

Logging Unit for Energy Measuring Unit **MODEL**



User's Manual (Details)

 Before operating the instrument, you should first read thoroughly this operation manual for safe operation and optimized performance of the product.
 Deliver this user's manual to the end user. Thank you for purchasing the Energy Measuring Unit.

• This manual describes setup and usage for this unit. Before using the product, please read this manual carefully to ensure correct use.

Especially, in the case of where this unit is to be installed, please read "1. Safety Precautions" to ensure correct use.

- Make sure that the end users read this manual and then keep the manual in a safe place for future reference.
- Make sure to deliver this manual to the end-user.
- If you are considering using this unit for special purpose such as nuclear power plants, aerospace, medical care, or passenger vehicles please refer to our sales representative. (For details, please see at the end of this manual.)

■Notations in this manual

Use the following marks in this manual

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Mark	Meaning			
ADanger This mark indicates that incorrect handling may result in death or severe injury, ignoring this				
	ution This mark indicates that incorrect handling may result in injury or property damage, ignoring this marking.			
✓ Supplement	This mark indicates that precautions to avoid a malfunction and to work the unit properly.			
-	This mark indicates that the pages described that related matters.			

■Checking package contents

The following items for this device are included in package. Check that no items are missing.



Trademarks

- Microsoft Excel is the registered trademark of the U.S. Microsoft Corporation in the U.S. and other countries.
- SD logo and SDHC logo are the trademarks of SD-3C, LLC.
- Other company and product names herein are trademarks or registered trademarks of their respective owners.

In the text, trademark symbols such as "TM" and "[®]" may not be written.

Features

- This unit can memorize the data of various quantities related to electricity such as voltage, current, power and energy and various pulse count values and analog input data (hereinafter referred to as measured data) measured by Energy Measuring Unit (EcoMonitorLight, EcoMonitorPlus) for a certain period. (Page 13)
- Memorized measured data can be output to an SD memory card in CSV format. (

 Page 16)
- You can check the data files output to the SD memory card by Microsoft Excel or GX LogViewer (Version 1.30G or after).

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1. Safety Precautions

Precautions for Operating Environment and Conditions

- This unit is premised on being used in pollution degree II ^[Note 1] environment. When used in higher pollution degree, protect this unit from pollution on another device side to be incorporated.
- Do not use this product in the places listed below. Failure to follow the instruction may cause malfunctions and a life decrease of product.
 - Places the operating temperature exceeds the range from -5 to +55°C
 - Places the average daily temperature exceeds +35°C
 - Places the operating humidity exceeds the range from 30 to 85%RH or places with dewfall
 - Vibration and impact exceed the specifications
 - ·Dust, corrosive gas, saline and oil smoke exist
 - ·Places exposed to direct sunlight
 - ·Places exposed to rain or water drop
 - Places in strong electromagnetic field or places large amounts of external noise exist
 - Places metal fragments or conductive substance are flying
 - •Operating altitude exceeds 2000m

[Note 1] For the definition of the pollution degree and the over voltage category, refer to EN61010-1/2010.

<For prevention of electric shock>

- This unit is the open type devices, which are designed to be housed within another device for prevention of electric shock. House this unit within the device such as the control panel which is grounded before use.
- To prevent persons with little knowledge about electric equipment from electric shock, panel must be taken either following measure.

•Lock the panel so that only those who get an education about electric equipment and have sufficient knowledge can unlock, or shut off power supply automatically by opening the panel.

•Cover the dangerous part of this unit. (Required protection code is higher than IP2X.)

Matters concerning the precaution before use

- Use the unit in specified usage environment and conditions.
- Before using this unit, set "Present time", "Logging ID", "Logging mode", "Logging start time (if Logging mode is set to "Date nomination")", "Detail data logging cycle" and "Logging item". If you do not set these values, the unit logs in the initial values. (Page 24)
- This unit stores a lithium battery. It is not connected at the factory. Connect it before use. (Page 7)

Installation and Wiring Precautions

Make sure to read this manual carefully before installation and wiring.

Caution

<Electric work precautions>

- Any person who is involved in installation and wiring of this unit should be fully competent to do this work.
- Work under electric outage condition when installing and wiring.
- Failure to do so may cause electric shock, a failure of the unit, a fire etc.
- When tapping or wiring, take care not to enter any foreign objects such as chips and wire pieces into this unit.
- Check the connection way when connecting to the Energy Measuring Unit. Wrong wiring may cause failure of the unit, a
 fire or electric shock.

Precautions for Use

- Before operating the product, check that active bare wire and so on does not exist around the product. If any exposed
 conductor is found, stop the operation immediately, and take an appropriate action such as isolation protection.
- In the event of a power outage during the setting, the unit is not set correctly. Please set again after power recovery.
- During communication with the SD memory card, the operations such as power-off, reset and ejection of the memory card
 may cause data corruption of the memory card or failure of this unit or the memory card. Power off or reset the unit, or
 eject the SD memory card after checking that SD C.LED turns off.
- Make sure to use the SD memory card manufactured by Mitsubishi Electric Corporation (Model EMU4-SD2GB). Using the other types of the SD memory card may cause the trouble such as data destruction of the memory card or system failure.
- Format an SD memory card in the way specified in this manual. (Page 37)
- Insert the SD memory card with the write protect switch "OFF". If the write protect switch is "ON", the logging unit does not communicate with an SD memory card.
- Present time data and logging data are erased by power-off with BAT. LED on. ("Logging ID", "Logging mode", "Logging start time", "Detailed data logging cycle" and "Logging item" are not erased, which are memorized in the nonvolatile memory.) If BAT. LED turns on, output logging data to the SD memory card and change a battery.

- All logging data of the Logging Unit is erased when you change the setting of "Phase wire system", "Primary voltage (Use or non-use of VT, Direct Voltage, Primary voltage with VT, Special primary voltage)", "Primary current (Direct sensor, 5A sensor, Special primary current)" or "Sensor type" of the Energy Measuring Unit (EcoMonitorLight Model: EMU4-BD1-MB, EMU4-HD1-MB, EMU4-FD1-MB, EMU4-BD1A-MB, EMU4-HD1A-MB, EcoMonitorPlus Model: EMU4-BM1-MB, EMU4-HM1-MB, EMU4-VA2, EMU4-A2) and "Phase wire system" and "Measurement mode" of the Energy Measuring Unit with Insulation Monitoring (Model: EMU4-LG1-MB). Before changing the setting of the Energy Measuring Unit, output the logging data to the SD memory card and check the output data in the PC whether the logging data is memorized properly.
- All logging data of the Logging Unit is erased when you change the setting of "Present time", "Logging mode", "Logging start time", "Detailed data logging cycle" or "Logging item" of the Logging Unit. Before changing the setting of the Logging Unit, output the logging data to the SD memory card and check the output data in the PC whether the logging data is memorized properly.
- The Logging Unit should not be used for multiple Energy Measuring Units. Otherwise, all logging data of the Logging Unit may be erased, or there may be some data for different Energy Measuring Units in the Logging Unit.

A Danger

- Do not touch the electrically charged portion. It may cause electric shock, electric burn injury or burnout of the device.
- Work under the electric outage condition when installing.

Caution

• Do not disassemble or modify this unit. It may cause failure, malfunction, injury, or fire.

Maintenance Precautions

- Use a soft dry cloth to clean off dirt of the unit surface. Do not let a chemical cloth remain on the surface for an extended period nor wipe the surface with thinner or benzine.
- Check for the following items to use this unit properly for long time.
 - <Daily maintenance>
 - (1) No damage on this unit
 - (2) No abnormality with LED indicators
 - (3) No abnormal noise, smell, or heat

Storage Precautions

- To store this unit, put it in a plastic bag.
- For long-time storage, avoid the following places. Failure to follow the instruction may cause a failure and reduced life of the unit.
 - Places the storage temperature exceeds the range from -10 to +60°C
 - •Places the average daily temperature exceeds +35°C
 - ·Places the relative humidity exceeds the range from 30 to 85% or places with dewfall
 - •Vibration and impact exceed the specifications
 - ·Dust, corrosive gas, saline and oil smoke exist
 - ·Places metal fragments or conductive substance are flying
 - Places exposed to rain, water drop or direct sunlight

Disposal Precautions

- When disposing of this unit, treat it as industrial waste.
- Lithium batteries are disposed of according to local regulation.

Caution Removed lithium batteries may have electric charge. Store them separately so as not to touch other metal, otherwise evolution of heat, burst or ignition may occur.

About packaging materials and this manual

For reduction of environment load, packaging materials are produced with cardboard.

2. Disclaimer

- It is prohibited to reprint or copy all contents of this document in any form without our permission.
- The contents of this document will be updated to follow revisions to software and hardware, however under unavoidable circumstances it may not be synchronized.

3. Name and function of each part

■Name of each part



Name and function of each part

No.	Name	Function
1)	LOG. LED	This indicates a state of logging operation. Turn on: Logging is running Turn off: Logging is stopped Blink slowly ^[Note 1] (5 seconds): Change of logging condition settings finished Blink quickly ^[Note 2] (30 seconds): Change of logging condition settings failed ^[Note 3] Blink quickly ^[Note 2] : Error occurrence ⁽³⁾
2)	SD C. LED	This indicates a state of communication with the SD memory card. Turn on: Communicating Turn off: Stop communicating Blink quickly ^[Note 2] : SD memory card error ^[Note 3]
3)	BAT. LED	This indicates a state of battery voltage. Turn on: Low battery voltage ^[Note 4] Turn off: Normal battery voltage
4)	Battery box	This stores a battery to back up present time data, logging data and system log data.
5)	SD memory card slot	This is a slot to insert an SD memory card.
6)	Battery connector	This connects a battery
7)	IEC rail stop	This is used to fix to an IEC rail.
8)	Connection stop	This is used to connect the Logging Unit to the Energy Measuring Unit.

[Note 1] Blink slowly: Repetition of 0.5-second on and 0.5-second off

[Note 2] Blink quickly: Repetition of 0.25-second on and 0.25-second off

[Note 3] Refer to "Error display and measures" if this indicates. (
Page 38)

[Note 4] resent time data and logging data are erased by power-off with battery voltage low. ("Logging ID", "Logging mode", "Logging start time", "Detailed data logging cycle" and "Logging item" are not erased, which are memorized in the nonvolatile memory.) If BAT.LED turns on, change a battery.

4. How to wire

How to connect to and disconnect from the Energy Measuring Unit

*This unit can be attached to EcoMonitorLight in below. This unit can connect and disconnect to EcoMonitorPlus as well.

- ■How to connect the Logging Unit
- (1) Remove the blank label stuck to the left side of the Energy Measuring Unit.
 - Blank label
- (3) Slide the connection stops (green-colored) in upside and downside of the Logging Unit to lock it.



- ■How to disconnect the Logging Unit
- (1) Slide the connection stops (green-colored) in upside and downside of the Logging Unit to unlock it.



(2) Insert the connector of the Logging Unit into that of the Energy Measuring Unit and contact the unit.



(2) Pull the Logging Unit to disconnect from the Energy Measuring Unit.



≜ Caution	 Work under the electric outage condition when connecting and disconnecting the Energy Measuring Unit.
DISCLAIMER	•The Logging Unit should not be used for multiple Energy Measuring Units. Otherwise, all logging data of the Logging Unit may be erased, or there may be some data for different Energy Measuring Units in the Logging Unit.

How to connect and change a battery

- How to connect the battery (just after the purchase)(1) Slide the battery box down to open it.
- - A BATTERY 38 BATTERY þ
- (2) Connect the connector of the battery cable to the battery connector.



(3) Fix the battery box to the Logging Unit.



⚠Caution	 Work under the electric outage condition when connecting battery. Failure to do so may cause electric shock, a failure of the unit, a fire etc. Please secure a space under the logging unit to replace the battery.

How to change a battery(1) Slide the battery box down to open it.



(3) Remove old battery and put new battery in battery box.



(5) Connect the connector of the new battery cable to the battery connector.



(2) Remove the connector of the battery cable to the battery connector.



(4) Attach the cable to the battery box. (2 places)* When attaching to the battery box, please insert two wires one by one.



(6) Fix the battery box to the Logging Unit.



⚠Caution	 Work under the electric outage condition when connecting and disconnecting battery. Failure to do so may cause electric shock, a failure of the unit, a fire etc. Present time data and logging data are erased by power-off with BAT. LED on. ("Logging ID", "Logging mode", "Logging start time", "Detailed data logging cycle" and "Logging item" are not erased, which are memorized in the nonvolatile memory.) Output logging data to the SD memory card before power-off. Change a battery when BAT.LED turns on or every 3 years. Please secure a space under the logging unit to replace the battery.
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How to insert and eject the SD memory card

■How to insert the SD memory card

Slide the SD memory card straight into the slot until it clicks into place.



DISCLAIMER	 Make sure to use the SD memory card manufactured by Mitsubishi Electric Corporation (Model EMU4-SD2GB). Using the other types of the SD memory card may cause the trouble such as data destruction of the memory card or system failure.
	 Format an SD memory card in the way specified in this manual. (Page 37) Insert the SD memory card with the write protect switch "OFF". If the write protect switch is "ON", the logging unit does not communicate with an SD memory card.

For the SD memory card on the market, please refer to the TECHNICAL BULLETIN EMS-YE-0001 from our site. However, at the time of use, please verify sufficient by the customer that there is no problem.

■ How to eject the SD memory card

Push the SD memory card in until it clicks into place. The SD memory card comes out by itself.



5. Installation

•Any person who is involved in installation and wiring of this unit should be fully competent to do this work.

There are two installation methods, surface mounting and panel mounting.

* Surfacing mouting only in EcoMonitorPlus.

When installing, this unit should be connected to the Energy Measuring Unit. (Page 6)

Surface mounting

*This unit can be attached to EcoMonitorLight in below. This unit can be attached to EcoMonitorPlus as well.

*In EcoMonitorPlus, connect to the base unit (model name: EMU4-BM1-MB/ EMU4-HM1-MB/ EMU4-LG1-MB/ EMU4-CNT-MB).



Panel mounting

- (1)Screw mounting (Measuring unit)* EcoMonitorLight only.
- •Panel cut dimension (101×44.5)

Outline of the logging unit



* Panel cut dimensions are made larger than the product considering tolerance in panel cut.

* If you want to prevent dust and other intrusion the gap of panel cut, cut the panel according to the product to be mounted.

How to mount



[Recommended mounting screw]						
Cross recessed pan-head screw with captive spring or						
plain washer						
JIS B 1188						
M3x10 2 screws						

(2) Screw mounting (When using the attachment for panel mounting) •Panel cut dimension (101×44.5) •How t

Outline of the logging unit



How to mount

Mount the plate by the screws (M3x10), then install the attachment on the plate. Tighting torque: $0.63N\cdot m$





Attachment for panel mounting

- * Panel cut dimensions are made larger than the product considering tolerance in panel cut.
- * If you want to prevent dust and other intrusion the gap of panel cut, cut the panel according to the product to be mounted.
- * Please screw up the panel mounting attachment where there are high levels of vibration.
- * The screws (mounting screws and screws for panel mounting attachment) are supplied with panel mounting attachment.

(11/63)

6. The number of logging circuits and connected units

In the case of connect to EcoMonitorLight

Only 1 energy measuring unit can connect to logging unit. You can measure and logging 1 circuit.



In the case of connect to EcoMonitorPlus

Max 4 energy measuring units can connect to logging unit. (1 Energy Measuring unit and Max 3 Expansion unit) You can measure and logging Max 7 circuits.

The	circuit number	(ch) of each unit is determined b	y the sum of the number of occup	pied circuit IDs
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Unit kind	Name	Model	Occupied circuit ID number
Base unit	Energy Measuring Standard Model EMU4-BM		1
	Energy Measuring High Performance Model	EMU4-HM1-MB	1
	Insulation Monitoring Model	1	
	Control unit	1	
Extension unit	Extension Model for Same Voltage System	EMU4-A2	2
	Extension Model for Different Voltage System	EMU4-VA2	2
	Extension Model for Pulse Input	EMU4-PX4	1
	Extension Model for Analog Input	EMU4-AX4	1

<Example>

Example 1:				Example 2:			
Unit kind	Model	Occupied circuit ID number		Unit kind	Model	Occupied circuit ID number	
Base unit	EMU4-HM1-MB	1] [Base unit	EMU4-HM1-MB	1	
Extension unit 1st	EMU4-VA2	2		Extension unit 1st	EMU4-VA2	2	
Extension unit 2nd	EMU4-A2	2	111	Extension unit 2nd	EMU4-A2	2	
Extension unit 3rd	EMU4-PX4	1		Extension unit 3rd	EMU4-VA2	2	
BATTERY Unit Circuit number(ch)	A Contraction of the second se	A Contraction of the contraction	BATTERY Logging Unit	Area and a set of the	tension Unit Unit 2nd 3 5 6 7		
	Energy measuring unit	EcoMonitorPlus			Energy measuring unit	EcoMonitorPlus	

7. Operations

The following figure indicates the summery of operation of this unit.



<Summery of operation>

- [1] This unit memorizes measured data acquired from the Energy Measuring Unit as logging data in the internal memory (volatile memory).
 - For details, refer to "Logging operation". (
 Page 13)
- [2] This unit outputs logging data or system log data memorized in the internal memory (volatile memory) of the Logging Unit as logging data file or system log data file to the SD memory card.
 ※ For details, refer to "Logging data output". (Page 16)

Logging operation

This unit memorizes measured data acquired from the Energy Measuring Unit as logging data in the internal memory as follows.

(1) Type of logging data

This unit memorizes measured data as both detailed data and One-hour data at the same time. And this memorizes events occurred in the Logging Unit as system log data.



For the content of detailed data and One-hour data, refer to the next page.

Type of logging data	Features			
Detailed data	 Memorize measured data in the 5 minutes, 10 minutes, 15 minu Memorizing time is as follows: 	e specified "Detailed data logging cycle" (1 second, 1 minute, tes or 30 minutes).		
	Detailed data logging cycle	Memorizing time		
	1 second	Every second		
	1 minute	Every minute		
	5 minutes	Every hour and 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 and 55 minutes past the hour		
	10 minutes	Every hour and 10, 20, 30, 40 and 50 minutes past the hour		
	15 minutes	Every hour and a quarter, a half and three quarters past the hour		
	30 minutes	Every hour and a half past the hour		
	This data is output to the SD memory card as detailed data file.			
One-hour data	 Memorize measured data in a hour cycle. Memorizing time is every hour. This data is output to the SD memory card as One-hour data file and One-day data file 			

(2) The number of logging items

This unit can set logging items by logging data type.

Type of logging data	The number of logging items				
Detailed data	Depend on the specified "Detailed data logging cycle".				
	Detailed data logging cycle	The number of logging items			
	1 second	Up to 4 items			
	1, 5, 10, 15 and 30 minute(s)	Up to 10 items			
	•Settable logging items depend on the connected Energy Measuring Unit and setting. Refer to "List of logging items". (Page 48)				
One-hour data	•Up to 10 items				
	•Settable logging items depend on the connected Energy Measuring Unit and setting.				
	Refer to "List of logging items". (Page 48)			

(3) Maximum logging period

Refer to "11. Specifications".

*1: The maximum logging period of this product depends on the number of circuits of the connected unit.

*2: The maximum logging period differs between Detailed data and One-hour data.

(4) Logging modes

The following logging modes are available. You can choose a suitable mode.

