



KM1/KE1 Setting Tool

KM1/KE1-Setting

Version 1.0

User's Manual

Cat. No. GAMS-010D

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Introduction

Thank you for using the KM1/KE1-Setting.

The KM1/KE1-Setting (hereinafter, referred to as the "Software") is a software product that sets the main unit of the KM1 series (Smart Power Monitor) and the KE1 series (Smart Monitoring Device). Furthermore, the Software has a monitoring function that checks the measurement after installation.

This manual describes how to install, set and operate the Software. Please read carefully and understand this manual before use.

For information regarding the KM1 and KE1 series, refer to "OMRON Industrial Automation (<http://www.ia.omron.com/>)".

Note: To use the Software, you need to separately prepare equipment, such as KM1/KE1 series units.

Intended Audience

This manual is intended at the following

- Person with computer management knowledge or network technologies;
- Person in charge of facilities or equipment control

Read and Understand this Manual:

This manual contains useful information on how to use the Software. Please use this product after carefully reading through this manual and fully understanding its contents. Also, carefully retain this manual after reading it, and store it in a place where it's easily accessible.

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Software Name: KM1/KE1-Setting

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Precautions for Correct Use

Unless otherwise specified, the screens and operational procedures described in this user's manual are based on Windows 7. If you are using a different Operating System, then substitute that for Windows 7.

Note regarding the environment of usage

Please take care of the following in using the Software:

- The character code for the file output by the Software is UTF-8. To reference the output file, use an application compatible with UTF-8 (for Excel, use Excel 2003 SP3 or later.)

Note regarding other units of equipment

- Before using the Software, each unit of equipment and wiring has been installed and necessary software products have been installed.

Meanings of Symbols

- For you to use the Software correctly, this manual indicates the following symbols. Please read other Precautions for Correct Use before use, too.

Precautions for Correct Use

This indicates items which need to be carried out or avoided for the safe use of the Software.

Note:

Additional Information

They refer to details equivalent to Useful Tips and Precautions for Correct Use.

[]

The menu items and buttons displayed on the Software are enclosed in parentheses [].

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- Any and all contents of this manual are protected by the Copyright Act.
- Please note that there may be a slight difference in the illustrations in this manual.

Revision History

The manual revision number is given at the end of the manual number on the bottom left of the front cover and back cover of the manual.

Cat. No. GAMS-010D

↑
Revision Code

Revision Code	Date of revision	Reason for revision/ pages revised
A	June 2012	First edition
B	September 2012	Items changed include: <ul style="list-style-type: none"> • EMU8A single operation: Reviewed ("1.2 System Structure for KM1/KE1"(p.1-2)) • Operation display LED for power connection during connection composition setting: Reviewed ("2.5 Procedure 3 Setup of connection composition and confirmation"(p.2-7)) • Note on time setting: Added ("2.6 Procedure 4 Optional setting, confirmation after installation"(p.2-11), "5.3.5 Time setting"(p.5-57)) • CTD8E 3-phase 4-wire current indication: Reviewed ("7.3.8 KE1-CTD8E"(p.7-18))
C	August 2013	Items revised include: <ul style="list-style-type: none"> • Unit installation procedures: Reviewed ("2. Flow and steps prior to unit installation" (p.2-1)) • Caution on unit setting connected to power: Reviewed ("5.2.5 Precautions for setting the unit connected to a power source"(p.5-10)) • Chapter describing setting examples to use major KM1/KE1 functions: Added ("3. Setting major functions"(p.3-1)) • Description on available items for KM1/KE1 setting: Added ("5.3.3 KM1 main unit setting"(p.5-16), "5.3.4 KE1 main unit setting"(p.5-53))
D	September 2019	Content: Reviewed to support Windows 10.

Related manuals

Manual No.	Model	Manual Name	Description
N171-E1-01	KM1-□□□□□-FLK	Model KM1 User's Manual for Smart Power Monitor	Describes the overview, features, functions and settings of KM1
SGTE-717	KE1-□□□□□-FLK KE1-□□□□□	Model KE1 User's Manual for Smart Monitoring Device	Describes the overview, characteristics, functions and settings of KE1
SGTE-718	KE1-DRT-FLK	Model KE1 User's Manual for DeviceNet Communication Unit	Describes the functions and settings of DeviceNet Communication Unit
SGTE-719	KM1/KE1	Communication Manual for Smart Power Monitor/Smart Measurement and Monitoring Instrument: Model KM1/KE1	Describes the details of communication for the KM1/KE1 series

Terminology

Abbreviation

Type of the KM1 series

Abbreviation	Model	Manual Name
PMU1A	KM1-PMU1A-FLK	Power Measurement Unit
PMU2A	KM1-PMU2A-FLK	Power Two-System Measurement Unit
EMU8A	KM1-EMU8A-FLK	Pulse/Temperature Input Unit

Type of the KE1 series

Abbreviation	Model	Manual Name
PGR1C	KE1-PGR1C-FLK	Power/Earth Leakage Monitoring Unit
PVS1C	KE1-PVS1C-FLK	Power/Voltage-Sag Monitoring Unit
VSU1B	KE1-VSU1B-FLK	Voltage-Sag Monitoring Unit
VAU1B	KE1-VAU1B-FLK	Voltage/Current Monitoring Unit
CTD8E	KE1-CTD8E	CT Expansion Unit
ZCT8E	KE1-ZCT8E	Zero-phase CT Expansion Unit
DRT	KE1-DRT-FLK	DeviceNet Communication Unit

Definition of Terms

Term	Description
Unit	Refers to each unit of KM1/KE1 series equipment
Measurement master unit (Measurement master)	Refers to a unit that can independently measure electric power and that sends/receives data to/from the computer through RS-485 connection and USB connection. Also, it can connect to a slave unit. If the unit is configured to do so, it can set the slave unit and collect measurement data through one measurement master unit and sends/receives data to/from the computer through RS-485 connection and USB connection.
Slave unit	Refers to a unit that can be used by connecting to a measurement master unit. The types of slave units are: <ul style="list-style-type: none"> • Functional slave unit • CT expansion slave unit • Communication slave unit
Functional slave unit (Functional slave)	Refers to a unit with measurement functions in itself, such as measurement of electric power, monitoring of voltage sag and measurement of voltage/power currents.
CT expansion slave unit (CT expansion slave)	Refers to a slave unit that interlocks with a measurement master unit and that is used for expanding CT or ZCT.
Communication slave unit (Communication slave)	Refers to a communication slave unit that can collect each type of measurement data and write each type of setting values for multiple units of KM1/KE1 series, from the upper equipment (PLC, PC) through DeviceNet.
Multiple-unit connection composition (System)	Refers to the state where one measurement master unit is connected to a slave unit(s). In this manual, the aggregation where multiple units are connected is called the "System".
Unit No.	Refers to a number that identifies a unit (01- 99)(01 to 99) The Software uses this Unit No. to identify a unit. Note: Unit no. is not duplicable
Slave ID	Refers to a number for the measurement master unit to identify a slave unit when connected. This can be set using the rotary switch on the back of the main unit.

Table of Contents

Introduction	1
Intended Audience	1
Read and Understand this Manual:	1
Software license agreement	2
Precautions for Correct Use	3
Note regarding the environment of usage	3
Note regarding other units of equipment	3
Meanings of Symbols	3
Disclaimers:	3
Revision History	4
Related manuals	5
Terminology	6
Abbreviation	6
Definition of Terms	6
Table of Contents	7
1. Overview of KM1/KE1-Setting	1-1
1.1. Overview	1-1
■ Main features	1-1
1.2. System Structure for KM1/KE1	1-2
■ Model kind	1-2
■ Structure	1-3
■ Example of System Structure	1-6
1.3. Connection method and available functions	1-7
■ USB connection	1-7
■ RS-485 connection	1-8
■ Connection method and available functions	1-8
1.4. Recommended operating environment for computer	1-9
1.5. Main functions of the Software	1-10
1.6. Specifications of the Software	1-11
2. Flow and steps prior to unit installation	2-1
2.1. Preparation for the use of the Software	2-1
2.1.1. USB connection	2-1
2.1.2. RS-485 connection (via USB)	2-1
2.2. Overview of operational procedures	2-2
2.2.1. USB connection	2-2

2.2.2.	RS-485 connection (via USB)	2-3
2.3.	Procedure for using USB connection	2-4
2.3.1.	Procedure 1 Setup of the Software	2-4
2.3.2.	Procedure 2 Setup of Unit No.	2-6
2.3.3.	Procedure 3 Setup of multiple-unit connection composition and confirmation	2-11
2.3.4.	Procedure 4 Optional setting, confirmation after installation	2-17
2.4.	Procedure for using RS-485 connection (via USB).....	2-24
2.4.1.	Procedure 4: Setup of communication converter	2-24
3.	Setting major functions	3-1
■	Common setting	3-1
■	Function to Use and Reference Page	3-1
3.1.	To measure power by measurement master unit.....	3-2
■	Overview	3-2
■	Mechanism of power measurement by measurement master unit	3-2
■	Available unit	3-3
■	Items required for setting	3-3
3.1.1.	To measure power of one electrical system	3-4
■	Overview	3-4
■	Setting example	3-4
3.1.2.	To measure power of two electrical systems	3-5
■	Overview	3-5
■	Setting example	3-5
3.2.	To measure power with CT Expansion Unit (CTD8E) connecting to the measurement master unit	3-6
■	Overview	3-6
■	Mechanism of power measurement by CT Expansion Unit.	3-6
■	Available unit	3-7
■	Items required for setting	3-7
3.2.1.	To measure power of one electrical system	3-8
■	Overview	3-8
■	Setting example	3-8
3.2.2.	To measure power of two electrical systems	3-9
■	Overview	3-9
■	Available unit	3-9
■	Setting example	3-9
3.3.	To measure large current exceeding the rated using a general- purpose CT.....	3-11
■	Overview	3-11
■	Available unit	3-11
■	Items required for setting	3-11

■	Setting example	3-12
3.4.	To measure high voltage exceeding the rated using a transformer	3-13
■	Overview	3-13
■	Available unit	3-13
■	Items required for setting	3-13
■	Setting example	3-14
3.5.	To output total power consumption pulse.....	3-15
■	Overview	3-15
■	Available unit	3-15
■	Items required for setting	3-15
■	Setting example	3-16
3.6.	To use 3-STATE function.....	3-17
■	Overview	3-17
3.6.1.	To 3-STATE classify based on either of power, current, and voltage.....	3-17
■	Overview	3-17
■	Available unit	3-17
■	Items required for setting	3-18
■	Setting example	3-18
3.6.2.	To 3-STATE classify based on Event input.....	3-19
■	Overview	3-19
■	Available unit	3-19
■	Items required for setting	3-19
■	Setting example	3-20
3.7.	To count pulses by event input.....	3-22
■	Overview	3-22
■	Available unit	3-22
■	Items required for setting	3-22
■	Setting example	3-23
3.8.	To measure power without voltage input (Simple measurement).....	3-24
■	Overview	3-24
■	Available unit	3-24
■	Items required for setting	3-24
■	Setting example	3-25
3.9.	To detect voltage sag	3-26
■	Overview	3-26
■	Available unit	3-26
■	Items required for setting	3-26
■	Setting example	3-27
3.10.	To detect earth leakage.....	3-28
■	Overview	3-28

■	Available unit	3-28
■	Items required for setting	3-28
■	Setting example	3-29
3.11.	To use alarm function	3-30
■	Overview	3-30
■	Available unit	3-30
■	Items required for setting	3-30
■	Setting example	3-32
3.12.	To configure communication setting	3-33
■	Overview	3-33
3.12.1.	To set Unit No.	3-34
■	Overview	3-34
■	Available unit	3-34
■	Items required for setting	3-34
■	Setting example	3-34
3.12.2.	If configuration of RS-485 communication setting other than the initial setting is required · 3-35	
■	Overview	3-35
■	Available unit	3-35
■	Items required for setting	3-36
■	Setting example	3-37
3.12.3.	To connect a slave unit to the measurement master unit	3-38
■	Overview	3-38
■	Available unit	3-38
■	Items required for setting	3-38
■	Setting example	3-39
4.	Installation and uninstallation	4-1
4.1.	Installation	4-1
■	Operational procedure	4-1
4.2.	Uninstallation	4-10
■	Operational procedure	4-10
4.3.	Version information	4-11
■	Operational procedure	4-11
5.	Operation description	5-1
5.1.	How to start and exit the Software	5-1
5.1.1.	How to start the Software	5-1
■	Operational procedure	5-1
5.1.2.	How to exit the Software	5-5
■	Operational procedure	5-5

5.2.	Basic operation.....	5-6
5.2.1.	Menu/tab configuration.....	5-6
5.2.1.1.	Application menu.....	5-7
5.2.1.2.	Functional tab.....	5-7
5.2.2.	Unit models.....	5-8
5.2.3.	Correspondence table for model-specific function.....	5-8
5.2.4.	Unit no. selection column.....	5-9
5.2.5.	Precautions for setting the unit connected to a power source.....	5-10
■	Operational procedure.....	5-10
5.3.	On-screen operation.....	5-11
5.3.1.	Application environmental setting.....	5-12
■	Overview of operational procedure.....	5-12
■	Operational screen.....	5-12
■	Operational procedure.....	5-14
5.3.2.	Unit search.....	5-16
■	Overview of operational procedure.....	5-16
■	Operational screen.....	5-16
■	Operational procedure.....	5-18
5.3.3.	KM1 main unit setting.....	5-23
■	Overview of operational procedure.....	5-23
■	Operational screen.....	5-24
■	Operational procedure.....	5-27
5.3.3.1.	Communication setting.....	5-30
■	How to set major functions.....	5-31
5.3.3.2.	Measurement setting.....	5-33
■	How to set major functions.....	5-38
5.3.3.3.	Alarm setting.....	5-44
■	How to set major functions.....	5-48
5.3.3.4.	Logging setting.....	5-51
■	How to set major functions.....	5-52
5.3.4.	KE1 main unit setting.....	5-53
■	Overview of operational procedure.....	5-53
■	Operational screen.....	5-54
■	Operational procedure.....	5-54
5.3.4.1.	Communication setting.....	5-55
5.3.4.2.	Measurement setting.....	5-56
■	How to set major functions.....	5-58
5.3.4.3.	Alarm setting.....	5-60
■	How to set major functions.....	5-65
5.3.4.4.	Logging setting.....	5-68

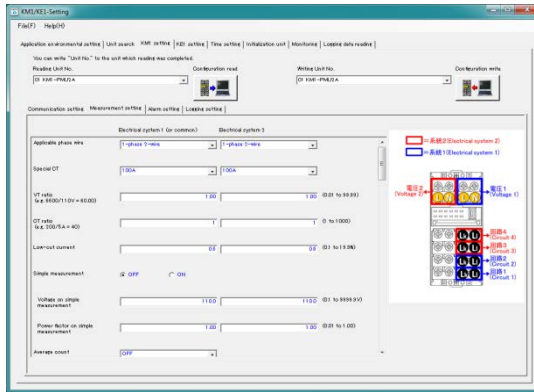
5.3.5.	Time setting	5-69
■	Overview of operational procedure	5-69
■	Operational screen	5-70
■	Operational procedure	5-72
5.3.6.	Initialization unit	5-77
■	Overview of operational procedure	5-77
■	Operational screen	5-78
■	Operational procedure	5-79
5.3.7.	Monitoring	5-81
■	Overview of operational procedure	5-81
■	Operational screen	5-81
■	Operational procedure	5-83
5.3.8.	Logging data reading	5-89
5.3.8.1.	Alarm history	5-89
■	Overview of operational procedure	5-89
■	Operational screen	5-90
■	Operational procedure	5-91
5.3.8.2.	Logging of voltage sag	5-93
■	Overview of operational procedure	5-93
■	Operational screen	5-93
■	Operational procedure	5-95
6.	Troubleshooting	6-1
6.1.	List of error messages	6-1
6.2.	Handling of communication errors	6-4
■	Handling of "No response"	6-5
6.3.	USB virtual COM port installation procedure for Windows XP	6-6
■	Operational procedure	6-6
6.4.	USB virtual COM port installation procedure for Windows 10	6-9
■	Operational procedure	6-9
6.5.	How to confirm the USB virtual COM port	6-10
6.6.	Uninstallation of the USB virtual COM port driver	6-15
6.7.	Garbled characters shown when opening a CSV file output	6-19
■	Operational procedure	6-19
6.8.	Installation of Microsoft .NET Framework	6-20
■	Installation procedure for .NET Framework	6-21
6.9.	Microsoft .NET Framework installation procedure for Windows 10	6-27
■	Installation procedure for .NET Framework	6-28
7.	Appendix	7-1
7.1.	List of main unit setting items for KM1/KE1	7-1

7.1.1.	Communication setting	7-1
7.1.2.	Measurement setting	7-2
7.1.3.	Alarm setting	7-4
7.1.4.	Logging setting	7-7
7.2.	Terminal diagram (Main unit setting for KM1or KE1)	7-8
■	Sample of terminal diagram	7-8
■	Explanation of wiring terminal symbols.	7-9
7.3.	Model-specific instantaneous value screen	7-10
■	Explanation of the tables.	7-10
7.3.1.	KM1-PMU1A	7-11
7.3.2.	KM1-PMU2A	7-13
7.3.3.	KM1-EMU8A	7-15
7.3.4.	KE1-PGR1C	7-15
7.3.5.	KE1-PVS1C	7-17
7.3.6.	KE1-VSU1B	7-19
7.3.7.	KE1-VAU1B	7-20
7.3.8.	KE1-CTD8E	7-21
7.3.9.	KE1-ZCT8E	7-22
7.4.	CSV output file format	7-23
7.4.1.	Unit research result file	7-24
■	File format (Line 1 for header, Line 2 and following lines are for data)	7-24
■	Output sample.	7-24
7.4.2.	Alarm history file	7-25
■	File format	7-25
■	Output sample.	7-25
7.4.3.	Logging of voltage sag file	7-26
■	File configuration	7-26
■	File format	7-28
■	Output sample.	7-30

1. Overview of KM1/KE1-Setting

1.1. Overview

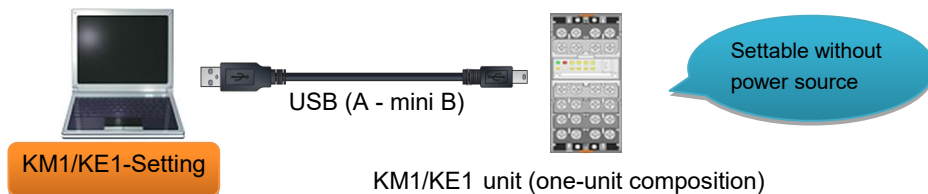
The KM1/KE1-Setting (hereinafter, referred to as the Software) is a software product that can easily set the main unit of KM1 and KE1 series products. The Software can read out the setting values for communication, measurement and alarm for the main unit on the screen and write the setting values changed into the main unit.



■ Main features

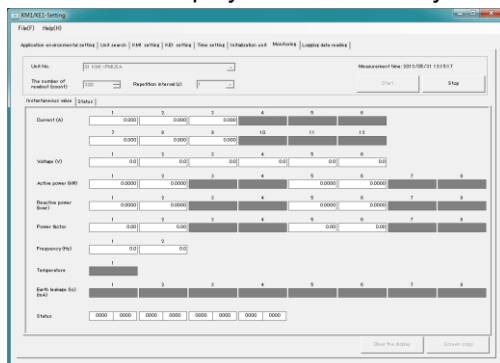
● Easy default setting only by connecting an USB

You can set initial values for each main unit easily by connecting a computer installed with the Software to each unit through an USB cable. Also, in case of one-unit configuration, a power distribution line is unnecessary for the unit at the time of settings (in case of using the monitoring function and logging data reading function, a power distribution line is necessary even in case of one-unit configuration).

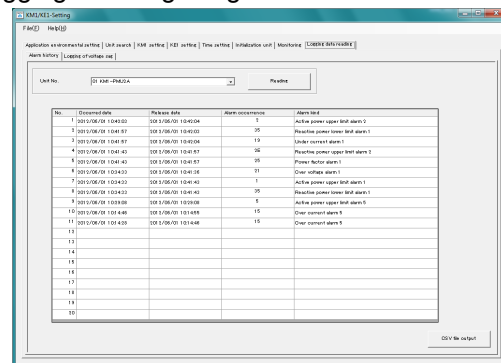


● Monitoring function and logging data reading function

The monitoring function can display measurement values (instantaneous values) for the unit and confirm if correct measurement is conducted after installation. Also, the logging data reading function can display the alarm history and logging of voltage sag stored in the main unit.



[Monitoring] Screen



[Logging data reading] Screen

1.2. System Structure for KM1/KE1

KM1/KE1 series products can be used with a measurement master alone, or by connecting the measurement master to a functional slave, CT expansion slave and communication slave. The aggregation where multiple units are connected is called the "System". For the system configured to connect multiple units, refer to "Model KM1 User's Manual " and "Model KE1 User's Manual".

■ Model kind

<KM1 series (Smart Power Monitor)>

	Measurement master		Functional slave
	PMU1A (Electric power)	PMU2A (Power Two-System Measurement Unit)	EMU8A (Pulse/Temperature Input Unit)
Master behavior	○	○	X
Independent behavior	○	○	X
CT Expansion	○	○	X
Measurement function (Monitoring)	Electric power	○	X
	Electric currents	○	X
	Voltage	○	X
	Temperature	X	○
	Pulse	X	○
	Phase-sequence	○	X

○: Supported.

X: Not supported.

<KE1 series (Smart Monitoring Device)>

	Measurement master		Functional slave		CT expansion slave		Communicati- on slave
	PGR1C (Power/ Leakage Monitoring Unit)	PVS1C (Power/ Voltage Sag)	VSU1B (Voltage Sag Monitoring Unit)	VAU1B (Voltage/ Current)	CTD8E (CT Expansion Unit)	ZCT8E (Zero-phase CT Expansion)	DRT (DeviceNet)
Master behavior	○	○	X	X	X	X	X
Independent behavior	○	○	○	○	X	X	X
CT Expansion	○	○	X	X	X	X	X
ZCT Expansion	○	X	X	X	X	X	X
Measurement function (Monitoring)	Voltage Sag	○	○	X	X	X	X
	Earth leakage	○	X	X	X	○	X
	Electric power	○	○	X	○	X	X
	Electric currents	○	○	X	○	X	X
	Voltage	○	○	○	X	X	X
	Phase-loss	○	○	○	X	X	X
	Phase-sequence	○	○	○	X	X	X

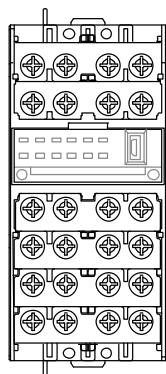
○: Supported.

X: Not supported.

■ Structure

(1) Minimum structure

A measurement master or functional slave can be used independently.

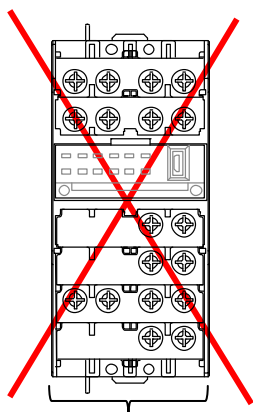


Measurement master
Functional slave

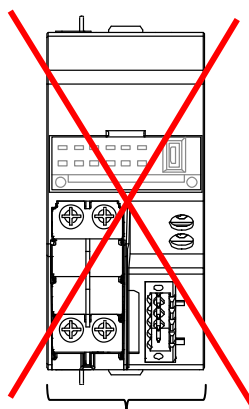
Note: An EMU8A unit does not work by itself.

[Unusable example]

An EMU8A, CT expansion slave, or communication slave cannot be used independently.



CT expansion slave
• CTD8E (CT Expansion)
• ZCT8E (ZCT Expansion)

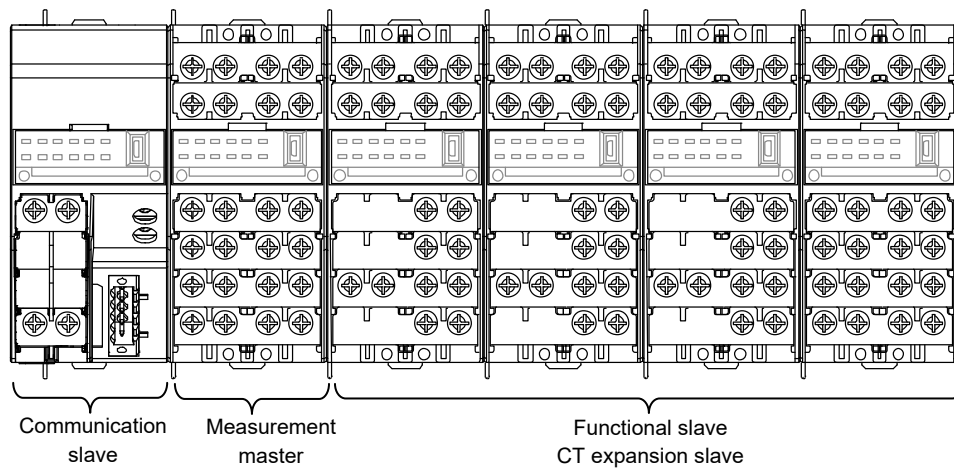


Communication slave
• DRT (DeviceNet)

(2) Maximum structure

One measurement master can connect to a maximum of four units, including functional slave and CT expansion slave units.

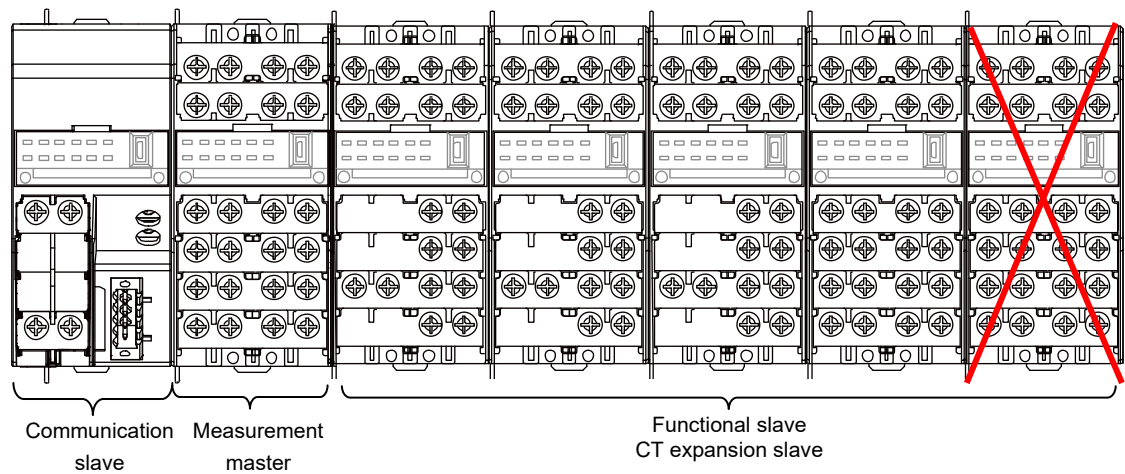
In addition to them, a communication slave can connect to one more unit.



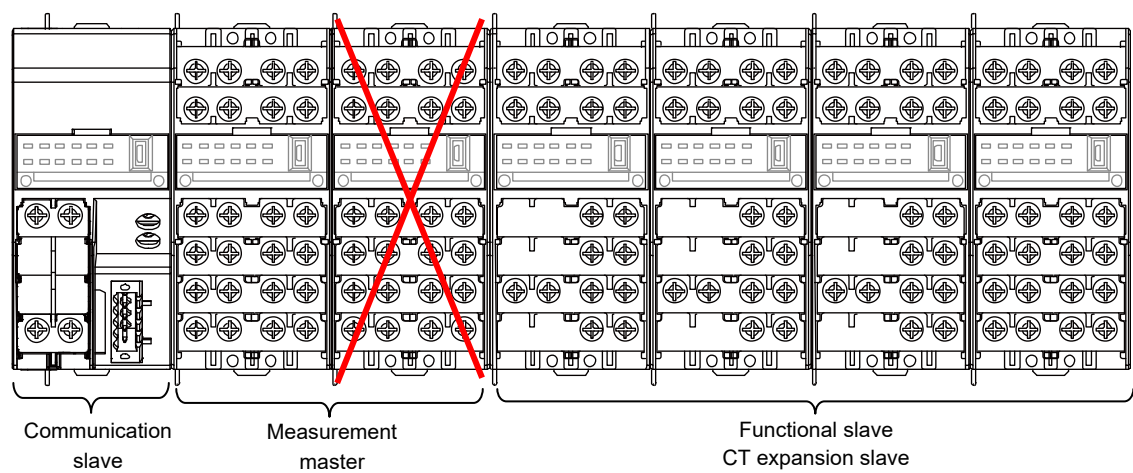
[Unusable example]

The unit cannot be used if:

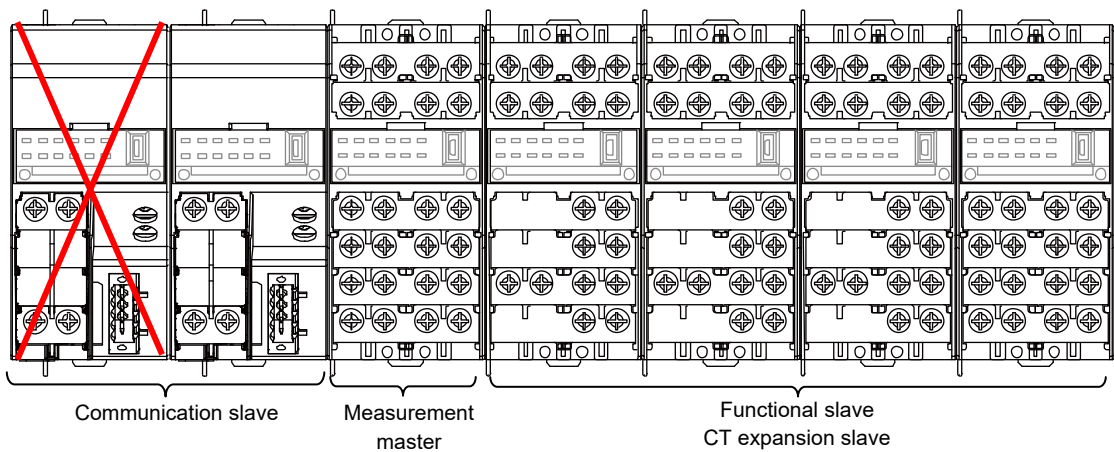
- Five or more functional slave or CT expansion slave units are added



- Two or more measurement master units are used



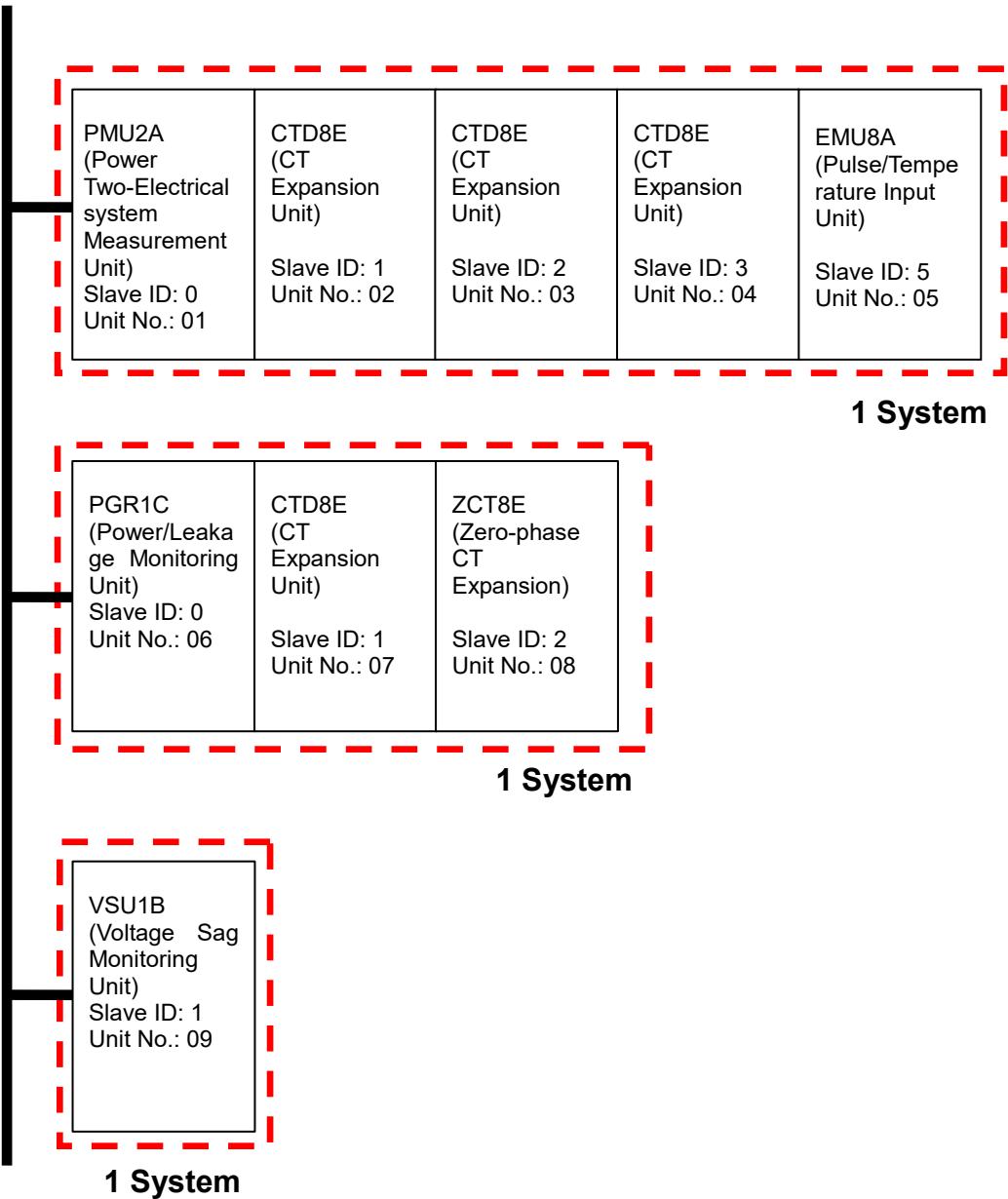
- Two or more communication slave units are used



■ Example of System Structure

Multiple systems can be connected through a RS-485 line.

RS-485



- Note 1: Set slave IDs in a way to avoid duplicates within the same system.
- Note 2: Set unit numbers in a way to avoid duplicates across the entire systems.
- Note 3: Set values for the communication protocol, baud rate, data length, top bits and vertical parity and ensure that they are matched.
- Note 4: Do not connect RS-485 wiring between the connected units in the same system. Communications are available in the same system through the connector.

1.3. Connection method and available functions

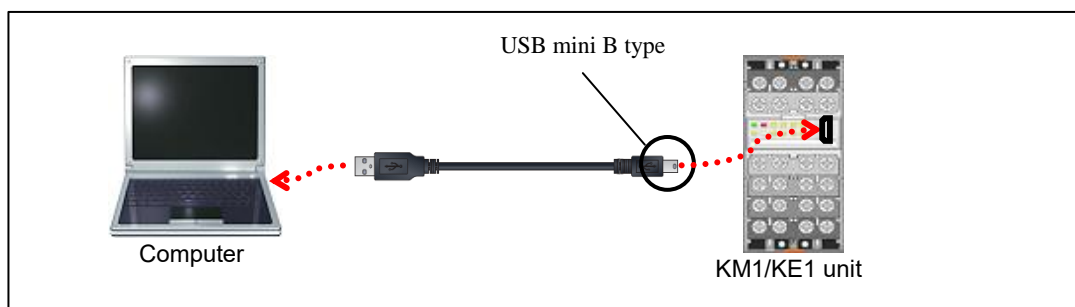
You can connect the computer installed with the Software to a KM1/KE1 series unit using either of two methods, "USB connection" or "RS-485 connection". Also, different functions can be used depending on the connection state and power supply. Select an appropriate connection method according to the function to be used.

■ USB connection

● One-unit composition

This is a connection method that connects one unit directly to a computer through an USB cable (A Type - mini B Type).

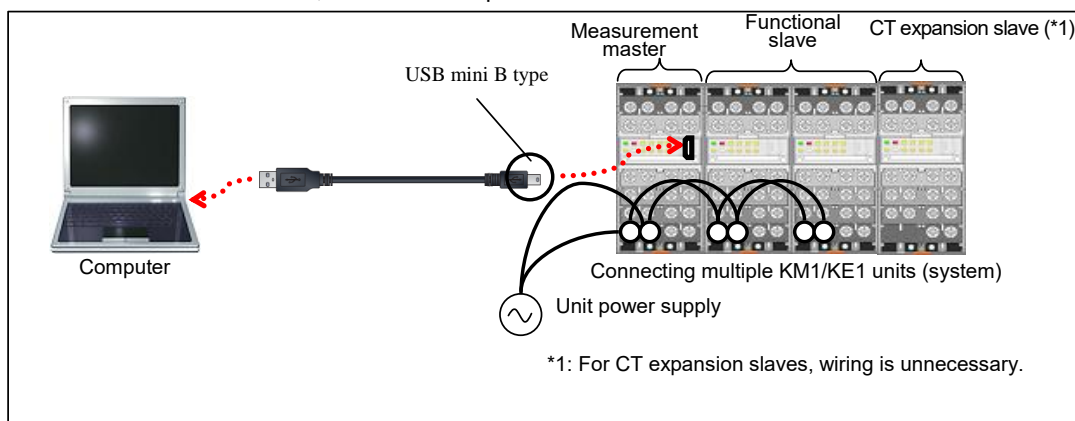
If the computer can be driven by the USB port bus power, the unit alone can be set without connecting to a power source. Monitoring requires connection to a power source.



● Multiple-unit connection composition

This is a connection method that connects multiple units connected (System) to a computer through an USB cable (A Type - mini B Type). The USB cable is connected to a measurement master configured to connect multiple units. When connecting a power source, the slave can be set and monitored through the measurement master.

Note: In case of no connection to a power source, only the measurement master can be set. The slave cannot be set. To set the slave, connect it to a power source.

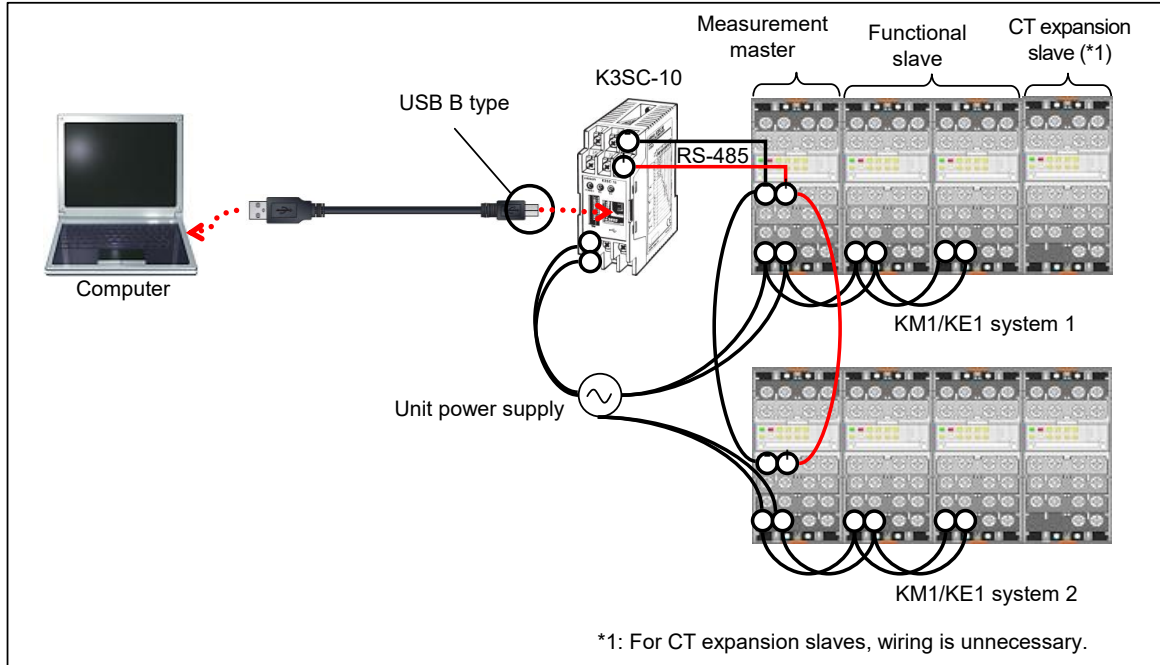


Precautions for Correct Use

- When connecting to a power source, refer to "5.2.5 Precautions for setting the unit connected to a power source"(p.5-10).
- For CTD8E (CT Expansion Unit) and ZCT8E (ZCT Expansion Unit), wiring is unnecessary. Power is supplied from the measurement master.

■ RS-485 connection

This is a connection method that connects a computer to a K3SC-10 through an USB cable (A Type - B Type) for setting, by means of connecting the unit to a USB/RS-485 communication convertor (K3SC-10) through a RS-485 communication cable. The multiple systems connected through the RS-485 can be set and monitored.



Precautions for Correct Use

- For setting and monitoring through RS-485 connection, install the main unit of K3SC-10 and a driver separately, and configure the driver setting.
- Do not operate the unit using both RS-485 connection and USB connection at the same time.

■ Connection method and available functions

The table below shows the difference in functions for connection methods:

Connection method	Power supply	Available functions	
		One-unit composition	Multiple-unit connection composition
USB connection (Connecting to unit)	Without connection to a power source (Driven by USB bus power)	Only setting possible (for all models)	Only setting possible (for measurement master only)
	With connection to a power source	Setting, monitoring and logging data reading possible (for all models)	Setting, monitoring and logging data reading possible (for all models) Note: Needs to be connected to a measurement master
RS-485 connection (Connecting to a K3SC-10)	Without connection to a power source	Not available	
	With connection to a power source	Setting, monitoring and logging data reading possible (for all models)	

1.4. Recommended operating environment for computer

Item	Specifications
OS/Service package (Essential environment)	Microsoft Windows XP (32-bit) SP3 or later Microsoft Windows Vista (32-bit) SP2 or later Microsoft Windows 7 (32-bit/64-bit) without SP or later Microsoft Windows 10 (32-bit/64-bit) .NET Framework 2.0 SP2/3.0/3.5 * Operation on Microsoft Windows 8 is not guaranteed.
CPU	Intel Core(TM) 2 Duo 1.8 GHz or higher
Memory	At least 500 MB of free memory
Screen size	XGA (1024 x 768 pixels) resolution or higher; HIGH color 16 bits or more (full color environment recommended)
Disk capacity	15MB
USB Port	A Type connector of USB V1.1 or later Compatible with high power device

1.5. Main functions of the Software

Function		Explanation	Compatible models
Unit search		Searches for a unit that enables communication. Can be used to confirm communication.	All models
KM1 main unit setting		Sets the main unit of KM1 series.	KM1 series
KE1 main unit setting		Sets the main unit of KE1 series.	KE1 series (*1)
Monitoring (*2)		Repeatedly reads out measurement values of KM1/KE1 (Instantaneous value) and has them displayed on the screen. The status of the main unit can be shown, too.	Other than KE1-DRT-FLK
Logging data reading (*2)	Alarm history	Reads out the alarm history logged by KM1/KE1 into the main unit and has them displayed on the screen. The CSV file for alarm history can be output, too.	Other than KE1-DRT-FLK
	Logging of voltage sag	Reads out the logging of voltage sag logged by KE1 into the main unit and has them displayed on the screen. The CSV file for logging of voltage sag can be output, too.	KE1-PVS1C-FLK KE1-VSU1B-FLK

*1: For KE1-DRT-FLK (DeviceNet communication unit), only Unit No. can be set.

*2: It cannot be used when being driven by USB bus power.

1.6. Specifications of the Software

Item	Specifications					
Compatible models	KM1 series					
	Model	Name	Unit type			
	KM1-PMU1A-FLK	Power Measurement Unit	Measurement master	Master		
	KM1-PMU2A-FLK	Power Two-System Measurement Unit				
	KM1-EMU8A-FLK	Pulse/Temperature Input Unit	Functional slave	Slave		
	KE1 series					
	Model	Name	Unit type			
	KE1-PGR1C-FLK	Power/Earth Leakage Monitoring Unit	Measurement master	Master		
	KE1-PVS1C-FLK	Power/Voltage-Sag Monitoring Unit				
	KE1-VSU1B-FLK	Voltage-Sag Monitoring Unit	Functional slave	Slave		
	KE1-VAU1B-FLK	Voltage/Current Monitoring Unit				
	KE1-CTD8E	CT Expansion Unit	CT expansion slave			
	KE1-ZCT8E	Zero-phase CT Expansion Unit				
	KE1-DRT-FLK	DeviceNet Communication Unit				Communication slave
	Communication protocol	CompoWay/F, Modbus (RTU)				
	Settable Unit No.	01 to 99 (duplication not allowed)				
Maximum no. of units under control	USB connection	Maximum of five units connected + one communication slave Note: Only one unit can be connected for setting when driven by USB bus power				
	RS-485 connection	CompoWay/F: Up to 31 units Modbus: Up to 99 units				
Language	Japanese, English, Korean (Hangul), Chinese (simplified), Chinese (traditional)					
Output file format	CSV file for UTF-8 (with BOM)					

Note 1: You can operate only one unit at one time using the Software.

Note 2: You cannot run more than one of the Software on the same computer.

Note 3: When operating by means of RS-485 connection using the Software, you cannot do so from multiple computers at the same time.

Also, you cannot use USB connection and RS-485 connection at the same time.

2. Flow and steps prior to unit installation

2.1. Preparation for the use of the Software

The Software configures the KM1/KE1 unit using connection through USB or RS-485 (via USB).

The following should be prepared before using the Software:

2.1.1. USB connection

Name	Explanation
Unit	A KM1 or KE1 series unit to be installed
Computer	A computer to use the Software For the recommended operating environment for computer, refer to "1.4 Recommended operating environment for computer" (p.1-9).
USB cable	A - mini B
Unit power supply	100 to 240VAC (50/60Hz) Note 1: The unit power supply is not required in the units are to be configured one by one via USB. The unit power supply is required if: <ul style="list-style-type: none"> • Multiple-unit connection composition, or • Single-unit that requires monitoring and/or logging data reading other than configuration Note 2: Attach a small breaker to the unit power supply so that the unit power supply can be turned on/off.

2.1.2. RS-485 connection (via USB)

Name	Explanation
Unit	A KM1 or KE1 series unit to be installed
Computer	A computer to use the Software For the recommended operating environment for computer, refer to "1.4 Recommended operating environment for computer" (p.1-9).
USB cable	A - mini B Note: Required for USB connection before RS-485 connection (via USB). A - B
RS-485 cable	Shielded twisted-pair (AWG24-AWG14)
USB/RS-485 communication convertor	K3SC-10
K3SC-10 virtual COM Port compatible USB driver	Required in case of using K3SC-10. Please download the OMRON web site.
Unit power supply	100 to 240VAC (50/60Hz) Note 1: Required for multiple unit connection through RS-485 connection (via USB). Note 2: Attach a small breaker to the unit power supply so that the unit power supply can be turned on/off.

2.2. Overview of operational procedures

Before installing the unit and starting measurement, follow the procedures below:

2.2.1. USB connection

Procedure 1 Setup of the Software (Item 2.3.1)

Install the Software to the computer and set default values.

Step 1: Install the Software.

Step 2: Start the Software.

Step 3: Connect to a unit with a USB cable.

Step 4: Select the Connection method.



Procedure 2 Setup of Unit No. (Item 2.3.2)

Set a Unit No. for each unit.

Step 1: Connect to a unit with a USB cable.

Step 2: Start the Software.

Step 3: Search for the unit and confirm communication.

Step 4: Set Unit No.

Step 5: Check the configured Unit No.

To set more than one unit continuously, replace the USB cable and go through Step 3 to Step 5 repeatedly.



Procedure 3 Setup of multiple-unit connection composition and confirmation (Item 2.3.3)

To use multiple units to be connected, connect the units and confirm their operational capabilities.

Step 1: Connect the units and turn on the power.

Step 2: Connect to the measurement master unit with a USB cable.

Step 3: Start the Software.

Step 4: Search for the measurement master unit and confirm communication.

Step 5: Enable the slave ID of the connection composition of the measurement master unit.

Step 6: Unplug the USB cable and turn on the power again.

Step 7: Search for all the units and confirm communication.



Procedure 4 Optional setting, confirmation after installation (Item 2.3.4)

Configure unit-specific setting and time, and check measured values if necessary.

Step 1: Set the settings of each KM1/KE1 unit.

Step 2: Unplug the USB cable and turn on the power again.

Step 3: Set the unit time.

Step 4: Unplug the USB cable and turn on the power again.

Step 5: Install the unit.

Step 6: Monitor instantaneous value/status.

Step 7: Read logging data (if necessary).

Step 8: Clear measured data (if necessary).

Step 9: Unplug the USB cable and turn on the power again (if measured data were cleared).

2.2.2. RS-485 connection (via USB)

Procedure 1 Setup of the Software (Item 2.3.1)

Use the same procedure as "2.2.1 USB connection", Procedure 1.



Procedure 2 Setup of Unit No. (Item 2.3.2)

Use the same procedure as "2.2.1 USB connection", Procedure 2.



Procedure 3 Setup of multiple-unit connection composition and confirmation (Item 2.3.3)

Use the same procedure as "2.2.1 USB connection", Procedure 3.



Procedure 4 Setup of communication converter (Item 2.4)

Configure the communication setting of the USB/RS-485 communication convertor K3SC-10, install the driver, and hard-wire the RS-485.

Step 1: Configure K3SC-10 communication setting.

Step 2: Install K3SC-10 driver.

Step 3: Wire the RS-485 communications cable.

Step 4: Start the Software.

Step 5: Search for all the units and confirm communication.

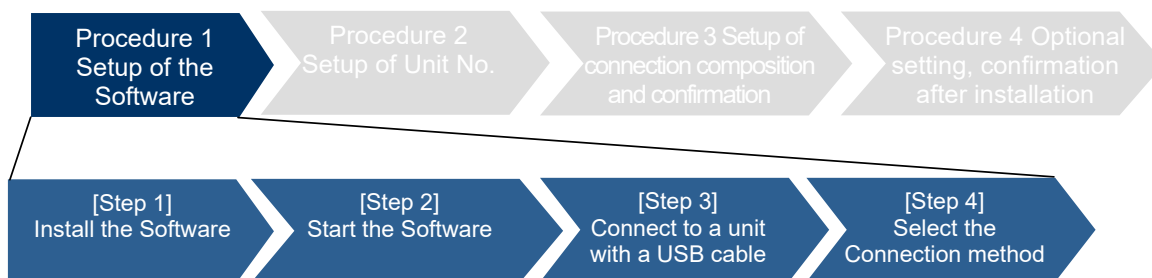


Procedure 5 Optional setting, confirmation after installation (Item 2.3.4)

Use the same procedure as "2.2.1 USB connection", Procedure 4.

2.3. Procedure for using USB connection

2.3.1. Procedure 1 Setup of the Software



You need to go through this procedure when you use the Software for the first time.

The Software requires connection with the KM1/KE1 unit to use. Otherwise it cannot be used.

[Step 1] Install the Software

From OMRON web site, download a compressed file for KM1/KE1-Setting, and decompress it in a selected folder on the computer.

Reference 4.1 Installation (p.4-1) (1) to (3)

[Step 2] Start the Software

Before starting the Software, please read the license agreement carefully.

To use the Software, prepare an USB virtual COM port driver to connect to a KM1/KE1series unit.

1. When the Software is started for the first time, the driver installation screen appears.
2. Install the USB virtual COM port driver.

Once the USB virtual COM port driver is installed, the following startup screen will appear.



3. Then the following [Connection method] dialog appears.

Do not click on any button yet.



Reference 4.1 Installation (p.4-1) (4) to (6)

2. Flow and steps prior to unit installation

[Step 3] Connect to a unit with a USB cable

Connect the computer to a unit through a USB cable (A Type - mini B Type).
Wait for the USB virtual COM port to be recognized automatically.



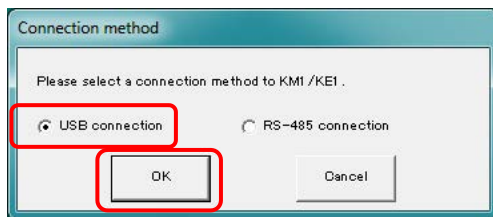
Additional Information

The USB virtual COM port must be recognized for each USB port in the computer. If you use an USB port different from the one used for setup, automatic recognition will be done. For the already recognized USB port, automatic recognition will be skipped even when a different model of unit is used.

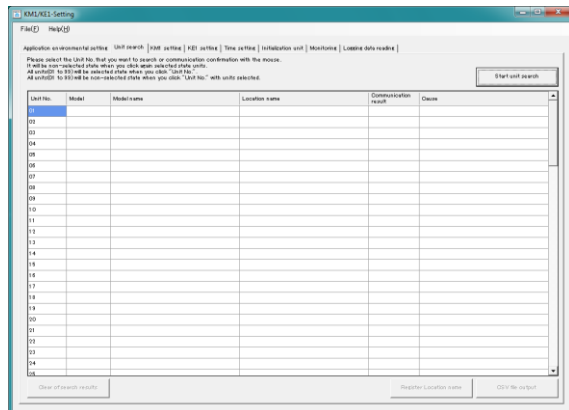
Reference 4.1 Installation (p.4-1) (7)

[Step 4] Select the Connection method

After the virtual COM port is automatically recognized, check that the computer and a unit are connected through a USB cable (A - mini B), select [USB connection] on the [Connection method] screen and click on the [OK] button.
When the [Unit search] screen appears without any message, then the setup of the Software is complete.

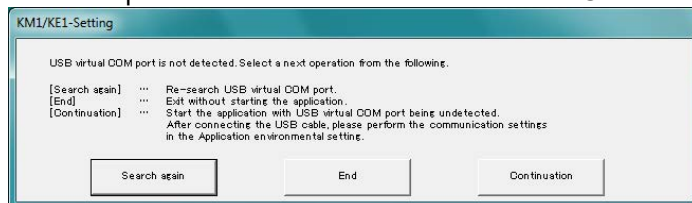


[Unit search] screen



Precautions for Correct Use

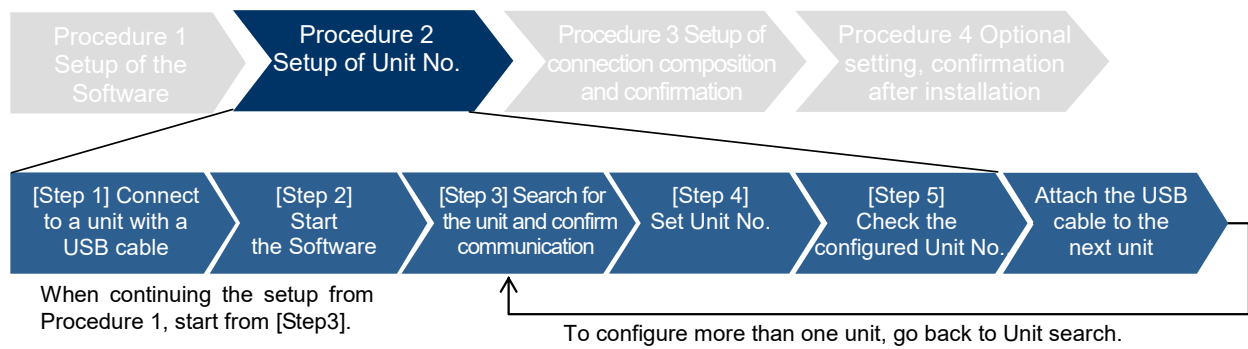
If the computer and a unit are not connected via USB cable, the following dialog box will appear.



In such a case, connect the computer and a unit through a USB cable and click on the [Search again] button.

Reference 4.1 Installation (p.4-1) (8)
6 Troubleshooting (p.6-1)

2.3.2. Procedure 2 Setup of Unit No.



Set a Unit No. for every unit.

[Step 1] Connect to a unit with a USB cable

Connect the computer to a unit to configure through a USB cable (A Type - mini B Type). Power supply to a unit is not required before connection. You can just connect the computer to a unit through a USB cable to configure thanks to the "driven by USB bus power" function.

The diagram shows a laptop on the left connected to a USB cable. The cable has a standard USB A connector on the laptop side and a USB mini B connector on the unit side. A red arrow points from the laptop to the cable, labeled 'Powered by USB bus power'. Another red arrow points from the cable to the unit, labeled 'Connect one by one'. The unit is shown as a rack-mounted device with multiple slots. Red dotted arrows indicate the connection path from the laptop, through the cable, to the unit. The unit is labeled 'KM1/KE1 units'.

Note: Only the configuration is available when driven by USB bus power. Monitoring and logging are not available.

Reference	5.1.1 How to start the Software (p.5-1) (1)
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[Step 2] Start the Software

Start the Software and select [USB connection] on the [Connection method] dialog box.

Reference	5.1.1 How to start the Software (p.5-1) (2) to (3)
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[Step 3] Search for the unit and confirm communication

To communicate with units via USB connection, search the units.

In the [Unit search] screen, perform the followings:

1. Select a Unit No.

Factory shipment: Select a Unit No.01 (the initial value of Unit No. is "01")

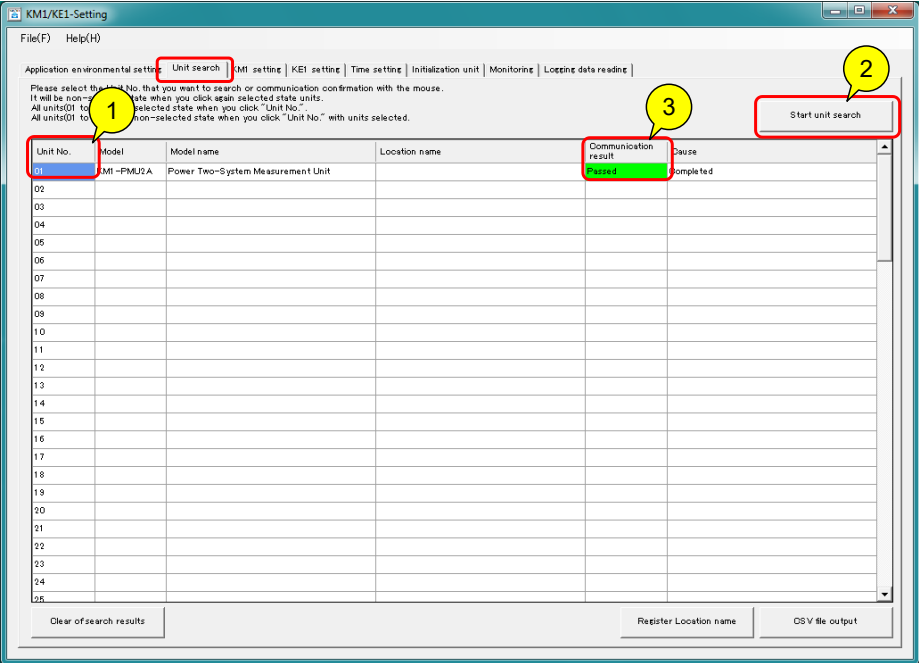
If you know the configured Unit No.: Select the Unit No.

If you do not know the configured Unit No.: Click on the [Unit No.] in the header and select the all Unit No. (*1)

*1: If you select all the unit numbers, it may take several minutes to complete.

2. Click on the [Start unit search] button to start unit search.

3. Check that the communication result is "Passed".



This allows communications with the searched unit and configuration read.

Note: Balloons in the screen indicate steps described above.

Precautions for Correct Use

- Before starting unit search, make sure to match the communication protocol for the Software and the unit. If the communication protocol for the Software and the unit is its initial value (factory shipment), no change of the setting is required.
- If you are not sure if the communication protocol has been changed or not, you can check it on the [Application environmental setting] screen for the software, and DIP switch to No. 2 on the main unit.
- If the model of the Unit No. found does not match the model of the Unit No. previously searched, [Model] and [Model name] will be indicated in yellow. Be sure to set unit numbers in a way to avoid duplicates across the RS-485 communications system.
- If a communication error occurs during unit search, refer to "6.2 Handling of communication errors".

Reference

5.3.2 Unit search (p.5-16)

5.3.1 Application environmental setting (p.5-12), 6.2 Handling of communication errors (p.6-4)

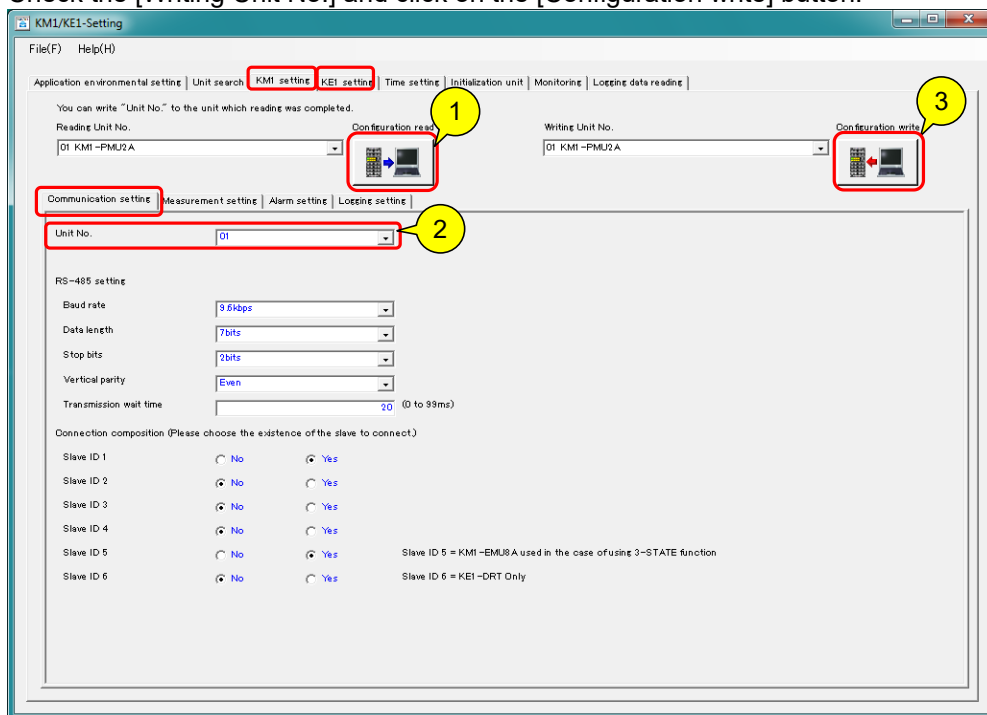


2. Flow and steps prior to unit installation

[Step 4] Set Unit No.

For upper equipment (including the Software and EW700) to communicate with the units through USB or RS-485 (via USB), set Unit No. for communications to every unit in a range from 01 to 99.

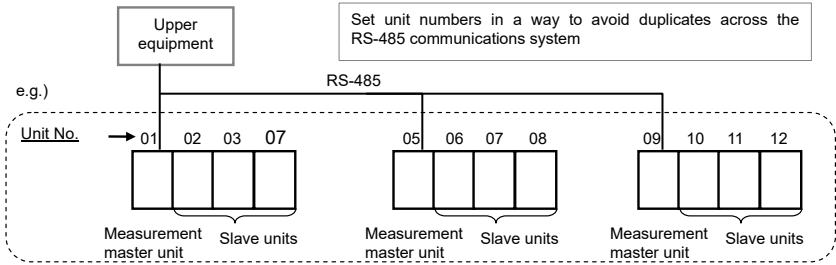
1. In the [KM1 setting] or [KE1 setting] screen, select a unit to change and click on the [Configuration read] button.
2. In the [Communication setting] tab, change "Unit No."
3. Check the [Writing Unit No.] and click on the [Configuration write] button.



Note: Balloons in the screen indicate steps described above.

Precautions for Correct Use

- To connect multiple units through RS-485, set unique Unit No. for each unit in the communications system, not in the connected system. Otherwise communication error occurs, resulting in communications unavailable.



- In case of the communication protocol of CompoWay/F as the factory shipment, the range of Unit No. is from 01 to 99. Note that the maximum number of units is 31 that can be connected through RS-485.
- In case of the communication protocol of Modbus (setting the DIP switch 2 ON), the range of Unit No. is from 01 to 99. Note that the maximum number of units is 99 that can be connected through RS-485.

Reference

5.3.3 KM1 main unit setting (p.5-23)
5.3.4 KE1 main unit setting (p.5-53)

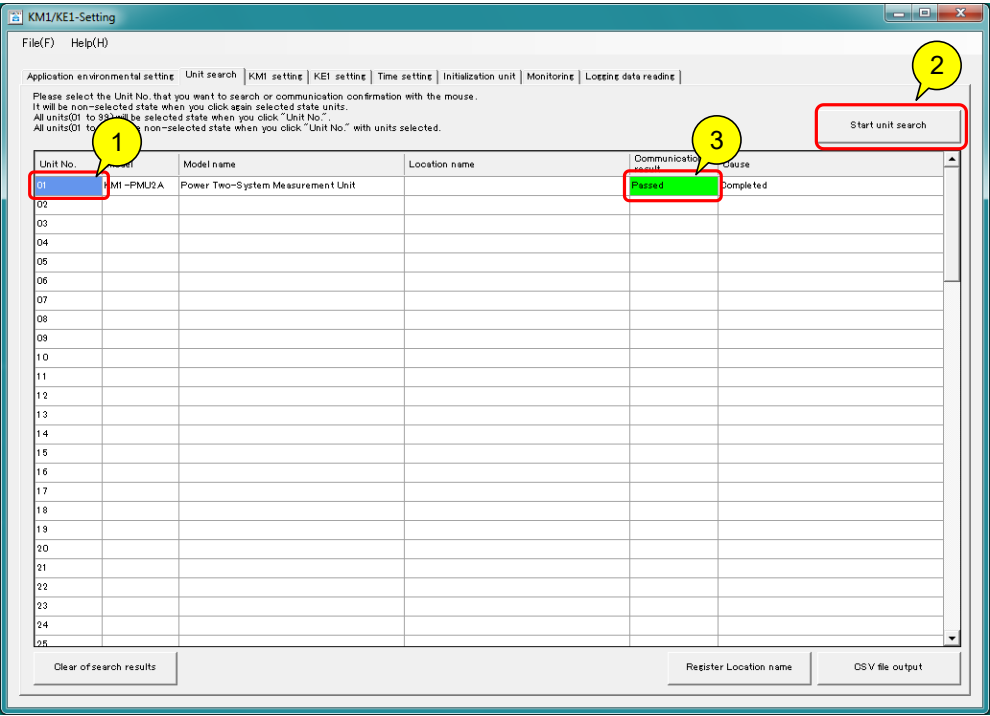
[Step 5] Check the configured Unit No.

Check that the communications are available with the units the Unit No. configured.

In the [Unit search] screen, perform the followings:

1. Select a configured Unit No.
2. Click on the [Start unit search] button to start unit search.
3. Check that the communication result is "Passed".

The result shows that the communications are available with the unit of the Unit No. specified above.



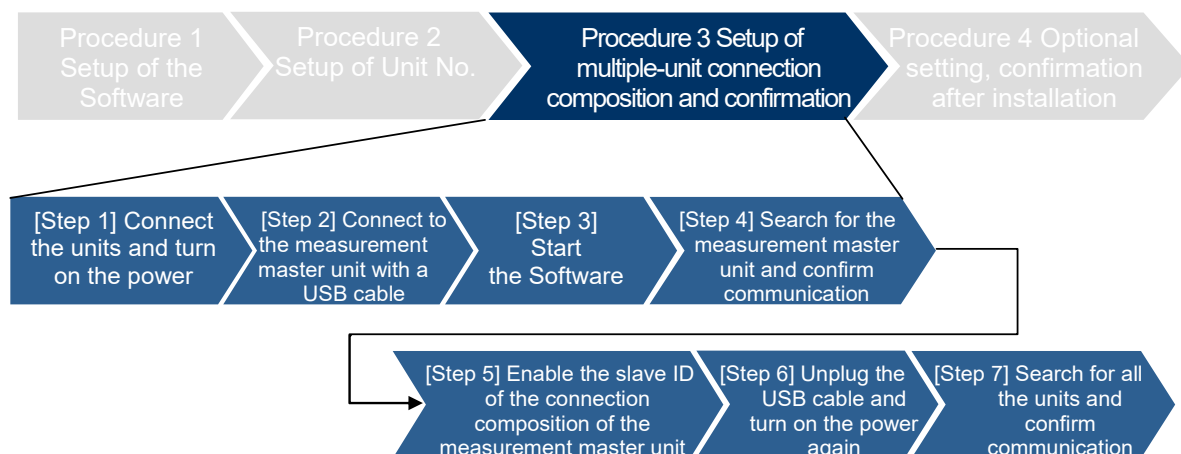
Note: Balloons in the screen indicate steps described above.

Reference

5.3.2 Unit search (p.5-16)

If there is a need to set another Unit No., connect the USB cable to the targeted unit and go through Step 3 to 5.

2.3.3. Procedure 3 Setup of multiple-unit connection composition and confirmation



Connect the measurement master unit and slave unit(s).

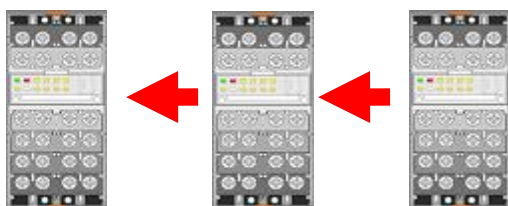
A number (slave ID) for the measurement master to identify a slave must be assigned to slave unit(s) using the following steps in addition to the Unit No. described above.

[Step 1] Connect the units and turn on the power

1. To connect units, use a horizontally connecting hook and a connector to connect adjacent units.

Measurement master

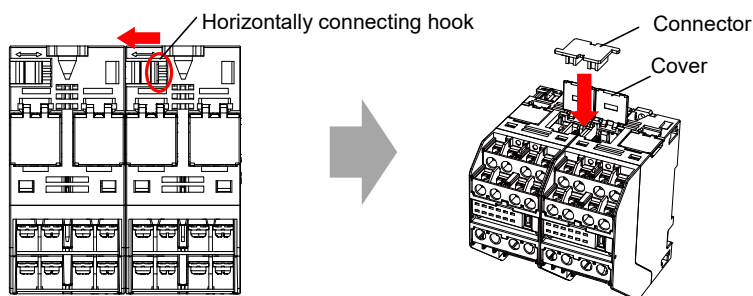
Slaves



Connecting multiple KM1/KE1 units (system)

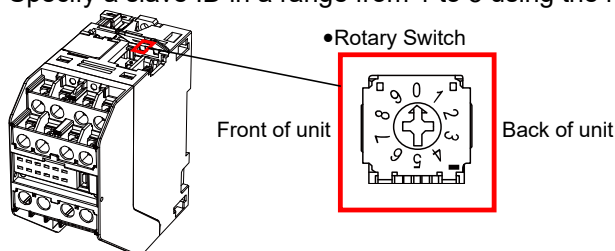
Slide the white, horizontally connecting hooks on top and at the bottom of the unit until a clicking sound is heard and lock

Open the unit top cover, attach the accessory connector, and close the cover



- Assign a slave ID to every slave unit for the measurement master to identify the slave unit in the connection composition.

Specify a slave ID in a range from 1 to 5 using the rotary switch. Set a unique number.



Slave unit: Set a number from "1" to "4"

EMU8A (temperature/pulse input unit): Set to "5" (if you use 3-STATE function based on the event input function as the judgment condition, or specific power consumption function)

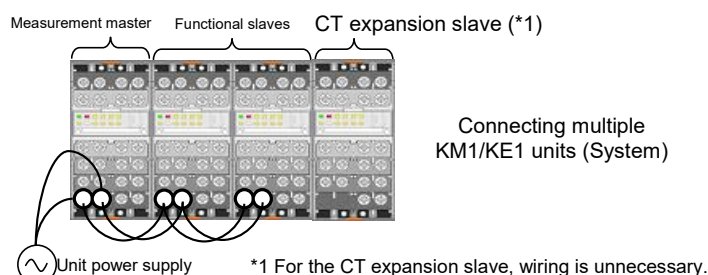
Note: DRT (DeviceNet Communication Unit): No need to assign (Fixed to 6)

Precautions for Correct Use

- For all the units to be connected, the setting of the DIP switch No.2 (switching of communication protocol) must be the same.
- Connect units do wiring, and set the DIP and rotary switches with the power of the main unit switched off.
The DIP and rotary switches will be enabled only when the power is switched on, and any change made during power distribution will be not reflected. To change the setting after connecting to the power, turn the power off, change the setting, and turn the power on again.

- Install a wire on the power-supply voltage terminal of each unit.

For CTD8E (CT Expansion Unit) and ZCT8E (ZCT Expansion Unit), wiring is unnecessary. Power is supplied from the measurement master.



- Turn on the power.

Make sure that the LED operational indications [PWR] on the connected measurement master unit and functional slave unit(s) are on or blinking. ([PWR] LED of the CT expansion slave is not on yet.)

2. Flow and steps prior to unit installation

Precautions for Correct Use	
<ul style="list-style-type: none">If the clock backup power supply is out, the operation display LED [PWR] blinks (Abnormal of RTC). If the LED still blinks even after the time setting is configured based on the "Procedure 4 Optional setting, confirmation after installation", refer to "Chapter 4: Troubleshooting" in "Model KM1 User's Manual" or "Model KE1 User's Manual".	
Reference	"Chapter 1: Overview", "Chapter 2: Preparation", "Chapter 4: Troubleshooting" in "Model KM1 User's Manual" or "Model KE1 User's Manual"

[Step 2] Connect to the measurement master unit with a USB cable

Connect the computer to the measurement master unit through a USB cable (A Type - mini B Type).

The diagram illustrates the connection setup. On the left, a laptop is labeled 'Computer'. A 'USB cable' connects the computer to the 'Measurement master' unit. The master unit is connected to several 'Slaves' and a 'CT expansion slave (*1)'. A 'Unit power supply' is connected to the master unit. A red dashed arrow points from the master unit to the slaves. Text on the right says 'Connecting multiple KM1/KE1 units (system)'. A note at the bottom right states '*1 For the CT expansion slave, wiring is unnecessary.'

Precautions for Correct Use

- Make sure that the power is on before connecting the USB cable. If you connected the USB cable before turning on the power, turn the power off and unplug the USB cable once. Check that the [PWR] LEDs of all the units are off, turn the power on again, and connect the USB cable again.

