Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!


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OMRON

NEW

Multi-circuit Smart Power Monitor

# KM1

## New Ways to Uncover Power Savings

# Measure Multiple Distribution Panels at the Same Time

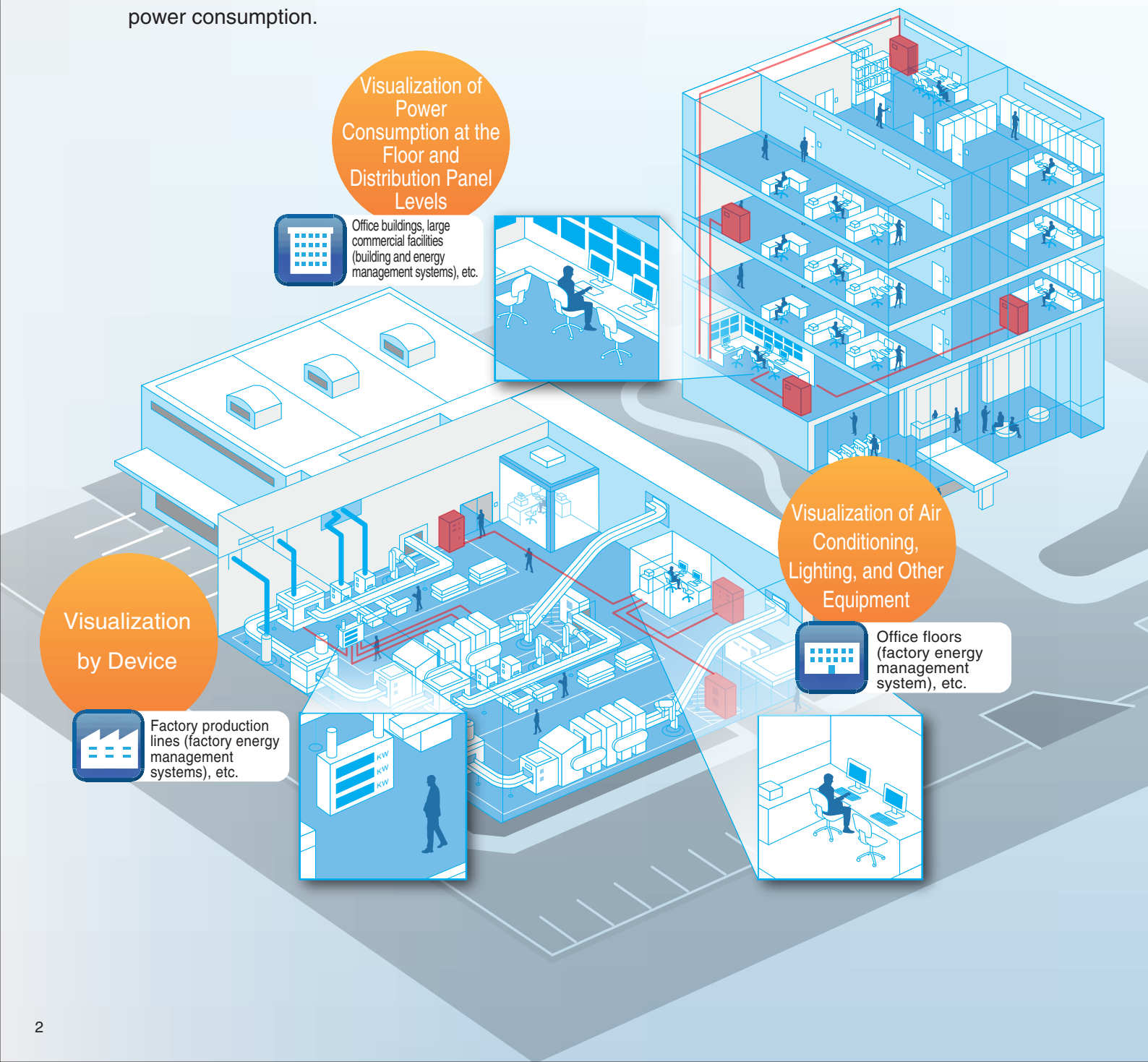
Visualize, Monitor, and Analyze Your Energy Usage

realizing

# Greater Visualization Enables More Energy Savings

## The key to saving energy lies in knowing the breakdown of electric power.

As we enter times of even greater power shortages, overall monitoring of electric power alone starts to lose its effectiveness. The key to finding hidden wastes of electric power is to enhance the visibility of power consumption at the distribution panel breaker level. The KM1 can help you determine when, where, and how much electric power is being used to help reduce unnecessary power consumption.



Calculation of specific power consumption for each device

Measurement of electric power at the breaker level

# OMRON's KM1 platform enables the visualization of power consumption for all distribution panels as a cohesive group.

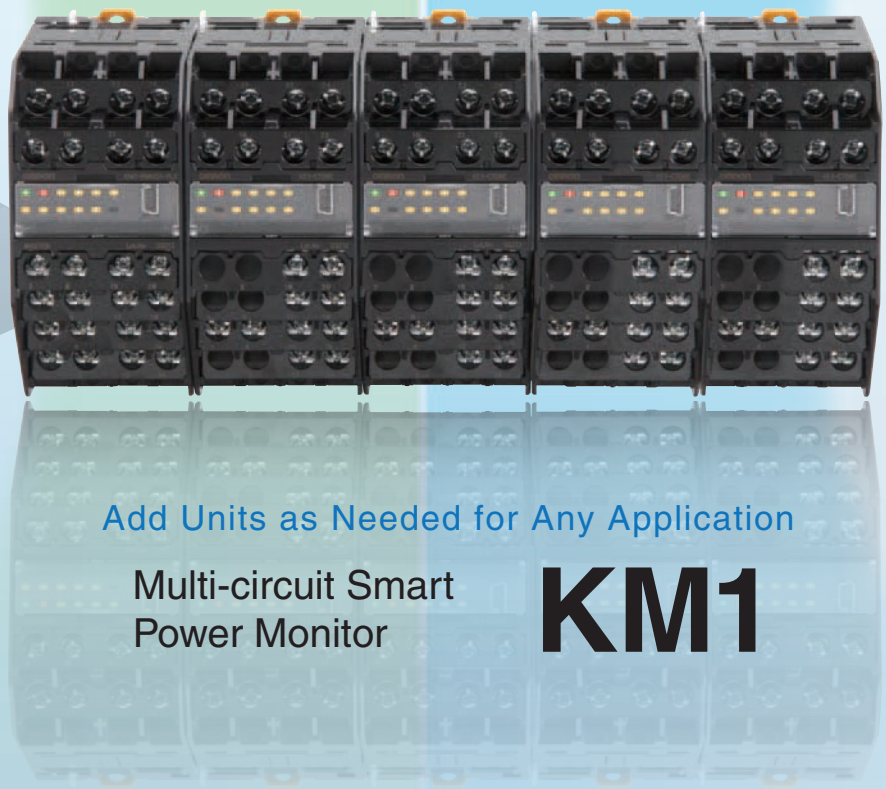
Measure two systems with a single Power Monitor

Measurements that give you a little more.

Save space and reduce wiring work

Measure up to 36 circuits.

