



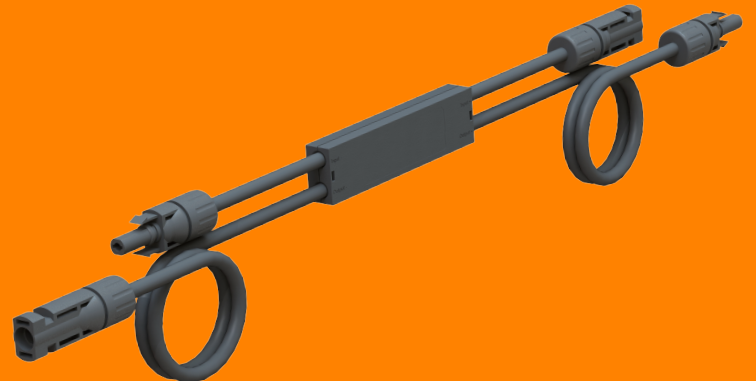
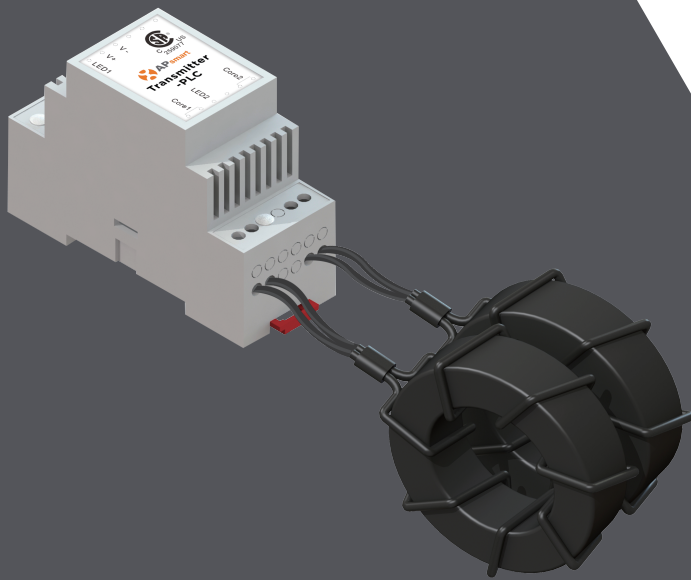
Installation / User Manual

APsmart rapid shutdown system Rev1.0 2019/09/11

RSD-S-PLC

TRANSMITTER-PLC/TRANSMITTER-PLC-PCBA/

TRANSMITTER-PLC-OUTDOOR KIT



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IMPORTANT SAFETY INSTRUCTIONS

This manual contains important instructions to be followed during installation and maintenance of the APsmart RSD and Transmitter. To reduce the risk of electrical shock and ensure the safe installation and operation of the APsmart RSD and Transmitter, the following symbols appear throughout this document to indicate dangerous conditions and important safety instructions.

Safety Instructions

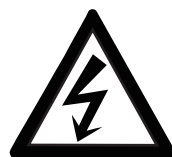
- Do NOT disconnect the PV module from the RSD-S-PLC without first disconnecting the AC power.
- Only qualified professionals should install and/or replace the APsystems RSD-S-PLC.
- Perform all electrical installations in accordance with local codes.
- Before installing or using the RSD-S-PLC, please read all instructions and cautionary markings in the technical documents and on the APsystems microinverter system and the solar array.
- Be aware that the body of the running RSD-S-PLC is the heat sink and can reach high temperatures. To reduce risk of burns, do not touch the body of the RSD-S-PLC.
- Do NOT attempt to repair the RSD-S-PLC. If it fails, contact APsystems Customer Support to obtain an RMA number and start the replacement process. Damaging or opening the RSD-S-PLC will void the warranty.

The transmitter control power supply MUST be on the same AC branch circuit as the inverter to meet rapid shutdown requirements.

Symbols replace words on the equipment, on a display, or in manuals

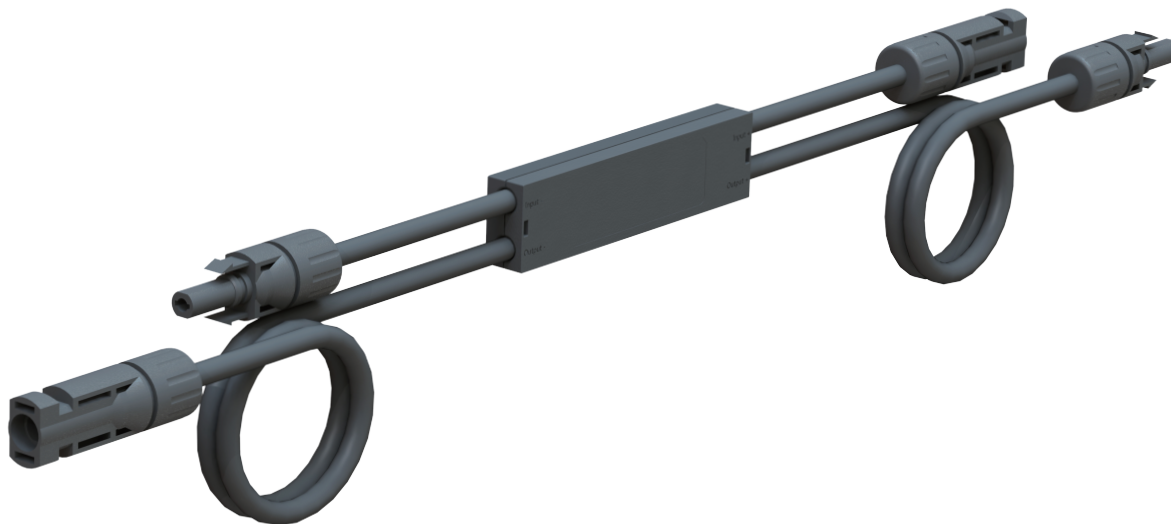
Qualified personne:

Person adequately advised or supervised by an electrically skilled person to enable him or her to perceive risks and to avoid hazards which electricity can create. For the purpose of the safety information of this manual, a "qualified person" is someone who is familiar with requirements for safety, refrigeration system and EMC and is authorized to energize, ground, and tag equipment, systems, and circuits in accordance with established safety procedures. The inverter and endues system may only be commissioned and operated by qualified personnel.



RSD PRODUCTS

RSD-S-PLC:

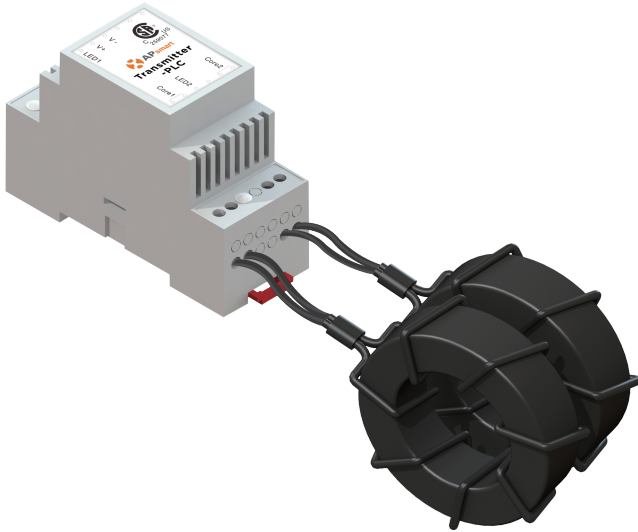


- Meets NEC 2017 (690.12) requirements
- Switch off RSS Transmitter,
rapid shutdown the output of PV modules
- Meets SunSpec requirements

RSD-S-PLC meets SunSpec demands: to maintain proper functioning by continually receiving heartbeat frame from Transmitter-PLC. In the meanwhile, users could stop the Transmitter-PLC by AC switching out in case of emergency to realize the module-level rapid shutdown.

