

The logo for Solar Pilot, featuring the word "Solar" in green, "Pilot" in black, and a stylized orange and white "P" icon.

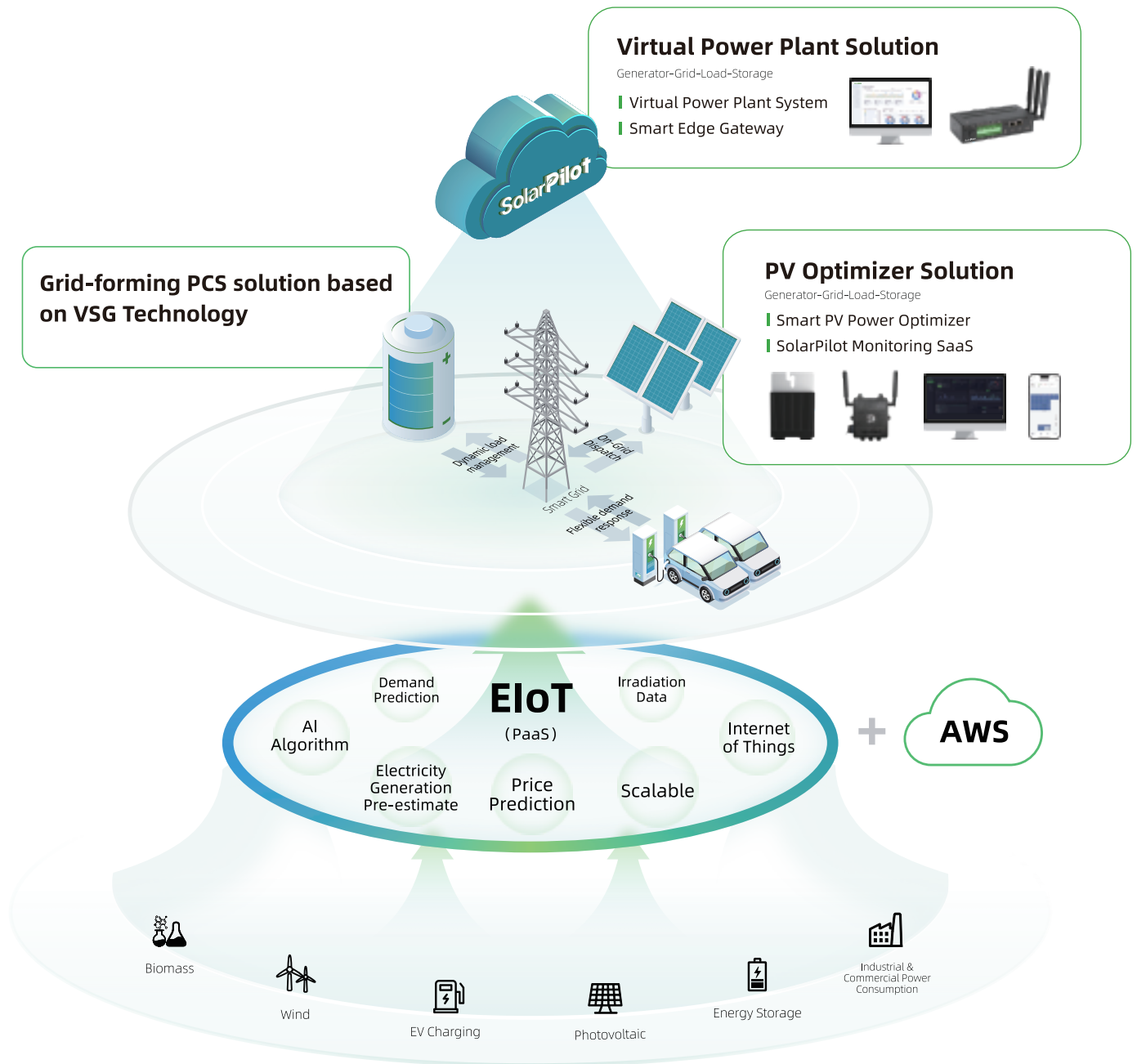
SolarPilot



# Solar Pro **EIoT** Solution

## EIoT Platform & Solution Matrix

SolarPilot's turn-key solution matrix is created on the basis of self-constructed EIoT (Energy-Internet of Things) platform which lays a solid foundation of powerful energy management from traditional power generation to renewable energy fusion, such as solar power optimization & monitoring, peak and frequency adjustment as well as grid load management etc.



