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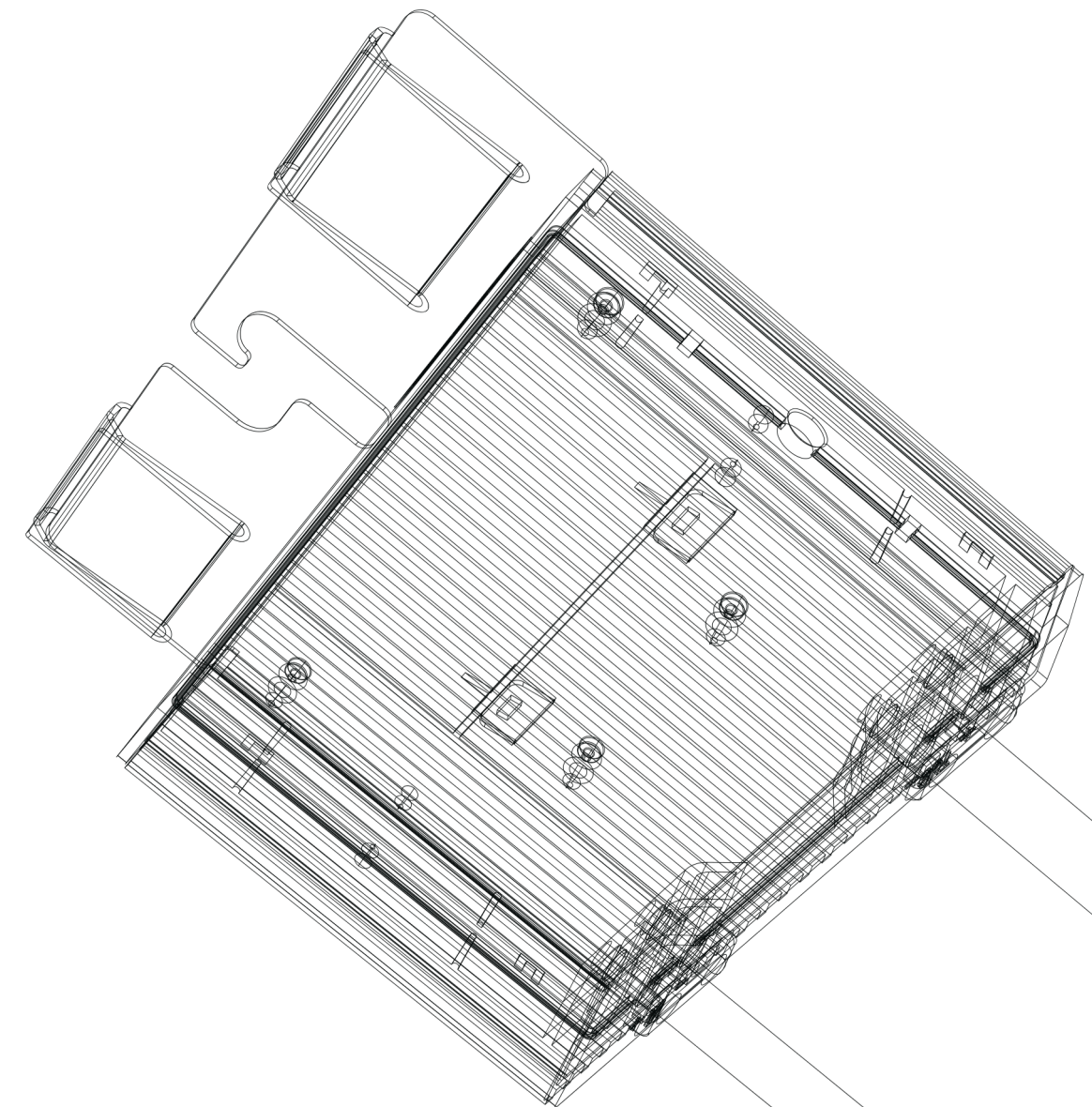


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# Smart Solar Optimizer Product Brochure

GO WITH SUNSHINE, ALWAYS OPTIMIZED



# SUNGO Energy

SUNGO Energy Technology focuses on the R&D and application of user-side solar+storage products, and is committed to providing global clients with excellent performance, leading-edge solar+storage products and comprehensive energy solutions. We have wide range product lines, including smart optimizers, and lithium-ion battery energy storage systems, which covers the entire industrial chain to meet users' requirements. In the future, we will continue to increase investment in R&D, continuously improve our competitive advantages, and provide global clients with products which are more integrated, easier to install and maintain.

Your green energy keep optimizing



1.5 million

Annual production capacity of smart optimizers



2GW

Optimizer installed capacity



15 years

Industry experience



More than 15%

Average gain per customer



30%

Percentage of R&D staff



30+

Exported countries

## Optimizer Application Scenarios



Blocking Shadow



Damage/Smudge



Differentiation Orientation



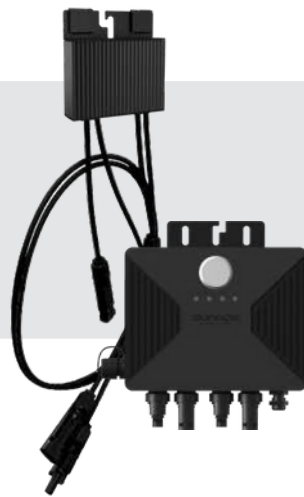
PV Module Differentiation Attenuation

# Optimizer Product Solutions

SUNGO Energy has been committed to the application and popularization of PV intelligent optimizer to produce more clean energy for users. The autonomously R&D optimizer products integrate optimization,rapid shutdown and module-level monitoring functions, which can effectively help PV systems to realize multi-generation and multi-installation and accurate management.



SUNGO OPT 600W  
SUNGO OPT PRO 800W  
Smart optimizer  
(optimization)