TRANSMITTER PRODUCTS

Transmitter-PLC:



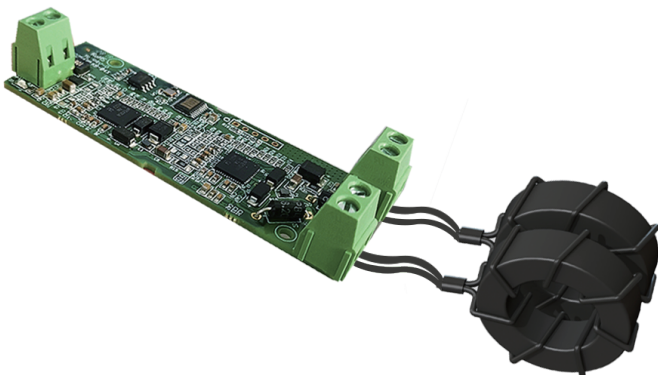
- Meets NEC 2017 (690.12) requirements
- Switch off RSS Transmitter, rapid shutdown the output of PV modules
- Meets SunSpec requirements
- Equipped with single/dual core
- Optional 120/240VAC power supply
- Optional 480/277VAC power supply

Transmitter-PLC-Outdoor Kit:



- Meets NEC 2017 (690.12) requirements
- Switch off RSS Transmitter, rapid shutdown the output of PV modules
- Meets SunSpec requirements
- Equipped with single/dual core
- Optional 120/240VAC power supply
- Optional 480/277VAC power supply

Transmitter-PLC-PCBA:

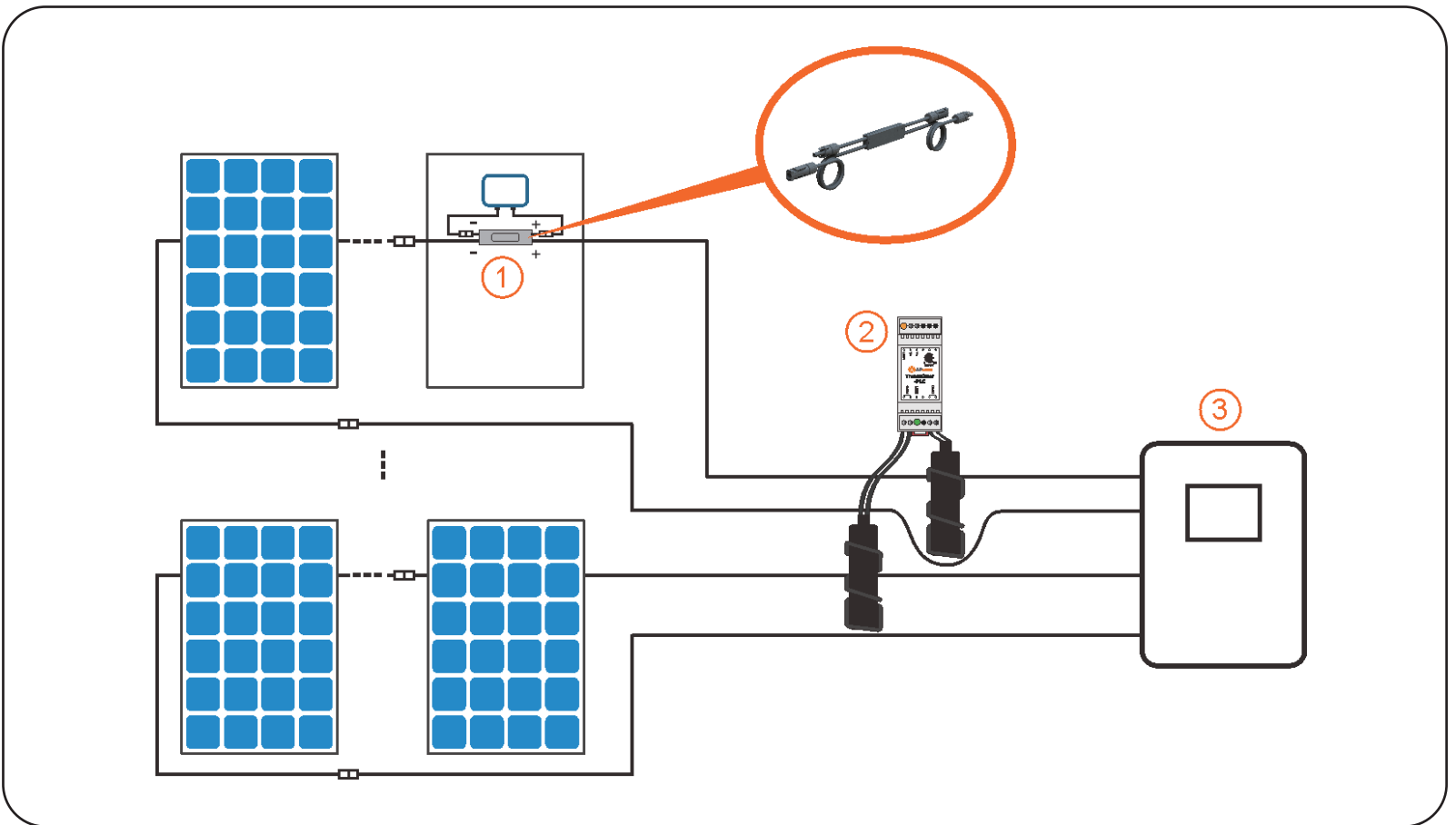


- Meets NEC 2017 (690.12) requirements
- Switch off RSS Transmitter, rapid shutdown the output of PV modules
- Meets SunSpec requirements
- Equipped with single/dual core
- Optional 120/240VAC power supply
- Optional 480/277VAC power supply

