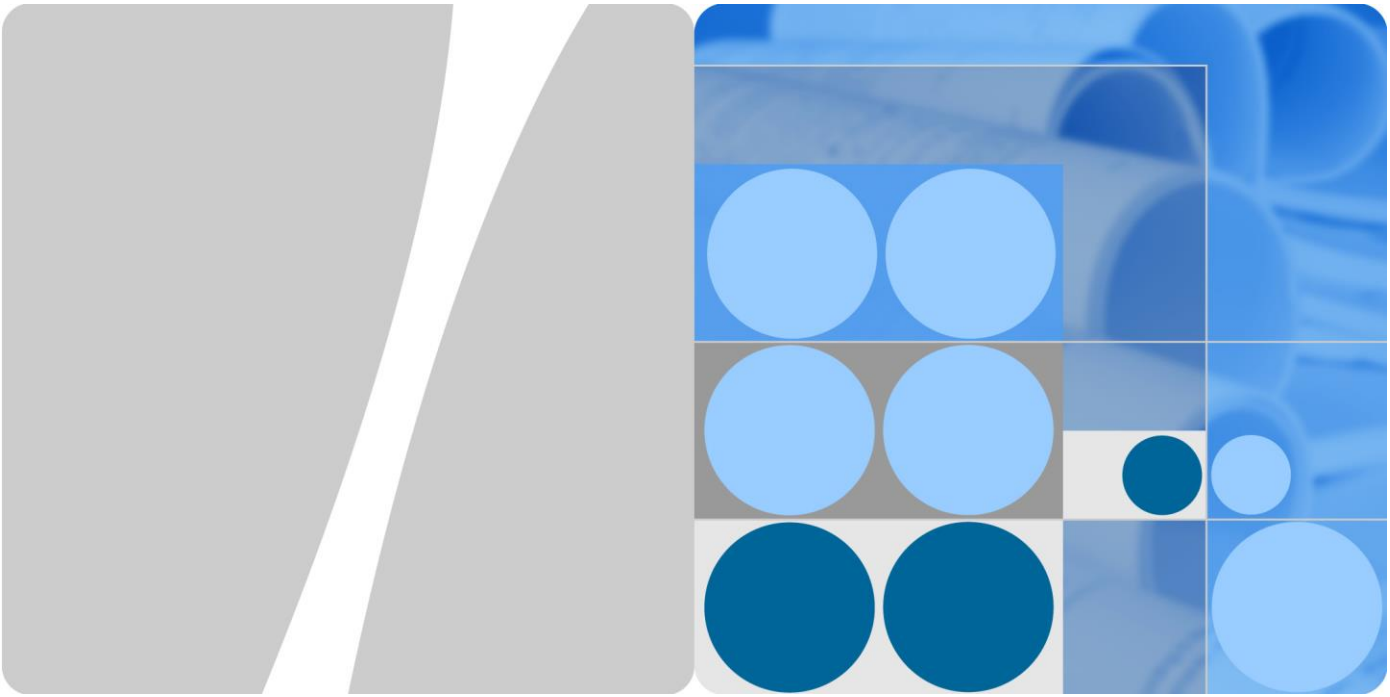


Part Number: 31010VJY



PLC CCO01A

User Manual

Issue 03
Date 2017-07-15

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About This Document

Purpose

This document introduces the installation, operation, maintenance, and troubleshooting of the PLC CCO01A (PLC CCO for short). Get familiar with the PLC CCO features, functions, and safety precautions provided in this document before installing and operating the PLC CCO.

Keep the hard copy of this document properly for future reference. You can also download the latest manual from <http://support.huawei.com>.






Figures used in this document are for reference only.

Intended Audience

This document is intended for photovoltaic (PV) power station personnel and qualified electrical technicians.

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
 DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
 NOTE	Calls attention to important information, best practices and

Symbol	Description
	tips. NOTE is used to address information not related to personal injury, equipment damage, or environment deterioration.

Change History

Changes between document issues are cumulative. The latest document issue contains all the changes made in earlier issues.

Issue 03 (2017-07-15)

Added the description about the application of the PLC CCO module in the SmartACU2000B smart array controller.

Issue 02 (2016-01-10)

This issue adds content about the installation and electrical connections for the PLC CCO used in a SUN2000 communication box.

Issue 01 (2015-08-15)

This issue is the first official release.

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1 Safety Precautions

Personnel Requirements

- Only qualified and trained electrical technicians are allowed to install and operate the PLC CCO.
- Operators should understand the components and functioning of a grid-tied PV power system, and they should be familiar with relevant local standards.

Label Protection

Do not remove or damage the bar code and label on the PLC CCO because they contain important product information.

Installation



NOTICE

Read this document before installation. Huawei shall not be liable for any consequence caused by violation of the regulations specified in this document.

-
- Before installation and cable connections of the PLC CCO, ensure that the PLC CCO is not connected to a power supply and is not powered on.
 - Before connecting cables, ensure that the switch to be connected to the PLC CCO AC power cable is off.
 - Install the PLC CCO in an environment with good ventilation to ensure efficient and long-term system performance.
 - Ensure that the PLC CCO is free from strong electromagnetic interference.
 - Ensure that the PLC CCO is away from heat sources.
 - Ensure that the PLC CCO air exhaust vents are free from blockage.

Operation



NOTICE

Perform operations in strict accordance with safety precautions specified in this document and other relevant documents.

Follow local laws and regulations when operating the device.

Maintenance and Replacement

- A faulty PLC CCO requires overall maintenance. If the PLC CCO is faulty, contact the supplier or Huawei technical support.
- Maintain the PLC CCO with sufficient knowledge of this document and proper tools and testing equipment.
- When maintaining the PLC CCO, observe ESD precautions.
- Before replacing the PLC CCO and maintaining PLC CCO cables, power off the PLC CCO.

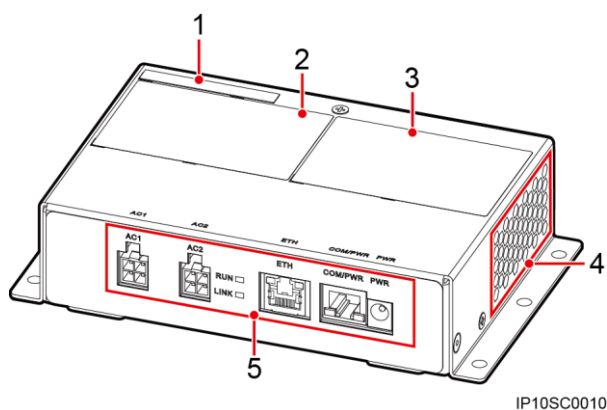
2 Overview

2.1 Product Overview

Exterior

Figure 2-1 shows a PLC CCO.

Figure 2-1 PLC CCO exterior



- | | | |
|-----------------------|--------------------------|-------------------------------|
| (1) ESN label | (2) Product label | (3) Qualification certificate |
| (4) Air exhaust vents | (5) Ports and indicators | |

Functions

- The PLC CCO can connect to SUN2000 inverters that support power line communication (PLC) functions to transmit data over the power line.
- The PLC CCO can connect to the data collector using an RS485 communications cable to transmit data and convert between PLC and RS485 communication.

Benefits

The PLC networking mode uses the existing power line for communication and does not require additional communications cable, which reduces the construction and maintenance costs and improves communication reliability and efficiency.

2.2 Networking

A PLC module consists of the station (STA) and central controller (CCO). [Figure 2-2](#) and [Figure 2-3](#) show the typical PLC networking.

- As the slave unit of the PLC, the STA is installed inside the SUN2000 as a communications board. The STA converts the RS485 communications data received from the inverter monitoring board and sends the converted data to the AC power cable. In addition, it converts the data received from the AC power cable and sends the converted data to the inverter monitoring board.
- As the master unit of the PLC, the CCO is installed in a SUN2000 communication box or box-type transformer as a standalone device. The CCO converts RS485 communications data received from the data collector and sends the converted data to the AC power cable. In addition, it converts the data received from the AC power cable and sends the converted data to the data collector.



NOTE

- The PLC CCO can connect to a maximum of 80 PLC STAs. Generally, a PLC CCO is configured for each grid-tied point.
- The PLC CCO supports only the Modbus RTU protocol.
- The AC port on the PLC CCO supports the highest input line voltage of 800 V.