[Step 3] Start the Software	
Start the Software and select [USB connection] on the [Connection method] dialog box.	
Reference	5.1.1 How to start the Software (p.5-1)

2. Flow and steps prior to unit installation

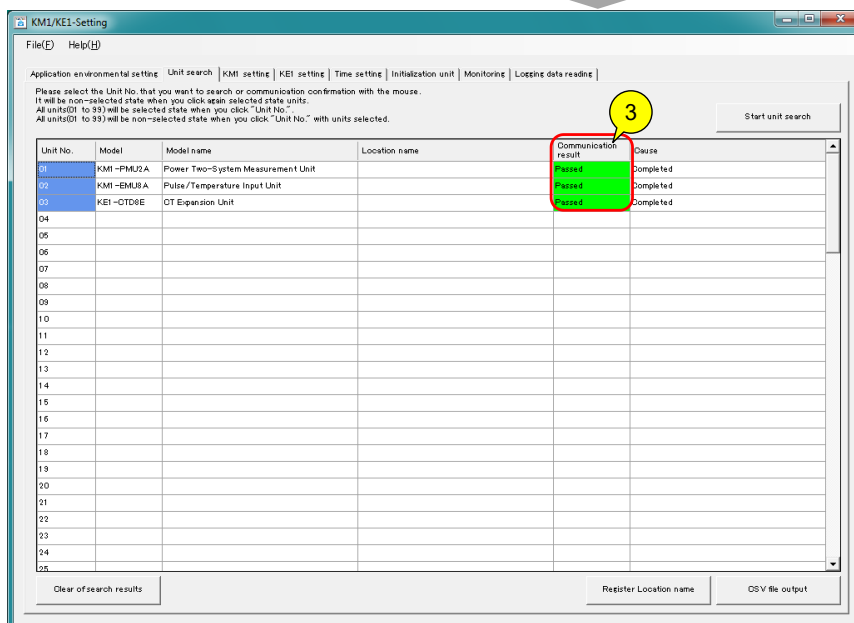
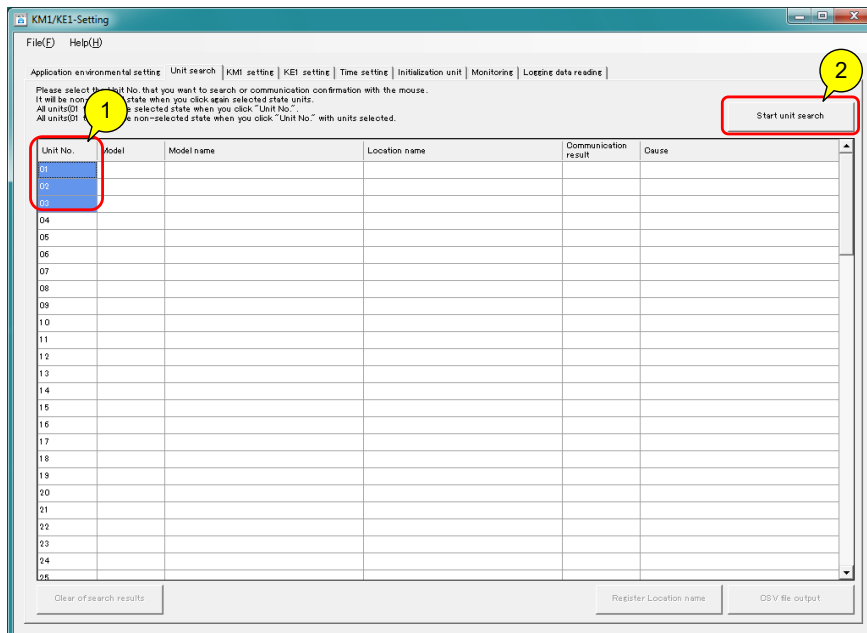
[Step 4] Search for the measurement master unit and confirm communication

To communicate with the measurement master, search the measurement master.

In the [Unit search] screen, perform the followings:

1. Select a Unit No. of the measurement master unit.
2. Click on the [Start unit search] button to start unit search.
3. Check that the communication result is "Passed".

This allows communications with the searched measurement master unit and configuration read.



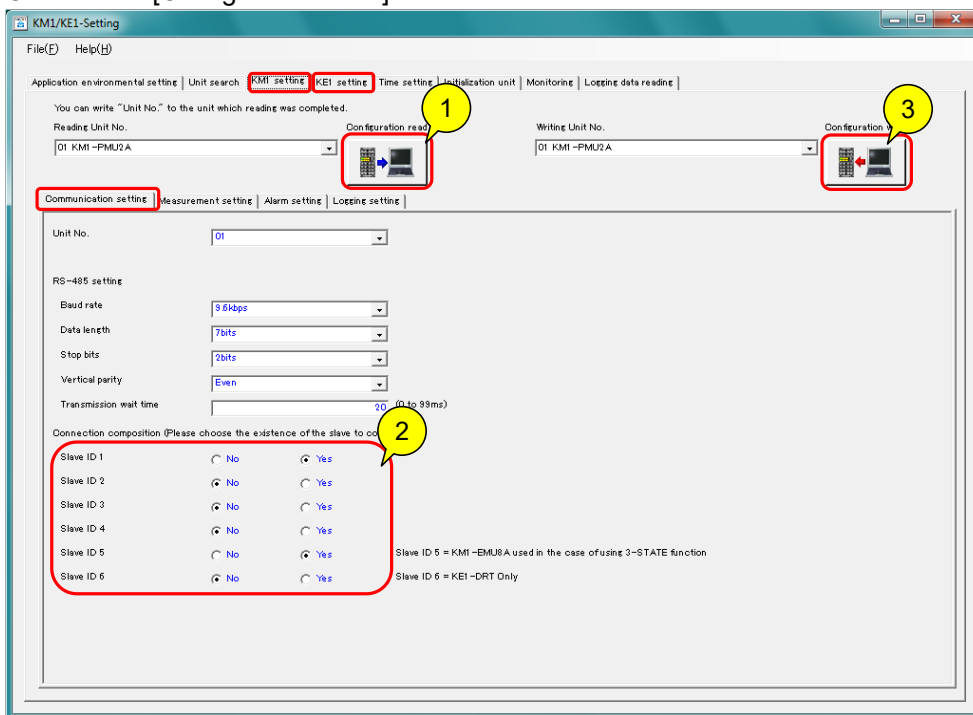
Note: Balloons in the screen indicate steps described above.

Reference 5.3.2 Unit search (p.5-16)

[Step 5] Enable the slave ID of the connection composition of the measurement master unit.

Enable slave ID(s) in the measurement master connection composition setting to let the measurement master to recognize the connected slave(s).

1. In the [KM1 setting] or [KE1 setting] screen, select the measurement master unit and click on the [Configuration read] button.
2. In the [Communication setting], set slave ID(s) in the connection composition "Enabled".
3. Click on the [Configuration write] button.



Note: Balloons in the screen indicate steps described above.

Reference

5.3.3 KM1 main unit setting (p.5-23)
 5.3.4 KE1 main unit setting (p.5-53)
 "1.2: Name and function of each part" in "Model KM1 User's Manual" or "Model KE1 User's Manual"

[Step 6] Unplug the USB cable and turn on the power again

Restart the unit.

1. Unplug the USB cable.
2. Turn the power of the entire system.
3. Turn on the power again. Make sure that the LED operational indication [CONN] is lighting after the unit started.
4. Connect the USB cable.

Additional Information

You can see if the units are correctly connected by checking the LED operational indication [CONN] on the unit after turning the power on. For other operational indications, refer to "Explanation of indications" of "1.2: Name and function of each part" in "Model KM1 User's Manual" or "Model KE1 User's Manual".

Reference

5.2.5 Precautions for setting the unit connected to a power source (p.5-10)

2. Flow and steps prior to unit installation

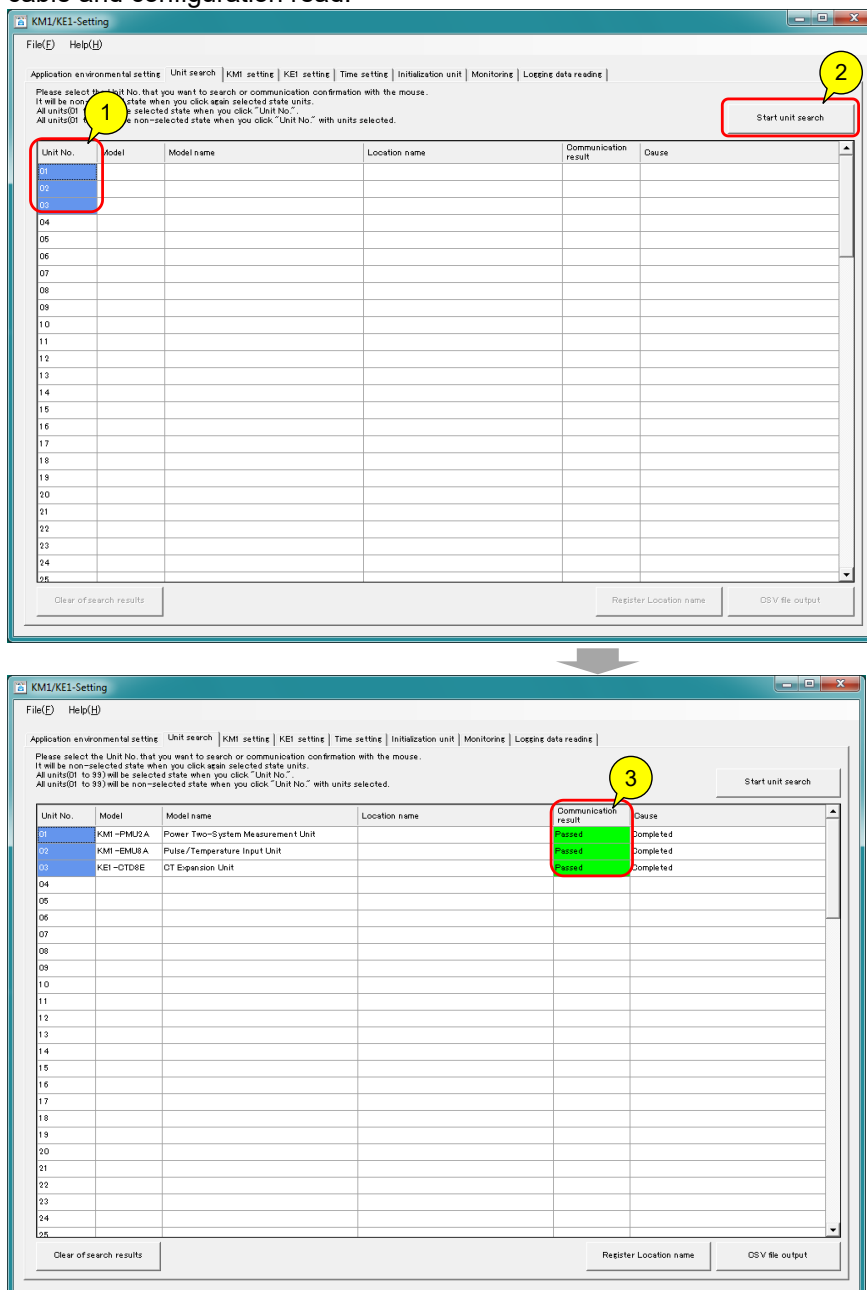
[Step 7] Search for all the units and confirm communication

To communicate with all the units, search all the connected units.

In the [Unit search] screen, perform the followings:

1. Select unit numbers.
2. Click on the [Start unit search] button to start unit search.
3. Check that the communication results with all the units are "Passed".

This allows communications with all the units connected to the measurement master unit via the USB cable and configuration read.



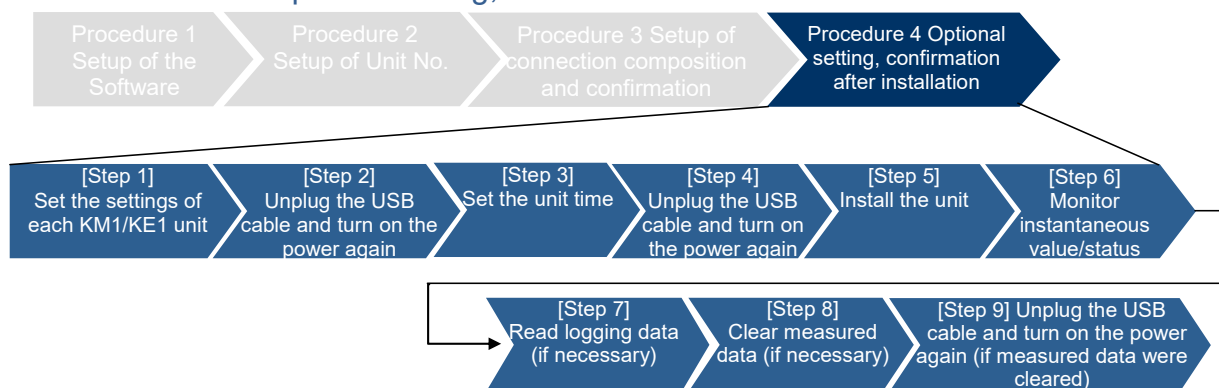
Note: Balloons in the screen indicate steps described above.

Reference

5.3.2 Unit search (p.5-16)

2. Flow and steps prior to unit installation

2.3.4. Procedure 4 Optional setting, confirmation after installation



Once the Unit No. and basic settings of connection composition are complete, you can install the unit. After each individual unit's optional settings, confirm that the settings are correct. Initialize unnecessary measurement data acquired during installation, if necessary.

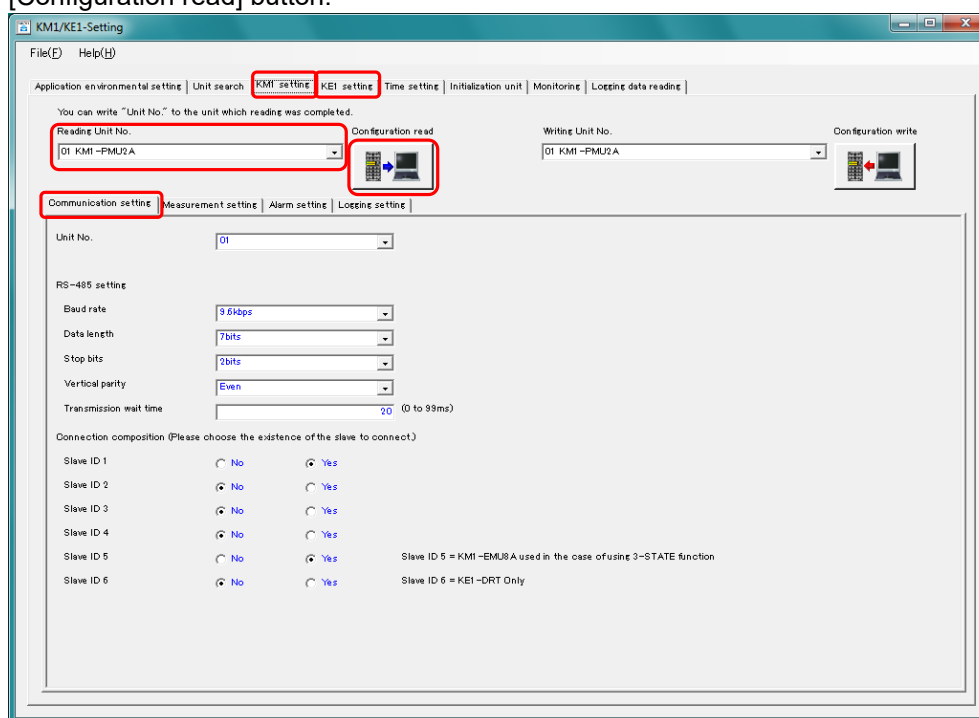
[Step 1] Set the settings of each KM1/KE1 unit

Set KM1/KE1 main unit settings

Unit with a model name starting with "KM1-": Use the [KM1 setting] screen to set.

Unit with a model name starting with "KE1-": Use the [KE1 setting] screen to set.

1. In the [KM1 setting] or [KE1 setting] screen, select a target [Reading Unit No.] and click on the [Configuration read] button.



2. Flow and steps prior to unit installation

2. Click on a category tab and change the unit settings.

The screenshot shows the 'Measurement setting' tab selected. It contains two columns for 'Electrical system 1 (or common)' and 'Electrical system 2'. Settings include 'Applicable phase wire' (3-phase 3-wire), 'Special CT' (100A and 5A), 'VT ratio' (1.00), 'CT ratio' (1), 'Low-cut current' (0.5), 'Simple measurement' (OFF), 'Voltage on simple measurement' (110.0), 'Power factor on simple measurement' (1.00), and 'Average count' (OFF). A diagram on the right illustrates the terminal block connections for Voltage 1, Voltage 2, Circuit 1, and Circuit 3.

[Measurement setting] tab

You can change a setting value related to measurement such as applicable phase wire and CT.

[Alarm setting] tab

You can set items to alarm and output terminal for alarm.

[Logging setting] tab

You can set logging of measured values.

For the setting examples of major functions, refer to "3. Setting major functions". For the setting screens and items, refer to "5.3.3 KM1 main unit setting" or "5.3.4 KE1 main unit setting".

3. Click on the [Configuration write] button.

The screenshot shows the 'KM1/KE1-Setting' application window. The 'Configuration write' button is highlighted with a red box. The window displays various settings for the unit, including 'Unit No.', 'RS-485 setting' (Baud rate, Data length, Stop bits, Vertical parity, Transmission wait time), and 'Connection composition' (Slave ID 1 to 6).

Reference

5.3.3 KM1 main unit setting (p.5-23), 5.3.4 KE1 main unit setting (p.5-53)
"Chapter 3: Functions" in "Model KM1 User's Manual" or "Model KE1 User's Manual"

2. Flow and steps prior to unit installation

[Step 2] Unplug the USB cable and turn on the power again

Restart the unit.

1. Unplug the USB cable.
2. Turn the power of the entire system.
3. Turn on the power again. Make sure that the LED operational indication [CONN] is lighting after the unit started.
4. Connect the USB cable.

Reference

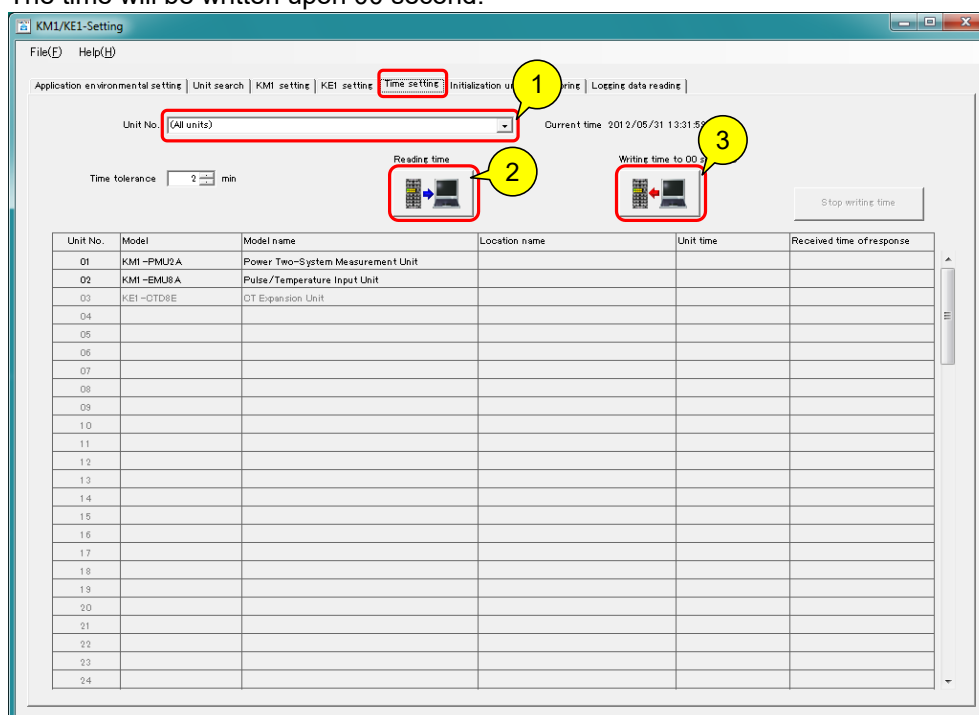
5.2.5 Precautions for setting the unit connected to a power source (p.5-10)

[Step 3] Set the unit time

Time setting is required for measurement value logging. For CTD8E (CT Expansion Unit) and ZCT8E (ZCT Expansion Unit), time setting is unnecessary as the time of the measurement master is reflected to slaves.

1. In the [Time setting] screen, select a Unit No.
2. Click on the [Reading time] button.
3. While the unit to set time is being selected, click on the [Writing time to 00 seconds] button.

The time will be written upon 00 second.



Note: Balloons in the screen indicate steps described above.

Precautions for Correct Use

- Measurement values will not be logged without time setting.
- Clock backup duration of a unit is about 7 days. If a certain time period has passed from the time setting to actual installation, set the time again after installation again.

Reference

5.3.5 Time setting (p.5-69)

[Step 4] Unplug the USB cable and turn on the power again

Restart the unit.

1. Unplug the USB cable.
2. Turn the power of the entire system.
3. Turn on the power again. Make sure that the LED operational indication [CONN] is lighting after the unit started.

Additional Information

After setting time, make sure that the LED operational indication [PWR] is lighting. For operational indications, refer to "Explanation of indications" of "1.2: Name and function of each part" in "Model KM1 User's Manual" or "Model KE1 User's Manual".

Reference	5.2.5 Time setting (p.5-10)
------------------	-----------------------------



[Step 5] Install the unit

Install the units to the location of operation.

1. Install the units and related equipment such as USB/RS-485 communication convertor (K3SC-10), with the power being turned off, to the actual location of operation.
2. Perform necessary wiring such as CT input, voltage input, and RS-485 cable of the units.
3. Turn on the units' power. Make sure that the LED operational indications [PWR] on all the installed units are on or blinking.
4. Connect the computer to a main unit or a USB/RS-485 communication convertor (K3SC-10) through a USB cable, and start the Software.
5. Use unit search to check that communications are available with all the installed units.

Precautions for Correct Use

- If the clock backup power supply is out, the operation display LED [PWR] blinks (Abnormal of RTC).
- If the LED still blinks even after time setting, refer to "Chapter 4: Troubleshooting" in "Model KM1 User's Manual" or "Model KE1 User's Manual".

Reference	"Chapter 2: Preparation", "Chapter 4: Troubleshooting" in "Model KM1 User's Manual" or "Model KE1 User's Manual"
------------------	--



[Step 6] Monitor instantaneous value/status

Before commercial operation, use the [Monitoring] screen to check measured values.

1. Select a unit to read.
2. Set the number of readout and repetition interval.
3. Clicking on the [Start] button reads out and displays an instantaneous value or status.
4. Select the [Instantaneous value] or [Status] tab.
5. Compare the values with the actual ones of the control panel and clamp meters to check that the settings and wirings are correct.
6. To stop monitoring, click on the [Stop] button.

[Instantaneous value] screen

Unit No. 01 KMI-PMU2A

The number of readout (count) 100 Repetition interval (s) 1

Measurement time: 15:01:57

Start Stop

Instantaneous value

Current (A)

1	2	3	4	5	6
39.200	87.232	0.000			
7	8	9	10	11	12
39.202	39.293	0.000			

Voltage (V)

1	2	3	4	5	6
1061.8	0.0	0.0	1062.8	0.0	0.0

Active power (W)

1	2	3	4	5	6	7	8
-26.148	-23.357			-27.0634	-27.0256		

Reactive power (var)

1	2	3	4	5	6	7	8
2.8538	77.8078			2.8746	3.2137		

Power factor

1	2	3	4	5	6	7	8
-0.98	-0.92			-0.99	-0.99		

Frequency (Hz)

1	2
60.0	60.0

Temperature

1

Earth leakage (mA)

1	2	3	4	5	6	7	8

Status

0001	0000	0000	0000	0000	0000	0000	0000
------	------	------	------	------	------	------	------

Clear the display Screen copy

[Status] screen

Unit No. 01 KMI-PMU2A

The number of readout (count) 100 Repetition interval (s) 1

Measurement time: 15:01:52

Start Stop

Status

16 15 0

0001 0000 0000 0000 0000 0000 0000 0000

Detail

bit	Power Two-System Measurement Unit	Condition
16		0
17		0
18	OUT 1	0
19	OUT 2	0
20	OUT 3	0
21	LOW condition (Electrical system 1)	0
22	MIDDLE condition (Electrical system 1)	0
23	HIGH condition (Electrical system 1)	0
24	LOW condition (Electrical system 2)	0
25	MIDDLE condition (Electrical system 2)	0
26	HIGH condition (Electrical system 2)	0
27		0
28	Alarm 1	1
29	Alarm 2	0
30		0
31		0

bit	Power Two-System Measurement Unit	Condition
0	Abnormal of RAM (E-M)	0
1	Abnormal of EEPROM (E-M2)	0
2	Abnormal of EEPROM (E-M3)	0
3	Abnormal of RTD (E-T1)	0
4	Abnormal of communication	0
5	Mode of operation	0
6	Input voltage exceed allowed range (E-S1)	0
7	Input current exceed allowed range (E-S2)	0
8	Insufficient input voltage	0
9	Abnormal input of frequency (E-S3)	0
10	OT input 1	0
11	OT input 2	0
12	OT input 3	0
13	OT input 4	0
14		0
15		0

Clear the display Screen copy

Note: Balloons in the screen indicate steps described above.

Reference

5.3.7 Monitoring (p.5-81)

2. Flow and steps prior to unit installation

[Step 7] Read logging data (if necessary)

1. In the [Logging data reading] screen, select the [Alarm history] or [Logging of voltage sag] tab.
2. Select a unit to read. To read logging of voltage sag, select the [Voltage sag detection] and [History] as well.
3. Click on the [Reading] button.

[Alarm history] screen

Application environment | Unit search | KMI setting | KE1 setting | Time setting | Initialization unit | Monitoring | **Logging data reading**

Alarm history | **Logging of voltage sag**

Unit No. [01 KMI-PMU2A] [Reading]

No.	Occurred date	Release date	Alarm occurrence	Alarm kind
1	2012/06/01 10:42:03	2012/06/01 10:42:04	2	Active power upper limit alarm 2
2	2012/06/01 10:41:57	2012/06/01 10:42:03	35	Reactive power lower limit alarm 1
3	2012/06/01 10:41:57	2012/06/01 10:42:04	19	Under current alarm 1
4	2012/06/01 10:41:43	2012/06/01 10:41:57	2E	Reactive power upper limit alarm 2
5	2012/06/01 10:41:43	2012/06/01 10:41:57	25	Power factor alarm 1
6	2012/06/01 10:34:33	2012/06/01 10:41:36	21	Over voltage alarm 1
7	2012/06/01 10:34:33	2012/06/01 10:41:43	1	Active power upper limit alarm 1
8	2012/06/01 10:34:33	2012/06/01 10:41:43	35	Reactive power lower limit alarm 1
9	2012/06/01 10:29:08	2012/06/01 10:29:08	5	Active power upper limit alarm 5
10	2012/06/01 10:14:46	2012/06/01 10:14:55	15	Over current alarm 5
11	2012/06/01 10:14:28	2012/06/01 10:14:46	15	Over current alarm 5
12				
13				
14				
15				
16				
17				
18				
19				
20				

CSV file output

[Logging of voltage sag] screen

Application environment | Unit search | KMI setting | KE1 setting | Time setting | Initialization unit | Monitoring | **Logging data reading**

Alarm history | **Logging of voltage sag**

Unit No. [09 KE1-VSU1B] Voltage sag detection [1] History [1] [Reading]

Parameter	Line No.	Effective value (V)	Parameter	Line No.	Effective value (V)
Before the detection of a wave	56	99.1	Before the detection of 10 waves	56	99.0
Before the detection of a wave	57	99.5	Before the detection of 10 waves	57	99.9
Before the detection of a wave	58	99.1	Before the detection of 10 waves	58	99.0
Before the detection of a wave	59	99.2	Before the detection of 10 waves	59	99.0
Before the detection of a wave	60	99.2	Before the detection of 10 waves	60	99.0
Before the detection of a wave	61	99.1	Before the detection of 10 waves	61	99.1
Before the detection of a wave	62	99.9	Before the detection of 10 waves	62	99.0
Before the detection of a wave	63	99.1	Before the detection of 10 waves	63	99.1
Before the detection of a wave	64	81.0	Before the detection of 10 waves	64	99.0
After the detection of a wave	1	74.6	Before the detection of 10 waves	65	99.0
After the detection of a wave	2	74.3	Before the detection of 10 waves	66	99.1
After the detection of a wave	3	74.3	Before the detection of 10 waves	67	99.0
After the detection of a wave	4	74.2	Before the detection of 10 waves	68	99.1
After the detection of a wave	5	74.3	Before the detection of 10 waves	69	99.0
After the detection of a wave	6	74.5	Before the detection of 10 waves	70	99.0
After the detection of a wave	7	74.2	Before the detection of 10 waves	71	99.1
After the detection of a wave	8	74.2	Before the detection of 10 waves	72	99.9
After the detection of a wave	9	74.2	Before the detection of 10 waves	73	99.0
After the detection of a wave	10	74.3	Before the detection of 10 waves	74	99.9

CSV file output

When the reading starts, alarm history or logging of voltage sag is displayed.

Note 1: Logging data read out here are alarm history and logging of voltage sag, not measured value logging.

Note 2: Balloons in the screen indicate steps described above.

Reference

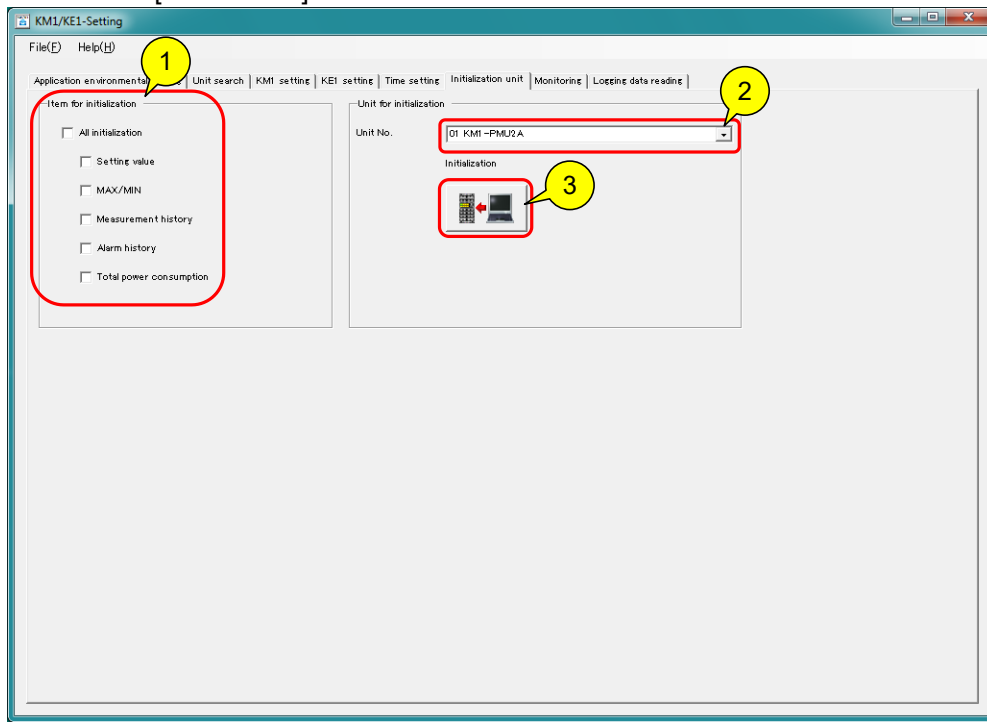
5.3.8 Logging data reading (p.5-89)

2. Flow and steps prior to unit installation

[Step 8] Clear measured data (if necessary)

To clear the measurement data measured during installation and adjustment before actually starting measurement, perform the following steps.

1. In the [Initialization unit] screen, select item(s) for initialization other than "Setting value".
2. Select a Unit No. of a unit that requires initialization.
3. Click on the [Initialization] button.



Note: Balloons in the screen indicate steps described above.

Precautions for Correct Use

Upon initialization, the data stored in the main unit will be initialized and will not be restored.

Reference 5.3.6 Initialization unit (p.5-77)

[Step 9] Unplug the USB cable and turn on the power again (if measured data were cleared)

If you cleared measured data, restart the unit.

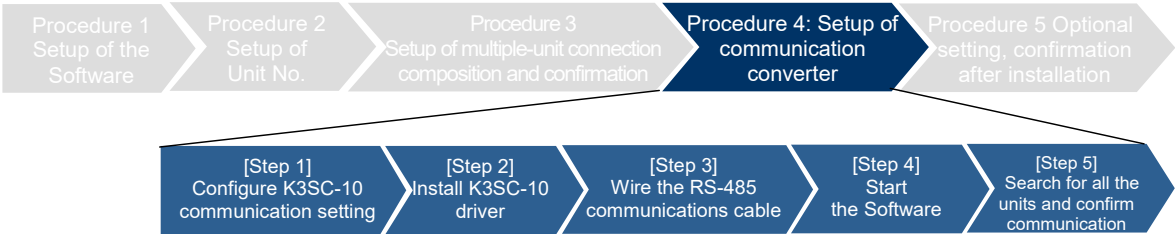
1. Unplug the USB cable.
2. Turn the power of the entire system.
3. Turn on the power again. Make sure that the LED operational indication [CONN] is lighting after the unit started.

The unit installation is complete. Exits the Software and start operation.

2.4. Procedure for using RS-485 connection (via USB)

In case of using RS-485 connection, perform the steps 1 to 3 in "2.3 Procedure for using USB connection" then 4 described below.

And perform "Procedure 4 Optional setting, confirmation after installation" in "2.3 Procedure for using USB connection" as the procedure 5.



2.4.1. Procedure 4: Setup of communication converter

[Step 1] Configure K3SC-10 communication setting

Use the DIP switches from SW1 to SW7 of the K3SC-10 to set the following communication settings:
Baud rate
Data length
Stop bits
Vertical parity
Set the DIP switches SW8, SW9, and SW0 to OFF for RS-485 setting.
The communication setting must be integrated in the entire system. If communication settings of KM1/KE1 and K3SC-10 are those in the factory shipment, you don't need to change them.
For details of setting, refer to "K3SC-10 Communication Converter Operation Manual". You can download it from the OMRON web site.

Reference	"K3SC-10 Communication Converter Operation Manual"
-----------	--

[Step 2] Install K3SC-10 driver

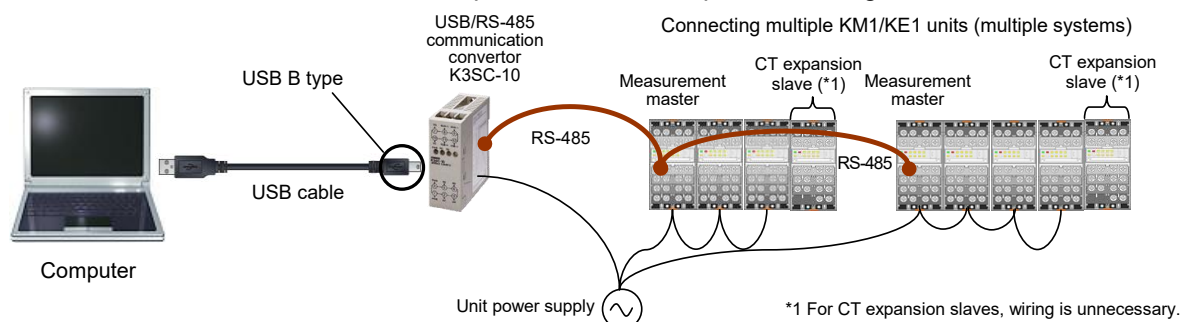
- 1. Download a K3SC-10 driver from OMORN web site and decompress it on the computer.
- 2. Turn on the K3SC-10 unit's power.
- 3. Connect the K3SC-10 to the computer through a USB cable (A Type - B Type).
- 4. Follow the instructions on the screen to install the driver. For details, see "Readme" in the file.

Reference	"K3SC-10 virtual COM Port compatible USB driver manual"
-----------	---

2. Flow and steps prior to unit installation

[Step 3] Wire the RS-485 communications cable

1. Turn off the K3SC-10 and other units' power.
2. Connect the K3SC-10 to the computer through a USB cable (A Type - B Type) and connect the K3SC-10 and the measurement master of multiple connection composition through RS-485.



3. Turn on the K3SC-10 and other units' power.

Reference

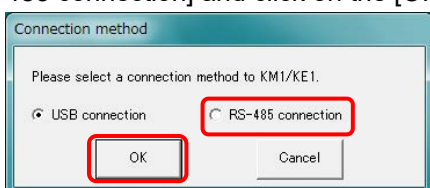
"Model KM1 User's Manual" or "Model KE1 User's Manual"
1.2 System Structure for KM1/KE1 (p.1-2)

[Step 4] Start the Software

1. When the Software is started, the following startup screen appears.



2. Then the [Connection method] dialog box appears.
3. Make sure that the computer and the K3SC-10 are connected through a USB cable (A - B), select [RS-485 connection] and click on the [OK] button.



The [Unit search] screen will appear.

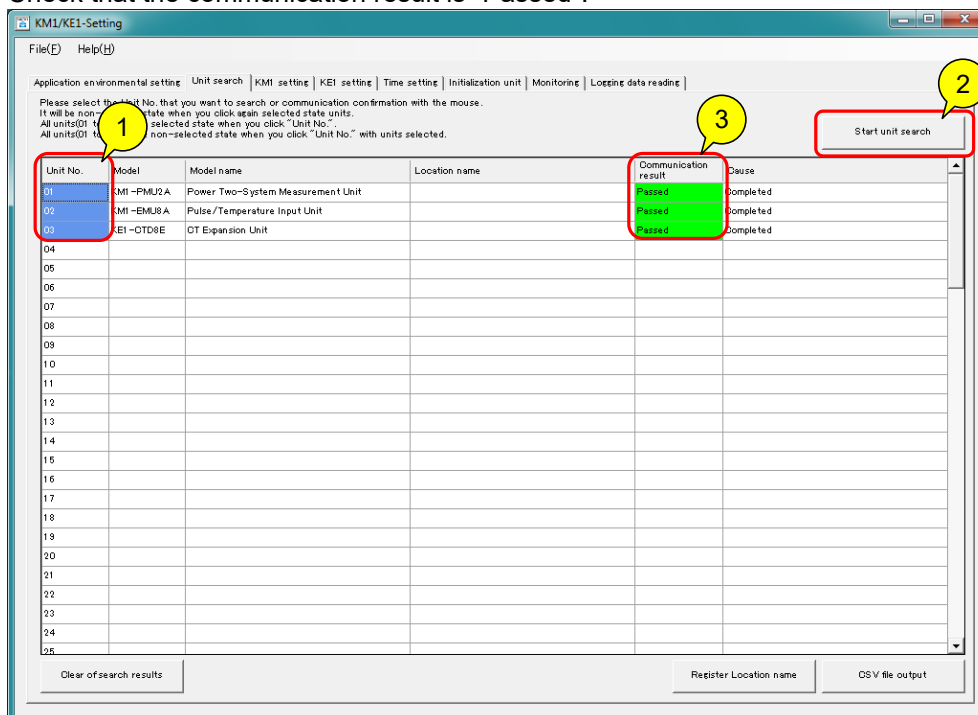
Reference

5.1.1 How to start the Software (p.5-1)

2. Flow and steps prior to unit installation

[Step 5] Search for all the units and confirm communication

1. In the [Unit search] screen, select unit numbers of all the connected units.
2. Click on the [Start unit search] button.
3. Check that the communication result is "Passed".

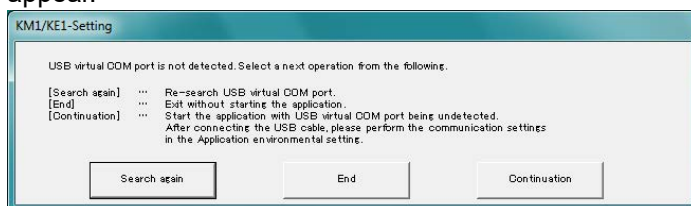


Note: Balloons in the screen indicate steps described above.

Precautions for Correct Use

The Software requires connection with the KM1/KE1 unit to use. Otherwise it cannot be used.

If the computer and the K3SC-10 unit are not connected via the USB cable, the following screen will appear.



In such a case, connect the computer and the K3SC-10 unit through a USB cable and click on the [Search again] button.

Reference

5.3.2 Unit search (p.5-16)

And perform "2.3.4 Procedure 4 Optional setting, confirmation after installation" (p.2-17) as the step 5.

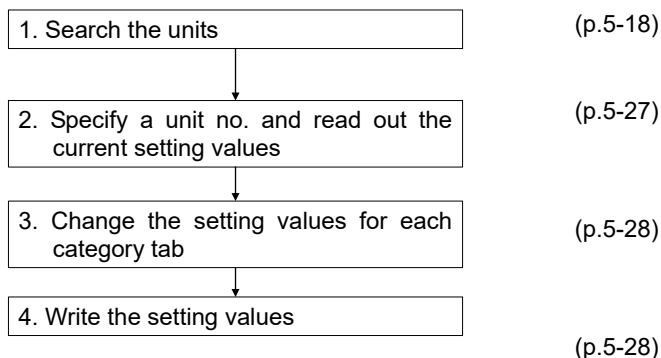
3. Setting major functions

This chapter describes major functions and required settings to use them.

Refer to the pages of the function you want to use and check the setting items. For setting procedures, refer to "5. Operation description" (p.5-1) to perform.

For all the KM1/KE1 unit (master/slave) settings by KM1/KE1-Setting, use the following common steps.

■ Common setting



■ Function to Use and Reference Page

3.1. To measure power by measurement master unit.....	3-2
3.1.1. To measure power of one electrical system	3-4
3.1.2. To measure power of two electrical systems	3-5
3.2. To measure power with CT Expansion Unit (CTD8E) connecting to the measurement master unit.....	3-6
3.2.1. To measure power of one electrical system	3-8
3.2.2. To measure power of two electrical systems	3-9
3.3. To measure large current exceeding the rated using a general-purpose CT	3-11
3.4. To measure high voltage exceeding the rated using a transformer.....	3-13
3.5. To output total power consumption pulse	3-15
3.6. To use 3-STATE function.....	3-17
3.6.1. To 3-STATE classify based on either of power, current, and voltage	3-17
3.6.2. To 3-STATE classify based on Event input	3-19
3.7. To count pulses by event input.....	3-22
3.8. To measure power without voltage input (Simple measurement)	3-24
3.9. To detect voltage sag	3-26
3.10. To detect earth leakage.....	3-28
3.11. To use alarm function	3-30
3.12. To configure communication setting.....	3-33
3.12.1. To set Unit No.	3-34
3.12.2. If configuration of RS-485 communication setting other than the initial setting is required ..	3-35
3.12.3. To connect a slave unit to the measurement master unit	3-38

3.1. To measure power by measurement master unit

■ Overview

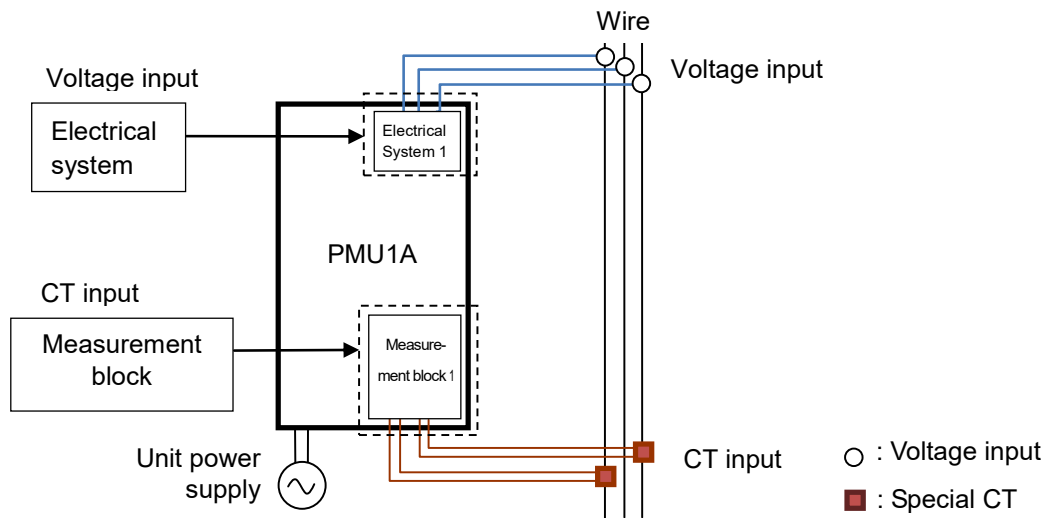
To use the measurement master unit for power measurement setting, set "Applicable phase wire" and "Special CT" for each voltage input system.

■ Mechanism of power measurement by measurement master unit

- What is "Electrical system"?

"Electrical system" is a collection of terminals to apply voltage for power measurement.

PMU2A allows voltage input from two electrical systems, while other measurement master that can measure power allows voltage input from one electrical system.



- What is "measurement block"?

"Measurement block" is a collection of terminals to connect CT for power measurement.

The number of circuits differs in models and phase-wire type used that can be measured by the measurement block.

Note that CT capacity (Special CT) and CT ratio of the CT connected to the same measurement block must be the same, as the settings related to measurement are done on a block basis.

- Relationship with measurement block

Power of the 1st electrical system of the measurement master is calculated based on current of "measurement block 1" and voltage of "electrical system 1".

Power of the 2nd electrical system of the PMU2A is calculated based on current of "measurement block 2" and voltage of "electrical system 2".

3. Setting major functions

■ Available unit

Model	KM1-			KE1-					
	PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E
Unit Name	Power measurement	Power Two-System Measurement	Pulse/Temperature	Power/Leakage	Power/Voltage Sag	Voltage Sag	Voltage/Current	CT Expansion	ZCT Expansion
To measure power by measurement master unit	○	○	-	○	○	-	-	-	-

○: Available.

-: Not available.

■ Items required for setting

Setup Item	Explanation	Setting	Screen of the Software
Applicable phase wire (Electrical system 1, Electrical system 2)	Phase/wire type for measurement is set for each voltage input system.	Electrical system 1: 1-phase 2-wire, 1-phase 3-wire, 3-phase 3-wire, 3-phase 4-wire (*1) *1 "3-phase 4-wire"cannot be selected for PMU2A. Electrical system 2: 1-phase 2-wire, 1-phase 3-wire, 3-phase 3-wire	KM1 measurement master unit: [KM1 setting] - [Measurement setting] or KE1 measurement master unit: [KE1 setting] - [Measurement setting]
Special CT (Electrical system 1, Electrical system 2)	CT type (capacity) for current measurement is set for each voltage input system.	5A, 50A, 100A, 200A, 400A, 600A	
Reference	•For KM1 unit setting, refer to p.5-38. •KE1 unit setting is same as KM1 unit.		

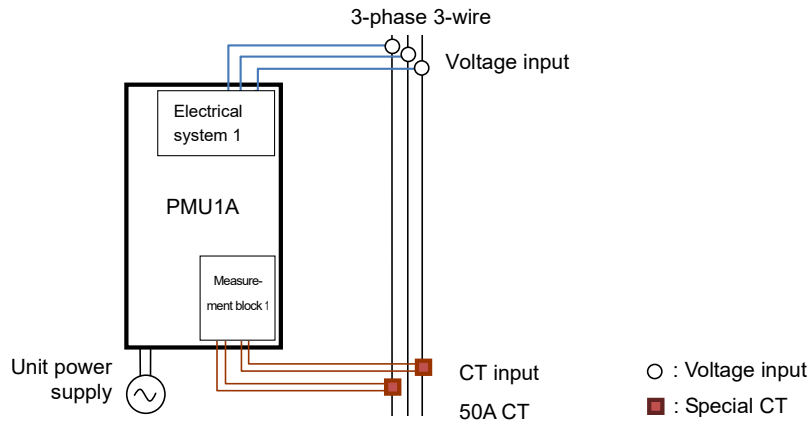
3.1.1. To measure power of one electrical system

■ Overview

To measure power of one electrical system, set "Applicable phase wire" and "Special CT" for voltage input system 1.

■ Setting example

Shown below is an example of measuring power of one electrical system using 50A CT in a 3-phase 3-wire circuit.



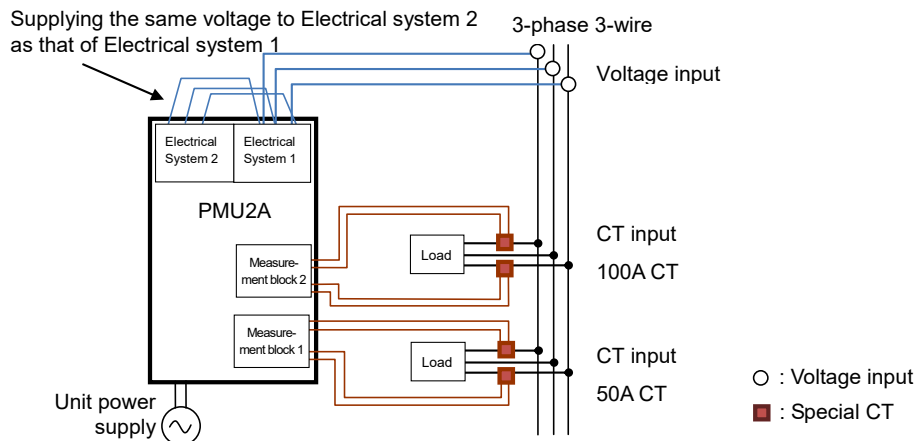
<Setting for installation above>

● PMU1A setting:

Applicable phase wire (Electrical system 1): 3-phase 3-wire
Special CT (Electrical system 1): 50A

Additional Information

PMU2A can be used in one electrical system. To do so, perform wiring and setting as shown below:



<Setting for installation above>

● PMU2A setting:

Applicable phase wire (Electrical system 1): 3-phase 3-wire
Special CT (Electrical system 1): 50A
Applicable phase wire (Electrical system 2): 3-phase 3-wire
Special CT (Electrical system 2): 100A

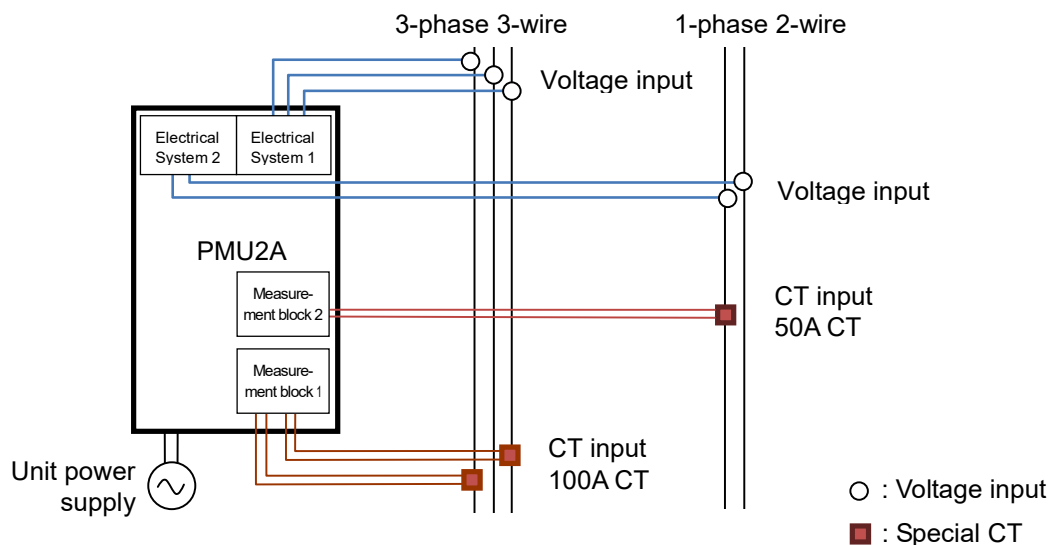
3.1.2. To measure power of two electrical systems

■ Overview

To measure power of two electrical systems using PMU2A, set "Applicable phase wire" and "Special CT" for voltage input systems 1 and 2.

■ Setting example

Shown below is an example of measuring power of two electrical systems of 3-phase 3-wire and 1-phase 2-wire.



<Setting for installation above>

● PMU2A setting:

Applicable phase wire (Electrical system 1):	3-phase 3-wire
Special CT (Electrical system 1):	100A
Applicable phase wire (Electrical system 2):	1-phase 2-wire
Special CT (Electrical system 2):	50A

3.2. To measure power with CT Expansion Unit (CTD8E) connecting to the measurement master unit

■ Overview

To measure power of multiple circuits using CTD8E connected to the measurement master unit, first set the power measurement setting on the measurement master unit, and set "Applicable phase wire", "Special CT"(*1), and "Synchronization selection for measuring block" on the CTD8E measurement setting.

*1 Install CTs with the same CT capacity in a measurement block. You cannot configure multiple Special CTs in one measurement block.

*2 CTD8E has two measurement blocks for current measurement.

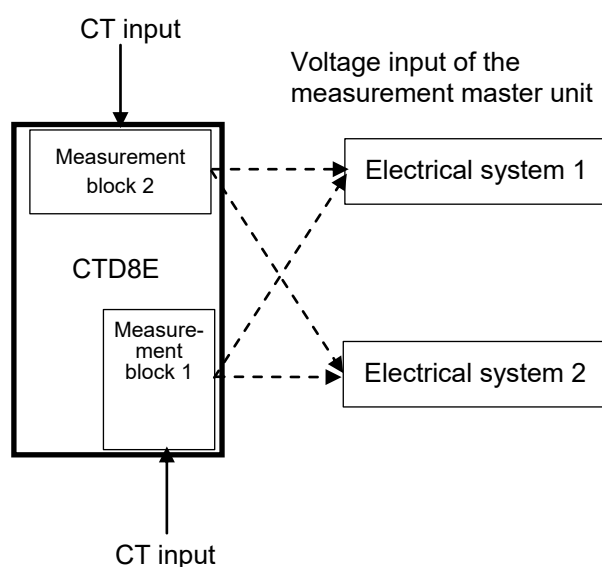
"Synchronization selection for measuring block" indicates that measurement blocks for current measurement are assigned to the voltage system 1 or 2 on the measurement master unit side to measure the power.

■ Mechanism of power measurement by CT Expansion Unit

CTD8E can be used for power measurement by connecting to the measurement master.

CTD8E measures power based on current measured by its measurement block 1 or 2 and voltage measured by the connected measurement master.

The item that sets an electrical system of the measurement master to CTD8E's measurement block 1 or 2 is called "Synchronization selection for measuring block".



3. Setting major functions

■ Available unit

Model	KM1-			KE1-					
	PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E
Unit Name	Power measurement	Power Two-Electrical system Measurement	Pulse/Temperature	Power/Leakage	Power/Voltage Sag	Voltage Sag	Voltage/Current	CT Expansion	ZCT Expansion
To measure power with CT Expansion Unit connecting to the measurement master unit	○	○	-	○	○	-	-	○	-

○: Available.

-: Not available.

■ Items required for setting

• Measurement master unit setting:

Measurement Master Unit Setting.			
Setup Item	Explanation	Setting	Screen of the Software
Applicable phase wire (Electrical system 1, Electrical system 2)	Specifies a phase wire type for measurement.	Electrical system 1: 1-phase 2-wire, 1-phase 3-wire, 3-phase 3-wire, 3-phase 4-wire (*1) *1 "3-phase 4-wire"cannot be selected for PMU2A. Electrical system 2: 1-phase 2-wire, 1-phase 3-wire, 3-phase 3-wire	KM1 measurement master unit: [KM1 setting] - [Measurement setting] or KE1 measurement master unit: [KE1 setting] - [Measurement setting]
Special CT (Electrical system 1, Electrical system 2)	CT type for current measurement is set for each electrical system.	5A, 50A, 100A, 200A, 400A, 600A	
Reference	•For KM1 unit setting, refer to p.5-38. •KE1 unit setting is same as KM1 unit.		

• CTD8E setting:

CTEOL setting.

Setup Item	Explanation	Setting	Screen of the Software
Electrical system 1 applicable phase wire, Electrical system 2 applicable phase wire	For Electrical system 1 applicable phase wire, set "Applicable phase wire (Electrical system 1)" configured for the measurement master unit. For Electrical system 2 applicable phase wire, set "Applicable phase wire (Electrical system 2)" configured for the measurement master unit.	1-phase 2-wire, 1-phase 3-wire, 3-phase 3-wire, 3-phase 4-wire (*1) *1 "3-phase 4-wire" cannot be selected for PMU2A used as the measurement master.	[KE1 setting] - [Measurement setting]
Special CT (Measurement block 1, Measurement block 2)	CT type for current measurement is set for each measurement block.	5A, 50A, 100A, 200A, 400A, 600A	
Synchronization selection for measuring block (Measurement block 1, Measurement block 2)	Voltage system of the measurement master unit is that synchronizes with the current measurement for each measurement block.	Electrical system 1, Electrical system 2	
Reference	•For KE1 unit setting, refer to p.5-58.		

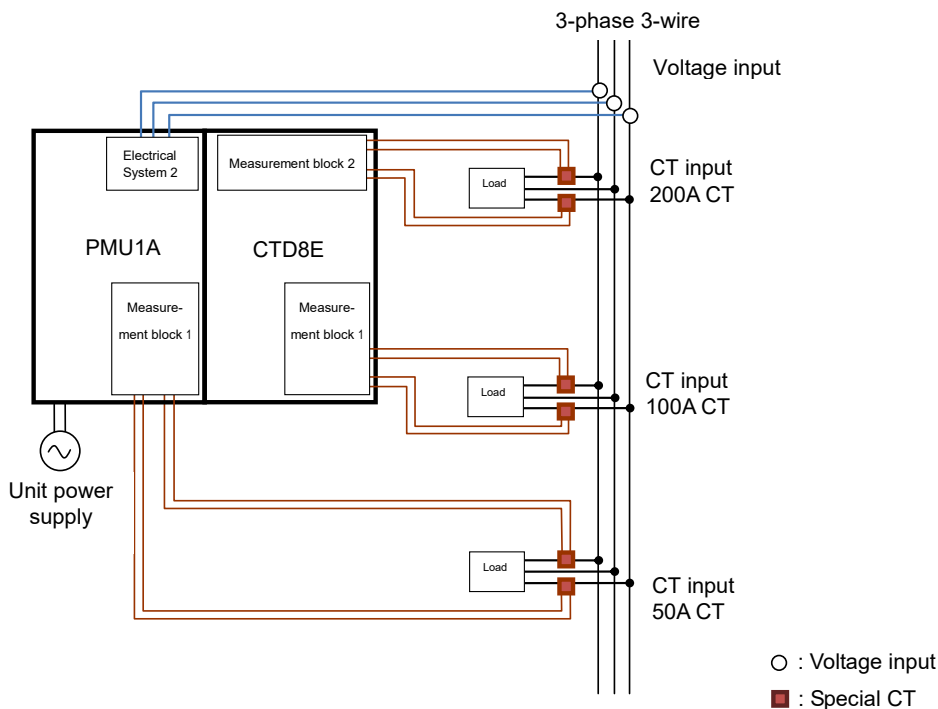
3.2.1. To measure power of one electrical system

■ Overview

To measure power of one electrical system using CTD8E, set "Electrical system 1" to "Synchronization selection for measuring block (Measuring block 1)" and "Synchronization selection for measuring block (Measuring block 2)" in the CTD8E measurement setting. For Electrical system 1 applicable phase wire, set the same applicable phase wire (Electrical system 1) of as that of the measurement master.

■ Setting example

Shown below is an example of power measurement of 3-phase 3-wire circuit with CTD8E connecting to the measurement master.



<Setting for installation above>

• PMU1A setting:

Applicable phase wire (Electrical system 1):

Special CT (Electrical system 1):

• CTD8E setting:

Electrical system 1 applicable phase wire:

Synchronization selection for measuring block (Measurement block 1):

Special CT (measurement block 1):

Synchronization selection for measuring block (Measurement block 2):

Special CT (measurement block 2):

3-phase 3-wire

50A

3-phase 3-wire

Electrical system 1

100A

Electrical system 1

200A

Must be the same

Must be the same

3.2.2. To measure power of two electrical systems

■ Overview

To measure power of two electrical systems using PMU2A and CTD8E, set "Electrical system 1" and "Electrical system 2" respectively to "Synchronization selection for measuring block (Measuring block 1)" and "Synchronization selection for measuring block (Measuring block 2)" in the CTD8E [Measurement setting].

For "Electrical system 1 applicable phase wire" and "Electrical system 2 applicable phase wire", set the same applicable phase wire types of the "Electrical system 1" and "Electrical system 2" assigned to PMU2A.

■ Available unit

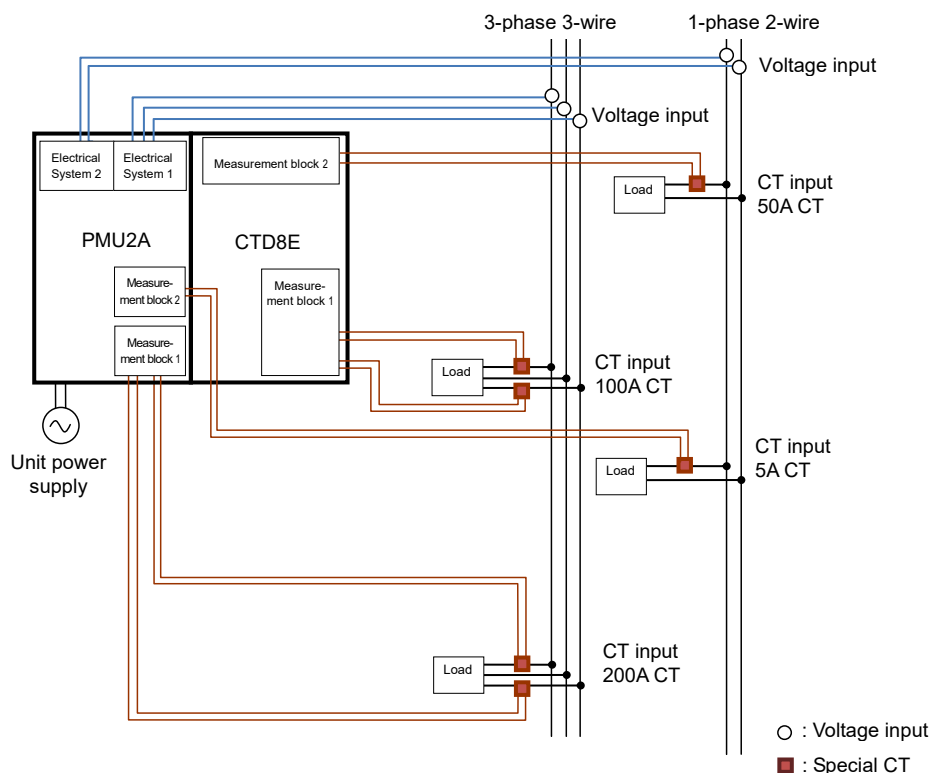
Model	KM1-			KE1-					
	PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E
Unit Name	Power measurement	Power Two-Electrical systems Measurement	Pulse/Temperature	Power/Leakage	Power/Voltage Sag	Voltage Sag	Voltage/Current	CT Expansion	ZCT Expansion
To measure power of two electrical systems	-	○	-	-	-	-	-	○	-

○: Available.

-: Not available.

■ Setting example

Shown below is an example of power measurement of 3-phase 3-wire and 1-phase 2-wire circuits with CTD8E connecting to the measurement master.



3. Setting major functions

<Setting for installation above>

- PMU2A setting:

Applicable phase wire (Electrical system 1):	3-phase 3-wire	•	Must be the same
Special CT (Electrical system 1):	200A		
Applicable phase wire (Electrical system 2):	1-phase 2-wire	•	Must be the same
Special CT (Electrical system 2):	5A		

- CTD8E setting:

Electrical system 1 applicable phase wire:	3-phase 3-wire	←
Synchronization selection for measuring block (Measurement block 1):	Electrical system 1	←
Special CT (measurement block 1):	100A	
Electrical system 2 applicable phase wire:	1-phase 2-wire	←
Synchronization selection for measuring block (Measurement block 2):	Electrical system 2	←
Special CT (measurement block 2):	50A	

3.3. To measure large current exceeding the rated using a general-purpose CT

■ Overview

To measure large current exceeding the rated using the 5A rated special CT, set the rated current ratio of the general-purpose CT to that of the special CT to "CT ratio". To set a CT ratio, the same CT ratio must be configured in the entire measurement block. You cannot configure multiple CT ratios in one measurement block.

■ Available unit

Model	KM1-			KE1-					
	PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E
Unit Name	Power measurement	Power Two-Electrical systems Measurement	Pulse/Temperature	Power/Leakage	Power/Voltage Sag	Voltage Sag	Voltage/Current	CT Expansion	ZCT Expansion
To measure large current exceeding the rated using a general-purpose CT	○	○	-	○	○	-	○	○	-

○: Available.

-: Not available.

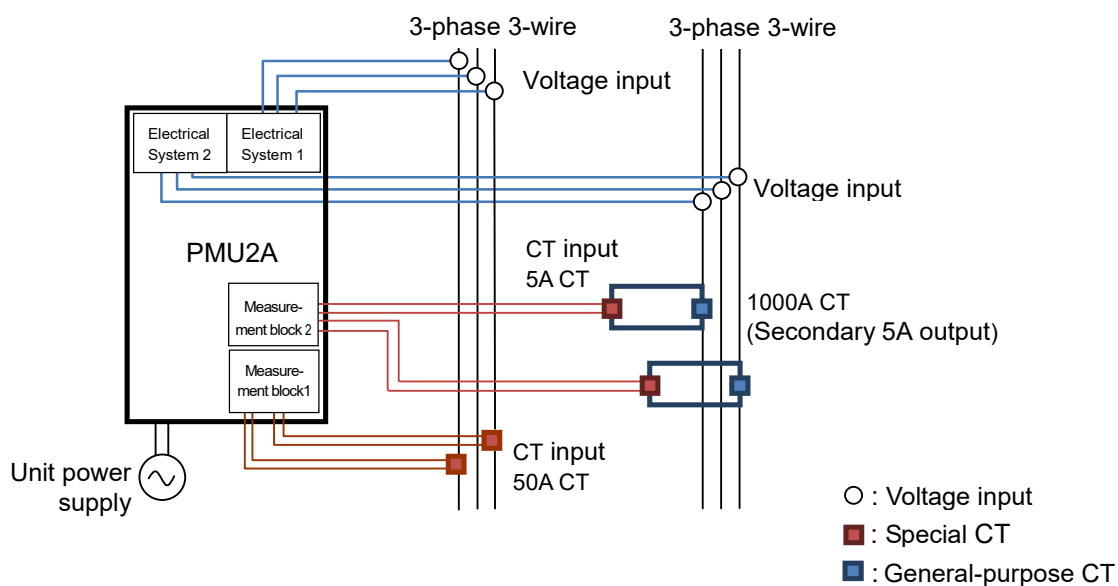
■ Items required for setting

Set the items listed below in addition to the basic power measurement items. For power measurement setting, refer to "3.1 To measure power by measurement master unit" (p.3-2) and "3.2 To measure power with CT Expansion Unit (CTD8E) connecting to the measurement master unit" (p.3-6).

Setup Item	Explanation	Setting	Screen of the Software
CT ratio (Electrical system 1, Electrical system 2)	Set a ratio of general-purpose CT output to special CT output. Note: A CT ratio can be set only when using the 5A rated special CT.	1 to 1000	[KM1 setting] - [Measurement setting] or [KE1 setting] - [Measurement setting]
Reference	•For KM1 unit setting, refer to p.5-38. •KE1 unit setting is same as KM1 unit.		

■ Setting example

Shown below is an example of measuring 1000A current using general-purpose CT and measuring its secondary output using 5A rated special CT. Set CT ratio as "200" (1000/5).



<Setting for installation above>

Applicable phase wire (Electrical system 1):	3-phase 3-wire
Special CT (Electrical system 1):	50A
CT ratio (Electrical system 1):	1
Applicable phase wire (Electrical system 2):	3-phase 3-wire
Special CT (Electrical system 2):	5A
CT ratio (Electrical system 2):	200

3.4. To measure high voltage exceeding the rated using a transformer

■ Overview

To measure high voltage exceeding the rated using a voltage transformer, set a ratio of the rated voltage of the transformer to the rated voltage of this unit's electrical voltage input to "VT ratio".

■ Available unit

Model	KM1-			KE1-					
	PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E
Unit Name	Power measurement	Power Two-Electrical systems Measurement	Pulse/Temperature	Power/Leakage	Power/Voltage Sag	Voltage Sag	Voltage/Current	CT Expansion	ZCT Expansion
To measure high voltage exceeding the rated using a general-purpose VT	○	○	-	○	○	○	○	○	-

○: Available.

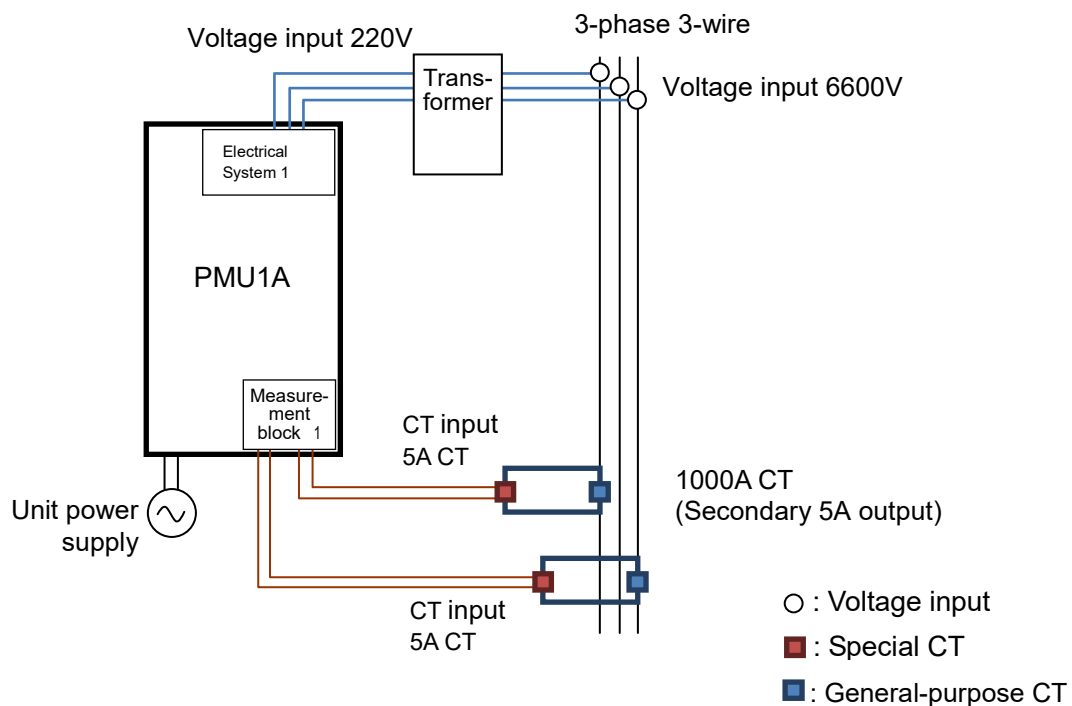
-: Not available.

■ Items required for setting

Setup Item	Explanation	Setting	Screen of the Software
VT ratio (Electrical system 1, Electrical system 2)	Set a ratio of the rated voltage of the general-purpose VT to the rated voltage of the measurement master unit on the secondary end.	0.01 to 99.99	[KM1 setting] - [Measurement setting] or [KE1 setting] - [Measurement setting]
Reference	•For KM1 unit setting, refer to p.5-38 and p.5-40. •KE1 unit setting is same as KM1 unit.		

■ Setting example

Shown below is an example of measuring 6600V voltage using a transformer and providing its secondary output of 220V for the measurement master unit. Set VT ratio as "30.00" (6600/220).



<Setting for installation above>

Applicable phase wire (Electrical system 1):	3-phase 3-wire
Special CT (Electrical system 1):	5A
VT ratio (Electrical system 1):	30.00
CT ratio (Electrical system 1):	200

3.5. To output total power consumption pulse

■ Overview

To output pulses for each configured total power consumption using a power measurement unit such as PMU1A, assign "Pulse output" to "Output terminal function".

When you need a pulse output of the total power consumption measured by the measurement master unit, specify the measured circuit in "Pulse output circuit".

