MITSUBISHI ELECTRIC

DISPLAY UNIT
LOGGING DISPLAY UNIT (for EcoMonitorPro)

MODEL

EMU2-D65
EMU2-D65-M

INSTRUCTION MANUAL (Detailed edition)

EMU2-D65-M

●Be sure to read this instruction manual before use.
●Please send this instruction manual to the end user.

1. Introduction

This is a product only for the Miitsubishi Energy Measuring Unit（EcoMonitorPro）.
It does not use for other purpose.

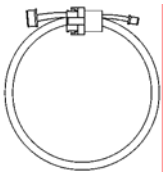
1.1 Feature

- The monitoring of measured data at Mitsubishi Energy Measuring Unit is possible.
- Easily viewable by backlight and dot matrix LCD display
- Multiple circuit monitoring is possible using only one unit.
- Up to 131 days data logging is possible. (Model: EMU2-D65-M)
  Logging data can collect to the PC and save as CSV format by using PC kit application software. (Model: EMU2-PK3-EN)

1.2 Confirmation of contents of package

Each unit comes with the following accessories. Check for missing ones.

Main Body x1



Connection cable x1

Instruction manual (Simplified edition) x1

Instruction manual (Detailed edition) x1

Switching boad Installating screw x2

1.3 Precautions concerning working environment and conditions

1.3.1 Working environment and working conditions

Do not use the unit in any of the following places. Doing so may cause malfunction or reduction in service life.

- Place where the ambient temperature exceeds the working temperature range (–5°C to 55°C)
- Place where the humidity exceeds the humidity range (30% to 80%RH) or condensation occurs
- Place with much dust, corrosive gas, salt or oily smoke
- Place where the unit may be exposed to rain or drops of water
- Place where metallic particles or inductive substances are dispersed
- Place where the daily mean temperature exceeds 35°C
- Place with much vibration or impact
- Place exposed to direct sunlight
- Place with strong electromagnetic field or much foreign noise

1.3.2 Installation and connection

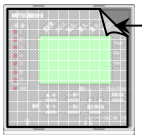
Before installing and connecting the unit, read the instruction manual without fail. For safety, the unit shall be installed and connected by experts in electrical work.

⚠Caution

- When threading and wiring, take utmost care that cuttings and wire pieces do not enter the unit.
- Connect the wires carefully checking the wiring diagram. Improper wiring can cause unit failure, fire and electric shock.
- Perform wiring work in a dead state. Do not wire the unit in a live state. Doing so can cause electric shock, ground fault, unit failure and fire.

1.3.3 Preparation before using

- An installation place shold keep the working environment and working conditions.
- The protection sheet for the crack prevention is put on the display part. Before use this product, remove the protection sheet. It is not unusual, although a LCD display part may light up by generating of static electricity in case it removes. After a while, it disappears by natural electric discharge.
- Following setup is need before using EMU2-D65-M.

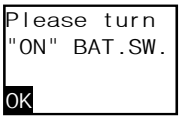


Please use after removing the protection sheet.

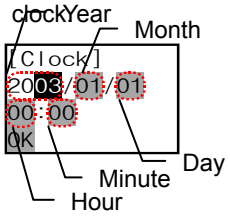
<Logging Display Unit (EMU2-D65-M)>

・The following messages are displayed when you use it for the first time. Please setup the clock after turning ON a battery switch according to a screen.

①Push the [↵/Phase] key after checking the battery switch (☛P4) is turnded to “ON” side.



②Clock setup screen will be displayed. Please setup the clock.



- Focus the cursor to the item you want to change by [▼] or [▲] key.
- Change the value by [+] or [−] key.
- After clock setup, focus the cursor to the “OK” and push the [↵/Phase] key.

1.3.4 Instructions for use

⚠Caution
● Do not disassemble or modify this product. Doing so can cause failure, electric shock or fire. ● Use the unit within the rated range stated herein. Using the unit out of the rated range may cause not only malfunction or unit failure, but also ignition or burnout.

1.4 Instructions for maintenance

- Wipe dirt on the surface with soft dry cloth. Avoid keeping a wipe in contact with the surface or wiping with benzene or thinner.
- Check the unit for the following points to ensure correct operation of the unit for a long time. Particularly, Items ① to ③ shall be checked in daily inspection.
  - ① Check the product for damage.
  - ② Check for abnormal indication of LED lamps.
  - ③ Check for abnormal noise, odor and heat generation.
  - ④ Check for loose fittings and loose wires on the terminal block.
    (Perform the check stated in ④ in the power-off state. Failure to do so can cause electric shock, unit failure or fire.)

1.5 Instructions for storage

- When storing the unit, turn off power, disconnect cables and wires, and put them in vinyl bags or the like.
- When storing the unit for a long time, avoid keeping it in a place as shown below. Doing so may result in failure or decrease in service life.
  - Place where the ambient temperature is out of the range from −10°C to 60°C
  - Place where the humidity exceeds the humidity range (30% to 80%RH) or condensation occurs
  - Place with much dust, corrosive gas, salt or oily smoke
  - Place where the unit is exposed directly to rain, water droplets or sunlight
  - Place where the daily mean temperature exceeds 35°C
  - Place with much vibration or impact
  - Place where metallic particles or inductive substances are dispersed

1.6 Instructions for disposal

Dispose of this product appropriately in accordance with national or community rule.

⚠Caution
Logging display unit (Model: EMU2-D65-M) have built-in lithium battery. Be careful about the mentioned below. ● The lithium battery is soldered. Be careful when remove it. ● Electric capacity may remain in the removed battery. Sinse other metal is contacted and there are generation of heat and burst, and a possibility of igniting, please be sure to cover a terminai (+, −) with adhesive insulating tape etc.

1.7 Packaging materials and instruction manual

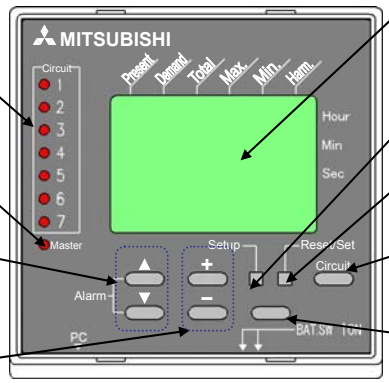
To reduce the effects on the environment, corrugated boards are used for packaging materials, and the instruction manual is printed on recycled paper.

Attention

- This document and this unit are delivered after strict quality control and product inspection. If the unit or instruction manual has any defect caused by inadequacy of manufacture, we will replace it with a new one. Contact the store where you bought the unit. However, failure or damage caused by act of God or incorrect usage is not included in the warranty.
- Understand that we are not liable for any trouble on the system caused by the customer or any third party, legal problem, failure caused by improper use or during use of the unit and damage caused by other nonconformance.
- The product is warranted without charge for less than one year after the day of your purchase or the delivery to the designated place or within 18 month after the day of shipment from our plant (reckoned from the date of manufacture), whichever comes first.
- The term of free warranty will not be renewed for the repaired product.
- It is prohibited to reprint or copy part or all of this document in any form without our permission.
- We are endeavoring to update this document to follow revisions to the software and hardware, but we cannot do so under unavoidable circumstances.

2. Part Names and Functions

Front



"Circuit" LED
A circuit number on display lights up. Moreover, LED of the circuit number blinks at the time of alarm occuring.

"Master" LED
The light is switched on at the time of operation.

[▲], [▼] key
Change of display item and selection of a menu are performed.

[+], [−] key
Display / Un-displaying of maximum or minimum value, and harmonics data at each order change of next data is performed。

LCD display
The measurement data and setting information are displayed.

[Setup] key
Shift to setup mode and closing of a setup are performed.

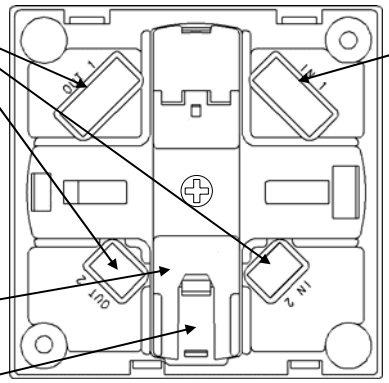
[Reset / Set] key
Reset/Set of Wh and varh data are performed.

[Circuit] key
Change the display circuit number.

[↵/ Phase] key
The data of each phase of current and voltage is switched and displayed. Moreover, it is used when concerning a setting value.

Note: At the time of alarm occuring, a circuit on display is carried out in a cycle of 100ms, and blink (early blink). And the other circuits blink in a cycle of 200ms (late blink).

Back



IN2, OUT 1, OUT2
Not use

IN 1
Use for connection with an Energy Measuring Unit.

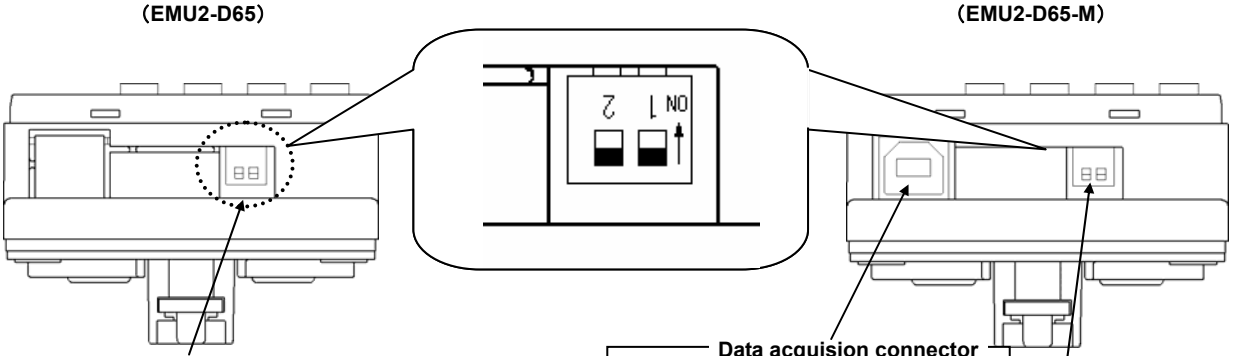
IEC rail attachment

IEC rail stopper
Use when installating on IEC rail.

Bottom

Display Unit
(EMU2-D65)

Loggin Display Unit
(EMU2-D65-M)



Maker setting switch
Not use. Use the following setting.

Switch 1: OFF
Switch 2: OFF

Data acquisition connector
In case a PC-kit (option) is used, connects with a personal computer by the cable.

Battery switch
The data memorized to this apparatus at the time of a power failure is backed up. Please carry out also to switches 1 and 2 at "ON" at the time of use.
ON: back up. OFF: not back up.

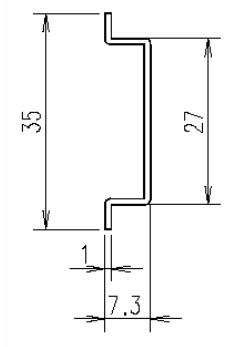
3. Installation

⚠Caution
· For safety, the unit shall be installed and connected by experts in electrical work.

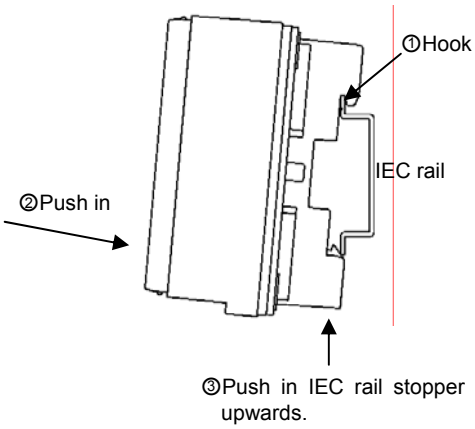
■IEC rail installation----------

Fix the display unit to IEC rail using IEC rail attachment on the back. Changing the direction of IEC rail attachment, it can attach in both direction of vertical and horizontal.

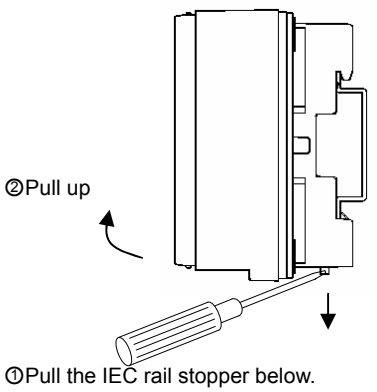
●Applicable IEC rail (35mm)



●Installation



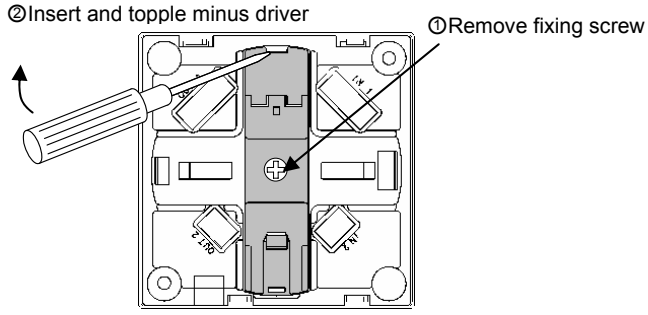
●Removal



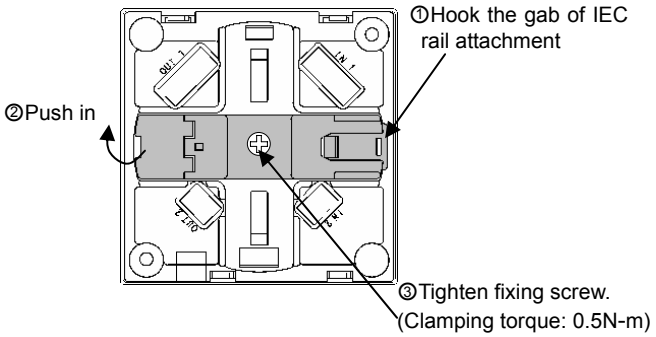
- Fit the IEC rail with M4 or M5 screws at distances of 25 to 100 mm.
- When installing the unit after once it was removed from the IEC rail, install it while pushing the IEC rail fitting upward.