Simple installation



Add Units as Needed for Any Application

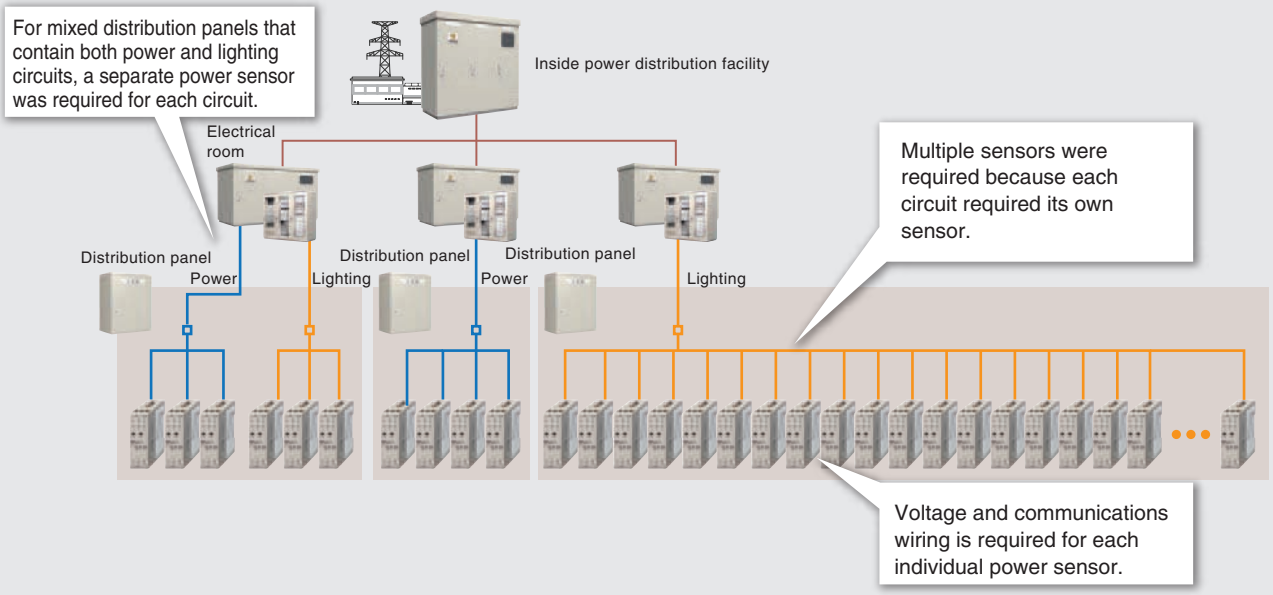
Multi-circuit Smart Power Monitor

**KM1**

# The KM1 platform solves the work and cost issues to visualize

## Previous Problems

Previously, measuring electric power for multiple circuits or systems required costly and difficult-to-install power sensors.



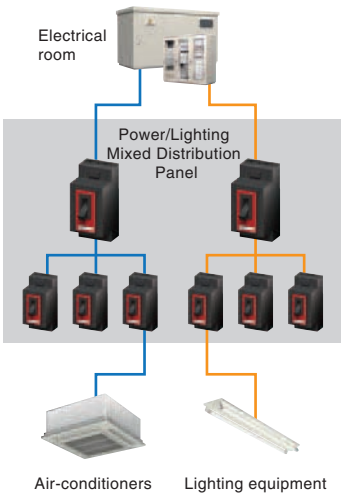

Measuring multiple circuits requires difficult installation and results in high costs.

## Simple and Smart: The KM1 Platform

### Dual System Monitoring

#### Industry-first Dual System Monitoring

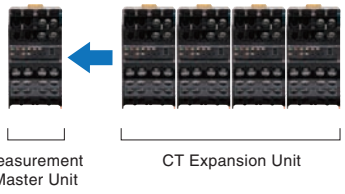
A single KM1 can perform measurements for mixed distribution panels with circuits for both air-conditioners and lighting equipment.



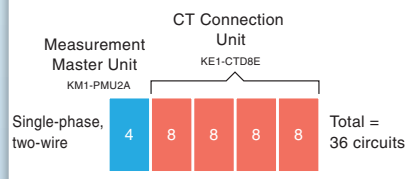

### Measure up to 36 circuits.

#### Add CT Expansion Units for More Measurements

One Measurement Master Unit accepts up to 4 CT inputs, and a CT Expansion Unit accepts up to 8 CT inputs. (Up to four CT Expansion Units can be added.) This enables the measurement of up to 36 single-phase two-wire circuits.



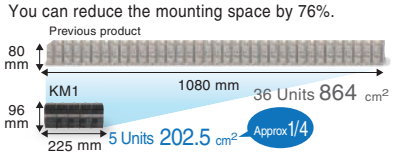

**Single-phase, two-wire**




### Space-efficient Design and Reduced Wiring

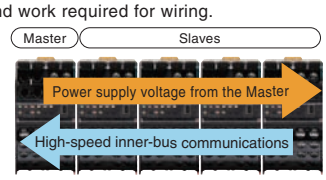
#### Mounting Space Reduced to 1/4 That of Previous Models

With the KM1, all you need is five Power Monitors. You can reduce the mounting space by 76%.



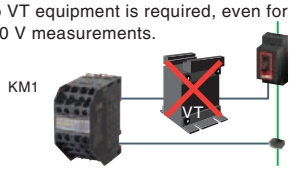

#### Linked design eliminates the need for voltage and communications wiring.

The elimination of communications and power line crossovers results in less time and work required for wiring.




#### Direct Measurement of 480 V without a VT

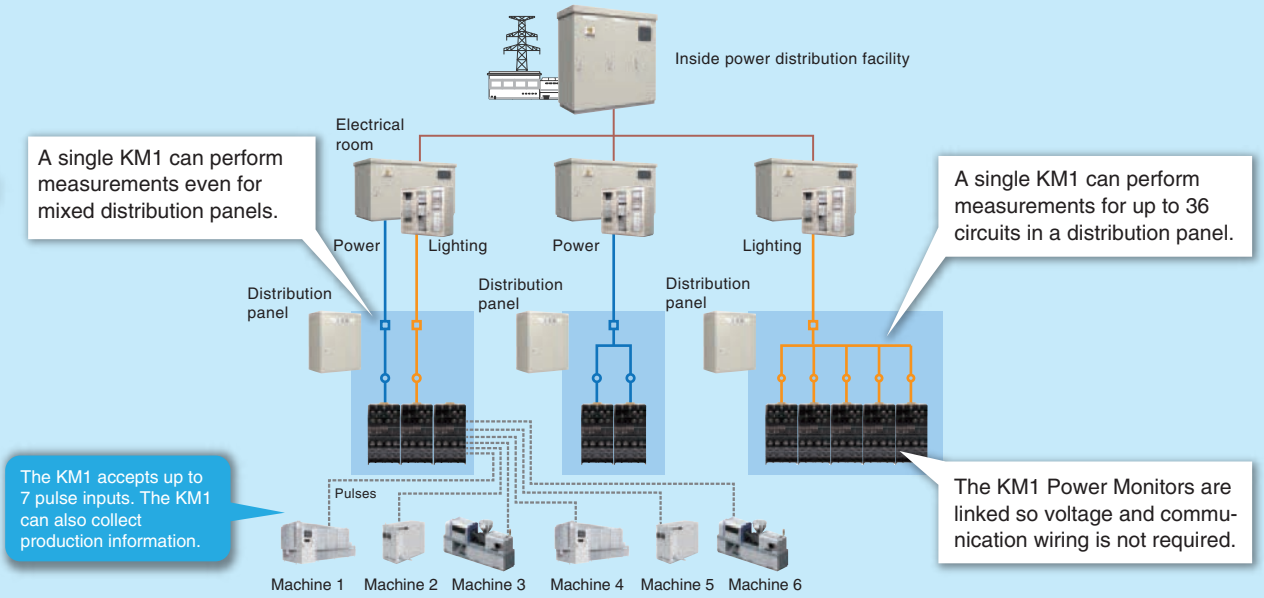
No VT equipment is required, even for 480 V measurements.



# power consumption across all distribution panels.

## With the KM1...

The KM1 solves both the time and cost issues even for multiple circuits and systems.

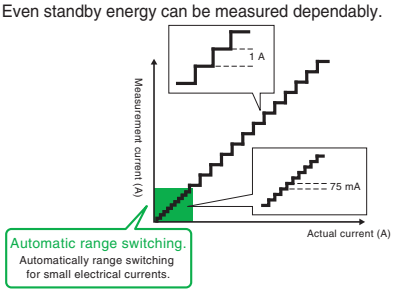



The KM1 provides a simple and smart solution to the issues encountered with traditional power sensors.

## High-precision Measurements

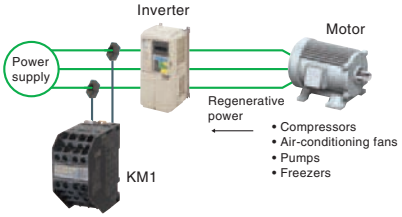
### High-precision Micropower Measurements

The KM1 performs high-precision measurement even below 5% of the rated current.
Even standby energy can be measured dependably.




### Primary-side Inverter Support

The KM1 can provide accurate measurements without any current waveform distortion even after an inverter is installed. Measurement accuracy: ±2% FS This enables measuring the effectiveness of energy conservation measures after installation.

