
SUNGROW
Clean power for all
POWERSTACK 200CS

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Powerstack 200CS

PowerStack 200CS Series

C&I Liquid-Cooled ESS

225kWh	110kW	2h
Capacity	Power	System

Up to 25x on-grid parallel

ST225kWh-110kW-2h

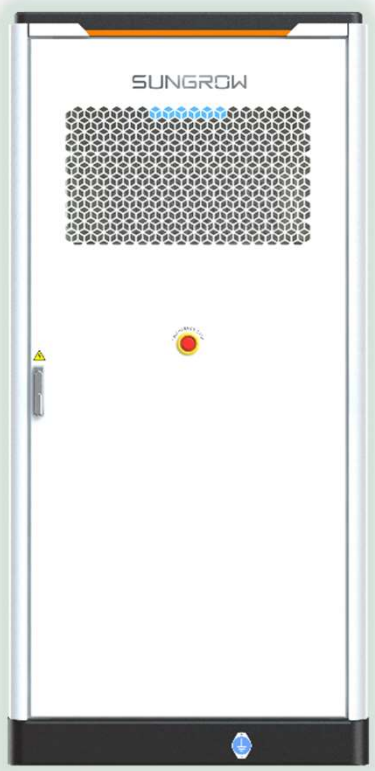
POWERSTACK: C&I SYSTEM FOR ENERGY STORAGE

Technical Specifications 1	
Dimensions W x H x D and weight	1150 x 2450 x 1610mm x 3100kg
Installation	Plug & Play (commissioning by SG)
Protection class	IP55 | C5-L
Cell cooling	A liquido
Operating humidity range	0 ÷ 100%
Operating temperature range	-30 ÷ 50°C
Maximum altitude	3.000 m
Noise	<70dB @1m
Security	Flammable Gas Detector, Smoke, Heat, Aerosol with Sprinkler

Technical Specifications 2	
Communication	Ethernet with Modbus TCP protocol
Cells	$LiFePO_4$ 3,2V | 280Ah
Nominal capacity	229kWh
DC Rated Voltage Range	691,2 ÷ 934,4V
AC on grid rated power	110kW
Voltage rating	400V
Nominal frequency	50Hz
Maximum on-grid current distortion	<3% @Pnom
DC Component	<0,5% @Pnom

ST225kWh-110kW-2h

All in one: battery pack, PCS and BMS integrated in a single solution



PCS
SC110CX

Liquid cooling unit

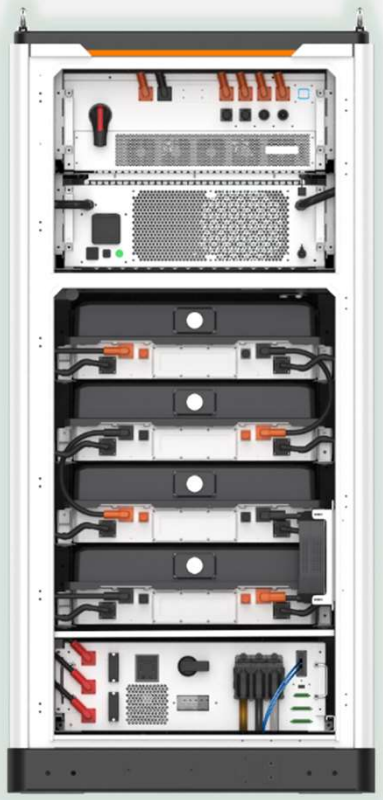
64S PACK

64S PACK

64S PACK

64S PACK

BMS



PCS

Liquid cooling unit

Pack

Water pan

Distribution box

AC outlet

Local Controller

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ST225kWh-110kW-2h

Cooling system managed by Artificial Intelligence

1

Thermal conductivity of liquid coolant

0.59 W/m/K

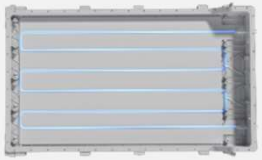
22 volte maggiore

Air thermal conductivity

0.026 W/m/K

2

AI heat dissipation balancing system acts at both the cell pack level and the system level

