

KIT-EMS-01

Energy Management Demonstration Kit

User Manual



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Model: KIT-EMS-01

ICP DAS CO., LTD.

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1. Product Introduction

KIT-EMS-01 is an integrated energy management demonstration kit that includes power meters, current transformers (CTs), power meter concentrators, and related communication devices. It can be used to demonstrate power monitoring system architecture, power meter and CT selection, and energy management applications.

The main devices, wiring, and demonstration settings are preconfigured before shipment. After connecting the power supply and powering on the system, users can immediately begin a demonstration using the default Software Simulation mode. The kit can also be used with the PM-2133D and its dedicated CT for real-time measurement.

This manual describes the unboxing and package contents, main devices, system architecture, quick start, operating procedures, and related demonstration functions of the KIT-EMS-01, helping users quickly set up the kit and perform basic demonstrations and operations.

2. Safety Precautions

Before using the KIT-EMS-01, check the demonstration case, power cord, and all related connection cables for visible damage or loose connections. Follow the safety precautions below during operation.

2.1 General and Power Safety

- Place the KIT-EMS-01 on a stable, dry, and well-ventilated surface.
- Use the supplied AC power cord or one that meets the required specifications, and ensure that the input power supply is within 85–264 VAC.
- Do not use damaged or lose power cords, plugs, or outlets.
- Do not touch the power plug, power cord, or power switch with wet hands.
- Do not disassemble, modify, or alter the devices or existing wiring inside the demonstration case.
- If you notice an unusual odor, smoke, abnormal noise, or excessive heat, immediately turn off the power and stop using the KIT.
- Before transporting or storing the KIT, turn off the power and disconnect the AC power cord and all external cables.

2.2 Real-Time Measurement Safety

The KIT-EMS-01 can be used with the PM-2133D and its dedicated CT for real-time measurement. Before performing actual measurements, make sure that the power meter, CT, and related wiring are properly connected.

- Connections to external electrical equipment or actual loads should be performed by personnel with appropriate electrical knowledge.
- Do not remove or modify the existing internal power wiring while the KIT is energized.
- When installing or removing the CT, avoid pulling or applying excessive force to the CT signal cable.
- For actual measurement applications, follow the installation and wiring instructions provided in the official user manuals for the PM-2133D and the CT.

CAUTION

The CTs mounted on the different cable sizes inside the demonstration case are intended only for CT selection and size comparison. They are not used for PM-2133D real-time measurement.

2.3 Communication Connection Precautions

The KIT-EMS-01 provides Ethernet and RS-485 communication interfaces for PC connections and external device communication demonstrations.

- Before connecting an external device, confirm the required communication interface and wiring method.
- For RS-485 connections, verify the data-line polarity and communication parameters before making the connection.
- For Ethernet connections, make sure the IP settings of the PC and the connected device are configured correctly.
- Do not connect Ethernet, RS-485, or other communication terminals to incompatible power or signal sources.

If any device is damaged, internal wiring is loose, or the KIT cannot start normally, stop using the KIT and turn off the power. If the problem cannot be resolved, contact your original supplier or ICP DAS Technical Support.

3. Unpacking and Package Contents

The main devices, wiring, and demonstration settings of the KIT-EMS-01 are preconfigured before shipment. Upon receiving the product, first inspect the demonstration case and verify that all included accessories are present before proceeding with operation.

3.1 Unpacking Inspection

After unpacking the KIT-EMS-01, check the following items:

- Make sure the demonstration case and enclosure show no obvious signs of impact, damage, or deformation.
- Make sure the devices, mounting panel, and wiring inside the demonstration case are secure and free from visible damage.
- Check the power cord, connectors, and related cables for cuts, deformation, or other abnormalities.
- Verify that all supplied accessories match the package contents.
- Make sure there are no foreign objects or other conditions inside the demonstration case that could affect safe operation.

Keep the original packaging materials and protective foam for future transportation or storage.

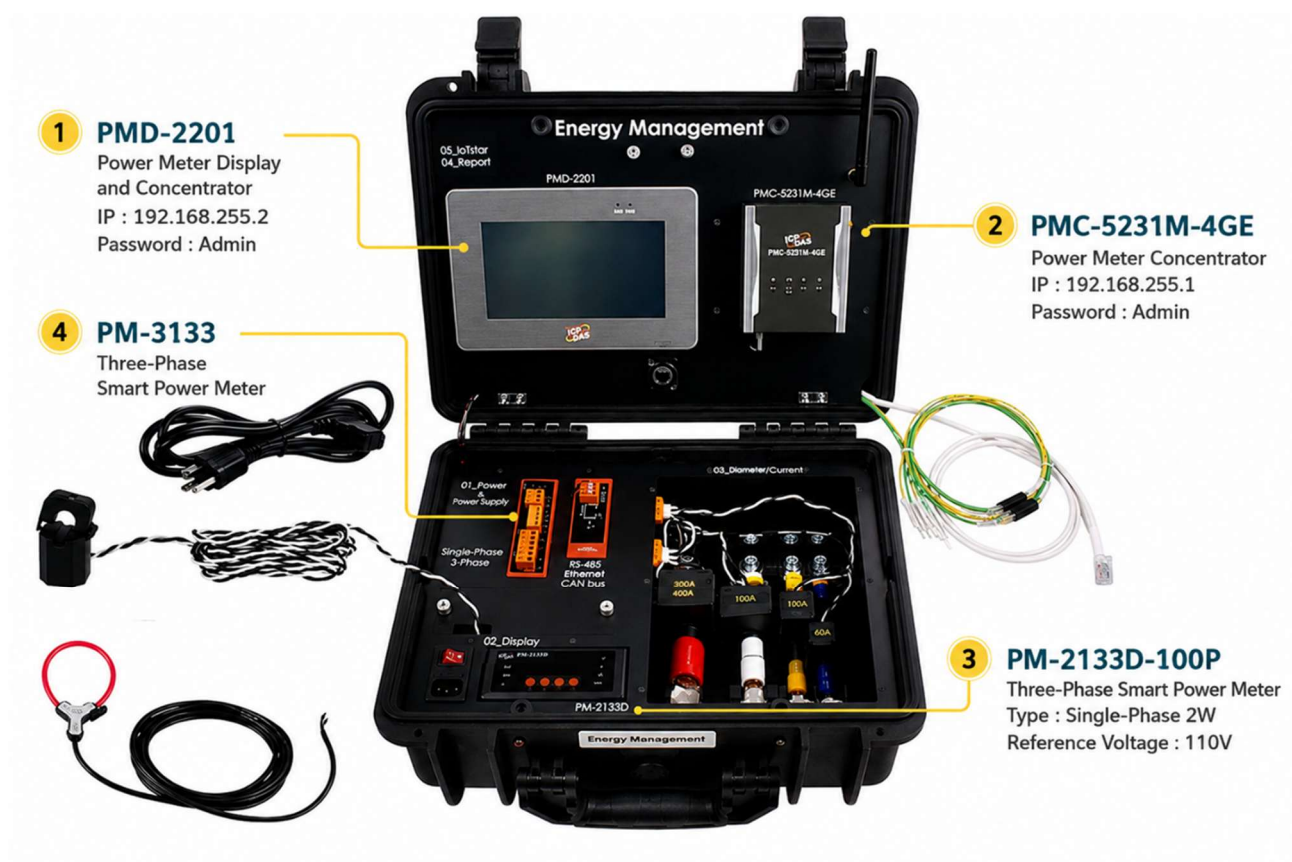
If any device or accessory appears to have been damaged during shipment, do not power on the KIT-EMS-01. Contact your original supplier or ICP DAS Technical Support for assistance.