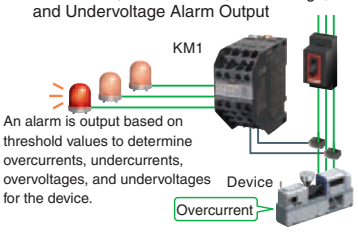



## Additional Measurements to Aid in Energy Conservation

### Visualization to Help Maintenance

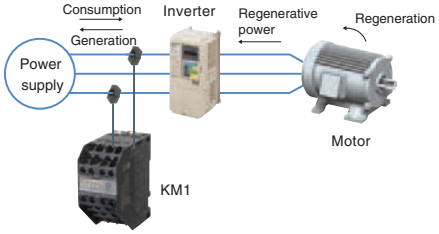
With the wide range of output capabilities on the KM1, you can see exactly when you should perform maintenance.

● Overcurrent, Undercurrent, Overvoltage, and Undervoltage Alarm Output



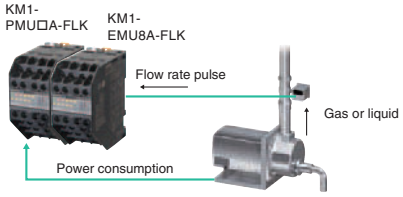

### Visualization of Power Generation Effectiveness

The effectiveness of power generation can be visualized by measuring the power consumption and regenerative power together at the same time.




### Visualization of Specific Power Consumption through Pulse/Temperature Input Units

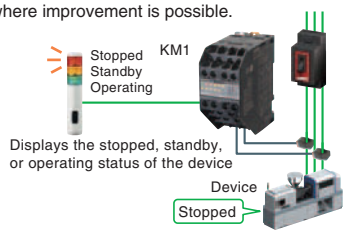
Use pulse inputs to measure production information at the same time, including flow rates, throughput, temperature inputs, and more. When this information is combined with other electric power data, you can easily visualize the specific power consumption.




* Input is performed with the KM1-EMU8A-FLK.

### Energy Classification

The total power consumption and total time can be divided up between the three states of stopped, standby, and operating based on the power consumption value and pulse input. Classifying energy helps to clearly identify areas where improvement is possible.

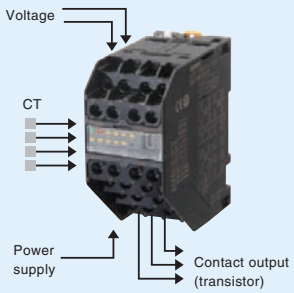



* This function is supported only by the KM1-PMU□A-FLK.

# Connect up to 4 Slave Units to a Master Unit for a maximum of 36 measurement points per set.

- A single Measurement Master Unit can measure two systems.
- Measure up to 36 circuits with CT Expansion Units.
- Simultaneous measurement of production information with extra measurements via a Pulse/Temperature Input Unit.

| Measurement Master Unit (One) | Slave Units (4 Max.) | | Communications Unit (One) |
|---|---|---|---|
| Dual System Measurement Unit* KM1-PMU2A-FLK | CT Expansion Unit KE1-CTD8E | Pulse/Temperature Input Unit KM1-EMU8A-FLK | DeviceNet Communications Unit KE1-DRT-FLK |




### Power Measurement Master Unit Measurement of Multiple Circuits Across Two Different Systems

Features: Dual system measurement of rated input voltage (a combination of two of the following types: single-phase, two-wire; single-phase, three-wire; or three-phase, three-wire)

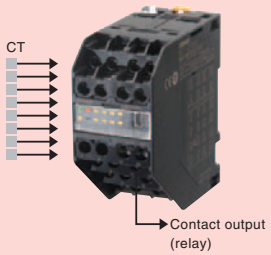
Maximum number of CT connections: 4 (two different types of selectable CTs)

Output: Three transistor outputs (measurement value alarm output, three-state output, or total power consumption pulse output)

Measurement/logging functions: Voltage, current, active power, reactive power, total power consumption, power factor, and frequency

Other functions: Three-state energy classification, total power consumption conversion ($CO_2$/currency), simple measurement, 480 V input without a VT

* Use the KM1-PMU1A-FLK Single-system Measurement Unit for three-phase, four-wire configurations.



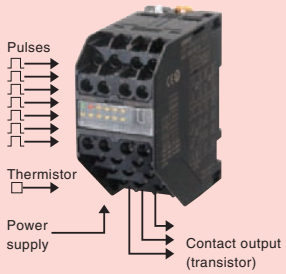

### 8 CT Connections per Unit Maximum of 32 CT Connections with 4 Units

Features: Connect up to 4 Units to the Master Unit (Cannot be used as a standalone device.)
No rated input voltage; phase wiring method is the same as the Master Unit.

Maximum number of CT connections: 8 (two different types of selectable CTs)

Output: One relay contact output (for alarm output)

Measurement functions: Current, active power, reactive power, total power consumption, and power factor



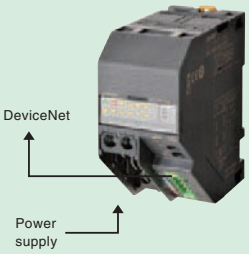

### Power Measurements and More Measure Throughput and Temperatures

Features: Connect up to 4 Units to the Master Unit (Cannot be used as a standalone devices.)

Event inputs: Seven pulse inputs (You can use event inputs to switch between pulse input counts (e.g., throughput), pulse conversion (e.g., flow rates), calculation of power consumption per pulse, pulse input ON time (e.g., operating time), and three-state energy function.)

Temperature input: One (thermistor input, abnormal temperature detection)

Measurement/logging functions: Pulse count, pulse input ON time, and temperature




### Efficiently Transfer Large Amounts of Data DeviceNet Communications Unit

Features: Manage multiple KM1 Power Monitors from a single host (PLC or PC). Connect up to five KM1 Power Monitors to a single DeviceNet Communications Unit.

Communications functions: Remote I/O communications, explicit message communications, configuration and monitoring of KM1 Power Monitors, and automatic detection of baud rates

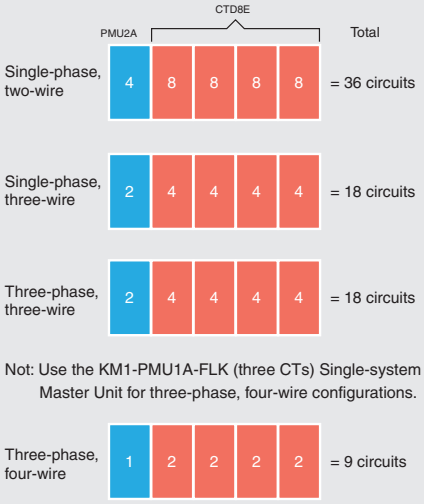
# Unit Configurations and the Number of Measurable Circuits

The maximum numbers of circuits that can be measured with the KM1-PMU2A-FLK Measurement Master Unit are as follows:

## Single System Voltage Input from One System to a Measurement Master Unit

### Maximum Circuit Configuration

Unit Configuration
KM1-PMU2A-FLK
Measurement Master Unit (Four CTs)
+ KE1-CTD8E
CT Expansion Unit (8 CTs)

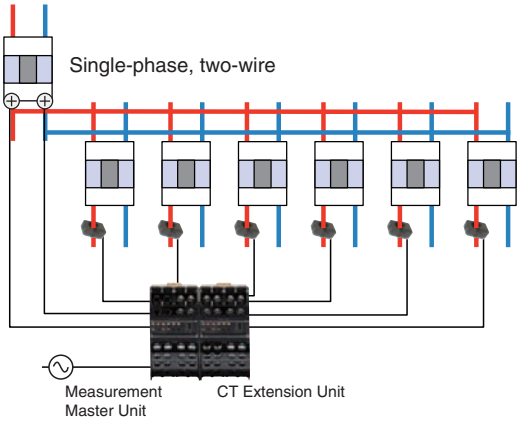



Not: Use the KM1-PMU1A-FLK (three CTs) Single-system Master Unit for three-phase, four-wire configurations.