Figure 2-2 Scenario with a double-column transformer

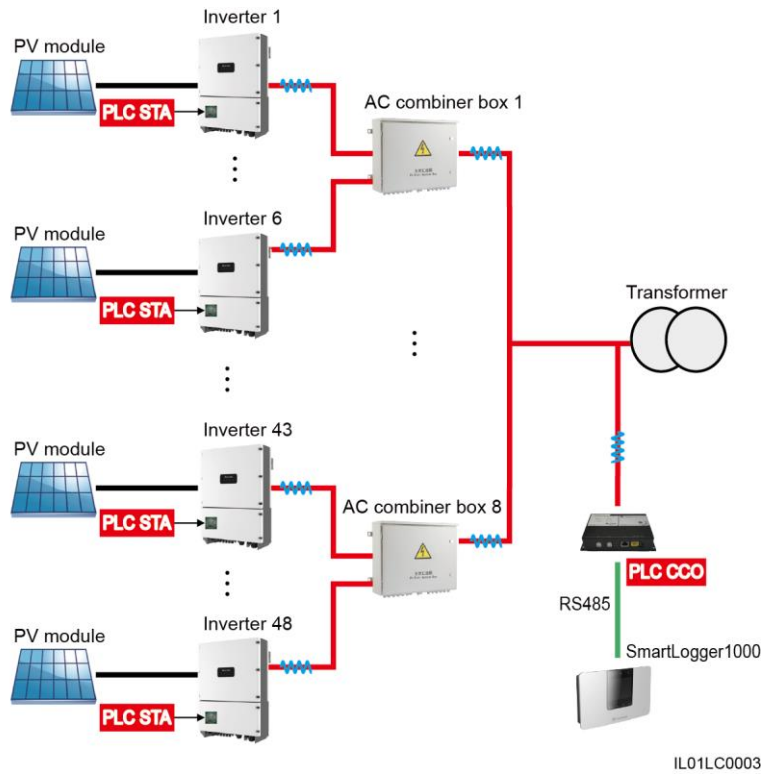
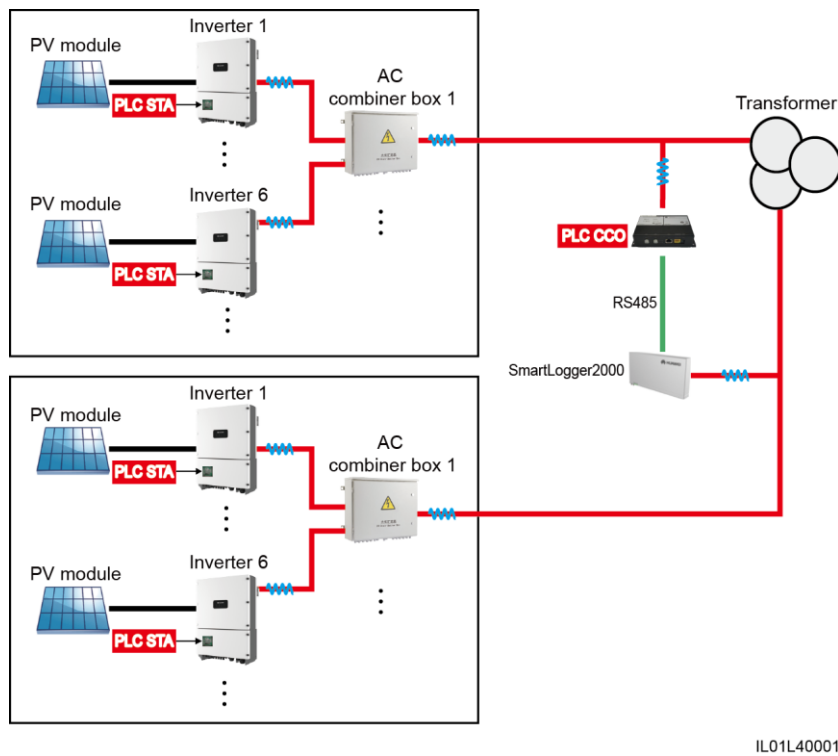


Figure 2-3 Scenario with a dual-split transformer

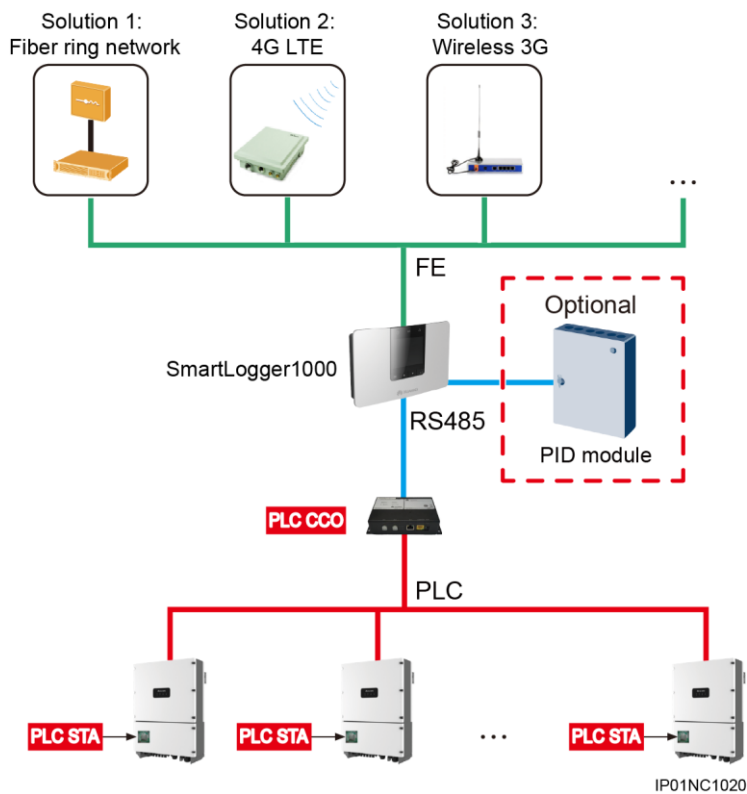


 **NOTICE**

- When applying in the scenario with a double-column transformer, the PLC CCO needs to work with the SmartLogger1000, and the voltage between busbars should be less than or equal to 500 V AC.
- When applying in the scenario with a dual-split transformer, the PLC CCO needs to work with the SmartACU2000B smart array controller, and the voltage between busbars should be less than or equal to 800 V AC.
- This document describes the PLC networking application using the 500 V AC scenario as an example. For the 800 V AC scenario, see the *SmartACU2000B Smart Array Controller User Manual*.

Figure 2-4 shows the location of the PLC CCO in a PV array network.

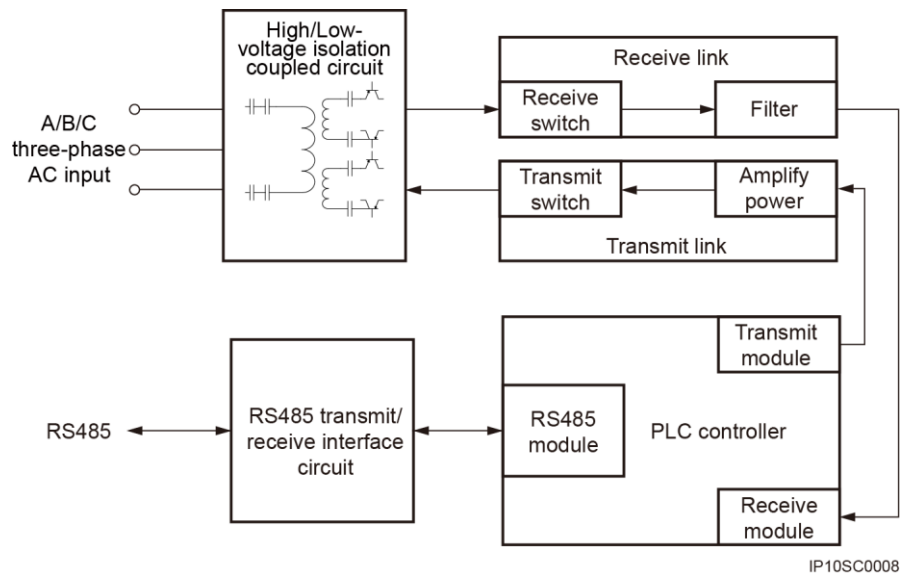
Figure 2-4 Location of the PLC CCO in a PV array network



2.3 Working Principles

Figure 2-5 shows the PLC CCO circuit diagram.

Figure 2-5 Circuit diagram



The working principles of the PLC CCO are as follows:

- Uses the high/low voltage isolation coupled circuit to isolate low-frequency three-phase AC power from board low voltages, thereby ensuring board safety. In addition, the PLC CCO provides the high-frequency circuit for injecting and extracting PLC signals.
- Filters and processes PLC signals over the receive link. The signals are extracted from the AC power cable.
- Amplifies the power of PLC signals and injects the PLC signals into the AC power cable over the transmit link.
- Converts between PLC and RS485 signals through the PLC controller.
- Provides the channel for sending and receiving RS485 signals over the RS485 transmit/receive interface circuit to communicate with the data collector.

3 Equipment Installation

3.1 Checking Before Installation

Before unpacking, check that the product is intact. After unpacking, check that product and accessories are complete.