3.2 Package Contents

The KIT-EMS-01 demonstration case integrates the main devices required for energy management demonstrations.

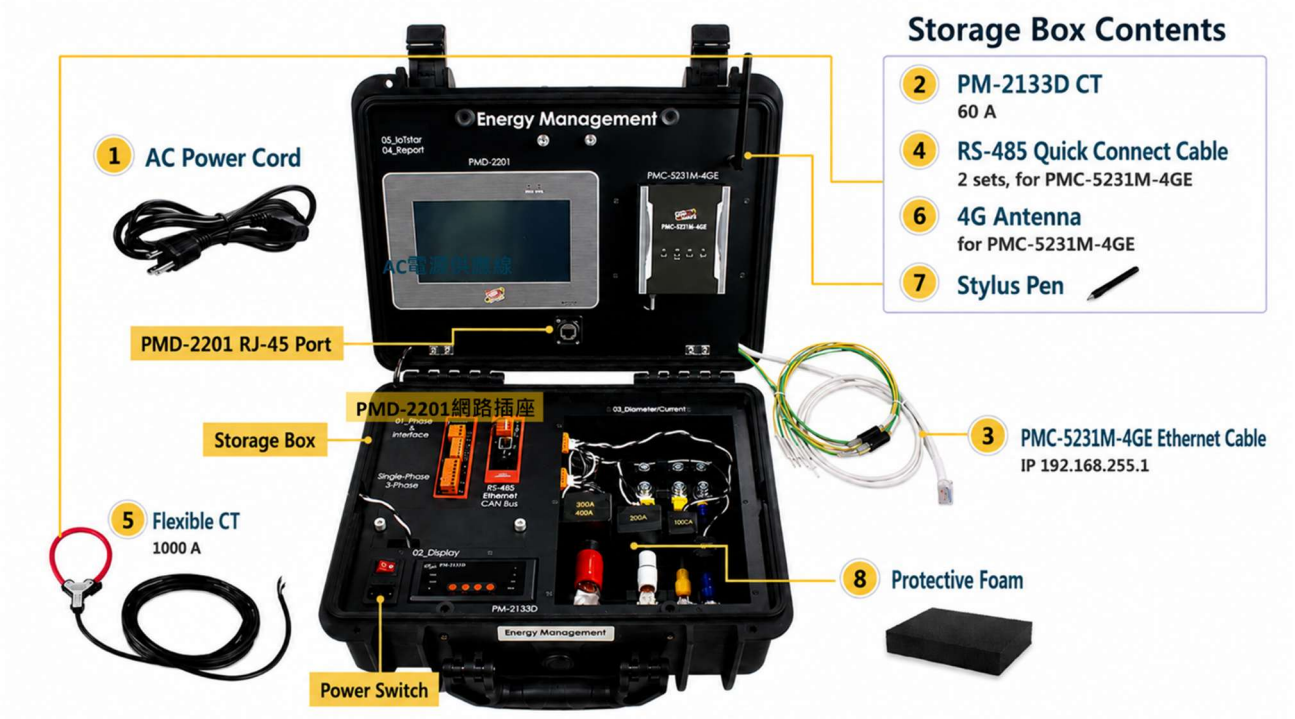
Main Devices

No.	Module	Quantity
1	PMD-2201	1
2	PMC-5231M-4GE	1
3	PM-2133D-100P	1
4	PM-3133	1



Included Accessories

No	Accessory	Quantity
1	AC Power Cord	1
2	RS-485 Quick Connect Cable	2
3	PMC-5231M-4GE Ethernet Cable	1
4	PM-2133D CT	1
5	Flexible CT	1
6	4G Antenna	1
7	Stylus Pen	1
8	Protective Foam	1



3.3 Demonstration Accessories

The CTs included in the KIT-EMS-01 are divided into two types according to their intended use: CTs for selection demonstration and the dedicated CT for PM-2133D real-time measurement.

- **CT Selection Demonstration**

The demonstration case includes cables of different sizes with various CTs mounted on them. These are used to compare cable size, CT inner diameter, and CT rated current.

These CTs are intended for selection and size comparison only and are not used for real-time measurement.

Nominal Cable Cross-Section	Corresponding CT
14 mm ²	60 A
22 mm ²	100 A
80 mm ²	200 A
125 mm ²	300 A or 400 A

- **PM-2133D CT for Real-Time Measurement**

A dedicated CT connected to the PM-2133D is stored separately in the storage box for real-time measurement of external equipment.

To perform a measurement, remove this CT from the storage box and clamp it around the conductor of the external device to be measured.

 Tip

The CTs mounted on the demonstration cables and the dedicated PM-2133D CT stored in the storage box serve different purposes. For actual measurements, always use the dedicated PM-2133D CT from the storage box.

4. KIT-EMS-01 Device Overview

The KIT-EMS-01 mainly consists of the PMD-2201, PMC-5231M-4GE, PM-2133D-100P, and PM-3133. These devices are used for power information display, data concentration, real-time measurement, and power meter selection demonstrations.

4.1 Device Overview

Device	Main Function
PMD-2201	Main operation and power information display interface for the KIT-EMS-01
PMC-5231M-4GE	Data acquisition from external RS-485 devices and Ethernet / Web communication demonstrations
PM-2133D-100P	Real-time power measurement using the dedicated CT
PM-3133	Demonstration of three-phase power meters and power meter selection concepts

PMD-2201

The PMD-2201 is the main operation and display device of the KIT-EMS-01. Its touchscreen can be used to view power meter information and demonstrate both simulated data and actual measurement data.

To connect a PC to the PMD-2201, connect an Ethernet cable to the RJ-45 port beside the touchscreen, and then use a web browser to view related information or configure settings.

For touchscreen operation, display meter switching, and measurement mode switching, refer to Chapter 7, “PMD-2201 Operation.”

For Web connection instructions, refer to Chapter 9, “Web Connection.”

PMC-5231M-4GE

The PMC-5231M-4GE is a power meter concentrator used for external device data acquisition and communication demonstrations.

The KIT-EMS-01 includes an external Ethernet cable for the PMC-5231M-4GE, which can be connected to a PC for viewing data and configuring settings through the Web interface.

Two RS-485 Quick Connect Cables are also provided for connecting external RS-485 devices for data acquisition and communication demonstrations.

For Web and RS-485 external device connection instructions, refer to Chapter 9, “Web Connection.”



Tip

Both the PMD-2201 and PMC-5231M-4GE can be connected to a PC via Ethernet, but their physical connection methods are different:

- PMD-2201: Use the RJ-45 port beside the touchscreen.
- PMC-5231M-4GE: Use the external PMC Ethernet cable supplied with the KIT.