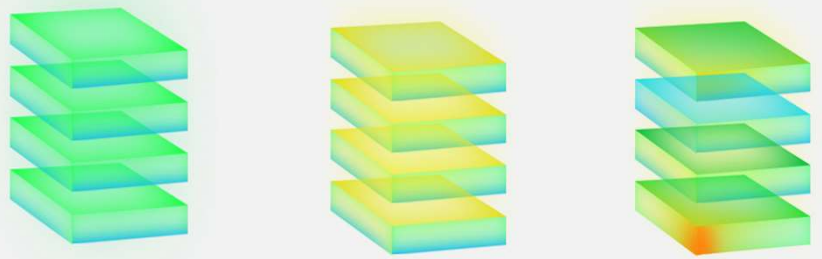


Pack-level channel:
Balanced heat dissipation for each cell

System-level channel:
Balanced heat dissipation of each pack

3

2,5 °C	3,0 °C	10 °C
PowerStack	Other liquid systems	Air system



* 0.5C, 1 cycle/day

The smaller the temperature difference between the cells, the longer the life of the system

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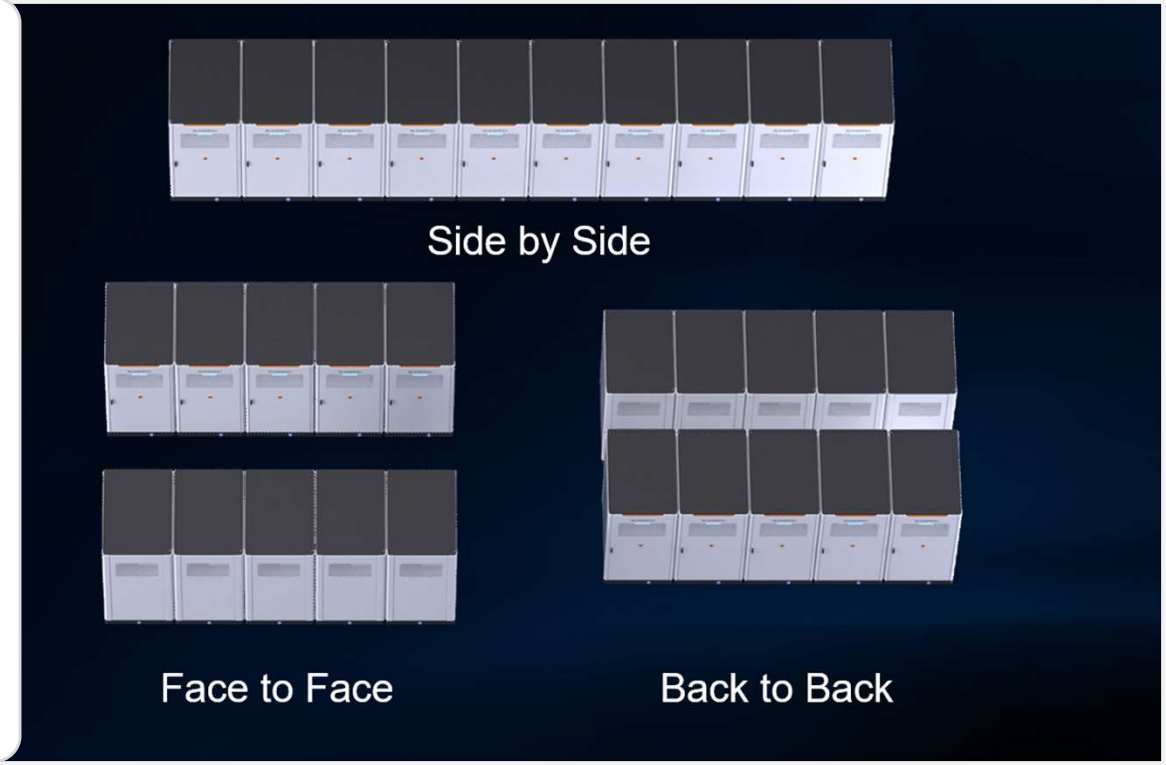
ST225kWh-110kW-2h

