Smart Communication Unit

User Manual

SCU100S-00-EU

Shanghai Chint Power Systems Co., Ltd.

Version 2.0 March 2026 Doc. No.: 9.0020.1151B0

CONTENTS

0 Preface

Thank you for choosing the SCU100S-00-EU smart communication unit (hereinafter referred to as "unit" or "communication unit") produced by Shanghai Chint Power Systems Co., Ltd. (hereinafter referred to as "Chint").

IMPORTANT!

This manual contains important information about the transportation, storage, installation, operation, use, and maintenance of the equipment. Please read it carefully before use, strictly follow the instructions in the manual, and adhere to all safety precautions marked on the equipment and in the manual.

In addition to complying with the "Danger", "Warning", "Caution", "Note", and "Instruction" items in the manual during transportation, storage, installation, operation, use, and maintenance, you must also comply with relevant international, national, or regional laws, regulations, standards, and industry requirements. Our company shall not be held responsible for any liabilities arising from violations of safety operation requirements or breaches of safety standards in the design, production, and use of the equipment.

The equipment should be used in an environment that meets the design specifications. Otherwise, any functional abnormalities or component damage caused to the equipment are not covered under the equipment quality guarantee. This company shall not be liable for any personal injury, death, or property damage that may result.

Manual Management

If you encounter any issues during installation or operation, please first refer to this manual, as the instructions herein can resolve most problems. If the issue persists, you may contact your local dealer or representative.

Please keep this manual properly for future reference.

Copyrights

Due to equipment version upgrades or other reasons, the content of this document will be updated periodically. Unless otherwise agreed, this document is for guidance only, and all statements, information, and suggestions herein do not constitute any express or implied warranties.

1 IMPORTANT SAFETY INSTRUCTIONS

PLEASE READ THIS USER MANUAL CAREFULLY BEFORE INSTALLING AND OPERATING THE EQUIPMENT. IF THE EQUIPMENT IS DAMAGED DUE TO IMPROPER INSTALLATION OR USE THAT DOES NOT COMPLY WITH THE INSTRUCTIONS IN THIS MANUAL, CHINT POWER RESERVES THE RIGHT TO REFUSE WARRANTY CLAIMS AND DENY QUALITY GUARANTEES!

1.1 Explanation of Symbols in This Document

	**DANGER!** DANGER indicates a hazardous situation with high level of risk which, if not avoided, will result in death or serious injury.
	**WARNING!** WARNING indicates a hazardous situation with medium level of risk which, if not avoided, could result in death or serious injury.
	**CAUTION!** CAUTION indicates a hazardous situation with low level of risk which, if not avoided, could result in minor or moderate injury.
	**NOTICE!** NOTICE indicates a hazardous situation which, if not avoided, could result in equipment working abnormally or property loss.
	**IMPORTANT!** Indicates additional information in the manual, emphasizing and supplementing the content. It may also provide tips or tricks for optimizing the use of the equipment, helping you solve problems or save time.

1.2 Markings and Meanings on the Device

	**HIGH VOLTAGE!** This equipment works with high voltages. All works on the equipment must only be performed as described in this document.
	For more details please see the user manual.
	**WARNING:** For continued protection against risk of fire, replace only with same type and ratings of fuse. Refer to instruction manual for details.

	**EARTH GROUND!** This symbol marks the location of a grounding terminal, which must be securely connected to the earth through the PE (protective earthing) cable to ensure operational safety.
	**RoHS Symbol:** Comply with the restrictions on the use of specific hazardous substances in electronic and electrical equipment.
	This device must not be disposed of as household waste.

1.3 Personal Safety

	**DANGER!** • Never work with live power during installation. Do not install or remove cables while the power is on. Transient contact between the cable core and the conductor can generate electric arcs or sparks, potentially causing fire or personal injury. • When the equipment is energized, improper or non-standard operations may result in fire, electric shock, or explosion, leading to casualties or property damage. • Strictly prohibit wearing watches, bracelets, bangles, rings, necklaces, or other conductive objects during operation to avoid burns caused by electric shock. • Dedicated insulated tools must be used during operation to prevent electric shock or short circuits. The insulation voltage rating must comply with local laws, regulations, standards, and specifications.
	**WARNING!** • All operations and connections must be performed by professional technical personnel! • Personal Protective Equipment (PPE) must be used during operation, such as protective clothing, insulated shoes, safety goggles, safety helmets, and insulated gloves. • To prevent the risk of electric shock during equipment maintenance or installation, ensure that all DC and AC power sources are disconnected from the equipment, and that the equipment is reliably grounded.
	**CAUTION!** Before mounting the device, double-check the wall bracket to ensure it is securely attached to the supporting surface.

1.4 General Requirements

- Do not disable equipment protection devices or ignore warnings, cautions, and precautions in the manual and on the equipment.
- During equipment operation, if a fault that may cause personal injury or equipment damage is discovered, terminate the operation immediately, report to the person in charge, and take effective protective measures.
- Do not power on the equipment if the installation is incomplete or has not been confirmed by professional personnel.
- Prohibit direct contact, contact using other conductors, or indirect contact through wet objects with the power supply equipment. Before touching any conductor surface or terminal, measure the voltage at the contact point to ensure there is no risk of electric shock.
- In case of fire, evacuate the building or equipment area immediately and press the fire alarm bell or dial the fire alarm number. Under no circumstances should anyone re-enter the burning building or equipment area.

1.5 Personnel Requirements

Personnel operating the equipment must be professional personnel or trained personnel.

- **Professional Personnel:** Individuals who are familiar with the principles and structure of the equipment, have training or experience in operating the equipment, and are clearly aware of the various potential hazards and risk levels involved in equipment installation, operation, and maintenance.
- **Trained Personnel:** Individuals who have undergone corresponding technical and safety training and possess the necessary experience to recognize the potential hazards to themselves or others during specific operations and can take measures to minimize these risks.

Requirements:

- Personnel responsible for installing and maintaining the equipment must undergo **strict training** beforehand to master the correct operating methods and understand various safety precautions and relevant standards of the country/region.
- **Only qualified professional personnel or trained personnel** are allowed to install, operate, and maintain the equipment.
- **Only qualified professional personnel** are allowed to dismantle safety devices and overhaul the equipment.

- Personnel performing tasks in special scenarios, such as electrical operations, working at heights, or operating special equipment, **must possess the special operation qualifications** required by the local country/region.
- Replacement of equipment or components (including software) must be completed by **authorized professional personnel**.
- Personnel not involved in the operation of the equipment are requested to **keep away from the equipment**.

1.6 Electrical Safety

	**DANGER!** 1. Before making electrical connections, ensure that the equipment is undamaged; otherwise, it may cause electric shock or fire. 2. Improper or non-standard operations may lead to accidents such as fire or electric shock. 3. Prevent foreign objects from entering the equipment during operation. Failure to do so may result in short circuits, equipment damage, load power loss, outages, or personal injury.
	**WARNING!** 1. The grounding resistance must comply with local electrical standards, and the equipment must be permanently connected to the protective ground. 2. During installation, connect the protective ground first; during dismantling, disconnect the protective ground last. 3. Electrical connection operations must be performed by professional personnel.
	**NOTICE!** Installation, operation, and maintenance must be performed in the sequence specified in the manual. Do not modify, add to, or alter the equipment, or change the installation sequence without authorization.

1.7 Environmental Requirements

	**DANGER!** • Strictly prohibit placing the equipment in environments with flammable or explosive gases or smog. Do not perform any operations in such environments. • Strictly prohibit storing flammable or explosive materials in the equipment area.

	• Keep the equipment away from heat sources or fire sources, such as fireworks, candles, heaters, or other heat-generating devices. Overheating may cause equipment damage or fire.
	**WARNING!** • The equipment should be installed in an area away from liquids. Strictly prohibit installation under water pipes, air outlets, or other locations prone to condensation; strictly prohibit installation under air conditioning vents, ventilation openings, or machine room windows prone to water leakage, to prevent liquid from entering and causing faults or short circuits. • When the equipment is running, do not block the ventilation openings or heat dissipation system, and do not cover it with other objects, to prevent damage or fire caused by high temperatures.
	**NOTICE!** Ensure good ventilation in the installation environment to facilitate natural heat dissipation. Do not install the equipment in direct sunlight to avoid equipment failure caused by internal temperatures exceeding design specifications.

1.8 Transportation Safety

If the Communication Unit needs to be transferred, the following conditions must be met:

- All operations related to transportation must comply with the relevant laws and regulations of the local country or region.
- During transportation, place the Communication Unit according to the direction indicated on the outer packaging and ensure adequate securing measures are in place.
- Avoid equipment and packaging damage caused by strong vibrations or bumping.
- Be prepared for load-bearing when moving the equipment. Avoid being crushed by the equipment. This device requires at least 3 people to move.

1.9 Storage Safety

If the Communication Unit is not installed immediately, the following conditions must be met for storage:

- Do not remove the outer packaging. Check periodically. If bug infestations, rodent bites, or packaging damage are found, replace the packaging immediately.
- The storage environment should have suitable temperature and humidity and be protected from dust and water vapor corrosion. If stored outdoors, dust-proof and waterproof measures are mandatory.

- When stacking, align neatly according to the stacking indicators on the outer packaging. Strictly prohibit human impact or crushing by other objects to avoid personal injury or equipment damage caused by tipping over.
- After long-term storage, the Communication Unit must be inspected and tested by professional personnel before being put into use.
- Equipment damage caused by failure to store the Communication Unit as required is not covered by the warranty.

1.10 Mechanical Safety

- Tools must be complete and inspected by professional agencies. It is strictly prohibited to use tools that are damaged, substandard, or have exceeded their inspection validity period. Ensure tools are secure and not overloaded.
- Before equipment installation, ensure that brackets, poles, and walls are stable to prevent the equipment from tilting or collapsing due to an unstable center of gravity, which could cause injury to installers or damage to the equipment.
- When pulling the equipment out of the cabinet, be careful of potentially unstable or heavy devices to avoid being crushed or smashed.
- Drilling holes on the equipment is strictly prohibited. Drilling will damage the sealing, electromagnetic shielding performance, internal components, and cables. Metal shavings generated by drilling entering the equipment will cause short circuits in the circuit boards.

.

2 Smart Communication Unit Introduction

This smart communication unit is an outdoor monitoring cabinet used in photovoltaic power generation systems. It integrates data loggers, electrical protection devices, and other equipment to achieve data collection, forwarding, storage, and command control for devices such as sub-array inverters, box-type transformers, meters, environmental monitors, and photovoltaic tracking brackets, achieving centralized monitoring and maintenance of photovoltaic sub-array equipment.

