Panasonic®

# KW2M-A/KW2M-X
# Eco-POWER METER
# User's Manual

WUME-KW2MA-04

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# Cautions for Your Safety

Read the manual carefully before installing, running and maintenance for proper operation. Before using, master the knowledge of the equipment, safety information and all of other notes. This manual uses two safety flags to indicate different levels of danger.

**⚠ WARNING** A handling error could cause serious physical injury to an operator and in the worst case could even be fatal.

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. In the USA, see NFPA 70E.
- Always take precautions to ensure the overall safety of your system, so that the whole system remains safe in the event of failure of this product or other external factor.
- Do not use this product in areas with inflammable gas. It could lead to an explosion.
- Exposing this product to excessive heat or open flames could cause damage to the lithium battery or other electronic parts.
- Do not open the secondary side of CT during power on the primary side current. It might cause electric shock or CT breakdown.

**⚠ CAUTION** A handling error could cause serious physical injury to an operator or damage to the equipment.

- To prevent abnormal exothermic heat or smoke generation, use this product at the values less than the maximum of the characteristics and performance that are assured in these specifications.
- Do not dismantle or remodel the product. It could lead to abnormal exothermic heat or smoke generation.
- Do not touch the terminal while turning on electricity. It could lead to an electric shock.
- Use the external devices to function the emergency stop and interlock circuit.
- Connect the wires or connectors securely. The loose connection might cause abnormal exothermic heat or smoke generation.
- Do not allow foreign matters such as liquid, flammable materials, metals to go into the inside of the product. It might cause exothermic heat or smoke generation.
- Do not undertake construction (such as connection and disconnection) while the power supply is on.
- Never remove the terminal block under applying current to load. It might cause electric shock or CT breakdown.
- Do not use at secondary side circuit of inverter. It might cause exothermic heat or damage.

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## Introduction

Thank you very much indeed for purchasing KW2M Eco-POWER METER.
In this manual, we explain the usage of KW2M Eco-POWER METER in detail.
Please use it correctly after understanding the content enough.

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# Cautions before using

## ■ About this product

**Eco-POWER METER is designed chiefly to manage saving energy.**
**It is neither nor can it be legally used for billing.**

## ■ Installation environment

**◇Do not use the Unit in the following environments.**

- ・Where the unit will be exposed to direct sunlight and where the ambient temperature is outside the range of -10 to 50 °C.
- ・Where the ambient humidity is outside the range of 30 to 85 % RH (at 20°C), non-condensing and where condensation might occur by sudden temperature changes
- ・Where inflammable or corrosive gas might be produced
- ・Where the unit will be exposed to excessive airborne dust or metal particles
- ・Where the unit will be exposed to water, oil or chemicals
- ・Where organic solvents such as benzene, paint thinner, alcohol, or strong alkaline solutions such as ammonia or caustic soda might adhere to the product
- ・Where direct vibration or shock might be transmitted to the product, and where water might wet the product
- ・Where the place near high-voltage cable, high-voltage device, power line, power device.
- ・Where the place near a machinery with transmission function such as amateur radio.
- ・Where the place near a machinery which occurs the big switching serge

**◇Please use the Unit according to the specifications described in this manual. Otherwise, it may malfunction or cause fire and an electric shock.**

- ・Connect to the power supply in compliance with the rating.
- ・Refer to the wiring diagram to ensure proper wiring for the power supply, input and output.
- ・Use the wire that conforms to the rated current.
- ・Do not perform wiring or installation with a live line. It may also lead to circuit burnout or fire by way of the secondary CT side opening.

## ■ Installation

- ・Eco-POWER METER is designed to be used in a control panel.
- ・If the additional noise effects the power supply line, incorrect measurements may result.
- ・Installation and wiring must be performed by expert personnel for electrical work or electric piping.
- ・Do not add an excess power to the display. It might break the inner liquid crystal.
- ・Although the case is made from fireproof resin, do not mount it next to flammable materials. Also, avoid placing it directly on top of materials that catch fire easily.

## ■ As to measurement

- ・If there is some distortion by harmonic or waveform, it may not measure correctly. Please check with the actual system before adopts it.
- ・It might not measure an instantaneous current such as an inrush current or an welding machine.
- ・When measuring the below loads, it might not satisfy with the accuracy guarantee.
  Out of rating current, Load with low power factor,
  Load with winding current, Load with ferromagnetic field
- ・Power factor operation is a method assuming balanced load. The error might be big when it measures unbalanced load.
- ・If the voltage to be measured is not the rated frequency (commercial frequency), it may take time to stabilize THD (total harmonic distortion).

## ■ Static electricity

- ・Discharge static electricity touching the grounded metal etc. when you touch the unit.
- ・Excessive static electricity might be generated especially in a dry place.

## ■ Cleaning

・Wipe dirt of the main unit with soft cloth etc. When thinner is used, the unit might deform or be discolored.

## ■ Power supply

・Connect a breaker to the voltage input part for safety reasons and to protect the device.
The breaker that connects to the voltage input part must arrange at the position easily reached, and display shows it is the breaker of the equipment.

・Do not turn on the power supply or input until all wiring is completed.

## ■ Before power on

Please note the following points when turning on power at the first time.

・Confirm there are neither wiring rubbish nor especially an electrical conduction when installed.

・Confirm neither the power supply wiring, the I/O wiring nor the power-supply voltage are wrong.

・Tighten the installation screw and the terminal screw surely.

・Use an electric wire applicable to the rated current.

## ■ Before change the setup

Set the password carefully.
In order to avoid unexpected change the settings, it can set password. However, if you forget the password you can't change the settings.
We recommend you to note the password when you set and change the password.

## ■ Precautions on using networks

This product supports various network connections therefore it is likely to be subject to the following security risks.

1. Leakage and outflow of information via this product
2. Illegal operation by third party with malicious acts
3. Interference and shut down by third party with malicious acts

It is recommended to take network security measures such as below for protecting against these risks under your responsibility.

・Use this product on the network that has been ensuring safety by using firewall

・Check and extermination against the infection of computer viruses and unauthorized program are you make sure that you have performed regularly

・To protect against unauthorized attacks, set the user name and password, and to limit the users who can log in.

・Restrict access by user authentication so that authentication information (user name, password) and network configuration information and equipment inside information is not leak on the network.

・Before you access this product via browser, close other windows.

・After you access this product via browser, close all browsers.

・Change password regularly.

・Do not install the place where it can be disassembled or remodeled easily.

We do not accept liability for the following cases.

1) Guarantee for any kind of damages to the things/products, caused by physical defects of the product.
2) When the other conditions than the ones specified in these specifications exist for handling, storage and transportation of the product after the delivery.
3) When damage is caused by the unpredictable phenomena with the technique that was practiced before the product delivery.
4) When damage is caused by natural disasters such as an earthquake, flood, fire, war and artificial disasters.
5) When necessary countermeasures are not taken to establish a system despite the precautions described in this specifications.

# Chapter 1 Unit's Outline

With KW2M Eco-POWER METER, electrical power (voltage, current, etc.), power factor, frequency, etc. are measured using AC voltage and AC current input via one of the following systems: single-phase two-wire system, single-phase three-wire system, three-phase three-wire system or three-phase four-wire system.
In addition, it measures harmonics and THD for power quality measurement.
Connecting the expansion unit to the main unit can measure up to 8-circuit (up to 24-circuit of single-phase 2-wire system). One unit can measure 2-circuit.

■**Eco-POWER METER is designed chiefly to manage saving energy. It is neither intended nor can it be legally used for billing.**

## 1.1 Model Number

| Model name | Model number |
|---|---|
| KW2M-A Eco-POWER METER Main unit (Standard type) | AKW263100A |
| KW2M-X Eco-POWER METER Main unit (Memory type) | AKW264100A |
| KW2M Eco-POWER METER Expansion unit (Power measurement) | AKW272100A |
| KW2M Eco-POWER METER Expansion unit (Multi analog input ) | AKW273230A |
| KW2M Eco-POWER METER Expansion unit (Digital I/O) | AKW274240A |

* It can't measure with only the Expansion unit. Be sure to use with connecting to main unit.

## 1.2 Firmware

●Combination software using the Expansion unit

| Expansion unit | AKW263100A firmware | AKW264100A firmware |
|---|---|---|
| AKW272100A (Power measurement) | Ver.1.00 or more | Ver.1.00 or more |
| AKW272100A Ver1.20 or more (with leakage current measurement) | Ver.1.10 or more | Ver.1.10 or more |
| AKW273230A | Ver.1.10 or more | Ver.1.10 or more |
| AKW274240A | Ver.1.10 or more | Ver.1.10 or more |

●For using the additional functions

| Functions / Model Number | -Power quality logging | -Custom logging<br>-Leakage current measurement |
|---|---|---|
| AKW263100A | Ver.1.00 or more | — |
| AKW264100A | Ver.1.01 or more | Ver.1.10 or more |
| AKW272100A | Ver.1.10 or more | Ver.1.20 or more |
| AKW273230A | Ver.1.20 or more | Ver.1.20 or more |
| AKW274240A | Ver.1.20 or more | Ver.1.20 or more |

* You can't use the expansion units or additional functions if the firmware doesn't support to each. Check beforehand to use them and upgrade the firmware.

## 1.3 Measurement outline

●Main unit, Expansion unit (Power measurement)

| | | | |
|---|---|---|---|
| Phase/Wire system | Single-phase two-wire (1P2W)<br>Single-phase three-wire (1P3W)<br>Three-phase three-wire (3P3W)<br>Three-phase four-wire (3P4W) | | (common) |
| Applicable power system | 100V system, 200V system, 400V system | | |
| Measurement circuit | Main unit | 1-system 2-circuit<br>(when measuring 1P2W: 1-system 6-circuit) | |
| | Expansion unit<br>(Power measurement) | 1-system 2-circuit<br>(when measuring 1P2W: 1-system 6-circuit) | |
| Input measurement voltage | 0 to 690VAC *0 to 300V for UL61010-1 | | |
| Input measurement current | 1 to 65,535A | | |
| Applicable current sensor | Secondary side output: 1A or 5A | | |

●Expansion unit (Multi analog input)

| | |
|---|---|
| Analog input (Voltage / Current) | 3-channel |
| Temperature measuring resister input | 2-channel |

●Expansion unit (Digital I/O)

| | |
|---|---|
| Pulse input | 2-channel |
| Pulse output | 4-channel |

## 1.4 Measurement items

●Main unit, Expansion unit (Power measurement)

| Item | | Unit | Display data range | |
|---|---|---|---|---|
| Instantaneous power | Active | W | -999.99P to 999.99P | Present value<br>Max. value<br>Min. value |
| | Reactive | var | | |
| | Apparent | VA | 0.000k to 999.99P | |
| Total integral power (import) | Active | Wh | 0.000k to 9999.9P | Present value |
| | Reactive | varh | | |
| | Apparent | VAh | | |
| Total integral power (export) | Active | Wh | 0.000k to 9999.9P | Present value |
| | Reactive | varh | | |
| Current | | A | 0.000 to 999.99k | Present value<br>Max. value<br>Min. value |
| Voltage | | V | 0.00 to 9999.9k | |
| Power factor | | | -1.000 to 0.000 to 1.000 | |
| Frequency | | Hz | 0.00 to 99.99 | |
| Pulse count value | | | 0.000 to 999999 | Present value |
| Power conversion value | | Wh | 0.000k to 9999.9P | Present value |
| Leakage current | | A | 0.0000 to 99999.9999 | Present value |

* ‘Display data range’ is the range to be able to indicate with the main unit display, it is not a range that can be measured.

・Power Quality

| Item | | Display data range | |
|---|---|---|---|
| Unbalanced current | Each phase | 0.00 to 300.00 % | Present value<br>Max. value<br>Min. value |
| Unbalanced voltage | Each phase | | |
| Current THD (total harmonic distortion) | Each phase | 0.00 to 400.00 % | Present value |
| Voltage THD (total harmonic distortion) | Each phase | | |
| Current harmonics ($2^{nd}$ to $31^{st}$ ) | Each phase | | |
| Voltage harmonics ($2^{nd}$ to $31^{st}$ ) | Phase | | |
| | Line | | |
| Hour Meter | ON-time | 0.0 to 99999.9 h | |
| | OFF-time | | |
| | Stand-by time | | |
| | Maintenance time | | |

* If the voltage to be measured is not the rated frequency (commercial frequency), it may take time to stabilize THD (total harmonic distortion).

・Demand

| Item | | Unit | Display data range | |
|---|---|---|---|---|
| Present demand *1 | Active | W | 0.000k to 999.99M | Present value<br>Max. value<br><br>Monthly max. value<br>(latest 13 months)<br>*2 |
| | Reactive | var | | |
| | Apparent | VA | | |
| | Active (export) | W | | |
| | Reactive (export) | var | | |
| | Current | A | 0.000k to 999.99k | |

*1 Please use this demand function as your standard.
The demand value calculated with this function is not guaranteed.
*2 only KW2M-X

●Expansion unit (Multi analog input)

| Item | Display data range |
|---|---|
| Digital conversion value | -999999999 to 999999999 |
| Temperature | -200.0 to +200.0°C |

*Digit of digital conversion value differs according to the setting scaling value.

●Expansion unit (Digital I/O)

| Item | Display data range |
|---|---|
| Pulse count value | 0.000 to 999999 |

*Digit of pulse count value differs according to the setting pre-scale value.

<Glossary>
Eco-POWER METER defines as below.

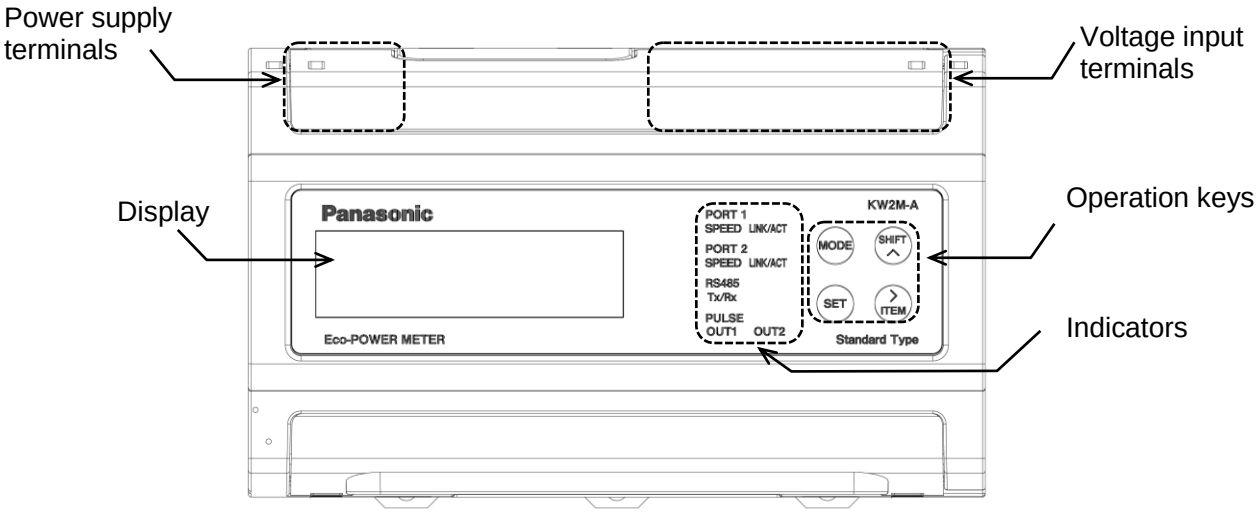
| | |
|---|---|
| THD (total harmonic distortion) | Ratio of harmonic distortion (voltage or current) for the fundamental frequency. Lower the value shows that the distortion is less. |
| Harmonics | Sinusoidal wave other than fundamental frequency.<br>It has frequency that is whole-number multiple of the fundamental frequency.<br>The frequency that has 2 times frequency (half wavelength) is called $2^{nd}$-order harmonics. |
| Voltage unbalancing | The different between each phase-voltage due to the load unbalancing.<br>It is calculated as below.<br>$\frac{\lvert \text{Max. (Min.) voltage of all phase} - \text{average voltage} \rvert}{\text{Average voltage}} \times 100\ (\%)$ |
| Current unbalancing | The difference between each-phase current due to the load unbalancing.<br>It is calculated as below.<br>$\frac{\lvert \text{Max. (Min.) current of all phase} - \text{average current} \rvert}{\text{Average current}} \times 100\ (\%)$ |
| Power interruption | Voltage under 5% of rating is kept 5ms or more. |
| Under voltage | Set the ratio for the rated voltage and it is used for threshold.<br>Voltage under the set ratio is kept 5ms or more, it will judge as under voltage. |
| Under current | Set the ratio for the rated current and it is used for threshold.<br>Current under the set ratio is kept 5ms or more, it will judge as under current. |
| Over current | Set the ratio for the rated current and it is used for threshold.<br>Current over the set ratio is kept 5ms or more, it will judge as over current. |
| Demand by IEC61557-12 | Based on IEC61557-12 Performance measuring and monitoring devices (PMD) |
| Sliding block interval demand | It calculates by measured power via CT with setting interval.<br>Set power interval by 1 to 60(min.) (every 1-min.). It calculates demand during latest finished interval and displays.<br>One interval is started every setting time. |
| fixed block interval demand | It calculates by measured power via CT with setting interval.<br>Set power interval by 1 to 60 (min.) (every 1-min.) It calculates demand during latest finished interval and displays. After one interval finishes, the next interval starts. |
| Current demand | It calculates based on a thermal demand meter.<br>It measures an average current (current demand) within setting interval and the max. value is considered as max. current demand. |

# Chapter 2 Parts Name and Working

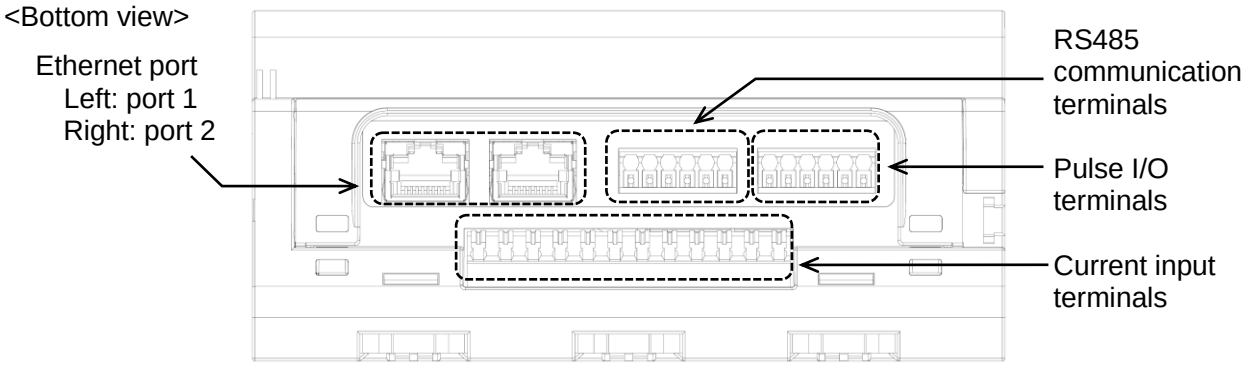
## 2.1 Parts Names

●Main Unit

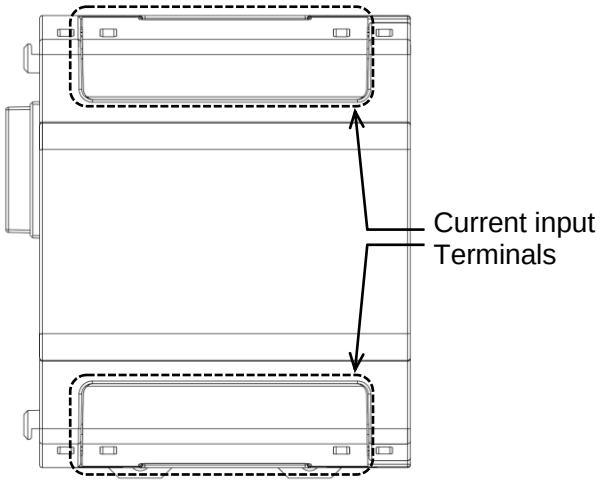
<Front>



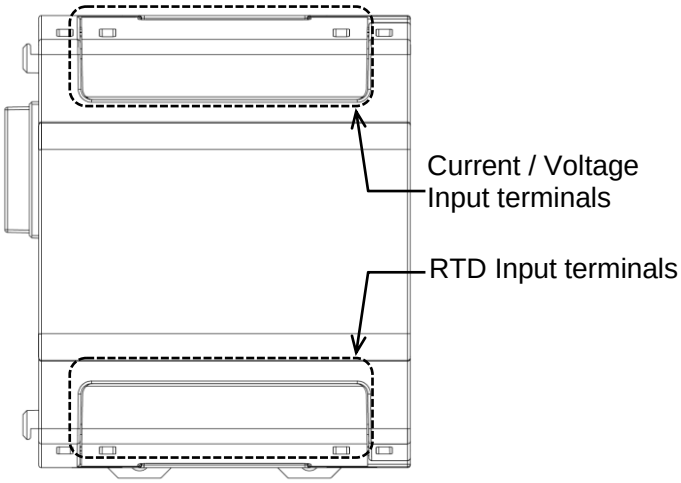

<Bottom view>



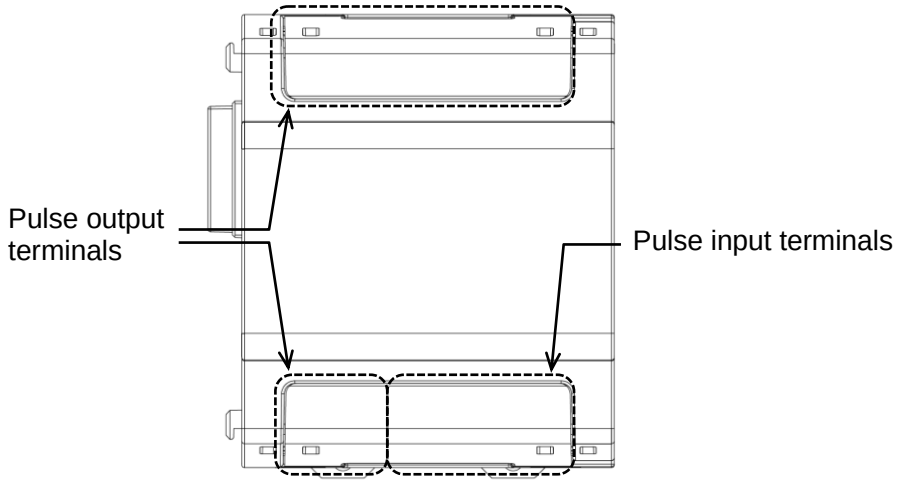

●Expansion Unit (Power measurement)




●Expansion Unit (Multi analog input)



●Expansion Unit (Digital I/O)




## 2.2 Key's functions

| Key | Functions | |
|---|---|---|
| <MODE> | Measuring mode | Shift to setting mode |
| | Setting mode | Shift to setting confirmation mode and measuring mode |
| <SET> | Setting mode | Set setting items and setting values |
| <SET> (continuous 3-sec) | Measuring mode Demand mode | All keys locked |
| | Lock mode | Release the lock mode |
| <SHIFT/∧> <ITEM/>> | Measuring mode | Select measuring item to display |
| | Setting mode | Select a setting value |
| | Demand mode | Select demand item to display |
| <MODE>+<SET> | Measuring mode Demand mode | Select unit to display |
| <MODE>+<SHIFT/∧> | Measuring mode | Shift to demand mode |
| | Demand mode | Shift to measuring mode |

●Lock mode

It is the mode makes all keys unable. In this mode, you can't input by any keys.
When you press <SET> continuously for about 3sec., lock mark is displayed.
Press <SET> continuously for about 3sec. again to release Lock mode.

# Chapter 3 Wiring

Be sure to wire correctly according to the terminal arrangement and wiring diagrams.
Please connect a fuse or a breaker to power supply part for safety reasons and to protect the device.
This has no built-in power switch, circuit breaker or fuse for measured voltage input parts.
Therefore it is necessary to install them in the circuit near this unit.
Do not turn on the power supply or input until all wiring is completed.

## 3.1 Main unit terminal arrangement

Power supply terminals

| Terminal number | 1 | 2 |
|---|---|---|
| Functions | L + | N− |
| | Power supply | |

Voltage input terminals

| Terminal number | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Functions | V1 | NC | V2 | NC | V3 | NC | Vn |
| | Measured voltage | vacant | Measured voltage | vacant | Measured voltage | vacant | Measured voltage |

*Do not use NC (vacant) terminals in any purpose.

Current input terminals

| Terminal number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Functions | K | L | K | L | K | L | K | L | K | L | K | L |
| | CH1(CT1) | | CH1(CT2) | | CH1(CT3) | | CH2(CT1) | | CH2(CT2) | | CH2(CT3) | |
| | Measured current (CH1) | | | | | | Measured current (CH2) | | | | | |

RS485 communication terminals

| Terminal number | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Functions | + | + | - | - | END | END |

*Each terminal is connected internally.

Pulse I/O terminals

| Terminal number | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Functions | + | - | + | - | + | - |
| | Pulse input | | Pulse output (OUT1) | | Pulse output (OUT2) | |

*It is insulated between OUT1 and OUT2.

## 3.2 Expansion unit terminal arrangement

●Power

Current input terminals (Upper)

| Terminal number | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Functions | K | L | K | L | K | L |
| | CH1(CT1) | | CH1(CT2) | | CH1(CT3) | |
| | Measured current (CH1) | | | | | |

Current input terminals (Lower)

| Terminal number | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Functions | K | L | K | L | K | L |
| | CH2(CT1) | | CH2(CT2) | | CH2(CT3) | |
| | Measured current (leak)(CH2) | | | | | |

●Multi analog input

Analog input terminals (Upper)

| Terminal number | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Functions | V/I | COM | V/I | COM | V/I | COM |
| | CH1 | | CH2 | | CH3 | |
| | Voltage / Current input | | | | | |

RTD input terminals (Lower)

| Terminal number | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Functions | A | B | b | A | B | b |
| | CH1 | | | CH2 | | |
| | RTD | | | | | |

●Digital I/O

Pulse output terminals (Upper)

| Terminal number | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Functions | + | - | + | - | + | - |
| | Pulse output (OUT1) | | Pulse output (OUT2) | | Pulse output (OUT3) | |

Pulse output terminals (Lower)

| Terminal number | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Functions | + | - | + | - | + | - |
| | Pulse output (OUT4) | | Pulse input (IN1) | | Pulse input (IN2) | |

⚠ **The input voltage to each terminal is as follows.**

| Terminal | Phase and wire system | Terminal No. | Input voltage |
|---|---|---|---|
| Power supply | Single-phase two-wire | 1 - 2<br>(L+ - N−) | 100-240V AC [100-240V ∿ ] |
| Voltage input terminals | | | |
| Measured voltage input | Single-phase two-wire | 1 - 7<br>(V1-Vn) | 0-690VAC [0-690V ∿ ] (L-L) |
| | Single-phase three-wire | 1 - 5 - 7<br>(V1-V3-Vn) | 0-690VAC [0-690V ∿ :3W] (L-L)<br>0-345VAC [0-345V ∿ :3W] (L-N) |
| | Three-phase three-wire | 1 - 5 - 7<br>(V1-V3-Vn) | 0-690VAC [0-690V 3 ∿ ] (L-L) |
| | Three-phase four-wire | 1 - 3 - 5 - 7<br>(V1-V2-V3-Vn) | 0-690VAC [0-690V 3∿ ] (L-L)<br>0-398VAC [0-398V 3N∿] (L-N) |

◆Applicable wire (Crimp-type terminal is recommended.)
・Stripping length: 7 to 8mm
・Power supply/Measured voltage
Screw type: M3
Tightening torque: 0.5 to 0.6N・m
Sectional area: single /stranded wire 0.13 to 3.3mm$^2$(AWG26 to12)
・for 2pcs.
single/stranded wire 2pcs.×0.5 to 2.5mm$^2$ (AWG20 to 12)

・Measured current (CT input)
Screw size: Push IN type
Sectional area: single /stranded wire 0.13 to 1.5mm$^2$(AWG24 to16)

*Use applicable wire according to the measured current.

・RS485 communication
Screw size: Push IN type
Sectional area: single /stranded wire 0.13 to 1.5mm$^2$(AWG24 to16)

・Output/Input
Screw size: Push IN type
Sectional area: single /stranded wire 0.13 to 1.5mm$^2$(AWG24 to16)

・Analog input/RTD
Screw size: Push IN type
Sectional area: single /stranded wire 0.13 to 1.5mm$^2$(AWG24 to16)

## 3.3 Measured-circuit

・It is not impossible to use to measure several loads by different strain power supply. (2-circuit of same system for 1 unit)
・Each unit (main unit, expansion unit (power measurement, power measurement + pulse output)) can measure 2-circuit of single-phase two-wire system, and 1-circuit of single-phase three-wire system or three-phase three-wire system. Each unit can be used with different phase and wire system. However be sure to check the wiring carefully.
・It is impossible to measure by only the expansion unit. Connect expansion units to main unit.
Up to 3 expansion units are connected to 1 main unit.

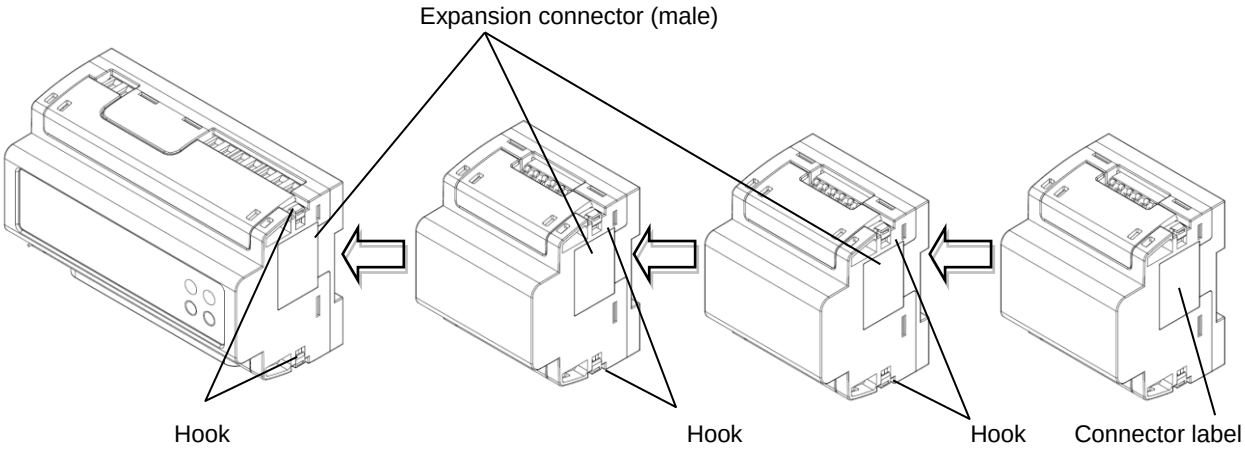
*Power source system
・Power source system is the electrical power system from one power source (normally one transformer).
・KW2M can measure 1-system max. 24-circuit of 1P2W system and 1-system max. 8-circuit of 1P3W and 3P3W system by connecting a main unit and expansion units.
・In order to measure several systems, it is necessary to use one main unit for each system.

## 3.4 Connection between the Main unit and the Expansion unit

**・Turn off the power of main unit when connecting expansion units.**

・Peel off connector label on the side before connecting.
(Do not peel off connector labels when not connecting.)
・It expands by connecting each male connector to female connector. Female connector is on the other side of male connector.
・After connecting, push the hooks into the unit to fix the expansion unit.
・Up to 3 expansion units can be connected per one main unit.

Note) Communication will be stopped or the measurement data will be lost when the units are removed or connected while turn on power.



## 3.5 Wiring Diagrams

Please connect a breaker or a fuse to the power supply and voltage input part for safety reasons and to protect the device.

- ・Recommended breaker: 3 to 15A (IEC approved or UL Listed)
- ・Recommended fuse : Time-lag fuse rated current 2A (IEC approved or UL Listed)

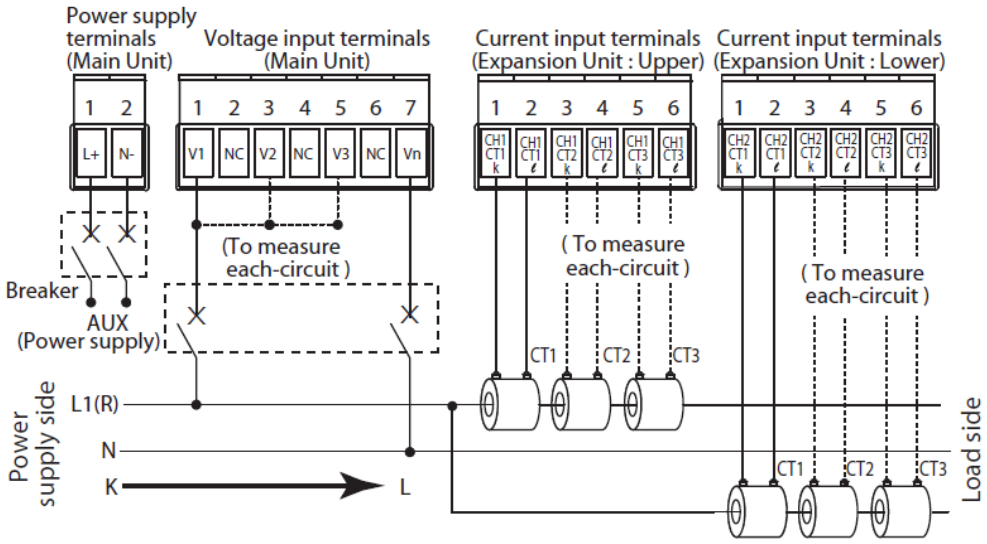
Grounding the secondary side of VT (Voltage transformer) and CT (Current transformer) is not necessary with low-voltage circuit.

*When using several CTs, set each CT approximately 1m apart. If the two CTs are set too close each other, it may not measure accurately due to magnetic field interference.

**◆When measuring a load with rated input voltage**

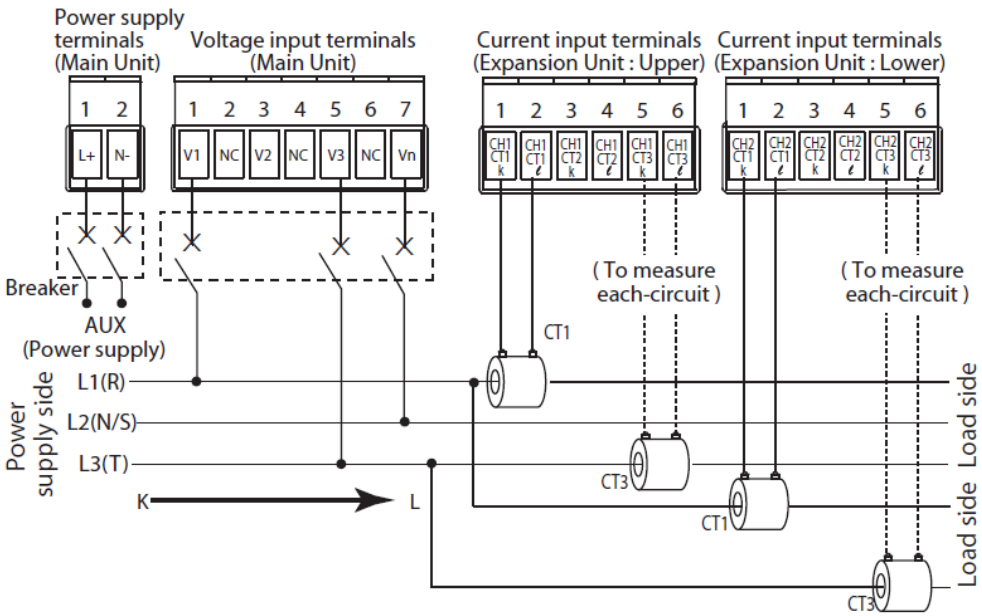
Single-phase two-wire system

*One CT is needed to measure single-phase two-wire system.
*2 CTs are needed to measure 2-circuit and 3 CTs are needed to measure 3-circuit.
*To measure 2-circuit, wire 1 and 3. To measure 3-circuit, wire 1 and 3 and 5.



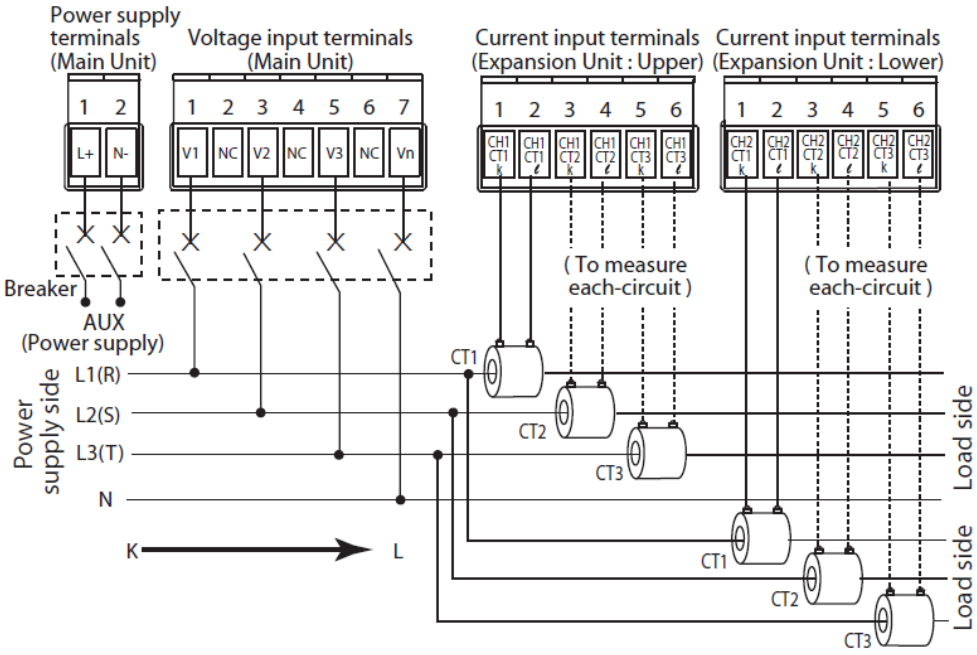

Single-phase three-wire/Three-phase three-wire

*2 CTs are needed to measure single-phase three-wire system, three-phase three-wire system.
*4 CTs are needed to measure 2-circuit.



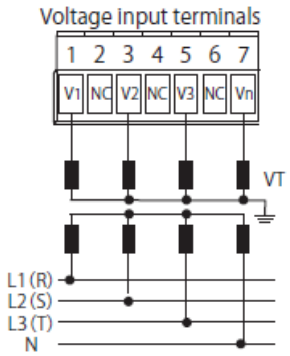
Three-phase four-wire system

*3 CTs are needed to measure three-phase four-wire system.
*6 CTs are needed to measure 2-circuit.

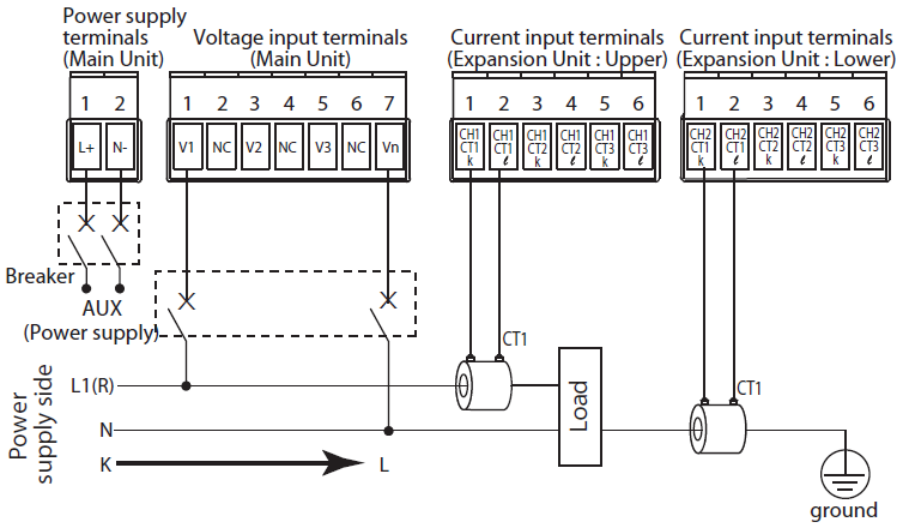



⚠ Vn terminal should be connected to N-phase which is grounded.

◆When measuring a load with exceed input voltage
Voltage transformer (VT) is needed when you measure a load with over input voltage.
Use a VT, those secondary voltage rating is 110V.
Grounding the secondary side of VT and CT is not necessary with low-voltage circuit.




**◆When measuring leak current (Only Expansion unit CH2)**




By inputting the ground line of the equipment to CT input or direct current input, it is possible to measure the leakage current of the ground, and it can be used as equipment maintenance.

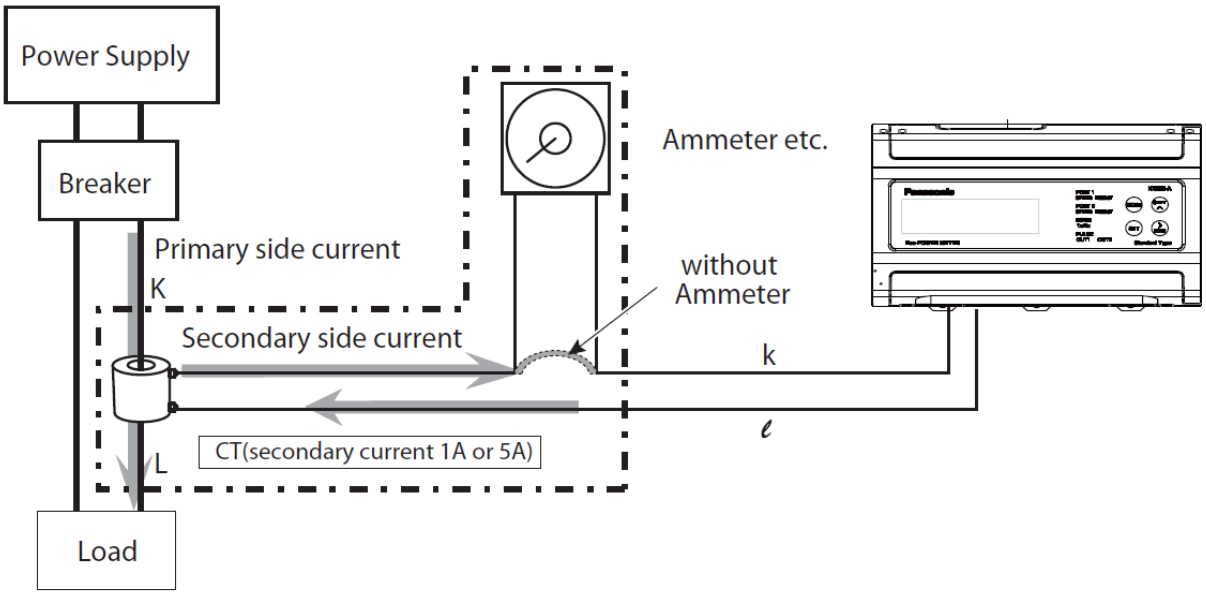
## 3.6 How to attach the Current Transformer (CT)

**DANGER**

●Never open the secondary circuit of CT under applying current to load.

・Use CT that the secondary side current is 5A or 1A.
・One CT is needed when measuring 1-circuit of 1P2W. Two CTs are needed when measuring 1P3W/3P3W (4 CTs for 2-circuit).Three CTs are needed when measuring 3P4W (6 CTs for 2-circuit). Using all CTs for one unit should be the same.
・Use the applicable wire, or it might cause a breakdown, burnout or electric shock.
・When connecting CT, connect the secondary side to the terminal of the main unit first, and after that wire the primary side to a load electric wire. **Incorrect order might cause an electric shock or break CT.**
・The CT has polarity. Wire correctly according to the K and L marks. **Wrong direction can't measure correctly.**
・If there is some distortion by harmonic or waveform, it may not measure correctly. Please check with the actual system before adopts it.
・Separate the wiring (strong electric part) of the measured voltage input terminal (operating power supply terminal) from the CT cable. It may not satisfy the accuracy due to noise.

(Connection example)




◆How to set the parameters for CT

(1) Select CT type (CT-T) according to the using CT.
(Select '5A' if secondary side current of using CT is 5A. Select '1A' if secondary side current of using CT is 1A.)
(2) Set the primary current of measured CT at primary side current of CT setting mode (CT-1).
< ex > If the measured CT is 400A/1A or 400A/5A, set to '400'.
(3) Connect CT according to the CT direction, power side (K) to load side (L).

## 3.7 For Input Connection

●Pulse input

・Contact input

Use highly reliable metal plated contacts. Since the contact's bounce time leads directly to error in the count value, use contacts with as short a bounce time as possible. In general, select 30Hz for max.counting speed.

・Non-contact input (Transistor input)

Connect with an open collector. Use the transistor with the following specifications.

$V_{CEO}$=20V min. $I_C$=20mA min. $I_{CBO}$=6μA max

Use transistors with a residual voltage of less than 3V when the transistor is ON.

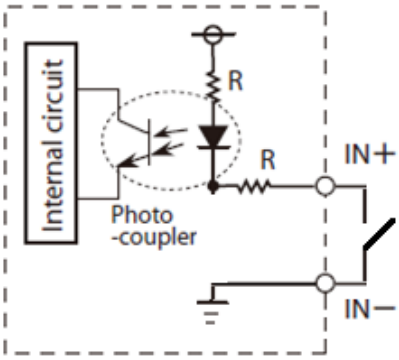
*Short-circuit impedance should be less than 1kΩ.

Open-circuit impedance should be more than 100kΩ.

(When the impedance is 0Ω, drain current is approx. 10mA.)

・Input wiring

Please wire as short as possible by using a shielded wire or a metallic electric wire tube individually.

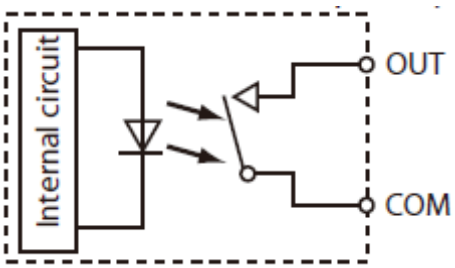



## 3.8 For Output Connection

●PhotoMOS relay output

・It adopts PhotoMOS relay output, there is no polarity.

Output: Rated capacity 30V AC/DC, 0.1A

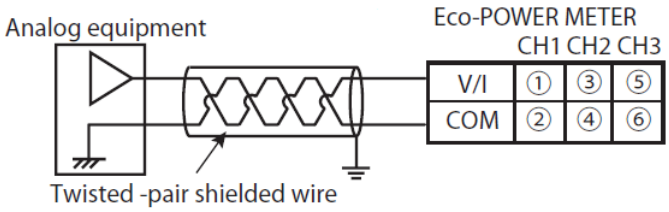



・Do not connect devices that voltage or load exceeds the rated capacity (30V AC/DC,0.1A)

・Please wire less than 100m for output.

If it is long, it may not work correctly due to floating capacitance.

## 3.9 For Analog Input Connection (Expansion unit (Multi analog unit))



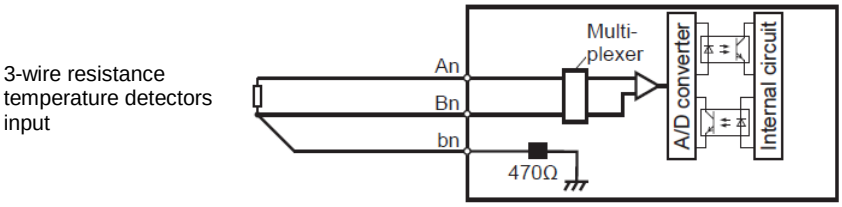

Note)

・Use double-core twisted-pair shielded wires. It is recommended to ground them. However, depending on the conditions of the external noise, it may be better not to ground the shielding.