Checking Outer Packing Materials

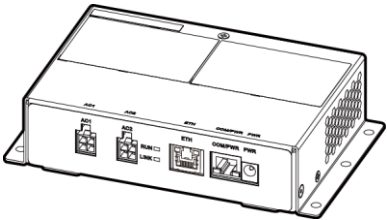
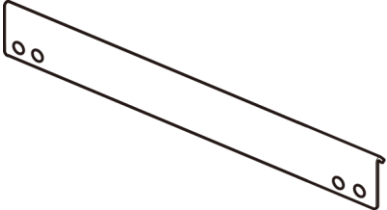
Check the outer packing materials for damage, such as holes and cracks, before unpacking the PLC CCO. If any damage is found, do not unpack the PLC CCO and contact the supplier or Huawei technical support promptly.

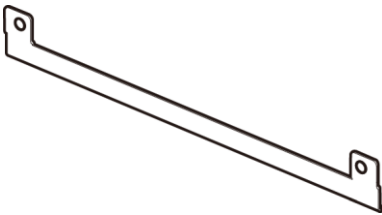
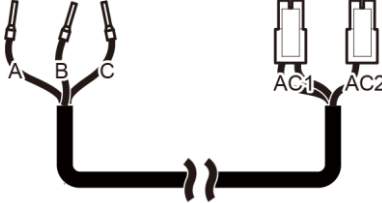

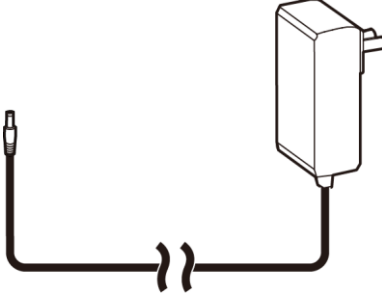

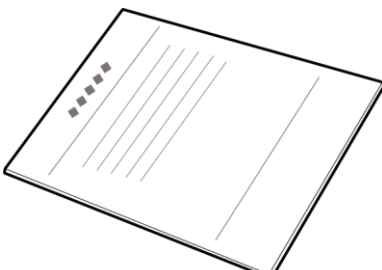
Checking the Product and Accessories

After unpacking the PLC CCO, check whether the product and accessories are intact and complete. If any item is missing or damaged, contact the supplier or Huawei technical support.

[Table 3-1](#) shows the product and accessories included in the delivery.



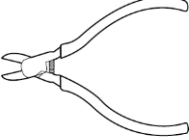

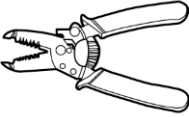
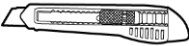
Table 3-1 PLC CCO product and accessories

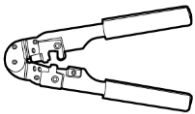


Name	Exterior	Quantity	Description
PLC CCO		1 PCS	N/A
Support 1		1 PCS	Applies when a guide rail is used for the installation.

Name	Exterior	Quantity	Description
Support 2		1 PCS	Applies when a guide rail is used for the installation.
AC power cable		1 PCS	The AC power cable is 1.25 m long.
RS485 communications cable		1 PCS	The RS485 communications cable is 0.8 m long.
Power adapter cable		1 PCS	The power adapter cable is 1.5 m long.
M4x8 screw assembly		8 PCS	Used for device mechanical installation.
Manual		1 PCS	Provides guidance for installing and using the PLC CCO.

3.2 Preparing Tools

Before installing the PLC CCO, prepare tools required for installation and cable connections.

Tool	Model	Function
<p>Torque screwdriver</p> 	<p>Phillips head: M4</p>	<p>Installs and removes PLC CCO screws.</p>
<p>Flat-head screwdriver</p> 	<ul style="list-style-type: none"> • Head width: 3 mm to 3.5 mm • Pole length (excluding the handle): at least 100 mm 	<p>Tightens or loosens screws when installing cables.</p>
<p>Diagonal pliers</p> 	<p>N/A</p>	<p>Cuts cable ties.</p>
<p>Cable tie</p> 	<p>N/A</p>	<p>Binds cables.</p>
<p>Wire stripper</p> 	<p>N/A</p>	<p>Peels cable jackets.</p>
<p>Utility knife</p> 	<p>N/A</p>	<p>Removes packages.</p>

Tool	Model	Function
RJ45 crimping tool 	N/A	Crimps RJ45 connectors.
Multimeter 	N/A	Checks cable connections.
ESD gloves 	N/A	Protect your hands during installation.

3.3 Determining the Installation Position

Basic Requirements

- The installation mode and position must be suitable for the weight (550 g) and dimensions (H x W x D: 100 mm x 169 mm x 39 mm) of the PLC CCO.
- Do not install the PLC CCO in areas with flammable or explosive materials.
- The AC power cable is 1.25 m long. If the AC power cable needs to be used, ensure that the PLC CCO is no more than 1.15 m away from the port to be connected to the AC power cable.
- The RS485 communications cable is 0.8 m long. If the RS485 communications cable needs to be used, ensure that the PLC CCO is no more than 0.7 m away from the port to be connected to the RS485 communications cable.
- The power adapter cable is 1.5 m long. When installing the PLC CCO, ensure that the PLC CCO is no more than 1.4 m away from the AC power port.



NOTE

To prevent insufficient cable length, you are advised to reserve at least 0.1 m when planning the cable route. That is, the cable route length should be no more than the cable length minus 0.1 m.

Installation Environment Requirements

- The ambient temperature must be below 70 ℃, which ensures optimal PLC CCO operation and extends the service life of the PLC CCO.

- The PLC CCO must be installed in a well-ventilated environment to ensure good heat dissipation.

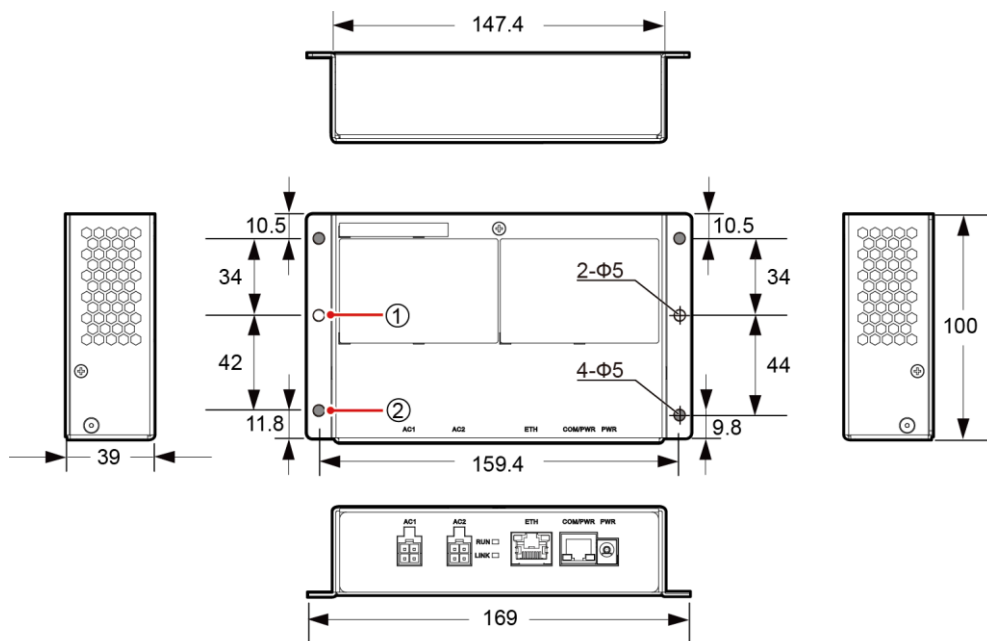
Carrier Requirements

- The carrier where the PLC CCO is installed must be fireproof.
- Do not install the PLC CCO on flammable building materials.
- Ensure that the surface on which the PLC CCO is to be installed is strong enough.

Installation Dimensions

Figure 3-1 shows the PLC CCO installation dimensions.

Figure 3-1 Installation dimensions (unit: mm)



IP10SC0006

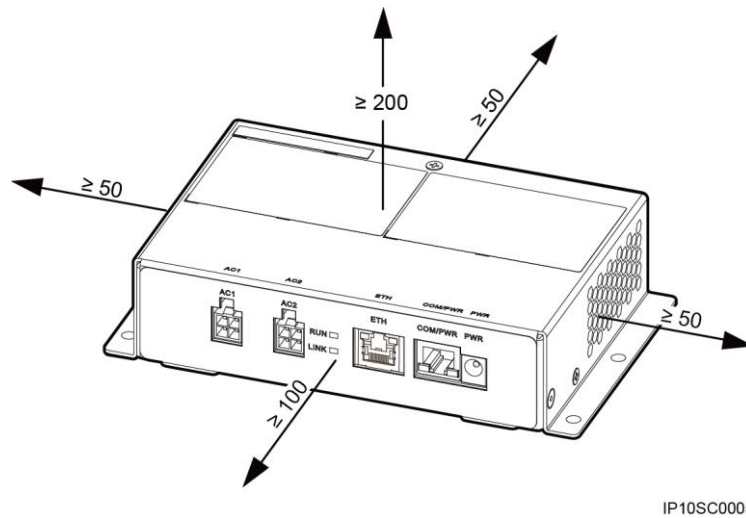
(1) Guide rail mounting hole

(2) Ear mounting hole

Installation Space Requirements

Reserve clearance around the PLC CCO to ensure sufficient space for installation and maintenance. Figure 3-2 shows the recommended installation space.