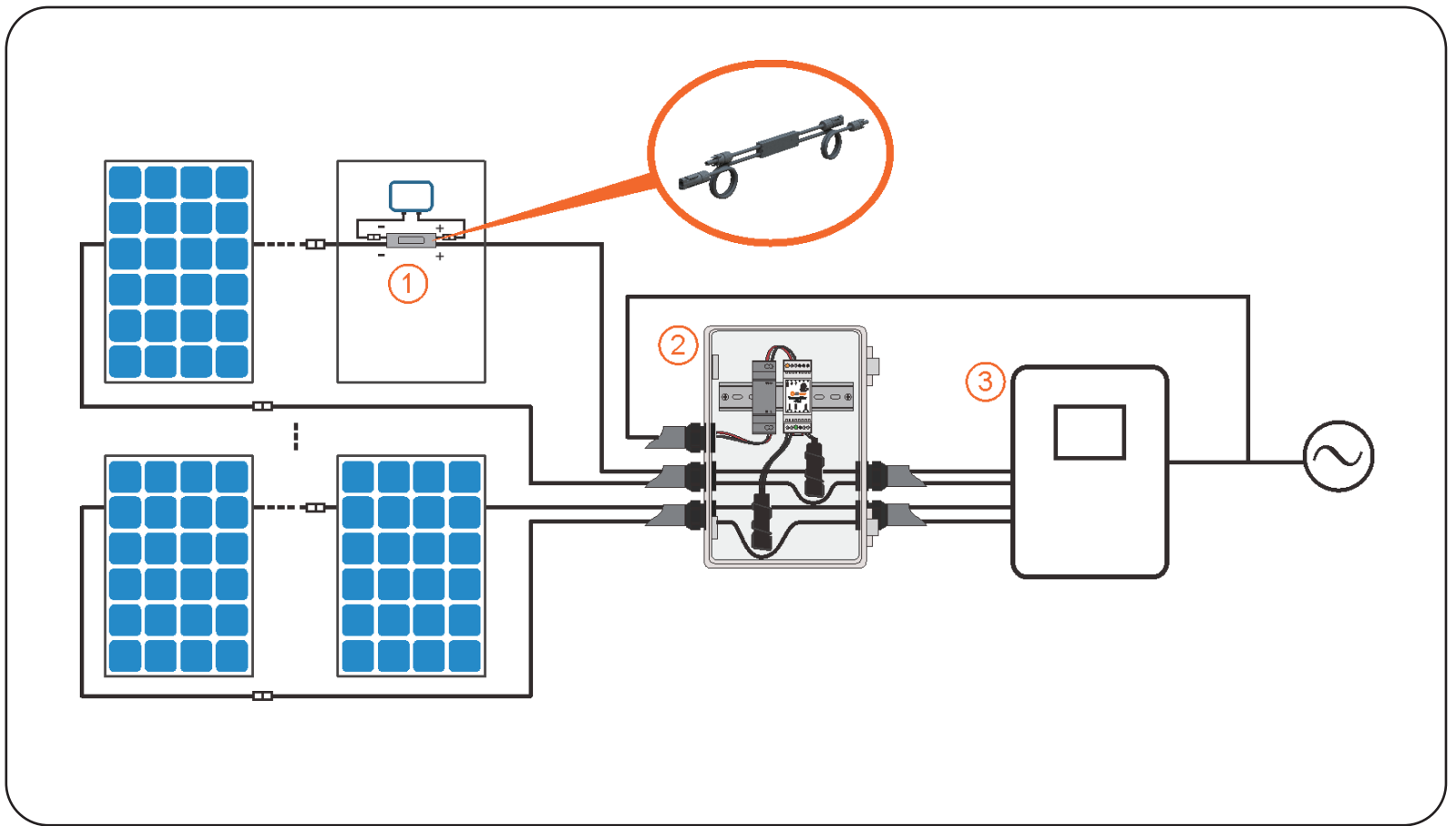
SYSTEM WIRING DIAGRAM

The APsmart Rapid Shutdown System (RSS) Transmitter-PLC is part of a rapid shutdown solution when paired with APsystems RSD-S-PLC, a PV module rapid shutdown unit. While powered on, the RSS Transmitter sends a signal to the RSD-S-PLC units to keep their PV modules connected and supplying energy.

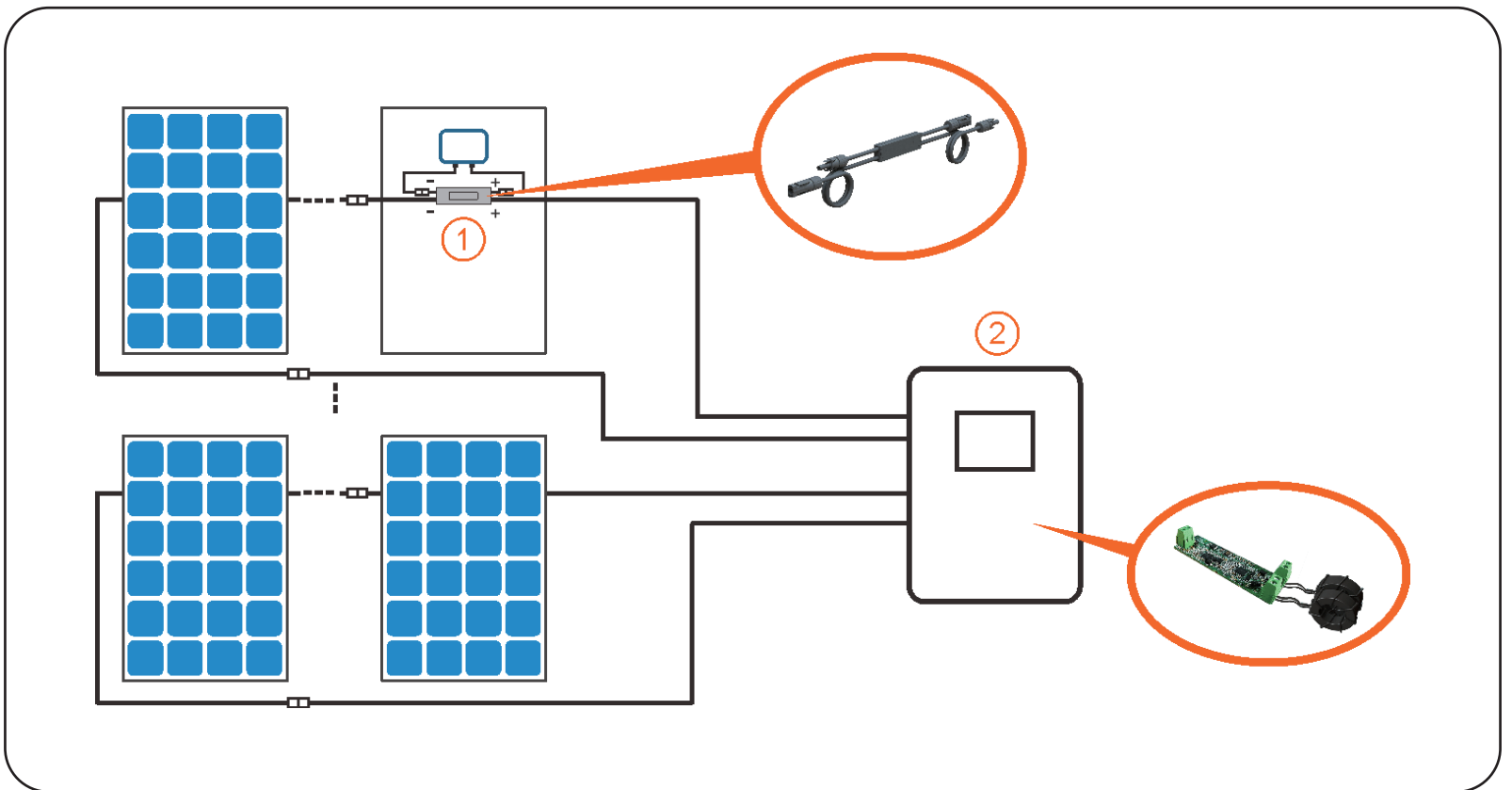
RSD-S-PLC units automatically enter rapid shutdown mode when the RSS Transmitter-PLC is switched off and resume energy production when power is restored to the RSS Transmitter. This solution complies with NEC 690.12 specifications for 2017 and supports the SunSpec signaling for rapid shutdown.