・Do not have the analog input wiring close to AC wires, power wires, or load.

・Digital conversion value is not stable when it is not wired.

## 3.10 For RTD Input Connection (Expansion unit (Multi analog unit))



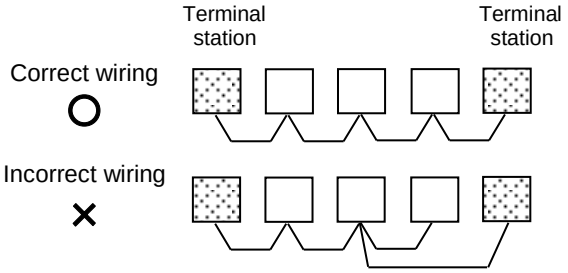

Note)

・For copper wires for wiring, use thick wires having insulation performance of IEC 60227-3 or equivalents to prevent a large increase in the electric resistance. (It is recommended to use shielded wires and to ground the shielding.

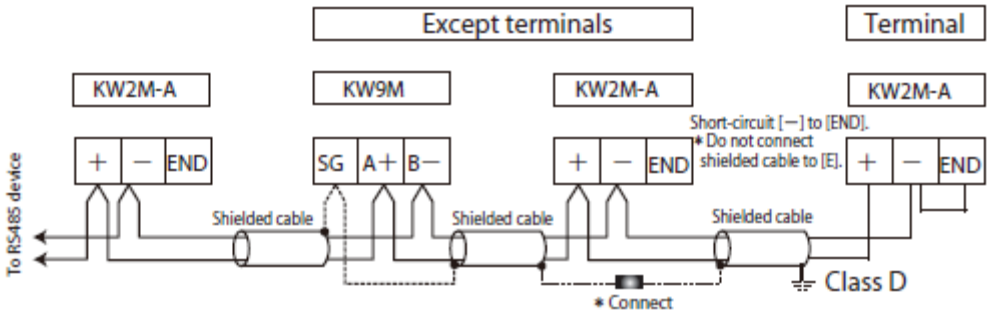
・Do not have the resistance temperature detectors input wiring close to AC wires, power wires, or load.

## 3.11 RS485 Communication

・When using shielded cable for the RS485 transmission line, ground one end.
Use a class D dedicated earth for grounding. Do not share a ground with other earth lines.
・Be sure to connect with daisy chain the RS485 transmission line between each unit.
Do not use a splitter.
・To avoid noise, separate the transmission line from high-voltage line (power supply, voltage line).




◆How to connect KW2M (2-wire) and KW9M (3-wire)



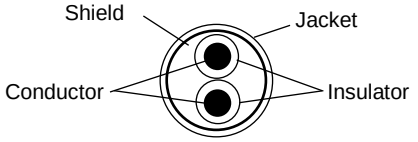
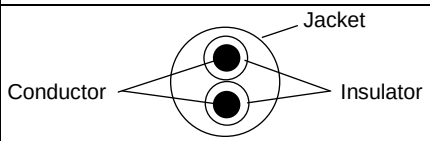

## 3.12 Backup Battery for Clock

It is possible to back up the clock with backup battery for 1-month. In order to charge full, it is necessary to turn on the power for 2 days. If it turns off within 2 days from first installation, it may not back up the clock for 1-month.

Recommended Cable

Use the transmission cables shown below for Eco-POWER METER RS485 communication system.

| Cable | Conductor | | Insulator | | Cable diameter | Applicable cable |
|---|---|---|---|---|---|---|
| | Size | Resistance (at 20°C) | Material | Thickness | | |
| Twisted-pair with shield | 1.25 $mm^2$ (AWG16) or more | Max.16.8Ω/km | Polyethylene | Max. 0.5 mm | Approx. 8.5 mm | HITACHI KPEV-S 1.25 $mm^2$×1P Belden Inc. 9860 |
| | 0.5 $mm^2$ (AWG20) or more | Max.33.4Ω/km | Polyethylene | Max. 0.5 mm | Approx. 7.8 mm | HITACHI KPEV-S 0.5 $mm^2$×1P Belden Inc. 9207 |
| VCTF | 0.75 $mm^2$ (AWG18) or more | Max.25.1Ω/km | PVC | Max. 0.6 mm | Approx. 6.6 mm | VCTF 0.75 $mm^2$×2C (JIS) |

| Cable | Section |
|---|---|
| Twisted-pair with shield |   |
| VCTF |   |

Notes
1) Use shielded type twist cables.
2) Use only one type of the transmission cables.
3) Do not mix different types of the cables.
4) Use twisted-pair cables under a bad noise environment.

## 3.13 Low Voltage Directive

For using under the measurement category III, install varistors or SPD between the lines of power supply and the measured voltage input. Use the varistors or SPD which is complied with European standard and specifications to meet power supply and added current.

When using in the application conforming to EN61010-1/IEC61010-1, make sure to satisfy the following conditions.

1) RS485 communication part and pulse input part secure only basic insulation. In order to secure reinforced (double) insulation demanded by EN 61010-1/ IEC61010-1, secure basic insulation or more with load side and reinforced (double) insulation with RS485 communication system side.
2) Provide the voltage input part with an EN60947-1 or EN60947-3 compliant circuit breaker.
3) Use a wire with basic insulation or more for a wire cramped (or connected) CT
4) Vn terminal should be connected to N-phase which is grounded.

【Environmental conditions】
- ・Overvoltage category III, Pollution degree 2
- ・Indoor use
- ・An ambient temperature of -10 to +50°C
- ・An ambient non-condensing humidity of 30 to 85%RH (at 20°C)
- ・Altitude of 2000m or less

【Mount the product in a place with】
- ・A minimum of dust, and an absence of corrosive gases
- ・No flammable, explosive gasses
- ・Few mechanical vibrations or shocks
- ・No exposure to direct sunlight
- ・No large capacity electromagnetic switches or cables through which large current is flowing

## 3.14 Symbol List

| Symbol | Explanation |
|---|---|
| ∿ | AC Voltage |
| ⎓ | DC Voltage |
| CE | CE Mark<br>Confirmation of conformity of the product with the applicable EU directives and compliance with the essential requirements contained in these directives |
| ⧈ | Protective insulation, device with protection class II |
| C US | Products with this mark comply with both the Canadian and the American requirements |

# Chapter 4 Settings

You can set basic parameters for measuring using the keys on Eco-POWER METER. For the parameters for other functions, use Web browser to set.
(URL:http//xxx.xxx.xxx.xxx/setup/index.htm Input the setting IP address to 'xxx.xxx.xxx.xxx')

After wiring Eco-POWER METER and CT, power on and set the parameters for power measurement, Eco-POWER METER can measure the electric power. In order to use the other functions, set other parameters according to your use.

◆Keys' functions at setting mode

| | |
|---|---|
| <MODE> | Shift to setting mode |
| <SET> | Set the items and values |
| <SHIFT/∧>, <ITEM/>> | Select items and change values |
| <MODE>+<SET> | Select channels and units |

◆Parameters for power measurement (for Main unit and Expansion unit (Power measurement))

○: Available　－: Not available

| Item | | Range | Initial value | Setting | |
|---|---|---|---|---|---|
| | | | | Keys | Web |
| Phase/Wire system | | 1P2W, 1P3W, 3P3W 3P4W | 1P2W | ○ | ○ |
| CT type | | 1, 5 [A] | 5A | | |
| Primary side current of CT | | 1 to 65535 [A] | 5A | | |
| VT secondary side voltage | | 100 to 690 [V] | 230V | | |
| VT primary side voltage | | 100 to 500000 [V] | 230V | | |
| Over voltage (ON threshold) | | 0.0 to 120.0 [%] | 0.0% | － | |
| Over voltage (OFF threshold) | | | | | |
| Under voltage (ON threshold) | | | | | |
| Under voltage (OFF threshold) | | | | | |
| Over current (ON threshold) | | | | | |
| Over current (OFF threshold) | | | | | |
| Under current (ON threshold) | | | | | |
| Under current (OFF threshold) | | | | | |
| Conversion rate (P) total | | 0.00 to 99.99/1kWh | 10.00 | | |
| Conversion rate (P) time-zone1 *1 | | | | | |
| Conversion rate (P) time-zone2 *1 | | | | | |
| Conversion rate (P) time-zone3 *1 | | | | | |
| Conversion rate (P) time-zone4 *1 | | | | | |
| Conversion rate (-P) total | | | | | |
| Conversion rate (-P) time-zone1 *1 | | | | | |
| Conversion rate (-P) time-zone2 *1 | | | | | |
| Conversion rate (-P) time-zone3 *1 | | | | | |
| Conversion rate (-P) time-zone4 *1 | | | | | |
| Hour meter threshold (ON-time) | | 0.1 to 100.0 [%] | 10.0% | | |
| Hour meter threshold (Standby-time) *1 | | 0.1 to 100.0 [%] | 0.1% | | |
| Power OFF time*1 | | Yes, No | No | | |
| Target phase for hour meter | | Phase1, Phase2, Phase3, All | All | | |
| Cut-off current | | 0.1 to 50.0% | 0.1% | | |
| Simple-measurement | Setup | OFF, Fixed voltage/PF, Measure one CT | OFF | | |
| | Voltage | 0.0 to 500000.0 [V] | 230V | | |
| | PF | 0.000 to 1.000 | 1.000 | | |
| Measurement mode *2 | | Power, Leak | Power | ○ | － |

*1 only KW2M-X
*2 only expansion unit (power measurement)

◆Parameters for leakage current measurement (Expansion unit (Power measurement))

○: Available　－: Not available

| Item | | Range | Initial value | Setting | |
|---|---|---|---|---|---|
| | | | | Keys | Web |
| CT type(CT1/CT2/CT3) | | 1, 5 [A] | 5A | ○ | ○ |
| Primary side current of CT (CT1/CT2/CT3) | | 1 to 65535 [A] | 5A | | |
| Leakage measurement | Threshold | 0.01 to 100.00[%] | 100.00% | | |
| | Detect time | 0.1 to 20.0[s] | 20.0s | | |
| Measurement mode *2 | | Power, Leak | Power | ○ | － |

◆Parameters for demand measurement (Main unit, Expansion unit (Power measurement))

○: Available　－: Not available

| Item | | Range | Initial value | Setting | |
|---|---|---|---|---|---|
| | | | | Keys | Web |
| Power demand type | | Sliding block, Fixed block | Sliding block | － | ○ |
| Power demand interval 1 | | 1 to 60 [min.] | 15 | | |
| Power demand interval 2 | | 1 to 60 [min.] | 1 | | |
| Power input | | CT (CT input),<br>Pulse(Pulse input) | CT | | |
| Pulse unit | | kWh (electric power),<br>PLS (pulse constant) | kWh | | |
| Pulse rate<br>(convert to electric power) | | 0.001 to 100.000 [kWh] | 1.000 | | |
| Pulse constant number | | 1000 to 99000[pulse/kWh] | 50000 | | |
| Current demand interval | | 1 to 60 [min.] | 15 | | |
| Total demand | Use | Available, Not available | Not available | | |
| | Measured target *1 | Main unitCH1<br>Main unitCH2<br>Expansion unit1 CH1<br>Expansion unit1 CH2<br>Expansion unit2 CH1<br>Expansion unit2 CH2<br>Expansion unit3 CH1<br>Expansion unit3 CH2 | None | | |

*1 Can be selected several items.

◆Parameters for leakage measurement

| Item | Range | Initial value | Setting | |
|---|---|---|---|---|
| | | | Keys | Web |
| CT type<br>(CT1/CT2/CT3) | 1, 5 [A] | 5 | ○ | ○ |
| Primary side current of CT<br>(CT1/CT2/CT3) | 1 to 65535 [A] | 5 | | |
| Leakage threshold<br>(CT1/CT2/CT3) | 0.01 to 100.00 [%] | 100.00 | | |
| Leakage delay time<br>(CT1/CT2/CT3) | 0.1 to 20.0 [s] | 20.0 | | |

◆Parameters for analog measurement

| Item | Range | Initial value | Setting | |
|---|---|---|---|---|
| | | | Keys | Web |
| Input range (CH1/CH2/CH3) | 0-60[V],<br>0-20[mA], 4-20[mA] | 0-60 | ○ | ○ |
| Scaling (min/max)<br>(CH1/CH2/CH3) | -999999999 to 999999999 | min:0<br>max:4000 | | |
| Point position (CH1/CH2/CH3) | 0.0001, 0.001, 0.01, 0.1, 1 | 1 | | |
| Shift average frequency<br>(CH1/CH2/CH3) | 0, 2, 4, 8, 16 | 8 | | |
| RTD setting<br>(CH1/CH2) | PT100, PT1000 | PT100 | | |

◆Parameters for pulse input and output (Main unit, Expansion unit (Digital I/O))

○: Available　ー: Not available

| Item | | Range | | Initial value | Setting Keys | Setting Web |
|---|---|---|---|---|---|---|
| Pulse input | | 30, 2000 | | 30 | ー | ○ |
| Pre-scale | | 0.001 to 100.000 | | 1.000 | | |
| Target unit to monitor measurement value | | Main unit CH1<br>Main unit CH2<br>Expansion unit 1 CH1<br>Expansion unit 1 CH2<br>Expansion unit 2 CH1<br>Expansion unit 2 CH2<br>Expansion unit 3 CH1<br>Expansion unit 3 CH2<br>Total demand | | Main unit CH1 | | |
| Unit for pulse output (OUT1,OUT2, OUT3,OUT4) | kWh | 0.001, 0.01, 0.1, 1, 10, 100 (kWh/1pulse) | | 0.001 | | |
| | alarm | Stand-by power, Active power, Reactive power, Apparent power, Over current, Under current, Power interruption, Power factor, Over voltage, Under voltage, Over frequency, Under frequency, Current THD, Voltage THD, Current harmonics, Voltage harmonics, Current unbalancing, Voltage unbalancing, Power demand, Current demand, Digital conversion value upper limit alarm, Digital conversion value lower limit alarm, Temperature upper limit alarm, Temperature lower limit alarm, Leak alarm | | | | |
| | General-purpose | General output | | | | |
| | Time Control*1 | Start | 0:00 to 24:00 | 0:00 | | |
| | | End | 0:00 to 24:00 | 0:00 | | |
| Target phase for pulse output (OUT1,OUT2,OUT3,OUT4) | | Total, Phase1, Phase2, Phase3 | | total | | |
| Target phase for alarm output (OUT1,OUT2, OUT3,OUT4) | electric power | Total, All, Phase1, Phase2, Phase3 | | total | | |
| | current | All, Phase1, Phase2, Phase3, Phase N | | All | | |
| | Power interruption<br>Over voltage<br>Under voltage | All, Phase1, Phase2, Phase3, Line 1-2, Line 2-3, Line 3-1 | | All | | |
| Integral direction (OUT1,OUT2,OUT3,OUT4) | | P, -P | | P | | |
| Output pulse width | | 1 to 100 [ms] | | 1 | | |
| Stand-by alarm (threshold) (OUT1,OUT2,OUT3,OUT4) | | 0.1 to 100.0 [%] | | 100.0 | | |
| Stand-by alarm (start time) (OUT1,OUT2,OUT3,OUT4) | | 0 to 9999 [sec.] | | 0 | | |
| Stand-by alarm (phase) (OUT1,OUT2,OUT3,OUT4) | | Phase1, Phase2, Phase3, All | | All | | |

*1 only KW2M-X

| Item | Range | Initial value | Setting | |
|---|---|---|---|---|
| | | | Keys | Web |
| Power alarm (active/reactive/apparent) threshold (ON/OFF) (OUT1,OUT2,OUT3,OUT4) | 0.00 to 999999999.999 [kW/kvar/kVA] | 999999999.999 | — | ○ |
| PF alarm threshold (ON/OFF) (OUT1,OUT2,OUT3,OUT4) | 0.000 to 1.000 | 0.000 | | |
| Over frequency alarm threshold (ON/OFF) (OUT1,OUT2,OUT3,OUT4) | 0.00 to 100.00 [Hz] | 100.00 | | |
| Under frequency alarm threshold (ON/OFF) (OUT1,OUT2,OUT3,OUT4) | | 0.00 | | |
| Voltage harmonics alarm threshold (ON/OFF) (OUT1,OUT2,OUT3,OUT4) | 0.00 to 400.0 [%] | 400.00 | | |
| Current harmonics alarm threshold (ON/OFF) (OUT1,OUT2,OUT3,OUT4) | | | | |
| Current THD alarm threshold (ON/OFF) (OUT1,OUT2,OUT3,OUT4) | | | | |
| Voltage THD alarm threshold (ON/OFF) (OUT1,OUT2,OUT3,OUT4) | | | | |
| Voltage unbalancing alarm threshold (ON/OFF) (OUT1,OUT2,OUT3,OUT4) | 0.00 to 300.00 [%] | 300.00 | | |
| Current unbalancing alarm threshold (ON/OFF) (OUT1,OUT2,OUT3,OUT4) | | | | |
| Power demand alarm power type (ON/OFF) (OUT1,OUT2,OUT3,OUT4) | Active, Reactive, Apparent, Active(Export), Reactive(Export) | Active | | |
| Power demand alarm threshold(ON/OFF) (OUT1,OUT2,OUT3,OUT4) | 0.000 to 99999.999 [kW/kvar/kVA] | 0 | | |
| Current demand alarm threshold (OUT1,OUT2,OUT3,OUT4) | 0.0 to 120.0 [%] | 0 | | |
| Preset value (OUT1,OUT2,OUT3,OUT4) | 0 to 999999 | 0 | | |
| Digital conversion value upper limit alarm threshold (ON/OFF) (OUT1,OUT2,OUT3,OUT4) *1 | -999999999 to 999999999 | 999999999 | | |
| Digital conversion value lower limit alarm threshold (ON/OFF) (OUT1,OUT2,OUT3,OUT4) *1 | -999999999 to 999999999 | 999999999 | | |
| Temperature upper limit alarm threshold (ON/OFF) (OUT1,OUT2,OUT3,OUT4) | -200.0 to 200.0[°C] | 200.0 | | |
| Temperature lower limit alarm threshold(ON/OFF) (OUT1,OUT2,OUT3,OUT4) | -200.0 to 200.0[°C] | -200.0 | | |

*1 Decimal point differs according to setting of AD setup.

◆Parameters for communication (RS485) ○: Available ー: Not available

| Item | Range | | Initial value | Setting | |
|---|---|---|---|---|---|
| | | | | Keys | Web |
| Protocol | MEWTOCOL, MODBUS(RTU), | | MEWTOCOL | ○ | ○ |
| Device number | MEWTOCOL | 1 to 99 | 1 | | |
| | MODBUS(RTU) | 1 to 247 | | | |
| Transmission speed | 38400, 19200, 9600,4800, 2400, 57600, 115200 [bps] | | 19200 | | |
| Transmission format | 8b-o(8bit odd), 8b-n(8bit none), 8bit-E(8bit even) | | 8b-o | | |
| Stop bit | 1,2 | | 1 | | |
| Response time | 1 to 99 [ms] | | 5 | | |

◆Parameters for communication (Ethernet) ○: Available ー: Not available

| Item | | Range | Initial value | Setting | |
|---|---|---|---|---|---|
| | | | | Keys | Web |
| MEWTOCOL | Use | Available, Not available | Available | ー | ○ |
| | Protocol | TCP,UDP | TCP | | |
| | Port number | 1024 to 65535 | 9094 | | |
| MODBUS(TCP) | Use | Available, Not available | Available | ー | |
| | Protocol | TCP,UDP | TCP | | |
| | Port number | 502,1024 to 65535 | 502 | | |
| IP address | DHCP | Yes (available), No (not available) | No | ○ | |
| | Fixed IP address | 1.0.0.0 to 255.255.255.255 | 192.168.1.5 | | |
| | Subnet mask | | 255.255.255.0 | | |
| | Default gateway | | 192.168.1.1 | | |
| DNS server | Acquisition method | Auto-setting, Manual-setting | Auto-setting | ー | |
| | DNS server | 0.0.0.0 to 255.255.255.255 | 0.0.0.0 | | |
| FTP Server *1 | Use | Available, Not available | Available | ー | |
| | Port number | 21,1024 to 65535 | 21 | ー | |
| | Administrator name | half-width alphanumeric (64-letter) | admin | ー | |
| | Password | half-width alphanumeric (16-letter) | admin | ー | |
| Web server | Web server settings | Yes (available), No (not available) | Yes | ○ | |
| | User name (administrator) | half-width alphanumeric (64-letter) | admin | ー | |
| | Password (administrator) | half-width alphanumeric (16-letter) | admin | ー | |
| | Use Password (standard user) | Yes (available), No (not available) | Yes | | |
| | User name (standard user) | half-width alphanumeric (64-letter) | user | ー | |
| | Password (standard user) | half-width alphanumeric (16-letter) | user | ー | |
| | Customer Web settings | Yes (available), No (not available) | Yes | ー | |

*1 only KW2M-X

◆Parameters for logging (only KW2M-X) ○: Available ー: Not available

| Item | | Range | | Initial value | Setting | |
|---|---|---|---|---|---|---|
| | | | | | Keys | Web |
| Save measurement log | | Available, Not available | | Not available | ー | ○ |
| Save demand log | | Available, Not available | | Not available | | |
| FTP Client | Use | Available, Not available | | Not available | | |
| | Server | 0.0.0.0 to 255.255.255.255 or domain name(64-letter) | | 192.168.1.5 | | |
| | Access folder | half-width alphanumeric (64-letter) | | /Log | | |
| | User name | half-width alphanumeric (64-letter) | | ftpcuser | | |
| | Password | half-width alphanumeric (16-letter) | | ftpcuser | | |
| | Upload time | 00:00:00 to 23:59:59 | | 00:00:00 | | |
| | Retry interval | 0 to 60[min] | | 10 | | |
| | Retry | 0 to 10[times] | | 3 | | |
| | Connection time out | 1 to 75[sec] | | 10 | | |
| | Upload data | Measurement log | Yes, No | No | | |
| | | Demand log | Yes, No | | | |
| Customized logging data select | Use | Available, Not available | | Not available | | |
| | Item | Integral active power(1), (2), (3), Total integral active power, Integral reactive power(1), (2), (3), Total integral reactive power, Integral apparent power(1), (2), (3), Total integral apparent power, Export active power(1), (2), (3), Total export active power, Export reactive power(1), (2), (3), Total export reactive power, Instantaneous active power(1), (2), (3), Total instantaneous active power, Instantaneous reactive power(1), (2), (3), Total instantaneous reactive power, Instantaneous apparent power(1), (2), (3), Total instantaneous apparent power, R-current, S-current, T-current, N-current, Average of current, R-voltage (L1-N), S-voltage (L2-N), T-voltage (L3-N), Average of phase-voltage, RS-voltage (L1-L2), ST-voltage (L2-L3), TR-voltage (L3-L1), Average of line-voltage, Power factor(1), (2), (3), Average of power factor, Frequency(1), (2), (3), Average of frequency, Current THD(1), (2), (3), Average of current THD, Phase-voltage THD(1), (2), (3), Average of phase-voltage THD, Line-voltage THD(1), (2), (3), Average of line-voltage THD, ON-time, OFF-time, Stand-by time, Maintenance-time, Pulse count value | | ー | | |

| | | | | | |
|---|---|---|---|---|---|
| | | Digital conversion value1,<br>Digital conversion value2,<br>Digital conversion value3,<br>Temperature1, Temperature2<br>Pulse count 1, Pulse count 2,<br>Leakage current 1,<br>Leakage current 2,<br>Leakage current 3 | — | — | ○ |

◆Parameters for time program (only KW2M-X) ○: Available —: Not available

| Item | | Range | Initial value | Setting | |
|---|---|---|---|---|---|
| | | | | Keys | Web |
| Program 1 | time-zone | T1, T2, T3, T4, OFF | T4 | — | ○ |
| | start-time | 00:00 to 23:59 | 00:00 | | |
| Program 2 | time-zone | T1, T2, T3, T4, OFF | T3 | | |
| | start-time | 00:00 to 23:59 | 6:00 | | |
| Program 3 | time-zone | T1, T2, T3, T4, OFF | T2 | | |
| | start-time | 00:00 to 23:59 | 8:00 | | |
| Program 4 | time-zone | T1, T2, T3, T4, OFF | T1 | | |
| | start-time | 00:00 to 23:59 | 10:00 | | |
| Program 5 | time-zone | T1, T2, T3, T4, OFF | T2 | | |
| | start-time | 00:00 to 23:59 | 12:00 | | |
| Program 6 | time-zone | T1, T2, T3, T4, OFF | T1 | | |
| | start-time | 00:00 to 23:59 | 14:00 | | |
| Program 7 | time-zone | T1, T2, T3, T4, OFF | T2 | | |
| | start-time | 00:00 to 23:59 | 16:00 | | |
| Program 8 | time-zone | T1, T2, T3, T4, OFF | T3 | | |
| | start-time | 00:00 to 23:59 | 22:00 | | |
| Program 9 | time-zone | T1, T2, T3, T4, OFF | OFF | | |
| | start-time | 00:00 to 23:59 | — | | |
| Program 10 | time-zone | T1, T2, T3, T4, OFF | OFF | | |
| | start-time | 00:00 to 23:59 | — | | |

<Initial setting for time program >

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | | | | | | | | | | | 4-term(PG-4) | | | | 6-term(PG-6) | | | | | | | | | | |
| T2 | | | | | | | | | 3-term(PG-3) | | | | 5-term(PG-5) | | | | | 7-term(PG-7) | | | | | | | |
| T3 | | | | | | 2-term(PG-2) | | | | | | | | | | | | | | | | | 8-term(PG-8) | | |
| T4 | 1-term(PG-1) | | | | | | | | | | | | | | | | | | | | | | | | |

◆Parameters for Calendar timer (only KW2M-X) ○: Available ー: Not available

| Item | | Range | Initial value | Setting | |
|---|---|---|---|---|---|
| | | | | Keys | Web |
| Calendar timer | | January 1st, 2015 00:00:00 to December 31st, 2099 23:59:59 | | ○ | ○ |
| Time-zone | | UTC-12:00 to UTC+14:00 | UTC+9:00 | | |
| SNTP | Use | Available, Not available | Not available | ー | |
| | Port Number | 123, 1204 to 65535 | 123 | | |
| | Access Time | 00:00:00 to 23:59:59 | 00:00:00 | | |
| | Server | 0.0.0.0 to 255.255.255.255 or half-width alphanumeric (32-letter) | 192.168.1.5 | | |
| | Retry interval | 0 to 60[min] | 10 | | |
| | Retry times | 0 to 10[times] | 3 | | |

◆Parameters for optional functions ○: Available ー: Not available

| Item | Range | Initial value | Setting | |
|---|---|---|---|---|
| | | | Keys | Web |
| Auto-off | 0 to 99 [min.] | 1 | ○ | ○ |
| Display update cycle | 0.5, 1.0, 2.0, 3.0 [sec.] | 1.0 sec | | |
| Reset all integral value | Yes, No | No | | |
| Reset integral value 1 | Yes, No | No | | |
| Reset integral value 2 | Yes, No | No | | |
| Reset integral value 3 | Yes, No | No | | |
| Reset hour meter | Yes, No | No | | |
| Reset count value | Yes, No | No | | |
| Reset logging data | Yes, No | No | | |
| Reset Memory *1 | Yes, No | No | ○ | ○ |
| Version | | | | |

*1 only KW2M-X

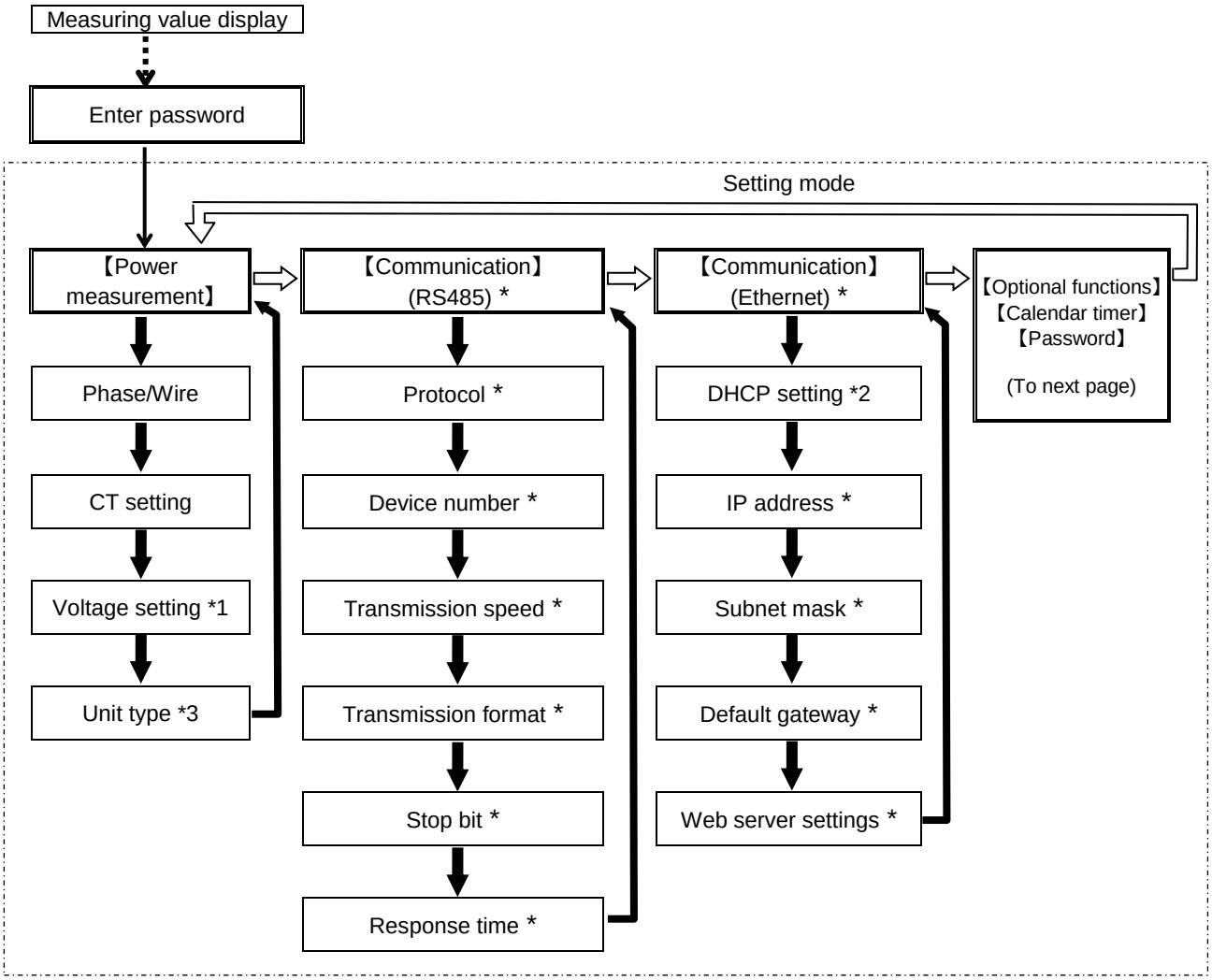
◆Password ○: Available ー: Not available

| Item | Range | Initial value | Setting | |
|---|---|---|---|---|
| | | | Keys | Web |
| Password change | 0000 to 9999 | 0000 | ○ | ー |

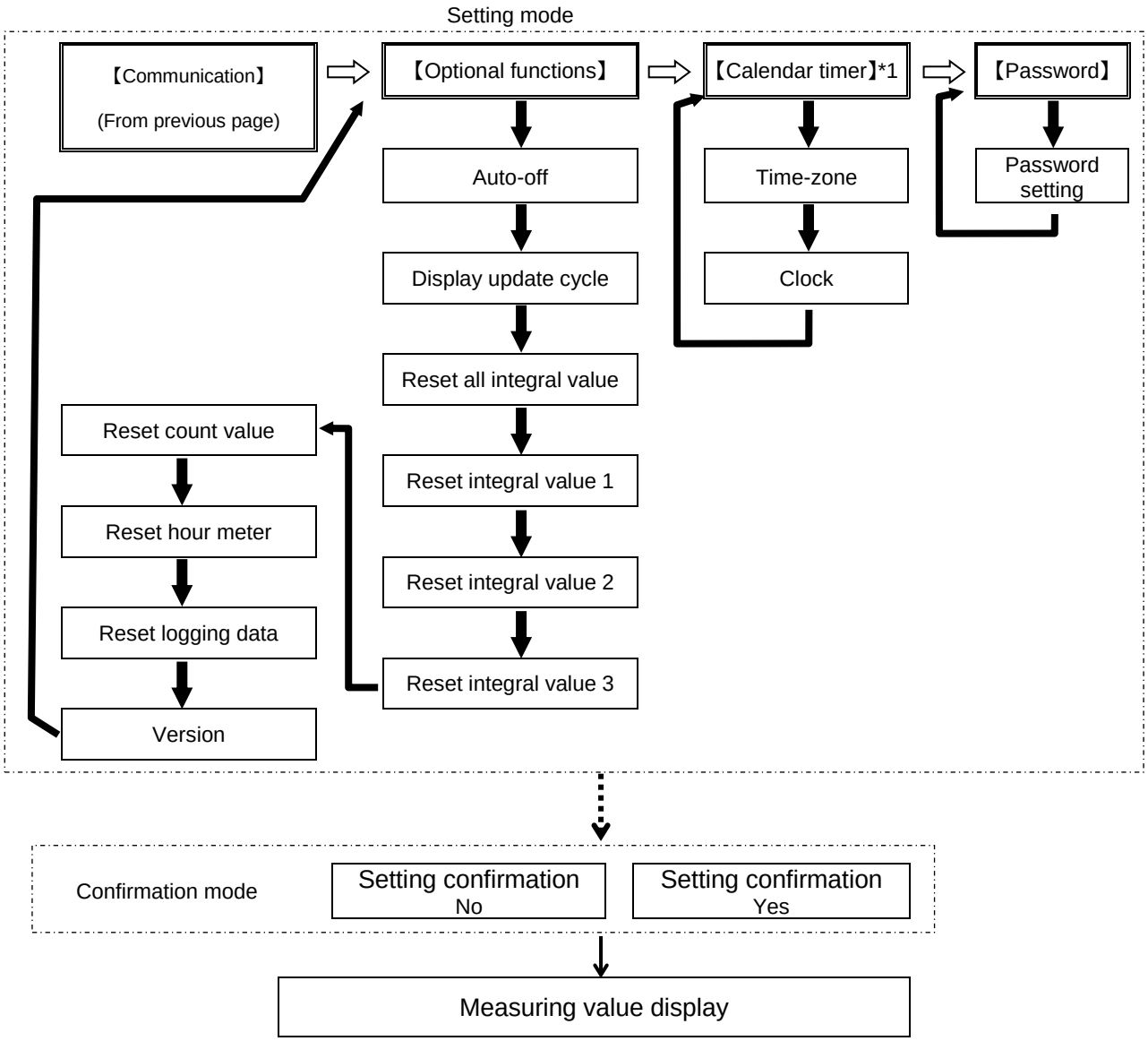
## 4.1 Setting Flow

Arrow mark means press each key

◆Main unit, Expansion unit (Power measurement))
Items with * are only for Main unit-CH1.



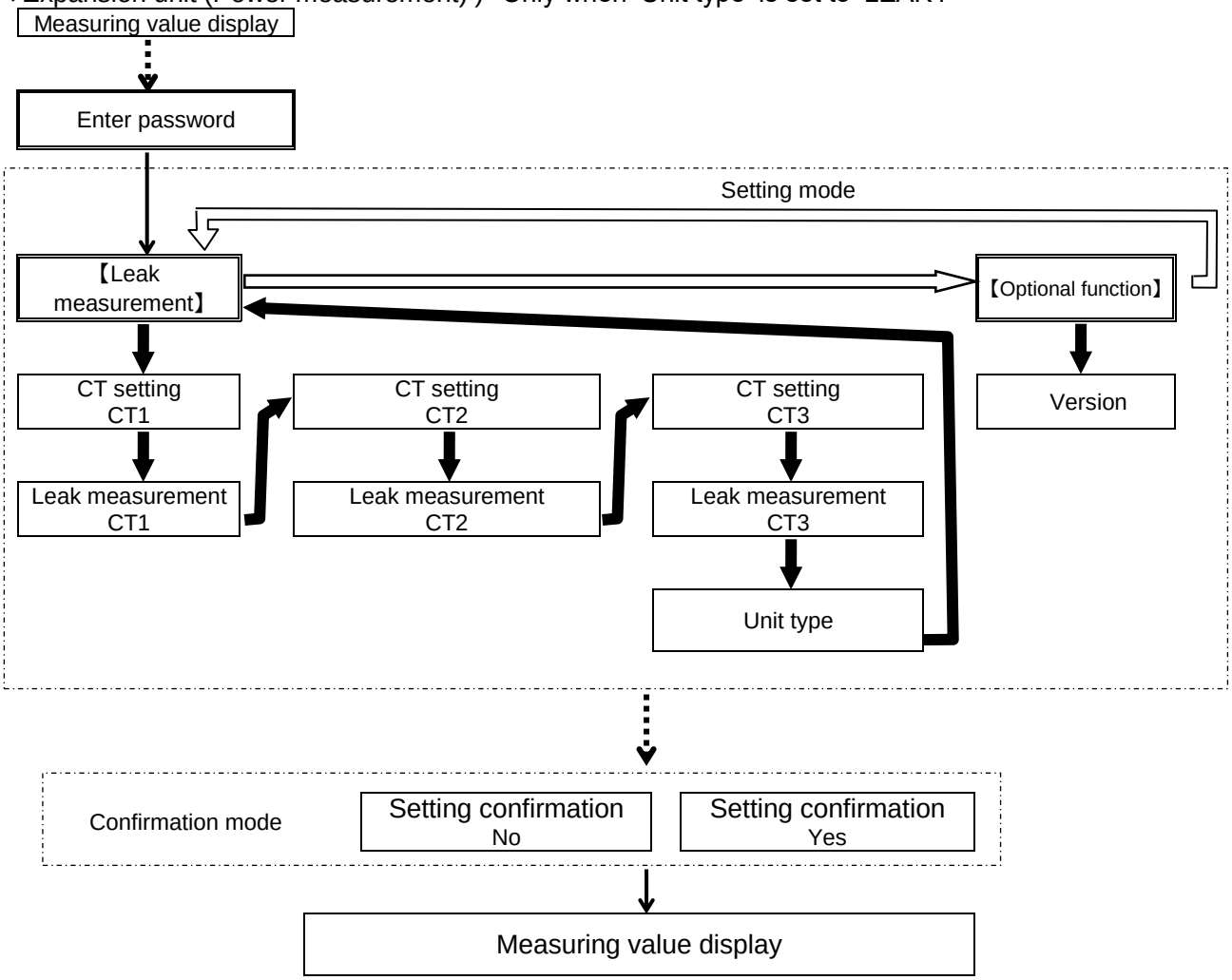

*1 'Voltage setting' is common to main unit CH1, CH2, expansion unit (power measurement) CH1, CH2.
*2 'IP address' and 'Subnet mask' are skipped when 'DHCP setting' is set to available.
*3 Only for expansion unit (power measurement) CH2




Press <SET> during each item is displayed to change the setting value.
Press <MODE> to display the confirmation window. Select [Yes] and press <SET> to decide the setting value. However no value is changed, the confirmation window is skipped and it displays the measuring value display.

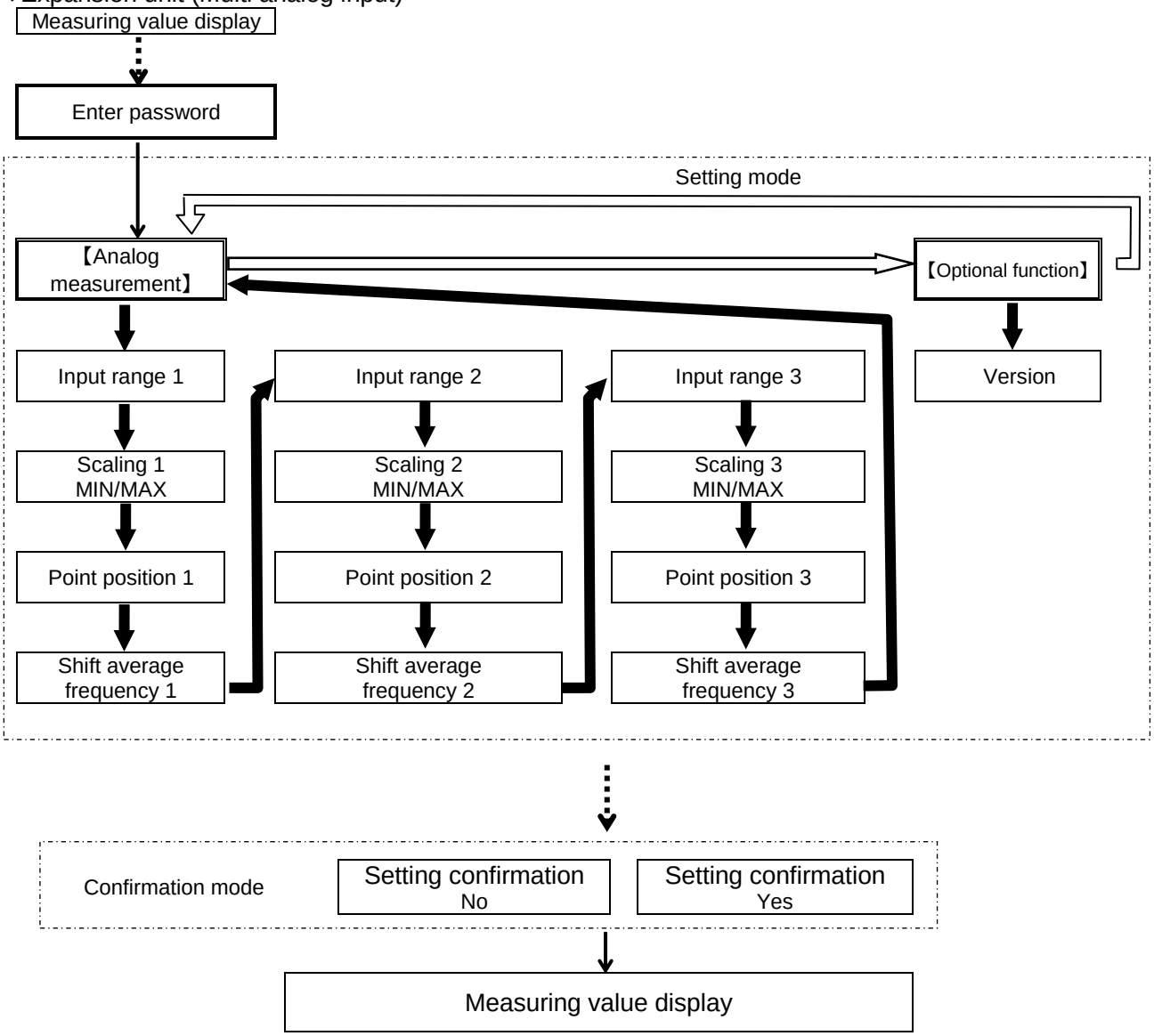
*1 only KW2M-X

◆Expansion unit (Power measurement) ) *Only when ‘Unit type’ is set to ’LEAK’.



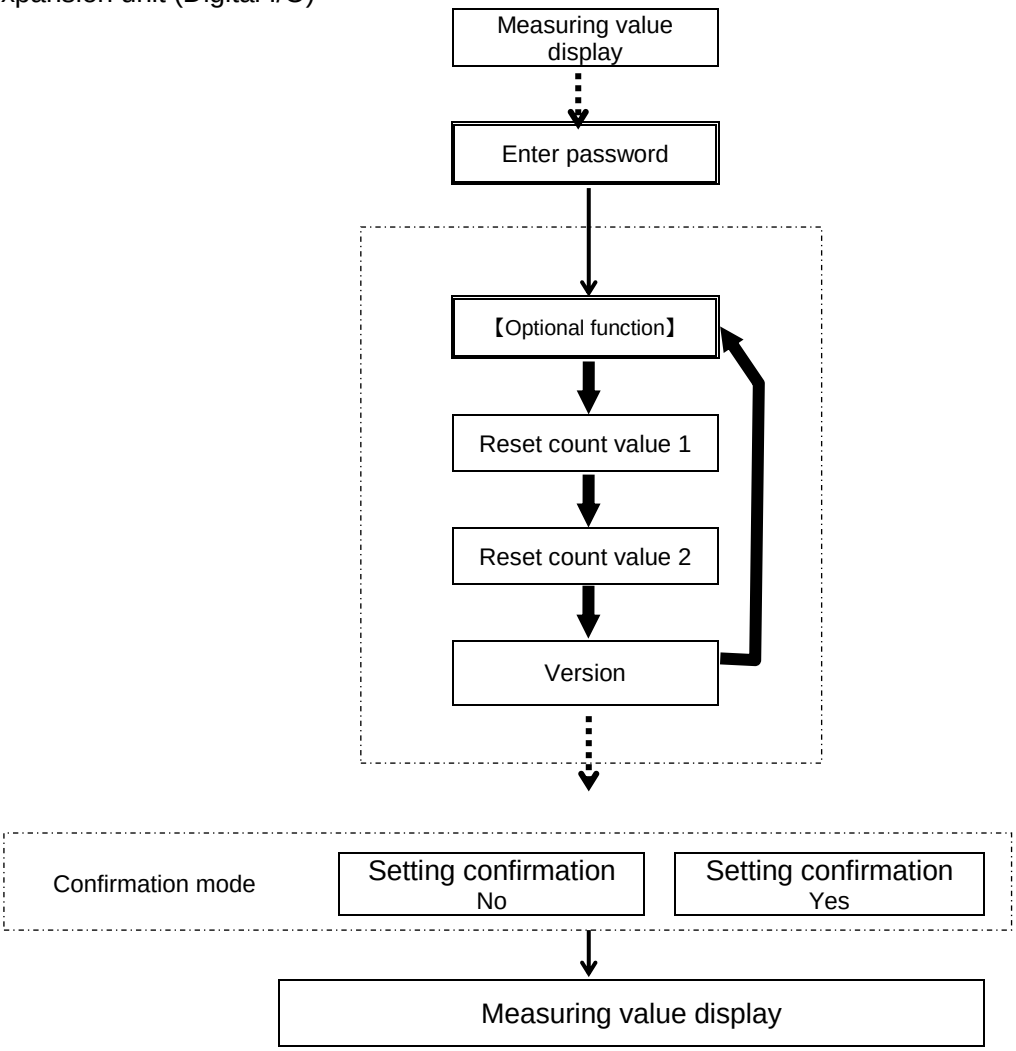

Press <SET> during each item is displayed to change the setting value.
Press <MODE> to display the confirmation window. Select [Yes] and press <SET> to decide the setting value. However no value is changed, the confirmation window is skipped and it displays the measuring value display.

◆Expansion unit (Multi analog input)




Press <SET> during each item is displayed to change the setting value.
Press <MODE> to display the confirmation window. Select [Yes] and press <SET> to decide the setting value. However no value is changed, the confirmation window is skipped and it displays the measuring value display.

◆Expansion unit (Digital I/O)




Press <SET> during each item is displayed to change the setting value.
Press <MODE> to display the confirmation window. Select [Yes] and press <SET> to decide the setting value. However no value is changed, the confirmation window is skipped and it displays the measuring value display.

## 4.2 Password Entry

It is necessary to enter password to shift to setting mode.
Enter [0000] and shift to password setting mode when you set password at the first time.
*When setting password, be careful for handling and note it.

Measuring value display

↓**<MODE>**

```
M - 1          P a s s w o r d

                        0 - - -
```

Press <MODE> and it shifts to password entry window.