### Connection Example

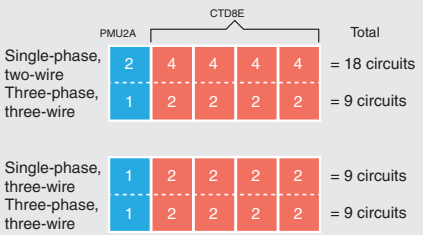
Distribution Panel for Lighting (Single-phase, Two-wire)
Measurement of Six Lights




## Dual System Voltage Inputs from Two Systems to a Measurement Master Unit

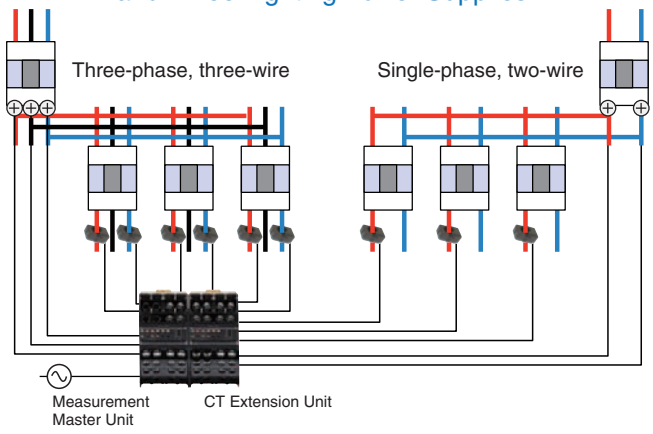
### Maximum Circuit Configuration

Unit Configuration
KM1-PMU2A-FLK
Measurement Master Unit (Four CTs)
+ KE1-CTD8E
CT Expansion Unit (8 CTs)




### Connection Example

Mixed Distribution Panel for Lighting and Operation
(Three-phase, Three-wire or Single-phase, Two-wire)
Measurement of Three Operational Power Supplies and Three Lighting Power Supplies



# Free Software Provides Support for Everything from Setup to the Collection and Analysis of Measurement Data

## Setup

Connect the KM1 to a PC with a USB cable to easily set up the KM1.

**Free Configuration Tool** (KM1/KE1-Setting)

- USB-powered, so there is no need to supply additional power to the KM1.
- Simple setting of the parameters that are required for setup.

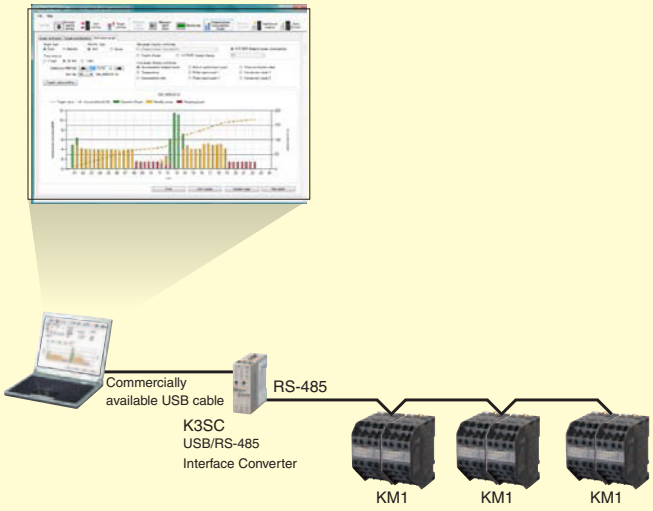

## Perform Evaluation and Verification

Data can be collected directly on a computer for evaluation and verification.

Free Data Collection Software: Easy KM-Manager V3

Release date: October 2012

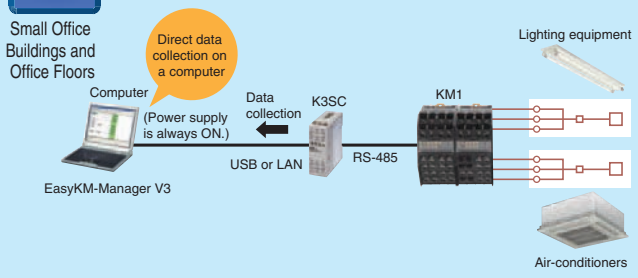
- Displays and trend analysis of instantaneous values
- Graphs of Integral power consumption and other data




## Application Examples

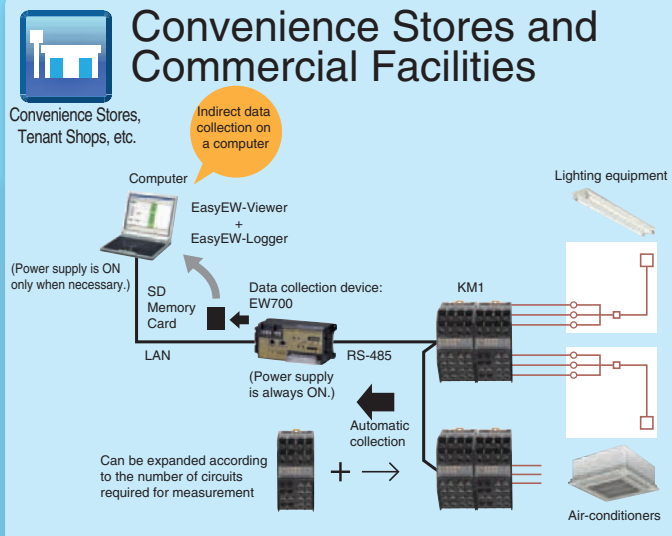
Highly configurable for any scale, from data collection directly from a computer to batch data collection with the EW700.

### Offices and Office Floors




USB or LAN <- RS-485 connection

### Convenience Stores and Commercial Facilities




LAN or SD Memory Card <- EW700 <- RS-485 connection

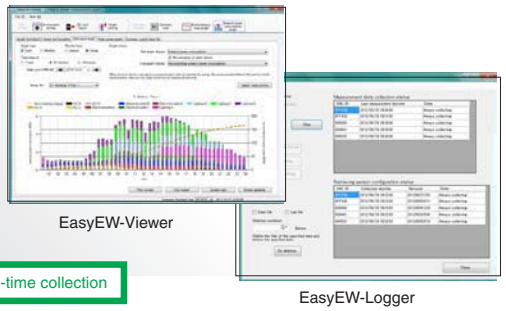
# Data Collection and Display Analysis

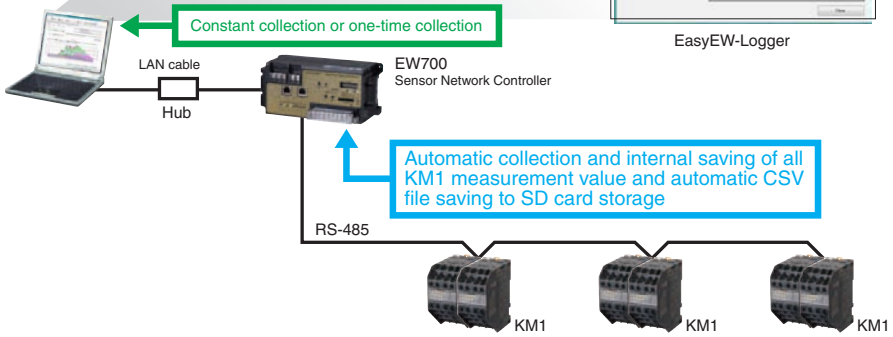
Perform advanced automatic data collection through a data collection device.