Logging mode	Features
Auto updating	 Logging operation starts right after the settings are finished. After memorable maximum logging period, the oldest data is erased to overwrite new one with the passing of time. LOG.LED is always on.
Date nomination	 Logging operation starts from the specified "Logging start time". After maximum logging period, logging operation is stopped automatically. Stop time of logging operation of detailed data is different from that of one-hour because maximum logging period of detailed data is different from that of one-hour. LOG.LED turns on until the end of maximum logging period of One-hour data.

[Note] Logging operation is stopped when the Energy Measuring Unit is in the test mode.

Auto updating



This unit store in the internal memory of the data logging period the from current time. Data older than the maximum logging period is erased.

Date nomination [Example] <Settings> Detailed data logging cycle → 1 minute

Logging start time \rightarrow 2013/6/24 AM 8:00

1 2013/6/24 AM 7:00

P 2013	resent time Logging s 3/6/24 AM7:00 2013/6/24	start time 4 AM8:00					
Detailed data							
One-hour data							
Logging operation is (2) 2013/6/24 AM 9:00	not started, current t	me has not	passed the l	ogging start ti	me.		
	Logging s 2013/6/24	start time 4 AM8:00	Present time 2013/6/24 AM9:00)			
Detailed data							
One-hour data							
Logging operation is ③ 2013/7/14 AM 8:00	started, current time Logging : 2013/6/2;	has passed	the logging s	Present time 13/7/14 AM8:00	Maximum logging pe	ariod for detailed	
Detailed data		ÌIIII			/		
One-hour data Detailed data logging One-hour data loggin (4) 2015/3/6 AM 8:00	operation is stoppe g operation is contin	d, current tin lued.	he has passe	ed the maxim	um logging peri	iod for detailed d	ata.
	Logging s 2013/6/24	start time 4 AM8:00	Maximum loggir	ng period for detaile	Ŀ	Present time 2015/3/6 AM8:(00
Detailed data		к ЦЦЦЦЦ					
One-hour data							
		<	Maximu	m logging period for	one-hour	>	
One-hour data logg	ing operation is stop	ped, current	time has pa	ssed the max	imum logging p	period for One-h	our data.

This unit outputs logging data and system log data memorized in the internal memory to the SD memory card in CSV format as follows.

(1) Type of output data file

This unit outputs logging data files and system log data files to the SD memory card. For the detailed specifications of each data file, refer to "CSV file specifications". (Page 18)



Type of data file		Features		
Logging data file				
Detailed data file	 This file is made based on detailed data. Every file acquires data in every specified "Detailed data logging cycle" for the following period 			
	Detailed data logging cycle	Data acquiring period per file]	
	1 second	1 hour		
	1, 5, 10, 15 and 30 minute(s)	1 day		
	•Integrated value is output as diffe "Detailed data logging cycle".	rence value between data acquire	d in every specified	
One-hour data file	 This file is made based on One-hour data. Every file acquires data in one hour cycle (every hour) for one day. Integrated value is output as difference value between data acquired every hour. Data of every hour is output as instantaneous data. 			
One-day data file	 This file is made based on One-hour data. Every file acquires data in one day cycle (every 12:00 a.m.) for one month. Integrated value is output as difference value between data acquired every 12:00 a.m. Data of every 12:00 a.m. is output as instantaneous data. 			
System log data file	Events occurred in this unit are output as system log data file. The unit outputs the events up to past 3600 records			

Logging unit (EMU4-LM)

(2) Data file name and storage location

Logging data file and system log data file are output to the SD memory card with the following filenames.

Type of data file	Logging ID folder ^[Note 1]	Type of data file folder	Year and month folder ^[Note 2]	File name ^[Note 2]	
Logging data file	—	—	—	—	
Detailed data file		—	—	—	
One-second data	LOG***	1SEC	YYMM	- SDDhh.CSV	
One-minute data		1MIN	YYMM —	- 01MDD.CSV	
Five-minute data		5MIN	YYMM	05MDD.CSV	
10-minute data		10MIN	YYMM	10MDD.CSV	
15-minute data		15MIN	YYMM	15MDD.CSV	
30-minute data		30MIN	YYMM	30MDD.CSV	
One-hour data file		1HOUR		HYYMMDD.CSV	
One-day data file		1DAY		DYYMM.CSV	
System log data file				SYS_LOG.CSV	
Setting data file				SET.CSV	

[Note 1] For detailed data files, data acquired in specified "Detailed data logging cycle" is only output.

[Note 2] "***" indicates the logging ID (001 to 255) specified in this unit.

"YY" indicates the last two digits of the year CE (00 to 99).

"MM" indicates the month (01 to 12).

"DD" indicates the day (01 to 31).

- "hh" indicates the hour (00 to 23).
- [Note 3] Setting data file is not a data outputted from this unit. When you set the logging conditions, please save the setting data file in the above-mentioned position of the SD memory card.

(3) Output time of the data file

This unit outputs data files to the SD memory card in the following time.

Output time	Range of output data			
Output time	Logging data file	System log data file		
[1] When the SD memory card is inserted during operation	<pre><if are="" card="" data="" files="" in="" logging="" memory="" no="" sd="" the="" there=""></if></pre>	 The unit outputs all system log data in itself. If there is system log data file in the SD memory 		
[2] When power turns on with the SD memory card inserted	If there are some logging data files in the SD memory card> The unit outputs data after the latest of detailed data file, One-hour data file and One-day data file in the SD memory card. (Data of the latest data file is overwritten.) All logging data is output if the Logging Unit does not memorize data to write to the latest data file.	card, it is overwritten.		
[3] Every hour during operation with the SD memory card inserted	•The unit outputs data from next to previous output data to the	present time.		

CSV file specifications

(1) CSV file format

The file format of logging data file and system log data file is as follows:

Item	Code
Delimiter	Comma (,)
Linefeed code	CR+LF (0x0D、0x0A)
Character code	ASCII

(2) Logging data file specifications Specifications of logging data file which this unit outputs are as follows:

		Column 1	Column 2	Column 3	Column 4	Column 5	Column 6		Column 20	
File inform	ation row	[LOGGING]	YM_1	, 2 ,	, 3	4	CR+LF			
Data type information	n row	DATETIME[YYYY /MM/DD hh:mm:ss]	INDEX	, DOUBLE[DEC.0]	DOUBLE[DEC.1]	DOUBLE[DEC.2],	DOUBLE[DEC.1],	,	DOUBLE[DEC.1]	CR+LF
Data nam	e row	TIME ,	INDEX	, CH1 WH[kWh] ,	CH1 I[A] ,	CH1 V[V] ,	CH1 W[kW]	,	CH1 W[kW]	CR+LF
	(Head)	2012/11/22 01:00:00 ,	1	, 9999999 ,	100.0 ,	220.00 ,	22000.0 ,	···· ,	22000.0	CR+LF
		2012/11/22 02:00:00 ,	2	, 999999 ,	100.5 ,	220.01 ,	22000.0 ,	···· ,	22000.0	CR+LF
		2012/11/22 03:00:00 ,	3	, 999999 ,	100.2 ,	220.02 ,	22000.0 ,	···· .	22000.0	CR+LF
		2012/11/22 04:00:00 ,	4	, 999999 ,	100.1 ,	220.03 ,	22000.0 ,	···· ,	22000.0	CR+LF
Data row ≺))	2012/11/22 05:00:00 ,	5	, 999999 ,	100.0 ,	220.10 ,	22000.0 ,	···· ,	22000.0	CR+LF
		2012/11/22 06:00:00 ,	6	, 999999 ,	100.0 ,	220.50 ,	22000.0 ,	,	22000.0	CR+LF
					,	···· ,	···· ,	···· ,	(CR+LF
		2012/11/22 23:00:00 ,	23	, 9999999 ,	100.2 ,	220.00 ,	22000.0 ,	···· ,	22000.0	CR+LF
	(End)	2012/11/23 00:00:00 ,	24	, 999999 ,	100.0 ,	220.62 ,	22000.0 ,	•••• ,	22000.0	CR+LF
		Date	Index	Data	Data	Data	Data		Data	

(a) File information row

	Column name	Content of output	Size [Byte]
Column 1	File type	Output "[LOGGING]".	9
Column 2	File version	Output "YM_1".	4
Column 3	Number of "Data type information row"	Output "2". This indicates what row "Data type information row" is.	1
Column 4	Number of "Data name row"	Output "3". This indicates what row "Data name row" is.	1
Column 5	Number of "Data start row"	Output "4". This indicates what row "Data start rows" start from.	1

(b) Data information row

	Column name	Content of output	Size [Byte]
Column 1	Date	Output "DATETIME[YYYY/MM/DD hh:mm:ss]".	29
Column 2	Index	Output "INDEX".	5
Column 3	Data	Output "DOUBLE[DEC.digits*]". *: "Digits" indicates the number of decimal places.	13
Column N			

(c) Data name row

	Column name	Content of output	Size [Byte]
Column 1	Date	Output "TIME".	4
Column 2	Index	Output "INDEX".	5
Column 3	Data	 Output "CH1 Item*[Unit*]". *: "Item" and "Unit" depend on the specified "Logging item". Refer to "List of logging items". (Page 48) *: For the correspondence between the connected unit and ch *, refer to "6. Model to be connected and number of logging circuits". (Page 12) 	8 to14

(d) Data r	ow										
	Column name		Content of output [B								
Column 1	Date	Output the o	he date. The output format of the date is "YYYY/MM/DD hh:mm:ss". nber of rows is as follows:								
		File type	Logging cycle	Data acquiring period per file	The maximum number of rows						
		Detailed data file	1 second	1 hour <example> For the file of two o'clock. From 02:00:01 to 03:00:00</example>	3600 rows						
			1 minute	1 day <example> For the file of March 4 From Mar 4 00:01:00 to Mar 5 00:00:00</example>	1440 rows						
			5 minutes	1 day <example> For the file of March 4 From Mar 4 00:05:00 to Mar 5 00:00:00</example>	288 rows						
			10 minutes	1 day <example> For the file of March 4 From Mar 4 00:10:00 to Mar 5 00:00:00</example>	144 rows						
			15 minutes	1 day <example> For the file of March 4 From Mar 4 00:15:00 to Mar 5 00:00:00</example>	96 rows						
			30 minutes	1 day <example> For the file of March 4 From Mar 4 00:30:00 to Mar 5 00:00:00</example>	48 rows						
		One-hour data file	1 hour	1 day <example> For the file of March 4 From Mar 4 01:00:00 to Mar 5 00:00:00</example>	24 rows						
		One-day data file	1 day	1 month <example> For the file of December From Dec 1 to Dec 31</example>	Between 28 and 31 rows (Depend on days in a month)						
Column 2	Index	Output the r Output "1"	numerical va if there are l	alue counted up from 1 in every file. losses of data, and count up from 1 for the fo	ollowing rows again.	1 to 4					
Column 3 : Column N	Data	Output mea For integrate •Detailed da indicated ir •One-day d column an	Output measured data. 0 For integrated values, output data is as follows: 0 • Detailed data and One-hour data: Difference value between the value at the time indicated in the date column and the previous one 0 • One-day data: Difference value between the value at the time indicated in the date column and the previous one 0								
		If there are I blanks.	losses of da	ta caused by power outage etc., columns fo	or the data become						

<Logging data file output contents at the time of the blackout outbreak>

Show below logging data file (detailed data file /1 hour data file /1 day data file) output contents at the time of the blackout outbreak.

(a) Logging data file output composition (detailed data file / 1 hour data file /1 day data file common)

		A B				F.G.H		
File creation cycle -								··· Time
Blackout state			Blackout			Blackout		
	\square	\bigtriangledown	\square	\bigcirc	\bigtriangledown	\bigcirc	\bigcirc	
Output logging data file		В	no outputi			G H		

* The data period of one file is shown. A file creation cycle changes with classification of a logging data file. Refer to the "Type of output data file" for a file creation cycle. (
Page.16)

The contents of an output of Period A to H are shown below.

《Output constitution》

Period A····All the time of a data line, the indexes, and data are outputted.

Period B····Data becomes blank although the time and the index of a data line are outputted.

Period C····A logging data file is not outputted.

Period D····All the time of a data line, the indexes, and data are not outputted.

Period E····All the time of a data line, the indexes, and data are outputted.

Period F....All the time of a data line, the indexes, and data are outputted.

Period G····Data becomes blank although the time and the index of a data line are outputted.

Period H····All the time of a data line, the indexes, and data are outputted.

(b) The contents of an output of an integrated value

[Detailed data file / 1-hour data file]

Logging cycle [※] Blackout state	A	B	C Bla	ckout	E	F	G	+ + >	time
Integrated value indicated value (Energy Measuring Unit indicated value)	100	200			300	400	500	600	I
Integrated value difference value (SD memory card output value)		100	Blank	Blank	Blank	100	100	100	ľ

* The logging cycle of detailed data differs with set-up "detailed data-logging cycles." The logging cycle of 1 hour data serves as fixation for 1 hour.

The integrated value of a detailed data file and a 1-hour data file turns into a difference value with a value the data which the time of a data line shows, and last value. Therefore, the data of the timing C, D, and E which cannot take difference becomes blank.

[One day data file]

* Logging cycle	A 	B	C	D I	E	F	G	H + >	time
Blackout state			Blad	ckout					
Integrated value indicated value Energy Measuring Unit indicated value)	100	200	- \		300	400	500	600	
Integrated value difference value (SD memory card output value)	100	Blank	Blank	Blank	100	100	100		

* The logging cycle of one day data will be fixation on the one day.

The integrated value of a one-day data file turns into a difference value with a value the data which the time of a data line shows, and next value. Therefore, the data of the timing B, C, and D which cannot take difference becomes blank.

(3) System log data file specifications

Specifications of system log data file which this unit outputs are as follows:



(a) Content of output

	Column name	Content of output	Size [Byte]
Column 1	Date	Output the time of event occurrence. The output format of the date is "YYYY/MM/DD hh:mm:ss". The number of rows is up to 3600.	21
Column 2	Data	Output a three-digit system log code. For system log codes, refer to "List of system log codes". (P Page 63)	3

(4) Setting data file specifications Specifications of setting data file used for setting logging conditions are as follows:

	Column 1		Column 2		Column 3	 Column 4		Column 5		Column 6		Column 7						
Basic setting row	00	,	2012		12	20		16		12	,	01		CR+LF				
Spare row 1 Logging row	0701		0501		0101	0D01	,	8001	,			0000	,	0000		,	0000	CR+LF
Spare row 2 Logging row	0701		0501	e.	0101	0D01		8001				0000		0000		,	0000	CR+LF
Spare row 3 Logging row	0701	,	0501		0101	0D01		8001				0000		0000			0000	CR+LF
Spare row 4 Logging row	0701	,	0501	e.	0101	0D01		8001				0000		0000		,	0000	CR+LF
Spare row 5 Logging row	0701		0501		0101	0D01		8001				0000	,	0000			0000	CR+LF
Spare row 6 Logging row	0701	,	0501		0101	0D01		8001				0000		0000			0000	CR+LF
Spare row 7 Logging row	0701		0501		0101	0D01		8001				0000	,	0000			0000	CR+LF
	Column 1		Column 2		Column 3	Column 4		Column 5				Column 10		Column 11			Column 20	

(a) Basic setting row (row 1)

	Column name	Content								
Column 1	Logging mode	This indicates a logging mode. The input value for each logging mode is as follows:								
		Logging mode	Logging mode Input value							
		Auto updating	00							
		Date nomination	01							
Column 2	Logging start time (Year)	This indicates the year of log mode is "Auto updating (00) Data range is from 2013 to 2	This indicates the year of logging start time. This is invalid when the logging node is "Auto updating (00)". Data range is from 2013 to 2099.							
Column 3	Logging start time (Month)	This indicates the month of logging start time. This is invalid when the logging mode is "Auto updating (00)". Data range is from "01" to "12".								
Column 4	Logging start time (Day)	This indicates the day of logging start time. This is invalid when the logging mode is "Auto updating (00)". Data range is from "01" to "31".								
Column 5	Logging start time (Hour)	This indicates the hour of log mode is "Auto updating (00) Data range is from "00" to "2	gging start time. This is ". 3".	invalid when the logging	2					
Column 6	Logging start time (Minute)	This indicates the minute of logging mode is "Auto updat Data range is from "00" to "5	of logging start time. ⁻ ting (00)". 9".	This is invalid when the	2					
Column 7	Detailed data logging	This indicates a detailed data	a logging cycle. data logging cycle is a	s follows:	2					
		Detailed data logging cycl	le Input value							
		1 second	00							
		1 minute	01							
		5 minutes	02							
		10 minutes	03							
		15 minutes	04							
		30 minutes	05							

(b) Loggin	g item row (Row 2 to 8)		
	Column name	Content	Size [Byte]
Column 1 : Column 10	Detailed data logging items 1 to 10	These indicate group number and channel number of detailed data logging items. Refer to "List of logging items" for the group channel number of a logging items. (● Page 48) 《Example》 In the case of the electric power current price Electric power current price Group number: 07, channel number:01 →input value:0701 Settable logging items depend on the connected Energy Measuring Unit. Refer to "List of logging items". (● Page 48) Detailed data logging items 5 to 10 are invalid if the detailed data logging cycle is set to 1 second. Please input 0000 (null) in all rows of circuits that not used.	4
Column 11 E Column 20	One-hour data logging items 1 to 10	These indicate group number and channel number of One-hour data logging items. Refer to " List of logging items " for the group channel number of a logging items. (● Page 48) 《Example》 In the case of consumption electric power Consumption electric power Group number: 80, channel number:01 →input value:8001 Settable logging items depend on the connected Energy Measuring Unit. Refer to "List of logging items". (● Page 48) Please input 0000 (null) in all rows of circuits that not used.	4

8. Directions

Procedure for operation

Procedure for operation of this unit is as follows:



≜ Caution	 Before operating the product, check that active bare wire and so on does not exist around the product. If any exposed conductor is found, stop the operation immediately, and take an appropriate action such as isolation protection. In the event of a power outage during the setting, the unit is not set correctly. Please set again after
	power recovery.

You need to operate the Energy Measuring Unit to set the present time.

<For EMU4-BD1-MB, EMU4-HD1-MB, and EMU4-FD1-MB>
Please setup by using Energy Measuring Unit. In Operating mode the following operations can be possible.





[Note] In case the present time is changed during data output to the SD memory card, data output is stopped and logging data is cleared.

<For EMU4-BD1A-MB and EMU4-HD1A-MB>

DISP/SET

Please setup by using Energy Measuring Unit. In Operating mode the following operations can be possible.

When connecting logging unit, you can set the clock of it.

On the date indication in operating mode, press both [+/PHASE] and [-/RESET] at the same time for more than two

seconds to transition to clock setting and enable the following operations.

*The date is not indicated in operating mode when the logging unit is not connected.





* If Time is changed in outputting to SD memory card. Stop the outputting data and clear the logging data.

DISCLAIMER	Logging data is initialized when change the Time. Please change the setup after output to SD card and confirm logging data is stored correctly.
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< EcoMonitorPlus(EMU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB) >

Please setup by using Display unit. In Operating mode the following operations can be possible.

1 Transition to t	he setup mode	
Screen	Operation	Note
1-1.	(1) Push the <i>PHASE</i> key.	
[Setup] 3 COM	(2) 1-1 will be displayed.	
4 Logging	(1) Confirm that the cursor forcuses the "5 Clock", push the <a>PHASE	
Clock V	key.	
	(2) 2-1 sill be displayed.	