Enter password from left to right using <ITEM/>>, <SHIFT/∧>.

| | |
|---|---|
| <SHIFT/∧> | Increase |
| <ITEM/>> | Shift entered digit to the right |

↓**<SET>**

```
M - 1          P o w e r
```

Press <SET> after enter the password.

If the password is correct, it shift to setting mode of power measurement.

If the password is wrong, [FAIL] is displayed and it returns to the password entry window.
*If you make wrong password 5 times, you can't set 1-hour after.

```
M - 1          P a s s w o r d

                          F a i l
```

## 4.3 Password Initialize

When you forget the password, initialize it in the following procedures. (Initial: [0000])
It is impossible to decode the set password.

Measuring value display

Press <MODE> and it shifts to password entry window.

↓**<MODE>**

```
M - 1          P a s s w o r d

                          0 - - -
```

Press <MODE> and <ITEM/>> for 30 seconds in the password entry window, and it shift to the password initialize window.

↓**<MODE>+<ITEM/>> 30sec.**

```
M - 1          P a s s w o r d

                    R e s e t
```

↓**<SET>**

```
M - 1          P a s s w o r d

                    R e s e t
                           N o
```

**<SHIFT/∧>**
⟷
**<ITEM/>>**

```
M - 1          P a s s w o r d

                    R e s e t
                           Y e s
```

↓**<SET>** ↓**<SET>**

Not initialize : [No]
Initialize : [Yes]

Return to the measuring value display

## 4.4 How to Set by Keys

■Set before measuring.

Select setting item with <ITEM/>> and press <SET>, and the value will be blinking.
Set with <ITEM/>> and <SHIFT/∧>.
When you select [Yes] with the confirmation window and press <SET>, the setting values are settled.
Setting items with (※) can be set to each CH and each unit.

### 4.4.1 Settings for power measurement

*Only for Main unit and Expansion unit (Power measurement)

**Phase/Wire system (※)**

**Select phase/wire system to measure.**

```
M - 1          Power
             System

              1P2w
```

Press <ITEM/>>, <SHIFT/∧> to select.

[Set list]
1P2W, 1P3W, 3P3W, 3P4W (initial: 1P2W)

*When the system is not matched with the measure system, it doesn't measure correctly.

**CT setting (※)**

**Select using CT type.**

```
M - 1          Power
                  CT
Primary           5A
Secondary         5A
```

Press <SET>, to select primary or secondary.

Press <ITEM/>>, <SHIFT/∧> to set.

[Set range]
Primary side : 1 to 65535 (initial:5)
Secondary side: 5 (5A), 1 (1A) (initial: 5)

SHIFT ∧ Increase
ITEM > decrease

To use CT with secondary side current 5A: [5]
To use CT with secondary side current 1A: [1]

**Voltage setting**

**Set the rated voltage to measure.**

```
M - 1          Power
                  VT
Primary         230V
Secondary       230V
```

Press <SET>, to select primary or secondary.

Press <ITEM/>>, <SHIFT/∧> to set the voltage.

[Set range]
Primary side : 100 to 500000 (initial:230)
Secondary side: 100 to 690 (initial:230)

*Set the rated voltage when it doesn't use VT.

SHIFT ∧ Increase
ITEM > decrease

**Unit type**

*Only Expansion unit (Power measurement) CH2

**Select the measured type.**

```
1 - 1                    Power
                 Unit  Type

                         Power
```

Press <ITEM/>>, <SHIFT/∧> to select.

[Set list]
Power, Leak (initial: Power)

4.4.2 Settings for leakage current measurement
*It is only when 'LEAK' is selected on Unit type.

**CT setting**

**Select using CT type.**

```
1 - 2                     Leak
                       CH1  CT
   Primary             65535A
   Secondary                5A
```

Press <SET>, to select primary or secondary.

Press <ITEM/>>, <SHIFT/∧> to set.

[Set range]
Primary side : 1 to 65535 (initial:5)
Secondary side: 5 (5A), 1 (1A) (initial: 5)

SHIFT ∧ Increase

ITEM > decrease

To use CT with secondary side current 5A: [5]
To use CT with secondary side current 1A: [1]

**Leak measurement**

**Set conditions to detect leakage current.**

```
1 - 2                     Leak
   CH1  Leak  measure
   Threshold          0.01%
   Delay  time         0.1s
```

Press <SET>, to select threshold or delay time.

Press <ITEM/>>, <SHIFT/∧> to set.

[Set range]
Threshold: 0.01 to 100.00[%] (initial: 100%)
Delay time:0.1 to 20.0[s] (initial:20.0s)

SHIFT ∧ Increase

ITEM > decrease

**Unit type**

*Only for expansion unit (power measurement) CH2

**Select measuring mode.**

```
1 - 1                     Leak
                 Unit  Type

                          Leak
```

Press <ITEM/>>, <SHIFT/∧> to select.

[Set list]
Power, Leak (initial: Power)

## 4.4.3 Settings for analog measurement *Only for Expansion unit (Multi analog input)

**Input range**

**Select input range.**

```
1 - 1                    Analog
        CH1  Input  rang
                         0-60V
```

Press <ITEM/>>, <SHIFT/∧> to select.

[Set list]
0-60V, 0-20mA, 4-20mA (initial: 0-60V)

---

**Scaling value**

**Set max. value and min. value for scaling.**

```
1 - 1                    Analog
              CH1  Scaling
   Min                       0
   Max                    4000
```

Press <SET>, to select minimum or maximum.

Press <ITEM/>>, <SHIFT/∧> to set.

[Set range]
Minimum: -999999999 to 999999999 (initial:0)
Maximum: -999999999 to 999999999 (initial:4000)

SHIFT ∧ Increase

ITEM > decrease

**Point position**

**Select the decimal point position for measurement value display.**

```
1 - 1                    Analog
   CH1  point  position
                            1
```

Press <ITEM/>>, <SHIFT/∧> to select.

[Set list]
0.0001, 0.001, 0.01, 0.1, 1 (initial: 1)

**Shift average frequency**

**Select shift average frequency.**

```
1 - 1                    Analog
              CH1  Average
                            0
```

Press <ITEM/>>, <SHIFT/∧> to select.

[Set list]
0, 2, 4, 8, 16 (initial: 8)

**RTD type**

**Select RTD type.**

```
1 - 1                    Analog
                            RTD
                         PT100
```

Press <ITEM/>>, <SHIFT/∧> to select.

[Set list]
PT100, PT1000 (initial: PT100)

### 4.4.4 Settings for communication (RS485) *Only for Main unit

**Protocol**

**Select protocol of main unit via serial communication (RS485).**

*When protocol is changed, device number, transmission speed (baud rate), transmission format, stop bit and response time will be initialized.

```
M - 1        COM  RS485
               Protocol

             MEWTOCOL
```

Press <ITEM/>>, <SHIFT/∧> to select.
[Set list]
MEWTOCOL, MODBUS(RTU)
(initial: MEWTOCOL)

**Device number**

**Set an individual device number for each unit when two or more units are connected to communicate via serial communication (RS485).**

```
M - 1        COM  RS485
                     No

                     99
```

Press <ITEM/>>, <SHIFT/∧> to set.
The setting range differs according to the protocol.

[Set range] MEWTOCOL: 1 to 99
MODBUS(RTU): 1 to 247

SHIFT ∧ increase

ITEM > decrease

**Transmission speed (Baud rate)**

**Select the serial communication (RS485) transmission speed.**
**Define the transmission speed according to the master's (PLC etc.).**

```
M - 1        COM  RS485
                   Speed

             38400bps
```

Press <ITEM/>>, <SHIFT/∧> to select.

[Set list]
2400, 4800, 9600, 19200, 38400, 57600, 115200 [bps]
(initial: 19200)

**Transmission format**

**Select serial communication (RS485) transmission format (Data length, Parity).**
**Define the transmission format according to the master's (PLC etc.).**

```
M - 1          COM RS485
                  Format

                 8bit-o
```

Press <ITEM/>>, <SHIFT/∧> to select.

[Set list]
8b-o (8bit odd), 8b-n (8bit none), 8b-E (8bit even)
(initial: 8b-o)

**Stop bit**

**Select serial communication (RS485) stop bit.**

```
M - 1          COM RS485
                Stop bit

                    1bit
```

Press <ITEM/>>, <SHIFT/∧> to select.

[Set list] 1, 2 (initial: 1)

**Response time**

**Set serial communication (RS485) response time of main unit.**
**When command is received, it sends response after setting response time passes.**

```
M - 1          COM RS485
          Response Time

                     5ms
```

Press <ITEM/>>, <SHIFT/∧> to set.

[Set range] 1 to 99 ms (initial: 5)

SHIFT ∧ increase

ITEM > decrease

* If Data Logger Unit (DLU) or Data Logger Light (DLL) is used as a master, set the response time to 5ms or more because DLU or DLL send the response after 1.1ms or less from receive a command when transmission speed is set to 19200bps.

### 4.4.5 Settings for communication (Ethernet) *Only for Main unit

**DHCP setting**

**Select DHCP for Ethernet communication.**

```
M - 1        COM Ethernet
                     DHCP

                       No
```

Press <ITEM/>>, <SHIFT/∧> to select.

[Set list] Yes (available), No (not available) (initial: No)

**IP address**

*It skips this item when [Yes] is set for DHCP setting.

**Set IP address for Ethernet communication.**

```
M - 1        COM Ethernet
                 IP Adress

     192.168.001.005
```

Press <ITEM/>>, <SHIFT/∧> to set.

[Set range] 0. 0. 0. 0 to 255. 255. 255. 255
(initial: 192.168.1.5)

SHIFT ∧ increase

ITEM > decrease

**Subnet mask**

*It skips this item when [Yes] is set for DHCP setting.

**Set subnet mask for Ethernet communication.**

```
M - 1        COM Ethernet
               Subnet mask

     255.255.255.000
```

Press <ITEM/>>, <SHIFT/∧> to set.

[Set range] 128. 000. 000. 000 to 255. 255. 255. 255
(initial: 255.255.255.0)

SHIFT ∧ increase

ITEM > decrease

**Default Gateway**

*It skips this item when [Yes] is set for DHCP setting.

**Set default gateway for Ethernet communication.**

```
M - 1        COM Ethernet
        Defualt Gateway

        192.168.001.001
```

Press <ITEM/>>, <SHIFT/∧> to set.

[Set range] 0. 0. 0. 0 to 255. 255. 255.255
(initial: 192.168.1.1)

SHIFT ∧ increase

ITEM > decrease

**Web server setting**

**Select Web server setting for Ethernet communication.**

```
M - 1        COM Ethernet
             web Server

                      Yes
```

Press <ITEM/>>, <SHIFT/∧> to select.

[Set list]
Yes (available), No (not available) (initial: Yes)

### 4.4.6 Settings for optional functions

**Auto-off** *Only for Main unit

**Display backlight turns off automatically when there is no key operation for a long time.**
**After it passes the setting time, backlight will turn off.**

```
M - 1          Option
           Auto OFF

                5min
```

Press <ITEM/>>, <SHIFT/∧> to set.

[Set range] 0 to 99 min. (initial:5)

SHIFT ∧ increase

ITEM > decrease

Always turn on : [0]
Turn off after setting time: [1 to 99]
After turns off the backlight, any key operation makes it turns on.

**Update cycle** *Only for Main unit

**Select update cycle for measuring window.**
**It updates the display of measured values every setting time.**

```
M - 1          Option
       Display update

                0.5s
```

Press <ITEM/>>, <SHIFT/∧> to select.

[Set list] 0.5, 1.0, 2.0, 3.0 [s] (initial:1.0)

**Reset all integral value**

*Only for Main unit and Expansion unit (Power measurement)

**Integral power (active, reactive, apparent) can be reset at one time.**

```
M - 1          Option
           All Reset

                Yes
```

Press <ITEM/>>, <SHIFT/∧> to select.

[Set list] Yes, No (initial: No)

Reset all : [Yes]
Not reset : [No]

**Reset integral value 1**

*Only for Main unit and Expansion unit (Power measurement)
*It skips this item when [Yes] is selected for reset all integral value.

**Reset the integral power of 1CH/1-phase (active, reactive, apparent) and integral export power of 1CH/1-phase (active, reactive).**

```
M - 1          Option
           Reset 1

                Yes
```

Press <ITEM/>>, <SHIFT/∧> to select.

[Set list] Yes, No (initial: No)

Reset : [Yes]
Not reset : [No]

**Reset integral value 2**

*Only for Main unit and Expansion unit (Power measurement)
*It skips this item when [Yes] is selected for reset all integral value.

**Reset the integral power of 2CH/2-phase (active, reactive, apparent) and integral export power of 2CH/2-phase (active, reactive).**

Press <ITEM/>>, <SHIFT/∧> to select.

```
M - 1          Option
             Reset  2

                  Yes
```

[Set list] Yes, No (initial: No)

Reset : [Yes]
Not reset : [No]

**Reset integral value 3**

*Only for Main unit and Expansion unit (Power measurement)
*It skips this item when [Yes] is selected for reset all integral value.

**Reset the integral power of 3CH/3-phase (active, reactive, apparent) and integral export power of 3CH/3-phase (active, reactive).**

Press <ITEM/>>, <SHIFT/∧> to select.

```
M - 1          Option
             Reset  3

                  Yes
```

[Set list] Yes, No (initial: No)

Reset : [Yes]
Not reset : [No]

**Reset count value**

*Only for Main unit and Expansion unit (Power measurement)
*It skips this item when [Yes] is selected for reset all integral value.

**Reset the count value.**

Press <ITEM/>>, <SHIFT/∧> to select.

```
M - 1          Option
        Reset  Count

                  Yes
```

[Set list] Yes, No (initial: No)

Reset : [Yes]
Not reset : [No]

**Reset count value 1** *Only for Expansion unit (Digital I/O)

**Reset the count value 1 of expansion unit (digital I/O).**

Press <ITEM/>>, <SHIFT/∧> to select.

```
1 - 1          Option
        Reset  Count 1

                  Yes
```

[Set list] Yes, No (initial: No)

Reset : [Yes]
Not reset : [No]

**Reset count value 2**

*Only for Expansion unit (Digital I/O)

**Reset the count value 2 of expansion unit (digital I/O).**

Press <ITEM/>>, <SHIFT/∧> to select.

```
1 - 1                    Option
            Reset  Count 2

                            Yes
```

[Set list] Yes, No (initial: No)

Reset : [Yes]
Not reset : [No]

**Reset hour meter**

*Only for Main unit and Expansion unit (Power measurement)
*It skips this item when [Yes] is selected for reset all integral value.

**Reset the values of measured by hour meter, ON-time, OFF-time, Stand-by-time, and Maintenance-time.**

Press <ITEM/>>, <SHIFT/∧> to select.

```
M - 1                    Option
      Reset  Hour  Meter

                            Yes
```

[Set list] Yes, No (initial: No)

Reset : [Yes]
Not reset : [No]

**Reset log data**

*Only for Main unit and Expansion unit (Power measurement)
*It skips this item when [Yes] is selected for reset all integral value.

**Reset all log data.**

Press <ITEM/>>, <SHIFT/∧> to select.

```
M - 1                    Option
                  Reset  Log

                            Yes
```

[Set list] Yes, No (initial: No)

Reset : [Yes]
Not reset : [No]

**Reset Memory (only KW2M-X)**

**Delete logging data (CSV file).**

Press <ITEM/>>, <SHIFT/∧> to select.

```
M - 1                    Option
            Reset  Memory

                            Yes
```

[Set list] Yes, No (initial: No)

Reset : [Yes]
Not reset : [No]

**Version**

**You can check the software version.**

```
M - 1                    V e r s i o n

B a s e
0 . 1 7
```

It displays the software version.

### 4.4.7 Settings for calendar timer (only KW2M-X)

**Time-zone**

**Set time-zone based on UTC standard.**

```
M - 1                    Clock
                   Time  zone

                 UTC+  08:30
```

Press <ITEM/>>, <SHIFT/∧> to select.

[Set list] UTC-12:00 to UTC+14:00(initial: UTC+9:00)

**Clock**

**Set year, month, day and time.**

Set the date and time to use logging function.

```
M - 1                    Clock

              2015/01/01
                 00:00:30
```

Press <SET> and year, month, date, time are blinking in turn.
With blinking the setting item and press <ITEM/>> and <SHIFT/∧>.

[Setting range]
January 1st, 2015 00:00:00
to December 31st, 2099 23:59:59

Caution;

The timing when the calendar timer is settled to the unit is the timing when you select [YES] with the confirmation window and press <SET>.
It doesn't set the calendar timer to the unit when you press <SET> with calendar timer setting window.
Give your attention when you set time by second.

### 4.4.8 Password setting

**Password setting**

**You can set password for changing the settings.**
**It is necessary to enter the password before moving the setting mode.**
**We recommend you to set password to avoid unexpected change.**

```
M - 2          P a s s w o r d
                      0 0 0 0
```

Press <SET> and [0] on the left is blinking.
Set password using <ITEM/>>, <SHIFT/∧>.

SHIFT ∧ Increase

ITEM > Shift entered digit to the right

Set from left to right. Make the digit to set blink.

[Set range] 0000 to 9999 (initial: 0000)

```
M - 2          P a s s w o r d
                      2 3 4 5
```

Set 4-digit password and press <SET>
After that the confirm window is displayed.

↓**<SET>**

```
M - 2          P a s s w o r d
                         N o
                    2 3 4 5
```

ITEM > ⟷

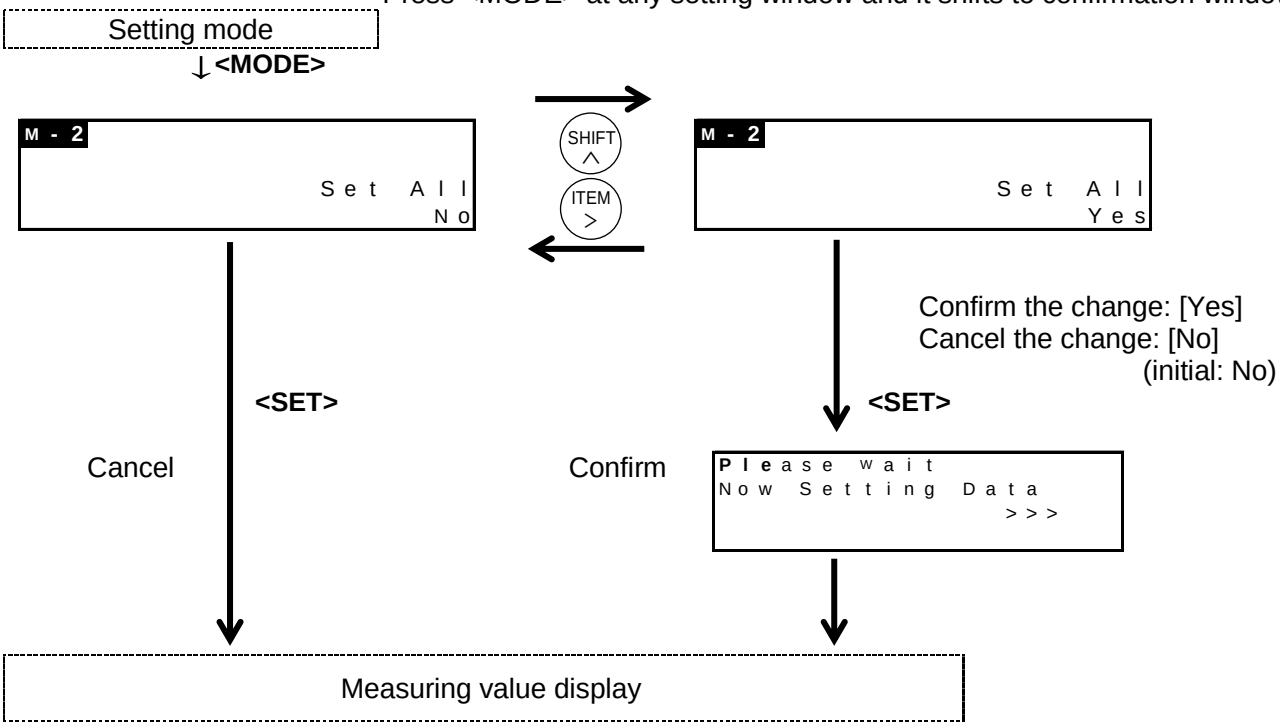
```
M - 2          P a s s w o r d
                         Y e s
                    2 3 4 5
```

[Set list] Yes, No (initial: N0)

Confirm: [Yes]
Not confirm: [No]

### 4.4.9 Confirmation window

Press <MODE> at any setting window and it shifts to confirmation window.

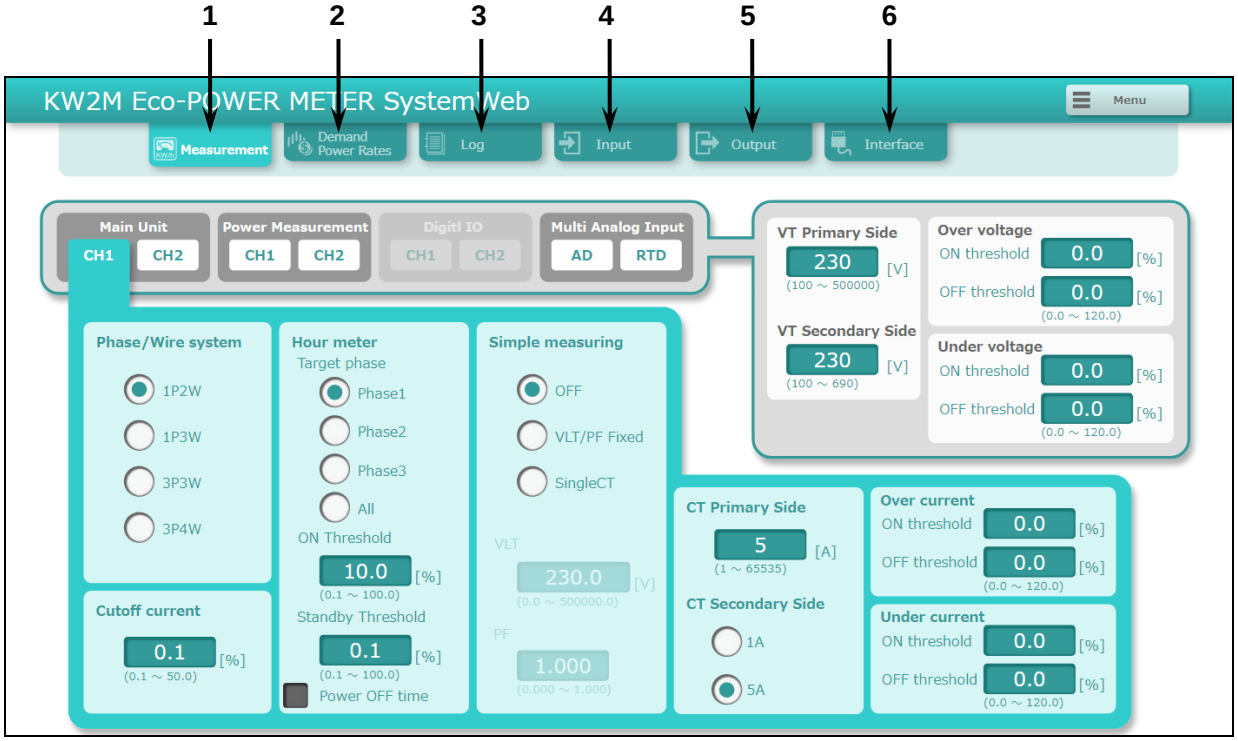


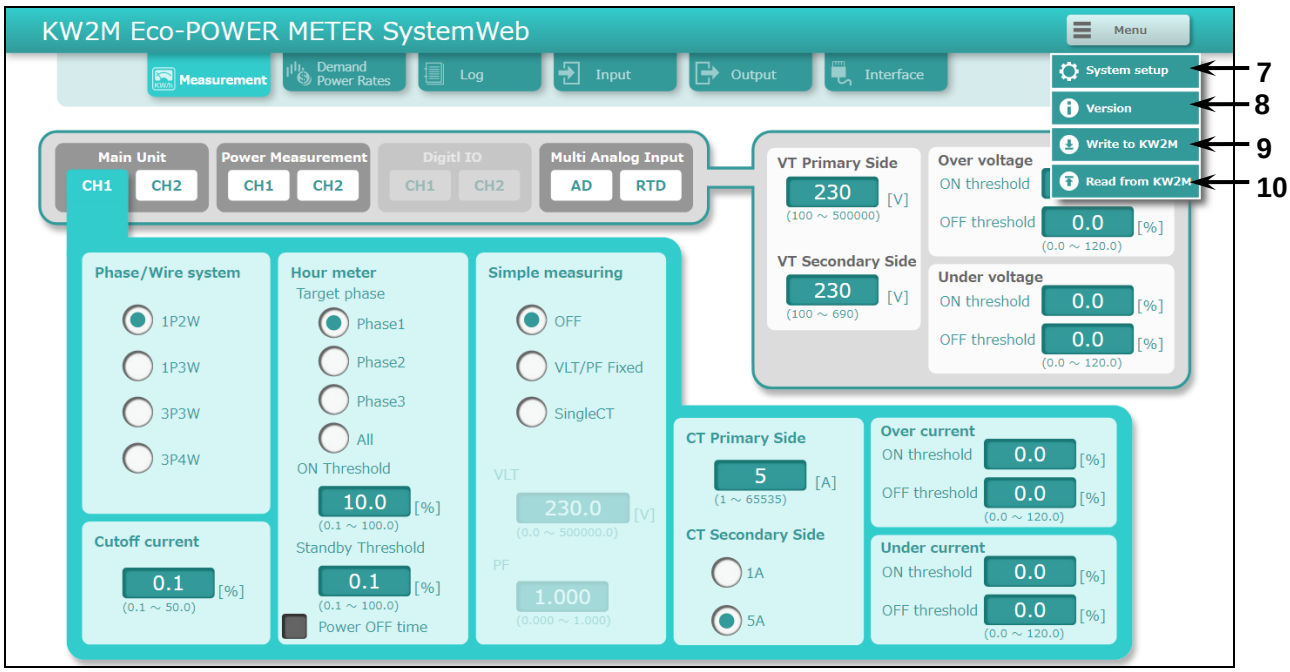
## 4.5 How to Set by Web Browser (System Web)

You can set by using Web browser.
Access to 'http://xxx.xxx.xxx.xxx/setup/index.htm'. Put the setting IP address to 'xxx.xxx.xxx.xxx'.
It is necessary to enter user name and password to access the website.
(Initial user name: admin, initial password: admin)
It may take time to get the website according to the communication environment.

### 4.5.1 Setting item

Select item from tabs to set

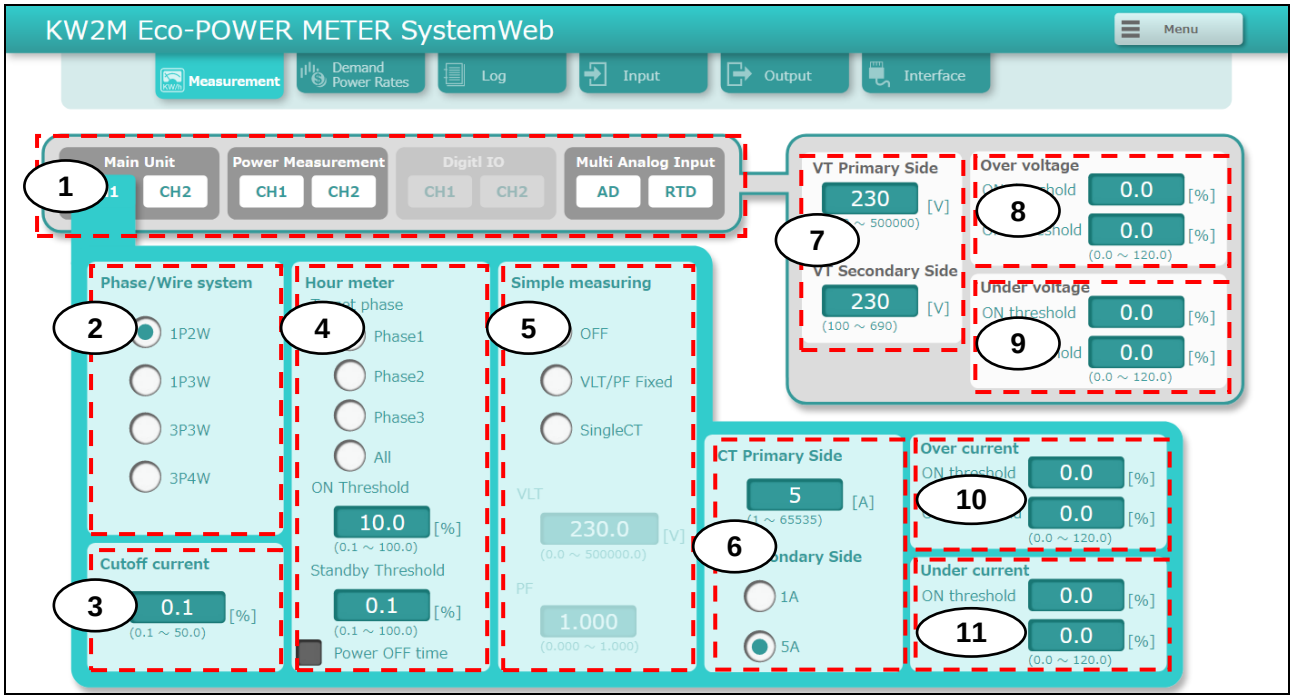


| Item | | Description |
|---|---|---|
| 1 | Measurement | Set parameters related to power measurement |
| 2 | Demand / Power Rates | Set parameters related to demand, conversion rate |
| 3 | Log *1 | Set parameters related to log |
| 4 | Input | Set parameters related to pulse input |
| 5 | Output | Set parameters related to pulse output |
| 6 | Interface | Set parameters related to Ethernet and RS485 communication |
| 7 | System setup | Set parameters related to system |
| 8 | Version | Confirm version information |
| 9 | Write→KW2M | Write parameters to Eco-POWER METER |
| 10 | Read←KW2M | Read out parameters from Eco-POWER METER |

*1 only KW2M-X

### 4.5.2 Settings for power measurement

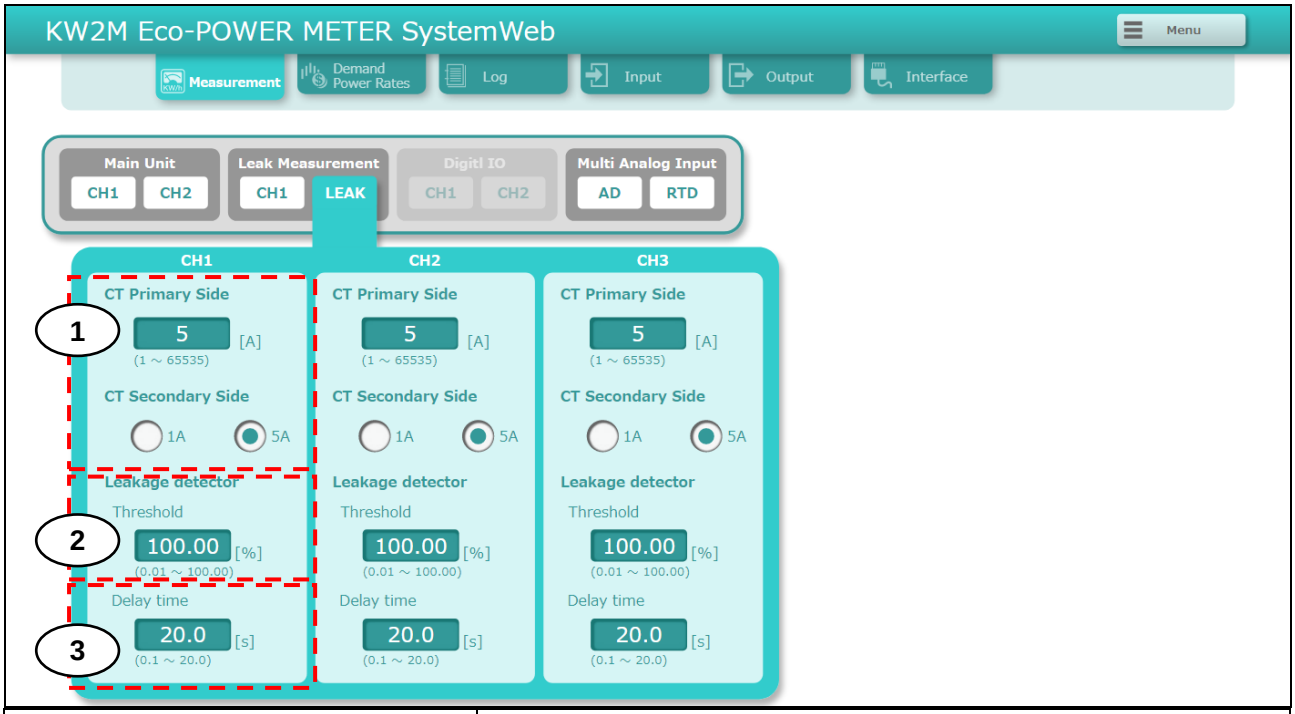



| Item | | Description |
|---|---|---|
| 1 | Select unit and CH | Select unit and CH to set. |
| 2 | Phase/Wire system | Select phase and wire system to power measurement.<br><br><List><br>1P2W, 1P3W, 3P3W, 3P4W (initial: 1P2W) |
| 3 | Cutoff current | Set a ratio of current for rated current used for cutoff that is not measured.<br><br><Range><br>0.1 to 50.0% (initial:0.1) |
| 4 | Hour meter | Set target phase, ratio for rated current use to measure ON-time and standby time.<br>Check box of [Power OFF Time], it measures as OFF-time when Eco-POWER METER turns off.<br>*only KW2M-X supports standby time and power off time.<br><List><br>Target phase : Phase1, Phase2, Phase3, ALL (initial:Phase1)<br>Threshold(ON Threshold) : 0.1 to 100.0% (initial:10.0)<br>Standby Threshold *1 : 0.1 to 100.0% (initial:0.1)<br>Power OFF Time *1 : Yes, No (initial: No) |
| 5 | Simple measuring | Select mode and set parameters for simple measuring.<br><br><List & Range><br>Type:<br>OFF (no use)<br>VLT/PF Fixed (Use actual current with fixed voltage and PF)<br>Single CT (Use phase 1 current and all voltage)<br>(initial: OFF)<br>VLT* : 0.0 to 500000.0V (initial:230V)<br>PF* : 0.000 to 1.000 (initial:1.000)<br><br>* VLT and PF can be set when 'VLT/PF Fixed' is selected. |

| | | |
|---|---|---|
| 6 | CT | Set parameters of CT.<br><br><Range><br>Primary side : 1 to 65535 (initial:5)<br>Secondary side: 5 (5A), 1 (1A) (initial: 5) |
| 7 | VT*2 | Set parameters of VT when VT is used.<br>When VT is not used, set parameters of rated voltage to measure.<br><br><Range><br>Primary side : 100 to 500000 (initial:230)<br>Secondary side: 100 to 690 (initial:230) |
| 8 | Over current*3 | Set a ratio of current for rated current used for threshold to judge over current.<br><br><Range><br>0.0 to 120.0% (initial:0.0) |
| 9 | Under current*3 | |
| 10 | Over Voltage*3 | Set a ratio of voltage for rated voltage used for threshold to judge over voltage.<br><br>< Range ><br>0.0 to 120.0% (initial:0.0) |
| 11 | Under Voltage*3 | |

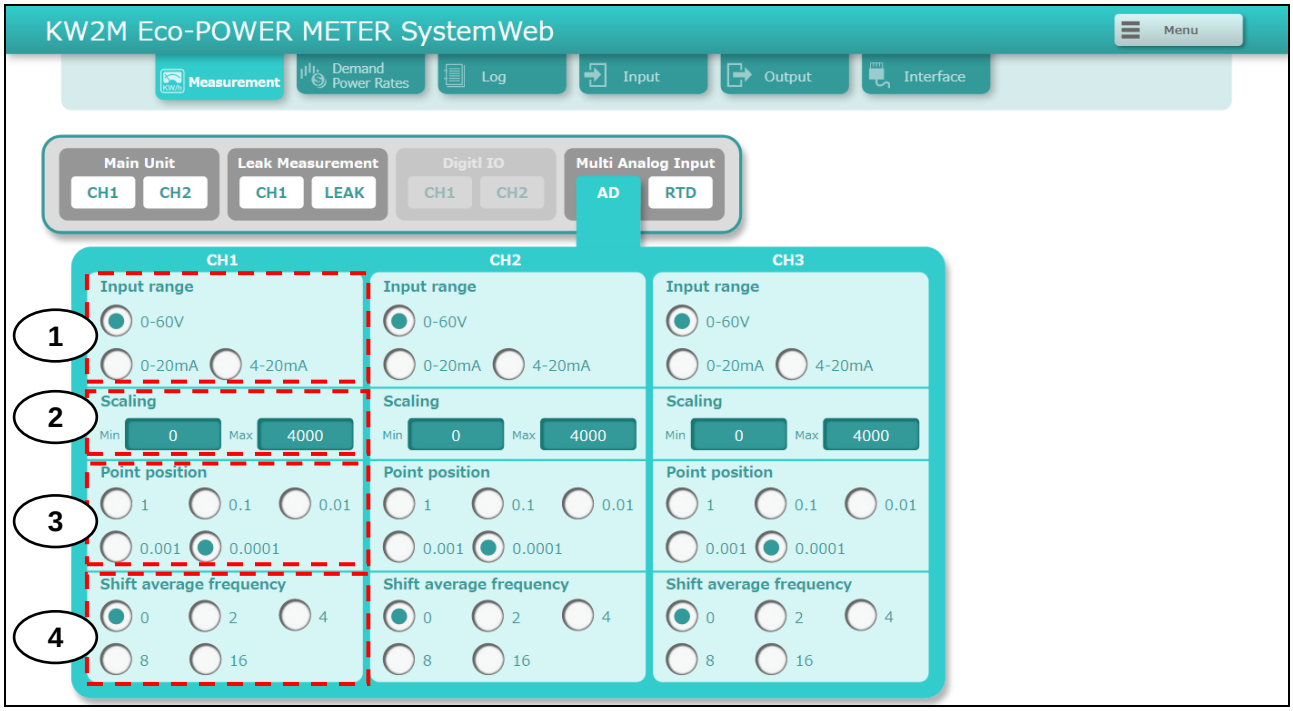
*1 only KW2M-X
*2 Common to unit and CH.
*3 For KW2M-A, it is common to unit and CH. For KW2M-X, it set for unit and each CH.

### 4.5.3 Setting for leakage current measurement



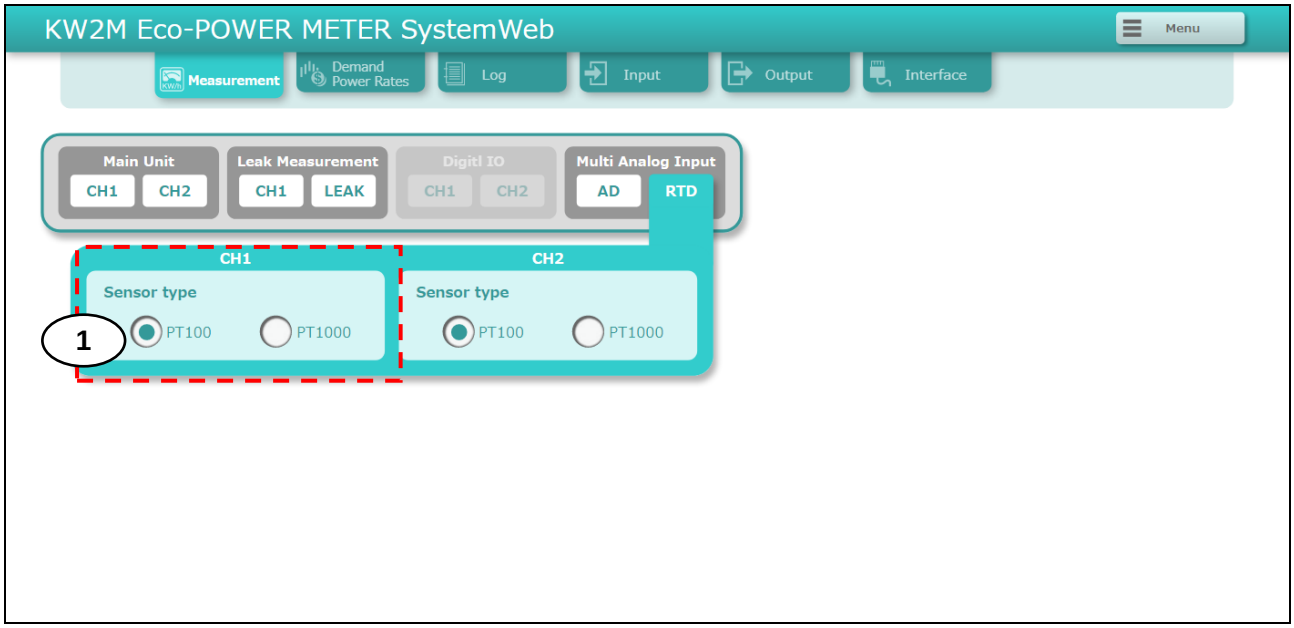

| Item | Description |
|---|---|
| 1 CT | Set parameters of CT.<br><br><Range><br>Primary side : 1 to 65535 (initial:5)<br>Secondary side: 5 (5A), 1 (1A) (initial: 5) |
| 2 Leak measurement | Set a ratio for rated value used for threshold to judge leakage.<br><br><Range><br>0.01 to 100.00% (initial:100.0) |
| 3 Delay time | Set on delay time, from the time it exceeds the threshold to it output alarm.<br><br><Range><br>0.1 to 20.0s (initial:20.0) |

### 4.5.4 Settings for AD conversion




| Item | Description |
|---|---|
| 1 Input range | Select input range<br><List><br>0-60V, 0-20mA, 4-20mA (initial: 0-60V) |
| 2 Scaling | Set scaling for analog conversion<br><br><Range><br>Min : -999999999 to 999999999 (initial:0)<br>Max : -999999999 to 999999999 (initial:4000) |
| 3 Point position | Select the decimal point for measurement value display<br>It effects to digital conversion value, scaling max. value and scaling min. value.<br><br><List> 1, 0.1, 0.01, 0.001, 0.0001 (initial:0.0001) |
| 4 Shift average frequency | Select shift average frequency for measurement value<br><br>When you select the bigger average frequency, you can suppress the unevenness.<br><br><List> 0, 2, 4, 8, 16 (initial: 8) |

### 4.5.5 Settings for RTD measurement

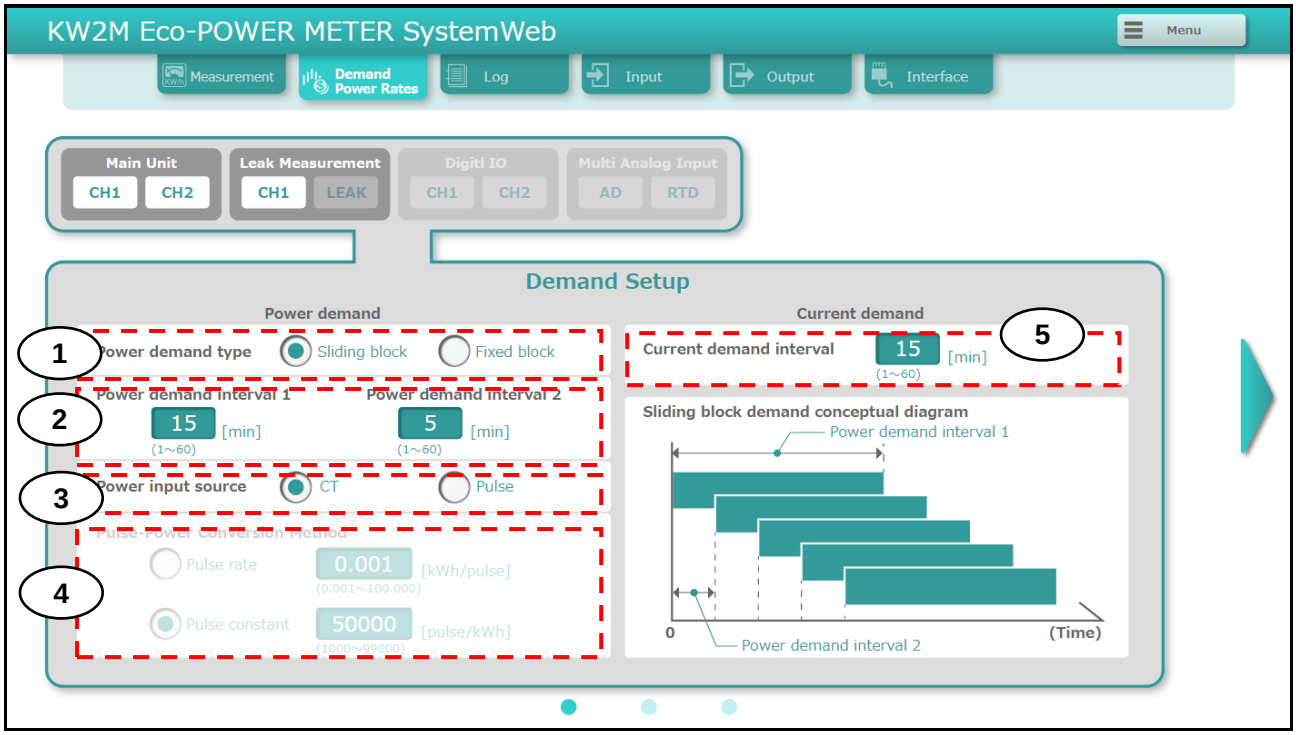



| Item | Description |
|---|---|
| 1 Sensor type | Select sensor type for temperature measurement<br><br><List> PT100, PT1000 (initial: PT100) |

4.5.6 Settings for demand and power rates

Click '◀ ▶' to shift window of 'Demand Setup' and 'Conversion rate Setup'.