# Smart PV Power Optimizer Solution

**5 ~ 30%**

Unique TinyML algorithm captures MPPT within 0.2s and improves 5~30% power output.

**10%**

Enable additional string connections up to 10%.

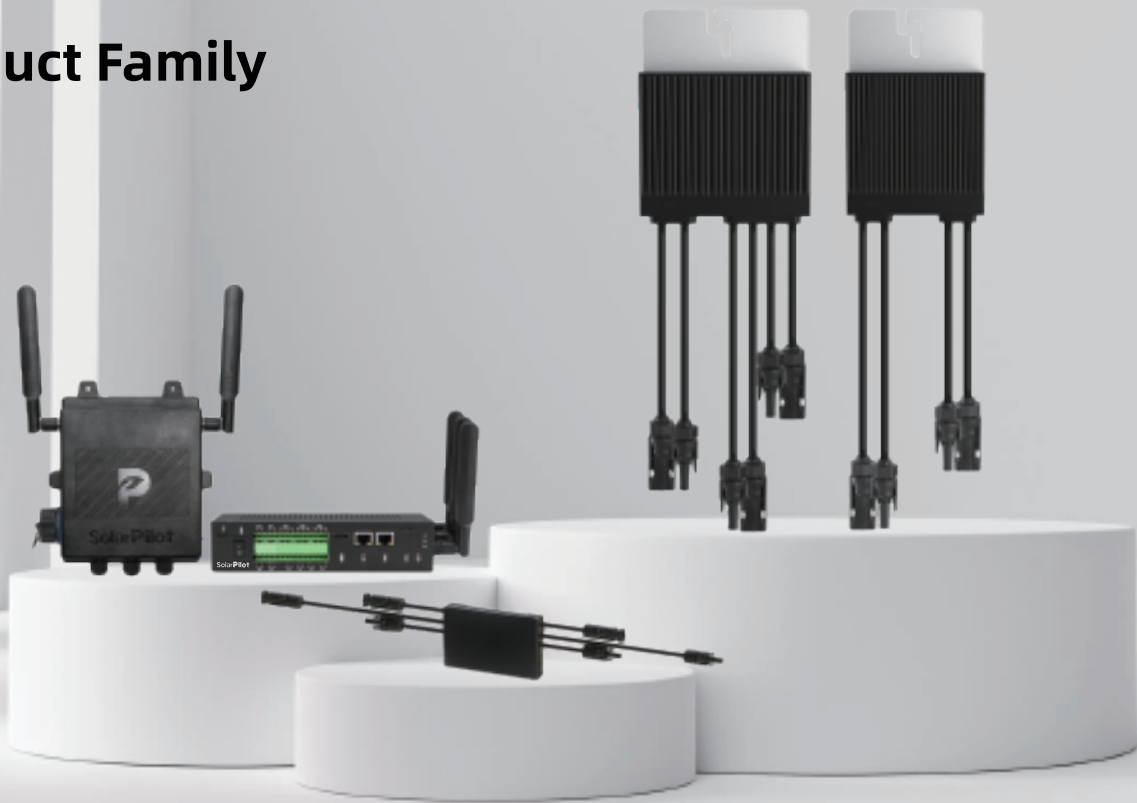
**1min**

Industrial-level zigbee solution ensures the highest frequency of data sampling, capturing data every other minute, to make remote system diagnosis more precise.