SUNGO iOPT 800W  
Smart optimizer  
(optimization + shutdown + monitoring)







iSungo  
Smart Management System

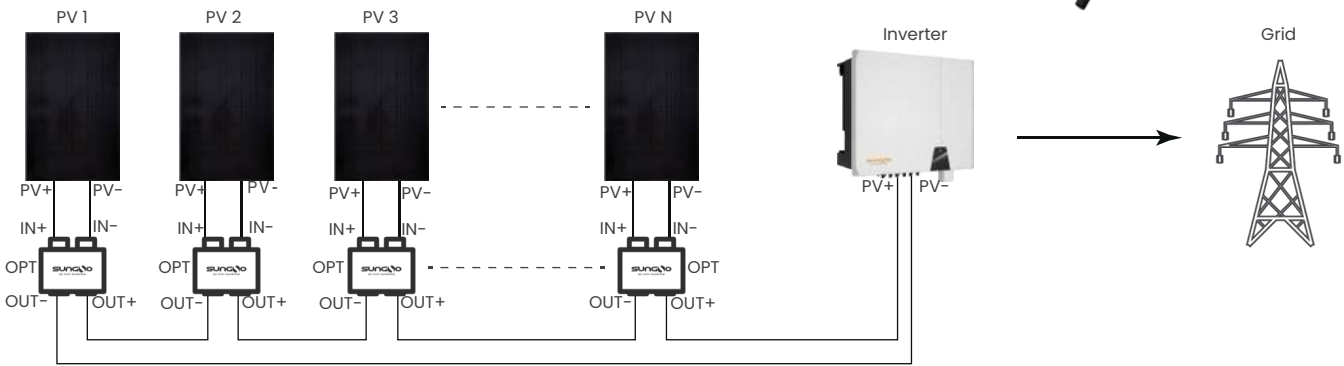


# Smart Optimizer SUNGO OPT

Optimize Power Generation  
Fearless of Shading

## Features

-  Module-level MPPT, no more worries of shading, power generation increased by 5%~30%
-  Easy to install, widely adapt, suitable for retrofitting existing power station and installing new PV power station
-  Compatible with mainstream PV modules and various inverters
-  12-year standard warranty, high stability, service life over 25 years



## Technical Parameters

Model	SUNGO OPT
DC Input	
Max input power	600W
Max voltage	60V
MPPT voltage range	7~60V
Max continuous input current	16A
Max input short-circuit current	18A
Night self-consumption	0W
DC Output	
Rated output voltage	42V
Max continuous output current	16A
Max output power	600W
Max system voltage	1500V
Efficiency	
Peak efficiency	99.7%
General Data	
Dimensions(W*D*H)	103*21.3*105.3mm
Weight	0.65kg
Input/output cable length	IN+ 200 / IN- 1100 / OUT+ 750 / IN- 750mm
Input/output cable size	4mm <sup>2</sup> (12AWG) / 4mm <sup>2</sup> (12AWG)
Terminals	MC4(Compatible)
Protection rating	IP67/NEMA6
Operating temperature range	-40~+65°C
Certification	CE
EMC	EN IEC 61000-6-1:2019EN IEC 61000-6-2:2019EN IEC 61000-6-3:2021EN IEC 61000-6-4:2019
Packaging	900pcs/pallets







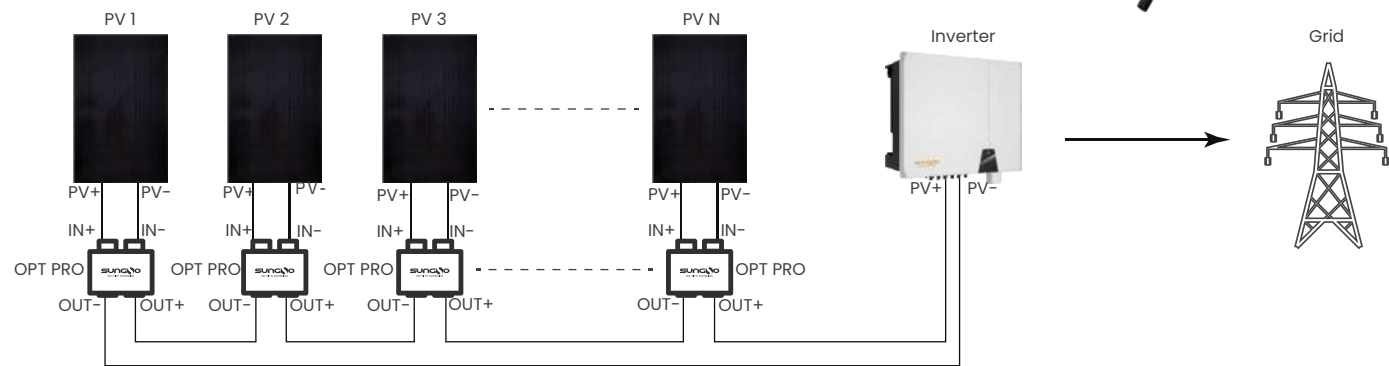


## Technical Parameters

Model	SUNGO OPT PRO
DC Input	
Max input power	800W
Max voltage	70V
MPPT voltage range	7~60V
Max continuous input current	21A
Max input short-circuit current	23A
Night self-consumption	0W
DC Output	
Rated output voltage	58V
Max continuous output current	21A
Max output power	780W
system voltage	1500V
Efficiency	
Peak efficiency	
Power loss @5A	99.7%
Power loss @8A	0.9W
Power loss @12A	1.4W
Power loss @15A	2.9W
Power loss @20A	4.5W
General Data	7.2W
Dimensions (W*D*H)	
Weight	103*21.3*105.3mm
Input/output cable length	0.65Kg
Input/output cable size	
Terminals	IN+ 200 / IN- 1100 / OUT+ 750 / IN- 750mm
Protection rating	4mm2(12AWG) / 4mm2(12AWG)
Relative humidity	MC4(compatible)
Operating temperature range	IP67/NEMA6
Cooling	0-100%RH
Overvoltage category	-40~+60°C
Maximum altitude	Natural cooling
Certification	OVC II
EMC Packaging	≤4000m
	CE
	EN IEC 61000-6-1:2019EN IEC 61000-6-2:2019EN IEC 61000-6-3:2021ENIEC 61000-6-4:2019
	900pcs/pallets

## Features

-  Module-level MPPT, no more worries of shading, power generation increased by 5%~30%
-  Easy to install, widely adapt, suitable for retrofitting existing power station and installing new PV power station
-  Compatible with mainstream PV modules and various inverters
-  12-year standard warranty, high stability, service life over 25 years





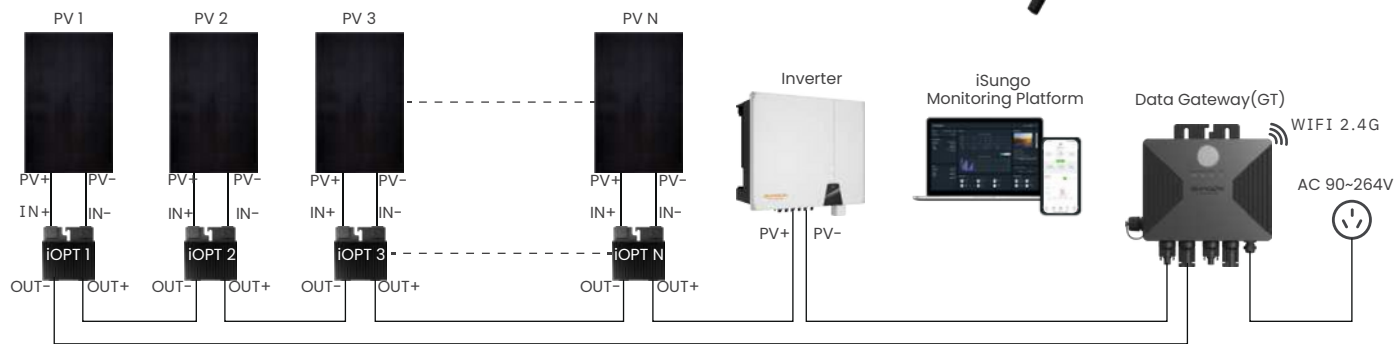


# Smart Optimizer SUNGO iOPT 800W

Optimize Power Generation  
Intelligent Management

## Features

- Module-level MPPT, no more worries of shading, power generation increased by 5%~30%
- Module-level rapid shutdown, ensuring fire and maintenance safety
- Module-level data intelligent monitoring and accurate management
- Fully utilize roof space to achieve system maximization
- Suitable for retrofitting existing power station and for installing new PV power station
- 12-year standard warranty,high stability, service life over 25 years
- 



