

Smart PV Optimizer

SP1-600W-AS/AL

Quick installation manual

1. Must Read Before Installation

CAUTION

When carrying out various operations of this product, the relevant equipment precautions and special safety instructions provided by SolarPilot Energy must be strictly observed.

It is strictly forbidden to open the case, disassemble and repair the product without authorization to ensure the safety of personnel. In case of such necessary services, find a trained or qualified professional technician to do it.

The operators should comply with local regulations.

WARNING

Installation or maintenance operations must follow the sequence of steps of the task, and do not change the structure and installation order of the equipment without the manufacturer's permission.

A certain distance should be reserved between the optimizer and the surrounding objects to ensure sufficient installation and heat dissipation space.

The installation, electrical connection, maintenance, troubleshooting, and replacement operations of the optimizer must be carried out by a professional electrical technician.

DANGER

DO NOT wear watches, bracelets, rings and other conductive objects on the wrist during operation.

DO NOT install the optimizer in locations where water can be submerged for a long time.

DO NOT cut off the cable that comes with the optimizer, otherwise the warranty will be invalidated.

Malpractice or improper work during installation or operation might cause fire. DO NOT store flammable and/or explosive materials surrounding the areas where the optimizers are installed.

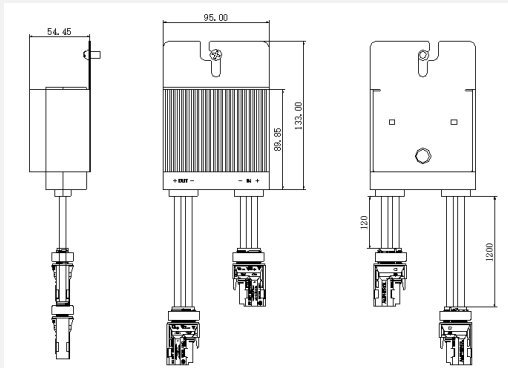
The high voltage DC that generated during string operation of the optimizer, might lead to electric shock that brings death, serious personal injury, or serious property damage. Please strictly follow the safety precautions listed in this manual and other relevant documents when operating.

SolarPilot uses Staubli MC4 as the DC connector of the optimizer, please make sure to use the same model of docking DC connector. If the model is different, the DC connector manufacturer must provide a connector compatibility report and a third-party external laboratory (TUV, VED, or Bureau Veritas) report that indicates qualified adaptability. The use of other incompatible DC connectors may lead to serious consequences, and thus equipment damage is not covered in optimizer warranty.

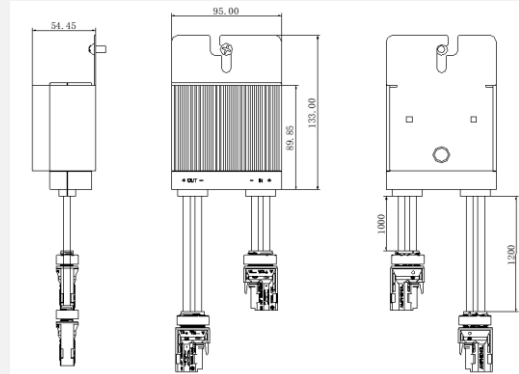
2. Product Introduction

SolarPilot PV Power Optimizer is a DC/DC conversion power supply for the post-stage PV module in the PV system, which continuously tracks the maximum power point (MPPT) of each PV module to increase the power generation of the PV system, and designed with the functions of module-level rapid shutdown and module-level real-time monitoring.

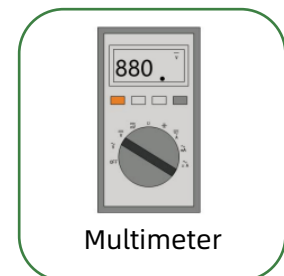
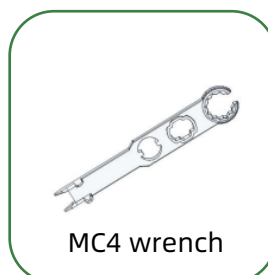
SP1-600W-AS (Short input cable)



SP1-600W-AL (Long input cable)