2.1 Network Topology

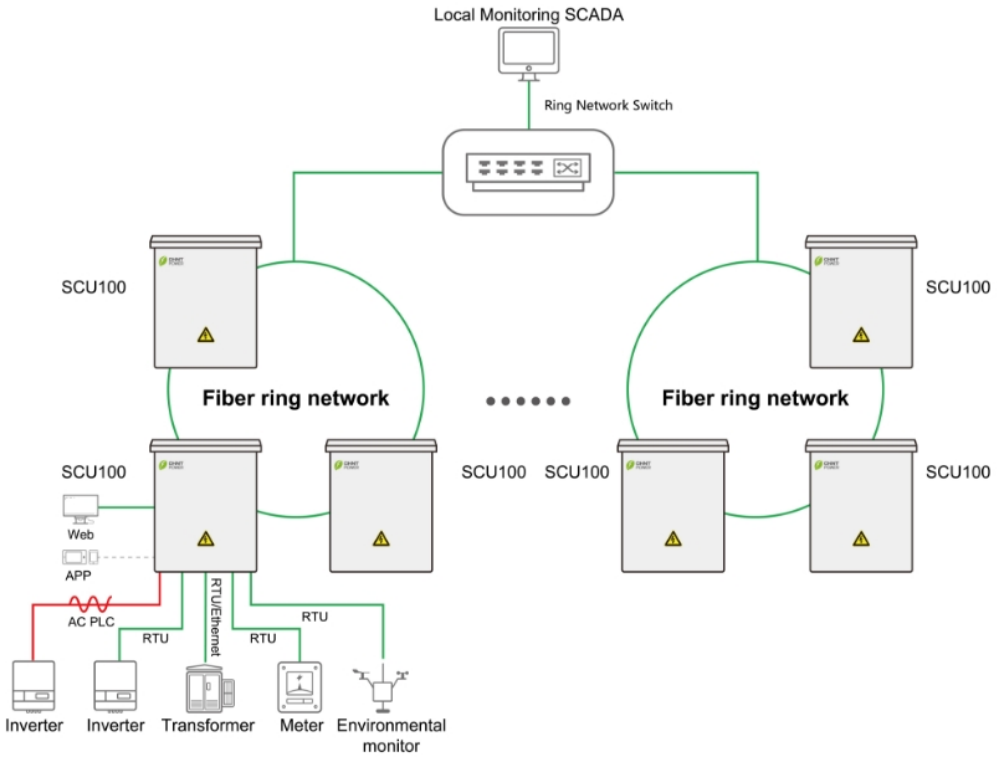


Figure 2-1 Network Topology Diagram

2.2 Product Overview

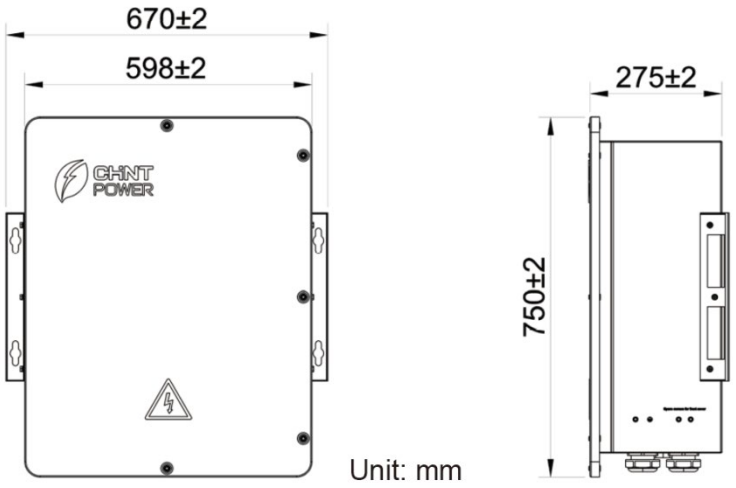


Figure 2-2 Smart communication unit dimensions

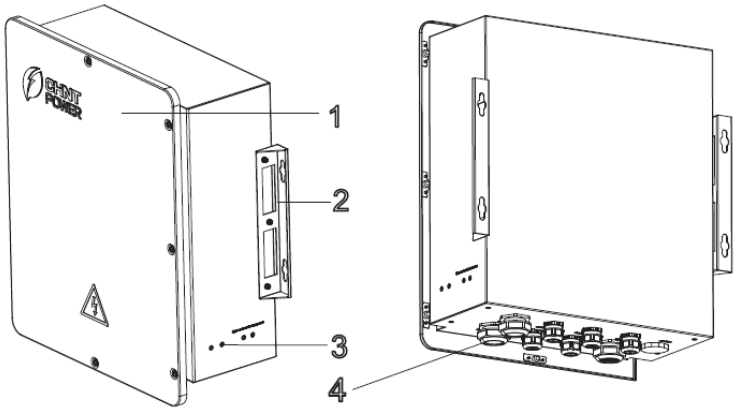


Figure 2-3 Main Components

No.	Name	Purpose
1	Front cover	Provides access to internal components for wiring
2	Mounting bracket	Secures the unit to a wall, pole, or support bracket
3	External Grounding Port	Connects the chassis to earth ground
4	Cable Glands	Seal and route incoming/outgoing cables

Table 2-1 Main components

2.3 Model Naming Convention

The model naming convention is described follows:

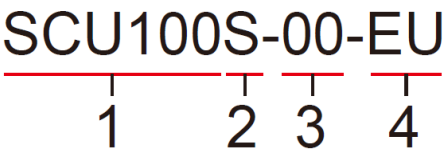


Figure 2-4 Model description

No.	Name	Description
1	Device Series	SCU100: Smart Communication Unit
2	Hardware Features	S: Supports, 2-channel PLC communication
3	Feature Identifier	00: Supports, 16-core fiber
4	Region Identifier	EU: Europe

Table 2-2 Model description

2.4 Internal Structure

The internal modules of the SCU100S-00-EU smart communication units are as follows.

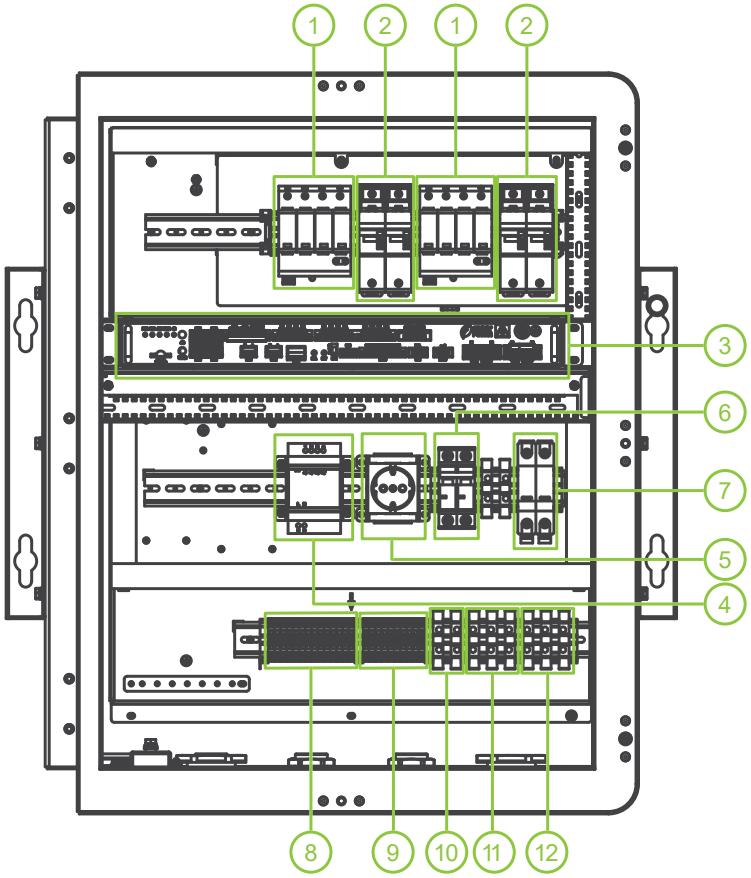


Figure 2-5 Internal Components of the Smart Communication Unit

No.	Name	Specification Description	Quantity
1	Three-phase AC SPD (Surge Protective Device)	Uc=1520V AC，15kA/25kA，25ns，4P	1
2	Three-phase AC Fuse	1000VAC，20A，2P	1
3	Smart Data Logger	SDL100	1
4	Power Supply Module	AC input: 85~264VAC; DC output: 24V/2.5A	1
5	Maintenance Socket	AC output: 85~250VAC	1
6	Miniature Circuit Breaker	–	1
7	Single-phase AC SPD	385VAC，20kA，40kA，25ns	1
8	DI/DO/AI Terminal	–	14
9	RS485 Terminal	–	5
10	Single-phase AC Input Terminal	100V – 240VAC	1
11	Three-phase Input Terminal 1	380V – 800VAC	1
12	Three-phase Input Terminal 2	380V – 800VAC	1

Table 2-3 Description and specifications of internal components

2.5 Electrical Diagram

The electrical wiring diagram of the communication unit is shown in Figure 2-6, and the corresponding component information is listed in Table 2-4.

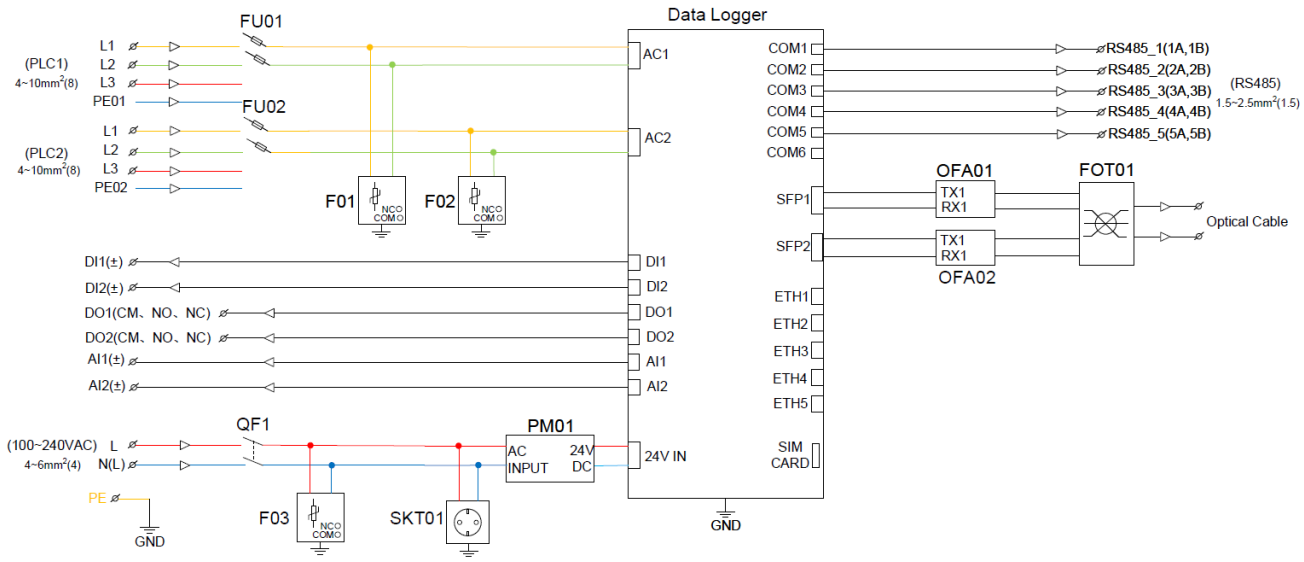


Figure 2-6 Electrical Wiring Diagram of the Smart Communication Unit

No.	Label	Name	Quantity
1	F01	Three-phase AC SPD	1
2	FU01	Three-phase AC Fuse	1
3	Data Logger	Smart Data Logger	1
4	PM01	Power Supply	1
5	SKT01	Maintenance Socket	1
6	QF1	Miniature Circuit Breaker	1
7	F03	Single-phase Lightning Arrester	1
8	FOT01	Fiber terminal box	1

Table 2-4 Components of the smart communication unit

2.6 Application Scenario

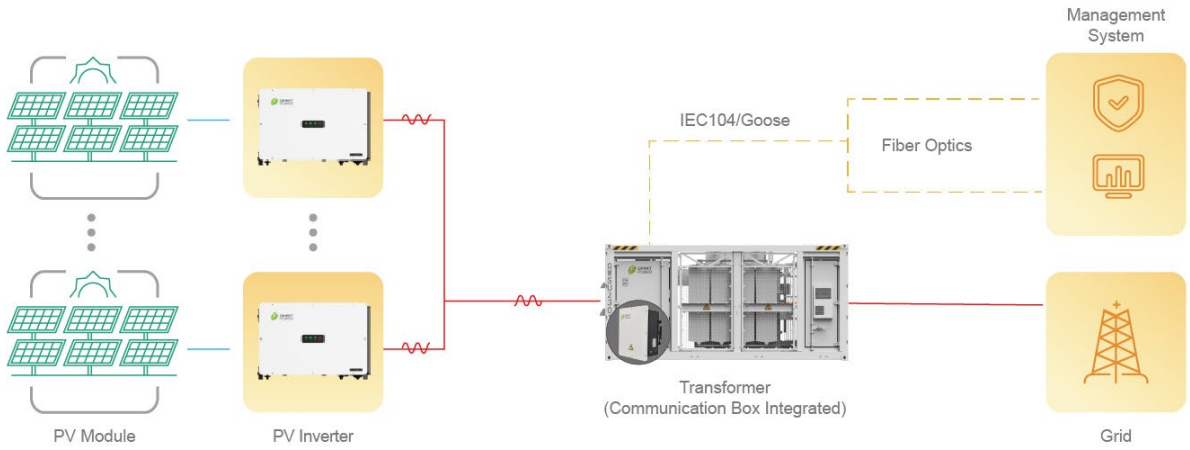


Figure 2-7 Application Scenario

3 Mechanical Installation

3.1 Storage Before Unpacking

If the smart communication unit is not immediately installed upon arrival, the following requirements should be met when storing the device:

- Do not remove the outer packing of the device.
- Store it in a clean, dry place to prevent dust and moisture intrusion.
- During the storage period, regular inspections are necessary (it is recommended to check at least once every three months). If packing damage is detected, replace the packaging materials promptly.
- Keep the packing box away from corrosive substances to avoid damaging the device casing.
- If the device has been stored for more than 1 year, perform a comprehensive inspection and test by professional personnel before putting it into operation.
- Do not stack multiple devices beyond the "Stacking Limit" indicated on the outer packing.