A method for changing the direction of IEC rail attachment

●Removal of the IEC rail attachment

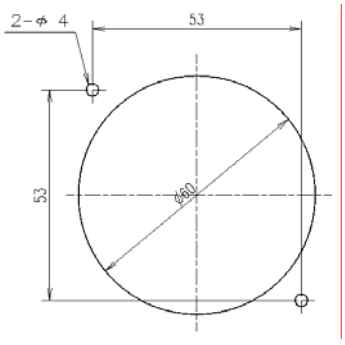


●Fitting of the IEC rail attachment

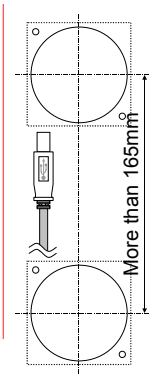


■Panel mounting ----------

●Cutout dimension

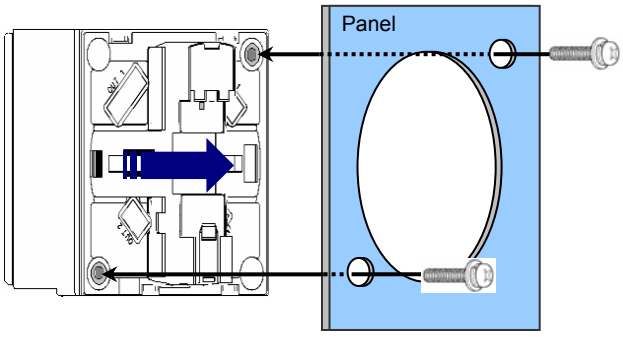


Front view of switching boad



When you put in order and install a logging display unit in the vertical direction, the 165mm or more interval is necesary to be able to connect and disconnect the connector of the data collection cable.

●Mount

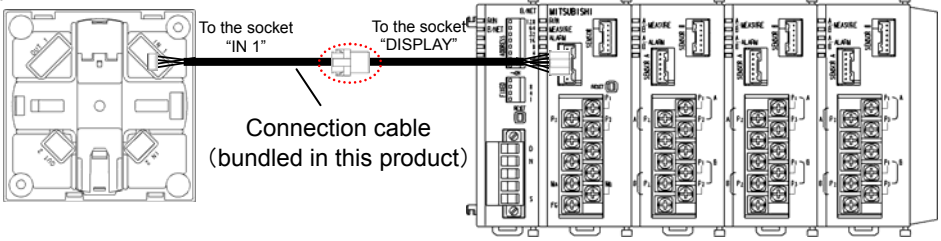


Attach the display unit from front side of panel, and tighten the screw from the backside.
(Clamping torque: 0.5N-m)

4. Connection method

Logging display unit (EMU2-D65-M)
Display unit (EMU2-D65)

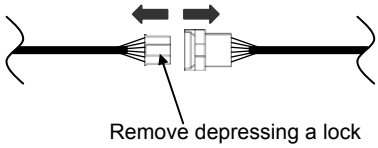
Energy Measuring Unit
(EcoMonitorPro)



Extension method of connection cable

It is extensible by a maximum of 10m by inserting the extension cable in the part enclosed by ◌ in the above and a connection figure.

(1) Remove the trunking connector



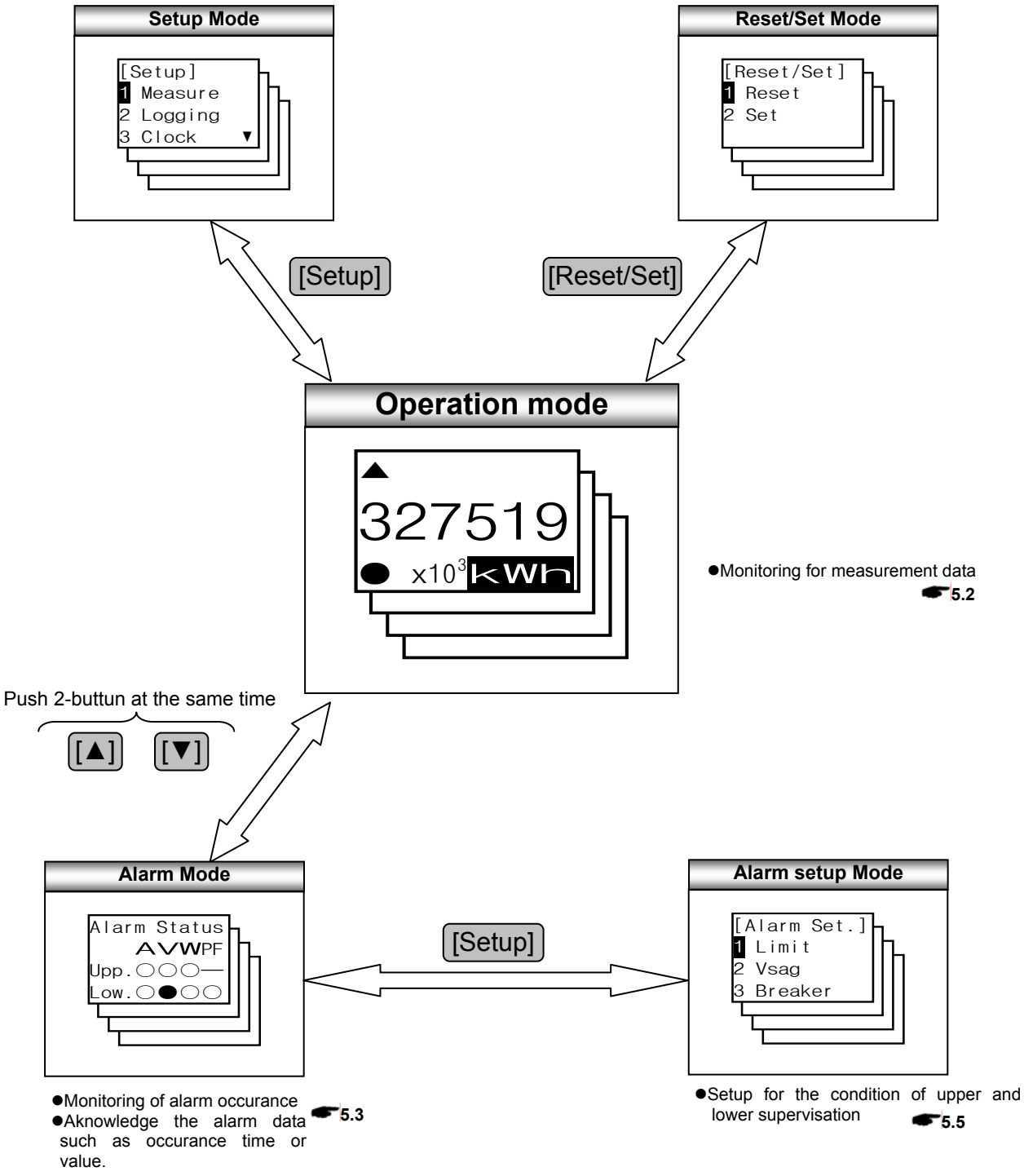
(2) Insert the extension cable, and connect the connector

Note1: It can use EMU2-CB-T1M, EMU2-CB-T5M, and EMU2-CB-T10M as extension cable.
Note2: The total of extension cable length should not exceed 10m.

5. Operations of Instrument

5.1 Operation mode

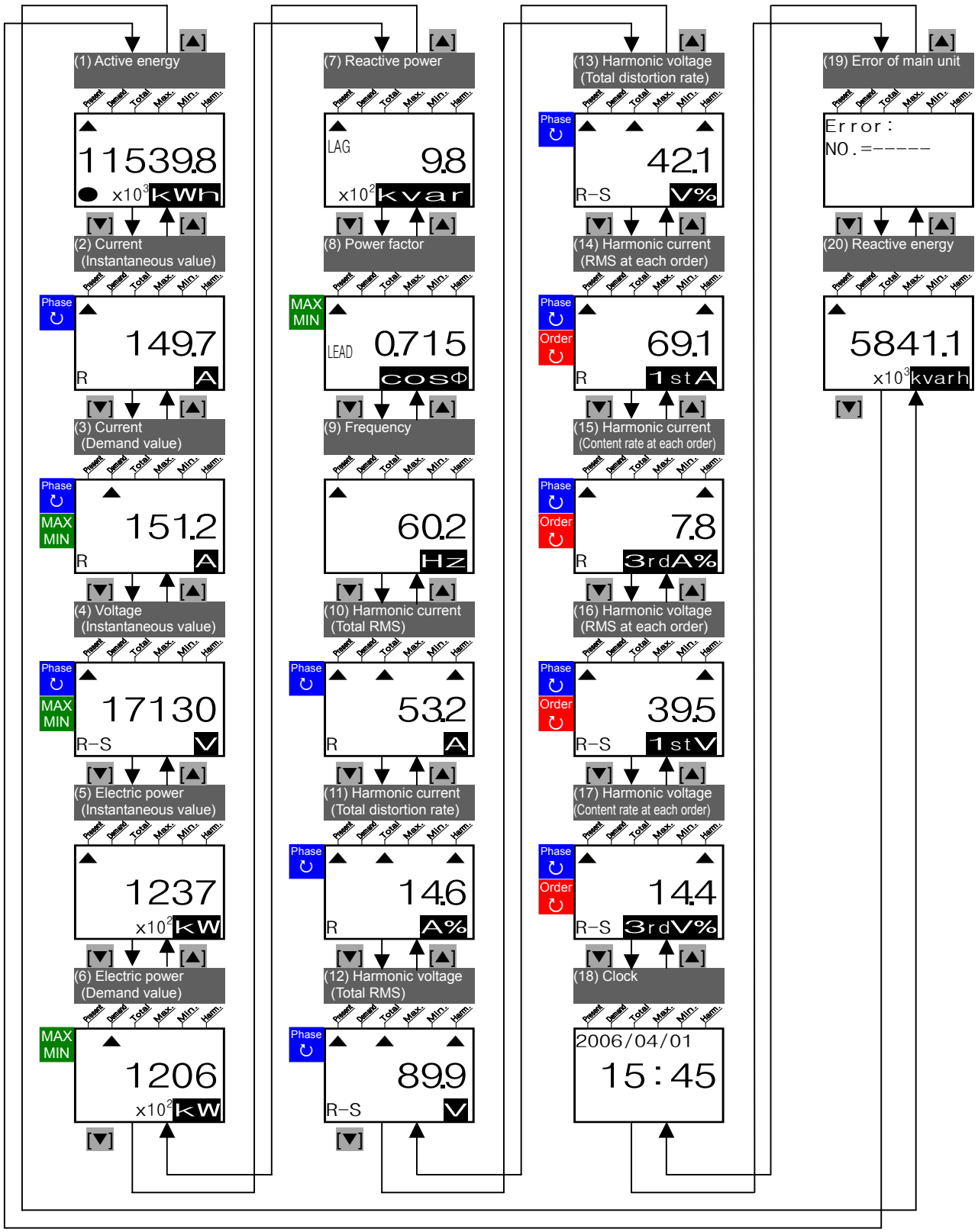
Ther are following modes of operation. Use it if needed, changing mode of operation.



5.2 Monitoring of measurement data (Operation mode)

5.2.1 Display transition

Below shows the display transition of operation mode.



Phase … By pressing the [↵/Phase] key, it is possible to change the phase of Current or Voltage.

MAX MIN … By pressing the [+] key or [−] key, it is possible to display Maxmimum or Minimumu value.

Order … By pressing the [+] key or [−] key, it is possible to change the order of harmonic current or harmonic voltage.

Note1: ”(18) Clock” is not displayed on EMU2-D65.
Note2: The screen that is displayed or not differs from settings. (☛ 5.2.2)
Note3: Displayed cuircuit can be switched by pushing the [Circuit] key at each screen. (except for (18) Clock, (19) Error of main unit)

5.2.2 Displayed elements

The elements displayed differ from setting of measurement mode.

●…Displayed −…Not disoplayed

Mode setting		Wh+A+4[note7]	Harmonics
(1)Active energy		●	●
(2)Current (instantaneous)	R, S, T, N, Total[note1]	●	●
(3)Current (Demand)	R, S, T, N[note1]	●	●
	Max./Min.	●	−
	Time stamp of Max./Min.	●	−
(4)Voltage (Instantaneous)	R-S, S-T, T-R, Total[ntoe2] R-N, S-N, T-N	①	●
	Max./Min.		−
	Timestamp of Max./Min.		−
(5)Active power (Instantaneous)		②	●
(6)Active power (Demand)	Present		●
	Max./Min.		−
	Time stamp of Max./Min.		−
(7)Reactive power		③	●
(8)Power factor	Present	④	●
	Max./Min.		−
	Time stamp of Max./Min.		−
(9)Frequency		⑤	●
(10),(11)Total harmonic current RMS/Distortion rate[note5]	R, S, T[note3]	⑥	●
(12),(13)Total harmonic voltage RMS/Distortion rate[note5]	R-S, S-T[note4] R-N, S-N, T-N	⑦	●
(14),(15)Harmonic current RMS/Content rate (Fundamental, 3rd, 5th, 7th, 9th, 11th, 13th)[note5]	R, S, T[note3]	−	●
(16),(17)Harmonic voltage RMS/Content rate (Fundamental, 3rd, 5th, 7th, 9th, 11th, 13th)[note5]	R-S, S-T[note4] R-N, S-N, T-N	−	●
(18)Clock[note6]		●	●
(19)Main unit error		●	●
(20)Reactive energy		⑧	−

Note1: In case of setting the Phase wire system to “1P2W”, phase “S” and “T” are not displayed. Phase “N” is displayed in only case of setting Phase Wire System to “3P4W”.

Note2: In case of setting the Phase wire system to “1P2W”, “S-T” and “T-R” are not displayed. “R-N”, “S-N” and “T-N” are displayed in only case of setting Phase Wire System to “3P4W”.

Note3: In case of setting the Phase wire system to “1P2W”, phase “T” is not displayed. Phase “S” is displayed in only case of setting Phase Wire System to “3P4W”.