[Demand Setup]

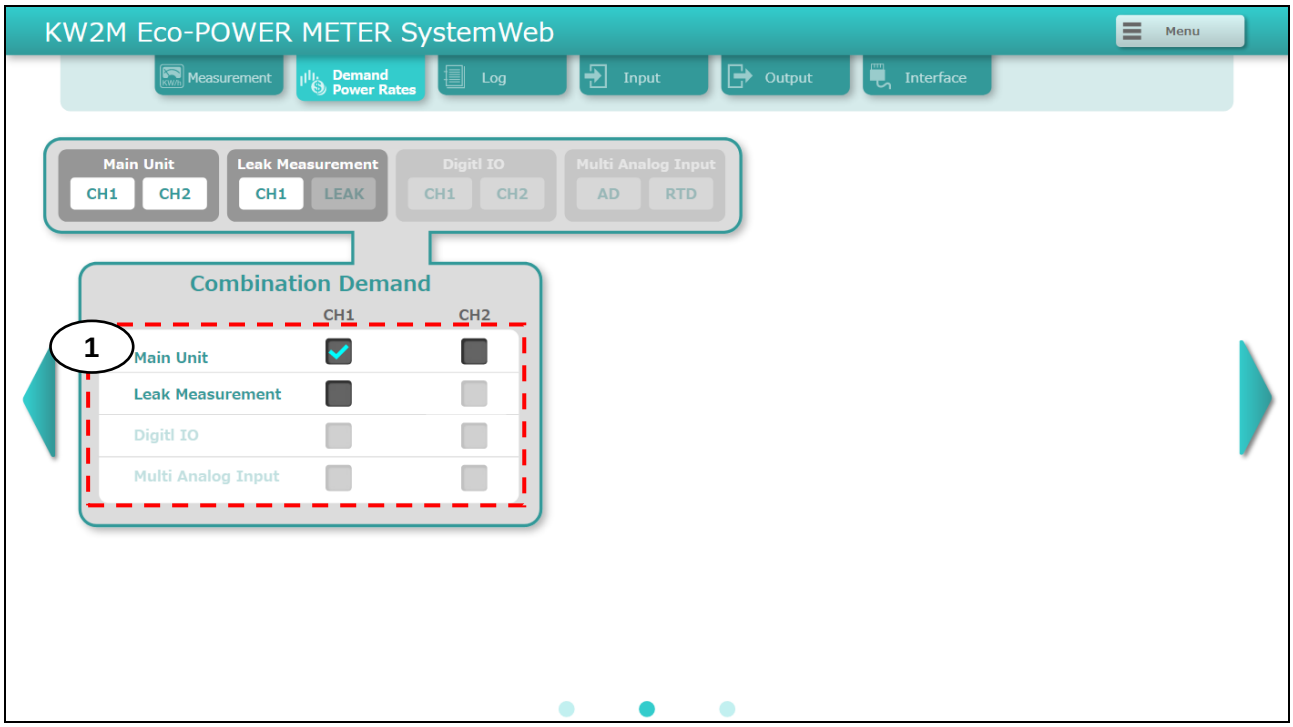



| Item | | Description |
|---|---|---|
| 1 | Power demand type | Select type of power demand measurement.<br><br><List><br>Sliding block, Fixed block (initial: Sliding block) |
| 2 | Power demand interval | Set interval time to use for power demand measurement.<br><br><Range><br>Power demand interval 1 : 1 to 60min (initial:15)<br>Power demand interval 2 : 1 to 60min (initial:1) |
| 3 | Power input source *1 | Select input type to use for demand measurement, current measurement or pulse input.<br><br><List><br>CT, Pulse (initial: CT) |
| 4 | Pulse-Power Conversion Method *2 | Select and set electric power value per 1-pulse or pulse constant value input by an outer pulse detector.<br><br><Range><br>Pulse rate : 0.001 to 100.000 kWh/pulse(initial:0.001)<br>Pulse constant : 1000 to 99000 pulse/kWh(initial:50000) |
| 5 | Current demand interval | Set interval to use for current demand calculation.<br><br>< Range ><br>1 to 60min(initial:15) |

*1 Power input source is setting for main unit CH1.

*2 Pulse-Power Conversion Method is available when [Pulse] is selected for 'Power input source'.

[Combination Demand]




| Item | Description |
|---|---|
| 1 Combination Demand | Select channel to use for totalizing demand |

[Conversion Rate Setup]

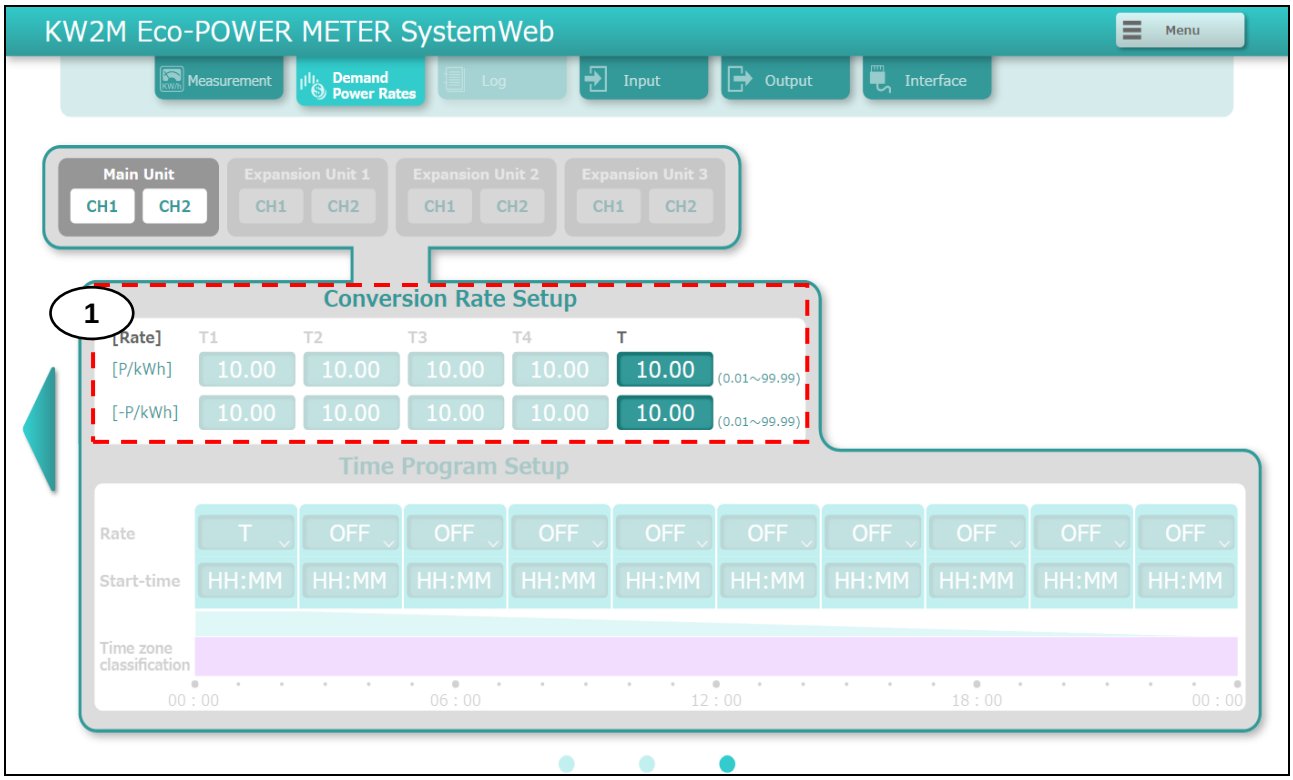



Image of KW2M-A

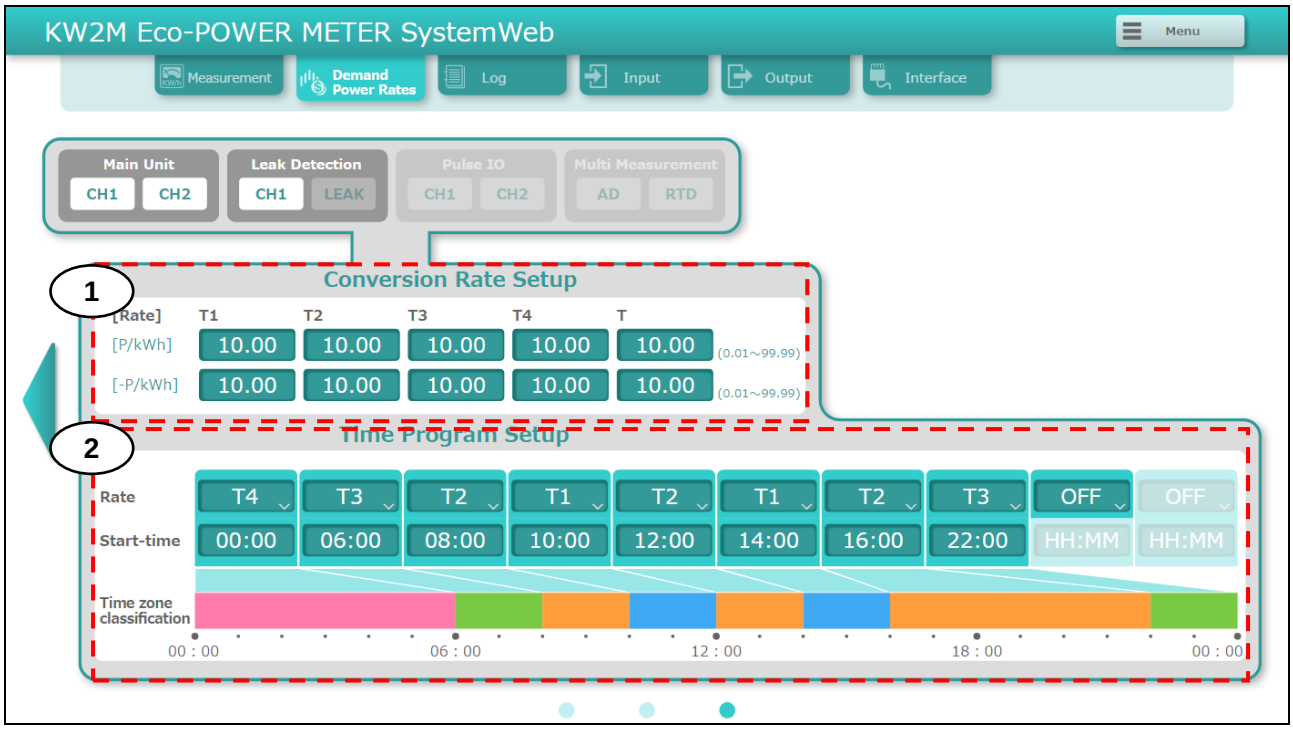


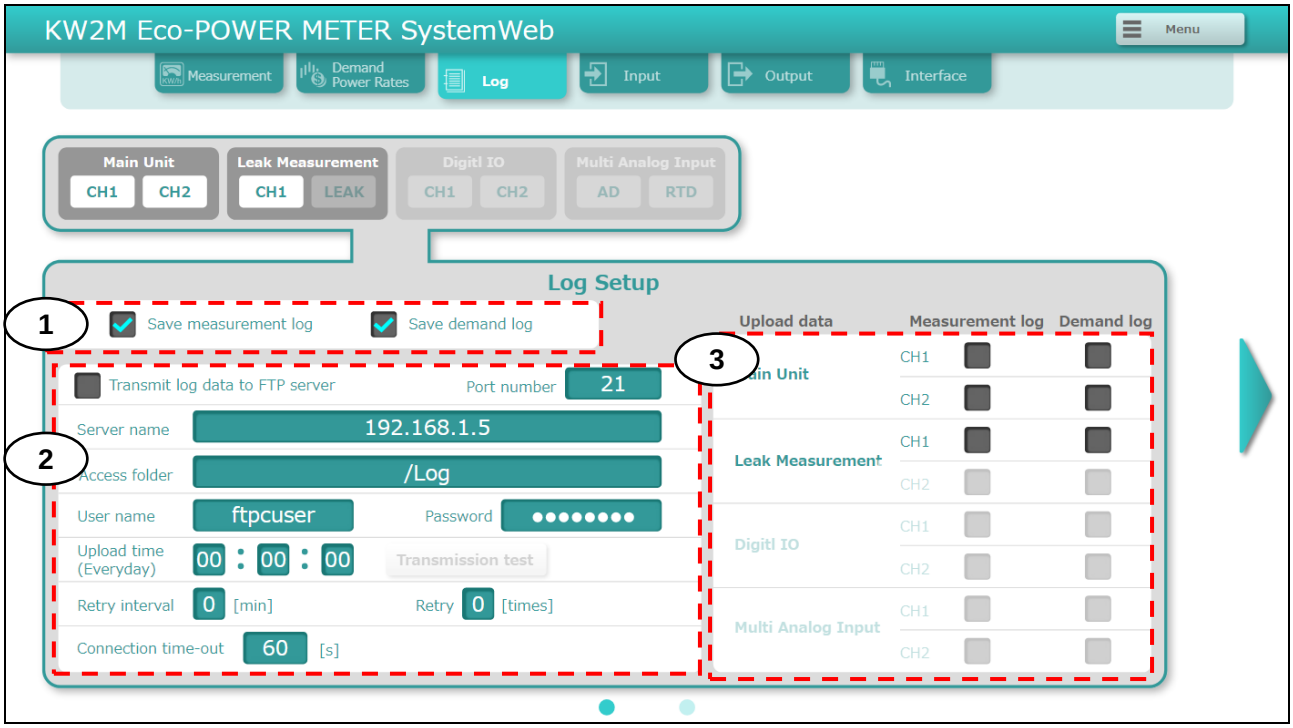

Image of KW2M-X

| Item | Description |
|---|---|
| 1 Conversion rate Setup | Set the conversion rate per integral active power (import and export) 1 kWh.<br><br>< Range ><br>P/kWh : 0.01 to 99.99 (initial:10.00)<br>-P/kWh : 0.01 to 99.99 (initial:10.00) |
| 2 Time Program Setup*1 | You can set 10-type time program.<br>Set start time for each time zone, and use it link with conversion rate.<br>Refer to 5.2 in detail.<br><br><List & Range><br>Rate:T1, T2, T3, T4, OFF<br>Start-Time: 00:00 to 23:59 |

*1 only KW2M-X

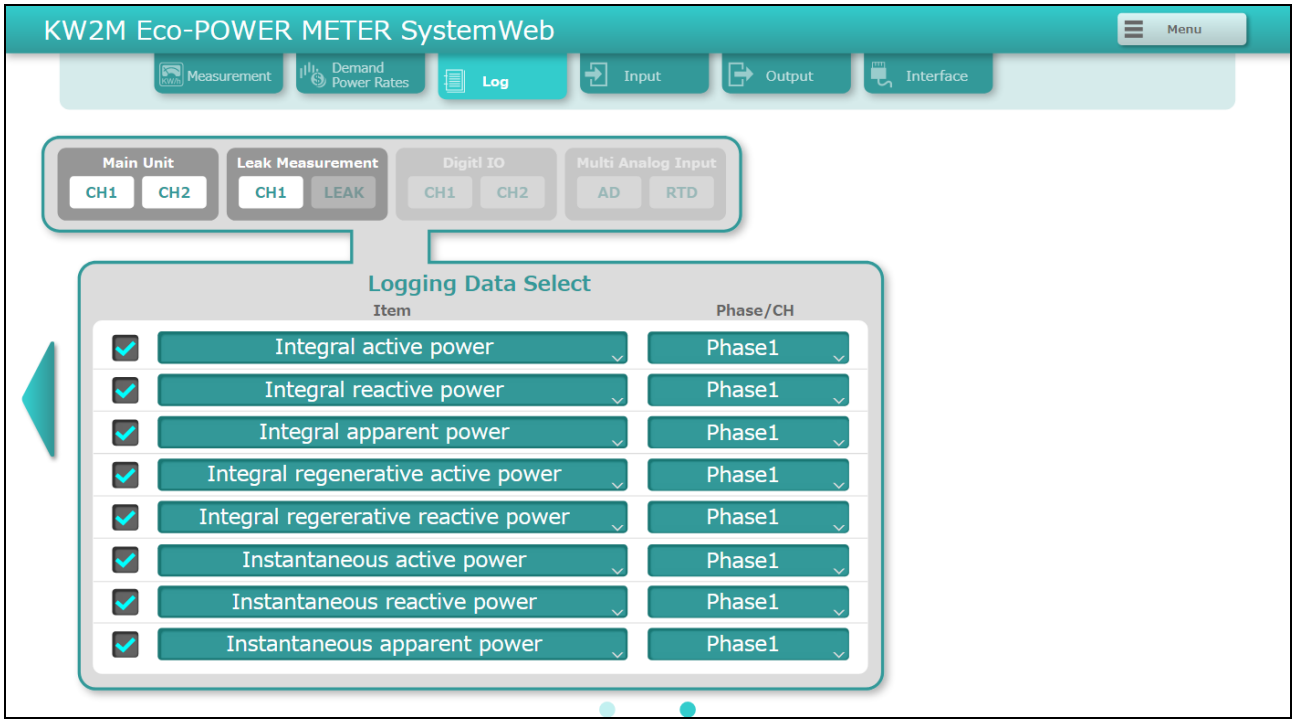
### 4.5.7 Settings for log (only KW2M-X)

[Log Setup]




| Item | Description |
|---|---|
| 1 Log item | Select log item to save with .csv.<br><br>For measurement log, it saves the instantaneous value of every 5-min and every 15-min.<br>For demand log, it saves demand value.<br><br>Save measurement log : Yes, No(initial: No)<br>Save demand log : Yes, No(initial: No) |
| 2 FTP Client | Set items related to upload log file to FTP server.<br>Log files are uploaded once a day at the designated time.<br>You can test to upload using [Transmission test].<br><br><List & Range><br>Transmit log data to FTP server : Yes, No(initial: No)<br>Port number : 21, 1024 to 65535(initial:21)<br>Server name : 0.0.0.0 to 255.255.255.255 or<br>domain name(64-letter)<br>Access folder : half-width alphanumeric(64-letter)<br>User name : half-width alphanumeric(64-letter)<br>Password : half-width alphanumeric(16-letter)<br>Upload time : 00:00:00 to 23:59:59 (initial:00:00:00)<br>Retry interval : 0 to 60[min](initial:10)<br>Retry : 0 to 10[times](initial :3)<br>Connection time-out : 1 to 300(initial:10) |
| 3 Upload data | Select files to upload to FTP server.<br><br>You can select the target log files of each unit and CH. |

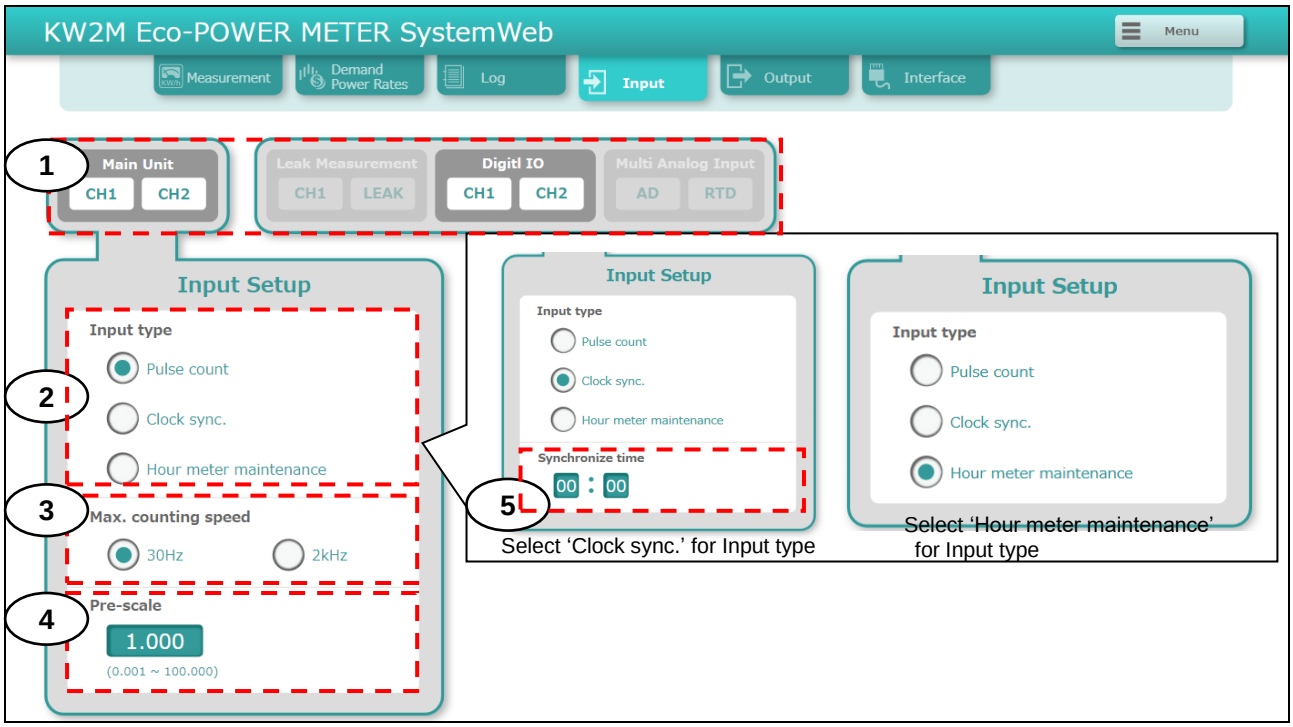
[Customized log Setup] *1




| Item | Description |
|---|---|
| 1 Logging Data Select | Select items to be logged in one csv file, up to 8 items.<br><br><List><br>Integral active power(1), (2), (3), Total integral active power,<br>Integral reactive power(1), (2), (3), Total integral reactive power,<br>Integral apparent power(1), (2), (3),<br>Total integral apparent power,<br>Export active power(1), (2), (3), Total export active power,<br>Export reactive power(1), (2), (3), Total export reactive power,<br>Instantaneous active power(1), (2), (3),<br>Total instantaneous active power,<br>Instantaneous reactive power(1), (2), (3),<br>Total instantaneous reactive power,<br>Instantaneous apparent power(1), (2), (3),<br>Total instantaneous apparent power,<br>R-current, S-current, T-current, N-current, Average of current,<br>R-voltage (L1-N), S-voltage (L2-N), T-voltage (L3-N),<br>Average of phase-voltage, RS-voltage (L1-L2),<br>ST-voltage (L2-L3), TR-voltage (L3-L1), Average of line-voltage,<br>Power factor(1), (2), (3), Average of power factor,<br>Frequency(1), (2), (3), Average of frequency,<br>Current THD(1), (2), (3), Average of current THD,<br>Phase-voltage THD(1), (2), (3), Average of phase-voltage THD,<br>Line-voltage THD(1), (2), (3), Average of line-voltage THD,<br>ON-time, OFF-time, Stand-by time, Maintenance-time,<br>Pulse count value,<br>Digital conversion value1, Digital conversion value2,<br>Digital conversion value3, Temperature1, Temperature2<br>Pulse count 1, Pulse count 2,<br>Leakage current 1, Leakage current 2, Leakage current 3 |

*1 only KW2M-X main unit

### 4.5.8 Settings for pulse input (only Main unit and Expansion unit (Digital I/O)



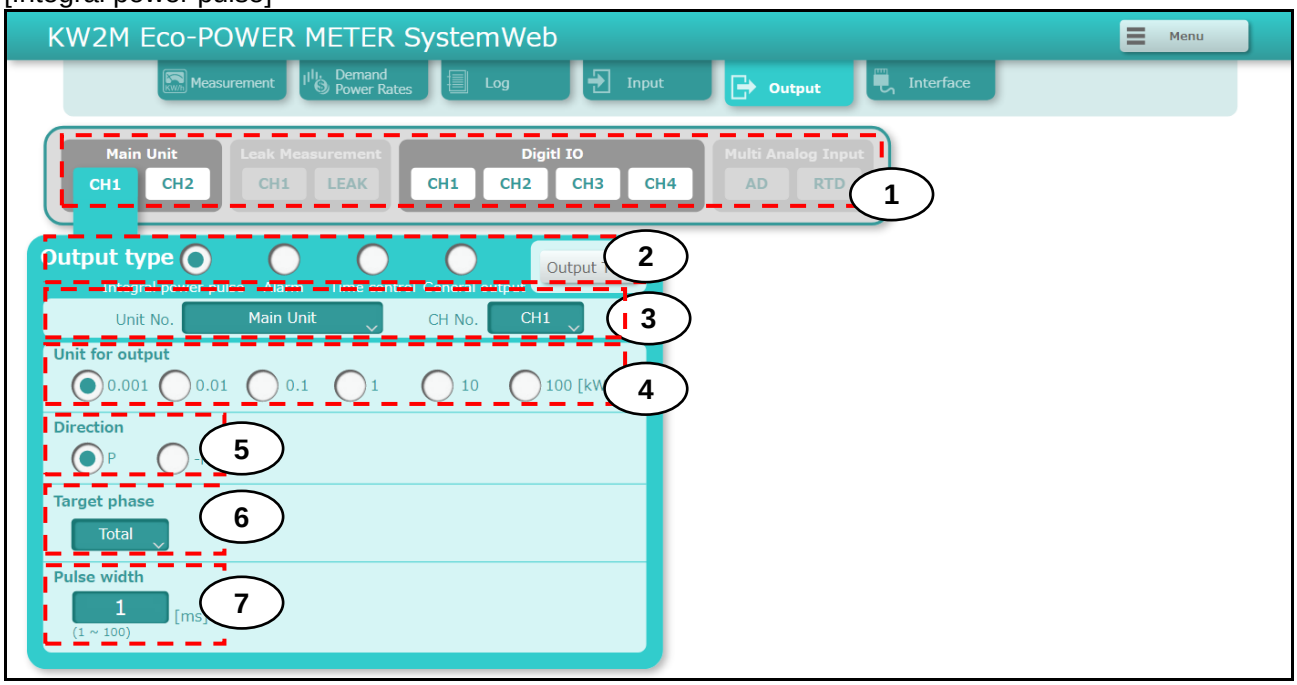

| Item | | Description |
|---|---|---|
| 1 | Select CH | Select CH to set. |
| 2 | Input type | Select usage of input<br><br><List><br>Pulse count, Clock sync.*1, Hour meter maintenance*1<br>(initial : Pulse count) |
| 3 | Max counting speed | Select pulse input max. counting speed.<br><br>< List ><br>30Hz, 2kHz (initial:30Hz) |
| 4 | Pre-scale | Set pre-scale value used to convert count value of pulse input.<br><br>< Range ><br>0.001 to 100.00 (initial:1.000) |
| 5 | Synchronize time *1 | Set time to synchronize when pulse is input.<br><br>*The clock is different 1-hour or more from the setting time, it doesn't synchronize.<br><br><Range><br>00:00 to 23:59(initial:00:00) |

*1 only KW2M-X main unit

### 4.5.9 Settings for pulse output (only Main unit and Expansion unit (Digital I/O)

You can select the unit and CH to be measured for each CH of pulse output.

[Integral power pulse]



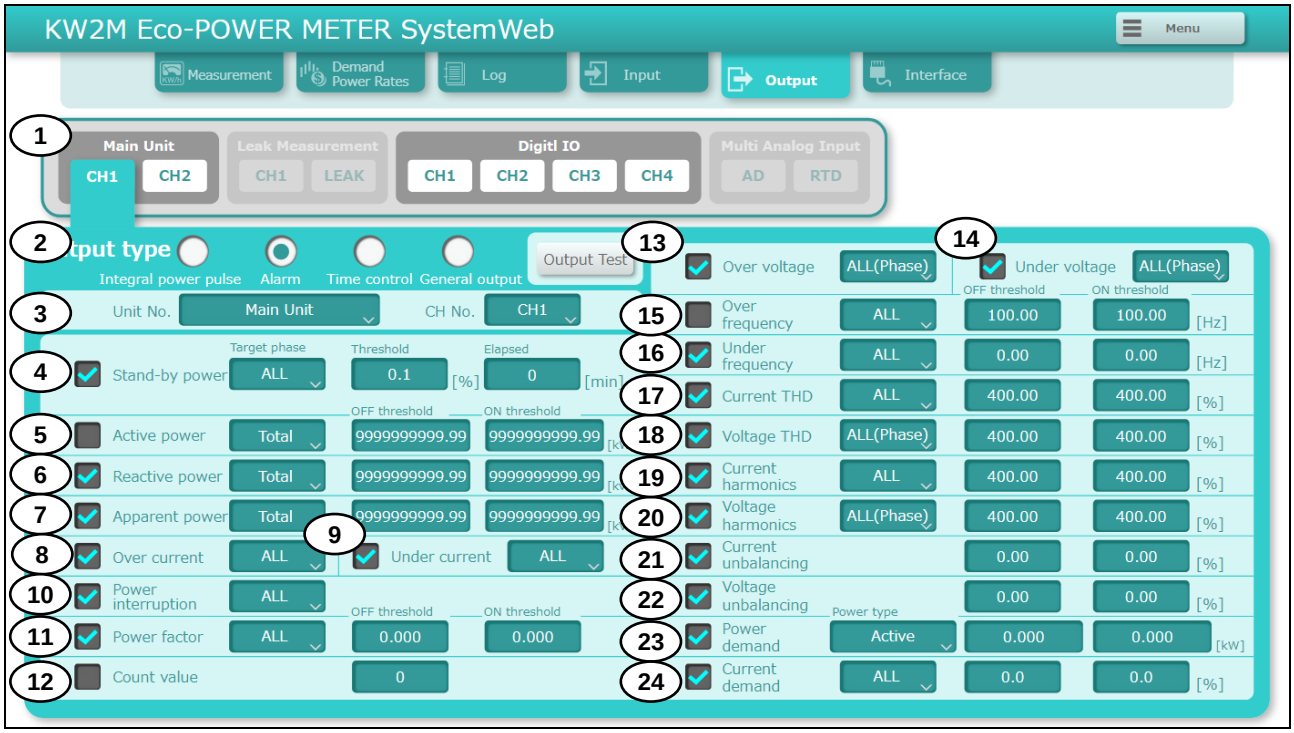

| Item | | Description |
|---|---|---|
| 1 | Select CH | Select CH to set. |
| 2 | Output type | Select pulse output type.<br><br>< List ><br>Integral power pulse, Alarm, Time control*1,General output (initial: Integral power pulse) |
| 3 | Measured target | Select unit and CH to measure.<br><br>< List ><br>Main Unit CH1, Main Unit CH2, Power Measurement CH1, Power Measurement CH2*2 (initial:Main Unit CH1) |
| 4 | Unit for output | Set unit used for pulse output.<br><br>< List ><br>0.001, 0.01, 0.1, 1, 10, 100kWh (initial:0.001) |
| 5 | Direction | Select the direction of power (import or export) for using as a threshold for pulse output.<br><br>< List ><br>P, -P (initial: P) |
| 6 | Target phase | Select phase to monitor in order to judge the output.<br>* Select 'Total' when it measures 3P3W.<br><br>< List ><br>Phase1, Phase2, Phase3, Total (initial: Total) |
| 7 | Pulse width | Set pulse width.<br><br>< Range ><br>1 to 100ms (initial:1) |

*1 only KW2M-X
*2 only when CH2 of expansion unit (power measurement) is set to measure power

[Alarm]
It differs the display according to the selected unit and CH.

●When you select main unit CH1, main unit CH2, expansion unit (power measurement) CH1 or expansion unit (power measurement) CH2, set to power measurement.

With checks to several boxes, it output alarm when it meets one of these conditions.

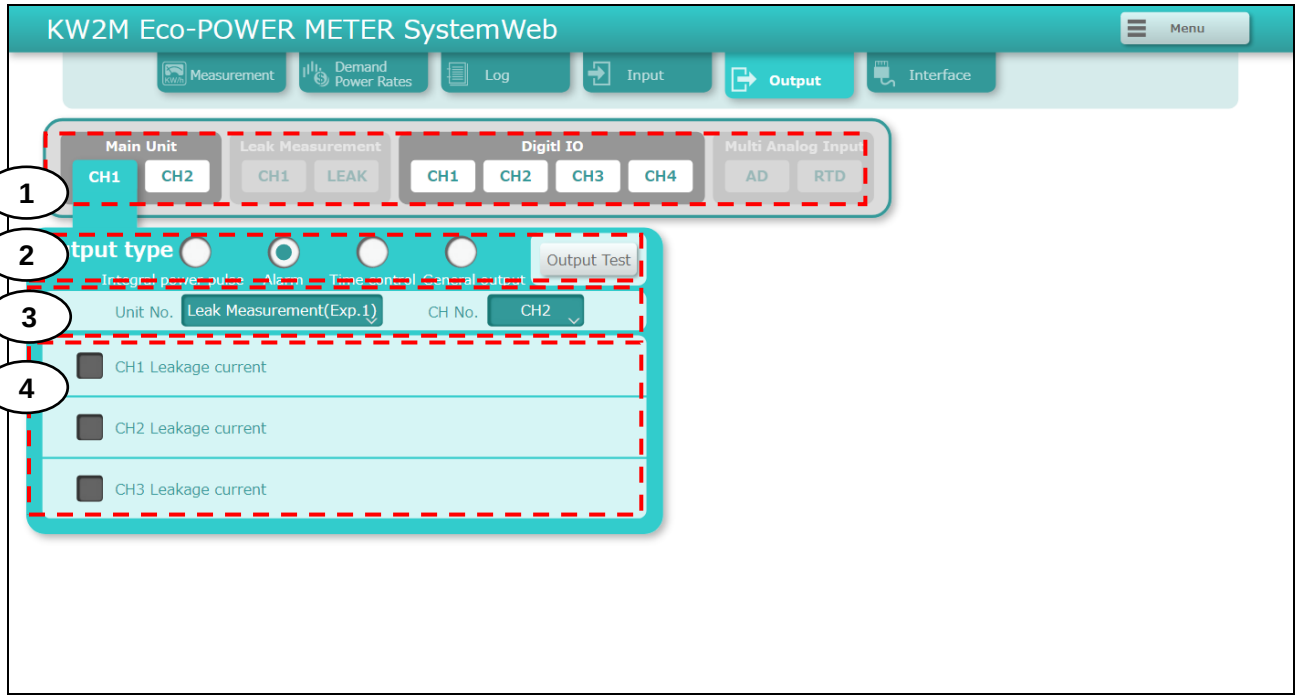



| Item | | Description |
|---|---|---|
| 1 | Select CH | Select CH to set. |
| 2 | Output type | Select pulse output type.<br><br>< List ><br>Integral power pulse, Alarm, General output<br>(initial: Integral power pulse) |
| 3 | Measured target | Select unit and CH to measure.<br><br>It differs the display according to the selected item.<br><br>< List ><br>Main Unit CH1, Main Unit CH2, Power Measurement CH1, Power Measurement (Leak Measurement) CH2, Pulse IO, Multi Measurement, Combination Demand<br>(initial:Main Unit CH1) |
| 4 | Stand-by power | Select phase to monitor and set threshold to use for output.<br><br><List & Range><br>Target phase : Phase1, Phase2, Phase3, ALL (initial: ALL)<br>Threshold: 0.1 to 100.0% (initial: 0.1%)<br>Elapsed: 0 to 9999min (initial: 0) |

| Item | | Description |
|---|---|---|
| 5 | Active power | Select phase to monitor and set threshold to use for output.<br>*Select 'Total' when measuring 3P3W.<br><br><List & Range><br>Target phase:Phase1, Phase2, Phase3, ALL, Total (initial: Total)<br>OFF threshold : 0.00 to 9999999999.99 (initial: 9999999999.99)<br>ON threshold : 0.00 to 9999999999.99 (initial: 9999999999.99) |
| 6 | Reactive power | |
| 7 | Apparent power | |
| 8 | Over current | Select phase to monitor.<br>*The threshold is the ratio that is set at 'Setting for Power Measurement'.<br><br>< List ><br>Target phase:Phase1, Phase2, Phase3, ALL (initial: ALL) |
| 9 | Under current | |
| 10 | Power interruption | |
| 11 | Power factor | Select phase to monitor and set threshold to use for output.<br>*Select 'All' when measuring 3P3W.<br><br>< List & Range ><br>Target phase:Phase1, Phase2, Phase3, ALL (initial: ALL)<br>OFF threshold : 0.00 to 9999999999.99 (initial: 9999999999.99)<br>ON threshold : 0.00 to 9999999999.99 (initial: 9999999999.99) |
| 12 | Count value | Set a value of count to use for alarm output.<br><br><Range><br>0 to 999999 (initial: 0) |
| 13 | Over Voltage | Select phase to monitor.<br>*The threshold is the ratio that is set at 'Setting for Power Measurement'.<br><br>< List ><br>Target phase:Phase1, Phase2, Phase3, ALL (initial: ALL) |
| 14 | Under Voltage | |
| 15 | Over frequency | Select phase to monitor and set threshold to use for output.<br><br>< List & Range ><br>Target phase:Phase1, Phase2, Phase3, ALL (initial: ALL)<br>OFF threshold : 0.00 to 100.00Hz (initial:100.00)<br>ON threshold : 0.00 to 100.00Hz (initial:100.00) |
| 16 | Under frequency | |
| 17 | Current THD | Select phase to monitor and set threshold to use for output.<br><br>< List & Range ><br>Target phase:Phase1, Phase2, Phase3, ALL (initial: ALL)<br>OFF threshold : 0.00 to 400.00% (initial:400.00)<br>ON threshold : 0.00 to 400.00% (initial:400.00) |
| 18 | Voltage THD | |
| 19 | Current harmonics | |
| 20 | Voltage harmonics | |
| 21 | Current unbalancing | Select phase to monitor and set threshold to use for output.<br><br>< Range ><br>OFF threshold : 0.00 to 300.00% (initial:300.00)<br>ON threshold : 0.00 to 300.00% (initial:300.00) |
| 22 | Voltage unbalancing | |

| Item | Description |
|---|---|
| 23 Power demand | Select demand type to monitor and set threshold to use for output.<br><br>< List & Range ><br>Power Type : Active, Reactive, Apparent, Active(Export), Reactive(Export) (initial: Active)<br>OFF threshold : 0.000 to 999999999.999 (initial:999999999.999)<br>ON threshold : 0.000 to 999999999.999 (initial:999999999.999) |
| 24 Current demand | Select phase to monitor and set threshold to use for output.<br><br>< List & Range ><br>Target phase:Phase1, Phase2, Phase3, ALL (initial: ALL)<br>OFF threshold : 0.00 to 120.00% (initial:0.00)<br>ON threshold : 0.00 to 120.00% (initial:0.00) |

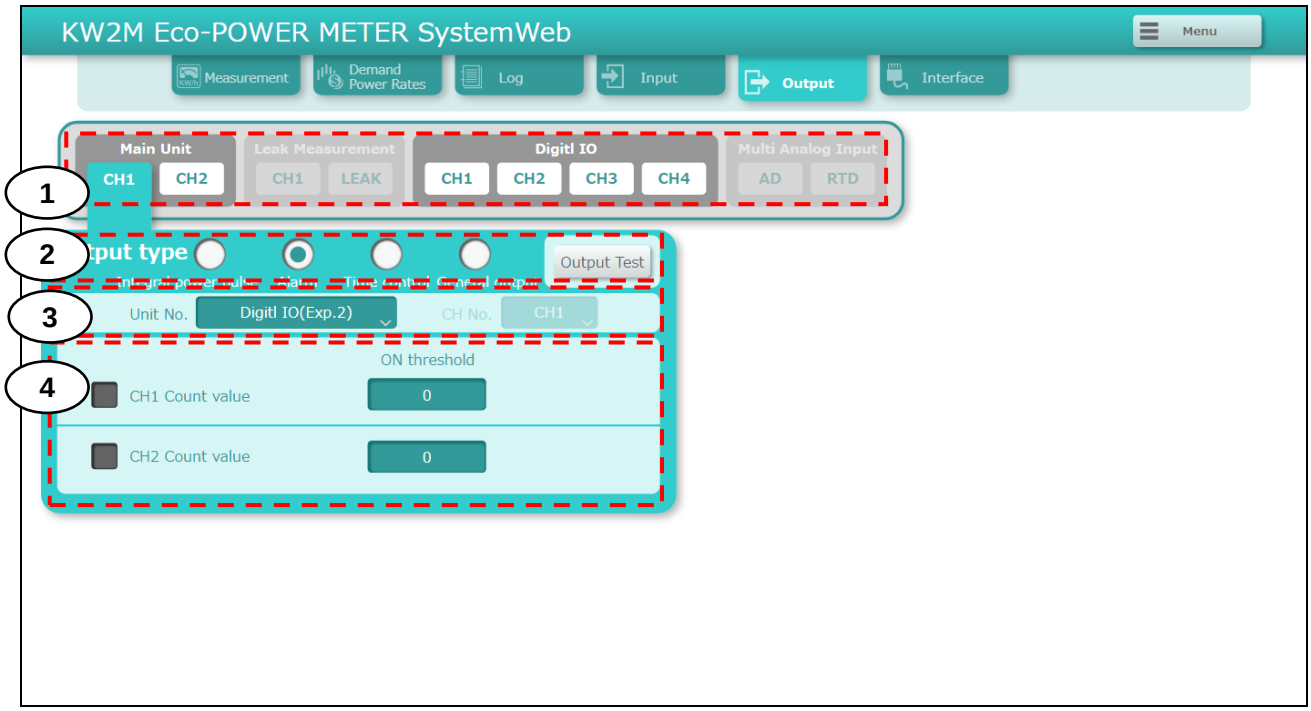
●When ‘Leak measurement CH2’ is selected with unit type




| | Item | Description |
|---|---|---|
| 1 | Select CH * | Select CH to set. |
| 2 | Output type | Select pulse output type.<br><br>< List ><br>Integral power pulse, Alarm, Time control*1,General output<br>(initial: Integral power pulse) |
| 3 | Measured target | Select unit and CH to measure.<br><br><List><br>Main Unit CH1, Main Unit CH2, Power Measurement CH1, Power Measurement (Leak Measurement) CH2, Pulse IO, Multi Measurement, Combination Demand<br>(initial:Main Unit CH1) |
| 4 | Monitor target | Select circuit to monitor. |

*1 only KW2M-X

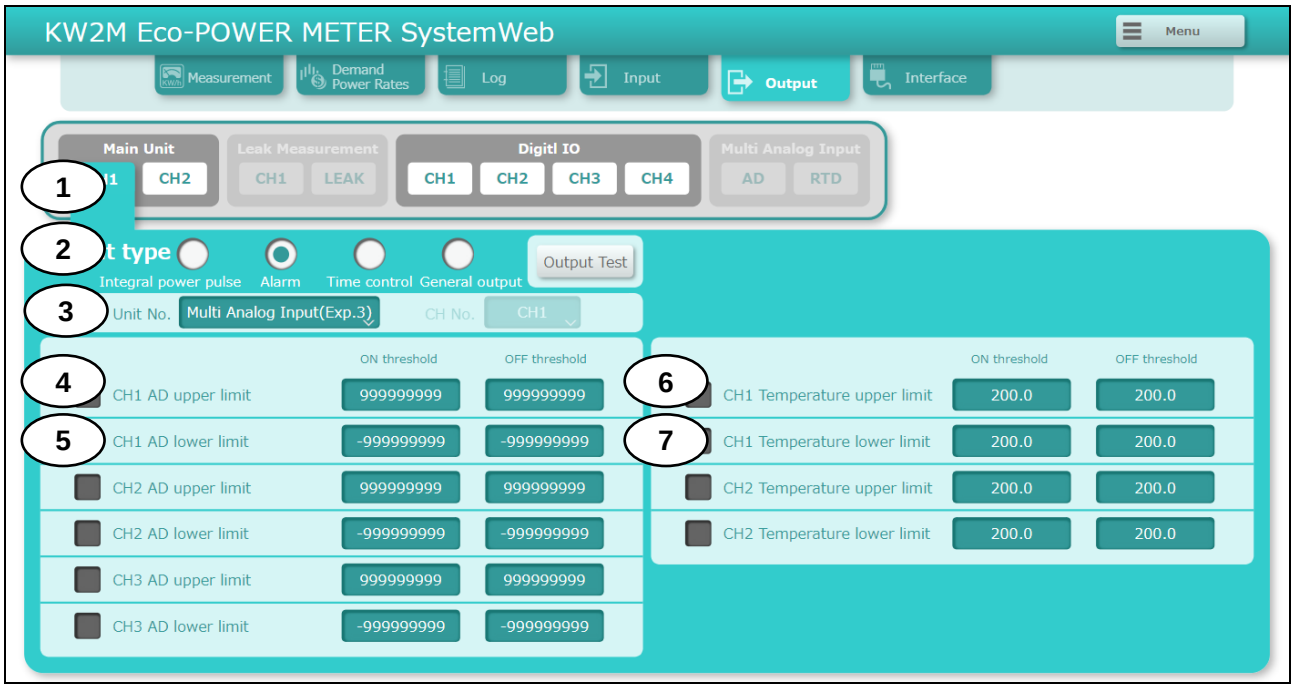
●When ‘Pulse I/O’ is selected for measured target




| Item | Description |
|---|---|
| 1 Select CH * | Select CH to set. |
| 2 Output type | Select pulse output type.<br><br>< List ><br>Integral power pulse, Alarm, Time control*1,General output<br>(initial: Integral power pulse) |
| 3 Measured target | Select unit and CH to measure.<br><br><List><br>Main Unit CH1, Main Unit CH2, Power Measurement CH1, Power Measurement (Leak Measurement) CH2, Pulse IO, Multi Measurement, Combination Demand<br>(initial:Main Unit CH1) |
| 4 Monitor target | Select circuit to monitor. |

*1 only KW2M-X

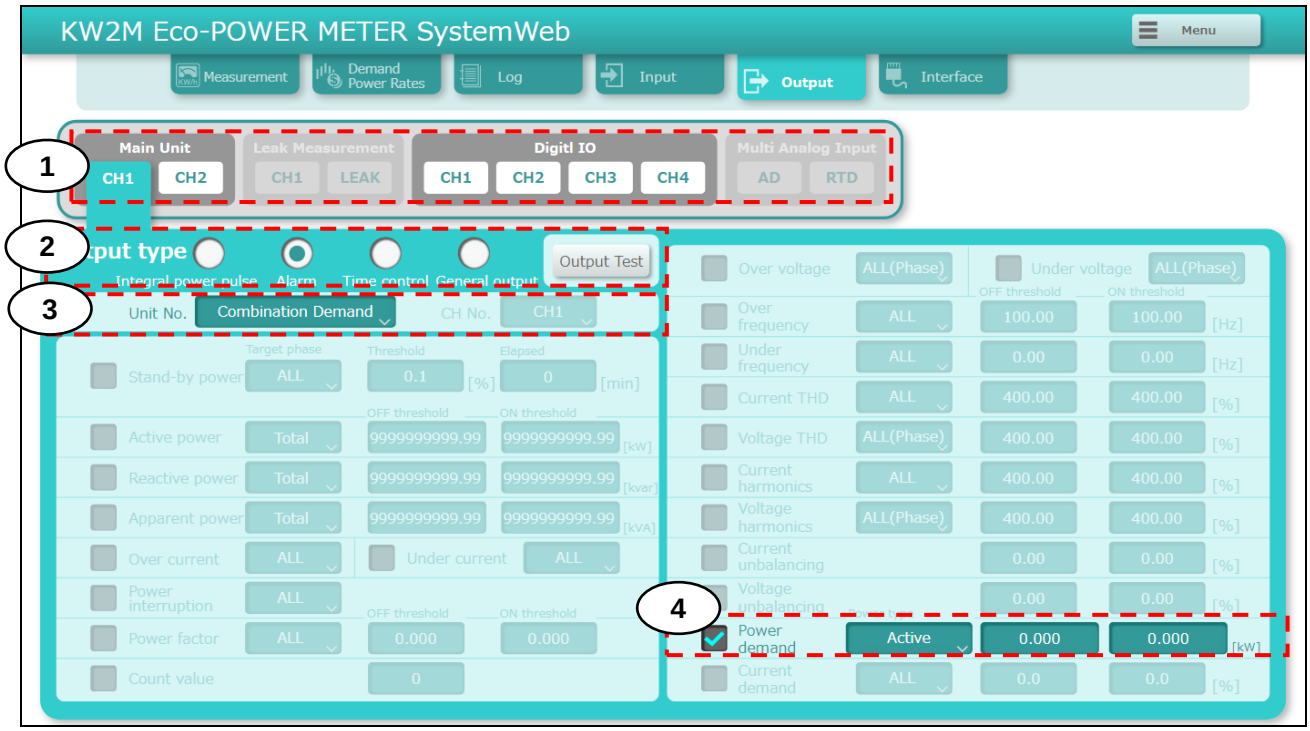
●When ‘Multi measurement’ is selected for measured target




| Item | | Description |
|---|---|---|
| 1 | Select CH | Select CH to set. |
| 2 | Output type | Select pulse output type.<br><br><List><br>Integral power pulse, Alarm, Time control*1, General output<br>(initial: integral power pulse) |
| 3 | Measured target | Select unit and CH to measure.<br><br><List><br>Main Unit CH1, Main Unit CH2, Power Measurement CH1, Power Measurement (Leak Measurement) CH2, Pulse IO, Multi Measurement, Combination Demand<br>(initial:Main Unit CH1) |
| 4 | AD upper limit | Select CH to monitor and set threshold to use for output<br><br><Range><br>OFF threshold : -999999999 to 999999999 (initial: 999999999)<br>ON threshold : -999999999 to 999999999 (initial: 999999999) |
| 5 | AD lower limit | |
| 6 | Temperature upper limit | Select CH to monitor and set threshold to use for output<br><br><Range><br>OFF threshold : -200.0 to 200.0 (initial: 200)<br>ON threshold : -200.0 to 200.0 (initial: 200) |
| 7 | Temperature lower limit | |