	**NOTICE!** Any damage to the equipment caused by improper storage is not covered by the warranty.

3.2 Unpacking Inspection

The smart communication unit has been carefully inspected and securely packaged before leaving the factory. However, during transportation, there may still be collisions or damage to the device. Therefore, before unpacking, first check whether the outer packaging is clean and intact, and then check whether all safety labels, warning labels, and nameplates on the device are intact. These labels must always be clearly visible, not removable or covered, until the product is scrapped. If there is any damage or abnormality, do not open it, contact the dealer.

During the movement and unloading of the device, avoid collisions, drops, and scratches.

Before installation, please check whether the following items are included in the packaging box, carefully verify the model and quantity of accessories. If there is any missing or damage, please contact the dealer.

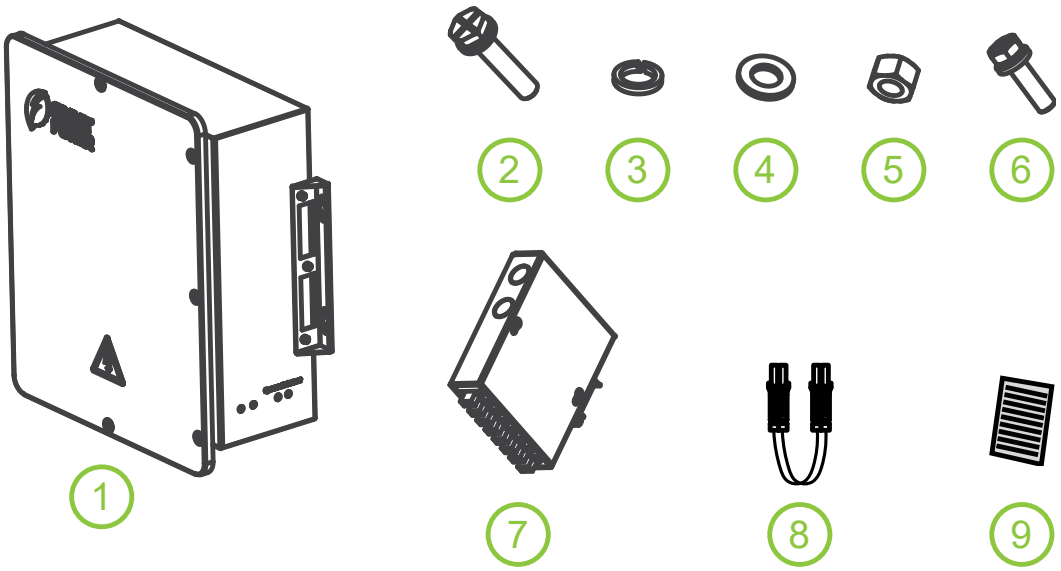


Figure 3-1 Delivery List

No.	Item	Qty	Remark
1	Smart Communication Unit	1	–
2	M10 × 50 Screw	4	For mounting communication unit
3	M10 Spring Washer	4	
4	M10 Washer	4	
5	M10 Nut	4	
6	M6 × 16 Screw	1	For external grounding
7	Fiber Optic Terminal Box	1	16-core; for fiber optic termination and patch cord connection
8	Fiber Optic Patch Cord	4	Length: 1m
9	Documentation	1	Quick installation guide

Table 3-1 Delivery List

3.3 Installation Precautions

- Check that the product environmental specifications (protection degree, operating temperature range, humidity and altitude, etc.) meet the requirements of the specific project location.
- Installation personnel must be qualified electricians or those who have received professional training.
- Wear and use proper PPE (personal protective equipment) during installation.
- Sufficient space must be provided to allow the communication unit cooling system to operate normally.
- Install the communication unit away from flammable and explosive substances, and prohibit old, sick, disabled people and children from approaching.
- The unit should be installed in an area far away from liquids; It is strictly prohibited to install it below water pipes, air vents, and other locations that are prone to condensation. It is strictly prohibited to install below the air conditioning outlet, ventilation outlet, machine room outlet window, and other locations that are prone to water leakage, to prevent liquid from entering the unit and causing unit malfunction or short circuit.
- The cable glands at the bottom of the unit cannot support weight. Do not place the bottom surface directly on the ground.
- When installing, if drilling is required, please make sure to avoid the water and electricity wiring inside the wall.
- The characteristics of salt mist are easily affected by factors such as seawater, sea breeze, precipitation, relative humidity, terrain, and forest range near the coast. Therefore, communication units should not be installed outdoors in salt affected areas (within 500m from the coast).
- The communication unit may generate noise during operation, please do not install it in a place that affects daily life.
- The installation height of the communication unit should be easy to facilitate electrical connection, operation, and maintenance.
- Ensure that the installation conditions do not exceed the specified temperature limits to prevent suboptimal energy efficiency.
- Do not install the unit near an electromagnetic source which can compromise the normal operation of electronic equipment.
- After routing the cables through the gland entry, apply sealant around the cables to prevent moisture ingress.
- Under no circumstances should the device structure, installation sequence, or any other aspect be modified without the permission of the manufacturer.

3.4 Installation Requirements

3.4.1 Installation Environment

- The protection level of the unit is IP66, suitable for outdoor installation environments.
- Installation environment: more than 500 m from the coast, more than 1500 m from severe pollution sources, and more than 1000 m from moderate pollution sources.
- Ambient temperature requirements: -30℃ – 60℃ (with shading facilities), -30℃ – 40℃ (without shading facilities).
- Ambient humidity requirement: relative humidity ≤95%, no condensation.
- Installation environment: It is recommended to install the communication unit under a sunshade to avoid direct sunlight (rain and snow accumulation).

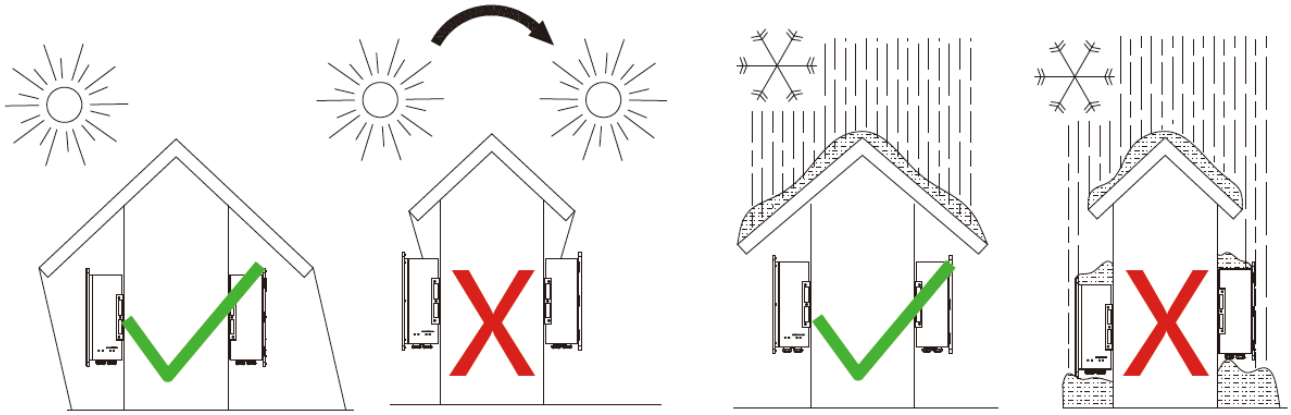
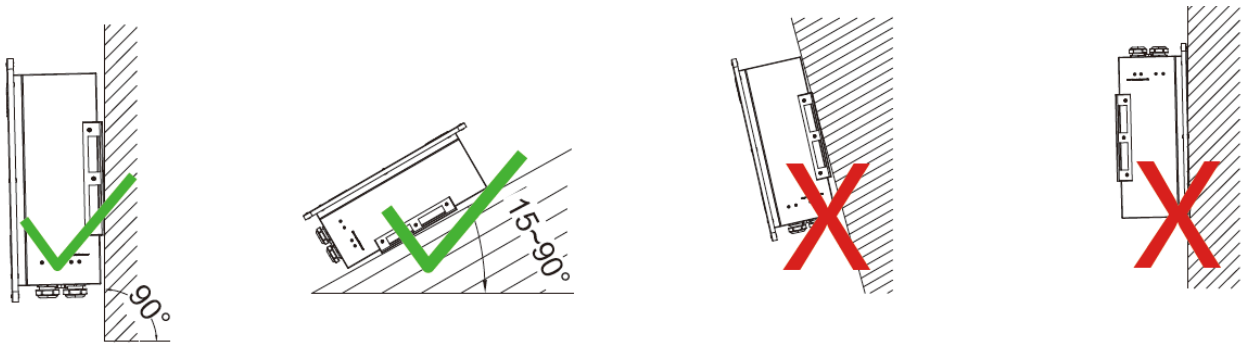


Figure 3-2 Installation Environment

3.4.2 Installation Mode



Vertical | Back Tilt | No Forward Tilt | No Upside Down

Figure 3-3 Installation Mode

3.4.3 Recommended Clearances

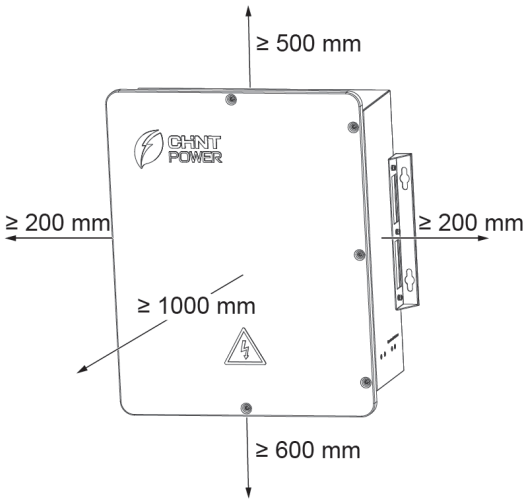


Figure 3-4 Recommended Clearances

3.5 Installation Method

The communication unit supports three installation methods: wall mounting, bracket mounting, and pole mounting. Each will be introduced below.

⚠	**CAUTION!** • Before installation, have a qualified engineer confirm that the selected support structure (wall, bracket, or pole) can support the unit's weight (30 kg). • Three people are recommended: two to lift and hold the unit, and one to mount it. Maintain balance to prevent it from tipping over or falling. • Install the unit on the shaded side of PV panels. • If a box-type transformer is present, the recommended cable length between the Communication Unit and the transformer is ≤ 10 m. A shorter distance improves communication performance.