Figure 3-2 Recommended installation space (unit: mm)



3.4 Installing the PLC CCO Using Mounting Ears (in the SUN2000 Communication Box Scenario)

Prerequisites

The holes planned for installing the PLC CCO meet the installation position requirements.



NOTE

This installation mode applies when the PLC needs to be installed inside a Huawei SUN2000 communication box.

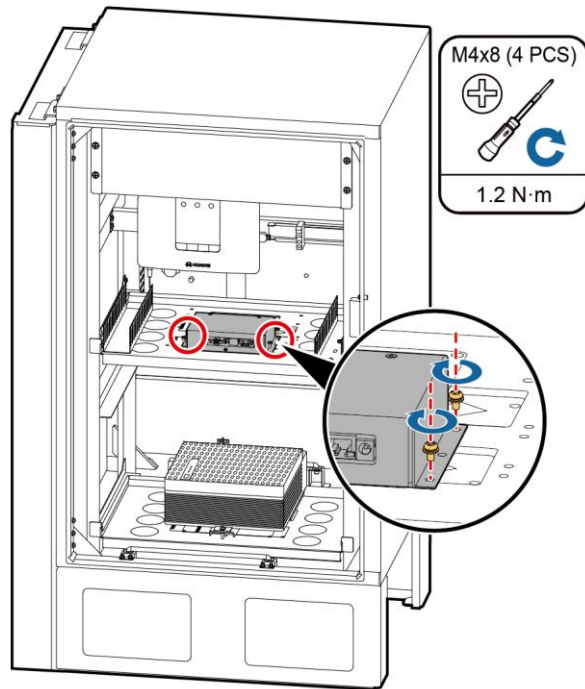
Context

Installing the PLC CCO in a SUN2000 communication box is used as an example to illustrate the ear-mounting installation method.

Procedure

- Step 1** Use four M4x8 screw assemblies to secure the PLC CCO to a torque of 1.2 N m, as shown in [Figure 3-3](#).

Figure 3-3 Ear-mounting the PLC CCO



---End

3.5 Installing the PLC CCO Using Guide Rails (in the Third-Party Device Scenario)

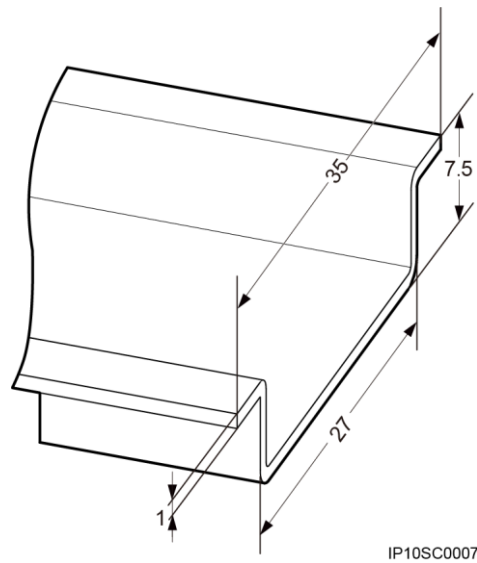
Prerequisites

The guide rails planned for installing the PLC CCO meet the installation position requirements.

NOTE

- Installation using guide rails applies when the PLC CCO needs to be installed in a third-party box-type transformer. If this installation mode is selected, the PLC CCO installation space and securing method need to be planned.
- Guide rails are not delivered with the PLC CCO. If users want to mount the PLC CCO along guide rails, they should prepare 35 mm standard guide rails by themselves. [Figure 3-4](#) shows the guide rail dimensions.

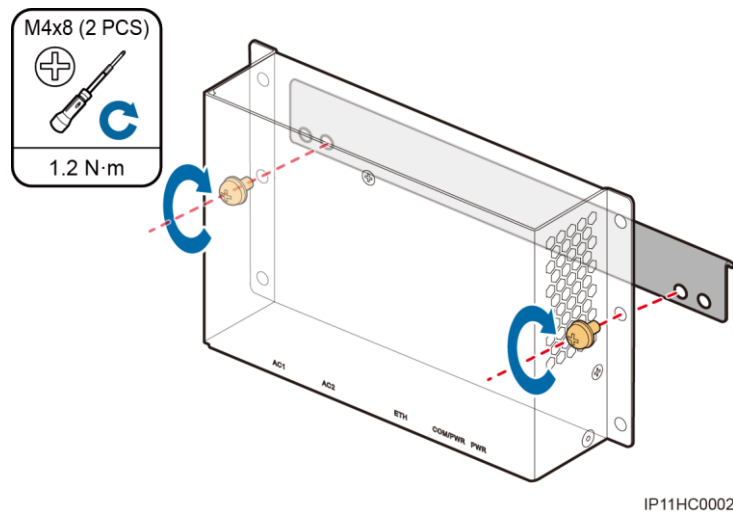
Figure 3-4 Guide rail dimensions (unit: mm)



Procedure

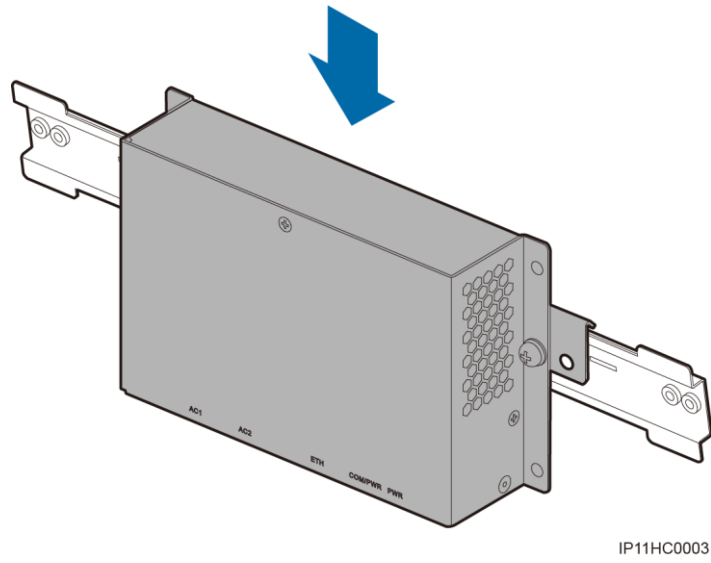
- Step 1** Use two M4x8 screw assemblies to secure the PLC CCO to support 1 to a torque of 1.2 N·m, as shown in [Figure 3-5](#).

Figure 3-5 Securing the PLC CCO



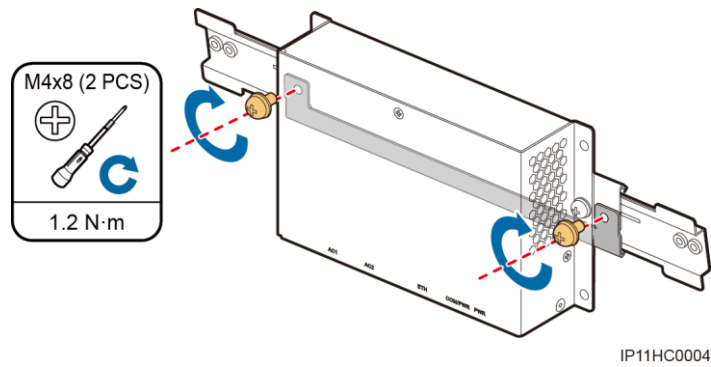
- Step 2** Snap support 1 in the guide rail, as shown in [Figure 3-6](#).

Figure 3-6 Clipping support 1



Step 3 Use two M4x8 screw assemblies to secure support 2 to support 1 to a torque of 1.2 N·m, as shown in [Figure 3-7](#).

Figure 3-7 Securing support 2



----End

4 Electrical Connections



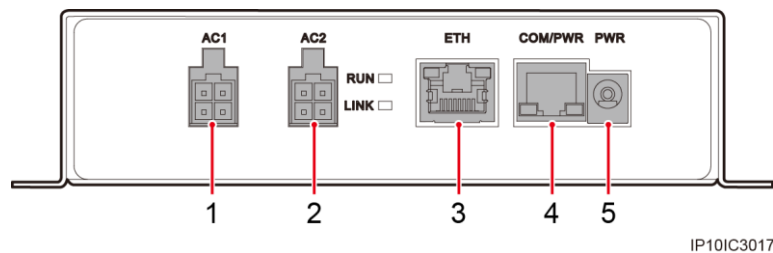
NOTICE

The cable colors and models shown in cable connections in this chapter are for reference only. Select cables according to local cable specifications.

4.1 Port Description

Figure 4-1 shows the PLC CCO ports and Table 4-1 describes them.