**10s**

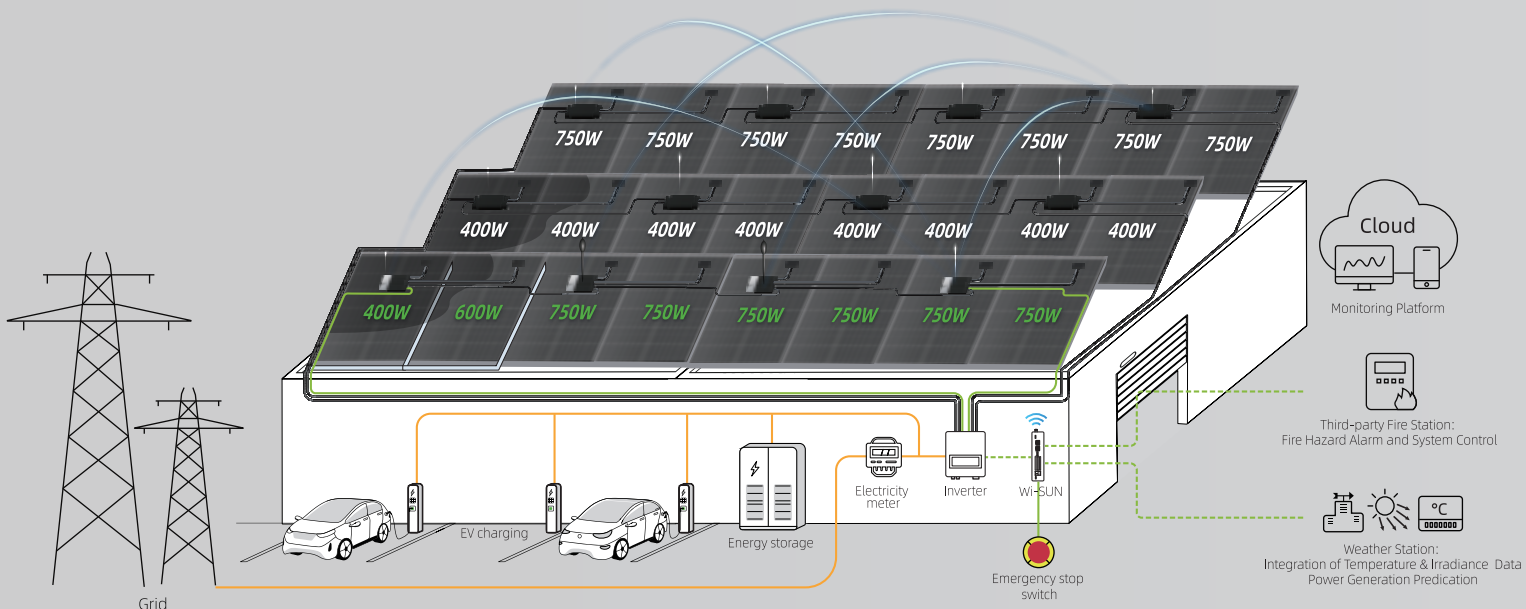
Rapid shutdown within 10s eradicates the fire risk results from high voltage arc; quicker and safer.

## Product Family



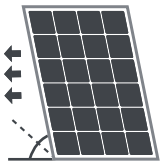
## Highlights

- Compatible with all leading branded string inverters & hybrid inverters.
- MC4 interface, plug & play without barriers.
- Easily integrated with existing PV system or newly installed plant.
- Either pre-installation or post-installation is available.
- Quick network configuration via QR code scanning.
- Smart control, precise data analysis through APP and web portal.
- IP68 protection, widely used in indoor and outdoor scenes.
- High efficient operation & maintenance via remote monitoring.
- Synchronized interaction with weather conditions & fire stations.