3.5.1 Wall Mounting

⚠	NOTICE! When determining the drilling position, ensure to avoid the water and electricity cables inside the wall to prevent hazards. To prevent dust generated during drilling from entering the respiratory tract or falling into the eyes, operators should wear dust masks and protective goggles. To ensure the installation parts are flat on the wall, after unscrewing the bolts, spring washers, and flat washers, the upper end face of the expansion tube must be flush with the cement wall surface and not protrude beyond it.

1. Remove the packing box cover (drilling template). Place it on the wall at a suitable installation position and use a level ruler to level it. Mark the installation holes with a marker.

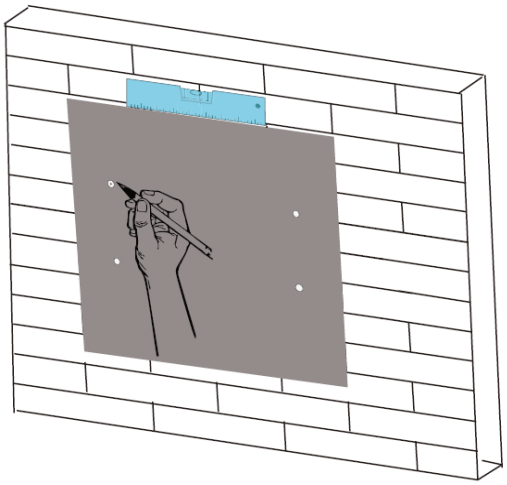


Figure 3-5 Mark Mounting Holes

2. Drill holes at the marked positions using an electric drill with a 12 mm bit.

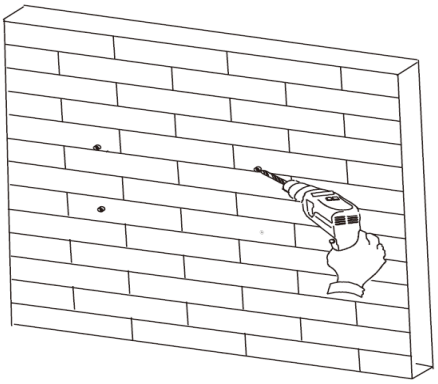


Figure 3-6 Drill Holes

3. Drive the M10 stainless steel expansion bolts (user-supplied) into the holes. Remove the bolts (A) and washers (B) for later use, leaving the sleeves (C) and expansion cones (D) in the wall.

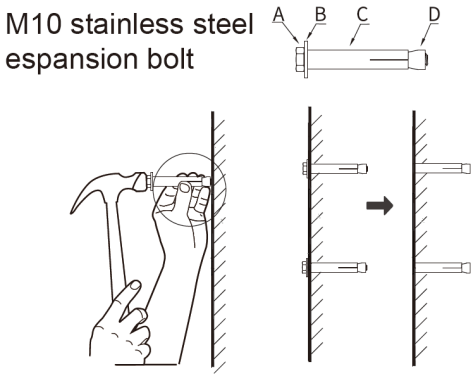


Figure 3-7 Inserting the expansion bolt

4. Two people are required to lift the unit and align the holes on mounting bracket with the expansion bolts. A third person secures the unit to the wall using the removed bolts (A) and washers (B).
   Tool: 17mm socket wrench; Torque: 25 N·m.

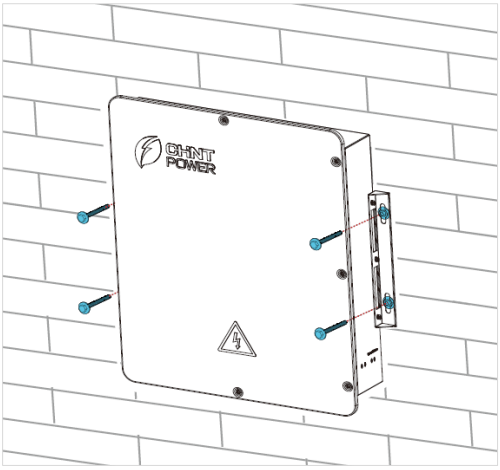


Figure 3-8 Communication unit fixed to the wall

3.5.2 Bracket Mounting

1. Remove the packing box cover (drilling template). Place it on the support bracket at the installation position and mark the installation holes with a marker.

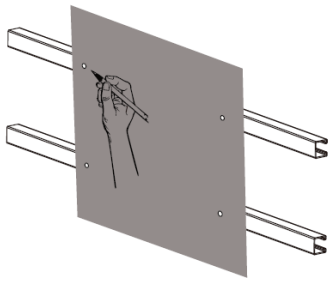


Figure 3-9 Marking hole positions with a marker pen

2. Drill holes at the marked positions using an electric drill with a 12 mm bit.

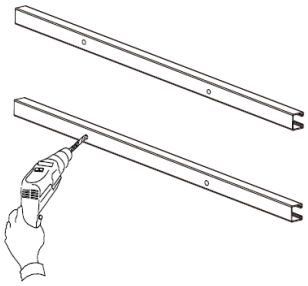


Figure 3-10 Drilling holes

3. Two people are required to lift the communication unit and align the holes on the mounting bracket (1) with the drilled holes on the support structure (6). A third person secures the unit as follows:

   - Insert the M10 × 50 screws (2) through the holes.
   - Secure using M10 flat washers (3), M10 spring washers (4), and M10 nuts (5).

   Tool: 17 mm socket wrench; Torque: 25 N·m

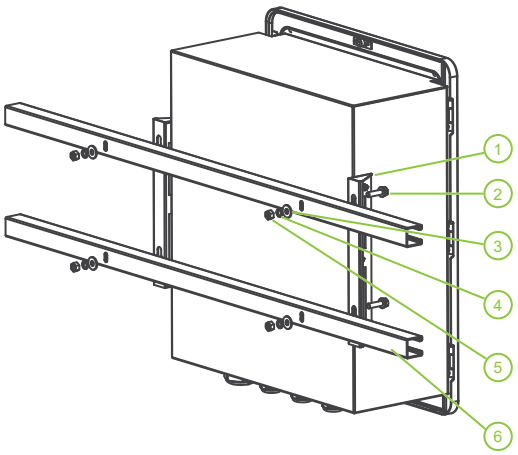


Figure 3-11 Communication unit fixed on the bracket

3.5.3 Pole Mounting

⚠	**NOTICE!** Before adopting the pole-mounted installation method, customers need to prepare the pole-mounted installation parts according to the size of the smart communication unit. It is recommended to use M12 U-bolts to secure the pole-mounted installation parts. The bracket must be evenly installed on the pole, and then the device should be installed in the middle position of the bracket to ensure balanced force on both ends of the bracket to prevent the device from tilting or falling.

1. Secure the support bracket (3) to the pole (2) using the pole clamps (1) and nuts. Ensure the bracket is mounted evenly to prevent tilting.

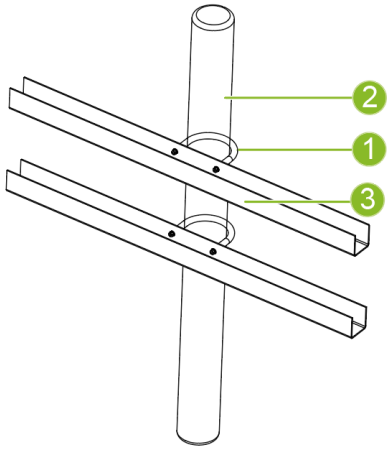


Figure 3-12 Preparation of Pole Mounting Components

2. Remove the packing box cover (drilling template). Place it on the support bracket at the installation position and mark the installation holes with a marker.

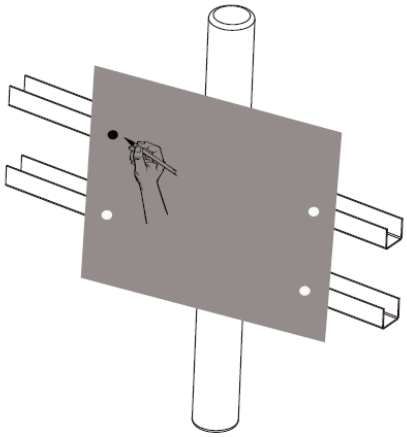


Figure 3-13 Mark Mounting Holes

3. Drill holes at the marked positions using an electric drill with a 12 mm bit.

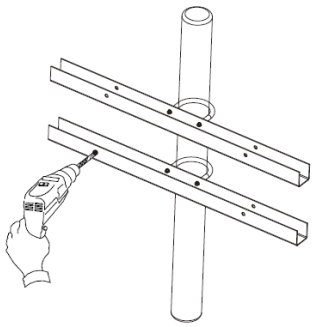


Figure 3-14 Drill Mounting Holes

4. Two people are required to lift the communication unit and align the holes on the mounting bracket with the drilled holes on the support bracket. A third person secures the unit as follows:

   - Insert the provided M10x50 screws through the holes.
   - Secure using M10 flat washers, M10 spring washers, and M10 nuts.

   Tool: 17 mm socket wrench; Torque: 25 N·m

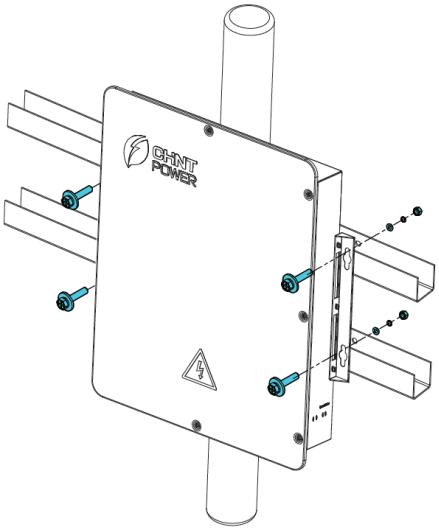


Figure 3-15 Secure Communication Unit

4 Electrical Connection

DANGER!

The cables shall be connected in accordance with the National Electrical Code and all other applicable local codes or jurisdictions.

Please use special protective equipment and insulated tools to avoid electric shock or short-circuit faults.

All cables must be connected only after ensuring the device is free from any damage. Otherwise, it may cause electric shock or fire.

High-temperature environments may result in insulation aging or damage of cables. The distance between the cables and heat-generating devices or the surrounding area of the heat source should be at least 30mm.

Before opening the cabinet door, disconnect all switches and circuit breakers upstream and inside the communication unit.

If it is necessary to open the cabinet door in rainy or snowy weather, take protective measures to prevent moisture.