2 Clock Setup		
Screen	Operation	Note
2-1. [Clock] 2013/01/01 00:00 OK Cancel 2-z. Logging data will be cleared. € Cancel	 (1) In 2-1,Push the ▲ or ▼ key, and move the cursor to the "Year". (2) Push the ⊕ or - key. Change the set value. (3) Push the ▼ key, and move the cursor to the "Month". (4) Push the ⊕ or - key. Change the set value. (5) In a similar way, change the "Day", "Hour", "Minute". ^{Note1} (6) After setting all of the items, push the ▲ or ▼ key, and move the cursor to the "OK". (7) Push the	[Year]: 13⇔14⇔15⇔16⇔17⇔⇔99⇔ [Month]: 01⇔02⇔03⇔04⇔⇔12⇔ [Day]: 01⇔02⇔03⇔04⇔⇔12⇔ [Hour]: 00⇔01⇔⇔12⇔13⇔23⇔ [Minute]: 00⇔01⇔⇔59⇔ Note 1 : The setting range of the day changes with setting in the year and the month. Note 2 : It becomes "00" second when the timing of pushing the ✔/PHASE key at the clock setup screen. Note 3: The logging data stored in EMU4-LMis deleted if clock setting is changed. Measured data stored in SD card is not deleted.

*If you change settings, please push the *L/PHASE* key and be sure to determine changes. If without determine, the changes will be discarded. *The underline means the default of setting. After you have been set, even if a power failure occurs does not disappear setting. *Setup value is stored in Logging unit (EMU4-LM).

* If Time is changed in outputting to SD memory card. Stop the outputting data and clear the logging data.

DISCLAIMER Logging data is initialized when change the Time. Please change the setup after output to SD card and confirm logging data is stored correctly.	
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Set logging ID

You need to operate the Energy Measuring Unit to set logging ID.

<For EMU4-BD1-MB, EMU4-HD1-MB, and EMU4-FD1-MB>

From User 's Manual of Energy Measuring Unit in "Setting menu 5: Setting related to Logging Unit" set logging ID and

clear logging data. In operating mode, press both <u>SET</u> and <u>- / RESET</u> at the same time for more than two seconds to transition to setting mode and enable the following operations.



	again. (Set point of setting many 5 cannot cool reflection definitely when do not set setting many 5 in individual
DISCLAIMEN	(Set point of setting mend 5 cannot cool reliection demittely when do not set setting mend 5 in individual
	treatment.)
	In case there is the data with the same logging ID in the SD memory card, it may be overwritten. Logging

ID should be set if you acquire data of multiple Logging Units with one SD memory card.

<For EMU4-BD1A-MB and EMU4-HD1A-MB>

In this menu, set the logging unit ID or logging data clear.

In operating mode, press both [DISP/SET] and [+/PHASE] at the same time for more than two seconds to transition to setting mode and enable the following operations.



5 in individual treatment.)

<For EcoMonitorPlus (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB)>

Please setup by using Display unit. In Operating mode the following operations can be possible.

1 Transition to t	he setup mode.	
Screen	Operation	Note
1–1.	(1)Push the SETUP key in operation mode.	
[Setup]	(2)1-1 will be displayed.	
3 COM	(1)Confirm that the cursor focuses the "4 Logging", and push the	
🛛 Logging 🔶	(2)2-1 will be displayed.	

2 Setup the logging unit ID											
Screen	Operation	Note									
2−1. [Logging] 1 ID 2 Data clear 0 Back ▼	 In 2-1, Push the ▲ or ▼ key, and move the cursor to the "1 ID". Push the	[ID]: <u>001</u> to 255									
2–2. [ID] ©01	 Push the										

3 Delete the logging data													
Screen	Operation	Note											
3-1. [Logging] 1 ID 2 Data clear 0 Back	 In 3-1, push the ▲ or ▼ key, and move the cursor to the "2 Data clear" Push the												
3-2. [Clear Logging data] [O]X Cancel	 Push the or key, and move the cursor toe the "OK". Push the <i>P</i>/PHASE key, and confirm the setup value. 3-1 will be displayed. 												

4 Save the settings												
Screen	Operation	Note										
4–1. Quit Setup Save 2 Not Save 3 Cancel	 After setting all of the items, push the <u>SETUP</u> key. 3-1 will be displayed. When save the settings, push the ▲ or ▼ key, move the cursor to the "1 Save", and Push the <i>√</i>/PHASE key. After completing the settings saving, "Completed" message will be displayed. Push the <i>√</i>/PHASE key. Return to the operation mode, and it will be displayed electric 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. 										

*If you change settings, please push the *H/PHASE* key and be sure to determine changes. If without determine, the changes will be discarded. *The underline means the default of setting. After you have been set, even if a power failure occurs does not disappear setting.

DISCLAIMER	Logging data may be overwritten when there are same ID in SD memory card. Please setup Logging ID in the case that logging multi data in a SD memory card.
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Clear the Logging data

Τ

You need to operate the Energy Measuring Unit to clear logging data in the Logging Unit. For the operation, refer to "Set logging ID" (Page 29)

[Note]In case logging data is cleared during data output to the SD memory card, data output is stopped and logging data is cleared.

DISCLAIMER	If you need logging data in the Logging Unit, output the data to SD memory card and check the output data in the PC whether the data is memorized properly before clearing the data.
------------	--

Set logging condition

There are two ways to set the logging condition as follows. Create a setting data file by either procedure and store the setting value in this product.

(1) When creating a setting data file using the logging unit utility

You can create setting data file by selecting setting values of logging elements etc. in pull down menu. For details of the setting method, refer to the owner's manual of the logging unit utility. (Logging unit utility can be downloaded free from our web site

* The logging unit utility does not support the control unit (model name: EMU4-CNT-MB).

When logging the control unit data, create the setting data file by the method (2).

<Setting procedure for logging condition>

Step 1: Make a setting data file in the PC

Step 2: Save the setting data file on SD memory card in the PC

Step 3: Insert the SD memory card in the Logging Unit

(2) When creating a setup data file using Microsoft Excel

Step 1: Make a setting data file in the PC

This manual explains how to make a setting data file by Microsoft Excel.

(a) Start up Microsoft Excel.

Select all cells, right-click to select [Format Cells...] or click [Format(O)] on the menu bar to select [Cell(E)]. In pop-up window, click [Number] tab to select "Text".

	9) -	(~ - -																			
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9			Date			The o	format ell is di	splaye	d exact	ed as ti ly as en	ext ev tered	en whe	en a nu	imbe	r is in the	cell.						
10			Percentag	e																		
11			Fraction Scientific																			
12			Text Special																			
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2	0701	0501	01.01	0001	B001	00	0901	81.01	0801	8063	0701	0501	01.01	0001	8001	OE01	0901	81.01	00801	8063
3	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
4	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
5	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
6	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
7	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
8	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
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20																				
21																				
22																				
23																				

The setting contents shown in the above figure are as follows:

	.	tin a litera	Cell	position	Sotting value		
	Set	ting item	Row	Column	Setting value		
Logging mode				Column 1	Date nomination (01)		
		Year		Column 2	2017 (2017)		
		Month		Column 3	January (01)		
Logging start tir	ne	Day	Row 1	Column 4	1st (01)		
		Hour		Column 5	0 (00)		
		Minute		Column 6	0 (00)		
Detailed data lo	ggin	g cycle		Column 7	1 minute (01)		
Circuit 1	Det	ailed data logging item 1		Column 1	Present electric power (0701)		
Circuit 1	Det	ailed data logging item 2		Column 2	Average voltage (Line voltage) (0501)		
Circuit 1	Det	ailed data logging item 3		Column 3	Average current (0101)		
Circuit 1	Det	ailed data logging item 4		Column 4	Present power factor (0D01)		
Circuit 1	Det	ailed data logging item 5		Column 5	Consumed electric energy (8001)		
Circuit 1	Det	ailed data logging item 6		Column 6	Frequency (0F01)		
Circuit 1	Det	ailed data logging item 7		Column 7	Present reactive power (0901)		
Circuit 1	Det	ailed data logging item 8		Column 8	Reactive energy (Consumption lag) (8101)		
Circuit 1	Det	ailed data logging item 9		Column 9	Power demand (0801)		
Circuit 1	Det	ailed data logging item 10		Column 10	Regenerated electric energy (8063)		
Circuit 1	One	e-hour data logging item 1	Row 2	Column 11	Present electric power (0701)		
Circuit 1	One	e-hour data logging item 2		Column 12	Average voltage (Line voltage) (0501)		
Circuit 1	One	e-hour data logging item 3		Column 13	Average current (0101)		
Circuit 1	One	e-hour data logging item 4		Column 14	Present power factor (0D01)		
Circuit 1	One	e-hour data logging item 5		Column 15	Consumed electric energy (8001)		
Circuit 1	One	e-hour data logging item 6		Column 16	Frequency (0F01)		
Circuit 1	One	e-hour data logging item 7		Column 17	Present reactive power (0901)		
Circuit 1	One-hour data logging item 8			Column 18	Reactive energy (Consumption lag) (8101)		
Circuit 1	One	e-hour data logging item 9		Column 19	Power demand (0801)		
Circuit 1	iit 1 One-hour data logging item 10			Column 20	Regenerated electric energy (8063)		
Spare			Rows 3 to 8	Columns 1 to 20	Same setup value in upper		

(c) Save data in the following format.

File name: SET.CSV (Note) Both capitals and lower-case letters are available for alphabet.

File format: CSV (comma-delimited)

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X		- 6	*	Ŧ																	
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8	0000	0000					-	-											00	000	0 0000
9				- * F	Favorit	tes	=														
10					Dow	nloads															
11					Desk	top															
12				94	Rece	nt Place	<														
13		- 1																			
14		- 1			ibrari	es															
15		- 1																			
17					Fi	le name	STE.	cvs										-			
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23			L																		

Step 2: Save the setting data file on SD memory card in the PC

(a) Make a logging ID folder

Name of the logging ID folder is as follows:

Folder name: LOG*** (***: Logging ID set to Logging Unit Range: 001 to 255)

- [Note 1] Both capitals and lower-case letters are available for alphabet.
- [Note 2] If the folder name is different from the logging ID set to the Logging Unit, the setting values are not read into the unit.
- <Example> When the logging ID is "1", the folder should be named "LOG001".



(b) Save the setting data file in logging ID folder.



(c) Save the logging ID folder with setting data file on the SD memory card.

Step 3: Insert the SD memory card in the Logging Unit

Insert the SD memory card described in Step 2 in the Logging Unit.

For inserting, refer to "How to insert and eject the SD memory card". (
Page 9)

For this operation, LOG.LED works as follows. When you change settings, make sure to check LOG.LED to confirm whether the settings are changed properly.

< If the settings are changed properly>

LOG.LED blinks slowly for 5 seconds (repetition of 0.5-second on and 0.5-second off).

<If the setting change is failed>

LOG.LED blinks quickly for 30 seconds (repetition of 0.25-second on and 0.25-second off). Refer to "Error display and measures". (Page 38)

<If LOG.LED does not blink>

The same as the settings of the current situation, or the filename (SET), the file format (CSV) or storage location of the setting data file on the SD memory card may be wrong. Set again according to "Set the logging condition" (**P**age 32).

DISCLAIMER	 Format an SD memory card in the way specified in this manual. (Page 37) After logging condition is changed, logging data is initialized. Before changing settings, output logging data to the SD memory card and check the output data in the PC whether the data is memorized properly. After settings for the Energy Measuring Unit are changed, logging data is initialized. Before changing
	settings, output logging data to the SD memory card and check the output data in the PC whether the data is memorized properly.

Open the configured data file which I made by Microsoft Excel again

Again, when opening the setting data file created once by Microsoft Excel, the following procedures perform it.

- (a) Start up Microsoft Excel.
- (b) [Data] choose [Text Files] among a tab.
- (c) The created setting data file [SET.CSV] is chosen, push [import].

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22	- 1	📑 🖳 Com	puter													
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27	_															
28	_			File name: C	T							Text Files		_	a 📕	
29	-			rite name: Si	ET.CVS						•	Text Files				
30											Tools 👻	Import	-	Cancel		
31	- 1															
32																
33																

(d)Perform the following setting [Text Import Wizard - Step 1 of 3]. push [Next].

- [Original data type]: [Delimited] chooses.
- [Start import at row]: It is set as [1].

Text Import Wizard - Step 1 of 3
The Text Wizard has determined that your data is Delimited.
If this is correct, choose Next, or choose the data type that best describes your data.
Original data type
Choose the the type that best describes your data: <u> </u>
Start import at row: 1 🔶 File grigin: 437 : OEM United States
Preview of file C:\Users\Win7-64bit\Desktop\LOG001\SET.cvs.csv.
1 '00, '2014, '04, '30, '11, '00, '03,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Cancel < Back Next > Finish

(e)Perform the following setting [Text Import Wizard – Step 2 of 3]. push [Next]. - [Delimiters]:check is put into [Comma] only.

Text Import W	izard - Step	2 of 3	-	-	-	-	-		2	×
This screen lets	s you set the	delimiters y	your data con	tains. You	can see	how you	r text is a	offected i	n the pr	eview
Delimiters										
Semicolon		Treat cons	ecutive delimi	ters as one	•					
Space	Tex	t <u>q</u> ualifier:	-	-						
Other:										
Data preview										
00 20	14 04	30 1	11 00	103	1		1			_ _
0701 05	01 0101	`0D01 `	8001 OF0	0901	8101	0801	18063	0701	0501	10:
10000 100	0000 0000	.0000	0000 0000	0000	0000	0000	.0000	0000	.0000	100
0000 00	00 0000	0000	0000 0000	0000	.0000	0000	.0000	.0000	.0000	100 -
										,
				Cancel	<	<u>B</u> ack	<u>N</u> e	xt >	E	jinish

(f)Perform the following setting [Text Import Wizard – Step 3 of 3]. push [Finish].

- [Data preview]: choose all the sequences (shift+ sequence is chosen).
- [Column data format]: Check is put into [Text]. (Preview of data changes to [Text].)

Text Impor	rt Wizar	d - Step	3 of 3		-	-		-	-	-	2	×
This screer	n lets yo	u select e	ach colu	mn and se	et the Da	ta Forma	at.					
Column d	ata form	at										
General converts numeric values to numbers, date values to dates, remaining values to text. O Do not import column (skip)								dates, a	nd all			
Fort	Fort	Tout	Tort	Fort	Tout	Tout	Fort	Towt	Fort	Fort	Fort	Fai
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					Ca	ancel) [<	<u>B</u> ack	Ne	ext >) E	inish

Note: The screen images and operation procedures described in this document may vary depending on the version of Microsoft Windows and Microsoft Excel.

You should use the formatter designated by SD Association to format the SD memory card for this unit. Download the SD formatter from the website of SD Association to format the SD memory card.

SD Association website

https://www.sdcard.org/jp/downloads/

DISCLAIMER	 -Make sure to use the SD memory card manufactured by Mitsubishi Electric Corporation (Model EMU4-SD2GB). Using the other types of the SD memory card may cause the trouble such as data destruction of the memory card or system failure. -Format is done already as of the purchase, so a SD memory card made by Mitsubishi Electric Corporation (Model EMU4-SD2GB) has use just as it is, and is no problem.
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Output logging data and system log data to the SD memory card

After inserting the SD memory card in this unit, the unit outputs logging data and system log data to the memory card automatically.

For inserting the SD memory card, refer to "How to insert and eject the SD memory card". (**P**Page 9) For details of output operation, refer to "Logging data output (3) Output time of data file". (**P**Page 17)

<When inserting the SD memory card>

Data after the latest file in SD memory card is output.

If there is no data in the SD memory card, all logging data in the Logging Unit is output.

[Note 1] It takes about one hour to output data if the storage area of the Logging Unit is full of logging data. Outputting logging data on a regular basis is recommended.

[Note 2] Output data size is up to 10MB if the storage area of Logging Unit is full of logging data.

<If the SD memory card is always inserted>

Logging data is output every hour.

- [Note 1] If output data exceeds maximum capacity of the SD memory card, output operation is stopped automatically. When output operation is stopped, SD C.LED blinks quickly (repetition of 0.25-second on and 0.25-second off). Before the SD memory card is out of space, back up data in the memory card and format it.
- [Note 2] Output file size of logging data file depends on specified "Detailed data logging cycle". Maximum output file size for each detailed data logging cycle is as follows:

Number of eirquite	Output file size									
	1 circuit	2 circuits	3 circuits	4 circuits	5 circuits	6 circuits	7 circuits			
Logging cycle:1s	6.5 MB/ day	10 MB/ day	13MB/ day	17MB/ day	20MB/ day	23MB/ day	27MB/ day			
Logging cycle: 1min	160 KB/ day	320 KB/ day	470KB/ day	630KB/ day	760KB/ day	940KB/ day	1.1MB/ day			
Logging cycle:5min	35 KB/ day	100KB/ day	190KB/ day	230KB/ day	305KB/ day	360KB/ day	420KB/ day			
Logging cycle: 10min	20 KB/ day	60KB/ day	110KB/ day	130KB/ day	174KB/ day	205KB/ day	239KB/ day			
Logging cycle:15min	15 KB/ day	45KB/ day	81KB/ day	100KB/ day	131KB/ day	155KB/ day	180KB/ day			
Logging cycle:30min	10 KB/ day	30KB/ day	54KB/ day	65KB/ day	87KB/ day	105KB/ day	120KB/ day			

DISCLAIMER	 Make sure to use the SD memory card manufactured by Mitsubishi Electric Corporation (Model EMU4-SD2GB). Using the other types of the SD memory card may cause the trouble such as data destruction of the memory card or system failure. Format an SD memory card in the way specified in this manual. (Page 37) The write-protect switch of the SD memory card should be turned OFF to connect to the unit. If the write protect switch is "ON", the logging unit does not communicate with an SD memory card. During communication with the SD memory card, the operations such as power-off, reset and ejection of the memory card may cause data corruption of the memory card or failure of this unit or the memory card. Power off or reset the unit, or eject the SD memory card after checking that SD C.LED turns off.
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9. Reference

This chapter explains the ways of dealing when you think the unit is in failure etc.

In case you think the unit is in failure

If an abnormal sound, bad-smelling smoke, fever break out from this unit, switch it off promptly and don't use it.

Error display and coping process

Errors of the Logging Unit are indicated in the following way.

<Indication ways of errors>

- (a) Error display of the Energy Measuring Unit (EcoMonitorLight)
- (b) Error display of the Display Unit (EMU4-D65) for Energy Measuring Unit (EcoMonitorPlus)
- (c) System log codes of the system log data file
- (d) LEDs of the Logging Unit

In case error is indicated, adopt measures indicated in the table below. If the unit does not resume after measures, it may be in failure. Contact our sales representative near you.

*: When you logging the elements of the EcoMonitorPlus expansion unit (EMU4-A2, EMU4-VA2, EMU4-AX4, EMU4-PX4) unless set logging elements, an error will be displayed (ALM A1(B1), ALM A2(B2) LED is turned ON, Error :00009 is displayed in small display unit).