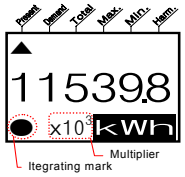
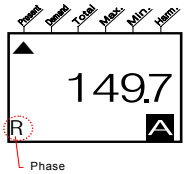
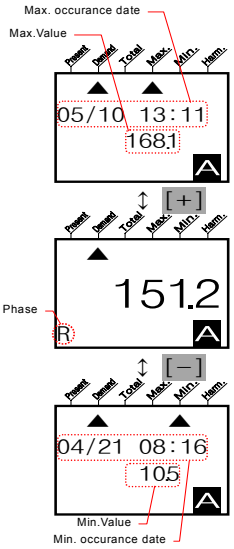
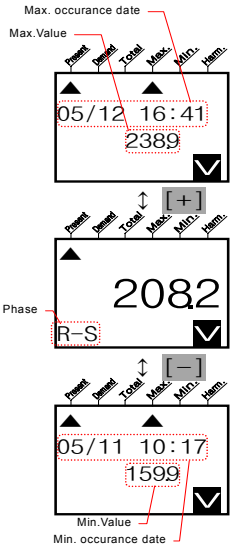
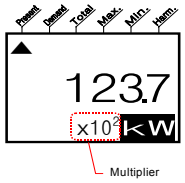
Note4: In case of setting the Phase wire system to “1P2W”, “S-T” will not be displayed. “R-N”, “S-N” and “T-N” are displayed in only case of setting Phase Wire System to “3P4W”. Harmonic voltage is measured not line voltage but phase voltage. Althogh it is displayed as line voltage, please identify “R-S” as “R-N”, “S-T” as “S-N”, “T-R” as “T-N”.

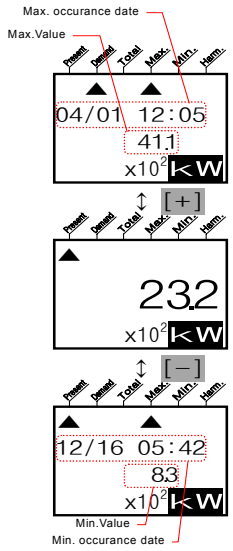
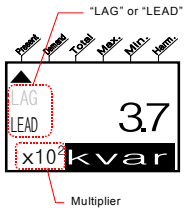
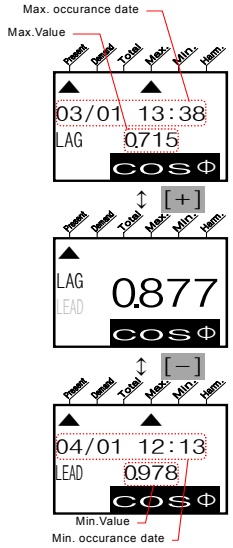
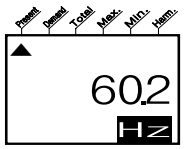
Note5: Either RMS value or Content and Distortion rate is displayed by the setting.

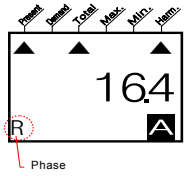
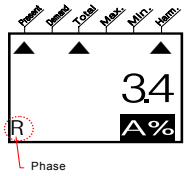
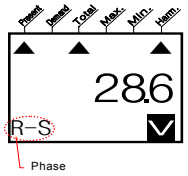
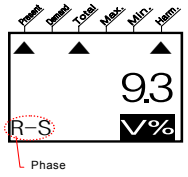
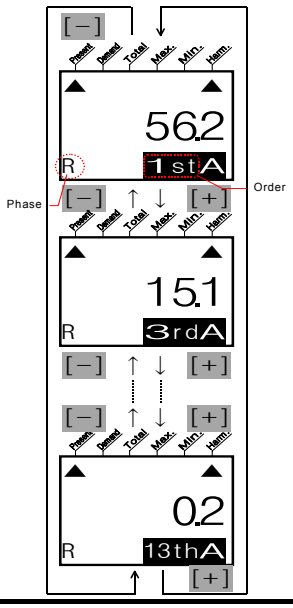
Note6: When set the Measure mode to “Wh+A+4”, it can display up to 4 items (Select amang ①~⑧) in addition to Active energy, Current.

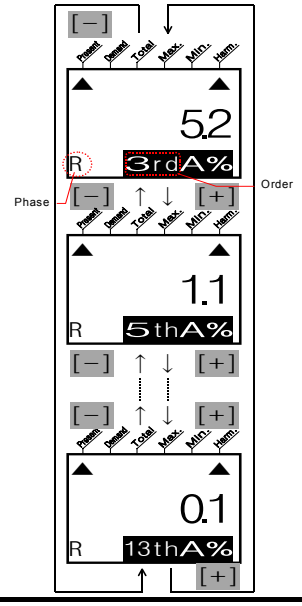
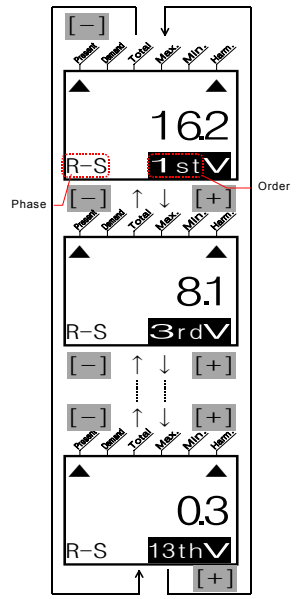
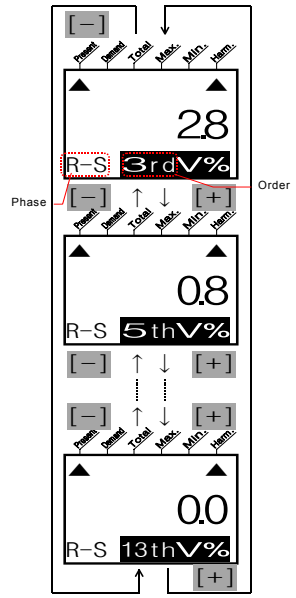
Note7: “Clock” screen is only displayed on EMU2-D65-M.

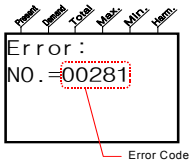
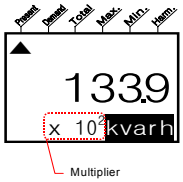
5.2.3 Detail about Display

Name	Screen	Key operation		Note
		Key	Motion	
(1) Active Energy		[▲]	Display the previous screen	The mark "●" is displayed in the lower left-hand corner of the screen when Wh value is integrating.
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Void key operation	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	
(2) Current (Instantanious value)		[▲]	Display the previous screen	•By pushing the [↵/Phase] key, display switch as follows. <1P2W> ↱R→Total┐ <3P3W> ↱R→S→T→Total┐ <3P4W> ↱R→S→T→N→Total┐
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Change the phase	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	
(3) Current (Demand value)		[▲]	Display the previous screen	•By pushing the [↵/Phase] key, display switch as follows. <1P2W> Only Phase "R" <3P3W> ↱R→S→T┐ <3P4W> ↱R→S→T→N┐ •The occurance date of Max./Min. value is displayed as the format "MM/DD hh:mm". (MM:Month, DD:Day, hh:hour, mm:minute)
		[▼]	Display the next screen	
		[+]	Display the Max. of demand current	
		[−]	Display the Min. of demand current	
		[↵/Phase]	Change the phase	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	
(4) Voltage		[▲]	Display the previous screen	•By pushing the [↵/Phase] key, display switch as follows. <1P2W> ↱R-S→Total┐ <3P3W> ↱R-S→S-T→T-R→Total┐ <3P4W> ↱R-S→S-T→T-R→R-N→S-N→T-N→Total┐ •The occurance date of Max./Min. value is displayed as the format "MM/DD hh:mm". (MM:Month, DD:Day, hh:hour, mm:minute)
		[▼]	Display the next screen	
		[+]	Display the Max. of voltage	
		[−]	Display the Min. of voltage	
		[↵/Phase]	Change the phase	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	
(5) Active power (Instantanious value)		[▲]	Display the previous screen	
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Void key operation	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	

Name	Screen	Key operation		Note
		Key	Motion	
(6) Active power (Demand value)		[▲]	Display the previous screen	•The occurance date of Max./Min. value is displayed as the format “MM/DD hh:mm”. (MM:Month, DD:Day, hh:hour, mm:minute)
		[▼]	Display the next screen	
		[+]	Display the Max. of demand power	
		[−]	Display the Min. of demand power	
		[↵/Phase]	Void key operation	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	
(7) Reactive power		[▲]	Display the previous screen	
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Void key operation	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	
(8) Power factor		[▲]	Display the previous screen	•The occurance date of Max./Min. value is displayed as the format “MM/DD hh:mm”. (MM:Month, DD:Day, hh:hour, mm:minute)
		[▼]	Display the next screen	
		[+]	Display the Max. of power factor	
		[−]	Display the Min. of power factor	
		[↵/Phase]	Void key operation	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	
(9) Frequency		[▲]	Display the previous screen	
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Void key operation	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	

Name	Screen	Key operation		Note
		Key	Motion	
(10) Harmonic current (Total RMS)		[▲]	Display the previous screen	•By pushing the [↵/Phase] key, display switch as follows. <1P2W> Only phase R <3P3W> ↱R→T┐ <3P4W> ↱R→S→T┐
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Change the phase	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	
(11) Harmonic current (Total distortion rate)		[▲]	Display the previous screen	•By pushing the [↵/Phase] key, display switch as follows. <1P2W> Only phase R <3P3W> ↱R→T┐ <3P4W> ↱R→S→T┐
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Change the phase	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	
(12) Harmonic voltage (Total RMS)		[▲]	Display the previous screen	•By pushing the [↵/Phase] key, display switch as follows. <1P2W> Only R-S <3P3W> ↱R-S→S-T┐ <3P4W> ↱R-S→S-T→T-R┐ It is measured not line voltage but phase voltage. Althogh it is displayed as line voltage, please identify “R-S” as “R-N”, “S-T” as “S-N”, “T-R” as “T-N”.
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Change the phase	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	
(13) Harmonic voltage (Total distortion rate)		[▲]	Display the previous screen	•By pushing the [↵/Phase] key, display switch as follows. <1P2W> Only R-S <3P3W> ↱R-S→S-T┐ <3P4W> ↱R-S→S-T→T-R┐ It is measured not line voltage but phase voltage. Althogh it is displayed as line voltage, please identify “R-S” as “R-N”, “S-T” as “S-N”, “T-R” as “T-N”.
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Change the phase	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	
(14) Harmonic current (RMS at each order)		[▲]	Display the previous screen	•By pushing the [↵/Phase] key, display switch as follows. <1P2W> Only phase R <3P3W> ↱R→T┐ <3P4W> ↱R→S→T┐ •By pushing the [+] key, display switch as follows. ↱1st→3rd→5th→7th→9th→11th→13 th┐ •By pushing the [−] key, display switch as follows. ↱1st→13th→11th→9th→7th→5th→3rd┐
		[▼]	Display the next screen	
		[+]	Display the next order	
		[−]	Display the previous order	
		[↵/Phase]	Change the phase	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode↓	

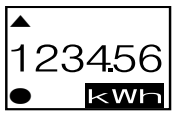
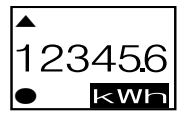
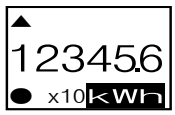
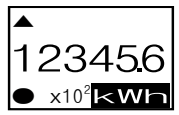
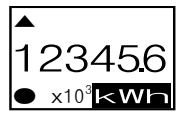
Name	Screen	Key operation		Note
		Key	Motion	
(15) Harmonic current (Content rate at each order)		[▲]	Display the previous screen	•By pushing the [↵/Phase] key, display switch as follows. <1P2W> Only phase R <3P3W> ↱R→T┐ <3P4W> ↱R→S→T┐ •By pushing the [+] key, display switch as follows. ↱3rd→5th→7th→9th→11th→13 th┐ •By pushing the [−] key, display switch as follows. ↱3rd→13th→11th→9th→7th→5th┐
		[▼]	Display the next screen	
		[+]	Display the next order	
		[−]	Display the previous order	
		[↵/Phase]	Change the phase	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	
(16) Harmonic voltage (RMS at each order)		[▲]	Display the previous screen	By pushing the [↵/Phase] key, display switch as follows. <1P2W> Only R-S <3P3W> ↱R-S→S-T┐ <3P4W> ↱R-S→S-T→T-R┐ It is measured not line voltage but phase voltage. Althogh it is displayed as line voltage, please identify “R-S” as “R-N”, “S-T” as “S-N”, “T-R” as “T-N”. •By pushing the [+] key, display switch as follows. ↱1st→3rd→5th→7th→9th→11th→13 th┐ •By pushing the [−] key, display switch as follows. ↱1st→13th→11th→9th→7th→5th→3rd┐
		[▼]	Display the next screen	
		[+]	Display the next order	
		[−]	Display the previous order	
		[↵/Phase]	Change the phase	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	
(17) Harmonic voltage (Content rate at each order)		[▲]	Display the previous screen	By pushing the [↵/Phase] key, display switch as follows. <1P2W> Only R-S <3P3W> ↱R-S→S-T┐ <3P4W> ↱R-S→S-T→T-R┐ It is measured not line voltage but phase voltage. Althogh it is displayed as line voltage, please identify “R-S” as “R-N”, “S-T” as “S-N”, “T-R” as “T-N”. •By pushing the [+] key, display switch as follows. ↱3rd→5th→7th→9th→11th→13 th┐ •By pushing the [−] key, display switch as follows. ↱3rd→13th→11th→9th→7th→5th┐
		[▼]	Display the next screen	
		[+]	Display the next order	
		[−]	Display the previous order	
		[↵/Phase]	Change the phase	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	

Name	Screen	Key operation		Note
		Key	Motion	
(18) Clock		[▲]	Display the previous screen	•Display format is as follows. YYYY/MM/DD hh:mm (MM:Month, DD:Day, hh:hour, mm:minute) •Not displayed when the model: EMU2-D65.
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Void key operation	
		[Circuit]	Void key operation	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	
(19) Error of main unit		[▲]	Display the previous screen	When no trouble:「NO.=-----」 When it is displayed any eroor code, please see ☛7.1
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Void key operation	
		[Circuit]	Void key operation	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	
(20) Reactive energy		[▲]	Display the previous screen	
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Void key operation	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Setup mode	
		[Reset/Set]	Transit to the Reset/set mode	
		[▲] + [▼]	Transit to the Alarm mode	

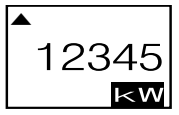
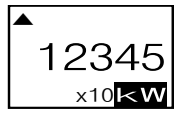
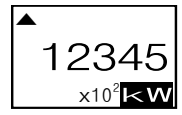
5.2.4 Number of Significant Digits

Here explain about number of significant digits at each measured item.