FLEXIBILITY

All in one
Integrated system design of EMS\PCS\BMS

Flexible layouts
Seamless side-by-side parallel connection supported

More convenient application
Support 1~25 200CS in parallel



ST225kWh-110kW-2h

EASY INSTALLATION

Conveyance with forklift/crane

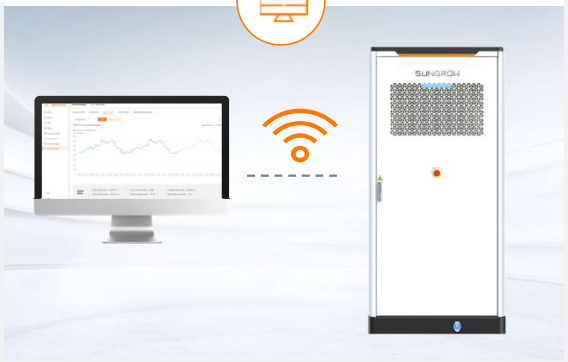
The bottom of the cabinet comes with forklift slots, which allow flexible conveyance at reduced cost.

Bottom wiring supported

Only the power line is needed, requiring no underground wiring and smaller footprint.

Intelligent EMS commission

Mobile phone or PC for EMS commissioning, no additional machine operation

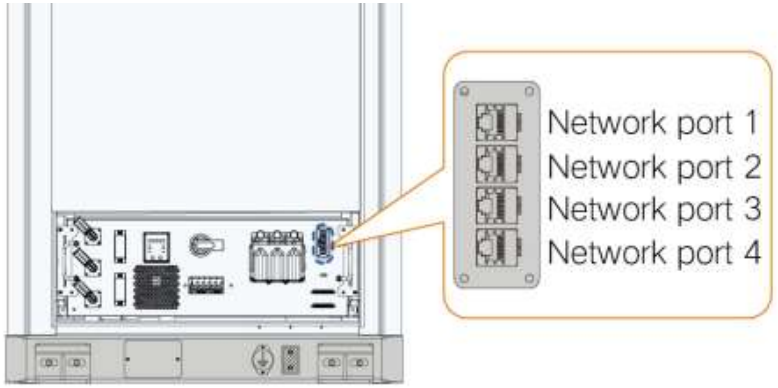


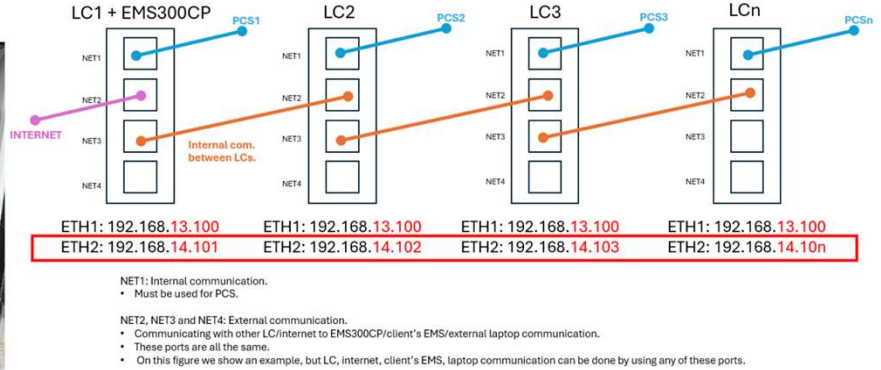
Powerstack 225kWh/110kW
EMS300CP

Mandatory to have at least on
EMS300CP per system

Local Controller (incl.)

EMS300CP (to be taken separately)