Display of the Energy Measuring Unit or Display Unit	System log data file	LED of the Logging Unit	Kind of error	Measures
009	_	_	Communication module error Error is displayed on the measuring unit. (ALM A1(B1),ALM A2(B2) LED is turn on)	Please setup logging item. Some units are not setting logging items
901	941	SD C.LED blinks quickly	The write protect switch of the SD memory card is "ON".	Turn the write protect switch if the SD memory card to "OFF" position. If the write protect switch is ON, the Logging Unit does not communicate with the SD memory card.
	942 to 951	_	SD memory card communication error	The SD memory card may be out of space or be formatted wrong. Format the SD memory card in the way specified in this manual. (Page 37)
902	902	l	Measured items which the Energy Measuring Unit cannot measure are set as logging item.	Reconfigure logging condition. Measured items which the Energy Measuring Unit cannot measure are set as logging item. * The following models do not support logging with the default setting, so this error will occur if you connect without setting. <u>EcoMonitorPlus</u> •models:EMU4-LG1-MB •models:EMU4-AX4 •models:EMU4-PX4
903	903	LOG. LED blinks quickly	FRAM error	Turn on the auxiliary power again.
904	—	LOG. LED blinks quickly	SRAM error	
905	905	LOG. LED	RTC error	Turn on the auxiliary power again.
906	906	blinks quickly		Then reconfigure the present time in the Energy Measuring Unit.
907	907	LOG. LED blinks quickly (For 30 sec.)	Failure of logging setting	Specifications of the setting data file may be incorrect or data may be out of range specified in this manual. Check the contents of the setting data file again.
912	912	LOG. LED blinks quickly	Communication error between units	Turn on the auxiliary power again.

After-sales service

If you have any questions or the product is broken down, contact our sales representative near you. (For details, please see at the end of this manual.)

- Gratis warranty is effective until the earlier of 1 year after the date of your purchase or 18 months after manufacturing.
- The gratis warranty shall apply if the product fails even though it is being used properly in the conditions, with the methods and under the environments in accordance with the terms and precautions described in the catalogs, the instruction manual, caution label on the product, etc.
- Repair shall be charged for the following cases even during the gratis warranty period.
 - Failures occurring due to your improper storage or handling, carelessness or fault
 - Failures due to faulty workmanship
 - Failures due to faults in use and undue modification
 - Failures due to accidental force such as a fire, abnormal voltage, etc. and force majeure such as an earthquake, wind, flood, etc.
 - Failures due to matters unpredictable based on the level of science technology at the time of product
- Our company shall not be liable to compensate for any loss arising from events not attributable to our company, opportunity
 loss and lost earning of the customer due to failure of the product, and loss, secondary loss, accident compensation,
 damage to other products besides our products and other operations caused by a special reason regardless of our
 company's predictability.

10. Requirement for the compliance with EMC Directives

EMC Directives prescribe both "Emission (electromagnetic interference): Do not radiate strong electromagnetic waves outside" and "Immunity (electromagnetic susceptibility): Do not be influenced by electromagnetic waves from outside".

This section compiles the precautions for the compliance of the system incorporating the Logging Unit (EMU4-LM), the Energy Measuring Unit (target model: EMU4-BD1-MB, EMU4-HD1-MB, EMU4-FD1-MB, EMU4-BD1A-MB, EMU4-HD1A-MB, EMU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB, EMU4-CNT-MB), Small Type Display Unit (EMU4-D65) and SD memory card (EMU4-SD2GB) with the EMC Directives. The following description is based on the requirement of the regulations and the standards we understand, but we do not guarantee to comply with the directives above for the whole system built in accordance with this description.

The manufacturer of the system finally needs to evaluate the way of the compliance with EMC Directives and whether the system complies with them or not.

(1) Harmonized standard for EMC Directives: EN61326-1:2013

(a) Compatibility condition for harmonized standard

The Energy Measuring Unit is the open type device (i.e. the device incorporated in other device), and needs to be installed in the conductive control panel.

The unit is tested with installed in the control panel for the emission and the immunity out of the test items for the standard.

(2) Recommended condition for installation in the control panel

(a) Control panel

- Control panel needs to have conducting property.
- When bolting the top panel, bottom panel etc. of the control panel, mask the grounding part of the panel so as not to be painted.
- In inner panel, keep the conductivity in as large area as possible by masking the bolting part to the main panel to keep the electric contact to main panel.
- Ground the main panel by the thick wire so as to keep high impedance even for high-frequency wave.
- (b) Installation of power line and ground line
 - Set up the ground point to the control panel near the power unit, and ground the Frame GND terminal of the unit to the ground terminal of the control panel (PE) by as thick and short wires as possible (wire length is 300 mm or shorter).

(3) SD memory card

The SD memory card is complied with EN61326-1:2013 if it is manufactured by Mitsubishi Electric corporation (Model EMU4-SD2GB).

<Basic specifications>

	Speemea	ltem	Specifications						
Mod	el		EMU4-LM						
Ratir	ng		6.4V DC (powered by the Energy Measuring Unit)						
Compensation for power failure		n for power failure	Battery (EMU4-BT) Total time of compensation is 1 year (average daily temperature is not more than +35°C). It is recommended that the battery is changed every 3 years.						
	Setting v	alues	Memorized in FRAM (nonvolatile memory) The data is not erased during power failure.						
	Logging System I	data og data	Memorized in SRAM (volatile memory) Data is erased if power failure occurs under low battery voltage condition (BAT.LED turns on).						
	Timing		During a power failure, timing operation continues by using the battery. Timing is stopped if power failure occurs under low battery voltage condition (BAT.LED turns on). After power recovery, timing is started from Jan 1, 2013, 00:00:00.						
Cloc	k accurac	у	1 minute per month						
Men	nory media	a for data output ^[Note 1]	SD memory card (SD, SDHC)						
Acco	ommodatii	ng model	Energy Measuring Unit EcoMonitorLight (Model: EMU4-BD1-MB, EMU4-HD1-MB, EMU4-FD1-MB, EMU4-BD1A-MB, EMU4-HD1A-MB) EcoMonitorPlus (Model: EMU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB, EMU4-CNT-MB) (It is also possible to acquire the data measured by EMU4-A2 / EMU4-VA2 / EMU4-DX4 / EMU4-AX4 compared to the above EcoMonitarDue)						
Stan	dard		EMC: EN-61326-1: 2013						
Usao envii	ge ronment	Operating temperature Operating humidity Storage temperature	-5°C to +55°C (average daily temperature is not more than+ 35°C) 30% to 85%RH (No condensation) -10°C to +60°C						
	Operating altitude		2000m or lower						
Mass			0.1kg (Mass of the Logging Unit only)						
External dimensions (Unit: mm)		nsions (Unit: mm)	25(W) x 90(H) x 60(D) (Dimension of the Logging Unit only)						
			(Maximum dimension including the protruding portions: 31.6 (W) x 99 (H) x 60 (D)) *Please secure a space under the logging unit to replace the battery.						
Optio	onal part		SD memory card (EMU4-SD2GB) [Note 1] [Note 2]						
Optio	onal supp	lies	Battery (EMU4-BT) [Note 2]						

[Note 1] Make sure to use the SD memory card manufactured by Mitsubishi Electric Corporation (Model EMU4-SD2GB). Using the other types of the SD memory card may cause the trouble such as data destruction of the memory card or system failure. For the SD memory card on the market, please refer to the TECHNICAL BULLETIN EMS-YE-0001 from our site. However, at the time of use, please verify sufficient by the customer that there is no problem.

[Note 2] For purchase of optional parts or supplies, contact the shop you bought this product.

<1	odding	snecifications>
	.ogginig	specifications

		5-		c	Poolifioati	000							
item		Specifications											
	Auto												
Logging	updating												
mode	Date	Auto start and stop by start time setting											
	nomination												
	Detailed	Memorize measured data in the specified "Detailed data logging cycle" (1 second, 1 minute, 5 minutes, 10											
lype of	data	minutes, 15 minutes, or 30 minutes).											
logging	<u> </u>	Data is output as detailed data file.											
data	One-nour	Memorize measured data i	n one-nour	Cycle.	u data fila								
The		Data is output as One-nour			iy data ille.								
Ine	Detailed	If the detailed data logging	cycle is "I	second : L	Jp to 4 Item	IS Jitoma							
numper	dala	If the detailed data logging	cycle is no	L I second		Jilems	5						
logging items	One-hour data	Up to 10 items	Up to 10 items										
		 It varies depending on the 	"detailed o	lata loggin	g cycle" se	et and i	the n	umber of r	neasure	ment circuits	•		
				Maximum	logging pe	riod							
		Number of expansion	1 Circuit	2 Circuit	3 Circuit	4 Cir	cuit	5 Circuit	6 Circu	it 7 Circuit			
		Logging cycle: 1 sec	20hour	6h	our		3ho	our		2hour	1		
	Detailed	Logging cycle: 1 min	20days	6d	ays	3da		ays		2days			
	data	Logging cycle: 5 min	100days	30c	lays	15d		ays		0days			
Internal		Logging cycle: 10 min	200days	60c	lays	30d		lays		20days			
memory		Logging cycle: 15 min	300days	90c	lays	45d		lays		80days			
logging		Logging cycle: 30 min	600days	180days			90d	ays	6	60days			
period													
		It varies depending on the number of measurement circuits.											
	. .		Maximum logging period										
	One-hour	Number of expansion	1 Circu	iit 2 Circ	uit 3 Cir	cuit	4 Ci	rcuit 5 C	ircuit (6 Circuit 7	Circuit		
	data		620day	/s	186days			93days		62day	S		
			(About	. (Abc	out 6 months)		(About 3 months)		ths)	(About 2 mo	onths)		
			20 mont	ns)		-,			,	,	,		
		 This is the duration for sto 	ring data fr	om one de	evice.								
		•The logging period varies depending on the "detailed data logging cycle" set and the number of extensi											
		units installed.											
0.5	Logging	Number of expansion	1 Circuit	2 Circuit	3 Circuit	4 Cir	cuit	5 Circuit	6 Circu	it 7 Circuit			
SD	[Note 3]	Logging cycle : 1sec	About	About	About	About		About	About	About			
memory	2)		Tumonths	omonths	4months	3mont	ths	3months	2months	2months			
card (2GE	P)	Logging cycle : 1min	Over	Over	Over 10vooro	About		About	About	About			
		Lagging avala + 5 10 15 20		Tuyears	Tuyears	oyear	5	Uyears	Jyears	Hyears			
	Control	Logging cycle : 5,10,15,30	$mm \rightarrow 0v$	er 10 yea	rs								
	number	By using a SD memory car	d multiple	data can h	ne saved o	n tha (SD m	omony car	-d[Note 4]				
System Ic		3600 records	a, multiple	uala Uall L	ic saveu U		וו שכ	icmory cal	u., ,				
	rmat of	CSV format (ASCII codo)											
logging data and													
system log data													

[Note 3] It is the period until capacity of 2GB SD memory card is filled in always-on connection. Data amount depends on the number of characters. It is the logging period when data is output in maximum volume.

[Note 4] If there is the logging data file with the same logging ID in the SD memory card, it is overwritten. Logging ID should be set if you acquire data of multiple Logging Units with one SD memory card.

12. Optional part (Available part)

■ SD memory card

· · · · · · · · · · · · · · · · · · ·					
Item	Specifications				
Model	EMU4-SD2GB				
Amount of memory	2GB				
Mass	2g				

[Note] Unit: mm

[Note] Unit: mm



13. Optional part (Available supplies)

Battery

Item	Specifications					
Model	EMU4-BT					
Туре	Manganese dioxide lithium battery					
Normal voltage	3V					
Capacity	220mAh					
Mass	3.8g					



14. External dimensions





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Battery	1, 7, 8, 43
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LOG.LED	5
Logging data	13, 14, 16
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Logging item	
Logging mode	15, 22, 33, 47
Logging period	

Logging start time	2
--------------------	---

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Storage Precautions	4
System log data	
System log data file	16, 17, 18, 21
The number of logging items	14
The unit is in failure	

List of setting items

	Setting item	Setting range	Initial value*			
Lo	gging ID	1 to 255	1			
Pr	esent time	Jan 1, 2013, 00:00:00 to Dec 31, 2099, 23:59:59	Jan 1, 2013, 00:00:00			
	Logging mode	Auto updating (00) Date nomination (01)	Auto updating (00)			
	Logging start time	Jan 1, 2013, 00:00:00 to Dec 31, 2099, 23:59:59	Jan 1, 2013, 00:00:00 *It is invalid because the logging mode set to "Auto updating".			
	Detailed data logging cycle	1 second (00), 1 minute (01), 5 minutes (02), 10 minutes (03), 15 minutes (04) and 30 minutes (05)	1 minute (01)			
	Detailed data logging item 1 (Logging item row of circuit 1 to 7)		Present electric power (0701)			
	Detailed data logging item 2 (Logging item row of circuit 1 to 7)		Average voltage (Line voltage) (0501)			
	Detailed data logging item 3 (Logging item row of circuit 1 to 7)		Average current (0101)			
	Detailed data logging item 4 (Logging item row of circuit 1 to 7)		Present power factor (0D01)			
	Detailed data logging item 5 (Logging item row of circuit 1 to 7)		Consumed electric energy (8001)			
	Detailed data logging item 6 (Logging item row of circuit 1 to 7)		Frequency (0F01)			
Ľ	Detailed data logging item 7 (Logging item row of circuit 1 to 7)		Present reactive power (0901)			
ogging	Detailed data logging item 8 (Logging item row of circuit 1 to 7)		Reactive energy (Consumption lag) (8101)			
condit	Detailed data logging item 9 (Logging item row of circuit 1 to 7)		Null (0000)			
ion	Detailed data logging item 10 (Logging item row of circuit 1 to 7)	These depend on the connected Energy Measuring Unit or setting of it.	Null (0000)			
	One-hour data logging item 1 (Logging item row of circuit 1 to 7)	Refer to "List of logging items" (Page 48).	Present electric power (0701)			
	One-hour data logging item 2 (Logging item row of circuit 1 to 7)		Average voltage (Line voltage) (0501)			
	One-hour data logging item 3 (Logging item row of circuit 1 to 7)		Average current (0101)			
	One-hour data logging item 4 (Logging item row of circuit 1 to 7)		Present power factor (0D01)			
	One-hour data logging item 5 (Logging item row of circuit 1 to 7)		Consumed electric energy (8001)			
	One-hour data logging item 6 (Logging item row of circuit 1 to 7)		Frequency (0F01)			
	One-hour data logging item 7 (Logging item row of circuit 1 to 7)		Present reactive power (0901)			
	One-hour data logging item 8 (Logging item row of circuit 1 to 7)		Reactive energy (Consumption lag) (8101)			
	One-hour data logging item 9 (Logging item row of circuit 1 to 7)		Null (0000)			
	One-hour data logging item 10 (Logging item row of circuit 1 to 7)		Null (0000)			

* If no logging conditions are set, it will operate at the default settings.
* The following models do not support logging with the default setting, so please setup the logging condition.

EcoMonitorPlus

•Energy Measuring Unit Insulation Monitoring Model (models:EMU4-LG1-MB)

•Energy Measuring Unit Extension Model for Analog Input (models:EMU4-AX4)

•Energy Measuring Unit Extension Model for Pulse Input (models:EMU4-PX4)

List of logging items

(1)	In the case of that target units of Logging is EcoMonitorl ight (EMU4-BD1-MB, EMU4-HD1-MB, EMU4-ED1-MB).
•	• •	
•		

							Model that logging is enable							
Logging item		Logging kind	Group	Channel Data		Unit	EMU4-BD1-MB EMU4-HD1-MB EMU4-FD1-MB							
		[Note3]	number	number	name		1P2W	1P3W	3P3W	1P2W	1P3W	3P3W	3P4W	
Current	Average		Present		01	Δ	[Δ]				•			
Ourient	phase 1		Present		21	1 4	[A]	ě						
	phase 2		Present	01	41	2 A	[A]	_			_			
	phase 3		Present	<u> </u>	61	3 A	[A]	_	ě	ě	_	ě	ě	ě
	phase N		Present		81	N A	[A]		_	_	_	_	_	ě
Current	phase 1		Present		21	1 DA	[A]	•	•	•	•	•		ě
demand	phase 2		Present		41	2 DA	[A]	_	ĕ	ě	_	ě	ě	ě
	phase 3		Present	02	61	3 DA	[A]	_	•	•	_	•	•	•
	phase N		Present		81	N DA	[A]			_	_		_	•
Voltage	phase 1N		Present		21	1N_V	[V]	—			_	_	_	•
-	phase 2N		Present	03	41	2N_V	[V]	—	_	_	_	_	_	•
	phase 3N		Present		61	3N_V	[V]	—					—	•
	Average (Line	voltage)	Present		01	V	[V]	•	•	•	•	•	•	•
	phase 12		Present	05	21	12_V	[V]							
	phase 23		Present	05	41	23_V	[V]	—	•	•	_	•		•
	phase 31		Present		61	31_V	[V]	—						
Present electri	ic power		Present	07	01	W	[kW]							
Power deman	d		Present	08	01	DW	[kW]		•	•	•	•	•	•
Present reactive	ve power		Present	09	01	VAR	[kvar]							•
Present appar	rent power		Present	0B	01	VA	[kVA]	—						
Present power	r factor		Present	0D	01	PF	[%]	•	•	•	•	•	•	•
Frequency			Present	0F	01	Hz	[Hz]	•	•	•	•	•	•	•
RMS value		phase 1	Present		21	1_1HA	[A]	—	_	_	•	•		•
of harmonic	Fundamental	phase 2	Present	29	41	2_1HA	[A]	—			_	_	_	•
current		phase 3	Present	_	61	3_1HA	[A]	—				•	•	•
		phase N	Present		81	N_1HA		_			_	_	_	•
		phase 1	Present		21	1_3HA		_	_		•	•	•	•
	3rd order	phase 2	Present	2B	41	2_3HA		_	_			_	_	•
		phase 3	Present	_	01	3_3HA		_				•	U	
		phase N	Present		01								_	
5th ord		phase 1	Present		<u></u>						•	•	•	
	5th order	phase 2	Present	2D	61	2_3HA 2_5HA								
		phase 3	Present		91							-		
		phase N	Present		21	1 7HA								
		phase 7	Present		41	2 7HA		_		_	_	_	_	
	7th order	phase 3	Present	2F	61	3 7HA	[Δ]							
		phase N	Present		81	N 7HA	[A]	_	_			_	_	ě
		phase 1	Present		21	1 9HA	[A]			_	•	•		ě
	011	phase 2	Present		41	2 9HA	[A]	—	—	—	_	_	_	•
	9th order	phase 3	Present	31	61	3 9HA	[A]	—	—	—				•
		phase N	Present	1	81	N_9HA	[A]	—	—	—	—	_	_	•
		phase 1	Present		21	1_11HA	[A]	—	—	—	•	•	•	•
	11th order	phase 2	Present	30	41	2_11HA	[A]	_	_	_		_		•
	ruruuer	phase 3	Present		61	3_11HA	[A]	—	_	—	—			
		phase N	Present		81	N_11HA	[A]		_	_		_	_	•
		phase 1	Present		21	1_13HA	[A]	—						
	13th order	phase 2	Present	35	41	2_13HA	[A]	—	_	_	_	_		•
		phase 3	Present		61	3_13HA	[A]	—	—	—	—			•
		phase N	Present		81	N_13HA	[A]	—	_	—		_	—	
1		phase 1	Present		21	3721	Null							
	15th order	phase 2	Present	37	41	3741	Null							
		phase 3	Present		61	3761	Null							
		phase N	Present	ļ	81	3781	Null	—	—	—	_			A
		phase 1	Present		21	1_HA	[A]		—	—				•
	Average	phase 2	Present	3F	41	2_HA	[A]		—	—	_	-	_	•
	U U	phase 3	Present		61	3_HA						•		•
		phase N	Present	1	81	INHA	IAI							•