*1 only KW2M-X

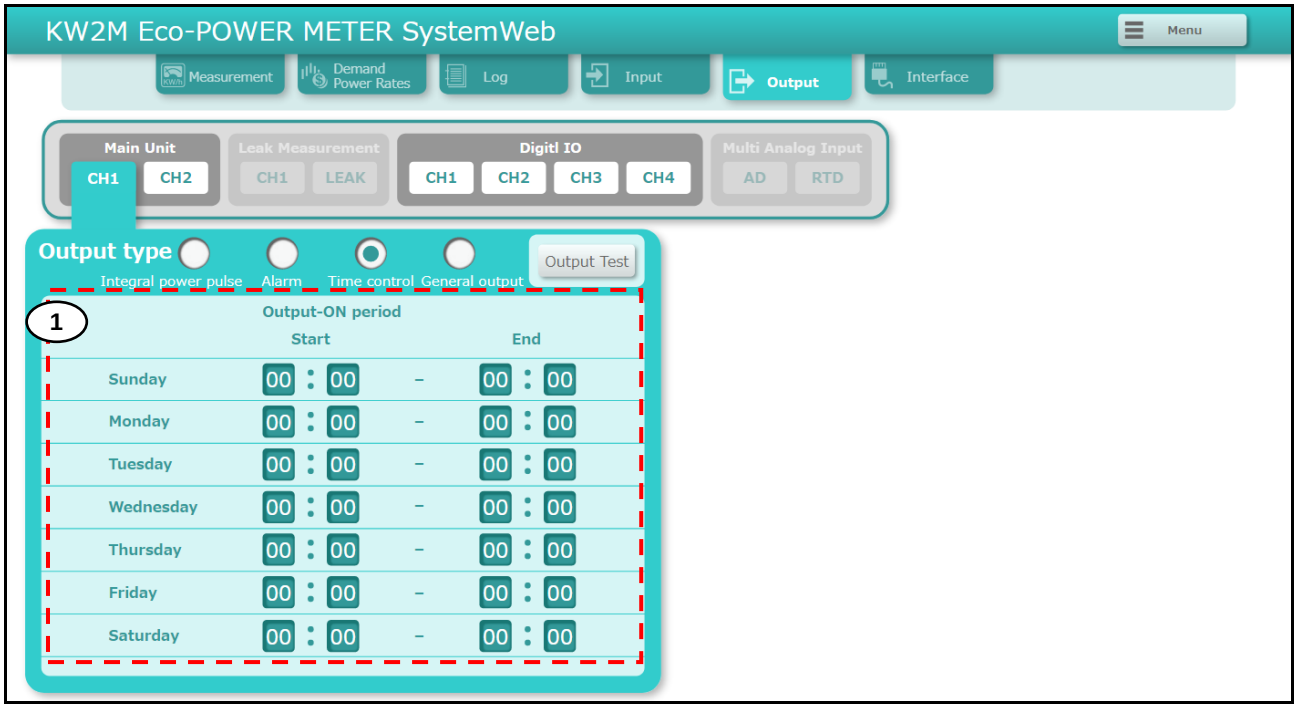
●When ‘Combination Demand’ is selected for measured target




| Item | | Description |
|---|---|---|
| 1 | Select CH | Select CH to set. |
| 2 | Output type | Select pulse output type.<br><br><List><br>Integral power pulse, Alarm, Time control*1, General output<br>(initial: integral power pulse) |
| 3 | Measured target | Select unit and CH to measure.<br><br><List><br>Main Unit CH1, Main Unit CH2, Power Measurement CH1, Power Measurement (Leak Measurement) CH2, Pulse IO, Multi Measurement, Combination Demand<br>(initial:Main Unit CH1) |
| 4 | Power demand | Select demand type to monitor and set threshold to use for output.<br><br>< List & Range ><br>Power Type : Active, Reactive, Apparent, Active(Export), Reactive(Export) (initial: Active)<br><br>OFF threshold : 0.000 to 999999999.999<br>(initial:999999999.999)<br>ON threshold : 0.000 to 999999999.999<br>(initial:999999999.999) |

*1 only KW2M-X

[Time control] (only KW2M-X)

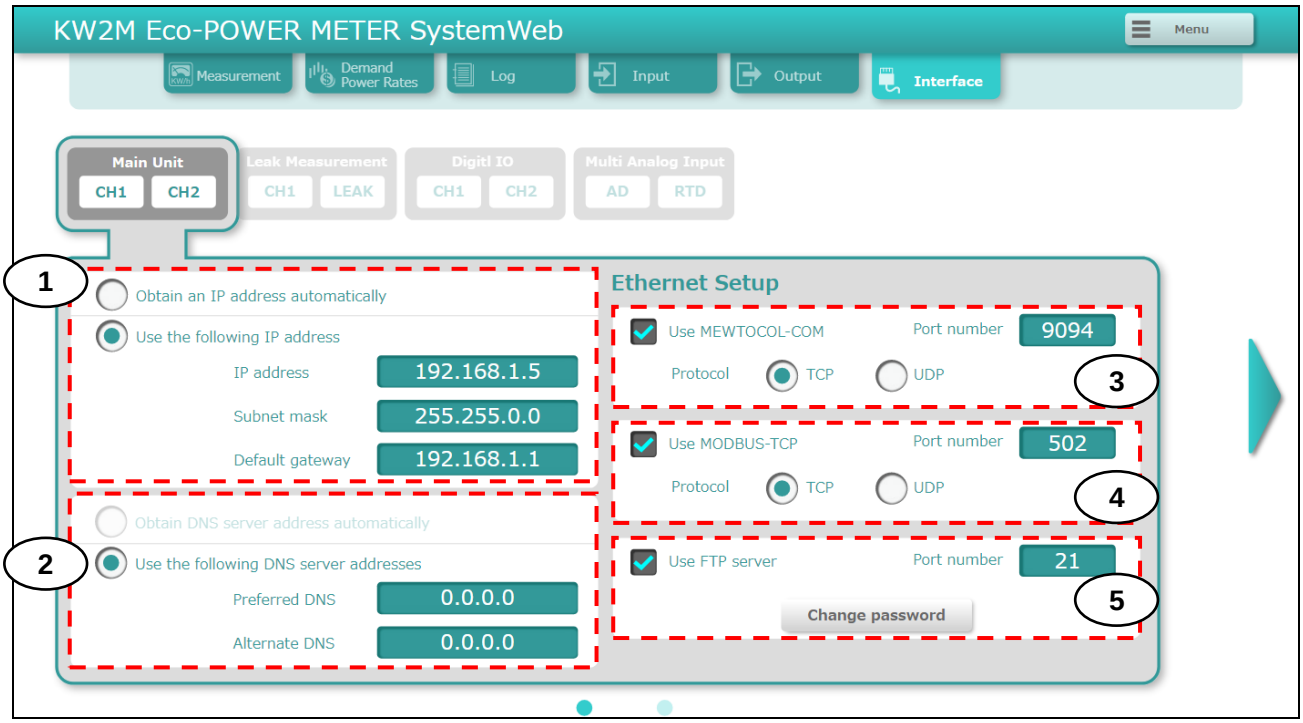



| Item | Description |
|---|---|
| 1 Output-ON period | Set time to output ON and OFF for each day.<br><br><Range><br>Start : 00:00 to 24:00 (initial:00:00)<br>End : 00:00 to 24:00 (initial:00:00) |

4.5.10 Settings for Ethernet and RS485 communication

Click ‘ ◀ ▶ ’ to shift window of ‘Ethernet Setup’ and ‘RS485 Setup’.

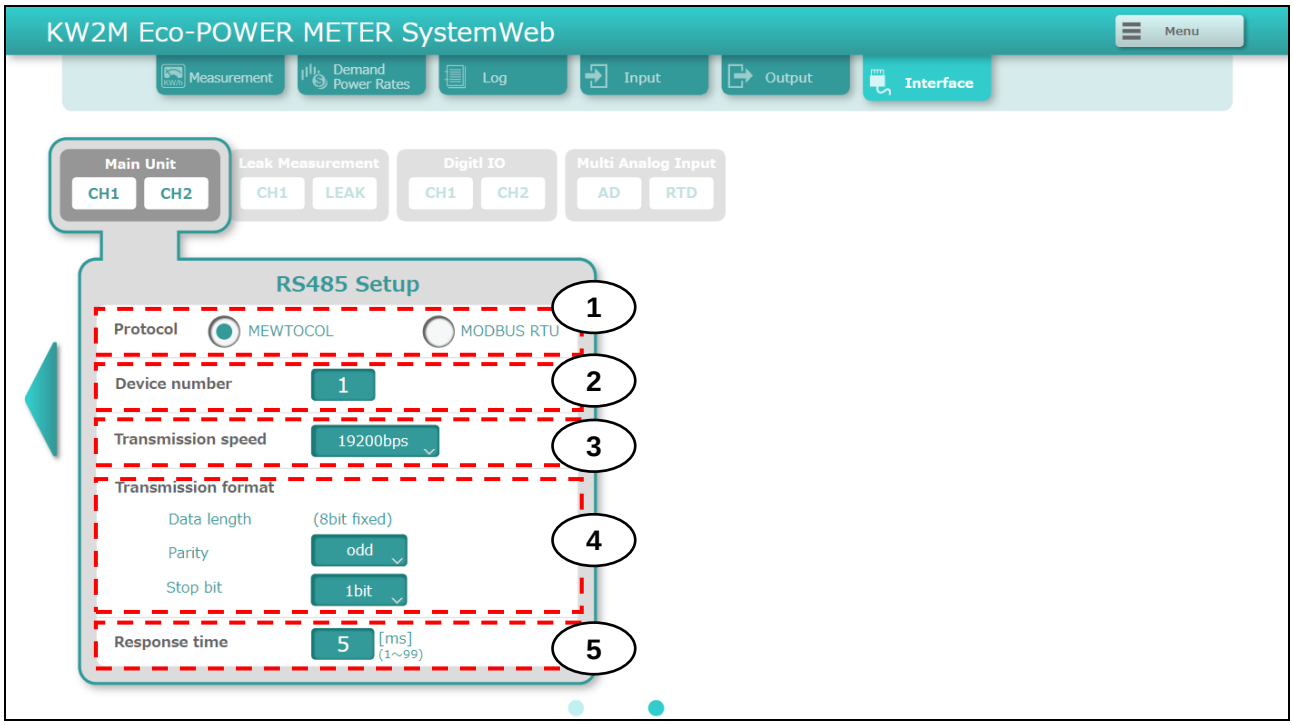
[Ethernet Setup]




| Item | Description |
|---|---|
| 1 IP address | Select setting method of IP address.<br>When you set manually, IP address, subnet mask and default gateway can be set by yourself.<br><br>< Range ><br>Setting IP address: Obtain an IP address automatically,<br>Use the following IP address<br>IP address: 001. 000. 000. 000 to 255. 255. 255. 255<br>(initial: 192.168.1.5)<br>Subnet mask: 128. 000. 000. 000 to 255. 255. 255. 255<br>(initial: 255.255.255.0)<br>Default gateway: 001. 000. 000. 000 to 255. 255. 255.255<br>(initial: 192.168.1.1) |
| 2 DNS Server | Select setting method of DNS server<br>When you set manually, IP address of Preferred DNS and Alternate DNS can be set by yourself.<br><br><Range><br>Setting DNS server: Obtain DNS server address automatically<br>Use the following DNS server addresses<br>Preferred DNS: 0.0.0.0 to 255.255.255.255(initial:0.0.0.0)<br>Alternate DNS: 0.0.0.0 to 255.255.255.255(initial:0.0.0.0) |
| 3 MEWTOCOL-COM | Set protocol and port number.<br><br>< List & Range ><br>Protocol: TCP, UDP (initial: TCP)<br>Port number: 1024 to 65535 (initial:9094) |

| Item | Description |
|---|---|
| 4 MODBUS-TCP | Set protocol and port number.<br><br>< List & Range ><br>Protocol: TCP, UDP (initial: TCP)<br>Port number: 502, 1024 to 65535 (initial:502) |
| 5 FTP Server | Set FTP server.<br><br><Range><br>Port number:21, 1024 to 65535(initial:21)<br>Administrator name : half-width alphanumeric (64-letter)<br>(initial: admin)<br>Password : half-width alphanumeric(16-letter)(initial: admin) |

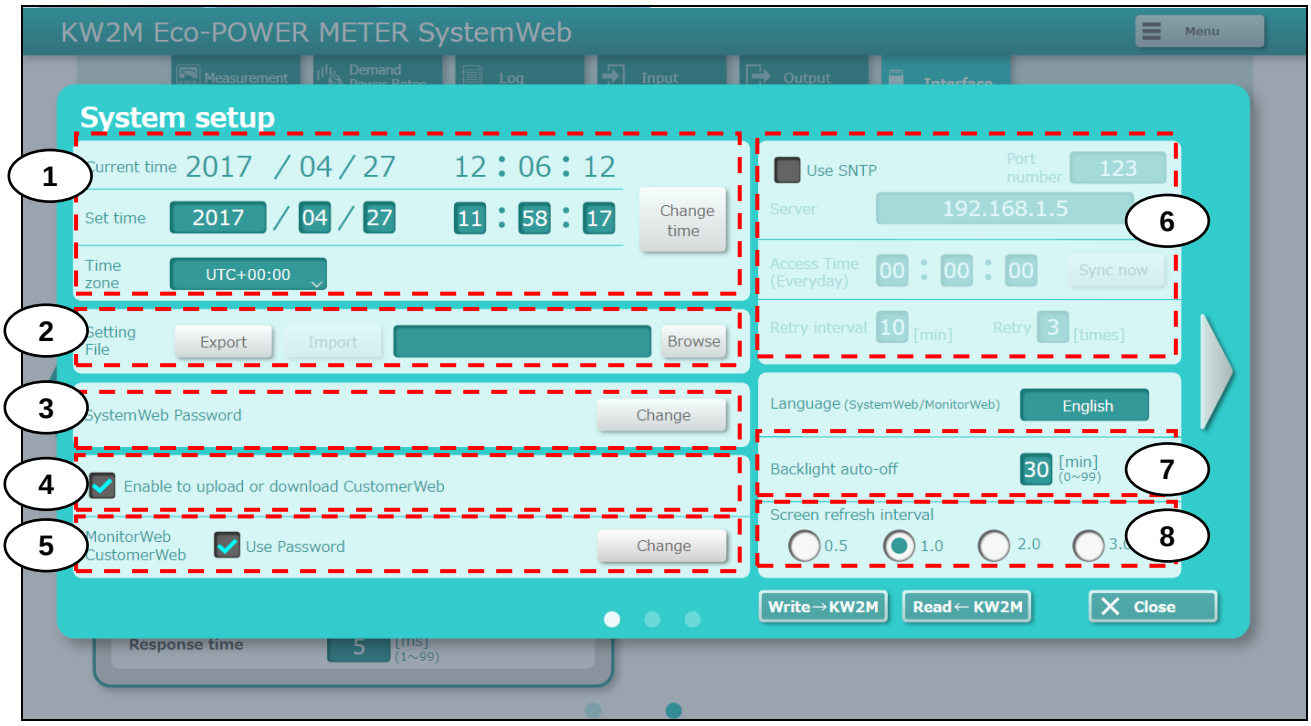
[RS485 Setup]




| Item | | Description |
|---|---|---|
| 1 | Protocol | Select communication protocol<br><br>< List ><br>MEWTOCOL, MODBUS RTU (initial: MEWTOCOL) |
| 2 | Device number | Set device number.<br><br>< Range ><br>MEWTOCOL:1 to 99<br>MODBUS RTU:1 to 247 |
| 3 | Transmission speed | Select transmission speed.<br><br>< List ><br>2400, 4800, 9600, 19200, 38400, 57600, 115200bps (initial:19200) |
| 4 | Transmission format | Select transmission format.<br><br>< List ><br>Parity: none, odd, even (initial: odd)<br>Stop bit:1bit, 2bit (initial:1bit) |
| 5 | Response time | Set response time.<br><br>< Range ><br>1 to 99ms (initial:5) |

## 4.5.11 System setup

[System setup]




| Item | Description |
|---|---|
| 1 Current time *1 | Set year, month, day, time and time-zone to Eco-POWER METER.<br>Click [Change time] to write the settings.<br>Even if you click [Write→KW2M], current time is not set.<br><br><Range><br>Set time : January 1st, 2015 00:00:00<br>to December 31st, 2099 23:59:59<br>Time zone : UTC-12:00 to UTC+14:00 (initial:UTC+9:00) |
| 2 Setting File | It saves setup conditions of Eco-POWER METER to your PC and it writes setup conditions, which are saved in PC, to Eco-POWER METER.<br><br><Item><br>Export: Save setup conditions of Eco-POWER METER to PC.<br>Import: Read out setup conditions saved in PC.<br>Browse: Select setup file which are saved in PC. |
| 3 System Web Password | Set password to access Web page. |
| 4 Setting Customer Web *1 | Check the box to upload and download web contents that is created by Control Web Creator.<br>When you check the box, you can upload and download.<br><br>6<List><br>Yes, No (initial: Yes) |
| 5 Monitor Web/Customer Web Password*1 | Set password to access Monitor Web and Customer Web.<br><br><Range><br>User Name : half-width alphanumeric (64-letter)(initial: user)<br>Password : half-width alphanumeric (16-letter)(initial: user) |

| | | |
|---|---|---|
| 6 | SNTP setting *1 | Set items to adjust time by SNTP.<br>Click [Sync now] to synchronize by SNTP server.<br><br><Range><br>Port number : 123, 1024 to 65535(initial:123)<br>Server : 0.0.0.0 to 255.255.255.255 or<br>half-width alphanumeric (32-letter)<br>Access Time : 00:00:00 to 23:59:59(initial:00:00:00)<br>Retry interval : 0 to 60[min](initial:10)<br>Retry : 0 to 10[times](initial:3) |
| 7 | Backlight auto-off | Display backlight turns off automatically when there is no key operation for a long time.<br>After it passes the setting time, backlight will turn off.<br><br>< Range ><br>0 to 99min (initial:5) |
| 8 | Screen refresh interval | Select refresh interval for measuring window.<br>It updates the display of measured values every setting time.<br><br>< List ><br>0.5, 1.0, 2.0, 3.0s (initial:1.0) |

*1 only KW2M-X

[Reset Data]

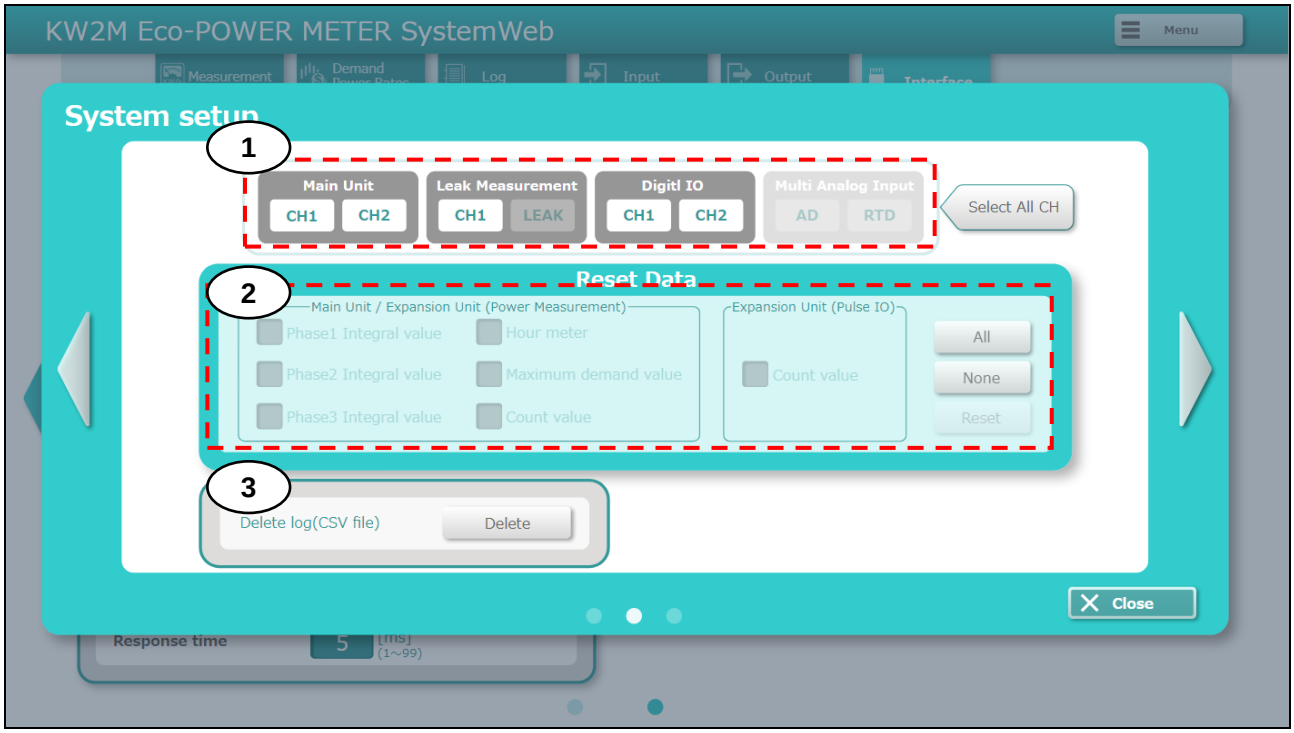



Image of KW2M-X

| Item | Description |
|---|---|
| 1 Select unit and CH | Select unit and CH to reset. |
| 2 Select item | Select data item to reset.<br>After selecting item, click ‘Reset’ to reset. |
| 3 Delete log(CSV file)*1 | Click to delete log files. |

*1 only KW2M-X

# Chapter 5 Various Functions

## 5.1 Power Quality Measurement and Logging Function

KW2M Eco-POWER METER can measure harmonics and THD for power quality measurement; therefore it is helpful to improve the power quality.

[Max. demand]
Maximum value of measured demand value (active, reactive, apparent, active (export), reactive (export), current)) are considered to the max. demand value. And it records the max. demand value.

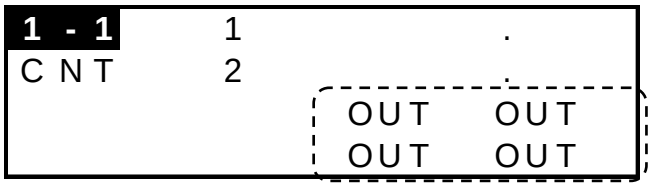
## 5.2 Pulse Output Function

<Main unit>
You can use 2-type pulse output, OUT1 and OUT2.
Refer to 4.5.9 Settings for pulse output.

[OUT1][OUT2] are blinking when it output pulse.

<Expansion unit (Digital I/O)>
You can use 4-type pulse output.
Refer to 4.5.9 Settings for pulse output.

[OUT1][OUT2][OUT3][OUT4] are blinking when it output pulse on the expansion unit display.

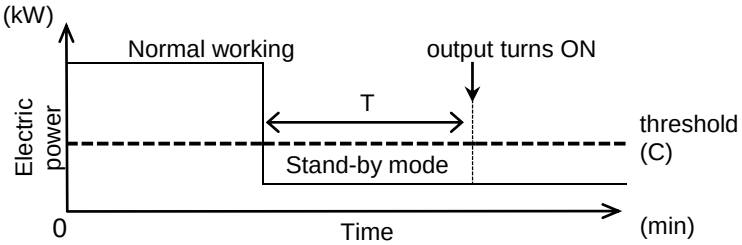



5.2.1 Output depends on integral electric power
Set the unit for pulse output of integral power value and pulse output turns on every time when integral electric power reaches the unit. (Pulse width: about 100ms)
It judges at the same time of sampling cycle.

5.2.2 Stand-by alarm
When it detects stand-by power (current) of the measured load, pulse output turns on in order to notice.

Set threshold (current) (C) and stand-by time (T) to judge stand-by power.
When the measured load is satisfied the setting conditions, pulse putout turns on in order to notice.
When it exceeds the setting threshold, it turns off and reset it.

(Working flow chart)




5.2.3 Under voltage alarm
When it falls below the setting voltage, pulse output turns on in order to notice.
When it exceeds, the output turns off.

5.2.4 Over voltage alarm
When it exceeds the setting voltage, pulse output turns on in order to notice.
When it falls below, the output turns off.

5.2.5 Power interruption alarm
When it detects the voltage under 5% of rated voltage for 5ms or more, pulse output turns on in order to notice.

5.2.6 Under current alarm
When it falls below the setting current, pulse output turns on in order to notice.
When it exceeds, the output turns off.

5.2.7 Current alarm
When it exceeds the setting current, pulse output turns on in order to notice.
When it falls below, the output turns off.

5.2.8 Power alarm
When it exceeds the setting instantaneous electric power (active, reactive, apparent, active (export), reactive (export)), pulse output turns on in order to notice.
When it falls below, the output turns off.

5.2.9 Other alarms
Output turns on or off according to each alarm setting.

PF alarm, over frequency alarm, under frequency alarm, voltage harmonics alarm, current harmonics alarm、voltage THD alarm, current THD alarm, voltage unbalancing alarm, current unbalancing alarm, power demand alarm, current demand alarm, Digital conversion value upper limit alarm, Digital conversion value lower limit alarm, Temperature upper limit alarm, Temperature lower limit alarm, Leak alarm

5.2.10 Output depends on count value
Set the preset value and pulse output turns on the time when count value reaches the preset value.
Refer to the next in detail.

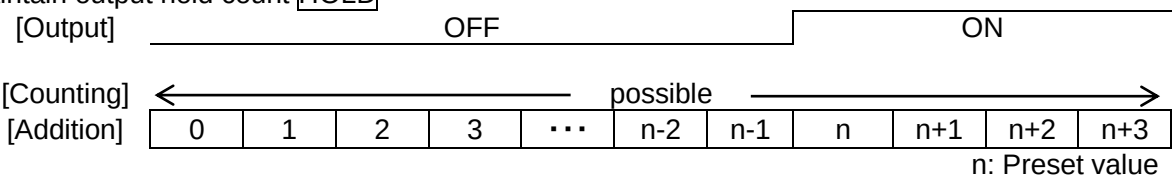
5.2.11 Time Control (only KW2M-X)
Output turns on or off according to the setting time for each day.

5.2.12 Level output
It runs on or off the output by writing 0 (OFF) or 1 (ON) to the designated data register (OUT1: DT50294, OUT2: DT50295) via communication by external control.

## 5.3 Counter Function

●Operation mode

Maintain output hold count HOLD




n: Preset value

(1) Output control is maintained after count-up completion and until reset. However counting is possible despite of count-up completion.

(2) It reverts“0” after counting up full scale, but output control is maintained. However output is OFF if count value or preset value is changed.

●Change the Preset Value

It is possible to change the preset value even during counting. However note the following points.

◇When the pre-scale value is “1.000”. (PSCL=1.000)

(1) If the preset value is changed to the value less than the count value, counting will continue until it reaches full scale, returns to “0” and then reaches the new preset value.

(2) If the preset value is changed to “0”, it will not count up at start with “0”. It counts up when the counting value comes to “0” again (after reach to full scale). However output is OFF if count value or preset value is changed.

(3) When the count value is fixed, output is changed according to the changing of preset value as below.

①If the preset value is changed to the value less than the count value or same as count value, output is ON.
(Count value ≧Preset value)

②If the preset value is changed to the value more than the count value, output is OFF.
(Count value ＜ Preset value)

◇When the pre-scale is not “1.000”. (PSCL≠1.000)

Even if the preset value is changed after counting to full scale, output is not changed.

## 5.4 Clock Correction Function (only KW2M-X)

This is the function that it corrects the clock of Eco-POWER METER by selecting ‘Clock sync.’ for pulse input type. However, the setting time is different from Eco-POWER METER time one-hour or more, it doesn’t synchronize.

Ex.) When you set [00:00] for synchronize time

Input pulse 1 makes clock April 2, 2015 00:00:00 when it was April 1, 2015 23:59:00.

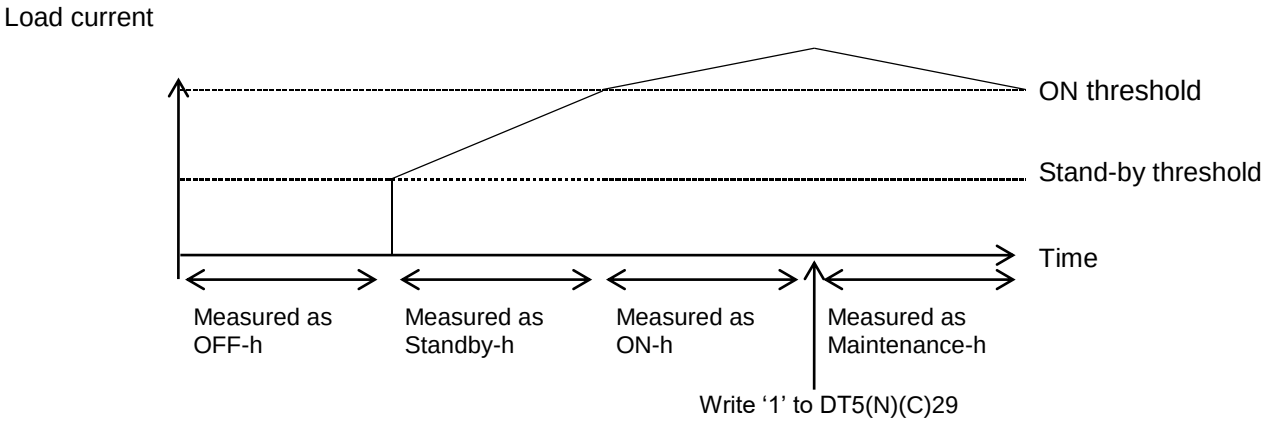
## 5.5 Hour Meter Function

This is the function that it measures several types of hours.

・When load current is over the setting current for time measurement (ON threshold), it measures as ON-time.
For KW2M-A, when load current is in the range of 0.001A to ON threshold, it measures as Standby-time. When load current is 0.000A, it measures OFF-time.
For KW2M-X, when load current is in the range of stand-by threshold to ON threshold, it measures as Standby-time. When load current is under stand-by threshold, it measures as OFF-time.

・It measures as maintenance-time as the below conditions.
Write ‘1’ to DT5(N)(C)28 *1
Input ON with the input type set to ‘Hour meter maintenance’ *2

*1 (N) and (C) are the value according to the unit and CH as below.
(N) unit number main unit: 0, expansion unit1: 1, expansion unit2: 2, expansion unit3: 3
(C) CH number CH1: 0, CH2: 5
*2 only KW2M-X



## 5.6 Demand Function

You can select demand calculation methods for KW2M Eco-POWER METER from the bellows.

・According to IEC61557-12
1. Sliding block interval demand
2. Fixed block interval demand
3. Current demand

Please use this simple demand function as your standard. The value is not guaranteed.

**Caution**
Definition of Demand
It is demand measurement in order to use by yourself as your standard.

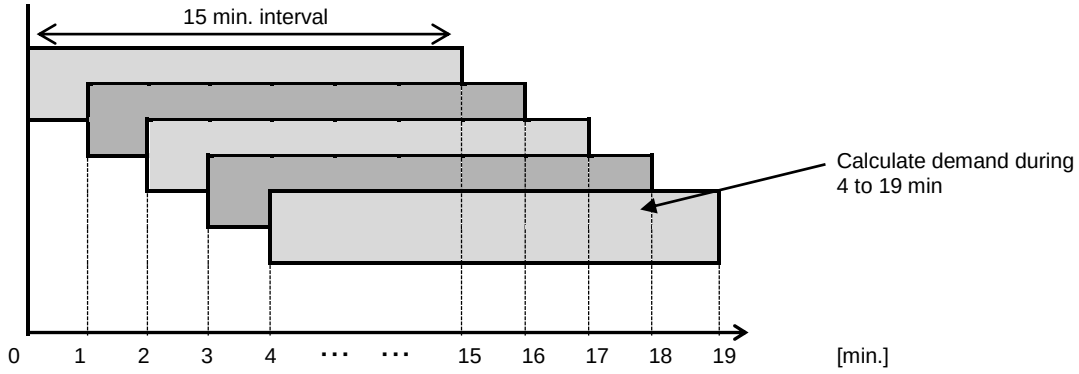
### 5.6.1 Block interval demand

It calculates demand by setting interval and displays.
You can select sliding block or fixed block for interval.
It output demand alarm according to the setting conditions.

Sliding block

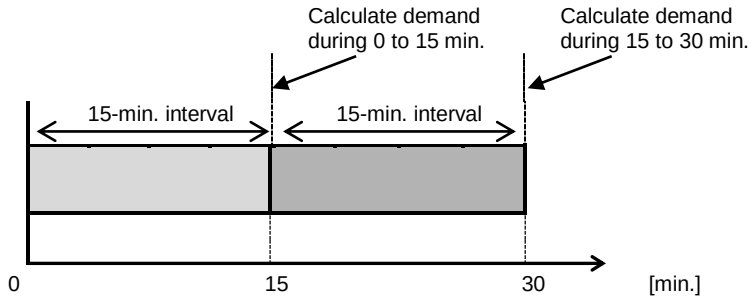
Set power interval by 1 to 60(min.) (every 1-min.). It calculates demand during latest finished interval and displays.
One interval is started every time that set for ‘power demand interval 2’.

Ex.) Power demand interval: 15 min.  Power demand interval 2: 1 min.




Fixed block

Set power interval by 1 to 60 (min.) (every 1-min.) It calculates demand during latest finished interval and displays. After one interval finishes, the next interval starts.

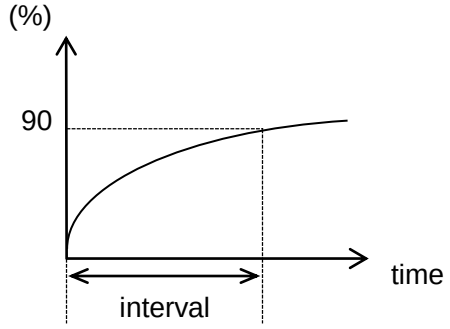


5.6.2 Current demand

Current demand calculates the demand based on a thermal demand meter.

Current demand =
(Average of current – last current demand value) × 90%(fixed) + Last current demand value

In case of that a stable current flows for interval time, 90% of current value is displayed.




5.6.3 Max. demand value

Maximum value of measured demand value (active, reactive, apparent, active (export), reactive (export), current)) are considered to the max. demand value. And it records the max. demand value.

5.6.4 Demand alarm output

- It output with pulse output terminal. (open collector)
- It output only when [alarm] is set for unit for pulse output.
- It doesn't output alarm if power demand alarm threshold is set to '0.000'kW.

5.6.5 Working at power failure and at recovery

<At power failure>

- It stops the demand measurement.
- It records monthly max. demand log, max. demand value in the internal memory.

<At recovery>

- It stops the demand measuring until next span starts. When the next span starts, it will start demand measuring.

5.6.6 Totaling the demand

- It totals the demand values that are measured with each channel and displays.
  You can read out with DT register.

## 5.7 Logging Data Writing Function (only KW2M-X)

This is the function that it writes the measurement data to the internal memory.
You can read out the log files by PC from Eco-POWER METER via FTP communication.

There are 4 kinds of file to write.
- ・5-min. instantaneous value (Save cycle: 5 minutes fixed)
- ・15-min. instantaneous value (Save cycle: 15 minutes fixed)
- ・Demand (Save cycle: 1 minute fixed)
- ・Power quality (When event is occurred.)

### 5.7.1 File creating

<Timing of creating files>
It writes the measurement data to temporary file at the below designated time.

| | |
|---|---|
| 5-min. instantaneous value | Every hour xx:05 |
| 15-min. instantaneous value | Every hour xx:15 |
| Demand | Every hour xx:25 |
| Power quality | Every hour xx:35 |

* When the capacity of the internal memory (temporary) reaches upper limit except the times, it will write too.

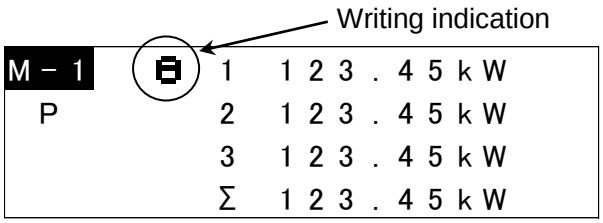
<Timing of confirming files>
It renames the temporary files at the below designated time.

| | |
|---|---|
| 5-min. instantaneous value | Every day 00:05 |
| 15-min. instantaneous value | Every month 1st 00:15 |
| Demand | Every day 00:25 |
| Power quality | When logging 1000-record |

<Timing of deleting saved files>
It deletes log files after the below designated time has passed.

| | |
|---|---|
| 5-min. instantaneous value | 60 days after creating file |
| 15-min. instantaneous value | 24 months after creating file |
| Demand | 60 days after creating file |
| Power quality | It reaches 100 files |

<Indication during writing>
Writing indication is appeared during writing.
Do not turn off the main unit during the indication is appeared, it may break the log files.



### 5.7.2 Format for written files

Log files written in the internal memory is saved with the below format as csv file.

<5-min. instantaneous value >

| | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Date | Time | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 2 | | | KW2M-X | KW2M-X | KW2M-X | KW2M-X | KW2M-X | KW2M-X | KW2M-X | KW2M-X |
| 3 | | | COM1[Unit | COM1[Unit | COM1[Unit | COM1[Unit | COM1[Unit | COM1[Unit | COM1[Unit | COM1[Unit |
| 4 | | | DT278 | DT280 | DT282 | DT284 | DT286 | DT262 | DT264 | DT266 |
| 5 | | | MOMENT | MOMENT | MOMENT | MOMENT | MOMENT | MOMENT | MOMENT | MOMENT |
| 6 | | | US32->FL | US32->FL | US32->FL | US32->FL | US32->FL | US32->FL | US32->FL | US32->FL |
| 7 | | | A | A | A | A | A | V | V | V |
| 8 | 2015/11/27 | 14:15:00 | | | | | | | | |
| 9 | 2015/11/27 | 14:20:00 | | | | | | | | |
| 10 | 2015/11/27 | 16:20:00 | | | | | | | | |
| 11 | 2015/11/27 | 16:25:00 | | | | | | | | |
| 12 | 2015/11/27 | 16:30:00 | | | | | | | | |
| 13 | 2015/11/27 | 16:35:00 | | | | | | | | |
| 14 | 2015/11/27 | 16:40:00 | | | | | | | | |
| 15 | 2015/11/27 | 16:45:00 | | | | | | | | |
| 16 | 2015/11/27 | 16:50:00 | | | | | | | | |
| 17 | 2015/11/27 | 16:55:00 | | | | | | | | |
| 18 | 2015/11/27 | 17:00:00 | | | | | | | | |

| | | |
|---|---|---|
| 1 | Device information | (row 1) Logging data number |
| | | (row 2) KW2M-X : Model name |
| | | (row 3) COM1[Unit No.1] : Device number (based on the unit setting) |
| | | (row 4) DT278 : Target address (main/expansion unit) |
| | | (row 5) MOMENT : Shows 'instantaneous value' |
| | | (row 6) US32 -> FLT : Unsigned integer 32 bit<br>S32 -> FLT : Signed integer 32 bit<br>US16 -> FLT : Unsigned integer 16 bit<br>S16 -> FLT : Signed integer 16 bit |
| | | (row 7) Unit (based on the target address) |
| 2 | Logging trigger | Timing to log data: 5 minutes fixed<br>(00,05,10,15,20,25,30,35,40,45,50,55 of each hour) |
| 3 | Record number | Record number for 1 file 288 records fixed<br>Timing of creating file 5-minute every hour<br>Timing of confirming file 00:05 every day |
| 4 | Logging data | Record '—' for items not measured |
| | | <Main unit, Expansion unit (Power measurement)><br>Logging data of the same timing: 14 data (fixed)<br>From column C to P<br>R-current, S-current, T-current, N-current, Average of current<br>R-voltage (L1-N), S-voltage (L2-N), T-voltage (L3-N),<br>Average of phase-voltage,<br>RS-voltage (L1-L2), ST-voltage (L2-L3), TR-voltage (L3-L1)<br>Average of line-voltage<br>Pulse count value<br><Expansion unit (Multi Analog Input)><br>Logging data of the same timing: 5 data (fixed)<br>From column C to G<br>Digital conversion value1, Digital conversion value2,<br>Digital conversion value3<br>Temperature1, Temperature2<br><Expansion unit (Digital I/O)><br>Logging data of the same timing: 2 data (fixed)<br>From column C to D<br>Pulse count 1, Pulse count 2 |

<15-min. instantaneous value >

1 4 2 3

| | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Date | Time | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 2 | | | KW2M-X | KW2M-X | KW2M-X | KW2M-X | KW2M-X | KW2M-X | KW2M-X | KW2M-X |
| 3 | | | COM1[Unit | COM1[Unit | COM1[Unit | COM1[Unit | COM1[Unit | COM1[Unit | COM1[Unit | COM1[Unit |
| 4 | | | DT100 | DT104 | DT108 | DT112 | DT116 | DT120 | DT124 | DT128 |
| 5 | | | MOMENT | MOMENT | MOMENT | MOMENT | MOMENT | MOMENT | MOMENT | MOMENT |
| 6 | | | US64->FL | US64->FL | US64->FL | US64->FL | US64->FL | US64->FL | US64->FL | US64->FL |
| 7 | | | kWh | kWh | kWh | kWh | kvarh | kvarh | kvarh | kvarh |
| 8 | 2015/11/27 | 14:15:00 | | | | | | | | |
| 9 | 2015/11/27 | 16:30:00 | | | | | | | | |
| 10 | 2015/11/27 | 16:45:00 | | | | | | | | |
| 11 | 2015/11/27 | 17:00:00 | | | | | | | | |
| 12 | 2015/11/28 | 2:15:00 | | | | | | | | |
| 13 | 2015/11/28 | 2:30:00 | | | | | | | | |
| 14 | 2015/11/28 | 2:45:00 | | | | | | | | |
| 15 | 2015/11/28 | 3:00:00 | | | | | | | | |
| 16 | 2015/11/28 | 3:15:00 | | | | | | | | |
| 17 | 2015/11/28 | 3:30:00 | | | | | | | | |
| 18 | 2015/11/28 | 3:45:00 | | | | | | | | |

| | | | |
|---|---|---|---|
| 1 | Device information | (row 1) | Logging data number |
| | | (row 2) | KW2M-X : Model name |
| | | (row 3) | COM1[Unit No.1] : Device number (based on the unit setting) |
| | | (row 4) | DT100 : Target address (main/expansion unit) |
| | | (row 5) | MOMENT : Shows 'instantaneous value' |
| | | (row 6) | US64 -> FLT : Unsigned integer 64 bit |
| | | | S64 -> FLT : Signed integer 64 bit |
| | | | US32 -> FLT : Unsigned integer 32 bit |
| | | | S32 -> FLT : Signed integer 32 bit |
| | | | US16 -> FLT : Unsigned integer 16 bit |
| | | | S16 -> FLT : Signed integer 16 bit |
| | | (row 7) | Unit (based on the target address) |
| 2 | Logging trigger | Timing to log data: 15 minutes fixed (00,15,30,45 of each hour) | |
| 3 | Record number | Record number for 1 file 2976 records fixed<br>Timing of creating file 15-minute every hour<br>Timing of confirming file 1st 00:15 every month | |

| | |
|---|---|
| 4 Logging data | Record ‘－’ for items not measured<br><Main unit、Expansion unit (Power measurement)><br>Logging data of the same timing: 67 data (fixed)<br>From column C to BT<br><br>Integral active power(1), (2), (3), Total integral active power,<br>Integral reactive power(1), (2), (3), Total integral reactive power,<br>Integral apparent power(1), (2), (3), Total integral apparent power,<br>Export active power(1), (2), (3), Total export active power,<br>Export reactive power(1), (2), (3), Total export reactive power,<br>Instantaneous active power(1), (2), (3), Total instantaneous active power,<br>Instantaneous reactive power(1), (2), (3), Total instantaneous reactive power,<br>Instantaneous apparent power(1), (2), (3), Total instantaneous apparent power,<br>R-current, S-current, T-current, N-current, Average of current,<br>R-voltage (L1-N), S-voltage (L2-N), T-voltage (L3-N), Average of phase-voltage,<br>RS-voltage (L1-L2), ST-voltage (L2-L3), TR-voltage (L3-L1), Average of line-voltage, Power factor(1), (2), (3), Average of power factor,<br>Frequency(1), (2), (3), Average of frequency, Current THD(1), (2), (3),<br>Average of current THD, Phase-voltage THD(1), (2), (3),<br>Average of phase-voltage THD, Line-voltage THD(1), (2), (3),<br>Average of line-voltage THD, ON-time, OFF-time, Stand-by time,<br>Maintenance-time, Pulse count value<br><Expansion unit (Multi analog input)><br>Logging data of the same timing: 5 data (fixed)<br>From column C to G<br><br>Digital conversion value1, Digital conversion value2, Digital conversion value3<br>Temperature1, Temperature2<br><Expansion unit (Digital I/O)><br>Logging data of the same timing: 2 data (fixed)<br>From column C to D<br><br>Pulse count 1, Pulse count 2 |

<Custom log>

1 4 2 3

| | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Date | Time | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 2 | | | KW2M-X | KW2M-X | KW2M-X | KW2M-X | KW2M-X | KW2M-X | KW2M-X | KW2M-X |
| 3 | | | COM1 [Unit | COM1 [Unit | COM1 [Unit | COM1 [Unit | COM1 [Unit | COM1 [Unit | COM1 [Unit | COM1 [Unit |
| 4 | | | DT100 | DT120 | DT140 | DT148 | DT168 | DT208 | DT228 | DT244 |
| 5 | | | MOMENT | MOMENT | MOMENT | MOMENT | MOMENT | MOMENT | MOMENT | MOMENT |
| 6 | | | US64->FLT | US64->FLT | US64->FLT | US64->FLT | US64->FLT | S64->FLT | S64->FLT | S64->FLT |
| 7 | | | kWh | kvarh | kVAh | kWh | kvarh | kW | kvar | kVA |
| 8 | 2017/5/11 | 0:30:00 | | | | | | | | |
| 9 | 2017/5/11 | 0:45:00 | | | | | | | | |
| 10 | 2017/5/11 | 1:00:00 | | | | | | | | |
| 11 | 2017/5/11 | 1:15:00 | | | | | | | | |
| 12 | 2017/5/11 | 1:30:00 | | | | | | | | |
| 13 | 2017/5/11 | 1:45:00 | | | | | | | | |
| 14 | 2017/5/11 | 2:00:00 | | | | | | | | |
| 15 | 2017/5/11 | 2:15:00 | | | | | | | | |
| 16 | 2017/5/11 | 2:30:00 | | | | | | | | |
| 17 | 2017/5/11 | 2:45:00 | | | | | | | | |
| 18 | 2017/5/11 | 3:00:00 | | | | | | | | |
| 19 | 2017/5/11 | 3:15:00 | | | | | | | | |
| 20 | 2017/5/11 | 3:30:00 | | | | | | | | |

| | | | |
|---|---|---|---|
| 1 | Device information | (row 1) | Logging data number |
| | | (row 2) | KW2M-X : Model name |
| | | (row 3) | COM1[Unit No.1] : Device number (based on the unit setting) |
| | | (row 4) | DT100 : Target address (main/expansion unit) |
| | | (row 5) | MOMENT : Shows 'instantaneous value' |
| | | (row 6) | US64 -> FLT : Unsigned integer 64 bit<br>S64 -> FLT : Signed integer 64 bit<br>US32 -> FLT : Unsigned integer 32 bit<br>S32 -> FLT : Signed integer 32 bit<br>US16 -> FLT : Unsigned integer 16 bit<br>S16 -> FLT : Signed integer 16 bit |
| | | (row 7) | Unit (based on the target address) |
| 2 | Logging trigger | Timing to log data: 15 minutes fixed (00,15,30,45 of each hour) | |
| 3 | Record number | Record number for 1 file 2976 records fixed<br>Timing of creating file 15-minute every hour<br>Timing of confirming file 1st 00:15 every month | |

| | |
|---|---|
| 4 Logging data | Record ‘－’ for items not measured |
| | Select up to 8 items<br>Integral active power(1), (2), (3), Total integral active power,<br>Integral reactive power(1), (2), (3), Total integral reactive power,<br>Integral apparent power(1), (2), (3), Total integral apparent power,<br>Export active power(1), (2), (3), Total export active power,<br>Export reactive power(1), (2), (3), Total export reactive power,<br>Instantaneous active power(1), (2), (3), Total instantaneous active power,<br>Instantaneous reactive power(1), (2), (3), Total instantaneous reactive power,<br>Instantaneous apparent power(1), (2), (3), Total instantaneous apparent power,<br>R-current, S-current, T-current, N-current, Average of current,<br>R-voltage (L1-N), S-voltage (L2-N), T-voltage (L3-N), Average of phase-voltage,<br>RS-voltage (L1-L2), ST-voltage (L2-L3), TR-voltage (L3-L1), Average of line-voltage, Power factor(1), (2), (3), Average of power factor,<br>Frequency(1), (2), (3), Average of frequency, Current THD(1), (2), (3),<br>Average of current THD, Phase-voltage THD(1), (2), (3),<br>Average of phase-voltage THD, Line-voltage THD(1), (2), (3),<br>Average of line-voltage THD, ON-time, OFF-time, Stand-by time,<br>Maintenance-time, Pulse count value<br>Digital conversion value1, Digital conversion value2,<br>Digital conversion value3, Temperature1, Temperature2<br>Pulse count 1, Pulse count 2,<br>Leakage current 1, Leakage current 2, Leakage current 3 |

<Demand> (Main unit, Expansion unit (Power measurement))

| | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Date | Time | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 2 | | | KW2M-X | KW2M-X | KW2M-X | KW2M-X | KW2M-X | KW2M-X | KW2M-X | KW2M-X |
| 3 | | | COM1[Unit | COM1[Unit | COM1[Unit | COM1[Unit | COM1[Unit | COM1[Unit | COM1[Unit | COM1[Unit |
| 4 | | | DT305 | DT307 | DT309 | DT311 | DT313 | DT325 | DT315 | DT317 |
| 5 | | | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND |
| 6 | | | US32->FL | US32->FL | US32->FL | US32->FL | US32->FL | US64->FL | US32->FL | US32->FL |
| 7 | | | kW | kvar | kVA | kW | kvar | kWh | A | A |
| 8 | 2015/11/27 | 14:11:00 | | | | | | | | |
| 9 | 2015/11/27 | 14:12:00 | | | | | | | | |
| 10 | 2015/11/27 | 14:13:00 | | | | | | | | |
| 11 | 2015/11/27 | 14:14:00 | | | | | | | | |
| 12 | 2015/11/27 | 14:15:00 | | | | | | | | |
| 13 | 2015/11/27 | 14:16:00 | | | | | | | | |
| 14 | 2015/11/27 | 14:17:00 | | | | | | | | |
| 15 | 2015/11/27 | 14:18:00 | | | | | | | | |
| 16 | 2015/11/27 | 14:19:00 | | | | | | | | |
| 17 | 2015/11/27 | 14:20:00 | | | | | | | | |
| 18 | 2015/11/27 | 14:21:00 | | | | | | | | |

| | | | |
|---|---|---|---|
| 1 | Device information | (row 1) | Logging data number |
| | | (row 2) | KW2M-X : Model name |
| | | (row 3) | COM1[Unit No.1] : Device number (based on the unit setting) |
| | | (row 4) | DT305 : Target address (main/expansion unit) |
| | | (row 5) | DEMAND : Shows 'demand value' |
| | | (row 6) | US64 -> FLT : Unsigned integer 64 bit |
| | | | S64 -> FLT : Signed integer 64 bit |
| | | | US32 -> FLT : Unsigned integer 32 bit |
| | | | S32 -> FLT : Signed integer 32 bit |
| | | | US16 -> FLT : Unsigned integer 16 bit |
| | | | S16 -> FLT : Signed integer 16 bit |
| | | (row 7) | Unit (based on the target address) |
| 2 | Logging trigger | Timing to log data: 1 minutes fixed (00 of each minute) | |
| 3 | Record number | Record number for 1 file 1440 records fixed<br>Timing of creating file 25-minute every hour<br>Timing of confirming file 00:25 every day | |
| 4 | Logging data | Record '—' for items not measured | |
| | | Logging data of the same timing: 9 data (fixed)<br>From column C to K<br>Present demand (active power, reactive power, apparent power, active power(export), reactive power(export))<br>Pulse conversion value for integral power,<br>Present current demand (1), (2), (3) | |

<Power quality> (Main unit, Expansion unit (Power measurement))

4

1

2

3

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Date | Time | Status | Type | Phase | Data |
| 2 | 2015/12/4 | 11:01:01 | Start | Under current | Phase 3 | – |
| 3 | 2015/12/4 | 11:04:00 | End | Under current | Phase 3 | 129ms |
| 4 | 2015/12/4 | 11:04:00 | Start | Over current | Phase 3 | – |
| 5 | 2015/12/4 | 11:11:02 | End | Over current | Phase 3 | 412ms |
| 6 | 2015/12/4 | 11:11:02 | Start | Under Voltage | Phase 3 | – |
| 7 | 2015/12/4 | 11:11:03 | End | Under Voltage | Phase 3 | 827ms |

| | | |
|---|---|---|
| 1 | Device information | (row1) Measured data item (fixed) |
| 2 | Logging trigger | Timing to log data: at the time when an event is occurred |
| 3 | Record number | Record number for 1 file 1000 records fixed<br>Timing of creating file 35-minute every hour<br>Timing of confirming file When logging 1000-record |
| 4 | Logging data | Record '—' for items not measured<br>(row C) Status of event<br>(row D) Event type<br>・Over Voltage<br>・Under Voltage<br>・Over Current<br>・Under Current<br>・Power interruption<br>(row E) Phase that the event has occurred<br>(row F) Time that the event has occurred |

### 5.7.3 File name and saved folder

Files are saved in the internal memory with the below constructions.