Figure 4-1 PLC CCO ports



IP10IC3017

Table 4-1 Port description

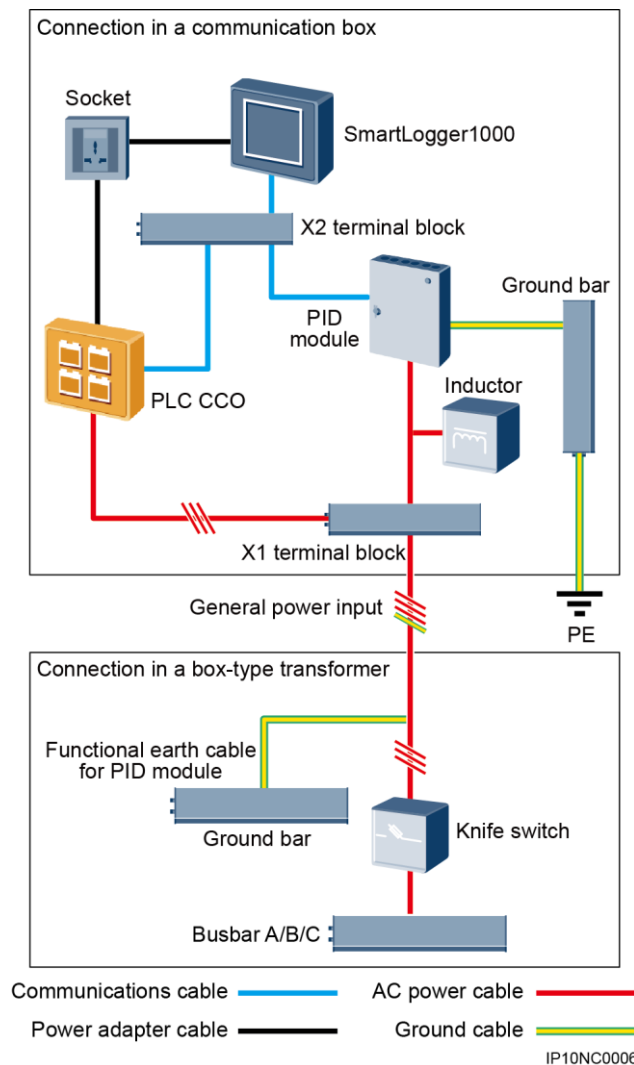
No.	Port Name (Silk Screen)	Description
1	AC power cable port 1 (AC1)	Connects phase A input and phase B input.
2	AC power cable port 2 (AC2)	Connects phase C input.
3	FE communications port (ETH)	Protected by a security mechanism.
4	RS485 communications port (COM/PWR)	Receives and sends communication data.

No.	Port Name (Silk Screen)	Description
5	Power port (PWR)	Power input connector.

4.2 Connecting Cables (in the SUN2000 Communication Box Scenario)

Figure 4-2 shows the cable connections for the PLC CCO used in a SUN2000 communication box.

Figure 4-2 Cable connections for the PLC CCO used in a SUN2000 communication box



NOTE

- The PID module and inductor are configured only in the SUN2000 communication box (with the PID module) and are preinstalled before delivery.

- When the PLC CCO applies in the SUN2000 communication box scenario, the voltage between busbars should be less than and equal to 500 V AC.
- The general input power cable for the SUN2000 communication box needs to be prepared by yourself. You are advised to use a four-core armored cable with the operating voltage to the ground greater than or equal to 600 V and the cross-sectional area of a single core wire being 4 mm².
- The cable from the busbar to the knife fuse switch needs to be prepared by yourself. You are advised to use a three-core armored cable with the operating voltage to the ground greater than or equal to 600 V and the cross-sectional area of a single core wire being 4 mm².

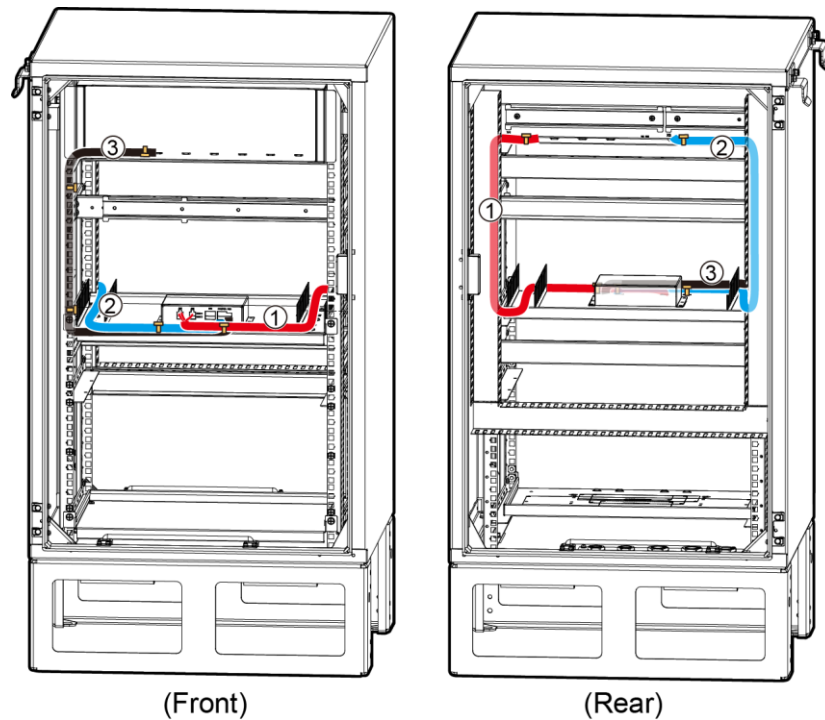
Table 4-2 describes the components to be configured in a SUN2000 communication box scenario.

Table 4-2 Components to be configured in a SUN2000 communication box scenario

Component		Model or Specifications	Quantity
PLC CCO		PLC CCO01A	1 PCS
Data collector		SmartLogger1000	1 PCS
Knife switch	Fuse	Rated voltage \geq 500 V; rated current: 6 A	3 PCS
	Knife switch box	Rated voltage \geq 500 V; rated current \geq 6 A; number of phases: three	1 PCS

Figure 4-3 shows the cable routes for the PLC CCO used in a SUN2000 communication box.

Figure 4-3 Cable routes (SUN2000 communication box scenario)



IP131C1001

- (1) AC power cable (2) RS485 communications cable (3) Power adapter cable

4.2.1 Connecting the AC Power Cable

Prerequisites



NOTICE

Before connecting the AC power cable, ensure that the upstream switch of the PLC CCO AC power cable is turned off.

The AC power cable is available. The cable can be:

- PLC CCO AC power cable delivered with the communication box. The cable number is 04092564-01^a or XXXXXXXX-12^b.



NOTE

- a: The corresponding communication box models are PDU8000-0010ACV5-CCA005 and PDU8000-0010ACV5-CCA007.
- b: The corresponding communication box models are PDU8000-0010ACV5-CCA002 and PDU8000-0010ACV5-CCA003.
- XXXXXXXX varies depending on the manufacturer.
- AC power cable delivered with the PLC CCO.

 **NOTE**

The AC power cable is 1.25 m long. If the AC power cable needs to be used, ensure that the PLC CCO is no more than 1.15 m away from the port to be connected to the AC power cable.

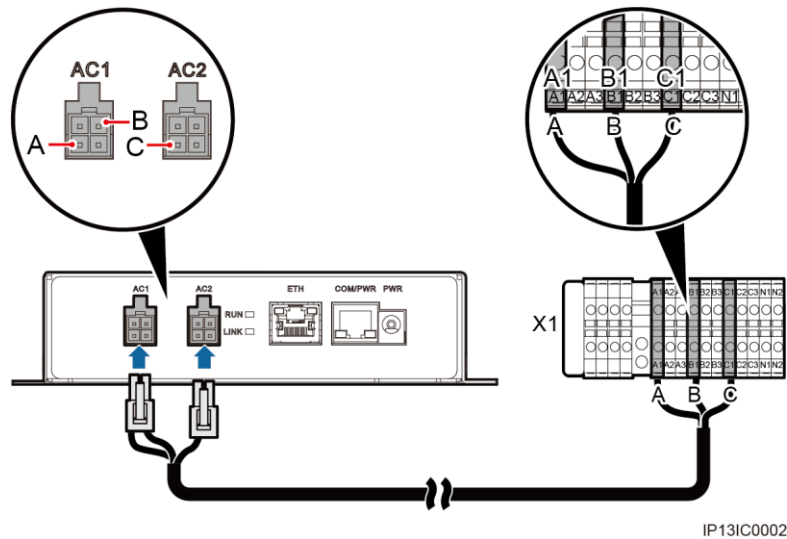
Procedure

Step 1 Connect the PLC CCO AC power cable, as shown in [Figure 4-4](#).

 **NOTE**

Ensure that the PLC CCO AC power cable is securely connected.

Figure 4-4 Connecting the AC power cable



----End

4.2.2 Connecting the RS485 Communications Cable

Prerequisites

The RS485 communications cable delivered with the communication box is available. The cable number is 04092564-02^a or XXXXXXXX-13^b.