Free Automatic Data Collection Software (Easy EW-Logger)
Free Graph Display Software (Easy EW-Viewer)

- Displays and trend analysis of instantaneous values
- Graphs of total power consumption and other data

Release date: July 2012

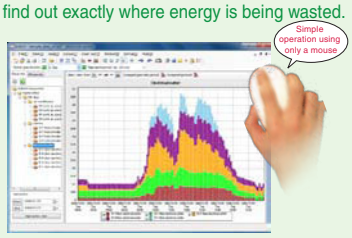



## Energy-saving Analysis Support Software Dr. ECO

Release date: October 2012

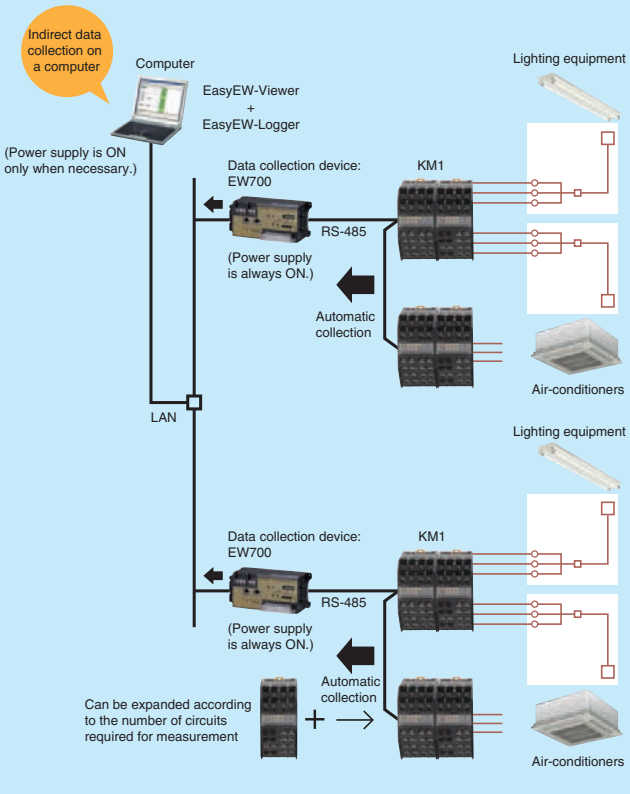
Freely manipulate and analyze collected data to help you find out exactly where energy is being wasted.




This software must be purchased separately.
Refer to the product catalog for details. (Cat. No.: N169)

## Large-scale Systems

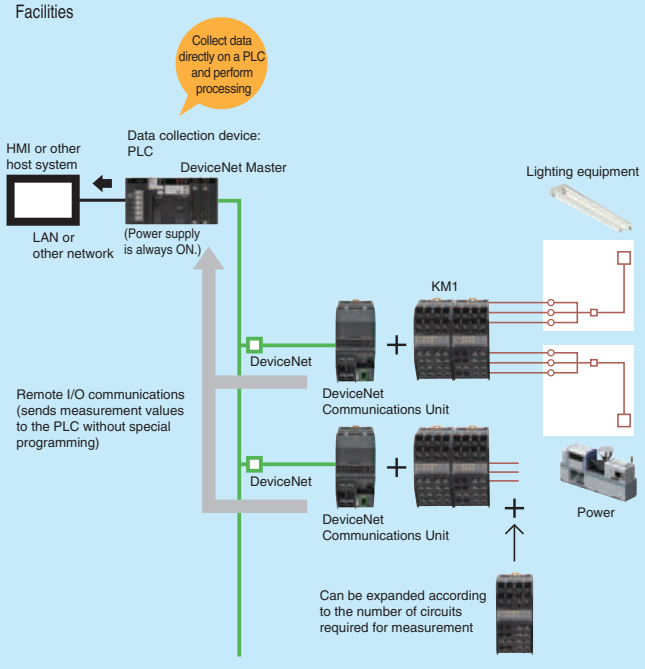
Manufacturing Facilities
Buildings, Offices, etc.




LAN <- EW700 <- RS-485

## Factories and Production Lines

Manufacturing Facilities




LAN <- PLC <- DeviceNet connection

# KM-series Power Monitor Models

| Item | | KM1 Series | | | KM50 Series | | KM20 Series | |
|---|---|---|---|---|---|---|---|---|
| | Series name | KM1 Series | | | KM50 Series | | KM20 Series | |
| | Types | Low-cost, reduced wiring, space-saving, versatile multi-circuit measurement | | | Intelligent on-panel type | | Stationary or embedded type | |
| | Model | KM1-PMU□A-FLK | KE1-CTD8E | KM1-EMU8A-FLK | KM50-C1-FLK | KM50-E1-FLK | KM20-B40-FLK | KM20-B40 |
| | Product name | Multi-circuit Smart Power Monitor | | | 48 × 48 Smart Power Monitor | 48 × 96 Smart Power Monitor | Compact power sensor with RS-485 communications | Compact power sensor with pulse output |
| External appearance | |  Master Unit for Single or Dual System Measurement |  Slave Unit for CT Expansion |  Pulse/Temperature Input Slave Unit |  |  |  |  |
| Features | | • Inherits the features of the KM50-E.<br>• Input of two systems with different voltages (PMU2A)<br>• Maximum number of measured circuits<br>Single-phase, two-wire: 4 circuits (PMU2A)<br>Single-phase, three-wire/ Three-phase, three-wire: 2 circuits (PMU2A))<br>Three-phase, four-wire: 1 circuit (PMU1A)<br>• Up to four Slave Units can be added | • Maximum number of measured circuits per Unit<br>Single-phase, two-wire: 8 circuits<br>Single-phase, three-wire: 4 circuits<br>Three-phase, three-wire: 4 circuits<br>Three-phase, four-wire: 2 circuits | • Seven event inputs<br>• One temperature input | • Primary-side Inverter measurement supported.<br>• Pulse input ON time measurement<br>• Specific power consumption management | • Primary-side inverter measurement supported.<br>• Three-state energy classification<br>• Pulse input ON time measurement<br>• Specific power consumption management<br>• 400-V direct measurement | • Simple and easy to use<br>• Affordable<br>• Easy initial setup with switches only | |
| Installation | | DIN Track | | | Front panel or DIN Track mounting bracket (sold separately) | | DIN Track | |
| Numeric display | | None | | | Eleven-segment LEDs | Eleven-segment LEDs | None | None |
| Dimensions (mm) | | 45 × 96 × 90 (W×H×D)<br>(maximum width of 45 × 5 when five Units are linked together) | | | DIN 48 × 48<br>Depth: 91<br>(Including terminal cover) | DIN 48 × 96<br>Depth: 88<br>(Including terminal cover) | W30×H80×D78 | W30×H80×D78 |
| Applicable phase wiring method | Single-phase, two-wire | OK | OK | – | OK | OK | OK | OK |
| | Single-phase, three-wire | OK | OK | – | OK | OK | OK | OK |
| | Three-phase, three-wire | OK | OK | – | OK | OK | OK | OK |
| | Three-phase, four-wire | PMU1A only | OK | – | – | OK | – | – |
| | 400-V direct measurement | OK | – | – | (A VT is required.) | OK | (A VT is required.) | (A VT is required.) |
| Power Monitor power supply | | 100 to 240 VAC | Provided from the Master Unit | 100 to 240 VAC | Same as measured circuits 100 to 240 VAC (common) | 100 to 240 VAC | Same as measured circuits 100 to 240 VAC (common) | |
| Measured items | Total power consumption | OK | OK | – | OK | OK | OK | OK |
| | Active power | OK | OK | – | OK | OK | OK | – |
| | Reactive power | OK | OK | – | OK | OK | – | – |
| | Current | OK | OK | – | OK | OK | OK (R and T phases) | – |
| | Voltage | OK | – | – | OK | OK | OK (R and T phases) | – |
| | Power factor | OK | OK | – | OK | OK | OK | – |
| | Frequency | OK | – | – | OK | OK | OK | – |
| | Pulse count | – | – | OK (Can be changed with event input.) | OK (Can be changed with event input.) | OK (Can be changed with event input.) | – | – |
| | Pulse Input ON Time | – | – | OK (Can be changed with event input.) | OK (Can be changed with event input.) | OK (Can be changed with event input.) | – | – |
| | Specific power consumption | OK (Can be changed with event input.) | – | – | OK (Can be changed with event input.) | OK (Can be changed with event input.) | – | – |
| | Temperature | – | – | OK | OK | OK | – | – |
| Functions | Three-state energy classification | OK | – | – | – | OK | – | – |
| | Simple power measurement (measures only the value of the input current) | OK | OK | – | OK | OK | – | – |
| | Micropower Measurements Mode (automatic range switching) | OK | OK | – | OK | OK | – | – |
| | Display of $CO_2$ emission | – | – | – | OK | OK | – | – |
| | Display of regenerative power | – | – | – | OK | OK | – | – |
| Outputs | Total power consumption pulse output | OK | – | – | OK | OK | – | OK |
| | Alarm output for measured items | OK | OK | Temperature alarms only | OK | OK | – | – |
| | Three-state (operating power, standby power, stopped power) status output | OK | – | – | – | OK | – | – |
| External interface | LAN port | – | – | – | – | – | – | – |
| | ComoWay/F RS-485 Communications (connections for up to 31 nodes) | OK | – | OK | OK | OK | OK | – |
| | Modbus RS-485 Communications (connections for up to 99 nodes) | OK | – | OK | OK | OK | – | – |
| Data logging | Logging to Power Monitor internal memory | OK | – | OK | OK | OK | – | – |
| | Logging to external memory | – | – | – | – | – | – | – |
| Applicable standards | | CE, S, KC, and TÜV mark | | | UL, CE, S, and KC mark | | – | – |