Preconditions: 1000 irradiation, 25 °C, module rated power 750W

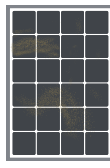
# Applicable Scenarios And IV Curve



Multi-orientation



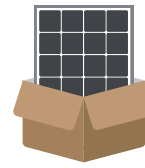
Shade



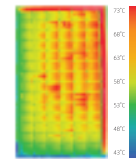
Stain



Attenuation Loss



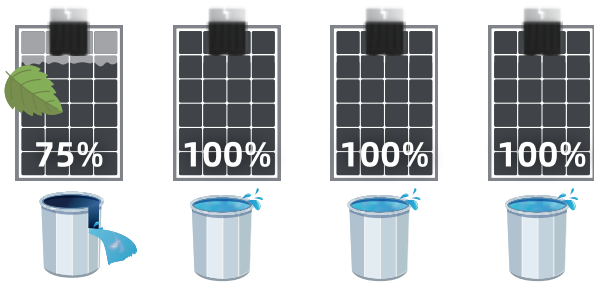
PV Engineering Tolerance



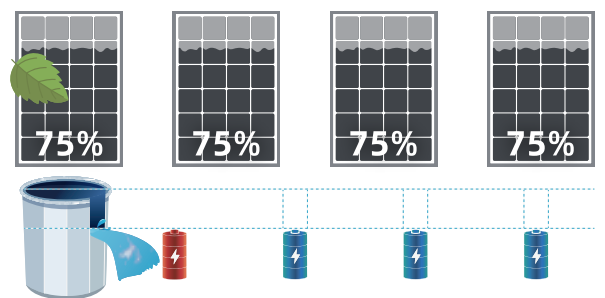
Uneven Heat Exposure

Install with optimizers

Without optimizer

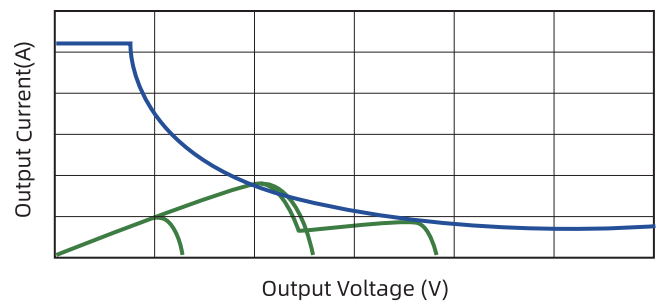
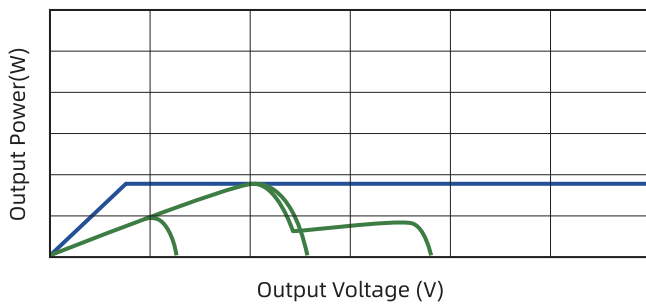


VS



P-V curves

I-V curves



## User Scenario



Residential Rooftop



Solar Car Port



Commercial Building Rooftop



Floating Solar



Telecom Tower Solar System



Highway Solar



# SolarPilot Energy APP



## Plant Management

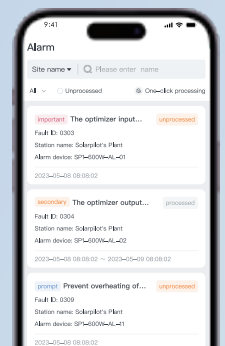
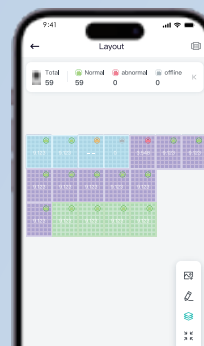
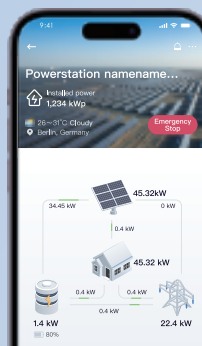
- Create Solar Plant
- Add Devices
- Remote Rapid Shutdown
- Physical Layout
- Time-of-use Rate

## Device Management

- Real-time Data
- Fault Alarm
- Device Upgrade
- Device Replacement

## Data Dashboard

- Power Flow
- Energy Analysis
- Revenue Analysis



# SolarPilot Monitoring SaaS

## Data Acquisition

Sampling data of PV modules & inverters every other minute

## Remote Maintenance

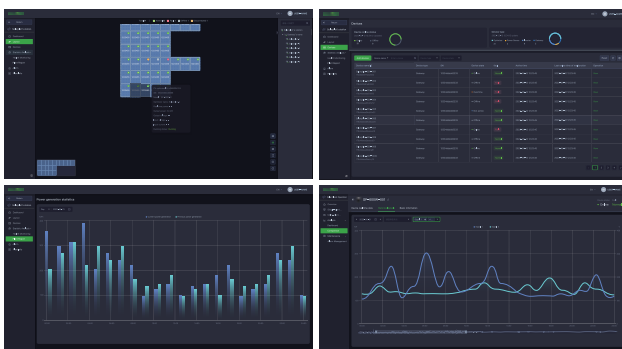
- Plant Management
- Physical Layout
- Plant Running Information
- Device Running Information

## Report & Alarm

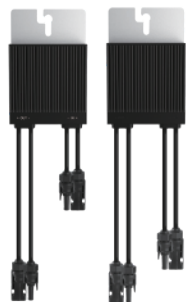
- Cockpit
- Plant Dashboard
- Plant Report
- Alarm Management

