

Smart PV Optimizer

SP4-1600W-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 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.

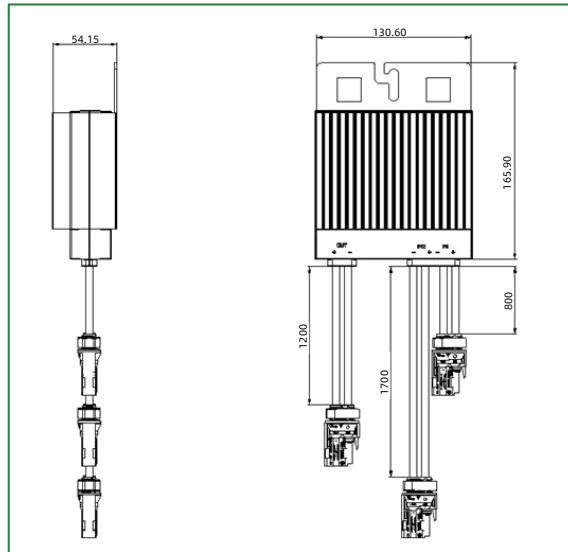
Malpractice or improper work during installation or operation might cause fire. DO NOT store flammable and/or explosive materials surrounding the areas where the optimizers are installed.

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.

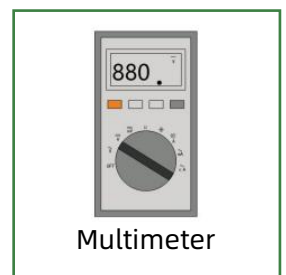
SolarPilot uses Staubi MC4 as the DC connector of the optimizer, please make sure to use the same model of docking DC connector. If the model is different, the DC connector manufacturer must provide a connector compatibility report and a third-party external laboratory (TUV, VED, or Bureau Veritas) report 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, and designed with the functions of module-level rapid shutdown and module-level real-time monitoring.