# Ordering Information

## Smart Power Monitors

| Model | Unit type | Unit category | Power supply voltage | Communications |
|---|---|---|---|---|
| KM1-PMU2A-FLK | Dual Power System Measurement Unit | Measurement master | 100 to 240 VAC | RS-485 |
| KM1-PMU1A-FLK | Power Measurement Unit | | | |
| KM1-EMU8A-FLK | Pulse/Temperature Input Unit | Function slave | | |
| KE1-CTD8E | CT Extension Unit | CT extension slave | Power supplied from the Measurement Master Unit | – |
| KE1-DRT-FLK | DeviceNet Communications Unit | Communications slave | 100 to 240 VAC | RS-485 or DeviceNet |

## Options (Order Separately)
## Separate or In-panel Current Transformer (CT)

| Model | Rated primary current | Rated secondary current | Installation |
|---|---|---|---|
| KM20-CTF-5A | 5 A | Special output | Installed separately |
| KM20-CTF-50A | 50 A | | |
| KM20-CTF-100A | 100 A | | |
| KM20-CTF-200A | 200 A | | |
| KM20-CTF-400A | 400 A | | |
| KM20-CTF-600A | 600 A | | |
| KM20-CTB-5A/50A | 5 A/50 A | | In-panel (penetration type) |

Note: CT Cables are not included with the CTs.

## Current Transformer (CT) Cable

| Model | Specification |
|---|---|
| KM20-CTF-CB3 | 3-m cable |

Note: Use the CT Cable specified by OMRON or one manufactured by JST Mfg. Co.
You can also use a 1.25-B3A crimping terminal or AWG22 power cable.

## Related Devices (Sold Separately)
## When Connected to a Computer
## Communications Interface Converter

| Model | Dimensions (mm) | Communications conversion | Power supply voltage |
|---|---|---|---|
| K3SC-10 AC100-240 | 30 × 80 × 78 (W×H×D) | RS-232C, USB <-> Half-duplex RS-485 | 100 to 240 VAC |
| K3SC-10 AC/DC24 | | | 24 VAC/DC |

# Ratings

| Item / Model | | Master Unit | | Slave Unit | |
|---|---|---|---|---|---|
| | | KM1-PMU2A-FLK (Dual Power Systems) | KM1-PMU1A-FLK (Single Power System) | KM1-EMU8A-FLK (Pulses/Temperatures) | KE1-CTD8E (CT Extension Unit) |
| Applicable phase wiring method | | Single-phase two-wire, single-phase three-wire, and three-phase three-wire | Single-phase two-wire, single-phase three-wire, three-phase three-wire, and three-phase four-wire | – | Single-phase two-wire, single-phase three-wire, three-phase three-wire, and three-phase four-wire |
| Maximum number of CT connections | | 4 | 3 | – | 8 |
| Selectable types of CT capacities | | 2 types | 1 type | – | Two types per Slave Unit |
| Power supply | Rated power supply voltage | 100 to 240 VAC, 50/60 Hz | | | – |
| | Allowable supply voltage range | 85% to 110% of rated power supply voltage | | | – |
| | Power supply allowable frequency range | 45 to 65 Hz | | | – |
| | Power consumption | Standalone: 10 VA max., Maximum expansion: 14 VA max. | | 10 VA max. | – |
| Input | Rated input voltage | 100 to 480 VAC (single-phase, 2-wire): Line voltage<br>100/200 VAC (single-phase, 3-wire): Phase voltage/line voltage<br>100 to 480 VAC (3-phase, 3-wire): Line voltage | 100 to 480 VAC (single-phase, 2-wire): Line voltage<br>100/200 VAC (single-phase, 3-wire): Phase voltage/line voltage<br>100 to 480 VAC (3-phase, 3-wire): Line voltage<br>58 to 277 VAC (3-phase, 4-wire): Phase voltage | – | |
| | Rated input current (CT) | (5, 50, 100, 200, 400, or 600 A) | | – | (5, 50, 100, 200, 400, or 600 A) |
| | Rated input power | With 5-A CT: 4 kW<br>With 50-A CT: 40 kW<br>With 100-A CT: 80 kW<br>With 200-A CT: 160 kW<br>With 400-A CT: 320 kW<br>With 600-A CT: 480 kW | | – | |
| | Rated input frequency | 50/60 Hz | | | – |
| | Allowable input frequency range | 45 to 65 Hz | | | – |
| | Allowable input voltage | 110% of rated input voltage (continuous) | | – | |
| | Allowable input current | 120% of rated input current (continuous) | | – | 120% of rated input current (continuous) |
| | Rated input load | Voltage input: 0.5 VA max. (excluding power supply)<br>Current input: 0.5 VA max. (for each input) | | – | Current input: 0.5 VA max. (for each input) |
| Clock | Clock setting | 2012 to 2099 (Adjusted for leap years during this period.) | | | – |
| | Clock accuracy | ±1.5 min./month (at 23° C) | | | – |
| | Clock backup period | Seven-day backup with an electric double-layer capacitor (after being powered for at least 24 hours and when at 23° C when the power is turned OFF) | | | – |
| Ambient operating temperature | | –10 to 55°C (with no condensation or icing) | | | |
| Storage humidity | | –25 to 65°C (with no condensation or icing) | | | |
| Ambient operating humidity | | 25% to 85% | | | |
| Storage humidity | | 25% to 85% | | | |
| Altitude | | 2,000 m max. | | | |
| Installation environment | | Overvoltage category II, pollution degree 2, measurement category II | | | |
| Compliant standards | | EN/IEC 61010-2-030 and EN/IEC 31626-1 Industrial electromagnetic environment | | | |

# Performance

| Item / Model | | Master Unit | | Slave Unit | |
|---|---|---|---|---|---|
| | | KM1-PMU2A-FLK (Dual Power Systems) | KM1-PMU1A-FLK (Single Power System) | KM1-EMU8A-FLK (Pulses/Temperatures) | KE1-CTD8E (CT Extension Unit) |
| Accuracy[*1] | Voltage | ±1.0% FS, ±1 digit; or, ±2.0% FS, ±1 digit for voltage across Vtr under the same conditions | | – | |
| | Current | ±1.0% FS, ±1 digit<br>However, the accuracy is ±2.0% FS, ±1 digit for the phase-S current for a three-phase, three-wire circuit and the phase-N current for a single-phase, three-wire circuit under the same conditions. | | – | ±1.0% FS, ±1 digit<br>However, the accuracy is ±2.0% FS, ±1 digit for the phase-S current for a three-phase, three-wire circuit and the phase-N current for a single-phase, three-wire circuit under the same conditions. |
| | Power (active power and reactive power) | Active power and reactive power<br>±2.0% FS, ±1 digit (Power factor = 1) | | – | Active power and reactive power<br>±2.0% FS, ±1 digit (Power factor = 1) |
| | Frequency | ±0.3 Hz ±1 digit | | – | |
| | Power factor[*2] | ±5.0% FS at an ambient temperature of 23° C, rated input, rated frequency, and a power factor of 0.5 to 1 to 0.5 | | – | ±5.0% FS at an ambient temperature of 23° C, rated input, rated frequency, and a power factor of 0.5 to 1 to 0.5 |
| | Temperature | – | | ±5°C two hours after the power supply is turned ON (after performing any adjustments for the ambient temperature) | – |
| Temperature influence | | ±1.0% FS (percentage of the measurement value at an ambient temperature of 23° C, rated input, rated frequency, and a power factor of 1 in the operating temperature range) | | ±1.0% FS (percentage of the measurement value at an ambient temperature of 23° C in the operating temperature range) | ±1.0% FS (percentage of the measurement value at an ambient temperature of 23° C, rated input, rated frequency, and a power factor of 1 in the operating temperature range) |
| Influence of frequency | | ±1.0% FS (percentage of the measurement value at an ambient temperature of 23° C, rated input, rated frequency, and a power factor of 1 in the rated frequency ±5 Hz range) | | – | ±1.0% FS (percentage of the measurement value at an ambient temperature of 23° C, rated input, rated frequency, and a power factor of 1 in the rated frequency ±5 Hz range) |
| Influence of harmonics | | ±0.5% FS (at ambient temperature of 23°C, error for superimposed 2nd, 3rd, 5th, 7th, 9th, 11th, and 13th harmonics for a content percentage of 30% for current and 5% for voltage of the basic wave) | | – | ±0.5% FS (at ambient temperature of 23°C, error for superimposed 2nd, 3rd, 5th, 7th, 9th, 11th, and 13th harmonics for a content percentage of 30% for current and 5% for voltage of the basic wave) |