4.1 Cable Specifications

No.	Cable	Recommended Model and Specification	Cross-sectional Range (Recommended value)
1	Three-phase AC Cable (From transformer to communication unit)	Three-core (L1, L2, L3) outdoor copper cable; Working voltage to ground ≥ 800V	4 – 10mm² (10mm²)
2	Single-phase AC cable	Two-core outdoor copper cable; Working voltage to ground ≥ 300V	4 – 6mm² (4mm²)
3	RS485 Communication Cable	Outdoor communication cable (DJYP2VP2-22 2×2×1) or armored shielded twisted pair	1.5 – 2.5mm² (1.5mm²)
4	DI/DO/AI Signal Cable	Two-core or multi-core outdoor copper cable	0.2 – 1.5mm² (1.5mm²)
5	Fiber Optic Patch Cord	Single-mode single-core LC-LC	–
6	External Grounding Cable	Outdoor copper cable and OT-M6 terminal	6 – 16mm² (16mm²)

4.2 Wiring Interfaces

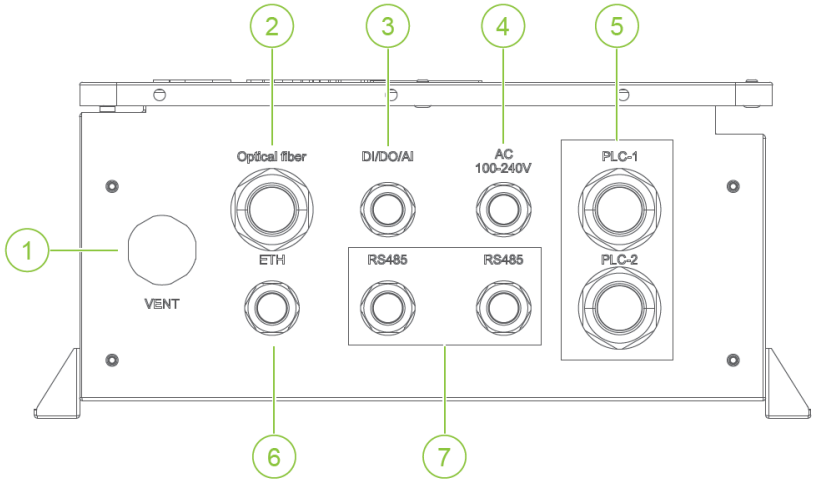


Figure 4-1 Wiring Interfaces

No.	Name	Purpose	Inner diameter
1	Vent Valve	For releasing internal pressure	–
2	Waterproof Fiber Optic Cable Gland	For connecting fiber optic cable	17 – 25mm
3	Waterproof DI/DO/AI Signal Cable Gland	For connecting DI/DO/AI signal cable	17 – 25mm
4	Waterproof Single-phase AC Cable Gland	For connecting 100–240 V single-phase AC cable	17 – 25mm
5	Waterproof Three-phase AC Cable Gland	For connecting three-phase AC cable	21 – 30mm
6	Waterproof Ethernet Cable Gland	For connecting Ethernet cable	17 – 25mm
7	Waterproof RS485 Communication Cable Gland	For connecting RS485 communication cable	17 – 25mm

4.3 Preparation Before Wiring

1. Use a 5mm hex wrench to remove the five screws on the front cover and open the front cover.

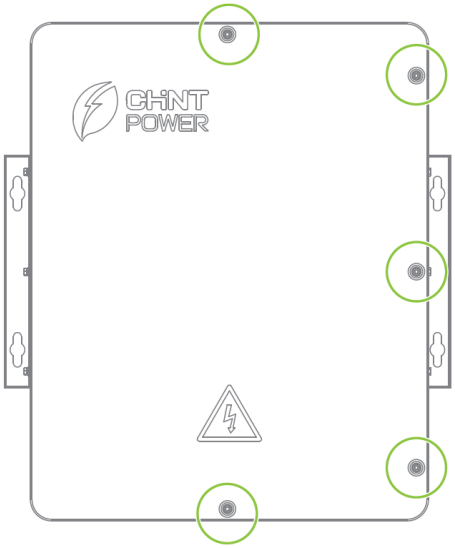


Table 4-1 Remove the Screws from Front Cover

2. Place the moving end of the support rod (2) into the slot (1) of the slide rail to secure the front cover.

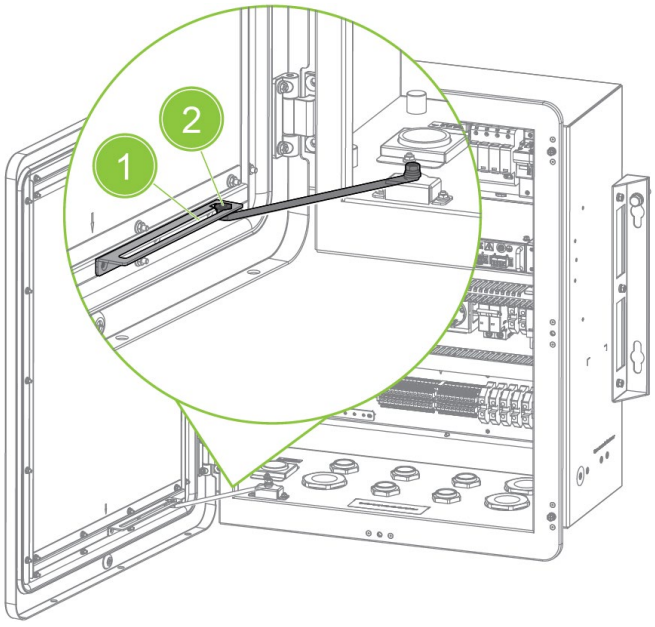


Figure 4-2 Secure the Front Cover

The interfaces at the bottom of the communication unit are equipped with cable glands. Before wiring, unscrew the cable gland nuts according to the wiring requirements for threading, as shown below:

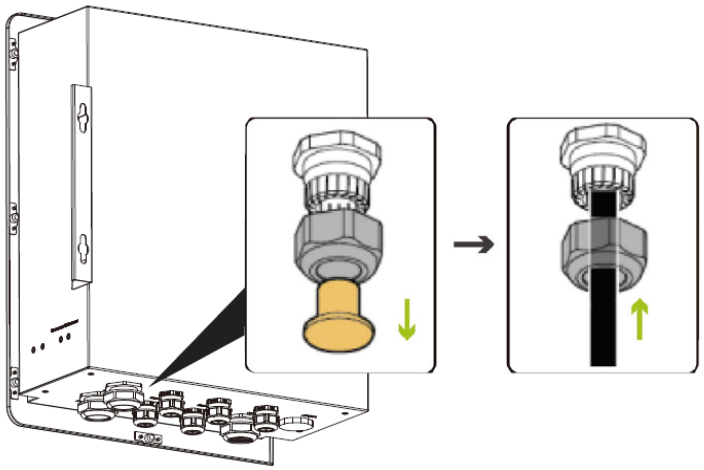


Figure 4-3 Unscrewing the cable gland nut and threading the cable

4.4 External Grounding

⚠	**NOTICE!** Ground the protective earth cable nearby or connect it to the box-type transformer ground bus. To improve the anti-corrosion performance of the grounding terminal, apply silicone or paint to the exterior of the grounding terminal after installation for protection. Other sizes of grounding cables that meet local standards and safety regulations can also be used for grounding connections. But CHINT shall not be liable for any damage caused.

Connect grounding cable to the grounding hole at the lower-right corner outside the communication unit using the M6x16 screw.

Tool: 10mm socket wrench; Torque: 6 N·m.

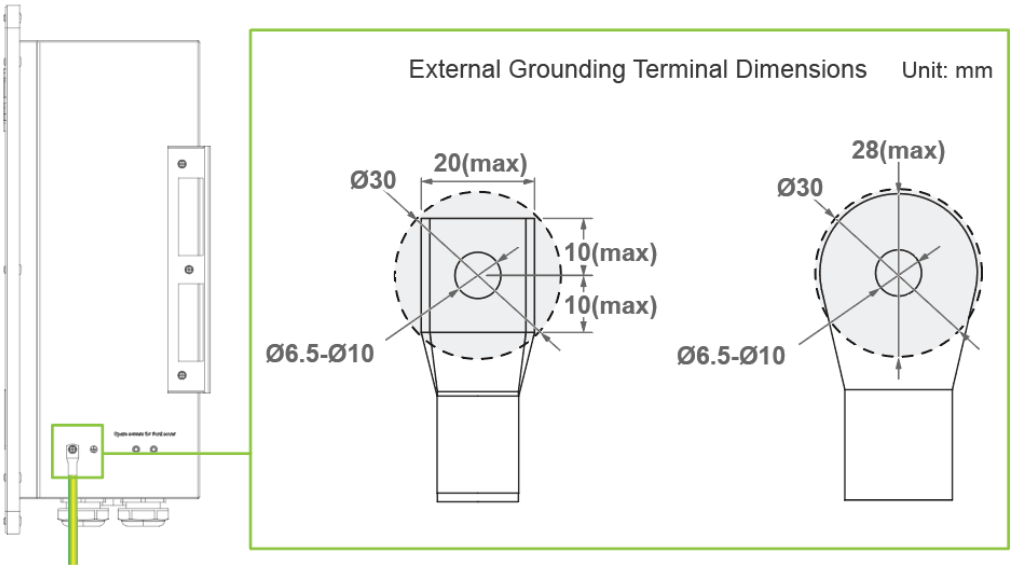


Figure 4-4 External Grounding

4.5 Connect Three-phase AC Cable for PLC Communication

⚠	**NOTICE!** Do not knot or tangle the cables. Communication cable laying method: cable trench or cable tray. When a box-type transformer is used, it is recommended that the cable length between the Communication Unit and the transformer does not exceed 10 m. A shorter distance improves communication performance.

1. Strip the jacket and insulation of the AC cable to the specified length (see figure below). Insert the conductors into the cord end terminal until the insulation touches the terminal collar. Crimp the metal barrel firmly. Note: The cord end terminals are user-supplied.

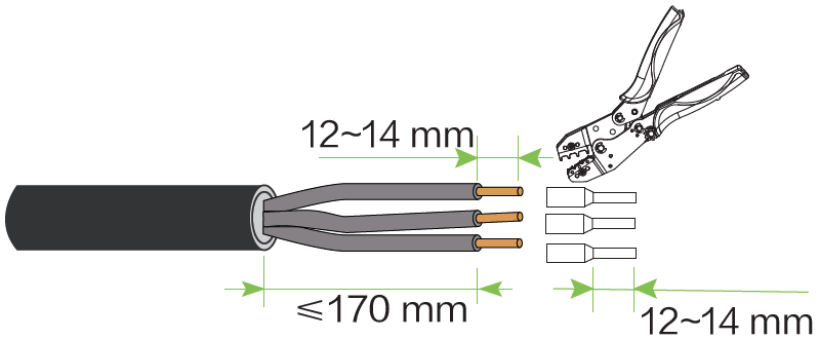


Figure 4-5 Stripping the insulation and protective sleeve and crimp the tubular terminal

2. Route the cables into the communication unit. Insert the crimped wires into the corresponding terminals and tighten the screws.

   Tool: Use a No. 2 screwdriver; Torque: 1.3 N·m.

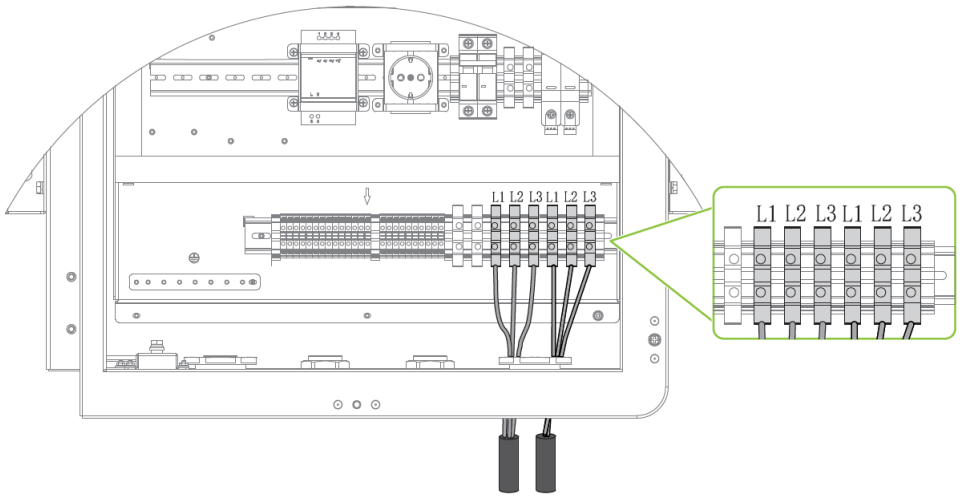


Figure 4-6 Insert the Crimped Three-phase AC Cable

4.5.1 PLC Cabling and Routing Guidelines

4.5.1.1 Cable Selection and Connection

Item	Requirement
Cable Type	Copper or Aluminum Alloy (Single / Three-core).
Terminals Connection	Use bimetallic lugs for Aluminum Alloy to copper busbar connections.
Coupling Point	• Smart Communication Unit (SCU) Connection: Connect the PLC port to the middle of the busbar. Example: If there are 26 branch circuit breakers in total, select the coupling point corresponding to the 13th or 14th branch. • Inverter Connection: To optimize signal distribution, inverters located further from the box-type substation should be connected to coupling points as close to the middle of the busbar as possible.