3. Prepared Tools

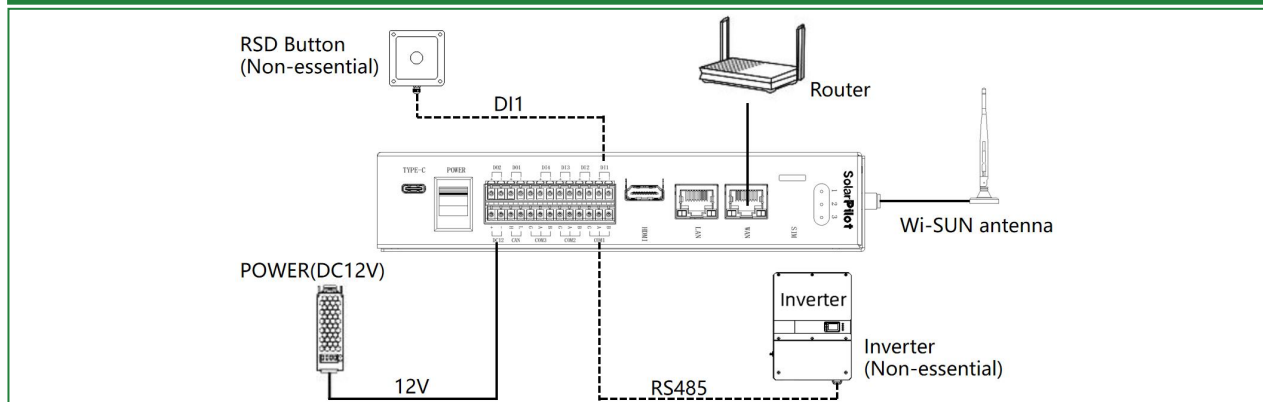


4. Prepared Materials

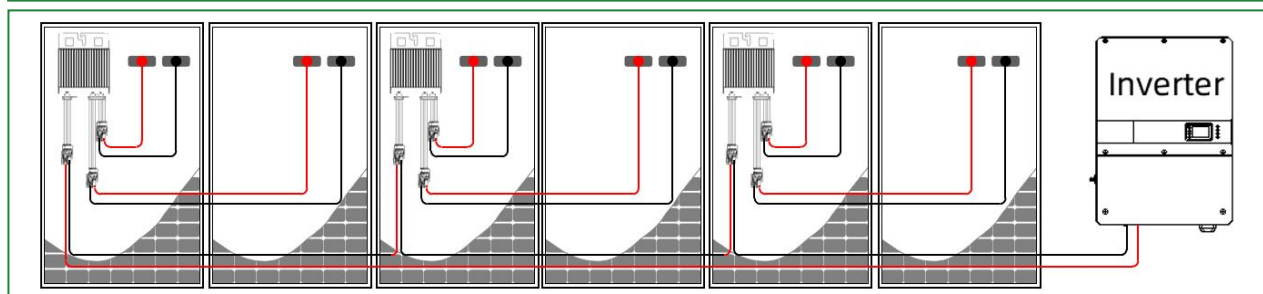
#	Material	Model	Function
1	DC connector	MC4	to connect PV optimizers
2	DC cable	PV1-F 1*4mm ²	
3	Ethernet cable	CAT 5E	to provide network to WiSUN gateway
4	Router	/	
5	Communication line	RVSP-2*1mm ²	to connect the RSD button(if you need)
6	DC power	12V	to provide power to WiSUN gateway
7	DC cable	20AWG	
8	Bolt kit	M6/M8	to securely fasten optimizers

5. Optimizer System Connection Diagram

Topology Diagram of Wi-SUN Gateway



Topology Diagram of PV Optimizer System

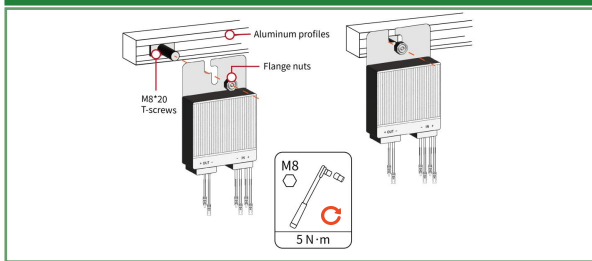


6. Installation Steps

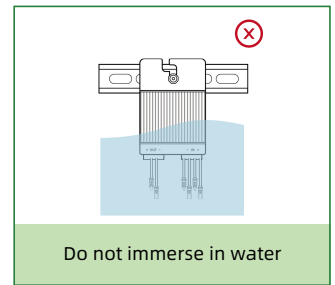
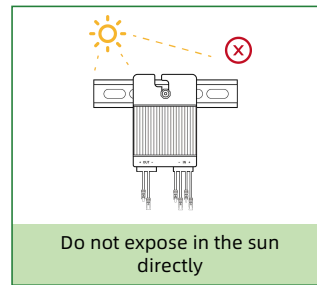
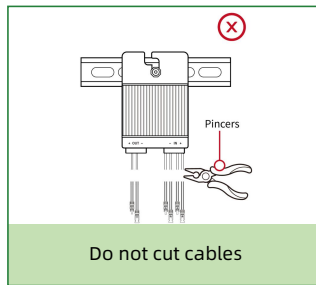
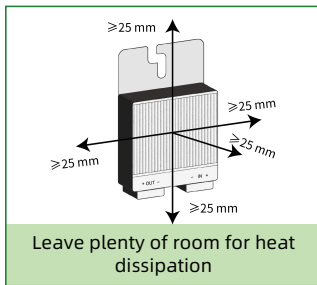
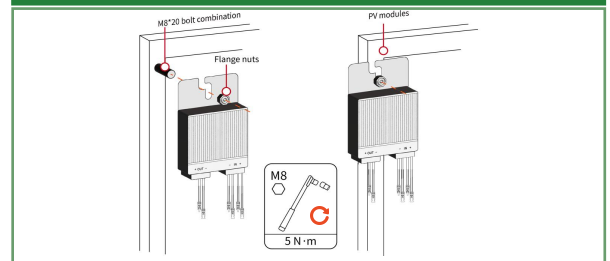
- Install optimizer
- Measure optimizer voltage
- Measure string voltage
- Connect to inverter
- Generate layout
- Connect devices via App