<5-min. instantaneous value>

[Folder]

```
LOG ─┬─ moment5_u0_1 ─┬─ moment5_u0_1(160101_001500_TRG).csv
     │                │  moment5_u0_1(160102_001500_TRG).csv
     │
     ├─ moment5_u1_1 ─── moment5_u1_1(160101_001500_TRG).csv
```

[Folder name]

LOG -> fixed

moment5_u0_1

- Circuit number (1: CH1, 2: CH2)
- Unit number (0: main unit, 1 to 3: expansion)

[File name]

moment5_u0_1(160101_001500_TRG).csv

- Condition of saved file
- hour/minute/second (00:15:00)
- year/month/day (January 1st, 2016)
- circuit number (1: CH1, 2: CH2)
- unit number (0: main unit, 1 to 3: expansion)

year/month/day, hour/minute/second in file name is the date of the beginning record.

<15-min. instantaneous value>

[Folder]

```
LOG ─┬─ moment15_u0_1 ─┬─ moment15_u0_1(160101_001500_TRG).csv
     │                 │  moment15_u0_1(160102_001500_TRG).csv
     │
     ├─ moment15_u1_1 ─── moment15_u1_1(160101_001500_TRG).csv
```

[Folder name]

LOG -> fixed

moment15_u0_1

- Circuit number (1: CH1, 2: CH2)
- Unit number (0: main unit, 1 to 3: expansion)

[File name]

moment15_u0_1(160101_001500_TRG).csv

- Condition of saved file
- hour/minute/second (00:15:00)
- year/month/day (January 1st, 2016)
- circuit number (1: CH1, 2: CH2)
- unit number (0: main unit, 1 to 3: expansion)

year/month/day, hour/minute/second in file name is the date of the beginning record.

<Custom log>
[Folder]
LOG custom custom(160101_001500_TRG).csv
custom(160102_001500_TRG).csv

[Folder name]
LOG -> fixed
custom -> fixed

[File name]
custom(160101_001500_TRG).csv

Condition of saved file
hour/minute/second (00:15:00)
year/month/day (January 1st, 2016)

year/month/day, hour/minute/second in file name is the date of the beginning record.

<Demand>
[Folder]
LOG demand_u0_1 demand_u0_1(160101_001500_TRG).csv
demand_u0_1(160102_001500_TRG).csv
demand_u1_1 demand_u1_1(160101_001500_TRG).csv

[Folder name]
LOG -> fixed
demand_u0_1

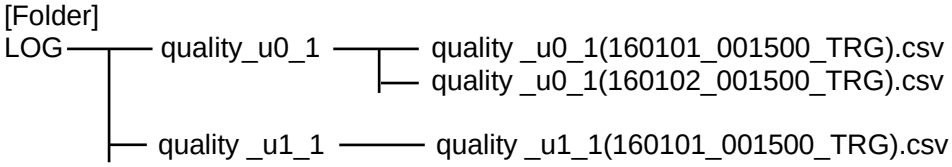
Circuit number (1: CH1, 2: CH2)
Unit number (0: main unit, 1 to 3: expansion)

[File name]
demand_u0_1(160101_001500_TRG).csv

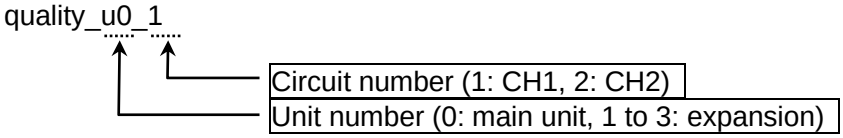
Condition of saved file
hour/minute/second (00:15:00)
year/month/day (January 1st, 2016)
circuit number (1: CH1, 2: CH2)
unit number (0: main unit, 1 to 3: expansion)

year/month/day, hour/minute/second in file name is the date of the beginning record.

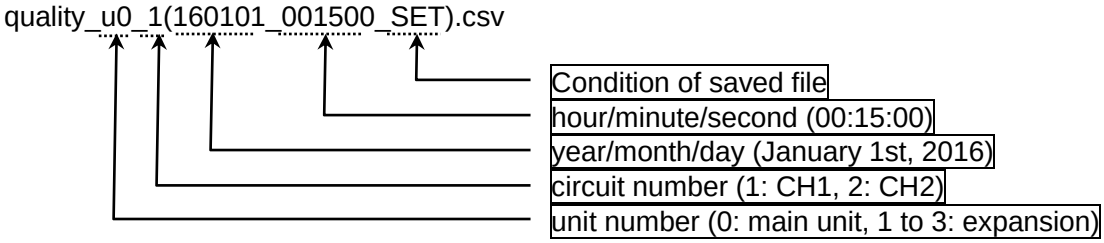
<power quality>
[Folder]




[Folder name]
LOG -> fixed




[File name]



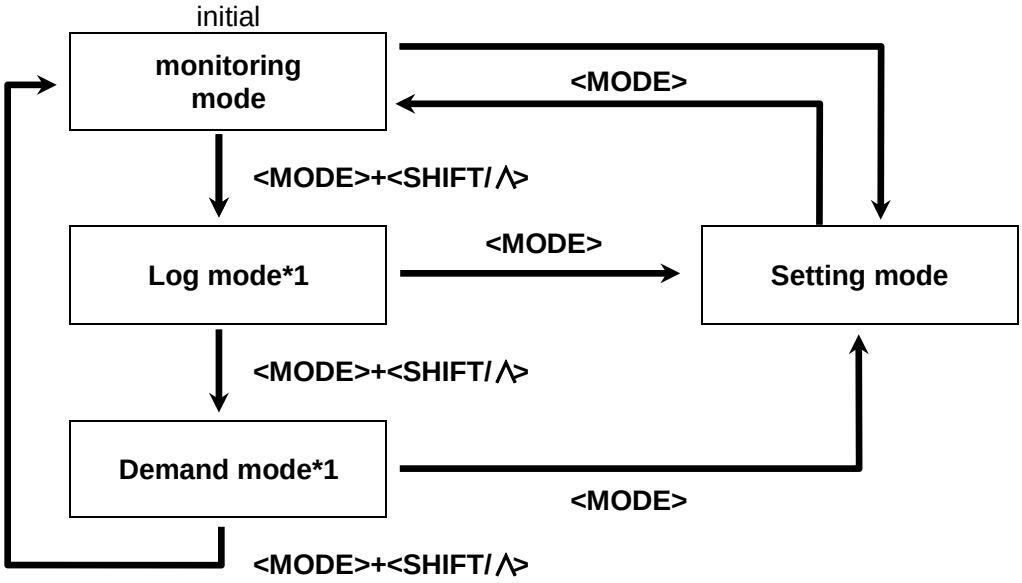

year/month/day, hour/minute/second in file name is the date of the beginning record.

| Condition of saved file | Recorded letter |
|---|---|
| ‘File write trigger’ occurs. | TRG |
| Record number reaches upper limit | SET |

# Chapter 6 Display of Each Value

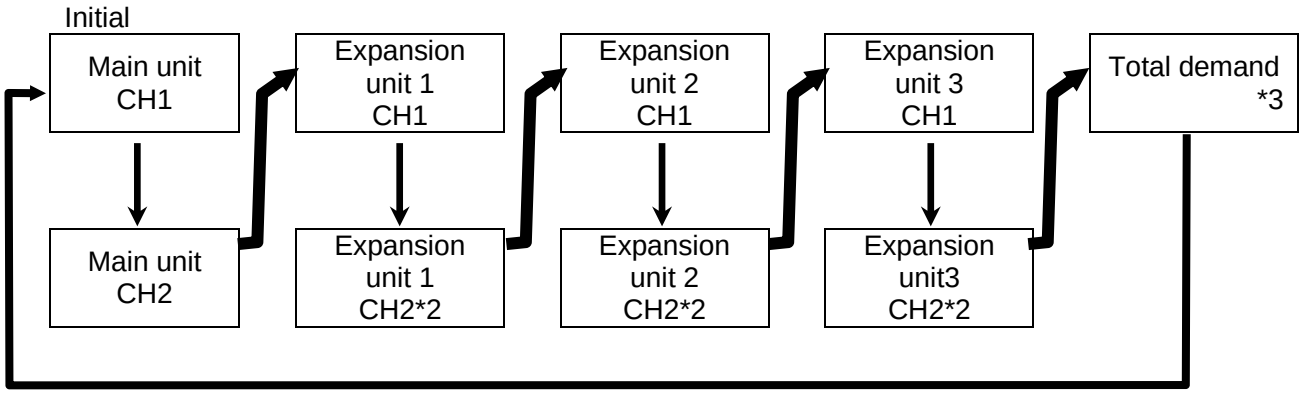
## 6.1 Working of Monitor Display

【Shift the display mode】
Press <SHIFT/∧> during pressing <MODE>, it shifts measuring mode, logging mode and demand mode.
Press <MODE> to shift the setting mode.




*1 only main unit and expansion unit (power measurement), set CH2 to power measurement

Press <SET> during pressing <MODE>, it shifts display channel and unit.

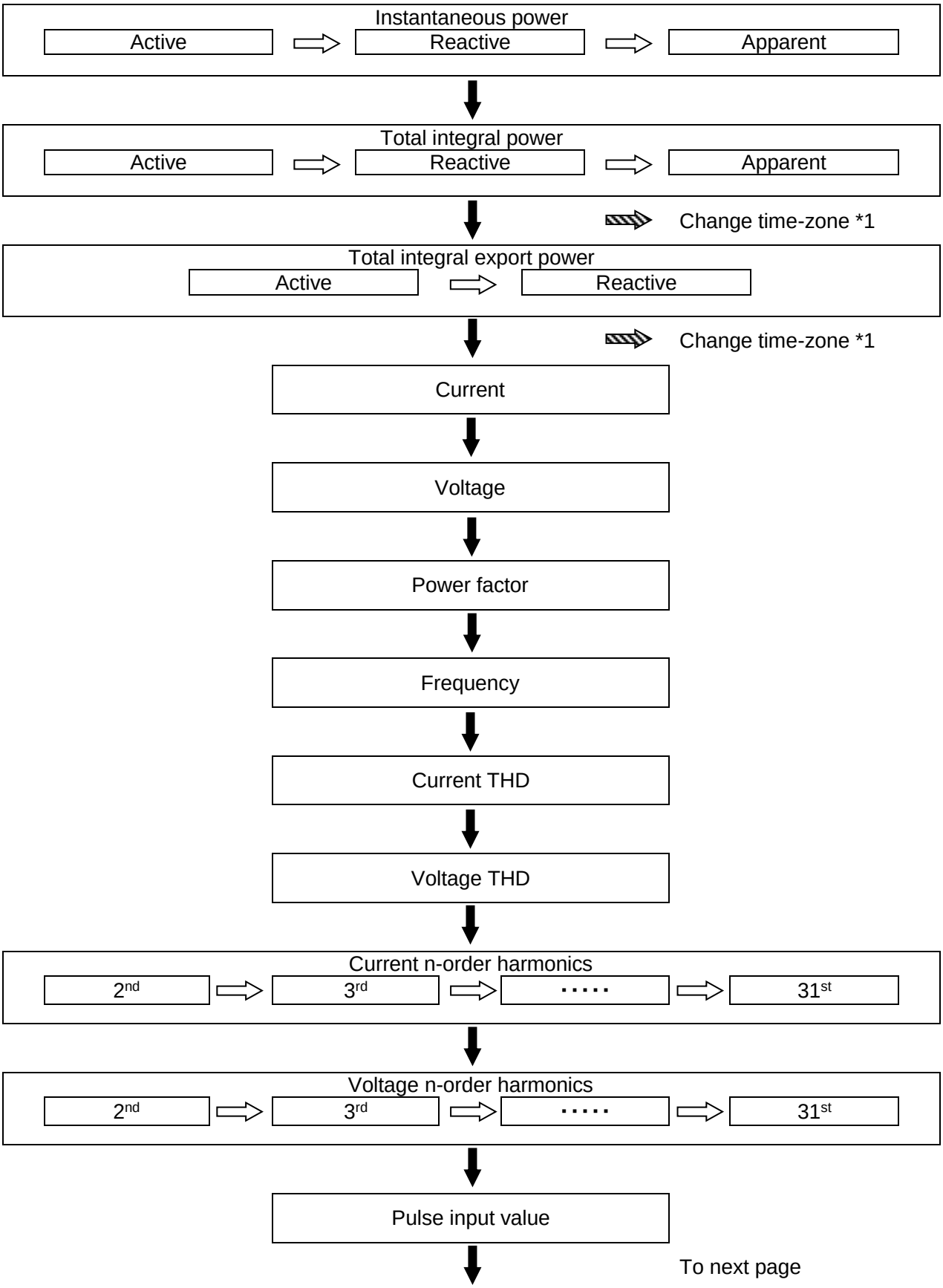



*2 only expansion unit (power measurement)
*3 only when it set to available the total demand function

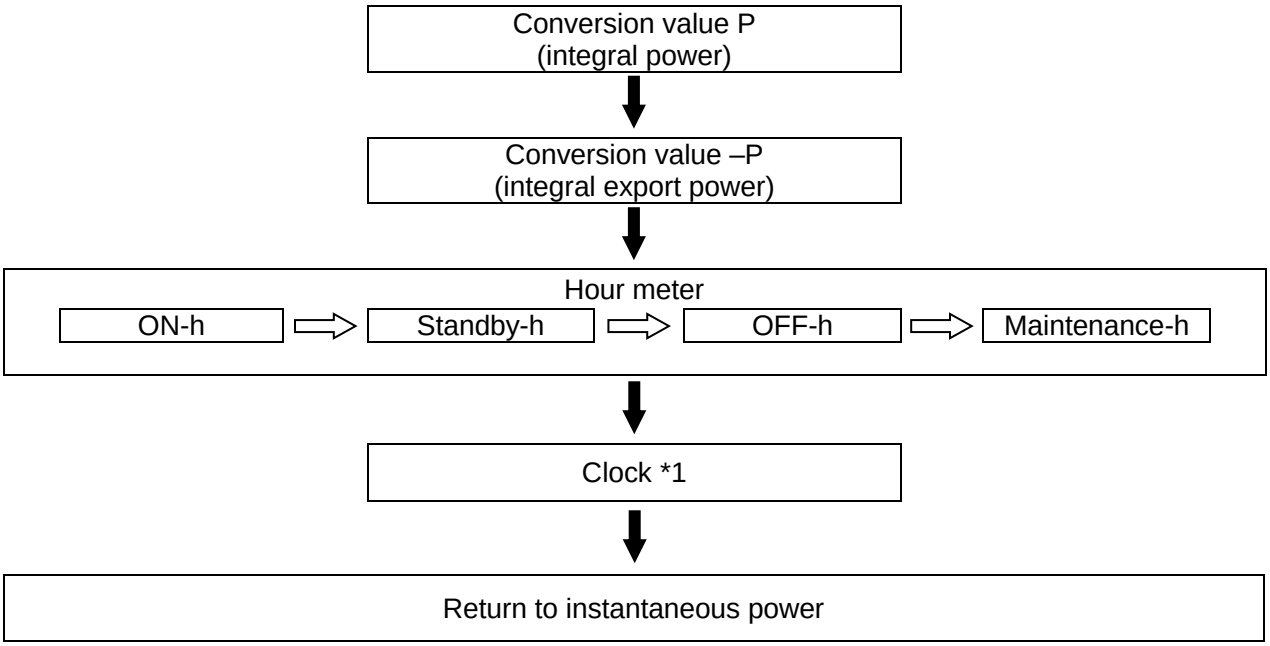
## 6.2 Working of Monitor Display (Main unit, Expansion unit (Power measurement))

6.2.1 Single-phase two-wire system

Arrow mark shows to press each key. ➡ <ITEM/>> ⇨ <SHIFT/▽> ⇨ <SET>



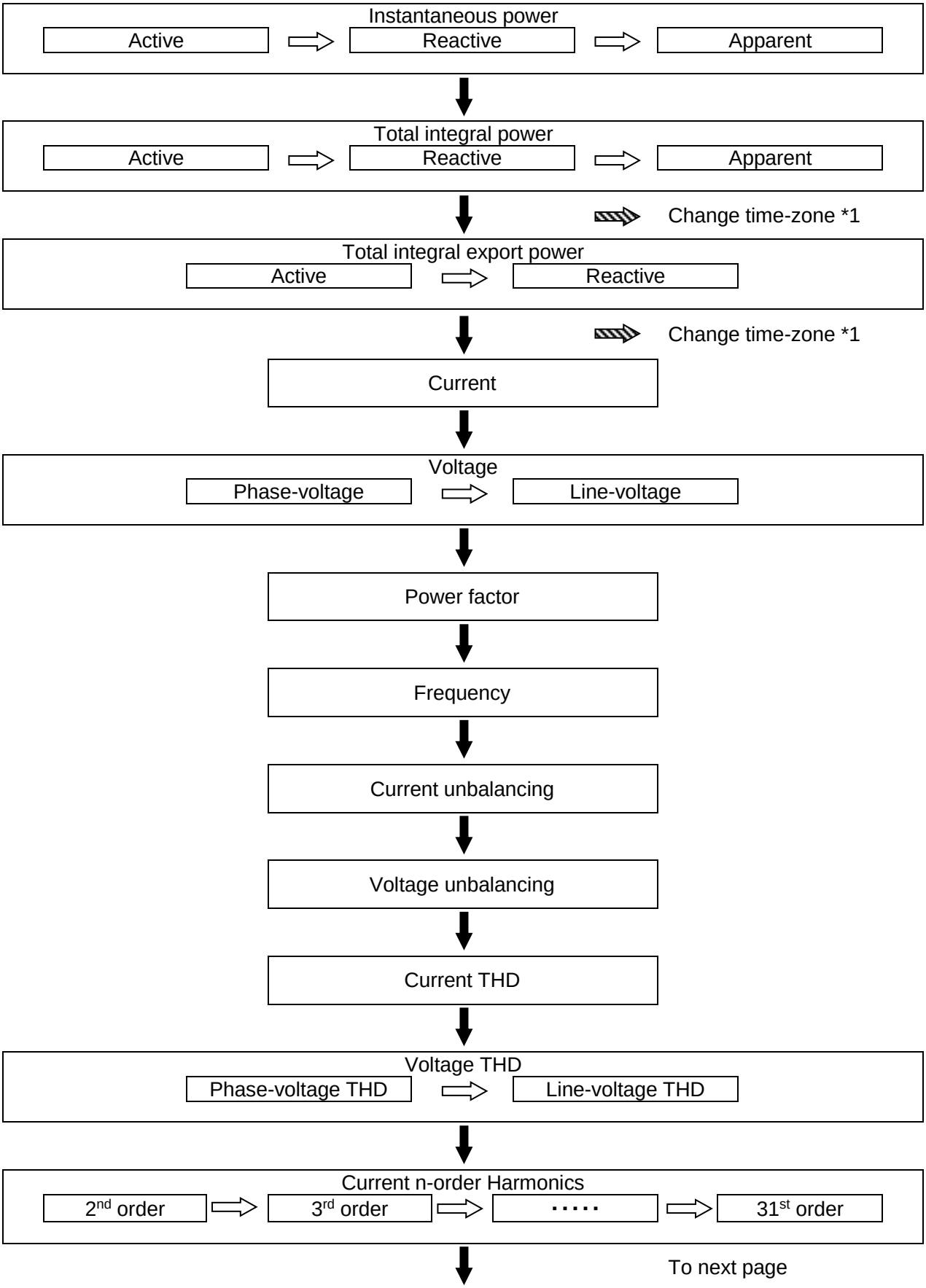
From the previous page

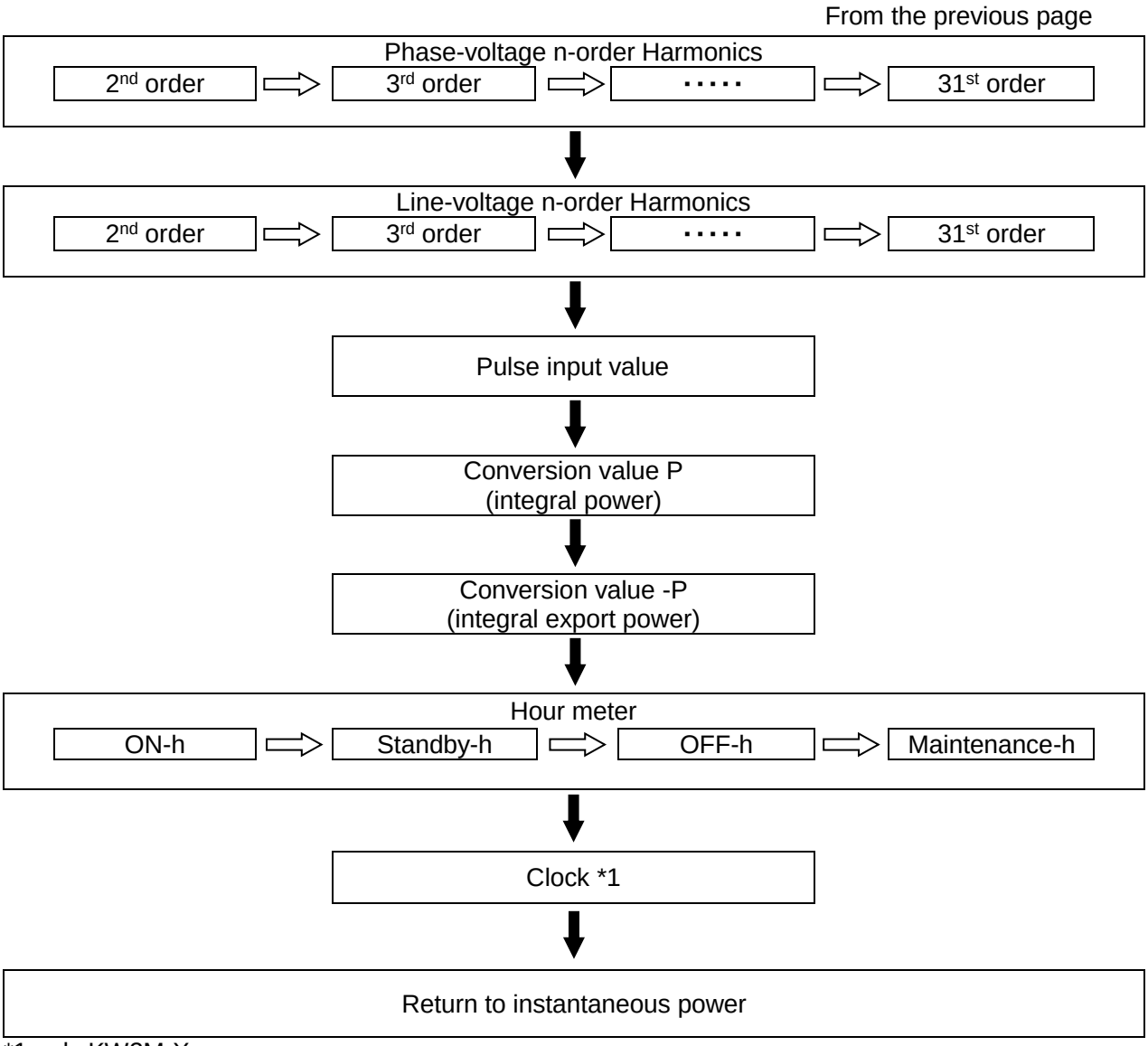



*1 only KW2M-X

### 6.2.2 Single-phase three-wire system

Arrow mark shows to press each key. ➡ <ITEM/>> ⇨ <SHIFT/▽> ⇨ <SET>

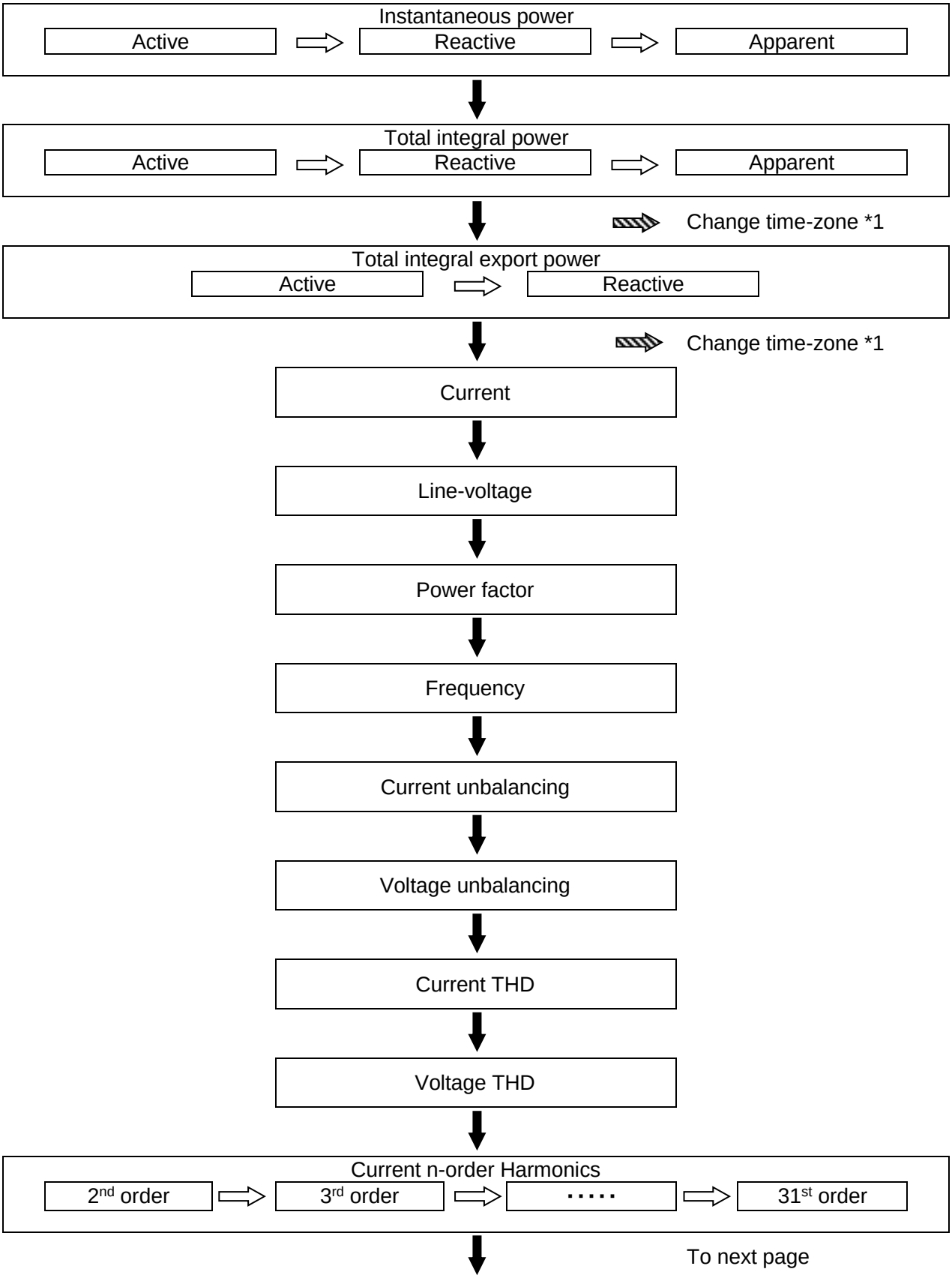


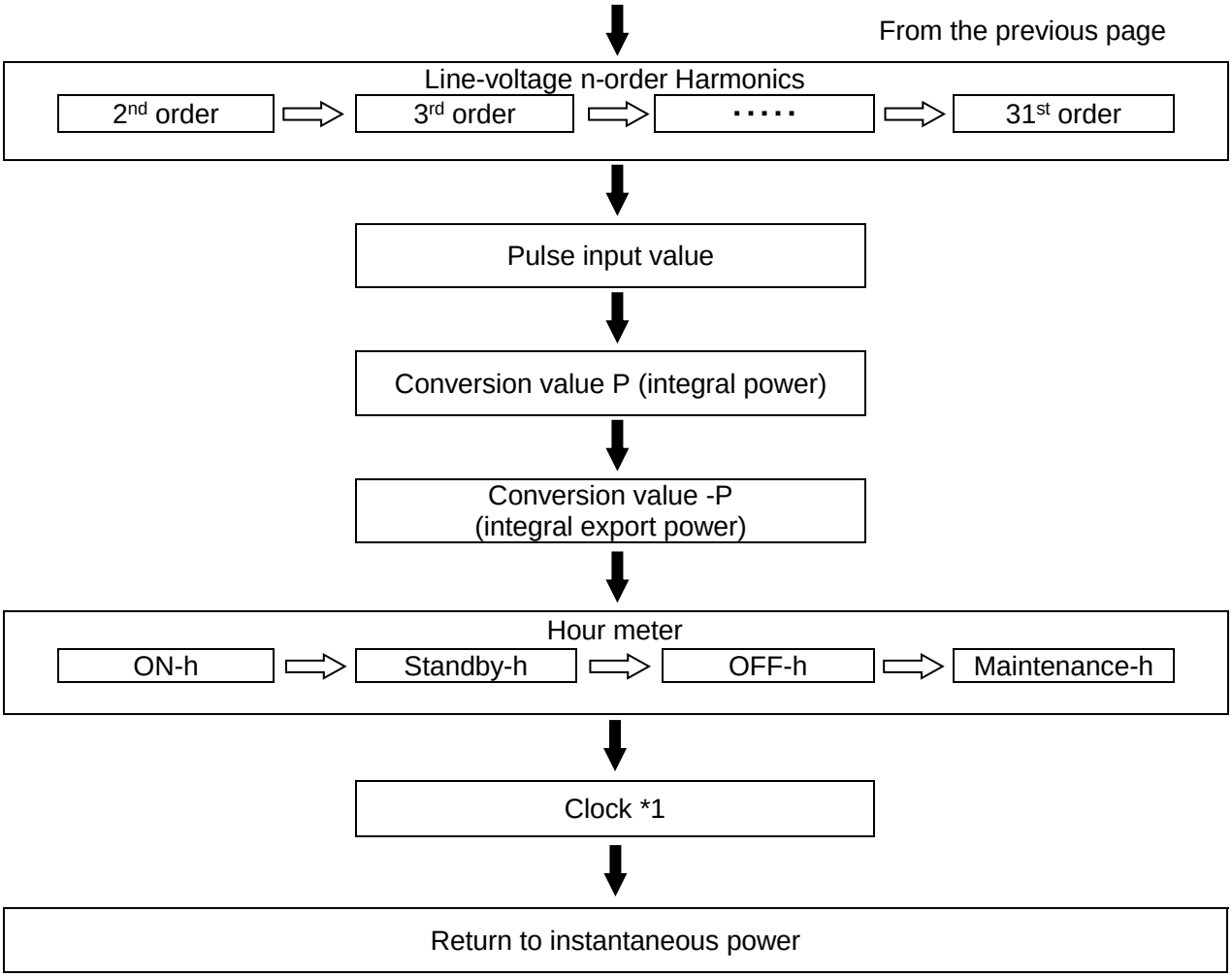

From the previous page
Phase-voltage n-order Harmonics
2nd order
3rd order
・・・・・
31st order
Line-voltage n-order Harmonics
2nd order
3rd order
・・・・・
31st order
Pulse input value
Conversion value P
(integral power)
Conversion value -P
(integral export power)
Hour meter
ON-h
Standby-h
OFF-h
Maintenance-h
Clock *1
Return to instantaneous power

*1 only KW2M-X

### 6.2.3 Three-phase three-wire system

Arrow mark shows to press each key. ➡ <ITEM/>> ⇨ <SHIFT/▽> ⇨ <SET>

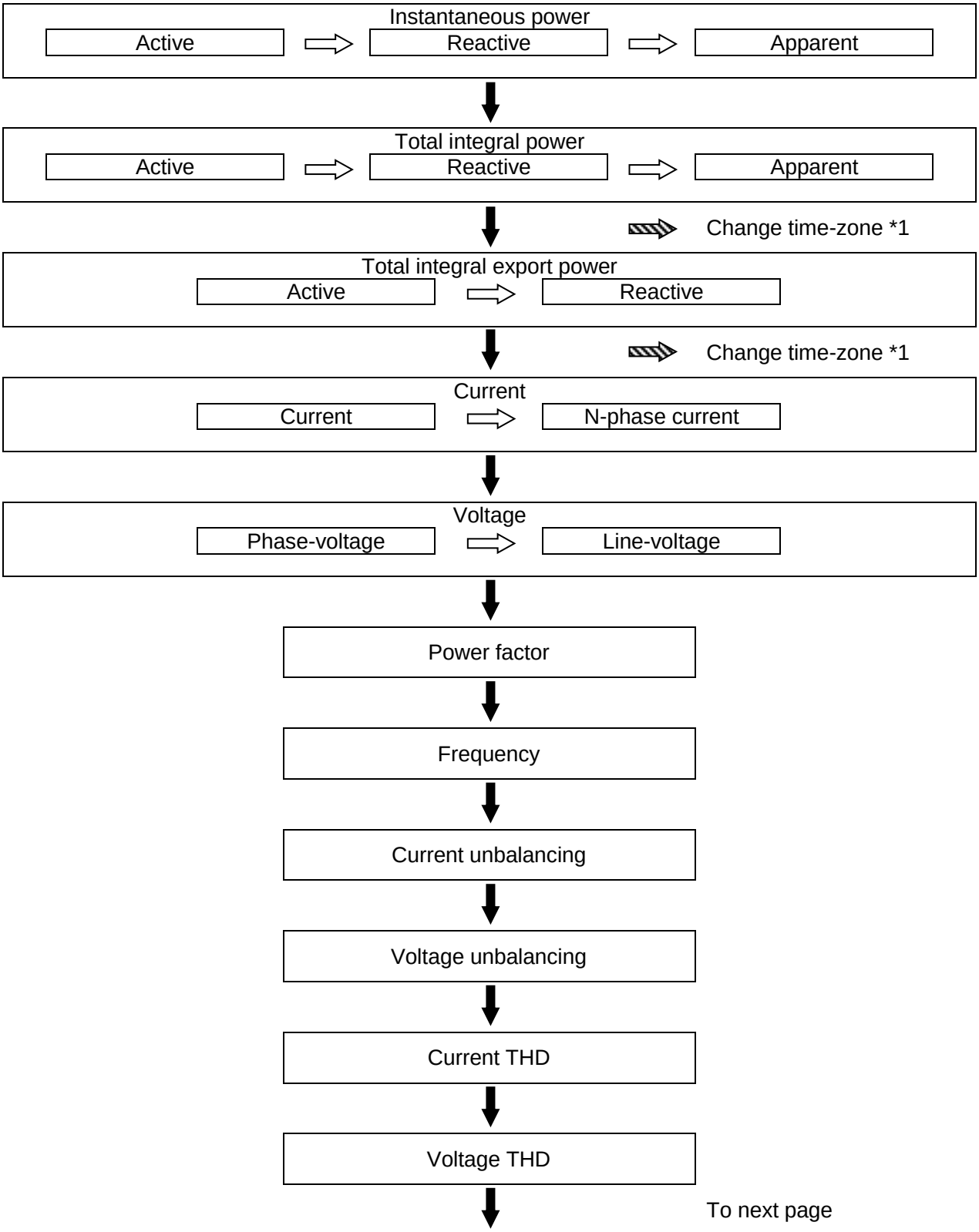


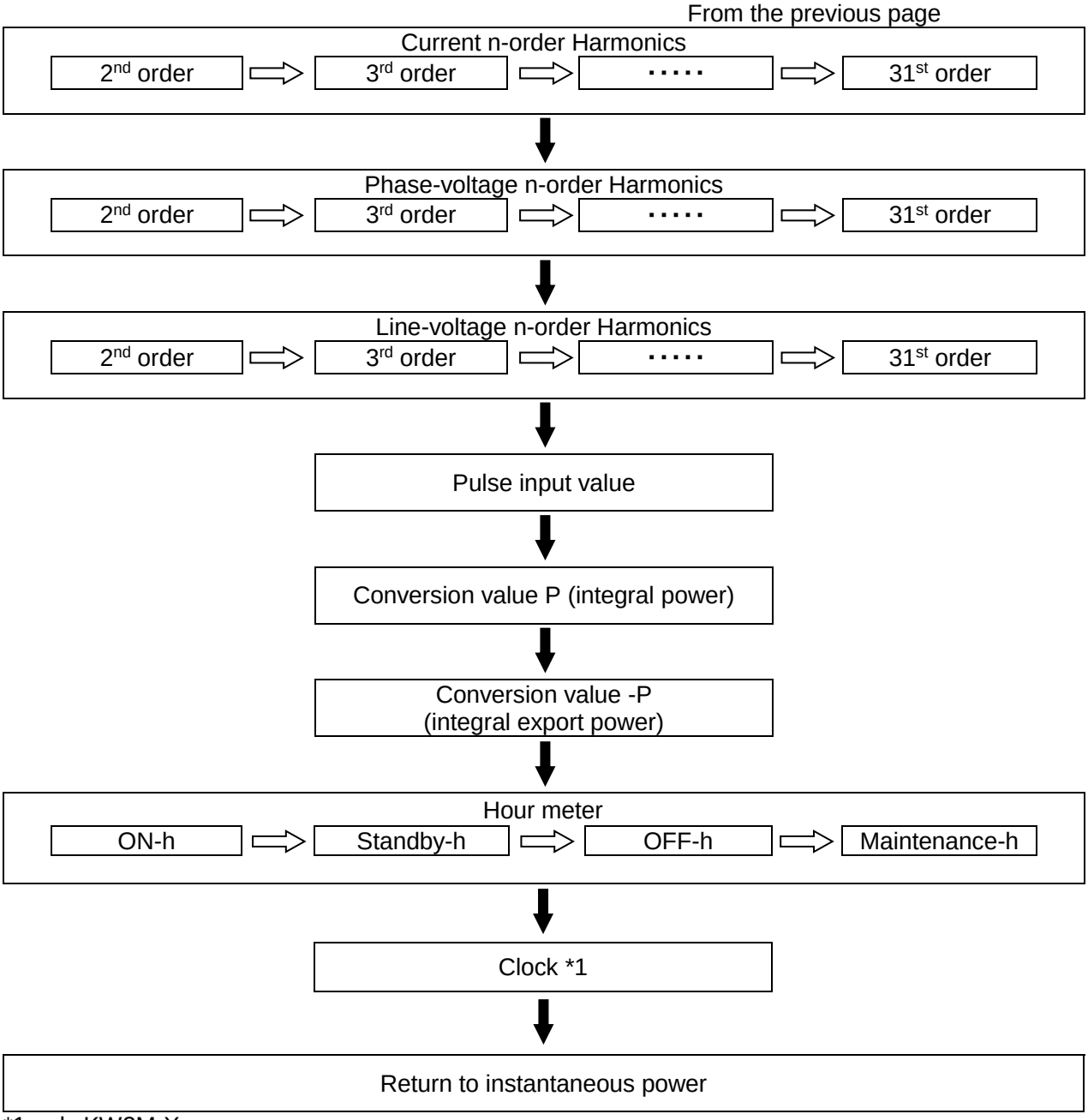

From the previous page
Line-voltage n-order Harmonics
2nd order
3rd order
・・・・・
31st order
Pulse input value
Conversion value P (integral power)
Conversion value -P
(integral export power)
Hour meter
ON-h
Standby-h
OFF-h
Maintenance-h
Clock *1
Return to instantaneous power

*1 only KW2M-X

### 6.2.4 Three-phase four-wire system

Arrow mark shows to press each key. ➡ <ITEM/>> ⇨ <SHIFT/▽> ⇨ <SET>




From the previous page
Current n-order Harmonics
2nd order
3rd order
・・・・・
31st order
Phase-voltage n-order Harmonics
2nd order
3rd order
・・・・・
31st order
Line-voltage n-order Harmonics
2nd order
3rd order
・・・・・
31st order
Pulse input value
Conversion value P (integral power)
Conversion value -P
(integral export power)
Hour meter
ON-h
Standby-h
OFF-h
Maintenance-h
Clock *1
Return to instantaneous power

*1 only KW2M-X

### 6.2.5 Instantaneous power

・The present instantaneous power of all phases or all circuits is displayed.
・Press <SHIFT/∧> to change active, reactive and apparent.