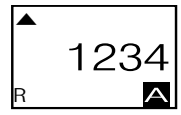
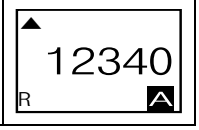
■Active energy/Reactive energy

Full load	<12kW	12kW <120kW	120kW <1200kW	1200kW <12000kW	12000kW <120000kW	120000kW
Significant Digit (Unit)	****.** (kWh)	*****.* (kWh)	*****.* x10(kWh)	*****.* $x10^2$ (kWh)	*****.* $x10^3$ (kWh)	*****.* $x10^4$ (kWh)
Example of screen						
	Value =1234.56kWh	Value =12345.6kWh	Value =12345.6x10 =123456kWh	Value =12345.6x100 =1234560kWh	Value =12345.6x1000 =12345600kWh	Value =12345.6x10000 =123456000kWh

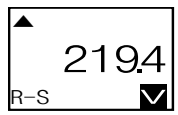
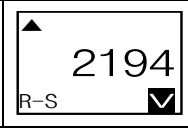
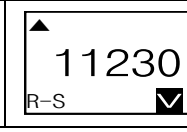
■Active power/Reactive power

Full load	<12kW	12kW <120kW	120kW <1200kW	1200kW <12000kW	12000kW <120000kW	120000kW
Digit (Unit)	**.*** (kW)	***.** (kW)	****.* (kW)	***** (kW)	***** x10 (kW)	***** $x10^2$ (kW)
Example of screen						
	Value =12.345kW	Value =123.45kW	Value =1234.5kW	Value =12345kW	Value 12345x10 =1234500kW	Value 12345x100 =12345000kW

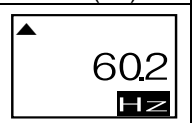
■Current/Harmonic current

Primary current	5A~30A	40A~300A	400A~3000A	4000A~30000A
Digit (Unit)	**.** (A)	***.* (A)	**** (A)	****0 (A)
Example of screen				

■Voltage/Harmonic voltage

Primary current	110V~220V	440V~2200V	3300V~110000V
Digit (Unit)	***.* (V)	**** (V)	****0 (V)
Example of screen			

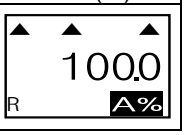
■Frequency

Digit (Unit)	**.* (Hz)
Example of screen	

■Power factor

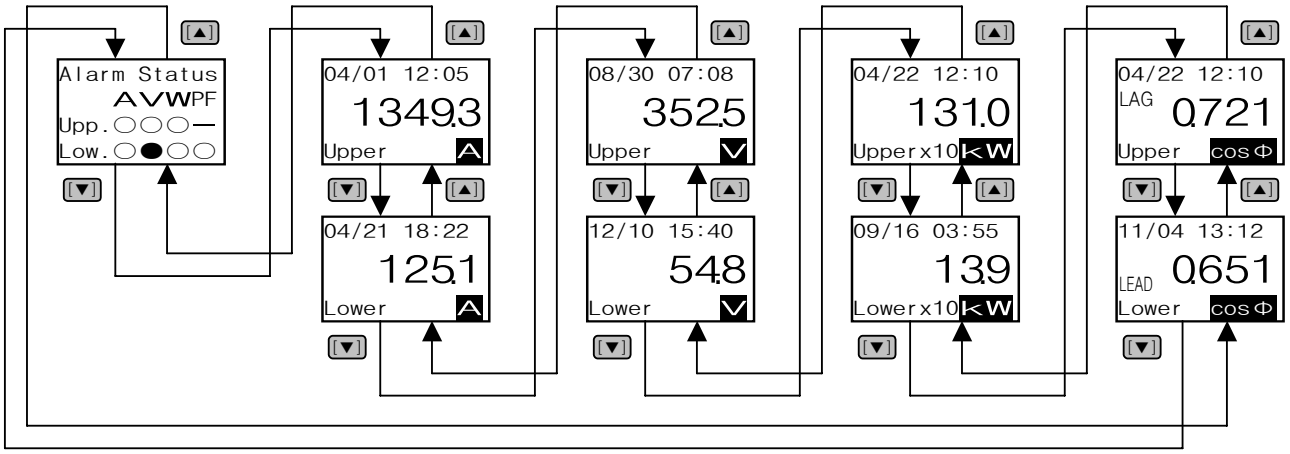
Digit (Unit)	*.***
Example of screen	

■Harmonic distortion rate/content rate

Digit (Unit)	***.* (%)
Example of screen	

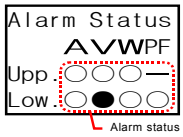
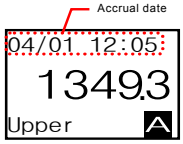
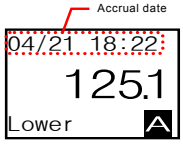
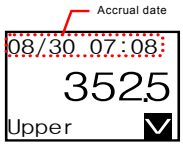
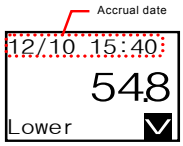
5.3 Monitorring of alarm（Alarm mode）

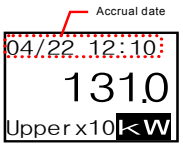
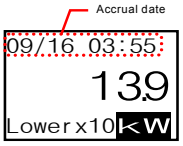
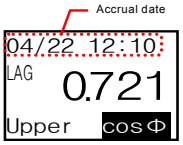
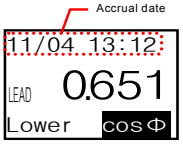
5.3.1 Display transition



Note1: The screen that setted “alarm surveillance is not carried out” is skipped.
Note2: Displayed cuircuit can be switched by pushing the [Circuit] key at each screen.

5.3.2 Detail about Display

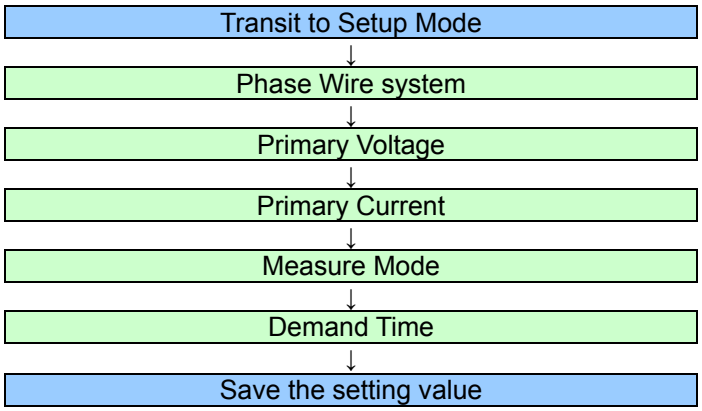
Name	Screen	Key operation		Note
		Key	Mortion	
(1) List of alarm status		[▲]	Display the previous screen	The meaning of a sign is as follows. "—"…Alarm surveillance has not been carried out. "○"…Alarm has not been in accrual. "●"…Alarm has been in accrual.
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Void key operation	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Alarm setup mode	
		[Reset/Set]	Void key operation	
		[▲] + [▼]	Transit to the operation mode	
(2) Upper alarm of current		[▲]	Display the previous screen	When the alarm has never occurred, accrual date and measured value at that time are displayed as following. <Accrual date> --/-- --:-- <Value> 0A
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Void key operation	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Alarm setup mode	
		[Reset/Set]	Void key operation	
		[▲] + [▼]	Transit to the operation mode	
(3) Lower alarm of current		[▲]	Display the previous screen	When the alarm has never occurred, accrual date and measured value at that time are displayed as following. <Accrual date> --/-- --:-- <Value> 0A
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Void key operation	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Alarm setup mode	
		[Reset/Set]	Void key operation	
		[▲] + [▼]	Transit to the operation mode	
(4) Upper alarm of voltage		[▲]	Display the previous screen	When the alarm has never occurred, accrual date and measured value at that time are displayed as following. <Accrual date> --/-- --:-- <Value> 0V
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Void key operation	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Alarm setup mode	
		[Reset/Set]	Void key operation	
		[▲] + [▼]	Transit to the operation mode	
(5) Upper alarm of voltage		[▲]	Display the previous screen	When the alarm has never occurred, accrual date and measured value at that time are displayed as following. <Accrual date> --/-- --:-- <Value> 0V
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Void key operation	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Alarm setup mode	
		[Reset/Set]	Void key operation	
		[▲] + [▼]	Transit to the operation mode	

Name	Screen	Key operation		Note
		Key	Mortion	
(6) Upper alarm of active power		[▲]	Display the previous screen	When the alarm has never occurred, accrual date and measured value at that time are displayed as following. <Accrual date> --/-- --:-- <Value> 0kW
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Void key operation	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Alarm setup mode	
		[Reset/Set]	Void key operation	
		[▲] + [▼]	Transit to the operation mode	
(7) Lower alarm of active power		[▲]	Display the previous screen	When the alarm has never occurred, accrual date and measured value at that time are displayed as following. <Accrual date> --/-- --:-- <Value> 0kW
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Void key operation	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Alarm setup mode	
		[Reset/Set]	Void key operation	
		[▲] + [▼]	Transit to the operation mode	
(8) Upper alarm of power factor		[▲]	Display the previous screen	When the alarm has never occurred, accrual date and measured value at that time are displayed as following. <Accrual date> --/-- --:-- <Value> 1.000
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Void key operation	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Alarm setup mode	
		[Reset/Set]	Void key operation	
		[▲] + [▼]	Transit to the operation mode	
(9) Lower alarm of power factor		[▲]	Display the previous screen	When the alarm has never occurred, accrual date and measured value at that time are displayed as following. <Accrual date> --/-- --:-- <Value> 1.000
		[▼]	Display the next screen	
		[+]	Void key operation	
		[−]	Void key operation	
		[↵/Phase]	Void key operation	
		[Circuit]	Change the circuit	
		[Setup]	Transit to the Alarm setup mode	
		[Reset/Set]	Void key operation	
		[▲] + [▼]	Transit to the operation mode	

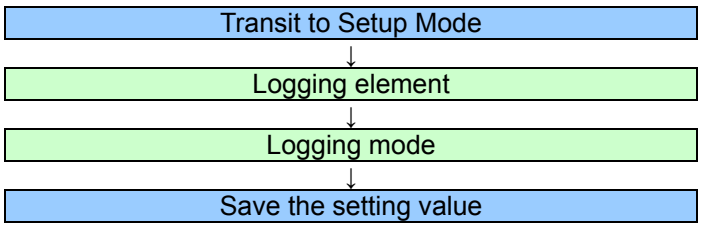
5.4 Setup about measuring, logging, clock and display.（Setup mode）

5.4.1 Setup flow

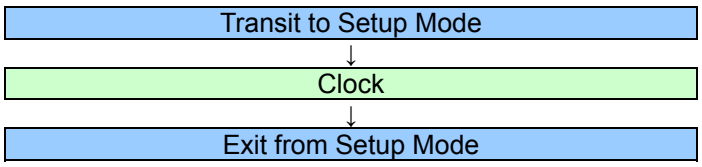
Measuring … Setup about measuring condition. ☛5.4.2



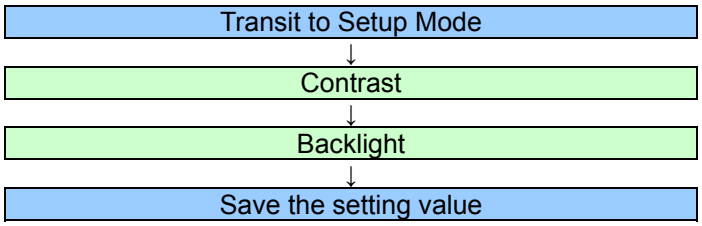
Logging … Setup about logging condition. (Only for EMU2-D65-M) ☛5.8.2



Clock … Setup the clock. ☛5.4.3



Display … Setup about display such as LCD contrast or backlight lighting pattern. ☛5.4.4



5.4.2 Measuring setup … Setup the measuring condition.

1 Transition to the setup mode		
Screen	Operation	Note
(EMU2-D65) [Setup] 1 Measure 2 Clock 0 Display (EMU2-D65-M) [Setup] 1 Measure 2 Logging 3 Clock ▼	1-1 Push the [Setup] key in operation mode. 1-2 Setup menu will be displayed. 1-3 Confirm that the cursor focuses the “1 Measure”, and push the [↵/Phase] key. 1-4 Measure setup menu will be displayed.	

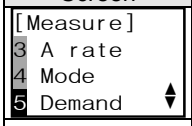
2 Setup the phase wire system		
Screen	Operation	Note
[Measure] 1 Wiring 2 V rate 3 A rate ▼	2-1 Push the [▲] or [▼] key, focus the cursor to “1 Wiring” 2-2 Push the [↵/Phase] key. 2-3 Phase-wire system setup screen will be displayed.	*1P2W, 1P3W, 3P3W, 3P4W*
[Wiring] 3P3W	2-4 Push the [+] or [−] key, and change the setting. 2-5 Push the [↵/Phase] key, and determine the setting. 2-6 Return to the measure setup menu screen. 2-7 When setup the other circuits, select the circuit by [Circuit] key, and repeat the operation from 2-1 to 2-6.	

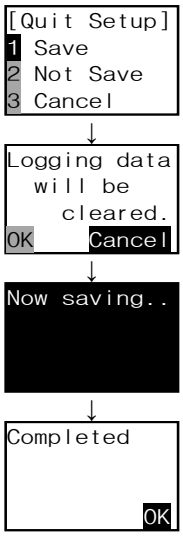
3 Setup the primary voltage		
Screen	Operation	Note
[Measure] 1 Wiring 2 V rate 3 A rate ▲▼	3-1 Push the [▲] or [▼] key, focus the cursor to “2 V rate” 3-2 Push the [↵/Phase] key. 3-3 Primary voltage setup screen will be displayed.	[1P2W, 3P3W] *110V Direct, **220V Direct**, 440V, 690V, 1100V, 2200V, 3300V, 6600V, 11000V, 13200V, 13800V, 15000V, 16500V, 22000V, 24000V, 33000V, 66000V, 77000V, 110000V* [1P3W] *110V Direct (Fixed)* [3P4W] (Phase voltage/Line voltage) *63.5V/110V, 110V/190V, 120V/208V, **220V/380V**, 240V/415V, 254V/440V*
[V rate] 220V Direct	3-4 Push the [+] or [−] key, and change the setting. 3-5 Push the [↵/Phase] key, and determine the setting. 3-6 Return to the measure setup menu screen. 3-7 When setup the other circuits, select the circuit by [Circuit] key, and repeat the operation from 3-1 to 3-6.	