① Install optimizer

Mounted on bracket

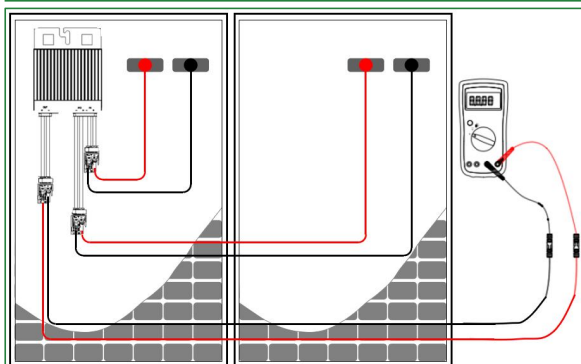


Mounted on fixed frame/corner



② Measure optimizer voltage

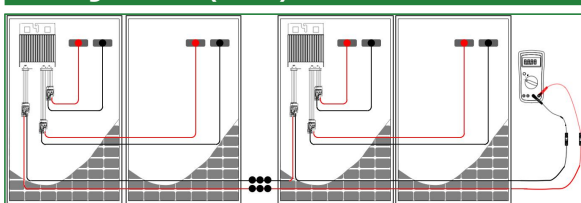
Voltage is 2V(±10%) in RSD mode



Voltage	Cause
$V=2V(\pm 10\%)$	The optimizer is normal.
$V > 2V(\pm 10\%)$	<ul style="list-style-type: none"> The optimizer works in Normal mode. The optimizer is faulty.
$V < 2V(\pm 10\%)$	<ul style="list-style-type: none"> The irradiance is low. The optimizer input cables are not connected. The optimizer cables are incorrectly connected. The optimizer is faulty.
$V \approx -2V(\pm 10\%)$	<ul style="list-style-type: none"> The probes are reversely connected.

③ Measure string voltage

Voltage is $N \cdot 2V(\pm 10\%)$ in RSD mode

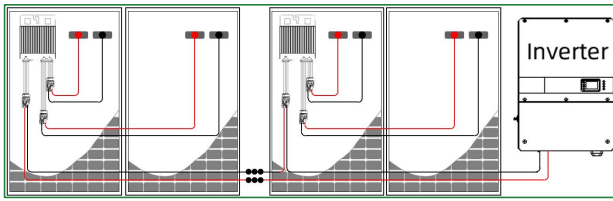


Voltage	Cause
$V=N \cdot 2V(\pm 10\%)$	The PV string is normal.
$V \approx 0$	<ul style="list-style-type: none"> The PV string is open-circuited. The cables are not connected to the same PV string.
$V < 0$	<ul style="list-style-type: none"> The probes are reversely connected. The cable labels are incorrect.
$0 < V < N \cdot 2V(\pm 10\%)$	<ul style="list-style-type: none"> Some optimizer input power cables are not connected. Some optimizer output power cables are not connected. Some optimizer output power cables are reversely connected.
$V > N \cdot 2V(\pm 10\%)$	<ul style="list-style-type: none"> The actual number of optimizers in the PV string is greater than expected. PV modules are directly connected to PV strings without being connected to optimizers. Partial optimizers work in Normal mode.

NOTE

If the voltage is abnormal, refer to the user manual for troubleshooting suggestions.