4.5.1.2 Routing and Laying Rules

Item	Requirement
Laying Geometry	• Cables must be laid in parallel within trenches or trays. Do not knot, twist, or tangle the cables. • Single-Core handling: If single-core cables are used, must be bundled at intervals of 1 m.
Dedicated Routing	Only AC cables within the same subarray shall be laid in the cable trenches or cable trays of that subarray.

4.5.1.3 Isolation and Spacing Limits

To ensure signal integrity, strictly follow these physical isolation limits:

Constraint Type	Rule and Minimum Spacing
Sub-array Isolation	The spacing between trenches of adjacent sub-arrays must be ≥ 3 m.
HV/LV Separation	• Parallel Routing: Minimum spacing > 3 m. • Cross Routing: Intersection angle 60°–120°, with vertical spacing > 1 m.

4.5.1.4 Environmental Constraints

Item	Requirement
Water Avoidance	Avoid routing cables through water bodies to prevent signal attenuation. Overhead routing is recommended for such sections.

4.6 Connect Single-phase AC Cable for Data Logger

1. Strip the jacket and insulation of the AC cable to the specified length (see figure below). Insert the conductors into the cord end terminal until the insulation touches the terminal collar. Crimp the metal barrel firmly. Note: The cord end terminals are user-supplied.

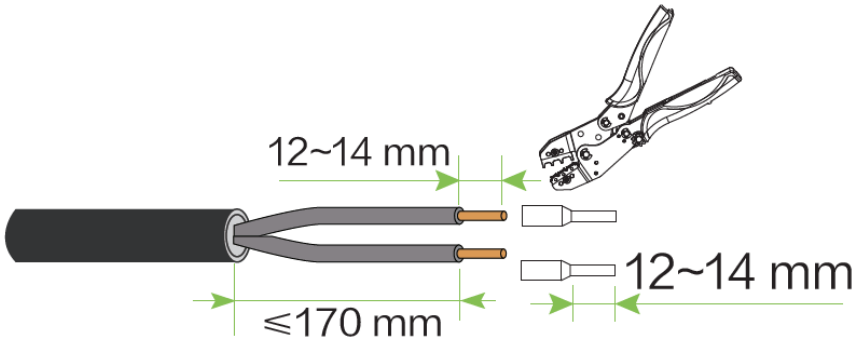


Figure 4-7 Stripping and crimping tubular terminals

2. Route the cables into the communication unit. Insert the crimped wires into the corresponding terminals and tighten the screws.
   Tool: Use a No. 2 screwdriver; Torque: 1.3N.m.

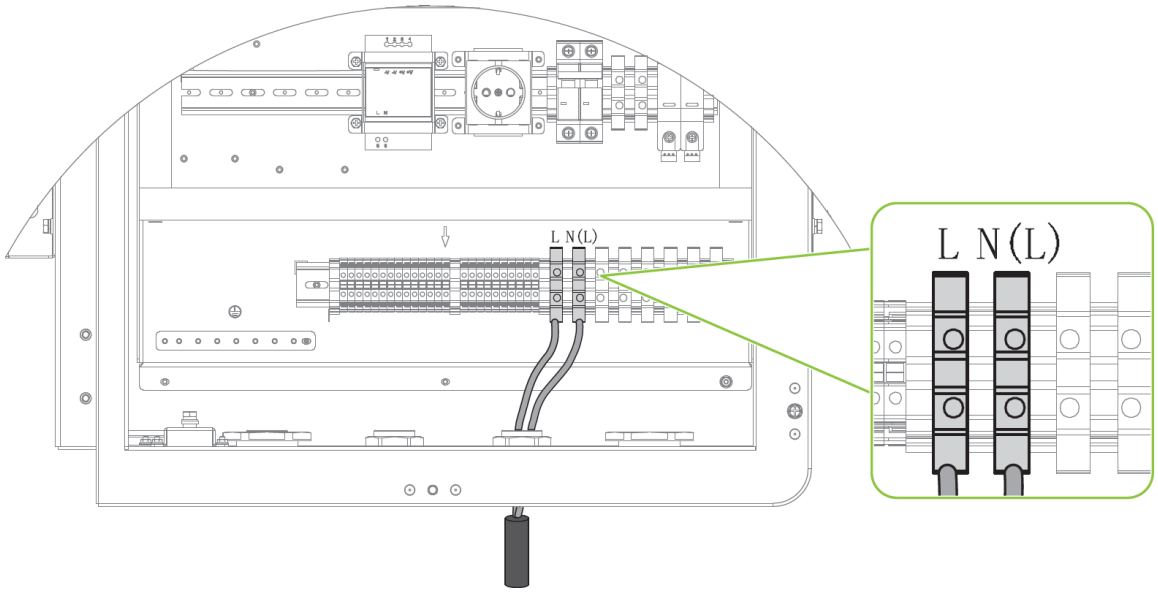


Figure 4-8 Crimping Single-phase AC Cable

4.7 Connect RS485 Communication and DI / DO / AI Cable

1. Strip the jacket and insulation of the RS485 cable and DI / DO / AI cable to the specified length (see figure below). Insert the conductors into the cord end terminal until the insulation touches the terminal collar. Crimp the metal barrel firmly.
   Note: The cord end terminals are user-supplied :

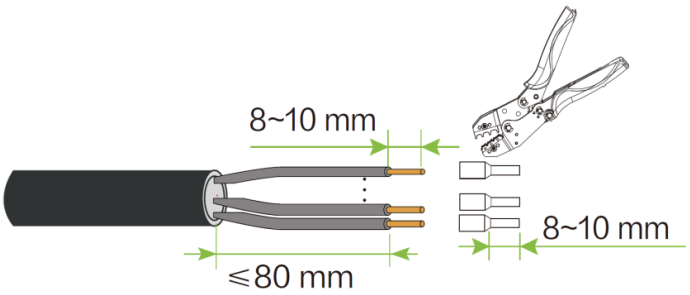


Figure 4-9 Crimp Cables

2. Connect cable:
   (A).Connect RS485 Communication Cable: Route the cables into the communication unit. Insert the crimped wires into the corresponding terminals and tighten the screws.
   Tool: Use a No. 1.5 screwdriver; Torque: 0.8 N.m.

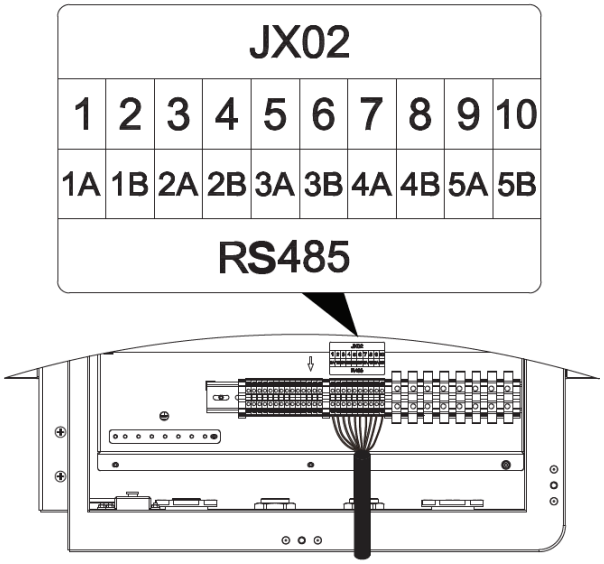


Figure 4-10 Connecting RS485 communication cable

No.	JX02 terminal block port	Description
1	RS485（1A）	RS485A, RS485 differential signal +
2	RS485（1B）	RS485B, RS485 differential signal-
3	RS485（2A）	RS485A, RS485 differential signal +
4	RS485（2B）	RS485B, RS485 differential signal-
5	RS485（3A）	RS485A, RS485 differential signal +

6	RS485（3B）	RS485B, RS485 differential signal-
7	RS485（4A）	RS485A, RS485 differential signal +
8	RS485（4B）	RS485B, RS485 differential signal-
9	RS485（5A）	RS485A, RS485 differential signal +
10	RS485（5B）	RS485B, RS485 differential signal-

(B). Connect the DI/DO/AI signal cable: Route the cables into the unit. Insert the crimped wire into the corresponding terminals and tighten the screws.

Tool: Use a No. 1.5 Phillips screwdriver; Torque: 0.8 N·m

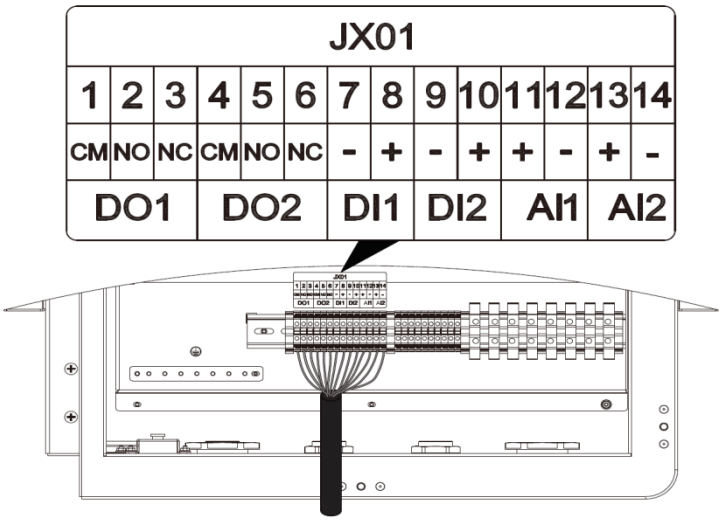


Figure 4-11 Connecting DI/DO/AI signal cable

DO Terminal Name	Description
CM	Common Terminal
NO	Normally Open
NC	Normally Closed

4.8 Fiber Optic Terminal Box Installation

The SCU100S series is supplied with one fiber optic terminal box as standard. Additional terminal boxes can be installed on site if required. Install the terminal box as follows:

1. Open the Terminal Box: Loosen the 4 screws on the cover of the Fiber Optic Terminal Box and remove the cover (see 1)
2. Cable Entry: Loosen the fiber optic cable gland at the bottom of the communication unit. Route the external fiber optic cable into the unit through this gland (see 2).
3. Splicing: Insert the fiber cable into the terminal box through its entry gland (see 3). Have a qualified professional splice the fibers and wind the excess length securely onto the internal splice tray.

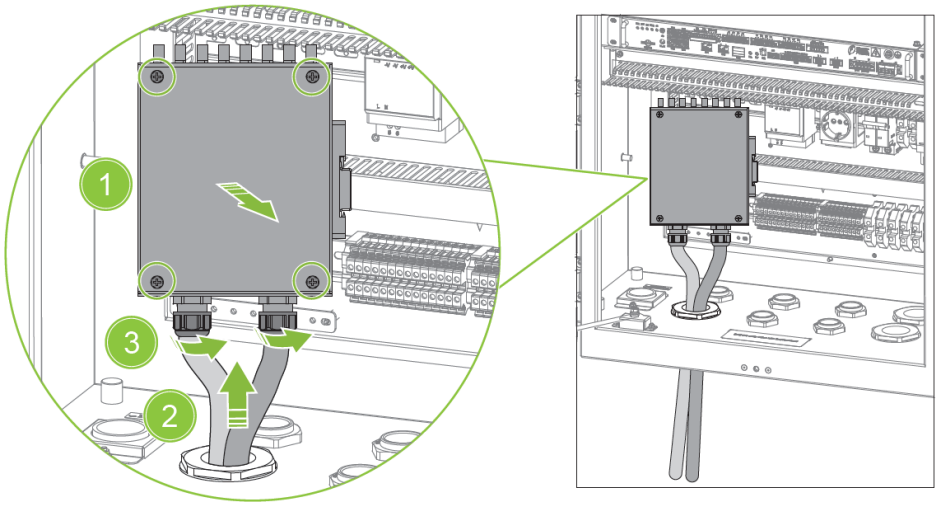


Figure 4-12 Connecting the terminal unit

4. Closing the Box: Once wiring is complete, reattach the cover and tighten the 4 screws.
5. Mount the Wired Terminal Box onto the Rail: Hook the upper spring clip (2) onto the top edge of the DIN rail (1), then press the bottom of the box (3) until it snaps into place (click sound) to ensure it is securely fixed.