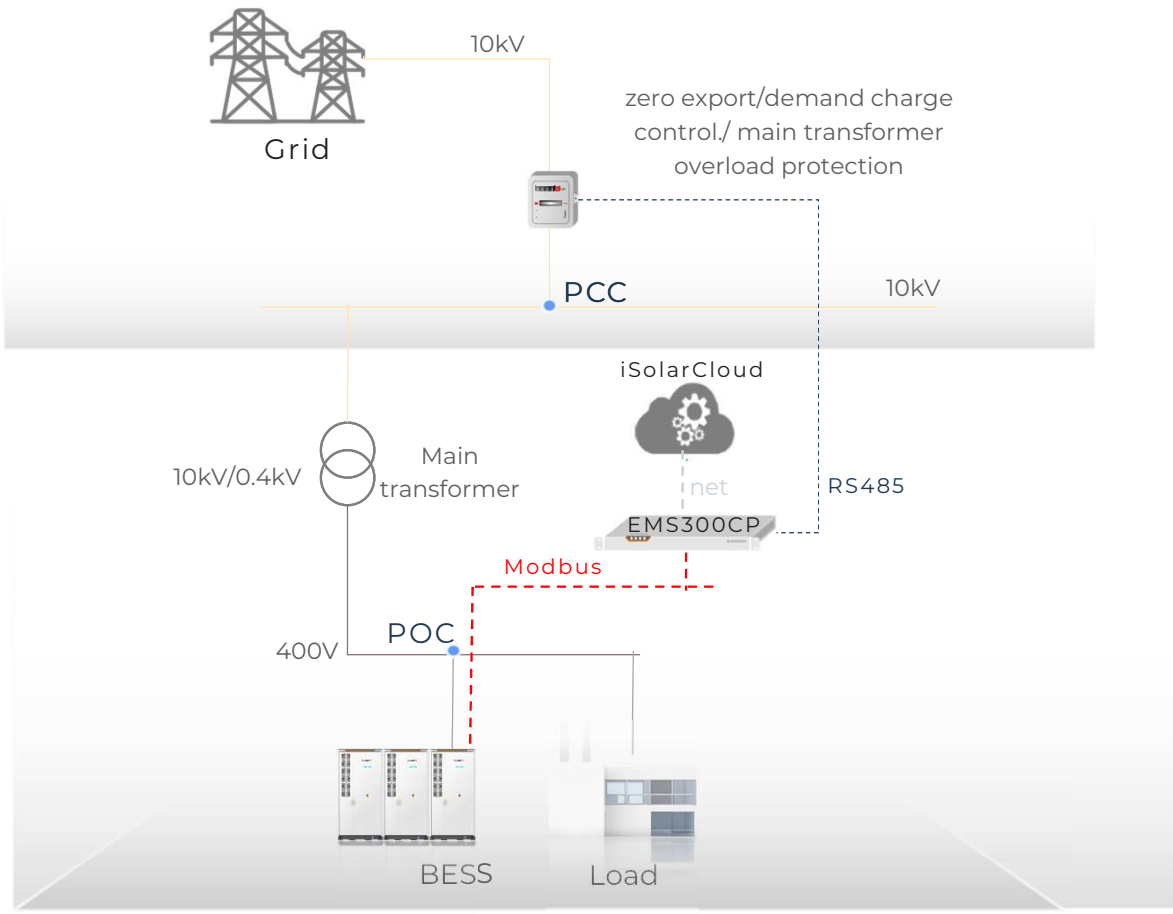


NET1: Internal communication.
- Must be used for PCS.

NET2, NET3 and NET4: External communication.
- Communicating with other LC/internet to EMS300CP/client's EMS/external laptop communication.
- These ports are all the same.
- On this figure we show an example, but LC, internet, client's EMS, laptop communication can be done by using any of these ports.

PowerStack + EMS300CP
Funzionalità

- On grid, off-grid (with transformer)
- Less than 25 PowerStacks
- One PCC, one MV/LV transformer, one meter
- Self-consumption – Also with third-party PV inverters
- Peak shaving– Even with third-party PV inverters
- Feed-in limitation – Only with Sungrow PV inverters