3. Prepared Tools

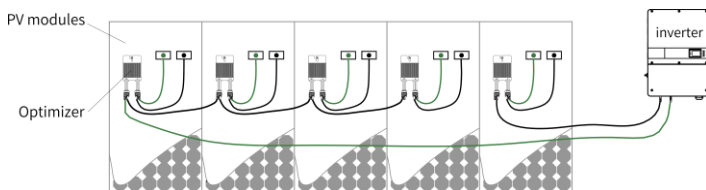
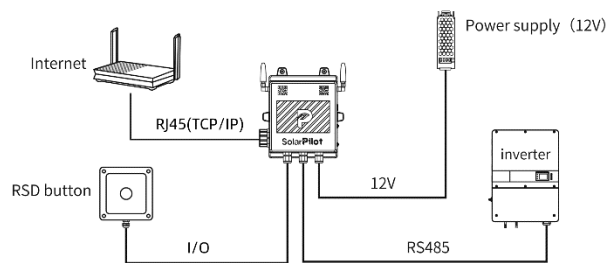


4. Prepared Materials

#	Material Name	Specification and Model	Function
1	DC connector	MC4	to connect individual electrical devices
2	DC cable	PV1-F 1*4mm ²	to connect each electrical devices
3	Network cable	CAT 5E	to provide network for zigbee gateway of the optimizer
4	Communication line	RVSP-2*1mm ²	to connect the RSD button (rapid shutdown) with zigbee gateway
5	Power cord	20AWG	power supply wire of zigbee gateway
6	Bolt kit	M6/M8	to securely fasten optimizers
7	Other accessories	/	/

5. Optimizer System Connection Diagram

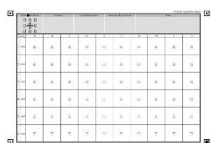
Topology Diagram of Communication Signal



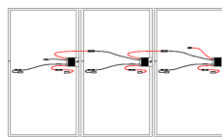
Topology Diagram of Solar System

6. Installation Steps

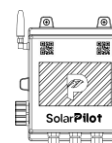
1 Determine the installation location and paste QR codes on optimizer layout card



2 Install, fix and connect electrical wire



3 Install zigbee gateway and RSD button (when your country required)



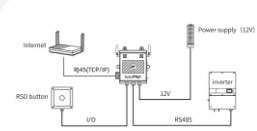
6 Resuming Quick Break



5 Setup and connecting the zigbee gateway with APP

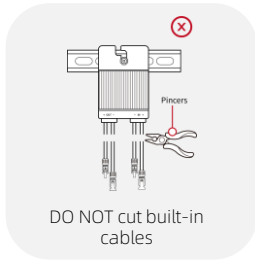
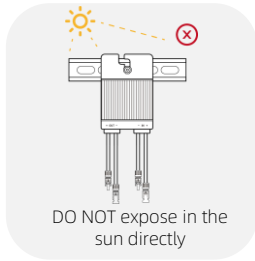
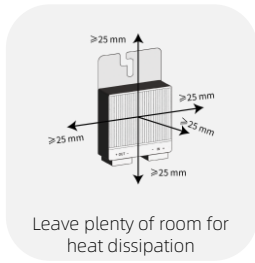


4 Power on zigbee gateway and get networking mode

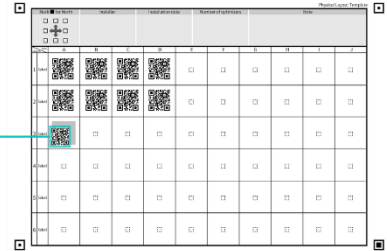


6.1 Determine the installation location and paste QR codes on optimizer layout card

Installation location requirements

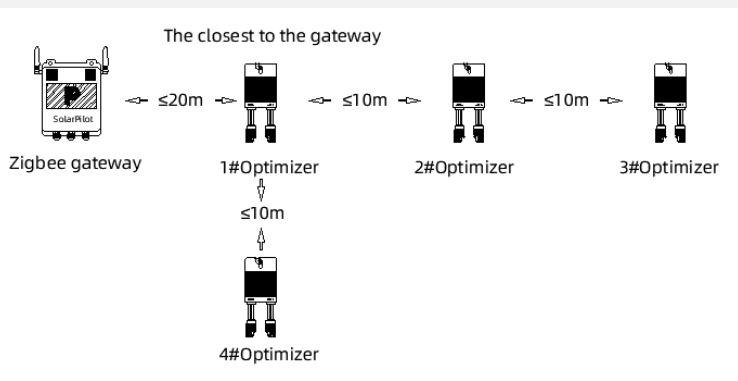


Once determining the location where optimizers are installed, tear off the QR codes from the optimizer and paste it on the physical layout template