- ① RSD-S-PLC
- ② Transmitter-PLC
- ③ Inverter



- ① RSD-S-PLC
- ② Transmitter-PLC-Outdoor Kit
- ③ Inverter



- ① RSD-S-PLC
- ② Inverter with Transmitter-PLC-PCBA

RSD-S-PLC INSTALLATION

INSTALLATION NOTES

Installation **MUST** comply with local regulations and technical rules:

- ① Perform all electrical installations in accordance with local codes.
- ② Be aware that only qualified professionals should install and/or replace the RSD-S-PLC.
- ③ Before installing or using an RSD-S-PLC, please read all instructions and warnings in the technical documents and on the inverter system itself as well as on the PV array.
- ④ Be aware that installation of this equipment includes the risk of electric shock.
- ⑤ Do not touch any live parts in the system, including the PV array, when the system has been connected to the electrical grid.
- ⑥ Ensure the solar module and inverter has been disconnected before installing an RSD-S-PLC.

- ① Be sure to verify the voltage and current specifications of your PV module match with those of the RSD-S-PLC.
- ② You must match the DC operating voltage range of the PV module with the allowable input voltage range of the RSD-S-PLC.
- ③ The maximum open circuit voltage of the PV module must not exceed the specified maximum input voltage of the APsystem RSD-S-PLC.

Additional installation components from APsystems

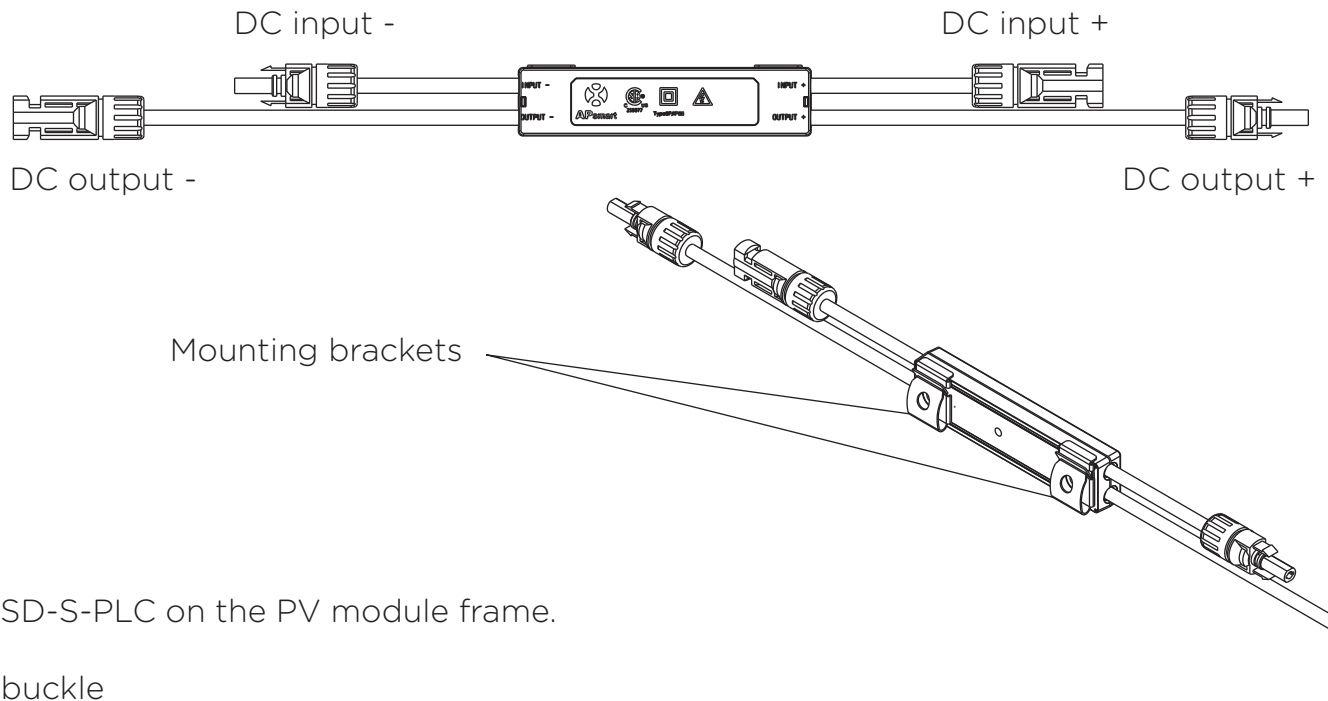
- DC extension cable (sold separately)

Required parts and tools to complete the installation

In addition to your PV array and its associated hardware, you will need the following items:

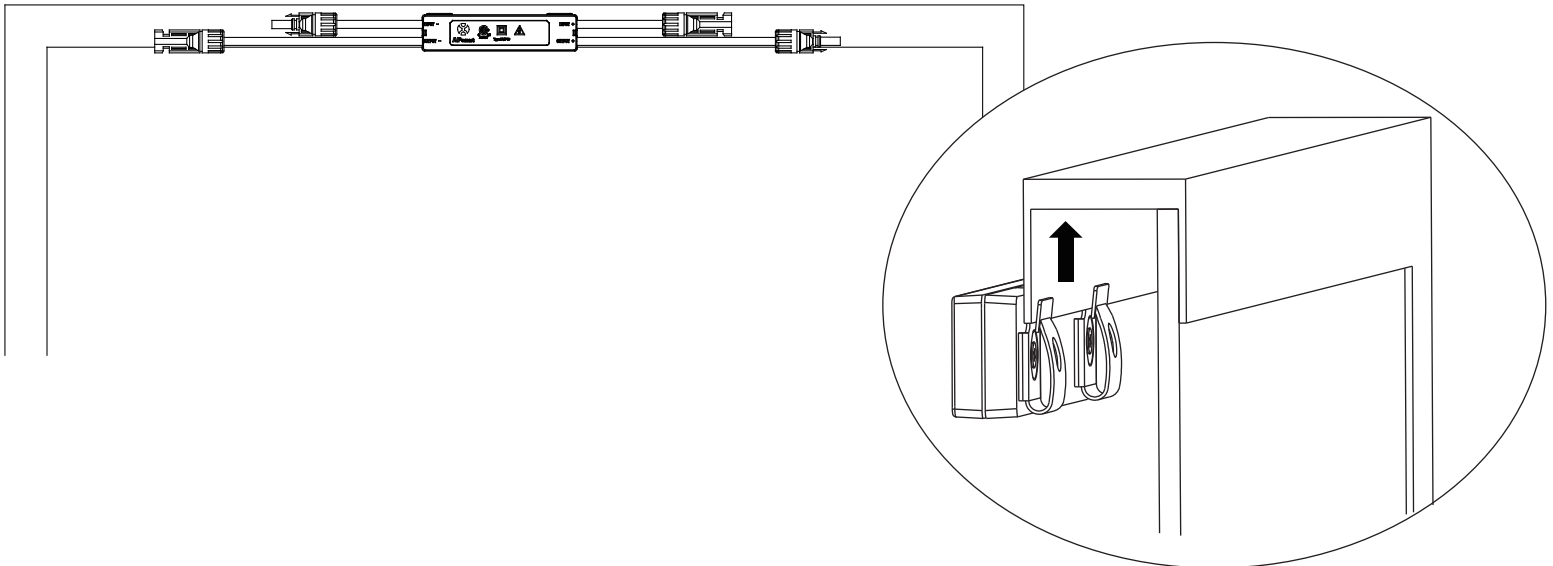
- Rapid shutdown device installation kit (screw, nut)
- A torque wrench and a Phillips screwdriver

Step 1: Install the RSD-S-PLC.