Set total power consumption per pulse on "Pulse output unit"

■ Available unit

Model	KM1-			KE1-					
	PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E
Unit Name	Power measurement	Power Two-Electrical systems Measurement	Pulse/Temperature	Power/Leakage	Power/Voltage Sag	Voltage Sag	Voltage/Current	CT Expansion	ZCT Expansion
To output total power consumption pulse	○	○	-	○	○	-	-	-	-

○: Available

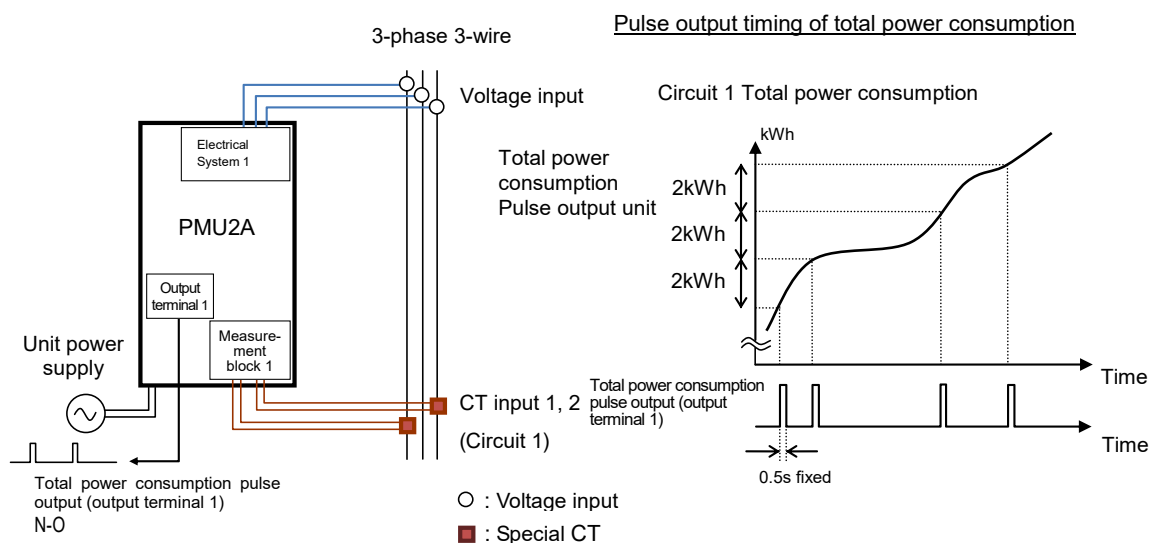
-: Not available

■ Items required for setting

Setup Item	Explanation	Setting	Screen of the Software
Output terminals 1-3 function setting (Common)	Set the output terminals 1 to 3 to use in which of the following functions. Each measurement block of alarm output, phase-sequence output, total power consumption pulse output, and 3-STATE output	Pulse output	[KM1 setting] - [Alarm setting] or [KE1 setting] - [Alarm setting]
Output terminals 1-3 conditions (Common)	Set the output terminals 1 to 3 to use in which of the following logics. N-O (Normally open): Outputs ON when power is on and OFF when power is off. N-C (Normally closed): Outputs ON when power is off and OFF when power is on.	N-O (Normally open) N-C (Normally closed)	
Pulse output unit (Common)	If "Pulse output" is set to one of the Output terminal 1-3 function settings, Total power consumption for one pulse is configured.	1Wh, 10Wh, 100Wh, 1kWh, 2kWh, 5kWh, 10kWh, 20kWh, 50kWh, 100kWh	[KM1 setting] - [Measurement setting] or [KE1 setting] - [Measurement setting]
Pulse output circuit (Common)	If "Pulse output" is set to one of the Output terminal 1-3 function settings, total power consumption pulse output of which circuit is configured. The target circuit is determined based on combination of phase wire type and CT input. For more details, refer to explanation of "Pulse output circuit" in "Model KM1 User's Manual" or "Model KE1 User's Manual".	Circuit 1, Circuit 2, Circuit 3, Circuit 4	
Reference	•For KM1 unit setting, refer to p.5-40. •KE1 unit setting is same as KM1 unit.		

■ Setting example

Shown below is an example of pulse output of total power consumption measured by the unit's circuit 1 (Pulse output circuit) to the output terminal 1 when increased by 2kWh (pulse output unit).



<Setting for installation above>

Output terminal 1 function setting:	Pulse output
Output terminal 1 condition:	N-O
Pulse output unit:	2kWh
Pulse output circuit:	Circuit 1

3.6. To use 3-STATE function

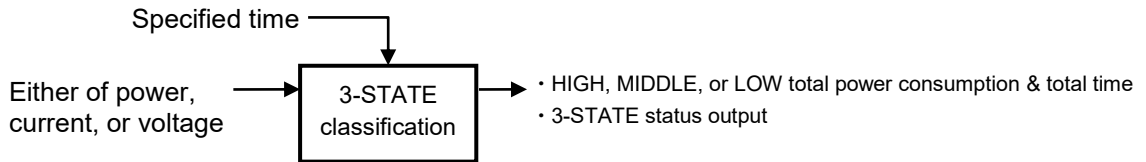
■ Overview

The 3-STATE function judges the operation status of the measurement target based on power, current, voltage, or contact input (called event input) as either of three states, HIGH, MIDDLE, or LOW, and classifies the total power consumption and total time to either of three states. Furthermore, the state can be provided as contact output through the output terminal.

3.6.1. To 3-STATE classify based on either of power, current, and voltage

■ Overview

To 3-STATE classify based on either of power, current, or voltage using PMU1A or PMU2A, specify either of power, current, or voltage to "3-STATE target". Set thresholds for "HIGH" and "LOW", to evaluate a value that exceeds or does not reach the thresholds respectively, and hysteresis. Furthermore, set start and stop times for 3-STATE classification.



■ Available unit

Model	KM1-			KE1-					
	PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E
Unit Name	Power measurement	Power Two-Electrical systems Measurement	Pulse/Temperature	Power/Leakage	Power/Voltage Sag	Voltage Sag	Voltage/Current	CT Expansion	ZCT Expansion
To 3-STATE classify based on either of power, current, and voltage	○	○	-	-	-	-	-	-	-

○: Available
-: Not available

3. Setting major functions

■ Items required for setting

• PMU1A or PMU2A setting

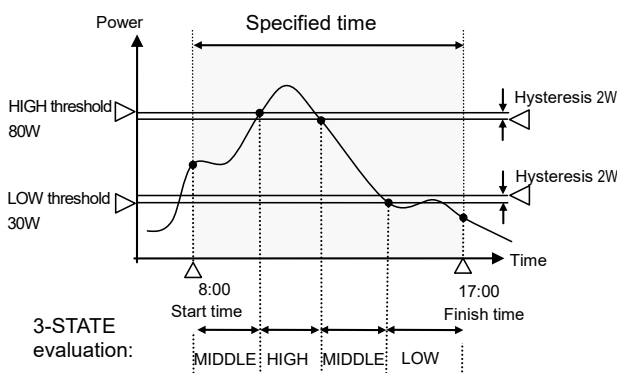
Setup Item	Explanation	Setting	Screen of the Software
3-STATE target (Electrical system 1, Electrical system 2)	Set a 3-STATE classification condition.	Power, current, voltage	[KM1 setting] - [Measurement setting]
3-STATE HIGH threshold (Electrical system 1, Electrical system 2)	To 3-STATE classify based on power (by 1W), current (by 0.1A), or voltage (by 0.1V), set a threshold to evaluate as a HIGH condition.	-120000000 to 120000000	
3-STATE LOW threshold (Electrical system 1, Electrical system 2)	To 3-STATE classify based on power (by 1W), current (by 0.1A), or voltage (by 0.1V), set a threshold to evaluate as a LOW condition.	-120000000 to 120000000	
3-STATE hysteresis (Electrical system 1, Electrical system 2)	To 3-STATE classify based on power (by 1W), current (by 0.1A), or voltage (by 0.1V), set a hysteresis value.	0 to 24000000	
Measurement start time (Common)	Set a start time to evaluate by 3-STATE function.	00:00 to 23:59	
Measurement end time (Common)	Set an end time to evaluate by 3-STATE function.	00:01 to 24:00	
Reference	•For KM1 unit setting, refer to p.5-41.		

Note: Measurement start time and measurement end time are common setting values that can be used in "3.6.2 To 3-STATE classify based on Event input" and specific power consumption measurement.

■ Setting example

Shown below is an example to classify total power consumption and its total time to 3 states based on power (3-STATE target) during 8:00 (Measurement start time) to 17:00 (Measurement end time). If the measured power is over 80W (HIGH threshold), it is judged as HIGH condition, and if it is under 30W (LOW threshold), LOW condition. The hysteresis is set to 2W to prevent frequent occurrence of status change.

Evaluation timing of 3-STATE classification based on power



<Setting for expected operation above>

PMU1A or PMU2A setting:

3-STATE target (Electrical system 1):	Electric power
3-STATE HIGH threshold (Electrical system 1):	80W
3-STATE LOW threshold (Electrical system 1):	30W
3-STATE hysteresis (Electrical system 1):	2W
Measurement start time:	08:00
Measurement end time:	17:00

3. Setting major functions

3.6.2. To 3-STATE classify based on Event input

■ Overview

To connect EMU8A and perform 3-STATE classification based on an event input to EMU8A, set "Event input" to "3-STATE target" of PMU1A or PMU2A.

Then set "3-ST (3-STATE classification)" to the EMU8A event input setting. Set an event input terminal of EMU8A to PMU1A or PMU2A based on which 3-STATE classification is performed. Furthermore, set start and stop times for 3-STATE classification.

■ Available unit

Model	KM1-			KE1-					
	PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E
Unit Name	Power measurement	Power Two-Electrical systems Measurement	Pulse/Temperature	Power/Leakage	Power/Voltage Sag	Voltage Sag	Voltage/Current	CT Expansion	ZCT Expansion
To 3-STATE classify based on Event input	○	○	○	-	-	-	-	-	-

○: Available.

-: Not available.

■ Items required for setting

• PMU1A or PMU2A setting

Setup Item	Explanation	Setting	Screen of the Software															
3-STATE target (Electrical system 1, Electrical system 2)	Set a 3-STATE classification condition.	Event input	[KM1 setting] - [Measurement setting]															
3-STATE/power consumption rate event input (Electrical system 1, Electrical system 2)	Set an event input terminal of EMU8A based on which 3-STATE classification is performed. Shown below is an evaluation list based on combination of two input terminals. <table><tr><th>Event input terminals 1/3/5</th><th>Event input terminals 2/4/6</th><th>Evaluation</th></tr><tr><td>Input OFF</td><td>Input OFF</td><td>LOW</td></tr><tr><td>Input OFF</td><td>Input ON</td><td>LOW</td></tr><tr><td>Input ON</td><td>Input OFF</td><td>MIDDLE</td></tr><tr><td>Input ON</td><td>Input ON</td><td>HIGH</td></tr></table>	Event input terminals 1/3/5		Event input terminals 2/4/6	Evaluation	Input OFF	Input OFF	LOW	Input OFF	Input ON	LOW	Input ON	Input OFF	MIDDLE	Input ON	Input ON	HIGH	1 and 2, 3 and 4, 5 and 6 (Terminal for event input)
Event input terminals 1/3/5	Event input terminals 2/4/6	Evaluation																
Input OFF	Input OFF	LOW																
Input OFF	Input ON	LOW																
Input ON	Input OFF	MIDDLE																
Input ON	Input ON	HIGH																
Measurement start time (Common)	Set a start time to calculate the following items. Pulse input count, specific power consumption, pulse input ON time, 3-STATE total power consumption, 3- STATE total time	00:00 to 23:59																
Measurement end time (Common)	Set an end time to calculate the following items. Pulse input count, specific power consumption, pulse input ON time, 3-STATE total power consumption, 3- STATE total time	00:01 to 24:00																
Reference	•For KM1 unit setting, refer to p.5-42.																	

Note: Measurement start time and measurement end time are common setting values that can be used in "3.6.1 To 3-STATE classify based on either of power, current, and voltage" and specific power consumption measurement.

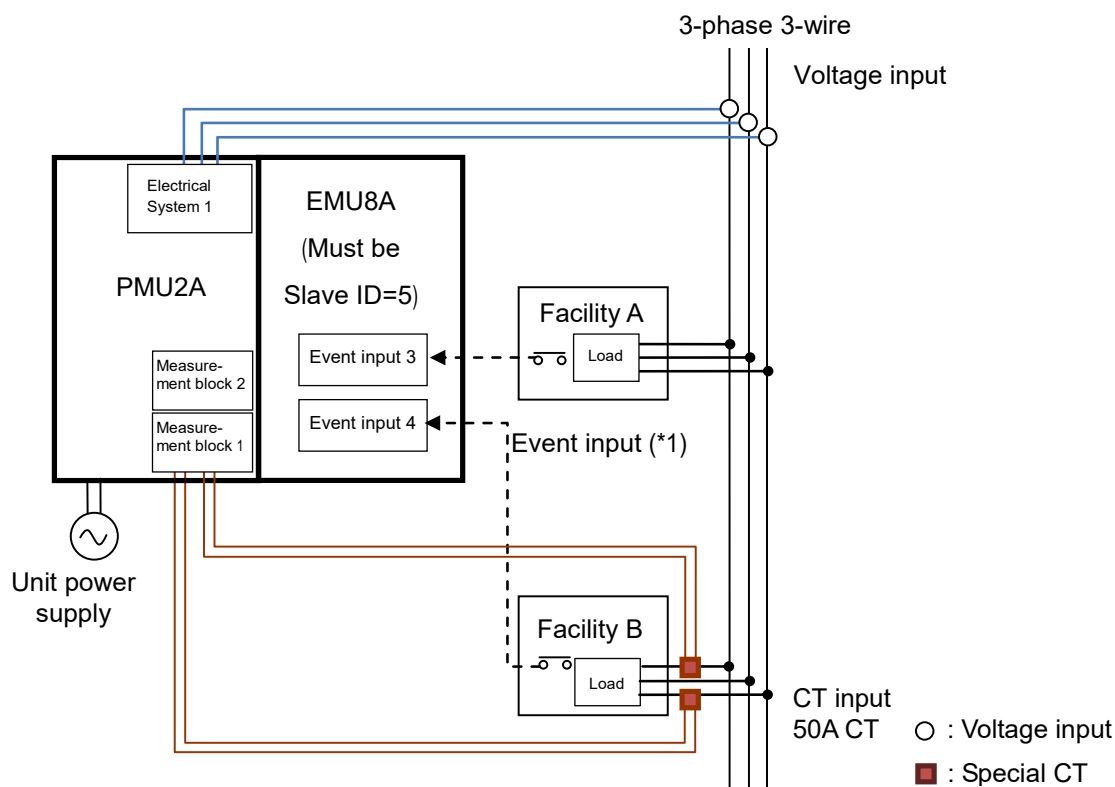
3. Setting major functions

• EMU8A setting:

Setup Item	Explanation	Setting	Screen of the Software
Event input setting 1-7 (Common)	Set the event inputs 1 to 7 to use in which of the following functions. Pulse input count (including specific power consumption function), pulse input ON time, 3-STATE function	3-ST (3-STATE classification)	[KM1 setting] - [Measurement setting]
NPN/PNP input mode setting (Common)	Set the event inputs 1 to 7 to use in which of the functions, no-voltage (NPN) or voltage (PNP).	PNP, NPN	
Input mode setting (Common)	Set the event inputs 1 to 7 to use in which of the following logics. N-O (Normally open): Outputs ON when input is on and OFF when input is off. N-C (Normally closed): Outputs ON when input is off and OFF when input is on.	N-O (Normally open) N-C (Normally closed)	
Reference	・For KM1 unit setting, refer to p.5-42.		

■ Setting example

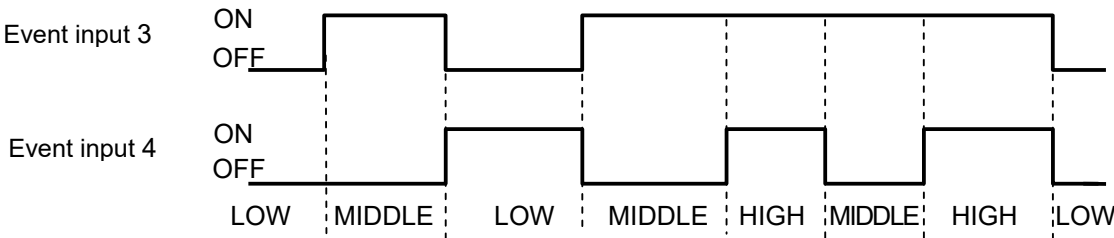
Shown below is an example to classify total power consumption and its total time to 3 states based on Event inputs 3 and 4 of EMU8A (3-STATE/power consumption rate event input target) during 8:00 (Measurement start time) to 17:00 (Measurement end time).



*1: 3-STATE classify monitoring time based on event input: e.g.) 8:00-17:00

3. Setting major functions

Evaluation timing of 3-STATE classification based on event input



Event input 3	Event input 4	3-STATE evaluation
OFF	OFF	LOW
OFF	ON	
ON	OFF	MIDDLE
ON	ON	HIGH

<Setting for installation above>

PMU1A or PMU2A setting:

3-STATE target (Electrical system 1):	Event input
3-STATE/power consumption rate event input (Electrical system 1):	3 and 4
Measurement start time:	08:00
Measurement end time:	17:00

EMU8A setting:

Event input setting 3:	3-ST (3-STATE classification)
NPN/PNP input mode setting:	NPN
Input mode setting:	N-O
Event input setting 4:	3-ST (3-STATE classification)
NPN/PNP input mode setting:	NPN
Input mode setting:	N-O

3.7. To count pulses by event input

■ Overview

To count pulses provided for event input of EMU8A, set "P.CSP (Pulse input count)" to the event input setting of EMU8A.

To convert the pulse count to an engineering unit such as flow rate, set the weight for one pulse as "Pulse conversion coefficient setting".

■ Available unit

Model	KM1-			KE1-					
	PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E
Unit Name	Power measurement	Power Two-Electrical systems Measurement	Pulse/Temperature	Power/Leakage	Power/Voltage Sag	Voltage Sag	Voltage/Current	CT Expansion	ZCT Expansion
To count pulses by event input	-	-	○	-	-	-	-	-	-

○: Available.

-: Not available.

■ Items required for setting

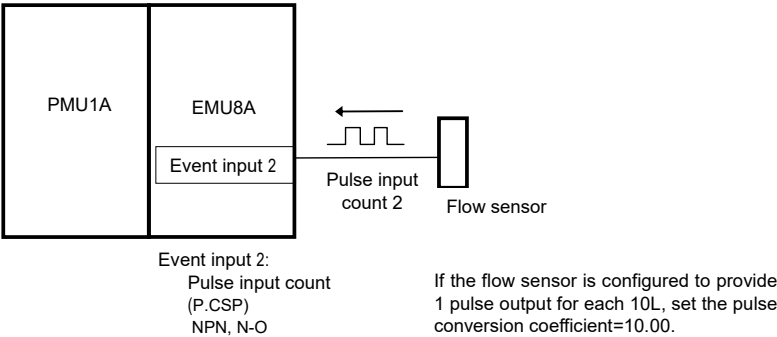
• EMU8A setting:

EMCON setting.

Setup Item	Explanation	Setting	Screen of the Software
Event input setting 1-7 (Common)	Set the event inputs 1 to 7 to use in which of the following functions. Pulse input count (including specific power consumption function), pulse input ON time, 3-STATE function	P.CSP (Pulse input count)	[KM1 setting] - [Measurement setting]
NPN/PNP input mode setting (Common)	Set the event inputs 1 to 7 to use in which of the functions, no-voltage (NPN) or voltage (PNP).	NPN, PNP	
Input mode setting (Common)	Set the event inputs 1 to 7 to use in which of the following logics. N-O (Normally open): Outputs ON when input is on and OFF when input is off. N-C (Normally closed): Outputs ON when input is off and OFF when input is on.	N-O (Normally open) N-C (Normally closed)	
Pulse conversion coefficient setting 1-7 (Common)	Set a coefficient to multiply by a pulse input count value if the Event input setting 1-7 is set as "pulse input count". This allows you to calculate a flow rate and other values. If the initial value of 1.00 is used, the pulse conversion values 1 to 7 remain pulse input values that are not converted.	0.01 to 9999.99	
Reference	•For KM1 unit setting, refer to p.5-43.		

■ Setting example

Shown below is an example to count pulses provided by other equipment using the EMU8A event input 2. Set 10 to the coefficient (pulse conversion coefficient) for one pulse to calculate the pulse converted value.



<Setting for expected operation above>

EMU8A setting:	
Event input setting 2:	Pulse input count (P.CSP)
Pulse conversion coefficient 2:	10.00
NPN/PNP input mode setting:	NPN
Input mode setting:	N-O

3.8. To measure power without voltage input (Simple measurement)

■ Overview

To measure power without voltage input (Simple measurement) using PMU1A, PMU2A, or CTD8E, set "Simple measurement", as well as voltage and power factor for power calculation manually. Use this function if voltage input is not available due to the installation environment and/or wiring conditions.

■ Available unit

Model	KM1-			KE1-					
	PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E
Unit Name	Power measurement	Power Two-Electrical systems Measurement	Pulse/Temperature	Power/Leakage	Power/Voltage Sag	Voltage Sag	Voltage/Current	CT Expansion	ZCT Expansion
To measure power without voltage input (Simple measurement)	○	○	-	-	-	-	-	○	-

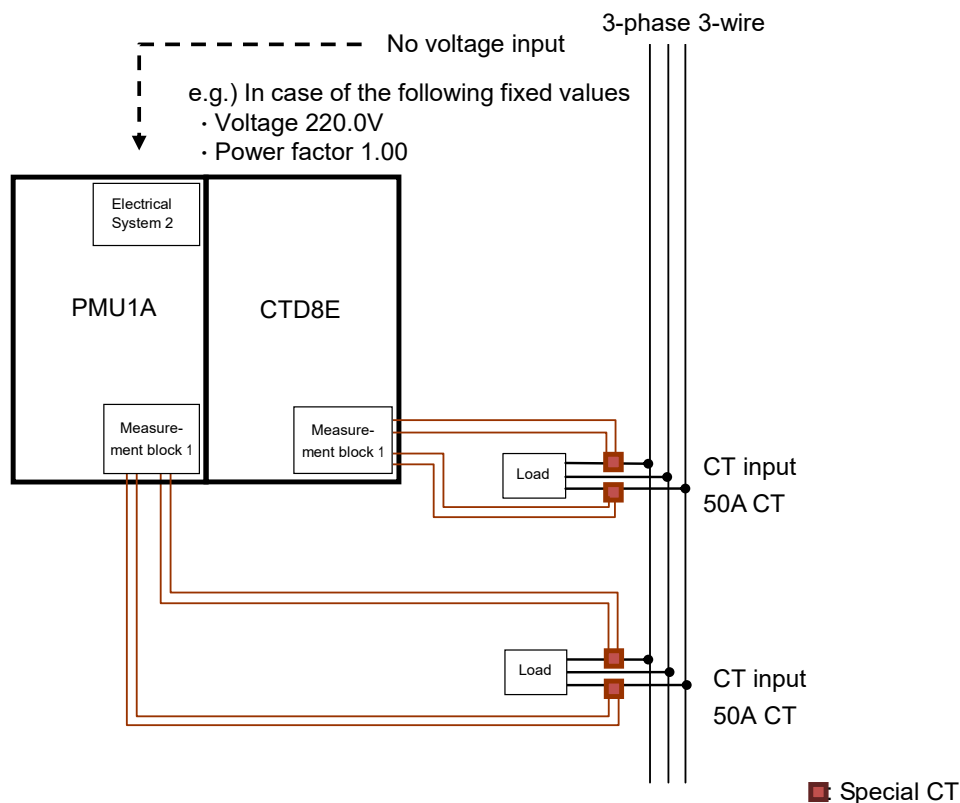
■ Items required for setting

Setup Item	Explanation	Setting	Screen of the Software
Simple measurement (Common)	Set whether the simple measurement function should be used or not.	ON	PMU1A or PMU2A: [KM1 setting] - [Measurement setting] CTD8E: [KE1 setting] - [Measurement setting]
Voltage on simple measurement (Electrical system 1, Electrical system 2)	Set a voltage for internal calculation when simple measurement function is used.	0.1 to 9999.9V	
Power factor on simple measurement (Electrical system 1, Electrical system 2)	Set a power factor for internal calculation when simple measurement function is used.	0.01 to 1.00	
Reference	•For KM1 unit setting, refer to p.5-40. •For KE1 setting is same as KM1 unit.		

3. Setting major functions

■ Setting example

Shown below is an example of calculating power of PMU1A, PMU2A, or CTD8E, assuming voltage as 220V fixed (Voltage on simple measurement) and power factor as 1.00 fixed (Power factor on simple measurement).



<Setting for installation above>

PMU1A setting:

Simple measurement:	ON
Voltage on simple measurement (Electrical system 1):	220.0V
Power factor on simple measurement (Electrical system 1):	1.00
Applicable phase wire (Electrical system 1):	3-phase 3-wire
Special CT (Electrical system 1):	50A

CTD8E setting:

Simple measurement	ON
Voltage on simple measurement at electrical system 1	220.0V
Power factor on simple measurement (Measurement block 1)	1.00
Electrical system 1 applicable phase wire	3-phase 3-wire
Special CT (Measurement block 1)	50A
Synchronization selection for measuring block (Measurement block 1)	Electrical system 1

3.9. To detect voltage sag

■ Overview

To detect voltage sag using PVS1C or VSU1B, specify which line voltage to detect for "Voltage sag detection". Set the conditions to evaluate as "voltage sag", when a voltage is less than a certain value for a certain period of time, in "Voltage sag detection voltage" and "Voltage sag duration time". The voltage sag alarm output is provided for the dedicated voltage sag alarm output terminal. Note that you can specify up to four conditions of voltage sag detection for one system.

■ Available unit

Model	KM1-			KE1-					
	PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E
Unit Name	Power measurement	Power Two-Electrical systems Measurement	Pulse/Temperature	Power/Leakage	Power/Voltage Sag	Voltage Sag	Voltage/Current	CT Expansion	ZCT Expansion
To detect voltage sag	-	-	-	-	○	○	-	-	-

○: Available.

-: Not available.

■ Items required for setting

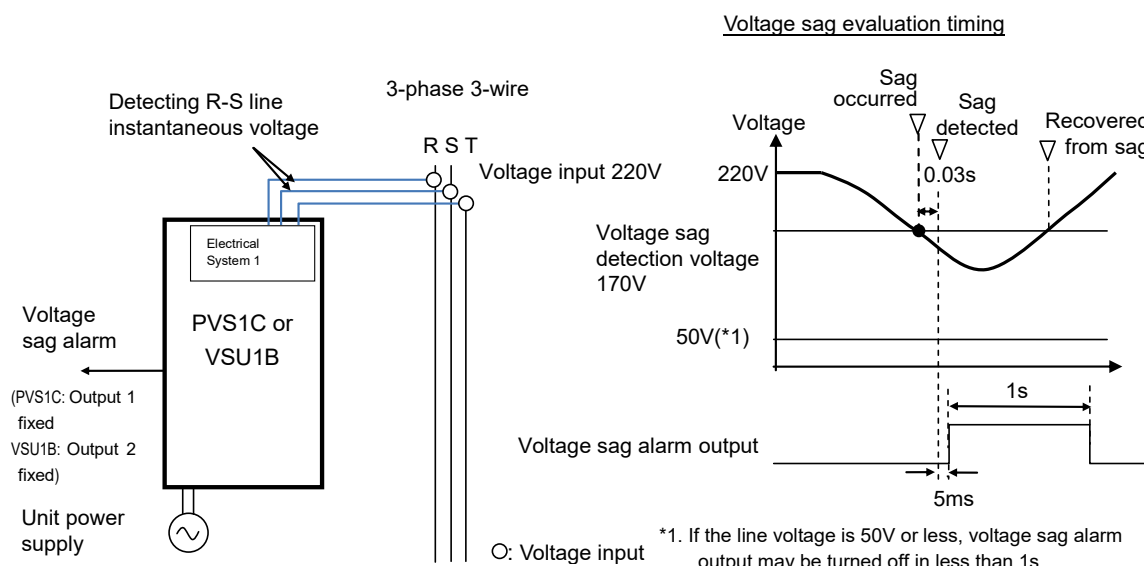
• PVS1C or VSU1B setting

Setup Item	Explanation	Setting	Screen of the Software
Voltage sag detection 1-4	Set a line to detect voltage sag.	• Vrs (3P3W, 1P2W, 1P3W), Vrn (3P4W) • Vst (3P3W, 1P3W), Vsn (3P4W) • Vtr (3P3W), Vtn (3P4W)	[KE1 setting] - [Alarm setting]
Voltage sag detection voltage 1-4	If the target line voltage falls under the value specified here for the voltage sag duration time or longer, it is evaluated as voltage sag.	0 to 480.0V	
Voltage sag duration time 1-4	If the target line voltage falls under the voltage sag detection voltage for a time period specified here or longer, it is evaluated as voltage sag.	0.02 to 1.00s	
Reference	•For KE1 unit setting, refer to p.5-65.		

3. Setting major functions

■ Setting example

Shown below is an example of evaluating as voltage sag when the R-S line voltage (Voltage sag detection) is less than 170V (Voltage sag detection voltage) for 0.03 seconds (Voltage sag duration time) in a 3-phase 3-wire circuit.



<Setting for expected operation above>

PVS1C or VSU1B setting:

Voltage sag detection 1:

Vrs (3P3W, 1P2W, 1P3W), Vrn (3P4W)

Voltage sag detection voltage 1:

170V

Voltage sag duration time 1:

0.03s

Back up at voltage sag:

OFF

Precautions for Correct Use

For the detailed operations under voltage sag, refer to "Model KE1 User's Manual".

3.10. To detect earth leakage

■ Overview

To detect earth leakage using PGR1C or ZCT8E, specify "earth leakage comparison set value" and "earth leakage operating time" to evaluate as earth leakage when current leakage exceeds a certain value for a certain period of time. To output earth leakage alarm, specify "earth leakage" to the output terminal function.

■ Available unit

Model	KM1-			KE1-					
	PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E
Unit Name	Power measure-ment	Power Two-Electrical systems Measure-ment	Pulse/ Tempera-ture	Power/ Leakage	Power/ Voltage Sag	Voltage Sag	Voltage/C urrent	CT Expansion	ZCT Expansion
To detect earth leakage	-	-	-	○	-	-	-	-	○

○: Available.

-: Not available.

■ Items required for setting

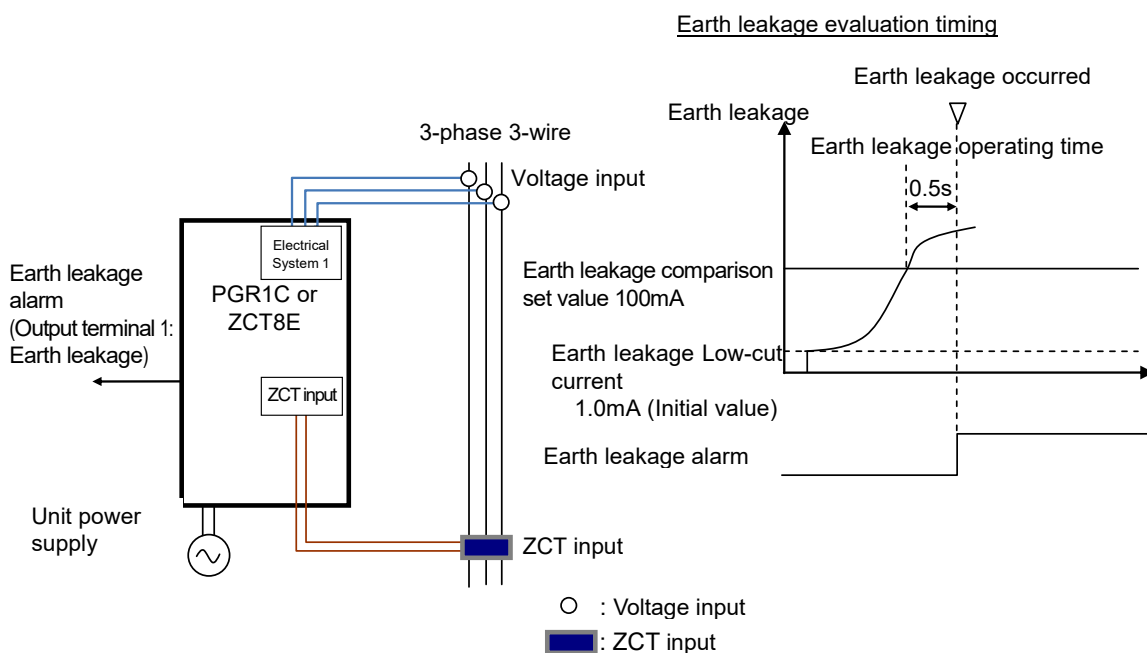
• PGR1C or ZCT8E setting

Setup Item	Explanation	Setting	Screen of the Software
earth leakage comparison set values 1-8	If the value specified here has been measured for an earth leakage operating time or longer, it is evaluated as alarm.	30 to 1000mA	[KE1 setting] - [Alarm setting]
earth leakage operating time 1-8	If the earth leakage comparison set value has been measured for the value specified here or longer, it is evaluated as alarm.	0.1 to 20.0s	
earth leakage Low-cut current	Set a value to forcibly set the measured earth leakage to 0 when the actual value of earth leakage (Io) falls under a certain value.	0.1 to 30.0mA	[KE1 setting] - [Measurement setting]
Output terminals 1-2 function setting	PGR1C: Set the output terminal to use in which of the following functions. Alarm output of each measurement block, earth leakage output, phase-loss alarm output, phase-sequence output, and total power consumption pulse output ZCT8E: Output terminal 1 is for earth leakage output only.	earth leakage output	[KE1 setting] - [Alarm setting]
Reference	•For KE1 unit setting, refer to p.5-66.		

3. Setting major functions

■ Setting example

Shown below is an example of evaluating as earth leakage when the measured ZCT input is 100mA (earth leakage comparison set value) for 0.5 seconds (earth leakage operating time) and providing output to the output terminal 1.



<Setting for expected operation above>

PGR1C or ZCT8E setting:

Earth leakage comparison set value 1:	100mA
Earth leakage operating time 1:	0.5s
Earth leakage Low-cut current:	1.0mA
Output terminal 1 function setting:	Earth leakage

3.11. To use alarm function

■ Overview

To use alarm function for voltage, current, power, or power factor, set an alarm type to "Alarm parameter setting". You can configure alarm thresholds such as upper and lower limit, as well as hysteresis for each alarm.

Furthermore, to use alarm function, set an alarm output item, assignment of measurement block alarm to an output terminal, and a terminal status.

■ Available unit

Model	KM1-			KE1-					
	PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E
Unit Name	Power measurement	Power Two-Electrical systems Measurement	Pulse/Temperature	Power/Leakage	Power/Voltage Sag	Voltage Sag	Voltage/Current	CT Expansion	ZCT Expansion
To use alarm function	○	○	-	○	○	○	○	○	-

○: Available.

-: Not available.

■ Items required for setting

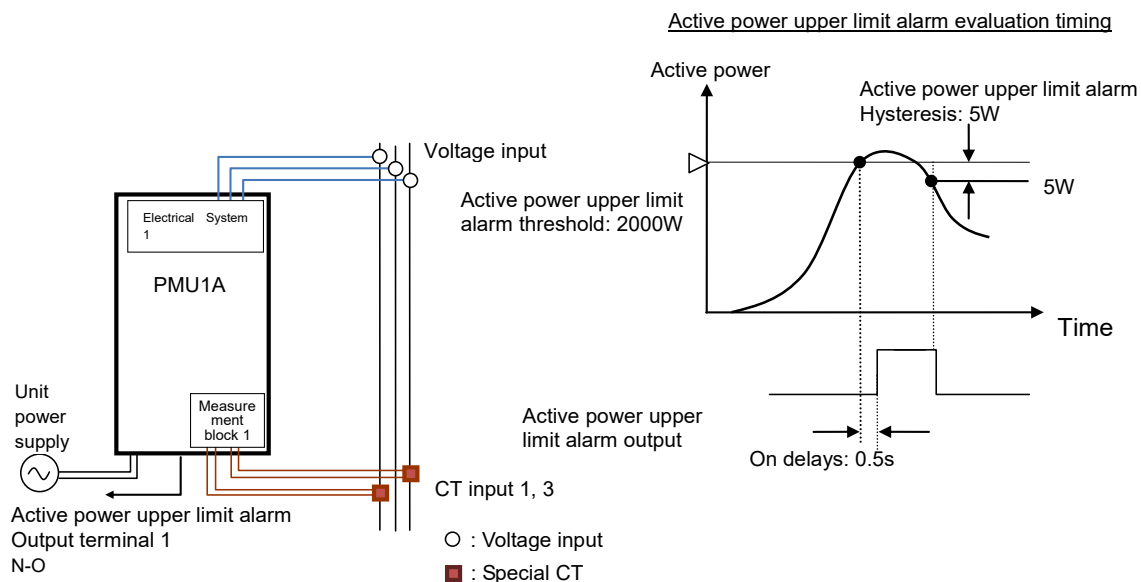
Setup Item	Explanation	Setting	Screen of the Software
Alarm parameter setting (Electrical system 1, Electrical system 2)	Set items to enable alarm function in the measurement master unit or CT Expansion Unit for each measurement block. You can enable more than one item.	Over voltage alarm Under voltage alarm Over current alarm Under current alarm Active power upper limit alarm Active power lower limit alarm Reactive power upper limit alarm Reactive power lower limit alarm Power factor alarm	[KM1 setting] - [Alarm setting] or [KE1 setting] - [Alarm setting]
Example) Active power upper limit alarm Threshold (Electrical system 1, Electrical system 2)	Set a threshold of active power upper limit alarm.	-120000000 to 120000000W	
Example) Active power upper limit alarm Hysteresis (Electrical system 1, Electrical system 2)	Set a hysteresis of active power upper limit alarm.	0 to 24000000W	
Example) Active power upper limit alarm On delays (Electrical system 1, Electrical system 2)	Set an on-delay time of active power upper limit alarm.	0.5 to 10.0s	
Active input setting (Common)	Unselect CT input or ZCT input that is not subject to alarm judgment.	Input 1, Input 2, Input 3, Input 4, Input 5, Input 6, Input 7, Input 8	

3. Setting major functions

Setup Item	Explanation	Setting	Screen of the Software
Alarm output setting (Electrical system 1, Electrical system 2)	Among selected items of alarm parameter setting, specify item(s) to enable alarm output function for each electrical system or measurement block. You can enable more than one item.	Over voltage alarm Under voltage alarm Over current alarm Under current alarm Active power upper limit alarm Active power lower limit alarm Reactive power upper limit alarm Reactive power lower limit alarm Power factor alarm	[KM1 setting] - [Alarm setting] or [KE1 setting] - [Alarm setting]
Output terminals 1-3 function setting (Common)	Set the output terminals 1 to 3 to use in which of the following functions. Alarm output of each measurement block (*1), temperature alarm output (*2), phase-sequence output, total power consumption pulse output, and 3-STATE output. *1 For CTD8E and ZCT8E, only this item can be selected. *2 For EMU8A, only the temperature alarm can be selected.	To provide an alarm configured in the "Alarm output setting" above for an output terminal, set to either of the followings. Measuring block 1 alarm Measuring block 2 alarm	
Output terminals 1-3 conditions (Common)	Set the output terminals 1 to 3 to use in which of the following logics. N-O (Normally open): Outputs ON when power is on and OFF when power is off. N-C (Normally closed): Outputs ON when power is off and OFF when power is on.	N-O (Normally open) N-C (Normally closed)	
Reference	•For KM1 unit setting, refer to p.5-48. •KE1 unit setting is same as KM1 unit.		

■ Setting example

Shown below is an example of evaluating as active power upper limit alarm when the active power measured with CT inputs 1 and 3 (Active input setting) exceeds 2000W (Threshold). Output is made to the output terminal 1 when the evaluated condition continues for 0.5 seconds (On delays) or longer.



<Setting for expected operation above>

Alarm parameter setting (Electrical system 1):	Active power upper limit alarm
Active power upper limit alarm Threshold (Electrical system 1):	2000W
Active power upper limit alarm Hysteresis (Electrical system 1):	5W
Active power upper limit alarm On delays (Electrical system 1):	0.5s
Active input setting:	Checking CT inputs 1 and 3
Alarm output setting (Electrical system 1):	Active power upper limit alarm
Output terminal 1 function setting:	Measuring block 1 alarm
Output terminal 1 condition:	N-O

3.12. To configure communication setting

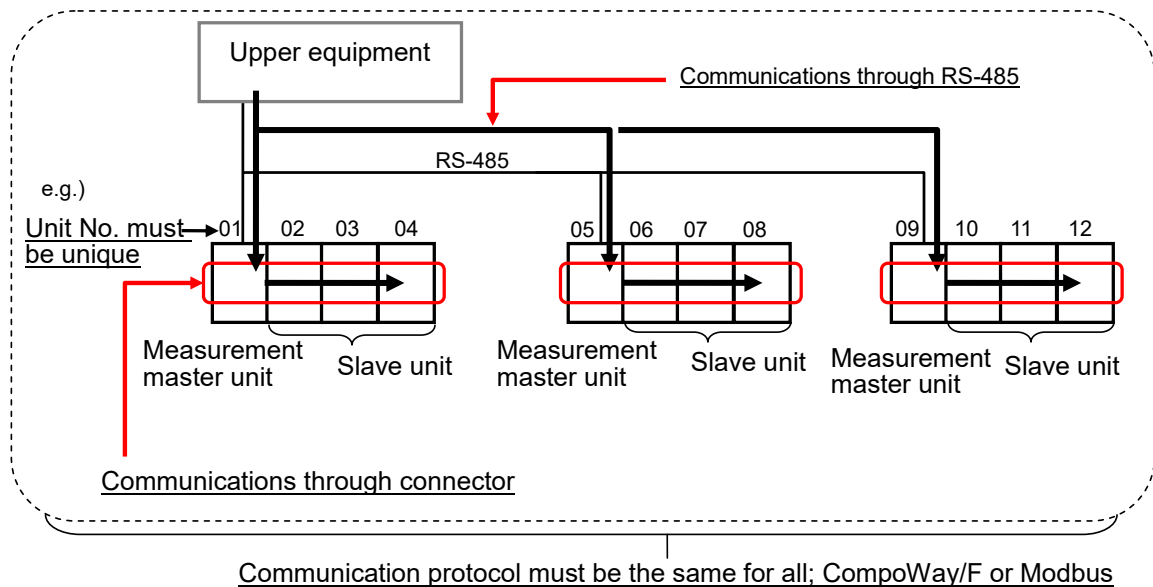
■ Overview

For model KM1/KE1, the measurement master unit communicates with slave unit(s), if connected, through the connector.

For upper equipment (including the Software and data acquisition unit such as EW700) to communicate with the units through USB or RS-485 (via USB) connection, set Unit No. the following conditions must be met.

- The same communication protocol is used in the entire system.
- Unit numbers are uniquely configured in the entire system including the RS-485 communications and unit-to-unit communications.

Note: Connection to EW700 is available for PMU2A, PMU1A, EMU8A, and CTD8E only.



3. Setting major functions

3.12.1. To set Unit No.

■ Overview

It is necessary to use the [KM1 setting] or [KE1 setting] screen, [Unit No.] in the [Communication setting] tab, to set and write Unit No. in a range from 01 to 99.

■ Available unit

Model	KM1-			KE1-						
	PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E	DRT
Unit Name	Power measurement	Power Two-Electrical systems Measurement	Pulse/Temperature	Power/Leakage	Power/Voltage Sag	Voltage Sag	Voltage/Current	CT Expansion	ZCT Expansion	DeviceNet Communication
To set Unit No.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

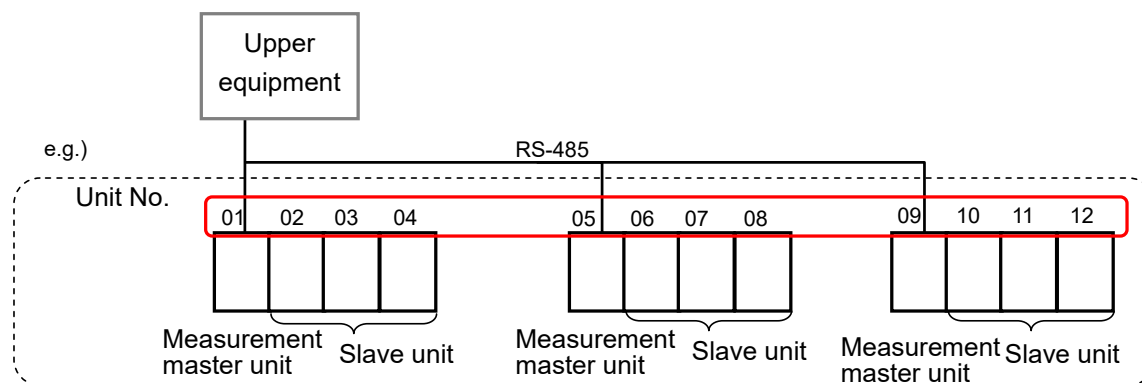
☐: Available.

■ Items required for setting

Setup Item	Explanation	Setting	Screen of the Software
Unit No.	Set an identification number for communications with upper equipment (including the Software and data acquisition unit such as EW700).	01 to 99	[KM1 setting] - [Communication setting] or [KE1 setting] - [Communication setting]
Reference	•For KM1 unit setting, refer to p.5-31. •KE1 unit setting is same as KM1 unit.		

■ Setting example

Shown below is an example of assigning unit numbers from 01 to 12 in the RS-485 communications system.



3.12.2. If configuration of RS-485 communication setting other than the initial setting is required

■ Overview

It is necessary to change the initial values of communications for either of the following cases, in the [Communication setting] of the [KM1 setting] or [KE1 setting] screen.

- Using communication protocol of Modbus
- Using higher baud rate, 19.2kbps or 38.4kbps
- Communications setting of upper equipment is different from others

Shown below are initial values, configuration method, and required conditions for setting communication conditions of KM1/KE1 units with upper equipment.

Setup Item	Initial value	Method	Required setting condition in the entire system
Communication protocol	CompoWay/F	Use the DIP switch 2 on the top of the unit	Must be the same for every unit.
RS-485 communication condition	Baud rate: 9.6kbps Data length: 7 bits, Stop bits: 2 bits, Vertical parity: Even	Use the Software for the unit	Must be the same for every measurement master units. A functional slave can communicate with the measurement master even if the communication conditions are different.

■ Available unit


Model	KM1-			KE1-						
	PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E	DRT
Unit Name	Power measurement	Power Two-Electrical system Measurement	Pulse/Temperature	Power/Leakage	Power/Voltage Sag	Voltage Sag	Voltage/Current	CT Expansion	ZCT Expansion	DeviceNet Communication
Communication protocol	○	○	○	○	○	○	○	○	○	○
RS-485 communication condition	○	○	○	○	○	○	○	-	-	-

○: Available.

-: Not available.

3. Setting major functions

■ Items required for setting

Setup Item		Explanation	Setting	Hardware switch/Screen of the Software
Communication protocol		<p>Set the communication protocol to communicate with upper equipment. Must be the same for every unit.</p> <p>Note 1: The number of units for CompoWay/F is up to 31. To connect 32 units or more, set to Modbus.</p> <p>Note 2: To use EW700 as upper equipment, set to CompoWay/F. The maximum number of units for 1 port of EW700 is 31, with 4 ports available.</p>	<p>DIP switch 2 on the top of the unit OFF: CompoWay/F (Initial value) ON: Modbus(*1) *1 To change the communication protocol to Modbus, set as shown below.</p> <p>Data length 8 bits Stop bits With vertical parity: 1 bit Without vertical parity: 2 bits</p>	 <p>ON to use Modbus</p>
RS-485 setting	Baud rate	Use the baud rate of upper equipment, if the baud rate of upper equipment connecting through RS-485 is other than 9.6kbps, or if you want higher baud rate with upper equipment.	9.6kbps (initial value), 19.2kbps, 38.4kbps	[KM1 setting] - [Communication setting] or [KE1 setting] - [Communication setting]
	Data length	In general use the initial value. Use the communication conditions of upper equipment, if the communication conditions of upper equipment connecting through RS-485 are other than data length of 7 bits, stop bits of 2 bits, or even parity.	7 bits (initial value), 8 bits	
	Stop bits		1 bit, 2 bits (initial value)	
	Vertical parity		No, Even (initial value), Odd	
	Transmission wait time	In general use the initial value. Set a value larger than the initial value if the communication receiving process of the upper equipment connecting through RS-485 is too slow.	0 to 99ms (initial value: 20ms)	
Reference	•For KM1 unit setting, refer to p.5-32. •KE1 unit setting is same as KM1 unit. •For communications protocol setting of the Software, refer to p.5-12.			

3. Setting major functions

Additional Information

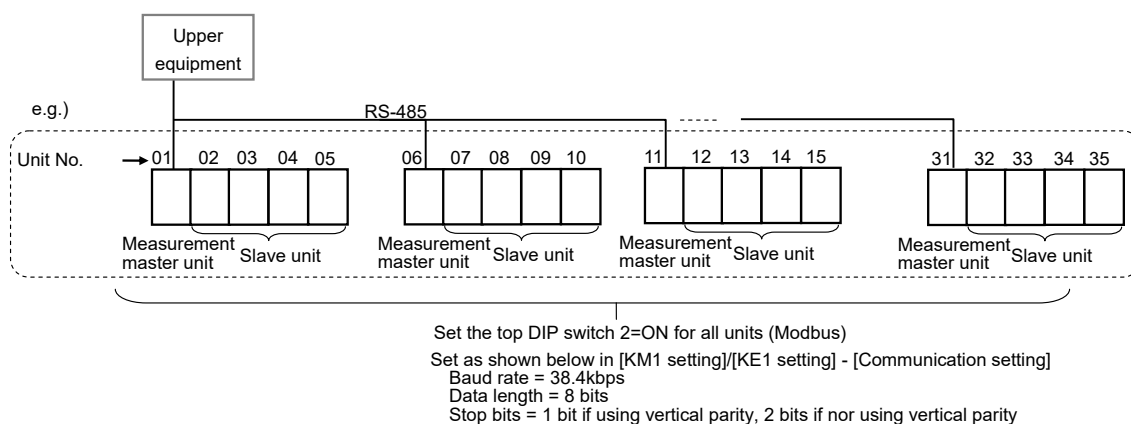
The communication settings of EW700 are listed below.

Item	Performance
Communication protocol	CompoWay/F
Baud rate	9.6k/19.2k/38.4kbps (factory shipment: 9.6kbps)
Data length	7 bits (fixed)
Stop bits	2 bits (fixed)
Vertical parity	Even (fixed)

■ Setting example

To use Modbus to connect to 32 units or more

To use baud rate of 38.4kbps



Precautions for Correct Use

Be sure to turn the power off before setting the DIP switch. The setting will be reflected to the unit after changing the setting and turning the power on again.

3.12.3. To connect a slave unit to the measurement master unit

■ Overview

To connect a slave unit to the measurement master unit, its slave ID, configured by the rotary switch on the top of the unit, must be recognized by the measurement master unit.

On the measurement master unit, it is necessary to use the [KM1 setting] or [KE1 setting] screen, [Connection composition] in the [Communication setting] tab, to set and write slave IDs.

■ Available unit


Model	KM1-			KE1-						
	PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E	DRT
Unit Name	Power measurement	Power Two-Electrical system Measurement	Pulse/Temperature	Power/Leakage	Power/Voltage Sag	Voltage Sag	Voltage/Current	CT Expansion	ZCT Expansion	Device Net Communication
Slave ID setting	-	-	○	-	-	○	○	○	○	-
Connection composition setting	○	○	-	○	○	-	-	-	-	○

○: Available.

-: Not available.

■ Items required for setting

• Slave unit setting

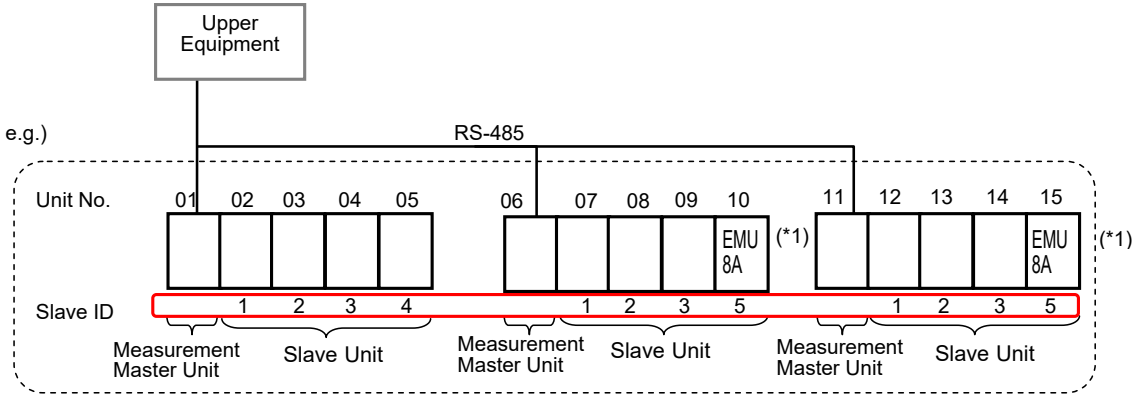
Setup Item	Explanation	Setting	Hardware switch
Slave ID	A number to assign to every slave unit for the measurement master unit to recognize the connected slave units. It must be unique in the system.	Specify a slave ID using the rotary switch on the top of a unit. If not configured properly, communications will not be available with the measurement master unit. - Slave unit: "1" to "4" - EMU8A: "5" (if you use 3-STATE function based on the event input function as the judgment condition, or specific power consumption function) - DRT: "6" (fixed) - Not available: "7" to "9", and "0" Note: You cannot use "0" as it is already assigned to the measurement master unit (fixed).	 Set 1 to 4, or 5
Reference	•For KM1 unit setting, refer to "Model KM1 User's Manual". •For KE1 unit setting, refer to "Model KE1 User's Manual".		

• Measurement master unit setting

Setup Item	Explanation	Setting	Screen of the Software
Connection composition	Set existence of connected slave ID(s) as a unit setting parameter to the measurement master unit.	Existence of slave IDs 1 to 6 Note: While the Slave ID 6 is fixed to the communication slave, set "Yes" to Slave ID 6 is the communication slave is connected.	Measurement master unit [KM1 setting] - [Communication setting] or [KE1 setting] - [Communication setting]
Reference	•For KM1 unit setting, refer to p.5-32. •KE1 unit setting is same as KM1 unit.		

■ Setting example

Shown below is an example of assigning unique slave IDs to slave units connected to the measurement master. For EMU8A, the slave ID "5" is set to use the 3-STATE function based on the event input function as the judgment condition.



*1 Use the slave ID 5 setting if you use the 3-STATE function based on the event input function of EMU8A (pulse/temperature) as the judgment condition, or specific power consumption function.

Precautions for Correct Use

Be sure to turn the power off before setting the rotary switch. The setting will be reflected to the unit after changing the setting and turning the power on again.

4. Installation and uninstallation

Precautions for Correct Use

When the latest version of the Software is released on OMRON web site, stop using the old version and remove it. Next, install the latest version according to the installation procedure.

4.1. Installation

To install the Software, prepare a unit to be set and an USB cable (A Type - mini B Type).

■ Operational procedure

(1) Download of the Software

From OMRON web site, download a compressed file for KM1/KE1-Setting.

(2) Creation of an installation folder

Create an installation folder for the Software in the location below:

`C:\OMRON\KM1_KE1-Setting`

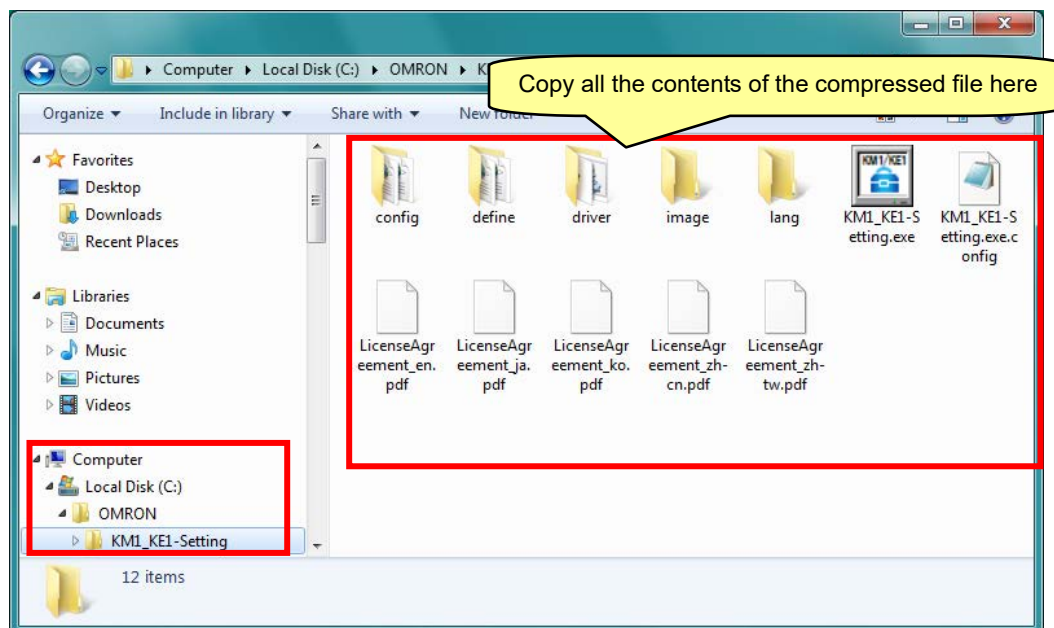
Precautions for Correct Use

The installation folder can be an optional folder. However, in case of copying to the folder requiring administrator authority for execution (e.g. "C:\Program Files" under Windows Vista, Windows 7 and Windows 10), you must [Run as administrator] at the time of startup. Or, select [Run as administrator] on [Advance setting] of the shortcut properties when creating a shortcut.

4. Installation and uninstallation

(3) Decompression of KM1_KE1-Setting

Decompress the compressed file for KM1/KE1-Setting "KM1_KE1-Setting Setup_***.zip" downloaded and copy it to the folder created in 2).



Note 1: The compressed file name "**** (number)" varies according to the version.

Note 2: To create a shortcut, specify "KM1_KE1-Setting.exe" to the link.

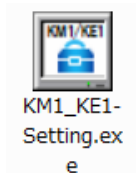
(4) Software license agreement

Open the appropriate file below in the folder copied and read the Software license agreement. By executing the Software, you acknowledge that you have accepted the Software license agreement. If you do not agree to the Software license agreement, stop using the Software immediately and dispose of any and all of the Software including download files.

Language of license agreement	File Name
Japanese	LicenseAgreement_ja.pdf
English	LicenseAgreement_en.pdf
Korean	LicenseAgreement_ko.pdf
Chinese (simplified)	LicenseAgreement_zh-cn.pdf
Chinese (traditional)	LicenseAgreement_zh-tw.pdf

(5) Execution of program file

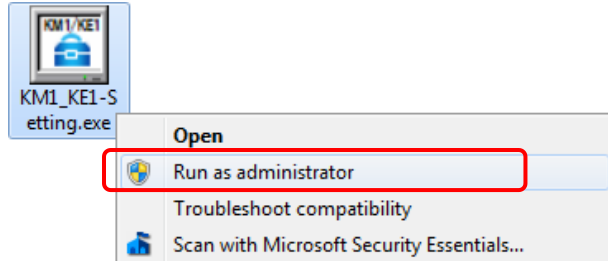
Double-click on "KM1_KE1-Setting.exe" in the installation folder.



[If administrator authority is required]

In case of installing the file to "C:\Program Files" under Windows Vista, Windows 7 or Windows 10, administrator authority is required for execution. In this case, right-click on [Run as administrator].

Note: If the [User account control] screen shows "Do you want to allow the following program from an unknown publisher to make changes to this computer", click on [Yes].

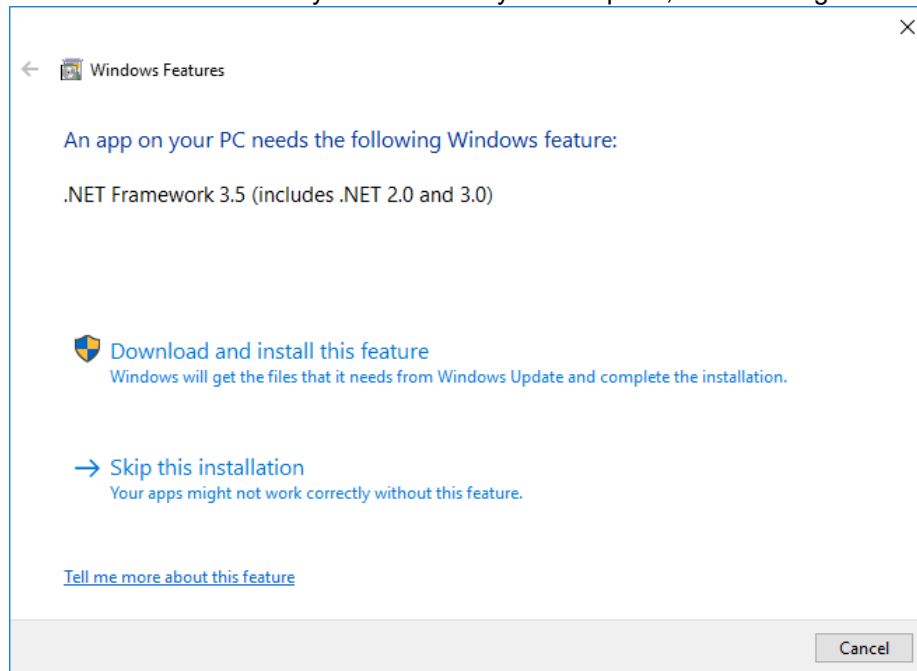


Precautions for Correct Use

If .NET Framework is not yet installed on your computer, the messages below will appear. When those messages appear, refer to "6.8 Installation of Microsoft .NET Framework"(p.6-20), or "6.9 Microsoft .NET Framework installation procedure for Windows 10"(p.6-27) and install .NET Framework.

[Windows 10]

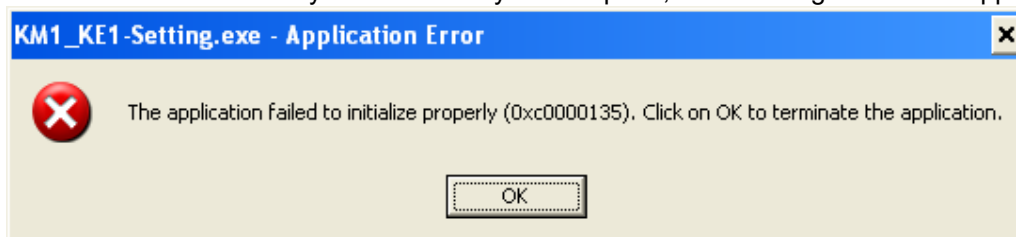
If .NET Framework is not yet installed on your computer, the following screen will appear.



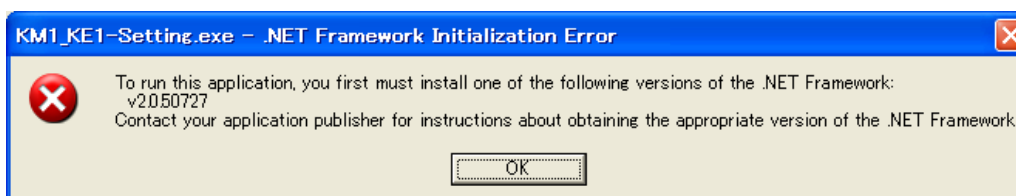
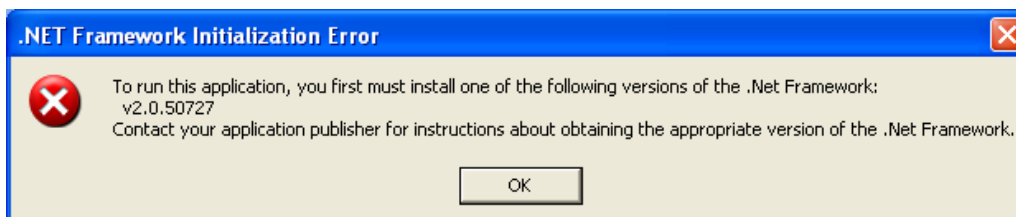
4. Installation and uninstallation

[Windows XP]

If .NET Framework is not yet installed on your computer, the following screen will appear.



For the version 1.x of .NET Framework, the following screen will appear.



4. Installation and uninstallation

(6) Installation of a driver

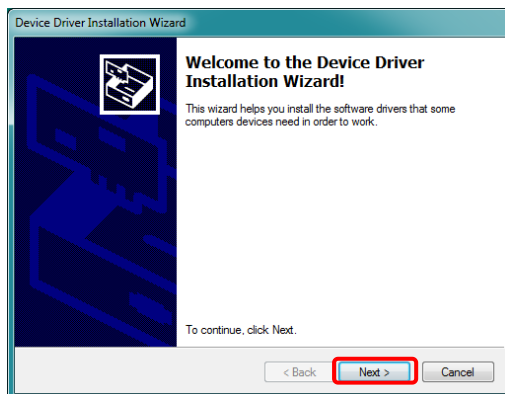
[Windows 10]

The driver will be automatically installed when the unit is connected to the computer.
When the initial screen is displayed, proceed to the step (7).

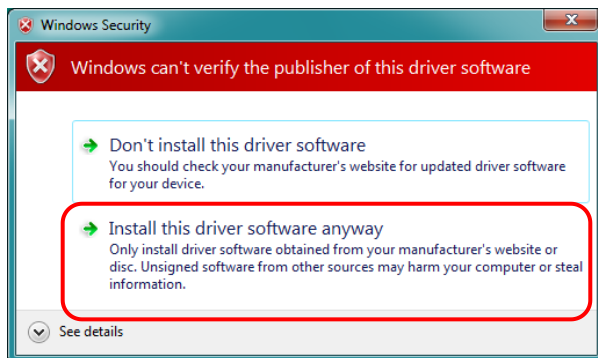
[Other than Windows 10]

When starting for the first time, you need to install an USB virtual COM port driver.

1. The driver installation screen will automatically appear. Click on the [Next] button.



2. From the [Windows security] screen, click on [Install this driver software anyway].



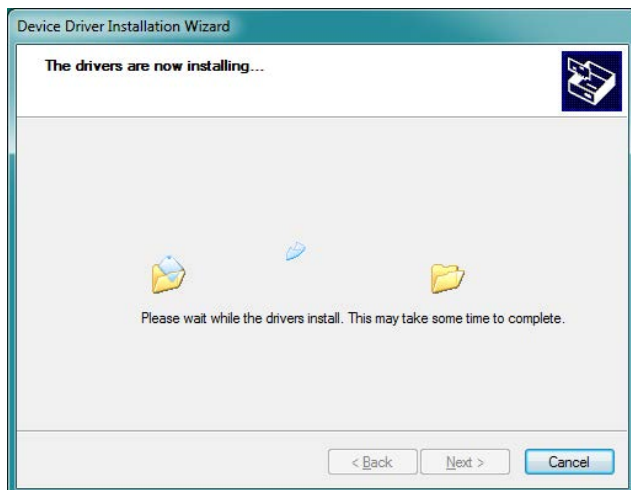
[Windows XP]

Click on [Continue Anyway] on the following screen.

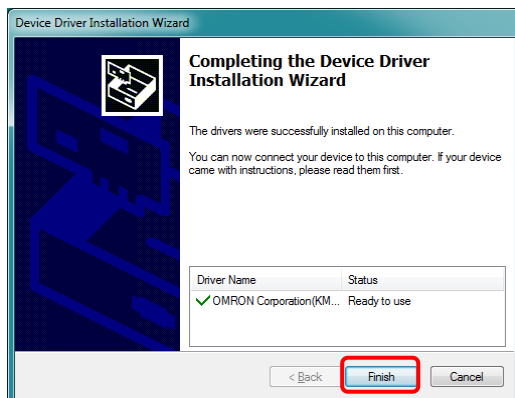


4. Installation and uninstallation

The progress will be shown.



3. After the message of "The drivers were successfully installed on this computer" appears, click on the [Finish] button.

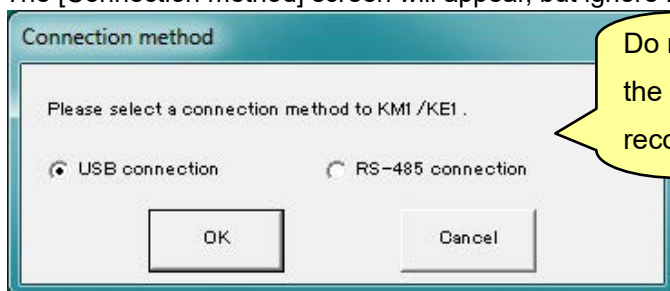


4. The start screen will appear for a few seconds.



(7) Connection to an USB cable

1. The [Connection method] screen will appear, but ignore it and move on to the next step.



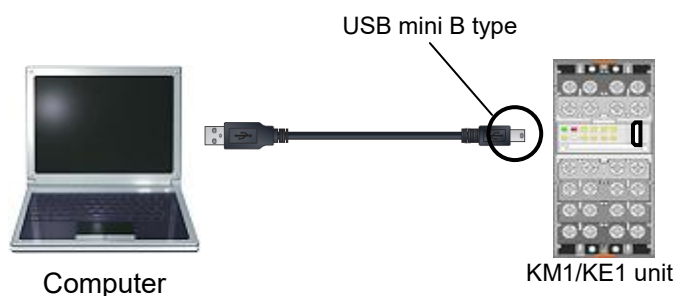
Do not proceed with operation until the USB virtual COM port is recognized.

Note: If you have mistakenly proceeded with operation, the message of "The USB virtual COM port was not detected" will appear. Click on the [Exit] button and double-click on "KM1/KE1-Setting.exe" again.

2. Connect one unit directly to the computer through an USB cable (A Type - mini B Type).

Note 1: It is unnecessary to connect the main unit to a power source.

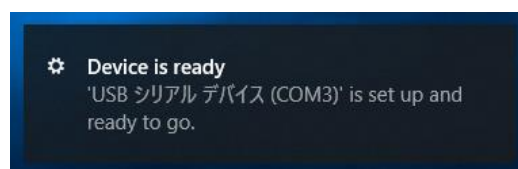
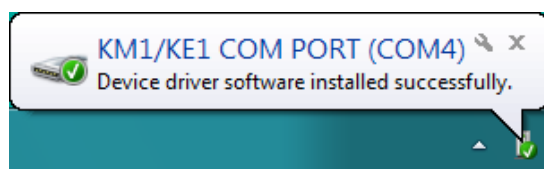
Note 2: You can connect any model of unit.



3. Wait until the USB virtual COM port is recognized.

In case of Windows 10, the driver for USB virtual COM port is automatically installed while waiting.

Once the USB virtual COM port is recognized, the following message will appear.



Note: COM port no. varies depending on the computer you use.

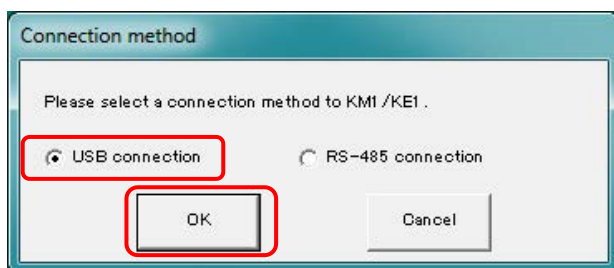
[Windows XP]

Refer to "6.3 USB virtual COM port installation procedure for Windows XP" (p.6-6).

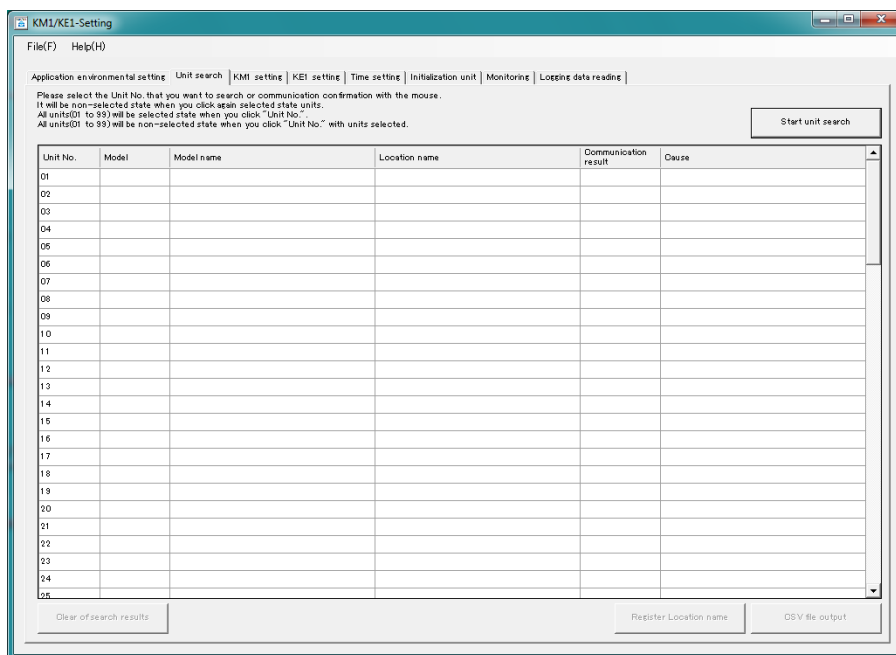
4. Installation and uninstallation

(8) Selection of connection method

1. Select [USB connection] and click on the [OK] button.



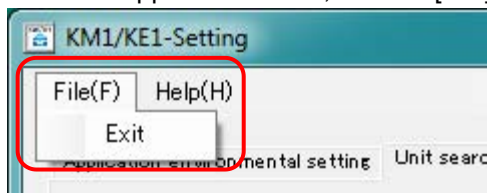
2. The [Unit search] screen will appear.



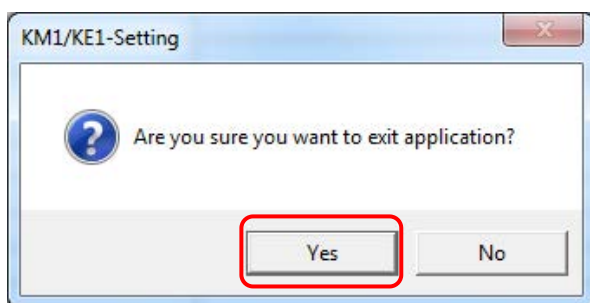
4. Installation and uninstallation

(9) Exit of the Software

1. From the application menu, click on [File]-[Exit].



2. The following confirmation message will appear. To exit the Software, click on the [Yes] button.



The installation is complete.

4.2. Uninstallation

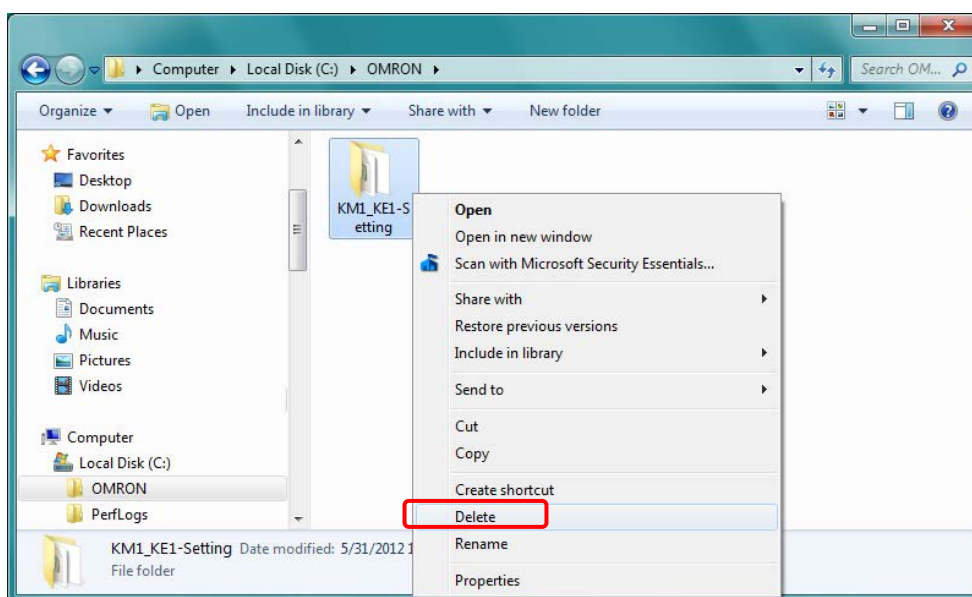
Uninstall the Software.