In case of the model EMU2-RD*-*-4W, settings about primary voltage is common for circuit1 and circuit2, or circuit3 and circuit4. For example, change the primary voltage settings of odd number circuits (Circuit 1, Circuit 3), the settings of even number circuits (Circuit 2, Circuit 4) are changed similarly.

4 Setup the primary current		
Screen	Operation	Note
[Measure] 1 Wiring 2 V rate 3 A rate ▲▼	4-1 Push the [▲] or [▼] key, focus the cursor to “3 A rate” 4-2 Push the [↵/Phase] key. 4-3 Setup screen for sensor type and primary current will be displayed.	[Sensor]…Select the “Direct” or “5A” by using sensor type. ***Direct*** *EMU-CT50/100/250/400/600* *5A* *EMU2-CT5, EMU2-CT5-4W* [A rate]…Select the primary current value of measuring circuit. Setting range varies according to sensor type. ----------Direct---------- *50A, **100A**, 250A, 400A, 600A* ----------5A---------- *5A, 6A, 7.5A, 8A, 10A, 12A, 15A, 20A, 25A, 30A, 40A, 50A, 60A, 75A, 80A, **100A**, 120A, 150A, 200A, 250A, 300A, 400A, 500A, 600A, 750A, 800A, 1000A, 1200A, 1500A, 1600A, 2000A, 2500A, 3000A, 4000A, 5000A, 6000A, 7500A, 8000A, 10000A, 12000A, 20000A, 25000A, 30000A*
[Sensor] Direct [A rate] 100A	4-4 Push the [▲] or [▼] key, and focus the cursor to the side “Sensor”. 4-5 Push the [+] or [−] key, and select the sensor type. 4-6 Push the [▲] or [▼] key, and focus the cursor to the side “A rate”. 4-7 Push the [+] or [−] key, and select the primary current. 4-8 Push the [↵/Phase] key, and determine the setting. 4-9 Return to the measure setup menu screen. 4-10 When setup the other circuits, select the circuit by [Circuit] key, and repeat the operation from 4-1 to 4-9.	

5 Setup the measurement mode		
Screen	Operation	Note
[Measure] 2 V rate 3 A rate 4 Mode ▲▼	5-1 Push the [▲] or [▼] key, focus the cursor to “4 Mode” 5-2 Push the [↵/Phase] key. 5-3 Setup screen for measurement mode will be displayed.	
[Mode] Wh+A+4 Harmonics	5-4 Push the [▲] or [▼] key, and select the measurement mode. 5-5 Push the [↵/Phase] key, and determine the setting. 5-6 Change the next transition from the selection of measurement mode. When selecting “Wh+A+4” → To 5-7 When selecting “Harmonics” → To 5-12	*Wh+A+4*…In addition to the active energy and current, up to 4 items can be displayed by selection. (The harmonics data is only about total.) *Harmonics*…It can display about harmonic data at each order.
[Element] ☑V ☐W ☐var ☐PF ☐Hz ☐varh ☐Simple DM ☐HA ☐HV ▲▼	5-7 Push the [▲] or [▼] key, and focus the cursor to target element. 5-8 Push the [+] or [−] key, and change the “☐" or “☑“. 5-9 When selecting the other measurement item, repeat the operation from 5-7 to 5-8. 5-10 Push the [↵/Phase] key, and determine the setting. 5-11 Change the next transition from the selection of measuring element. Not check “HA” and “HV” → Return to the measure setup menu Check “HA” or “HV” → To 5-12	*☐(Selected), ☑(Deselected)* V … Voltage W… Active power var…Reactive power PF…Power factor Hz…Frequency varh…Reactive energy Simple DM…Demand of active power HA…Harmonic current HV…Harmonic voltage *The selectable number of elements is up to 4. So, change the selection at the state that already 4 items are selected, deselect the items before changing.
[HA,HV] r.m.s.	5-12 Push the [+] or [−] key, and change the setting. 5-13 Push the [↵/Phase] key, and determine the setting. 5-14 Return to the measure setup menu screen. 5-15 When setup the other circuits, select the circuit by [Circuit] key, and repeat the operation from 5-1 to 5-14.	*RMS* …Display the RMS value of harmonic current or harmonic voltage. *%* …Display the distortion rate and content rate of harmonic current or harmonic voltage.

6 Setup the demand time		
Screen	Operation	Note
	6-1 Push the [▲] or [▼] key, focus the cursor to “5 Demand” 6-2 Push the [↵/Phase] key. 6-3 Setup screen for demand time will be displayed.	Setting range is as follows. *0sec, 10sec, 20sec, 30sec, 40sec, 50sec, 1min, 2min, 3min, 4min, 5min, 6min, 7min, 8min, 9min, 10min, 11min, 12min, 13min, 14min, 15min, 20min, 25min, 30min*
	6-4 Push the [▲] or [▼] key, and focus the cursor to “A” side. 6-5 Push the [+] or [−] key, and change the demand time of current. 6-6 Push the [▲] or [▼] key, and focus the cursor to “W” side. 6-7 Push the [+] or [−] key, and change the demand time of active power. 6-8 Push the [↵/Phase] key, and determine the setting. 6-9 Return to the measure setup menu screen. 6-10 When setup the other circuits, select the circuit by [Circuit] key, and repeat the operation from 6-1 to 6-9.	

7 Save the settings		
Screen	Operation	Note
	7-1 After setting all of the items, push the [Setup] key. 7-2 Setup exit menu will be displayed. 7-3 When save the settings, focus the cursor to “1 Save” by pushing the [▲] or [▼] key and push the [↵/Phase] key. Following action differs according to the model. EMU2-D65 →To 7-6 EMU2-D65-M →To 7-4 7-4 Since it will be displayed confirmation screen of logging data erasing, focus the cursor to “OK” by pushing the [▲] or [▼] key and push the [↵/Phase] key. 7-5 Since if will be displayed confirmation screen after completing the settings saving, push the [↵/Phase] key. 7-6 Return to the operation mode, and it will be displayed active energy screen.	1 Save →Save settings and return to the operation mode. 2 Not Save →Discard the changes and return to the operation mode. 3 Cancel →Continue the setup. *Confirmation screen of logging data erasing will be not displayed by changes of setting.

*Full load is calculated by following formula.

(Full load)＝(Primary voltage) x (Primary current) x (Coefficient) / 1000[kW]

*1: In case 3P4W, apply the not phase voltage but line voltage as primary voltage.

*2: Coefficient is varies according to the phase wire system.

1P2W →1

3P3W/3P4W →1.73

*The primary voltage and primary current must be set to ensure that the product of primary voltage setting and primary current setting does not exceed 88665 kW. For example, if the primary current is set to 30,000 A when the primary voltage setting is 110,000 V, the primary voltage setting is automatically initialized to 220 V. If the primary voltage is set to 110,000 V when the primary current setting is 30,000 A, the primary current setting is automatically initialized to 100 A.

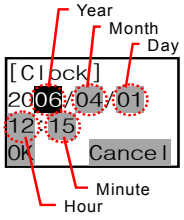
* If change a settings, please push the [↵/Phase] key and be sure to determine changes. If without determine, the changes will be discarded.

*The underline means the default of setting.

*When change the settings, other setting or measured data may be initialized. (☛See 5.6 Intialize of setting value)

5.4.3 Clock setup … Setup the clock.

1 Transition to the setup mode		
Screen	Operation	Note
(EMU2-D65) [Setup] 1 Measure 2 Clock 0 Display (EMU2-D65-M) [Setup] 1 Measure 2 Logging 3 Clock ▼	1-1 Push the [Setup] key in operation mode. 1-2 Setup menu will be displayed.	

2 Clock setup		
Screen	Operation	Note
(EMU2-D65) [Setup] 1 Measure 2 Clock 0 Display (EMU2-D65-M) [Setup] 1 Measure 2 Logging 3 Clock ▲▼	2-1 Focus the cursor to “Clock” by pushing the [▲] or [▼] key. 2-2 Push the [↵/Phase] key. 2-3 Following action differs according to the model. EMU2-D65 →To 2-7 EMU2-D65-M →To 2-4	Year : *2000~2099* Month : *01~12* Day : *01~31* Hour : *00~23* *Minute* : *00~59* The screen layout of clock setup is as follows. 
(EMU2-D65-M) [Clock] 1 Download 2 Upload 0 back	2-4 Push the [▲] or [▼] key, focus the cursor to “1 Download” 2-5 Push the [↵/Phase] key. 2-3 Clock setup screen for clock will be displayed	
(EMU2-D65) [Clock] 2006/04/01 12:15 OK Cancel (EMU2-D65-M) [Download] 2006/04/01 12:15 OK Cancel ↓ Logging data will be cleared. OK Cancel ↓ Now saving..	2-7 Push the [▲] or [▼] key, and focus the cursor to the position of year. 2-8 Push the [+] or [−] key, and change the year. 2-9 Push the [▼] key, and focus the cursor to the position of month. 2-10 Push the [+] or [−] key, and change the month. 2-11 In a similar way, set the day, hour and minute. 2-12 Focus the cursor to “OK” by pushing the [▲] or [▼] key and push the [↵/Phase] key. Following action differs according to the model. EMU2-D65 →To 2-14 EMU2-D65-M →To 2-13 2-13 Since it will be displayed confirmation screen of logging data erasing, focus the cursor to “OK” by pushing the [▲] or [▼] key and push the [↵/Phase] key. 2-14 Clock setup menu will be displayed after completing the settings saving.	<In case the model: EMU2-D65> Note1: It becomes “00” second when the timing of pushing the [↵/Phase] key at the clock setup screen. <In case the model: EMU2-D65-M> Note1: It becomes “00” second when the timing of pushing the [↵/Phase] key at the confirmation screen of logging data erasing. **Note2: If carrying out the clock setup, logging data will be erased.**

3 Ajust the clock of logging display unit to the clock of energy measuring unit (Only for the model: EMU2-D65-M)

Screen	Operation	Note
[Setup] 1 Measure 2 Logging 3 Clock ▲▼	3-1 Push the [▲] or [▼] key, and focus the cursor to “3 Clock”. 3-2 Push the [↵/Phase] key. 3-3 Clock setup menu will be displayed.	Year : *2000~2099* Month : *01~12* Day : *01~31* Hour : *00~23* Minite : *00~59*
[Clock] 1 Download 2 Upload 0 back	3-4 Focus the cursor to “2 Upload” by pushing the [▲] or [▼] key. 3-5 Push the [↵/Phase] key. 3-6 It will be displayed confirmation screen of logging data erasing.	
Logging data will be cleared. OK Cancel ↓ Now saving.. ↓ Completed OK	3-7 Push the [↵/Phase] key after focusing the curosor to “OK” by pushing the [▲] or [▼] key, and the adjustment will be carried out. 3-8 Since if will be displayed confirmation screen after completing the settings saving, push the [↵/Phase] key. 3-9 Clock setup menu will be displayed.	

4 Exit from the setup mode

Screen	Operation	Note
[Quit Setup] 1 Save 2 Not Save 3 Cancel	4-1 Push the [Setup] key. 4-2 Focus the cursor to the “2 Not Save” by pushing the [▲] or [▼] key, and push the [↵/Phase] key. 4-3 Return to the operation mode, and it will be displayed active energy screen.	

5.4.4 Display setup … Setup about display such as LCD contrast or backlight lighting pattern.

1 Transit to the setup mode		
Screen	Operation	Note
(EMU2-D65) [Setup] 1 Measure 2 Clock 3 Display ▲ (EMU2-D65-M) [Setup] 2 Logging 3 Clock 4 Display ▲	1-1 Push the [Setup] key in operation mode. 1-2 Setup menu will be displayed. 1-3 Push the [▲] or [▼] key, and focus the cursor to “Display”. 1-4 Push the [↵/Phase] key. 1-5 Display setup menu will be displayed.	

2 Setup for the LCD contrast		
Screen	Operation	Note
[Display] 1 Contrast 2 Backlight 0 Back	2-1 Push the [▲] or [▼] key, and focus the cursor to “1 Contrast”. 2-2 Push the [↵/Phase] key. 2-3 The LCD contrast setup screen will be displayed.	The contrast of LCD can set in eight steps. Default setting is 4th dark.
[Contrast] −■■■■□□□□+	2-4 Adjust the contrast by pushing the [+] (Dark) or [−] (Light) key. 2-5 Push the [↵/Phase] key when easily viewable. 2-6 Display setup menu will be displayed.	−■■■□□□□□+ ← [−] (Light) −■■■■■□□□+ → [+] (Dark)

3 Setup for the backlight lighting method		
Screen	Operation	Note
[Display] 1 Contrast 2 Backlight 0 Back	3-1 Push the [▲] or [▼] key, and focus the cursor to “2 Backlight”. 3-2 Push the [↵/Phase] key. 3-3 The setup screen for backlight lighting method will be displayed.	*Auto OFF*: If 5 minute has passed since the last key operation, backlight will be OFF automatically. There are any key operation, backlight wll be lighted again. ***Always ON***: Backlight is always lighted.
[Backlight] Auto OFF Always ON	3-4 Choose the backlight lighting method by pushing the [▲] or [▼] key. 3-5 Push the [↵/Phase] key after choosing 3-6 Display setup menu will be displayed.	

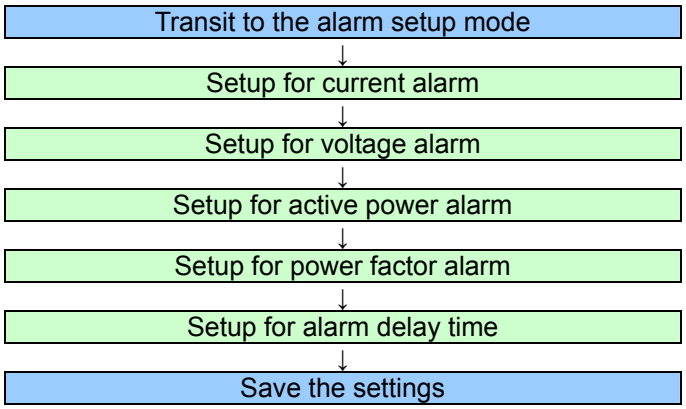
4 Save the settings		
Screen	Operation	Note
[Quit Setup] 1 Save 2 Not Save 3 Cancel ↓ Now saving.. ↓ Completed OK	4-1 After setting all of the items, push the [Setup] key. 4-2 Setup exit menu will be displayed. 4-3 When save the settings, focus the cursor to “1 Save” by pushing the [▲] or [▼] key and push the [↵/Phase] key. 4-5 Since if will be displayed confirmation screen after completing the settings saving, push the [↵/Phase] key. 4-6 Return to the alarm mode, and it will be displayed alarm status screen.	1 Save →Save settings and return to the operation mode. 2 Not Save →Discard the changes and return to the operation mode. 3 Cancel →Continue the setup.