			I a contra co						Μ	lodel tha	at loggin	g is ena	ble	
	Logging itom		Logging	Group	Channel	Data	Unit	EM		MD		EMU4-I	HD1-MB	
	Logging item		[Note3]	number	number	name	Unit		04-601			EMU4-	FD1-MB	
			[Note5]					1P2W	1P3W	3P3W	1P2W	1P3W	3P3W	3P4W
RMS value		phase 1N	Present		21	1N_1HV	[V]	_					_	
of harmonic	Fundamental	phase 2N	Present	41	41	2N_1HV	[V]	—	—	—	—	—	—	•
voltage		phase 3N	Present		61	3N_1HV	[V]	—	—	—	—	—	—	•
		phase 1N	Present		21	1N_3HV	[V]		—		—	—	—	
	3rd order	phase 2N	Present	43	41	2N_3HV	[V]	—		—		—	-	
	-	phase 3N	Present		61	3N_3HV	[V]		—	—	—	_	_	•
		phase 1N	Present		21	1N_5HV	[V]		—		—	—	—	•
	5th order	phase 2N	Present	45	41	2N_5HV					_		_	•
	-	phase 3N	Present		61	3N_5HV							_	•
	744	phase 1N	Present	47	21	1N_7HV			_	_	_		_	
	7th order	phase 2N	Present	47	41	2N_/HV				_			_	
		phase 3N	Present		01									
	Oth order	phase IN	Present	40	41									
	Surolder	phase 2N	Present	45	61	3NI QHV	[V]	_	_		_			
		phase 3N	Present		21	1N 11HV		_		_	_			
	11th order	phase 2N	Present	4B	41	2N 11HV		_	_	_	_		_	
	Thiroidei	phase 3N	Present	ЧD	61	3N 11HV		_			_	_	_	
		phase 1N	Present		21	1N 13HV	IV]	_				_	_	ě
	13th order	phase 2N	Present	4D	41	2N 13HV	IV1						_	ě
		phase 3N	Present		61	3N 13HV	IV1	—	_	—	_	_	—	ě
		phase 1N	Present		21	4F21	Null	—	_	—	_	_	—	
	15th order	phase 2N	Present	4F	41	4F41	Null	—	_	—	_	_	—	
		phase 3N	Present		61	4F61	Null	<u> </u>	i —	—	i —	—	—	
		phase 1N	Present		21	1N HV	IV1						_	ē
	Average	phase 2N	Present	57	41	2N HV	IV1	—	_	—	_	_	—	ě
	5	phase 3N	Present	-	61	3N HV	IV1	_		_		_	_	•
		phase 12	Present	=0	21	12 1HV	IV1	—	_	—	•	•	•	_
	Fundamental	phase 23	Present	59	41	23 1HV	IV1	—	_	—	_	ě	ě	—
		phase 12	Present		21	12 3HV	IV1	_			•	•	•	_
	3rd order	phase 23	Present	5B	41	23 3HV	IV1	1 —		_	_	ě	ĕ	—
		phase 12	Present		21	12 5HV	[V]	_			•	Ó	ě	—
	5th order	phase 23	Present	5D	41	23 5HV	[V]	_			_	Ó	ě	—
		phase 12	Present		21	12 7HV	ĪV1	—	_	—	•	•	•	—
	7th order	phase 23	Present	5F	41	23 7HV	IV1	—	_	—	_	ě	ě	—
		phase 12	Present		21	12 9HV	IV1	_			•	•	•	_
	9th order	phase 23	Present	61	41	23 9HV	IV1	—	_	—	_	ě	ě	—
		phase 12	Present		21	12 11HV	IV1	—	_	—	•	ě	ě	—
	11th order	phase 23	Present	63	41	23 11HV	M	—	—		—	•	•	—
	1011	phase 12	Present	05	21	12 13HV	M	—			•	Ó	Ō	—
	13th order	phase 23	Present	65	41	23 13HV	M	—			_	Ó	Ō	—
	450	phase 12	Present	07	21	6721	Null	—						—
	15th order	phase 23	Present	67	41	6741	Null	—						_
	A	phase 12	Present		21	12_HV	[V]	—	—	—	•	•	•	—
	Average	phase 23	Present	юг	41	23_HV	[V]	_	_	_	_	٠	•	—
Content rate	3rd order		Present		73	1_3HA	[%]	—	—	—	•	•	•	•
of harmonic	5th order		Present		75	1_5HA	[%]	—	—			٠	•	٠
current	7th order		Present		77	1_7HA	[%]	—	_	_	•	•	•	•
	9th order	phase 1	Present		79	1_9HA	[%]	—	—		•	•		٠
	11th order	phase i	Present		7B	1_11HA	[%]	—		_	•	•	•	•
	13th order]	Present		7D	1_13HA	[%]	<u> </u>						
	15th order]	Present		7F	717F	Null							
	Average		Present		86	1_HA	[%]						•	
	3rd order]	Present		89	2_3HA	[%]					_		•
	5th order]	Present		8B	2_5HA	[%]			—		—	—	•
	7th order	1	Present		8D	2_7HA	[%]							
	9th order	phase 2	Present		8F	2_9HA	[%]						—	
	11th order	pilube Z	Present		91	2_11HA	[%]			—	_	—	—	
	13th order	1	Present		93	2_13HA	[%]							
	15th order	1	Present		95	7195	Null						—	
	Average		Present	71	9C	2_HA	[%]							
	3rd order	1	Present		9F	3_3HA	[%]	<u> </u>						
	5th order	1	Present		A1	3_5HA	[%]			—	—		•	•
	7th order	1	Present		A3	3_7HA	[%]	<u> </u>						
	9th order	phase 3	Present		A5	3_9HA	[%]							
	11th order		Present		A7	3_11HA	[%]	<u> </u>				•	•	•
	13th order	1	Present		A9	3_13HA	[%]	<u> </u>						•
	15th order	1	Present		AB	71AB	Null	<u> </u>						
	Average	ļ	Present		B2	3_HA	[%]	<u> </u>						•
	3rd order	1	Present		B5	N_3HA	[%]	<u> </u>						•
	5th order	1	Present		B7	N_5HA	[%]	<u> </u>						•
	7th order	1	Present		B9	N_7HA	[%]	<u> </u>						•
	9th order	phase N	Present		BB	N_9HA	[%]	<u> </u>						•
	11th order	P	Present		BD	N_11HA	[%]	<u> </u>						•
	13th order	4	Present		BF	N_13HA	[%]	<u> </u>						•
	15th order	4	Present		C1	71C1	Null	<u> </u>						
	Average		Present		C8	N_HA	[%]	—	—	—	—	—	—	

Logging item Logging item Channel Number Data name Unit EMU4-801-MS EMU4-801-MS EMU4-801-MS EMU4-801-MS Content rate of Sin order inder order Sin order inder Present inder 73 12,34V PS0 193W 193W 193W 193W 193W 394W Mamonio valoge Sin order inder Present inder Present inder Present inder 12,34V PS0											Model that	at logging	ı is enable)	
Content rish order rish order risk order ri		Logging iter	m	Logging kind	Group	Channel	Data name	Unit	EN	1U4-BD1-	мв		EMU4-I	HD1-MB	
Content 3d order Present <				[Note3]	number	number			1P2W	1P3W	3P3W	1P2W	1P3W	3P3W	3P4W
rate of bin order bin order (bin order (bin order (bin order (bin order) (bin order) (bin order) (bin order (bin order) (bin	Content	3rd order	1	Present		73	12.3HV	[%]				•	•	•	
harmonic Th order Present Present 11fh order Present Present Present Present Present 3rd oddr Present Present Present Present Present 3rd oddr Present Present Present Present Present 10h order Present Present Present Present Present 3rd order Present Pres	rate of	5th order		Present		75	12 5HV	[%]	_	_	_	ě	ě	ě	_
9bin order 13th order 13th order 13th order 13th order 13th order 13th order 13th order 13th order 13th order Present Present Present 13th order 13th order Present Present Present 13th order 13th order Present Present Present Present Present 13th order Present Present Present Present Present Present Present Present Present Present Present Present 13th order Present Pr	harmonic	7th order		Present		77	12 7HV	[%]	_	_	—	ě	Ŏ	ě	—
11fn order Present	voltage	9th order	1	Present		79	12 9HV	[%]	_	_	—	Ó	Ó	Ó	_
13th order Present		11th order	phase 12	Present		7B	12 11HV	[%]	—	—	—	•		•	_
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		13th order		Present		7D	12 13HV	[%]	—	—	_				_
Average Sth order Sth order Present Present Present Present 72 86 12 HV %6		15th order		Present		7F		Null	—	_	_				_
3d order Present Present Present Present		Average		Present	70	86	12 HV	[%]	_		_				_
Sh order 9th order 11th order 11th order 13th order Present Present Present Present Present Present B8 23 SHV %		3rd order		Present	12	89	23_3HV	[%]	—	—	—	_		•	—
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		5th order		Present		8B	23_5HV	[%]	—	—	—			•	—
ght order 11th order phase 23 Present Present SF 23 9HV % <td></td> <td>7th order</td> <td></td> <td>Present</td> <td></td> <td>8D</td> <td>23_7HV</td> <td>[%]</td> <td>_</td> <td> </td> <td> </td> <td> </td> <td></td> <td>•</td> <td>—</td>		7th order		Present		8D	23_7HV	[%]	_					•	—
11th order 13th order Present Present 91 23 11H/V 1%		9th order	nhaaa 02	Present		8F	23_9HV	[%]	—	—	—			٠	—
13th order Present 93 23 13HV 1%1 -		11th order	pnase 23	Present		91	23_11HV	[%]	—	—	—			٠	—
Ifsh order Present 95 7285 Null A A Average Present Present 9C 23 HV (%)		13th order		Present		93	23_13HV	[%]	—	—	—			٠	—
Average Present 9C 23 HV %		15th order		Present		95	7295	Null	—	—	—				—
3rd order Std order Present		Average		Present		9C	23_HV	[%]	—				•	•	—
Sth order 7th order Present 9th order Present 9th order Present 13th order Present Present 75 1N, SHV %6		3rd order		Present		73	1N_3HV	[%]	—				—		•
7h order 9h order 9hase 1N Present Present 9resent 77 1N, 7H %		5th order		Present		75	1N_5HV	[%]	—				—		•
<u>9th order</u> <u>11th order</u> <u>phase 1N</u> <u>11th order</u> <u>Phase 1N</u> <u>Present</u> <u>79 1N, 9HV [%] <u>79 1N, 13HV [%] <u>70 (N, 14HV [%] <u>71 (N, 14HV [%] <u>N, 13HV [%] <u>N</u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u>		7th order		Present		77	1N_7HV	[%]	_		_		_		
11th order 13th order Present Present 7B 1N.11V/ %		9th order	nhaaa 1N	Present		79	1N_9HV	[%]	—				—		•
I 3th order 15th order Present Present Present Present TO 11.3HV [%]		11th order	phase IN	Present		7B	1N_11HV	[%]	—				—		•
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		13th order		Present		7D	1N_13HV	[%]	_	_	-	_	_	_	•
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		15th order		Present		7F	737F	Null	—				—		
3rd order 5th order Present Present Present Present Present Present 99 2N. 3HV 1%1		Average		Present		86	1N_HV	[%]	_		_		_		
Sth order 7th order Present Present Present Present Present Present Presen		3rd order		Present		89	2N_3HV	[%]	—	_	_	_	—	_	•
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		5th order		Present		8B	2N_5HV	[%]	—	_	—	_	—	_	•
9th order 11th order phase 2N Present Present 73 8F 2N_9HV [%] -		7th order		Present		8D	2N_7HV	[%]	—	_	—		—		•
11th order Present		9th order	nhasa 2N	Present	73	8F	2N_9HV	[%]	—	—	—	—	—	—	
13th order Present 93 2N_13HV [%] </td <td></td> <td>11th order</td> <td>phase 2N</td> <td>Present</td> <td>75</td> <td>91</td> <td>2N_11HV</td> <td>[%]</td> <td>—</td> <td>—</td> <td>—</td> <td></td> <td>—</td> <td></td> <td></td>		11th order	phase 2N	Present	75	91	2N_11HV	[%]	—	—	—		—		
15th order Present 95 7395 Null <td></td> <td>13th order</td> <td></td> <td>Present</td> <td></td> <td>93</td> <td>2N_13HV</td> <td>[%]</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td></td>		13th order		Present		93	2N_13HV	[%]	—	—	—	—	—	—	
Average Present 3rd order 3rd order 5th order Present 7th order Present 9th order Present 9th order Present 9th order Present 9th order Present 11th order Present 13th order Present 13th order Present Average Present Present Present Present Present Present Present Present Present Present Present Average Present Present Present Average Present Present AB B2 3N_13HV B2 3N_HV B2 3N_HV B2 3N_HV B3 01 Wh B4 01 Wh B4 01 VARh B4 01 VARh <		15th order		Present		95	7395	Null			—		—		
3rd order Sth order Present 9F 3N_3HV [%] <th< td=""><td></td><td>Average</td><td></td><td>Present</td><td></td><td>9C</td><td>2N_HV</td><td>[%]</td><td>—</td><td></td><td>—</td><td></td><td>—</td><td></td><td></td></th<>		Average		Present		9C	2N_HV	[%]	—		—		—		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		3rd order		Present		9F	3N_3HV	[%]	—	—	—	—	—	—	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		5th order		Present		A1	3N_5HV	[%]	—	—	—	—	—	—	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		7th order		Present		A3	3N_7HV	[%]	—	—	—	—	—	—	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		9th order	phase 3N	Present		A5	3N_9HV	[%]			—		—		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		11th order	prideo or t	Present		A7	3N_11HV	[%]	—	—	—	—	—	—	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		13th order		Present		A9	3N_13HV	[%]			—		—		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		15th order		Present		AB	73AB	Null			—		—		
Electric energy Consumption difference difference 80 01 Wh [kWh] •		Average		Present		B2	3N_HV	[%]							•
energy Regeneration difference 60 63 RWh [kWh] ●	Electric	Consumption		difference	80	01	Wh	[kWh]							
Reactive energy Consumption lag difference 81 01 VARh [kvarh] •	energy	Regeneration		difference		63	RWh	[kWh]			•				
Pulse input ^[Note 1] difference 83 01 Pl1 Null	Reactive	Consumption la	ag	difference	81	01	VARh	[kvarh]	•	•	•	•	•	•	•
Periodic electric energy [Note 2] difference 8B 01 PWh [kWh] — — — ● ● ● Null — 00 00 — — ●	Pulse input ®	Note 1]		difference	83	01	PI1	Null	<u> </u>	_	_	•	•	•	•
	Periodic elec	ctric energy ^[Note 2]		difference	8B	01	PWh	[kWh]	_	_	—	ě	ē	ě	ě
	Null	31		_	00	00				•	•	ē	Ŏ	ē	Ĭ

[Note 1] Pulse input is unavailable if the external input is set to contact input.

[Note 2] Periodic electric energy is unavailable if the external input is set to Pulse input. [Note 3] Instantaneous values are the measured values at the collection timing that are logged.

For the difference value, the differential value between the weighing value of this collection timing and the weighing value of the previous collection timing is logged.

Weighing value at collecting timing is logged for integrated value.

[Note 4] "▲" means EMU4-FD1-MB only.

	('	2)	In the case of that target units of Logging is EcoMonitorPlu	s (EMU4-BM1-MB, EMU4-HM1-MB
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				Logging						Ν	lodel that	t logging i	s enable		
	Logging	item		kind	Group	Channel	Data	Unit	EMU	J4-BM1-N	B		EMU4-H	IM1-MB	
				[Note5]	namber	namber	name		1P2W	1P3W	3P3W	1P2W	1P3W	3P3W	3P4W
Current		Avera	age	Present		01	A	[A]					•		•
		phas	e 1	Present		21	1_A	[A]	•		•		•	•	•
		phas	e 2	Present	01	41	2_A	[A]	[Note1]	•	•	INote11	•	•	•
		phas	e 3 o N	Present		61 81	3_A	[A]			•			•	
Current dem	and	phas	e 1	Present		21	1 DA	[A]	•	•	•	•	•	•	
ounone donn	ana	phas	ie 2	Present		41	2 DA	[A]	_	ě	ě	_	ĕ	ě	ě
		phas	e 3	Present	02	61	3_DA	[A]	[Note1]			[Note1]			
		phas	e N	Present		81	N_DA	[A]					_		
Voltage		phas	e 1N	Present		21	1N_V	[V]		—			_		•
		pnas		Present	03	41	2N_V								•
		Aver	ade	Present		01		[v]							•
		(Line	voltage)	Tresent		01	V	[V]	•	•	•	•	•	•	•
		phas	e 12	Present	05	21	12_V	[V]					٠		
		phas	e 23	Present		41	23_V	[V]	[Note1]			[Note1]			
		phas	e 31	Present	07	61	31_V	[V]	_	•	•		•	•	•
Present elect	tric power	[1] [100	ote2]	Present	07	01	W 0761	[KVV]		•	•				
		[4] ¹ 10	te2]	Present	07	01		INUII [k\//I					_		
Power dema	nd	[2] ^{[No}	ote2]	Present	08	61	0861	Null	Ĭ				_		_
Present reac	tive	[1] ^{[No}	ote2]	Present	09	01	VAR	[kvar]	ě	•	•	ě	•	•	•
power		[2] ^{[No}	ote2]	Present	09	61	0961	Null		—	_		_	_	—
Present appa	arent power			Present	0B	01	VA	[kVA]	—	—	—	—	—	—	•
Present pow	er factor			Present	0D	01	PF	[%]	•	•	•	•	•	•	•
Present pow	er factor	[1] ^{[No}	ote2]	Present	0D	21	0D21	Null	•	_	_	•	_	_	—
2 circuits measurin	ig in 1P2W	[2] ^{[No}	ote2]	Present	0D	61	0D61	Null	•	_	_	•	_	_	_
Frequency				Present	0F	01	Hz	[Hz]							
Current unba	alance rate			Present	01	1E	011E	Null	•	•	•	•	•	•	•
Voltage unba	alance rate			Present	03	1E	031E	Null		•		•	•	•	•
RMS value	Fundame	ntal	phase 1	Present		21	1_1HA	[A]	_	—		•	•	•	•
harmonic		-	phase 2	Present	29	61	2_1HA 3_1HA	[A]			_	[Note1]		_	
current		F	phase 0	Present		81	N 1HA	[A]	_					_	ě
	3rd orde	er	phase 1	Present		21	1_3HA	[A]	_			•	•	•	Ŏ
			phase 2	Present	28	41	2_3HA	[A]					_		
		_	phase 3	Present	20	61	3_3HA	[A]	—	—		[Note1]			
			phase N	Present		81	N_3HA	[A]	_	—		_	_	_	•
	5th orde	er	phase 1	Present		21	1_5HA	[A]				•	•	•	•
		-	phase 2	Present	2D	61	2_3HA 3_5HA	[Α] [Δ]	_	_	_	[Note1]	-		
		F	phase N	Present		81	N 5HA	[A]	_				_	_	•
	7th orde	er	phase 1	Present		21	1_7HA	[A]	_		—	•	•	•	•
			phase 2	Present	2F	41	2_7HA	[A]	_	—	—		_	—	
		Ļ	phase 3	Present	<u>-</u> 1	61	3_7HA	[A]				[Note1]	•		•
	7#		phase N	Present		81	N_7HA	[A]							
	/ th orde	i.	phase 2	Present		∠1 1	1_9HA 2 9HA	[A] [A]					-		
		┢	phase 3	Present	31	61	3 9HA	[A]				[Note1]	•	•	
		F	phase N	Present		81	N 9HA	[A]	_	_		_		_	•
	11th orde	er	phase 1	Present		21		[A]							•
			phase 2	Present	33	41	2_11HA	[A]		—			_	—	
		Ļ	phase 3	Present	00	61	3_11HA	[A]				[Note1]	•		•
	12th and-		phase N	Present		81	N_11HA	[A]							
	13th orde	1	phase 7	Present		∠1 <u>⊿1</u>	2 13HA	[A] [Δ]				-	-		
		┢	phase 3	Present	35	61	3 13HA	[A]				[Note1]	•	•	
		F	phase N	Present		81	N_13HA	[A]	—	—	—		_	_	•
	Average		phase 1	Present		21	1_HA	[A]	_						
			phase 2	Present	ЗE	41	2_HA	[A]	_	—	—	—	_	—	•
		Ļ	phase 3	Present	01	61	3_HA	[A]				[Note1]	•		•
1	1		phase N	Present		81	NHA	[A]	_	— —	—			I —	