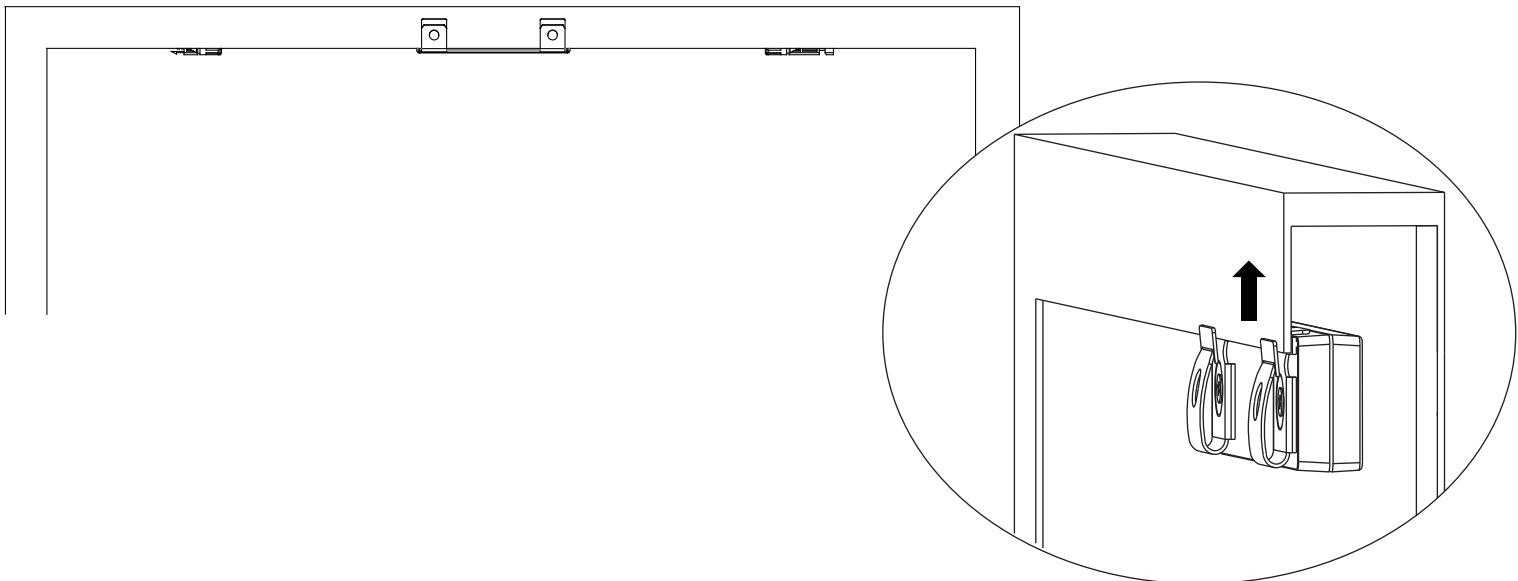


Buckle RSD-S-PLC on the PV module frame.