## Intelligent PV Diagnosis

- I-V Curve Tracing
- Real Time Monitoring
- Potential Induced Degradation (PID)
- Defective Bypass Diode



# Smart PV Power Optimizer



## Basic Information

Product	Optimizer for 1x PV module
Power	<b>600W</b>
Model	SP1-600W-AS / SP1-600W-AL
Warranty	25 years
Life Circle	25 years <sup>+</sup>

## Certificates



## Specifications

Product model	SP1-600W-AS   SP1-600W-AL	
Efficiency	Maximum efficiency	≥99.5%
	European area	≥99.0%
	North American area	≥99.1%
DC input	Maximum input power	600 W
	Maximum input voltage	70 V
	Maximum input current	15 A
	MPPT voltage range	10 ~ 70 V
DC output	Starting voltage	15 V
	Output power	0 ~ 600 W
	Output voltage	0 ~ 70 V
Function	Maximum output current	18 A
	Bypass cut-off function	have
	Auto shutdown function	have
	Manual shutdown function	have
	DC overvoltage protection	have
	DC overload protection	have
	Reverse polarity protection	have
Detection accuracy	Short circuit protection function	have
	Wireless data acquisition function	have
	Electric voltage	0.01 V
General parameters	Electric current	0.01 A
	Dimension	95mm*129mm*56mm
	Net weight	≤1000 g
	Ingress protection	IP68
	System voltage	1100 V
	Data collection frequency	1 minute
	Wireless data transmission distance	≤100m (outdoor) ≤30m (indoor)
	Connectors	MC4 compatible
	Input DC cable length	0.12 m   1m
	Output DC cable length	1.2 m
	Operating temperature	-45°C~85°C
	Storage temperature	-40°C~70°C
	Working humidity	0%~100%
	Working altitude	≤2000 m
	Power supply	PV module
	Off time	10s
	Installation method	fixed on bracket/ fixed on PV panel frame

# Zigbee Gateway



## Basic Information

Product	Zigbee Gateway
Protocol	Zigbee
Model	SP1-zigbee-GW-W / SP1-zigbee-GW-G
Warranty	3 years
Life Circle	10 years <sup>+</sup>

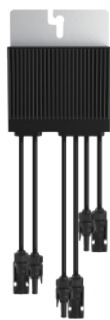
## Certificates



## Specifications

Product model	SP1-zigbee-GW-W   SP1-zigbee-GW-G	
Communicate with optimizer	Telecommunication protocol	Zigbee wireless communication
	Wireless data transmission distance	≤100m (outdoor) ≤30m (indoor)
	Maximum number of connecting devices	30 pcs
Communicate with RSD button	Control mode	I/O
	Wired Internet access	RJ45×1 100Mbps
Communicate with cloud computing platforms	Wireless Internet access	Wi-Fi   4G
	Number of antennas	2
	Sampling interval	1 minute
Expand communication connections	RS485	COM×1, 9600bps, Modbus-RTU
	Reset button	Reset button×1
Interaction	Indicator light	LED×2
	APP	SolarPilot APP
General parameters	Working temperature	-20°C ~ 55°C
	Dimension	181mm*163mm*51mm (height * width * thickness)
	Weight	≤200g
	Installation method	Wall-mounted
Specification	Ingress protection	IP65
	Power supply	DC 12V
	Compliant to	CE, RoHS, RED
Compatibility with optimizer/RSD	Model	SP1, SP2, SP3 series

# Smart PV Power Optimizer



## Basic Information

Product	Optimizer for 2x PV modules
Power	<b>1600W</b>
Model	SP4-1600W-AL
Warranty	25 years
Life Circle	25 years <sup>+</sup>