			Logging	•		-				Model th	at logging	is enable		
	Logging item		kind	Group	Channel	Data	Unit	EN	NU4-BM1-I	MB		EMU4-	HM1-MB	
			[Note5]	number	number	name		1P2W	1P3W	3P3W	1P2W	1P3W	3P3W	3P4W
RMS	Fundamental	phase 1N	Present		21	1N 1HV	Γ/1							
value of	rundamentai	phase 2N	Present	/1	/1	2N 1HV		_		_	_		_	
harmonic		phase 2N	Present		61	3NI 1HV		_		_	_		_	
voltage	3rd ordor	phase JN	Prosont		21		[v]	_	_			_	_	
voluge	Sid Older	phase IN	Present	12	41									
		phase 2N	Present	43	41							_		
	Eth ordor	phase 3N	Present		01									
	Surrorder	phase IN	Present	45	21							_	_	
		phase 2N	Present	45	41	2N_5HV								
	741	phase 3N	Present		01							_	_	
	7th order	phase TN	Present	47	21	IN_/HV								
		phase 2N	Present	47	41	2N_7HV	[V]	_			_	_		•
		phase 3N	Present		61	3N_7HV	[V]					_		•
	9th order	phase 1N	Present		21	1N_9HV	[V]	_	-	-	-	_	_	•
		phase 2N	Present	49	41	2N_9HV	[V]					_		•
		phase 3N	Present		61	3N_9HV	[V]	_	-	-	-	_	_	•
	11th order	phase 1N	Present		21	1N_11HV	[V]			—	_		_	•
		phase 2N	Present	4B	41	2N_11HV	[V]		—	—	—	—	—	
		phase 3N	Present		61	3N_11HV	[V]	_	—	—	—	—	—	•
	13th order	phase 1N	Present		21	1N_13HV	[V]	—	-	—	—	—	—	
		phase 2N	Present	4D	41	2N_13HV	[V]	-	-	—	—	—	—	
		phase 3N	Present		61	3N_13HV	[V]	-	-	—	—	—	—	
	Average	phase 1N	Present		21	1N_HV	[V]	—	—	—	—	—	—	
		phase 2N	Present	57	41	2N_HV	[V]	—	—	—	—	—	—	
		phase 3N	Present		61	3N_HV	[V]	—	-	—	—	_	—	
	Fundamental	phase 12	Present	50	21	12_1HV	[V]	—	—	—			•	—
		phase 23	Present	59	41	23_1HV	[V]	—	—		[Note1]	•	•	—
	3rd order	phase 12	Present	ED.	21	12_3HV	[V]	_	_		•	•	•	—
		phase 23	Present	ЭD	41	23_3HV	[V]	—	—		[Note1]	•	•	—
	5th order	phase 12	Present	50	21	12 5HV	[V]	-	-	—				-
		phase 23	Present	50	41	23 5HV	[V]	-	-	—	[Note1]			-
	7th order	phase 12	Present		21	12 7HV	M	_	_	_	•	•	•	_
		phase 23	Present	5⊦	41	23 7HV	Ń	_	_	_	[Note1]		•	_
	9th order	phase 12	Present		21	12 9HV	ÎVÎ	_	_	_	•	ě	ě	_
		phase 23	Present	61	41	23 9HV	N1	_	_	_	[Note1]	ě	ě	_
	11th order	phase 12	Present		21	12 11HV	N1	_		_		ĕ	ě	
	i i i i i i i i i i i i i i i i i i i	phase 23	Present	63	41	23 11HV	N1	_	_	_	[Note1]	ě	ě	_
	13th order	phase 12	Present		21	12 13HV	IV1	_	_	_		ě	ě	_
	iour or doi	phase 23	Present	65	41	23_13HV	IV1	_	_	_	[Note1]	ě	ě	_
	Average	phase 12	Present		21	12 HV	[V]	_	_	_		ě	ě	_
	/ Weilage	phase 23	Present	6F	41	23 HV	[V]	_	_	_	[Note1]			_
Content	3rd order	phase 1	Present		73	1 344	[%]	_		_				
rate of	5th order	priase i	Prosont		75		[70]	_	_					
harmonic	7th order		Present		77		[/0]							
current	Oth order		Present		70		[/0]							
ourion	911 Oldel		Present	-	79	1_9FIA	[70]							
	1 Ith order		Present	-	7D		[%]							
	Average	1	Drocant		10		[%]	<u> </u>	<u> </u>					
	Average 2rd crdor	phone 2	Present		00		[%]	<u> </u>	<u> </u>			-	-	
	Siu Order	phase 2	Present	-	09	2_3NA	[%]	<u> </u>	<u> </u>	_				
	7th order	1	Drocant		0D		[%]	<u> </u>	<u> </u>					
		1	Present	-	0U 0E		[%]	<u> </u>						
	9th order	1	Present	-	ŏ⊢ 04	2_9HA	[%]		<u> </u>					
	1 Tun order	1	Present	-	91	2_11HA	[%]		<u> </u>					
	13th order		Present		93	2_13HA	[%]	_	-	-	-	_	_	•
	Average		Present	71	90	2_HA	[%]			—		_	_	•
	3rd order	phase 3	Present		9F	3_3HA	[%]			—		•	•	
	5th order		Present		A1	3_5HA	[%]					•	•	
	7th order		Present		A3	3_7HA	[%]	<u> </u>		—		•	•	
	9th order		Present		A5	3_9HA	[%]				[INote1]	•	•	
	11th order	l	Present		A7	3_11HA	[%]		-	—	●[Note1]			
	13th order	l	Present		A9	3_13HA	[%]			—	[Note1]			
	Average		Present		B2	3_HA	[%]			—	[Note1]			
	3rd order	phase N	Present		B5	N_3HA	[%]			—			—	
	5th order		Present		B7	N_5HA	[%]			_	—		—	
	7th order		Present		B9	N_7HA	[%]							
	9th order]	Present		BB	N_9HA	[%]				_		_	•
	11th order]	Present		BD	N_11HA	[%]				_		_	•
	13th order		Present]	BF	N_13HA	[%]	—	—	—	—	_	—	
	Average	1	Present	1	C8	N HA	[%]	_	_				_	

			Logging		. .					Model t	hat logging	is enable	9	
	Logging item		kind	Group	Channel	Data name	Unit	EM	IU4-BM1-	MB		EMU4-+	IM1-MB	
			[Note5]	namber	number			1P2W	1P3W	3P3W	1P2W	1P3W	3P3W	3P4W
Content	3rd order	phase 12	Present		73	12 3HV	[%]	_	_		•	•	•	—
rate of	5th order		Present		75	12_5HV	[%]	_	_	—	•		•	—
harmonic	7th order		Present		77	12 7HV	[%]		_	_	•		۲	_
voltage	9th order		Present		79	12 9HV	[%]	—	—	—	•	•	•	—
	11th order		Present		7B	12 11HV	[%]	—	_	—	•		•	—
	13th order		Present		7D	12 13HV	[%]			_			•	_
	Average		Present	70	86	12 HV	[%]	—	_	—	•		•	—
	3rd order	phase 23	Present	72	89	23 3HV	[%]			_	[Note1]		۲	_
	5th order		Present		8B	23_5HV	[%]	_	_	—	[Note1]		•	—
	7th order		Present		8D	23_7HV	[%]	_	_	—	[Note1]		•	—
	9th order		Present		8F	23 9HV	[%]	—		—	[Note1]		•	—
	11th order		Present		91	23 11HV	[%]			_	[Note1]		•	_
	13th order		Present		93	23 13HV	[%]	—	_	—	[Note1]	•	•	—
	Average		Present		9C	23 HV	[%]	—	_	—	[Note1]	•	•	—
	3rd order	phase 1N	Present		73	1N 3HV	[%]		_	—		—	_	•
	5th order	1	Present		75	1N 5HV	[%]		_	—		—	_	Ō
	7th order		Present		77	1N 7HV	[%]	_	_				_	•
	9th order		Present		79	1N 9HV	[%]	_	_	_	_	_	_	ě
	11th order		Present		7B	1N 11HV	[%]	_	_	_	_	_	_	ě
	13th order		Present		7D	1N 13HV	[%]	_	_	_		_	_	ě
	Average		Present	-	86	1N HV	[%]	_	_	_		_	_	ě
	3rd order	phase 2N	Present		89	2N 3HV	[%]			_		_	_	ě
	5th order	p.1000 211	Present		8B	2N_5HV	[%]	_	_	_	_		_	ě
	7th order		Present	-	8D	2N 7HV	[%]	_	_	_		_	_	ě
	9th order		Present	73	8F	2N 9HV	[%]			_	_		_	ě
	11th order		Present	10	91	2N_011	[%]	_		_	_	_	_	ě
	13th order		Present		93	2N_13HV	[%]	_		_	_	_	_	ě
	Average		Present		90	2N_10/11	[%]	_		_	_	_	_	
	3rd order	phase 3N	Present		96 9F	3N 3HV	[%]						_	
	5th order	phase or	Present	-	Δ1	3N 5HV	[%]	_		_		_		
	7th order		Present		A3	3N 7HV	[%]		_	_			_	ě
	9th order		Present		Δ5		[%]						_	
	11th order		Present	-	Δ7	3N 11HV	[%]	_		_		_		
	13th order		Present	-	Δ9	3N 13HV	[%]	_		_		_		
			Present	-	R2	3N HV	[%]	_		_		_		
Electric	Consumption	[1] [Note2]	differenc		DZ		[/0] [kWh]						•	
power	Consumption	1.1	e	80	01	Wh	licenti	•	•	•	•	•	•	-
		[2] ^[Note2]	differenc e	8A	01	8A01	Null	•		—	•	—		—
	Regenerated	[1] ^[Note2]	differenc e	80	63	RWh	[kWh]	•	•	•	•	•	•	•
		[2] ^[Note2]	differenc e	8A	63	8A63	Null	•	_	_	•	—	—	—
Reactive energy	Consumption la	ag	differenc e	81	01	VARh	[kvarh]	•	●	•	●	•	٠	•
Pulse input ^{[No}	ote]3		differenc e	83	01	PI1	Null	—	_	—	•	•	•	•
Pulse Conve	ersion value ^[Note3]		differenc e	83	6A	836A	Null	_	_	—	٠	•	•	•
Periodic elec	tric energy ^[Note4]		differenc e	8B	01	PWh	[kWh]	—	_	—	•	•	•	•
Null			_	00	00	-	-	•	•	•	•	•	•	•

[Note 1] Second circuit (3 side circuit) is displayed in 2 circuits measuring in 1P2W.

[Note 2] [1] is showed first circuit in 2 circuits measuring in 1P2W. [1] is also used in not setup 2 circuits measuring in 1P2W and setup 1P3W, 3P3W and 3P4W (Excluding Present power factor). [2] is showed second circuit in 2 circuits measuring in 1P2W.

[Note 3] Pulse inputs and Pulse conversion is unavailable if the external input is set to contact input.

[Note 4] Periodic power is unavailable if the external input is set to pulse input.

[Note 5] Instantaneous values are the measured values at the collection timing that are logged.

For the difference value, the differential value between the weighing value of this collection timing and the weighing value of the previous collection timing is logged.

Weighing value at collecting timing is logged for integrated value.

			0	Logging				T Ó	Model	that loggi	ing is ena	ble
	Logging	g item		kind	Group number	Channel number	Data name	Unit	EM	U4-A2/E	MU4-VA2	2
				[Note4]					1P2W	1P3W	3P3W	3P4W
Current		Avera	ige	Present		01	А	[A]	٠	•	•	٠
		phase	e 1	Present		21	1_A	[A]		•	•	•
		phase	2	Present	01	41	2_A	[A]	[Note1]	•	•	•
	-	phase	93 N	Present		61	3_A	[A]		•	•	
Current dom	and	phase		Present		21				_		
Current dem	anu	phase	ד ד 2	Present		41		[A] [A]				
	·	phase	3	Present	02	61	3 DA	[A]	[Note1]	ě	ě	ě
		phase	e N	Present		81	N DA	[A]	_	_	_	ě
Voltage		phase	e 1N	Present		21	1N V	M	_	_	_	Ŏ
	ľ	phase	e 2N	Present	03	41	2N_V	[V]	—	—	—	
		phase	e 3N	Present		61	3N_V	[M]	_	—		
		Avera	ige voltage)	Present		01	V	[V]	•	•	•	•
	·	phase	• 12	Present	05	21	12 V	[V]	•		•	
	ŀ	phase	23	Present		41	23 V	[V]	●[N[ote1	Ĭ	ě	ě
	ł	phase	e 31	Present	1	61	31_V	M	_	Ō	Ó	Ó
Present elec	tric	[1] ^{[Note}	2]	Present	07	01	w	[kW]	•	•	•	
power		[2] [Note	e2]	Present	07	61	0761	Null		—	_	
Power doma	nd	[1] ^{[Note}	2]	Present	08	01	DW	[kW]	•	•	•	
Fower dema	iiu	[2] ^{[Note}	e2]	Present	08	61	0861	Null	•	—	_	—
Present reac	tive	[1] ^{[Note}	2]	Present	09	01	VAR	[kvar]	•			
power		[2] ^{[Note}	e2]	Present	09	61	0961	Null	•	—	—	
Present appa	arent powe	r		Present	0B	01	VA	[kVA]		-	_	•
Present pow	er factor	ran (Note	201	Present	0D	01	PF	[%]	•	•	•	•
Present pow	er factor	[1] [Note	e2]	Present		21	0D21	Null				
2 circuits measurin	ig in 1P2VV	[2]	,	Present	00	01				_		
Current unba	alance rate			Present	01	1F	011F	Null				
Voltage unba	alance rate			Present	03	1E	031E	Null	•	ě	ě	ě
RMS value	Fundam	ental	phase 1	Present		21	1 1HA	[A]	•	Ŏ	Ŏ	Ŏ
of			phase 2	Present	20	41	2_1HA	[A]	_	—	_	•
harmonic			phase 3	Present	29	61	3_1HA	[A]	[Note1]			
current			phase N	Present		81	N_1HA	[A]		—	—	
	3rd orde	r	phase 1	Present		21	1_3HA	[A]	•			•
			phase 2	Present	2B	41	2_3HA	[A]		_	_	•
			phase 3	Present		61	3_3HA			•	•	•
	Eth and a		phase N	Present		81	N_3HA	[A]	_	_	_	
	Sunorder		phase 1	Present		<u></u>					-	
			phase 2	Present	2D	61	2_3HA 3_5HA	[4]	[Note1]			
			phase N	Present		81	N 5HA			_	_	
	7th order	r	phase 1	Present		21	1 7HA	[A]	•		•	Ĭ
			phase 2	Present	25	41	2_7HA	[A]	_	_	_	•
			phase 3	Present	∠⊦	61	3_7HA	[A]	[Note1]			
			phase N	Present		81	N_7HA	[A]	_	—		
	9th order	r –	phase 1	Present		21	1_9HA	[A]	•			
			phase 2	Present	31	41	2_9HA	[A]	-			•
			phase 3	Present		61	3_9HA	[A]	[INOte1]			•
	114	~ ~	phase N	Present		81	N_9HA	[A]				
	Thin orde	er	phase 1	Present		27	2 11UA	[A]	-	-	•	
			pliase 2	Present	33	41 61	2_11⊓A 3_11⊔∧	[A] [A]	[Note1]			
			phase N	Present		81	N 11HA			-	_	
	13th orde	er	phase 1	Present		21	1 13HA	[A]		•	•	ě
			phase 2	Present	07	41	2 13HA	[A]	-	-	_	•
			phase 3	Present	35	61	3_13HA	[A]	[Note1]	•	•	Ō
			phase N	Present		81	N_13HA	[A]	—	—	—	•
	Average		phase 1	Present		21	1_HA	[A]	•			
			phase 2	Present	35	41	2_HA	[A]		—		•
			phase 3	Present	51	61	3_HA	[A]	[Note1]			
	1		phase N	Present		81	N HA	[A]	—	-	—	