PM-2133D-100P

The PM-2133D-100P is a three-phase smart power meter with a local display. In the KIT-EMS-01, it is mainly used for real-time power measurement demonstrations.

For real-time measurement, use the dedicated CT connected to the PM-2133D and stored in the storage box. The PM-2133D can display the measured data directly on its local display.

For detailed real-time measurement procedures, refer to Sections 6.4 and 7.4.

PM-3133

The PM-3133 is a three-phase smart wired power meter. In the KIT-EMS-01, it is mainly used to demonstrate three-phase power meters and related selection concepts, including:

- Three-Phase Measurement: Understand applications for three-phase power monitoring.
- Reference Voltage Terminals: Identify the reference voltage connection points used for three-phase power measurement.

- Communication Interface Selection: Select a power meter model that supports RS-485, Ethernet, or CAN bus according to application requirements.
- Power Meter and CT Matching: Understand the relationship between power meter rated current, CT specifications, and cable size.

For detailed power meter and CT selection guidelines, refer to Chapter 8, “KIT-EMS-01 Demonstration Functions.”

4.2 Default Communication Settings

The main communication settings of the KIT-EMS-01 are preconfigured before shipment. For standard demonstrations, the following parameters normally do not need to be changed.

Device	Item	Default Setting
PMD-2201	IP Address	192.168.255.2
	Administrator Password	Admin
PMC-5231M-4GE	IP Address	192.168.255.1
	RS-485 Interface	COM3 / COM4
	Baud Rate	19200 bps
	Data Format	8N1

Tip

This chapter provides only an overview of the main functions and default communication settings of the devices in the KIT-EMS-01.

- System connections: Refer to Chapter 5, “System Architecture.”
- PMD-2201 operation: Refer to Chapter 7.
- Power meter and CT selection demonstrations: Refer to Chapter 8.
- Web and RS-485 connections: Refer to Chapter 9.

5. System Architecture

The KIT-EMS-01 provides three main demonstration paths: Software Simulation, PM-2133D Real-Time Measurement, and PMC External Device Communication, as shown in Figure 5-1.

For detailed operating procedures, refer to Chapters 6, 7, and 9.

5.1 System Architecture Overview

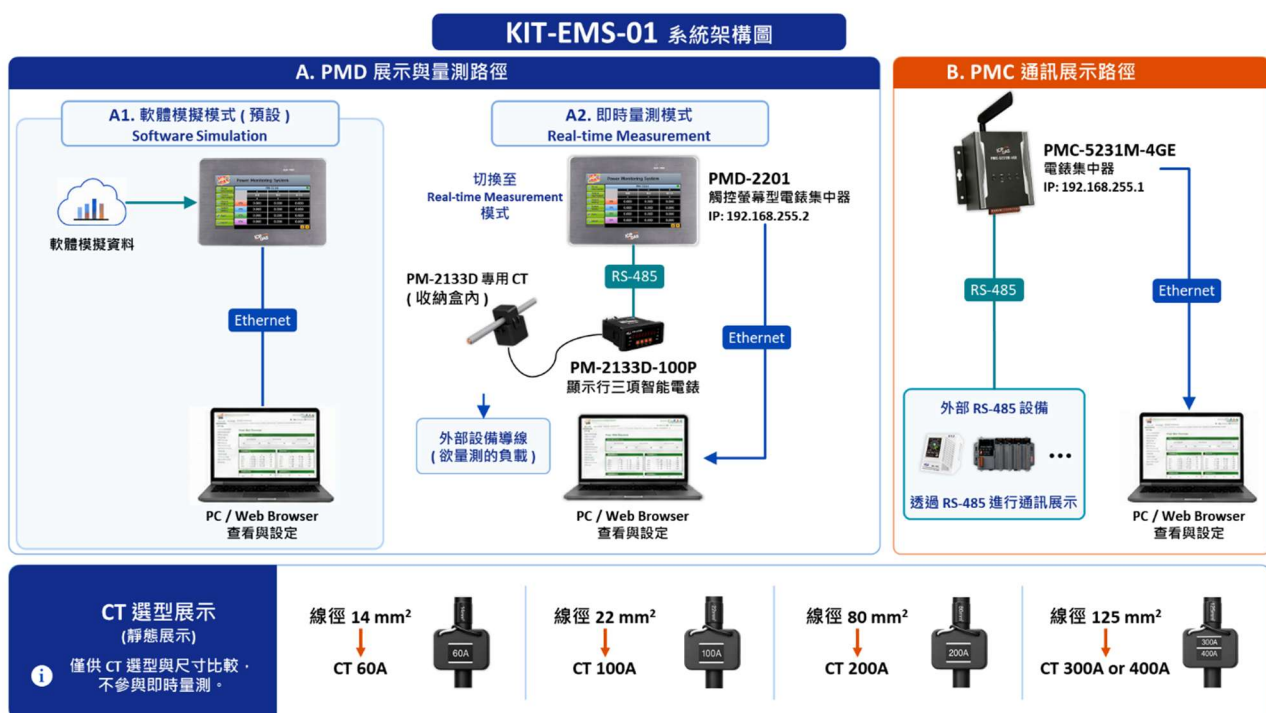


Figure 5-1. KIT-EMS-01 System Architecture

6. Quick Start

The main devices, wiring, and demonstration settings of the KIT-EMS-01 are preconfigured before shipment. For a standard demonstration, simply complete the basic setup procedures and connect the power supply to begin using the default Software Simulation mode.

6.1 Preparation Before Use

Before using the KIT-EMS-01 for the first time, complete the following steps:

1. Place the demonstration case on a stable surface and open the case.
2. Remove the protective foam from inside the case.
3. Take out the AC power cord.
4. Rotate the 4G antenna of the PMC-5231M-4GE to the upright position.
5. Open the storage box and take out the stylus pen and any accessories required for the demonstration.
6. If PM-2133D real-time measurement will be demonstrated, take out the dedicated PM-2133D CT from the storage box.



Tip

If only the standard software simulation demonstration is required, the dedicated PM-2133D CT does not need to be connected to an external device.

6.2 Powering On the KIT

1. Connect the AC power cord to the AC power inlet of the KIT-EMS-01. The internal power supply module supports an input range of 85–264 VAC. Before applying power, make sure the available power source is within this range.
2. Make sure the power cord is securely connected, and then turn on the power switch of the demonstration case.
3. Wait for the PMD-2201, PMC-5231M-4GE, and related devices to complete their startup process.



CAUTION

Before applying power, check the demonstration case, power cord, and all related cables for visible

damage or loose connections. For additional safety information, refer to Chapter 2, “Safety Precautions.”

6.3 Starting a Demonstration

The PMD-2201 is set to Software Simulation mode by default. After the system has completed startup, the PMD-2201 touchscreen can immediately display the preset simulated power data without connecting an actual load.

Use the meter selection buttons on the touchscreen to switch between the configured demonstration meters and view their simulated power information.

A typical demonstration can begin directly in the default Software Simulation mode.