 **NOTE**

- a: The corresponding communication box models are PDU8000-0010ACV5-CCA005 and PDU8000-0010ACV5-CCA007.
- b: The corresponding communication box models are PDU8000-0010ACV5-CCA002 and PDU8000-0010ACV5-CCA003.
- XXXXXXXX varies depending on the manufacturer.

Context

[Figure 4-5](#) shows the connector when the surface without the fastener faces upwards. [Table 4-3](#) defines the cable sequence numbers and pins.

Figure 4-5 Connector

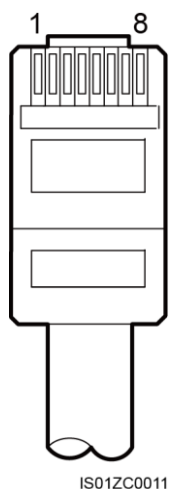


Table 4-3 Pin definitions

No.	Pin Definition	Description
1	Reserved	N/A
2	Reserved	N/A
3	12 Vin, power	N/A
4	RS485+, RS485 differential signal +	Connects to the COM + port on the SmartLogger1000 through the A4 wiring terminal.
5	RS485-, RS485 differential signal -	Connects to the COM - port on the SmartLogger1000 through the B4 wiring terminal.
6	Reserved	N/A
7	Reserved	N/A
8	PGND	N/A

Procedure

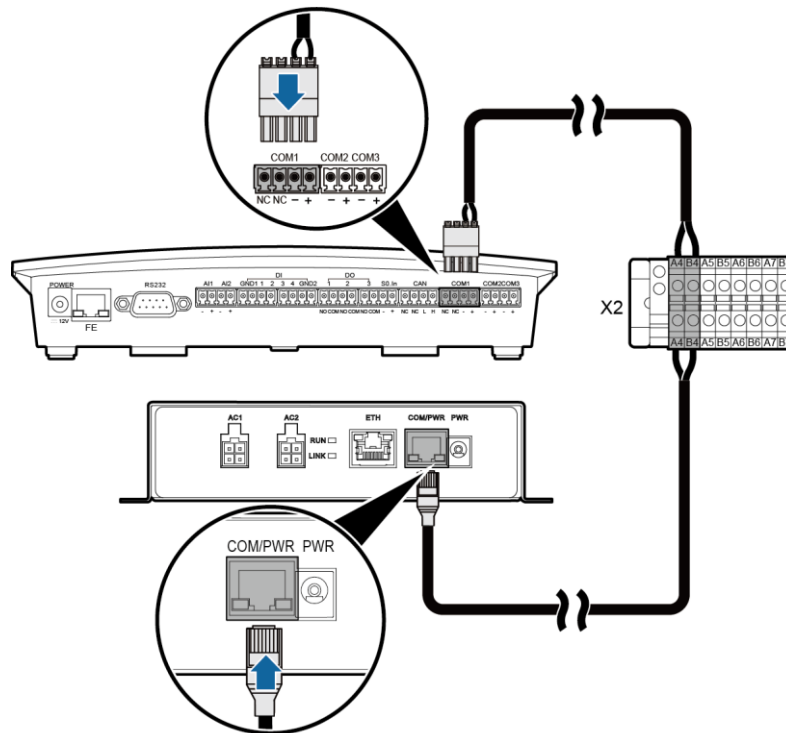
Step 1 Connect the RS485 communications cable to the PLC CCO, as shown in [Figure 4-6](#).



NOTE

- The PLC CCO supports only the Modbus RTU protocol.
- Connect the RS485 communications cable to A4 (RS485+) and B4 (RS485-) on X2 terminal block.
- Ensure that the RS485 communications cable is securely and reliably connected.

Figure 4-6 Connecting the RS485 communications cable



IP101C3020

----End

4.2.3 Connecting the Power Adapter Cable

Prerequisites



NOTICE

Before connecting the power adapter cable, ensure that the upstream switch of the PLC CCO power port is turned off.

The power adapter cable delivered with the PLC CCO is available.



NOTE

The power adapter cable is 1.5 m long. When installing the PLC CCO, ensure that the PLC CCO is no more than 1.4 m away from the AC power port.

Procedure

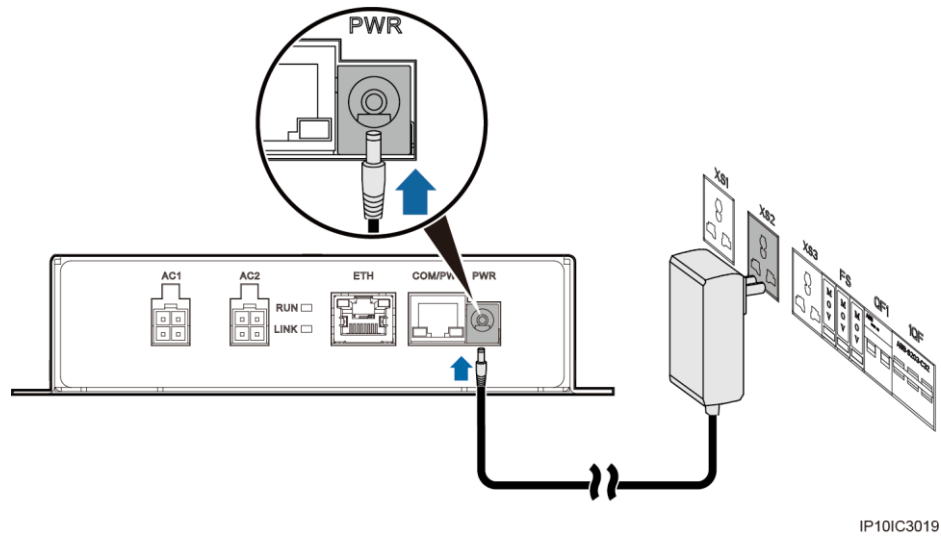
Step 1 Connect the PLC CCO power adapter cable, as shown in [Figure 4-7](#).



NOTE

Ensure that the PLC CCO power adapter cable is securely and reliably connected.

Figure 4-7 Connecting the power adapter cable

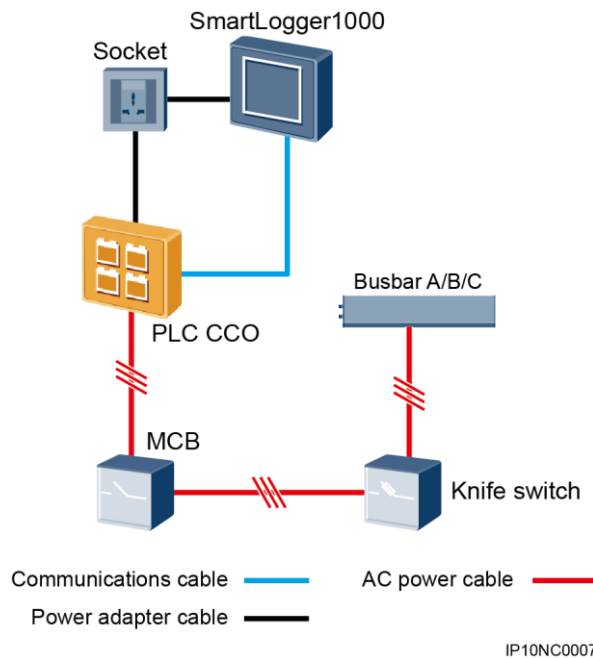


----End

4.3 Connecting Cables (in the Third-Party Device Scenario)

Figure 4-8 shows the cable connections for the PLC CCO used in a third-party device.

Figure 4-8 Connecting cables to the PLC CCO used in a third-party device



 **NOTE**

- The cable from the knife fuse switch to the MCB needs to be prepared by yourself. You are advised to use a three-core armored cable with the operating voltage to the ground greater than or equal to 600 V and the cross-sectional area of a single core wire being 4 mm².
- The cable from the busbar to the knife fuse switch needs to be prepared by yourself. You are advised to use a three-core armored cable with the operating voltage to the ground greater than or equal to 600 V and the cross-sectional area of a single core wire being 4 mm².

Table 4-4 describes the components to be configured in a third-party device scenario.

Table 4-4 Components to be configured in a third-party device scenario.

Component		Model or Specifications	Quantity
PLC CCO		PLC CCO01A	1 PCS
Data collector		SmartLogger1000	1 PCS
Knife switch	Fuse	Rated voltage \geq 500 V; rated current: 6 A	3 PCS
	Knife switch box	Rated voltage \geq 500 V; rated current \geq 6 A; number of phases: three	1 PCS
Socket		Matches the power adapter	2 PCS
MCB		Rated voltage \geq 480 V; rated current \geq 6 A; number of phases: three	1 PCS

4.3.1 Connecting the AC Power Cable

Prerequisites



NOTICE

Before connecting the AC power cable, ensure that the upstream switch of the PLC CCO AC power cable is turned off.