			Logging					Mode	that log	ging is o	enable
	Logging item		kind	Group	Channel	Data name	Unit	EN	IU4-A2/	′EMU4-\	/A2
	00 0		[Note4]	numper	number			1P2W	1P3W	3P3W	3P4W
RMS value	Fundamental	phase 1N	Present		21	1N 1HV	[V]				•
of	. and an official	phase 2N	Present	41	41	2N_1HV	[M]	—	_	—	•
harmonic		phase 3N	Present		61	3N_1HV	[V]	_			
voltage	3rd order	phase 1N	Present		21	1N_3HV	[V]	—		—	•
		phase 2N	Present	43	41	2N_3HV	[V]	—	—	—	•
	54 1	phase 3N	Present		61	3N_3HV	M	_		_	•
	5th order	phase 1N	Present	45	21	1N_5HV					•
		phase 2N	Present	45	61						
	7th order	phase 3N	Present		21	1N 7HV					
	/ in order	phase 2N	Present	47	41	2N 7HV	[V]				•
		phase 3N	Present		61	3N 7HV	M				Ŭ
	9th order	phase 1N	Present		21	1N_9HV	M		—	—	•
		phase 2N	Present	49	41	2N_9HV	[V]	_	_	_	
		phase 3N	Present		61	3N_9HV	[V]	_	—	_	•
	11th order	phase 1N	Present	15	21	1N_11HV	M	_		_	•
		phase 2N	Present	4B	41	2N_11HV		_			•
	13th ordor	phase 3N	Present		21	3N_11HV 1N_13HV					
	ISTICICE	phase 1N	Present	4D	41	2N 13HV					
		phase 3N	Present	שד	61	3N 13HV	IVI IVI	_	_	<u> </u>	
	Average	phase 1N	Present		21	1N_HV	M				•
	Ĭ	phase 2N	Present	57	41	2N_HV	M				•
		phase 3N	Present		61	3N_HV	[M]				
	Fundamental	phase 12	Present		21	12_1HV	[V]	•	•	•	_
		phase 23	Present	59	41	23 1HV	[V]	[Nifote1		•	_]
	0-4	phase 40	Dress-4		01	12 21 11	5.0	[iv[ote1			
	3ra	phase 12	Present	5R	21	12_3HV			-	-	
		pilase 23	FICSEIIL	JD	41	23_3HV	[v]	[N[ote1	•	•	—
	5th order	phase 12	Present		21	12_5HV	M	•	•	•	_
		phase 23	Present	5D	41	22 5411/	M	•			
		·			41	23_5HV		[Note1]	•	•	_
	7th order	phase 12	Present		21	12_7HV	[V]	•	•	•	—
		phase 23	Present	5F	41	23 7HV	[V]	[N[ote1	•	•	—
	Oth and an	phase 10	Dresent		01	-	БЛ	[refore i			
	9th order	phase 12	Present	61	21	12_9HV			•	•	
		priase 25	Flesent	01	41	23_9HV	[v]	[N[ote1	•	•	—
	11th order	phase 12	Present		21	12_11HV	M	•	•	•	—
		phase 23	Present	63	11	22 11 41	[V]	•			_
		-			41	23_1180		[N[ote1	•	•	
	13th order	phase 12	Present	05	21	12_13HV	[1]	•		•	_
		phase 23	Present	65	41	23_13HV	[V]	IN[ote1	•	•	—
	Average	phase 12	Present		21		БЛ				
	Average	phase 12 phase 23	Present	6F	21	12_110				-	
		pridoc 20	Tresent	01	41	23_HV	[•]	[N[ote1	•	•	—
Content	3rd order	phase 1	Present		73	1_3HA	[%]		•	•	
rate of	5th order		Present		75	1_5HA	[%]				
harmonic	7th order		Present		77	1_7HA	[%]	٠	٠	٠	•
current	9th order	-	Present		79	1_9HA	[%]	•	•	•	
	11th order		Present		7B	1_11HA	[%]	•	•	•	•
		4	Present		7 D 86		[%]				
	3rd order	phase 2	Present		89	2 3HA	[%]				
	5th order	pridoc Z	Present		8B	2 5HA	[%]	_	_		
	7th order	1	Present		8D	2_7HA	[%]	İ —	<u> </u>	1 —	•
	9th order]	Present		8F	2_9HA	[%]				•
	11th order]	Present		91	2_11HA	[%]				
	13th order	4	Present		93	2_13HA	[%]				
	Average	<u> </u>	Present		9C	2_HA	[%]				
	3rd order	phase 3	Present		9F	3_3HA	[%]	[Niote1	•	•	
	5th order	-	Present					[, 4[065]			
			I ICOCIIL	71	A1	3_5HA	[%]	[N[ote1			-
	7th order	1	Present		40	2 74	r0/ 1	•	•	•	•
					AJ	3_/TA	[70]	[N[ote1			
	9th order		Present		A5	3 9HA	[%]		•	•	
	114	-	Draga ([,*]	liviote1	_		
	inth order		Present		A7	3_11HA	[%]	[N[ote1	-	•	•
	13th order	1	Present						•	•	
			, rosont		A9	3_13HA	[%]	[N[ote1			-
	Average	1	Present		Do	3 44	F0/ 1	•	•	•	●
					DZ	3_FIA	[70]	[N[ote1			
	3rd order	phase N	Present		B5	N_3HA	[%]	<u> </u>		L —	•
	5th order	4	Present		B7	N_5HA	[%]				•
	7th order	-	Present		B9	N_7HA	[%]				
	9th order	4	Present		BB	N_9HA	[%]	<u> </u>	<u> </u>	<u> </u>	
	13th order	4	Present		BD		[%] [0/_1				
		1	Present		C8		[%]	$\vdash =$	$\vdash =$	$\vdash \equiv$	
l	листауе	1	I ICSCIIL	1	00	- <u></u>	[/0]	· ·	· -	· ·	•

			Logging					Model	that log	iging is	enable
	Logging item		kind	Group	Channel	Data	Unit	EM	1U4-A2/	′EMU4−V	/A2
			[Note4]	number	number	name		1P2W	1P3W	3P3W	3P4W
Content	3rd order	phase 12	Present		73	12_3HV	[%]		•		—
rate of	5th order		Present		75	12_5HV	[%]	•	•	•	—
harmonic	7th order		Present		77	12_7HV	[%]	•	•	•	—
voltage	9th order		Present		79	12_9HV	[%]	•	•	•	—
	11th order		Present		7B	12_11HV	[%]		•		—
	13th order		Present		7D	12_13HV	[%]				—
	Average		Present		86	12_HV	[%]				—
	3rd order	phase 23	Present		89	23_3HV	[%]	[Note1]	•	•	—
	5th order		Present	72	8B	23_5HV	[%]	[Note1]	[N[ote1	•	_
	7th order		Present		8D	23_7HV	[%]	[Note1]	•	•	—
	9th order		Present		8F	23_9HV	[%]	[Note1]	•	•	_
	11th order		Present		91	23_11HV	[%]	[Note1]	•	•	—
	13th order		Present		93	23_13HV	[%]	[Note1]	•	•	—
	Average		Present		9C	23_HV	[%]	[Note1]	•	•	—
	3rd order	phase 1N	Present		73	1N_3HV	[%]	—			
	5th order		Present		75	1N_5HV	[%]		_		•
	7th order		Present		77	1N_7HV	[%]	_			
	9th order		Present		79	1N_9HV	[%]	—			
	11th order		Present		7B	1N_11HV	[%]	—	_		
	13th order		Present		7D	1N_13HV	[%]	—	_	—	
	Average		Present		86	1N_HV	[%]	_	_		
	3rd order	phase 2N	Present		89	2N_3HV	[%]	—	_	—	
	5th order		Present		8B	2N_5HV	[%]	—			
	7th order		Present		8D	2N_7HV	[%]	—		—	•
	9th order		Present	73	8F	2N_9HV	[%]	—		—	•
	11th order		Present		91	2N_11HV	[%]	—		—	•
	13th order		Present		93	2N_13HV	[%]	_	_	_	•
	Average		Present		90	2N_HV	[%]	_			•
	3rd order	phase 3N	Present		9F	3N_3HV	[%]				•
	5th order		Present		A1	3N_5HV	[%]			_	•
	7th order		Present		A3	3N_7HV	[%]				•
	9th order		Present		AS	3N_9HV	[%]	_		_	•
	11th order		Present		A'/	3N_11HV	[%]				•
	13th order		Present		A9	3N_13HV	[%]				
El a atria	Average	rat [Note?	Present	00	B2	3IN_HV	[%]	_	_	_	
Electric	Consumption	[1] Note2	difference	00	01	94.01			-		
chergy	Pogonoration	[4] Viete2	difference	0A 80	63	DWb					
	regeneration	[1] Note2]	difference	84	63	8463	Null				
Reactive	Consumption la	<u> </u>	difference	81	01	VARh	[kvarh]	•	•	•	
energy									-		
Null			—	00	00	-	—				

[Note 1] Second circuit (3 side circuit) is displayed in 2 circuits measuring in 1P2W.

[Note 2] [1] is showed first circuit in 2 circuits measuring in 1P2W. [1] is also used in not setup 2 circuits measuring

in 1P2W and setup 1P3W, 3P3W and 3P4W (Excluding Present power factor). [2] is showed second circuit in 2 circuits measuring in 1P2W.

[Note 3] Instantaneous values are the measured values at the collection timing that are logged.

For the difference value, the differential value between the weighing value of this collection timing and the weighing value of the previous collection timing is logged.

Weighing value at collecting timing is logged for integrated value.

(4) In the case of that target units of Logging is EcoMonitorPlus (EMU4-LG1-MB).

	Logging					Mode	el that log	ging is ei	nable
Logging item	kind	Group	Channel number	Data name	Unit		EMU4-L	.G1-MB	
	[Note1]					1P2W	1P3W	3P3W	3P4W
Leak current	Present	11	01	10	[mA]	•	•	•	•
Demand leak current	Present	12	01	DIO	[mA]	•	•	•	•
Leak current for resistance	Present	7A	01	lOr	[mA]	•	•	•	—
Demand leak current for resistance	Present	7B	01	7B01	Null	•	•	•	—
Differential conversion leak current for resistance	Present	7A	82	7A82	Null	•	•	•	_
Null	_	00	00	-	-	•	•	•	•

[Note 1] Instantaneous values are the measured values at the collection timing that are logged.

For the difference value, the differential value between the weighing value of this collection timing and the weighing value of the previous collection timing is logged.

Weighing value at collecting timing is logged for integrated value.

(5) In the case of that target units of Logging is EcoMonitorPlus (EMU4-CNT-MB). $_{\left(1/2\right) }$

Logging item	Logging kind [Note1]	Group number	Channel number	Data name	Unit	Data
Contact output status (Terminal ID=1)	Present	A0	30	A030	Null	The logged data represents the
Contact output status (Terminal ID=2)	Present		02	A202	Null	following states:
Contact output status (Terminal ID=3)	Present		03	A203	Null	
Contact output status (Terminal ID=4)	Present		04	A204	Null	00H(0000) : All contact outputs are OFF
Contact output status (Terminal ID=5)	Present		05	A205	Null	01H(0001): Contact output 1 is ON,
Contact output status (Terminal ID=6)	Present		06	A206	Null	02H(0010): Contact output 2 is ON
Contact output status (Terminal ID=7)	Present		07	A207	Null	Contact output 2 is ON,
Contact output status (Terminal ID=8)	Present		08	A208	Null	03H(0011) Contact output 1 and 2 are ON
Contact output status (Terminal ID=9)	Present		09	A209	Null	Contact output 3 is OFF
Contact output status (Terminal ID=10)	Present		0A	A20A	Null	04H (0100) : Contact output 3 is ON,
Contact output status (Terminal ID=11)	Present		0B	A20B	Null	Contact output 1 and 2 are OFF
Contact output status (Terminal ID=12)	Present		0C	A20C	Null	05H(0101): Contact output 1 and 3 are ON,
Contact output status (Terminal ID=13)	Present		0D	A20D	Null	Contact output 2 is OFF
Contact output status (Terminal ID=14)	Present		0E	A20E	Null	06H(0110): Contact output 2 and 3 are ON,
Contact output status (Terminal ID=15)	Present		0F	A20F	Null	Contact output 1 is OFF
Contact output status (Terminal ID=16)	Present		10	A210	Null	07H(0111): All contact outputs are ON
Contact output status (Terminal ID=17)	Present	A2	11	A211	Null	
Contact output status (Terminal ID=18)	Present		12	A212	Null	
Contact output status (Terminal ID=19)	Present		13	A213	Null	
Contact output status (Terminal ID=20)	Present		14	A214	Null	
Contact output status (Terminal ID=21)	Present		15	A215	Null	
Contact output status (Terminal ID=22)	Present		16	A216	Null	
Contact output status (Terminal ID=23)	Present		17	A217	Null	
Contact output status (Terminal ID=24)	Present		18	A218	Null	
Contact output status (Terminal ID=25)	Present		19	A219	Null	
Contact output status (Terminal ID=26)	Present		1A	A21A	Null	
Contact output status (Terminal ID=27)	Present		1B	A21B	Null	
Contact output status (Terminal ID=28)	Present		1C	A21C	Null	
Contact output status (Terminal ID=29)	Present		1D	A21D	Null	
Contact output status (Terminal ID=30)	Present		1E	A21E	Null	
Contact output status (Terminal ID=31)	Present		1F	A21F	Null	
Contact output status (Terminal ID=32)	Present		20	A220	Null	
Analog output specification (Terminal ID=1)	Present		B1	E0B1	Null	1:Voltage output
Analog output specification (Terminal ID=2)	Present		B2	E0B2	Null	2:Current output
Analog output specification (Terminal ID=3)	Present		B3	E0B3	Null	
Analog output specification (Terminal ID=4)	Present		B4	E0B4	Null	
Analog output specification (Terminal ID=5)	Present	E0	B5	E0B5	Null	
Analog output specification (Terminal ID=6)	Present		B6	E0B6	Null	
Analog output specification (Terminal ID=7)	Present		B7	E0B7	Null	
Analog output specification (Terminal ID=8)	Present		B8	E0B8	Null	
Analog output specification (Terminal ID=9)	Present		B9	E0B9	Null	

(2/2)

Logging item	Loggin g kind [Note1]	Group number	Channel number	Data name	Unit	Data
Analog output specification (Terminal ID=10)	Present		BA	E0BA	Null	The logged data represents the
Analog output specification (Terminal ID=11)	Present		BB	E0BB	Null	following states:
Analog output specification (Terminal ID=12)	Present		BC	E0BC	Null	1:Voltage
Analog output specification (Terminal ID=13)	Present		BD	E0BD	Null	2:Current
Analog output specification (Terminal ID=14)	Present		BE	E0BE	Null	
Analog output specification (Terminal ID=15)	Present		BF	E0BF	Null	
Analog output specification (Terminal ID=16)	Present		C0	E0C0	Null	
Analog output specification (Terminal ID=17)	Present		C1	E0C1	Null	
Analog output specification (Terminal ID=18)	Present		C2	E0C2	Null	
Analog output specification (Terminal ID=19)	Present		C3	E0C3	Null	
Analog output specification (Terminal ID=20)	Present		C4	E0C4	Null	
Analog output specification (Terminal ID=21)	Present		C5	E0C5	Null	
Analog output specification (Terminal ID=22)	Present		C6	E0C6	Null	
Analog output specification (Terminal ID=23)	Present		C7	E0C7	Null	
Analog output specification (Terminal ID=24)	Present		<u>C8</u>	E0C8	Null	
Analog output specification (Terminal ID=25)	Present		<u>C9</u>	E0C9	Null	
Analog output specification (Terminal ID=26)	Present		CA	EUCA	NUI	
Analog output specification (Terminal ID=27)	Present		CB	EUCB	NUII	
Analog output specification (Terminal ID=26)	Present			EUCC	Null	
Analog output specification (Terminal ID=29)	Present		CD	EUCD	Null	
Analog output specification (Terminal ID = 30)	Present		CE	EUCE	Null	
Analog output specification (Terminal ID=31)	Present			EOCF	Null	
Analog output specification (Terminal ID= 32) Analog output value (Terminal ID=1)	Present		D0	E0D1	Null	The logged data represents the
Analog output value (Terminal ID = 1) Analog output value (Terminal ID = 2)	Present		D2	E0D2	Null	following states:
Analog output value (Terminal ID=2)	Present		D2	E0D2	Null	The data range depends on the
Analog output value (Terminal ID=0)	Present		D4	E0D0	Null	Analog output specification.
Analog output value (Terminal ID=5)	Present		D5	E0D5	Null	
Analog output value (Terminal ID=6)	Present		D6	E0D6	Null	 In the case of current output
Analog output value (Terminal ID=7)	Present	=0	D7	E0D7	Null	Data:4000 to 20000
Analog output value (Terminal ID=8)	Present	E0	D8	E0D8	Null	Output:4.000 to 20.000mA
Analog output value (Terminal ID=9)	Present		D9	E0D9	Null	In the case of voltage output
Analog output value (Terminal ID=10)	Present		DA	E0DA	Null	Data:0000 to 5000
Analog output value (Terminal ID=11)	Present		DB	E0DB	Null	Output: 0.000 to 5.000V
Analog output value (Terminal ID=12)	Present		DC	E0DC	Null	
Analog output value (Terminal ID=13)	Present		DD	E0DD	Null	
Analog output value(Terminal ID=14)	Present		DE	E0DE	Null	
Analog output value (Terminal ID=15)	Present		DF	E0DF	Null	
Analog output value (Terminal ID=16)	Present		E1	E0E1	Null	
Analog output value (Terminal ID=17)	Present		E2	E0E2	Null	
Analog output value (Terminal ID=18)	Present		E3	E0E3	Null	
Analog output value (Terminal ID=19)	Present		E4	E0E4	Null	
Analog output value (Terminal ID=20)	Present		E5	E0E5	Null	
Analog output value (Terminal ID=21)	Present		E6	E0E6	Null	
Analog output value (Terminal ID=22)	Present		E/	EUE7	NUI	
Analog output value (Terminal ID=23)	Present		E8	EUE8	NUI	
Analog output value (Terminal ID=24)	Present		E9	E0E9	Null	
Analog output value (Terminal ID = 26)	Present				Null	
Analog output value (Terminal ID -20)	Present		ED	EVED	Null	
Analog output value (Terminal ID $= 28$)	Present		ED	EOED	Null	
Analog output value (Terminal ID=20)	Present		EE	EOEE	Null	
Analog output value (Terminal ID=30)	Present		FF	FOFF	Null	1
Analog output value (Terminal ID=31)	Present		 F0	E0F0	Null	1
Analog output value (Terminal ID=32)	Present		F1	E0F1	Null	
Control status (RUN/STOP)	Present		50	5050	Null	0:STOP
	Drecort		F2	EUF2	NI: -11	1:RUN
Contact Output 1 status	Present		F3		Null	
Contact output 2 status	Present		F4		NUII	
Null		00	F9	EUF3	INUII	
i von	1 -	00	00			

[Note 1] Instantaneous values are the measured values at the collection timing that are logged.

(6) In the case of that target units of Logging is EcoMonitorPlus (EMU4-PX4).

		Logging			_		Model that logging is enable
Logging item		kind [Note1]	Group number	Channel number	Data name	Unit	EMU4-PX4
Pulse count	CH1	difference	83	01	PI1	Null	
Pulse count	CH2	difference	84	01	Pl2	Null	
Pulse count	CH3	difference	85	01	PI3	Null	•
Pulse count	CH4	difference	86	01	Pl4	Null	•
Pulse conversion	CH1	difference	83	6A	836A	Null	
Pulse conversion	CH2	difference	84	6A	846A	Null	•
Pulse conversion	CH3	difference	85	6A	856A	Null	
Pulse conversion	CH4	difference	86	6A	866A	Null	
Contact state	CH1	Present		00	A000	Null	•
Contact state	CH2	Present	40	01	A001	Null	•
Contact state	CH3	Present	AU	02	A002	Null	•
Contact state	CH4	Present		03	A003	Null	•
Null		-	00	00	—	—	•

[Note 1] Instantaneous values are the measured values at the collection timing that are logged.

For the difference value, the differential value between the weighing value of this collection timing and the weighing value of the previous collection timing is logged.

Weighing value at collecting timing is logged for integrated value.

(7) In the case of that target units of Logging is EcoMonitorPlus (EMU4-AX4).