* If change a settings, please push the [↵/Phase] key and be sure to determine changes. If without determine, the changes will be discarded.
*The underline means the default of setting.

5.5 Setup about alarm (Alarm Setup mode)

5.5.1 Setup flow

Setup about the surveillance condition of upper and lower alarm.



5.5.2 Setup about the surveillance condition of upper and lower alarm

1 Transit to the alarm setup mode		
Screen	Operation	Note
[Alarm Set.] 1 Limit 2 Vsag 3 Breaker	1-1 Push the [Setup] key in alarm mode. 1-2 Alarm setup menu will be displayed.	
	1-3 Confirm that the cursor focuses the “1 Limit”, and push the [↵/Phase] key. 1-4 Limit alarm setup menu will be displayed.	

2 Setup for current alarm		
Screen	Operation	Note
[Limit] 1 A Limit 2 V Limit 3 W Limit ▼	2-1 Push the [▲] or [▼] key, and focus the cursor to “1 A Limit”. 2-2 Push the [↵/Phase] key. 2-3 Setup screen for current alarm condition will be displayed.	Alarm surveillance is ☐ …*not carried out* ☑ …*carried out*
☑A Upper 30000 A ☐A Lower 00300 A	2-4 Push the [▲] or [▼] key, and focus the cursor to checkbox of ”A Uppper”. 2-5 Push the [+] or [−] key, and change the setting. (Check or uncheck) 2-6 If check the box, push the [▲] or [▼] key, and set the upper value. 2-7 In a similar way, set the lower alarm setting. 2-8 Push the [↵/Phase] key, and determine the setting. 2-9 Limit alarm setup menu will be displayed. 2-10 When setup the other circuits, select the circuit by [Circuit] key, and repeat the operation from 2-1 to 2-9.	*0A ~ (Primary current)A* <Default> Upper: ***Primary current*** Lower: ***0*** *The minimum unit of settable value is varies by primary current. 5A～30A Step: 0.01A 40A～300A Step: 0.1A 400A～3000A Step: 1A 4000A～30000A Step: 10A

3 Setup for voltage alarm		
Screen	Operation	Note
[Limit] 1 A Limit 2 V Limit 3 W Limit ▲▼	3-1 Push the [▲] or [▼] key, and focus the cursor to “2 V Limit”. 3-2 Push the [↵/Phase] key. 3-3 Setup screen for voltage alarm condition will be displayed.	Alarm surveillance is ☐ …*not carried out* ☑ …*carried out*
☐V Upper 2200 V ☑V Lower 0200 V	3-4 In a similar way as 2-4~2-10, set the alarm condition of voltage.	*0V ~ (Primary voltage x 15/11)V* <Default> Upper: ***Primary voltage x 15/11*** Lower: ***0*** *The minimum unit of settable value is varies by primary voltage. Fewer than 440V Step: 0.1V 440V~2200V Step: 1V 3300V~110000V Step: 10V

- ●Voltage alarm surveillance monitors not phase voltage but line voltage”.
- ●In case of the model EMU2-RD*-*-4W, settings about voltage suverillance is common for circuit1 and circuit2, or circuit3 and circuit4. Please setup about not even number circuits (Circuit 2, Circuit 4) but odd number circuits (Circuit 1, Circuit 3). The settings about even number circuit are avoided.

4 Setup for active power alarm		
Screen	Operation	Note
[Limit] 1 A Limit 2 V Limit 3 W Limit ▲▼	4-1 Push the [▲] or [▼] key, and focus the cursor to "3 W Limit". 4-2 Push the [↵/Phase] key. 4-3 Setup screen for active power alarm condition will be displayed.	Alarm surveillance is ☐ *…not carried out* ☑ *…carried out*
☑W Upper 11410 x10^2kW ☑W Lower 00114 x10^2kW	4-4 In a similar way as 2-4~2-10, set the alarm condition of active power.	*0W ~ (Full load)W* <Default> Upper: ***Full load*** Lower: ***0*** *The minimum unit of settable value is varies by full load(W_{full}). W_{full}<12kW Step: 0.001kW 12kW ≤ W_{full} < 120kW Step: 0.01kW 120kW ≤ W_{full} < 1200kW Step: 0.1kW 1200kW ≤ W_{full} < 12000kW Step: 1kW 12000kW ≤ W_{full} < 120000kW Step: 10kW 120000kW ≤ W_{full} Step: 100kW

*Full load is calculated by following formula.

(Full load)＝(Primary voltage) x (Primary current) x (Coefficient) / 1000[kW]

*1: In case 3P4W, apply the not phase voltage but line voltage as primary voltage.

*2: Coefficient is varies according to the phase wire system.

1P2W →1

3P3W/3P4W →1.73

5 Setup for power factor alarm		
Screen	Operation	Note
[Limit] 2 V Limit 3 W Limit 4 PF Limit ▲▼	5-1 Push the [▲] or [▼] key, and focus the cursor to "4 PF Limit". 5-2 Push the [↵/Phase] key. 5-3 Setup screen for power factor alarm condition will be displayed.	Alarm surveillance is ☐ *…not carried out* ☑ *…carried out*
☑PF Upper 0.500 ☑PF Lower −0.500	5-4 In a similar way as 2-4~2-10, set the alarm condition of power factor.	*−0.500(LEAD) ~ −0.950,* *1. 000, 0.950 ~ 0.500(LAG)* Step: 0.050 <Default> Upper: ***−0.500(LEAD)*** Lower: ***0.500 (LAG)***

6 Setup for alarm delay time		
Screen	Operation	Note
[Limit] 3 W Limit 4 PF Limit 5 Delay ▲▼	6-1 Push the [▲] or [▼] key, and focus the cursor to "5 Delay". 6-2 Push the [↵/Phase] key. 6-3 Setup screen for alarm delay time will be displayed.	*0sec, 5sec, **10sec**, 20sec, 30sec, 40sec, 50sec, 1min, 2min, 3min, 4min, 5min*
[Delay] 10sec	6-4 Push the [+] or [−] key, and change the setting. 6-5 Push the [↵/Phase] key, and determine the setting. 6-6 Limit alarm setup menu will be displayed. 6-7 When setup the other circuits, select the circuit by [Circuit] key, and repeat the operation from 6-1 to 6-6.	

●In case of the model EMU2-RD*-*-4W, settings about voltage suverillance is common for circuit1 and circuit2, or circuit3 and circuit4. Please setup about not even number circuits (Circuit 2, Circuit 4) but odd number circuits (Circuit 1, Circuit 3). The settings about even number circuit are avoided.

7 Save the settings		
Screen	Operation	Note
[Quit Setup] 1 Save 2 Not Save 3 Cancel	7-1 After setting all of the items, push the [Setup] key. 7-2 Setup screen for measurement mode will be displayed. 7-3 When save the settings, focus the cursor to "1 Save" by pushing the [▲] or [▼] key and push the [↵/Phase] key. 7-5 Since if will be displayed confirmation screen after completing the settings saving, push the [↵/Phase] key. 7-6 Return to the alarm mode, and it will be displayed alarm status screen.	1 Save →Save settings and return to the operation mode. 2 Not Save →Discard the changes and return to the operation mode. 3 Cancel →Continue the setup.

* If change a settings, please push the [↵/Phase] key and be sure to determine changes. If without determine, the changes will be discarded.
*The underline means the default of setting.
*When change the settings, other setting or measured data may be initialized. (☛See 5.6 Intialize of setting value)

5.6 Initialize of setting value

When changing the setting, the other settings are initialized following below table. Please resetup the initialized settings.

	Change item / Initialized Item	Phase Wire	Sensor type	V Rate	A Rate	Demand Time		Alarm setting				Measure Mode	Logging	Clock
						A	W	A	V	W	PF			
Setting data	Sensor type	Initialize												
	V rate	Initialize			Note1									
	A rate	Initialize	Initialize	Note1										
	Demand time													
	A Upper/Lower	Initialize	Initialize		Initialize									
	V Upper/Lower	Initialize		Initialize										
	W Upper/Lower	Initialize	Initialize	Initialize	Initialize									
	PF Upper/Lower													
	Alarm delay time													
	Loggging	Initialize										Initialize	Initialize	
Measurement data	Alarm (A)	Initialize	Initialize		Initialize			Initialize						
	Alarm (V)	Initialize		Initialize					Initialize					
	Alarm (W)	Initialize	Initialize	Initialize	Initialize					Initialize				
	Alarm (PF)	Initialize	Initialize	Initialize	Initialize						Initialize			
	Current (instantaneous)	Initialize	Initialize		Initialize									
	Current (Demand)	Initialize	Initialize		Initialize	Initialize								
	Voltage	Initialize		Initialize										
	Active power (instantaneous)	Initialize	Initialize	Initialize	Initialize									
	Active power (demand)	Initialize	Initialize	Initialize	Initialize		Initialize	Initialize						
	Power Factor	Initialize	Initialize	Initialize	Initialize									
	Reactive power	Initialize	Initialize	Initialize	Initialize									
	Frequency	Initialize												
	Harmonics current	Initialize	Initialize		Initialize									
	Harmonics voltage	Initialize		Initialize										
	Demand power	Initialize	Initialize	Initialize	Initialize									Note2
	Active energy													
	Reactive energy													
	Logging data	Initialize										Initialize	Initialize	Initialize

Note1: The primary voltage and primary current must be set to ensure that the product of primary voltage setting and primary current setting does not exceed 88665 kW. For example, if the primary current is set to 30,000 A when the primary voltage setting is 110,000 V, the primary voltage setting is automatically initialized to 220 V. If the primary voltage is set to 110,000 V when the primary current setting is 30,000 A, the primary current setting is automatically initialized to 100 A.

Note2: It is initialized only by the change over the demand interval (30min). It will not be initialized if it is in the same demand interval.

5.7 Reset the measured data / Set the value of Active energy Reactive energy (Reset/Set mode)

5.7.1 Reset the measured data.

1 Transit to the Reset/Set mode		
Screen	Operation	Note
[Reset/Set] 1 Reset 2 Set	1-1 Push the [Reset/Set] key in operation mode. 1-2 Reset/set menu screen will be displayed. 1-3 Push the [▲] or [▼] key, and focus the cursor to “1 Reset”. 1-4 Push the [↵/Phase] key. 1-5 Data reset screen will be displayed.	*When cancel the resetting, push the [Reset/Set] key. All of the operations in Reset/Set mode will be canceled, and return to the operation mode.

2 Select the items to reset		
Screen	Operation	Note
[Reset] ☑Max•Min ☐AL(Limit) ☐AL(Vsag) ☐Wh,varh ☐Logging	2-1 Select the target circuit by pushing the [Circuit] key. (The LED of selected cuircuit is lighted on.) 2-2 Focus the cursor to the taget item by pushing the [▲] or [▼] key. 2-3 Check the box by pressing the [+] or [−] key. 2-4 Repeat the operations as 2-2 and 2-3, and check the all of the boxes to reset.	*When cancel the resetting, push the [Reset/Set] key. All of the operations in Reset/Set mode will be canceled, and return to the operation mode.

3 Carry out resetting		
Screen	Operation	Note
Do you really execute? OK Cancel ↓ Completed OK	3-1 After checking all of the items to reset, push the [↵/Phase] key. 3-2 Since it will be displayed confirmation screen of carrying out the reset, focus the cursor to “OK” by pushing the [▲] or [▼] key and push the [↵/Phase] key. (If choosing the ”Cancel”, return to the data reset screen.) 3-3 Resetting the selected data is carried out. 3-4 Since if will be displayed confirmation screen after completing the resetting, push the [↵/Phase] key. 3-5 Return to the operation mode, and it will be displayed active energy screen.	*When cancel the resetting, push the [Reset/Set] key. All of the operations in Reset/Set mode will be canceled, and return to the operation mode.

5.7.2 Set the value of Active energy or Reactive energy

1 Transit to the Reset/Set mode		
Screen	Operation	Note
[Reset/Set] 1 Reset 2 Set	1-1 Push the [Reset/Set] key in operation mode. 1-2 Reset/set menu screen will be displayed. 1-3 Push the [▲] or [▼] key, and focus the cursor to “2 Set”. 1-4 Push the [↵/Phase] key. 1-5 Data set menu will be displayed.	*When cancel the setting, push the [Reset/Set] key. All of the operations in Reset/Set mode will be canceled, and return to the operation mode.

2 Set the active energy value		
Screen	Operation	Note
[Set] 1 Wh 2 varh	2-1 Select the target circuit by pushing the [Circuit] key. (The LED of selected cuircuit is lighted on.) 2-2 Focus the cursor to the “1 Wh” by pushing the [▲] or [▼] key. 2-3 Press the [↵/Phase] key. 2-4 The screen of setting for active energy will be displayed. (The value of active energy at that time will be displayed.)	*When cancel the setting, push the [Reset/Set] key. All of the operations in Reset/Set mode will be canceled, and return to the operation mode.
[Wh] 523719 x10^{3}kWh	2-5 Push the [▲] or [▼] key, and move the cursor to the target didit to change. 2-6 Push the [+] or [−] key, and change the value. 2-7 Repeat the operations as 2-5 and 2-6, and change all of the didists. 2-8 After change all of the didits, push the [↵/Phase] key. 2-9 Confirmation screen of carrying out the setting will be displayed.	*When cancel the setting, push the [Reset/Set] key. All of the operations in Reset/Set mode will be canceled, and return to the operation mode.
Do you really execute? OK Cancel	2-10 Focus the cursor to the “OK” by pushing the [▲] key, and push the [↵/Phase] key. (If choosing the ”Cancel”, return to the operation mode.) 2-11 Setting is carried out. 2-12 Since if will be displayed confirmation screen after completing the setting, push the [↵/Phase] key. 2-13 Return to the operation mode, and it will be displayed active energy screen.	