Open the Demonstration Case → Take Out Required Accessories → Connect to AC Power → Turn On the Power → Wait for the Device to Start → Start the Demonstration

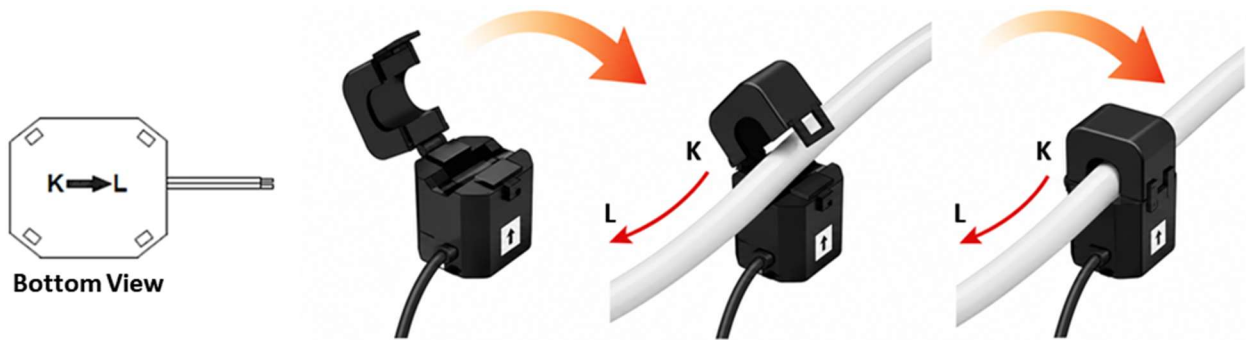
6.4 Preparing for Real-Time Measurement

To demonstrate real-time measurement using the PM-2133D:

1. Remove the dedicated CT connected to the PM-2133D from the storage box.



2. Clamp the CT around the conductor of the external device to be measured.



3. The real-time current measurement can be viewed directly on the PM-2133D display.



4. To view the measurement data on the PMD-2201, switch the PMD-2201 to Real-time Measurement mode.

Tip

The CTs mounted on the different demonstration cables inside the case are intended only for CT selection and size comparison. For real-time measurement, use the dedicated PM-2133D CT stored in the storage box.

The PMD-2201 measurement mode switching procedure is described in detail in Chapter 7, “PMD-2201 Operation.”

7. PMD-2201 Operation

The PMD-2201 is the main operation and display interface of the KIT-EMS-01. It can be used to view power meter information, switch between demonstration meters, and change between software simulation and real-time measurement modes.

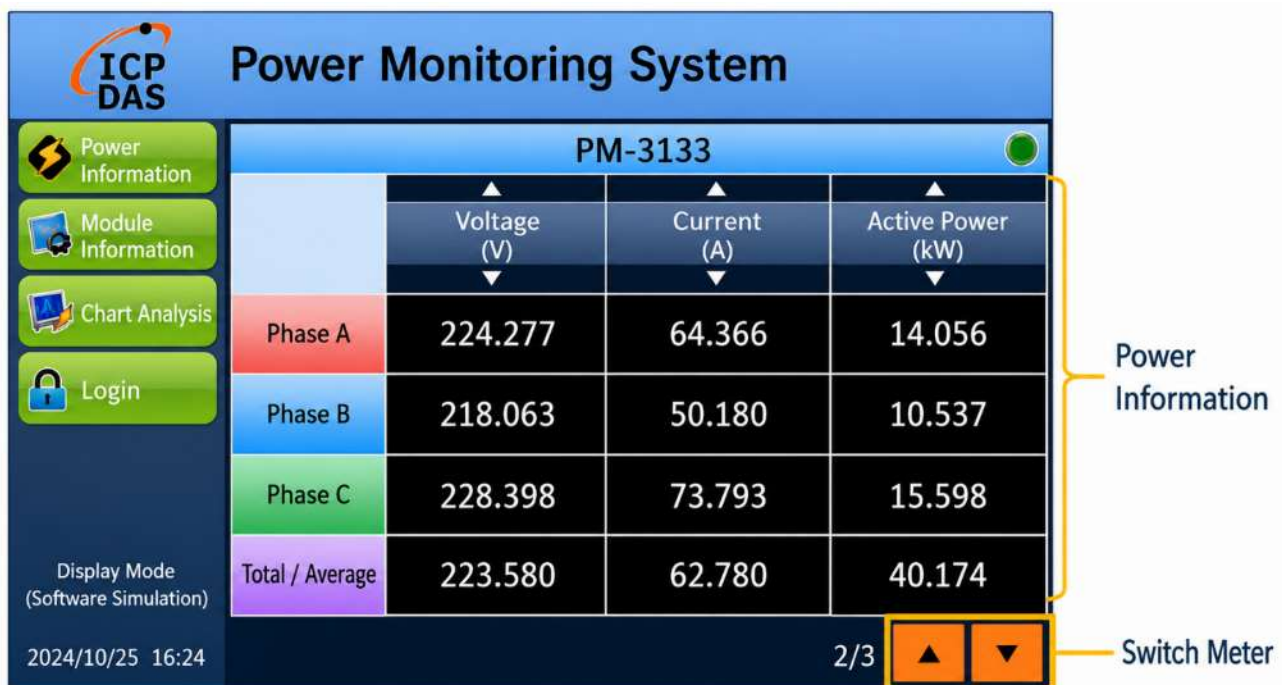
The KIT-EMS-01 is set to Software Simulation mode by default. For standard demonstrations, no additional configuration is required to view the simulated power data.

7.1 Viewing and Switching Demonstration Meters

The following demonstration meters are preconfigured in the PMD-2201:

- PM-2133D
- PM-3133
- PM-4324

Use the Up / Down buttons at the lower-right corner of the PMD-2201 touchscreen to switch between the configured meters and view their power information.



In Software Simulation mode, each demonstration meter displays preset simulated power data without requiring an actual load connection.

7.2 Measurement Modes

The PMD-2201 supports the following two measurement modes:

Mode	Description
Software Simulation	Displays preset simulated power data and is recommended for standard demonstrations.
Real-time Measurement	Reads measurement data from the connected physical power meter and is used for PM-2133D real-time measurement demonstrations.

The KIT-EMS-01 currently provides real-time measurement through the PM-2133D only.

After switching to Real-time Measurement mode, the PM-2133D displays actual measurement data, while the other preconfigured demonstration meters appear offline.



Tip

For standard demonstrations, it is recommended to keep the PMD-2201 in the default Software Simulation mode. Switch to Real-time Measurement mode only when demonstrating actual measurements with the PM-2133D.

7.3 Switching the Measurement Mode

To change the measurement mode of the PMD-2201, follow the steps below:

1. On the PMD-2201 touchscreen, tap Login.
2. Enter the administrator password: Admin.
3. Select the Tools menu.
4. Select Measurement Mode Switch.
5. Select the desired mode:
 - Software Simulation
 - Real-time Measurement
6. Tap Confirm. The PMD-2201 will restart automatically.
7. After the restart is complete, confirm that the selected measurement mode is active.

CAUTION

The PMD-2201 restarts after the measurement mode is changed. Wait until the system has fully restarted before continuing operation.

7.4 Viewing PM-2133D Real-Time Measurement Data

To view PM-2133D real-time measurement data on the PMD-2201:

1. Clamp the dedicated PM-2133D CT from the storage box around the conductor of the external device to be measured.
2. Confirm that the PM-2133D is displaying real-time measurement data.
3. Switch the PMD-2201 to Real-time Measurement mode.
4. After the PMD-2201 restarts, switch to the PM-2133D screen to view the real-time measurement data.