## Optimizer Technical Parameters

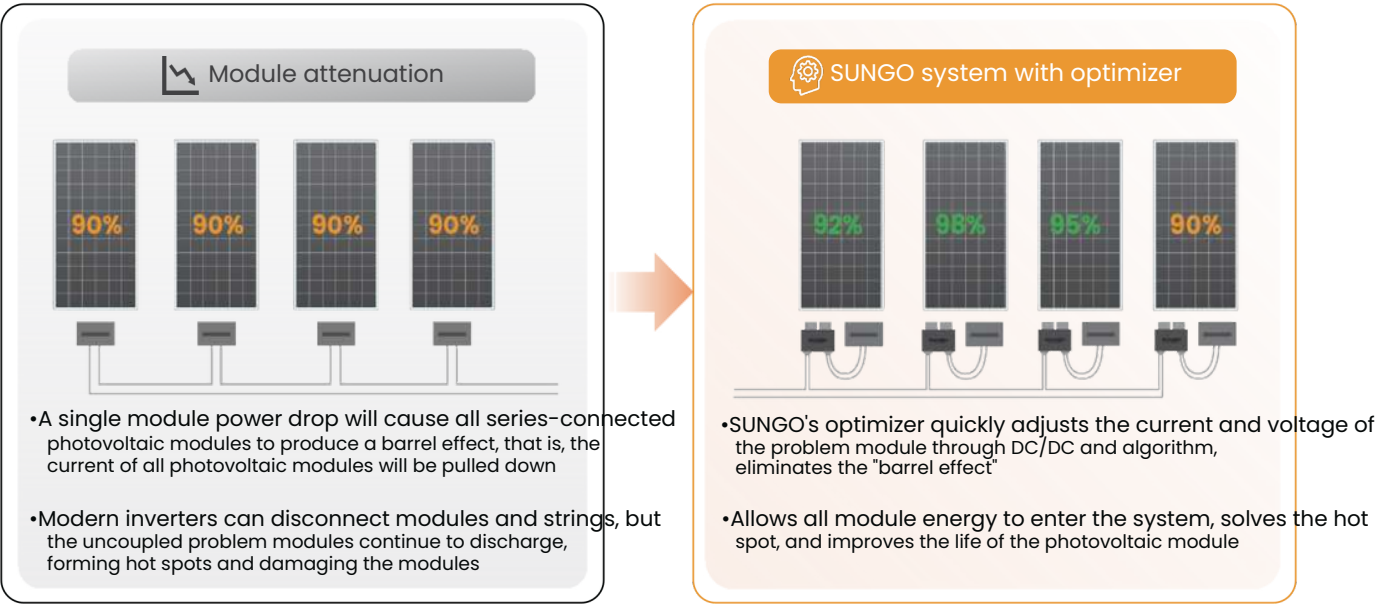
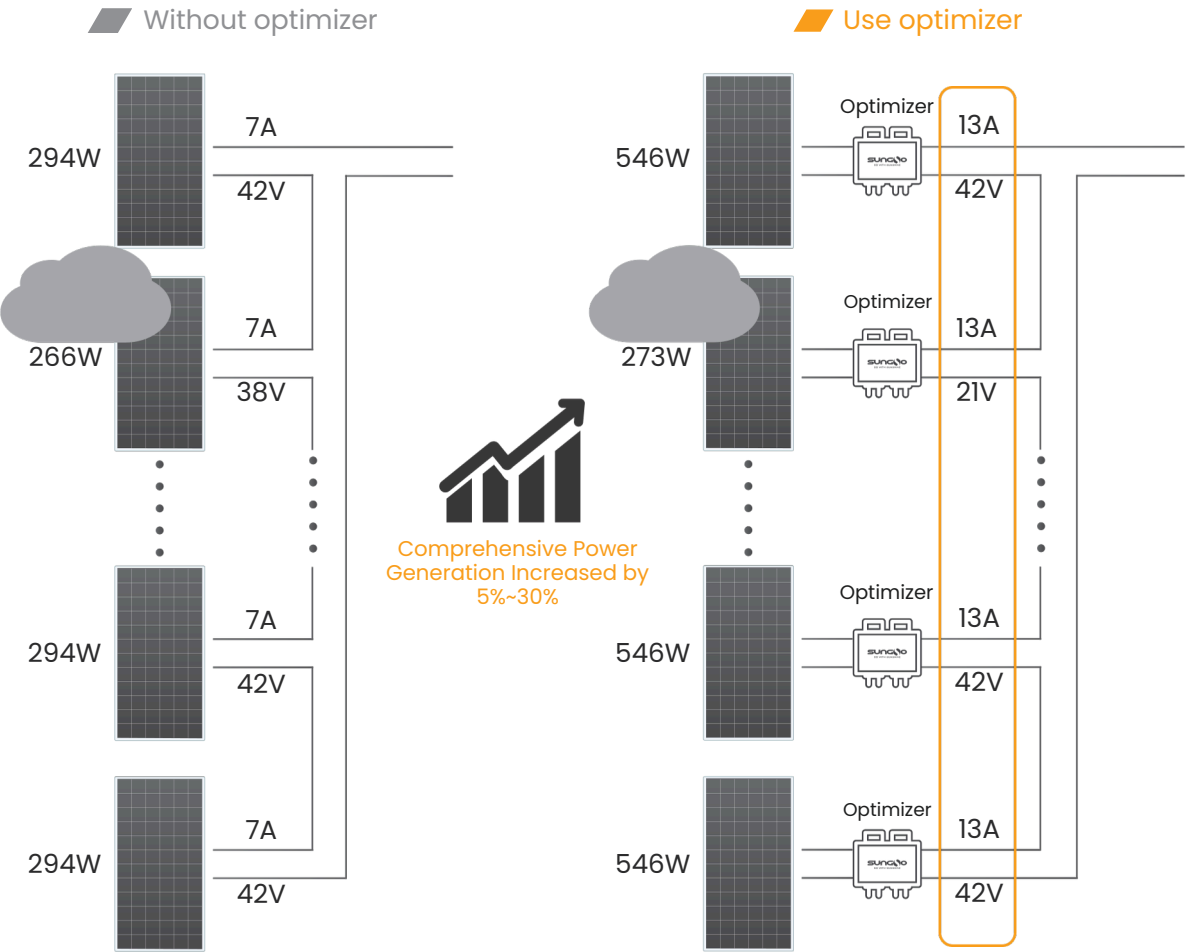
Model	SUNGO iOPT 800W	
DC Input	800W	
Max input power	70V	
Max voltage	12~60V	
MPPT voltage range	21A	
Max continuous input current	23A	
Max input short-circuits current	0W	
Night self-consumption	0~60V	
DC Output	21A	
Output voltage	780W	
Max continuous output current	1500V	
Max output power	1±0.1V	
Max system voltage		
DC Output During Shutdown	≥99.7%	
Output voltage (without SUNGO GT)		
Efficiency	PLC	
Peak MPPT efficiency	PV Voltage, Output Voltage, Output Current, Output Power, Temperature, State	
Communication	>75V	
Communication Method	>22A	
Communication parameter	>800W	
Advanced Protection	>110°C	
Input overvoltage protection	116*31.5*123mm	
Output overcurrent protection	0.865kg	
Output overload protection	IN+ 200 / IN- 1100 / OUT+ 750 / IN- 750mm	
High temperature protection	4mm2 (12AWG) / 4mm2 (12AWG)	
General Data	MC4(Compatible)	
Dimensions (W*D*H)	IP68	
Weight	0~100%RH	
Input/output cable length	-40~-+65°C	
Input/output cable size	Natural cooling	
Terminals	CE	
Protection rating	840pcs/pallets	
Relative humidity		
Operating temperature range		
Cooling		
Certification		
Packaging		

## Data Gateway Technical Parameters

Model	SUNGO GT	
Match with	SUNGO iOPT 800W	
AC Input Parameters		
AC input voltage range	90~264V	
AC Input frequency	50/60Hz	
Maximum AC input power	5W	
Maximum AC input current	0.1A@90Vac	
PV Input Parameters		
Terminals	MC4(Compatible)	
Maximum system voltage	1500V	
Nos of input strings	2	
Max current of each string	21A	
Max Module Nos per string	30	
Communication Method		
Communication with optimizer	PLC	
Communication with upper machine	2.4GHz Wi-Fi / RS485	
Rapid Shutdown	1. OFF when AC is not connected 2. ON when AC is connected	
Initial state	Press the button once until the Running light is on	
Switch-on	<5s	
Switch-on time	1. Press the button once until the RSD indicator lights up 2. Controller AC power off, all indicator lights off	
Shut-down		
Shut-down time	<30s	
Standards		
Electromagnetic compatibility (EMS)	IEC61000-6-1, IEC61000-6-2, IEC61000-6-3	
Safety	IEC62109-1	
RoHs	Yes	
Installation Specification		
Dimension (W*D*H)	140*33.5*175mm	
Weight	0.88kg	
AC input cable length	1m	
Protection level	IP67	
Working temperature range	-40~-+70°C	
Storage temperature range	-40~-+85°C	
Cooling	Natural cooling	
Form of installation	Wall hanging/holding, screw locking	
Certification	CE	
Packaging	40pcs/pallets	



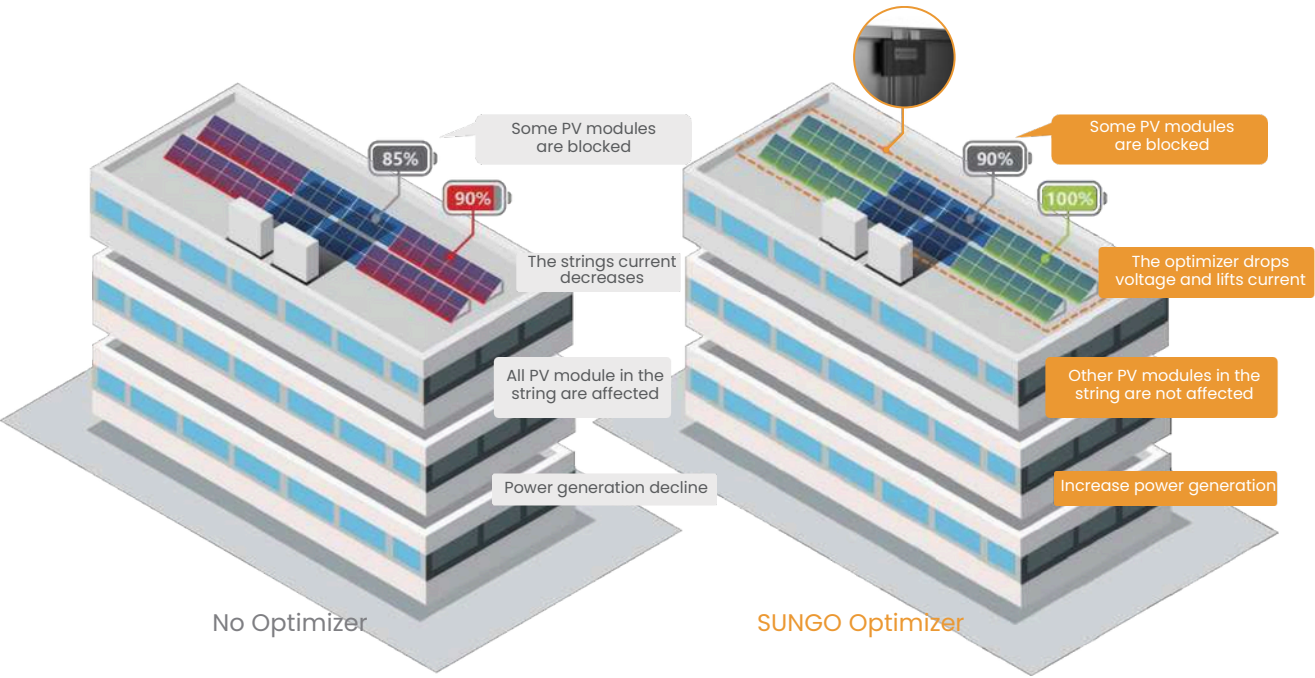
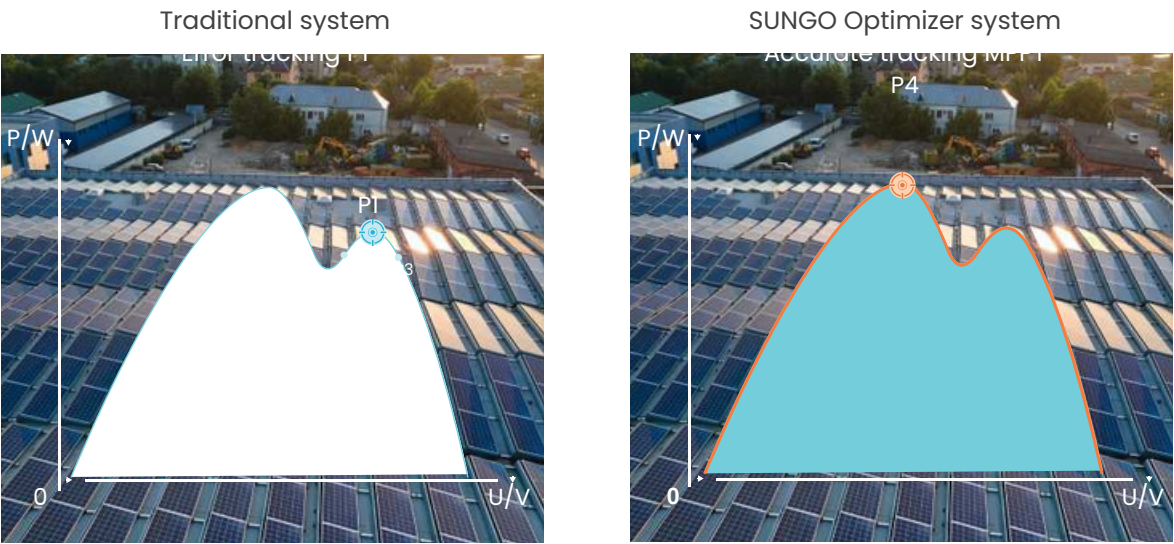
# How the Optimizer Works



## Module-level Optimization

Individual optimizations at the module level ensure that each module works at its own optimum operating condition and tracks the maximum current of the string.

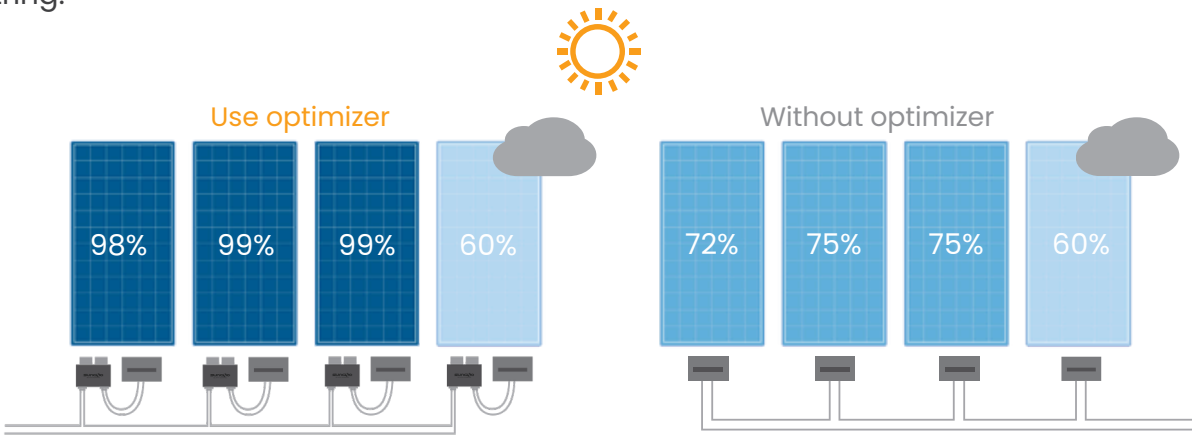
Accurate tracking of the maximum power point, increase the system power generation.





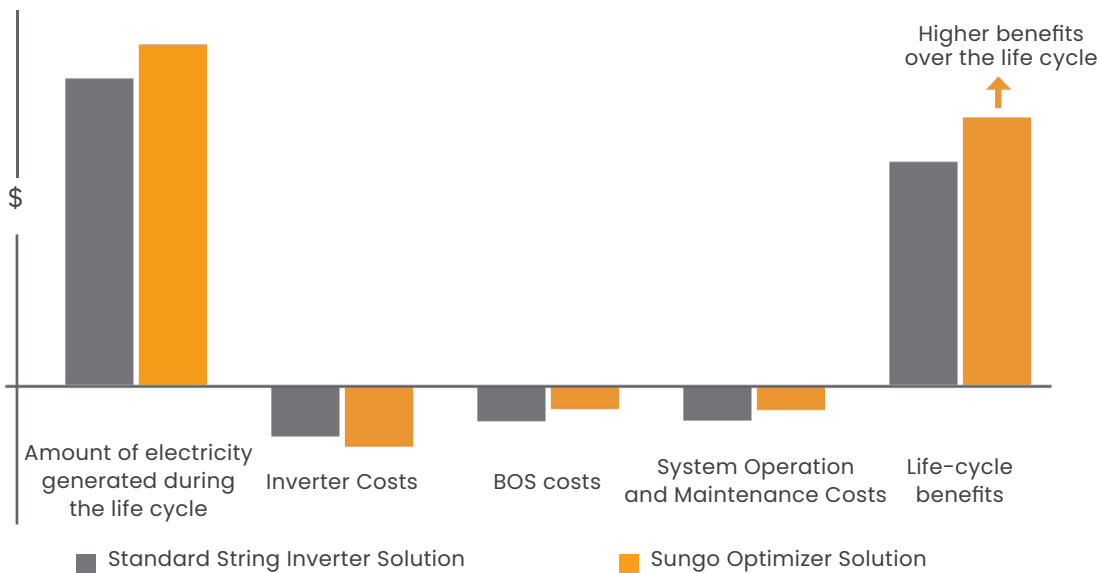
# What Problem to Solve

Module-level MPPT tracking to prevent one PV module from affecting the entire string.



## More Cost-effective Optimizer Solutions

Sungo's PV Smart Optimizer allows customers to optimize the cost of power generation over the life cycle of the system by increasing the amount of power generation and reducing the cost. It is able to optimize the power generation of each module, thus increasing the amount of power generation within the life cycle of the PV system. Compared to the traditional inverter system, the initial investment of the Sungo system is slightly higher, but the overall installation cost and the maintenance cost within the life cycle are lower, thus making Sungo's overall solution more attractive economically.



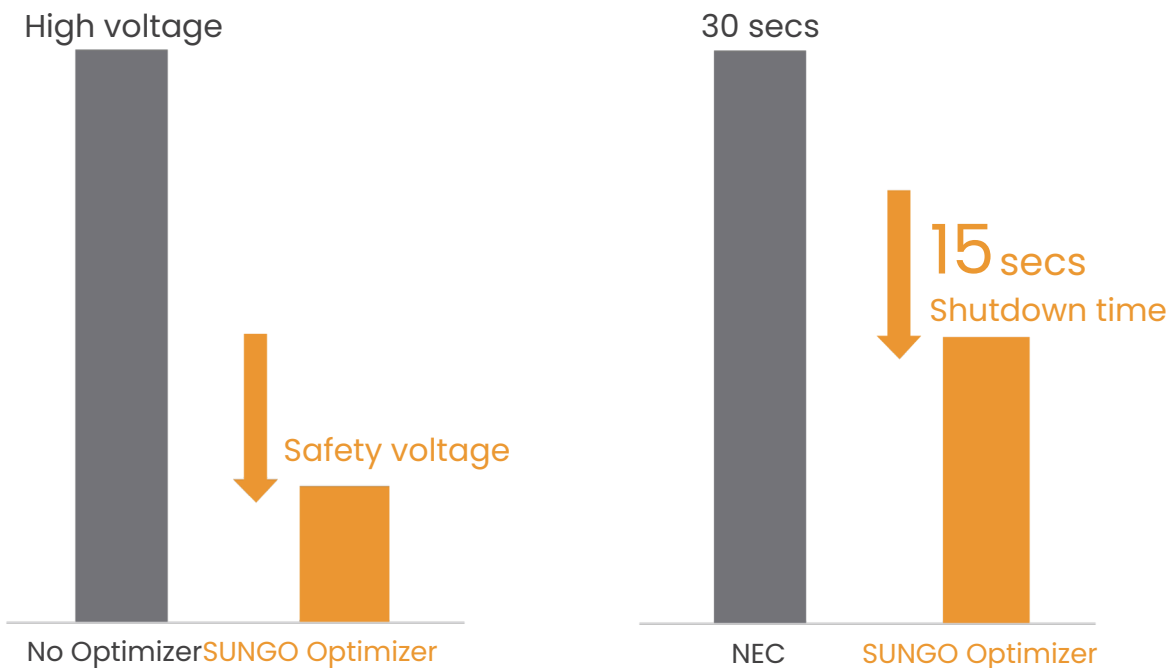
## Avoid PV Module Factory Mismatch

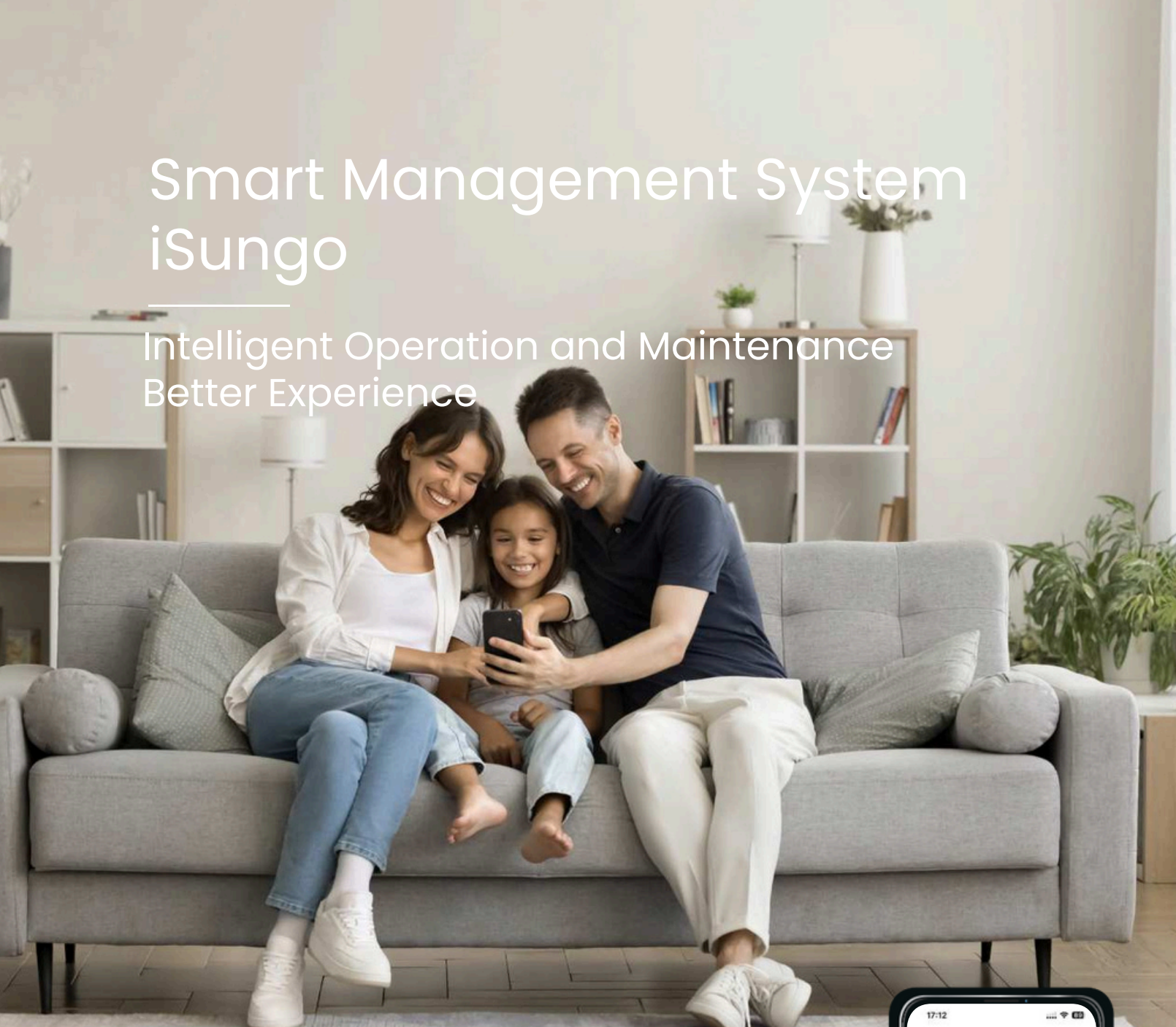
The manufacturers indicate that the module has 0~3% power tolerance, which will bring power generation loss of the system. The optimizer can solve it effectively.



## PV Module Protection and Comprehensive Roof Safety Solutions

Shutdown time of 15s, which is significantly faster than the 30s required by the NEC standard.





# Smart Management System iSungo

Intelligent Operation and Maintenance  
Better Experience

## App



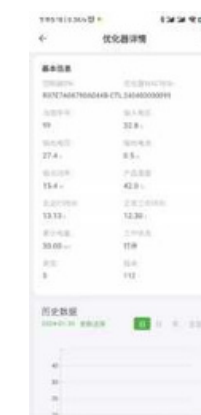
Station interface for creating new stations and viewing station information



Core data presented succinctly and at a glance

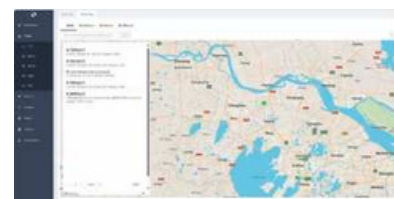


PV Module Layout View Module Information Status



Optimizer details are used to view the status of optimizer information

## Web



Multi-view display at a glance, easy to manage all your power stations

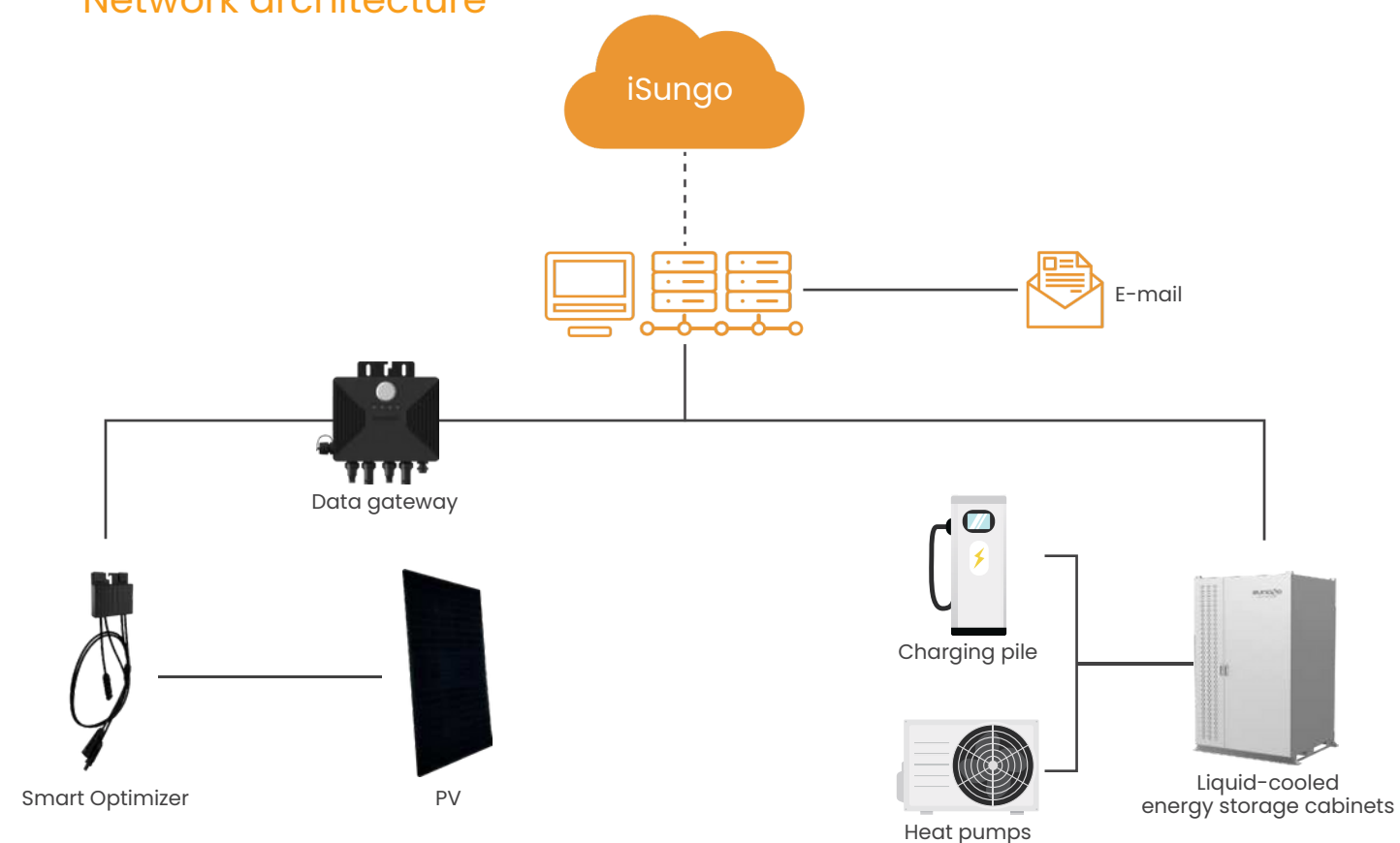


Fast access to component-level performance data to pinpoint component problems







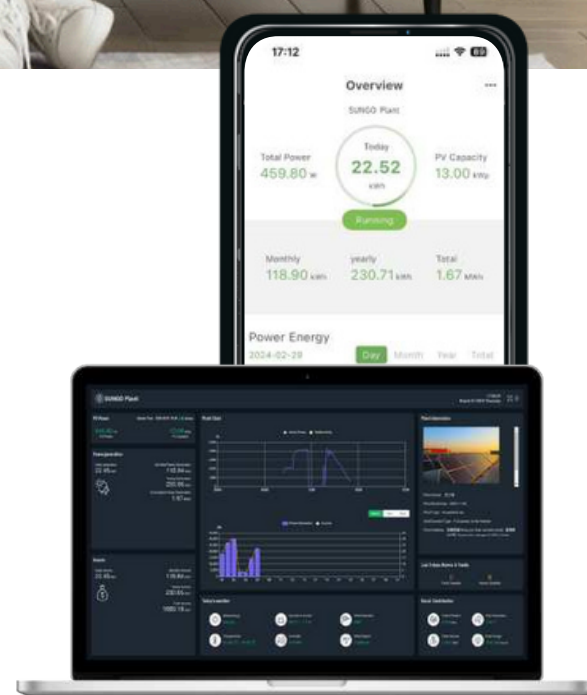
View current and historical data by day, week, month, and year, with earnings automatically calculated

## Network architecture



## Features

-  Intelligent management, data at a glance
-  Module-level data management for easier operation and maintenance
-  Comprehensive control of power station operation to realize maximum benefits
-  Remote fault analysis to reduce O&M costs

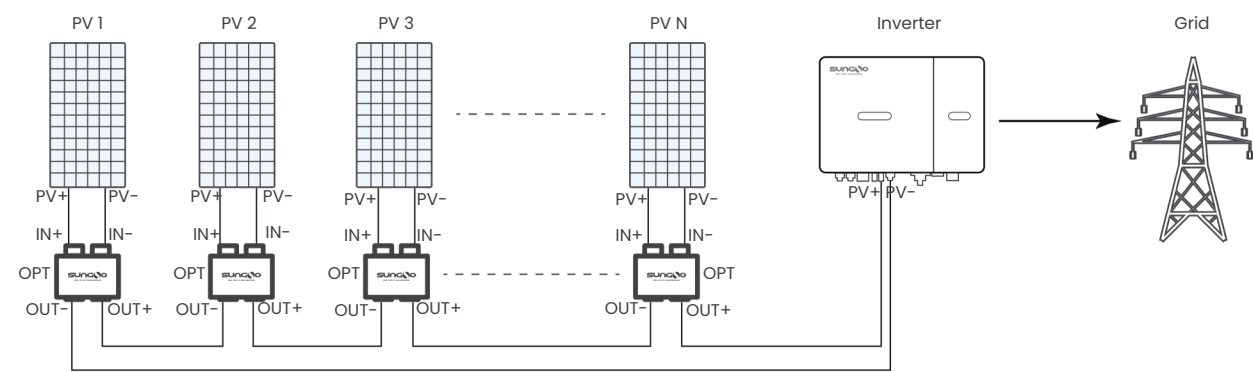




# Typical Project Case Introduction

Comparison of two adjacent power stations with and without the optimizer installed.

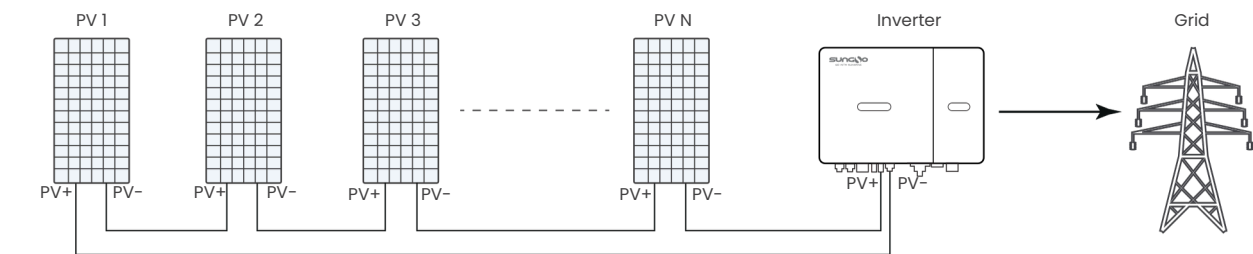
Average power generation increase: 17.34%



Optimizer installed



No optimizer installed



Optimizer installation date: July 1, 2020



Installed pv capacity: < 50kw for both systems



Number of optimizer installations: 143 pcs

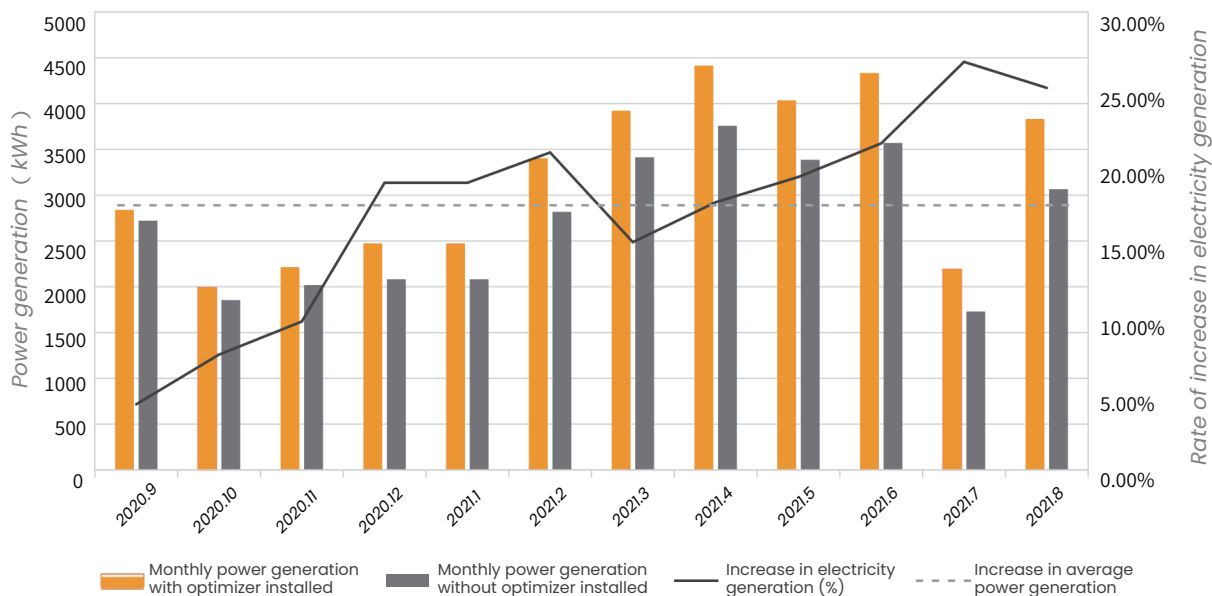


Average power generation increase: 17.34%

## Comparative Data for Two Neighboring Power Stations

Improvement effect within one year (measured value).

Effect of installing an optimizer (increase in monthly power generation)



Note: This data is collected from actual measurements taken from September 2020 to August 2021 by the customer.

The graph presented visually contrasts the power output of the Gunma Solar PV project in Japan, highlighting the substantial enhancement that occurred when an optimizer was incorporated. The optimizer proved to be highly efficacious, boosting the solar power generation by an impressive margin. Specifically, it enhanced the power generation efficiency from a baseline of 4.30% to a peak of 26.74% within the period spanning September 2020 to August 2021. On average, the installation of the optimizer led to a substantial average improvement of 17.34%, demonstrating its profound positive impact on the overall performance of the system.

Overall, the efficiency of PV power generation tends to improve with optimizers. However, the degree of improvement varies depending on the actual internal and external environment of the project, but the longer the life of the PV panels, the greater the optimization effect. According to a large amount of actual data, the average efficiency increase after using Sungo's optimizers is 16.04%.

# Project Cases



March 2021 - Fukuoka, Japan - 32 pieces  
- comprehensive power generation increased by 22.3%



April 2021 - Czech Republic - 200 pieces  
- comprehensive power generation increased by 17.2%



May 2021 - Slovenia - 200 pieces  
- comprehensive power generation increased by 10.8%



January 2022 - Switzerland - 22 pieces  
- comprehensive power generation increased by 10.2%



July 2022 - Munich, Germany - 18 pieces  
- comprehensive power generation increased by 13.5%



September 2022 - Italy - 1,500 pieces  
- comprehensive power generation increased by 15.9%

# Professional and Comprehensive Service



**Fast Response**  
12-hour agreement signing, 24-hour accurate quotation



**Professional R&D Team**  
Structural, electrical, software, industrial design engineers to satisfy the diverse requirements of clients

## After-sales service



Remote Support Troubleshooting



On-site support: Global projects, 24 hours arrival



Follow up & Customer Satisfaction Survey



Adhere to the concept of global localized operation and service

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