The AC power cable delivered with the PLC CCO is available.

 **NOTE**

The AC power cable is 1.25 m long. If the AC power cable needs to be used, ensure that the PLC CCO is no more than 1.15 m away from the port to be connected to the AC power cable.

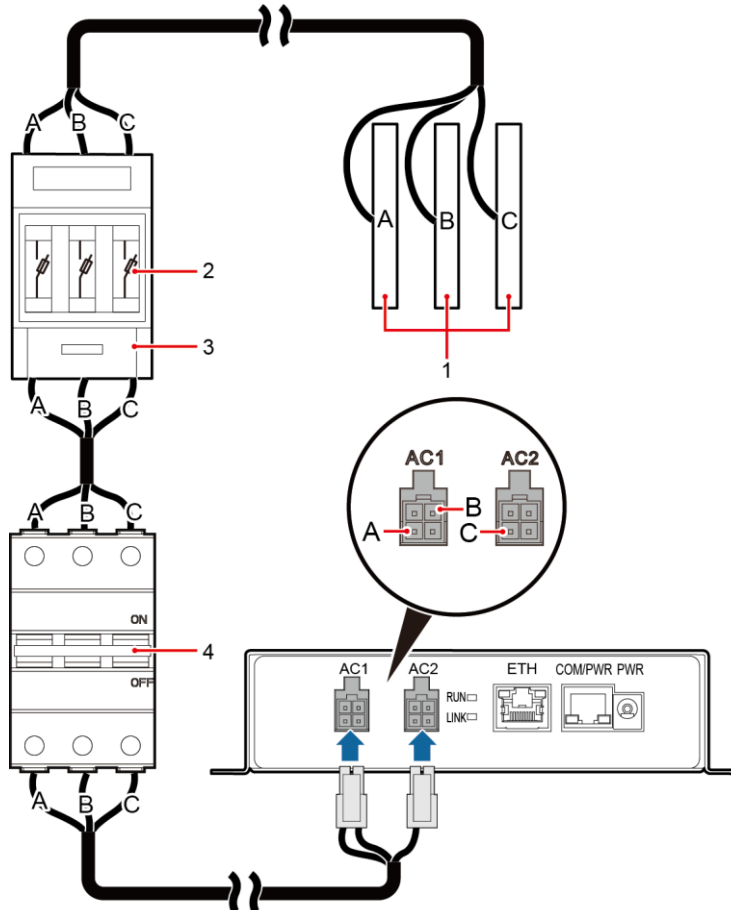
Procedure

Step 1 Connect the PLC CCO AC power cable, as shown in [Figure 4-9](#).

NOTE

- Ensure that the PLC CCO AC power cable is securely connected.
- It is recommended that a circuit breaker be reserved for the busbar to connect a cable to the PLC CCO. If such a circuit breaker is not reserved, connect the PLC CCO AC power cable from the circuit breaker output end in the middle of the busbar.

Figure 4-9 Connecting the AC power cable



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- | | |
|----------------------|----------|
| (1) Busbar A/B/C | (2) Fuse |
| (3) Knife switch box | (4) MCB |

----End

4.3.2 Connecting the RS485 Communications Cable

Prerequisites

The RS485 communications cable delivered with the PLC CCO is available.

 **NOTE**

- The RS485 communications cable is 0.8 m long. If the RS485 communications cable needs to be used, ensure that the PLC CCO is no more than 0.7 m away from the port to be connected to the RS485 communications cable.
- If the RS485 communications cable needs to be prepared by the customer, it is recommended that a CAT 5E outdoor shielded network cable with a diameter less than 9 mm, internal resistance no greater than 1.5 ohms/10 m, and a shielded RJ45 connector be used.

The cable terminal block delivered with the SmartLogger1000 is available.

Context

Figure 4-10 shows the connector when the surface without the fastener faces upwards. Table 4-5 defines the cable sequence numbers and pins.

Figure 4-10 Connector

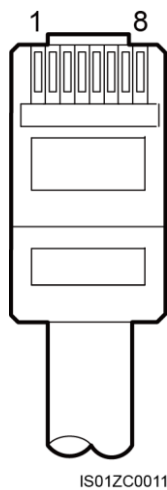


Table 4-5 Pin definitions

No.	Pin Definition	Description
1	Reserved	N/A
2	Reserved	N/A
3	12 Vin, power	N/A
4	RS485+, RS485 differential signal +	Connects to the COM + port of the SmartLogger1000.
5	RS485-, RS485 differential signal -	Connects to the COM - port of the SmartLogger1000.
6	Reserved	N/A
7	Reserved	N/A
8	PGND	N/A

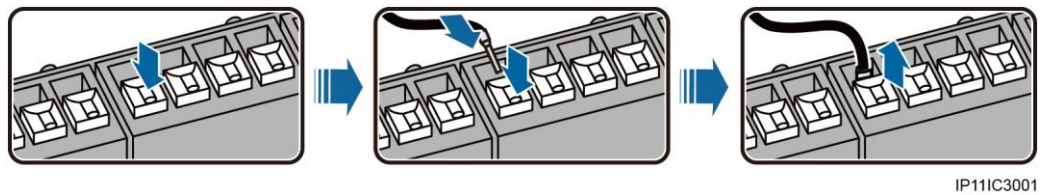
Procedure

Step 1 Connect a cable to the terminal block, as shown in [Figure 4-11](#).

Connect RS485+ to COM + port of the SmartLogger1000 and connect RS485- to COM - port of the SmartLogger1000.

1. Press the white contact plate of the corresponding wiring terminal to flip the metal spring inside the wiring terminal.
2. Insert the cord end terminal into the wiring terminal.
3. Release the white contact plate to fasten the cable.

Figure 4-11 Cable connection for the terminal block

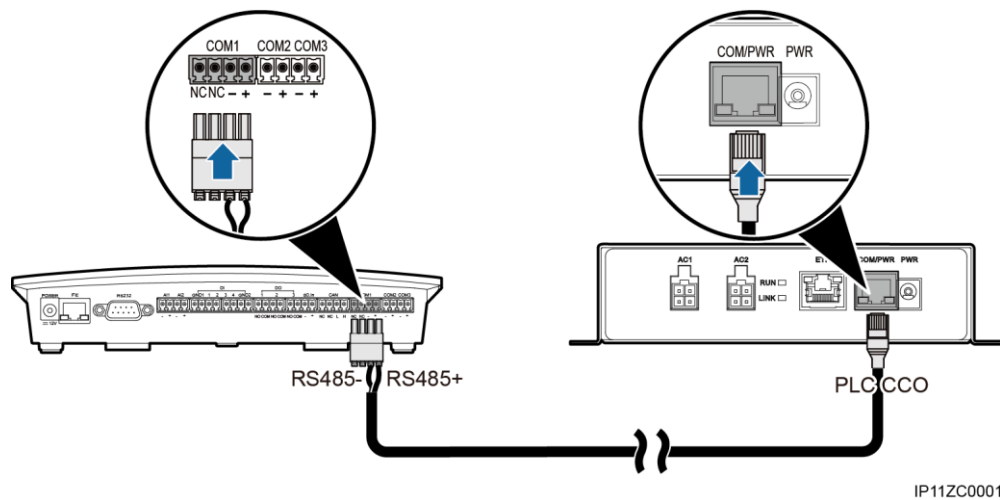


Step 2 Connect the RS485 communications cable to the PLC CCO, as shown in [Figure 4-12](#).

 **NOTE**

- The PLC CCO supports only the Modbus RTU protocol.
- Ensure that the RS485 communications cable is securely and reliably connected.

Figure 4-12 Connecting the RS485 communications cable



----End

4.3.3 Connecting the Power Adapter Cable

Prerequisites



NOTICE

Before connecting the power adapter cable, ensure that the upstream switch of the PLC CCO power port is turned off.

The power adapter cable delivered with the PLC CCO is available.



NOTE

The power adapter cable is 1.5 m long. When installing the PLC CCO, ensure that the PLC CCO is no more than 1.4 m away from the AC power port.

Procedure

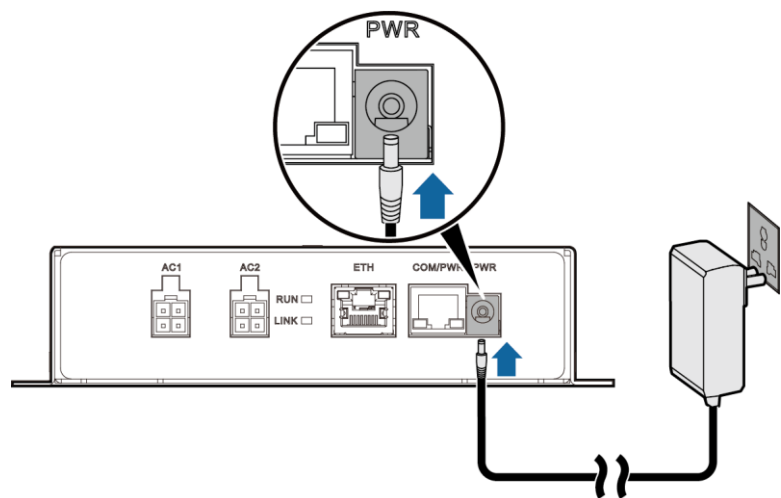
Step 1 Connect the PLC CCO power adapter cable, as shown in [Figure 4-13](#).