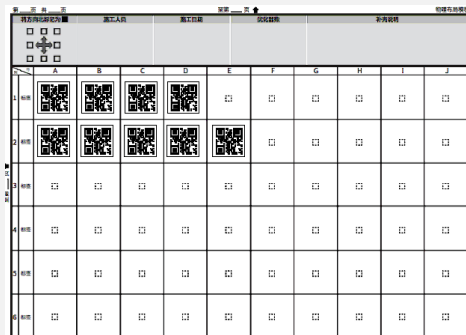
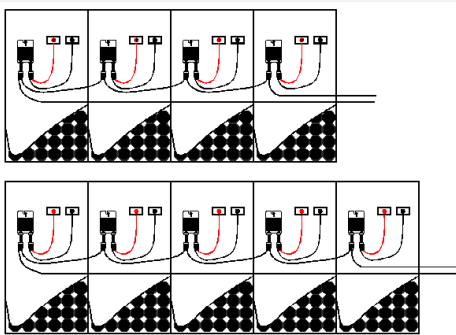


The distance between the nearest optimiser to the Zigbee gateway is $\leq 20m$, the distance between the 2# optimiser and the 1# optimiser is $\leq 10m$, and the distance between the 3# optimiser and the 2# optimiser is $\leq 10m$

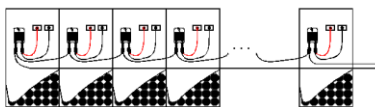
Scan the QR code below to read the details



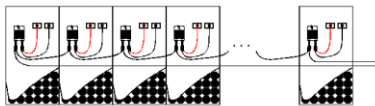
Physical layout use cases



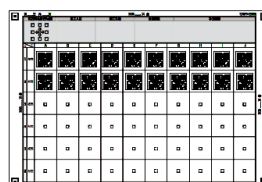
15 panels in a row



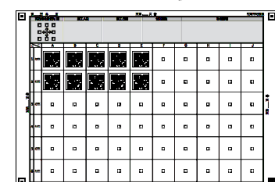
15 panels in a row

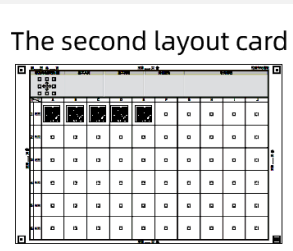
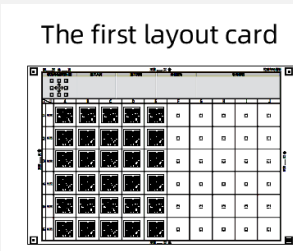
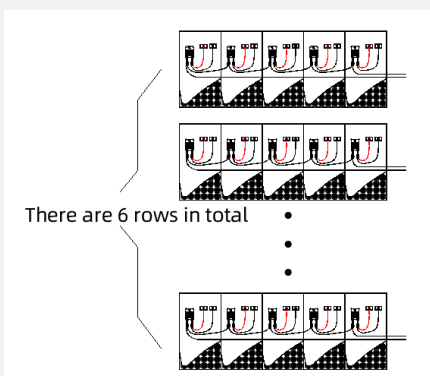


The first layout card



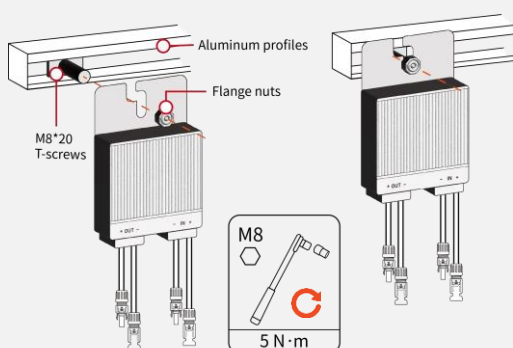
The second layout card



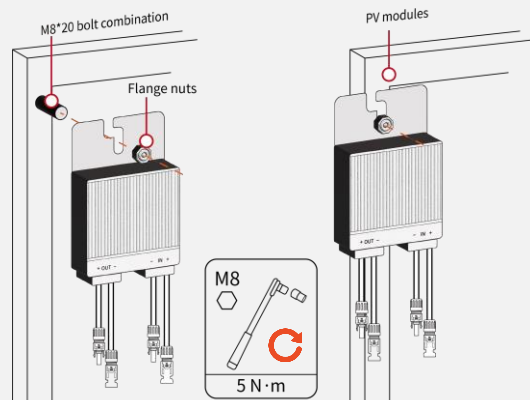


6.2 Install, fix and connect electrical wire

Install on the bracket (T bolts or Wing nuts)