Tip

The PM-2133D can display the measurement data directly on its local display. The PMD-2201 must be switched to Real-time Measurement mode before it can display the PM-2133D real-time data.

7.5 Returning to the Standard Demonstration Mode

After completing the real-time measurement demonstration, follow the same procedure described in Section 7.3 and switch the measurement mode back to Software Simulation.

After the PMD-2201 restarts, the standard simulated power data demonstration will be restored.

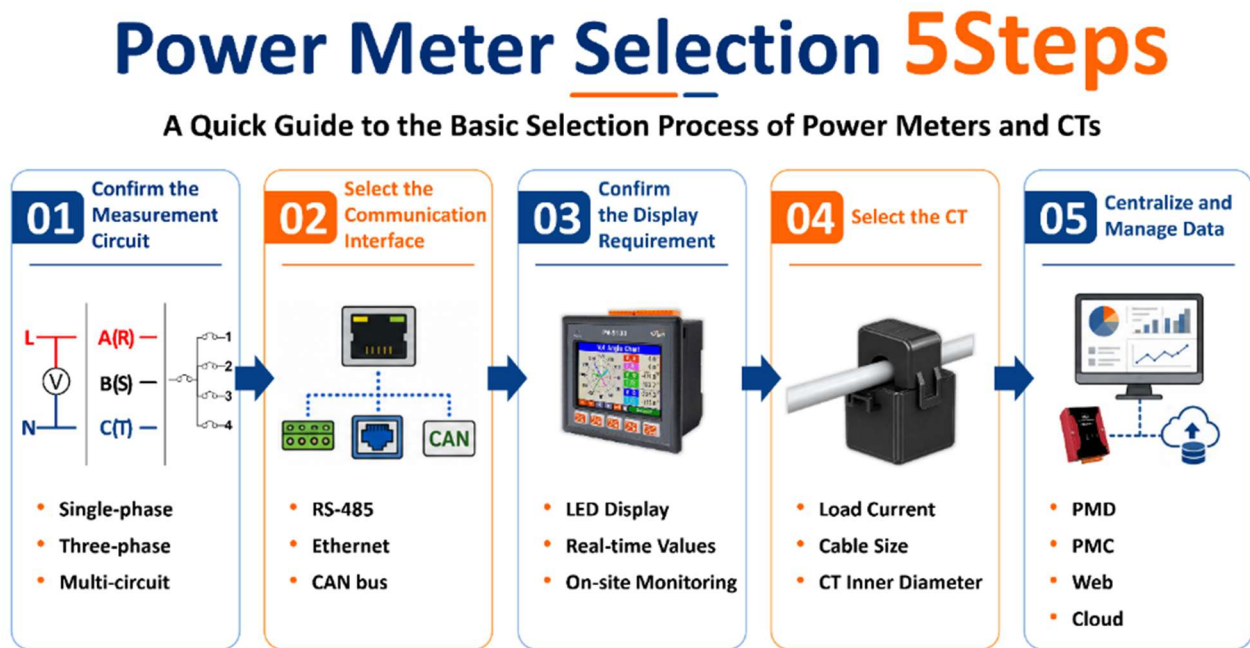
8. KIT-EMS-01 Demonstration Functions

The KIT-EMS-01 can be used to demonstrate power meter selection, CT selection, real-time measurement, and centralized data management. This chapter uses a 5-step power meter selection process as the main guideline to help users quickly understand the basic process from power meter selection to subsequent data management using the devices and demonstration accessories included in the KIT.

The power meter selection process can be summarized in the following five steps:

1. Confirm the Measurement Circuit
2. Select the Communication Interface
3. Confirm the Local Display Requirement
4. Select the CT
5. Centralize and Manage Data

The following sections describe the main demonstration points according to this process.



8.1 5-Step Power Meter Selection

When selecting a power meter for a power monitoring system, users should consider not only whether the application requires single-phase or three-phase measurement, but also the communication interface, local display requirements, CT specifications, and subsequent data concentration and management requirements.

The KIT-EMS-01 integrates these selection concepts into the demonstration case and can be introduced using the following five steps.

Step 1 Confirm the Measurement Circuit

First, determine the type of electrical circuit to be monitored, such as:

- Single-phase circuit
- Three-phase circuit
- Multi-circuit application

Select the appropriate type of power meter according to the number and type of measurement circuits.

The PM-3133 included in the KIT-EMS-01 can be used to demonstrate three-phase power meter connections and basic selection concepts. The KIT can also be used to explain the application differences among single-phase, three-phase, and multi-circuit power meters.

Step 2 Select the Communication Interface

Select the appropriate communication interface according to the existing field devices and monitoring system architecture.

Common communication interfaces include:

- **RS-485** : Modbus RTU
- **Ethernet** : Modbus TCP
- **CAN bus** : CANopen

The KIT-EMS-01 uses RS-485, Ethernet, and CAN bus as the main communication interface options for demonstrating power meter selection.

Step 3 Confirm the Local Display Requirement

Determine whether a local display is required at the installation site.

A power meter with an LED display allows users to directly view information such as voltage, current, and power at the equipment location. This is suitable for applications where operators need to quickly check power conditions on site.

The PM-2133D in the KIT-EMS-01 can be used to demonstrate a power meter with a local display.

Step 4 Select the CT

When a power meter is used with a Current Transformer (CT), the following factors should be considered:

- Load current
- Cable size
- CT rated current
- CT inner diameter

The KIT-EMS-01 includes demonstration cables of different sizes together with several CT specifications, allowing users to directly compare the relationship between cable size and CT selection.

For detailed CT selection guidelines, refer to Section 8.2, “CT Selection Demonstration.”

Step 5 Centralize and Manage Data

After the power meters are installed for field measurement, the collected power information can be further centralized and managed according to system requirements.

Using the PMD-2201 and PMC-5231M-4GE, the KIT-EMS-01 can demonstrate:

- Power meter data concentration
- Web-based data viewing
- Data acquisition from external RS-485 devices
- Subsequent data statistics and management



Tip

The 5-step power meter selection process is intended to explain the basic selection concept. For an actual application, power meters and CTs should be selected according to the electrical system, measurement requirements, communication architecture, and device specifications.

8.2 CT Selection Demonstration

The KIT-EMS-01 includes demonstration cables of different sizes and multiple CT specifications. These components help users understand the basic CT selection process based on **cable specifications, load current, and installation dimensions**.

When selecting a CT, two main conditions should be confirmed:

- 1. Current Range**

The rated current of the CT should cover the actual load current of the circuit being measured.

- 2. Installation Size**

The inner diameter of the CT must be larger than the finished outer diameter of the cable so that the CT can be installed correctly.

The basic selection process is:

Confirm Cable Specification → Confirm Cable Load Current and Outer Diameter → Select an Appropriate CT Rated Current → Confirm CT Inner Diameter

Cable and CT Selection Reference

The following table lists the cable specifications and CTs used in the KIT-EMS-01 demonstration as a reference for understanding CT selection.