Precautions for Correct Use

If there is any folder or file other than for the Software in the "C:\OMRON" folder, do not delete the "C:\OMRON" folder. Otherwise, other software may not run properly.

■ Operational procedure

1. Exit the Software if it is running.
2. Delete the "C:\OMRON\KM1_KE1-Setting" folder where the Software installed.



3. Confirm that there is not any folder or file other than for the Software in the "C:\OMRON" folder and delete the "C:\OMRON" folder.

The uninstallation is complete.

Note 1: If you have created a shortcut, delete it as well.

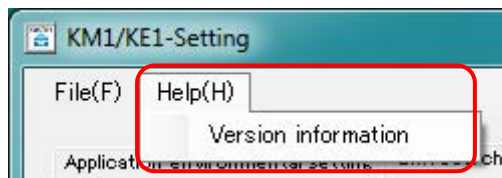
Note 2: For the uninstallation of USB virtual COM port driver, refer to "6.6 Uninstallation of the USB virtual COM port driver" (p.6-15). When installing the same or newer version of the Software again, it is unnecessary to remove the current driver.

4.3. Version information

Version information for the Software is as follows:

■ Operational procedure

1. From [Help] on the application menu, select [Version information].



2. The version information will be shown.



Note: The contents shown depend on the version.

5. Operation description

5.1. How to start and exit the Software

5.1.1. How to start the Software

■ Operational procedure

(1) Connection to an USB cable

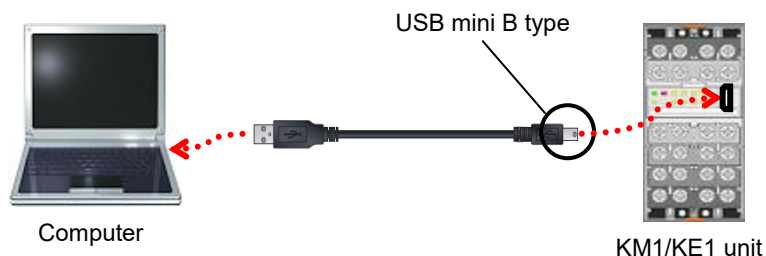
In case of USB connection, connect the computer to the main unit through an USB cable.

In case of RS-485 connection, connect the computer to an USB/RS-485 communication convertor (K3SC-10) through an USB cable.

● USB connection

• One-unit composition

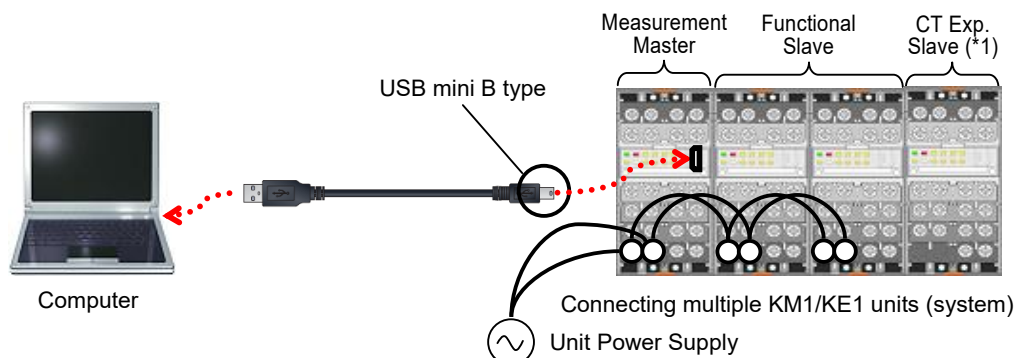
Connect the computer to the main unit through an USB cable (A Type - mini B Type).



Note: It is unnecessary to connect the main unit to a power source.

• Multiple-unit connection composition

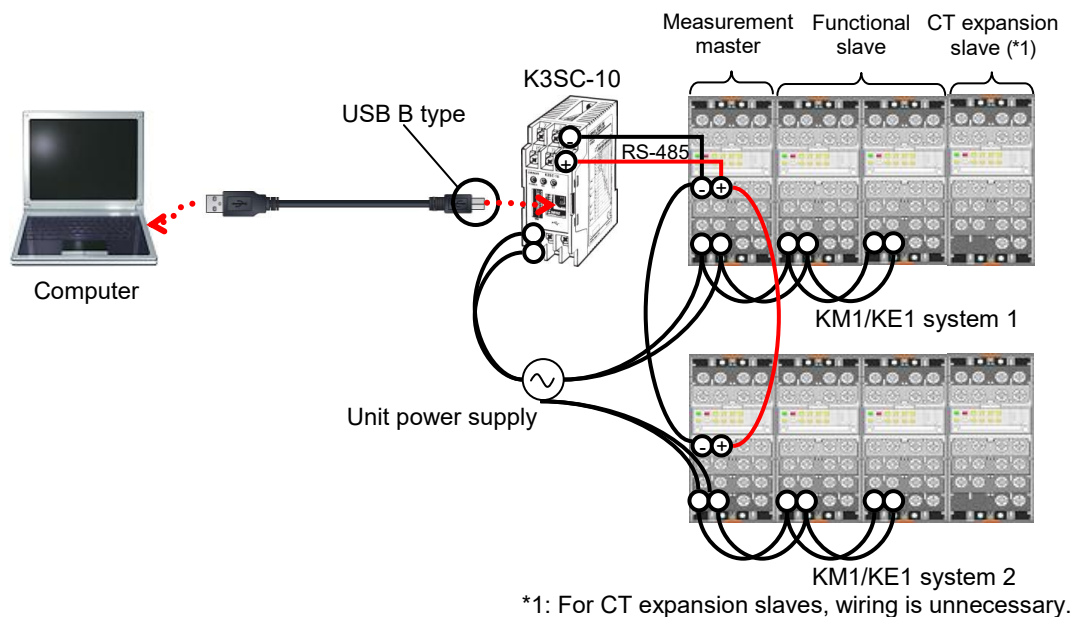
Connect the computer to a measurement master through an USB cable (A Type - mini B Type) with the main unit switched on.



*1: For CT expansion slaves, wiring is unnecessary.

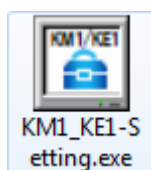
● RS-485 connection

Connect the computer to an USB/RS-485 communication convertor (K3SC-10) through an USB cable (A Type - B Type).



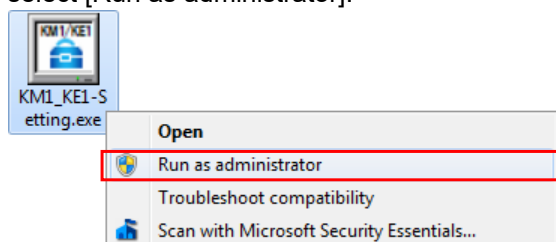
(2) Execution of program file

1. Open the installation folder and double-click on "KM1_KE1-Setting.exe".



[If administrator authority is required]

In case of installing to a folder requiring administrator authority for execution under Windows Vista and Windows 7, such as "C:\Program Files", right-click on "KM1_KE1-Setting.exe" and select [Run as administrator].

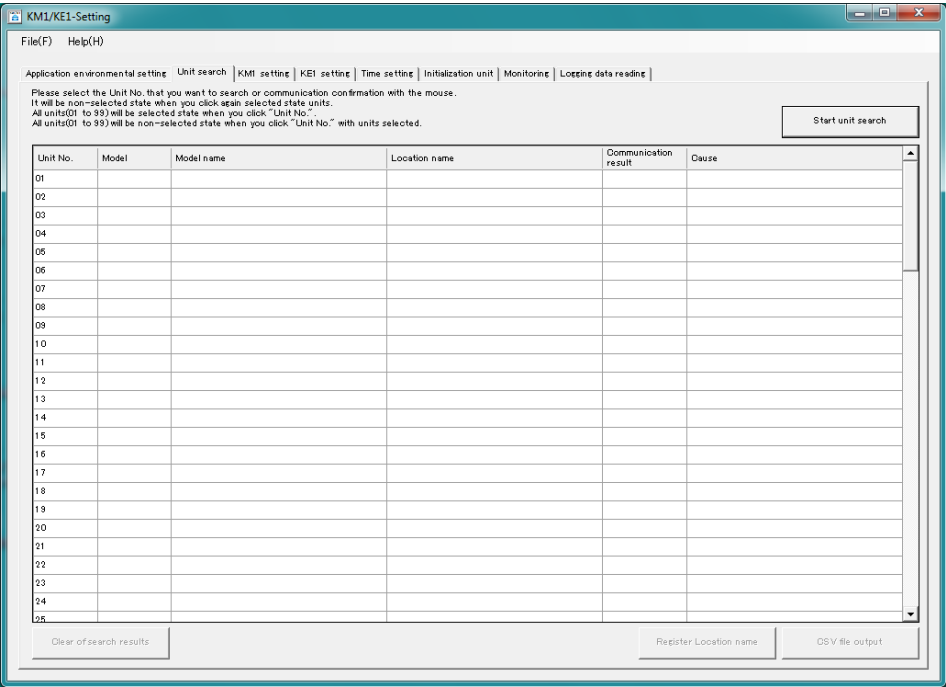


2. start screen will appear for a few seconds.



(3) Selection of connection method

1. For USB connection, select [USB connection] and for RS-485 connection, select [RS-485 connection]. Click on the [OK] button.
2. The [Unit search] screen will appear.



The Software has successfully started.

[If USB virtual COM port cannot be found]

If an USB virtual COM port cannot be found, the message below will appear.

Confirm the USB cable or connect the USB cable again, and then click on the [Search again] button. If the following message appears again, check the connection method.



[Search again] button:

Searches the USB virtual COM port again

[End] button:

Exits the unit without starting the Software

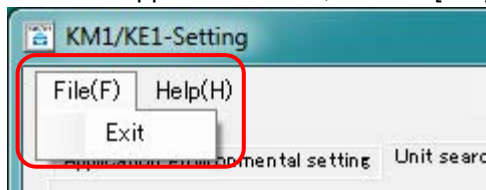
[Continuation] button

Starts the Software without the USB virtual COM port detected

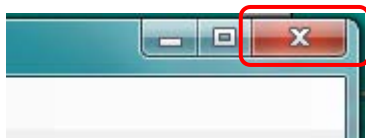
5.1.2. How to exit the Software

■ Operational procedure

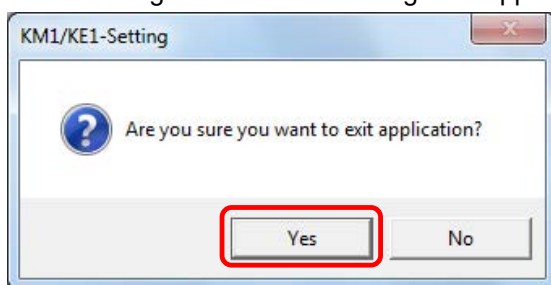
1. From the application menu, click on [File]-[Exit].



Or, click on the [x] button in the upper-right corner of the screen.



2. The following confirmation message will appear. To exit the Software, click on the [Yes] button.

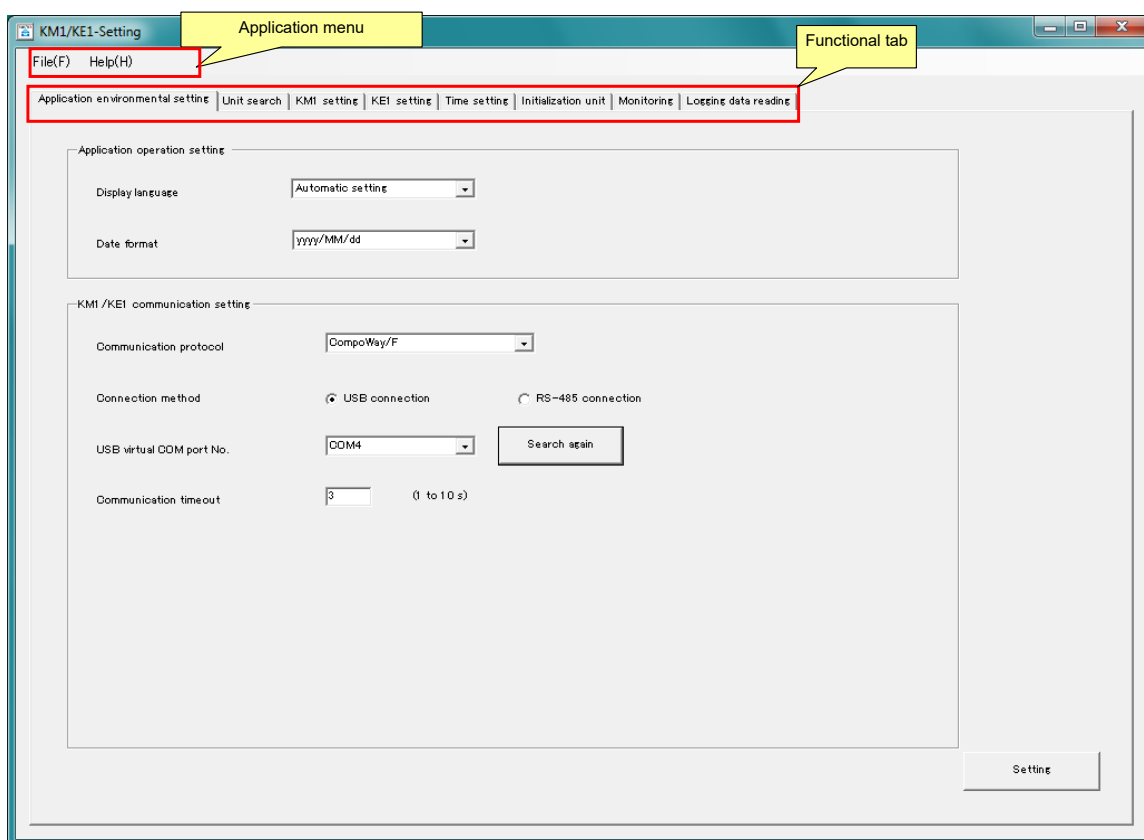


3. Unplug the USB cable from the computer and the main unit, or from the computer and the USB/RS-485 communication convertor (K3SC-10).
The Software has successfully exited.

5.2. Basic operation

5.2.1. Menu/tab configuration

The menu has an application menu and functional tab to run the Software.



5.2.1.1. Application menu

Menu	Description
File(F)	
End	Exits the Software
Help(H)	
Version information	Shows information regarding the Software, such as version information

5.2.1.2. Functional tab

Menu	Description
Application environmental setting	Sets necessary items for the Software to run appropriately
Unit search	Searches for a unit that can be communicated.
KM1 main unit setting	Displays on the screen, modifies and writes setting values for the main unit of KM1 or KE1
KE1 main unit setting	
Time setting	Sets the computer time on a unit that is time-settable
Initialization unit	Initializes the values registered with the main unit of KM1 or KE1
Monitoring	Displays the instantaneous value and the status of KM1 or KE1
Logging data reading	Displays the logging data registered with KM1 or KE1 on the screen
Alarm history	Displays the information registered with the main unit when an alarm occurs
Logging of voltage sag	Displays the information registered with the main unit when voltage sag is detected

5.2.2. Unit models

The following are the unit models displayed on the Software:

Model		Name	Model name used by the Software
KM1	KM1-PMU1A-FLK	Power Measurement Unit	KM1-PMU1A
	KM1-PMU2A-FLK	Power Two-System Measurement Unit	KM1-PMU2A
	KM1-EMU8A-FLK	Pulse/Temperature Input Unit	KM1-EMU8A
KE1	KE1-PGR1C-FLK	Power/Earth Leakage Monitoring Unit	KE1-PGR1C
	KE1-PVS1C-FLK	Power/Voltage-Sag Monitoring Unit	KE1-PVS1C
	KE1-VSU1B-FLK	Voltage-Sag Monitoring Unit	KE1-VSU1B
	KE1-VAU1B-FLK	Voltage/Current Monitoring Unit	KE1-VAU1B
	KE1-CTD8E	CT Expansion Unit	KE1-CTD8E
	KE1-ZCT8E	Zero-phase CT Expansion Unit	KE1-ZCT8E
	KE1-DRT-FLK	DeviceNet Communication Unit	KE1-DRT

5.2.3. Correspondence table for model-specific function

Function	KM1			KE1						
	PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E	DRT
	Measurement master	Measurement master	Functional slave	Measurement master	Measurement master	Functional slave	Functional slave	CT expansion slave	CT expansion slave	Communication slave
	Power Measurement Unit	Power Two-Electrical system Measurement	Pulse/Temperature Input Unit	Power/Earth Leakage Monitoring Unit	Power/Voltage-Sag Monitoring Unit	Voltage-Sag Monitoring Unit	Voltage/Current Monitoring Unit	CT Expansion Unit	Zero-phase CT Expansion Unit	DeviceNet Communication Unit
Unit search	○	○	○	○	○	○	○	○	○	○
KM1 main unit setting	○	○	○	-	-	-	-	-	-	-
KE1 main unit setting	-	-	-	○	○	○	○	○	○	○
Time setting	○	○	-	○	○	△	△	-	-	-
Initialization unit	○	○	○	○	○	○	○	○	○	○
Monitoring	○	○	○	○	○	○	○	○	○	-
Alarm history	○	○	○	○	○	○	○	○	○	-
Logging of voltage sag	-	-	-	-	○	○	-	-	-	-

○: Supported.

-: Not supported.

△: Supported only for independent use. Only time can be read out in case of multiple-unit connection (*1).

*1: In case of multiple-unit connection composition, time is set for the measurement master. Time setting for the slave is unnecessary.

The time on the measurement master will be reflected to the slave.

5.2.4. Unit no. selection column

To identify the unit that you wish to run, specify the Unit No. on each function screen.
After starting the Software, go to unit search to confirm the unit connected. You can specify the unit that is confirmed to be communicated by unit search, on each function screen.
For details, please refer to "5.3.2 Unit search" (p.5-16).

● Unit search and Unit No. list box

If Unit No. 01, 02 and 03 are found by unit search as the diagram below indicates, you can select Unit No. 01, 02 or 03 units from the Unit No. list box on each screen.

The list box will show "Unit No. + model".

Unit No.	Model	Model name	Location name	Communication result
01	KM1-PMU2A	Power/Ten-System Measurement Unit		Passed
02	KM1-EMU8A	Pulse/Temperature Input Unit		Passed
03	KE1-CTD8E	OT Expansion Unit		Passed
04				Failed
05				
06				
07				
08				
09				
10				

(Unit search screen)

Unit No.

01 KM1-PMU2A
01 KM1-PMU2A
02 KM1-EMU8A
03 KE1-CTD8E

(Unit No. list box for each screen)

● Registration of location name

From the [Unit search] screen, register [Location name]. The registered name will be shown as well. The Unit No. list box on each screen will show "Unit No. + Model + Location name".

Unit No.	Model	Model name	Location name	Communication result	Clear
01	KM1-PMU2A	Power/Ten-System Measurement Unit	Bldg.1 8/F A/C 1-2	Passed	Completed
02	KM1-EMU8A	Pulse/Temperature Input Unit	Bldg.1 8/F TEMP.1	Passed	Completed
03	KE1-CTD8E	OT Expansion Unit	Bldg.1 8/F LTG.1-8	Passed	Completed
04				Failed	No response
05					
06					
07					
08					
09					
10					

(Unit search screen)

Unit No.

01 KM1-PMU2A Bldg.1 8/F A/C 1-2
01 KM1-PMU2A Bldg.1 8/F A/C 1-2
02 KM1-EMU8A Bldg.1 8/F TEMP.1
03 KE1-CTD8E Bldg.1 8/F LTG.1-8

(Unit No. list box for each screen)

Note: Different models will be shown depending on the screen. Not all units will be shown on all the screen as the above diagram indicates.

5.2.5. Precautions for setting the unit connected to a power source

Precautions for Correct Use

Every time you changed the settings or initialized a unit connected to the power, unplug the USB cable and restart the power of the entire system.

If you continue the operation without restarting the power, correct values will not be shown for monitoring and logging data reading, or the unit will not be able to communicate with the slave through the measurement master.

Shown below are unit settings that require power restart of the entire system.

KM1 main unit setting

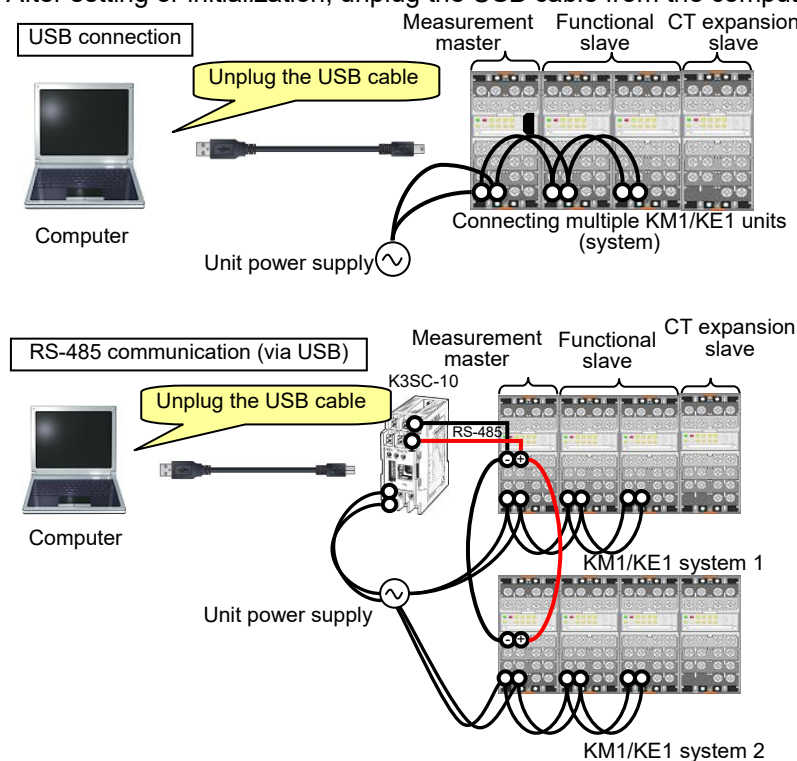
KE1 main unit setting

Time setting

Main unit initialization

Operational procedure

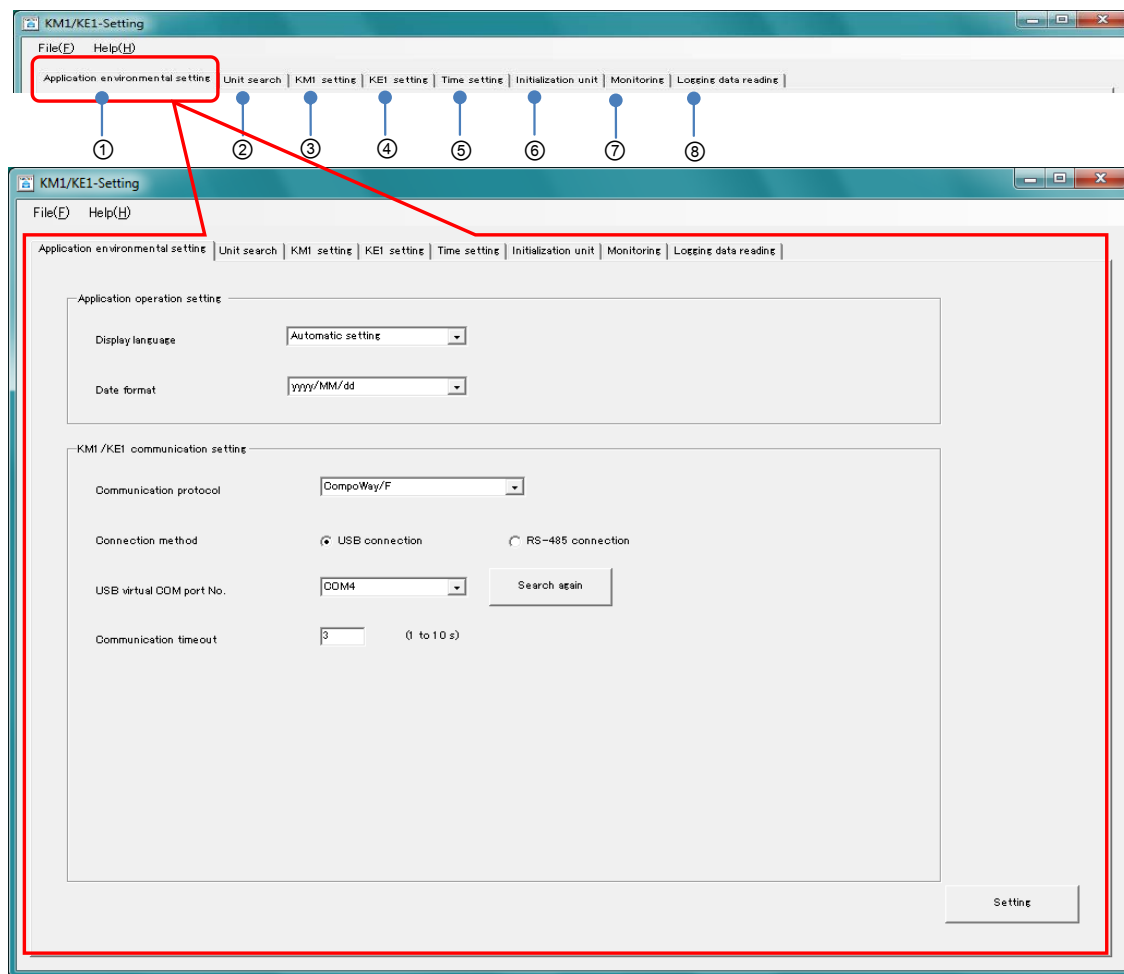
1. After setting or initialization, unplug the USB cable from the computer.



2. Turn off the power of the entire system.
3. Turn on the power again. In case of multiple-unit connection composition, make sure that the LED operational indication [CONN] is lighting after the unit started.
4. Connect the USB cable to the computer.
Communications become available with slave unit(s) through the measurement master.

5.3. On-screen operation

Click on the functional tab, and each function screen will open.



[Details of on-screen operation]

- | | |
|-------------------------------------|--|
| ① Application environmental setting | → refer to “5.3.1 Application environmental setting”(p.5-12) |
| ② Unit search | → refer to “5.3.2 Unit search”(p.5-16) |
| ③ KM1 main unit setting | → refer to “5.3.3 KM1 main unit setting”(p.5-23) |
| ④ KE1 main unit setting | → refer to “5.3.4 KE1 main unit setting”(p.5-53) |
| ⑤ Time setting | → refer to “5.3.5 Time setting”(p.5-69) |
| ⑥ Initialization unit | → refer to “5.3.6 Initialization unit”(p.5-77) |
| ⑦ Monitoring | → refer to “5.3.7 Monitoring”(p.5-81) |
| ⑧ Logging data reading | → refer to “5.3.8 Logging data reading”(p.5-89) |

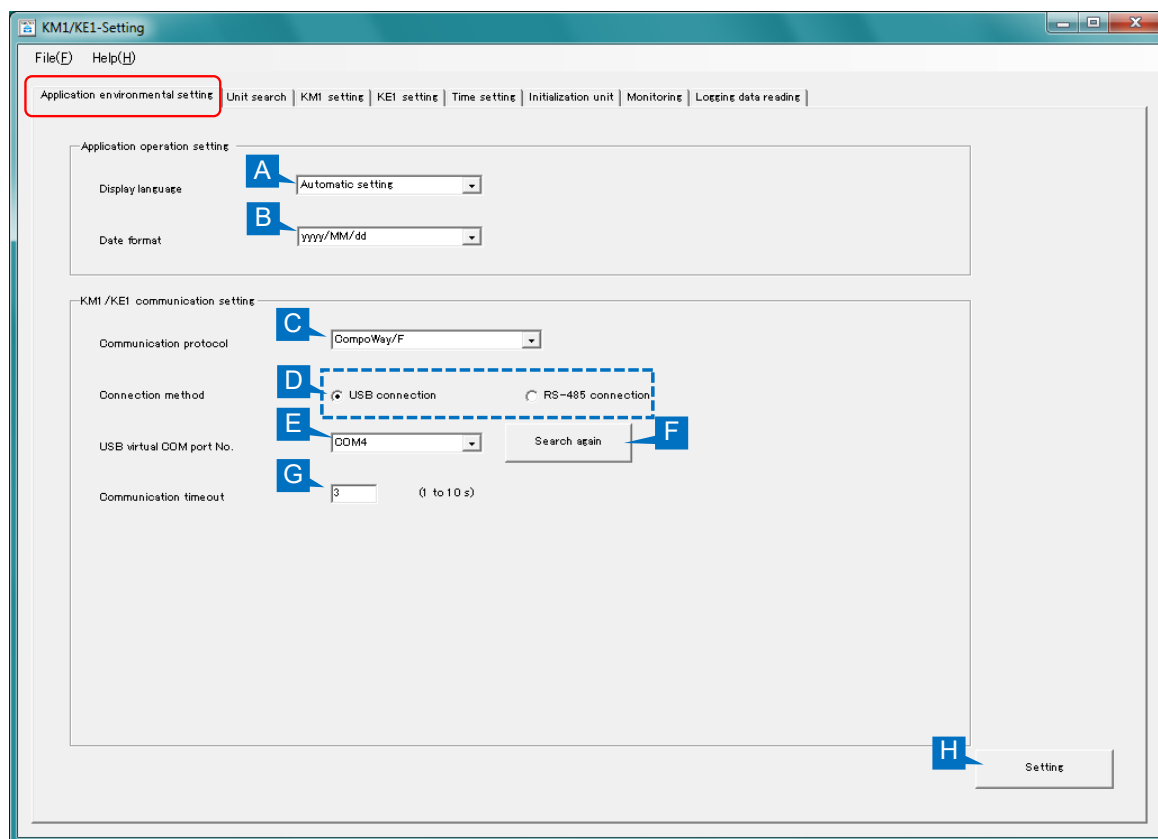
5.3.1. Application environmental setting

The Software operation will be set.

■ Overview of operational procedure

Click on the [Application environmental setting] tab, select items of [Application operation setting] and [KM1/KE1 communication setting], and click on the lower-right [Setting] button on the screen.

■ Operational screen



[Main setting items and functions]

Symbol	Item	Explanation	Initial value
A	Language	Specify the language for the screen display and file output. (Options: Automatic setting, English, Japanese, Korean, Chinese, Taiwanese) · [Automatic setting] Based on the language used for the OS, one of [English], [Japanese], [Korean], [Chinese] and [Taiwanese] will be automatically selected. If the language cannot be identified by the OS, then [English] will be selected. [English]: When you wish to be displayed in English [Japanese]: When you wish to be displayed in Japanese [Korean]: When you wish to be displayed in Korean [Chinese]: When you wish to be displayed in Chinese (simplified) [Taiwanese]: When you wish to be displayed in Chinese (traditional)	Automatic setting
B	Date format	Select the date format to be used for the screens and output files of the Software. (Options: :yyyy/MM/dd, yyyy-MM-dd, M/d/yyyy) (Example) In case of March 10, 2012 yyyy/MM/dd : 2012/03/10 yyyy-MM-dd : 2012-03-10 M/d/yyyy : 3/10/2012	yyyy/MM/dd
C	Communication protocol	Specify a protocol to be used for communication with the unit. (Options: CompoWay/F, Modbus) Note: Make sure the communication protocol matches with the one for the main unit. Confirm the communication protocol by the DIP switch No. 2 on the main unit.	CompoWay/F
D	Connection method	The connection method selected at the time of startup of the Software will be shown. You can switch USB connection to RS-485 connection, and vice versa. (Options: USB connection, RS-485 connection)	USB connection
E	USB virtual COM port No.	The COM port no. will be shown that was automatically recognized at the time of startup of the Software. Switch [Connection method], and the USB virtual COM port for the connection method to be set will be searched and shown automatically. If more than one port is recognized, the smallest number will be shown. If you use any port other than the USB virtual COM port automatically shown, you may select the port of your choice from the list box. Note: The USB virtual COM port that can communicate to the unit is only the one selected here. You cannot use multiple USB virtual COM ports for communication at the same time.	The COM port no. automatically recognized at the time of startup of the Software
F	Search again button	Click on it, and the COM port recognized by OS will be searched again and shown in [USB virtual COM port No.].	
G	Communication timeout	Wait for the communication response from the unit until the specified time. If you do not receive the response from unit within the specified time, it will be deemed to be "No response". In this case, specify a larger value for communication timeout for adjustment. (Setting range: 1 to 10 s) Note: For other expected causes and handling methods in case of "No response", refer to "6.2 Handling of communication errors" (p.6-4).	3 (Recommended)
H	Setting button	The contents you entered will be reflected by clicking on this button.	

■ Operational procedure

● Application environmental setting

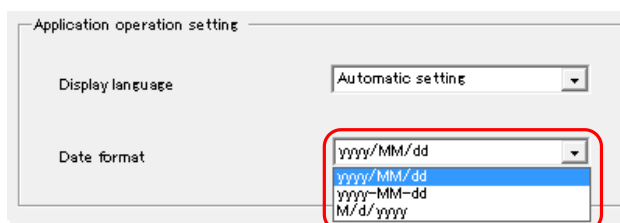
To run the Software with different values from the initial ones, change relevant values.

(1) Application operation setting

1. Select the language to be used on the screen.

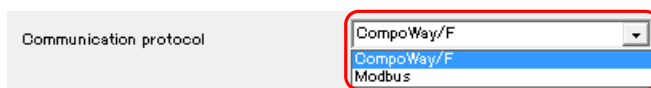


2. Select the date format to be used for the screens and output files.

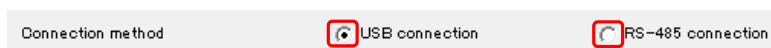


(2) KM1/KE1 communication setting

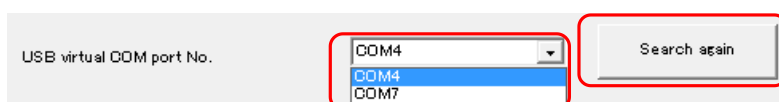
1. Set the communication protocol. It must be matched with the communication protocol for the main unit.



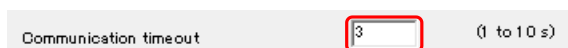
2. In case of changing the connection method with the Software running, select the connection method.



3. When multiple USB virtual COM ports are searched, you can switch [USB virtual COM port No.]. Click on the [Search again] button with the Software running and the USB cable connected, and the recognized USB virtual COM port will be shown in the list box again.



4. Enter the communication timeout time. (1 to 10 s)

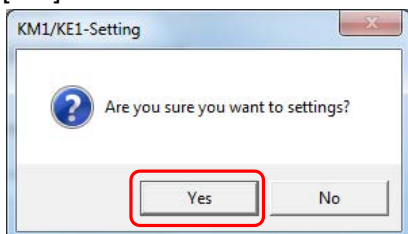


(3) Setting

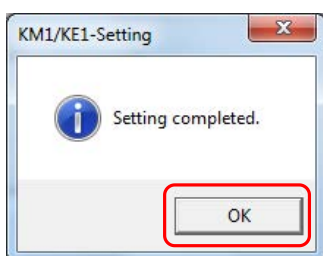
1. To change the settings, click on [Setting].



2. The following confirmation message will appear. To confirm the settings changed, click on the [Yes] button.



3. The following message will appear. Click on the [OK] button.



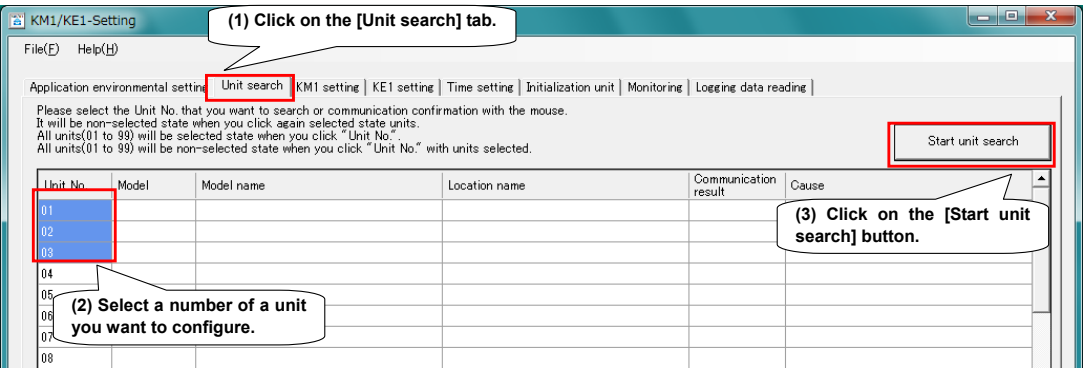
The application environmental setting is complete.

5.3.2. Unit search

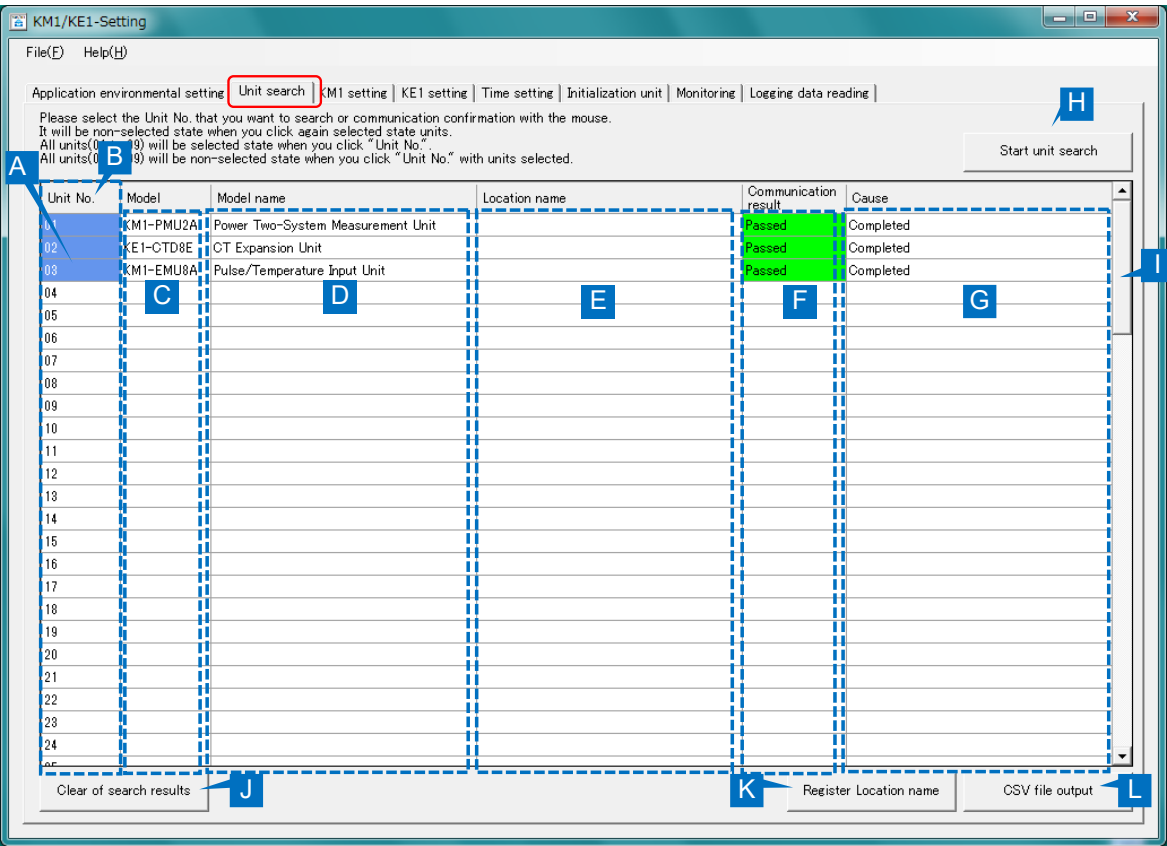
A unit that can communicate with the Software will be searched. To set each unit using the Software, implement unit search on this screen and confirm that the unit can be communicated appropriately.

■ Overview of operational procedure


Click on the [Start unit search] button in the upper-right corner of the screen with the Unit No. selected.



■ Operational screen



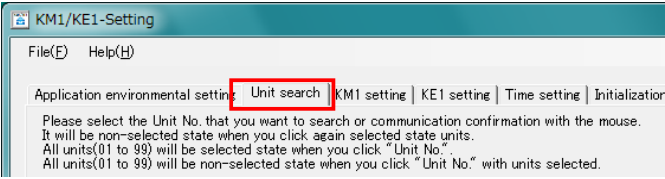
[Main setting items and functions]

Symbol	Item	Explanation
A	Unit No. (01 to 99)	Unit no. 01 - 99 are indicated in serial numbers. Click on the no., and the cell turn blue being in a selective mode as a target unit. Click on the same no. again, and the cell turn white being in a non-selected mode.
B	[Unit No.] (Header)	Click on the [Unit No.], and all [Unit No.] rows will switch to be selective or disabled mode. 
C	Model (01 - 99 lines)	After unit search, the unit model found will be shown. Except for KM1 and KE1, if KM50-C/E, KM20 or KM100 is connected, the relevant model will be shown. Note: KM50-C/E, KM20 and KM100 cannot read out and write the setting values.
D	Model name (01 - 99 lines)	After unit search, the model name of the unit found will be shown.
E	Location name (01 - 99 lines)	After unit search, you can enter a name for the unit found. The location name registered will be shown as a unit name when selecting a unit on each screen. The contents will be stored until clicking on the [Clear of search results] button to clear the data. (No. of digits to be entered: up to 20 single-bytes, 10 double-bytes)
F	Communication result (01 - 99 lines)	After unit search, the search result for the Unit No. selected for search will be shown. [Passed] : If the unit can be communicated properly [Failed] : If the unit fails to be communicated (abnormal of communication) [] : If unit search is not implemented (cancellation of unit search)
G	Cause	If the communication result is "Failed" after unit search, the cause of the communication error will be shown. For details, refer to "6.2 Handling of communication errors" (p.6-4).
H	Start unit search button	Click on this button. Communication will be performed for the unit selected and the results (model, model name, communication result and cause of the communication error) will be shown on the screen.
I	Scroll bar	Scrolls vertically on the screen.
J	Clear of search results button	Click on this button, and [Model], [Model name], [Location name], [Communication result] and [Cause of the communication error] of the unit selected will be cleared and left blank. Without clearing the search results, the contents shown other than the data in the communication result column will be stored even after exiting the Software.
K	Register Location name button	Click on this button, and the contents entered into [Location name] will be registered. The Location name will be shown in the Unit No. list box on each screen. Note: [Location name] is used within the Software. This is not a function that writes data to the main unit.
L	CSV file output button	Click on this button, and the contents shown on the screen will be output to a CSV file.

■ Operational procedure

● Unit search

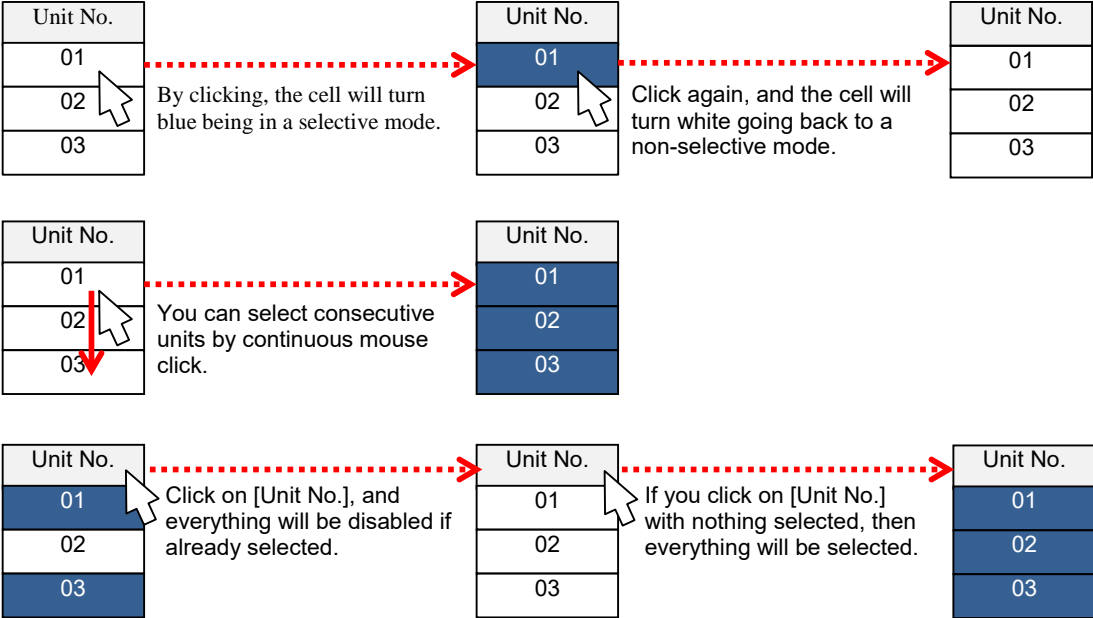
1. Click on the [Unit search] tab to display the Unit search screen.



2. Click on a number of a unit you want to configure.

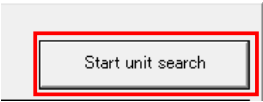
Unit No.	Model	Model name
01		
02		
03		
04		
05		

The cell for the unit selected will be indicated in blue.



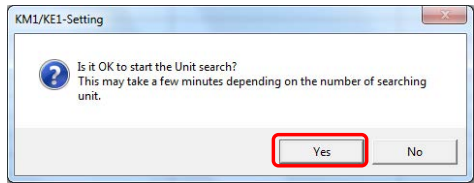
Unit no. for every unit must have been configured beforehand. For Unit No. setting, refer to "2. Flow and steps prior to unit installation (p.2-1)".

3. Click on the [Start unit search] button.



The following dialog box appears.

4. Click on the [Yes] button. Unit search starts.

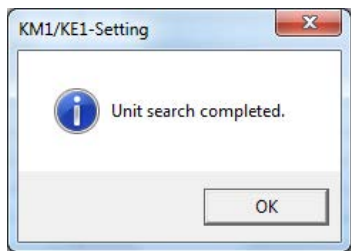


[Model], [Model name], [Communication result] and [Cause of communication error] for each unit will be shown.

For the successful unit, the communication result will be indicated to be [Passed] (green).

Communication result	Cause
Passed	Completed
Passed	Completed
Passed	Completed

5. The following message will appear. Click on the [OK] button.



The unit search is complete.

<Color of cells>

- Unit search failed: Red

If the search fails, [Communication result] for the unit will be indicated in red. Find the cause of the communication error and take necessary measures.

For actions to take, refer to "6.2 Handling of communication errors" (p.6-4).

Unit No.	Model	Model name	Location name	Communication result	Cause
01	KM1-PMU2A	Power Two-System Measurement Unit		Failed	Port open failure

- The model is not matched: Yellow

If the model of the Unit No. found does not match the model retained in the Software, [Model] and [Model name] will be updated and the background will be indicated in yellow.

[Communication result] will be indicated in green. [Location name] will not be updated.

Unit No.	Model	Model name	Location name	Communication result	Cause
01	KM1-PMU2A	Power Measurement Unit		Passed	Completed

- Unit search is cancelled: Gray

If you cancel the unit search on the [Unit searching] screen, [Communication result] for the unit yet to be found will be indicated in gray.

Unit No.	Model	Model name	Location name	Communication result	Cause
01	KM1-PMU2A	Power Measurement Unit		Passed	Completed
02				Failed	No response
03				Failed	No response
04				Unexecuted	
05				Unexecuted	

For the unit found before cancellation, the search result will be shown in [Communication result].

● Registration of location name

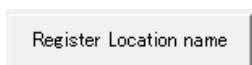
1. Start unit search and enter [Location name] for the unit for which [Communication result] is indicated to be [Passed].

The name registered will be shown along with the Unit No. when selecting the unit on each screen.

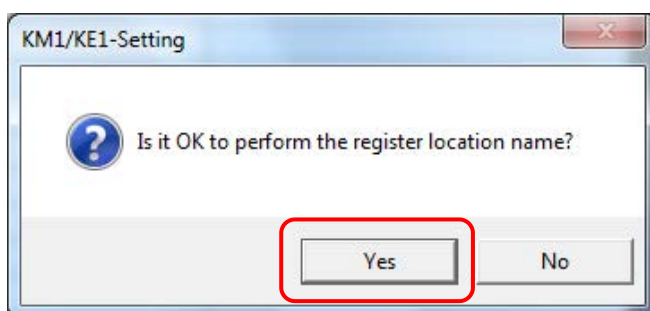
(Up to 20 single-bytes, 10 double-bytes)

Unit No.	Model	Model name	Location name	Communication result	Cause
01	KM1-PMU2A	Power Two-System Measurement Unit	Bldg.1 flr.1 A/C 1-2	Passed	Completed

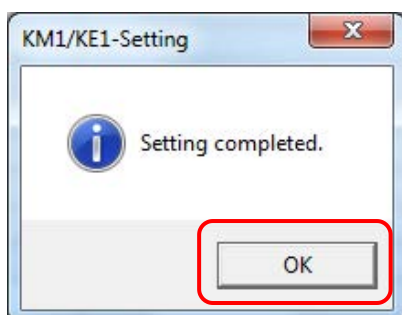
2. Click on the [Register Location name] button.



3. The following confirmation message will appear. To register the location name, click on the [Yes] button.



4. The following message will appear. Click on the [OK] button.



The registration of location name is complete.

Precautions for Correct Use

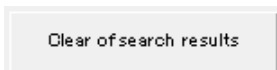
The location name will not be written to the main unit. Therefore, the location name will be deleted by clearing the search result and the location name previously found will be not be shown even after searching again.

● Clear of search results

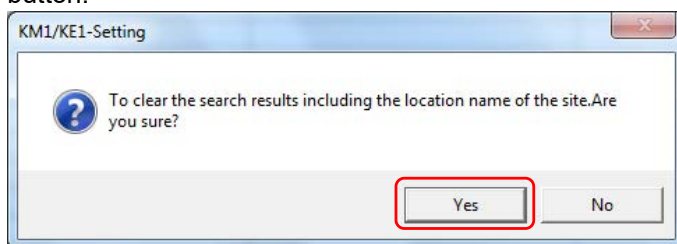
1. Select the Unit No. for which the search result will be cleared. The unit can be selected in the same way as "Unit search" (p.5-18).

Unit No.	Model	Model name	Location name	Communication result	Cause
01	KM1-PMU2A	Power Two-System Measurement Unit	Bldg.1 flr.1 A/C 1-2	Passed	Completed
02	KM1-EMU8A	Pulse/Temperature Input Unit	Bldg.1 flr.1 TEMP.1	Passed	Completed
03	KE1-OTD8E	OT Expansion Unit	Bldg.1 flr.1 LTG.1-8	Passed	Completed

2. Click on the [Clear of search results] button.



3. The following confirmation message will appear. To clear the search result, click on the [Yes] button.



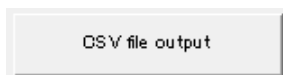
4. Only the search result of the unit selected will be left blank.

Unit No.	Model	Model name	Location name	Communication result	Cause
01					
02	KM1-EMU8A	Pulse/Temperature Input Unit	Bldg.1 flr.1 TEMP.1	Passed	Completed
03	KE1-OTD8E	OT Expansion Unit	Bldg.1 flr.1 LTG.1-8	Passed	Completed

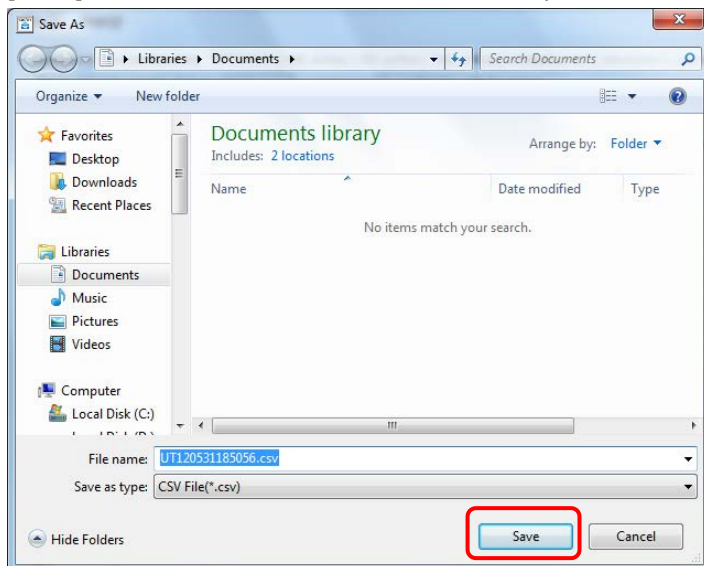
The clear of search result is complete.

- CSV file output

1. To save the search result, click on the [CSV file output] button.



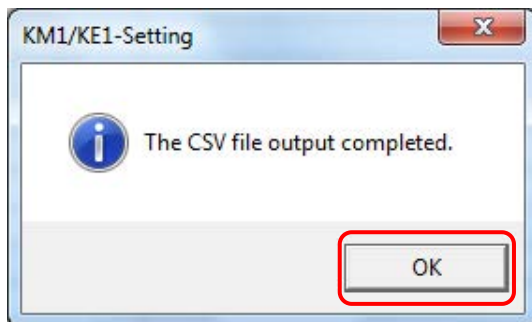
2. The [Save as a new file] screen will appear. Specify the folder to save the file and click on the [Save] button. The contents shown will be output to a CSV file.



Note 1: For the format of the CSV file output, refer to "7.4.1 Unit research result file"(p.7-24).

Note 2: If the CSV file shows garbled characters, refer to "6.7 Garbled characters shown when opening a CSV file output" (p.6-19).

3. The following message will appear. Click on the [OK] button.



The output to the CSV file is complete.

5.3.3. KM1 main unit setting

The main unit of KM1 series will be set.

The setting values of the main unit will be read out, shown on the screen, modified and written.

Shown below is a list of unit models available for setting in the KM1 setting screen.

Series Name	Model	Name	Abbreviation
KM1	KM1-PMU1A-FLK	Power Measurement Unit	PMU1A
	KM1-PMU2A-FLK	Power Two-System Measurement Unit	PMU2A
	KM1-EMU8A-FLK	Pulse/Temperature Input Unit	EMU8A

The symbol "○" or "◎" for each function described on the Setup Item List for each category tab means that the item is settable, while "-" indicating that the item is not settable.

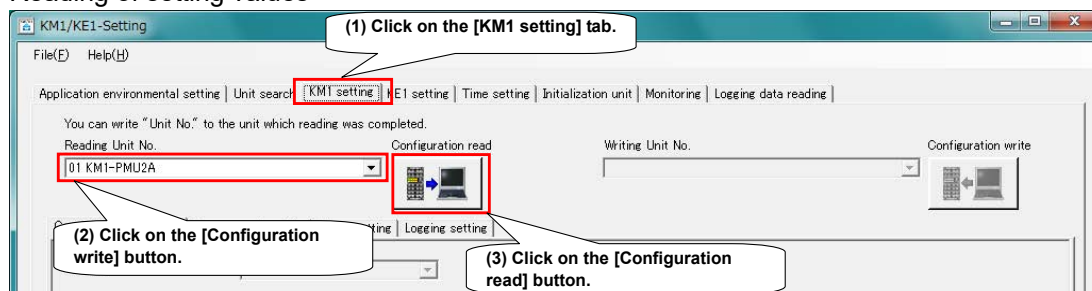
Precautions for Correct Use

- In case of writing the setting values to a unit different from the unit that read out those settings value, only the same model of unit is available for writing.
- When the setting values are written to the same model of a different unit, items other than the Unit No. will be written.
- If you change the Unit No., make sure that you can start unit search with the Unit No. changed and the unit can be connected.
- When the setting values are written to the unit with the power switched on, unplug the USB cable from the computer after writing and restart the power of the entire system.
For details, refer to "5.2.5 Precautions for setting the unit connected to a power source"(p.5-10).
- To the KM1 master unit, KE1 series CT expansion unit (CTD8E) can be connected. In the [KM1 setting] screen, you cannot configure the setting of a CT expansion unit (CTD8E) connected to the KM1 master unit. Always use the [KE1 setting] screen to set.

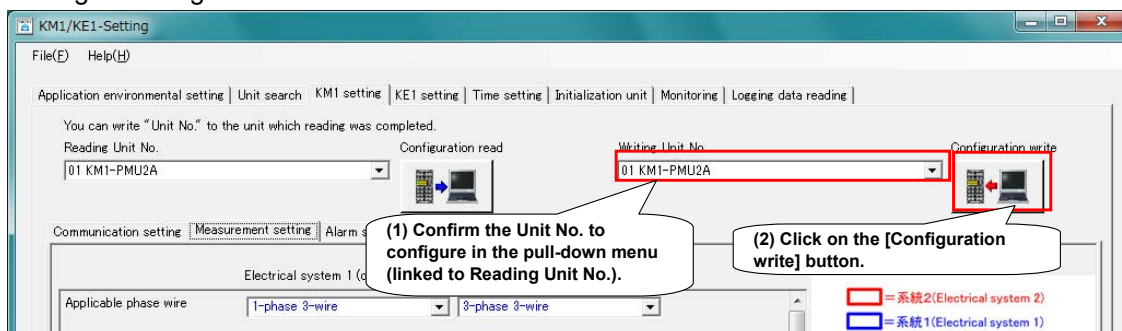
■ Overview of operational procedure

From [Reading Unit No.], select the unit for which setting values will be read out, click on the [Configuration read] button. Change the setting values for each category tab. From [Writing Unit No.], select the Unit No. for which setting values will be written, and click on the [Configuration write] button.

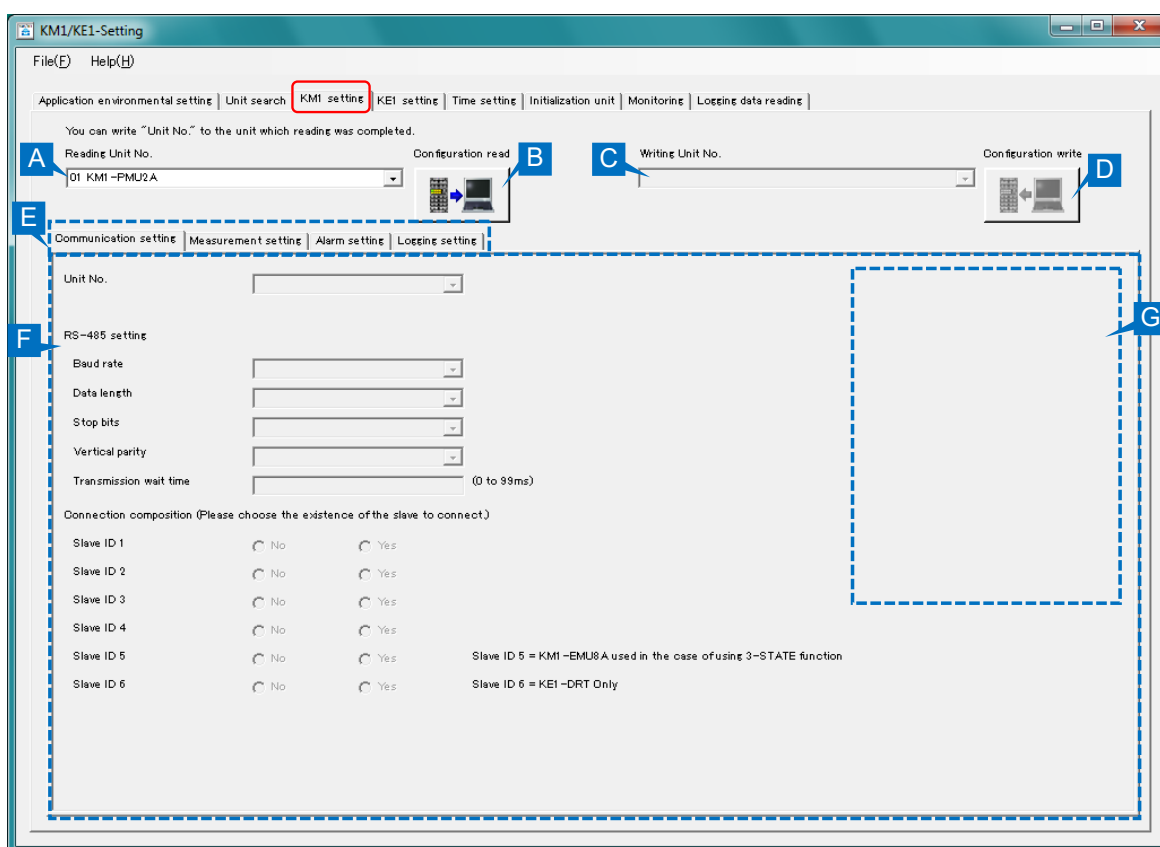
Reading of setting values



Writing of setting values



■ Operational screen



[Main setting items and functions]

Symbol	Item	Explanation
A	Reading Unit No.	Select the unit for which the setting values will be read out. "Unit No. + Model + Location name" will be shown.
B	Configuration read button	Click this button, and each setting value will be acquired for the unit selected and shown on the screen.
C	Writing Unit No.	Selects the unit for which the setting values will be written. "Unit No. + Model + Location name" will be shown.
D	Configuration write button	By clicking, writes the contents of each setting value information to the main unit. The information can be written to the unit only when the unit for reading is of the same model of unit.
E	Category tab	By clicking, shows setting values according to category. (Category tab: communication setting, measurement setting, alarm setting and logging setting)
F	Each setting value information	Shows the setting values selected by the category tab. If there is a need to change the setting values, you may do so by

5 Operation description

Symbol	Item	Explanation
		selection or keyboard entry. Note 1: For the detailed functions for each setting value, refer to "Model KM1 User's Manual". Note 2: For the settings related to RS-485 communication ([RS-485 setting] column), set the contents responding to the settings of K3SC-10.
G	Applicable phase wire guide ([Measurement setting] tab)	By clicking on the [Measurement setting] tab, shows a wiring method for applicable phase wires. For details of the applicable phase wire, please refer to "7.2 Terminal diagram (Main unit setting for KM1or KE1)" (p.7-8).

[Information screen for each category tab]

(Communication setting)

Communication setting | Measurement setting | Alarm setting | Logging setting

Unit No.

RS-485 setting

Baud rate

Data length

Stop bits

Vertical parity

Transmission wait time (0 to 99ms)

Connection composition (Please choose the existence of the slave to connect)

Slave ID 1 ☐ No ☒ Yes

Slave ID 2 ☒ No ☐ Yes

Slave ID 3 ☒ No ☐ Yes

Slave ID 4 ☒ No ☐ Yes

Slave ID 5 ☐ No ☒ Yes

Slave ID 6 ☒ No ☐ Yes

Slave ID 5 = KM1-EMU8A used in the case of using 3-STATE function

Slave ID 6 = KE1-DRT Only

(Measurement setting)

Communication setting | Measurement setting | Alarm setting | Logging setting

Electrical system 1 (or common) Electrical system 2

Applicable phase wire

Special CT

VT ratio (e.g. 6600/110V = 60.00) (0.01 to 99.99)

CT ratio (e.g. 200/5A = 40) (1 to 1000)

Low-cut current (0.1 to 19.9%)

Simple measurement ☒ OFF ☐ ON

Voltage on simple measurement (0.1 to 9999.9V)

Power factor on simple measurement (0.01 to 1.00)

Average count

G

□ = 系統2(Electrical system 2)
□ = 系統1(Electrical system 1)

電圧2 (Voltage 2)
電圧1 (Voltage 1)
回路3 (Circuit 3)
回路1 (Circuit 1)

(Alarm setting)

Communication setting | Measurement setting | Alarm setting | Logging setting

Electrical system 1 (or common)		Electrical system 2	
Alarm parameter setting	<input type="checkbox"/> Over voltage alarm <input type="checkbox"/> Under voltage alarm <input type="checkbox"/> Over current alarm <input type="checkbox"/> Under current alarm <input type="checkbox"/> Active power upper limit alarm <input type="checkbox"/> Active power lower limit alarm <input type="checkbox"/> Reactive power upper limit alarm <input type="checkbox"/> Reactive power lower limit alarm <input type="checkbox"/> Power factor alarm	<input type="checkbox"/> Over voltage alarm <input type="checkbox"/> Under voltage alarm <input type="checkbox"/> Over current alarm <input type="checkbox"/> Under current alarm <input type="checkbox"/> Active power upper limit alarm <input type="checkbox"/> Active power lower limit alarm <input type="checkbox"/> Reactive power upper limit alarm <input type="checkbox"/> Reactive power lower limit alarm <input type="checkbox"/> Power factor alarm	
Over voltage alarm			
Threshold	528.0	528.0	(0 to 12100.0V)
Hysteresis	24.0	24.0	(0 to 2200.0V)
On delays	01	01	(0.1 to 10.0s)
Under voltage alarm			
Threshold	85.0	85.0	(0 to 12100.0V)
Hysteresis	24.0	24.0	(0 to 2200.0V)
On delays	01	01	(0.1 to 10.0s)

(Logging setting)

Communication setting | Measurement setting | Alarm setting | Logging setting

Data logging 1 item	Voltage MAX 1	Data logging 1 cycle	5min
Data logging 2 item	Voltage MAX 2	Data logging 2 cycle	5min
Data logging 3 item	Voltage MAX 3	Data logging 3 cycle	5min
Data logging 4 item	Voltage MIN 1	Data logging 4 cycle	5min
Data logging 5 item	Voltage MIN 2	Data logging 5 cycle	5min
Data logging 6 item	Voltage MIN 3	Data logging 6 cycle	5min

<Colors of setting values>

Setting values read out are indicated in blue.

Unit No.

Setting values changed are indicated in red. Setting values after writing:

Unit No.

Setting values written are indicated in black.

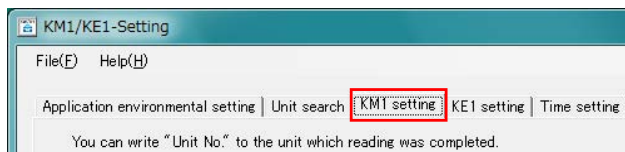
Unit No.

Unit No.

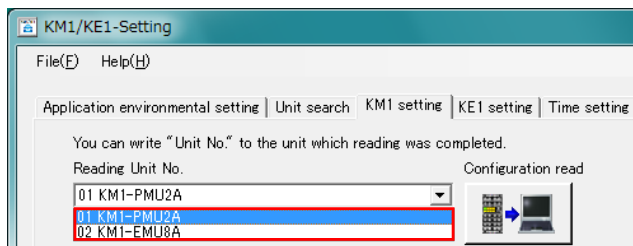
■ Operational procedure

● Specify a Unit No. and read out the current setting values

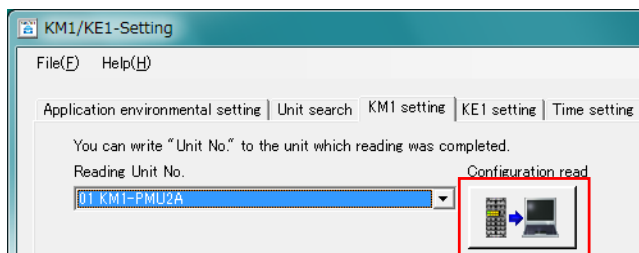
1. Click on the [KM1 setting] tab to display the KM1 setting screen.



2. Click on a number of a unit you want to configure from the [Reading Unit No.] pull-down menu.

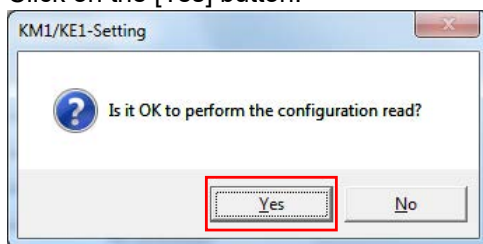


3. Click on the [Configuration read] button.



The following dialog box appears.

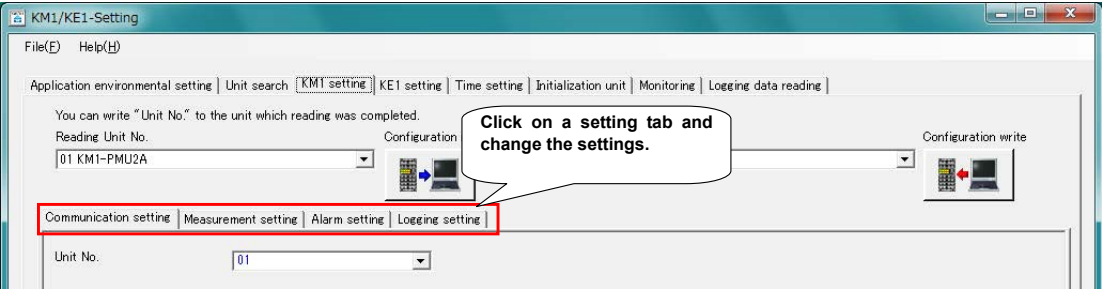
5. Click on the [Yes] button.



When the configuration read is successful, the setting item will be indicated as active instead of being grayed out. Configure the setting values for each category tab if necessary.

● Change the setting values

Click on a category tab shown below one by one and change the read KM1/KE1 settings.

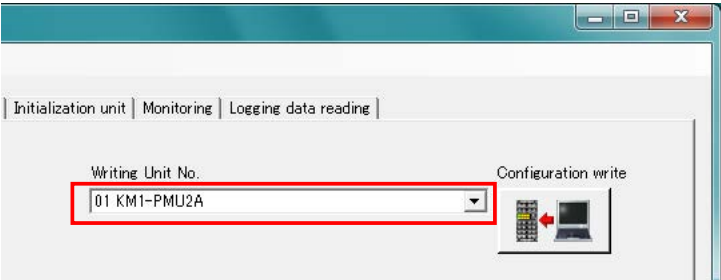


For details of the setting items in each category tab, please refer to the following pages.

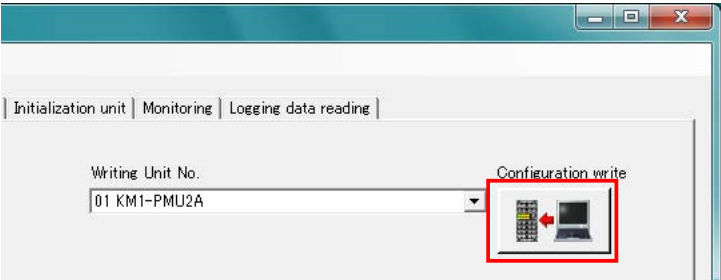
Category tabs in the [KE1 setting] screen	Reference page
[Communication setting] tab	p.5-30
[Measurement setting] tab	p.5-33
[Alarm setting] tab	p.5-44
[Logging setting] tab	p.5-51

● Write the setting values

1. Confirm that each Unit No. you configured should be displayed.

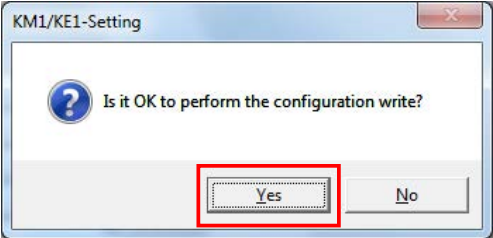


2. Click on the [Configuration write] button.

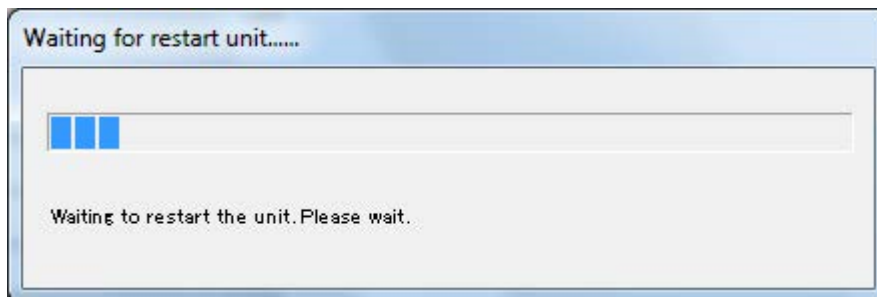


The following dialog box appears.

3. To write the main unit settings, click on the [Yes] button.



The following progress bar appears, reflecting the settings.



Note: In case an error occurs during the communication with the unit, the cause of communication error will be shown on the communication result screen. For details of the cause of the error, please refer to "6.2 Handling of communication errors" (p.6-4).

4. The [Waiting for restart the unit] screen will disappear and the setting values will be shown in black.

If the unit power is on, unplug the USB cable from the computer and turn on the power of the entire system again.

Now, the writing of the main unit setting has been completed.

5.3.3.1. Communication setting

Shown below is a list of setting items of each category tab in the [KE1 setting] screen.