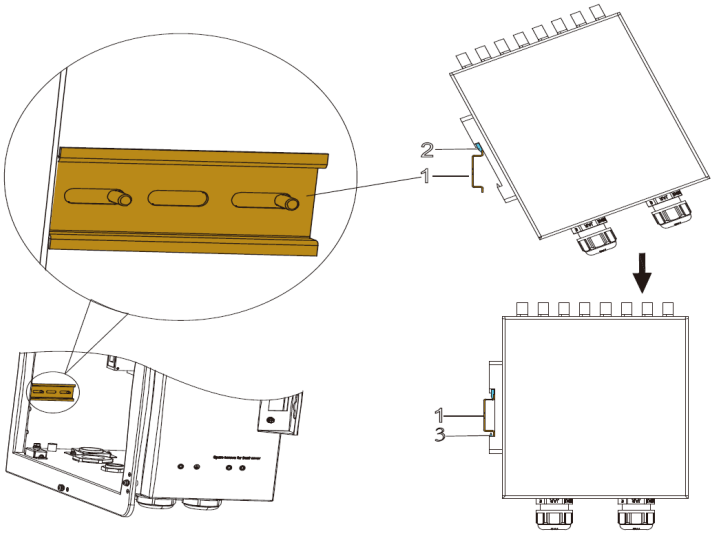


Figure 4-13 Mount the Terminal Box onto the Rail

6. Connecting Patch Cords: Connect one end of the fiber optic patch cord to the terminal box and the other end to the SFP 1 (Optical Module 1) and SFP 2 (Optical Module 2) ports of the Data Logger until you hear a "click".

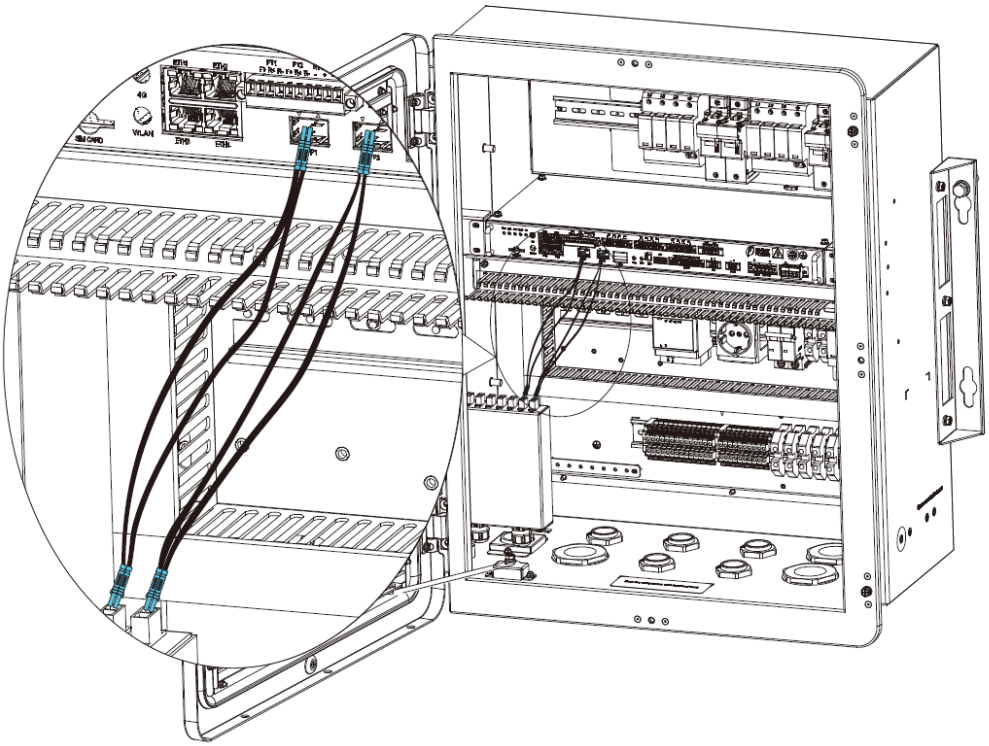


Figure 4-14 Connect the Fiber Optic Patch Cord

4.9 Finishing Installation

1. Cable Management & Sealing: Adjust the positions of all cables inside the cabinet. Tighten the cable gland nuts at the bottom to secure the cables, and apply fireproof mud (sealing compound) to the cable entries to prevent moisture ingress.

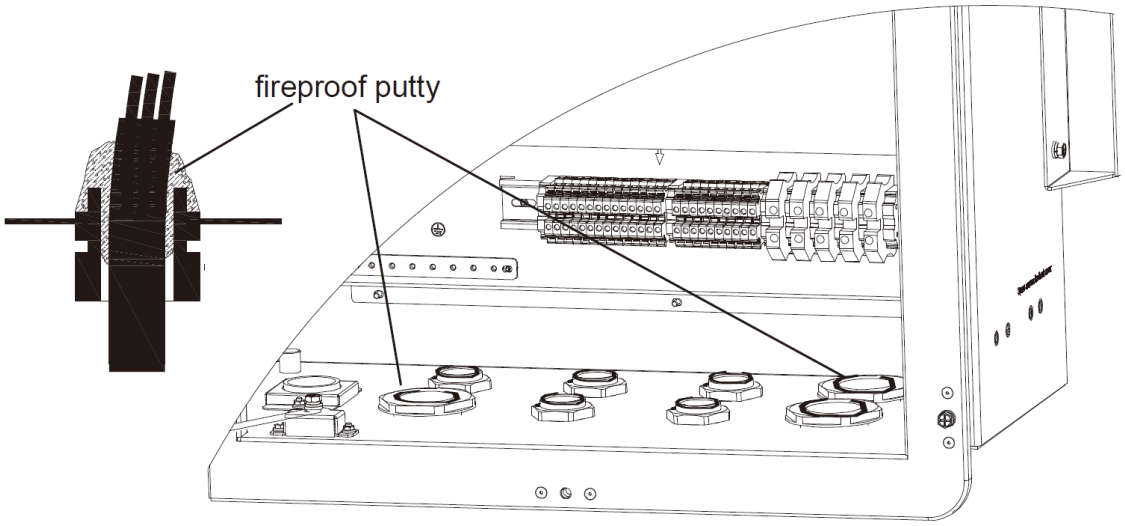


Figure 4-15 Apply fireproof putty

3. Closing the Unit: Retract the support rod on the front cover. Close the cover and tighten the original 5 screws to complete the installation. Torque: 3 N·m.

5 System Operation

⚠	**NOTICE!** Ensure that the check before power-on has been completed before powering on; All inspection and power-on/off operations must use special protective equipment and insulated tools to avoid electric shock or short-circuit faults; Ensure that the input power voltage of the data acquisition communication unit is within its working voltage range, and the three-phase input voltage is also within the working voltage range of the PLC.

5.1 Inspection Before Power-On

- **Breaker Status**: Ensure that the upstream switch and internal circuit breakers are set to the **OFF** position.
- **Mechanical Installation**: Verify that the communication unit and all components inside are reliably installed in place.
- **Cable Routing:** Rout power and signal cables separately to comply with high/low voltage separation requirements and the system wiring plan.
- **Cable Connections:** Ensure all the cable connections inside the unit are correct, secure, and reliable, with no exposed metal parts/wire cores.
- **Cable Dressing:** Ensure the cables inside the unit are bundled neatly. Ensure cable ties are evenly spaced, moderately tight, and uniformly aligned.
- **Cleanliness:** Ensure the unit interior is clean and free of dust, dirt, or construction debris.
- **Sealing:** Tighten the locking nuts on all used cable glands. Ensure unused glands are blocked with plugs and their caps are securely tightened.
- **Exterior Inspection:** Ensure the exterior paintwork and safety labels are intact. Immediately touch up any damaged paint to prevent corrosion.

5.2 System Power-on

1. Switch on the single-phase power switch at the remote box-type transformer that supplies power to the smart communication unit.
2. Switch on the three-phase power switch at the remote box-type transformer for HPLC communication.
3. Measure the input voltage at the line side of all internal switches using a multimeter. Verify that the voltage falls within the operating range of the corresponding components.
4. Turn on the internal single-phase input circuit breaker (QF01).
5. Retract the support rod, close the cabinet door, and tighten the screws.

5.3 System Power-Off

1. Turn off the single-phase power switch at the remote box-type transformer that feeds the Smart Communication Unit.
2. Turn off the three-phase power switch at the remote box-type transformer connected to the Smart Communication Unit.
3. Turn off the internal single-phase circuit breaker (QF01).

5.4 Debugging

After the communication unit is powered on, connect a PC to the ETH3 port or any available network port on the Data Acquisition Unit using an Ethernet cable. Log in to the SDL100 Web UI. For detailed operations, refer to *SDL100 Smart Data Logger User Manual*.

6 Maintenance

6.1 Regular Maintenance

DANGER!

- Only qualified and authorized personnel are permitted to perform maintenance or other operations on the smart communication unit.
- Perform operations on the unit only after it has been taken out of operation (powered off).
- After maintenance is complete, ensure that no metal parts (such as screws or washers) are left inside the unit, as this may cause damage.

Maintenance Safety Guidelines:

- Always power off the communication unit (disconnect the external power supply) before performing any maintenance work.
- Use a multimeter to ensure that the smart communication unit is completely de-energized.
- Wear proper PPE and use insulated tools to prevent electric shocks or short circuits.
- If the cabinet door must be opened in rainy or snowy weather, take protective measures to prevent rain or snow from entering the cabinet. Do not open the cabinet if such ingress cannot be prevented.

Inspection content	Inspection method
Cabinet Inspection	1. Check the exterior of the unit for damage or deformation. 2. Check the interior for dust and dirt. 3. Check the cleanliness of the chassis and internal components.
System Operation Status	1. Check if all internal electronic devices are operating normally. 2. Check whether the internal lightning protection equipment (SPD) is operating normally.
Electrical Connections	1. Check if cable connections are loose or disconnected. 2. Inspect cables for damage, paying special attention to cuts or abrasions on the insulation where cables contact metal surfaces. 3. Ensure unused cable glands are plugged and their locking caps are tightened.
Grounding Reliable	Check if all ground cables are securely connected.

Table 6-1 Maintenance list

6.2 Troubleshooting

Common faults and troubleshooting suggestions for the Smart Communication Unit are listed in the table below. If the problem cannot be resolved using the table or if you still have questions, please contact Chint Power. To resolve the issue more efficiently, please provide the following information:

- Model, Serial Number (S/N), and software version of the Smart Communication Unit.
- Brand, model, and configuration of the devices connected to the Smart Communication Unit.

- Fault information and a brief description of the issue.
- Photos of the fault site, if on-site conditions permit.

No.	Symptom	Possible Cause	Solution
1	**Cannot power on**	**Poor contact** at the single-phase AC input terminals.	Use a multimeter to check the connection between the power cable and the terminals.
		Poor contact at the AC input terminals of the power adapter.	Use a multimeter to check the connection between the AC power cable and the power adapter's AC input terminals.
		Poor contact at the DC output terminals of the power adapter.	Use a multimeter to check the connection between the DC power cable and the power adapter's DC output terminals.
		Power adapter fault.	**Replace** the power adapter.
		SDL100 fault.	Contact the distributor or **Chint Power Customer Service Center**.
2	**Cannot detect devices**	No devices connected to terminals (RS485/232/CAN/ETH), or cables are **loose, disconnected, or reversed**.	Check RS485/232/CAN/ETH cable connections. If loose, disconnected, or reversed, **reconnect and tighten them**.
		Devices that do not support auto-detection (e.g., environmental monitors, meters) were not **manually added**.	Manually add devices such as environmental monitors and meters via the corresponding **Web UI**.
		RS485 communication parameters are incorrect.	Re-check RS485 parameter settings. Ensure the **baud rate** and **communication address** are correct, and the inverter address is within the searchable range.
		SDL100 fault.	Contact the distributor or **Chint Power Customer Service Center**.
3	**Communication failure during networking**	AC power cable is **loose, disconnected, or reversed**.	Check the AC power cable connection. If loose, disconnected, or reversed, **reconnect and tighten it**.
		The **upstream switch** for the AC power cable is not closed (turned on).	Check whether the upstream switch of the AC power cable is **closed**.