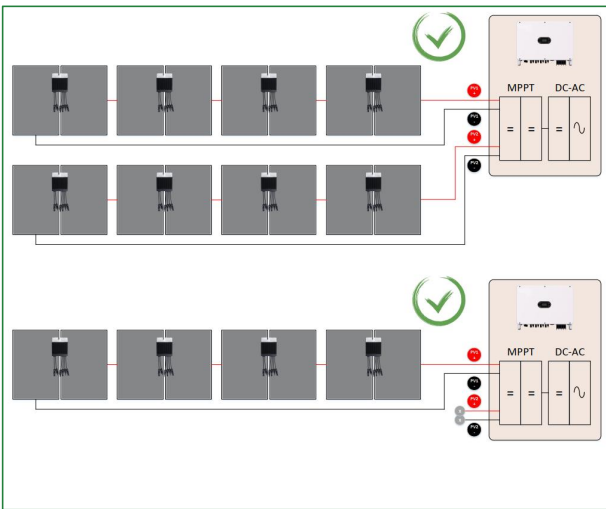
④ Connect to inverter



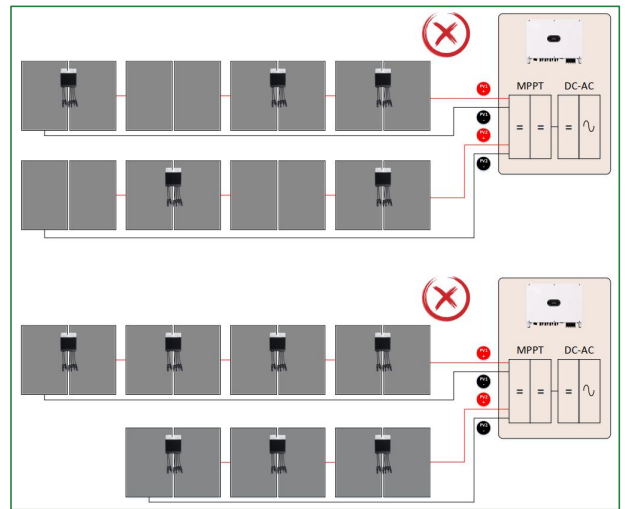
NOTE

Only Support Full optimizer:
All PV modules connected to the inverter should be connected to the optimizer.