A. Front buckle

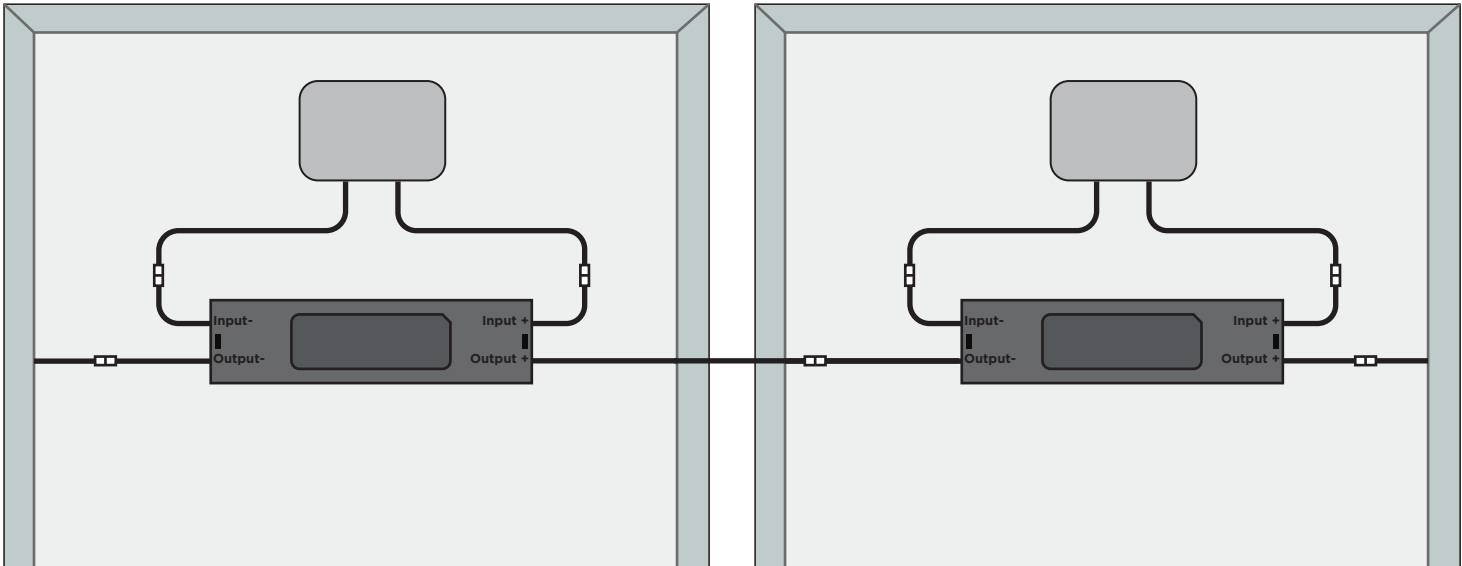


B. Back buckle

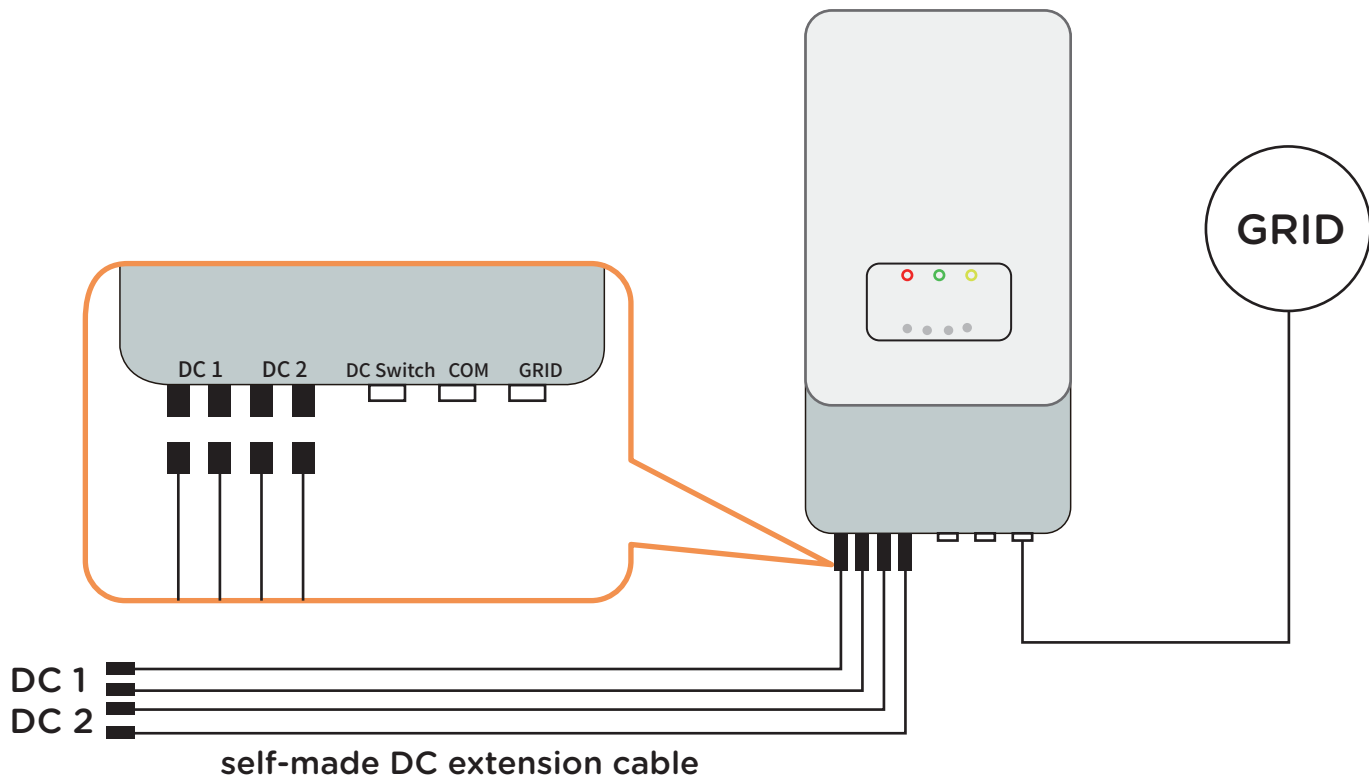


Note: Both installations can be installed anywhere on the PV module frame.

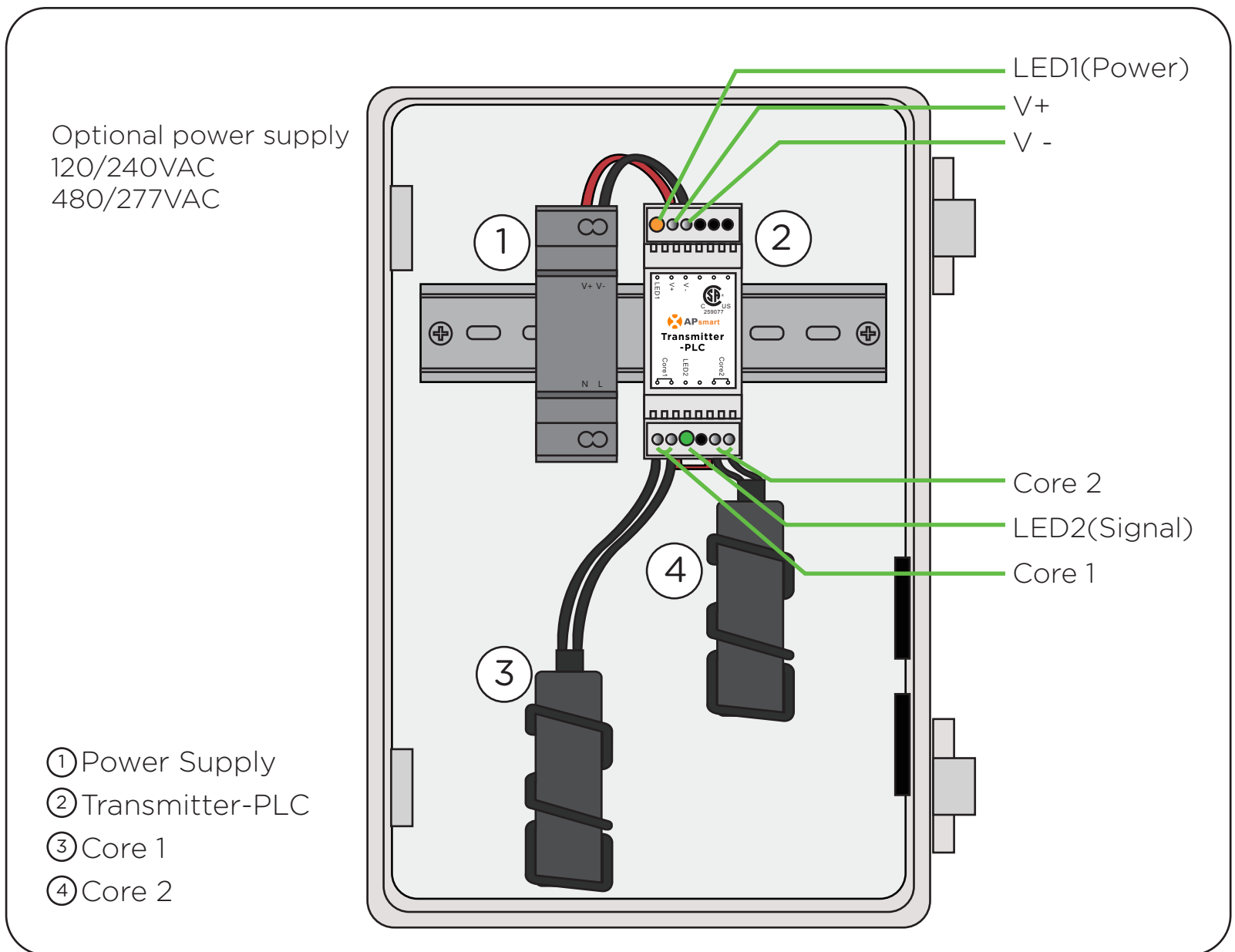
Step 2: According to the component arrangement, connect the output port of the RSD-S-PLC and connect the input port to the junction box.



Step 3: Connect the RSD-S-PLC serially connected output to the inverter with a self-made DC extension cable.