[Communication setting] tab

[Setup Item List]

Setup Item Name		Explanation	Options/setting range	Initial value	KM1-		
					PMU1A	PMU2A	EMU8A
Unit No.		Set an identification number for communications with upper equipment (including the setting tool and EW700). * To connect multiple measurement master units, the unit numbers must be unique for all the units, including the measurement master and slave units.	01, 02, 03, 04, ..., 99	01	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
RS-485 setting	Baud rate	Use the baud rate of upper equipment, if the baud rate of upper equipment connecting through RS-485 is other than 9.6kbps, or if you want higher baud rate with upper equipment.	9.6kbps, 19.2kbps, 38.4kbps	9.6kbps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Data length	In general use the initial value.	7 bits, 8 bits	7 bits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Stop bits	Use the communication conditions of upper equipment, if the communication conditions of upper equipment connecting through RS-485 are other than data length of 7 bits, stop bits of 2 bits, or even parity.	1 bit, 2 bits	2 bits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Vertical parity	To use EW700 as upper equipment, set as shown below. • Data length: 7 bits • Stop bits: 2 bits • Vertical parity: Even	No, Even, Odd	Even	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Transmission wait time	In general use the initial value. Set a value larger than the initial value if the communication receiving process of the upper equipment connecting through RS-485 is too slow.	(0 to 99ms)	20ms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Setup Item Name		Explanation	Options/setting range	Initial value	KM1-		
					PMU1A	PMU2A	EMU8A
Connection composition	Slave ID1	To recognize a slave with the slave ID1 in the connection composition, set to "Enabled".	Disabled, Enabled	Disabled	<input type="radio"/>	<input type="radio"/>	-
	Slave ID2	To recognize a slave with the slave ID2 in the connection composition, set to "Enabled".	Disabled, Enabled	Disabled	<input type="radio"/>	<input type="radio"/>	-
	Slave ID3	To recognize a slave with the slave ID3 in the connection composition, set to "Enabled".	Disabled, Enabled	Disabled	<input type="radio"/>	<input type="radio"/>	-
	Slave ID4	To recognize a slave with the slave ID4 in the connection composition, set to "Enabled".	Disabled, Enabled	Disabled	<input type="radio"/>	<input type="radio"/>	-
	Slave ID5	To recognize an EMU8A slave (only if using the 3-STATE function or specific power consumption function in the event input) with the slave ID5 in the connection composition, set to "Enabled".	Disabled, Enabled	Disabled	<input type="radio"/>	<input type="radio"/>	-
	Slave ID6	To recognize a DRT slave with the slave ID6 in the connection composition, set to "Enabled".	Disabled, Enabled	Disabled	<input type="radio"/>	<input type="radio"/>	-

■ How to set major functions

Shown below are methods to set major functions of the KM1. Explanations are given in the balloons on the setting screens based on the setting examples described in "3 Setting major functions".

● Setting Unit No.

To assign unit numbers from 01 to 99 in the RS-485 communications system, use the following screen.

Communication setting | Measurement setting | Alarm setting | Logging setting

Unit No.

RS-485 setting

Baud rate

Data length

Stop bits

Vertical parity

Transmission wait time (0 to 99ms)

Connection composition (Please choose the existence of the slave to connect.)

Slave ID 1 ☐ No ☒ Yes

Slave ID 2 ☒ No ☐ Yes

Slave ID 3 ☒ No ☐ Yes

Slave ID 4 ☒ No ☐ Yes

Slave ID 5 ☐ No ☒ Yes

Slave ID 6 ☒ No ☐ Yes

Slave ID 5 = KM1-EMU8A used in the case of using 3-STATE function

Slave ID 6 = KE1-DRT Only

● Setting RS-485 communication

To configure RS-485 communication conditions other than the initial values, use the following screen.

Communication setting | Measurement setting | Alarm setting | Logging setting

Unit No.

RS-485 setting

Baud rate

Data length

Stop bits

Vertical parity

Transmission wait time (0 to 99ms)

Connection composition (Please choose the existence of the slave to connect)

Slave ID 1	<input type="radio"/> No	<input checked="" type="radio"/> Yes
Slave ID 2	<input checked="" type="radio"/> No	<input type="radio"/> Yes
Slave ID 3	<input checked="" type="radio"/> No	<input type="radio"/> Yes
Slave ID 4	<input checked="" type="radio"/> No	<input type="radio"/> Yes
Slave ID 5	<input type="radio"/> No	<input checked="" type="radio"/> Yes
Slave ID 6	<input checked="" type="radio"/> No	<input type="radio"/> Yes

Slave ID 5 = KM1-EMU8A used in the case of using 3-STATE function
Slave ID 6 = KE1-DRT Only

Precautions for Correct Use

To change the RS-485 communication settings with RS-485 connection (USB via), the same communications settings must be applied to the following between three items.

Main unit (through [KM1 setting] or [KE1 setting] screen - [Communication setting] tab)

The Software (through [Application environmental setting] screen)

USB/RS-485 communication converter (with DIP switch for the K3SC-10 main unit)

If the communication settings are different for the main unit, the Software, and the USB/RS-485 converter, communications will be unavailable.

If communications are unavailable due to incorrect communication settings of a unit, turn off the unit power and reconfigure the settings through USB connection.

● Connection composition setting

If you have a slave unit to connect to the measurement master unit, set its slave ID in the following screen.

Communication setting | Measurement setting | Alarm setting | Logging setting

Unit No.

RS-485 setting

Baud rate

Data length

Stop bits

Vertical parity

Transmission wait time

Connection composition (Please choose the existence of the slave to connect)

Slave ID 1	<input type="radio"/> No	<input checked="" type="radio"/> Yes
Slave ID 2	<input checked="" type="radio"/> No	<input type="radio"/> Yes
Slave ID 3	<input checked="" type="radio"/> No	<input type="radio"/> Yes
Slave ID 4	<input checked="" type="radio"/> No	<input type="radio"/> Yes
Slave ID 5	<input type="radio"/> No	<input checked="" type="radio"/> Yes
Slave ID 6	<input checked="" type="radio"/> No	<input type="radio"/> Yes

Slave ID 5 = KM1-EMU8A used in the case of using 3-STATE function
Slave ID 6 = KE1-DRT Only

5.3.3.2. Measurement setting

[Measurement setting] tab

Communication setting | **Measurement setting** | Alarm setting | Logging setting

Electrical system 1 (or common) Electrical system 2

Applicable phase wire: 3-phase 3-wire 3-phase 3-wire

Special CT: 100A 100A

VT ratio (e.g. 6600/110V = 60.00): 1.00 1.00 (0.01 to 99.99)

CT ratio (e.g. 200/5A = 40): 1 1 (1 to 1000)

Low-cut current: 0.6 0.6 (0.1 to 19.9%)

Simple measurement: ☒ OFF ☐ ON

Voltage on simple measurement: 110.0 110.0 (0.1 to 9999.9V)

Power factor on simple measurement: 1.00 1.00 (0.01 to 1.00)

Average count: OFF

[Setup Item List]

Setup Item Name	Explanation	Options/setting range	Initial value	KM1-		
				PMU1A	PMU2A	EMU8A
Applicable phase wire (Electrical system 1, Electrical system 2)	Phase/wire type for measurement is set for each voltage input system. * Between slaves connected to the measurement master unit, the same phase-wire must be configured for each electrical system.	Electrical system 1 1-phase 2-wire, 1-phase 3-wire, 3-phase 3-wire, 3-phase 4-wire (*1) Electrical system 2 1-phase 2-wire, 1-phase 3-wire, 3-phase 3-wire *1:"3-phase 4-wire" cannot be selected for PMU2A.	Electrical system 1: 3-phase 3-wire Electrical system 2: 3-phase 3-wire	○	◎	-
Special CT (Electrical system 1, Electrical system 2)	Set the Special CT type (capacity).	5A, 50A, 100A, 200A, 400A, 600A	100A	○	◎	-

Note: "◎" symbol indicates that the setting is available for both Electrical systems 1 and 2, or measurement blocks 1 and 2.

5 Operation description

Setup Item Name		Explanation	Options/setting range	Initial value	KM1-		
					PMU1A	PMU2A	EMU8A
VT ratio (Electrical system 1, Electrical system 2)		Set a ratio of the rated voltage of the general-purpose VT to the rated voltage of the measurement master unit. To measure output voltage using a general-purpose VT on the primary end, you can measure voltage of the scale multiplier specified here for the normal rated voltage of the measurement master unit on the secondary end.	(0.01 to 99.99)	1.00	○	⊗	-
CT ratio (Electrical system 1, Electrical system 2)		Set a ratio of the rated current of the general-purpose VT to the rated current of the special CT with the rated current of 5A on the secondary end. To measure output current by the special CT using a general-purpose CT on the primary end, you can measure current of the scale multiplier specified here for the normal rated current of the special CT.	(1 to 1000)	1	○	⊗	-
Low-cut current (Electrical system 1, Electrical system 2)		Set a value to forcibly set the current and power to 0 when the measured current falls under a percentage value of the normal rated current.	(0.1 to 19.9%)	0.6%	○	⊗	-
Simple measurement (Common)		Set whether the simple measurement function should be used or not.	OFF (Regular measurement), ON (Simple measurement)	OFF	○	○	-
	Voltage on simple measurement (Electrical system 1, Electrical system 2)	Set a voltage for internal calculation when simple measurement function is used.	(0.1 to 9999.9V)	110.0V	○	⊗	-
	Power factor on simple measurement (Electrical system 1, Electrical system 2)	Set a power factor for internal calculation when simple measurement function is used.	(0.01 to 1.00)	1.00	○	⊗	-
Average Count (Common)		Set a measurement count for the averaging process of the following measured values. Active power, current, voltage, power factor, reactive power If set to OFF, an instantaneous value of every 100ms is provided as it is.	OFF, 2 times, 4 times, 8 times, 16 times, 32 times, 64 times, 128 times, 256 times, 512 times, 1024 times	OFF	○	○	-
Pulse output unit (Common)		If "Total power consumption pulse output" is set to one of the Output terminal 1-3 function settings, Total power consumption for one pulse is configured.	1Wh, 10Wh, 100Wh, 1kWh, 2kWh, 5kWh, 10kWh, 20kWh, 50kWh, 100kWh	100Wh	○	○	-

Note: "⊗" symbol indicates that the setting is available for both Electrical systems 1 and 2, or measurement blocks 1 and 2.

5 Operation description

Setup Item Name	Explanation	Options/setting range	Initial value	KM1-		
				PMU1A	PMU2A	EMU8A
Pulse output circuit (Common)	If "Total power consumption pulse output" is set to one of the Output terminal 1-3 function settings, total power consumption pulse output of which circuit is configured.	Circuit 1, Circuit 2, Circuit 3, Circuit 4	Circuit 1	○	○	-
Total power coefficient (Electrical system 1, Electrical system 2)	Set a coefficient to multiply the total power consumption. This allows you to calculate CO2 emission, charge, and so on. If the initial value of 1.00 is used, the total power consumption remains one that is not converted.	(0.000 to 9999.999)	1.000	○	⊙	-
3-STATE target (Electrical system 1, Electrical system 2)	Set a 3-STATE classification condition.	Power, Current, Voltage, Event input, No	None	○	⊙	-
3-STATE/power consumption rate event input (Electrical system 1, Electrical system 2)	3-STATE/power consumption rate event input (Electrical system 1, Electrical system 2)	Set an event input terminal of EMU8A based on which 3-STATE classification is performed or power consumption is calculated.	1 and 2, 3 and 4, 5 and 6 (Terminal for event input)	○	⊙	-
	3-STATE HIGH threshold (Electrical system 1, Electrical system 2)	To 3-STATE classify based on power (by 1W), current (by 0.1A), or voltage (by 0.1V), set a threshold to evaluate as a HIGH condition.	(-120000000 to 120000000)	○	⊙	-
	3-STATE LOW threshold (Electrical system 1, Electrical system 2)	To 3-STATE classify based on power (1W unit), current (0.1A unit), or voltage (0.1V unit), set a threshold to evaluate as a LOW condition.	(-120000000 to 120000000)	○	⊙	-
	3-STATE hysteresis (Electrical system 1, Electrical system 2)	To 3-STATE classify based on power (1W unit), current (0.1A unit), or voltage (0.1V unit), set a hysteresis value.	(0 to 24000000)	○	⊙	-
Measurement start time (Common)	Set a start time to calculate the following items. Pulse input count, specific power consumption, pulse input ON time, 3-STATE total power consumption, 3-STATE total time	(00:00 to 23:59)	00:00	○	○	-

Note: "⊙" symbol indicates that the setting is available for both Electrical systems 1 and 2, or measurement blocks 1 and 2.

5 Operation description

Setup Item Name		Explanation	Options/setting range	Initial value	KM1-		
					PMU1A	PMU2A	EMU8A
Measurement end time (Common)		Set an end time to calculate the following items. Pulse input count, specific power consumption, pulse input ON time, 3-STATE total power consumption, 3-STATE total time	(00:01 to 24:00)	24:00	○	○	-
Event input setting 1 (Common)		Set the event input 1 to use in which of the following functions. Pulse input count (including specific power consumption function), pulse input ON time, 3-STATE function	P.CSP (Pulse input count) H-ON (Pulse input ON time) 3-ST (3-STATE classification)	P.CSP	-	-	○
	NPN/PNP input mode setting	Set the event input 1 to use in which of the functions, no-voltage (NPN) or voltage (PNP).	PNP, NPN	PNP	-	-	○
	Input mode setting	Set the event input 1 to use in which of the following logics. N-O (Normally open): Outputs ON when input is on and OFF when input is off. N-C (Normally closed): Outputs ON when input is off and OFF when input is on.	N-O (Normally open) N-C (Normally closed)	N-O	-	-	○
Event input setting 2 (Common)		Same as Event input setting 1	Same as on the left	P.CSP	-	-	○
	NPN/PNP input mode setting	Same as NPN/PNP input setting of Event input setting 1	Same as on the left	PNP	-	-	○
	Input mode setting	Same as input mode setting of Event input setting 1	Same as on the left	N-O	-	-	○
Event input setting 3 (Common)		Same as Event input setting 1	Same as on the left	P.CSP	-	-	○
	NPN/PNP input mode setting	Same as NPN/PNP input setting of Event input setting 1	Same as on the left	PNP	-	-	○
	Input mode setting	Same as input mode setting of Event input setting 1	Same as on the left	N-O	-	-	○
Event input setting 4 (Common)		Same as Event input setting 1	Same as on the left	P.CSP	-	-	○
	NPN/PNP input mode setting	Same as NPN/PNP input setting of Event input setting 1	Same as on the left	PNP	-	-	○
	Input mode setting	Same as input mode setting of Event input setting 1	Same as on the left	N-O	-	-	○

5 Operation description

Setup Item Name	Explanation	Options/setting range	Initial value	KM1-		
				PMU1A	PMU2A	EMU8A
Event input setting 5 (Common)	Same as Event input setting 1	Same as on the left	P.CSP	-	-	○
	NPN/PNP input mode setting	Same as NPN/PNP input setting of Event input setting 1	PNP	-	-	○
	Input mode setting	Same as input mode setting of Event input setting 1	N-O	-	-	○
Event input setting 6 (Common)	Same as Event input setting 1	Same as on the left	P.CSP	-	-	○
	NPN/PNP input mode setting	Same as NPN/PNP input setting of Event input setting 1	PNP	-	-	○
	Input mode setting	Same as input mode setting of Event input setting 1	N-O	-	-	○
Event input setting 7 (Common)	Same as Event input setting 1	Same as on the left	P.CSP	-	-	○
	NPN/PNP input mode setting	Same as NPN/PNP input setting of Event input setting 1	PNP	-	-	○
	Input mode setting	Same as input mode setting of Event input setting 1	N-O	-	-	○
Temperature unit (Common)	Set a unit to measure the temperature for EMU8A.	Celsius (C), Fahrenheit (F)	Celsius	-	-	○
Temperature compensation (Common)	Set the temperature compensation value for EMU8A.	(-50.0 to 50.0)	0	-	-	○
Pulse conversion coefficient setting 1 (Common)	Set a coefficient to multiply by a pulse input count value if the Event input setting 1 is set as "pulse input count". This allows you to calculate a flow rate and other values. If the initial value of 1.00 is used, the pulse input count 1 remains one that is not converted.	(0.01 to 9999.99)	1.00	-	-	○
Pulse conversion coefficient setting 2 (Common)	Same as Pulse conversion coefficient setting 1	Same as on the left	1.00	-	-	○
Pulse conversion coefficient setting 3 (Common)	Same as Pulse conversion coefficient setting 1	Same as on the left	1.00	-	-	○
Pulse conversion coefficient setting 4 (Common)	Same as Pulse conversion coefficient setting 1	Same as on the left	1.00	-	-	○
Pulse conversion coefficient setting 5 (Common)	Same as Pulse conversion coefficient setting 1	Same as on the left	1.00	-	-	○
Pulse conversion coefficient setting 6 (Common)	Same as Pulse conversion coefficient setting 1	Same as on the left	1.00	-	-	○
Pulse conversion coefficient setting 7 (Common)	Same as Pulse conversion coefficient setting 1	Same as on the left	1.00	-	-	○

■ How to set major functions

Shown below are methods to set major functions of the KM1. Explanations are given in the balloons on the setting screens based on the setting examples described in "3 Setting major functions".

- To measure power by measurement master unit
- To measure power of one electrical system

Shown below is an example of measuring power of one electrical system using 50A CT in a 3-phase 3-wire circuit.

The screenshot shows the 'Measurement setting' tab with two columns: 'Electrical system 1 (or common)' and 'Electrical system 2'. A red box highlights the 'Applicable phase wire' and 'Special CT' settings for Electrical system 1. The 'Applicable phase wire' is set to '3-phase 3-wire' and the 'Special CT' is set to '50A'. A callout balloon points to these settings with the following text:

In the [Measurement setting] tab, configure the following items.

- Applicable phase wire:
Electrical system 1: 3-phase 3-wire
- Special CT:
Electrical system 1: 50A

Other visible settings include 'VT ratio (e.g. 6600/110V = 60.00)' and 'CT ratio (e.g. 200/5A = 40)'.

- To measure power of two electrical systems

Shown below is an example of measuring power of two electrical systems of 3-phase 3-wire and 1-phase 2-wire.

The screenshot shows the 'Measurement setting' tab with two columns: 'Electrical system 1 (or common)' and 'Electrical system 2'. A red box highlights the 'Applicable phase wire' and 'Special CT' settings for both systems. For Electrical system 1, 'Applicable phase wire' is '3-phase 3-wire' and 'Special CT' is '100A'. For Electrical system 2, 'Applicable phase wire' is '1-phase 2-wire' and 'Special CT' is '50A'. A callout balloon points to these settings with the following text:

In the [Measurement setting] tab, configure the following items.

- Applicable phase wire:
Electrical system 1: 3-phase 3-wire
Electrical system 2: 1-phase 2-wire
- Special CT:
Electrical system 1: 100A
Electrical system 2: 50A

Other visible settings include 'VT ratio (e.g. 6600/110V = 60.00)' and 'CT ratio (e.g. 200/5A = 40)'.

Precautions for Correct Use

Use the [KE1 setting] screen to set a CT Expansion Unit. For details, refer to "To measure power with CT Expansion Unit (CTD8E) connecting to the measurement master unit (p.5-58)".

- To measure large current exceeding the rated using a general-purpose CT

Shown below is an example of measuring 1000A current using general-purpose CT and measuring its secondary output using 5A rated special CT (Electrical system 2). Set CT ratio as "200" (1000/5).

In the [Measurement setting] tab, configure the following items.

- Applicable phase wire:
 - Electrical system 1: 3-phase 3-wire
 - Electrical system 2: 3-phase 3-wire
- Special CT:
 - Electrical system 1: 50A
 - Electrical system 2: 5A

• CT ratio:
Electrical system 1: 1
Electrical system 2: 200

- To measure high voltage exceeding the rated using a transformer

Shown below is an example of measuring 6600V voltage using a transformer and providing its secondary output of 220V for the measurement master unit. Set VT ratio as "30.00" (6600/220).

In the [Measurement setting] tab, configure the following items.

- Applicable phase wire:
 - Electrical system 1: 3-phase 3-wire
- Special CT:
 - Electrical system 1: 5A
- VT ratio:
 - Electrical system 1: 30.00
- CT ratio:
 - Electrical system 1: 200

● To output total power consumption pulse

Shown below is an example of pulse output of total power consumption measured by the unit's circuit 1 (Pulse output circuit) to the output terminal 1 when increased by 2kWh (pulse output unit).

The screenshot shows the 'Measurement setting' tab with the following configuration:

- Average count:** OFF
- Pulse output unit:** 2kWh
- Pulse output circuit:** Circuit 1
- Total power coefficient:** 1.000 (0.000 to 9999.999)

A callout box indicates: "In the [Measurement setting] tab, configure the following items."

- Pulse output unit: 2kWh
- Pulse output circuit: Circuit 1

Configure the output terminal setting in the [Alarm setting] tab. For details, see page 5-50.

● To measure power without voltage input (Simple measurement)

Shown below is an example of calculating power of PMU1A or PMU2A, assuming voltage as 220V fixed (Voltage on simple measurement) and power factor as 1.00 fixed (Power factor on simple measurement).

The screenshot shows the 'Measurement setting' tab with the following configuration:

- Electrical system 1 (or common):** Electrical system 1
- Applicable phase wire:** 3-phase 3-wire
- Special CT:** 50A
- VT ratio (e.g. 6600/110V = 60.00):** 1.00 (0.01 to 99.99)
- CT ratio (e.g. 200/5A = 40):** 1 (1 to 1000)
- Low-cut current:** 1
- Simple measurement:** ON
- Voltage on simple measurement:** 220.0 (0.1 to 9999.9V)
- Power factor on simple measurement:** 1.00 (0.01 to 1.00)

Callout boxes provide additional configuration details:

- Top callout: "In the [Measurement setting] tab, configure the following items."
 - Applicable phase wire: 3-phase 3-wire
 - Special CT: 50A
- Bottom callout: "Simple measurement: ON"
 - Voltage on simple measurement: 220.0V
 - Power factor on simple measurement: 1.00

Precautions for Correct Use

Use the [KE1 setting] screen to set a CT Expansion Unit. For details, refer to "●To measure power without voltage input (Simple measurement) (p.5-59)".

- To 3-STATE classify based on either of power, current, and voltage

Shown below is an example to classify total power consumption and its total time to 3 states based on power (3-STATE target) during 8:00 (Measurement start time) to 17:00 (Measurement end time). If the measured power is over 80W (HIGH threshold), it is judged as HIGH condition, and if it is under 30W (LOW threshold), LOW condition. The hysteresis is set to 2W to prevent frequent occurrence of status change.

- PMU1A or PMU2A setting ([Measurement setting] tab)

Communication setting | Measurement setting | Alarm setting | Logging setting

Electrical system 1 (or common)

3-STATE target: Power (1W unit)

3-STATE/power consumption rate event input: 1 and 2

3-STATE HIGH threshold: 80

3-STATE LOW threshold: 30

3-STATE hysteresis: 2

Measurement start time: 08:00

Measurement end time: 17:00

Event input setting 1

NPN/PNP input mode

In the [Measurement setting] tab, configure the following items.

- 3-STATE target: Power (1W unit)
- 3-STATE HIGH threshold: 80
- 3-STATE LOW threshold: 30
- 3-STATE hysteresis: 2
- Measurement start time: 08:00
- Measurement end time: 17:00

● To 3-STATE classify based on Event input

Shown below is an example to classify total power consumption and its total time to 3 states based on Event inputs 3 and 4 of EMU8A (3-STATE event input target) during 8:00 (Measurement start time) to 17:00 (Measurement end time).

• PMU1A or PMU2A setting

Communication setting | **Measurement setting** | Alarm setting | Logging setting

Electrical system 1 (or common) Ele

3-STATE target: Event input

3-STATE/power consumption rate event input: 3 and 4

3-STATE HIGH threshold: 1000

3-STATE LOW threshold: 800

3-STATE hysteresis: 50

Measurement start time: 08:00

Measurement end time: 17:00

Event input setting 1

NPN/PNP input mode

In the [Measurement setting] tab, configure the following items.

- 3-STATE target: Event input
- 3-STATE/power consumption rate event input: 3 and 4
- Measurement start time: 08:00
- Measurement end time: 17:00

• EMU8A setting

Communication setting | **Measurement setting** | Alarm setting | Logging setting

Electrical system 1 (or common) Ele

Event input setting 3: 3-ST (3-STATE classification)

NPN/PNP input mode setting: NPN

Input mode setting: N-O (Normally open)

Event input setting 4: P.CSP (Pulse input count)

NPN/PNP input mode setting: PNP

Input mode setting: N-O (Normally open)

Event input setting 5: P.CSP (Pulse input count)

NPN/PNP input mode setting: PNP

In the [Measurement setting] tab of EMU8A, configure the following items.

- Event input setting 3: 3-ST (3-STATE classification)
- NPN/PNP input mode setting: NPN
- Input mode setting: N-O
- Event input setting 4: 3-ST (3-STATE classification)
- NPN/PNP input mode setting: PNP
- Input mode setting: N-O

● To count pulses by event input

Shown below is an example to count pulses provided by other equipment using the EMU8A event input 2. Set 10 to the coefficient (pulse conversion coefficient) for one pulse to calculate the pulse converted value.

Communication setting | Measurement setting | Alarm setting | Logging setting

Electrical system

In the [Measurement setting] tab, configure the following items.

- Event input setting 2: P.CSP (Pulse input count)
- NPN/PNP input mode setting: NPN
- Input mode setting: N-O (Normally open)

Event input setting 2: P.CSP (Pulse input count)

NPN/PNP input mode setting: PNP

Input mode setting: N-O (Normally open)

Event input setting 3: P.CSP (Pulse input count)

NPN/PNP input mode setting: PNP

Input mode setting: N-O (Normally open)

Event input setting 4: P.CSP (Pulse input count)

NPN/PNP input mode setting: PNP

Scroll with mouse.

Communication setting | Measurement setting | Alarm setting | Logging setting

Electrical system 1 (or common) | Electrical system 2

Temperature compensation

Pulse conversion coefficient setting 1

Pulse conversion coefficient setting 2: 10.0 (0.01 to 9999.99)

Pulse conversion coefficient setting 3: 1.00 (0.01 to 9999.99)

Pulse conversion coefficient setting 4: 1.00 (0.01 to 9999.99)

Pulse conversion coefficient setting 5: 1.00 (0.01 to 9999.99)

Pulse conversion coefficient setting 6: 1.00 (0.01 to 9999.99)

Pulse conversion coefficient setting 7: 1.00 (0.01 to 9999.99)

To convert the pulse count of the event input setting 2 to engineering units, set a coefficient to the Pulse conversion coefficient setting 2.

- Pulse conversion coefficient 2: 10.0

5.3.3.3. Alarm setting

[Alarm setting] tab

Communication setting | Measurement setting | **Alarm setting** | Logging setting

Electrical system 1 (or common) Electrical system 2

Alarm parameter setting

☐ Over voltage alarm ☐ Over voltage alarm

☐ Under voltage alarm ☐ Under voltage alarm

☐ Over current alarm ☐ Over current alarm

☐ Under current alarm ☐ Under current alarm

☐ Active power upper limit alarm ☐ Active power upper limit alarm

☐ Active power lower limit alarm ☐ Active power lower limit alarm

☐ Reactive power upper limit alarm ☐ Reactive power upper limit alarm

☐ Reactive power lower limit alarm ☐ Reactive power lower limit alarm

☐ Power factor alarm ☐ Power factor alarm

Over voltage alarm

Threshold 528.0 528.0 (0 to 12100.0V)

Hysteresis 24.0 24.0 (0 to 2200.0V)

On delays 0.1 0.1 (0.1 to 10.0s)

Under voltage alarm

Threshold 85.0 85.0 (0 to 12100.0V)

Hysteresis 24.0 24.0 (0 to 2200.0V)

On delays 0.1 0.1 (0.1 to 10.0s)

[Setup Item List]

Setup Item Name	Explanation	Options/setting range	Initial value	KM1-		
				PMU1A	PMU2A	EMU8A
Alarm parameter setting (Electrical system 1, Electrical system 2)	<p>Specify item(s) to enable the alarm function.</p> <p>You can enable more than one item. (*1)(*2)</p> <p>Alarm settings configured here are reflected to alarm history (can be read through communications), status (alarm 1/2 that can be read through communications), and alarm LED (ALM). (*3)(*4)</p> <p>Note that temperature alarm and phase-sequence alarm are not specified in this item.</p> <p>*1: When you enabled multiple alarm items, the alarm history saves alarm for each alarm item.</p> <p>*2: For PMU2A, alarm items must be configured for each measurement block.</p> <p>*3: When you enabled multiple alarm items, operation indication LED [ALM] of [Status] and the unit works in OR logic.</p> <p>*4: For PMU2A, operation indication LED [ALM] of the unit works in OR logic of the measurement blocks 1 and 2.</p>	Over voltage alarm Under voltage alarm Over current alarm Under current alarm Active power upper limit alarm Active power lower limit alarm Reactive power upper limit alarm Reactive power lower limit alarm Power factor alarm	Uncheck all	○	◎	-

Note: "◎" symbol indicates that the setting is available for both Electrical systems 1 and 2, or measurement blocks 1 and 2.

5 Operation description

Setup Item Name		Explanation	Options/setting range	Initial value	KM1-		
					PMU1A	PMU2A	EMU8A
Over voltage alarm (Electrical system 1, Electrical system 2)	Threshold	Set a threshold of over voltage alarm.	(0 to 12100.0V)	528.0V	○	⊙	-
	Hysteresis	Set a hysteresis of over voltage alarm.	(0 to 2200.0V)	24.0V	○	⊙	-
	On delays	Set an on-delay time of over voltage alarm.	(0.1 to 10.0s)	0.1s	○	⊙	-
Under voltage alarm (Electrical system 1, Electrical system 2)	Threshold	Set a threshold of under voltage alarm.	(0 to 12100.0V)	85.0V	○	⊙	-
	Hysteresis	Set a hysteresis of under voltage alarm.	(0 to 2200.0V)	24.0V	○	⊙	-
	On delays	Set an on-delay time of under voltage alarm.	(0.1 to 10.0s)	0.1s	○	⊙	-
Over current alarm (Electrical system 1, Electrical system 2)	Threshold	Set a threshold of over current alarm.	(0 to 6000.0A)	100.0A	○	⊙	-
	Hysteresis	Set a hysteresis of over current alarm.	(0 to 1000.0A)	5.0A	○	⊙	-
	On delays	Set an on-delay time of over current alarm.	(0.1 to 10.0s)	0.1s	○	⊙	-
Under current alarm (Electrical system 1, Electrical system 2)	Threshold	Set a threshold of under current alarm.	(0 to 6000.0A)	10.0A	○	⊙	-
	Hysteresis	Set a hysteresis of under current alarm.	(0 to 1000.0A)	5.0A	○	⊙	-
	On delays	Set an on-delay time of under current alarm.	(0.1 to 10.0s)	0.1s	○	⊙	-
Active power upper limit alarm (Electrical system 1, Electrical system 2)	Threshold	Set a threshold of active power upper limit alarm.	(-120000000 to 120000000W)	1000W	○	⊙	-
	Hysteresis	Set a hysteresis of active power upper limit alarm.	(0 to 24000000W)	100W	○	⊙	-
	On delays	Set an on-delay time of active power upper limit alarm.	(0.5 to 10.0s)	0.5s	○	⊙	-
Active power lower limit alarm (Electrical system 1, Electrical system 2)	Threshold	Set a threshold of active power lower limit alarm.	(-120000000 to 120000000W)	300W	○	⊙	-
	Hysteresis	Set a hysteresis of active power lower limit alarm.	(0 to 24000000W)	100W	○	⊙	-
	On delays	Set an on-delay time of active power lower limit alarm.	(0.5 to 10.0s)	0.5s	○	⊙	-
Reactive power upper limit alarm (Electrical system 1, Electrical system 2)	Threshold	Set a threshold of reactive power upper limit alarm.	(-120000000 to 120000000var)	1000var	○	⊙	-
	Hysteresis	Set a hysteresis of reactive power upper limit alarm.	(0 to 24000000var)	100var	○	⊙	-
	On delays	Set an on-delay time of reactive power upper limit alarm.	(0.5 to 10.0s)	0.5s	○	⊙	-

Note: "⊙" symbol indicates that the setting is available for both Electrical systems 1 and 2, or measurement blocks 1 and 2.

5 Operation description

Setup Item Name		Explanation	Options/setting range	Initial value	KM1-		
					PMU1A	PMU2A	EMU8A
Reactive power lower limit alarm (Electrical system 1, Electrical system 2)	Threshold	Set a threshold of reactive power lower limit alarm.	(-120000000 to 120000000var)	300var	<input type="radio"/>	<input checked="" type="radio"/>	-
	Hysteresis	Set a hysteresis of reactive power lower limit alarm.	(0 to 24000000var)	100var	<input type="radio"/>	<input checked="" type="radio"/>	-
	On delays	Set an on-delay time of reactive power lower limit alarm.	(0.5 to 10.0s)	0.5s	<input type="radio"/>	<input checked="" type="radio"/>	-
Power factor alarm (Electrical system 1, Electrical system 2)	Threshold	Set a threshold of power factor alarm.	(-1.00 to 1.00)	0.00	<input type="radio"/>	<input checked="" type="radio"/>	-
	Hysteresis	Set a hysteresis of power factor alarm.	(0.00 to 1.00)	0.05	<input type="radio"/>	<input checked="" type="radio"/>	-
	On delays	Set an on-delay time of power factor alarm.	(0.5 to 10.0s)	0.5s	<input type="radio"/>	<input checked="" type="radio"/>	-
Active input setting (Common)		Unselect CT input or ZCT input for alarm judgment.	Input 1, Input 2, Input 3, Input 4, Input 5, Input 6, Input 7, Input 8	Check all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alarm output setting (Electrical system 1, Electrical system 2)		<p>Among selected items of alarm parameter setting, specify item(s) to enable alarm output function. You can enable more than one item. (*1)(*2)</p> <p>The alarm settings configured here are reflected to the alarm output. Note that temperature alarm and phase-sequence alarm are not specified in this item.</p> <p>*1: When you enabled multiple alarm items, they work in OR logic. If any of the alarm items meets its alarm condition, the output turns ON.</p> <p>*2: For PMU2A, items must be configured for each measurement block. When you enabled multiple alarm items, they work in OR logic for each measurement block.</p>	Over voltage alarm Under voltage alarm Over current alarm Under current alarm Active power upper limit alarm Active power lower limit alarm Reactive power upper limit alarm Reactive power lower limit alarm Power factor alarm	Uncheck all	<input type="radio"/>	<input checked="" type="radio"/>	-
Upper-limit temperature alarm (Common)	Threshold	Set a threshold of upper-limit temperature alarm.	(-50.0 to 100.0)	80.0	-	-	<input type="radio"/>
	Hysteresis	Set a hysteresis of upper-limit temperature alarm.	(0.0 to 10.0)	5.0	-	-	<input type="radio"/>
	On delays	Set an on-delay time of upper-limit temperature alarm.	(0.5 to 10.0s)	0.5s	-	-	<input type="radio"/>
Lower-limit temperature alarm (Common)	Threshold	Set a threshold of lower-limit temperature alarm.	(-50.0 to 100.0)	0.0	-	-	<input type="radio"/>
	Hysteresis	Set a hysteresis of lower-limit temperature alarm.	(0.0 to 10.0)	5.0	-	-	<input type="radio"/>
	On delays	Set an on-delay time of lower-limit temperature alarm.	(0.5 to 10.0s)	0.5s	-	-	<input type="radio"/>

Note: "⊗" symbol indicates that the setting is available for both Electrical systems 1 and 2, or measurement blocks 1 and 2.

5 Operation description

Setup Item Name		Explanation	Options/setting range	Initial value	KM1-		
					PMU1A	PMU2A	EMU8A
Phase-sequence detection (Common)		Set whether the voltage phase-sequence should be detected or not. (The phase sequence alarm does not have threshold, hysteresis, and on-delay settings)	OFF, ON	OFF	<input type="radio"/>	<input type="radio"/>	-
Output terminal 1 function setting (Common)		Set the output terminal 1 to use in which of the following functions. Each measurement block of alarm output (*1)(*2), temperature alarm output (*3), phase-sequence output, total power consumption pulse output, and 3-STATE output *1: Output is made when an alarm of the item configured in the "Alarm output setting" occurred. *2: For PMU1A, the measuring block 2 alarm cannot be used. *3: For EMU8A, only the temperature alarm can be selected.	OFF Measuring block 1 alarm Measuring block 2 alarm Temperature Phase-sequence Pulse output Measuring block 1 3-STATE HIGH Measuring block 1 3-STATE MIDDLE Measuring block 1 3-STATE LOW Measuring block 2 3-STATE HIGH Measuring block 2 3-STATE MIDDLE Measuring block 2 3-STATE LOW	OFF	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Output terminal 1 condition (Common)	Set the output terminal 1 to use in which of the following logics. N-O (Normally open): Outputs ON when power is on and OFF when power is off. N-C (Normally closed): Outputs ON when power is off and OFF when power is on.	N-O (Normally open) N-C (Normally closed)	N-O	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Output terminal 2 function setting (Common)		Same as Output terminal 1 function setting.	Same as on the left	OFF	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Output terminal 2 condition (Common)	Same as Output terminal 1 function condition.	Same as on the left	N-O	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Output terminal 3 function setting (Common)		Same as Output terminal 1 function setting.	Same as on the left	OFF	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Output terminal 3 condition (Common)	Same as Output terminal 1 function condition.	Same as on the left	N-O	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

■ How to set major functions

Shown below are methods to set major functions of the KM1. Explanations are given in the balloons on the setting screens based on the setting examples described in "3 Setting major functions".

● To use alarm function

Shown below is an example of evaluating as active power upper limit alarm when the active power measured with CT inputs 1 and 3 (Active input setting) exceeds 2000W (Threshold). Output is made to the output terminal when the evaluated condition continues for 0.5 seconds (On delays) or longer. For output unit setting, refer to "●To set alarm output " described later.

The following steps illustrate the configuration of the Active power upper limit alarm:

- Alarm parameter setting:** In the [Alarm setting] tab, configure alarm types. You can enable more than one alarm. In this example, Active power upper limit alarm of the Electrical system 1 is selected.

Electrical system 1 (or common)	Electrical system 2
<input type="checkbox"/> Over voltage alarm	<input type="checkbox"/> Over voltage alarm
<input type="checkbox"/> Under voltage alarm	<input type="checkbox"/> Under voltage alarm
<input type="checkbox"/> Over current alarm	<input type="checkbox"/> Over current alarm
<input type="checkbox"/> Under current alarm	<input type="checkbox"/> Under current alarm
<input checked="" type="checkbox"/> Active power upper limit alarm	<input type="checkbox"/> Active power upper limit alarm
<input type="checkbox"/> Active power lower limit alarm	<input type="checkbox"/> Active power lower limit alarm
<input type="checkbox"/> Reactive power upper limit alarm	<input type="checkbox"/> Reactive power upper limit alarm
<input type="checkbox"/> Reactive power lower limit alarm	<input type="checkbox"/> Reactive power lower limit alarm
<input type="checkbox"/> Power factor alarm	<input type="checkbox"/> Power factor alarm
- Active power upper limit alarm configuration:** In the [Alarm setting] tab, configure the Active power upper limit alarm as shown below.

Electrical system 1 (or common)	Electrical system 2
Threshold: 2000	100 (0 to 24000000W)
Hysteresis: 5	100 (0 to 24000000W)
On delays: 0.5	0.5 (0.5 to 10.0s)
- Active input setting:** Unselect CT input for which alarm judgment should not be made.

Electrical system 1	Electrical system 2
<input checked="" type="checkbox"/> Input 1	<input type="checkbox"/> Input 1
<input type="checkbox"/> Input 2	<input type="checkbox"/> Input 2
<input checked="" type="checkbox"/> Input 3	<input type="checkbox"/> Input 3
<input type="checkbox"/> Input 4	<input type="checkbox"/> Input 4
<input type="checkbox"/> Input 5	<input type="checkbox"/> Input 5
<input type="checkbox"/> Input 6	<input type="checkbox"/> Input 6
<input type="checkbox"/> Input 7	<input type="checkbox"/> Input 7
<input type="checkbox"/> Input 8	<input type="checkbox"/> Input 8

● To set alarm output

Shown below is an example of providing output to the output terminal 1 when the "Active power upper limit alarm" for the Electrical system 1 is configured for the alarm item setting and judged as alarm.

Communication setting | Measurement setting | **Alarm setting** | Logging setting

Electrical system 1 (or common) Electrical system 2

Active input setting

- ☒ Input 1
- ☐ Input 2
- ☒ Input 3
- ☐ Input 4
- ☐ Input 5
- ☐ Input 6
- ☐ Input 7
- ☐ Input 8

Alarm output setting

- ☐ Over voltage alarm
- ☐ Under voltage alarm
- ☐ Over current alarm
- ☐ Under current alarm
- ☒ Active power upper limit alarm
- ☐ Active power lower limit alarm
- ☐ Reactive power upper limit alarm
- ☐ Reactive power lower limit alarm
- ☐ Power factor alarm

In the [Alarm setting] tab, configure the following items.
• Alarm output setting: Active power upper limit alarm
Select alarm item checkbox(s) to output. If not selected, alarm output is not made. (Logging is made)

Scroll with mouse.

Communication setting | Measurement setting | **Alarm setting** | Logging setting

Electrical system 1 (or common) Electrical system 2

Threshold

Hysteresis

On delays

Phase-sequence detection

☒ OFF ☐ ON

Output terminal 1 function setting

Measuring block 1 alarm

Output terminal 1 condition

N-O (Normally open)

Output terminal 2 function setting

OFF

Output terminal 2 condition

N-O (Normally open)

Output terminal 3 function setting

OFF

Output terminal 3 condition

N-O (Normally open)

In the [Alarm setting] tab, configure the following items.
• Output terminal 1 function setting: Measuring block 1 alarm
• Output terminal 1 condition: N-O (Normally open)

● To output total power consumption pulse

Shown below is an example of output terminal setting that provides total power consumption pulse output.

Communication setting | Measurement setting | Alarm setting | Logging setting

Electrical system 1 (or common) Electrical system 2

Threshold:

Hysteresis:

On delays:

Phase-sequence detection: ☒ OFF ☐ ON

Output terminal 1 function setting:

Output terminal 1 condition:

Output terminal 2 function setting:

In the [Alarm setting] tab, configure the following items.

- Output terminal 1 function setting:
Electrical system 1: Pulse output
- Output terminal 1 condition:
Electrical system 1: N-O (Normally open)

For pulse output unit and pulse output circuit, refer to page 5-40.

5.3.3.4. Logging setting

[Logging setting] tab

Communication setting Measurement setting Alarm setting Logging setting			
Data logging 1 item	<input type="text" value="Voltage MAX 1"/>	Data logging 1 cycle	<input type="text" value="5min"/>
Data logging 2 item	<input type="text" value="Voltage MAX 2"/>	Data logging 2 cycle	<input type="text" value="5min"/>
Data logging 3 item	<input type="text" value="Voltage MAX 3"/>	Data logging 3 cycle	<input type="text" value="5min"/>
Data logging 4 item	<input type="text" value="Voltage MIN 1"/>	Data logging 4 cycle	<input type="text" value="5min"/>
Data logging 5 item	<input type="text" value="Voltage MIN 2"/>	Data logging 5 cycle	<input type="text" value="5min"/>
Data logging 6 item	<input type="text" value="Voltage MIN 3"/>	Data logging 6 cycle	<input type="text" value="5min"/>

[Setup Item List]

Setup Item Name		Explanation	Options/setting range	Initial value	KM1-		
					PMU1A	PMU2A	EMU8A
Log 1	Item to save	Specify item(s) to save to the log 1.	Refer to "List of logs to be saved" in "User's manual for KM1/KE1".	Voltage MAX1 (Temperature MAX1 only for EMU8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Logging cycle	Specify a cycle to save to the log 1.	5m, 10m, 30m, 1h, 2h, 6h, 12h, 24h	5 minutes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Log 2	Item to save	Same as Item to save for Log 1.	Same as on the left	Voltage MAX2 (Temperature MIN1 only for EMU8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Logging cycle	Same as Log 1 cycle.	Same as on the left	5 minutes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Log 3	Item to save	Same as Item to save for Log 1.	Same as on the left	Voltage MAX3 (Pulse input ON time 1 only for EMU8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Logging cycle	Same as Log 1 cycle.	Same as on the left	5 minutes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Log 4	Item to save	Same as Item to save for Log 1.	Same as on the left	Voltage MIN1 (Pulse input ON time 2 only for EMU8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Logging cycle	Same as Log 1 cycle.	Same as on the left	5 minutes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Log 5	Item to save	Same as Item to save for Log 1.	Same as on the left	Voltage MIN2 (Pulse input count 1 only for EMU8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Logging cycle	Same as Log 1 cycle.	Same as on the left	5 minutes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Log 6	Item to save	Same as Item to save for Log 1.	Same as on the left	Voltage MIN3 (Pulse input count 2 only for EMU8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Logging cycle	Same as Log 1 cycle.	Same as on the left	5 minutes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

■ How to set major functions

Shown below are methods to set major functions of the KM1. Explanations are given in the balloons on the setting screens based on the setting examples described in "3 Setting major functions".

● Logging setting

Communication setting | Measurement setting | Alarm setting | **Logging setting**

Data logging item		Data logging 1 cycle
Data logging 1 item	Voltage MAX 1	5min
Data logging 2 item	Voltage MAX 2	
Data logging 3 item	Voltage MAX 3	
Data logging 4 item	Voltage MIN 1	
Data logging 5 item	Voltage MIN 2	
Data logging 6 item	Voltage MIN 3	

Select an item to save to the log from the pull-down menu.

- Total active power consumption 1, 2, 5, 6
- Total regenerated energy 1, 2, 5, 6
- Total leading reactive power 1, 2, 5, 6
- Total lagging reactive power 1, 2, 5, 6
- Accumulative total reactive power 1, 2, 5, 6
- Voltage MAX1 to 6
- Voltage MIN1 to 6
- Current MAX1 to 6
- Current MIN1 to 6
- Active power MAX1, 2, 5, 6
- Active power MIN1, 2, 5, 6
- Power factor MAX1, 2, 5, 6
- Power factor MIN1, 2, 5, 6
- Specific power consumption 1 to 4
- 3-STATE HIGH total power consumption 1 to 4
- 3-STATE MIDDLE total power consumption 1 to 4
- 3-STATE LOW total power consumption 1 to 4
- 3-STATE HIGH total time 1 to 4
- 3-STATE MIDDLE total time 1 to 4
- 3-STATE LOW total time 1 to 4

Select a cycle to save to the log from the pull-down menu.

- 5 minutes
- 10 minutes
- 30 minutes
- 1h
- 2h
- 6h
- 12h
- 24h

5.3.4. KE1 main unit setting

The main unit of KE1 series will be set.

The setting values of the main unit will be read out, shown on the screen, modified and written.

Shown below is a list of unit models available for setting in the KE1 setting screen.

Series Name	Model	Name	Abbreviation
KE1	KE1-PGR1C-FLK	Power/Earth Leakage Monitoring Unit	PGR1C
	KE1-PVS1C-FLK	Power/Voltage-Sag Monitoring Unit	PVS1C
	KE1-VSU1B-FLK	Voltage-Sag Monitoring Unit	VSU1B
	KE1-VAU1B-FLK	Voltage/Current Monitoring Unit	VAU1B
	KE1-CTD8E	CT Expansion Unit	CTD8E
	KE1-ZCT8E	Zero-phase CT Expansion Unit	ZCT8E
	KE1-DRT-FLK	DeviceNet Communication Unit	DRT

The symbol "○" or "◎" for each function described on the Setup Item List for each category tab means that the item is settable, while "-" indicating that the item is not settable.

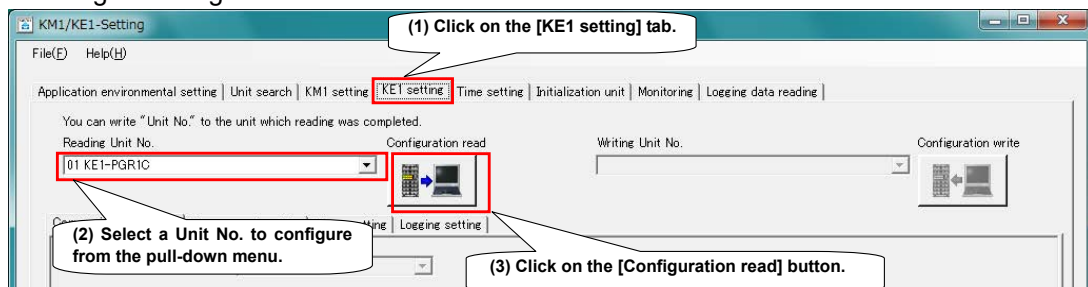
Precautions for Correct Use

- In case of writing the setting values to a unit different from the unit that read out those settings value, only the same model of unit is available for writing.
- When the setting values are written to the same model of a different unit, items other than the Unit No. will be written.
- If you change the Unit No., make sure that you can start unit search with the Unit No. changed and the unit can be connected.
- When the setting values are written to the unit with the power switched on, unplug the USB cable from the computer after writing and restart the power of the entire system.
For details, refer to "5.2.5 Precautions for setting the unit connected to a power source"(p.5-10).

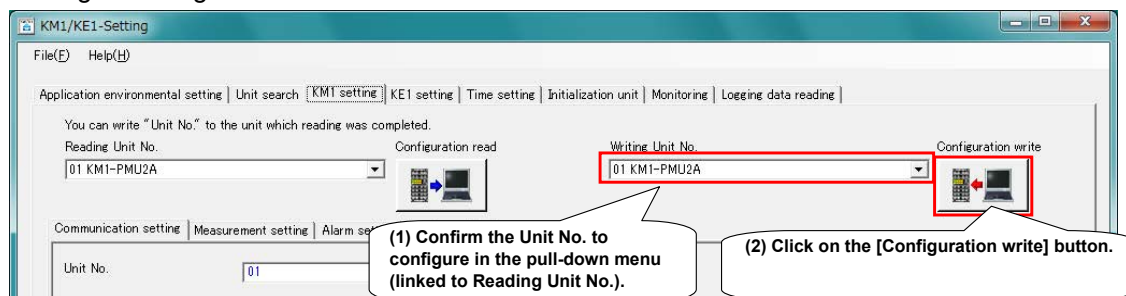
Overview of operational procedure

From [Reading Unit No.], select the unit for which setting values will be read out, click on the [Configuration read] button. Change the setting values for each category tab. From [Writing Unit No.], select the Unit No. for which setting values will be written, and click on the [Configuration write] button.

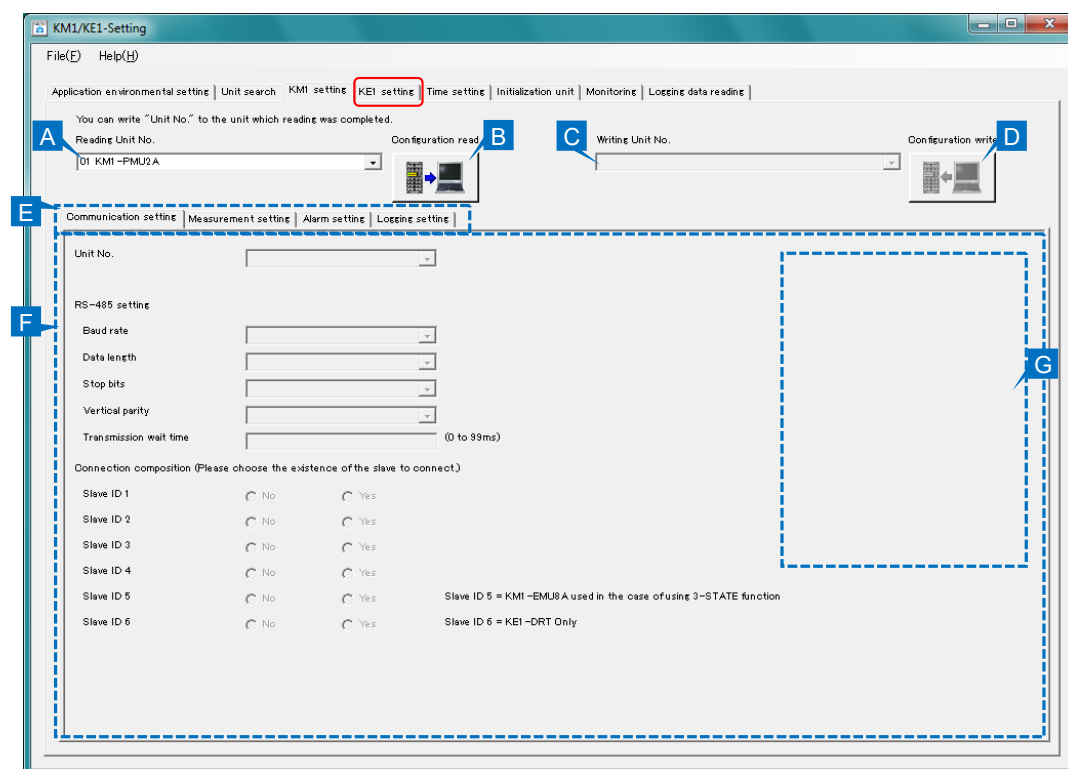
Reading of setting values



Writing of setting values



■ Operational screen



[Main setting items and functions]

The setting items and functions are the same as "Main unit setting for KM1". Refer to "5.3.3 KM1 main unit setting" (p.5-23).

For the detailed functions for each setting value, refer to "Model KE1 User's Manual".

■ Operational procedure

The operational procedure is the same as "Main unit setting for KM1". Refer to "5.3.3 KM1 main unit setting" (p.5-23).

5.3.4.1. Communication setting

[Communication setting] tab

Communication setting | Measurement setting | Alarm setting | Logging setting

Unit No.

RS-485 setting

Baud rate

Data length

Stop bits

Vertical parity

Transmission wait time (0 to 99ms)

Connection composition (Please choose the existence of the slave to connect.)

Slave ID 1 ☐ No ☒ Yes

Slave ID 2 ☒ No ☐ Yes

Slave ID 3 ☒ No ☐ Yes

Slave ID 4 ☒ No ☐ Yes

Slave ID 5 ☐ No ☒ Yes Slave ID 5 = KM1-EMU8A used in the case of using 3-STATE function

Slave ID 6 ☒ No ☐ Yes Slave ID 6 = KE1-DRT Only

[Setup Item List]

Setup Item Name		Explanation	Options/ setting range	Initial value	KE1-					
					PGRIC	PSIC	VSUB	VAUB	CTDE	ZCTE
Unit No.		Set an identification number for communications with upper equipment (including the setting tool and EW700). * To connect multiple measurement master units, the unit numbers must be unique for all the units, including the measurement master and slave units.	01, 02, 03, 04, ..., 99	01	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
RS-485 setting	Baud rate	Use the baud rate of upper equipment, if the baud rate of upper equipment connecting through RS-485 is other than 9.6kbps, or if you want higher baud rate with upper equipment.	9.6kbps, 19.2kbps, 38.4kbps	9.6kbps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	<input type="radio"/>
	Data length	Use the communication conditions of upper equipment, if the communication conditions of upper equipment connecting through RS-485 are other than data length of 7 bits, stop bits of 2 bits, or even parity.	7 bits, 8 bits	7 bits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	<input type="radio"/>
	Stop bits		1 bit, 2 bits	2 bits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	<input type="radio"/>
	Vertical parity		No, Even, Odd	Even	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	<input type="radio"/>
	Transmission wait time	Set a value larger than the initial value if the communication receiving process of the upper equipment connecting through RS-485 is too slow.	(0 to 99ms)	20ms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	<input type="radio"/>
Connection composition	Slave ID1	To recognize a slave with the slave ID1 in the connection composition, set to "Enabled".	Disabled, Enabled	Disabled	<input type="radio"/>	<input type="radio"/>	-	-	-	-
	Slave ID2	To recognize a slave with the slave ID2 in the connection composition, set to "Enabled".	Disabled, Enabled	Disabled	<input type="radio"/>	<input type="radio"/>	-	-	-	-
	Slave ID3	To recognize a slave with the slave ID3 in the connection composition, set to "Enabled".	Disabled, Enabled	Disabled	<input type="radio"/>	<input type="radio"/>	-	-	-	-
	Slave ID4	To recognize a slave with the slave ID4 in the connection composition, set to "Enabled".	Disabled, Enabled	Disabled	<input type="radio"/>	<input type="radio"/>	-	-	-	-
	Slave ID5	To recognize an EMU8A slave (only if using the 3-STATE function or specific power consumption function in the event input) with the slave ID5 in the connection composition, set to "Enabled".	Disabled, Enabled	Disabled	-	-	-	-	-	-
	Slave ID6	To recognize a DRT slave with the slave ID6 in the connection composition, set to "Enabled".	Disabled, Enabled	Disabled	<input type="radio"/>	<input type="radio"/>	-	-	-	-

5.3.4.2. Measurement setting

[Measurement setting] tab

Communication setting | **Measurement setting** | Alarm setting | Logging setting

Electrical system 1 (or common) Electrical system 2

Applicable phase wire: 3-phase 3-wire

Synchronization selection for measuring block: []

Special CT: 100A

VT ratio (e.g. 6600/110V = 60.00): 1.00 (0.01 to 99.99)

CT ratio (e.g. 200/5A = 40): 1 (1 to 1000)

Low-cut current: 0.6 (0.1 to 19.9%)

Earth leakage Low-cut current: 1.0 (0.1 to 30.0mA)

Simple measurement: ☐ OFF ☐ ON

Voltage on simple: [] (0.1 to 9999.9V)

Note: For CTD8E, "Electrical system 1 (or common)" and "Electrical system 2" on top of the screen are indicated as "Measuring block 1 (or common)" and "Measuring block 2".

[Setup Item List]

Item name	Explanation	Options/setting range	Initial value	KE1-					
				PGRIC	PSIC	VSUB	VAUB	CTD8E	ZCT8E
Applicable phase wire	Phase/wire type for measurement is set for each voltage input system.(*1) *1: Between slaves connected to the measurement master unit, the same phase-wire must be configured.	1-phase 2-wire, 1-phase 3-wire, 3-phase 3-wire, 3-phase 4-wire	3-phase 3-wire	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-
Synchronization selection for measuring block (Measurement block 1, Measurement block 2)	Set which of the measurement blocks 1 or 2 for current measurement of the CT expansion unit should be assigned to which of the electrical systems 1 or 2 for voltage input of the measurement master unit.	Electrical system 1, Electrical system 2	Measurement block 1: Electrical system 1, Measurement block 2: Electrical system 1	-	-	-	-	<input type="radio"/>	-
Special CT (Measurement block 1, Measurement block 2)	Set the Special CT type (capacity).	5A, 50A, 100A, 200A, 400A, 600A	100A	<input type="radio"/>	<input type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-

5 Operation description

Item name	Explanation	Options/setting range	Initial value	KE1-						
				PGRI1C	PVSI1C	VSI1B	VSI1B	CTD8E	ZCT8E	DRT
VT ratio	Set a ratio of the rated voltage of the general-purpose VT to the rated voltage of the measurement master unit. To measure output voltage using a general-purpose VT on the primary end, you can measure voltage of the scale multiplier specified here for the normal rated voltage of the measurement master unit on the secondary end.	(0.01 to 99.99)	1.00	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-
CT ratio	Set a ratio of the rated current of the general-purpose VT to the rated current of the special CT with the rated current on the secondary end. To measure output current by the special CT using a general-purpose CT on the primary end, you can measure current of the scale multiplier specified here for the normal rated current of the special CT.	(1 to 1000)	1	<input type="radio"/>	<input type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	-
Low-cut current	Set a value to forcibly set the current and power to 0 when the measured current falls under a percentage value of the normal rated current.	(0.1 to 19.9%)	0.6%	<input type="radio"/>	<input type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	-
Earth leakage Low-cut current	Set a value to forcibly set the measured Earth leakage to 0 when the actual value of Earth leakage (Io) falls under a certain value.	(0.1 to 30.0mA)	1.0mA	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-
Average Count	Set a measurement count for the averaging process of the following measured values. Active power, current, voltage, power factor, reactive power If set to OFF, an instantaneous value of every 100ms is provided as it is.	OFF, 2 times, 4 times, 8 times, 16 times, 32 times, 64 times, 128 times, 256 times, 512 times, 1024 times	OFF	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-
Pulse output unit	If "Total power consumption pulse output" is set to one of the Output terminal 1-3 function settings, Total power consumption for one pulse is configured.	1Wh, 10Wh, 100Wh, 1kWh, 2kWh, 5kWh, 10kWh, 20kWh, 50kWh, 100kWh	100Wh	<input type="radio"/>	<input type="radio"/>	-	-	-	-	-
Pulse output circuit	If "Total power consumption pulse output" is set to one of the Output terminal 1-3 function settings, total power consumption pulse output of which circuit is configured.	Circuit 1, Circuit 2, Circuit 3, Circuit 4	Circuit 1	<input type="radio"/>	<input type="radio"/>	-	-	-	-	-
Total power coefficient	Set a coefficient to multiply the total power consumption. This allows you to calculate CO2 emission, charge, and so on. If the initial value of 1.00 is used, the total power consumption remains one that is not converted.	(0.000 to 9999.999)	1.000	<input type="radio"/>	<input type="radio"/>	-	-	<input type="radio"/>	-	-

■ How to set major functions

Shown below are methods to set major functions of the KE1. Explanations are given in the balloons on the setting screens based on the setting examples described in "3. Setting major functions".

- To measure power with CT Expansion Unit (CTD8E) connecting to the measurement master unit
Use the [KE1 setting] screen to set the measurement setting for a CT Expansion Unit.

- To measure power of one electrical system

Shown below is an example of power measurement of 3-phase 3-wire circuit with CTD8E connecting to the measurement master. The electrical system 1 of the measurement master is assigned to the measurement blocks 1 and 2 of CTD8E.

In the [Measurement setting] tab, configure the following items.

- Electrical system 1 applicable phase wire: 3-phase 3-wire

Synchronization selection for measuring block:

- Measuring block 1: Electrical system 1
- Measuring block 2: Electrical system 1

Special CT:

- Measuring block 1: 100A
- Measuring block 2: 200A

Electrical system 1 applicable phase wire: 3-phase 3-wire

Electrical system 2 applicable phase wire: 3-phase 3-wire

Synchronization selection for measuring block: Electrical system 1, Electrical system 1

Special CT: 100A, 200A

Electrical system 1 VT ratio (e.g. 6600/110V = 60.00): 1.00

- To measure power of two electrical systems

Shown below is an example of power measurement of 3-phase 3-wire and 1-phase 2-wire circuits with CTD8E connecting to the measurement master. The electrical systems 1 and 2 of the measurement master are assigned to the measurement blocks 1 and 2 of CTD8E, respectively.

In the [Measurement setting] tab, configure the following items.

- Electrical system 1 applicable phase wire: 3-phase 3-wire
- Electrical system 2 applicable phase wire: 1-phase 2-wire

Select measurement block synchronization:

- Measuring block 1: Electrical system 1
- Measuring block 2: Electrical system 2

Special CT:

- Measuring block 1: 100A
- Measuring block 2: 50A

Electrical system 1 applicable phase wire: 3-phase 3-wire

Electrical system 2 applicable phase wire: 1-phase 2-wire

Synchronization selection for measuring block: Electrical system 1, Electrical system 2

Special CT: 100A, 50A

Electrical system 1 VT ratio (e.g. 6600/110V = 60.00): 1.00

● To measure power without voltage input (Simple measurement)

Shown below is an example of calculating power of CTD8E, assuming voltage as 220V fixed (Voltage on simple measurement) and power factor as 1.00 fixed (Power factor on simple measurement).

Communication setting | Measurement setting | Alarm setting | Logging setting

Measuring block 1 (or common)

Electrical system 1 applicable phase wire: 3-phase 3-wire

Electrical system 2 applicable phase wire: 3-phase 3-wire

Synchronization selection for measuring block: Electrical system 1

Special CT: 50A

Electrical system 1 VT ratio (e.g. 6600/110V = 60.00): 1.00 (0.01 to 99.99)

In the [Measurement setting] tab, configure the following items.

- Applicable phase wire: 3-phase 3-wire
- Special CT: 50A
- Synchronization selection for measuring block: Electrical system 1

Scroll with mouse.

Communication setting | Measurement setting | Alarm setting | Logging setting

Measuring block 1 (or common)

Simple measurement: OFF ON

Voltage on simple measurement at electrical system 1: 220.0 (0.1 to 9999.9V)

Voltage on simple measurement at electrical system 2: 110.0 (0.1 to 9999.9V)

Power factor on simple measurement: 1.00 (0.01 to 1.00)

Measuring block 2

- Simple measurement: ON
- Voltage on simple measurement at electrical system 1: 220.0V
- Power factor on simple measurement: 1.00

5.3.4.3. Alarm setting

[Alarm setting] tab

Communication setting | Measurement setting | **Alarm setting** | Logging setting

	Electrical system 1 (or common)	Electrical system 2
Alarm parameter setting	<input type="checkbox"/> Over voltage alarm <input type="checkbox"/> Under voltage alarm <input type="checkbox"/> Over current alarm <input type="checkbox"/> Under current alarm <input type="checkbox"/> Active power upper limit alarm <input type="checkbox"/> Active power lower limit alarm <input type="checkbox"/> Reactive power upper limit alarm <input type="checkbox"/> Reactive power lower limit alarm <input type="checkbox"/> Power factor alarm	<input type="checkbox"/> Over voltage alarm <input type="checkbox"/> Under voltage alarm <input type="checkbox"/> Over current alarm <input type="checkbox"/> Under current alarm <input type="checkbox"/> Active power upper limit alarm <input type="checkbox"/> Active power lower limit alarm <input type="checkbox"/> Reactive power upper limit alarm <input type="checkbox"/> Reactive power lower limit alarm <input type="checkbox"/> Power factor alarm
Over voltage alarm		
Threshold	<input type="text" value="528.0"/>	(0 to 12100.0V)
Hysteresis	<input type="text" value="24.0"/>	(0 to 2200.0V)
On delays	<input type="text" value="0.1"/>	(0.1 to 10.0s)
Under voltage alarm		
Threshold	<input type="text" value="85.0"/>	(0 to 12100.0V)
Hysteresis	<input type="text" value="24.0"/>	(0 to 2200.0V)
On delays	<input type="text" value="0.1"/>	(0.1 to 10.0s)

Note: For CTD8E, "Electrical system 1 (or common)" and "Electrical system 2" on top of the screen are indicated as "Measuring block 1 (or common)" and "Measuring block 2".

[Setup Item List]

Item name	Explanation	Options/setting range	Initial value	KE1-					
				PGRIC	PVSIC	VSI1B	VAU1B	CTD8E	DRT
Alarm parameter setting	<p>Specify item(s) to enable the alarm function. You can enable more than one item. (*1)(*2)</p> <p>Alarm settings configured here are reflected to alarm history (can be read through communications), status (alarm 1/2 that can be read through communications), and alarm LED (ALM). (*3)(*4)</p> <p>Note that voltage sag alarm, earth leakage alarm, phase-loss alarm, and phase-sequence alarm are not specified in this item.</p> <p>*1: When you enabled multiple alarm items, the alarm history saves alarm for each alarm item.</p> <p>*2: For CTD8E, alarm items must be configured for each measurement block.</p> <p>*3: When you enabled multiple alarm items, operation indication LED [ALM] of [Status] and the unit works in OR logic.</p> <p>*4: For CTD8E, operation indication LED [ALM] of the unit works in OR logic of the measurement blocks 1 and 2.</p>	Over voltage alarm Under voltage alarm Over current alarm Under current alarm Active power upper limit alarm Active power lower limit alarm Reactive power upper limit alarm Reactive power lower limit alarm Power factor alarm	Uncheck all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-

5 Operation description

Item name		Explanation	Options/setting range	Initial value	KE1-						
					PGRIC	PVSIC	VSI/IB	VAUIB	CTD8E	ZCT8E	DRT
Over voltage alarm	Threshold	Set a threshold of over voltage alarm.	(0 to 12100.0V)	528.0V	○	○	○	○	-	-	-
	Hysteresis	Set a hysteresis of over voltage alarm.	(0 to 2200.0V)	24.0V	○	○	○	○	-	-	-
	On delays	Set an on-delay time of over voltage alarm.	(0.1 to 10.0s)	0.1s	○	○	○	○	-	-	-
Under voltage alarm	Threshold	Set a threshold of under voltage alarm.	(0 to 12100.0V)	85.0V	○	○	○	○	-	-	-
	Hysteresis	Set a hysteresis of under voltage alarm.	(0 to 2200.0V)	24.0V	○	○	○	○	-	-	-
	On delays	Set an on-delay time of under voltage alarm.	(0.1 to 10.0s)	0.1s	○	○	○	○	-	-	-
Over current alarm	Threshold	Set a threshold of over current alarm.	(0 to 6000.0A)	100.0A	○	○	-	○	○	-	-
	Hysteresis	Set a hysteresis of over current alarm.	(0 to 1000.0A)	5.0A	○	○	-	○	○	-	-
	On delays	Set an on-delay time of over current alarm.	(0.1 to 10.0s)	0.1s	○	○	-	○	○	-	-
Under current alarm	Threshold	Set a threshold of under current alarm.	(0 to 6000.0A)	10.0A	○	○	-	○	○	-	-
	Hysteresis	Set a hysteresis of under current alarm.	(0 to 1000.0A)	5.0A	○	○	-	○	○	-	-
	On delays	Set an on-delay time of under current alarm.	(0.1 to 10.0s)	0.1s	○	○	-	○	○	-	-
Active power upper limit alarm	Threshold	Set a threshold of active power upper limit alarm.	(-120000000 to 120000000W)	1000W	○	○	-	-	○	-	-
	Hysteresis	Set a hysteresis of active power upper limit alarm.	(0 to 24000000W)	100W	○	○	-	-	○	-	-
	On delays	Set an on-delay time of active power upper limit alarm.	(0.5 to 10.0s)	0.5s	○	○	-	-	○	-	-
Active power lower limit alarm	Threshold	Set a threshold of active power lower limit alarm.	(-120000000 to 120000000W)	300W	○	○	-	-	○	-	-
	Hysteresis	Set a hysteresis of active power lower limit alarm.	(0 to 24000000W)	100W	○	○	-	-	○	-	-
	On delays	Set an on-delay time of active power lower limit alarm.	(0.5 to 10.0s)	0.5s	○	○	-	-	○	-	-
Reactive power upper limit alarm	Threshold	Set a threshold of reactive power upper limit alarm.	(-120000000 to 120000000var)	1000var	○	○	-	-	○	-	-
	Hysteresis	Set a hysteresis of reactive power upper limit alarm.	(0 to 24000000var)	100var	○	○	-	-	○	-	-
	On delays	Set an on-delay time of reactive power upper limit alarm.	(0.5 to 10.0s)	0.5s	○	○	-	-	○	-	-
Reactive power lower limit alarm	Threshold	Set a threshold of reactive power lower limit alarm.	(-120000000 to 120000000var)	300var	○	○	-	-	○	-	-
	Hysteresis	Set a hysteresis of reactive power lower limit alarm.	(0 to 24000000var)	100var	○	○	-	-	○	-	-
	On delays	Set an on-delay time of reactive power lower limit alarm.	(0.5 to 10.0s)	0.5s	○	○	-	-	○	-	-
Power factor alarm	Threshold	Set a threshold of power factor alarm.	(-1.00 to 1.00)	0.00	○	○	-	-	○	-	-
	Hysteresis	Set a hysteresis of power factor alarm.	(0.00 to 1.00)	0.05	○	○	-	-	○	-	-
	On delays	Set an on-delay time of power factor alarm.	(0.5 to 10.0s)	0.5s	○	○	-	-	○	-	-
Active input setting		Unselect CT input or ZCT input that is not subject to alarm judgment.	Input 1, Input 2, Input 3, Input 4, Input 5, Input 6, Input 7, Input 8	Check all	○	○	○	○	○	○	-

5 Operation description

Item name	Explanation	Options/setting range	Initial value	KE1-						
				PGRC	PVSI1C	VSU1B	VAU1B	CTD8E	ZCT8E	DRT
Alarm output setting	<p>Among selected items of alarm parameter setting, specify item(s) to enable alarm output function. You can enable more than one item. (*1)(*2)</p> <p>The alarm settings configured here are reflected to the alarm output.</p> <p>Note that voltage sag alarm, earth leakage alarm, phase-loss alarm, and phase-sequence alarm are not specified in this item.</p> <p>*1: When you enabled multiple alarm items, they work in OR logic for each measurement block. If any of the alarm items meets its alarm condition, the output turns ON.</p> <p>*2: For CTD8E, items must be configured for each measurement block. When you enabled multiple alarm items, they work in OR logic for each measurement block.</p>	Over voltage alarm Under voltage alarm Over current alarm Under current alarm Active power upper limit alarm Active power lower limit alarm Reactive power upper limit alarm Reactive power lower limit alarm Power factor alarm	Uncheck all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-
Earth leakage comparison set value 1	If the value specified here has been measured for an Earth leakage operating time 1 or longer, it is evaluated as alarm.	(30 to 1000mA)	30mA	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-
Earth leakage operating time 1	If the Earth leakage comparison set value 1 has been measured for the value specified here or longer, it is evaluated as alarm.	(0.1 to 20.0s)	0.5s	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-
Earth leakage comparison set value 2	Same as Earth leakage comparison set value 1.	(30 to 1000mA)	30mA	-	-	-	-	-	<input type="radio"/>	-
Earth leakage operating time 2	Same as Earth leakage operating time 1.	(0.1 to 20.0s)	0.5s	-	-	-	-	-	<input type="radio"/>	-
Earth leakage comparison set value 3	Same as Earth leakage comparison set value 1.	(30 to 1000mA)	30mA	-	-	-	-	-	<input type="radio"/>	-
Earth leakage operating time 3	Same as Earth leakage operating time 1.	(0.1 to 20.0s)	0.5s	-	-	-	-	-	<input type="radio"/>	-
Earth leakage comparison set value 4	Same as Earth leakage comparison set value 1.	(30 to 1000mA)	30mA	-	-	-	-	-	<input type="radio"/>	-
Earth leakage operating time 4	Same as Earth leakage operating time 1.	(0.1 to 20.0s)	0.5s	-	-	-	-	-	<input type="radio"/>	-
Earth leakage comparison set value 5	Same as Earth leakage comparison set value 1.	(30 to 1000mA)	30mA	-	-	-	-	-	<input type="radio"/>	-
Earth leakage operating time 5	Same as Earth leakage operating time 1.	(0.1 to 20.0s)	0.5s	-	-	-	-	-	<input type="radio"/>	-
Earth leakage comparison set value 6	Same as Earth leakage comparison set value 1.	(30 to 1000mA)	30mA	-	-	-	-	-	<input type="radio"/>	-
Earth leakage operating time 6	Same as Earth leakage operating time 1.	(0.1 to 20.0s)	0.5s	-	-	-	-	-	<input type="radio"/>	-
Earth leakage comparison set value 7	Same as Earth leakage comparison set value 1.	(30 to 1000mA)	30mA	-	-	-	-	-	<input type="radio"/>	-
Earth leakage operating time 7	Same as Earth leakage operating time 1.	(0.1 to 20.0s)	0.5s	-	-	-	-	-	<input type="radio"/>	-

5 Operation description

Item name		Explanation	Options/setting range	Initial value	KE1-						
					PGR1C	PVS1C	VSI1B	VAU1B	CTD8E	ZCT8E	DRT
Earth leakage comparison set value 8		Same as Earth leakage comparison set value 1.	(30 to 1000mA)	30mA	-	-	-	-	-	○	-
Earth leakage operating time 8		Same as Earth leakage operating time 1.	(0.1 to 20.0s)	0.5s	-	-	-	-	-	○	-
Phase-loss detection		Specify whether voltage phase-loss should be detected in the 3-phase 3-wire or 3-phase 4-wire.	OFF, ON	OFF	○	○	○	○	-	-	-
Phase-sequence detection		Set whether the voltage phase-sequence should be detected or not. (The phase sequence alarm does not have threshold, hysteresis, and on-delay settings)	OFF, ON	OFF	○	○	○	○	-	-	-
Output terminal 1 function setting		Set the output terminal 1 to use in which of the following functions. Each measurement block of alarm output (*1), Earth leakage output (*2), phase-loss alarm output, phase-sequence output, and total power consumption pulse output *1: Output is made when an alarm of the item configured in the "Alarm output setting" for the measurement blocks 1/2 occurred. This item can be selected for CTD8E only. *2: This item can be selected only when PGR1C or ZCT8E is used.	OFF Measuring block 1 alarm Measuring block 2 alarm Earth leakage Phase-loss Phase-sequence Pulse output	OFF	○	-	○	○	○	○	-
	Output terminal 1 condition	Set the output terminal 1 to use in which of the following logics. N-O (Normally open): Outputs ON when power is on and OFF when power is off. N-C (Normally closed): Outputs ON when power is off and OFF when power is on.	N-O (Normally open) N-C (Normally closed)	N-O	○	-	○	○	○	○	-
Output terminal 2 function setting		Same as Output terminal 1 function setting.	Same as on the left	OFF	○	○	-	○	-	-	-
	Output terminal 2 condition	Same as Output terminal 1 status.	Same as on the left	N-O	○	○	-	○	-	-	-
Voltage sag detection 1		Set a line to detect voltage sag.	OFF Vrs (3P3W, 1P2W, 1P3W), Vrn (3P4W) Vst (3P3W, 1P3W), Vsn (3P4W) Vtr (3P3W), Vtn (3P4W)	OFF	-	○	○	-	-	-	-
	Voltage sag detection voltage	If the target line voltage falls under the value specified here for the voltage sag duration time or longer, it is evaluated as voltage sag.	(0 to 480.0V)	80.0V	-	○	○	-	-	-	-
	Voltage sag duration time	If the target line voltage falls under the voltage sag detection voltage for a time period specified here or longer, it is evaluated as voltage sag.	(0.02 to 1.00s)	0.02s	-	○	○	-	-	-	-
Voltage sag detection 2		Same as Voltage sag detection 1.	Same as on the left	OFF	-	○	○	-	-	-	-
	Voltage sag detection voltage	Same as Voltage sag detection 1.	Same as on the left	80.0V	-	○	○	-	-	-	-
	Voltage sag duration time	Same as Voltage sag detection 1.	Same as on the left	0.02s	-	○	○	-	-	-	-

5 Operation description

Item name		Explanation	Options/setting range	Initial value	KE1-						
					PGRTC	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E	DRT
Voltage sag detection 3		Same as Voltage sag detection 1.	Same as on the left	OFF	-	○	○	-	-	-	-
	Voltage sag detection voltage	Same as Voltage sag detection 1.	Same as on the left	80.0V	-	○	○	-	-	-	-
	Voltage sag duration time	Same as Voltage sag detection 1.	Same as on the left	0.02s	-	○	○	-	-	-	-
Voltage sag detection 4		Same as Voltage sag detection 1.	Same as on the left	OFF	-	○	○	-	-	-	-
	Voltage sag detection voltage	Same as Voltage sag detection 1.	Same as on the left	80.0V	-	○	○	-	-	-	-
	Voltage sag duration time	Same as Voltage sag detection 1.	Same as on the left	0.02s	-	○	○	-	-	-	-
Back up at voltage sag		Set whether the system power is backed up by UPS or not. For the detailed operational differences by the backup power, refer to "Voltage Sag Detection" of "Model KE1 User's Manual".	OFF, ON	OFF	-	○	○	-	-	-	-

■ How to set major functions

Shown below are methods to set major functions of the KE1. Explanations are given in the balloons on the setting screens based on the setting examples described in "3.Setting major functions".