Nominal Cable Cross-Section	Finished Cable Diameter	Reference Current	Recommended CT Rated Current	CT Inner Diameter
14 mm ²	8.7 mm	55 A	60 A	10 mm
22 mm ²	9.8 mm	70 A	100 A	16 mm
80 mm ²	16.0 mm	165 A	200 A	24 mm
125 mm ²	20.2 mm	220 A	300 A / 400 A	36 mm

Selection Example

For an **80 mm² cable**:

- Reference current: **165 A**
- Finished cable diameter: **16.0 mm**
- Recommended CT: **200 A rated current with a 24 mm inner diameter**

The 200 A CT can cover the reference current range of the cable, and its 24 mm inner diameter is larger than the 16.0 mm cable diameter, making it suitable for this selection example.

**Tip**

The table above is intended to demonstrate the CT selection concept used in the KIT-EMS-01. In an actual application, the CT rated current should be selected according to the circuit breaker capacity, actual maximum load current, and power meter specifications. The CT inner diameter must also be large enough for the actual cable being used.

 CAUTION

The CTs mounted on the different cable sizes inside the KIT-EMS-01 are intended for **static CT selection and size comparison only**. They are not used for PM-2133D real-time measurement. For real-time measurement, use the dedicated PM-2133D CT stored in the storage box.

8.3 PM-2133D Real-Time Measurement Demonstration

The KIT-EMS-01 can use the PM-2133D together with its dedicated CT to demonstrate actual current measurement from external equipment.

Measurement data can be viewed directly on the PM-2133D or through the PMD-2201.

For detailed operating procedures, refer to Sections 6.4 and 7.4.

8.4 Power Meter Concentration and Data Management

Demonstration

The KIT-EMS-01 includes the PMD-2201 and PMC-5231M-4GE for demonstrating power data concentration, Web-based monitoring, and external device communication.

- **PMD-2201** : Centrally displays power meter information and supports both Software Simulation and Real-time Measurement demonstrations.
- **PMC-5231M-4GE** : Connects to external devices through RS-485 and allows data viewing and configuration through an Ethernet connection and Web browser.

Power meter concentrators can help collect, organize, store, and manage power information from field devices.

8.5 Recommended Demonstration Sequence

When introducing the KIT-EMS-01, the following demonstration sequence is recommended:

1. **Introduce Power Meter Selection**

Explain measurement circuits, communication interfaces, and local display requirements.

2. **Introduce CT Selection**

Use the demonstration cables and different CT specifications to compare rated current and inner diameter.

3. **Demonstrate Simulated Power Data**

Use the PMD-2201 in **Software Simulation mode** to display the preset power data.

4. **Demonstrate Real-Time Measurement**

Use the dedicated PM-2133D CT to measure an external device and view the real-time data on the PM-2133D or PMD-2201.

5. **Introduce Data Concentration and Management**

Explain how the PMD-2201 and PMC-5231M-4GE can be used to centralize field device data and support subsequent data management.



Tip

If demonstration time is limited, focus on the following four key points:

Power Meter Selection → CT Selection → PMD-2201 Simulated Data → PM-2133D Real-Time Measurement

This sequence provides a quick overview of the main functions of the KIT-EMS-01.

9. Web Connection

The KIT-EMS-01 allows a PC to connect to the **PMD-2201** or **PMC-5231M-4GE** via Ethernet and use a web browser to view data and configure related settings.

The Ethernet connection points for the two devices are different:

Device	Ethernet Connection Point
PMD-2201	RJ-45 port beside the touchscreen
PMC-5231M-4GE	External PMC Ethernet cable supplied with the KIT



Tip

If the demonstration only uses the PMD-2201 touchscreen, a PC connection and Web configuration are not required.

9.1 PC Network Settings

Before connecting to the PMD-2201 or PMC-5231M-4GE, configure the Ethernet interface of the PC to the same network segment as the KIT-EMS-01.

Recommended settings are shown below:

Item	Recommended Setting
IP Address	192.168.255.xxx
Subnet Mask	255.255.255.0
Default Gateway	Leave blank

For xxx, use an unused address from 3 to 254.

Do not use the following IP addresses because they are already assigned to devices in the KIT:

- 192.168.255.1 : PMC-5231M-4GE
- 192.168.255.2 : PMD-2201

For example, the PC can be configured as:

192.168.255.10

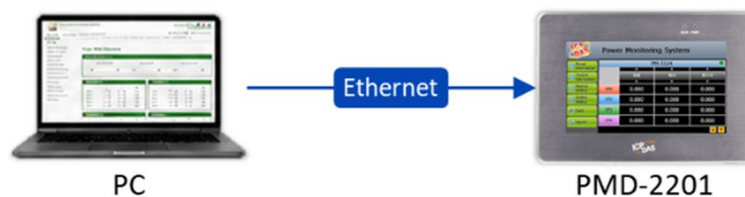
After completing the network settings, connect the Ethernet cable to the device you want to access.

⚠ CAUTION

If the PC has Wi-Fi or other network interfaces enabled and the device cannot be reached, temporarily disable the other network interfaces and try the connection again.

9.2 PMD-2201 Web Connection

The PMD-2201 can be connected directly to a PC via Ethernet.



Connection Procedure

1. Configure the PC Ethernet interface to the 192.168.255.xxx network segment.
2. Use the PMC-5231M-4GE external Ethernet cable supplied with the KIT to connect the PMC to the PC.
3. Open a web browser and enter:
`http://192.168.255.1`
4. After the PMC Web interface opens, you can view related information and configure communication settings.

The default IP address of the PMC-5231M-4GE is:

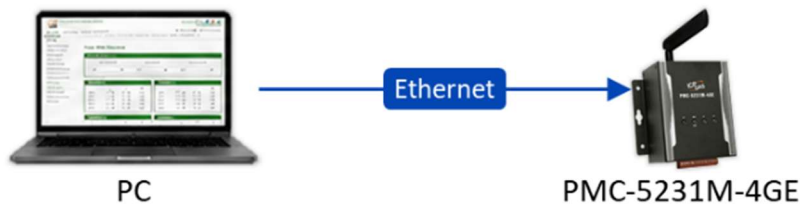
192.168.255.2

💡 Tip

For detailed PMD-2201 Web functions and configuration, refer to the official **PMD-2201 User Manual**. This manual describes only the basic connection procedure for the KIT-EMS-01.

9.3 PMC-5231M-4GE Web Connection

The PMC-5231M-4GE can be connected to a PC through the Ethernet cable supplied with the KIT. A web browser can then be used to view measurement, I/O, and communication-related information.



Connection Procedure

1. Configure the PC Ethernet interface to the 192.168.255.xxx network segment.
2. Use the PMC-5231M-4GE external Ethernet cable supplied with the KIT to connect the PMC to the PC.
3. Open a web browser and enter:
`http://192.168.255.1`
4. After the PMC Web interface opens, you can view related information and configure communication settings.

The default IP address of the PMC-5231M-4GE is:
192.168.255.1

9.4 Connecting an External RS-485 Device

The KIT-EMS-01 provides two **RS-485 Quick Connect Cables** for connecting external RS-485 devices to the PMC-5231M-4GE for data acquisition demonstrations.