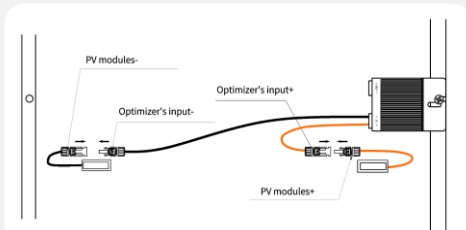


Install on the fixed border/corner



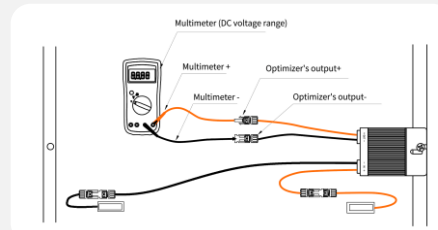
6.3 Install, fix and connect electrical wire

1. Connect optimizer with PV module



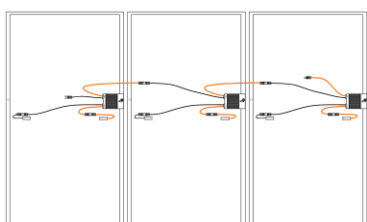
Connect the input positive pole of optimizer to the positive pole of PV module, and connect the input negative pole of optimizer to the negative pole of PV module.

2. Check optimizer's output voltage



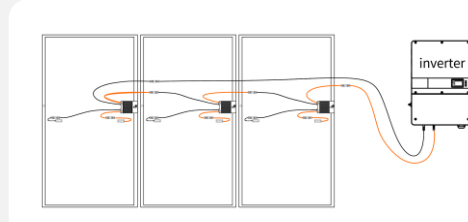
The detection voltage is 1V

3. Series connection of all optimizers



Connect optimizers in light of the photovoltaic design requirements. The positive output electrode of the optimizer shall be connected to the negative electrode of neighbour optimizer.

4. Connect optimizers with the inverter



6.4 Install Zigbee gateway and RSD button

Height $\geq 500\text{mm}$

max $\leq 55^{\circ}\text{C}$

min $\geq -25^{\circ}\text{C}$

$\leq 100\%$

DO NOT get close to fire or heating device

The maximum distance of zigbee gateway from the optimizer is 100-meter in an open environment and 30-meter in areas surrounding obstacles.

SolarPilot does not supply the RSD button directly, the user could buy it separately from a third party as per the regulations of your country.

Please install the RSD button in an easy-to-access place indoor and use in emergency case ONLY.

The gateway shall be installed vertically. DO NOT install on inclined object or slope.

DO NOT install the gateway on the table horizontally

DO NOT expose in the sun directly

DO NOT soak in water

IP65

6.5 Setup and connecting the Zigbee gateway with APP

① Download the app

Method 1:

Search "SolarPilot Energy" in the App Store, Google Play or other application market on smart phone;



SolarPilot Energy APP icon

Method 2:

Scan the QR code to download the APP in right hand.



QR code for Android



QR code for IOS

② Follow the gateway operation process to complete the network configuration

For details about the gateway operation process, see «SolarPilot-User Manual SP1-600W-AS Smart PV Optimizer», «SolarPilot-User Manual SP1-Zigbee-GW-W»

6.6 Resuming Quick Break (Very Important)

Resume the quick-break operation

You need to send a quick break recovery command on the APP, otherwise the PV system will not be able to operate normally (it will be turned off by default)

Quick-break test

After 5 minutes, a quick shutdown command is issued to observe whether the inverter stops working

Resume the quick-break operation

After 5 minutes, a quick shutdown and recovery command is issued to observe whether the photovoltaic system is running and working.