping, etc. after purchase.
6. When this product is handled without following this instruction manual.

■Other

●Our company shall not be held responsible for any losses or damages incurred in relation to this product.
●The purchase price does not include the cost of engineer support or service costs. If you require attendance at installation, trial operation, maintenance inspections, technical guidance, or testing or inspection as specified by the customer, we will charge a separate fee.