● To detect voltage sag

Shown below is an example of evaluating as voltage sag when the R-S line voltage (Voltage sag detection) is less than 170V (Voltage sag detection voltage) for 0.03 seconds (Voltage sag duration time) in a 3-phase 3-wire circuit.

Communication setting | Measurement setting | **Alarm setting** | Logging setting

Electrical system 1 (or common)		Electrical system 2
Voltage sag detection 1	Vrs(3P3W, 1P2W, 1P3W), Vrn(3P4W)	
Voltage sag detection voltage	170	(0.0 to 480.0V)
Voltage sag duration time	0.03	(0.02 to 1.00s)
Voltage sag detection 2	OFF	
Voltage sag detection voltage		
Voltage sag duration time	0.02	(0.02 to 1.00s)
Voltage sag detection 3	OFF	
Voltage sag detection voltage	80.0	(0.0 to 480.0V)

Scroll with mouse.

Back up at voltage sag: OFF ON

• Back up at voltage sag: OFF
If you back up the supply voltage using a UPS, set the Back up at voltage sag to ON.

● To detect Earth leakage

Shown below is an example of evaluating as Earth leakage when the measured ZCT input is 100mA (Earth leakage comparison set value) for 0.5 seconds (Earth leakage operating time) and providing output to the output terminal 1.

Communication setting | Measurement setting | Alarm setting | Logging setting

Electrical system 1 (or common)

Earth leakage comparison set value 1: 100 (30 to 1000mA)

Earth leakage operating time 1: 0.5 (0.1 to 20.0s)

Earth leakage comparison set value 2: (30 to 1000mA)

Earth leakage operating time 2: (0.1 to 20.0s)

Earth leakage comparison set value 3: (30 to 1000mA)

Earth leakage operating time 3: (0.1 to 20.0s)

Earth leakage comparison set value 4: (30 to 1000mA)

Earth leakage operating time 4: (0.1 to 20.0s)

In the [Alarm setting] tab, configure the following items.

- Earth leakage comparison set value 1: 100mA
- Earth leakage operating time 1: 0.5s

Scroll with mouse.

Communication setting | Measurement setting | Alarm setting | Logging setting

Electrical system 1 (or common)

Output terminal 1 function setting: Earth leakage

Output terminal 1 condition: N-O (Normally open)

Output terminal 2 function setting: OFF

Output terminal 2 condition: N-O (Normally open)

Voltage sag detection 1: (0.0 to 480.0V)

Voltage sag detection voltage: (0.02 to 1.00s)

Voltage sag duration time: (0.0 to 480.0V)

Voltage sag detection 2: (0.0 to 480.0V)

To provide output to the output terminal when leakage occurs, configure the following items in the [Alarm setting] tab.

- Output terminal 1 function setting: Earth leakage

- Earth leakage Low-cut current setting ([Measurement setting] tab)

Communication setting | **Measurement setting** | Alarm setting | Logging

Electrical system 1 (or common)

Earth leakage Low-cut current (0.1 to 30.0mA)

Simple measurement ☐ OFF ☐ ON

Voltage on simple measurement (0.1 to 9999.9V)

Power factor on simple measurement (0.01 to 1.00)

Average count

Pulse output unit

Pulse output circuit

Total power coefficient (0.000 to 9999.999)

In the [Measurement setting] tab, configure the following items.

- Earth leakage Low-cut current: 1.0mA

5.3.4.4. Logging setting

[Logging setting] tab

Communication setting Measurement setting Alarm setting Logging setting			
Data logging 1 item	Voltage MAX 1	Data logging 1 cycle	5min
Data logging 2 item	Voltage MAX 2	Data logging 2 cycle	5min
Data logging 3 item	Voltage MAX 3	Data logging 3 cycle	5min
Data logging 4 item	Voltage MIN 1	Data logging 4 cycle	5min
Data logging 5 item	Voltage MIN 2	Data logging 5 cycle	5min
Data logging 6 item	Voltage MIN 3	Data logging 6 cycle	5min

[Setup Item List]

Setup Item Name		Explanation	Options/setting range	Initial value	KE1-						
					PG1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E	DRT
Log 1	Item to save	Specify item(s) to save to the log 1.	Refer to "List of logs to be saved" in "User's manual for KM1/KE1".	Voltage MAX1 (Temperature MAX1 only for EMU8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-
	Logging cycle	Specify a cycle to save to the log 1.	5m, 10m, 30m, 1h, 2h, 6h, 12h, 24h	5 minutes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-
Log 2	Item to save	Same as Item to save for Log 1.	Same as on the left	Voltage MAX2 (Temperature MIN1 only for EMU8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-
	Logging cycle	Same as Log 1 cycle.	Same as on the left	5 minutes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-
Log 3	Item to save	Same as Item to save for Log 1.	Same as on the left	Voltage MAX3 (Pulse input ON time 1 only for EMU8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-
	Logging cycle	Same as Log 1 cycle.	Same as on the left	5 minutes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-
Log 4	Item to save	Same as Item to save for Log 1.	Same as on the left	Voltage MIN1 (Pulse input ON time 2 only for EMU8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-
	Logging cycle	Same as Log 1 cycle.	Same as on the left	5 minutes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-
Log 5	Item to save	Same as Item to save for Log 1.	Same as on the left	Voltage MIN2 (Pulse input count 1 only for EMU8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-
	Logging cycle	Same as Log 1 cycle.	Same as on the left	5 minutes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-
Log 6	Item to save	Same as Item to save for Log 1.	Same as on the left	Voltage MIN3 (Pulse input count 2 only for EMU8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-
	Logging cycle	Same as Log 1 cycle.	Same as on the left	5 minutes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-

5.3.5. Time setting

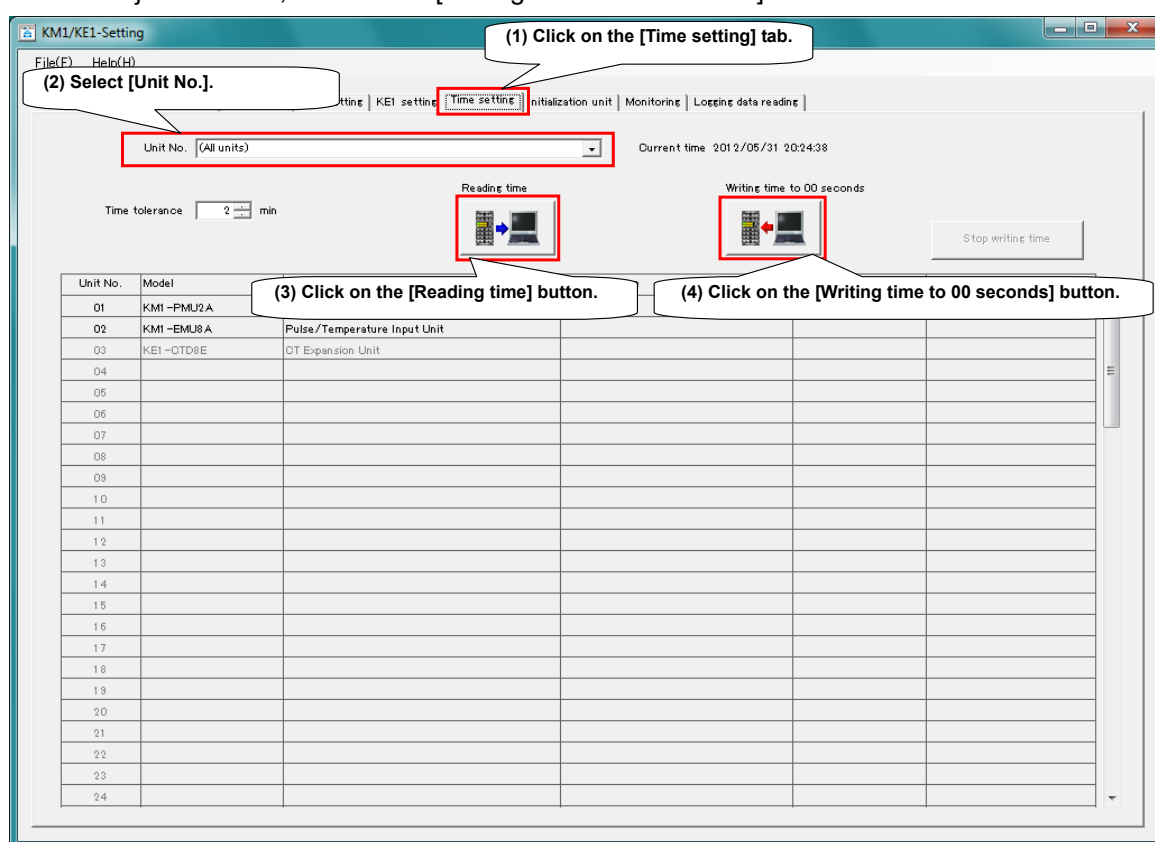
Based upon the time on the computer used, set the time on the internal clock in the unit. Make sure that the time on the computer is correct before doing so.

Precautions for Correct Use

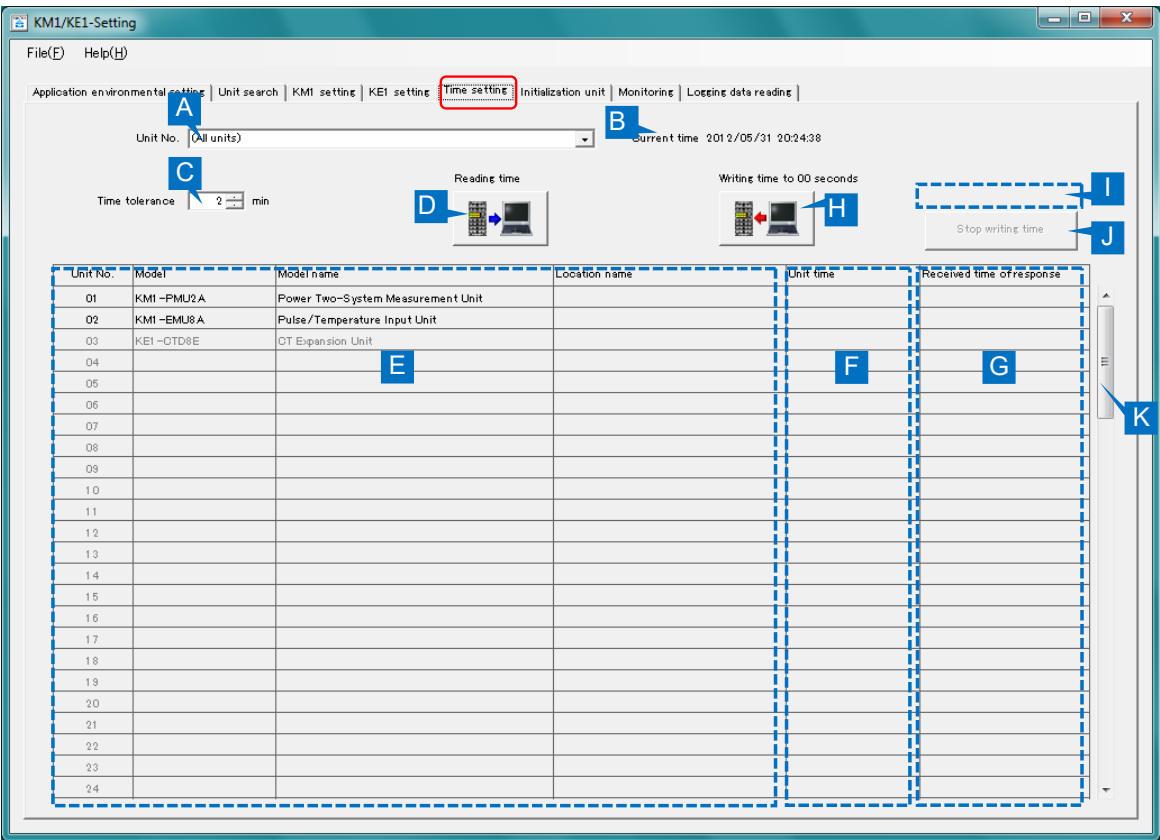
- When the setting values are written to the unit with the power switched on, unplug the USB cable from the computer after writing and restart the power of the entire system.
For details, refer to "5.2.5 Precautions for setting the unit connected to a power source"(p.5-10).
- If the operation display LED [PWR] still blinks even after time setting, refer to "Chapter 4: Troubleshooting" in "Model KM1 User's Manual" or "Model KE1 User's Manual".

■ Overview of operational procedure

From [Unit No.], select the unit for which time will be set and click on [Reading time]. If there is a need to adjust the time, click on the [Writing time to 00 seconds] button.



■ Operational screen

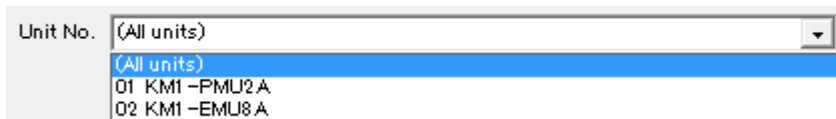


[Main setting items and functions]

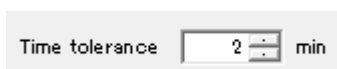
Symbol	Item	Explanation
A	Unit No.	Selects the unit for which the time will be set. Selection of [(All units)] will allow you to set the time for all targeted units that are time- settable. If you select one unit, then the time will be set for that unit only.
B	Current time	Shows the current time on the computer.
C	Time tolerance (min)	Sets the time tolerance between the computer and the unit by the minute. If the difference between the computer and the unit exceeds the time tolerance when the time is read out, the line for the relevant unit will be indicated in yellow. But it will not affect the reading and writing of time. (Setting range: 1 to 99 minutes)
D	Reading time button	By clicking, reads out the time set from the unit selected. Shows a list of [Unit time] and [Received time of response].
E	Unit information (01 - 99 lines)	The unit information selected by [Unit No.] will be shown. Unit No.: Unit no. 01 - 99 are indicated in serial numbers. Model: The unit model is shown. Model name: The unit model name is shown. Location name: [Location name] registered on the [Unit search] screen will be shown. Note: The following models are not available for time setting, so the characters will be indicated in gray. ·KE1-CTD8E ·KE1-ZCT8E ·KE1-DRT
F	Unit time (01 - 99 lines)	Shows the unit time read from the unit.
G	Received time of response (01 - 99 lines)	Shows the time on the computer when [Unit time] is received from the unit.
H	Writing time to 00 seconds button	By clicking, writes the time on the computer to 00 seconds for the unit indicated in the unit (not indicated in gray) information column.
I	Countdown indication	By clicking the [Writing time to 00 seconds] button, shows the number of minutes to execute writing.
J	Stop writing time button	Activates while [Countdown indication] is indicated. By clicking, stops the writing of time.
K	Scroll bar	Scrolls vertically on the screen.

■ Operational procedure**● Time setting****(1) Selection of the unit for which time will be read out**

Select the unit for which the time will be read out. By selecting [(All units)], you can set all targeted units.

**(2) Setting of time tolerance**

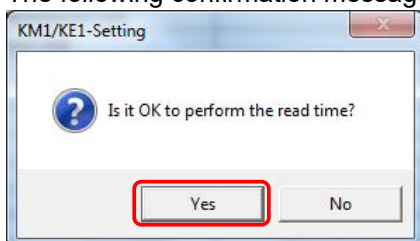
Set the time tolerance for the computer and the unit for which the time will be set. (1- 99 minutes)

**(3) Reading of time**

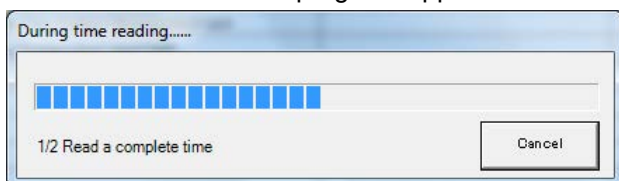
1. Click on the [Reading time] button.



2. The following confirmation message will appear. To read the time, click on the [Yes] button.



Wait for a while until the progress appears.



(3) [Unit time] and [Received time of response] for the targeted units will be shown.

For the units for which the time was successfully read out, [Unit time] will be indicated in blue.

Unit No.	Model	Model name	Location name	Unit time	Received time of response
01	KM1-PMU2A	Power Two-System Measurement Unit		2012/05/31 20:41:13	20:41:13

<Colors of background and characters after time reading>

- When exceeding the time tolerance as a result of time reading

The background will be indicated in yellow. [Unit time] will be indicated in red.

Unit No.	Model	Model name	Location name	Unit time	Received time of response
01	KM1-PMU2A	Power Two-System Measurement Unit		2012/05/31 20:16:22	20:19:44

- When the time reading is unsuccessful

The background will be indicated in red. An error message will be indicated in the [Unit time] and [Received time of response] columns. For actions to take on error, refer to "6.2 Handling of communication errors" (p.6-4).

Unit No.	Model	Model name	Location name	Unit time	Received time of response
01	KM1-PMU2A	Power Two-System Measurement Unit		Port open failure	

(4) Selection of the unit for which time will be written.

Selects the unit for which the time will be written. By selecting [(All units)], you can write the time to all targeted units.

Unit No.	<div>(All units)</div> <div>(All units)</div> <div>01 KM1-PMU2A</div> <div>02 KM1-EMU8A</div>
----------	---

Precautions for Correct Use

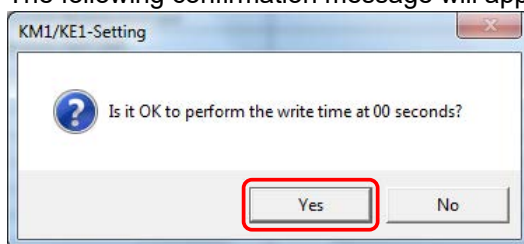
Writing by selecting each individual slave is not possible in case of multi-unit connecting composition. Select [(All units)] or Measurement master to set the time. The time on the measurement master will be reflected to the slave.

(5) Writing of time

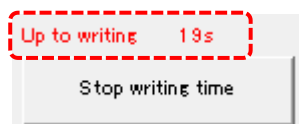
1. If you wish to write the time on the computer to the unit selected, click on the [Writing time to 00 seconds] button.



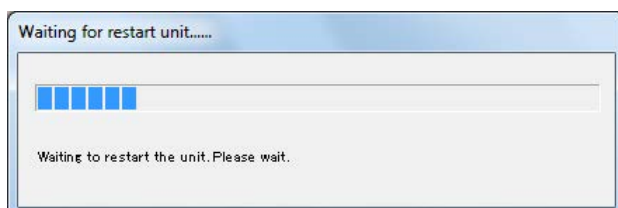
2. The following confirmation message will appear. Click on the [Yes] button.



3. The countdown to time writing will be indicated. Upon [up to writing 00s], the time will be written to the unit.



The [Waiting for restart the unit] screen will appear. Please wait.



- Note 1: The contents indicated on the [Waiting for restart the unit] screen vary depending on the unit and system configuration selected.
- Note 2: In case an error occurs during the communication with the unit, the cause of communication error will be shown on the communication result screen. For details of the cause of the error, please refer to "6.2 Handling of communication errors" (p.6-4).

4. For the units for which the time was successfully written, [Unit time] and [Received time of response] will be indicated in black.

If the unit power is on, unplug the USB cable from the computer and turn on the power of the entire system again.

Unit No.	Model	Model name	Location name	Unit time	Received time of response
01	KM1-PMU2A	Power Two-System Measurement Unit		2012/05/31 20:34:42	20:38:03

<Colors of background and characters after time writing>

- When the time writing is unsuccessful

The background will be indicated in red. An error message will be indicated in the [Unit time] and [Received time of response] columns. For actions to take on error, refer to "6.2 Handling of communication errors" (p.6-4).

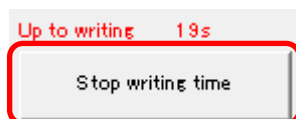
Unit No.	Model	Model name	Location name	Unit time	Received time of response
01	KM1-PMU2A	Power Two-System Measurement Unit			Port open failure

5. Execute the time reading again to ensure that the time was successfully modified.

The time setting is complete.

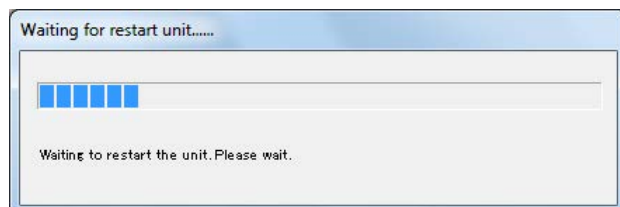
[Stop of time writing]

To stop the time writing, click on the [Stop writing time] button.



The [Waiting for restart the unit] screen will appear. Please wait.

Note: The contents indicated on the screen vary depending on the unit and system configuration selected.

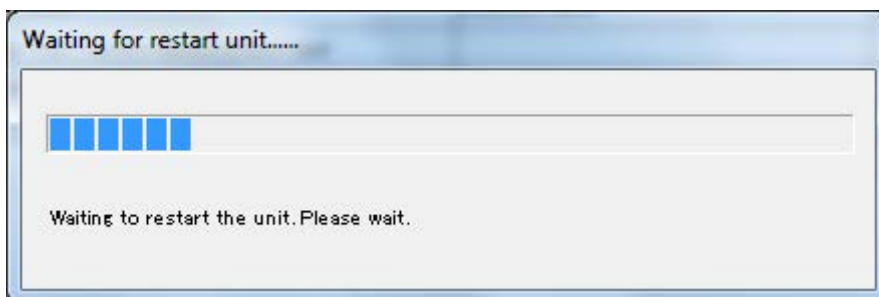


Additional Information

<[Unit restarting] screen for time setting>

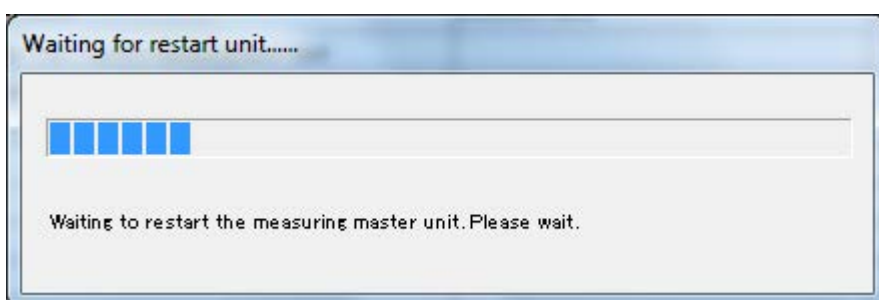
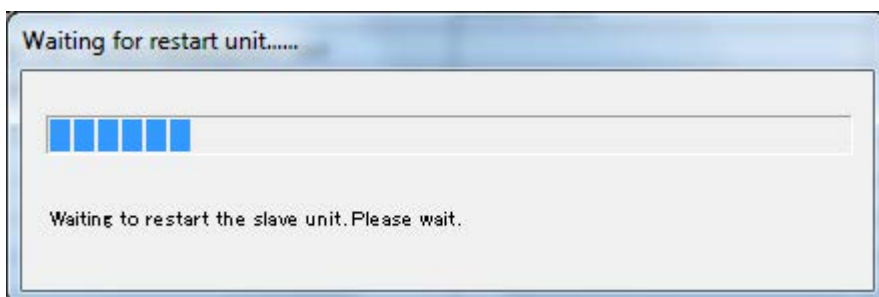
Stop the time writing or reading, and the [Waiting for restart the unit] screen will appear. The contents indicated on the screen vary depending on the unit and system configuration selected.

[Selecting each individual unit through unit selection]

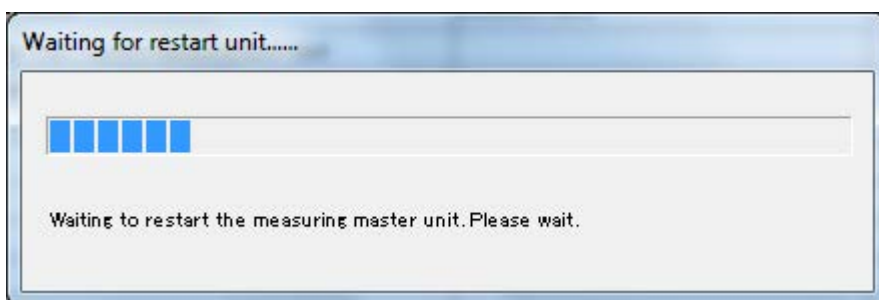


[Selecting (all units) through unit selection]

Multiple-unit connection composition



- Measurement master only



5.3.6. Initialization unit

Setting values, measurement values and history registered with the main unit can be initialized. This operation is not mandatory. You can implement this operation as necessary.

The following are the items for initialization:

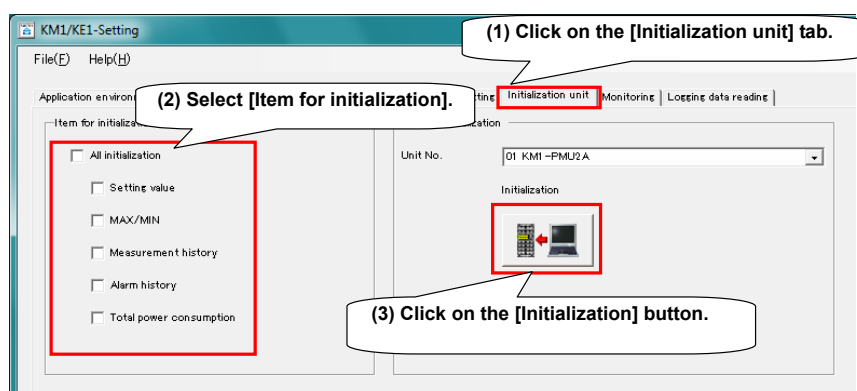
Item for initialization	Explanation
All initialization	All of setting values, measurement history, alarm history and total power consumption will be initialized.
Setting	All setting values except for time will be restored to factory setting.
MAX/MIN	Maximum value and minimum value for each measurement value will be reset. Reset of maximum value: At the time of reset, the value will be reset to 0 that is a minimum value. Reset of minimum value: At the time of reset, the value will be reset to a maximum value that is within the measurement range.
Measurement history	All of measurement history (measurement logging data) will be initialized.
Alarm history	Alarm history will be initialized.
Total power consumption	Total power consumption will be reset to 0. Upon reset, the power consumption will be accumulated again.

Precautions for Correct Use

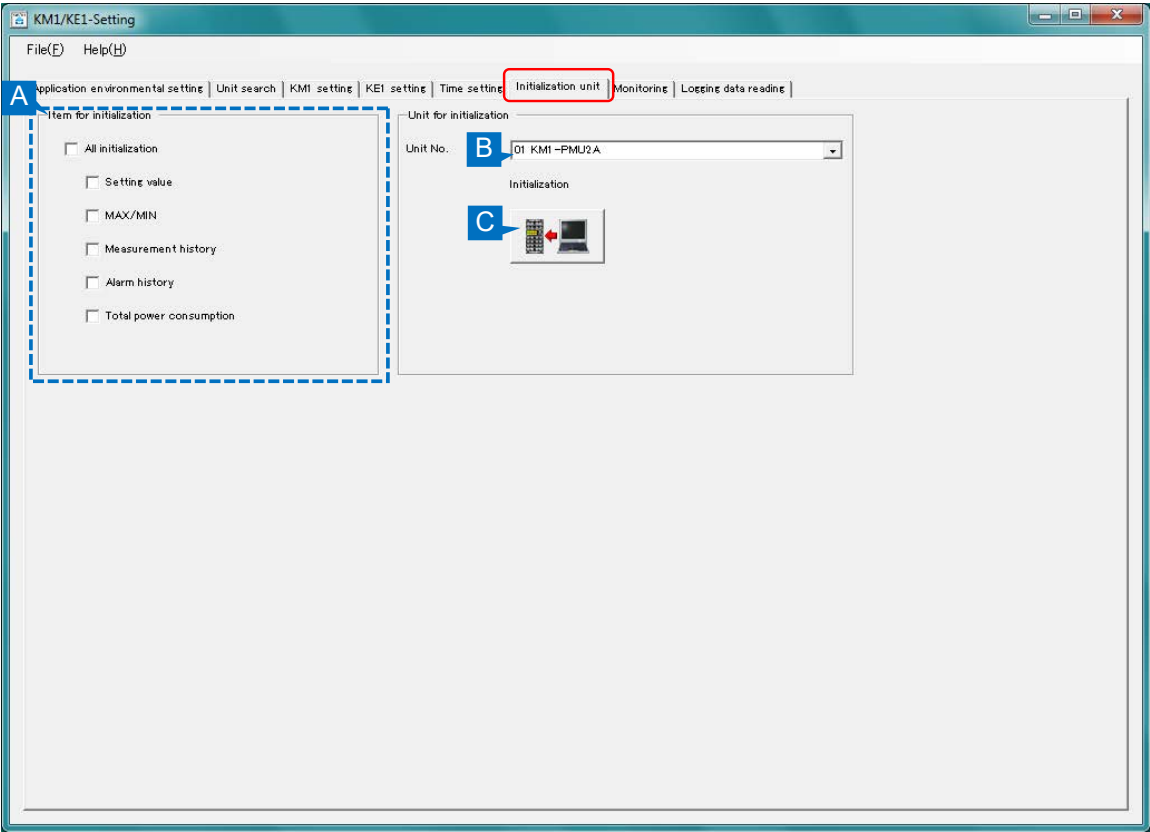
- Upon initialization, the data stored in the main unit will be initialized and will not be restored.
- Upon all initialization or initialization of setting values, the Unit No. will be set to "01" and therefore the main unit must be set again. Communication settings (baud rate, data length, stop bits and vertical parity) will be initialized as well, therefore the RS-485 connection will not be possible when the unit is used with the communication settings different from the initial values through RS-485 connection. In this case, set the values again through USB connection.
- When the setting values are written to the unit with the power switched on, unplug the USB cable from the computer after writing and restart the power of the entire system. For details, refer to "Precautions for setting the unit connected to a power source"(p.5-10).
- For details of each item for initialization for KM1, refer to "3.6 Other functions" in "Model KM1 User's Manual".
- For details of each item for initialization for KE1, refer to "3.8 Other functions" in "Model KE1 User's Manual".

■ Overview of operational procedure

From [Unit No.], select the targeted unit and select the item to be initialized. Click on the [Initialization] button.



■ Operational screen



[Main setting items and functions]

Symbol	Item	Explanation
A	Item for initialization	Select the item to be initialized. Except for all initialization, you can select more than one item. (Targeted items: all initialization, setting values, MAX/MIN, measurement history, alarm history and total power consumption)
B	Unit No.	Select the unit to be initialized. You can initialize only one unit at one time. "Unit No. + Model + Location name" will be shown.
C	Initialization button	Initialization will be implemented for the unit specified by clicking.

■ Operational procedure

● Initialization

1. Select the unit to be initialized.

Unit No. 01 KM1 -PMU2A
01 KM1 -PMU2A
02 KM1 -EMU8A
03 KE1 -CTD8E

2. Click on the item to be initialized. (Multiple items can be selected)
Select [All initialization], and all items will be initialized.

Item for initialization

☐ All initialization

☐ Setting value

☐ MAX/MIN

☐ Measurement history

☐ Alarm history

☐ Total power consumption

➔

Item for initialization

☒ All initialization

☐ Setting value

☐ MAX/MIN

☐ Measurement history

☐ Alarm history

☐ Total power consumption

3. Click on the [Initialization] button.



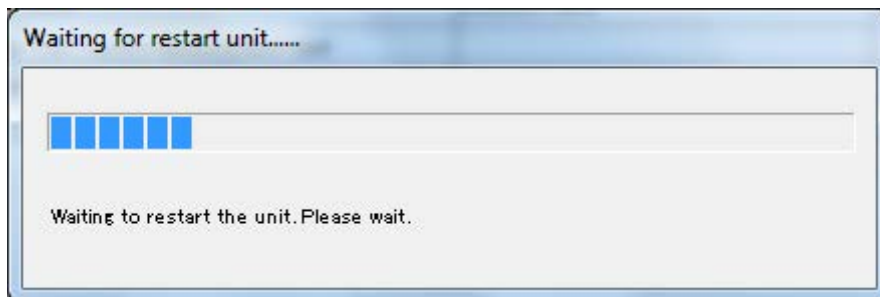
4. The following confirmation message will appear. If you proceed with initialization, click on the [Yes] button.

KM1/KE1-Setting

Initialize the data stored in the unit.(Only the selected item)
If it initializes, it becomes impossible to restore.
Are you sure you want to initialize?

Yes
No

The [Waiting for restart the unit] screen will appear. Please wait.



Note 1: When you select [All initialization], [Setting values], [Measurement history] and [Alarm history], this screen will appear. For [MAX/MIN] and [Total power consumption], this screen will not appear because it is unnecessary to restart the unit.

Note 2: In case an error occurs during the communication with the unit, the cause of communication error will be shown on the communication result screen. For details of the cause of the error, please refer to "6.2 Handling of communication errors" (p.6-4).

5. Once the [Waiting for restart the unit] screen disappears, the initialization of the main unit is complete.

If the unit power is on, unplug the USB cable from the computer and turn on the power of the entire system again.

5.3.7. Monitoring

Measurement values of the unit will be read out regularly and shown on the screen.

The [Instantaneous value] tab enables the instantaneous value for each measurement item to be shown in real time. The [Status] tab enables the internal operation state for the main unit of KM1/KE1 to be shown in real time.

This is not a regular monitoring. The monitoring time will be determined according to number of readout (count) and repetition intervals.

Precautions for Correct Use

The measurement value will be set to 0 and will not be properly displayed when driven by the USB bus power. To monitor measurement values properly, connect the unit to a power source.

■ Overview of operational procedure

From [Unit No.], select the unit to be monitored. Specify [Number of readout (count)] and [Repetition interval (s)], and click on the [Start] button.

■ Operational screen

The top screenshot shows the 'Monitoring' tab of the KM1/KE1-Setting software. It includes a 'Unit No.' dropdown menu, 'The number of readout (count)' and 'Repetition interval (s)' input fields, and 'Start' and 'Stop' buttons. Callouts (1), (2), and (3) guide the user through the initial setup steps.

The bottom screenshot shows the 'Instantaneous value' tab. It displays a grid of measurement items with corresponding input fields for each. Callouts A through J highlight specific features:

- A:** Unit No. dropdown menu
- B:** The number of readout (count) input field
- C:** Repetition interval (s) input field
- D:** Measurement time label
- E:** Start button
- F:** Stop button
- G:** Instantaneous value tab label
- H:** Current (A) measurement section
- I:** Clear the display button
- J:** Screen copy button

The measurement items displayed include:

- Current (A): 12 channels
- Voltage (V): 6 channels
- Active power (kW): 8 channels
- Reactive power (kvar): 8 channels
- Power factor: 8 channels
- Frequency (Hz): 2 channels
- Temperature: 1 channel
- Earth leakage (Io) (mA): 8 channels
- Status: 8 channels

[Each measurement value screen]

(Instantaneous Value)

Instantaneous value	Status
Current (A)	1 2 3 4 5 6
	7 8 9 10 11 12
Voltage (V)	1 2 3 4 5 6
Active power (kW)	1 2 3 4 5 6 7 8
Reactive power (kvar)	1 2 3 4 5 6 7 8
Power factor	1 2 3 4 5 6 7 8
Frequency (Hz)	1 2
Temperature	1
Earth leakage (Io) (mA)	1 2 3 4 5 6 7 8
Status	

Note: For model-specific measurement value columns in detail, refer to "7.3 Model-specific instantaneous value screen" (p.7-10).

(Status)

[illegible]

[Main setting items and functions]

Symbol	Item	Explanation
A	Unit No.	Specify the unit to be monitored. "Unit No. + Model + Location name" will be shown.
B	The number of readout (count)	Specify the number of monitoring activities between 1 and 300 times. (Initial value: 300 times) Measurement values will be read out according to the number of monitoring activities specified and [Repetition intervals].
C	Repetition interval (s)	Select from the number of 0, 1, 2, 3, 4 and 5. (Initial value: 1 second) Specify the waiting time, starting from the completion of reading of all items until the start of next reading. Note: This does not refer to measurement intervals for each item.
D	Time of measurement	The time on the computer will be shown upon completion of each measurement.
E	Start button	By clicking, the main unit will be read out with the conditions specified and the acquired information will be shown on the screen.
F	Stop button	By clicking, the repeated reading will be stopped.
G	Switch tab	The [Instantaneous value] screen and [Status] screen can be switched.
H	Each measurement value column ([Instantaneous value] tab)	The instantaneous value read out will be shown. All measurement items except for targeted unit models will be shown in gray. For details of measured value column for each model, please refer to "7.3 Model-specific instantaneous value screen" (p.7-10).
I	Clear the display button	By clicking, the values acquired by monitoring will be cleared. Note: This function can be activated when the monitoring is not working.
J	Screen copy button	By clicking, the contents shown on the screen will be copied to the clipboard. Note: This function can be activated when the monitoring is not working.
K	Status details ([Status] tab)	The status details will be shown.

■ Operational procedure

● Monitoring

1. Select the unit to be monitored.

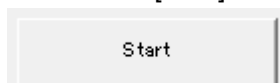
2. Specify the number of readout (count). (1 to 300 times)

3. Specify the repetition intervals for reading. (0 to 5 s)

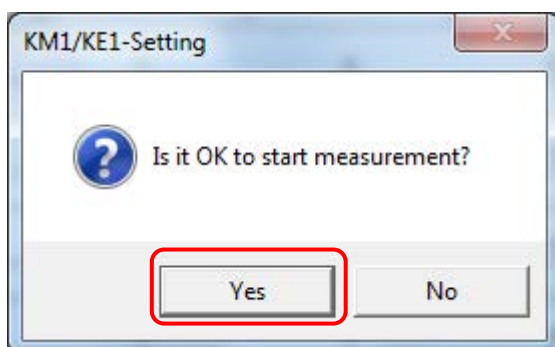
Precautions for Correct Use

The repetition intervals are the interval starting from the completion of measurement of all items until the start of next measurement. This does not refer to measurement intervals for each item.

- Click on the [Start] button.



- The following confirmation message will appear. To start monitoring, click on the [Yes] button.



Note: In case an error occurs during the communication with the unit, the cause of communication error will be shown on the communication result screen. For details of the cause of the error, please refer to "6.2 Handling of communication errors" (p.6-4).

- Each measurement value will be shown repeatedly with the conditions specified. The measurement time will be updated upon completion of each measurement.

Unit No. 01 KM1-PMU2A Measurement time: 2012/06/01 11:14:20

The number of readout (count) 300 Repetition interval (s) 1

Start Stop

Instantaneous value Status

	1	2	3	4	5	6	7	8
Current (A)	28.180	86.071	0.000					
	28.480	28.499	0.000					
Voltage (V)	1049.6	0.0	0.0	1051.1	0.0	0.0		
Active power (kW)	-15.3927	-26.0577			-15.0542	-14.3256		
Reactive power (kvar)	0.5588	77.9736			0.4765	0.6730		
Power factor	-0.99	-0.92			-0.99	-0.99		
Frequency (Hz)	60.0	59.9						
Temperature								
Earth leakage (Io) (mA)								
Status	0001	0000	0000	0000	0000	0000	0000	0000

Clear the display Screen copy

Note: For model-specific measurement value columns in detail, refer to "7.3 Model-specific instantaneous value screen" (p.7-10).

Click on the [Status] tab, and the details of the status will be shown repeatedly.

Unit No.

01 KM1-PMU2A

Measurement time: 2012/06/01 11:15:55

The number of readout (count)

300

Repetition interval (s)

1

Start

Stop

Instantaneous value

Status

31

16

15

0

0001

0000

0000

0000

0000

0000

0000

0000

bit

Power Two-System Measurement Unit

Condition

16

0

17

0

18

OUT 1

0

19

OUT 2

0

20

OUT 3

0

21

LOW condition (Electrical system 1)

0

22

MIDDLE condition (Electrical system 1)

0

23

HIGH condition (Electrical system 1)

0

24

LOW condition (Electrical system 2)

0

25

MIDDLE condition (Electrical system 2)

0

26

HIGH condition (Electrical system 2)

0

27

0

28

Alarm 1

1

29

Alarm 2

0

30

0

31

0

bit

Power Two-System Measurement Unit

Condition

0

Abnormal of RAM (E-M1)

0

1

Abnormal of EEPROM (E-M2)

0

2

Abnormal of EEPROM (E-M3)

0

3

Abnormal of RTC (E-T1)

0

4

Abnormal of communication

0

5

Mode of operation

0

6

Input voltage exceed allowed range (E-S1)

0

7

Input current exceed allowed range (E-S2)

0

8

Insufficient input voltage

0

9

Abnormal input of frequency (E-S3)

0

10

CT input 1

0

11

CT input 2

0

12

CT input 3

0

13

CT input 4

0

14

0

15

0

Clear the display

Screen copy

<Status>

By reading the status through communication, you can confirm the internal operational condition of KM1/KE1. The status is made up of 32 bits: bit 1 indicating the occurrence and bit 0 indicating non-occurrence (mode of operation 1: stop; 0: operation). When the status is set to "1", the background will be indicated in light blue.

For the status in detail, refer to "Communication manual: Model KM1/KE1".

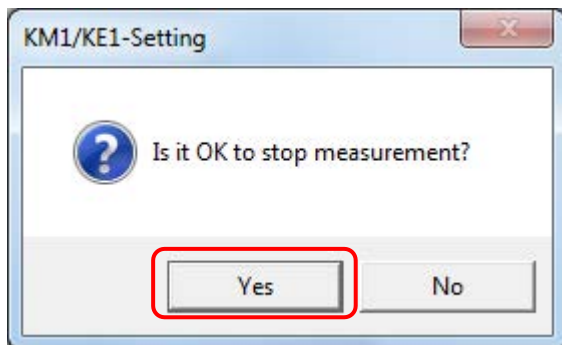
The procedure for monitoring is complete.

[Stop of monitoring]

1. Click on the [Stop] button. Monitoring will be suspended.



2. The following confirmation message will appear. To stop monitoring, click on the [Yes] button.

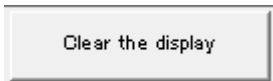


[Yes] button: Stops monitoring. By clicking on the [Start] button again, you can start monitoring from first according to [Number of readout (count)].

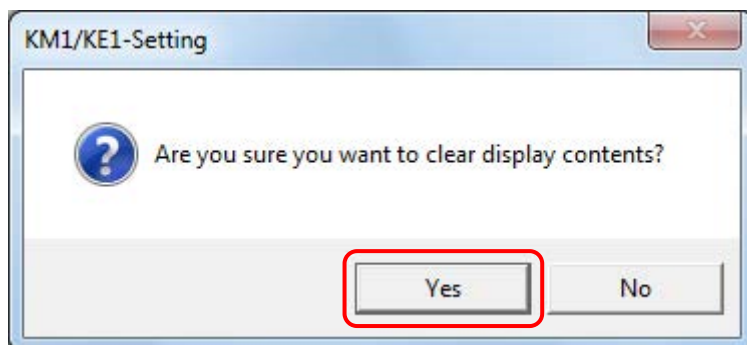
[No] button: You can start monitoring again according for the remaining number of [Number of readout (count)].

● Display clear

1. To clear the contents shown, click on the [Clear the display] button.



2. The following confirmation message will appear. To confirm, click on the [Yes] button.



3. Both of [Instantaneous value] and [Status] will be restored to default settings.
(Instantaneous Value)

	Instantaneous value		Status					
Current (A)	1	2	3	4	5	6		
	7	8	9	10	11	12		
Voltage (V)	1	2	3	4	5	6		
Active power (kW)	1	2	3	4	5	6	7	8
Reactive power (kvar)	1	2	3	4	5	6	7	8
Power factor	1	2	3	4	5	6	7	8
Frequency (Hz)	1	2						
Temperature	1							
Earth leakage (Io) (mA)	1	2	3	4	5	6	7	8
Status								

(Status)

[illegible]

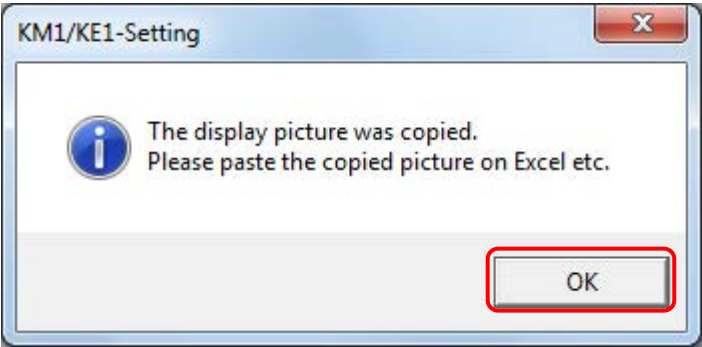
The contents shown are cleared.

● Screen copy

1. To copy the screen shown, click on the [Screen copy] button.
The image of the screen will be copied to the clipboard.



2. The following message will appear. Click on the [OK] button. Displayed image copied to the clipboard can be pasted on Excel etc.



(Image of the screen copied with [Status] tab selected)

Unit No. Measurement time: 2012/06/01 11:15:55

The number of readout (count) Repetition interval (s)

Start Stop

Instantaneous value **Status**

Status 31 16 15 0

0001 0000 0000 0000 0000 0000 0000 0000

Detail

bit	Power Two-System Measurement Unit	Condition
16		0
17		0
18	OUT 1	0
19	OUT 2	0
20	OUT 3	0
21	LOW condition (Electrical system 1)	0
22	MIDDLE condition (Electrical system 1)	0
23	HIGH condition (Electrical system 1)	0
24	LOW condition (Electrical system 2)	0
25	MIDDLE condition (Electrical system 2)	0
26	HIGH condition (Electrical system 2)	0
27		0
28	Alarm 1	1
29	Alarm 2	0
30		0
31		0

bit	Power Two-System Measurement Unit	Condition
0	Abnormal of RAM (E-M1)	0
1	Abnormal of EEPROM (E-M2)	0
2	Abnormal of EEPROM (E-M3)	0
3	Abnormal of RTC (E-T1)	0
4	Abnormal of communication	0
5	Mode of operation	0
6	Input voltage exceed allowed range (E-S1)	0
7	Input current exceed allowed range (E-S2)	0
8	Insufficient input voltage	0
9	Abnormal input of frequency (E-S3)	0
10	OT input 1	0
11	OT input 2	0
12	OT input 3	0
13	OT input 4	0
14		0
15		0

Clear the display Screen copy

The screen is copied.

5.3.8. Logging data reading

Logging data registered with the main unit will be shown.

The following information can be shown:

- Alarm history -> Refer to "5.3.8.1 Alarm history" (p.5-89).
- Logging of voltage sag -> Refer to "5.3.8.2 Logging of voltage sag" (p.5-93).

5.3.8.1. Alarm history

Alarm history registered with the main unit will be read out and shown on the screen.

This function is available for the following models:

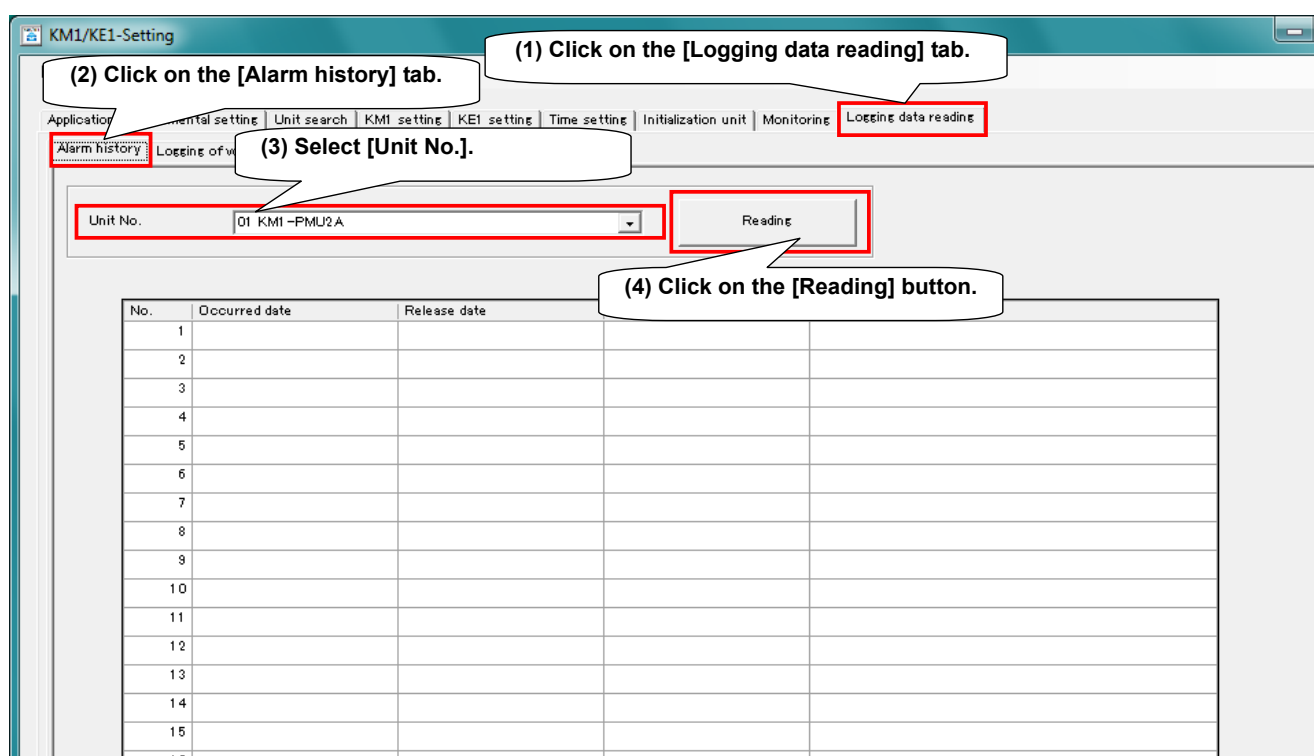
Series Name	Model	Name	Abbreviation
KM1	KM1-PMU1A	Power Measurement Unit	PMU1A
	KM1-PMU2A	Power Two-System Measurement Unit	PMU2A
	KM1-EMU8A	Pulse/Temperature Input Unit	EMU8A
KE1	KE1-PGR1C	Power/Earth Leakage Monitoring Unit	PGR1C
	KE1-PVS1C	Power/Voltage-Sag Monitoring Unit	PVS1C
	KE1-VSU1B	Voltage-Sag Monitoring Unit	VSU1B
	KE1-VAU1B	Voltage/Current Monitoring Unit	VAU1B
	KE1-CTD8E	CT Expansion Unit	CTD8E
	KE1-ZCT8E	Zero-phase CT Expansion Unit	ZCT8E

Precautions for Correct Use

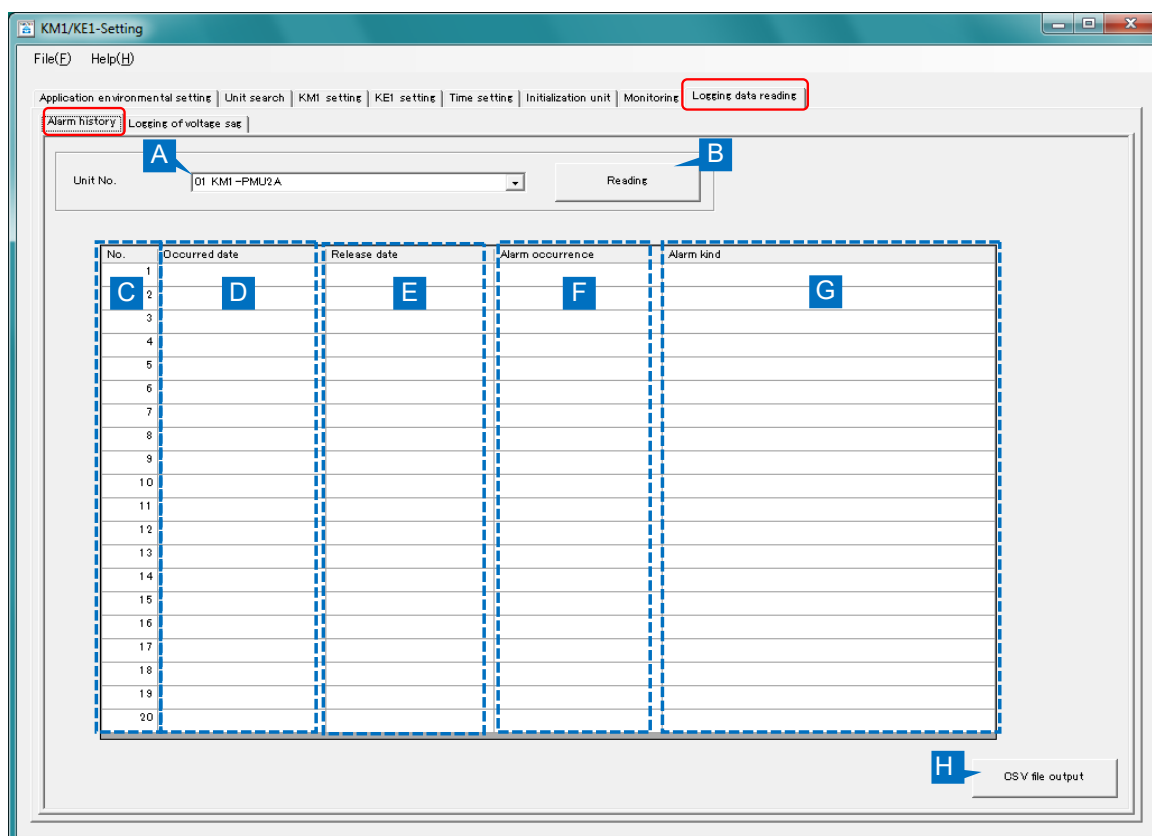
- The alarm currently occurring will not be shown in [Alarm history]. After the alarm is disabled, the logging data for alarm history will be registered with the unit and shown in [Alarm history].
- To turn off the power after an alarm occurred, wait for 5 minutes after the alarm before turning off the power. If you turn off the power within 5 minutes after an alarm, its alarm history may not be browsed when the power is turned on again.

■ Overview of operational procedure

From [Unit No.], select the unit for which [Alarm history] will be shown and click on the [Reading] button.



■ Operational screen



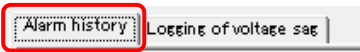
[Main setting items and functions]

Symbol	Item	Explanation
A	Unit No.	Specify the unit for which alarm history will be shown. "Unit No. + Model + Location name" will be shown. Only unit models with the alarm logging function can be shown.
B	Reading button	By clicking, alarm history for the unit specified will be read out and its contents will be indicated in the alarm history column.
C	(Alarm history) No.	Up to 20 alarms can be shown.
D	Occurred date	The date (yyyy/MM/dd HH:mm:ss) when the alarm occurred will be shown. Note: The date is indicated in the format set by the application operation setting.
E	Release date	The date (yyyy/MM/dd HH:mm:ss) when the alarm released will be shown. Note: The date is indicated in the format set by the application operation setting.
F	Alarm occurrence	The alarm occurrence code will be shown. For details, refer to "Communication manual: Model KM1/KE1".
G	Alarm kind	The alarm kind will be shown. For details, refer to "Model KM1 User's Manual" and "Model KE1 User's Manual".
H	CSV file output button	Click on this button, and the contents shown on the screen will be output to a CSV file.

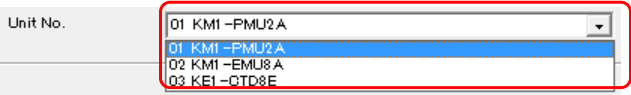
■ Operational procedure

● Reading of alarm history

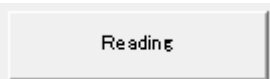
1. Click on the [Alarm history] tab.



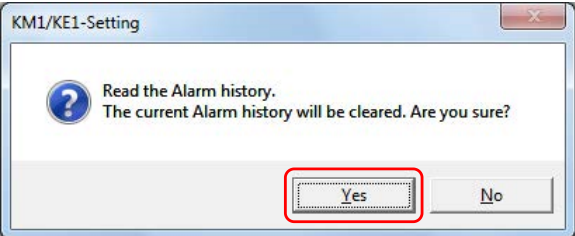
2. Select the unit for which [Alarm history] will be shown.



3. Click on the [Reading] button.



4. The following confirmation message will appear. To clear the alarm history currently being shown and read out the latest alarm history, click on the [Yes] button.



Note: In case an error occurs during the communication with the unit, the cause of communication error will be shown on the communication result screen. For details of the cause of the error, please refer to "6.2 Handling of communication errors" (p.6-4).

5. The alarm history of the targeted unit will be read out and its contents will be shown on the screen.

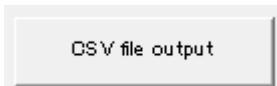
A screenshot of a software interface showing a table of alarm history. The table has five columns: 'No.', 'Occurred date', 'Release date', 'Alarm occurrence', and 'Alarm kind'. The table contains 11 rows of data, with the first 11 rows highlighted by a red dashed border. The 'Unit No.' dropdown menu is set to '01 KM1-PMU2A' and the 'Reading' button is visible. A 'CSV file output' button is located at the bottom right of the table area.

No.	Occurred date	Release date	Alarm occurrence	Alarm kind
1	2012/06/01 10:42:03	2012/06/01 10:42:04	2	Active power upper limit alarm 2
2	2012/06/01 10:41:57	2012/06/01 10:42:03	35	Reactive power lower limit alarm 1
3	2012/06/01 10:41:57	2012/06/01 10:42:04	13	Under current alarm 1
4	2012/06/01 10:41:43	2012/06/01 10:41:57	2E	Reactive power upper limit alarm 2
5	2012/06/01 10:41:43	2012/06/01 10:41:57	25	Power factor alarm 1
6	2012/06/01 10:34:33	2012/06/01 10:41:36	21	Over voltage alarm 1
7	2012/06/01 10:34:33	2012/06/01 10:41:43	1	Active power upper limit alarm 1
8	2012/06/01 10:34:33	2012/06/01 10:41:43	35	Reactive power lower limit alarm 1
9	2012/06/01 10:29:08	2012/06/01 10:29:08	5	Active power upper limit alarm 5
10	2012/06/01 10:14:46	2012/06/01 10:14:55	15	Over current alarm 5
11	2012/06/01 10:14:28	2012/06/01 10:14:46	15	Over current alarm 5
12				
13				
14				
15				
16				
17				
18				
19				
20				

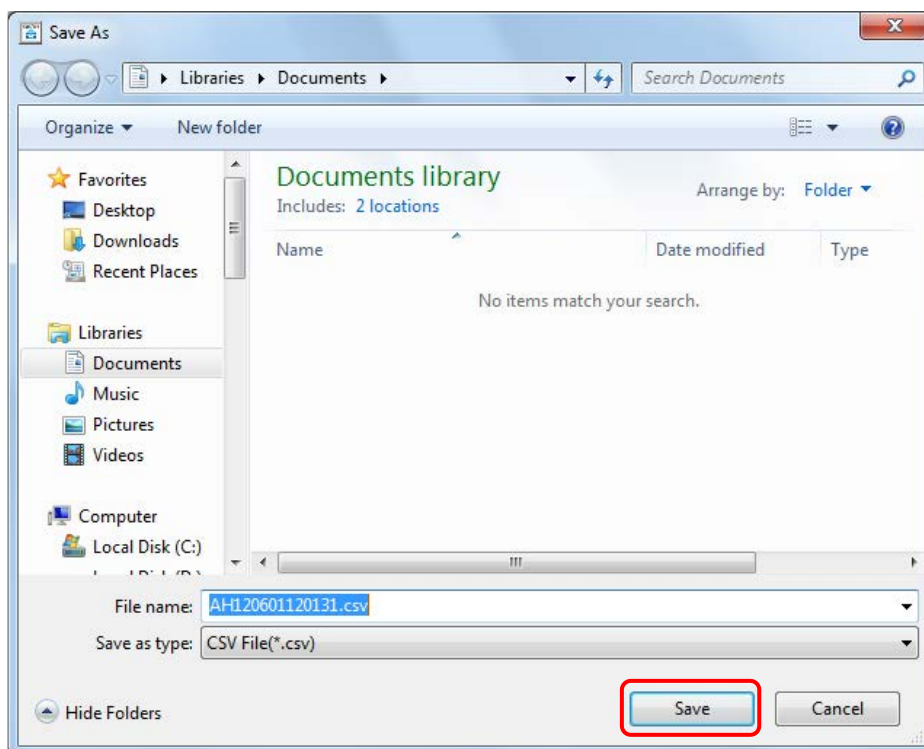
The alarm reading is complete.

● CSV file output

1. To save the contents shown, click on the [CSV file output] button.



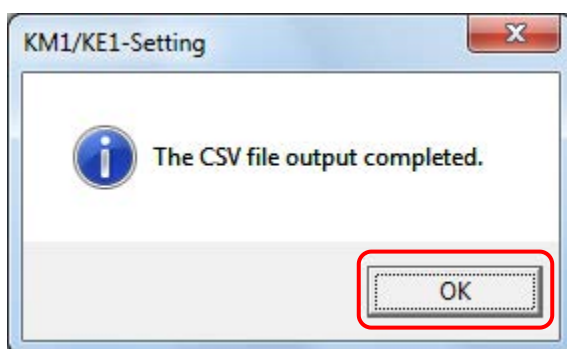
2. The [Save as a new file] screen will appear. Specify the folder to save the data and click on the [Save] button. The contents shown on the screen will be output to a CSV file.



Note 1: For the format of the CSV file output, refer to "7.4.2 Alarm history file"(p.7-25).

Note 2: If the CSV file shows garbled characters, refer to "6.7 Garbled characters shown when opening a CSV file output" (p.6-19).

3. The following message will appear. Click on the [OK] button.



The output to the CSV file is complete.

5.3.8.2. Logging of voltage sag

Logging of voltage sag registered with the main unit will be read out and shown on the screen.

This function is available for the following models:

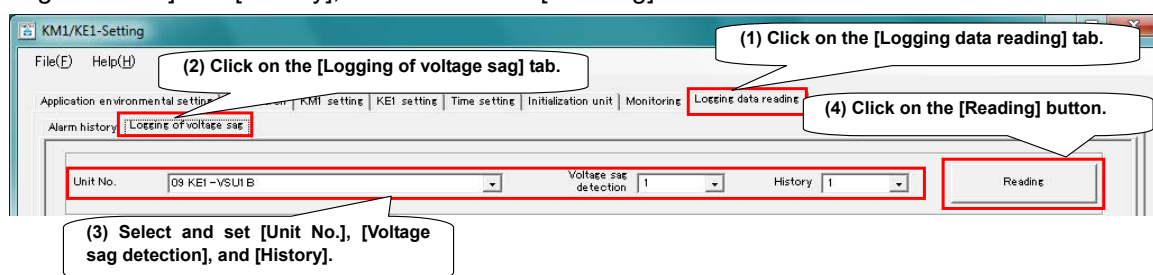
Series Name	Model	Name	Abbreviation
KE1	KE1-PVS1C	Power/Voltage-Sag Monitoring Unit	PVS1C
	KE1-VSU1B	Voltage-Sag Monitoring Unit	VSU1B

Precautions for Correct Use

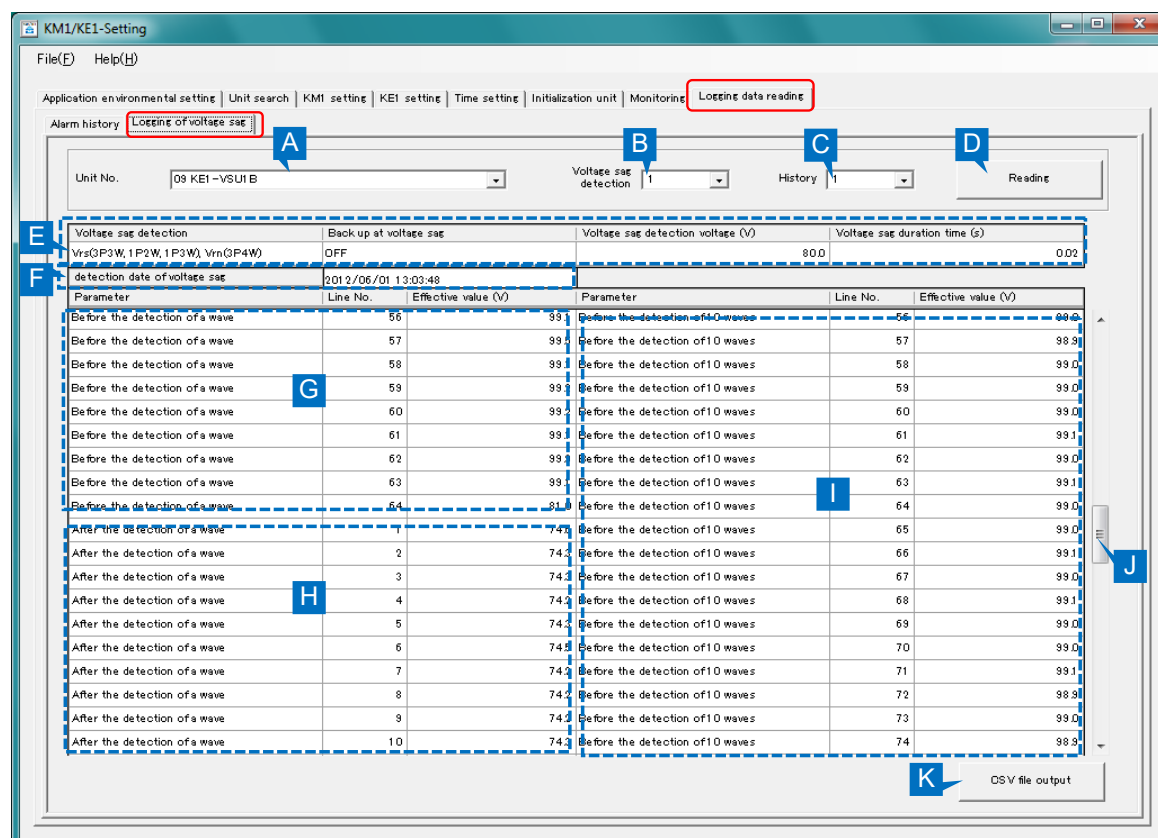
Logging of voltage sag will be registered, starting from 1 to 8 in the history. For the data for voltage sag occurred more than eight times, the oldest data will be overwritten. Therefore, the order of the history no. and detection date of voltage sag does not always match.

■ Overview of operational procedure

From [Unit No.], select the unit for which [Logging of voltage sag] will be shown. Select [Voltage sag detection] and [History], and click on the [Reading] button.



■ Operational screen



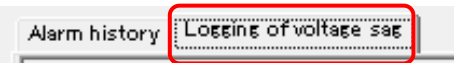
[Main setting items and functions]

Symbol	Item	Explanation
A	Unit No.	Specify the unit for which [Logging of voltage sag] will be shown. "Unit No. + Model + Location name" will be shown. Only unit models with the voltage sag function can be shown.
B	Voltage sag detection	Of the four types of conditions registered with [Voltage sag detection], select one of them to show the logging voltage sag.
C	History	Select the history no. within 1 to 8 accumulated in the unit. The main unit stores the latest eight voltage sags according to voltage sag detection.
D	Reading button	By clicking, the logging voltage sag of the unit will be read out with the conditions specified and the effective value will be shown.
E	Voltage sag-related setting value column	The voltage sag-related setting value for the targeted unit will be read out and shown. Voltage sag : Target for monitoring voltage sag. detection : Existence or absence of a backup power source Back up at voltage for voltage sag unit. sag : Setting value of threshold voltage for voltage sag Voltage sag alarm. detection voltage (V) : Time until recognized as voltage sag after falling Voltage sag duration below voltage sag detection voltage. time (s)
F	Detection date of voltage sag	The detection date for voltage sag of the targeted unit (yyyy/MM/dd HH:mm:ss) will be shown. Note: The date is indicated in the format set by the application operation setting.
G	History before the detection of 1 waves (64 lines)	64 effective values before the detection of 1 wave will be shown.(*1) Item (row): Before the detection of 1 wave Line No. (row): Serial numbers of 1 to 64 will be indicated. Effective value (row): The effective value before the detection of 1 wave will be shown. *1: For 50 Hz, the value before the detection is about 1.28 seconds and for 60 Hz about 1.06 seconds.
H	History after the detection of a wave (64 lines)	64 effective values after the detection of a wave will be shown.(*1) Item (row): After the detection of a wave Line No. (row): Serial numbers of 1 to 64 will be indicated. Effective value (row): The effective value after the detection of a wave will be shown. *1: For 50 Hz, the value after the detection is about 1.28 seconds and for 60 Hz about 1.06 seconds.
I	History before the detection of 10 waves (120 lines)	120 effective values before the detection of 10 wave will be shown.(*1) Item (row): Before the detection of 10 waves Line No. (row): Serial numbers of 1 to 120 will be indicated. Effective value (row): The effective value before the detection of 10 wave will be shown. *1: For 50 Hz, the value before the detection is about 24 seconds and for 60 Hz about 20 seconds.
J	Scroll bar	Scrolls vertically on the screen.
K	CSV file output button	Click on this button, and the contents shown on the screen will be output to a CSV file.

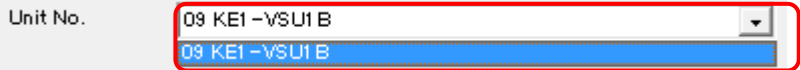
■ Operational procedure

● Reading of logging of voltage sag

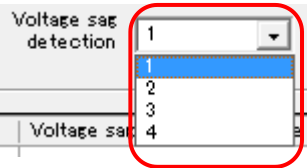
1. Click on the [Logging of voltage sag] tab.



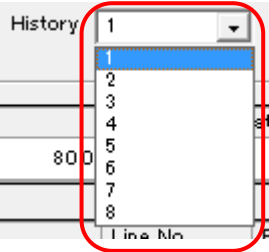
2. Select the unit for which [Logging of voltage sag] will be shown.



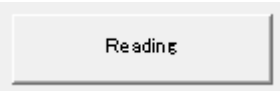
3. Select [Voltage sag detection].(1 to 4)



4. Select [History].(1 to 8)



5. Click on the [Reading] button.



Note: In case an error occurs during the communication with the unit, the cause of communication error will be shown on the communication result screen. For details of the cause of the error, please refer to "6.2 Handling of communication errors" (p.6-4).