		SDL100 fault.	Contact the distributor or **Chint Power Customer Service Center**.
4	**SDL100 shows device status as "Disconnected"**	Cable or network cable connection is **loose or disconnected**.	Check the connection of communication cables and network cables between the device and the SDL100. If loose or disconnected, **reconnect and tighten them**.
		Device is **powered off**.	After ensuring the device connection is correct, **power on** the device.
		Device **baud rate** or **RS485 address** has been modified.	Check if the device's baud rate and RS485 address are set correctly.
		Device has been **replaced**.	Check if the device has been replaced. If so, **re-search** or **manually add** the device.
		Device has been removed but not connected.	If the device has been removed, perform the **"Delete"** operation via "Device Management".
5	**Communication abnormality with Environmental Monitor**	**RS485 cable connection** between the Environmental Monitor and SDL100 is incorrect, loose, or disconnected.	Check if the cable connection is correct. If loose or disconnected, **reconnect and tighten it**.
		Environmental Monitor is **not powered on**.	**Power on** the Environmental Monitor.
		Environmental Monitor **RS485 parameters** do not match SDL100.	Check if the Environmental Monitor's RS485 communication parameters are set correctly.
		Environmental Monitor parameter settings are incorrect.	Log in to the **Web UI** and check if the Environmental Monitor parameters are set correctly.
6	**Cannot log in to the Smart Data Logger Web UI**	SDL100 is not connected to the PC, or the cable is **loose/disconnected**.	Check if the Ethernet port of the SDL100 is correctly connected to the PC.
		PC network signal is abnormal.	Observe if the PC network signal icon is normal.
		Wired or wireless network parameters are set incorrectly.	Check if the wired or wireless network parameters are set correctly.
		Management system parameters are set incorrectly.	Check if the management system parameters are set correctly.
7	**Communication failure during RS485 networking**	**RS485 cable connection** is incorrect, disconnected, or loose.	Check if the RS485 communication cable is correctly connected to the port on the terminal block.

			Confirm that the RS485 port of other devices is correctly connected to the corresponding port on the SDL100.
			Check RS485 cable connections. If loose, disconnected, or reversed, **reconnect and tighten them**.
		Devices are **not powered on**.	**Power on** the SDL100 and other devices.
		RS485 communication parameters are incorrect.	Check RS485 communication parameter settings.
		SDL100 fault.	Contact the distributor or **Chint Power Customer Service Center**.
8	**Adding Env Monitor failed (Device already exists on port)**	A device with the **same communication address** exists on the port.	Modify the communication address of the device with the duplicate address under the port via the **Web UI**, then re-add the Environmental Monitor.
		Duplicate addresses are not allowed.	Modify the communication address of the Environmental Monitor, then **re-add** it.
9	**Data Logger LED is off**	The Data Logger is not **successfully powered**.	• Check if the switches at both the **remote box-type transformer side** and the **local cabinet side** are closed. • Check if the auxiliary transformer in the box-type transformer is working normally. • Check the **24VDC power supply**. • Check the status of the **power supply fuse**.
10	**Cannot connect to the O&M platform**	• The wired network does not meet the cloud connectivity conditions. • The remote operation and maintenance platform switch is in the off state.	• Check whether the wired network can access the Ethernet. • Check whether the remote cloud - connection hardware switch is turned on (disabled by default). • Check whether the remote cloud - connection software switch is turned on (disabled by default).

6.3 Web-based Maintenance

1. Log in to the Web UI and verify that the device communication status is normal.
2. Log in to the Web UI and verify that the Smart Logger parameters are configured correctly.
3. Log in to the Web UI and check the software version of the Smart Data Logger.

6.4 After-sales Inspection and Frequency

Inspection Item	Inspection method	Maintenance cycle
Operating Environment	• Ensure there are no sources of strong electromagnetic interference around the Smart Communication Unit. • Ensure there are no **heat sources** around the unit. • Ensure there are no **corrosive substances** around the unit.	Every six months
Cabinet Inspection	• 1. Check the exterior of the unit for damage or deformation. • 2. Check the interior of the unit for dust and dirt.	Annually
Hardware Maintenance	• Confirm that the internal power supply is normal. • Confirm that all internal electronic devices are intact and operating normally. • Confirm that all wiring connections are secure and not loose.	Every six months
Terminals	• Check if terminal screws are secure and check for discoloration (e.g., rust). • Inspect cables for damage, paying special attention to cuts or abrasions on the insulation where cables contact metal surfaces. • Ensure unused cable glands are plugged and their locking caps are tightened.	Annually
Grounding Reliability	Check if all ground cables are securely connected.	Annually

6.5 Replace the Data Logger

The Data Logger is pre-installed inside the Smart Communication Unit. If removal is required, use a Phillips screwdriver to remove the four securing screws, as shown in the figure below.

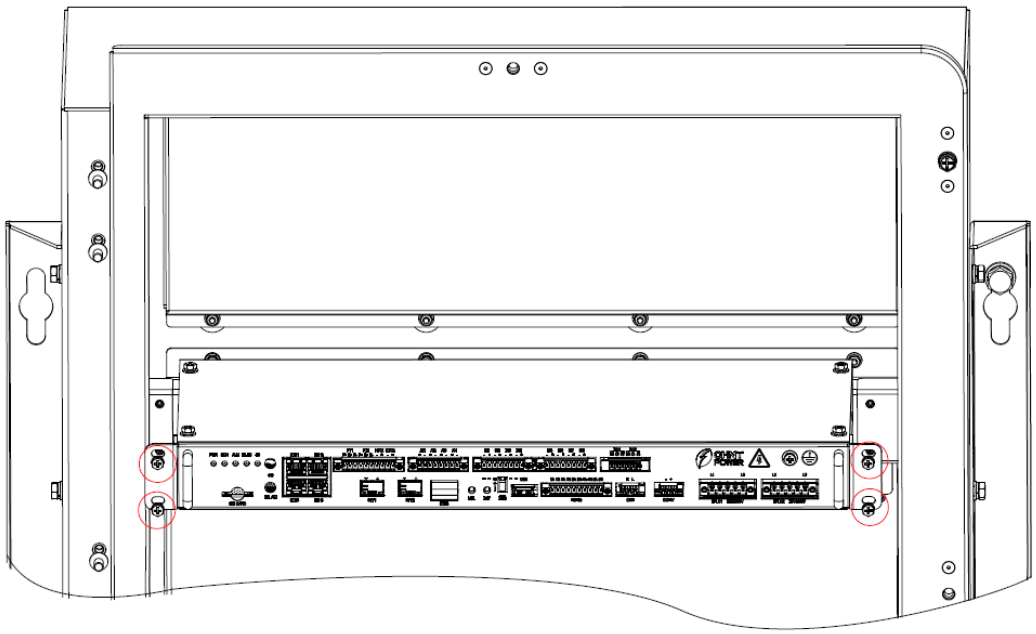


Figure 6-1 Disassembling the data logger

7 Technical Data

Model		SCU100S-00-EU
Communication Mode		HPLC/RS485/Ethernet
Ethernet port (ETH)		5, ≤100m
SFP Optical Port		2, ≤10km (single-mode, 1000Mbps)
RS485		5
CAN communication		1
HPLC communication		2
Digital Input (DI)		8
Digital Output (DO)		2
Analog Input (AI)		4
PT100		2
NTC (Negative Temperature Coefficient)		2
Bluetooth and Wi-Fi		Supported
Web Interface		Supported
Power Supply	Three-phase AC Input	380 – 1000VAC
	Single-phase Operating Voltage	100 – 240VAC
	Single-phase Input Power	30W Max
	Frequency	50 / 60Hz
Mechanical Parameters	Operation & Maintenance Method	Front Access
	Mounting Mode	Wall, Bracket, and Pole
	Dimensions (W × H × D)	750 mm × 598 mm × 290 mm (including mounting accessories)
	Net weight	≤ 30kg (including fireproof putty, screws, and mounting accessories)
Environment	Operating Environment	Indoor, outdoor
	Altitude	4000m
	IP Rating	IP66
	Salt Mist Resistance Class	C5-M
	Operating Relative Humidity	0% – 100%, no condensation

	Operating Temperature	-30°C – 60°C (with sunshade) -30°C – 40°C (without sunshade)
	Storage Temperature	-40°C – 70°C

8 Quality Assurance

8.1 Liability Exemption

1. Exceed the quality assurance period of the product.
2. Cannot provide product serial number or the SN is not clear/complete. Incorrect or inappropriate use of the product (including installation and use).
3. Damage during transportation/storage/handling.
4. Misuse, abuse, intentional damage, negligence or accidental damage.
5. Improper commissioning, testing, operation, maintenance or installation performed by customer, including but not limited to:
   - Failure to meet safe operating environment or system requirements of external electrical parameters provided in written document;
   - Failure to operate the covered product in accordance with the product's operating manual or user guide;
   - Relocate and reinstall systems not in accordance with the requirements of Chint power;
   - Unsafe electrical or chemical environment or other similar kind of conditions;
   - Direct failure caused by wrong voltage or faulty power system;
   - Unauthorized disassembly of the products, or unauthorized modification of the product or provided software;
6. Entrust installation, maintenance personnel not designated by the CHINT to install, repair and disassemble the products.
7. Damages caused by ignoring the safety warnings in the manual or break the rules in relevant statutory safety regulations.
8. Damages caused by operating environment beyond the requirements of the product user manual or failure to commissioning, install, use and maintain the equipment according to the requirements of the product user manual.
9. Unforeseen disasters or irresistible accidents (including but not limited to acts of public enemies, acts of government agencies or domestic or foreign institutions, vandalism, riots, fires, floods, typhoons, explosions or other disasters, epidemic or quarantine restrictions, labor disturbances or labor shortages, accidents, cargo embargoes or any other events beyond the control of CHINT).
10. The lightning protection measures have not been implemented or are not in accordance with standards (Photovoltaic systems' lightning protection measures should comply with the relevant national and IEC standards; otherwise, it may result in damage to photovoltaic devices such as modules, inverters, distribution facilities, etc., due to lightning strikes).
11. Other circumstances that are not covered by the company's after-sales warranty agreement.

8.2 Quality Clause (warranty Clause)

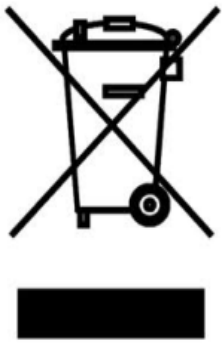
1. For products that fail during the warranty period, our company will repair or replace new products free of charge;
2. Customer shall present the invoice of the product and date of purchase. At the same time, the trademark on the product should be clearly visible, otherwise we have rights to refuse quality assurance.
3. The unqualified product under replacement should be returned to our company;

4. It is necessary to provide a reasonable time for the company to overhaul the equipment.
5. For more warranty terms, refer to the applicable standard warranty policy in place at time of purchase.

If you have any questions about the Smart Communication Unit, please contact us, we will be very happy to help you.

9 Recycling

Distributors or installers should contact the inverter manufacturer after removing the inverter from the photovoltaic module and follow the instructions.



The communication unit cannot be disposed of as household waste.

When the inverter's service life expires, please dispose of it in accordance with the electrical waste disposal laws applicable to the installation location.

You can contact the communication unit manufacturer or distributor for handling.

Shanghai Chint Power Systems Co., Ltd.

Headquarters: No. 5999, Guangfulin Road, Songjiang District, Shanghai, China

Main line: 021-37791222

Fax: 021-37791222-866001

Website: www.chintpower.com

Service hotline: 400-679-1222

Email: service.cps@chint.com