<1P2W/1P3W/3P4W>

Active

```
M - 1        1   1 2 3 . 4 5 k w
 P           2             k w
             3             k w
             Σ             k w
```

SHIFT ∧ →

Reactive

```
1 - 2        1             k v a r
 Q           2             k v a r
             3             k v a r
             Σ             k v a r
```

SHIFT ∧ →

Apparent

```
2 - 2        1             k V A
 S           2             k V A
             3             k V A
             Σ             k V A
```

・Eco-POWER METER displays the power as below.

| Display | 1P2W | 1P3W | 3P4W |
|---|---|---|---|
| 1 | 1st circuit | R-phase | R-phase |
| 2 | 2nd circuit | --- | S-phase |
| 3 | 3rd circuit | T-phase | T-phase |
| ∑ | Total (1+2+3) | Total (R+T) | Total (R+S+T) |

<3P3W>

Active

```
M - 1
 P
                x . x x x k w
```

SHIFT ∧ →

Reactive

```
M - 1
 Q
                x . x x x k v a r
```

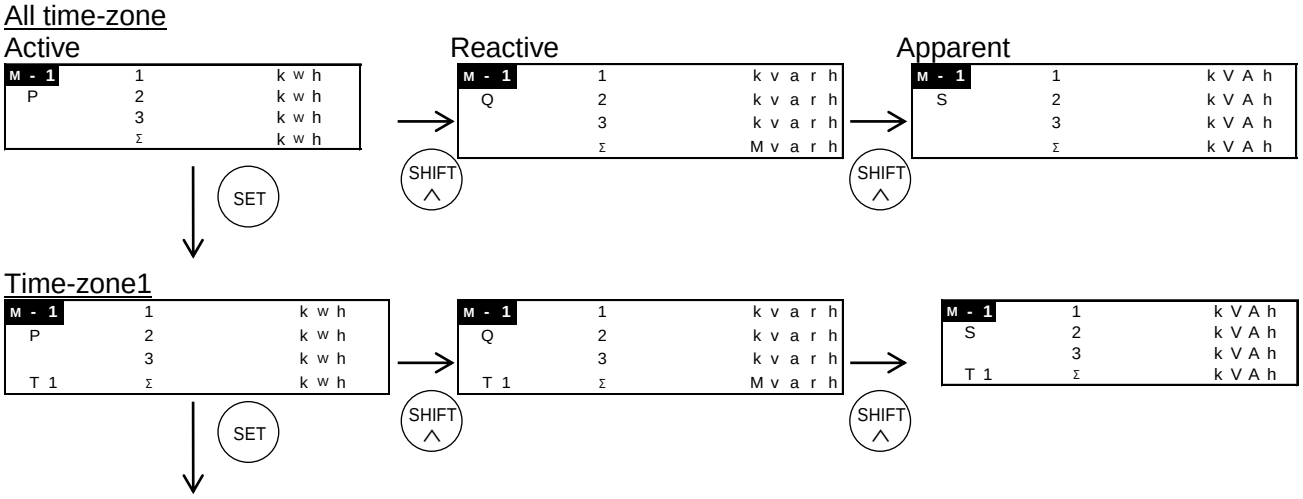
SHIFT ∧ →

Apparent

```
M - 1
 S
                x . x x x k V A
```

### 6.2.6 Total integral power

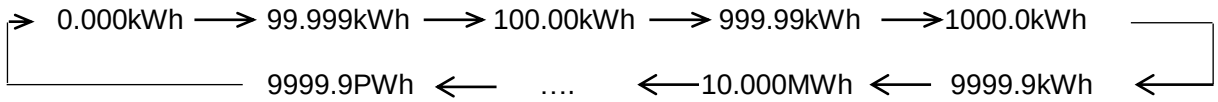
・The present total integral power is displayed.
・Press <SHIFT/∧> to change active, reactive and apparent.
・Press <SET> to change the display with each time-zone. *1
After changing, press <SET> to change displayed time-zone.
time-zone1(T1) -> time-zone2(T2) -> time-zone3(T3) -> time-zone4(T4) -> All time-zone
*Time-zone without setting for any time program is not displayed.




time-zone2, time-zone3, time-zone4 and all time-zone are changed in turn.

*It doesn't light [∑] with 3P3W system.

・Total integral power is measured and displayed from 0.000 (kWh/kvarh/kVAh) to 9999.9 (PWh/Pvar/PVA).
・The decimal point is changed automatically.




(After reach the full scale, 9999.9PWh, the value reverts to 0.000 but continues to measure.)

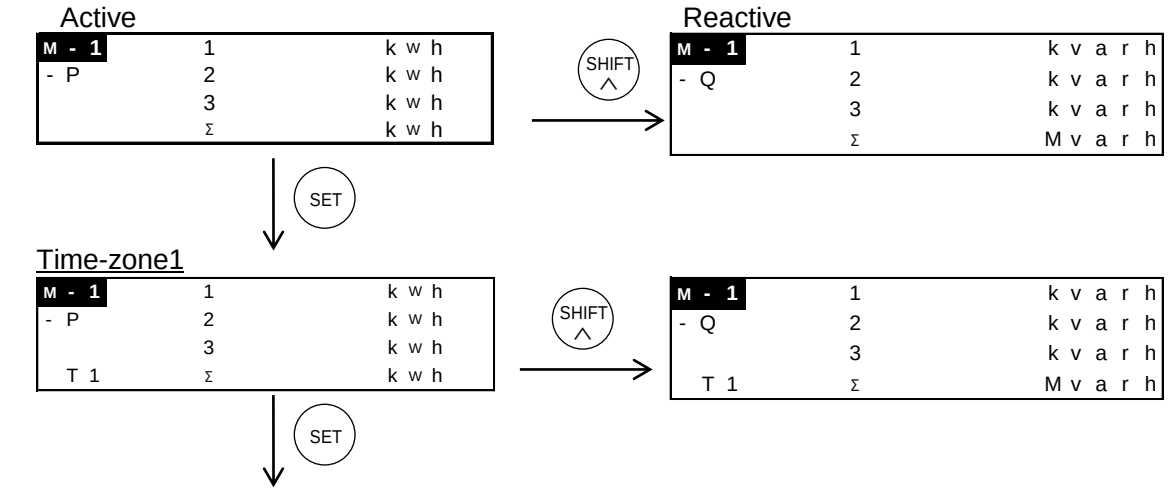
*1 only KW2M-X

### 6.2.7 Total integral export power

・The present total export power is displayed.
・Press <SHIFT/∧> to change active, reactive and apparent.

・Press <SET> to change the display with each time-zone. *1
After changing, press <SET> to change displayed time-zone.
time-zone1(T1) -> time-zone2(T2) -> time-zone3(T3) -> time-zone4(T4) -> All time-zone
*Time-zone without setting for any time program is not displayed.

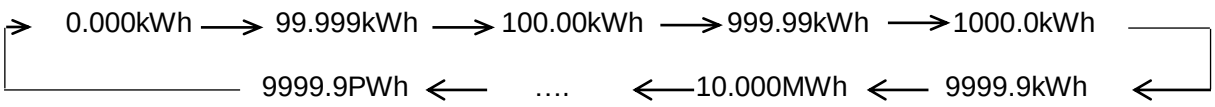
All time-zone




time-zone2, time-zone3, time-zone4 and all time-zone are changed in turn.

*It doesn't light [∑] with 3P3W system.

・Total integral power is measured and displayed from 0.000 (kWh/kvarh/kVAh) to 9999.9 (PWh/Pvar/PVA).
・The decimal point is changed automatically.

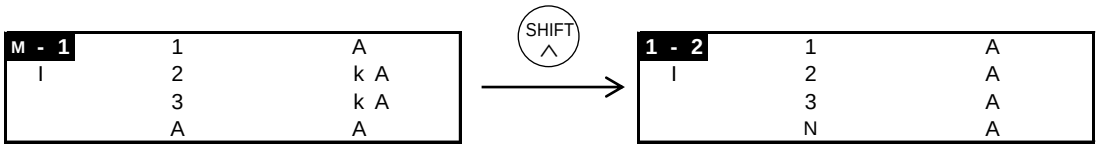



(After reach the full scale, 9999.9PWh, the value reverts to 0.000 but continues to measure.)

*1 only KW2M-X

### 6.2.8 Current

・The present current value is displayed. (N-phase current is displayed for 3P4W.)



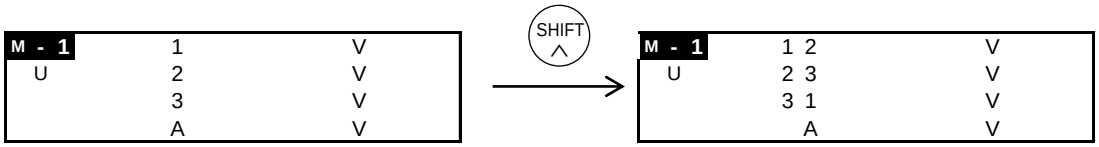

・It measures from 0.1% of CT secondary current.
・When input current exceeds 200% or the display range, it displays '- - - - -'.
Check and confirm the measurement environment.
・Current measuring points Eco-POWER METER measures the current as below.

| Display | 1P2W | 1P3W | 3P3W<br>3P4W |
|---|---|---|---|
| 1 | 1st circuit R-current | R-current | R-current |
| 2 | 2nd circuit R-current | N-current | S-current |
| 3 | 3rd circuit R-current | T-current | T-current |
| A | Average | Average of R and T | Average |
| N | — | — | N-current *only 3P4W |

### 6.2.9 Voltage

・The present voltage is displayed.
・Press <SHIFT/∧> to change phase voltage and line voltage.
(Line voltage is not displayed for 1P2W system. Phase voltage is not displayed for 3P3W system.

Phase voltage Line voltage




・When input voltage is under 3V (when VT ratio is 1.), it displays '0.00' and doesn't measure.
・When input voltage exceeds 828V or the display range, it displays '- - - - -'.
Check and confirm the measurement environment.
・Voltage measuring points Eco-POWER METER measures the voltage as below.

| Display | 1P2W | 1P3W | 3P3W | 3P4W |
|---|---|---|---|---|
| 1 | R-voltage (L1-N)<br>or 1st circuit R-voltage | R-voltage (L1-N) | No display | R-voltage (L1-N) |
| 2 | None or<br>2nd circuit R-voltage | None | | S-voltage (L2-N) |
| 3 | None or<br>3rd circuit R-voltage | T-voltage (L3-N) | | T-voltage (L3-N) |
| A | Average | Average of R and T | | Average |
| 1 2 | No display | R-voltage (L1-N) | RS-voltage (L1-L2) | RS-voltage (L1-L2) |
| 2 3 | | T-voltage (L3-N) | ST-voltage (L2-L3) | ST-voltage (L2-L3) |
| 3 1 | | TR-voltage (L3-L1) | TR-voltage (L3-L1) | TR-voltage (L3-L1) |
| A | | Average of R and T | Average | Average |

### 6.2.10 Power factor

・The present power factor of the load is displayed.

<1P2W/1P3W/3P4W>

```
M - 1        1
P F          2
             3
             A
```

<3P3W>

```
M - 1
P F
                    1 2 3
```

*Power factor operation is a method assuming balanced load. The error might be big when it measures unbalanced load.

### 6.2.11 Frequency

・The present frequency is displayed.

<1P2W/1P3W/3P4W>

```
M - 1        1        Hz
  F          2        Hz
             3        Hz
             A        Hz
```

<3P3W>

```
M - 1
  F
                      Hz
```

### 6.2.12 Current unbalance

・The present current unbalance is displayed. (No display for 1P2W.)

```
M - 1
  I
            100.00%
```

### 6.2.13 Voltage unbalancing

・The present voltage unbalancing is displayed. (No display for 1P2W.)

```
M - 1
  U
            100.00%
```

### 6.2.14 Current THD

・The present THD for current is displayed.

```
M - 1        1        %
T H D i      2        %
             3        %
             A        %
```

### 6.2.15 Voltage THD

・The present THD for voltage displayed.

```
M - 1        1        %
T H D u      2        %
             3        %
             A        %
```

```
M - 1        1 2      %
T H D u      2 3      %
             3 1      %
               A      %
```

### 6.2.16 Current n-order harmonics

・The present current n-order harmonics is displayed.

・Press <SHIFT/∧> to change display.

2nd order, 3rd order, 4th order ・・・・・ up to 31st order

```
M - 1        1        %
H - I 2      2        %
             3        %
             A        %
```

### 6.2.17 Voltage n-order harmonics

・The present voltage n-order harmonics is displayed.

・Press <SHIFT/∧> to change display.

2nd order, 3rd order, 4th order ・・・・・ up to 31st order

```
M - 1        1        %
H - U 2      2        %
             3        %
             A        %
```

### 6.2.18 Pulse input value

・The present pulse input value is displayed.
・Pulse input status (ON or OFF) is confirmed via communication. (MEWTOCOL and MODBUS)

Pulse input

```
M - 1
C N T

                1 2 3 4 5 6 7 8 9 0 1
```

*Turn on the unit during IN1 is shorted, first 1-pulse is not counted. After that, when pulse is input pulse it count the pulse.

### 6.2.19 Conversion value for integral active power

・The conversion value for the present integral active power (P) is displayed.
(Only total conversion value is displayed for 3P3W system.)
・Press <SHIFT/∧> to change total, phase 1 (1st circuit), phase 2 (2nd circuit) and phase 3 (3rd circuit).

<1P2W/1P3W/3P4W>
Total

```
M - 1        1
C H G        2
             3
             Σ   1 2 3 4 5 6 7 8 9 0 1
```

<3P3W>
Total

```
M - 1        1
C H G        2
             3
             Σ   1 2 3 4 5 6 7 8 9 0 1
```

*The conversion value exceeds ‘99999999’,
[－－－－－－－－] is displayed.
Check and confirm the measurement environment.

### 6.2.20 Conversion value for integral export power

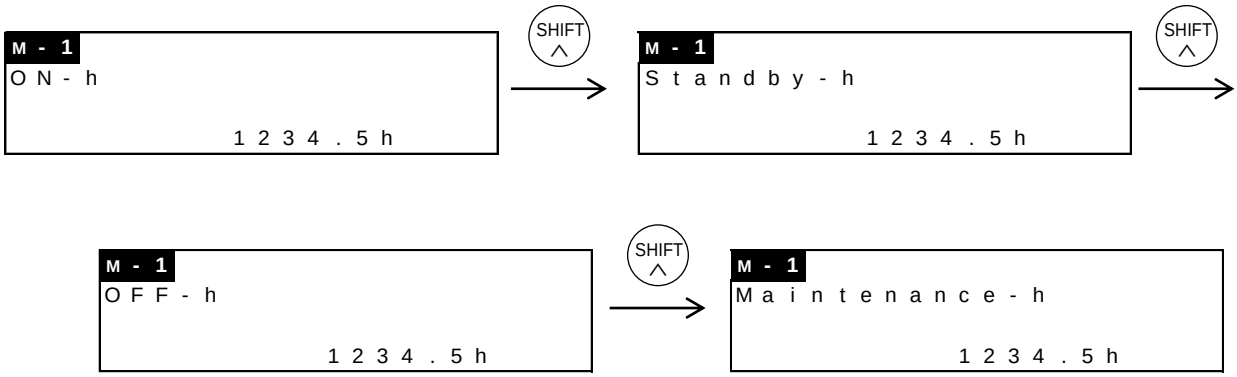
・The conversion value for the present integral export active power (-P) is displayed.
(Only total conversion value is displayed for 3P3W.)
・Press <SHIFT/∧> to change total, phase 1 (1st circuit), phase 2 (2nd circuit) and phase 3 (3rd circuit).

<1P2W/1P3W/3P4W>
Total

```
M - 1        1
C H G -      2
             3
             Σ
```

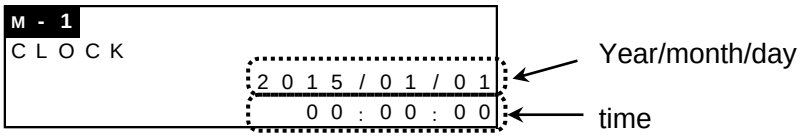
### 6.2.21 Hour meter

・ON-time, Standby-time, OFF-time and Maintenance-time of setting phase are displayed.
・Press <SHIFT/∧> to change ON-time, Standby-time, OFF-time and Maintenance time.




### 6.2.22 Clock (only KW2M-X)

・It displays the present time.



## 6.3 Working of Monitor Display (Expansion unit (Leak measurement))

Leakage current

### 6.3.1 Leakage current

・The present leakage current is displayed.

```
1 - 2        1  1 2 3 4 5 . 6 7 8 9 A
L e a k      2  1 2 3 4 5 . 6 7 8 9 A
             3  1 2 3 4 5 . 6 7 8 9 A
```

・After measured leakage current value exceeds the threshold and it passes the delay time, and the measured value still exceeds the threshold, it will judge it is the leakage current and display alarm.

Press <ITEM/>> and '←' is displayed. Point CH to reset alarm with '←' and press <SET>
It will reset the alarm.

```
1 - 2        ! 1 ← 1 2 3 4 5 . 6 7 8 9 A
L e a k      ! 2   1 2 3 4 5 . 6 7 8 9 A
             ! 3   1 2 3 4 5 . 6 7 8 9 A
```

## 6.4 Working of Monitor Display (Expansion unit (Multi analog input))

Arrow mark shows to press each key. ➡ <ITEM/>

Analog measured value

⬇

Temperature

⬇

Return to analog measured value

### 6.4.1 Analog measured value

・It displays the present analog measured value.
Continuous press <SHIFT/▽> to shift display with raw data.

```
1 - 1        1  1 2 3 4 5 6 . 7 8 9
A n a l o g  2 - 1 2 3 4 5 6 . 7 8 9
             3  1 2 3 4 5 6 . 7 8 9
```

### 6.4.2 Temperature

・It displays the present temperature calculated by resistance value.
(Numerical value of shift average of samplings data during 5 sec.)

```
1 - 1        1  1 2 3 . 4 ° C
T E M P      2 - 1 2 3 . 4 ° C
```

## 6.5 Working of Monitor Display (Expansion unit (Digital I/O))

Pulse input value

6.5.1 Pulse input value

・The present pulse input value is displayed.
・Pulse input status (ON or OFF) is confirmed via communication. (MEWTOCOL and MODBUS)

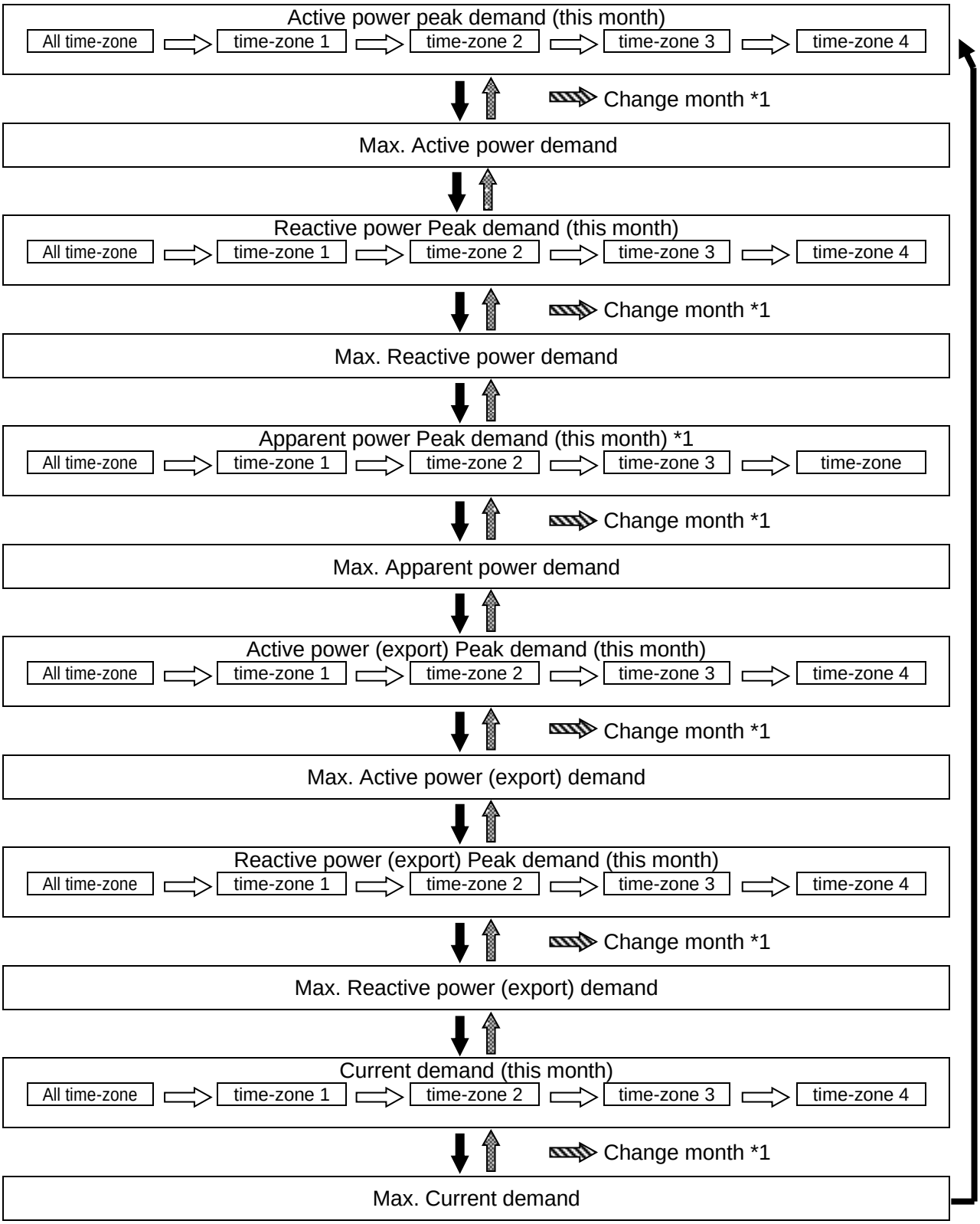
```
1 - 1        1  1 2 3 4 5 6 . 7 8 9
C N T        2  1 2 3 4 5 6 . 7 8 9
```

*Turn on the unit during IN1 is shorted, first 1-pulse is not counted. After that, when pulse is input pulse it count the pulse.

## 6.6 Working of Logging Mode

Each measured value is displayed as below. It differs according to the selected phase/wire system.
Arrow mark shows to press each key.

<ITEM/>> <SHIFT/∧> <SET> <SET>+<ITEM/>>

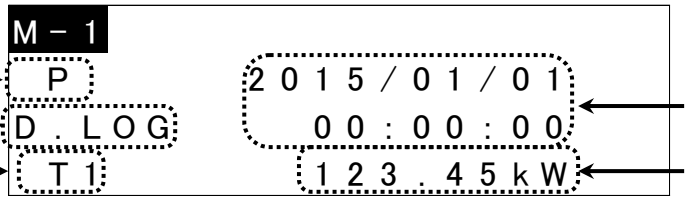



*1 only KW2M-X

### 6.6.1 Max. demand value

・Log data of peak demand is displayed.
・Press <SHIFT/∧> to change displayed time-zone. *1
All time-zone -> time-zone1(T1) -> time-zone2(T2) -> time-zone3(T3) -> time-zone4(T4)
・Press <SET> to change the display with each month.
1-month before -> 2-month before -> 3-month before ->・・・・・(12-month before)
*Time-zone without setting for any time program is not displayed.
*When you change the setting of phase/wire system, max. demand value will be reset.

Power demand

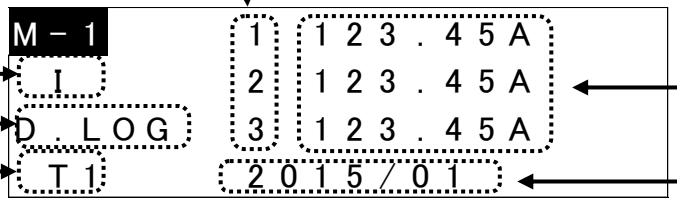



Item indicator
Lighting [D.LOG]
Time-zone
Indicator *1
None: All time-zone
T1:time-zone1
T2: time-zone2
T3: time-zone3
T4: time-zone4

Recorded date and time *1
Max demand

Current demand

Phase




Item indicator
Lighting [D.LOG]
Time-zone
Indicator *1
None: All time-zone
T1:time-zone1
T2: time-zone2
T3: time-zone3
T4: time-zone4

Max demand
Recorded year and month *1

・Press <ITEM/＞> to change items to display.

| Item | Display | |
|---|---|---|
| | Indicator | unit |
| Active power Peak demand | P | kW |
| Reactive power Peak demand | Q | kvar |
| Apparent power Peak demand | S | kVA |
| Active power (export) Peak demand | -P | kW |
| Reactive power (export) Peak demand | -Q | kvar |
| Current Peak demand | I | A |

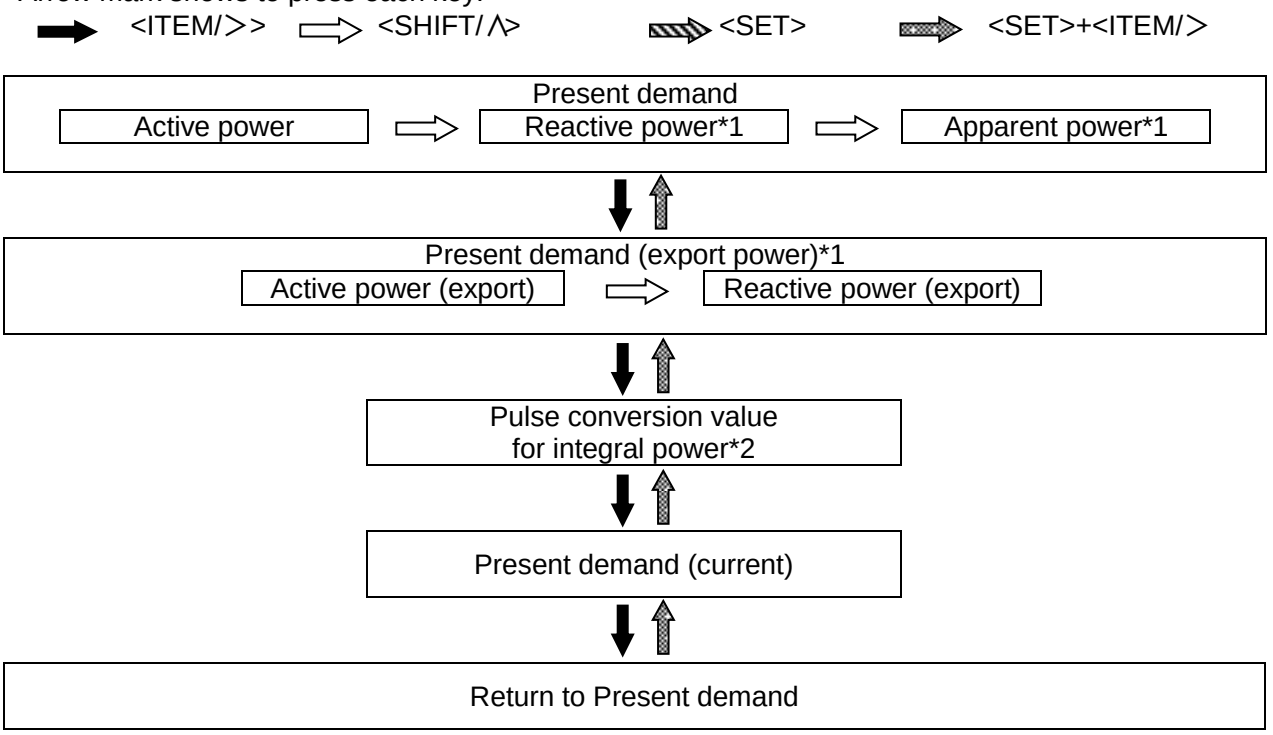
*1 only KW2M-X

## 6.7 Working of Demand Mode

Each measured value is displayed as below. It differs according to the selected demand type.
Press <MODE> and <SET＞ to change CH.
When total demand function is set to available, press <MODE> and <SET＞, and it displays total demand at the last window.

### 6.7.1 Block interval demand (Sliding block, fixed block)

Arrow mark shows to press each key.




*1 only ‘CT’ is selected with ‘Power input source’
*2 only ‘Pulse’ is selected with ‘Power input source’

## Present power demand

・Each demand value is displayed.
・Press <SHIFT/∧> to change active power, reactive power, apparent power.
・Measuring date and time is displayed on the middle lines. (only KW2M-X)

Active power present demand

```
M - 1
  P        2015/01/01
DEM           00:00:00
  Pv          123.45kw
```

SHIFT ∧ →

Reactive power present demand

```
M - 2
  Q        2015/01/01
DEM           00:00:00
  Pv          123.45kvar
```

Apparent power present demand

SHIFT ∧ →

```
M - 1
  S        2015/01/01
DEM           00:00:00
  Pv          123.45kVA
```

* [－－－－－－－－－] is displayed during the following cases.
  ・Until passing the setting time to start monitoring demand
  ・Demand value exceeds the display range
  ・Clock is changed between demand time span
  ・Until starting next time span at power failure

## Present export power demand

・Each demand value is displayed.
・Press <SHIFT/∧> to change active power (export), reactive power (export).
・Measuring date and time is displayed on the middle lines. (only KW2M-X)

Active power (export) present demand

```
M - 1
- P        2015/01/01
DEM           00:00:00
  Pv          123.45kw
```

SHIFT ∧ →

Reactive power (export) present demand

```
M - 2
- Q        2015/01/01
DEM           00:00:00
  Pv          123.45kvar
```

* [－－－－－－－－－] is displayed during the following cases.
  ・Until passing 1 minute after starting monitoring demand
  ・Demand value exceeds the display range

Pulse conversion value for integral power

・Present value of pulse conversion value for integral power.

```
M - 1
P L S

                 1 2 3 . 4 5 k w h
```

Present current demand

・Present value of current demand is displayed.

```
M - 1        1   1 2 . 3 4 5 A
  I          2   1 2 . 3 4 5 A
D E M        3   1 2 . 3 4 5 A
  P V
```

Total demand

・Total of demand value measured with each CH is displayed.

```
S U M
  P
D E M
  P v            1 2 3 . 4 5 k w
```

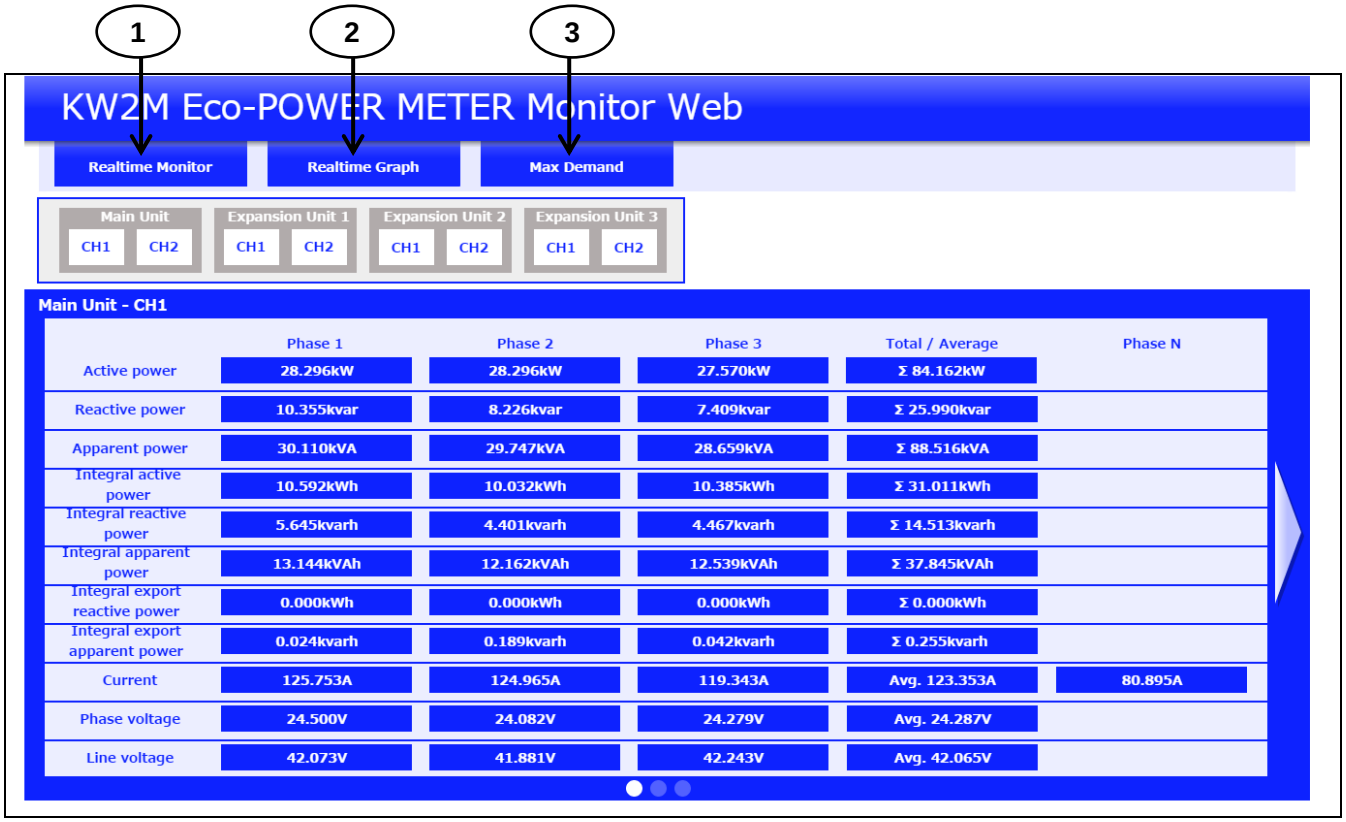
# Chapter 7 Monitoring Measured Value via Web Browser (Monitor Web)

(only KW2M-X)

You can monitor the measured value of Eco-POWER METER via Web browser.

Access to http://xxx.xxx.xxx.xxx/monitor/index.htm by web browser.*1*2
It may take time to display according to the communication conditions.

*1 Input setting IP address to 'xxx.xxx.xxx.xxx'
*2 When you select 'use' password for Monitor Web and Customer Web, password is necessary to access it. <Initial user name: user> <Initial password: user>




| Item | | Description |
|---|---|---|
| 1 | Real time Monitor | Display measured instantaneous values |
| 2 | Real time Graph | Display graph of measured instantaneous values |
| 3 | Max Demand | Display max demand |

# Chapter 8 Creating Web Contents (Customer Web)

(only KW2M-X)

You can upload your designed screen (contents) created by Control Web Creator to Eco-POWER METER and you can monitor the information of web server in Eco-POWER METER by browser.

Access to http://xxx.xxx.xxx.xxx/cu/index.htm by web browser. *2 *3
It may take time to display according to the communication conditions.

*1 Refer to [FP7 Web Server Function Manual] about [Control Web Creator].
*2 Input setting IP address to 'xxx.xxx.xxx.xxx'
*3 When you select 'use' password for Monitor Web and Customer Web, password is necessary to access it. <Initial user name: user> <Initial password: user>

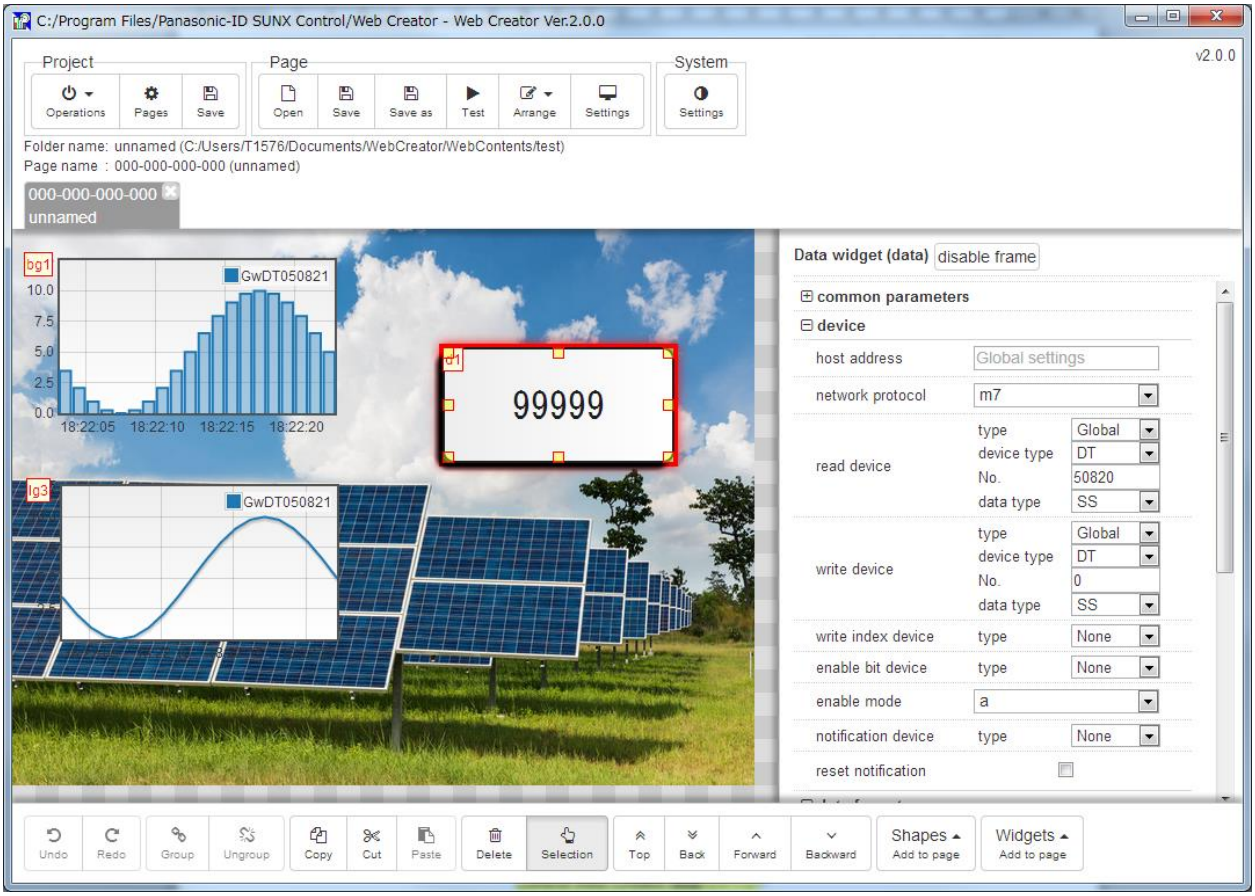
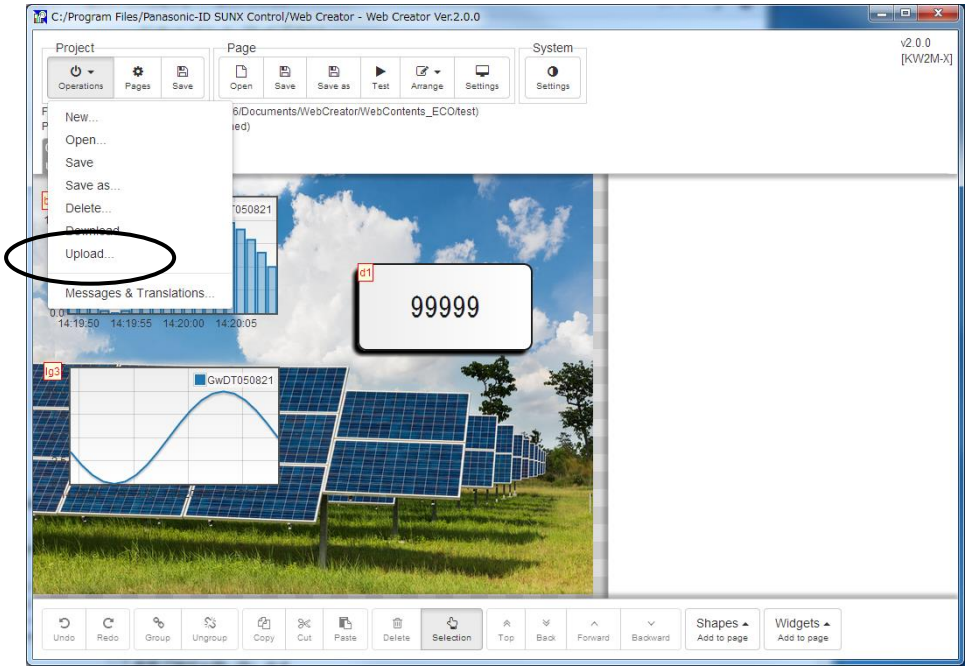



Image of Control Web Creator

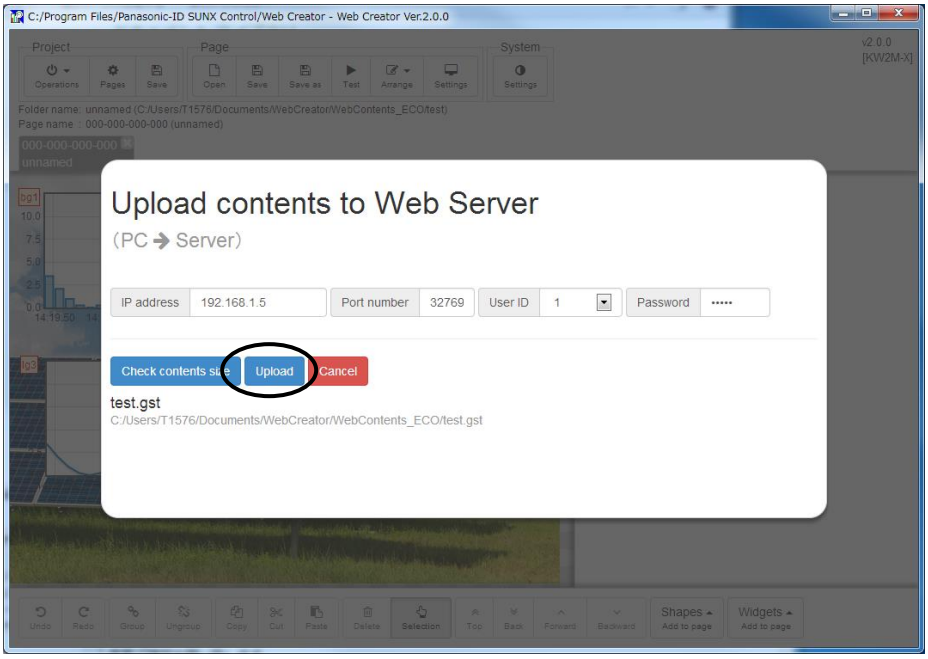
## 8.1 How to Upload Web Contents

Upload the web contents that are created by Control Web Creator to Eco-POWER METER.

1) Click [Operations] – [Upload] of Control Web Creator.



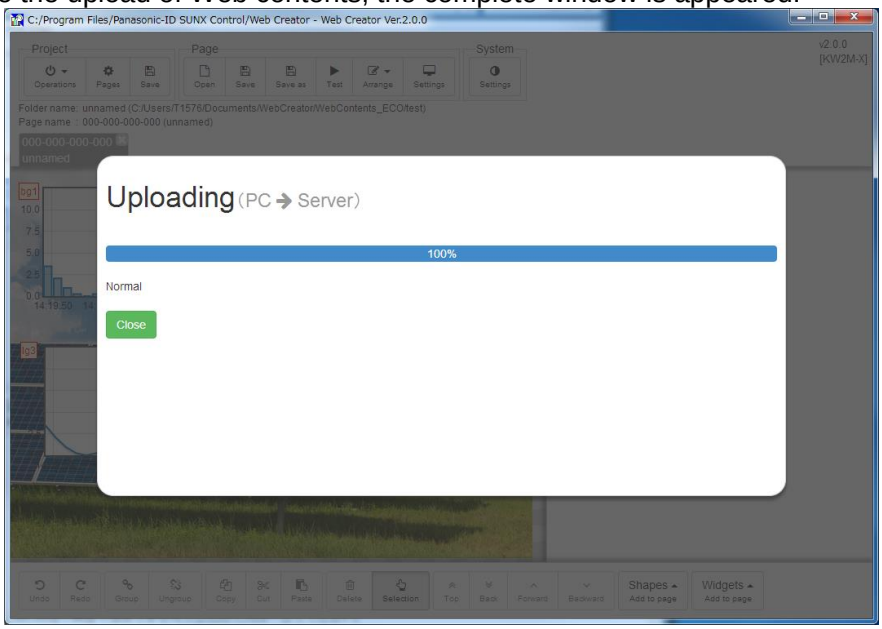

2) Set IP address, Port number, User ID and Password and click [Upload].
   Upload window is appeared.




<Setting values>

| Item | Contents |
|---|---|
| IP address | IP address of Eco-POWER METER (initial:192.168.1.5) |
| Port number | 32769 (fixed) |
| User ID | 1 (fixed) |
| Password | Password of System Web (initial: admin) |

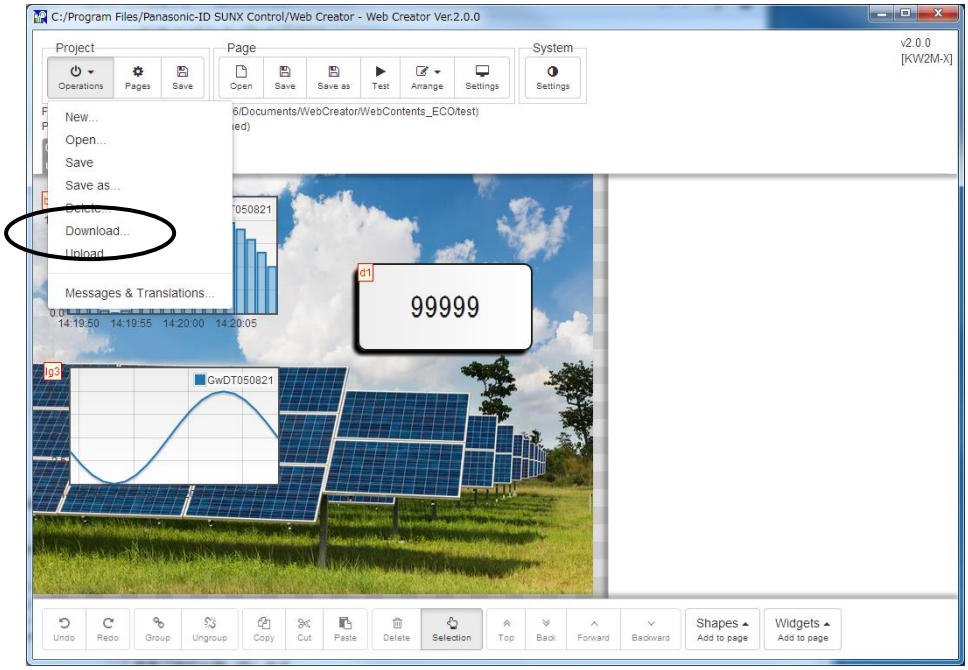
3) After complete the upload of Web contents, the complete window is appeared.



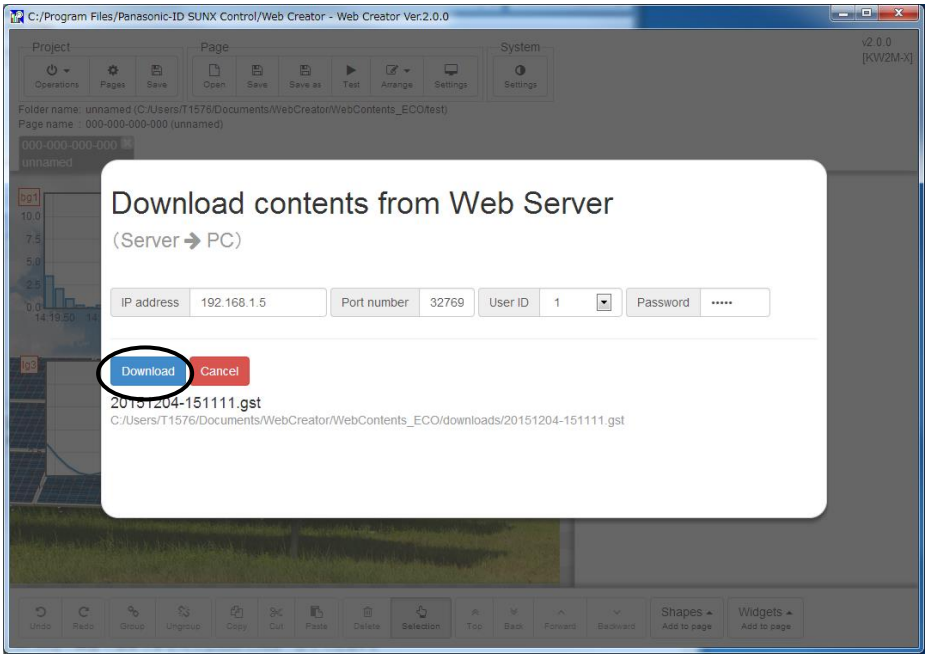

## 8.2 How to Download Web Contents

Download the web contents that are uploaded to Eco-POWER METER.

1) Click [Operations] – [Download] of Control Web Creator.