- *PCC: point of common coupling*
- *PoC: point of connection*

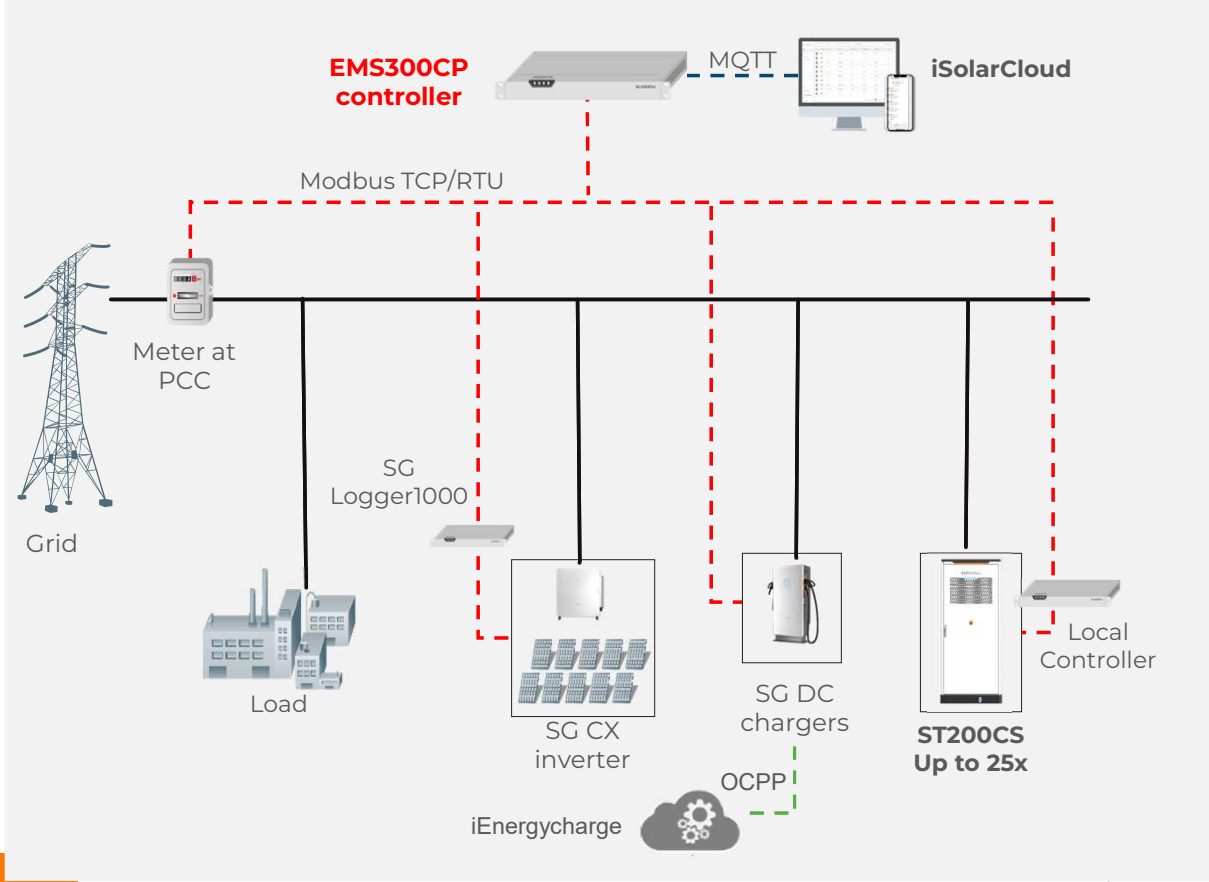
PowerStack + EMS300CP
Combinations and quantities with all Sungrow products

ESS Stand-alone	• ≤25 PowerStack 2h units
PV + ESS	• PV: ≤6MWp, SGCX, SGCX-P2 + COM100E/D-EU • ESS ≤25 PowerStack Drives
PV + ESS + EV	• PV: ≤6MWp • ESS: ≤25 PowerStack drives • EV chargers: ≤20 units IDC30E, IDC180E, IDC480E

PowerStack AC System Solution
Condizioni generali

- PowerStack AC is controlled by EMS300CP (at least one per system required).
- If the customer wants to have full control of PV+ESS from different brands, then an external EMS must be used. In this case, EMS300CP is only used for site monitoring via iSolarCloud.

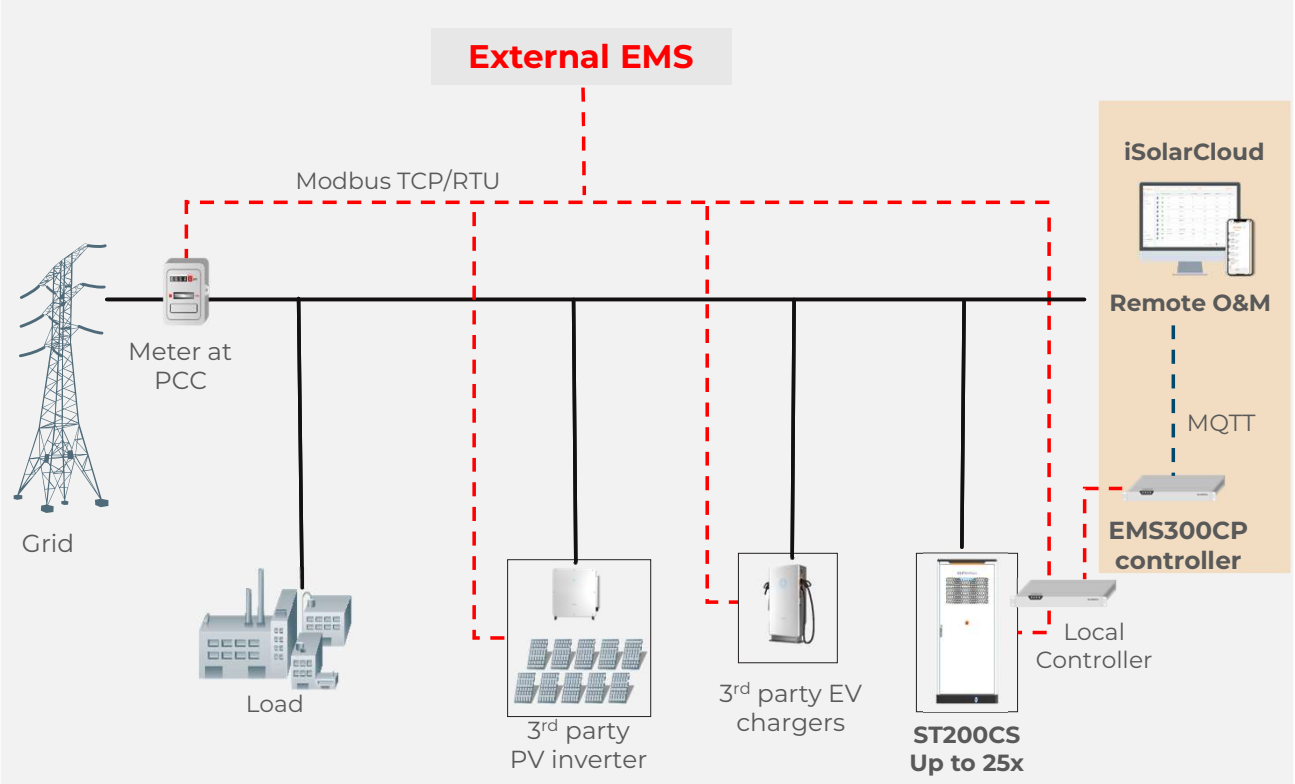
EMS300CP Master
All of Sungrow



- <u>Operating conditions for EMS300CP as a master controller:</u>
  - Only with compatible Sungrow PV inverters and EV chargers. You must use Logger1000.
  - EMS300CP cannot connect directly to Nordpool or other dynamic rate providers.
  - Third-party PV system cannot be controlled by EMS300CP.
  - EMS300CP can be controlled by an external EMS via Modbus TCP protocol.

Third-party EMS

For integrations with third-party PV systems



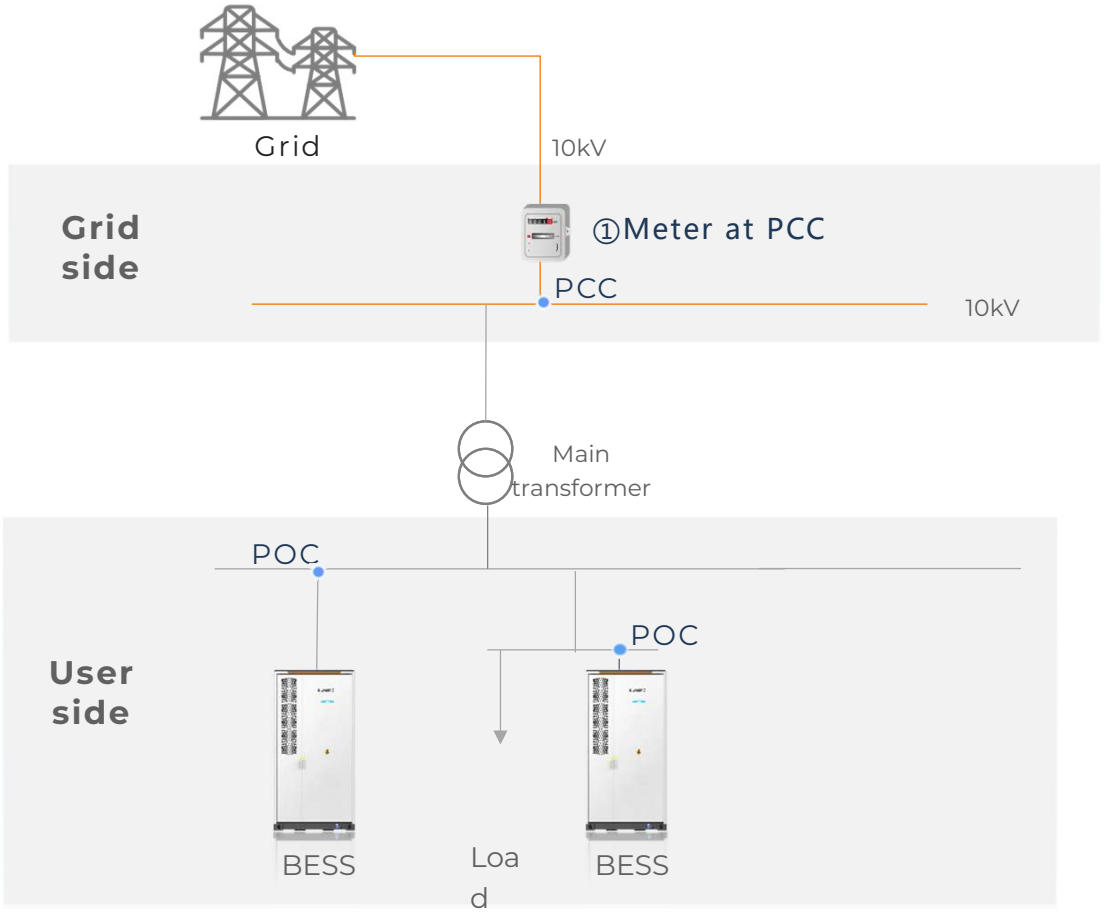
- Operating modes that require an external EMS:
  - Energy trading;
  - Frequency regulation or ancillary services;
  - Control of third-party PV inverters, batteries and EV chargers;
  - Control based on dynamic rates via external API;
  - AI-forecasted control of PV systems and loads;
- In this case, EMS300CP is only used for connecting to iSolarCloud for remote firmware update and O&M