NOTE

Ensure that the PLC CCO power adapter cable is securely and reliably connected.

Figure 4-13 Connecting the power adapter cable



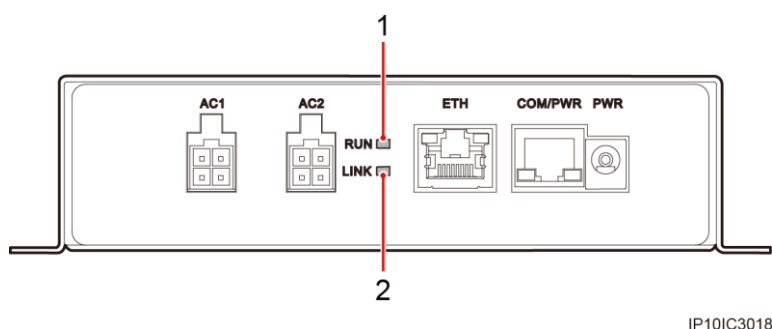
----End

5 System Operation

5.1 Indicator Position and Meaning

Figure 5-1 shows the position of indicators, and Table 5-1 describes the indicators.

Figure 5-1 Indicator position



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Table 5-1 Meaning

No.	Indicator	Status	Meaning
1	RUN	Off	The power supply is disconnected.
		Steady green	The PLC CCO is running properly.
2	LINK	Off	No data is transmitted.
		Steady green or blinking	The PLC CCO is receiving or transmitting data.

5.2 Checking Before Power-On

To ensure the normal running of the PLC CCO, check the PLC CCO before powering it on.
Check the PLC CCO according to [Table 5-2](#).

Table 5-2 Checking before power-on

No.	Check Item	Check Result
1	The PLC CCO is properly installed.	<input type="checkbox"/> Compliant <input type="checkbox"/> Incompliant
2	The PLC CCO AC power cable is securely and reliably connected.	<input type="checkbox"/> Compliant <input type="checkbox"/> Incompliant
3	The RS485 communications cable is securely and reliably connected.	<input type="checkbox"/> Compliant <input type="checkbox"/> Incompliant
4	The PLC CCO power adapter cable is securely and reliably connected.	<input type="checkbox"/> Compliant <input type="checkbox"/> Incompliant
5	The upstream fuse of the PLC CCO AC power cable is connected.	<input type="checkbox"/> Compliant <input type="checkbox"/> Incompliant
6	The upstream switches of the PLC CCO power port and PLC CCO AC power cable are off.	<input type="checkbox"/> Compliant <input type="checkbox"/> Incompliant
7	Routing for the AC power cable and signal cable meets the requirements for routing strong-current and weak-current cables and complies with the cable routing plan.	<input type="checkbox"/> Compliant <input type="checkbox"/> Incompliant
8	Cables are bound neatly, and cable ties are secured evenly and properly in the same direction.	<input type="checkbox"/> Compliant <input type="checkbox"/> Incompliant
9	There are no unnecessary adhesive tape or cable ties on cables.	<input type="checkbox"/> Compliant <input type="checkbox"/> Incompliant

5.3 Powering On and Commissioning the PLC CCO

Context

This section uses a PLC CCO to be connected to the SmartLogger1000 as an example to illustrate how to power on and commission the PLC CCO.

Procedure

Step 1 Turn on the upstream switches of the PLC CCO power port and PLC CCO AC power cable.



NOTE

Ensure that the RUN indicator is steady green, indicating that the PLC CCO power system is running properly.

Step 2 Add the PLC device on the SmartLogger1000 and set the PLC CCO baud rate. For details, see *SmartLogger1000 User Manual*.



NOTE

- For details about how to add a PLC on the SmartLogger1000, see the *SmartLogger1000 User Manual*.
- If the software version is SUN2000 V100R001C72SPC003 or later, the PLC CCO supports auto-negotiation of baud rates 9600 bit/s and 115200 bit/s. If the PLC networking is used, you are advised to set **Baud rate** to **115200** for the RS485 port of the SmartLogger1000 to achieve better communication performance.
- If the software version is earlier than SUN2000 V100R001C72SPC003, the PLC CCO does not support auto-negotiation of baud rates 9600 bit/s and 115200 bit/s. When the PLC networking is used, set **Baud rate** to **115200** for the RS485 port of the SmartLogger1000.

----End

5.4 Powering Off the PLC CCO

Context

Power off the PLC CCO before you replace it, maintain its cables, or stop using it.

Procedure

Step 1 Turn off the switch connected to the PLC CCO AC power cable.

Step 2 Disconnect the PLC CCO adapter power cable.

----End

6 Maintenance and Troubleshooting

6.1 Routine Maintenance

You need to maintain the PLC CCO periodically so that it works properly for a long service life.

Maintenance Interval

An interval of three to six months is recommended for maintaining the PLC CCO.

Maintenance Items



NOTICE

- Before maintaining PLC CCO cables, power off the PLC CCO.
- When maintaining the PLC CCO, observe ESD precautions.
- Ensure that the PLC CCO is free from strong electromagnetic interference.
- Ensure that the PLC CCO is away from heat sources.
- Ensure that the PLC CCO air exhaust vents are free from blockage.
- Periodically clean up the dirt and dust on the PLC CCO.
- Periodically check that the PLC CCO cables are securely and reliably connected.

6.2 Troubleshooting

Table 6-1 Typical faults

No.	Symptom	Cause	Measure
1	The PLC CCO cannot be powered on.	The DC output terminal of the power adapter is not connected to the PWR port on the PLC CCO.	Connect the DC output terminal of the power adapter to the PWR port on the PLC CCO.

No.	Symptom	Cause	Measure
		The AC input terminal of the power adapter is not connected to the AC power port.	Connect the AC input terminal of the power adapter to the AC power port.
		The power adapter is faulty.	Replace the power adapter.
		The PLC CCO is faulty.	Contact the supplier or Huawei technical support.
2	Failed to search for inverters on the SmartLogger1000 through the PLC CCO.	The COM/PWR port of the PLC CCO is not connected to any devices or the cable is disconnected, loose, or reversely connected.	Check the connection of the RS485 communications cable. Reconnect the cable if it is disconnected, loose, or reversely connected.
		The RS485 communications parameter values are incorrect.	Correctly set RS485 communications parameters, and ensure that the baud rate and the communication address are correctly set.
3	The device status on the SmartLogger1000 is displayed as disconnected.	The RS485 communications cable between the PLC CCO and the SmartLogger1000 is loose or disconnected.	Check the RS485 communications cable connection between the PLC CCO and the SmartLogger1000. Reconnect the cable if it is loose or disconnected.
		The PLC CCO is powered off.	Check that the PLC CCO is connected properly and power on the device.
		The PLC CCO AC power cable is not connected or disconnected.	Reconnect the PLC CCO AC power cable if it is not connected or disconnected.



NOTE

If the fault persists, contact the supplier or Huawei technical support.

6.3 Parts Replacement

A PLC CCO requires overall maintenance. Replace the PLC CCO if it is faulty.



NOTICE

- Before replacing the PLC CCO, power off the PLC CCO.
 - Before replacing the PLC CCO, confirm the PLC CCO installation mode and prepare required tools.
 - When replacing the PLC CCO, observe ESD precautions.
-

7 PLC CCO Disposal

If the PLC CCO service life has expired, dispose of the PLC CCO in accordance with local rules for disposal of electrical equipment waste.

8 Technical Specifications

Table 8-1 Technical specifications

Item	Specifications
Input voltage of the power adapter	100 V AC to 240 V AC, 50/60 Hz
Power consumption	2 W (maximum: 4 W)
Input cable voltage of the AC port	380 V AC to 800 V AC
Dimensions (H x W x D)	100 mm x 169 mm x 39 mm
Weight	550 g
Operating temperature	-25 °C to +70 °C
Relative humidity (non-condensing)	5% to 95%
Altitude	0 m to 4000 m
Protection level	IP20
Installation mode	Installed using mounting ears or a guide rail
Number of indicators	2 PCS
Maximum number of PLC STAs that can be connected	80 PCS
Maximum transmission rate	115200 bit/s
Safety/EMC	EN61000-6-2, EN61000-6-3, EN61000-3-11, EN61000-3-12, EN/IEC62109-1, EN/IEC62109-2

A Acronyms and Abbreviations

A

AC alternating current

C

CCO central controller

D

DC direct current

E

EMC electromagnetic compatibility

ESD electrostatic discharge

ESN equipment serial number

M

MCB miniature circuit breaker

P

PLC power line communication

PV photovoltaic

S

STA station