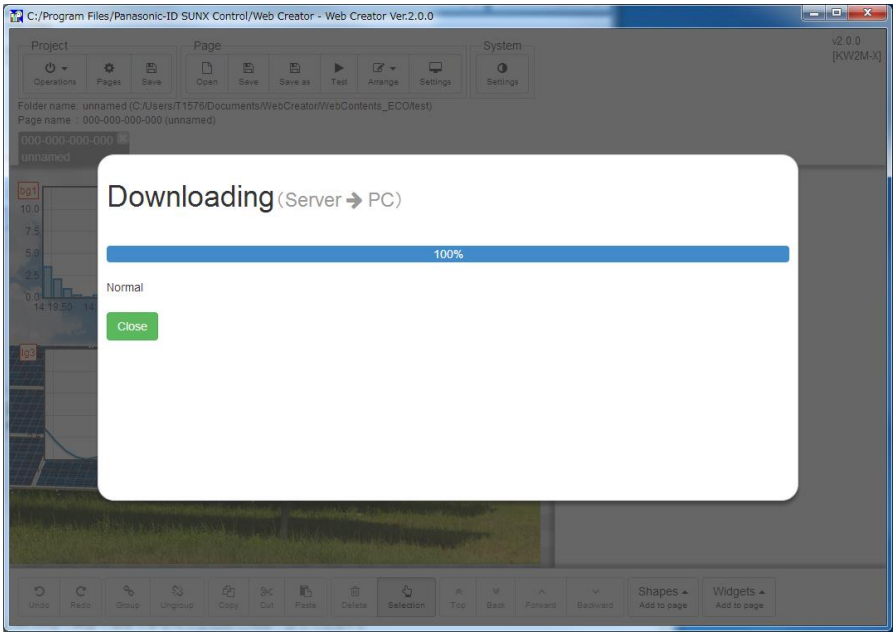
2) Set IP address, Port number, User ID and Password and click [Download].
Download window is appeared.




<Setting values>

| Item | Contents |
|---|---|
| IP address | IP address of Eco-POWER METER (initial:192.168.1.5) |
| Port number | 32769 (fixed) |
| User ID | 1 (fixed) |
| Password | Password of System Web (initial: admin) |

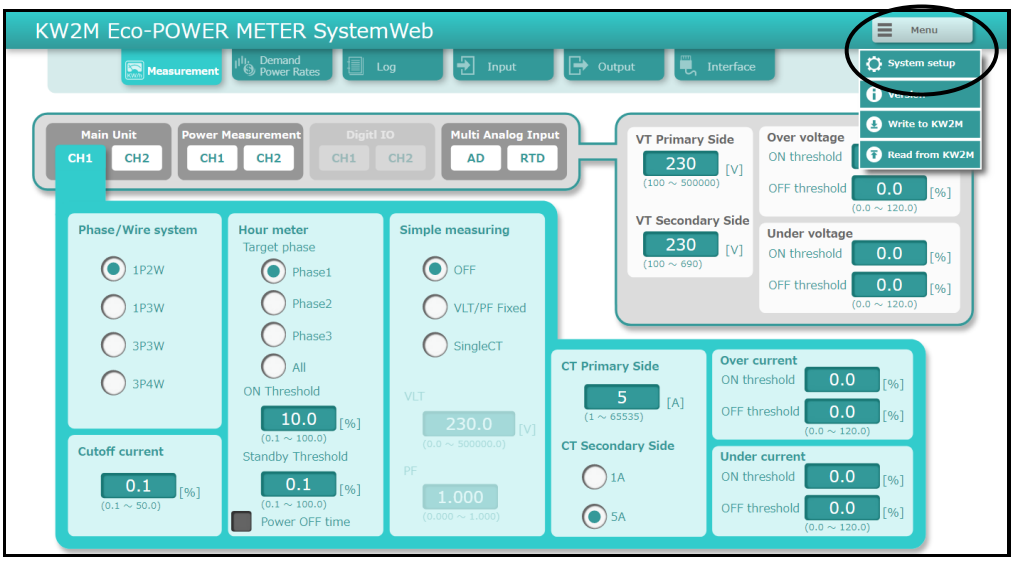
3) After complete the download of Web contents, the complete window is appeared.



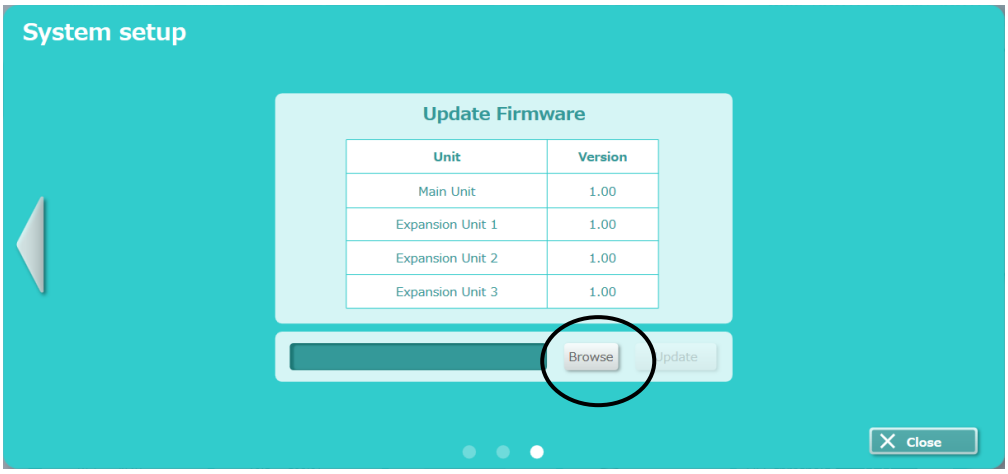
# Chapter 9 How to Update the Firmware

You can update the firmware by System Web.
Expansion units that connect to the main unit are updated at the same time.

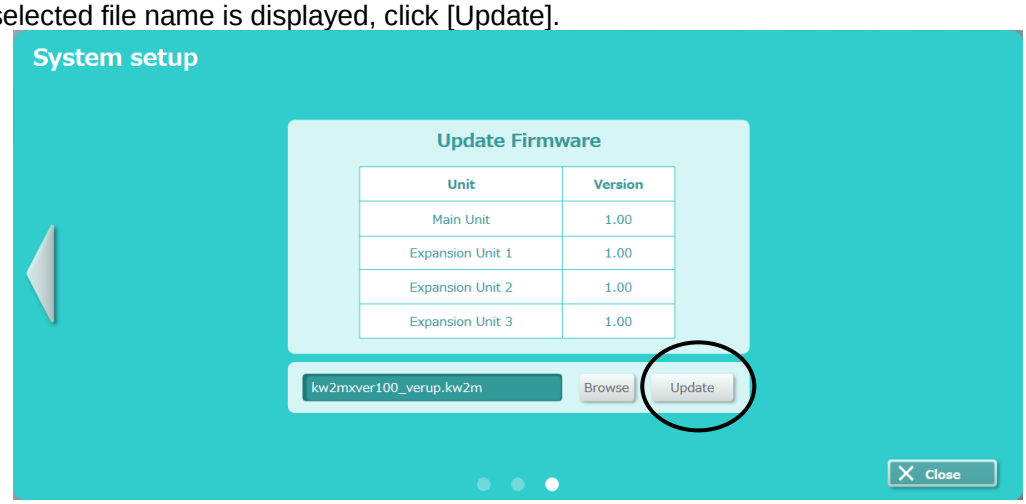
1) Access to http://xxx.xxx.xxx.xxx/setup/index.htm by web browser.
2) Click [System setup] at System Web.




3) Click [Browse] and it opens the window to select firmware.
Select file to update 'kw2maverxxx_verup.kw2m' / 'kw2mxverxxx_verup.kw2m' and click [Open].
*You can download from our website the latest firmware.

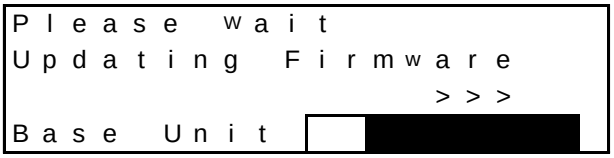



4) When selected file name is displayed, click [Update].



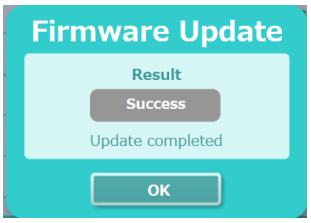
5) When it starts updating, the indicator is appeared on web browser and Eco-POWER METER.

Web browser

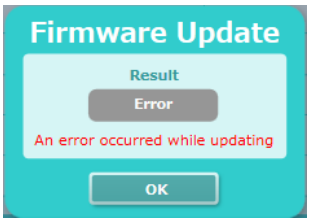



Eco-POWER METER

6) When it completes updating the firmware, the complete window will be appeared and Eco-POWER METER has restarted automatically.




When it fails updating the firmware, error window will be appeared.
Check and confirm the communication conditions and update again.



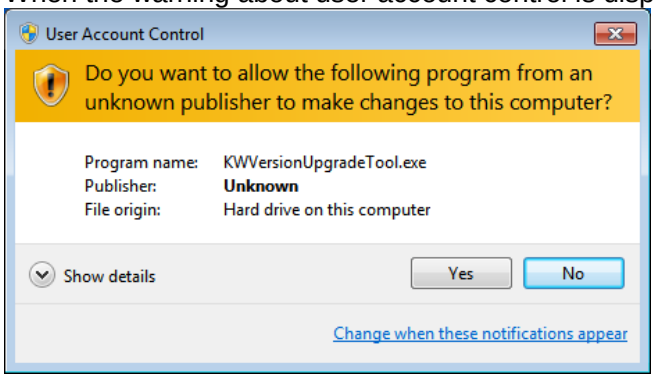

7) Click [OK] to exit System Web.
You can use Eco-POWER METER as it is.

# Chapter 10 How to Update the Web Contents

You can update System Web contents with using KW Version Upgrade Tool.
Refer to the manual of KW Version Upgrade Tool regard to use it.

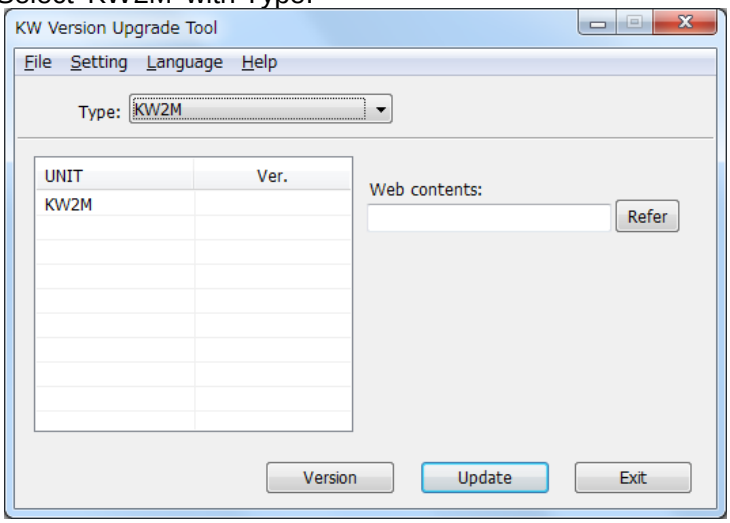
1) Start KW Version Upgrade Tool.exe
C:¥Program Files¥Panasonic-EW SUNX Control¥KW Version Upgrade Tool

When the warning about user account control is displayed, click [Yes].

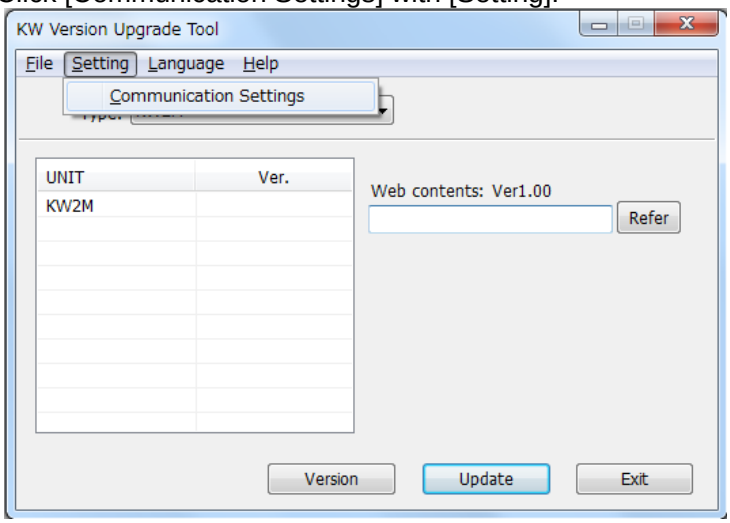



*Use KW Version Upgrade Tool version 1.60 or more.

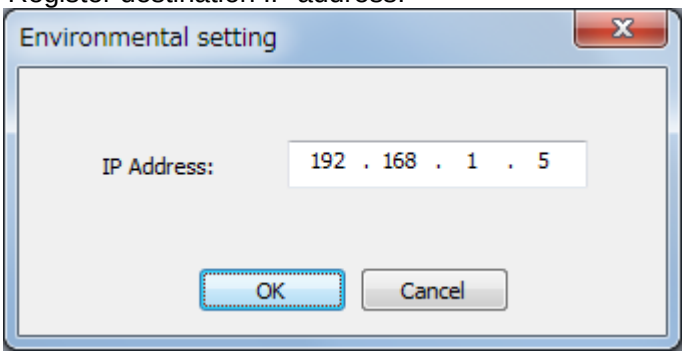
2) Select 'KW2M' with Type.



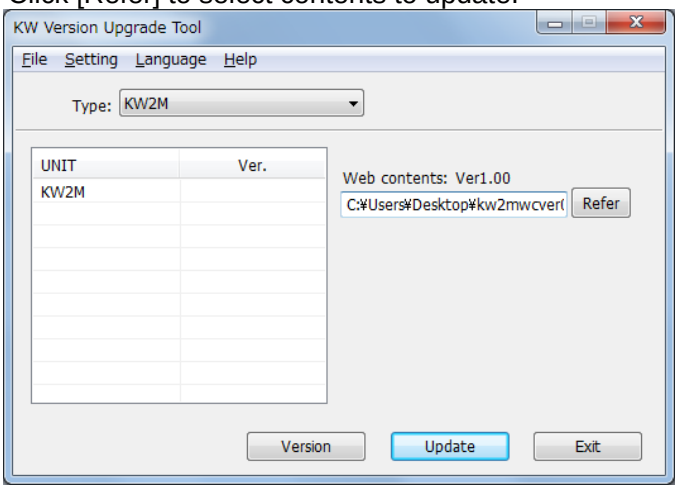

3) Click [Communication Settings] with [Setting].



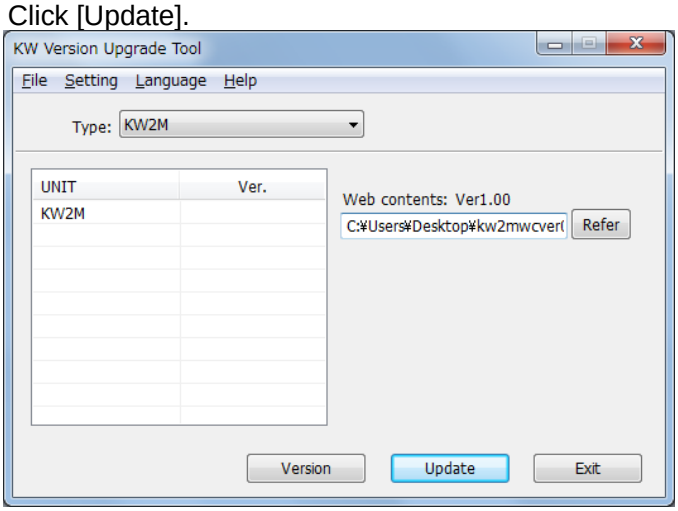
4) Register destination IP address.



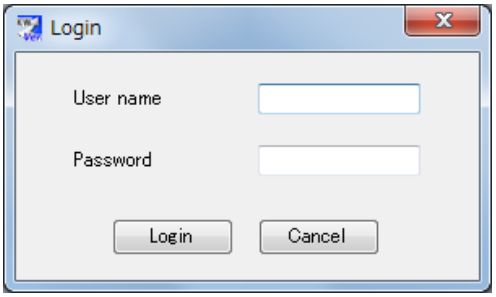

5) Click [Refer] to select contents to update.



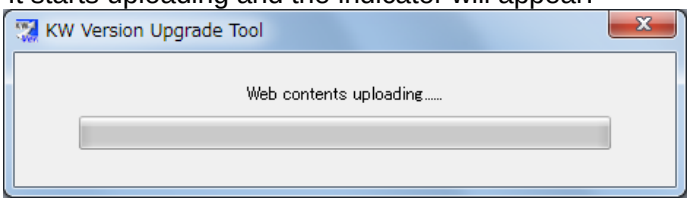

6) Click [Update].



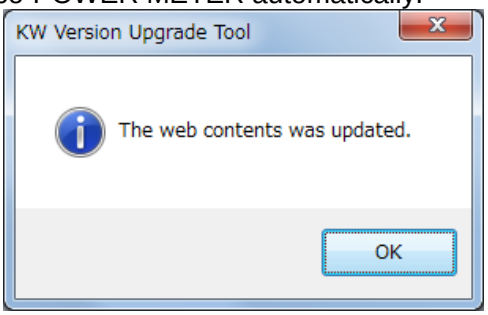
7) Login window will appear and input ‘User name’ and ‘Password’ to log in Web contents.
After that, click [Login].



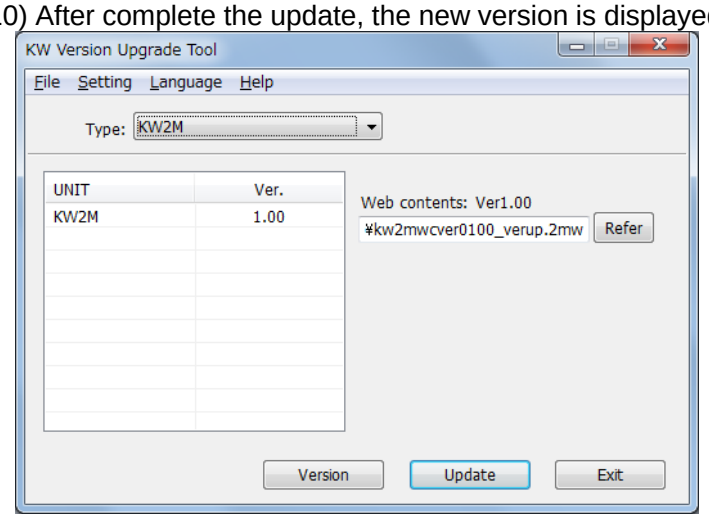

8) It starts uploading and the indicator will appear.




9) When it completes updating the web contents, the complete window will appear and restart Eco-POWER METER automatically.




10) After complete the update, the new version is displayed at the display.



# Chapter 11 Specifications

## 11.1 General Specification (Main unit, Expansion unit)

| | | |
|---|---|---|
| Supply voltage range | | 100 to 240V AC |
| Rated frequency | | 50/60Hz |
| Nominal power consumption | | Approx. 15VA (240V AC at 25°C) |
| Inrush current | | 30A or less (240V AC/DC at 25°C) |
| Allowable momentary power-off time | | 10ms |
| Ambient temperature | | Operation -10 to + 50°C |
| | | Storage -25 to + 70°C |
| Ambient humidity | | 30 to 85%RH (at 20°C) non-condensing |
| Breakdown voltage (initial) | | Between the isolated circuits: 2,000V/1min |
| | | a) enclosure ⇔all terminals<br>b) primary insulated circuits ⇔secondary insulated circuits (Double insulation)<br>・power supply terminals ⇔other terminals<br>・voltage input terminals ⇔other terminals |
| Insulation resistance (initial) | | Between the isolated circuits: 100 MΩ or more |
| Vibration resistance | | 10 to 150Hz (7.5 minutes/cycle)<br>single amplitude:0.075mm (1h on 3 axes) |
| | | 10 to 55Hz (1 minute/cycle)<br>single amplitude:0.375mm (1h on 3 axes) |
| Shock resistance | | Min. 294m/s$^2$ (5 times on 3 axes) |
| Noise immunity | | 1500V[p-p]<br>Pulse width 50ns, 1µs (noise simulator) |
| Serge immunity | | IEC61000-4-5<br>1kV |
| Display method | | LCD with backlight |
| Display updated cycle | | 500, 1000, 2000, 3000 ms (set with setting mode) |
| Power failure memory method (when power is off) | | Internal memory |
| Sea level altitude | | Under 2,000m |
| Overvoltage category | | III |
| Pollution degree | | 2 |
| Dimensions H/W/D | | Main unit 85 x 140 x 65 mm<br>Expansion unit 85 x 70 x 65 mm |
| Weight | | Main unit Approx. 450g |
| | | Expansion unit (Power measurement) Approx. 200g |
| | | Expansion unit (Multi analog input, Digital I/O) Approx. 140g |
| Calendar timer *1 | Range | January 1, 2015 00:00:00 to December 31, 2099 23:59:59<br>(leap year supported) |
| | Time accuracy | Monthly accuracy max. 15 sec. (at 25°C) |
| | Back up period | About 1 month<br>(by secondary battery<br>*When power off after 48-hour or more of power on time, at 23°C) |

*1 only KW2M-X

## 11.2 Measurement Specifications

●Power measurement (Main unit and Expansion unit (Power measurement))

| | | | | |
|---|---|---|---|---|
| Measured circuit number | | Main unit | | 2-circuit of 1-system<br>(6-circuit of 1-system for 1P2W) |
| | | Expansion unit | | 2-circuit of 1-system<br>(6-circuit of 1-system for 1P2W) |
| Max. measured circuit number | | 8-circuit of 1-system (24-circuit of 1-system for 1P2W)<br>(3 Expansion units are connected to main unit.) | | |
| Measured data | | AC sine | | |
| Phase/wire system | | Single-phase two-wire (1P2W) (max.3-circuit)<br>Single-phase three-wire (1P3W)<br>Three-phase three-wire (3P3W)<br>Three-phase four-wire (3P4W) | | (common) |
| Applicable power system | | 100V system, 200V system, 400V system | | |
| Measured frequency | | 50/60Hz | | |
| Sampling rate | | Sampling | | 1.024MHz (approx.1.0μs) |
| | | Data update | | 100ms<br>22.5s for Harmonics (2nd to 31st except THD) |
| Voltage | Direct input voltage | 1P2W | L-L | 0-690V AC *0-300V AC for UL standard |
| | | 1P3W | L-L | 0-690V AC *0-300V AC for UL standard |
| | | | L-N | 0-350V AC *0-152V AC for UL standard |
| | | 3P3W | L-L | 0-690V AC *0-300V AC for UL standard |
| | | 3P4W | L-L | 0-690V AC *0-300V AC for UL standard |
| | | | L-N | 0-398V AC *0-173V AC for UL standard |
| | Impedance | 2 MΩ or more (L-N; V1/V2/V3/Vn) | | |
| | Resolution | 0.01V | | |
| | Power consumption | Approx. 0.2VA (L-N; V1/V2/V3 - Vn) | | |
| | Accuracy *1 | ±0.2% | *±0.5% for 2-phase of 1P3W, 3-1 voltage of 3P3W and line voltage of 3P4W. | |
| | Input voltage with VT | Primary voltage *3 | 100 to 500000V | |
| | | Secondary voltage *3 | 100 to 690V | |
| Current | Input current (with CT) | Primary current | 65,535A or less | |
| | | Secondary current | 1A or 5A (set with setting mode) | |
| | Max. current | 10A (200% of the rating) | | |
| | Overload capacity | 1000% of the rating for 3s | | |
| | Resolution | 0.001A | | |
| | Power consumption | Approx. 0.2VA (between K and L of CT) | | |
| | Accuracy *1 | ±0.2% *2<br>*±0.5% for 2(N)-phase of 1P3W and 2(S)-phase of 3P3W. | | |
| Power | Accuracy *1 | ±0.5% | | |
| | | Active power | Class 0.5S (IEC 62053-22) | |
| | | Reactive power | Class 2 (IEC 62053-23) | |

*1 Without error of current transformers (CT) and voltage transformers (VT)
*2 When it measures current under 5% of rating, it may not satisfy the accuracy according to setting of CT. (Max.error 0.5%)
*3 When it input direct, set primary voltage and secondary voltage to the same value.

●Leakage current measurement (Expansion unit (Power measurement))

| | | | |
|---|---|---|---|
| Measured circuit number *1 | | 1-circuit of 1-system (3-circuit of 1-system for 1P2W) | |
| Max. measured circuit number | | 3-circuit | |
| Measured frequency | | 50/60Hz | |
| Sampling rate | | Sampling | 1.024MHz (approx. 1.0μs) |
| | | Data update | 100ms |
| Leakage Current | Input leakage current (with CT) | Primary current | 65,535A or less |
| | | Secondary current | 1A or 5A (set with setting mode) |
| | Max. current | 5A (100% of the rating) | |
| | Overload capacity | 1000% of the rating for 3s | |
| | Resolution | 0.0001A (0.1mA) *2 | |
| | Power consumption | Approx. 0.2VA (between K and L of CT) | |
| | Accuracy | ±2.5% | |
| Leakage monitor | Leakage period | 0.1 to 20.0s | |
| | Accuracy | ±0.2s | |
| | Reset method | Key operation, RS485 communication or Ethernet communication | |

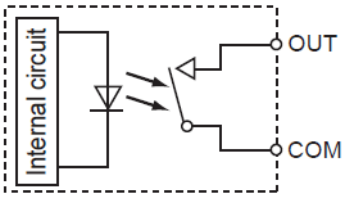
*1 When it set to leak measurement, it can measure power only 1-circuit, CH1.
*2 It doesn’t measure under 0.1% of rating current.

## 11.3 Output Specifications (Main unit and Expansion unit (Digital I/O))

| | | |
|---|---|---|
| Number of output point | Main unit | 2 points *Insulate between output terminals |
| | Expansion unit (Digial I/O) | 4 points *Insulate between output terminals |
| Insulation method | | MOSFET relay |
| Output type | | 1a |
| Output capacity | | 100mA, 30V AC/DC |
| Output mode (OUT1/OUT2) | | ・Pulse by integral power<br>・Output by alarm or events (set with setting mode) |
| Pulse by integral power | Pulse width | 1 to 100ms (set with setting mode) |
| | Pulse output unit | 0.001kWh/ 0.01kWh/ 0.1kWh/ 1kWh/ 10kWh/ 100kWh |
| Alarm Event | Type | Stand-by alarm/ Under voltage alarm/ Over voltage alarm/ Power interruption alarm/ Under current alarm/ Over current alarm/ Active power alarm/ Reactive power alarm/ Apparent power alarm/ PF alarm/ Over frequency alarm/ Under frequency alarm/ Voltage harmonics alarm/ Current harmonics alarm/ Voltage THD alarm/ Current THD alarm/ Unbalanced voltage alarm/ Unbalanced current alarm/ Power demand alarm/ Current demand alarm/ counter output/ Leakage alarm/ Digital conversion value upper limit alarm/ Digital conversion value lower limit alarm/ Temperature upper limit alarm/ Temperature lower limit alarm/ Level output (external control) / Time control *1 |
| | Alarm reset | Self-reset (according to the setting) / Manual-reset |
| Protection element | | Varistor |
| Alarm output | Indicator | Lighting alarm mark and blinking backlight |
| | Output signal | 2 points (can set separately)<br>Normal; OFF Alarm; ON |
| | Output capacity | 100mA, 30V AC/DC |

*1 only KW2M-X

<Internal output circuit>



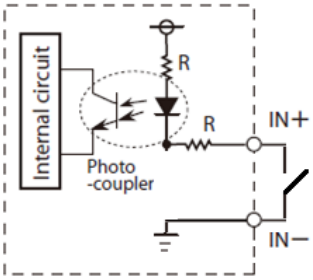
## 11.4 Input Specifications

●Pulse input (Main unit and Expansion unit (Digital I/O))

| | | | | |
|---|---|---|---|---|
| Number of input point | Main unit | 1 point | | |
| | Expansion unit (Digial I/O) | 2 points | | |
| Insulation method | | Designated insulation for input (insulate to the other functions) | | |
| Input method | | Contact/ non-voltage a contact or open-collector | | |
| Input signal | | Non-voltage | ・Impedance; Max. 1kΩ (when short-circuit current: Max. 10mA)<br>・Residual voltage when shorted; Max. 3V<br>・Impedance when open: Min. 100kΩ | |
| Input mode | | Pulse input<br>Synchronized with input from outer device *1<br>Measure maintenance time *1 | | |
| Max. counting speed | | 2000Hz (when 2000Hz is set) / 30Hz (when 30Hz is set) | | |
| Min. input signal width | | 0.25ms (when 2000Hz is set) / 16.7ms(when 30Hz is set)<br>ON:OFF ratio＝1:1 | | |
| Pre-scale | Decimal point | Under 3-digit | | |
| | Range | 0.001 to 100.000 (set with setting mode) | | |
| Output mode (when pulse output is selected) | | HOLD | | |
| Protective elements | | Zener diode | | |
| Pulse input | Input signal | 1,000 to 99,000 pulse/kWh (set with setting mode)<br>(External pulse converter is necessary.) | | |
| | Pulse rate | 0.001 to 100.000 kWh/pulse | | |
| | Input condition | 2000Hz | Pulse width | 0.25ms or more |
| | | | Pulse interval | 0.5ms or more<br>(OFF time 0.25ms or more) |
| | | 30Hz | Pulse width | 16.7ms or more |
| | | | Pulse interval | 33.4ms or more<br>(OFF time 16.7ms or more) |
| | Operation voltage/current | 5VDC 10mA | | |

*1 only KW2M-X

<Internal input circuit>




R: resister

●Analog input (Expansion unit (Multi analog input))

| | | |
|---|---|---|
| Input channel | | 3-channel |
| Insulation system | | Exclusive insulation for input<br>(Not insulated between channels) |
| Input range<br>(select with setting mode) | Voltage | 0 to 60V |
| | Current | 0 to 20mA / 4 to 20mA (set with setting mode) |
| Digital conversion value | | -999999999 to 999999999 *1 |
| Resolution | Voltage | 24bit |
| | Current | |
| Total accuracy | | Within ±0.1%F.S. (at 25°C)<br>Within ±0.3%F.S. (-10 to +50°C) |
| Conversion rate (Data update) | | 100ms |
| Input impedance | Voltage | 265kΩ |
| | Current | 80Ω |
| Absolute maximum rating | Voltage | -0.3 to +65V |
| | Current | -2 to +28mA*2 |
| Input protection | | Diode |

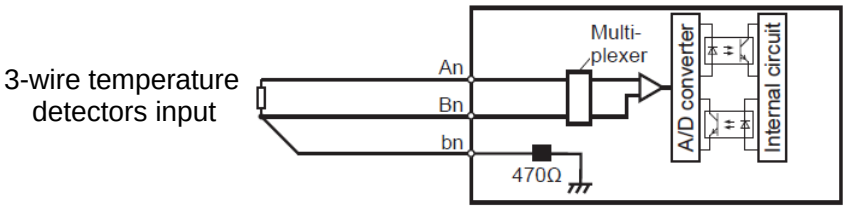
*1 Digital conversion value differs according to the setting scaling value.
When analog input value exceeds the upper or lower limit, it keeps the limit value for digital conversion value.
*2 When it detects input of 28 mA or more, the protection circuit works and it switches to voltage measurement.

●RTD input (Expansion unit (Multi analog input))

| | | |
|---|---|---|
| Input channel | | 2-channel |
| Insulation system | | Exclusive insulation for input<br>(Not insulated between channels) |
| Input range | | Pt 100 -200.0~+200.0°C |
| | | Pt 1000 -200.0~+200.0°C |
| Resolution (24bit) | | 0.1°C |
| Total accuracy | CH1 | Within ±0.3%F.S. (at 25°C)<br>Within ±0.5%F.S.(at-10 to +50°C) |
| | CH2 | Within ±0.5%F.S. (at 25°C)<br>Within ±1.0%F.S.(at+10 to +40°C)<br>Within ±1.5%F.S. (at-10 to +50°C) |
| Conversion rate (Data update)*1 | | 500ms |
| Input protection | | Diode |

*1 It displays the numerical value of shift average of sampling data during 5 sec.

<Internal input circuit>



## 11.5 Demand Monitor and Control Specifications (common to 9, 10)

| | |
|---|---|
| Demand type | IEC61557-12 demand<br>1. Sliding block interval<br>2. Fixed block interval<br>3. Current demand |
| Power input type | Current transformer input<br>Pulse input *1 (set with setting mode) |
| Demand span | 1 to 60 min. (set with setting mode) |
| Measurement item | Present demand |
| Data update cycle | 1 min. |
| Display | Present demand (active/ reactive/ apparent/ active(export)/ reactive(export)/ current) |
| Saved data | Max.demand, Monthly max. demand (Latest 13 months)*2 |

*1 Only CH1 of main unit is available.
Only current transformer input is available for CH2 of Main unit and Expansion unit (power measurement).
*2 only KW2M-X

## 11.6 Communication Specifications

<RS485>

| | | |
|---|---|---|
| Interface | | Conforming to RS485 |
| Communication method | | Half-duplex |
| Synchronous system | | Synchronous communication method |
| Isolation status | | Isolated with the internal circuits |
| Protocol | | MEWTOCOL, MODBUS(RTU) (select with setting mode) |
| Number of connected unit | | 99 (max.) *1 |
| Transmission distance | | 1200m *2 |
| Transmission speed | | 115200,57600,38400,19200,9600,4800,2400bps<br>(select with setting mode) |
| Transmission format | Data length | 8bit (fixed) |
| | Parity | Not available / odd number / even number<br>(select with setting mode) |
| | Stop bit | 1bit, 2bit (select with setting mode) |

*1 For RS485 converter on the computer side, we recommend SI-35 and SI-35USB (from LINE EYE Co.,Ltd.). When using SI-35, SI-35USB or PLC from our company (which can be connected up to 99 units), up to 99 can be connected. In case using this system with the other devices, up to 31 can be connected.
*2 Please check with the actual devices when some commercial devices with RS485 interface are connected. The number of connected devices, transmission distance, and transmission speed may be different according to using transmission line.

< Ethernet >

| | | |
|---|---|---|
| Port number | | 2 port |
| Interface | | IEEE802.3u,100BASE-T/10BASE-TX |
| Connector shape | | RJ45 |
| Transmission | Transmission speed | 100Mbps / 10Mbps |
| | Transmission method | Base band |
| | Max. segment length | 100m |
| Transmission cable | | UTP (Category 5) |
| Protocol (DNS, DHCP) | | TCP/IP, UDP / IP |
| Web server | | Setting, Monitoring measured values*3, Web customization *2*3 |
| Functions | | Auto-negotiation *1<br>MDI / MDI-X Auto-crossover |
| Dedicated communication | | MEWTOCOL, MODBUS(TCP) (2 session for each) |

*Ethernet is the trademark of Xerox of USA.
*This product has the software developed by OpenSSL Project in order to use OpenSSL Toolkit. (http://www.openssl.org/)

*1 It changes the transmission speed automatically with auto-negotiation function.
*2 Control Web Creator is necessary to customize the web.
*3 only KW2M-X

## 11.7 Web Server Specifications (common to Main unit and Expansion unit)）

| | |
|---|---|
| Simultaneous access number | 6 sessions |
| Web browser *1 | Windows<br>Google Chrome<br>Mozilla Firefox<br>iOS *2<br>Safari<br>Google Chrome<br>Android *2<br>Google Chrome |

* Windows is the trademark of Microsoft Corporation in USA and other companies.
Google Chrome and Android are the trademarks of Google Inc.
Firefox is the trademark of Mozilla Foundation in USA and the other companies.
Safari and OS X are the trademark or the registered trademark of Apple Inc. of USA.
iOS is the trademark or the registered trademark of Cisco in USA and the other companies.

*1 Use OS and browser with the latest version.
*2 System Web is not supported.

## 11.8 Main Unit Memory Specifications (only KW2M-X)

Logging Function

| | | |
|---|---|---|
| 5-min. instantaneous value | Save cycle | 5 minutes |
| | Saved data | R-current, S-current, T-current, N-current, Average of current<br>R-voltage (L1-N), S-voltage (L2-N), T-voltage (L3-N),<br>Average of phase-voltage,<br>RS-voltage (L1-L2), ST-voltage (L2-L3), TR-voltage (L3-L1)<br>Average of line-voltage<br>Pulse count value<br>Digital conversion value(1), Digital conversion value(2),<br>Digital conversion value(3), Temperature(1), Temperature(2),<br>Count value(1), Count value(2), Leakage current(1),<br>Leakage current(2), Leakage current(3) |
| | Write timing | Every hour xx:05:05 (fixed) |
| | Saved data amount | 96 records for 1 file (for one-day) (Max. 60 days) |
| 15-min. instantaneous value | Save cycle | 15 minutes |
| | Saved data | Integral active power(1), (2), (3), Total integral active power,<br>Integral reactive power(1), (2), (3), Total integral reactive power,<br>Integral apparent power(1), (2), (3), Total integral apparent power,<br>Export active power(1), (2), (3), Total export active power,<br>Export reactive power(1), (2), (3), Total export reactive power,<br>Instantaneous active power(1), (2), (3), Total instantaneous active power,<br>Instantaneous reactive power(1), (2), (3), Total instantaneous reactive power,<br>Instantaneous apparent power(1), (2), (3), Total instantaneous apparent power,<br>R-current, S-current, T-current, N-current, Average of current<br>R-voltage (L1-N), S-voltage (L2-N), T-voltage (L3-N),<br>Average of phase-voltage,<br>RS-voltage (L1-L2), ST-voltage (L2-L3), TR-voltage (L3-L1)<br>Average of line-voltage<br>Power factor(1), (2), (3), Average of power factor<br>Frequency(1), (2), (3), Average of frequency<br>Current THD(1), (2), (3), Average of current THD<br>Phase-voltage THD(1), (2), (3), Average of phase-voltage THD<br>Line-voltage THD(1), (2), (3), Average of line-voltage THD<br>ON-time, OFF-time, Stand-by time, Maintenance-time,<br>Pulse count value<br>Digital conversion value(1), Digital conversion value(2),<br>Digital conversion value(3), Temperature(1), Temperature(2),<br>Count value(1), Count value(2), Leakage current(1),<br>Leakage current(2), Leakage current(3) |
| | Write timing | Every hour xx:15:05 (fixed) |
| | Saved data amount | 2976 records for 1 file (for one-month) (Max. 24 months) |

| | | |
|---|---|---|
| Customized log | Save cycle | 15 minutes |
| | Saved data | Select items below max. 8-item<br>Integral active power(1), (2), (3), Total integral active power,<br>Integral reactive power(1), (2), (3), Total integral reactive power,<br>Integral apparent power(1), (2), (3), Total integral apparent power,<br>Export active power(1), (2), (3), Total export active power,<br>Export reactive power(1), (2), (3), Total export reactive power,<br>Instantaneous active power(1), (2), (3), Total instantaneous active power,<br>Instantaneous reactive power(1), (2), (3),<br>Total instantaneous reactive power,<br>Instantaneous apparent power(1), (2), (3),<br>Total instantaneous apparent power,<br>R-current, S-current, T-current, N-current, Average of current<br>R-voltage (L1-N), S-voltage (L2-N), T-voltage (L3-N),<br>Average of phase-voltage,<br>RS-voltage (L1-L2), ST-voltage (L2-L3), TR-voltage (L3-L1)<br>Average of line-voltage<br>Power factor(1), (2), (3), Average of power factor<br>Frequency(1), (2), (3), Average of frequency<br>Current THD(1), (2), (3), Average of current THD<br>Phase-voltage THD(1), (2), (3), Average of phase-voltage THD<br>Line-voltage THD(1), (2), (3), Average of line-voltage THD<br>ON-time, OFF-time, Stand-by time, Maintenance-time,<br>Pulse count value<br>Digital conversion value(1), Digital conversion value(2),<br>Digital conversion value(3), Temperature(1), Temperature(2),<br>Count value(1), Count value(2), Leakage current(1),<br>Leakage current(2), Leakage current(3) |
| | Write timing | Every hour xx:15:05 (fixed) |
| | Saved data amount | 2976 records for 1 file (for one-month) (Max. 24 months) |
| Demand | Save cycle | 1 minute |
| | Saved data | Present demand<br>(active power, reactive power, apparent power,<br>active power(export), reactive power(export))<br>Pulse conversion value for integral power,<br>Present current demand (1), (2), (3) |
| | Write timing | Every hour xx:25:05 (fixed) |
| | Saved data amount | 1000 records for 1 file (Max. 100 files) |
| Power quality | Saved data | Power interruption, Over voltage, Under voltage, Over current, Under current<br>(with time stamp of event occurrence and occurrence period) |
| | Write timing | Every hour xx:35:00 (fixed) |
| | Saved data amount | 1000 records for 1 file (Max. 100 files) |

## 11.9 Self-diagnostic

When error is happened, error code will be indicated.
List of Error Code

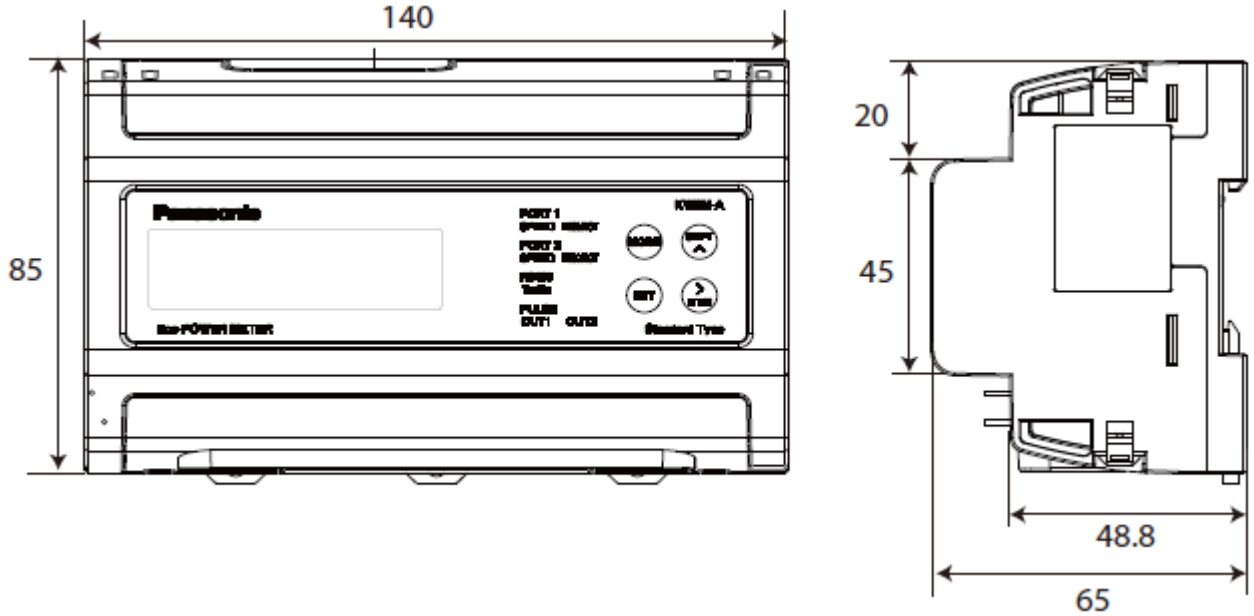
| No. | Name | Action to take |
|---|---|---|
| W0001 | DHCP server access error | Connect to DHCP server. |
| W0002 | Obtain the illegal IP address by DHCP server | Confirm DHCP server. |
| W0003 | IP address duplication | Change IP address. |
| W0004 | SNTP server access error | Confirm the access to SNTP server |
| W0005 | SNTP server domain name error | Confirm SNTP server domain name |
| W0006 | FTP server access error | Confirm the access to FTP server |
| W0007 | FTP server domain name error | Confirm FTP server domain name |
| W0008 | FTP server log in error | Confirm user name and password of FTP server |
| W0009 | No directory of FTP server | Confirm the directory in FTP server |
| W0013 | During lock out web server according to authentication failure | Leave it 10 minutes |
| E0042 | Remove the expansion units | Turn off power and connect the expansion unit |
| E0049 | Hard ware error | Turn on power again<br>When it doesn't recovery, change main unit because of the life is short. |
| E0091 | Internal memory error 1 | Turn on power again<br>When it doesn't recovery, change main unit because of the life is short |
| E0096 | Internal memory error 2 | Turn on power again<br>When it doesn't recovery, change main unit because of the life is short |

# Chapter 12 Mounting

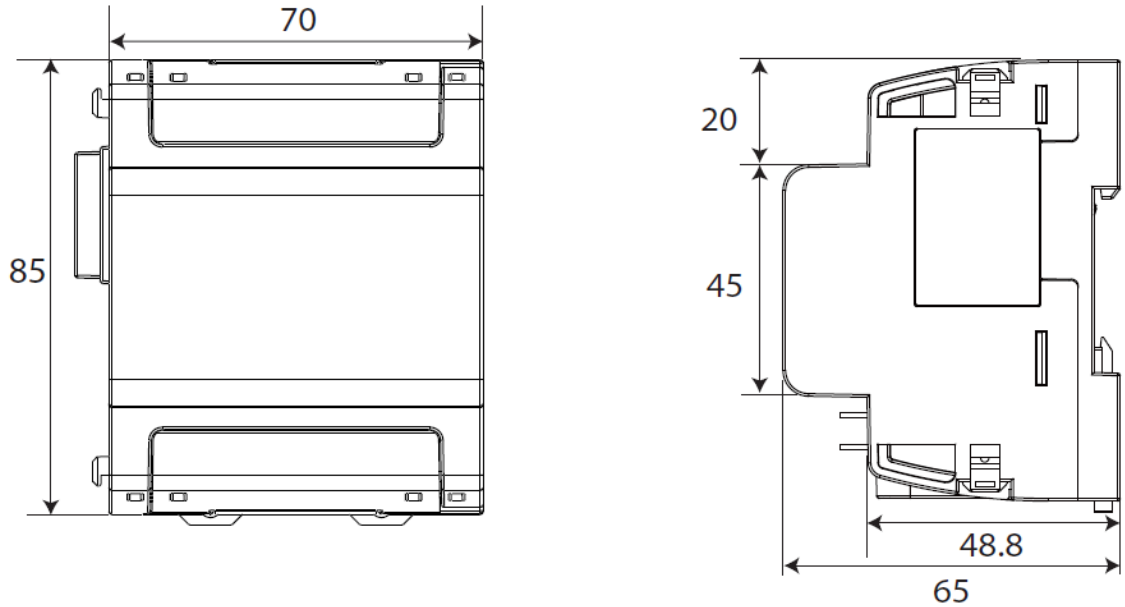
## 12.1 Dimensions

### 12.1.1 Main unit (KW2M-A/KW2M-X)

(Unit: mm)
(Clearance: ±1.0)




### 12.1.2 Expansion unit



# Revision History

| Issue Date | Manual No. | Content of revision |
|---|---|---|
| June, 2015 | WUME-KW2MA-01 | First edition |
| January, 2016 | WUME-KW2MA-02 | 2nd edition<br>Add series (KW2M-X Eco-POWER METER) |
| January, 2018 | WUME-KW2MA-03 | 3rd edition<br>Add series, Expansion unit (Multi analog input) and Expansion unit (Digital I/O)<br>[Add functions]<br>-Customized logging function for KW2M-X<br>-Leakage current measurement mode<br>for Expansion unit (Power measurement)<br>-Combination Demand function |
| May, 2019 | WUME-KW2MA-04 | 4th edition<br>[Correct errors]<br>- Delete note for 5.7 Logging Data Writing Function |
| | | |

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