## Certificates



## Specifications

Product model	SP4-1600W-AL		
Efficiency	Maximum efficiency	≥99%	
	European area	≥98.8%	
	North American area	≥98.5%	
DC input	Maximum input power	1600 W	
	DC input	2-way	
	Maximum input voltage	150 V	
	Input power range	12.5V ~ 75V / 12.5V ~ 75V	
	MPPT voltage range	15V ~ 75V / 15V ~ 75V	
	Maximum input current	20A / 20A	
	Starting voltage	15 V	
DC output	Maximum output power	1600 W	
	Maximum output voltage	150 V	
	Maximum output current	22 A	
Function	Bypass cut-off function	have	
	Auto shutdown function	have	
	Manual shutdown function	have	
	DC overvoltage protection	have	
	DC overload protection	have	
	Reverse polarity protection	have	
	Short circuit protection function	have	
	Wireless data acquisition function	have	
	General parameters	Dimension	≤131mm*172mm*55mm (height * width * thickness)
		Net weight	≤1500 g
Ingress protection		IP68	
System voltage		1500 V	
Data collection frequency		1 minute	
Wireless data transmission distance		≤500m	
Connectors		MC4 / EVO2	
Input DC cable length		0.8m / 0.8m 1.7m / 1.7m	
Output DC cable length		1.2m / 1.2m	
Operating temperature		-45°C~85°C	
Storage temperature		-40°C~70°C	
Working humidity		0%~100%	
Working altitude		≤2000 m	
Power supply		PV module	
Off time		≤10s	
Installation method		fixed on bracket	

# Wi-SUN Gateway



## Basic Information

Product	Wi-SUN Gateway
Protocol	Wi-SUN
Model	SP4-WISUN-GW-N / SP4-WISUN-GW-G
Warranty	3 years
Life Circle	10 years <sup>+</sup>

## Certificates



## Specifications

Product model	SP4-WISUN-GW-N   SP4-WISUN-GW-G		
Communicate with optimizer or rapid shutdown device	Telecommunication protocol	Wi-SUN wireless communication	
	Wireless data transmission distance	≤500m	
	Maximum number of connecting devices	300 pcs	
System parameters	CPU	Quad core ARM Cortex-A53 @ 1.6 GHz	
	RAM	2G	
	Memorizer	8GB eMMC	
	OS system	Linux 5.10.160	
	WAN	RJ45x1 1000M	
Expand communication connections	LAN	RJ45x1 100M	
	HDMI	1080P	
	Console port	USB-C	
	Wi-SUN	868 MHz *Europe, 915 MHz *North America External antenna	
	4G	Not supported   CAT1, Pluggable SIM card, External antenna	
	RS485	COMx3	
	CAN	CANx1	
	DI	DIx4	
	DO	DOx2	
	Working temperature	-20°C ~ 55°C	
General parameters	Dimension	190mm*94.8mm*38.7mm (height * width * thickness)	
	Weight	≤800g	
	Installation method	Fixed on DIN35mm guide rail	
	Indicator light	LEDx3	
	Ingress protection	IP20	
	Power supply	DC 12V	
	Consumption	≤4W   ≤6W	
Specification	Compliant to	CE, RoHS, RED	
Compatibility with optimizer/RSD	Model	SP4, SP5 series	



# Smart Rapid Shutdown Connector (for 2x PV modules)



Dual-channel DC input

## SP5-RSD-AG

### Module-based Rapid Shutdown

In comply with NEC2017 & NEC2020 690.12 terms.

### Easy Installation

Plug & Play, free of configuration.

### MLPE Monitoring

Realise smart operation through data collection (power, voltage, current) of solar modules.

### Higher Efficiency

Lower power consumption, wider working voltage range.

### More Even Temperature Dissipation

Better heat dissipation on the surface.

## Product Specifications

Product model	SP5-RSD-AG	
DC input	Maximum input power	1600 W
	Input working voltage range	12.5~75V / each channel
	Maximum continuous input current	20A / each channel
	Maximum short-circuit current	25A
DC output	Output working voltage range	25 ~ 150V
	Maximum output current	20A
	Maximum system voltage	1500V
	Maximum series fuse current rating	30A
Specifications	Working environment temperature range	-40°C ~ 85°C
	Cable length	input 500mm / output 2200mm
	Cable diameter	TUV: 4mm <sup>2</sup> / UL:12AWG
	DC connector input	input EVO2 or customer designated; output SolarPilot designated or customer designated
	Ingress protection	IP68
	Over-temperature protection	100°C
Characteristics & compliance	Methods of telecommunication	Wi-SUN
	Safety assurance compliance	NEC2017, 2020&2023 (690.12) ; UL1741

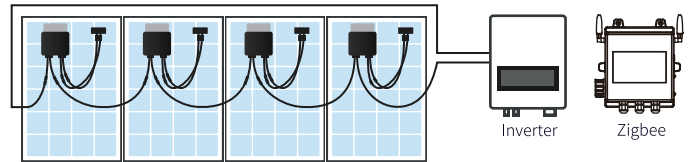
\*Provide only solution capabilities

# How to configure the system at different cases?

## 600W Optimizer + Zigbee Gateway

- Suitable for residential & small commercial scenarios, like rooftop of house, restaurant, car port & barn etc.
- Rapid shutdown within 10s for safety assurance.
- Improve power generation when shading.