6. The logging of voltage sag of the targeted unit will be read out and its effective value will be shown on the screen.

Unit No. 09 KE1-VSUIB Voltage sag detection 1 History 1 Reading

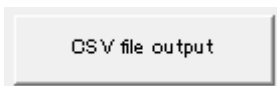
Voltage sag detection	Back up at voltage sag	Voltage sag detection voltage (V)	Voltage sag duration time (s)		
Vs(OP3W, IP2W, IP3W), Vm(OP4W)	OFF	80.0	0.02		
detection date of voltage sag	2012/06/01 13:03:48				
Parameter	Line No.	Effective value (V)	Parameter	Line No.	Effective value (V)
Before the detection of a wave	56	99.1	Before the detection of 10 waves	56	99.0
Before the detection of a wave	57	99.5	Before the detection of 10 waves	57	99.9
Before the detection of a wave	58	99.1	Before the detection of 10 waves	58	99.0
Before the detection of a wave	59	99.2	Before the detection of 10 waves	59	99.0
Before the detection of a wave	60	99.2	Before the detection of 10 waves	60	99.0
Before the detection of a wave	61	99.1	Before the detection of 10 waves	61	99.1
Before the detection of a wave	62	99.9	Before the detection of 10 waves	62	99.0
Before the detection of a wave	63	99.1	Before the detection of 10 waves	63	99.1
Before the detection of a wave	64	81.0	Before the detection of 10 waves	64	99.0
After the detection of a wave	1	74.6	Before the detection of 10 waves	65	99.0
After the detection of a wave	2	74.3	Before the detection of 10 waves	66	99.1
After the detection of a wave	3	74.3	Before the detection of 10 waves	67	99.0
After the detection of a wave	4	74.2	Before the detection of 10 waves	68	99.1
After the detection of a wave	5	74.3	Before the detection of 10 waves	69	99.0
After the detection of a wave	6	74.5	Before the detection of 10 waves	70	99.0
After the detection of a wave	7	74.2	Before the detection of 10 waves	71	99.1
After the detection of a wave	8	74.2	Before the detection of 10 waves	72	99.9
After the detection of a wave	9	74.2	Before the detection of 10 waves	73	99.0
After the detection of a wave	10	74.3	Before the detection of 10 waves	74	99.9

CSV file output

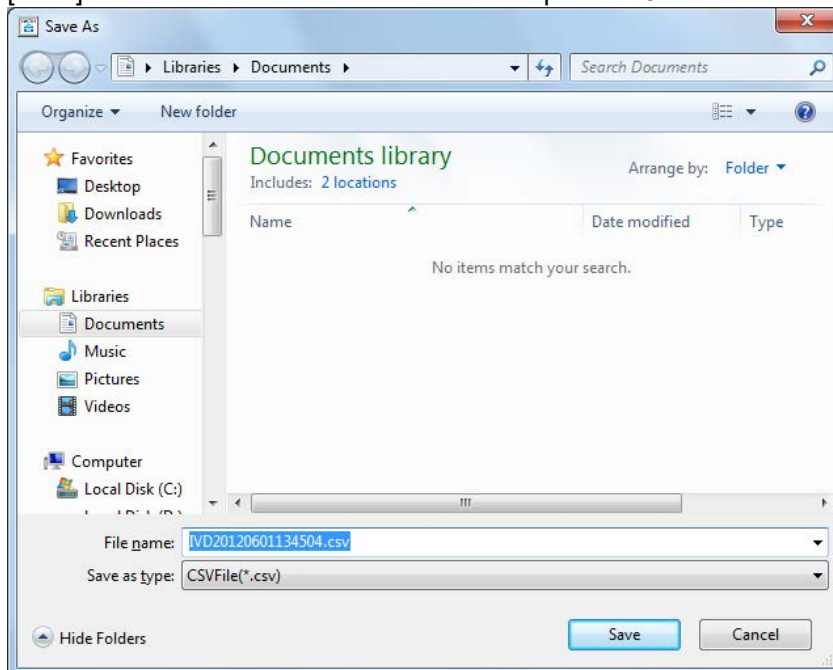
The reading of logging of voltage sag is complete.

- CSV file output

1. To save the contents shown, click on the [CSV file output] button.



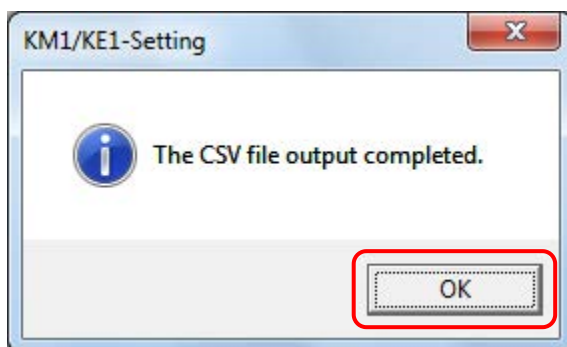
2. The [Save as a new file] screen will appear. Specify the folder to save the file and click on the [Save] button. The contents shown will be output to a CSV file.



Note 1: For the format of the CSV file output, refer to "7.4.3 Logging of voltage sag file"(p.7-26).

Note 2: If the CSV file shows garbled characters, refer to "6.7 Garbled characters shown when opening a CSV file output" (p.6-19).

3. The following message will appear. Click on the [OK] button.



The output to the CSV file is complete.

6. Troubleshooting

6.1. List of error messages

Error messages in the Software and how to resolve them are explained as follows:

General	
Message description	Explanation and measures to be taken
FileError (File name)	The file shown on the file name cannot be found. The file may have been deleted. Please install the setup file for the Software again that was downloaded from Omron's "Internet Service for Omron Controls (http://www.fa.omron.co.jp/)".
KM1/KE1-Setting has already started.	The Software is already running. You cannot run more than one of the Software at the same time.
Application cannot start because the driver file required for communication does not exist or it is inaccurate,	This message appears when the installation of an USB virtual COM port driver for KM1/KE1connection is cancelled halfway. Complete the installation of the driver.
Failed to write the configuration file. Please make sure that the file is not open or read-only. Please start this software with administrative privileges, if the object file is under the folder which requires administrator privileges in Windows Vista/7/10. (ex: Program Files) Configuration file name:	This message appears when the Software cannot be written to a setting file. Do not open the setting file. If the setting file is open, close it. When you installed the Software to Program Files under Windows Vista, Windows 7 or Windows 10, exit the Software first and [Run as administrator] when starting the Software again. "Setting file name" is followed by the target file name.
Failed to write the configuration file. Please make sure that the file is not open or read-only. Please start this software with administrative privileges, if the object file is under the folder which requires administrator privileges in Windows Vista/7/10. (ex: Program Files) You have not saved your settings. Do you want to exit application? Configuration file name:	This message appears when the Software cannot be written to a setting file. Do not open the setting file. If the setting file is open, close it. When you installed the Software to Program Files under Windows Vista, Windows 7 or Windows 10, exit the Software first and [Run as administrator] when starting the Software again. The settings will not be saved, so set the Software again. "Setting file name" is followed by the target file name.
The unit of the model which can use this function is not detected. When you omitted unit search, please perform unit search first.	This function is available to specific models. This message appears when the model that can use this function cannot be found through unit search. Implement unit search after connecting this unit. Then, use this function after the search is completed.
USB virtual COM port is not detected.	This message appears when an USB cable is not connected to the unit or a K3SC-10. Connect the USB cable to the unit or the K3SC-10 and make sure that the unit and the K3SC-10 are connected to a power source. Then from [Application environmental setting], click on the [Search again] button to detect the USB virtual COM port no.
System error occurred.	An unexpected error occurred. <ul style="list-style-type: none"> • Start the Software again. • Start the computer again. If the Software does not operate properly after performing the above measures, install the Software again. If the same phenomenon still occurs, please contact Customer Support Center listed at the end of this manual.

Application environmental setting	
Message description	Explanation and measures to be taken
USB virtual COM port of USB connection is not detected. Please check whether USB is connected to the PC	This message appears when an USB virtual COM port for USB connection cannot be found. Connect the computer and the unit through an USB cable and go through the same procedure again.
USB virtual COM port of RS-485 connection is not detected. Please check whether USB is connected to the PC	This message appears when an USB virtual COM port for RS-485 connection cannot be found. Connect the computer and the K3SC-10 through an USB cable and go through the same procedure again. If you have not installed a K3SC-10 driver yet, install it. Without a K3SC-10 driver, you cannot use RS-485 connection.
"Communication timeout" setting value is inaccurate.	This message appears when the value for the communication timeout is inaccurate. Enter the integral numbers of 1 to 10 for "Communication timeout".
Unit search	
Message description	Explanation and measures to be taken
Details shown in [Cause] <ul style="list-style-type: none"> • Port open failure • Model mismatch: (Model) • Equipment definition file injustice • No response • Abnormal of response 	This message appears when the unit cannot be communicated. For details, refer to "6.2 Handling of communication errors" (p.6-4).
The unit for search is not specified. Please specify the unit for search.	This message appears when the Unit No. is not specified at the time of the start of unit search. Click on the Unit No. for which unit search will be implemented. After the background turns blue, implement [Start unit search].
The Location name of the unit** is inaccurate. Please set the Location name within 20 single-byte characters or 10 double-byte characters.	This message appears when the number of characters exceeds the number specified to be entered into the location name column for the targeted Unit No. Adjust the number of characters to fit in the range (total of 20 bytes: 20 single-bytes, 10 double-bytes).
Failed to output the file of Unit search. Make sure that the folder exist. Or, when the file is opened by Excel, etc., please close it. Output file:	This message appears when the output to a CSN file failed. Confirm if the folder for output exists or the file is writable. To overwrite the file, close the file before writing and save it.
KM1 setting/KE1 setting	
Message description	Explanation and measures to be taken
Setting value (Item name) is inaccurate. Please set up again.	This message appears when the value for the setting item shown in "(Item name)" is inaccurate. Modify the value for resetting. The entry range for each item is indicated on the right side of the entry column.
Are you sure you move other screen without saving setting?	This message appears when attempting to transition the screen after changing the setting values prior to writing. If the writing is necessary, click on the [No] button for writing.
Other operations cannot perform during the Unit setting.	This message appears when attempting to transition the screen while the setting values for the main unit is currently being read out or written. Wait until the reading or writing is complete.

Time setting	
Message description	Explanation and measures to be taken
Other operations cannot perform until the time writing finished.	This message appears when attempting to transition the screen before the time writing for the main unit is complete. In this case, wait until the time writing is complete or click on the [Stop writing time] button to exit.
Initialization unit	
Message description	Explanation and measures to be taken
Other operations cannot perform during the unit initialization.	This message appears when attempting to transition the screen before the initialization for the main unit is complete. Wait until the initialization is complete.
Monitoring	
Message description	Explanation and measures to be taken
Other operations cannot perform during the monitoring.	This message appears when attempting to transition the screen during monitoring. In this case, wait until the monitoring is complete or click on the "Stop" button to exit.
Logging data reading (Alarm history)	
Message description	Explanation and measures to be taken
Other operations cannot perform during Alarm history reading.	This message appears when attempting to transition the screen before the reading of alarm history is complete. Wait until the reading of alarm history is complete.
Failed to output the file of Alarm history. Make sure that the folder exist. Or, when the file is opened by Excel, etc., please close it. Output file:	This message appears when the output to a CSN file failed. Confirm if the folder for output exists or the file is writable. To overwrite the file, close the file before writing and save it.
Logging data reading (Logging of voltage sag)	
Message description	Explanation and measures to be taken
Other operations cannot perform during Voltage sag log reading.	This message appears when attempting to transition the screen before the reading of logging of voltage sag is complete. Wait until the reading of logging of voltage sag is complete.
Failed to output the file of Voltage sag log. Make sure that the folder exist. Or, when the file is opened by Excel, etc., please close it. Output file:	This message appears when the output to a CSN file failed. Confirm if the folder for output exists or the file is writable. To overwrite the file, close the file before writing and save it.
Communication result screen	
Message description	Explanation and measures to be taken
Details shown in [Cause] <ul style="list-style-type: none"> • Port open failure • Model mismatch: (Model) • Equipment definition file injustice • No response • Abnormal of response 	This message appears when the unit cannot be communicated. For details, refer to "6.2 Handling of communication errors" (p.6-4).

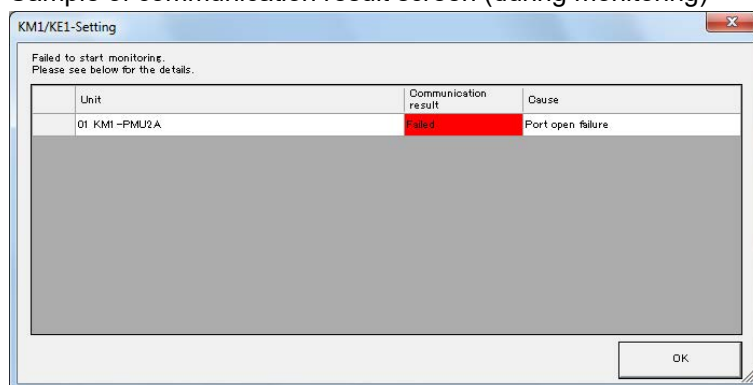
6.2. Handling of communication errors

In case an error occurs during the communication with the unit, the cause of communication error will be shown on the communication result screen.

In case of a communication result of "Failed", take appropriate measures to resolve the communication error.

The cause indicated in the [Cause] columns of [Unit search] and the [Unit time] and [Received time of response] columns of [Time setting] are the same.

Sample of communication result screen (during monitoring)

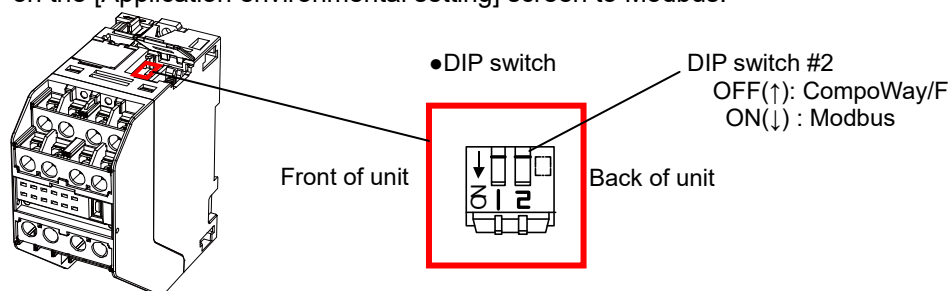


Details shown in [Cause]	Status	Expected cause and measures to be taken
Port open failure	The unit cannot be communicated.	Make sure that the USB cable is not unplugged or disconnected.
		Make sure that the USB virtual COM port is correctly recognized. Unplug the USB cable and connect it, and go through the same procedure again.
Model mismatch: (Model)	The unit at the time of unit search and the unit model to be communicated do not match.	Through unit search, search for the Unit No. to be communicated and go through the same procedure again.
Equipment definition file injustice	The internal setting file is incorrect.	The setting file may have been deleted or damaged.
No response	No response was returned after sending a command to the unit.	Unplug the USB cable and connect it, and go through the same procedure again.
		Make sure that the unit is connected to a power source.
		In some cases, the connection may fail because of inappropriate communication timing (e.g. the unit is starting), so go through the same procedure again.
		Extend the value for the communication timeout in the [Application environmental setting] tab and go through the same procedure again.
		Make sure that the Unit No. to be searched and the Unit No. set in the main unit do match.
		If a communication error occurs ever after taking the above measures, refer to [Handling of "No response"] described below.
Abnormal of response	The response from the unit is not correct	In case of RS-485 connection, go through the operation with no noise occurred in the line.
		Make sure that the load on the computer is not abnormally increasing.

■ Handling of "No response"

When "No response" is shown, check the USB cable and the setting of the main unit as described below, and start the Software again.

- Make sure that the LED operational indication on the main unit [PWR] is lighting.
- Make sure that the DIP switch No.2 that sets the main unit (switch of communication protocol) is switched off. The DIP switch No.2 is switched off (CompoWay/F) at the factory.
- To switch the DIP switch (switching the communicating protocol to Modbus), make sure to go through the procedure with the power off. The settings will be read only when connected to a power source and any change made during power distribution will not be reflected. To change the settings, unplug the USB cable to switch off the power first and change the settings. Then, connect the cable to the power source again. At the same time, set the Communication protocol on the [Application environmental setting] screen to Modbus.



Note: In case any message other than the ones on the list appears or the same phenomenon occurs after restarting the Software or computer, obtain the Software again from OMRON web site, then uninstall and install it again. If the same phenomenon still occurs, please contact Customer Support Center listed at the end of this manual.

6.3. USB virtual COM port installation procedure for Windows XP

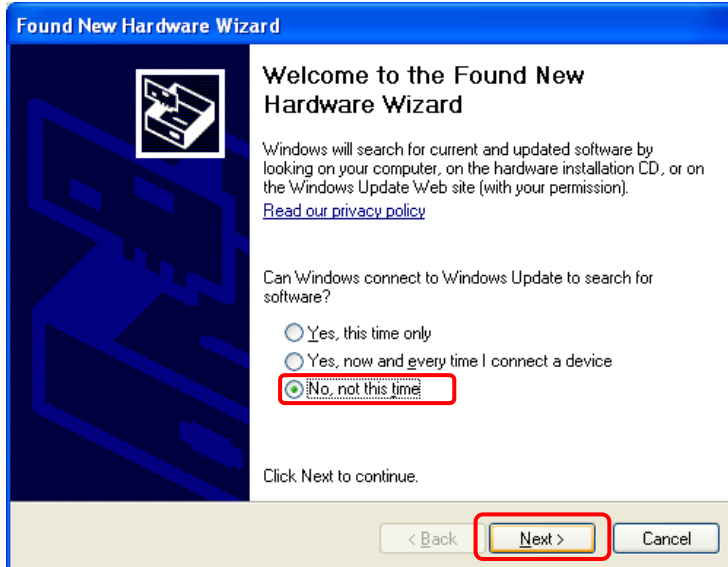
For Windows XP, install an USB virtual COM port according to the procedure below for "(7) Connection to an USB cable" in "4.1 Installation" (p.4-1). Procedure (1) to (6) in "4.1 Installation" (p.4-1)" must be completed to go through this procedure.

■ Operational procedure

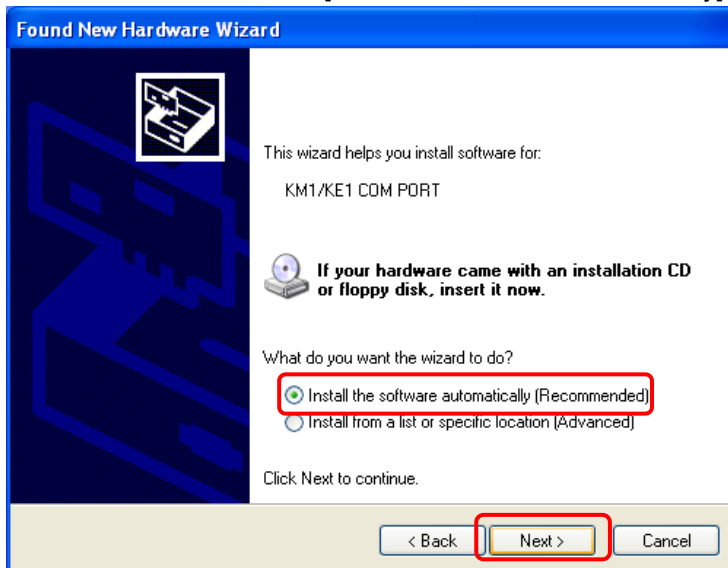
1. Connect the computer to the unit through an USB cable, and a message in a balloon will appear in the lower right portion of the screen, along with the "Found New Hardware wizard" screen.



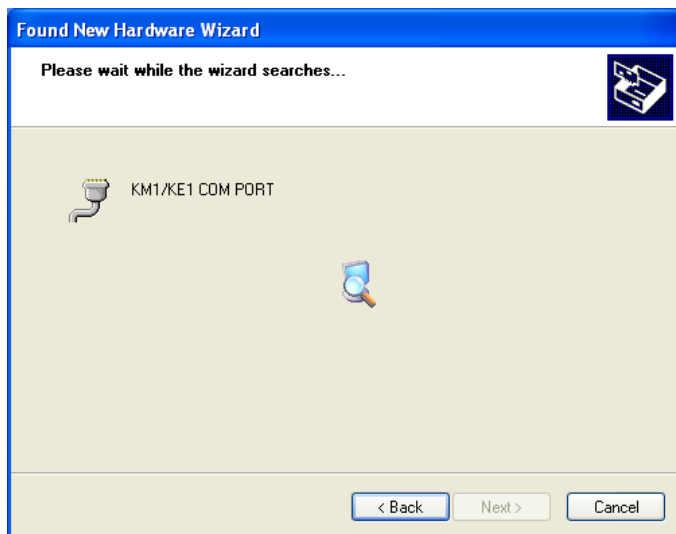
2. When the connection to the web site was confirmed through "Start of New hardware detection wizard", select [No, not this time] and click on the [Next] button.



3. On the next screen, select [Install the software automatically] and click on the [Next] button.



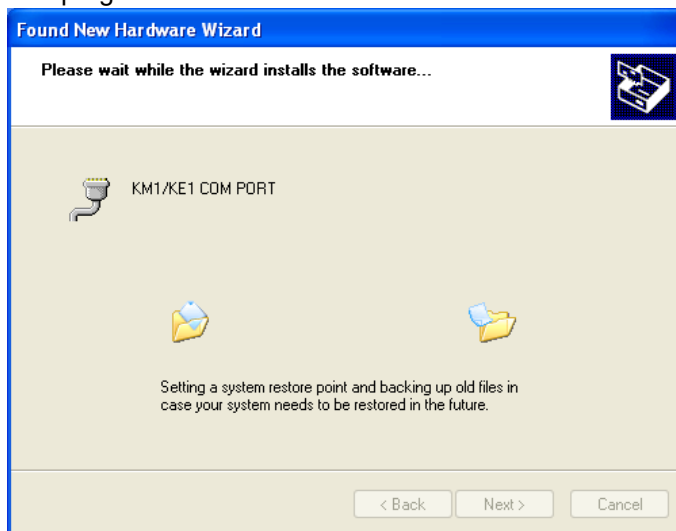
The search screen will appear.



4. From "Hardware Installation", click on the [Continue Anyway] button.



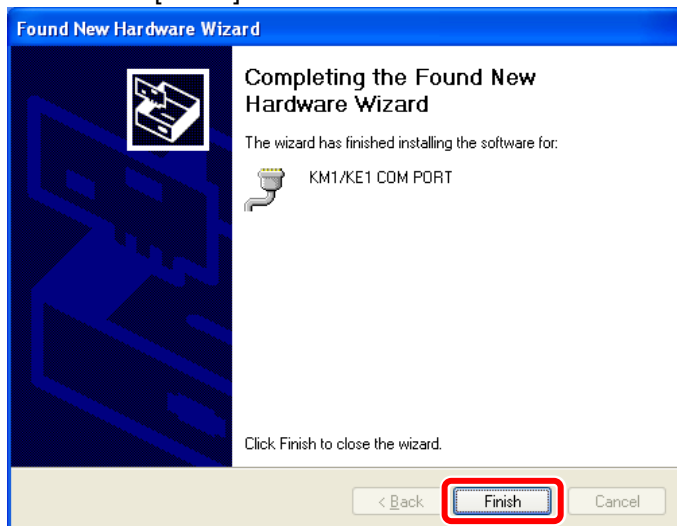
The progress will be shown.



Upon completion, a message in a balloon of "Found New Hardware" will appear in the lower right portion of the screen.



5. Click on the [Finish] button.



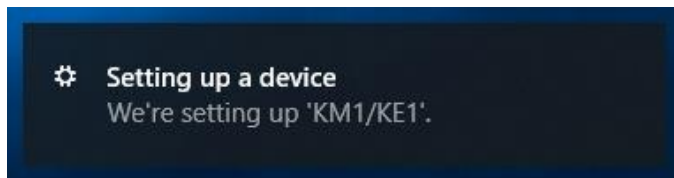
The installation of the USB virtual COM port is complete.

6.4. USB virtual COM port installation procedure for Windows 10

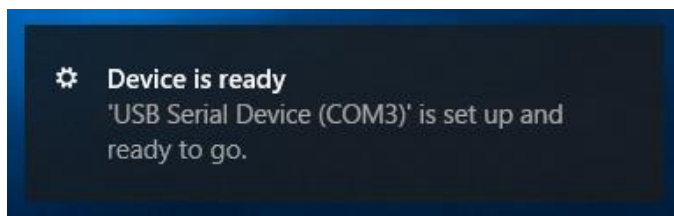
In case of Windows 10, it is automatically installed while "(7) Connection to an USB cable" in "4.1 Installation" (p.4-1). This operation assumes that the steps from (1) to (6) in "4.1 Installation" (p.4-1) have been done.

■ Operational procedure

1. When the USB cable is connected between the computer and the unit, "Setting up a device" appears on the bottom right of the screen. No operation is required.



2. Wait for a while and "Device is ready" appears on the bottom right.



The confirmation of the USB virtual COM port is complete.

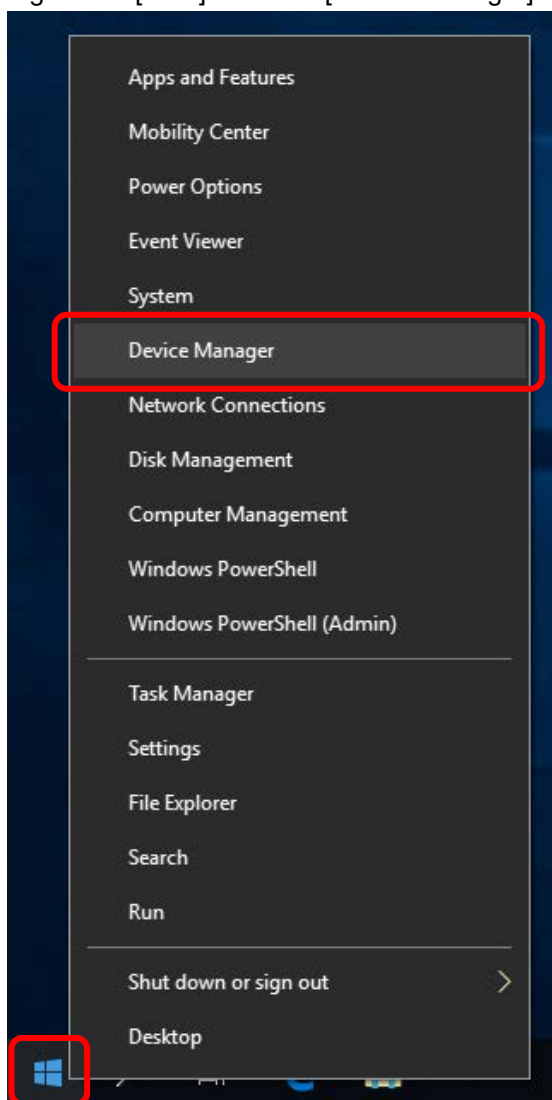
6.5. How to confirm the USB virtual COM port

The Software enables the communication with the unit through an USB virtual COM port. If the USB virtual COM port is not properly recognized by your computer, the message of "The USB virtual COM port is not detected" will be displayed on the screen or "Port open failure" will appear in the communication result.

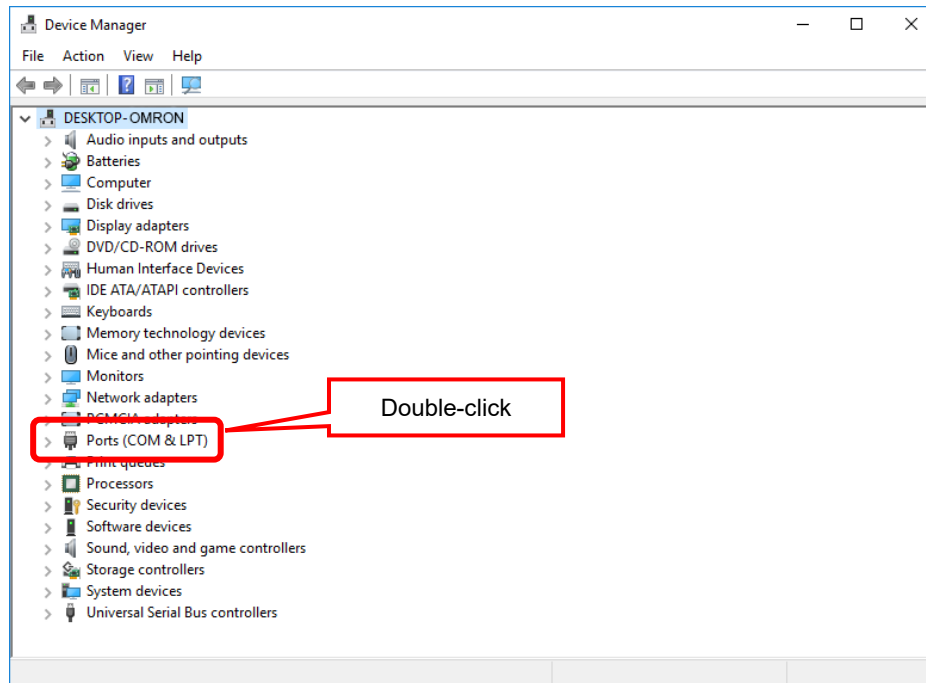
Follow the procedure below to confirm if the USB virtual COM port is properly recognized.

[Windows 10]

1. Connect the computer to the unit through an USB cable.
2. Right-click [Start] and click [Device Manager].

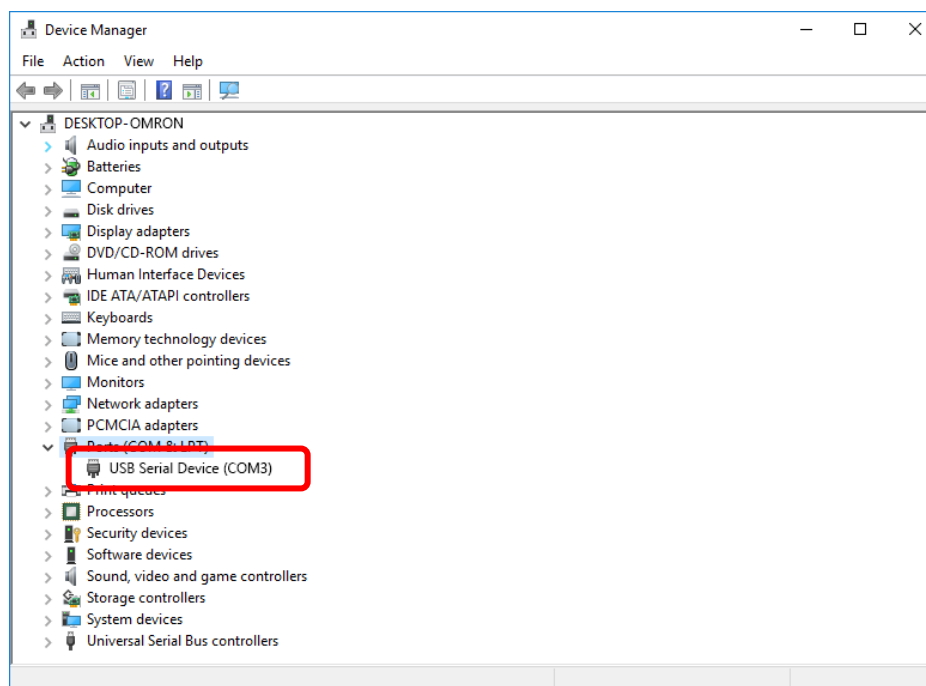


3. Double-click [Ports (COM & LPT)].



4. When [USB serial device (COM**)] is shown as the diagram below indicates, the USB virtual COM port is properly recognized.

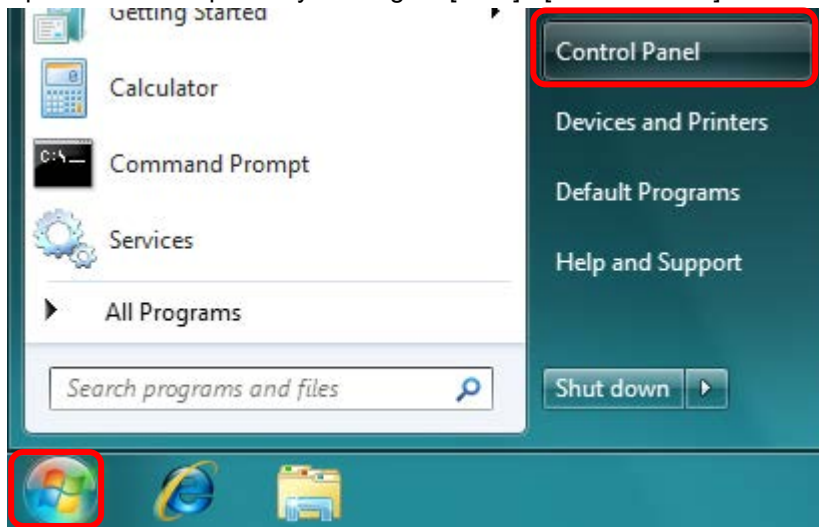
Note: "COM**" varies depending on the computer used.



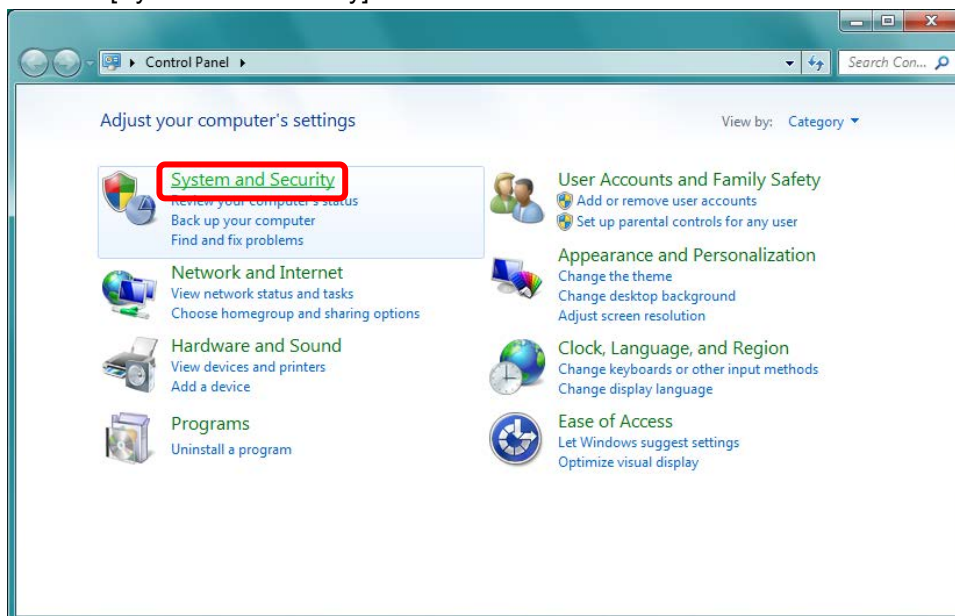
The confirmation of the USB virtual COM port is complete.

[Windows XP]

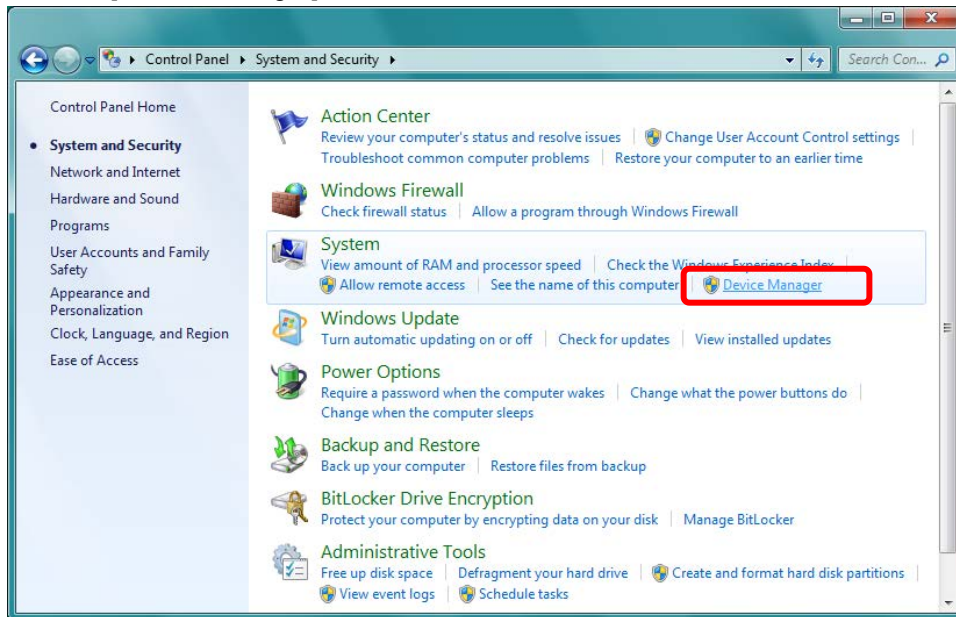
1. Connect the computer to the unit through an USB cable.
2. Open the control panel by clicking on [Start] - [Control Panel].



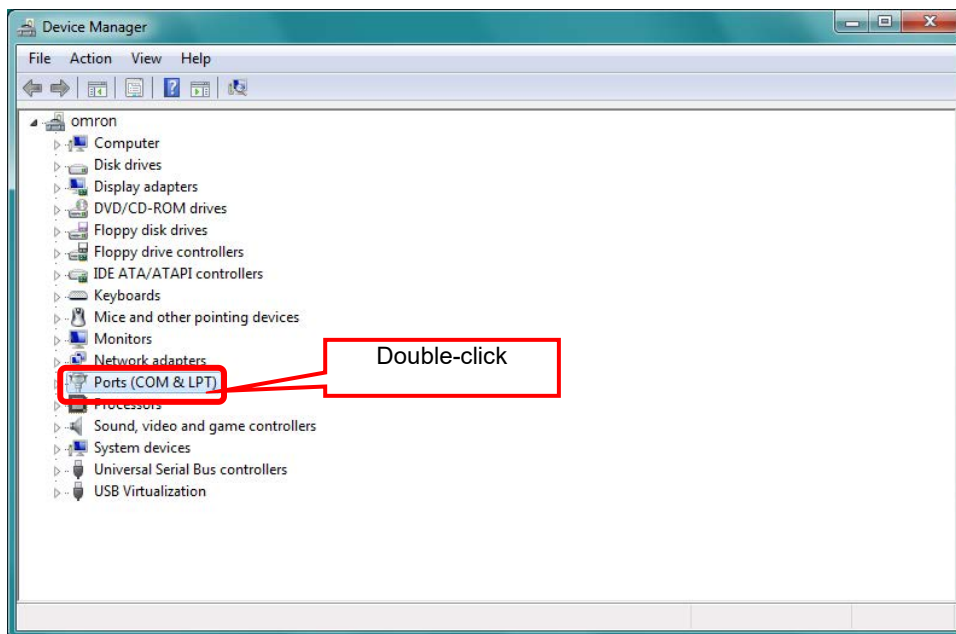
3. Click on [System and Security].



4. Click on [Device Manager].

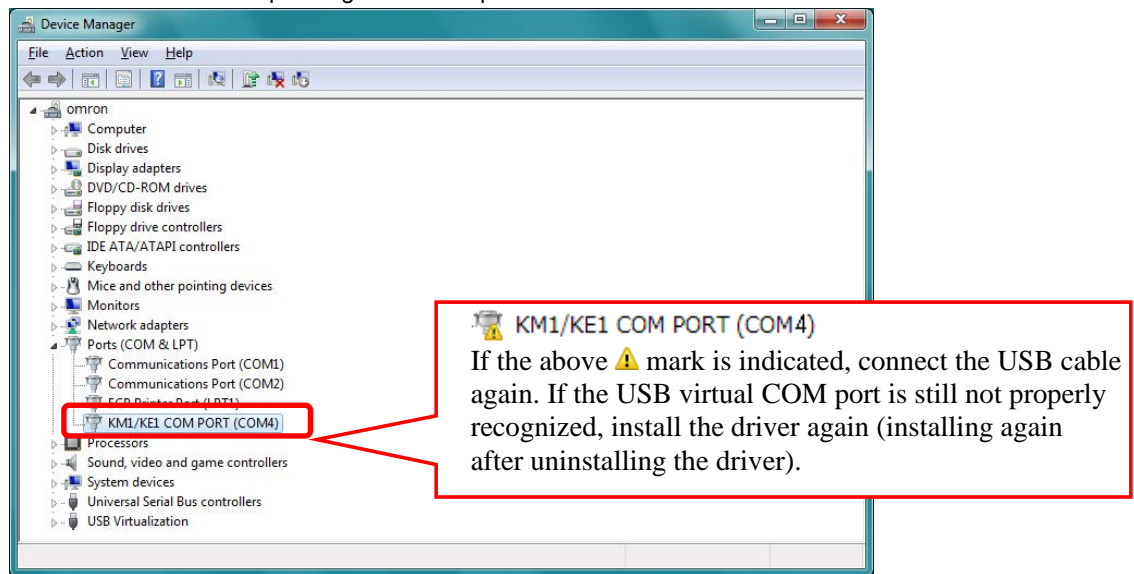


5. Double-click on [Port (COM and LPT)].



6. When [KM1/KE1 COM PORT (COM**)] is shown as the diagram below indicates, the USB virtual COM port is properly recognized.

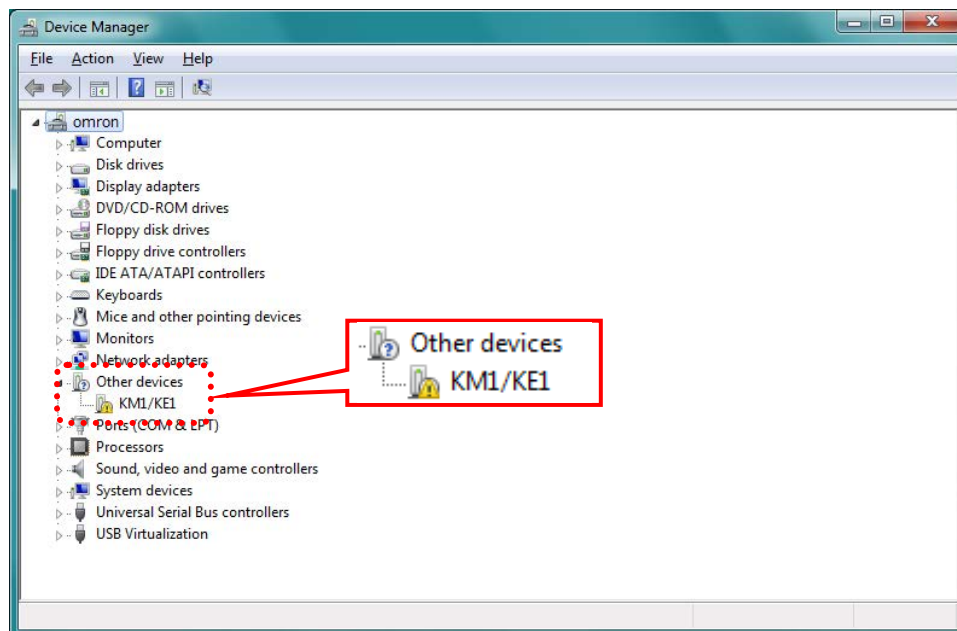
Note: "COM**" varies depending on the computer used.



The confirmation of the USB virtual COM port is complete.

Additional Information

- When connecting the computer to a K3SC-10, "OMRON K3SC-10 Interface Virtual COM Port (COM**)" will be shown as the diagram above indicates if recognized properly.
- The connection of the computer to the unit before the driver is installed is indicated as below. Implement "4.1 Installation" (p.4-1) to install the driver.



6.6. Uninstallation of the USB virtual COM port driver

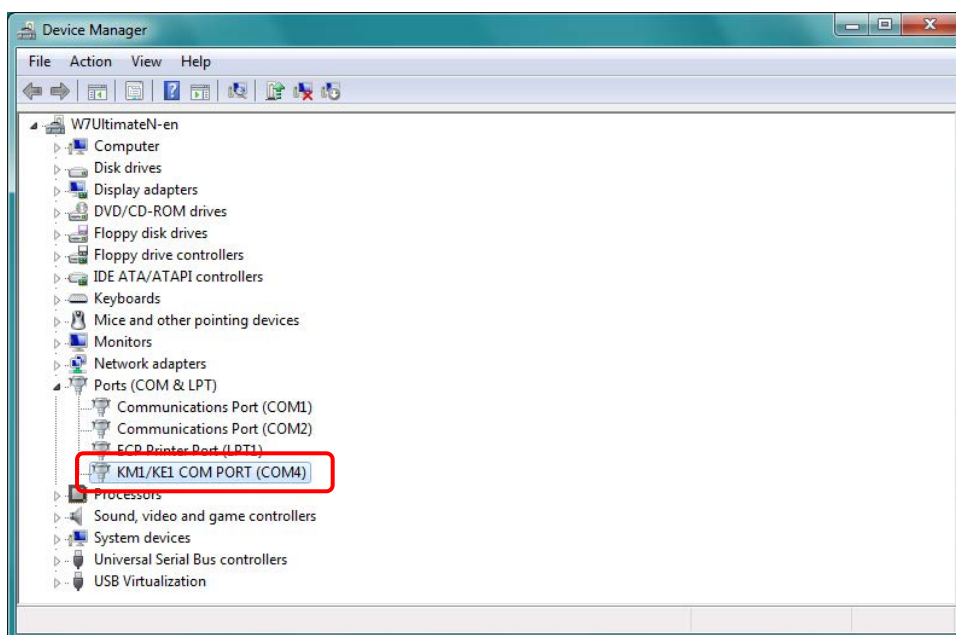
Follow the procedure below to uninstall the USB virtual COM port.

[Windows 10]

In case of Windows 10, you do not need to uninstall the USB virtual COM port driver.

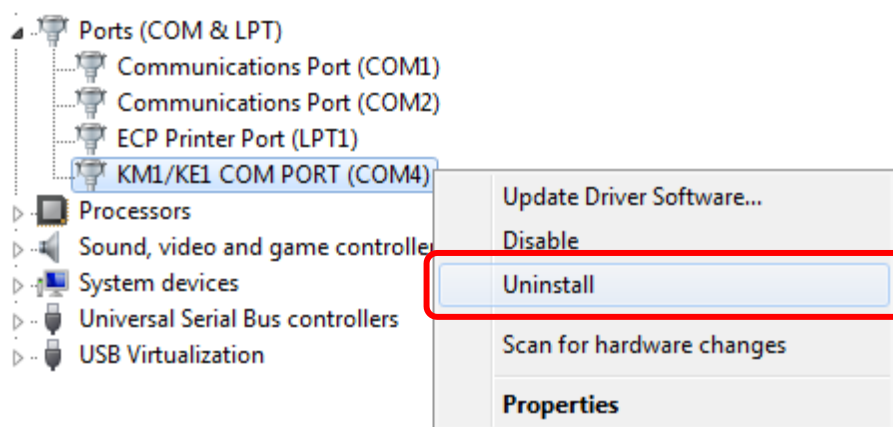
[Other than Windows 10]

1. Exit the Software if it is running.
2. Connect the computer to the unit through a USB cable.
3. Open the device manager by clicking on [Start] - [Control Panel] - [System and Security] - [Device Manager] and double-click on [Port (COM and LPT)].

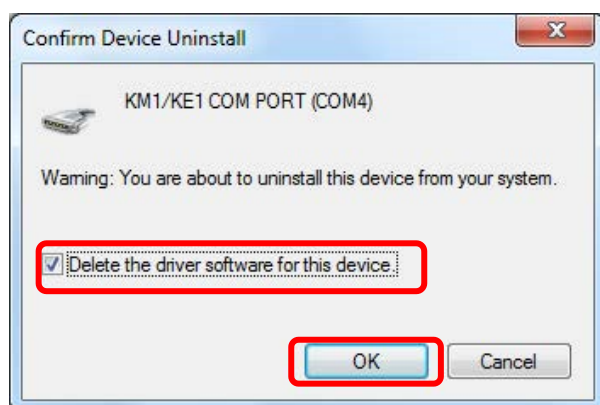


4. Right-click on [KM1/KE1 COM PORT (COM**)] and click on [Uninstall].

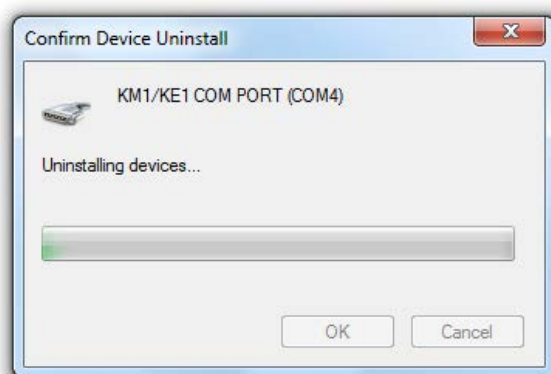
Note: "COM**" varies depending on the computer used.



5. Select "Delete the driver software for this device" and click on the [OK] button. (This option is not available for Windows XP.)



6. The following screen will appear.



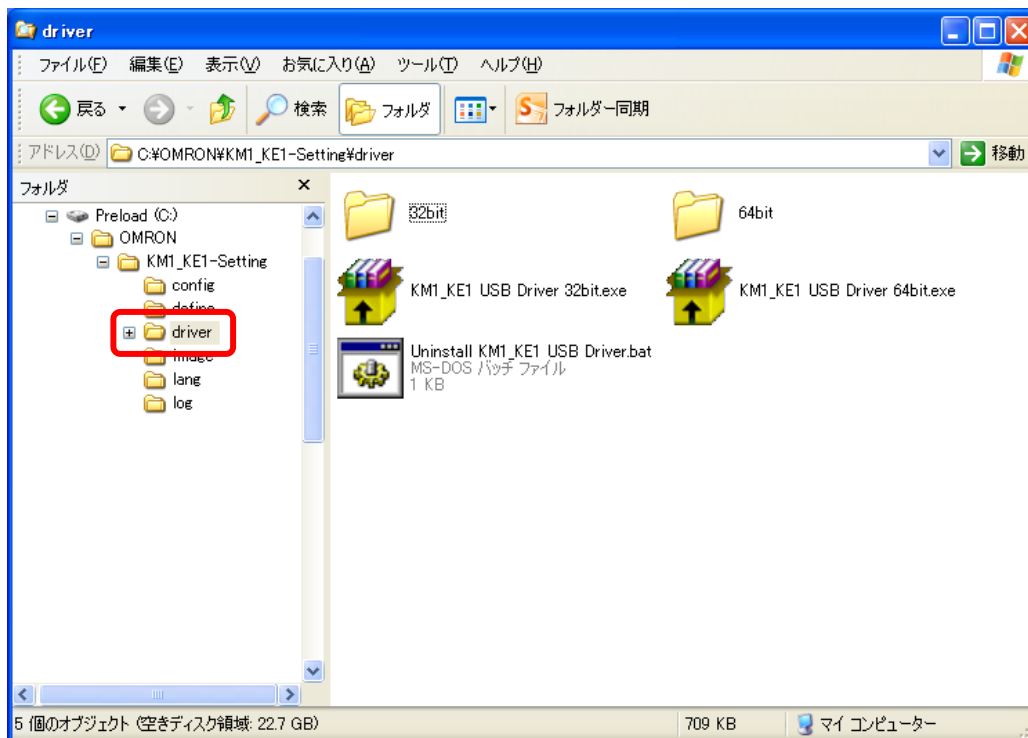
7. For Windows Vista or Windows 7, when the "Confirm device uninstall" screen automatically closes, then the uninstallation is complete. For Windows XP or if you forget to select "Delete the driver software for this device" in Procedure 5, continue the procedure below.

Additional Information

The procedure below should be followed after Procedure 7 in the previous page for Windows XP or if you forget to select "Delete the driver software for this device" in Procedure 5.

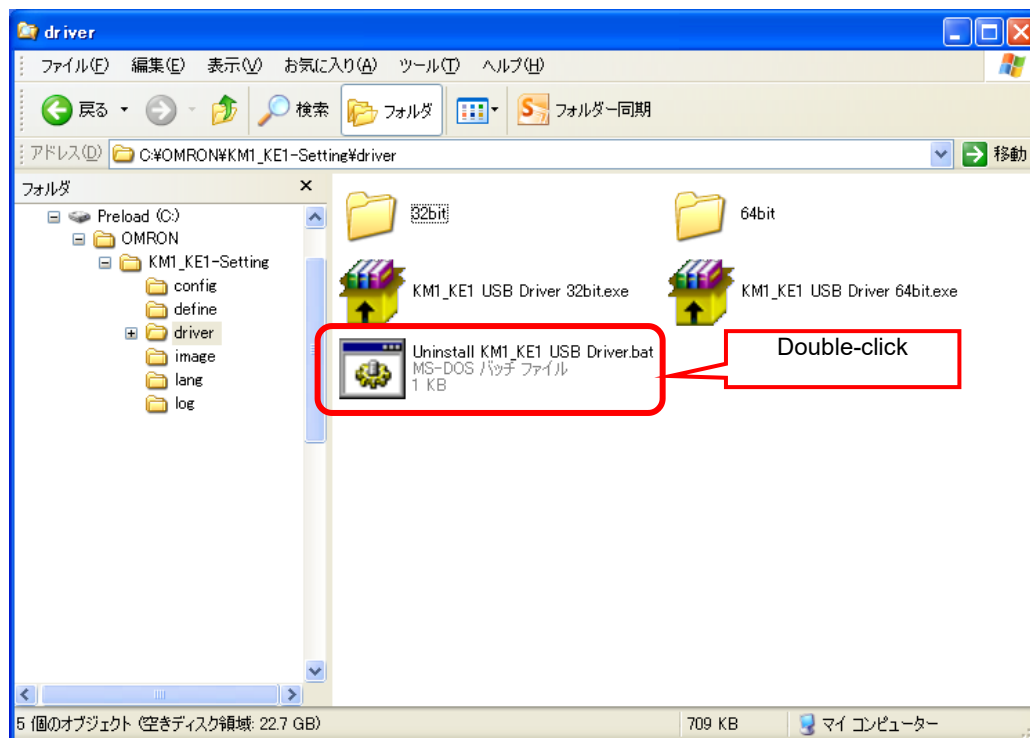
The operational procedure and screens are based on Windows XP.

8. Unplug the USB cable from the computer if the computer and the unit are connected through an USB cable.
9. Open Internet Explorer by clicking on [Start] - [All programs] - [Accessories] - [Explorer].
10. Open the "driver" folder in the folder installed with the Software.

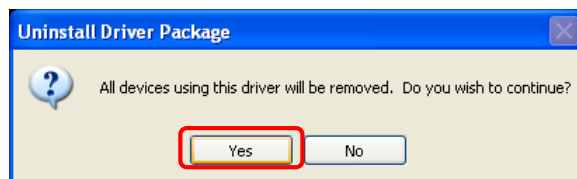


Note: The diagram above shows the installation of the Software to the "C:\OMRON\KM1_KE1-Setting" folder.

11. Double-click on "Uninstall KM1_KE1 USB Driver. bat".



12. The following message will appear. Click on the [Yes] button.



The installation of the driver is complete.

Additional Information

To install the driver again, refer to "4.1 Installation" (p.4-1).

6.7. Garbled characters shown when opening a CSV file output

The character code for the file output by the Software is UTF-8. If the characters are shown by an application that is not compatible with UTF-8, double-byte characters will turn into garbled characters.

To reference the CSV file, use an application compatible with UTF-8 (for Excel, use Excel 2003 SP3 or later).

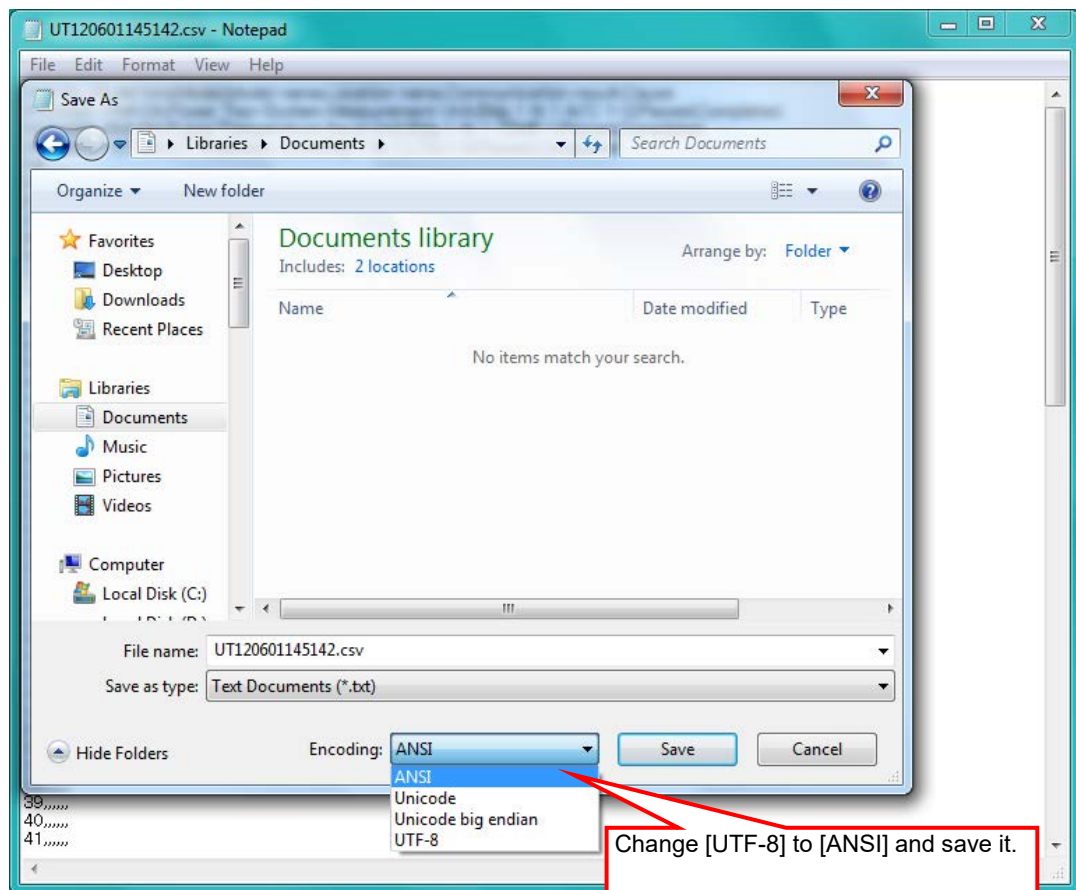
If there is a need to reference the file by an application that is not compatible with UTF-8, follow the procedure below to convert the character code for the file.

■ Operational procedure

1. Use a notepad to open the targeted file.

Note: In case of opening the file using a different method, make sure to open it in read-only mode. If you open the file in readable mode, the data cannot be written from the Software and an error may occur.

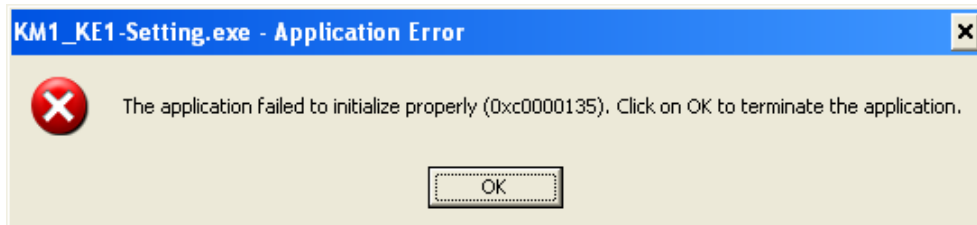
2. Specify the file name and folder by clicking on [File]-[Save as a new file], and specify and save [ANSI] as a character code.



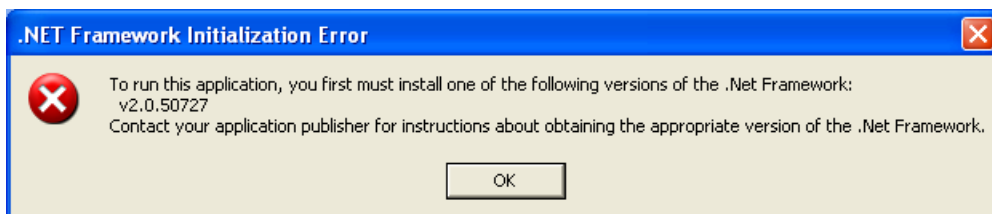
6.8. Installation of Microsoft .NET Framework

To use the Software, you need to install any of .NET Framework 2.0 SP2, 3.0 and 3.5 into your computer. .NET Framework is pre-installed into Windows Vista and Windows 7, but you need to install it manually if you are using Windows XP.

If the following message appears when starting the Software, .NET Framework is not installed. Please install it into your computer. If the same message appears even when you are using Windows Vista or Windows 7, follow the same procedure to install .NET Framework.



The above message appears when .NET Framework is not installed.



The above message appears when the old version of .NET Framework is installed.

■ Installation procedure for .NET Framework

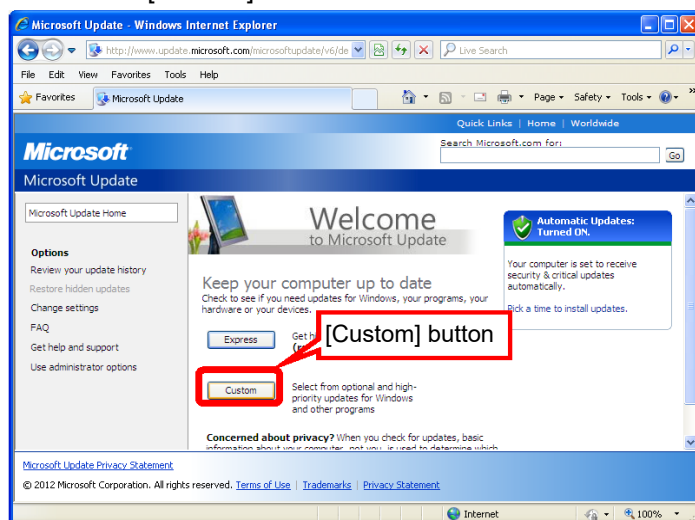
This section explains how to install the software below from Windows Update, for Windows XP using Internet Explorer 8.

- Microsoft .NET Framework 3.5 Service Pack 1
- Microsoft .NET Framework 3.5 Service Pack 1 Language Pack

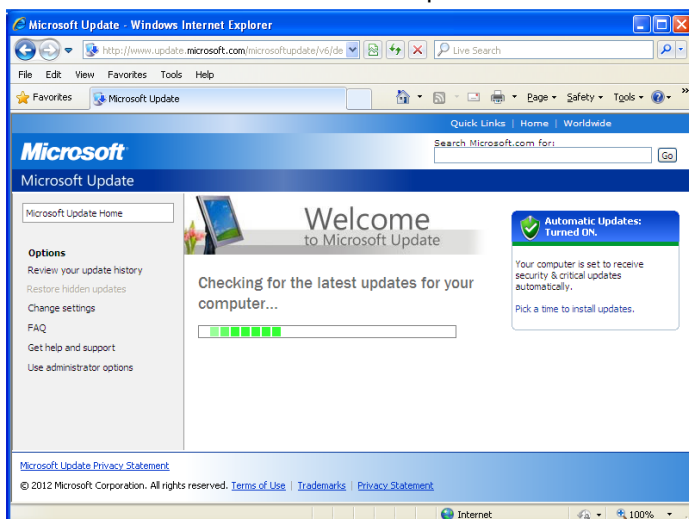
Precautions for Correct Use

.NET Framework has a large download capacity, so connect to a wired internet network to go through the procedure.

1. Start Internet Explorer and click on [Tool] - [Windows Update] from the menu bar.
2. Click on the [Custom] button.



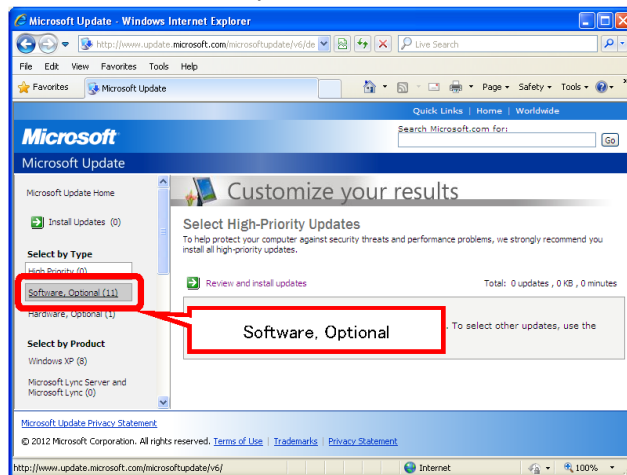
3. Wait for a while to check the latest updates.



4. The following message will appear. Click on the [Yes] button.



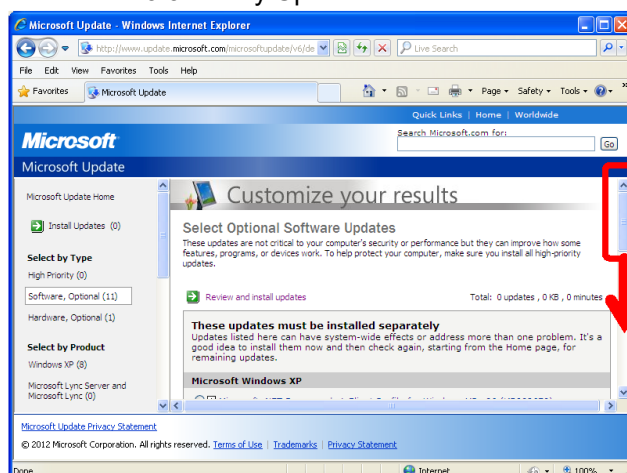
5. Click on "Software, Optional".



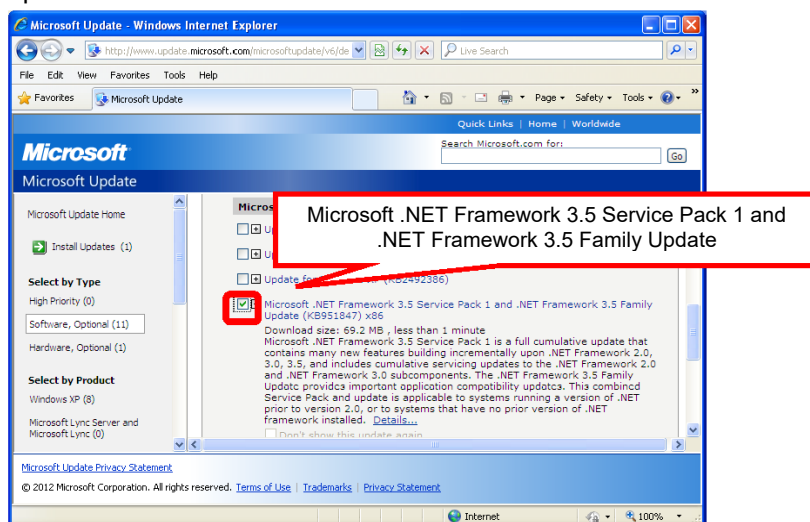
6. The following message will appear. Click on the [Yes] button.



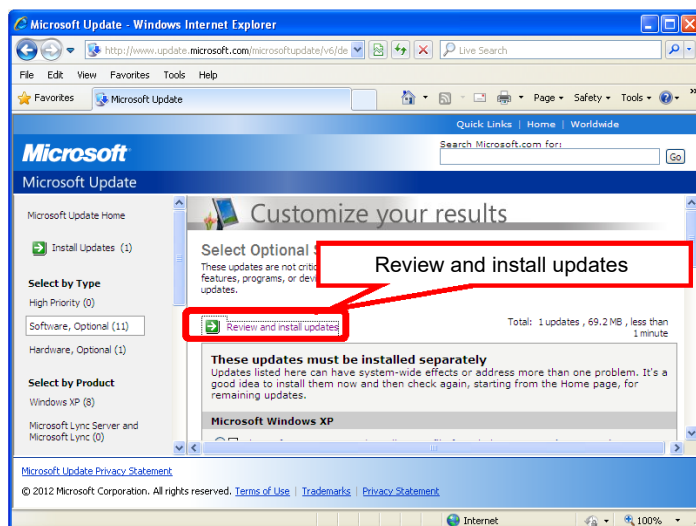
7. Scroll down the page and look for "Microsoft .NET Framework 3.5 Service Pack 1 and .NET Framework 3.5 Family Update".



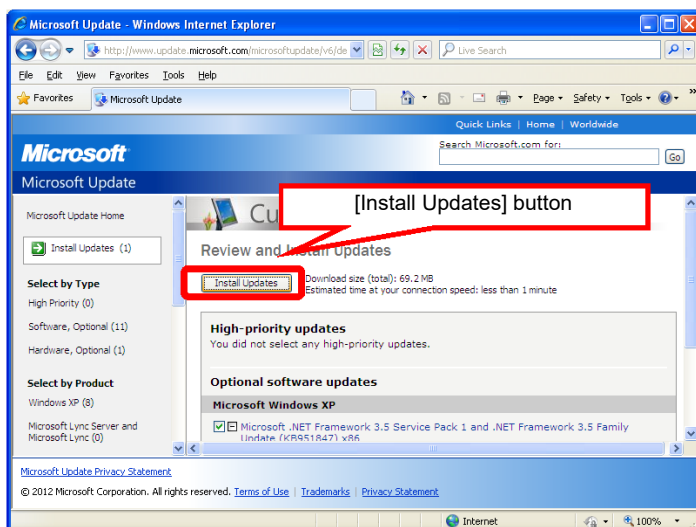
8. Select "Microsoft .NET Framework 3.5 Service Pack 1 and .NET Framework 3.5 Family Update".



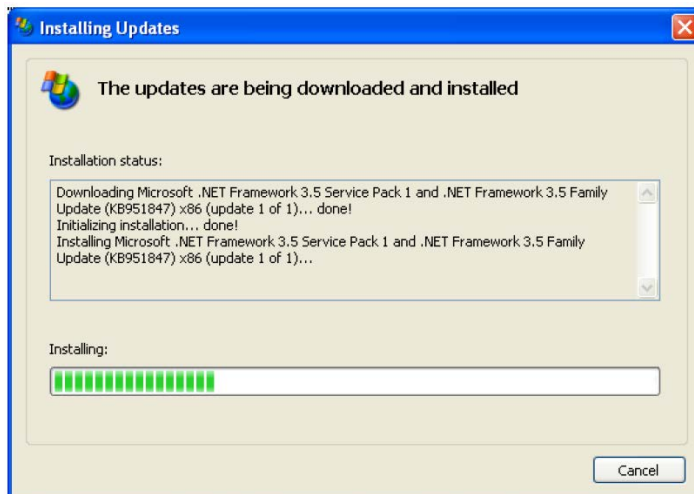
9. Scroll up the page and click on "Review and install updates"



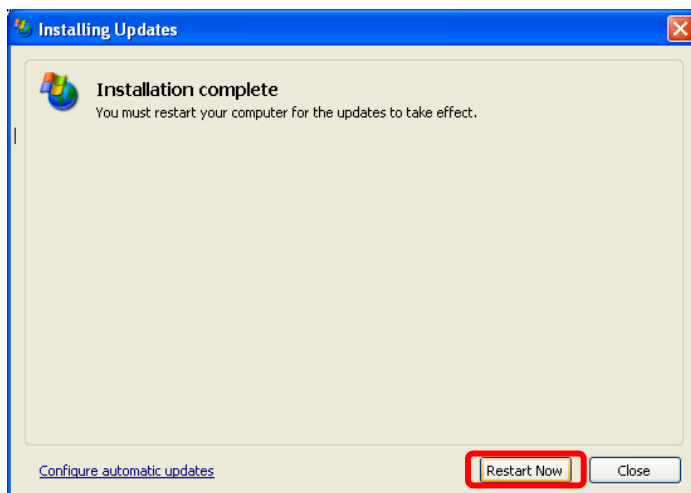
10. Click on [Install updates].



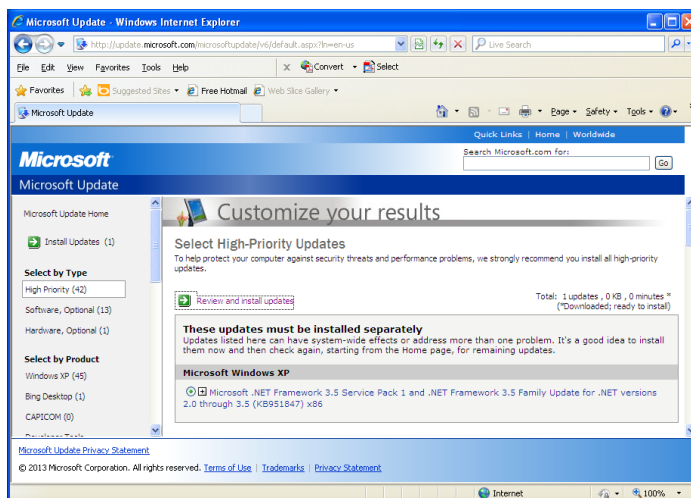
11. Update programs will be downloaded and installed shortly. Wait for a while.



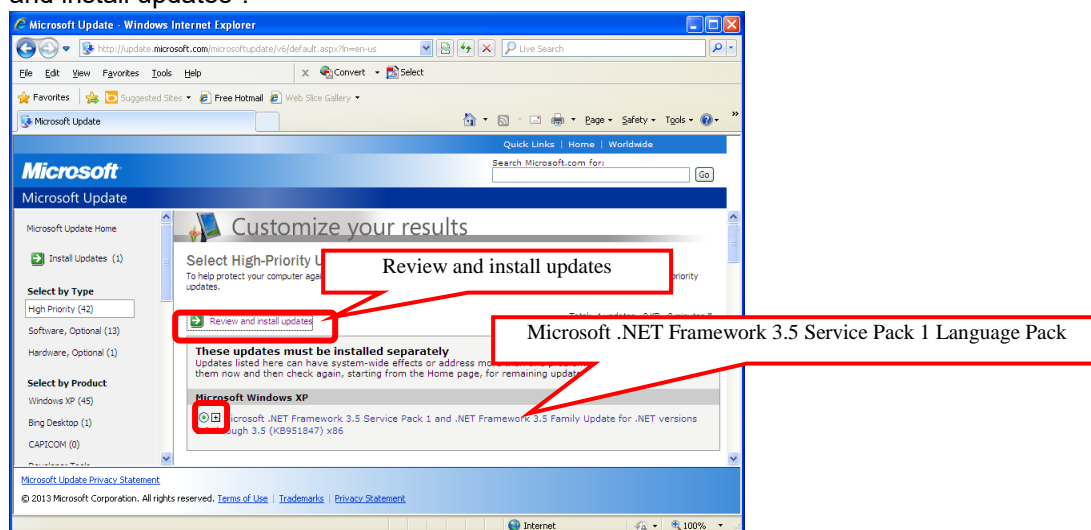
12. After the "Installation complete" screen appears, click on the "Restart Now" button to restart the computer.