# Performance

| Item \ Model | | Master Unit | | Slave Unit | |
|---|---|---|---|---|---|
| | | KM1-PMU2A-FLK (Dual Power Systems) | KM1-PMU1A-FLK (Single Power System) | KM1-EMU8A-FLK (Pulses/Temperatures) | KE1-CTD8E (CT Extension Unit) |
| Low-cut current set value | | 0.1% to 19.9% of rated input in 0.1% increments | | – | 0.1% to 19.9% of rated input in 0.1% increments |
| Sampling cycle | | 100 ms for measurement voltage at 50 Hz and 83.3 ms for measurement voltage at 60 Hz | | 100 ms | 100 ms for measurement voltage at 50 Hz and 83.3 ms for measurement voltage at 60 Hz |
| Insulation resistance | | Insulation resistance: 20 M (at 500 VDC) | | | |
| Dielectric strength | | All models: Locations to which 2,000 V was applied for one minute: Between all terminals and case<br>KM1-PMU1A-FLK: Between the power supply terminals and RS-485/USB/transistor output<br>Between the power supply terminals and current/voltage input<br>Between current/voltage input and RS-485/USB/transistor outputs<br>KM1-PMU2A-FLK: Between the power supply terminals and RS-485/USB/transistor outputs<br>Between the power supply terminals and current/voltage input<br>Between current/voltage inputs and RS-485/USB/transistor outputs<br>Between current/voltage input 1 and voltage input 2<br>KM1-EMU8A-FLK: Between power supply terminals, temperature input, and RS-485/USB/transistor outputs<br>KE1-CTD8E: Between current inputs and USB/relay outputs | | | |
| Vibration resistance | | Single-amplitude: 0.35 mm, Acceleration: 50 m/s$^2$<br>Vibration: 10 to 55 Hz, 10 sweeps of 5 minutes each along 3 axes | | | |
| Shock resistance | | 150 m/s$^2$, 3 times each in 6 directions (up/down, left/right, forward/backward) | | | |
| Weight | | 230 g | | | |
| Memory backup | | No. of writes to non-volatile memory: 1,000,000 times | | | |
| Event inputs | Number of inputs | – | | 7 | – |
| | No-voltage inputs | – | | ON current: 15 mA max.,<br>ON residual voltage: 8 V max.,<br>OFF leakage current: 1.5 mA max. | – |
| | Voltage input | – | | High level: 4.75 to 30 VDC<br>Low level: 0 to 2 VDC<br>Input impedance: Approx. 2 kΩ | – |
| | Minimum input time | – | | 5ms | – |
| Temperature inputs | Thermistor inputs | – | | 1 | – |
| | Applicable thermistor | – | | E52-THE5A<br>Color code (blue): –50 to 50° C<br>Color code (black): 0 to 100° C | – |
| Combinations | | Capable of supporting 7 event inputs and 1 temperature input when linked with the KM1-EMU8A-FLK. | | – | |
| Transistor outputs | Number of outputs | Three open collectors (OUT1, OUT2, OUT3) and common | | | – |
| | Output capacity | 30 VDC, 30 mA | | | – |
| | ON residual voltage | 1.2 V max. | | | – |
| | OFF leakage current | 100 μA max. | | | – |
| | Total power consumption pulse output | Outputs one pulse when the power consumption reaches the set pulse output unit (1, 10, 100, 1k, 2k, 5k, 10k, 20k, 50k, 100k W/h). | | | – |
| | Alarm output | Outputs an alarm based on the set alarm output threshold. | | | – |
| | Recovery method | Automatic recovery only | | | – |
| Relay output | Number of outputs | – | | | One NO contact (OUT1) |
| | Rated load | – | | | Resistance load, 125 VAC, 3 A; 30 VDC, 3 A |
| | Mechanical life expectancy | – | | | 5,000,000 times min. |
| | Electrical life expectancy | – | | | 200,000 times min. (rated load switching frequency: 1,800 times/h) |
| | Failure rate P level | – | | | 5 VDC, 10 mA (at a switching frequency of 120 times/min) |
| | Alarm output | – | | | Turns output ON or OFF based on the alarm set value. |
| | Recovery method | – | | | Automatic recovery only |
| RS-485 | Protocols | Communications protocol setting: Compoway/F or Modbus | | | |
| | Sync method | Start-stop | | | |
| | Node number setting | CompoWay/F: 0 to 99, Modbus:1 to 99<br>When a switch operation is performed to set the protocol to Modbus when the node number is set to 0, the node number is automatically changed to 1. | | | |
| | Baud rate | 9,600 bps, 19,200 bps, or 38,400 bps | | | |
| | Transmission code | CompoWay/F: ASCII, Modbus: Binary | | | |
| | Data length *3 | CompoWay/F: 7 bits, 8 bits; Modbus: 8 bits | | | |
| | Stop bits *3 | CompoWay/F: 1 bits or 2 bits; Modbus: 1 bit with priority, 2 bits without priority | | | |
| | Parity | Even, odd, or none | | | |
| | Maximum transmission distance | 500 m | | | |
| | Maximum number of nodes | CompoWay/F: 31, Modbus: 99 | | | |
| | Communication items | Refer to the relevant communications specifications manuals. | | | |
| USB | | USB 1.1 compatible | | | |
| Memory retention for power interruptions | | Parameter data<br>Total power consumption (Saved to internal memory every 5 minutes.) | | | |
| Number of link connector insertions/removals | | 25 times | | | |

*1. Based on JISC1111, without special CT error, at ambient temperature of 23° C, rated input, and rated frequency. Applicable to 2nd, 3rd, 5th, 7th, 9th, 11th, and 13th harmonics.
*2. Power factor formula: Power factor = Active power/Apparent power
Apparent power = $\sqrt{(\text{Active power})^2 + (\text{Reactive power})^2}$
*3. The set value may change when the protocol is changed to Modbus. Check the set values if you change the DIP switch settings.

# Performance

Special CTs
Current Transformer (CT) Cable

| Configuration | Installed separately | | | | | | In-panel (penetration type) |
|---|---|---|---|---|---|---|---|
| Item Model | KM20-CTF-5A | KM20-CTF-50A | KM20-CTF-100A | KM20-CTF-200A | KM20-CTF-400A | KM20-CTF-600A | KM20-CTB-5A/50A |
| Rated primary current | 5 A | 50 A | 100 A | 200 A | 400 A | 600 A | 5 A/50 A |
| Rated secondary current | 1.67 mA | 1.67 mA | 33.3 mA | 66.7 mA | 66.7 mA | 66.7 mA | 1.67 mA/16.7 mA |
| Secondary winding | 3,000 turns | | | | 6,000 turns | 9,000 turns | 3,000 turns |
| Applicable frequency | 10 Hz to 5 kHz | | | | | | |
| Insulation resistance | Between output terminals and case: 50 MΩ min. (at 500 VDC) | | | | | | |
| Dielectric strength | Between output terminals and case: 2,000 VAC for 1 minute | | | | | | |
| Protective element | 7.5-V clamp element | | | | | | |
| Allowable number of connections/disconnections | 100 times | | | | | | |
| Applicable wire diameter ✻ | 7.9 mm max. | 9.5 mm max. | 14.5 mm max. | 24.0 mm max. | 35.5 mm max. | | 8.4 mm max. |
| Operating temperature and humidity ranges | –20 to 60° C, 85% max. (with no condensation) | | | | | | |
| Storage temperature and humidity ranges | –30 to 65° C, 85% max. (with no condensation) | | | | | | |

Note: Operate the Special CTs at a low voltage of 600 V or less.
✻ If you use a flat cable, select the cable based on the dimensions of the CT.