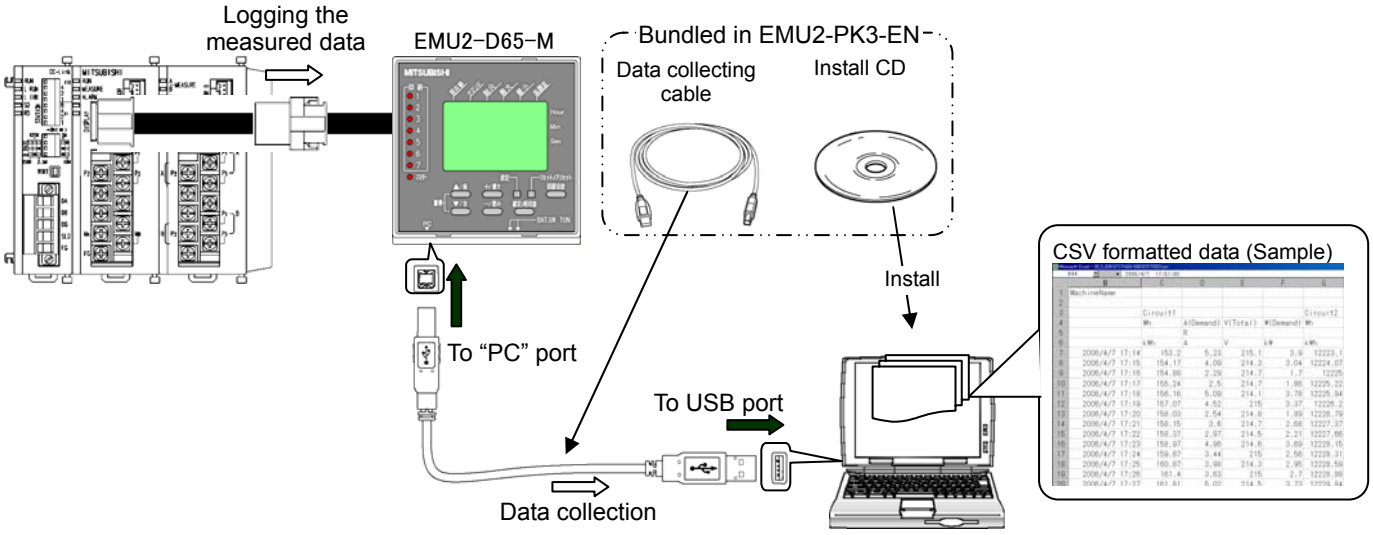
3 Set the reactive energy value		
Screen	Operation	Note
[Set] 1 Wh 2 varh	3-1 Select the target circuit by pushing the [Circuit] key. (The LED of selected cuircuit is lighted on.) 3-2 Focus the cursor to the “2 varh” by pushing the [▲] or [▼] key. 3-3 Press the [↵/Phase] key. 3-4 The screen of setting for active energy will be displayed. (The value of reactive energy at that time will be displayed.)	*When cancel the setting, push the [Reset/Set] key. All of the operations in Reset/Set mode will be canceled, and return to the operation mode.
[Wh] 001927 kvarh	3-5 Push the [▲] or [▼] key, and move the cursor to the target didit to change. 3-6 Push the [+] or [−] key, and change the value. 3-7 Repeat the operations as 2-5 and 2-6, and change all of the didists. 3-8 After change all of the didits, push the [↵/Phase] key. 3-9 Confirmation screen of carrying out the setting will be displayed.	*When cancel the setting, push the [Reset/Set] key. All of the operations in Reset/Set mode will be canceled, and return to the operation mode.
Do you really execute? OK Cancel	3-10 Focus the cursor to the “OK” by pushing the [▲] key, and push the [↵/Phase] key. (If choosing the ”Cancel”, return to the operation mode.) 3-11 Setting is carried out. 3-12 Since if will be displayed confirmation screen after completing the setting, push the [↵/Phase] key. 3-13 Return to the operation mode, and it will be displayed active energy screen.	

5.8 Data logging (Only for the model: EMU2-D65-M)

*Only logging display unit (model: EMU2-D65-M) have a logging function. Display unit (model: EMU2-D65) does not have loggin function.
*PC kit (model: EMU2-PK3-EN; optional) is necessary for collecting or viewing the logging data.

5.8.1 Introduction

EMU-D65-M can store up to 4 data (Active energy + other 3 elements) displayed on screen.
Logging data can collect to PC by optional PC kit, and save as CSV format file. Please see the manual of PC kit about the method of data collecting.



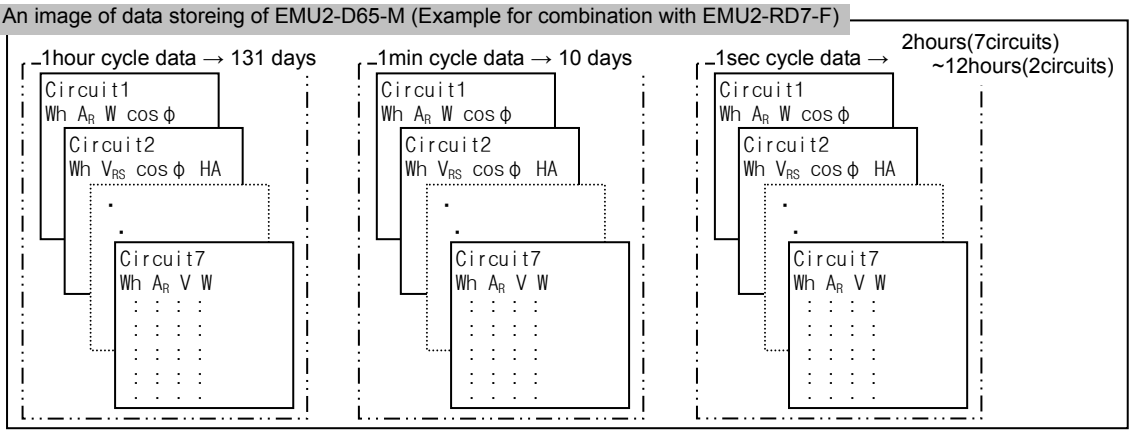
EMU2-D65-M can memory 1hour cycle, 1minute cycle data, and 1hour cycle data at the same time.
Following table shows the maximum logging period.

EcoMonitorPro (Mode)	1sec cycle data	1min cycle data	1hour cycle data
EMU2-RD2-F-4W EMU2-RD2-C-4W	12 hours	10 days	131 days
EMU2-RD3-F EMU2-RD3-C			
EMU2-RD4-F-4W EMU2-RD4-C-4W	4 hours		
EMU2-RD5-F EMU2-RD5-C			
EMU2-RD7-F EMU2-RD7-C	2 hours		

*Maximum logging period is fixd not varies by the number of logging elements.
*The logging span of 1second cycle data is varies by the connected energy measuring unit.

It is possible to log the different elements by each circuit. However, logging elements is in common among 1hour cycle data, 1minute cycle data and 1second cycle data.

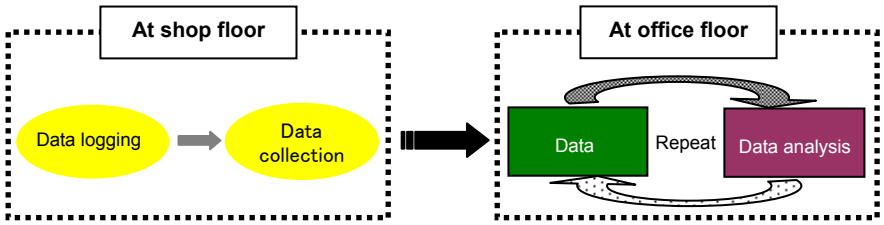
An image of data storeing of EMU2-D65-M (Example for combination with EMU2-RD7-F)



It is necessary to repeat action and affirmation of effects for energy saving activities. (Example: Design for operating condition of production facility)

The data of the 1 hour cycle, 1 minute cycle and a 1 second cycle are useful for the finding out of action and cofirming the effect by processing and analysis the data.

Examples of how the logging data is used



1hour cycle data	1minute cycle data	1second cycle data
●Analysis by each hours Analaysis according to work shift As hourly management	●Anaysis energy usage Daily, weekly, monthly report: Hourly energy usage Detailed analysis: Evely 5 or 1 minites energy usage	●Operation analysis of equipment (Process improvement) The change of current every 10 seconds, the change of current every 1 second

For example, follwing usage is possible

Analyzing of energy usage by each hours

Example: In case of 3-Shift work
How the energy efficiency at each shift"

Shift1 (Timezone 1): 08:00~16:00
Shift2 (Timezone 2): 16:00~00:00
Shift3 (Timezone 3): 00:00~08:00
Rest time (Timezone 4): 12:00,20:00,4:00

↓

Inefficient in Shift2!!

↓

Analyzing of enegy usage

↓

Investigations into the causes→Improvement

Analyzing of enegy usage by various cycle.

Data processing — Look hourly data! (Interval: 1hour)

↓

Data analysis — The usage of Oct. 10th 13:00~14:00 is very large!

↓

Data processing — Analysis more in detail (Interval: 5 minutes)

↓

Data analysis — Abnormal between 13:25~13:30! What's happen at that time?

↓

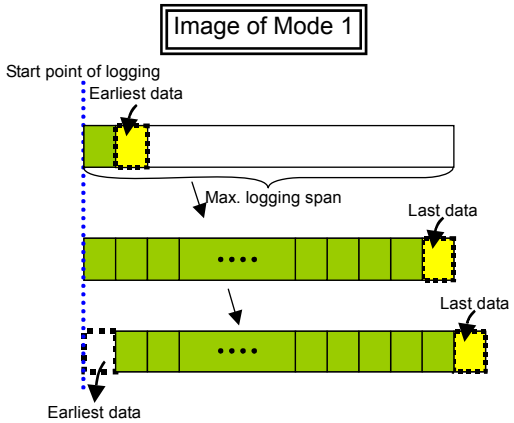
Investigations into the causes→Improvement

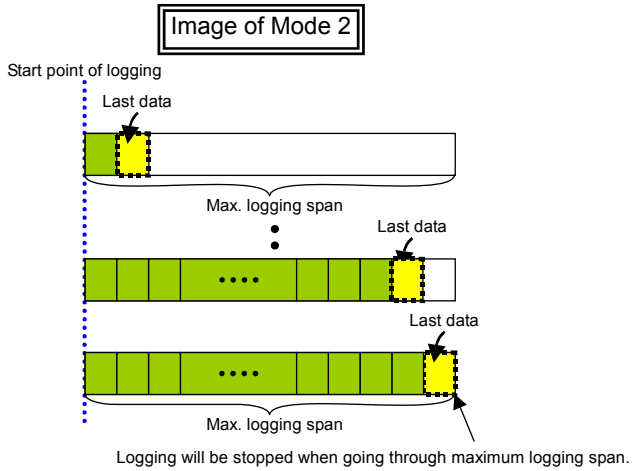
Logging mode

It can select 2 logging mode about 1 second cycle and 1 minute cycle data.

- •Mode1: When going through the maximum of looging span, the logging data is overwrited from the earliest data.
- •Mode2: The data storing will be started at starting date (setting). When going through the maximum of looging span, the logging will be stopped.

The 1 hour cycle data is stored always as "Mode 1"





5.8.2 Setup logging condition… Setup for logging condition

1 Transit to the setup mode		
Screen	Operation	Note
(EMU2-D65-M) [Setup] 1 Measure 2 Logging 0 Clock ▼	1-1 Push the [Setup] key in operation mode. 1-2 Setup menu will be displayed. 1-3 Focus the cursor to “2 Logging” by pushing the [▲] or [▼] key, and push the [↵/Phase] key. 1-4 Logging setup menu will be displayed.	

2 Setup for logging elements		
Screen	Operation	Note
[Logging] 1 Log data 2 Log mode 0 Back	2-1 Push the [▲] or [▼] key, and focus the cursor to “1 Log data”. 2-2 Push the [↵/Phase] key. 2-3 Logging elements list will be displayed.	
[Log data] 1 A_R 2 W(DM) 3 PF ▼	2-4 Focus the corsor to the target number (1~3) by pushing the [▲] or [▼] key 2-5 Push the [↵/Phase] key. 2-6 Logging element setting screen will be displayed.	
[Element1] ◉A ○V ○W ○var ○PF ○Hz ○varh ○HA ○HV ○Io ○Hlo ○Not Set ▲▼	2-7 Push the [▲] or [▼] key, and focus the cursor to the target elemet. 2-8 Push the [↵/Phase] key.	

When selected Current (A), Voltage (V), Active power (W), Harmonic current (HA) or Harmonic voltage (HV), more detailed setting screen will be displayed.

Set as follows operation on detailed setting screen.

1 Focus the corsor to the target by pushing the [▲] or [▼] key
2 Push the [+] or [−] key, and change the value.
3 Confirm the settings by pushing the [↵/Phase] key.

Screen	Selectable list
When selecting the active power (W) [W] Present	*Present, Demand*

*When setted “3P4W” as phase and wire system, please identify “R-S” as “R-N”, “S-T” as “S-N”, “T-R” as “T-N”.

Screen	Selectable list
When selecting the current (A) [A] Present R	*Selectable list varies by the setting of phase wire system.*

Phase wire	Type	Phase
1P2W	*Present*	*R, Total*
	Demand	*R*
3P3W	*Present*	*R, S, T, Total*
	Demand	*R, S, T*
3P4W	*Present*	*R, S, T, N, Total*
	Demand	*R, S, T, N*

When selecting the voltage (V)

[V]
R-S

*Selectable list varies by the setting of phase wire system.

Phase wire	Phase
1P2W	*R-S, Total*
1P3W, 3P3W	*R-S, S-T, T-R, Total*
3P4W	*R-S, S-T, T-R, R-N, S-N, T-N, Total*

When selecting the harmonic current (HA)

[HA]
r.m.s.
R
1st

*Selectable list varies by the setting of phase wire system.