600W Optimizer : Zigbee Gateway = **30 : 1**

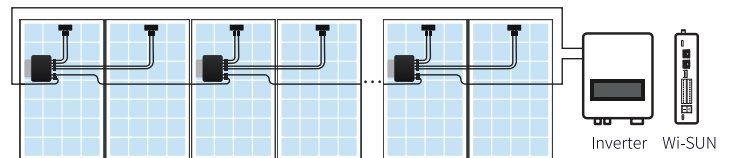


Connecting each solar panel with a 600W optimizer

## 1600W Optimizer + Wi-SUN Gateway

- Suitable for commercial building rooftop (large scale solar system) like rooftop of hotel, hospital & factory workwhop etc.
- Rapid shutdown within 10s for safety assurance.
- Improve power generation when shading.
- Strong telecommunication network and system monitoring control.

1600W Optimizer : Wi-SUN Gateway = **300 : 1**

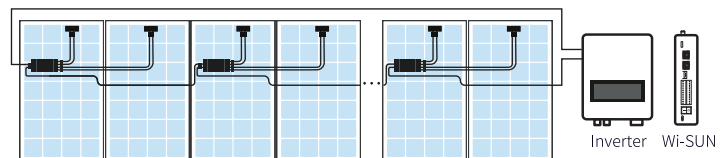


Connecting two solar panels in parallel with a single 1600W optimizer

## 1600W Rapid Shutdown + Wi-SUN Gateway

- Costdown solution for rapid shutdown function only.
- Suitable for unshaded modules but need RSD compliance.
- APP smart control and remote monitoring by SaaS system.

1600W Rapid Shutdown Connector : Wi-SUN Gateway = **300 : 1**

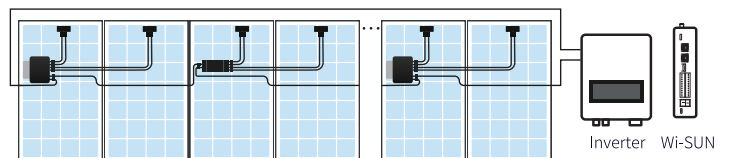


Connecting two solar panels in parallel with a single 1600W rapid shutdown

## 1600W Optimizer + 1600W RSD + Wi-SUN Gateway

- A combo solution for shaded & unshaded PV modules.
- One APP & SaaS connecting all device data of optimizers & RSD.
- Real-time MLPE data monitoring and system management.

(1600W Optimizer + 1600W Rapid Shutdown Connector) : Wi-SUN Gateway = **300 : 1**



Connecting two solar panels in parallel with a single 1600W optimizer or 1600W rapid shutdown  
 - 1600W optimizer for shaded PV modules  
 - 1600W RSD for unshaded PV modules

# SolarPilot

Maximizing Clean Energy Sustainability



## Mission

To make new energy utilization safer and more efficient through the integration of IT and OT.

## Vision

To become a global leading EIoT platform and renewable energy service provider that enables people all over the world to benefit at maximum from clean, free and abundant solar energy via cutting-edge technology.

## SolarPilot

provides turn-key solutions for photovoltaic monitoring & maintenance, virtual power plants, and energy management as well as smart grid operation service.

The photovoltaic monitoring & maintenance system is aimed at improving power output efficiency, reducing power loss in case of shading or attenuation, and ensuring stable operation of solar plant via precise fault alarm & analysis.

With a cloud-native IoT platform, SolarPilot virtual power plant solution is helping customers at home and abroad on multi-protocol control of electrical facilities, dynamic demand forecast, peak load and frequency regulation services.



Cloud-Native



Cloud-Edge Integration



Big Data



Flexible Deployment



Safe & Reliable



Cross-Protocol




Deep Matrix Algorithms



Power Predication & Price Forecast

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