The basic connection is:

External RS-485 Device → RS-485 Quick Connect Cable → PMC-5231M-4GE

Connection Procedure

1. Confirm that the external device uses an RS-485 communication interface.
2. Connect one end of the RS-485 Quick Connect Cable to the external device.
3. Connect the other end to the RS-485 connection of the PMC-5231M-4GE in the KIT.
4. Use a PC to access the PMC Web interface.
5. Configure the communication settings according to the external device.
6. After configuration is complete, related communication or I/O information can be viewed through the PMC Web interface.

The default RS-485 interfaces and communication settings of the KIT are:

Item	Default Setting
RS-485 介面	COM3 / COM4
Baud Rate	19200 bps
Data Format	8N1

CAUTION

The Baud Rate, Data Format, station address, and other communication parameters of the external RS-485 device must match the actual device settings. They may be different from the default KIT settings.

Tip

For a standard KIT-EMS-01 demonstration, the default RS-485 settings of the PMC-5231M-4GE normally do not need to be changed. Connecting an external RS-485 device is intended as an advanced demonstration function.

10. Shutdown and Storage

After completing a KIT-EMS-01 demonstration, shut down the equipment and store all accessories properly according to the instructions in this chapter. Proper shutdown and storage help prevent damage to cables, CTs, and other devices during transportation.

10.1 Shutting Down the KIT

1. Complete all operations on the PMD-2201, PMC-5231M-4GE, and related demonstration devices.
2. If any external devices are connected, stop the related measurement or communication operations first.
3. Turn off the AC power switch of the KIT-EMS-01.
4. Disconnect the AC power cord.
5. Disconnect any external Ethernet cables, RS-485 cables, or other connection cables.

CAUTION

When disconnecting a cable, hold the connector body and pull it out carefully. Do not pull directly on the cable.

10.2 Storing the Accessories

Before storage, make sure all removable accessories are returned to their designated locations.

Store the accessories as follows:

- **PM-2133D Dedicated CT:** Remove it from the external device conductor and return it to the storage box.
- **RS-485 Quick Connect Cables:** Organize the cables and return them to the storage box.
- **Stylus Pen:** Return it to the storage box.
- **PMC-5231M-4GE Ethernet Cable:** Coil the cable neatly and return it to its original storage location inside the demonstration case.
- **PMC-5231M-4GE 4G Antenna:** Remove the antenna and return it to the storage box.
- **Flexible CT:** Return it to its original storage location.
- **AC Power Cord:** Organize the power cord and return it to its original storage location inside the demonstration case.

**Tip**

The CTs mounted on the demonstration cables inside the case are intended for static CT selection demonstrations. Do not remove them or change their original positions.

10.3 Closing and Transporting the Case

Before closing the demonstration case, complete the following checks:

- Make sure all external connection cables have been disconnected.
- Make sure the accessories described in Section 10.2 have been properly stored.
- Make sure no cables or accessories extend beyond the edge of the case, where they could be pinched when the case is closed.
- Return the protective foam to its original position to protect the devices inside the case.
- After confirming that all accessories are properly stored, close the demonstration case.

 CAUTION

Before transporting the KIT-EMS-01, make sure the demonstration case is completely closed and securely fastened to prevent devices or accessories from becoming loose or being damaged during transportation.

10.4 Long-Term Storage

If the KIT-EMS-01 will not be used for an extended period of time, it is recommended to:

- Disconnect the AC power cord and all external connection cables.
- Store the demonstration case in a dry, well-ventilated location away from high temperature and high humidity.
- Do not place heavy objects on top of the demonstration case.
- Before using the KIT again, check the power cord, connectors, and internal devices for visible damage or loose connections.

If any device or accessory appears abnormal, **do not power on the KIT-EMS-01**. Contact your original supplier or ICP DAS Technical Support for assistance.

11. Troubleshooting

If an abnormal condition occurs while using the KIT-EMS-01, perform the basic checks described in this chapter before requesting technical support.

Symptom	Possible Cause	Recommended Action
KIT-EMS-01 does not respond after power-on	The AC power cord is not connected correctly, or the power switch is not turned on.	Make sure the AC power cord is connected correctly and the power switch is turned on.
PMD-2201 screen is not displayed	The device is still starting up.	Wait until the PMD-2201 completes its startup process before operating it.
PMD-2201 does not display simulated power data	The measurement mode is not set to Software Simulation .	Make sure the PMD-2201 is set to Software Simulation mode.
PMD-2201 does not display PM-2133D real-time measurement data	The PMD-2201 has not been switched to Real-time Measurement mode.	Switch the PMD-2201 to Real-time Measurement mode and wait until the restart is complete.
PM-2133D does not display real-time measurement data	The dedicated PM-2133D CT is not installed correctly on the external device conductor.	Make sure the dedicated CT connected to the PM-2133D and stored in the storage box is being used, and verify that the CT is installed correctly.
Unable to access the PMD-2201 Web interface	The PC and PMD-2201 are not on the same network segment.	Set the PC IP address to 192.168.255.xxx and make sure it does not conflict with 192.168.255.2 .
Unable to access the PMC-5231M-4GE Web interface	The PC and PMC are not on the same network segment.	Set the PC IP address to 192.168.255.xxx and make sure it does not conflict with 192.168.255.1 .
The device Web page cannot be opened in the browser	The Ethernet cable is not connected, the IP address is incorrect, or the device has not completed startup.	Check the Ethernet cable, device power, PC IP settings, and the device IP address entered in the browser.
PMC cannot acquire data from an external RS-485 device	RS-485 wiring, polarity, or communication parameters do not match.	Check the RS-485 wiring and verify the Baud Rate, Data Format, station address , and other communication settings.

Symptom	Possible Cause	Recommended Action
The external RS-485 device still cannot communicate	The external device settings are different from the KIT default settings.	Configure the PMC-5231M-4GE according to the actual communication specifications of the external device.
Unusual odor, smoke, abnormal noise, or excessive heat is detected	A power supply or hardware fault may have occurred.	Immediately turn off the power and stop using the KIT. Do not disassemble or repair the equipment yourself.



Tip

If the issue is related to PMD-2201 measurement mode switching, refer to Chapter 7, “PMD-2201 Operation.”

If the issue is related to Web or RS-485 communication, refer to Chapter 9, “Web Connection.”



CAUTION

If internal wiring is loose, a device is damaged, or the problem cannot be resolved using the checks above, stop using the KIT and contact your original supplier or ICP DAS Technical Support. Do not disassemble, modify, or alter the existing devices or wiring inside the demonstration case.

12. Related Documents and Technical Support

This chapter lists the related product documents for the KIT-EMS-01 to help users quickly locate additional information.

For detailed hardware specifications and complete function descriptions, refer to the official **Datasheets** and **User Manuals** for each product.

12.1 Related Product Documents

For complete information about device configuration, wiring, and functions, refer to the corresponding official product documents:

KIT-EMS-01 Datasheet	PMD-2201 User Manual	PMC / PMC Webpage User Manual	PM-2133D User Manual	PM-3133 User Manual
				

12.2 Technical Support

If the problem cannot be resolved after following the instructions in this manual, prepare the following information before contacting your original supplier or ICP DAS Technical Support:

- KIT-EMS-01 model and serial number
- Model number of the device experiencing the problem
- Description of the abnormal condition
- Relevant screen images or error messages
- For communication-related problems, the current IP or RS-485 settings

Providing complete information will help technical support personnel identify and troubleshoot the problem more efficiently.