Current Transformer (CT) Cable

| Model | KM20-CTF-CB3 |
|---|---|
| Cable length | 3 m |

Note: Either use the CT Cable specified by OMRON or use 1.25-B3A crimp terminals and AWG22 wire from J.S.T. Mfg. Co., Ltd.

# Specifications

DeviceNet Communications Unit (KE1-DRT-FLK)
• DeviceNet Communications Specifications

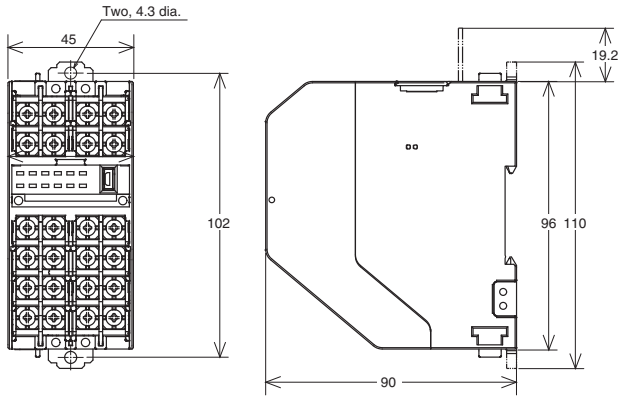
| Item | Specification | | | |
|---|---|---|---|---|
| Communications | • Remote I/O communications (I/O assignment settings with simple assignment settings or the Configurator)<br>• Message communications | | | |
| Connection configuration | Can be a combination of multidrops and T-branching (for both main and branch lines). | | | |
| Baud rate | 500, 250, or 125 kbps (automatically detected) | | | |
| Rated primary current | 5 dedicated lines (2 signal lines, 2 power lines, and 1 shield) | | | |
| Communications distance | Baud rate | Maximum network length | Branch line length | Total for all branch lines |
| | 500 kbps | 100 m max. (100 m max.) | 6 m max. | 39 m max. |
| | 250 kbps | 250 m max. (100 m max.) | 6 m max. | 78 m max. |
| | 125 kbps | 500 m max. (100 m max.) | 6 m max. | 156 m max. |
| | Numbers in parentheses are the lengths for thin cable. | | | |

# Dimensions

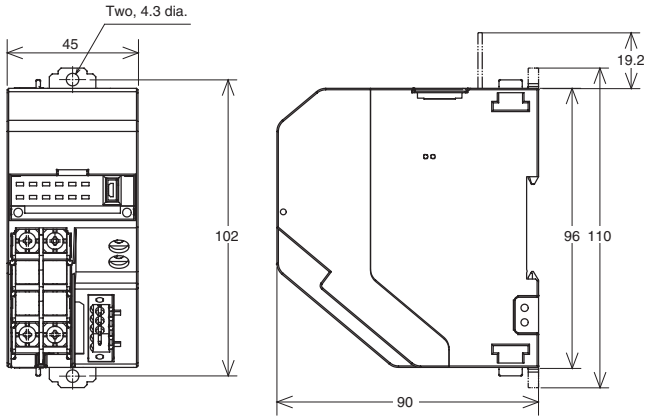
(Unit: mm)

## Smart Power Monitors

KM1-PMU1A-FLK/PMU2A-FLK/EMU8A-FLK/KE1-CTD8E

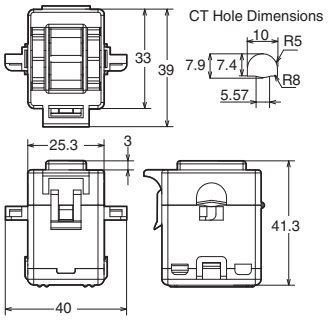



KE1-DRT-FLK

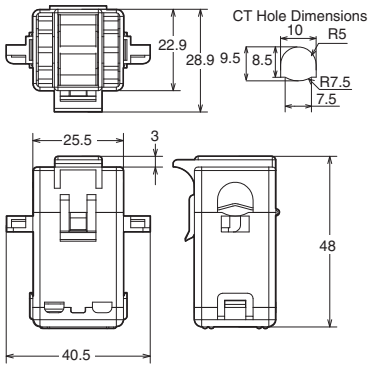



## Separate Current Transformers (CTs)

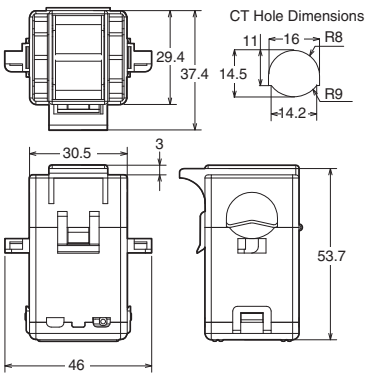
KM20-CTF-5A



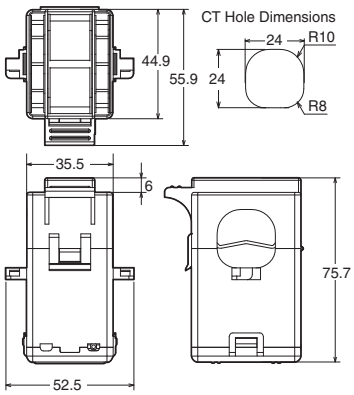

KM20-CTF-50A



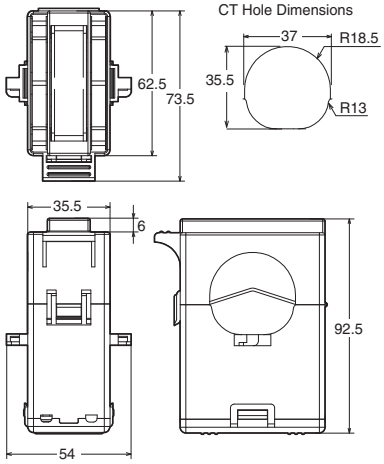

KM20-CTF-100A




KM20-CTF-200A

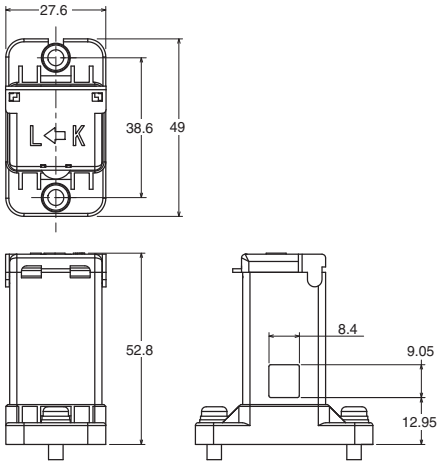



KM20-CTF-400A/600A



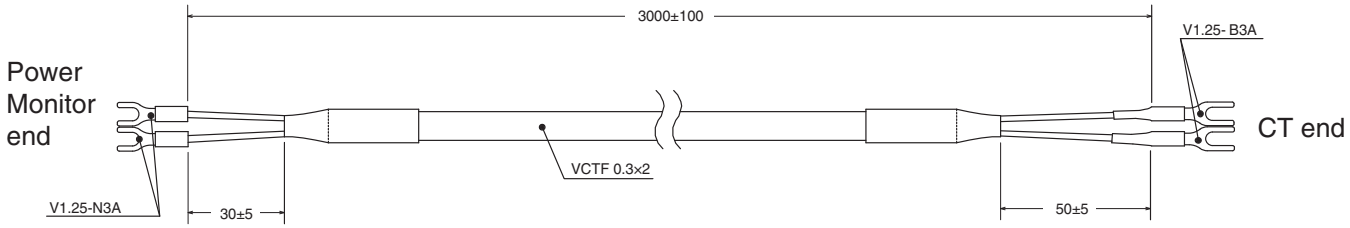

### In-panel CT, penetration type

KM20-CTB-5A/50A




## CT Cable

KM20-CTF-CB3 (Special CT cable)



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