Phase wire	Phase	Order
1P2W	*R*	*1st, 3rd, 5th, 7th, 9th, 11th, 13th, Total*
1P3W, 3P3W	*R, T*	
3P4W	*R, S, T*	

When selecting the harmonic voltage (HV)

[HV]
%
R-S
3rd

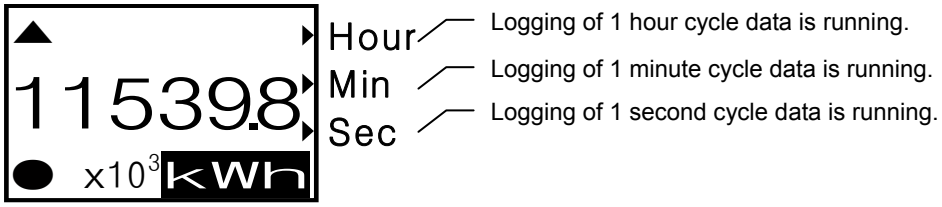
*Selectable list varies by the setting of phase wire system.

Phase wire	Phase	Order
1P2W	*R-S*	*1st, 3rd, 5th, 7th, 9th, 11th, 13th, Total*
1P3W, 3P3W	*R-S, S-T*	
3P4W	*R-S, S-T, T-R*	

3 Setup for logging mode		
Screen	Operation	Note
[Logging] 1 Log data 2 Log mode 0 Back	3-1 Push the [▲] or [▼] key, and focus the cursor to “2 Log mode”. 3-2 Push the [↵/Phase] key. 3-3 Logging mode menu will be displayed.	
[Log mode] 1 1sec data 2 1min data 0 Back	3-4 Push the [▲] or [▼] key, and focus the cursor to the target element. 3-5 Push the [↵/Phase] key. 3-6 Logging mode setup screen will be displayed.	
[1sec data] Mode1 Mode2 [1min data] Mode1 Mode2	3-7 Select the logging mode by pushing the [▲] or [▼] key. 3-8 Confirm the setting by pushing the [↵/Phase] key. 3-9 When selected “Mode1”: Return to the logging mode menu. When selected “Mode2”: Start date setup screen will be displayed.	*Mode1*: When going through the maximum of looging span, the logging data is overwrited from the earliest data. *Mode2*: The data storing will be started at starting date (setting). When going through the maximum of looging span, the logging will be stopped.
[Start] 2006/04/01 15:00 OK	3-10 Push the [▲] or [▼] key, and focus the cursor to the position of year. 3-11 Push the [+] or [−] key, and change the year. 3-12 Push the [▼] key, and focus the cursor to the position of month. 3-13 Push the [+] or [−] key, and change the month. 3-14 In a similar way, set the day, hour and minute. 3-15 Focus the cursor to “OK” by pushing the [▲] or [▼] key and push the [↵/Phase] key. 3-16 Logging mode setup screen will be displayed.	Year: *2000~2099* Month: *01~12* Day: *01~31* Hour: *00~23* Second: *00~59*

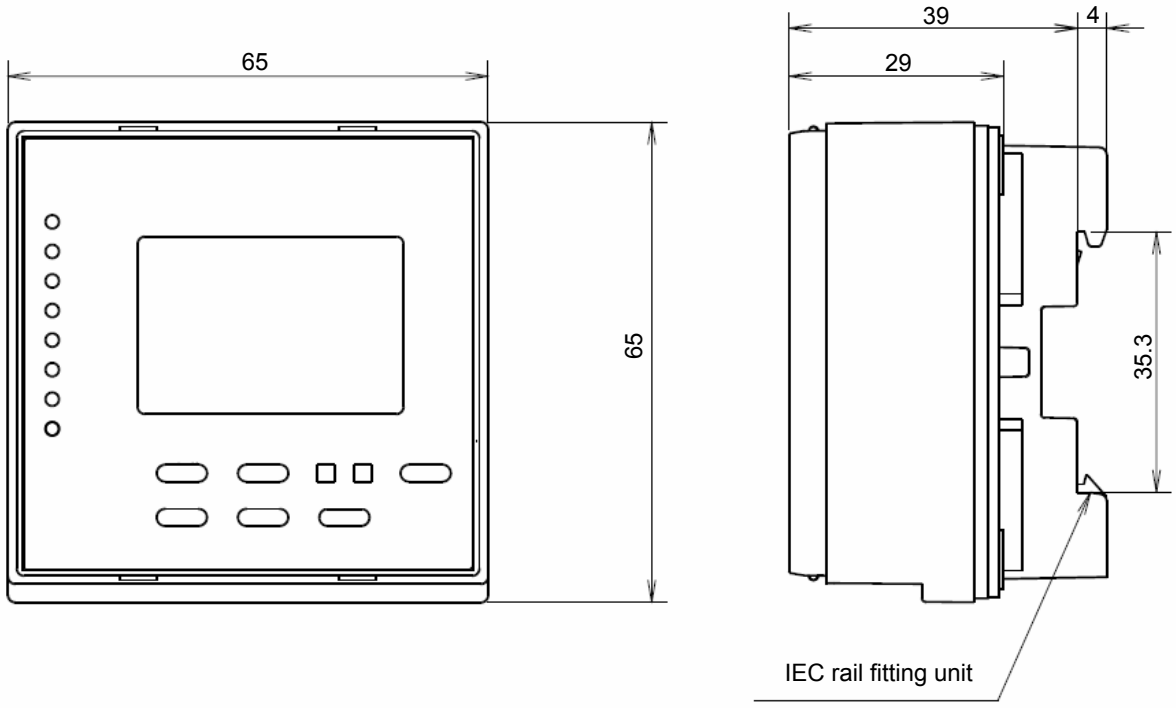
4 Save the settings		
Screen	Operation	Note
[Quit Setup] 1 Save 2 Not Save 3 Cancel ↓ Logging data will be cleared. OK Cancel ↓ Now saving.. ↓ Completed OK	4-1 After setting all of the items, push the [Setup] key. 4-2 Setup exit menu will be displayed. 4-3 When save the settings, focus the cursor to “1 Save” by pushing the [▲] or [▼] key and push the [↵/Phase] key. Following action differs according to the model. EMU2-D65 →To 4-6 EMU2-D65-M →To 4-4 4-4 Since it will be displayed confirmation screen of logging data erasing, focus the cursor to “OK” by pushing the [▲] or [▼] key and push the [↵/Phase] key. 4-5 Since if will be displayed confirmation screen after completing the settings saving, push the [↵/Phase] key. 4-6 Return to the operation mode, and it will be displayed active energy screen.	1 Save →Save settings and return to the operation mode. 2 Not Save →Discard the changes and return to the operation mode. 3 Cancel →Continue the setup. *Confirmation screen of logging data erasing will be not displayed by changes of setting.

*If logging operation starts, the mark “►” is displayed at the right bottom of a LCD screen. If logging operation stops, the mark will disappear automatically.



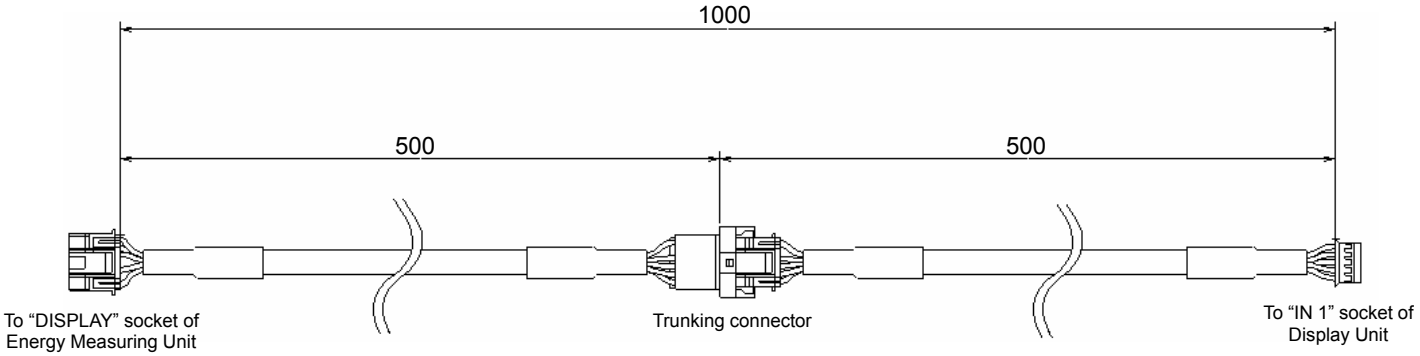
6. Outline drawing

Display Unit main body (EMU2-D65, EMU2-D65-M)



Unit: mm

Display unit connection cable

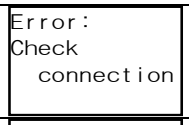
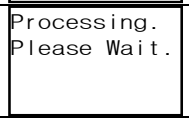
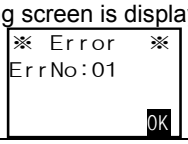
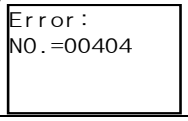


Unit: mm

7. Reference

7.1 Troubleshooting

Please turn off the power immediately, if an unusual sound, a smell, smoke, and generation of heat occur from this unit.
Moreover, please check the following points before taking out to repair.

Error description	Remedy	EMU2-D65	EMU2-D65-M
Nothing is displayed	•Check the connection between energy measuring unit and this unit. •Check the power supplement to the energy measuring unit.	✓	✓
"– – – – – –" is displayed as measured value.	Are the dipswitches located bottom of this unit turned ON? The dipswitches may turn OFF.	✓	
Following screen are displayed on start-up. 	Check the connection between energy measuring unit and this unit.	✓	✓
	This message will be displayed in correcting processing of logging data. After ending the processing, this message will be disappered.		✓
Following screen is displayed. 	Energy measuring unit is busy state. Escape the error message by pushing the [↵/Phase] key and retry the same operation.	✓	✓
Error codes are displayed such as "00404", "00405" or "00501" 	It is failure of a display unit (EMU2-D65-M). Please contact to dealer.		✓
The backlight of display goes out.	"Auto OFF" is selected as backlight setting, has passed since the last key operation, backlight will be OFF automatically. There are any key operation, backlight wll be lighted again.	✓	✓
	Although the backlights out under following condition, it will be lighted again automatically. ①Immediately after power ON ②When changing the settings. ③When resetting the logging data		✓

8. Specification

Item		Specification	
Product name		Display Unit	Logging Display Unit
Model name		EMU2-D65	EMU2-D65-M
Display part		Dot matrix Liquid Crystal Display (with backlight)	
Rating		9V DC	
Math		100g	105g
Display renewal interval		500ms	
Backup at power failure	Setting value about display (LCD contrast, backlight)	Stored in EEPROM (non volatile memory) *Setting values about measurement are stored in EcoMonitorPro.	
Applocable model		Energy Measuring Unit (EcoMonitorPro) EMU2-RD3-F, EMU2-RD3-C EMU2-RD5-F, EMU2-RD5-C EMU2-RD7-F, EMU2-RD7-C EMU2-RD2-F-4W, EMU2-RD2-C-4W EMU2-RD4-F-4W, EMU2-RD4-C-4W	
Connecting method		Connecting by dedicated cable (Bundled in this product. Length: 1m)	
Maximum extention length		10m	
Working temperature range		-5℃~55℃ (daily mean temperature: 35°C or less)	
Working humidity range		30%~80%Rh (no condensation)	
Storage temperature range		-10℃~60℃	
Installing method		IEC rail mounting Panel mounting	
Expected product life		10 years *LCD contrast reduction by half is five years. However, adjustment of LCD contrast is possible.	

Logging specification (Only for Logging Display Unit (EMU2-D65-M))

Item	Specification			
Logging span	Model name of EcoMonitorPro	1sec data	1min data	1hour data
	EMU2-RD2-F, C-4W	12 hours	For 10 days	For 131 days
	EMU2-RD3-F, C			
	EMU2-RD4-F, C-4W	4 hours		
	EMU2-RD5-F, C			
	EMU2-RD7-F, C	2 hours		
Backup at power failure	If the battery switch is turned ON, logging data will not be erased even if a power failure occurs. **Logging data will be erased if once battery switch turns OFF during a power failure.**			

<Optional product>

Product name	Model name	Note
Extension cable	EMU2-CB-T1M	1m
	EMU2-CB-T5M	5m
	EMU2-CB-T10M	10m
Data collection PC-kit	EMU2-PK3-EN	Only for EMU2-D65-M

Display Unit/ Logging Display Unit
Instruction manual

Contact one of the following offices.

Country/ Region	Company	Address	Telephone
Indonesia	P.T. SAHABAT INDONESIA	JL Muara Karang Selatan Blok A/Utara No. 1 kav. NO. 11 P.O. Box 5045/Jakarta/11050, Jakarta Indonesia	+62-(0)21-6621780
Korea	MITSUBISHI ELECTRIC AUTOMATION KOREA CO., LTD.	2Fl. Dong Seo Game Channel Bldg., 1F 660-11 Deungchon-Dong, Kanguseo-ku, Seoul, 157-030 Korea	+82-2-3668-6567
Lao PDR	SOCIETE LAO IMPORT-EXPORT	43-47 Lane Xang Road P.O. BOX 2789 VT Vientiane Lao PDR.	21-215043, 21-215110
Myanmar	PEACE MYANMAR ELECTRIC CO., LTD.	NO. 216, Bo Aung Gyaw Street, Botataung 1161, Yangon, Myanmar	+95-(0)1-202589, 202449, 202590
Nepal	Watt & Volt House Co., Ltd.	KHA 2-65, Volt House Dllli Bazar Post Box: 2108, Katmandu, Nepal	+977-1-411330
Pakistan	Prince Electric Co.	16 Brandreth Road Lahore 54000, Pakistan	+92-(0)42-7654342
Philippines	EDISON ELECTRIC INTERGRATED, INC.	24th Fl. Galleria Corporate Center Edsa Cr. Ortigas Ave. uezon City, Metro Manila, Philippines	+63-(0)2-643-8691
Taiwan	Setsuyo Enterprise Co., Ltd.	6F, NO. 105 Wu-Kung 3rd rd., Wu-Ku Hsiang, Taipen Hsien Taiwan	+866-(0)2-2298-8889
Thailand	UNITED TRADING & IMPORT CO. LTD.	77/12 Bumrungmuang Road, Klong Mahanak, Pomprab Bangkok 10100	+66-223-4220-3
Vietnam	Sa Giang Techno Co., Ltd.	207/4 Nguyen Van Thu St., Dist 1, Ho Chi Minh City, Vietnam	848-821-6453

MITSUBISHI ELECTRIC CORPORATION