TRANSMITTER-PLC INSTALLATION

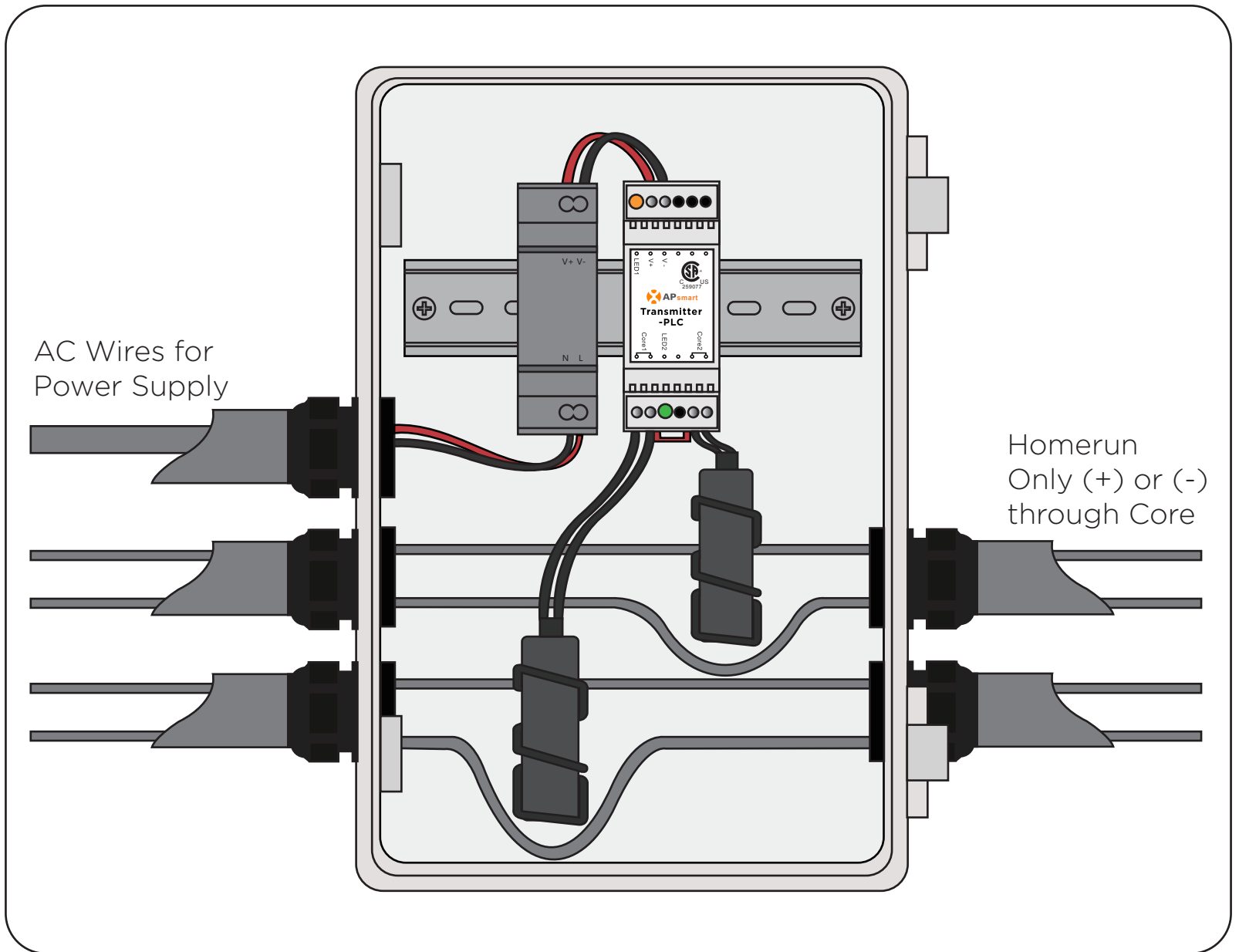


Transmitter power supply must be on same AC branch circuit as inverter to meet rapid shutdown requirements

Note: Install RSD-S-PLC before powering on Transmitter.

- Mount Transmitter-PLC and power supply on DIN rail
- Connect DC leads from power supply to transmitter-PLC
- Connect single/dual core(Core 1 and Core 2) to transmitter-PLC

Place rapid shutdown system label no more than 1m (3ft) from Transmitter or AC disconnect if not at same location.



Note: Install RSD-S-PLC before powering on Transmitter.

- Pass either positive or negative homerun through Cores (Max 10 strings per core)
- Connect wires to AC side of Power supply