Appendix A. Internal Wiring Diagrams

This appendix provides reference information for the main internal connections, communication interfaces, and maintenance of the KIT-EMS-01. It is intended primarily for FAEs, distributors, and personnel with appropriate technical knowledge.

For standard product demonstrations, users do not need to rewire the KIT or modify the existing device settings according to this appendix.

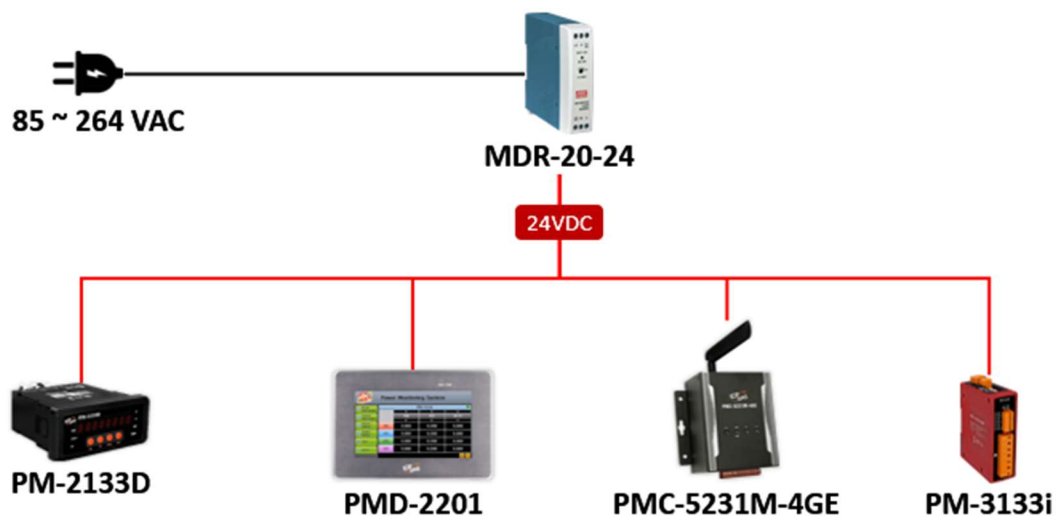
⚠ CAUTION

The main devices, wiring, and demonstration settings of the KIT-EMS-01 are preconfigured before shipment. Unless maintenance or troubleshooting is required, do not disassemble the equipment, alter internal devices, or modify the existing wiring.

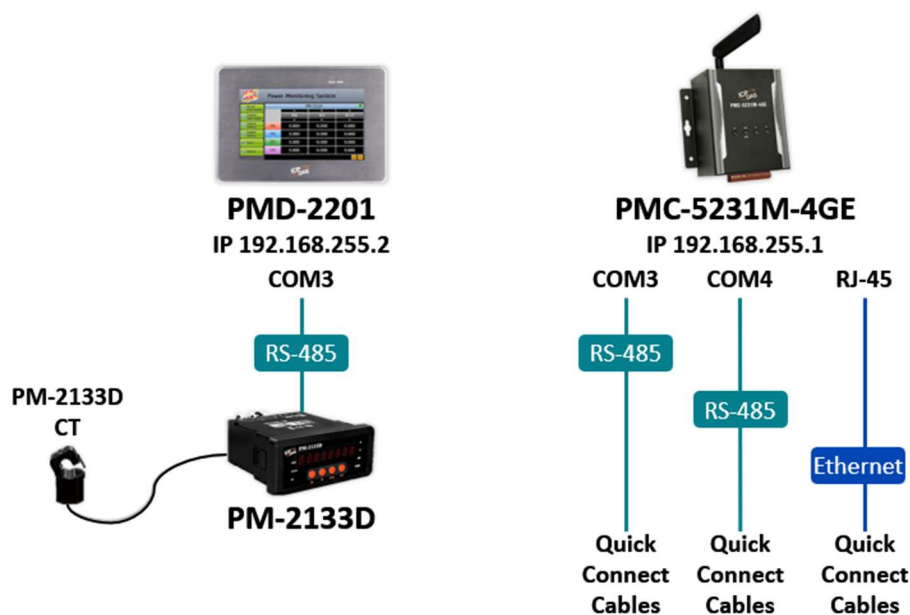
A.1 Internal Wiring Diagrams

The internal wiring diagrams are provided for maintenance, troubleshooting, and verification of the existing internal connections.

Power Wiring Diagram



Signal Wiring Diagram



 Note

These wiring diagrams are intended for equipment maintenance, troubleshooting, and internal wiring verification. They are not part of the standard demonstration procedure.

A.2 Safety Check Before Maintenance

Before inspecting any internal device or wiring, complete the following steps:

1. Turn off the power to the KIT-EMS-01.
2. Disconnect the AC power cord.
3. Disconnect all external Ethernet, RS-485, and other external cables.
4. Make sure the external measurement device has been separated from the dedicated PM-2133D CT.
5. Wait until all devices have completely stopped operating before beginning the inspection.

 WARNING

Do not disassemble or modify internal power wiring while the equipment is energized.

A.3 Basic Hardware Inspection

If an abnormal condition occurs and the shutdown and maintenance preparation described in Section A.2 has been completed, perform the following basic hardware checks.

Power and Device Status

- Check the AC power cord, power inlet, and power switch for looseness or damage.
- Make sure the main modules inside the demonstration case are securely mounted and are not visibly loose or detached.
- When power is reapplied for testing, make sure the PMD-2201, PMC-5231M-4GE, PM-2133D, and other devices can start normally.

PM-2133D and CT

- Check the existing connection between the dedicated PM-2133D CT and the power meter for looseness or damage.
- Inspect the CT signal cable, connector, and physical condition.
- For real-time measurement, make sure the dedicated PM-2133D CT stored in the storage box is being used.
- Make sure the PM-2133D can display measurement information normally.

PMC-5231M-4GE Communication Interfaces

- Check the RS-485 cables and connectors for COM3 / COM4 for looseness.
- When demonstrating communication with an external RS-485 device, verify that the signal polarity and wiring are correct.
- Check that the Ethernet cable and RJ-45 connector are securely connected.
- If the hardware connection appears normal but communication still fails, verify that the communication parameters match the external device.

PMD-2201 and Network Connection

- Check that the PMD-2201 Ethernet cable and connector are secure.
- Make sure the touchscreen displays correctly and responds to operation.
- If the hardware connection is normal but Web access is unavailable, refer to Chapter 9, “Web Connection,” and verify the network settings.



Tip

For the default IP addresses, RS-485 interfaces, and communication parameters of the PMD-2201 and PMC-5231M-4GE, refer to Section 4.2, “Default Communication Settings.” These settings are not repeated in this appendix.

** CAUTION**

If internal wiring is disconnected, a connector is damaged, a module cannot start, or another obvious hardware problem is found, do not replace components or modify the original wiring yourself. Stop using the KIT and contact your original supplier or ICP DAS Technical Support.