Examples of correct configuration

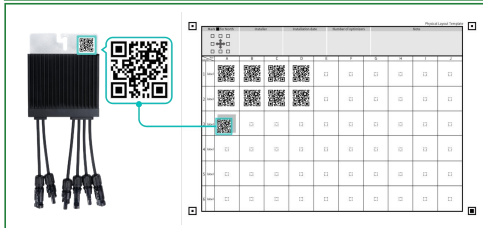


Examples of incorrect configuration



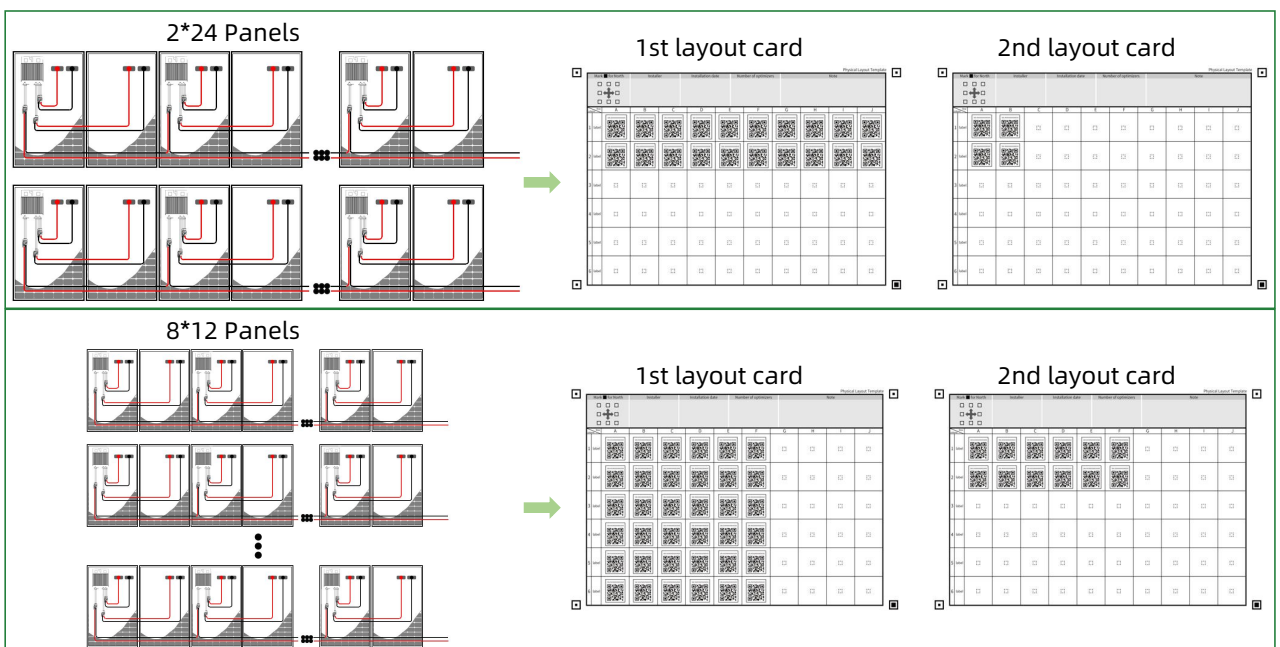
⑤ Generate Layout

Paste QR code



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

Examples of physical layout template



⑥ Connect devices via 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



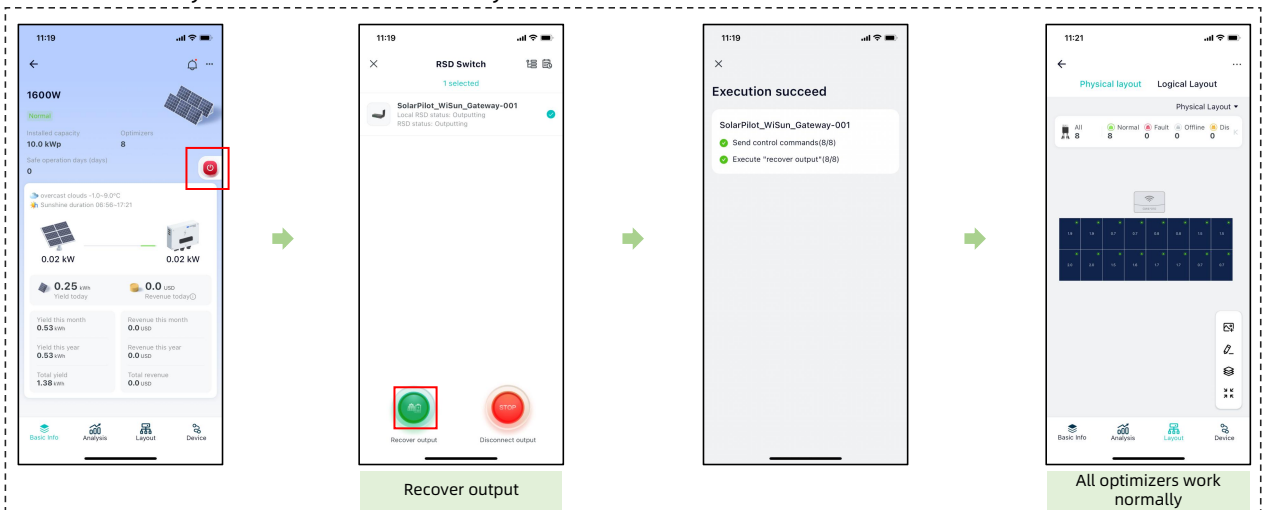
QR code for IOS

② Follow the APP operation guide to complete adding devices

For details about the gateway operation process, see 《SolarPilot-User Manual-SP4-1600W-AL》、
《SolarPilot-User Manual-SP4-WISUN-GW》

7. Execute Recover Output (Very Important)

The optimizer works in RSD mode by default and needs to recover output.
Otherwise the PV system will work abnormally.



8. Odd module Installation Instructions

NOTE

For odd module,
VIN1+ is connected to the positive terminal of the PV module,
VIN2- is connected to the negative terminal of the PV module,
VIN1-/VIN2+ are connected to each other.