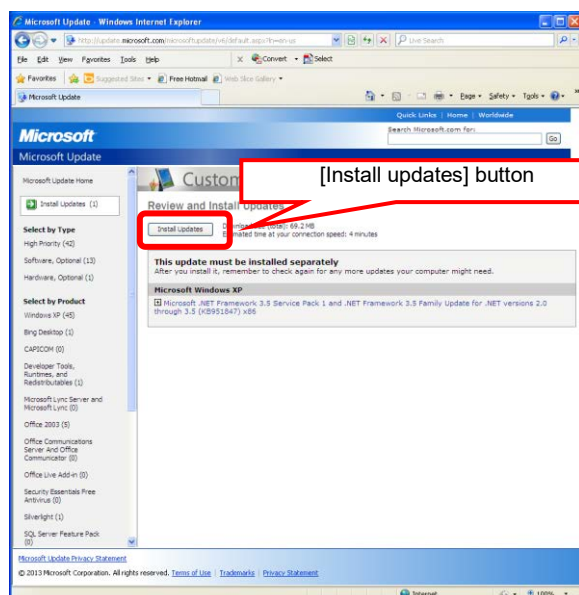
13. After restart of the computer, perform the steps from 1 to 6.



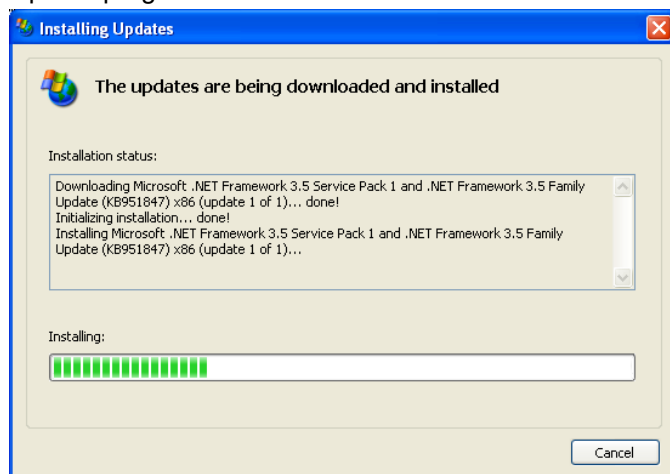
14. Select "Microsoft .NET Framework 3.5 Service Pack 1 Language Pack", and click on "Review and install updates".



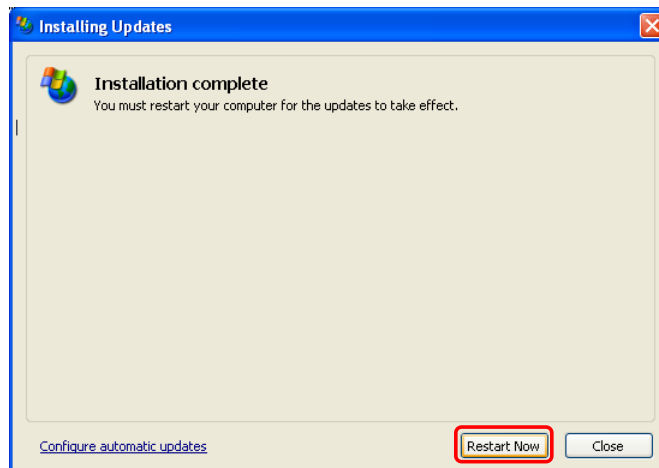
15. Click on [Install updates].



16. Update programs will be downloaded and installed shortly. Wait for a while.



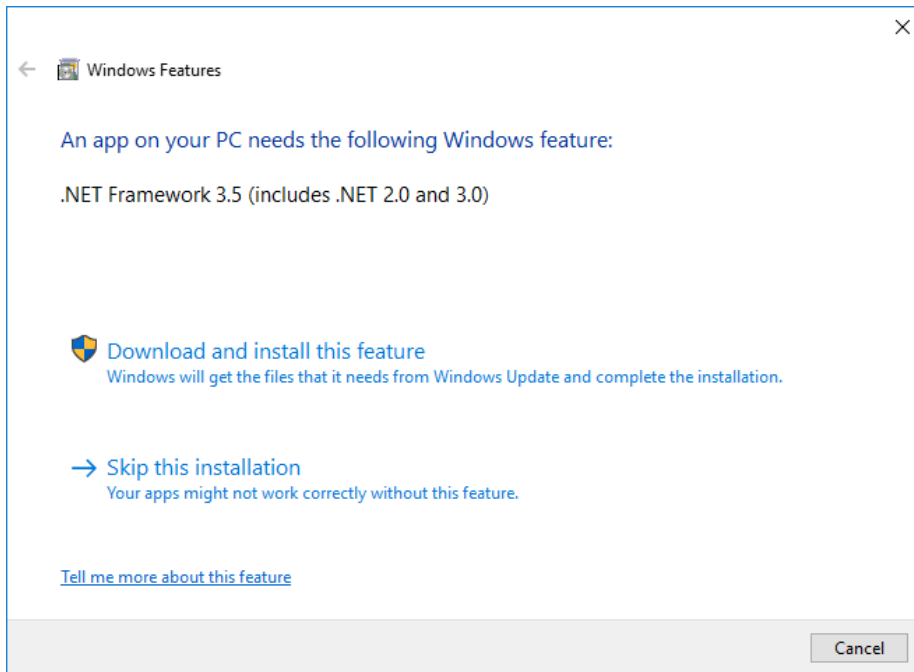
17. When the "Installation complete" screen appears, the installation is completed. Click on the [Close] button.



The installation of Microsoft .NET Framework is complete.

6.9. Microsoft .NET Framework installation procedure for Windows 10

To use the Software, you need to install .NET Framework 3.5 into your computer. If the following message appears when this software is launched, you must install .NET Framework.



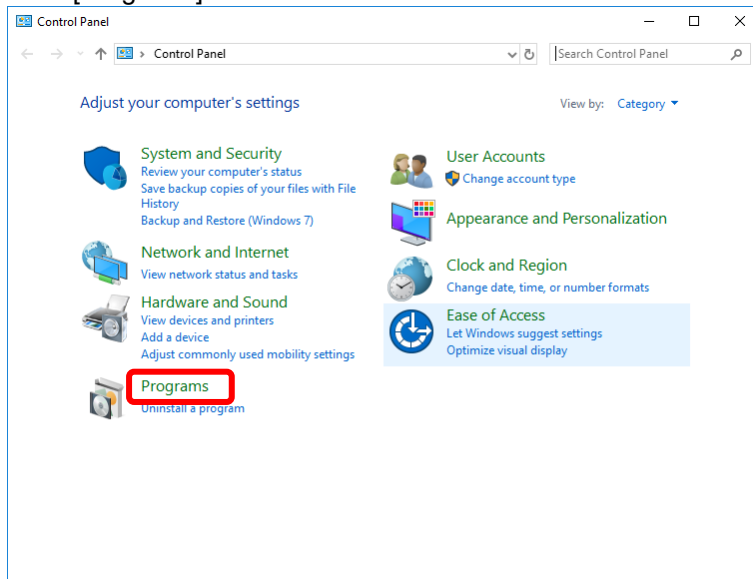
■ Installation procedure for .NET Framework

This section describes how to install .NET Framework 3.5 using Windows Update.

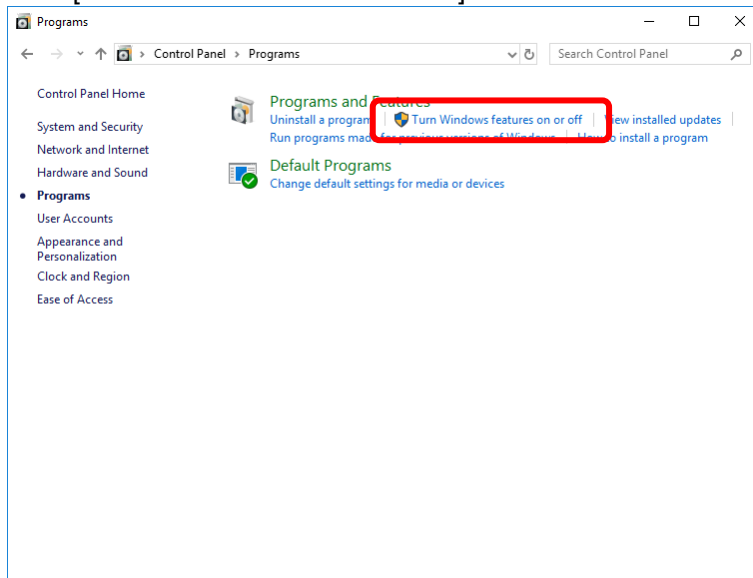
Precautions for Correct Use

.NET Framework has a large download capacity, so connect to a wired internet network to go through the procedure.

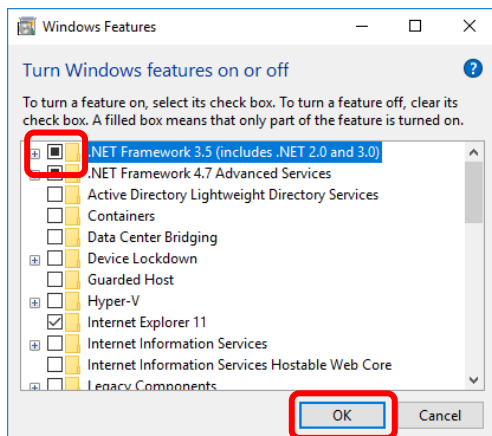
1. Select [Start] - [Windows System] - [Control Panel] to open the Control Panel.
2. Click [Programs].



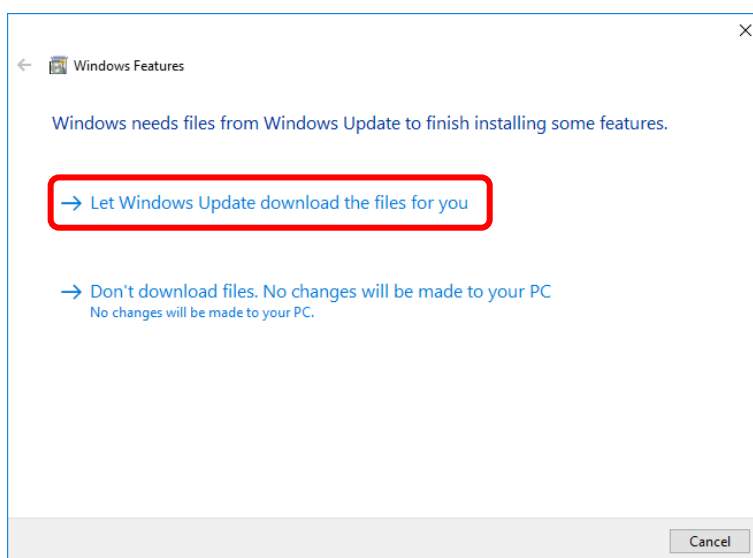
3. Click [Turn Windows features on or off].



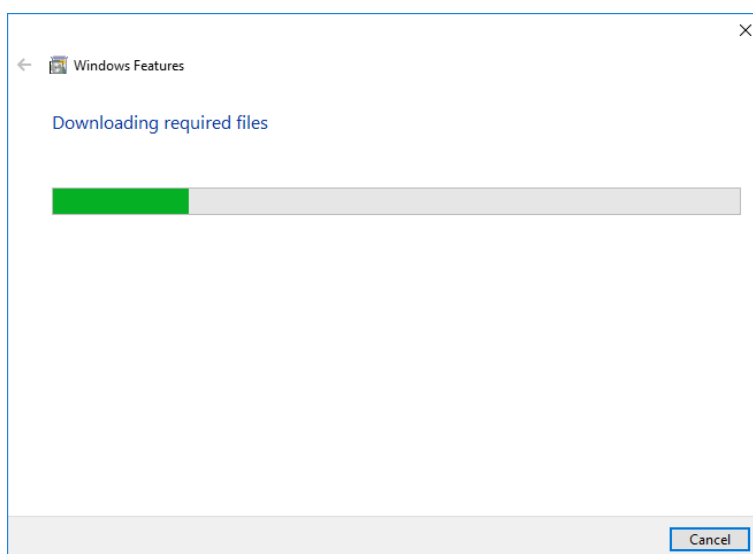
4. Select the [.NET Framework 3.5] check box and click [OK].



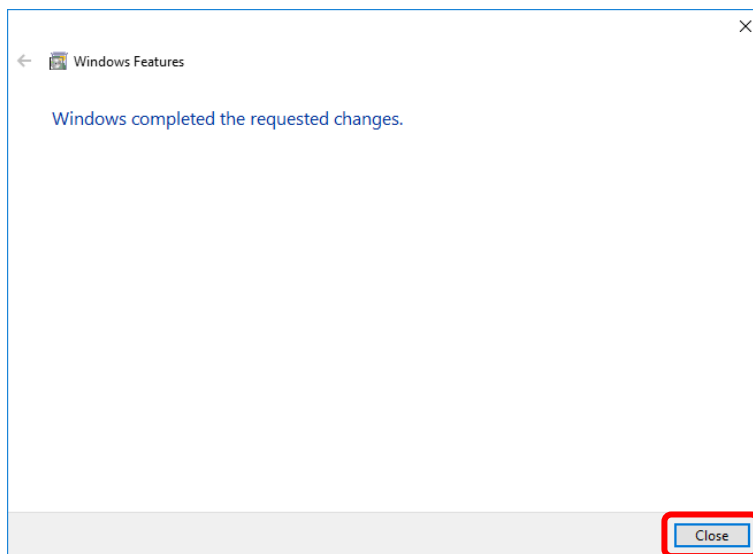
5. When the following screen appears, click [Let Windows Update download the files for you].



6. Please wait for a while. The software patch is downloaded and installed.



7. When "Windows completed the requested changes." appears, click [Close].



The installation of Microsoft .NET Framework is complete.

7. Appendix

7.1. List of main unit setting items for KM1/KE1

This is a list of setting items for "5.3.3 KM1 main unit setting" (p.5-23) or "5.3.4 KE1 main unit setting" (p.5-53).

"○" or "◎" for each function means that the item is settable, while "-" indicating that the item is not settable.

"○" means that the item can set only Electrical system 1 or Measurement block 1, and "◎" means that the item can set Electrical system 1 and 2 or Measurement block 1 and 2.

For "Options/setting range", the format of the setting range (X - Y) is indicated for setting items that can be directly entered, and the options are indicated for setting items that are selective.

7.1.1. Communication setting

No.	Item name	KM1			KE1							Initial value	Options/setting range
		PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E	DRT		
1	RS-485 setting Unit No.	○	○	○	○	○	○	○	○	○	○	01	01, 02, 03, 04, ..., 99
2	RS-485 setting Baud rate	○	○	○	○	○	○	○	-	-	○	9.6kbps	9.6kbps, 19.2kbps, 38.4kbps
3	RS-485 setting Data length	○	○	○	○	○	○	○	-	-	○	7 bits	7 bits, 8 bits
4	RS-485 setting Stop bits	○	○	○	○	○	○	○	-	-	○	2 bits	1 bit, 2 bits
5	RS-485 setting Vertical parity	○	○	○	○	○	○	○	-	-	○	Even	No, Even, Odd
6	RS-485 setting Transmission wait time	○	○	○	○	○	○	○	-	-	○	20ms	(0 to 99ms)
7	Connection composition Slave ID1	○	○	-	○	○	-	-	-	-	-	Disabled	Disabled, Enabled
8	Slave ID2	○	○	-	○	○	-	-	-	-	-	Disabled	Disabled, Enabled
9	Connection composition Slave ID3	○	○	-	○	○	-	-	-	-	-	Disabled	Disabled, Enabled
10	Connection composition Slave ID4	○	○	-	○	○	-	-	-	-	-	Disabled	Disabled, Enabled
11	Connection composition Slave ID5	○	○	-	-	-	-	-	-	-	-	Disabled	Disabled, Enabled
12	Connection composition Slave ID6	○	○	-	○	○	-	-	-	-	-	Disabled	Disabled, Enabled

7.1.2. Measurement setting

No.	Item name	KM1			KE1							Initial value	Options/setting range
		PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSI1B	VAI1B	CTD8E	ZCT8E	DRT		
1	Applicable phase wire	○	⊙	-	○	○	○	○	⊙	-	-	3-phase 3-wire	Electrical system 1 1-phase 2-wire, 1-phase 3-wire, 3-phase 3-wire, 3-phase 4-wire (*1) Electrical system 2 1-phase 2-wire, 1-phase 3-wire, 3-phase 3-wire *1: "3-phase 4-wire" cannot be selected for PMU2A.
2	Synchronization selection for measuring block	-	-	-	-	-	-	-	⊙	-	-	Electrical system 1	Electrical system 1, Electrical system 2
3	Special CT	○	⊙	-	○	○	-	○	⊙	-	-	100A	5A, 50A, 100A, 200A, 400A, 600A
4	VT ratio	○	⊙	-	○	○	○	○	⊙	-	-	1.00	(0.01 to 99.99)
5	CT ratio	○	⊙	-	○	○	-	○	⊙	-	-	1	(1 to 1000)
6	Low-cut current	○	⊙	-	○	○	-	○	⊙	-	-	0.6%	(0.1 to 19.9%)
7	Earth leakage Low-cut current	-	-	-	○	-	-	-	-	○	-	1.0mA	(0.1 to 30.0mA)
8	Simple measurement	○	○	-	-	-	-	-	○	-	-	OFF	OFF (Regular measurement), ON (Simple measurement)
9	Voltage on simple measurement	○	⊙	-	-	-	-	-	⊙	-	-	110.0V	(0.1 to 9999.9V)
10	Power factor on simple measurement	○	⊙	-	-	-	-	-	⊙	-	-	1.00	(0.01 to 1.00)
11	Average Count	○	○	-	○	○	○	○	○	○	-	OFF	OFF, 2 times, 4 times, 8 times, 16 times, 32 times, 64 times, 128 times, 256 times, 512 times, 1024 times
12	Pulse output unit	○	○	-	○	○	-	-	-	-	-	100Wh	1Wh, 10Wh, 100Wh, 1kWh, 2kWh, 5kWh, 10kWh, 20kWh, 50kWh, 100kWh
13	Pulse output circuit	○	○	-	○	○	-	-	-	-	-	Circuit 1	Circuit 1, Circuit 2, Circuit 3, Circuit 4
14	Total power coefficient	○	⊙	-	○	○	-	-	⊙	-	-	1.000	(0.000 to 9999.999)
15	3-STATE target	○	⊙	-	-	-	-	-	-	-	-	None	Power, Current, Voltage, Event input, No
16	3-STATE/power consumption rate event input	○	⊙	-	-	-	-	-	-	-	-	1 and 2	1 and 2, 3 and 4, 5 and 6 (Terminal for event input)
17	3-STATE HIGH threshold	○	⊙	-	-	-	-	-	-	-	-	1000	(-120000000 to 120000000)
18	3-STATE LOW threshold	○	⊙	-	-	-	-	-	-	-	-	800	(-120000000 to 120000000)
19	3-STATE hysteresis	○	⊙	-	-	-	-	-	-	-	-	50	(0 to 24000000)
20	Measurement start time	○	○	-	-	-	-	-	-	-	-	00:00	(00:00 to 23:59)
21	Measurement end time	○	○	-	-	-	-	-	-	-	-	24:00	(00:01 to 24:00)

No.	Item name	KM1			KE1							Initial value	Options/setting range
		PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZC78E	DRT		
22	Event input setting 1	-	-	○	-	-	-	-	-	-	-	P.CSP	Event input setting 1-7 P.CSP (Pulse input count) H-ON (Pulse input ON time) 3-ST (3-STATE classification) NPN/PNP input mode setting PNP, NPN Input mode setting N-O (Normally open) N-C (Normally closed)
23	NPN/PNP input mode setting	-	-	○	-	-	-	-	-	-	-	PNP	
24	Input mode setting	-	-	○	-	-	-	-	-	-	-	N-O	
25	Event input setting 2	-	-	○	-	-	-	-	-	-	-	P.CSP	
26	NPN/PNP input mode setting	-	-	○	-	-	-	-	-	-	-	PNP	
27	Input mode setting	-	-	○	-	-	-	-	-	-	-	N-O	
28	Event input setting 3	-	-	○	-	-	-	-	-	-	-	P.CSP	
29	NPN/PNP input mode setting	-	-	○	-	-	-	-	-	-	-	PNP	
30	Input mode setting	-	-	○	-	-	-	-	-	-	-	N-O	
31	Event input setting 4	-	-	○	-	-	-	-	-	-	-	P.CSP	
32	NPN/PNP input mode setting	-	-	○	-	-	-	-	-	-	-	PNP	
33	Input mode setting	-	-	○	-	-	-	-	-	-	-	N-O	
34	Event input setting 5	-	-	○	-	-	-	-	-	-	-	P.CSP	
35	NPN/PNP input mode setting	-	-	○	-	-	-	-	-	-	-	PNP	
36	Input mode setting	-	-	○	-	-	-	-	-	-	-	N-O	
37	Event input setting 6	-	-	○	-	-	-	-	-	-	-	P.CSP	Celsius (C), Fahrenheit (F) (-50.0 to 50.0) (0.01 to 9999.99)
38	NPN/PNP input mode setting	-	-	○	-	-	-	-	-	-	-	PNP	
39	Input mode setting	-	-	○	-	-	-	-	-	-	-	N-O	
40	Event input setting 7	-	-	○	-	-	-	-	-	-	-	P.CSP	
41	NPN/PNP input mode setting	-	-	○	-	-	-	-	-	-	-	PNP	
42	Input mode setting	-	-	○	-	-	-	-	-	-	-	N-O	
43	Temperature unit	-	-	○	-	-	-	-	-	-	-	Celsius	
44	Temperature compensation 1	-	-	○	-	-	-	-	-	-	-	0	
45	Pulse conversion coefficient setting 1	-	-	○	-	-	-	-	-	-	-	1.00	
46	Pulse conversion coefficient setting 2	-	-	○	-	-	-	-	-	-	-	1.00	
47	Pulse conversion coefficient setting 3	-	-	○	-	-	-	-	-	-	-	1.00	
48	Pulse conversion coefficient setting 4	-	-	○	-	-	-	-	-	-	-	1.00	
49	Pulse conversion coefficient setting 5	-	-	○	-	-	-	-	-	-	-	1.00	
50	Pulse conversion coefficient setting 6	-	-	○	-	-	-	-	-	-	-	1.00	
51	Pulse conversion coefficient setting 7	-	-	○	-	-	-	-	-	-	-	1.00	

7.1.3. Alarm setting

No.	Item name	KM1			KE1							Initial value	Options/setting range
		PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E	DRT		
1	Alarm parameter setting	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	-	-	Uncheck all	Over voltage alarm Under voltage alarm Over current alarm Under current alarm Active power upper limit alarm Active power lower limit alarm Reactive power upper limit alarm Reactive power lower limit alarm Power factor alarm
2	Over voltage alarm Threshold	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	528.0V	(0 to 12100.0V)
3	" Hysteresis	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	24.0V	(0 to 2200.0V)
4	" On delays	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	0.1s	(0.1 to 10.0s)
5	Under voltage alarm Threshold	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	85.0V	(0 to 12100.0V)
6	" Hysteresis	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	24.0V	(0 to 2200.0V)
7	" On delays	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	0.1s	(0.1 to 10.0s)
8	Over current alarm Threshold	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	<input type="radio"/>	<input checked="" type="radio"/>	-	-	100.0A	(0 to 6000.0A)
9	" Hysteresis	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	<input type="radio"/>	<input checked="" type="radio"/>	-	-	5.0A	(0 to 1000.0A)
10	" On delays	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	<input type="radio"/>	<input checked="" type="radio"/>	-	-	0.1s	(0.1 to 10.0s)
11	Under current alarm Threshold	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	<input type="radio"/>	<input checked="" type="radio"/>	-	-	10.0A	(0 to 6000.0A)
12	" Hysteresis	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	<input type="radio"/>	<input checked="" type="radio"/>	-	-	5.0A	(0 to 1000.0A)
13	" On delays	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	<input type="radio"/>	<input checked="" type="radio"/>	-	-	0.1s	(0.1 to 10.0s)
14	Active power upper limit alarm Threshold	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	-	<input checked="" type="radio"/>	-	-	1000W	(-120000000 to 120000000W)
15	" Hysteresis	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	-	<input checked="" type="radio"/>	-	-	100W	(0 to 24000000W)
16	" On delays	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	-	<input checked="" type="radio"/>	-	-	0.5s	(0.5 to 10.0s)
17	Active power lower limit alarm Threshold	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	-	<input checked="" type="radio"/>	-	-	300W	(-120000000 to 120000000W)
18	" Hysteresis	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	-	<input checked="" type="radio"/>	-	-	100W	(0 to 24000000W)
19	" On delays	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	-	<input checked="" type="radio"/>	-	-	0.5s	(0.5 to 10.0s)
20	Reactive power upper limit alarm Threshold	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	-	<input checked="" type="radio"/>	-	-	1000var	(-120000000 to 120000000var)
21	" Hysteresis	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	-	<input checked="" type="radio"/>	-	-	100var	(0 to 24000000var)
22	" On delays	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	-	<input checked="" type="radio"/>	-	-	0.5s	(0.5 to 10.0s)
23	Reactive power lower limit alarm Threshold	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	-	<input checked="" type="radio"/>	-	-	300var	(-120000000 to 120000000var)
24	" Hysteresis	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	-	<input checked="" type="radio"/>	-	-	100var	(0 to 24000000var)
25	" On delays	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	-	<input checked="" type="radio"/>	-	-	0.5s	(0.5 to 10.0s)
26	Power factor alarm Threshold	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	-	<input checked="" type="radio"/>	-	-	0.00	(-1.00 to 1.00)
27	" Hysteresis	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	-	<input checked="" type="radio"/>	-	-	0.05	(0.00 to 1.00)
28	" On delays	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	-	<input checked="" type="radio"/>	-	-	0.5s	(0.5 to 10.0s)
29	Active input setting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	Check all	Input 1, Input 2, Input 3, Input 4, Input 5, Input 6, Input 7, Input 8
30	Alarm output setting	<input type="radio"/>	<input checked="" type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	-	-	Uncheck all	Same as No. 1
31	Earth leakage comparison set value 1	-	-	-	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-	30mA	(30 to 1000mA)
32	Earth leakage operating time 1	-	-	-	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-	0.5s	(0.1 to 20.0s)
33	Earth leakage comparison set value 2	-	-	-	-	-	-	-	-	<input type="radio"/>	-	30mA	(30 to 1000mA)
34	Earth leakage operating time 2	-	-	-	-	-	-	-	-	<input type="radio"/>	-	0.5s	(0.1 to 20.0s)
35	Earth leakage comparison set value 3	-	-	-	-	-	-	-	-	<input type="radio"/>	-	30mA	(30 to 1000mA)
36	Earth leakage operating time 3	-	-	-	-	-	-	-	-	<input type="radio"/>	-	0.5s	(0.1 to 20.0s)

No.	Item name	KM1			KE1							Initial value	Options/setting range
		PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSI1B	VAU1B	CTD8E	ZCT8E	DRT		
37	Earth leakage comparison set value 4	-	-	-	-	-	-	-	-	○	-	30mA	(30 to 1000mA)
38	Earth leakage operating time 4	-	-	-	-	-	-	-	-	○	-	0.5s	(0.1 to 20.0s)
39	Earth leakage comparison set value 5	-	-	-	-	-	-	-	-	○	-	30mA	(30 to 1000mA)
40	Earth leakage operating time 5	-	-	-	-	-	-	-	-	○	-	0.5s	(0.1 to 20.0s)
41	Earth leakage comparison set value 6	-	-	-	-	-	-	-	-	○	-	30mA	(30 to 1000mA)
42	Earth leakage operating time 6	-	-	-	-	-	-	-	-	○	-	0.5s	(0.1 to 20.0s)
43	Earth leakage comparison set value 7	-	-	-	-	-	-	-	-	○	-	30mA	(30 to 1000mA)
44	Earth leakage operating time 7	-	-	-	-	-	-	-	-	○	-	0.5s	(0.1 to 20.0s)
45	Earth leakage comparison set value 8	-	-	-	-	-	-	-	-	○	-	30mA	(30 to 1000mA)
46	Earth leakage operating time 8	-	-	-	-	-	-	-	-	○	-	0.5s	(0.1 to 20.0s)
47	Upper-limit temperature alarm Threshold	-	-	○	-	-	-	-	-	-	-	80.0	(-50.0 to 100.0)
48	" Hysteresis	-	-	○	-	-	-	-	-	-	-	5.0	(0.0 to 10.0)
49	" On delays	-	-	○	-	-	-	-	-	-	-	0.5s	(0.5 to 10.0s)
50	Lower-limit temperature alarm Threshold	-	-	○	-	-	-	-	-	-	-	0.0	(-50.0 to 100.0)
51	" Hysteresis	-	-	○	-	-	-	-	-	-	-	5.0	(0.0 to 10.0)
52	" On delays	-	-	○	-	-	-	-	-	-	-	0.5s	(0.5 to 10.0s)
53	Phase-loss detection	-	-	-	○	○	○	○	-	-	-	OFF	OFF, ON
54	Phase-sequence detection	○	○	-	○	○	○	○	-	-	-	OFF	OFF, ON
55	Output terminal 1 function setting	○	○	○	○	-	○	○	○	○	-	OFF	OFF Measuring block 1 alarm Measuring block 2 alarm Earth leakage Temperature Phase-loss Phase-sequence Pulse output Measuring block 1 3-STATE HIGH Measuring block 1 3-STATE MIDDLE Measuring block 1 3-STATE LOW Measuring block 2 3-STATE HIGH Measuring block 2 3-STATE MIDDLE Measuring block 2 3-STATE LOW
56	Output terminal 1 condition	○	○	○	○	-	○	○	○	○	-	N-O	N-O (Normally open) N-C (Normally closed)
57	Output terminal 2 function setting	○	○	○	○	○	-	○	-	-	-	OFF	Same as No. 55
58	Output terminal 2 condition	○	○	○	○	○	-	○	-	-	-	N-O	Same as No. 56
59	Output terminal 3 function setting	○	○	○	-	-	-	-	-	-	-	OFF	Same as No. 55
60	Output terminal 3 condition	○	○	○	-	-	-	-	-	-	-	N-O	Same as No. 56
61	Voltage sag detection 1	-	-	-	-	○	○	-	-	-	-	OFF	OFF Vrs (3P3W, 1P2W, 1P3W), Vrn (3P4W) Vst (3P3W, 1P3W), Vsn (3P4W) Vtr (3P3W), Vtn (3P4W)
62	Voltage sag detection voltage	-	-	-	-	○	○	-	-	-	-	80.0V	(0 to 480.0V)
63	Voltage sag duration time	-	-	-	-	○	○	-	-	-	-	0.02s	(0.02 to 1.00s)

7 Appendix

No.	Item name	KM1			KE1							Initial value	Options/setting range
		PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSU1B	VAU1B	CTD8E	ZCT8E	DRT		
64	Voltage sag detection 2	-	-	-	-	○	○	-	-	-	-	OFF	Same as No. 61
65	Voltage sag detection voltage	-	-	-	-	○	○	-	-	-	-	80.0V	(0 to 480.0V)
66	Voltage sag duration time	-	-	-	-	○	○	-	-	-	-	0.02s	(0.02 to 1.00s)
67	Voltage sag detection 3	-	-	-	-	○	○	-	-	-	-	OFF	Same as No. 61
68	Voltage sag detection voltage	-	-	-	-	○	○	-	-	-	-	80.0V	(0 to 480.0V)
69	Voltage sag duration time	-	-	-	-	○	○	-	-	-	-	0.02s	(0.02 to 1.00s)
70	Voltage sag detection 4	-	-	-	-	○	○	-	-	-	-	OFF	Same as No. 61
71	Voltage sag detection voltage	-	-	-	-	○	○	-	-	-	-	80.0V	(0 to 480.0V)
72	Voltage sag duration time	-	-	-	-	○	○	-	-	-	-	0.02s	(0.02 to 1.00s)
73	Back up at voltage sag	-	-	-	-	○	○	-	-	-	-	OFF	OFF, ON

7.1.4. Logging setting

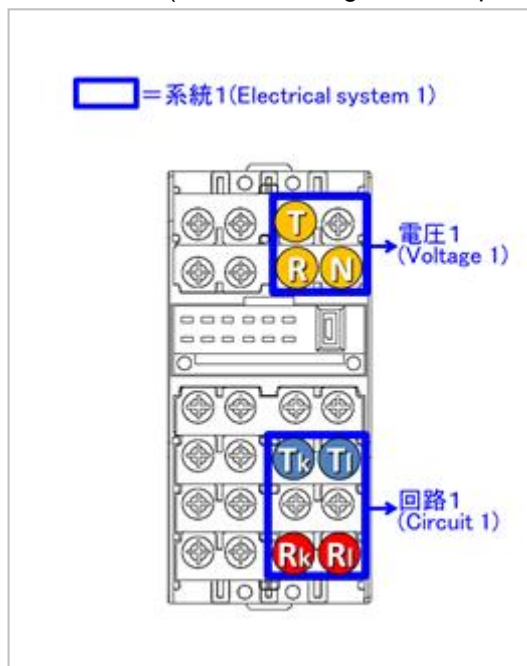
No.	Item name	KM1			KE1							Initial value	Options/setting range
		PMU1A	PMU2A	EMU8A	PGR1C	PVS1C	VSI1B	VAI1B	CTD8E	ZCT8E	DRT		
1	Data logging 1 item	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	Voltage MAX1 (Temperature MAX1 only for EMU8)	Refer to "List of logs to be saved" in "User's manual for KM1/KE1".
2	Data logging 1 cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	5 minutes	5m, 10m, 30m, 1h, 2h, 6h, 12h, 24h
3	Data logging 2 item	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	Voltage MAX2 (Temperature MIN1 only for EMU8)	Same as No. 1
4	Data logging 2 cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	5 minutes	Same as No. 2
5	Data logging 3 item	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	Voltage MAX3 (Pulse input ON time 1 only for EMU8)	Same as No. 1
6	Data logging 3 cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	5 minutes	Same as No. 2
7	Data logging 4 item	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	Voltage MIN1 (Pulse input ON time 2 only for EMU8)	Same as No. 1
8	Data logging 4 cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	5 minutes	Same as No. 2
9	Data logging 5 item	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	Voltage MIN2 (Pulse input count 1 only for EMU8)	Same as No. 1
10	Data logging 5 cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	5 minutes	Same as No. 2
11	Data logging 6 item	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	Voltage MIN3 (Pulse input count 2 only for EMU8)	Same as No. 1
12	Data logging 6 cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	-	-	5 minutes	Same as No. 2

7.2. Terminal diagram (Main unit setting for KM1or KE1)

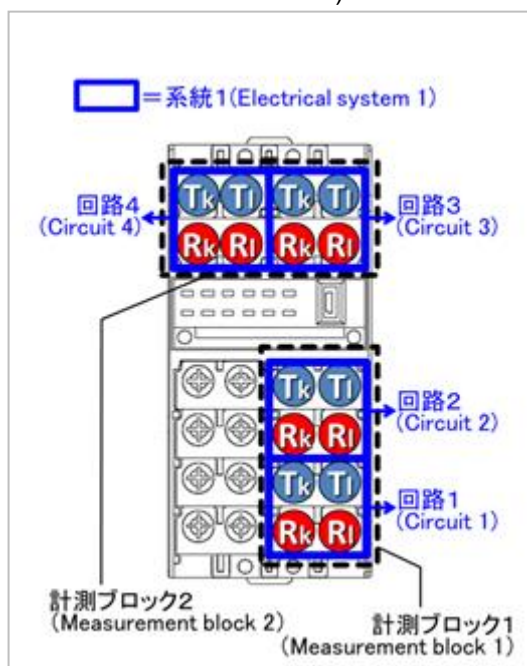
The [Measurement setting] tab for main unit settings for KM1 or KE1 shows a terminal diagram describing wiring terminals necessary for measurement based upon the details of the phase wire method and synchronization selection for measuring block (only KE1-CTD8E).

■ Sample of terminal diagram




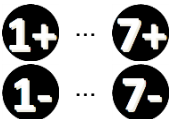
KM1-PMU1A (When selecting the three phase three-wire system)



KE1-CTD8E (Selecting Electrical system 1 (three phase three-wire system) along with Measurement block 1 and 2)



■ Explanation of wiring terminal symbols

Input type	Wiring terminal symbol	Explanation
Voltage input	 <p>The circled alphabetical character (L, R, S, T and N) refers to a voltage phase.</p>	Connect the relevant voltage phase to the terminal location indicating a wiring terminal symbol.
CT input	 <p>The circled alphabetical character on the left side (L, R, S, T) refers to a phase, and the alphabetical character on the right side (k, l) refers to polarity for CT.</p>	<p>Connect the CT clamped to the relevant phase to the terminal location indicating a wiring terminal symbol. In this case, make sure that k and l are in the right direction.</p> <p>Connect (K) to the power source side for k, and connect (L) to the load side for l.</p>
ZCT input	 <p>The circled number on the left side (1 to 8) refers to a ZCT number, and the alphabetical character on the right side (k, l) refers to polarity for ZCT. The same ZCT number means the same ZCT.</p>	<p>Connect the ZCT clamped to the relevant phase to the terminal location indicating a wiring terminal symbol. In this case, make sure that k and l are in the right direction.</p> <p>Connect (K) to the power source side for k, and connect (L) to the load side for l.</p>
Event input	 <p>The circled number on the left side (1 to 7) refers to an event input number, and the symbol (+, -) on the right side refers to polarity for input power source. The same event number means the same input point.</p>	Connect the event input to the terminal location indicating a wiring terminal symbol.

7.3. Model-specific instantaneous value screen

On the [Instantaneous value] screen of the [Monitoring] tab, the contents shown in each measurement value column vary depending on the model and applicable phase wire. For each model to be shown, confirm the instantaneous value according to the tables below.

■ Explanation of the tables

Reference the number to be confirmed on the screen, from relevant measurement items indicated in the tables of models used described below.

For example, to confirm the value shown in "Current 3" on the screen when measuring the three phase three-wire by the KM1-PMU2A model, reference the "Three phase three-wire" column for the item "3" from "Current (A)" in Table "KM1-PMU2A" (IT (Circuit 1)).

<[Instantaneous value] screen of [Monitoring] tab>

<Correspondence table for M1-PMU2A (sample)>

Current (A)	1 to 3 columns indicate electric currents of the electrical system 1. 7 to 9 columns indicate electric currents of the electrical system 2. 4 to 6 and 10 to 12 are made undisplayed.											
		1	2	3	4	5	6					
	Single phase two-wire	IR (Circuit 1)	IR (Circuit 2)	0.00 fixed	(Non-display)	(Non-display)	(Non-display)					
	Single phase three-wire	IR (Circuit 1)	IN (Circuit 1)	IT (Circuit 1)	(Non-display)	(Non-display)	(Non-display)					
	Three phase three-wire	IR (Circuit 1)	IS (Circuit 1)	IT (Circuit 1)	(Non-display)	(Non-display)	(Non-display)					
		7	8	9	10	11	12					
	Single phase two-wire	IR (Circuit 3)	IR (Circuit 4)	0.000 fixed	(Non-display)	(Non-display)	(Non-display)					
	Single phase three-wire	IR (Circuit 2)	IN (Circuit 2)	IT (Circuit 2)	(Non-display)	(Non-display)	(Non-display)					
	Three phase three-wire	IR (Circuit 2)	IS (Circuit 2)	IT (Circuit 2)	(Non-display)	(Non-display)	(Non-display)					

7.3.1. KM1-PMU1A

Current (A)	1 to 3 columns indicate electric currents. 4 to 12 are made undisplayed.							
		1	2	3	4	5	6	
	1 phase 2-wire	IR (Circuit 1)	IR (Circuit 2)	IR (Circuit 3)	(Non-display)	(Non-display)	(Non-display)	
	1 phase 3-wire	IR (Circuit 1)	IN (Circuit 1)	IT (Circuit 1)	(Non-display)	(Non-display)	(Non-display)	
	3 phase 3-wire	IR (Circuit 1)	IS (Circuit 1)	IT (Circuit 1)	(Non-display)	(Non-display)	(Non-display)	
	3 phase 4-wire	IR (Circuit 1)	IS (Circuit 1)	IT (Circuit 1)	(Non-display)	(Non-display)	(Non-display)	
		7	8	9	10	11	12	
	1 phase 2-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	
	1 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	
	3 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	
	3 phase 4-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	
	Voltage (V)	1 to 6 show voltage.						
			1	2	3	4	5	6
1 phase 2-wire		VLN	0.0 fixed	0.0 fixed	0.0 fixed	0.0 fixed	0.0 fixed	
1 phase 3-wire		VRN	VTN	VRT	0.0 fixed	0.0 fixed	0.0 fixed	
3 phase 3-wire		VRS	VST	VTR	0.0 fixed	0.0 fixed	0.0 fixed	
3 phase 4-wire		VRN	VSN	VTN	VRS	VST	VTR	
Active power (kW)		1 to 3 show active power/reactive power. 4 to 8 are made undisplayed.						
		1	2	3	4			
	1 phase 2-wire	CT input 1	CT input 2	CT input 3	(Non-display)			
	Reactive power (kvar)	1 phase 3-wire	CT input 1, 3	0.0000 fixed	0.0000 fixed	(Non-display)		
		3 phase 3-wire	CT input 1, 3	0.0000 fixed	0.0000 fixed	(Non-display)		
		3 phase 4-wire	CT input 1, 2 and 3	0.0000 fixed	0.0000 fixed	(Non-display)		
		5	6	7	8			
	1 phase 2-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)			
	1 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)			
	3 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)			
	3 phase 4-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)			

7 Appendix

Power factor	1 to 3 indicate a power factor. 4 to 8 are made undisplayed.				
		1	2	3	4
	1 phase 2-wire	CT input 1	CT input 2	CT input 3	(Non-display)
	1 phase 3-wire	CT input 1, 3	0.00 fixed	0.00 fixed	(Non-display)
	3 phase 3-wire	CT input 1, 3	0.00 fixed	0.00 fixed	(Non-display)
	3 phase 4-wire	CT input 1, 2 and 3	0.00 fixed	0.00 fixed	(Non-display)
		5	6	7	8
	1 phase 2-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)
	1 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)
	3 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)
	3 phase 4-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)
Frequency (Hz)	1 shows frequency. 2 is made undisplayed.				
	1	2			
	Frequency	(Non-display)			
Temperature (C or F)	Not displayed				
Earth leakage (Io) (mA)	Not displayed				

7.3.2. KM1-PMU2A

Current (A)	1 to 3 columns indicate electric currents of the electrical system 1. 7 to 9 columns indicate electric currents of the electrical system 2. 4 to 6 and 10 to 12 are made undisplayed.						
		1	2	3	4	5	6
	1 phase 2-wire	IR (Circuit 1)	IR (Circuit 2)	0.000 fixed	(Non-display)	(Non-display)	(Non-display)
	1 phase 3-wire	IR (Circuit 1)	IN (Circuit 1)	IT (Circuit 1)	(Non-display)	(Non-display)	(Non-display)
	3 phase 3-wire	IR (Circuit 1)	IS (Circuit 1)	IT (Circuit 1)	(Non-display)	(Non-display)	(Non-display)
		7	8	9	10	11	12
	1 phase 2-wire	IR (Circuit 3)	IR (Circuit 4)	0.000 fixed	(Non-display)	(Non-display)	(Non-display)
	1 phase 3-wire	IR (Circuit 2)	IN (Circuit 2)	IT (Circuit 2)	(Non-display)	(Non-display)	(Non-display)
	3 phase 3-wire	IR (Circuit 2)	IS (Circuit 2)	IT (Circuit 2)	(Non-display)	(Non-display)	(Non-display)
Voltage (V)	1 - 3 and 4 - 6 columns indicate electric currents of the electrical system 1 and 2, respectively.						
		1	2	3	4	5	6
	1 phase 2-wire	VLN (Electrical system 1)	0.0 fixed	0.0 fixed	VLN (Electrical system 2)	0.0 fixed	0.0 fixed
	1 phase 3-wire	VRN (Electrical system 1)	VTN (Electrical system 1)	VRT (Electrical system 1)	VRN (Electrical system 2)	VTN (Electrical system 2)	VRT (Electrical system 2)
	3 phase 3-wire	VRS (Electrical system 1)	VST (Electrical system 1)	VTR (Electrical system 1)	VRS (Electrical system 2)	VST (Electrical system 2)	VTR (Electrical system 2)

7 Appendix

Active power (kW)	1 - 2 columns indicate active/reactive power of the electrical system 1. 5 - 6 columns indicate active/reactive power of the electrical system 2. 3 - 4 and 7 - 8 are made undisplayed.				
Reactive power (kvar)		1	2	3	4
	1 phase 2-wire	CT input 1	CT input 2	(Non-display)	(Non-display)
	1 phase 3-wire	CT input 1 and 2	0.0000 fixed	(Non-display)	(Non-display)
	3 phase 3-wire	CT input 1 and 2	0.0000 fixed	(Non-display)	(Non-display)
		5	6	7	8
	1 phase 2-wire	CT input 3	CT input 4	(Non-display)	(Non-display)
	1 phase 3-wire	CT input 3 and 4	0.0000 fixed	(Non-display)	(Non-display)
	3 phase 3-wire	CT input 3 and 4	0.0000 fixed	(Non-display)	(Non-display)
		1	2	3	4
	1 phase 2-wire	CT input 1	CT input 2	(Non-display)	(Non-display)
	1 phase 3-wire	CT input 1 and 2	0.00 fixed	(Non-display)	(Non-display)
3 phase 3-wire	CT input 1 and 2	0.00 fixed	(Non-display)	(Non-display)	
	5	6	7	8	
1 phase 2-wire	CT input 3	CT input 4	(Non-display)	(Non-display)	
1 phase 3-wire	CT input 3 and 4	0.00 fixed	(Non-display)	(Non-display)	
3 phase 3-wire	CT input 3 and 4	0.00 fixed	(Non-display)	(Non-display)	
Power factor	1 - 2 columns indicate power factor of the electrical system 1. 5 - 6 columns indicate power factor of the electrical system 2. 3 - 4 and 7 - 8 are made undisplayed.				
		1	2	3	4
	1 phase 2-wire	CT input 1	CT input 2	(Non-display)	(Non-display)
	1 phase 3-wire	CT input 1 and 2	0.00 fixed	(Non-display)	(Non-display)
	3 phase 3-wire	CT input 1 and 2	0.00 fixed	(Non-display)	(Non-display)
		5	6	7	8
	1 phase 2-wire	CT input 3	CT input 4	(Non-display)	(Non-display)
	1 phase 3-wire	CT input 3 and 4	0.00 fixed	(Non-display)	(Non-display)
	3 phase 3-wire	CT input 3 and 4	0.00 fixed	(Non-display)	(Non-display)
		1	2		
	Electrical system 1	Electrical system 2			
	Frequency (Hz)	1 and 2 columns indicate frequency of the electrical system 1 and 2, respectively.			
Temperature (C or F)	Not displayed				
Earth leakage (Io) (mA)	Not displayed				

7.3.3. KM1-EMU8A

Current (A)	Not displayed
Voltage (V)	Not displayed
Active power (kW)	Not displayed
Reactive power (kvar)	Not displayed
Power factor	Not displayed
Frequency (Hz)	Not displayed
Temperature (C or F)	Temperature from the thermistor input is displayed. Values are displayed in a unit configured in the unit. <div style="border: 1px solid black; padding: 2px; display: inline-block;"> 1 Temperature </div>
Earth leakage (Io) (mA)	Not displayed

7.3.4. KE1-PGR1C

Current (A)	1 - 3 columns indicate electric currents. 4 - 12 are made undisplayed.						
		1	2	3	4	5	6
	1 phase 2-wire	IR (Circuit 1)	IR (Circuit 2)	IR (Circuit 3)	(Non-display)	(Non-display)	(Non-display)
	1 phase 3-wire	IR (Circuit 1)	IN (Circuit 1)	IT (Circuit 1)	(Non-display)	(Non-display)	(Non-display)
	3 phase 3-wire	IR (Circuit 1)	IS (Circuit 1)	IT (Circuit 1)	(Non-display)	(Non-display)	(Non-display)
	3 phase 4-wire	IR (Circuit 1)	IS (Circuit 1)	IT (Circuit 1)	(Non-display)	(Non-display)	(Non-display)
		7	8	9	10	11	12
	1 phase 2-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)
	1 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)
	3 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)
	3 phase 4-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)
	Voltage (V)	1-6 show voltage.					
		1	2	3	4	5	6
1 phase 2-wire		VLN	0.0 fixed	0.0 fixed	0.0 fixed	0.0 fixed	0.0 fixed
1 phase 3-wire		VRN	VTN	VRT	0.0 fixed	0.0 fixed	0.0 fixed
3 phase 3-wire		VRS	VST	VTR	0.0 fixed	0.0 fixed	0.0 fixed
3 phase 4-wire		VRN	VSN	VTN	VRS	VST	VTR

7 Appendix

Active power (kW)	1- 3 show active power/reactive power. 4 - 8 are made undisplayed.							
Reactive power (kvar)		1	2	3	4			
	1 phase 2-wire	CT input 1	CT input 2	CT input 3	(Non-display)			
	1 phase 3-wire	CT input 1, 3	0.0000 fixed	0.0000 fixed	(Non-display)			
	3 phase 3-wire	CT input 1, 3	0.0000 fixed	0.0000 fixed	(Non-display)			
	3 phase 4-wire	CT input 1, 2 and 3	0.0000 fixed	0.0000 fixed	(Non-display)			
		5	6	7	8			
	1 phase 2-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)			
	1 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)			
	3 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)			
	3 phase 4-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)			
Power factor	1 - 3 indicate a power factor. 4 - 8 are made undisplayed.							
	1	2	3	4				
	1 phase 2-wire	CT input 1	CT input 2	CT input 3	(Non-display)			
	1 phase 3-wire	CT input 1, 3	0.00 fixed	0.00 fixed	(Non-display)			
	3 phase 3-wire	CT input 1, 3	0.00 fixed	0.00 fixed	(Non-display)			
	3 phase 4-wire	CT input 1, 2 and 3	0.00 fixed	0.00 fixed	(Non-display)			
		5	6	7	8			
	1 phase 2-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)			
	1 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)			
	3 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)			
	3 phase 4-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)			
Frequency (Hz)	1 shows frequency. 2 is made undisplayed.							
	1	2						
	Frequency	(Non-display)						
Temperature (C or F)	Not displayed							
Earth leakage (Io) (mA)	1 shows Earth leakage. 2 - 8 are made undisplayed.							
	1	2	3	4	5	6	7	8
	ZCT	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)

7.3.5. KE1-PVS1C

Current (A)	1 - 3 columns indicate electric currents. 4 - 12 are made undisplayed.						
		1	2	3	4	5	6
	1 phase 2-wire	IR (Circuit 1)	IR (Circuit 2)	IR (Circuit 3)	(Non-display)	(Non-display)	(Non-display)
	1 phase 3-wire	IR (Circuit 1)	IN (Circuit 1)	IT (Circuit 1)	(Non-display)	(Non-display)	(Non-display)
	3 phase 3-wire	IR (Circuit 1)	IS (Circuit 1)	IT (Circuit 1)	(Non-display)	(Non-display)	(Non-display)
	3 phase 4-wire	IR (Circuit 1)	IS (Circuit 1)	IT (Circuit 1)	(Non-display)	(Non-display)	(Non-display)
		7	8	9	10	11	12
	1 phase 2-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)
	1 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)
	3 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)
	3 phase 4-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)
Voltage (V)	1-6 show voltage.						
		1	2	3	4	5	6
	1 phase 2-wire	VLN	0.0 fixed	0.0 fixed	0.0 fixed	0.0 fixed	0.0 fixed
	1 phase 3-wire	VRN	VTN	VRT	0.0 fixed	0.0 fixed	0.0 fixed
	3 phase 3-wire	VRS	VST	VTR	0.0 fixed	0.0 fixed	0.0 fixed
Active power (kW) Reactive power (kvar)	3 phase 4-wire	VRN	VSN	VTN	VRS	VST	VTR
	1- 3 show active power/reactive power. 4 - 8 are made undisplayed.						
		1	2	3	4		
	1 phase 2-wire	CT input 1	CT input 2	CT input 3	(Non-display)		
	1 phase 3-wire	CT input 1, 3	0.0000 fixed	0.0000 fixed	(Non-display)		
	3 phase 3-wire	CT input 1, 3	0.0000 fixed	0.0000 fixed	(Non-display)		
	3 phase 4-wire	CT input 1, 2 and 3	0.0000 fixed	0.0000 fixed	(Non-display)		
		5	6	7	8		
	1 phase 2-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)		
	1 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)		
	3 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)		
	3 phase 4-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)		

7 Appendix

Power factor	1 - 3 indicate a power factor. 4 - 8 are made undisplayed.				
		1	2	3	4
	1 phase 2-wire	CT input 1	CT input 2	CT input 3	(Non-display)
	1 phase 3-wire	CT input 1, 3	0.00 fixed	0.00 fixed	(Non-display)
	3 phase 3-wire	CT input 1, 3	0.00 fixed	0.00 fixed	(Non-display)
	3 phase 4-wire	CT input 1, 2 and 3	0.00 fixed	0.00 fixed	(Non-display)
		5	6	7	8
	1 phase 2-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)
	1 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)
	3 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)
	3 phase 4-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)
	Frequency (Hz)	1 shows frequency. 2 is made undisplayed.			
	1	2			
	Frequency	(Non-display)			
Temperature (C or F)	Not displayed				
Earth leakage (Io) (mA)	Not displayed				

7.3.6. KE1-VSU1B

Current (A)	Not displayed						
Voltage (V)	1-6 show voltage.						
		1	2	3	4	5	6
	1 phase 2-wire	VLN	0.0 fixed	0.0 fixed	0.0 fixed	0.0 fixed	0.0 fixed
	1 phase 3-wire	VRN	VTN	VRT	0.0 fixed	0.0 fixed	0.0 fixed
	3 phase 3-wire	VRS	VST	VTR	0.0 fixed	0.0 fixed	0.0 fixed
	3 phase 4-wire	VRN	VSN	VTN	VRS	VST	VTR
Active power (kW)	Not displayed						
Reactive power (kvar)	Not displayed						
Power factor	Not displayed						
Frequency (Hz)	1 shows frequency. 2 is made undisplayed.						
	1	2					
	Frequency	(Non-display)					
Temperature (C or F)	Not displayed						
Earth leakage (Io) (mA)	Not displayed						

7.3.7. KE1-VAU1B

Current (A)	1 - 3 columns indicate electric currents. 4 - 12 are made undisplayed.						
		1	2	3	4	5	6
	1 phase 2-wire	IR (Circuit 1)	IR (Circuit 2)	IR (Circuit 3)	(Non-display)	(Non-display)	(Non-display)
	1 phase 3-wire	IR (Circuit 1)	IN (Circuit 1)	IT (Circuit 1)	(Non-display)	(Non-display)	(Non-display)
	3 phase 3-wire	IR (Circuit 1)	IS (Circuit 1)	IT (Circuit 1)	(Non-display)	(Non-display)	(Non-display)
	3 phase 4-wire	IR (Circuit 1)	IS (Circuit 1)	IT (Circuit 1)	(Non-display)	(Non-display)	(Non-display)
		7	8	9	10	11	12
	1 phase 2-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)
	1 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)
	3 phase 3-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)
	3 phase 4-wire	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)	(Non-display)
Voltage (V)	1-6 show voltage.						
		1	2	3	4	5	6
	1 phase 2-wire	VLN	0.0 fixed	0.0 fixed	0.0 fixed	0.0 fixed	0.0 fixed
	1 phase 3-wire	VRN	VTN	VRT	0.0 fixed	0.0 fixed	0.0 fixed
	3 phase 3-wire	VRS	VST	VTR	0.0 fixed	0.0 fixed	0.0 fixed
	3 phase 4-wire	VRN	VSN	VTN	VRS	VST	VTR
Active power (kW)	Not displayed						
Reactive power (kvar)	Not displayed						
Power factor	Not displayed						
Frequency (Hz)	1 shows frequency. 2 is made undisplayed.						
	1	2					
	Frequency	(Non-display)					
Temperature (C or F)	Not displayed						
Earth leakage (Io) (mA)	Not displayed						

7.3.8. KE1-CTD8E

Current (A)	1 - 6 columns indicate electric currents of the measurement block 1. 7 - 12 columns indicate electric currents of the measurement block 2.							
		1	2	3	4	5	6	
	1 phase 2-wire	IR (Circuit 1)	IR (Circuit 2)	IR (Circuit 3)	IR (Circuit 4)	0.000 fixed	0.000 fixed	
	1 phase 3-wire	IR (Circuit 1)	IN (Circuit 1)	IT (Circuit 1)	IR (Circuit 2)	IN (Circuit 2)	IT (Circuit 2)	
	3 phase 3-wire	IR (Circuit 1)	IS (Circuit 1)	IT (Circuit 1)	IR (Circuit 2)	IS (Circuit 2)	IT (Circuit 2)	
	3 phase 4-wire	IR (Circuit 1)	IS (Circuit 1)	IT (Circuit 1)	0.000 fixed	0.000 fixed	0.000 fixed	
		7	8	9	10	11	12	
	1 phase 2-wire	IR (Circuit 5)	IR (Circuit 6)	IR (Circuit 7)	IR (Circuit 8)	0.000 fixed	0.000 fixed	
	1 phase 3-wire	IR (Circuit 3)	IN (Circuit 3)	IT (Circuit 3)	IR (Circuit 4)	IN (Circuit 4)	IT (Circuit 4)	
	3 phase 3-wire	IR (Circuit 3)	IS (Circuit 3)	IT (Circuit 3)	IR (Circuit 4)	IS (Circuit 4)	IT (Circuit 4)	
	3 phase 4-wire	IR (Circuit 2)	IS (Circuit 2)	IT (Circuit 2)	0.000 fixed	0.000 fixed	0.000 fixed	
	Voltage (V)	Not displayed						
	Active power (kW)	1 - 4 columns indicate active/reactive power of the measurement block 1. 5 - 8 columns indicate active/reactive power of the measurement block 2.						
	Reactive power (kvar)		1	2	3	4		
1 phase 2-wire		CT input 1	CT input 2	CT input 3	CT input 4			
1 phase 3-wire		CT input 1 and 2	CT input 3 and 4	0.0000 fixed	0.0000 fixed			
3 phase 3-wire		CT input 1 and 2	CT input 3 and 4	0.0000 fixed	0.0000 fixed			
3 phase 4-wire		CT input 1, 2 and 3	0.0000 fixed	0.0000 fixed	0.0000 fixed			
		5	6	7	8			
1 phase 2-wire		CT input 5	CT input 6	CT input 7	CT input 8			
1 phase 3-wire		CT input 5 and 6	CT input 7 and 8	0.0000 fixed	0.0000 fixed			
3 phase 3-wire		CT input 5 and 6	CT input 7 and 8	0.0000 fixed	0.0000 fixed			
3 phase 4-wire		CT input 5, 6 and 7	0.0000 fixed	0.0000 fixed	0.0000 fixed			

Power factor	1 - 4 columns indicate power factor of the measurement block 1. 5 - 8 columns indicate power factor of the measurement block 2.				
		1	2	3	4
	1 phase 2-wire	CT input 1	CT input 2	CT input 3	CT input 4
	1 phase 3-wire	CT input 1 and 2	CT input 3 and 4	0.00 fixed	0.00 fixed
	3 phase 3-wire	CT input 1 and 2	CT input 3 and 4	0.00 fixed	0.00 fixed
	3 phase 4-wire	CT input 1, 2 and 3	0.00 fixed	0.00 fixed	0.00 fixed
		5	6	7	8
	1 phase 2-wire	CT input 5	CT input 6	CT input 7	CT input 8
	1 phase 3-wire	CT input 5 and 6	CT input 7 and 8	0.00 fixed	0.00 fixed
	3 phase 3-wire	CT input 5 and 6	CT input 7 and 8	0.00 fixed	0.00 fixed
	3 phase 4-wire	CT input 5, 6 and 7	0.00 fixed	0.00 fixed	0.00 fixed
Frequency (Hz)	Not displayed				
Temperature (C or F)	Not displayed				
Earth leakage (Io) (mA)	Not displayed				

7.3.9. KE1-ZCT8E

Current (A)	Not displayed							
Voltage (V)	Not displayed							
Active power (kW)	Not displayed							
Reactive power (kvar)	Not displayed							
Power factor	Not displayed							
Frequency (Hz)	Not displayed							
Temperature (C or F)	Not displayed							
Earth leakage (Io) (mA)	1 - 8 show Earth leakage.							
	1	2	3	4	5	6	7	8
	ZCT-1	ZCT-2	ZCT-3	ZCT-4	ZCT-5	ZCT-6	ZCT-7	ZCT-8

7.4. CSV output file format

Unless otherwise specified in this section, the symbols have the following meanings:

[Date]

Symbol	Explanation
yyyy	Four digits of the year
yy	Last two digits of the year
MM	Two digits of the month
M	Month (one digit to be used for the month in less than two digits)
dd	Two digits of the day
d	Day (one digit to be used for the day in less than two digits)

Note: The date in a file is output in the date format set by [Application environmental setting].

[Time]

Symbol	Explanation
HH	Two digits of the time
mm	Two digits of the minute
ss	Two digits of the second

7.4.1. Unit research result file

This file is output by "CSV file output" of unit search.

File Name	Explanation
UTyyMMddHHmmss.csv yyMMdd: Output date (year, month, day) HHmmss: Output time (hour, minute, second)	A header line (list of item names) is output to the Line 1 of the file, and the date is output from the Line 2. 99 lines of data from Unit no.01 - 99 are output. Output file format: CSV file (comma-delimited text format) Character code: UTF-8 (with BOM) Linefeed code: CR+LF Number of file lines: 100 lines fixed

■ File format (Line 1 for header, Line 2 and following lines are for data)

[Line 1 (header)]

No.	Item name	Data Format	Maximum size	Explanation
1	"Unit No."	Character string	11	Output "Unit No."
2	"Model kind"	Character string	8	Output "Model kind"
3	"Model"	Character string	4	Output "Model"
4	"Model name"	Character string	8	Output "Model name"
5	"Location name"	Character string	12	Output "Location name"
6	"Communication result"	Character string	8	Output "Communication result"
7	"Cause"	Character string	4	Output "Cause"

[Line 2 and following lines (data)]

No.	Item name	Data Format	Maximum size	Explanation
1	Unit No.	Numerical value	2	Unit no. set in the main unit
2	Model kind	Character string	2	Internal number for the Software allocated to each model
3	Model	Character string	9	For models used by the Software (format) Refer to "5.2.2 Unit models" (p.5-8).
4	Model name	Character string	24	Model name
5	Location name	Character string	20	Location name registered on the unit search screen
6	Communication result	Character string	2	"Passed" or "Failed" or left blank
7	Cause	Character string	19	"Completed" when the communicating result is "Passed". The cause of the communication error when the communicating result is "Failed". Blank when the communication result is left blank

■ Output sample

Unit No.,Model kind,Model,Model name,Location name,Communication result,Cause 01,6,KM1-PMU1A,Power Measurement Unit,Bldg.1 flr. 1 A/C 1-2,Passed,Completed 02,13,KE1-CTD8E,CT Expansion Unit, Bldg.1 flr. 1 Lights 1-8,Passed,Completed 03,,,,,,,,, . . . 98,,,,,,,,, 99,,,,,,,,,

7.4.2. Alarm history file

This file is output by "CSV file output" of Alarm history (Logging data reading).

File Name	Explanation
AHyyMMddHHmmss.csv yyMMdd: Output date (year, month, day) HHmmss: Output time (hour, minute, second)	Unit no. and model are output to the Line 1, a header line (list of item names) is output to the Line 2, and the data is output from the Line 3. Output file format: CSV file (comma-delimited text format) Character code: UTF-8 (with BOM) Linefeed code: CR+LF Number of file lines: 22 lines fixed

■ File format

[Line 1]

No.	Item name	Data Format	Maximum size	Explanation
1	Unit No.	Numerical value	2	Unit no. set in the main unit
2	Model	Character string	9	Unit model
3	Location name	Character string	20	Location name registered on the unit search screen

[Line 2 (header)]

No.	Item name	Data Format	Maximum size	Explanation
1	"No."	Character string	3	Output "No"
2	"Occurred date"	Character string	8	Output "Occurred date"
3	"Release date"	Character string	8	Output "Release date"
4	"Alarm occurrence"	Character string	8	Output "Alarm occurrence"
5	"Alarm kind"	Character string	8	Output "Alarm kind"

[Line 3 and following lines (data)]

No.	Item name	Data Format	Maximum size	Explanation
1	No.	Numerical value	2	1 to 20
2	Occurred date	Date Time	19	Time occurred for alarm yyyy/MM/dd HH:mm:ss
3	Release date	Date Time	19	Release date for alarm yyyy/MM/dd HH:mm:ss
4	Alarm occurrence	Numerical value	2	Code allocated to each alarm kind. For details, refer to "Communication manual/(SGTE-719)".
5	Alarm kind	Character string	17	Details of alarm occurrence

■ Output sample

```
01,KM1-PMU1A,Equipment A
No.,Occurred date,Release date,Alarm occurrence,Alarm kind
1,2012/04/24 17:37:12,2012/04/24 17:37:12,12,Over current alarm 2
2,2012/04/24 17:37:12,2012/04/24 17:37:33,1,Active power upper limit alarm 1
3,2012/04/24 17:36:39,2012/04/24 17:36:39,23,Under voltage alarm 1
4,2012/04/24 17:36:39,2012/04/24 17:36:39,19,Under current alarm 1
•
•
•
20,2012/04/24 17:32:29,2012/04/24 17:33:14,9,Active power lower limit alarm 1
```

7.4.3. Logging of voltage sag file

This file is output by "CSV file output" of logging of voltage sag (logging data reading).

File Name	Explanation
IVDyyyyMMddHHmmss.csv yyyyMMdd: Output date (year, month, day) HHmmss: Output time (hour, minute, second)	Output file format: CSV file (comma-delimited text format) Character code: UTF-8 (with BOM) Linefeed code: CR+LF Number of file lines: 125 lines fixed

■ File configuration

For logging of voltage sag, more than one information item is output to one file as follows:

Line 1	Unit No., Model, Location name, Voltage sag detection, History				
	Line 1	(Unit no.)	(Model)	(Location name)	(Voltage sag detection) (History)
Line 2 Line 3	Value for the header for voltage sag-related setting value column and voltage sag-related setting value column (values for Line 2)				
	Line 2 Line 3	Voltage sag detection	Back up at voltage sag	Voltage sag detection voltage (V)	Voltage sag duration time (s)
		(Value)	(Value)	(Value)	(Value)
Line 4	Detection date of voltage sag				
	Line 4	Detection date of voltage sag	yyyy/MM/dd HH:mm:ss		

Line 5
to
Line 125

Header and data lines for logging of voltage sag
64 lines for "Before the detection of a wave" and "After the detection of a wave", and 120 lines
"Before the detection of 10 waves"

Line 5	Before the detection of 1 wave			After the detection of a wave			Before the detection of 10 waves		
	Item	Line No.	Effective value (V)	Item	Line No.	Effective value (V)	Item	Line No.	Effective value (V)
Line 6	Before the detection of 1 wave	1	(Value)	After the detection of a wave	1	(Value)	Before the detection of 10 waves	1	(Value)
Line 7	Before the detection of 1 wave	2	(Value)	After the detection of a wave	2	(Value)	Before the detection of 10 waves	2	(Value)
Line 8	Before the detection of 1 wave	3	(Value)	After the detection of a wave	3	(Value)	Before the detection of 10 waves	3	(Value)

Line 67	Before the detection of 1 wave	62	(Value)	After the detection of a wave	62	(Value)	Before the detection of 10 waves	62	(Value)
Line 68	Before the detection of 1 wave	63	(Value)	After the detection of a wave	63	(Value)	Before the detection of 10 waves	63	(Value)
Line 69	Before the detection of a wave	64	(Value)	After the detection of a wave	64	(Value)	Before the detection of 10 waves	64	(Value)
Line 70	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	Before the detection of 10 waves	65	(Value)
Line 71	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	Before the detection of 10 waves	66	(Value)
Line 72	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	Before the detection of 10 waves	67	(Value)
	Before the detection of 10 waves
Line 123	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	Before the detection of 10 waves	118	(Value)
Line 124	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	Before the detection of 10 waves	119	(Value)
Line 125	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	Before the detection of 10 waves	120	(Value)

■ File format

[Line 1]

No.	Item name	Data Format	Maximum size	Explanation
1	Unit No.	Numerical value	2	Unit no. set in the main unit
2	Model	Character string	9	Unit model
3	Location name	Character string	20	Location name registered on the unit search screen
4	Voltage sag detection	Character string	4	The settings (1 - 4) of voltage sag detection shown on the screen are output to be "" (* refers to 1 - 4).
5	History	Character string	4	The history no. (1 - 8) shown on the screen are output to be "" (* refers to 1 - 8).

[Line 2 (header)]

No.	Item name	Data Format	Maximum size	Explanation
1	"Voltage sag detection"	Character string	12	Output "Voltage sag detection"
2	"Back up at voltage sag"	Character string	18	Output "Back up at voltage sag"
3	"Voltage sag detection voltage (V)"	Character string	15	Output "Voltage sag detection voltage (V)"
4	"Voltage sag duration time (s)"	Character string	16	Output "Voltage sag detection time (s)"

[Line 3]

No.	Item name	Data Format	Maximum size	Explanation
1	Voltage sag detection	Character string	64	"OFF" "Vrs (3P3W, 1P2W, 1P3W), Vrn (3P4W)" "Vst (3P3W, 1P3W), Vsn (3P4W)" "Vtr (3P3W), Vtn (3P4W)"
2	Back up at voltage sag	Character string	3	OFF, ON
3	Voltage sag detection voltage (V)	Numerical value	7	0 to 12100.0
4	Voltage sag duration time (s)	Numerical value	4	0.02 to 1.00

[Line 4]

No.	Item name	Data Format	Maximum size	Explanation
1	"detection date of voltage sag"	Character string	12	Output "Detection date of voltage sag"
2	Detection date of voltage sag	Date Time	19	Date of relevant voltage sag detected yyyy/MM/dd HH:mm:ss

[Line 5 (header)]

No.	Item name	Data Format	Maximum size	Explanation
1	"Parameter"	Character string	4	Output "Parameter"
2	"Line No."	Character string	5	Output "Line No."
3	"Effective value (V)"	Character string	9	Output "Effective value (V)"
4	"Parameter"	Character string	4	Output "Parameter"
5	"Line No."	Character string	5	Output "Line No."
6	"Effective value (V)"	Character string	9	Output "Effective value (V)"
7	"Parameter"	Character string	4	Output "Parameter"
8	"Line No."	Character string	5	Output "Line No."
9	"Effective value (V)"	Character string	9	Output "Effective value (V)"

[Line 6 and following lines]

No.	Item name	Data Format	Maximum size	Explanation
1	Item (Before the detection of a wave)	Character string	14	Output "Before the detection of a wave"
2	Line No. (Before the detection of a wave)	Numerical value	2	1 to 64
3	Effective value (Before the detection of a wave)	Numerical value	7	Effective value before the detection of a wave (V) 0 to 12100.0
4	Item (After the detection of 1 wave)	Character string	14	Output "After the detection of 1 wave"
5	Line No. (After the detection of 1 wave)	Numerical value	2	1 to 64
6	Effective value (After the detection of 1 wave)	Numerical value	7	Effective value after the detection of 1 wave (V) 0 to 12100.0
7	Item (Before the detection of 10 wave)	Character string	14	Output "Before the detection of 10 wave"
8	Line No. (Before the detection of 10 wave)	Numerical value	3	1 to 120
9	Effective value (Before the detection of 10 wave)	Numerical value	7	Effective value before the detection of 10 wave (V) 0 to 12100.0

■ Output sample

```

01,KE1-PVS1C,Equipment A," 1"," 5"
Voltage sag detection,Back up at voltage sag,Voltage sag detection voltage (V),Voltage sag duration time (s)
"Vrs (3P3W, 1P2W, 1P3W), Vrn (3P4W)",OFF,80.0,0.02
detection date of voltage sag,2012/05/08 11:00:49
Parameter,Line No.,Effective value (V),Parameter,Line No.,Effective value (V),Parameter,Line No.,Effective value (V)
Before the detection of a wave,1,74.5,After the detection of a wave,1,78.6,Before the detection of 10 waves,1,99.5
Before the detection of a wave,2,99.6,After the detection of a wave,2,76.2,Before the detection of 10 waves,2,99.5
Before the detection of a wave,3,99.6,After the detection of a wave,3,74.6,Before the detection of 10 waves,3,99.5
Before the detection of a wave,4,99.6,After the detection of a wave,4,74.7,Before the detection of 10 waves,4,99.5
Before the detection of a wave,5,99.6,After the detection of a wave,5,74.6,Before the detection of 10 waves,5,99.4
Before the detection of a wave,6,99.6,After the detection of a wave,6,74.6,Before the detection of 10 waves,6,99.5
Before the detection of a wave,7,99.6,After the detection of a wave,7,74.6,Before the detection of 10 waves,7,99.5
•
•
•
Before the detection of a wave,61,99.7,After the detection of a wave,61,74.6,Before the detection of 10 waves,61,99.5
Before the detection of a wave,62,99.6,After the detection of a wave,62,74.6,Before the detection of 10 waves,62,99.5
Before the detection of a wave,63,99.6,After the detection of a wave,63,74.7,Before the detection of 10 waves,63,99.4
Before the detection of a wave,64,99.6,After the detection of a wave,64,74.6,Before the detection of 10 waves,64,99.5
,,,,,Before the detection of 10 waves,65,99.4
,,,,,Before the detection of 10 waves,66,99.4
,,,,,Before the detection of 10 waves,67,99.4
•
•
•
,,,,,Before the detection of 10 waves,118,99.5
,,,,,Before the detection of 10 waves,119,99.4
,,,,,Before the detection of 10 waves,120,99.6

```


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