		Logging					Model that logging is enable
Logging item		kind [Note1]	Group number	Channel number	Data name	Unit	EMU4-AX4
AD conversion value	CH1	Present	19	01	An1	Null	
AD conversion value	CH2	Present	1B	01	An2	Null	•
AD conversion value	CH3	Present	1D	01	An3	Null	•
AD conversion value	CH4	Present	1F	01	An4	Null	
Scaling value	CH1	Present	19	21	1921	Null	•
Scaling value	CH2	Present	1B	21	1B21	Null	•
Scaling value	CH3	Present	1D	21	1D21	Null	
Scaling value	CH4	Present	1F	21	1F21	Null	
Number of times exceeding the Limit A	CH1	Integral		00	9100	Null	•
Number of times exceeding the Limit B	CH1	Integral		01	9101	Null	•
Number of times exceeding the Limit C	CH1	Integral		02	9102	Null	•
Number of times exceeding the Limit D	CH1	Integral		03	9103	Null	•
Number of times exceeding the Limit A	CH2	Integral		10	9110	Null	•
Number of times exceeding the Limit B	CH2	Integral		11	9111	Null	•
Number of times exceeding the Limit C	CH2	Integral		12	9112	Null	•
Number of times exceeding the Limit D	CH2	Integral	01	13	9113	Null	•
Number of times exceeding the Limit A	CH3	Integral	51	20	9120	Null	•
Number of times exceeding the Limit B	CH3	Integral		21	9121	Null	•
Number of times exceeding the Limit C	CH3	Integral		22	9122	Null	•
Number of times exceeding the Limit D	CH3	Integral		23	9123	Null	•
Number of times exceeding the Limit A	CH4	Integral		30	9130	Null	•
Number of times exceeding the Limit B	CH4	Integral		31	9131	Null	•
Number of times exceeding the Limit C	CH4	Integral		32	9132	Null	•
Number of times exceeding the Limit D	CH4	Integral		33	9133	Null	•
Null		_	00	00	_	_	

[Note 1] Instantaneous values are the measured values at the collection timing that are logged.

For the difference value, the differential value between the weighing value of this collection timing and the weighing value of the previous collection timing is logged.

Weighing value at collecting timing is logged for integrated value.

(8) In the case of that target units of Logging is EcoMonitorLight (EMU4-BD1A-MB, EMU4-HD1A-MB).

									Model that logging is enable							
Logging item								EMI	EMU4-BD1A-MB EMU4-HD1A-MB							
		Logging kind [Note5]	Group number	Channel number	Data name	Unit	1P2W	1P3W	3P3W_ 2CT	1P2W	1P3W	3P3W_ 2CT 3P3W_ 3CT	3P4W			
Current		Avera	ge	Present		01	А	[A]			•	•				
		phase	e 1	Present		21	1 A	[A]	•	•	•	•	•	•	•	
		phase	2	Present	01	41	2_A	[A]	—		•	_	•	•		
		phase	3	Present		61	3_A	[A]	[Note1]		•	[Note1]	•		•	
		phase	N	Present		81	N_A	[A]	—	—	—	—	_	—		
Current dem	and	phase	e 1	Present		21	1_DA	[A]								
		phase	2	Present	02	41	2_DA	[A]	—							
		phase	3	Present		61	3_DA	[A]	[Note1]	•	•	[Note1]	•	•	•	
) (alta aa		phase	e N	Present		81		[A]							•	
voltage		phase	e 1N	Present	02	21	1N_V		_		_		_	_	•	
		phase		Present	03	41	2N_V									
		phase		Present		01	JIN_V	[v]							•	
		(Line	ye voltage)	Flesen		01	V	[V]	•	•	•	•	•	•	•	
		phase	22	Present	05	21	12_V	[V]	INato11	•	•	INiste11	•	•	•	
		phase	23	Present		41	23_V		Inote I		•		•		•	
		pnase	21	Present	07	01	31_V		_			_				
Present elect	tric power	[1][Note	-2]	Present	07	61	0761	[KVV]		•	•		•	•	•	
		[2] ¹		Present	07	01							_	_	_	
Power dema	nd	[1]. [2] [Note	:2]	Present	08	61	0861	Null		-	-		_	-	-	
Present reac	tive	[1] [Note	2]	Present	09	01	VAR	[kvar]				ě	•			
power	uve	[2] [Note	:2]	Present	09	61	0961	Null	ě	_	_	ě	_	_	_	
Present appa	Present apparent power			Present	0B	01	VA	[kVA]	_	_	—	_	—	—	•	
Present pow	Present power factor			Present	0D	01	PF	[%]	•	•	•	•	•		•	
-	[41 [Note2]		-21	Present	00	01	0004	[/v]		-	•		•	•	•	
Present pow	er factor	[1][****	~_]	T lesent	UD	21	UDZT	INUII	•		_	•	_	_	_	
2 circuits measurin	2 circuits measuring in 1P2vv [2] [Note2]		2]	Present	0D	61	0D61	Null	•	—	—	•	—	—	—	
Frequency	Frequency			Present	0F	01	Hz	[Hz]								
Current unba	lance rate			Present	01	1E	011E	Null	_	•	•		•	•	•	
Voltage unba	oltage unbalance rate			Present	03	1E	031E	Null		•	•	_	•	•	•	
RIVIS value	Fundame	ntai	phase 1	Present		21	1_1HA	[A]			_	•	•	INote61		
harmonic		-	phase 2	Present	29	41	2_1HA					■[Note1]				
current		-	phase 3	Present		81	3_1ΠΑ Ν 1ΗΔ	[A] [A]			_	- · · ·	_	_		
	3rd orde	ər	phase 1	Present		21	1.3HA	[A]	_	_	_					
	ord orde	-	phase 2	Present		41	2 3HA	[A]	_	_	_	_	_	[Note6]	ě	
			phase 3	Present	2B	61	3 3HA	[A]	_	_	—	[Note1]	•		ě	
			phase N	Present		81	N 3HA	[A]			—	_	_	_	•	
	5th orde	er	phase 1	Present		21	1_5HA	[A]	_	—	—		•			
			phase 2	Present	20	41	2_5HA	[A]			—		_	[Note6]		
			phase 3	Present	20	61	3_5HA	[A]	—	—	—	[Note1]				
			phase N	Present		81	N_5HA	[A]		<u> </u>			_	<u> </u>		
	7th orde	er	phase 1	Present		21	1_7HA	[A]	—	—				INjete?1	•	
		⊢	pnase 2	Present	2F	41	2_/HA	[A]		<u> </u>	<u> </u>	Note11			•	
		⊢	phase 3	Present		61 04	3_/HA	[A]					•	•		
	7th orde	or l	phase N	Present		01 21				\vdash						
	7010106	-	phase 2	Present		<u></u> /1	2 0114	[A]	_	_	_	_	_	[Note6]		
		⊢	phase 3	Present	31	61	3 9HA	[A]		<u> </u>	<u> </u>	[Note1]	•			
		⊢	phase N	Present		81	N 9HA	[A]	—	—	- 1		_		-	
	11th order		phase 1	Present		21	1 11HA	[A]	—	—	—				•	
		F	phase 2	Present	20	41	2_11HA	[A]	—	—	—	_	_	[Note6]	•	
		Γ	phase 3	Present	33	61	3_11HA	[A]	_	—	—	[Note1]				
			phase N	Present		81	N_11HA	[A]	—	—			_	—	•	
	13th orde	r	phase 1	Present		21	1_13HA	[A]		—						
		L	phase 2	Present	35	41	2_13HA	[A]	—	-		—	—	[Note6]		
		L	phase 3	Present		61	3_13HA	[A]		<u> </u>		●[Note1]	•			
			phase N	Present		81	N_13HA	[A]	—	—		_	_	-	•	
	Average	H	phase 1	Present		21	1_HA	[A]		<u> </u>	<u> </u>	•	•	Note61		
		\vdash	phase 2	Present	3F	41 61	2_HA 3_LIA	[A]				Note11		•		
		⊢	phase 3	Present		01 Q1	<u>з_па</u>						-			
1	1		pilase IN	FICSEIIL		01	IN LIA	141	_	1 -			. —	i –	-	

	Model that logging is enable													
								EN	IU4-BD1A-	MB		EMU4-H	D1A-MB	
	Logging item		Logging kind [Note5]	Group number	Channel number	Data name	Unit	1P2W	1P3W	3P3W_ 2CT	1P2W	1P3W	3P3W_ 2CT 3P3W_ 3CT	3P4W
RMS	Fundamental	phase 1N	Present		21	1N_1HV	[V]	_	-	—	-	_	—	•
value of		phase 2N	Present	41	41	2N_1HV	[V]	—	—	—	—	—	—	•
harmonic		phase 3N	Present		61	3N_1HV	[V]	-	_	—	—	_	—	•
vollage	3rd order	phase 1N	Present	40	21	1N_3HV			_					
		phase 2N	Present	43	61									
	5th order	phase 3N	Present		21	1N 5HV	[V]	_	_	_	_		_	
	our or doi	phase 2N	Present	45	41	2N 5HV	M	—	_	—	—	—	—	ě
		phase 3N	Present		61	3N_5HV	[V]	_	_	—			—	•
	7th order	phase 1N	Present		21	1N_7HV	[V]	—	—	—	—	—	—	
		phase 2N	Present	47	41	2N_7HV	[V]	-	_	—	—		—	•
	Oth and an	phase 3N	Present		61	3N_7HV			_		_	_	_	
	Surorder	phase IN	Present	10	<u></u> _/1				_		_			
		phase 3N	Present	+3	61	3N 9HV	IVI IVI	_	_		_	_	_	
	11th order	phase 1N	Present		21	1N_11HV	M	-	_	-	-	_	_	•
		phase 2N	Present	4B	41	2N_11HV	[V]		—		—		—	
		phase 3N	Present		61	3N_11HV	[V]							•
	13th order	phase 1N	Present	40	21	1N_13HV	[V]			<u> </u>				
		phase 2N	Present	4D	41	2N_13HV						_	_	
	Average	phase 3N	Present		21	1N HV		_	_		_		_	
	/ weidge	phase 2N	Present	57	41	2N HV	[V]	_	_	_	_		_	ě
		phase 3N	Present		61	3N HV	M	_	_	_	_		_	ě
	Fundamental	phase 12	Present	50	21	12_1HV	[V]	—	—	—				
		phase 23	Present	39	41	23_1HV	[V]	—	—	—	[Note1]			—
	3rd order	phase 12	Present	5B	21	12_3HV	[V]	-	_	—	Iblata1	•	•	—
	Eth order	phase 23	Present	_	41	23_3HV			_			•	•	
	Striorder	phase 12	Present	5D	<u></u> 	12_0HV					[Note1]			
	7th order	phase 23	Present		21	12 7HV	[V]	_	_	_	•	ě	ě	_
	, ar or doi	phase 23	Present	5F	41	23 7HV	M	—	_	—	[Note1]	ě	ě	_
	9th order	phase 12	Present	61	21	12_9HV	[V]	—	_	—	•			
		phase 23	Present	01	41	23_9HV	[V]	—	—	—	[Note1]	•	•	_
	11th order	phase 12	Present	63	21	12_11HV	[V]	-	—	—		•	•	—
	12th order	phase 23	Present		41	23_11HV								
	13th order	phase 12	Present	65	<u></u> 	12_13HV					[Note1]			
	Average	phase 20	Present		21	12 HV	IV]	_	_	_				
	, tronugo	phase 23	Present	6F	41	23 HV	M	_	_	_	[Note1]	ě	Ŏ	_
Content	3rd order	phase 1	Present		73	1_3HA	[%]	_	_	_	•			•
rate of	5th order		Present		75	1_5HA	[%]	—	—	—	•			۲
harmonic	7th order		Present		77	1_7HA	[%]	-	_	—	•	•	•	•
Current	9th order		Present	1	/9 7P	1_9HA	[%]							
	13th order		Present			1_11HA	[%]	+ $-$		+ -				
	Average		Present	1	86	1 HA	[%]	- 1	—	t —	•	ě	•	ě
	3rd order	phase 2	Present]	89	2_3HA	[%]	<u> </u>	_				[Note6]	•
	5th order		Present		8B	2_5HA	[%]	—	—	—	—		[Note6]	
	7th order		Present		8D	2_7HA	[%]						[Note6]	•
	9th order		Present	-	8F	2_9HA	[%]	-		<u> </u>			[Note6]	
	13th order		Present	1	91	2_11HA	[%]	<u> </u>					[Note6]	
	Average	1	Present		9C	2 HA	[%]	<u> </u>		<u> </u>			[Note6]	
	3rd order	phase 3	Present	71	9F	3_3HA	[%]	—	—	-	[Note1]	•	•	ě
	5th order		Present]	A1	3_5HA	[%]				[Note1]			
	7th order		Present		A3	3_7HA	[%]		—	-	[Note1]	•	•	•
	9th order		Present	-	A5	3_9HA	[%]		—		[Note1] [Note1]	•	•	•
	11th order		Present	-	A7	3_11HA	[%]	<u> </u>			[Note1]			
	Average		Present	1	A9 R2	3 HA	[%]	+ =		+ = -	[Note1]			
	3rd order	phase N	Present	1	B5	N 3HA	[%]	- 1	_	t			-	
	5th order		Present	1	B7	N_5HA	[%]	—	—	1 —	—		—	ĕ
	7th order		Present]	B9	N_7HA	[%]	—	—	—	—	—	—	•
	9th order		Present		BB	N_9HA	[%]	<u> </u>		L —				•
	11th order		Present	4	BD	N_11HA	[%]	<u> </u>		<u> </u>				
	Average		Present	1	C8		[%]				_			
1	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		1 100011				1 1/01							

								Model that logging is enable							
								EM	U4-BD1A	-MB		EMU4-H	D1A-MB		
	Logging item		Logging kind [Note5]	Group number	Channel number	Data name	Unit	1P2W	1P3W	3P3W_ 2CT	1P2W	1P3W	3P3W_ 2CT 3P3W_ 3CT	3P4W	
Content	3rd order	phase 12	Present		73	12_3HV	[%]	—	_	_	•		•	—	
rate of	5th order		Present		75	12_5HV	[%]	—		—	•			—	
harmonic	7th order		Present		77	12_7HV	[%]	_		—	•		•	_	
voltage	9th order		Present		79	12_9HV	[%]	—		—	•	•	•	_	
	11th order		Present		7B	12_11HV	[%]			—	•		•		
	13th order		Present		7D	12_13HV	[%]	_	-	_	•	•	•	_	
	Average		Present	70	86	12_HV	[%]	—		—	•			—	
	3rd order	phase 23	Present	12	89	23_3HV	[%]			—	[Note1]		•		
	5th order		Present		8B	23_5HV	[%]	—		—	[Note1]	•	•	_	
	7th order		Present		8D	23_7HV	[%]			—	[Note1]		•		
	9th order		Present		8F	23_9HV	[%]		_	—	[Note1]		•		
	11th order		Present		91	23_11HV	[%]		_	—	[Note1]		•		
	13th order		Present		93	23_13HV	[%]	-		—	[Note1]		•		
	Average		Present		9C	23_HV	[%]		_	—	[Note1]		•		
	3rd order	phase	Present		73	1N_3HV	[%]		_	—	_	—	—	•	
	5th order	1N	Present		75	1N_5HV	[%]		_	—		—	—	•	
	7th order		Present		77	1N_7HV	[%]		_	—		—	—	•	
	9th order		Present		79	1N_9HV	[%]	-		—	_	—	—	•	
	11th order		Present		7B	1N_11HV	[%]		_	—		—	—	•	
	13th order		Present		7D	1N_13HV	[%]		_	—		—	—	•	
	Average		Present		86	1N_HV	[%]	-		—	_	—	—	•	
	3rd order	phase	Present		89	2N_3HV	[%]		_	—		—	—	•	
	5th order	2N	Present		8B	2N_5HV	[%]		_	—		—	—	•	
	7th order		Present		8D	2N_7HV	[%]		_	—	_	—	—	•	
	9th order		Present	73	8F	2N_9HV	[%]		_	—		—	—	•	
	11th order		Present		91	2N_11HV	[%]		_	—		—	—	•	
	13th order		Present		93	2N_13HV	[%]	-		—	_	—	—	•	
	Average		Present		9C	2N_HV	[%]		_	—		—	—	•	
	3rd order	phase	Present		9F	3N_3HV	[%]	—	—	—	_	—	—		
	5th order	3N	Present		A1	3N_5HV	[%]	_	_	—	_	—	—		
	7th order		Present		A3	3N_7HV	[%]	—	—	—	_	—	—		
	9th order		Present		A5	3N_9HV	[%]	_	—	—	_	—	—	•	
	11th order		Present		A7	3N_11HV	[%]	—	—	—	_	—	—		
	13th order		Present		A9	3N_13HV	[%]	_	—	—	—	—	—		
	Average		Present		B2	3N_HV	[%]	_	—	—	_	—	—	•	
Electric	Consumption	[1] [Note2]	difference	80	01	Wh	[kWh]				•				
power		[2] ^[Note2]	difference	8A	01	8A01	Null		—	—	•	—	—	_	
	Regenerated	[1] ^[Note2]	difference	80	63	RWh	[kWh]								
		[2] ^[Note2]	difference	8A	63	8A63	Null		—	—		—	—	—	
Reactive energy	Consumption la	g	difference	81	01	VARh	[kvarh]	•	•	•	●	•	•	●	
Pulse input ^{[No}	ote]3		difference	83	01	Pl1	Null	—		—	•			•	
Pulse Conve	rsion value ^[Note3]		difference	83	6A	836A	Null			—					
Periodic elect	tric energy ^[Note4]		difference	8B	01	PWh	[kWh]							•	
Null			-	00	00	-	-						•	•	

[Note 1] Second circuit (3 side circuit) is displayed in 2 circuits measuring in 1P2W.

[Note 2] [1] is showed first circuit in 2 circuits measuring in 1P2W. [1] is also used in not setup 2 circuits measuring in 1P2W and setup 1P3W, 3P3W and 3P4W (Excluding Present power factor). [2] is showed second circuit in 2 circuits measuring in 1P2W.

[Note 3] Pulse inputs and Pulse conversion is unavailable if the external input is set to contact input.

[Note 4] Periodic power is unavailable if the external input is set to pulse input.

[Note 5] Instantaneous values are the measured values at the collection timing that are logged.

For the difference value, the differential value between the weighing value of this collection timing and the weighing value of the previous collection timing is logged.

Weighing value at collecting timing is logged for integrated value.

[Note 6] Logged only for 3P3W_3CT.

List of system log codes

System log code	Meaning
001	The Logging Unit was booted.
100	Power failure occurred.
150	Power failure occurred during communication with the SD memory card. Data in the memory card may be broken, so format the memory card in the way specified in this manual. (Page 37)
201	The present time data was reset due to power-off with battery voltage low.
202	Logging data and system log data were erased due to power-off with battery voltage low.
203	The Energy Measuring Unit was replaced to the other. All logging data is erased.
301	Logging condition was changed. All logging data is erased.
302	Logging ID was changed.
303	The present time setting was changed. All logging data is erased.
304	Logging data was cleared.
305	Either "Phase wire system", "Primary voltage (Use or non-use of VT, Direct Voltage, Primary voltage with VT, Special primary voltage)", "Primary current (Direct sensor, 5A sensor, Special primary current)" or "Sensor type" was changed. All logging data is erased.
907	Change of logging condition was failed.
801	Fall of battery voltage was detected.
902	Logging setting error occurred. Refer to "Error display and measures" (Page 38).
912	Communication error between units occurred. Refer to "Error display and measures" (Page 38).
903	FRAM error occurred. Refer to "Error display and measures" (Page 38).
905, 906	RTC error occurred. Refer to "Error display and measures" (Page 38).
941	The SD memory card was connected with the write protect switch "ON". Turn the write protect switch to "OFF" position.
942 to 951	SD memory card error occurred. Refer to "Error display and measures" (Page 38).

Logging Unit for Energy Measuring Unit

Please refer to our website for service network. Our website address: https://www.mitsubishielectric.com/fa/



HEAD OFFICE: TOKYO BUILDING, 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN