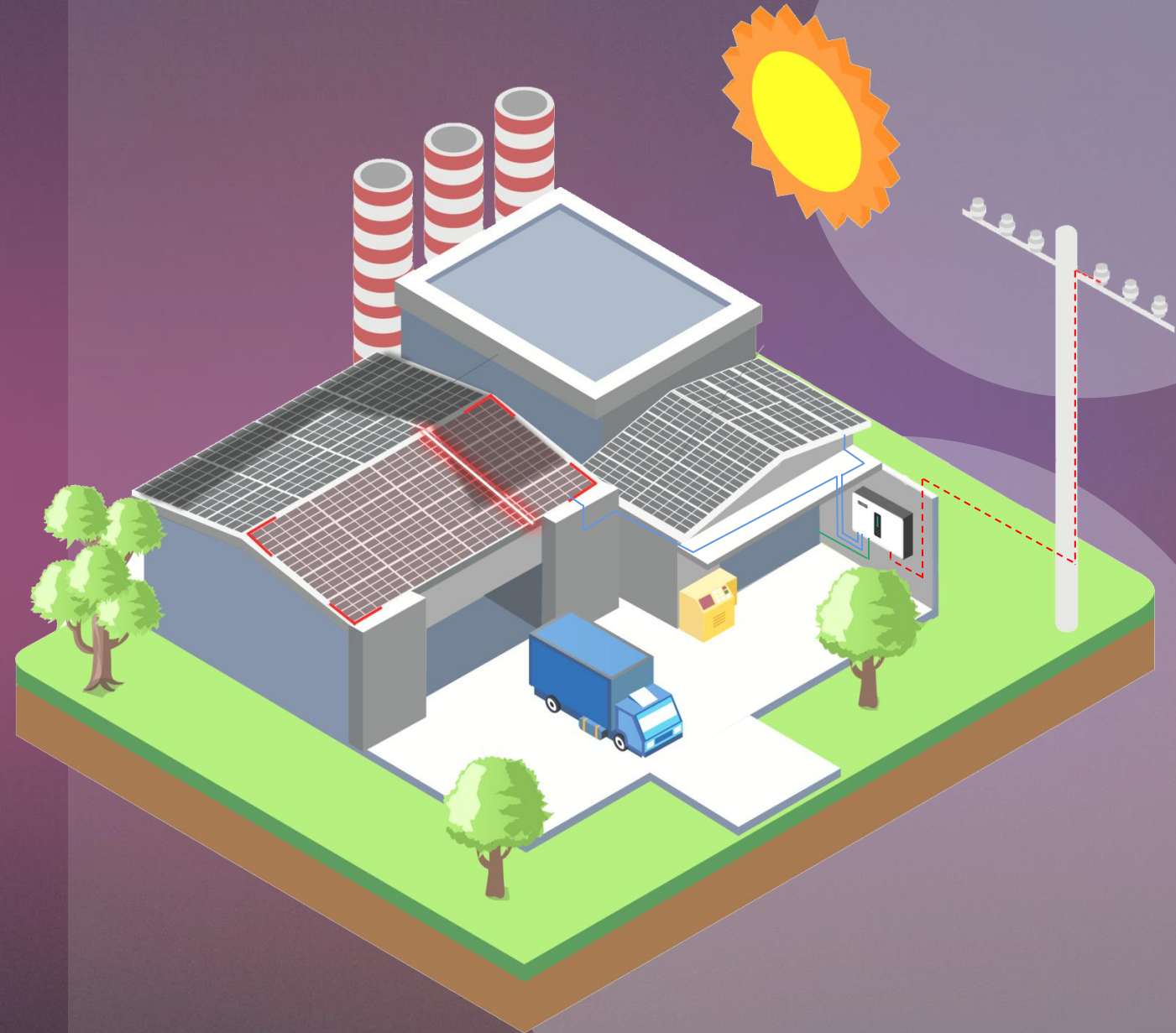# Solinteg Shadow Scan Solution

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What is Shadow Scan

⚡ Introduction

The Shadow Scan function is a shade repair technique that is frequently utilized when solar systems are shaded due to unavoidable shading. The inverter detects shadow and optimizes yield at the string level using a highly efficient and powerful MPP tracking algorithm.

👍 Benefits

More Yield

With Shadow Scan function, you can always generating with the best efficiency – even when there is partial shade.

More Convenient

This function is integrated into the inverter, and all without installing additional components.

Less Cost

Not only does this cost less owing to fewer system components, it also keeps installation and service costs to a minimum.
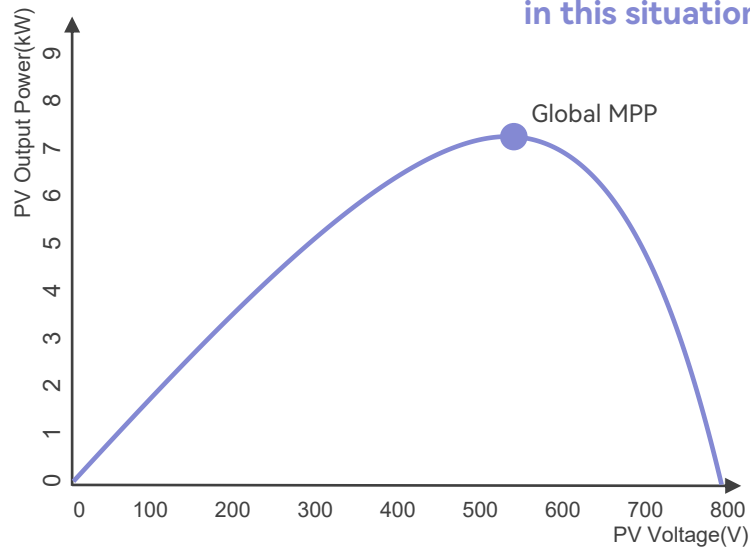
Shadow Scan for More Yield under Shading

Shadow Situation
(MPPT works with shadow)


Normal Situation
(MPPT works without shadow)

No need to use Shadow Scan in this situation

The MPPT function ensures the solar inverter work at its maximum power by tracking DC voltage and current. Under normal circumstances, this works for all inverters.

Shadow Scan can find MAX Power Point of WHOLE MPPT voltage

Not its Max Power Point

Global MPP

Local MPP

Might stop at this point
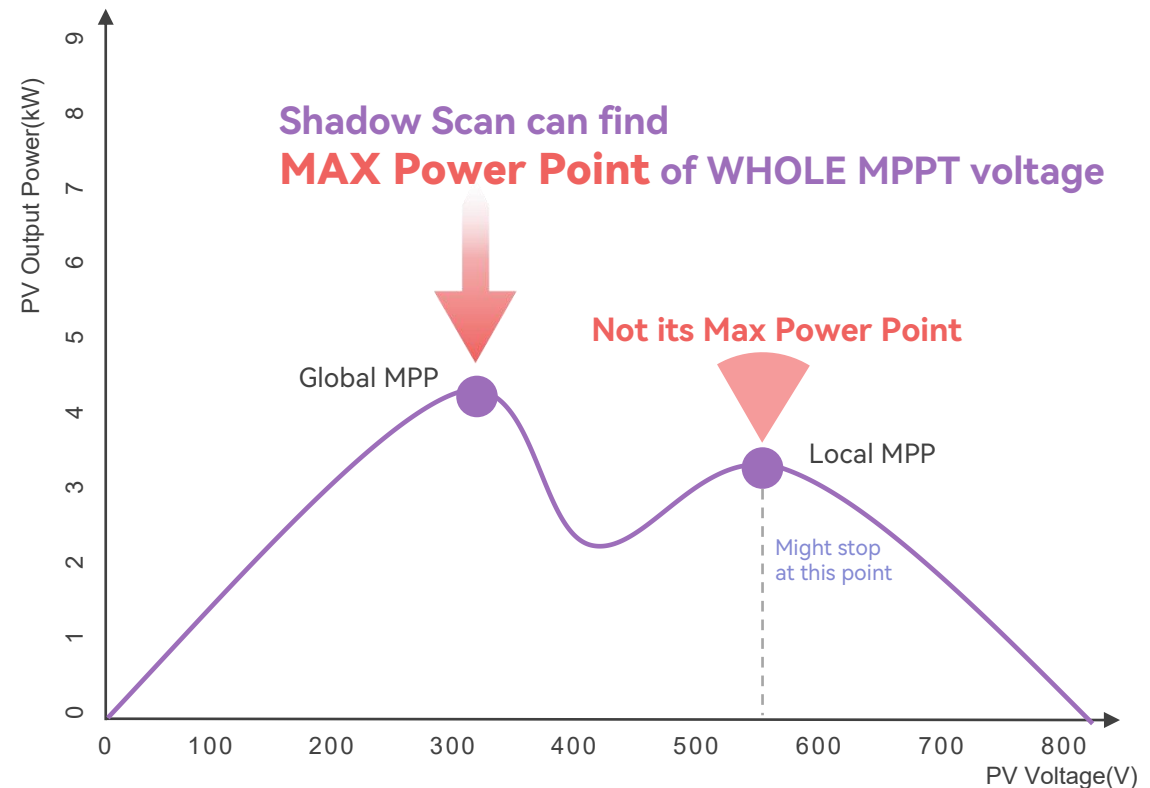
When there is a shadow, the output power has multiple peak power points rather than just one. The MPP tracker will still stop at the first maximum power point it tracks, but IT MAY NOT BE ITS MAXIMUM POWER, resulting in a power loss of the solar system.

A photovoltaic system should be as unshaded as possible all year-round to deliver high yields.

However, the environment may change with time, resulting in partial shading of the PV modules.

When there're leaves on the PV panels

When PV panels are shaded for a certain period of time

When cloudy weather is likely to producing shadows

When PV panels are shaded by other structures

When PV panels are affected by adverse weather conditions

Efficiency

High Efficient MPPT Algorithm

Solinteg Shadow Scan integrates a high-efficiency MPP tracking algorithm that detects shadow and optimizes yield at the string level.

Regularly Scaning

The scanning interval period in Solinteg Shadow Scan can be adjusted. Scanning on a regular basis to discover the most efficient power point, resulting in maximum yields despite shade.

Flexibility

Simultaneous Scans Available

Solinteg Shadow Scan can scan PV strings of different MPPTs at the same time, distinct MPPT scans do not require time intervals.

Independent Control

Solinteg Shadow Scan allows each MPPT to be controlled independently, simply turn on the Shadow Scan function of the shaded PV string, which will not influence the usual power generation of other strings.

Economical

No External Components

Solinteg Shadow Scan eliminates the need for external components at the PV module level, which are integrated directly into the inverter, lowering the cost of purchasing components.

Reduce Labour Costs

Solinteg Shadow Scan does not require maual installation, which reduces the cost of labour.

The Solinteg Shadow Scan function can be divided into three stages: preparation for scanning, scanning the whole voltage range, and tracing back to the global maximum power point. The complete procedure will take no more than 30 seconds.

First Stage

Preparation for scanning

Upon activation of the function, the MPP tracker will stop working and the voltage will reach PV open circuit voltage in preparation for scanning the whole voltage range.

Speed: MPPT stops working and reaches the open circuit voltage directly

Start Point: Present working voltage

End Point: PV open circuit voltage

● Strat Point
● End Point

PV Output Power(kW)

Present working voltage

Voc of PV

PV Voltage(V)
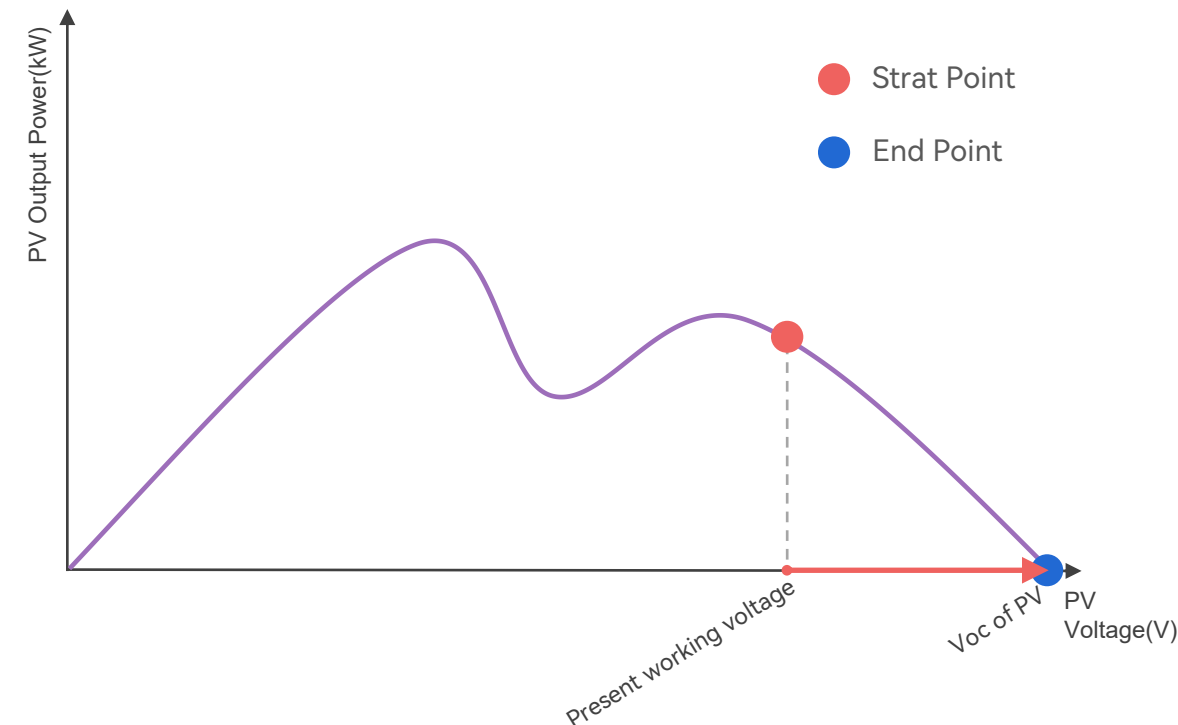
Second Stage

Scan whole voltage range

The inverter will scan the whole voltage range from PV open circuit voltage to minimum MPPT voltage, to find out the global maximum power point. The algorithm will divide the voltage range to be detected into up to 40 equal parts and calculate the step size, with a minimum of 6V, to detect the power in every voltages.

Speed: 1/40 of whole voltage /600ms, in minimum 6V /600ms

Start Point: PV open circuit voltage

End Point: Minimum MPPT voltage

Strat Point

End Point

PV Output Power(kW)

1/40 of whole voltage /600ms

Min MPPT voltage

Voc of PV

PV Voltage(V)
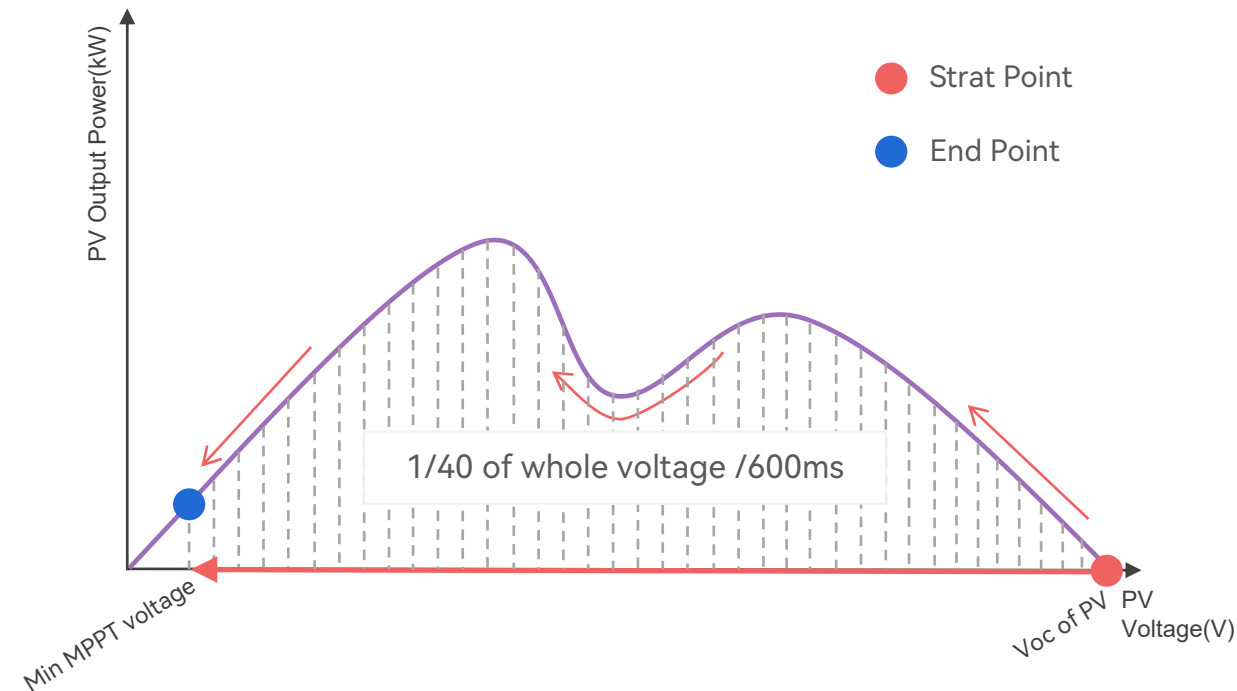
Third Stage

Trace back to the real maximum power point

As the tracker find out the global maximum power point, it will trace back to the point and work at this voltage, to make sure the inverter works at the max power of PV strings.

Speed: Directly reach the global maximum power point voltage

Start Point: Minimum MPPT voltage

End Point: Global maximum power point voltage
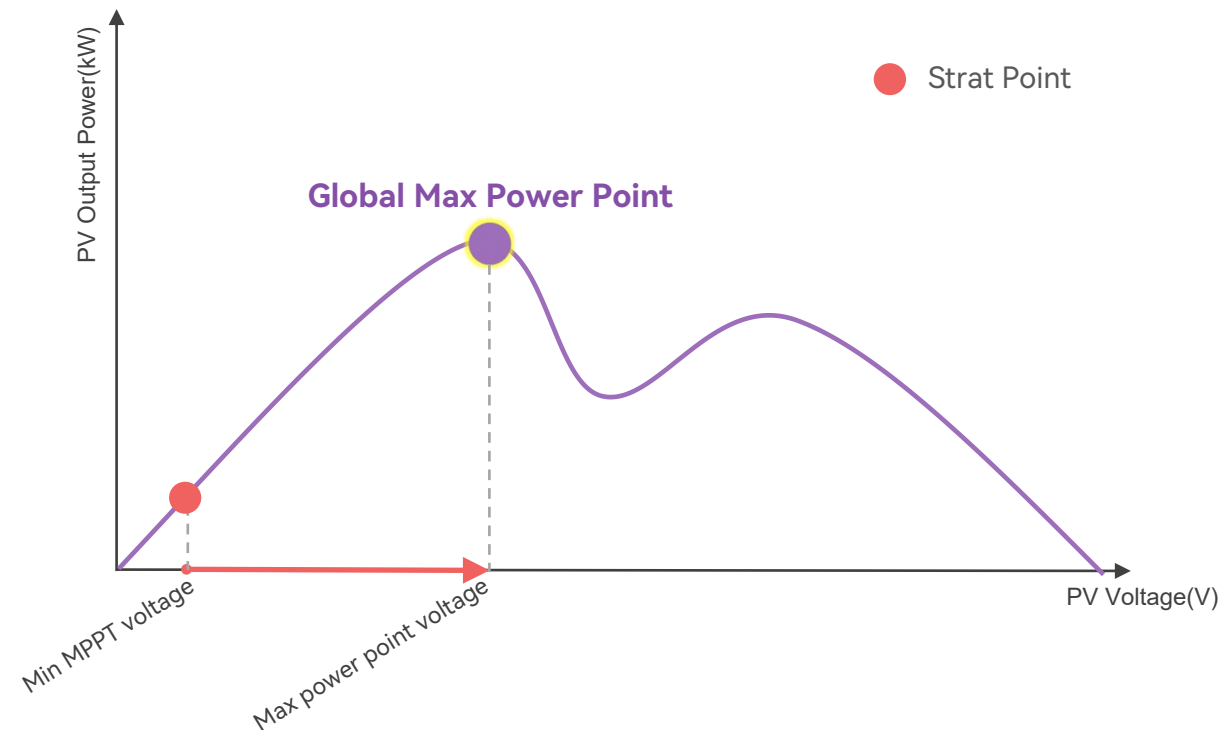
SHADOW SCAN
READY
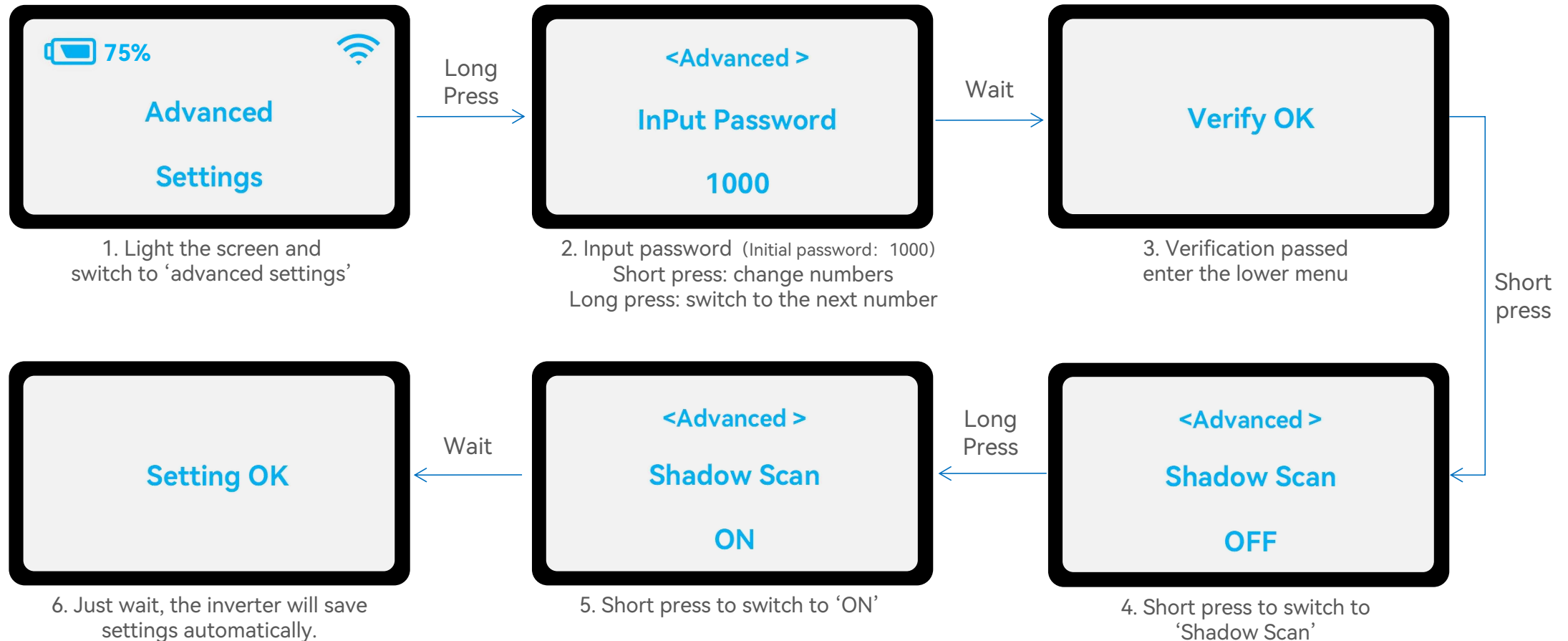
MHT 4-20K

MHT 25-50K

· AVAILABLE AT ·

MHT SERIES
*OGS/OGT/MHS SERIES can be developed depend on needs.

- Single MPPT scanning completed within 30s
- The scan interval is set to 5 minutes by default, support custom setting of scanning interval time
- Support multiple MPPTs under scanning at the same time
- Support independent control of each MPPT on App or monitoring platform(under development, and will be ready in Q2 2024)

How to Configure Shadow Scan Function

75%

Advanced

Settings

Long Press →

<Advanced >

InPut Password

1000

Wait →

Verify OK

1. Light the screen and switch to 'advanced settings'

2. Input password (Initial password: 1000)
Short press: change numbers
Long press: switch to the next number

3. Verification passed enter the lower menu

Short press

Setting OK

← Wait

<Advanced >

Shadow Scan

ON

← Long Press

<Advanced >

Shadow Scan

OFF

6. Just wait, the inverter will save settings automatically.

5. Short press to switch to 'ON'

4. Short press to switch to 'Shadow Scan'

Note:
1. The ARM version needs to be V01(24) or above.
2. More detailed configurations can be set in future versions of App and monitoring platform.

Setting guidance:
Short press(1s): switch window.
Long press(3s): enter the lower menu.
Wait: no need to press, please wait for 10 seconds and the inverter will automatically save your settings or modifications.
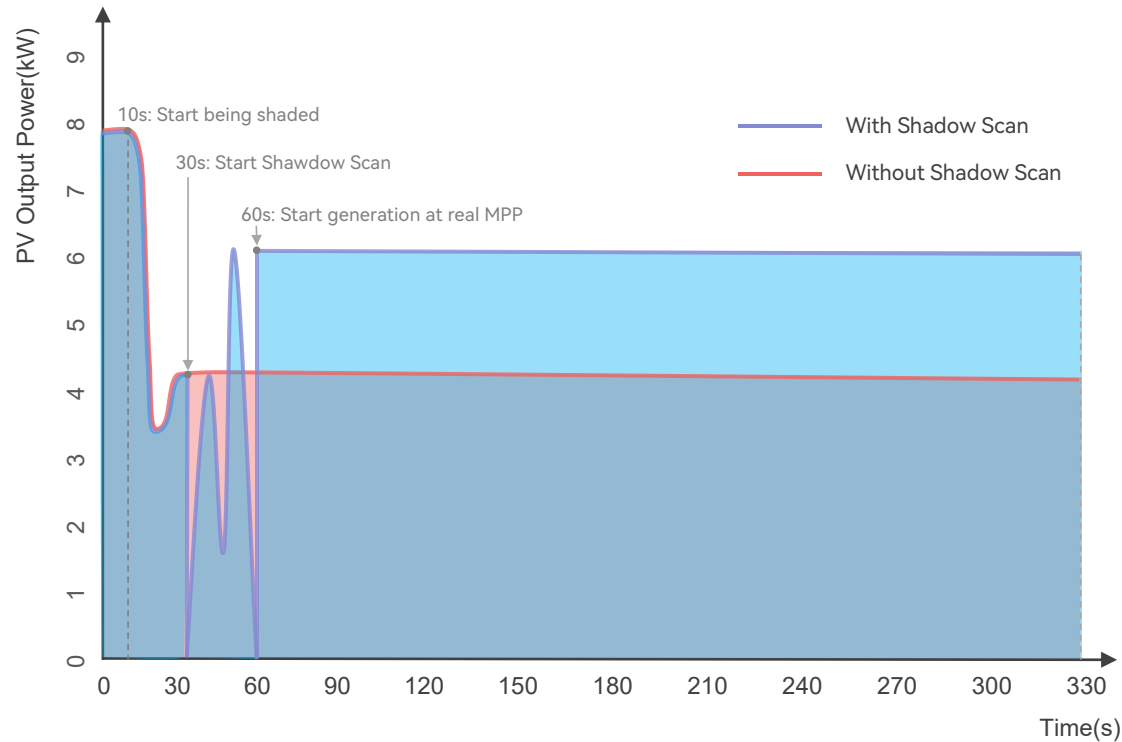
Case Scenarios

0-10s : Before being shaded

A Solinteg MHT15kW inverter in an ideal state with enough irradiation, at this time, maximum power point of single MPPT is

Vmppt=650V, Imppt=12.3A, Pmppt=8kW

10-30s : Unstable voltage and power by shading

At 10 seconds, the PV panels begin to be shaded, the MPPT algorithm starts adjusting and then finds the maximum power point near the voltage.

Vmppt=600V, Imppt=6.7A, Pmppt=4kW

30-60s : Unstable voltage and power by Shadow Scan turned on

At 30 seconds, Shadow Scan function is activated to perform a global scan (Shadow Scan takes 30 seconds) and ultimately find the real maximum power point in this state.
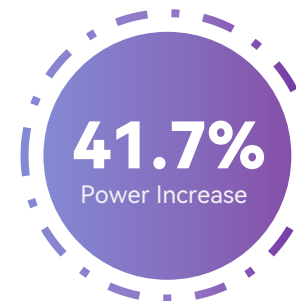
Vmppt=520V, Imppt=11.5A, Pmppt=6kW

60-330s : Higher power generation under shading

PV panels will use this point found by Shadow Scan as the maximum power point to generate electricity until the next shadow scan.

Vmppt=520V, Imppt=11.5A, Pmppt=6kW

*Assuming scanning interval is 5 minutes and 30-330 seconds will be one cycle.

10s: Start being shaded

30s: Start Shawdow Scan

60s: Start generation at real MPP

With Shadow Scan
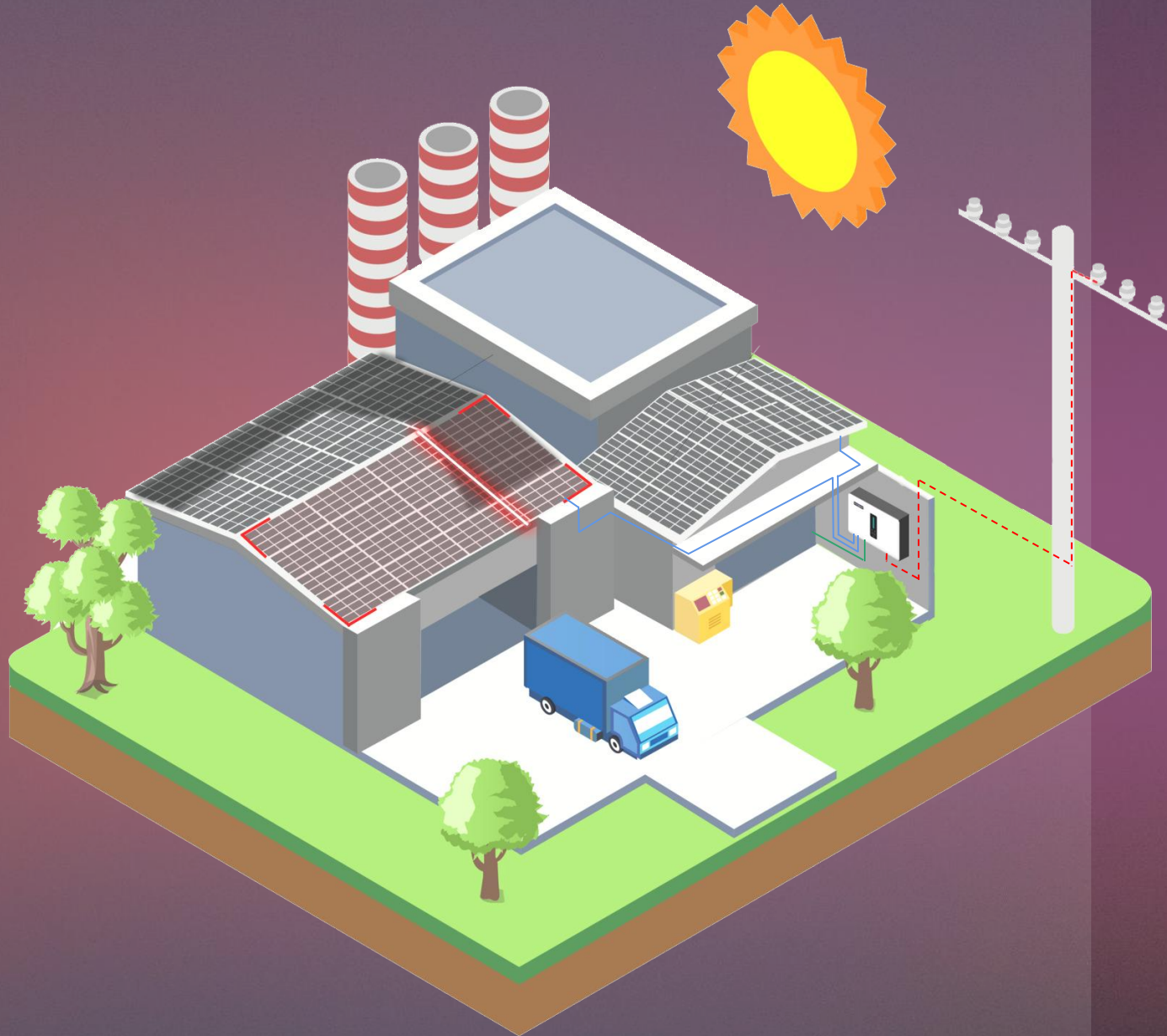Without Shadow Scan

41.7%
Power Increase

Under heavily shadowed condition

Benefits

Compared to the inverter without Shadow Scan, Shadow Scan function brings (in 5 minutes):

- Extra energy is approximately 143.8W;
- Increased electricity production by 41.7%.

END
Visit Solinteg website to find out more

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