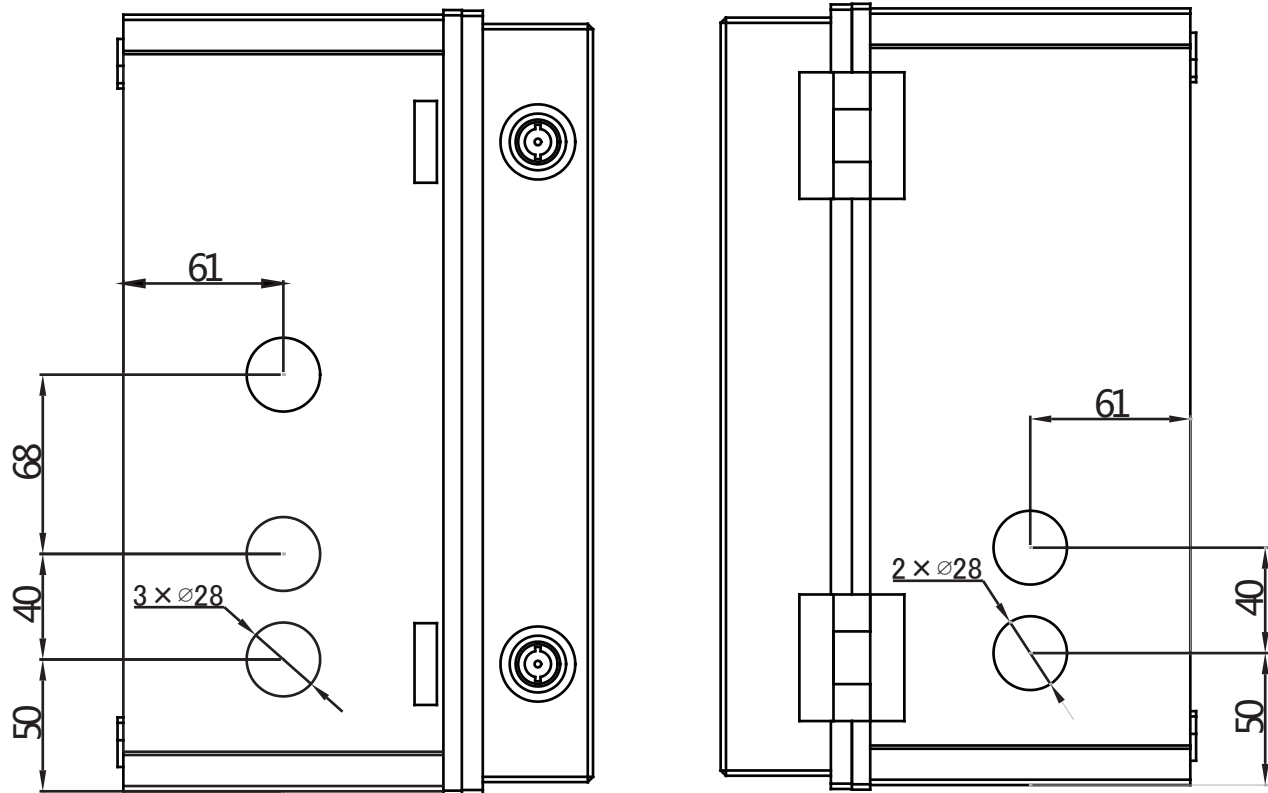
Max number of strings per Core: **10**

Max string length: **30 modules**

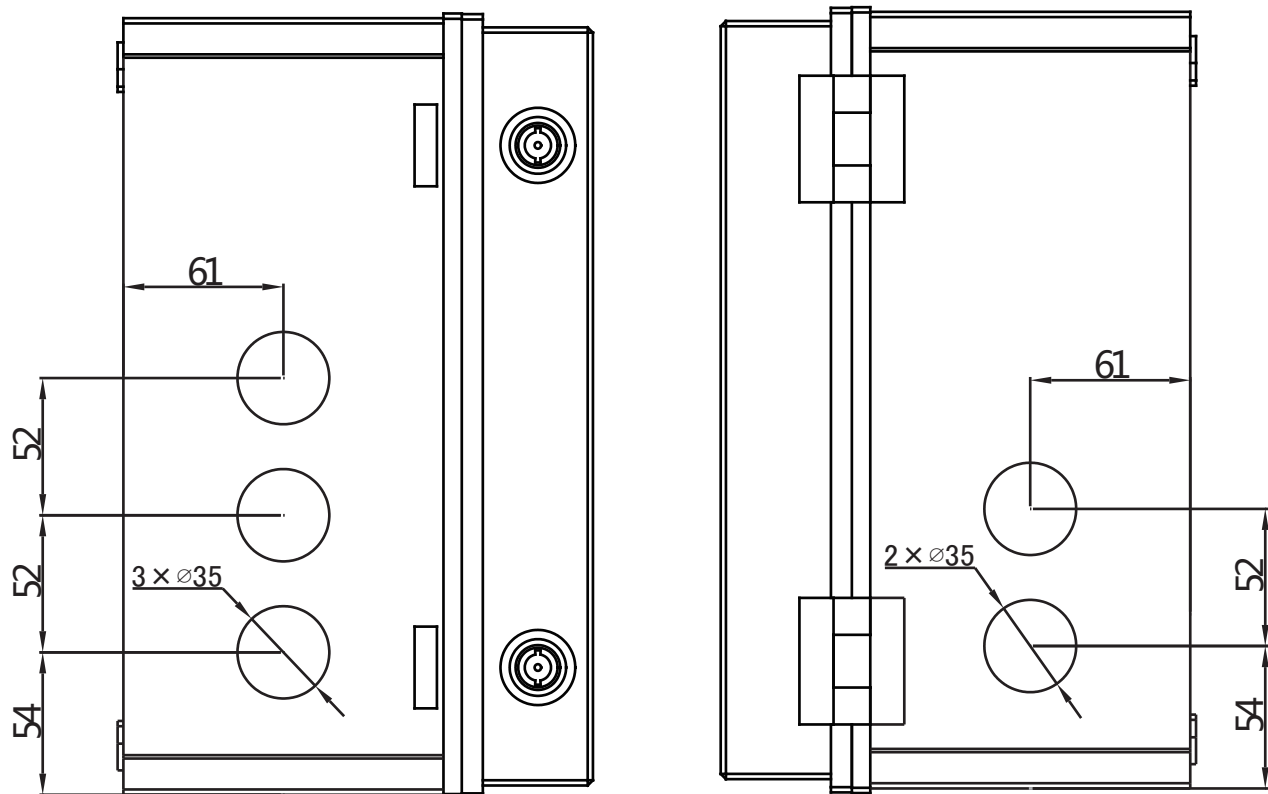
Max current per Core: **150A**

Max cable length from inverter (+) to inverter (-): **1000ft (300m)**

Drilling Guide for .75" Conduit



Drilling Guide for 1" Conduit



TECHNICAL DATA—RSD-S-PLC

Model	RSD-S-PLC
Input Data (DC)	
Input operating Voltage Range	8-80V
Maximum Cont. Input Current (Imax)	15A
Maximum Input Power	800W
Output Data (DC)	
Output operating Voltage Range	8-80V
Output Power Range	0-800W
Maximum System Voltage	1000V/1500V
Mechanical Data	
Operating Ambient Temperature Range	-40 °C to + 85 °C (-40 oF to +185 oF)
Dimensions (without cable&connectors)	5"x1.2"x0.6"(129mm x 30mm x 16mm)
Cable length	Input 250mm/Output 1200mm or Customize
Module Connector	MC-4 Compatible or Customize
Enclosure Rating	Type 6P/IP68
Overtemperature protection	Yes
Features & Compliance	
Communication	PLC
Safety Compliance	NEC 2017 (690.12);UL1741;CSA C22.2 No. 330-17; IEC/EN62109-1;2PFG2305
EMC Compliance	FCC Part15;ICES-003;IEC/EN62109-1/-2/-3/-4

TECHNICAL DATA—TRANSMITTER-PLC

Model

Transmitter-PLC

Main electrical data

Input Voltage

12 VDC

Input Current

1A

Communication

PLC

Power Supply

Residential (optional)

85-264VAC Input, 12VDC Output,

90mm x 17.5mmx58.4 mm

Commercial (optional)

200-500VAC Input, 12VDC Output,

125.2mm x 40mmx113.5mm

Core data

Max. Current

300A (150AX2)

Max. System Voltage

1500VDC

Internal Opening For Wires

29mm

Max. Number Of Strings

10x2

Max. Supported PV Modules per String

30 modules

Environmental

Temperature

-40 °C ~ +85 °C

Structure data

Dimensions (W x H x D)

90x35x62mm

Enclosure Environmental Rating

IP30

Features & Compliance

Safety Compliance

NEC 2017 (690.12);UL1741;CSA C22.2 No. 330-17

EMC Compliance

FCC Part15;ICES-003

TECHNICAL DATA— TRANSMITTER-PLC-OUTDOOR KIT

Model	Transmitter-PLC-Outdoor Kit
Main electrical data	
Input Voltage	12 VDC
Input Current	1A
Communication	PLC
Power Supply	
Residential (optional)	85-264VAC Input, 12VDC Output, 90mm x 17.5mmx58.4 mm
Commercial (optional)	200-500VAC Input, 12VDC Output, 125.2mm x 40mmx113.5mm
Core data	
Max. Current	300A (150AX2)
Max. System Voltage	1500VDC
Internal Opening For Wires	29mm
Max. Number Of Strings	10x2
Max. Supported PV Modules per String	30 modules
Environmental	
Temperature	-40 °C ~ +85 °C
Structure data	
Dimensions (W x H x D)	198.5x298x179mm
Enclosure Environmental Rating	IP65
Features & Compliance	
Safety Compliance	NEC 2017 (690.12);UL1741;CSA C22.2 No. 330-17
EMC Compliance	FCC Part15;ICES-003;IEC/EN62109-1/-2/-3/-4

TECHNICAL DATA—TRANSMITTER-PLC-PCBA

Model

Transmitter-PLC-PCBA

Main electrical data

Input Voltage

12 VDC

Input Current

1A

Communication

PLC

Power Supply

Residential (optional)

85-264VAC Input, 12VDC Output,

90mm x 17.5mmx58.4 mm

Commercial (optional)

200-500VAC Input, 12VDC Output,

125.2mm x 40mmx113.5mm

Core data

Max. Current

300A (150AX2)

Max. System Voltage

1500VDC

Internal Opening For Wires

29mm

Max. Number Of Strings

10x2

Max. Supported PV Modules per String

30 modules

Environmental

Temperature

-40°C ~ +85°C

Structure data

Dimensions (W x H x D)

84x29x17.1mm

Features & Compliance

Safety Compliance

NEC 2017 (690.12);UL1741;CSA C22.2 No. 330-17

EMC Compliance

FCC Part15;ICES-003;IEC/EN62109-1/-2/-3/-4

ORDERING INFORMATION

Transmitter

406000	Dual Core Transmitter-PLC (no power supply)
406001	Single Core Transmitter-PLC (no power supply)
408000	Dual Core Transmitter-PLC-Outdoor Kit(no power supply)
408001	Single Core Transmitter-PLC-Outdoor Kit(no power supply)
409000	Dual Core Transmitter-PLC-PCBA (no power supply)
409001	Single Core Transmitter-PLC-PCBA (no power supply)
902000	120/240VAC Power Supply
903000	480/277VAC Power Supply

RSD-S-PLC

405001	1000V UL/TUV, 1.2m cable, MC4 compatible, Mounting brackets
405002	1000V UL/TUV, 1.2m cable, MC4, Mounting brackets
405003	1500V UL/TUV, 1.2m cable, MC4-Evo2, Mounting brackets

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