EMS300CP
Connection with meter

Energy Meter Compatible	Weidmuller: Energy Meter 610 Janitza: UMG 604

Recommended distances
RS485: 800m
LAN: 100m

When using LAN, it is advisable to use fiber optics to reach distances >100m



- *PCC: point of common coupling*
- *PoC: point of connection*

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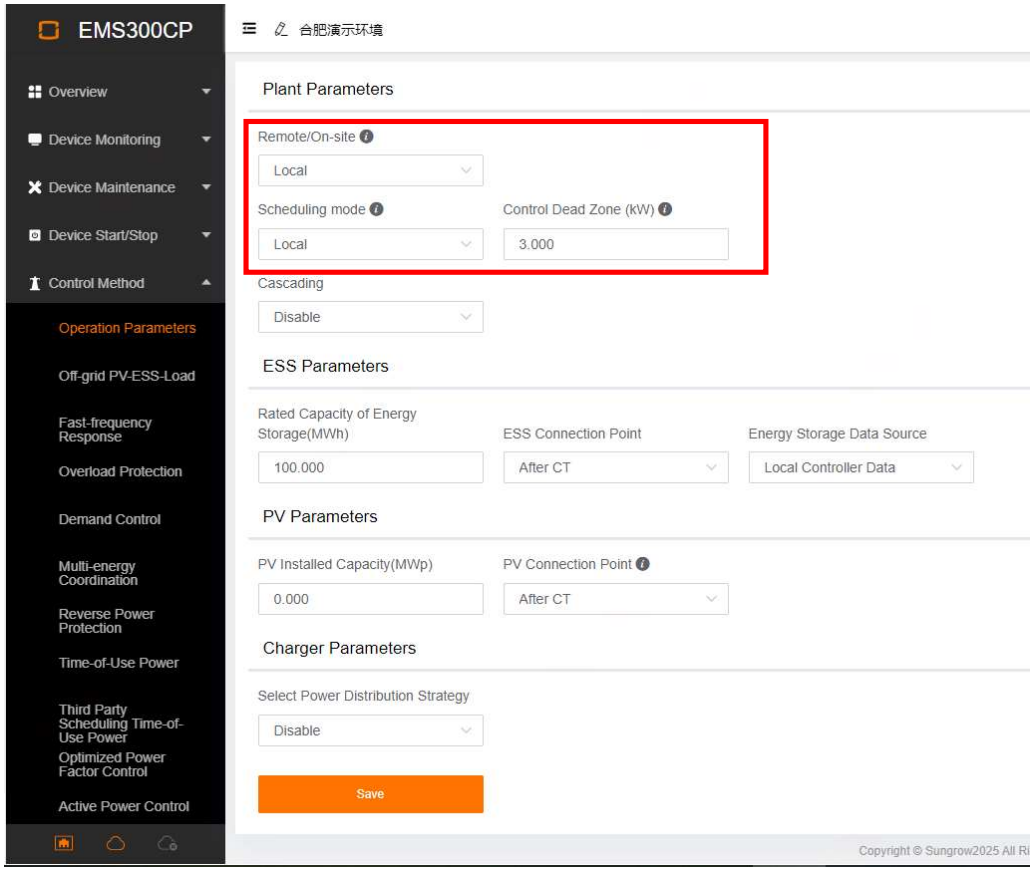
Funzionalità EMS300CP

Features EMS300CP
Setting Operation Parameters

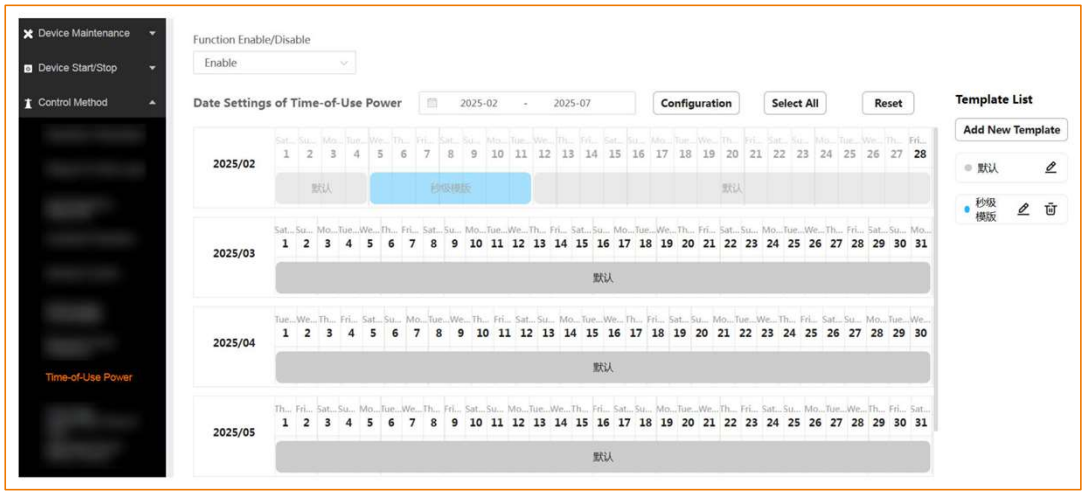
- Set local control e local scheduling;
- Set the rated capacity of the ESS and the installed PV capacity;
- Connection point always "after CT" since the meter is at the PCC and the entire system is behind the meter.



Features EMS300CP

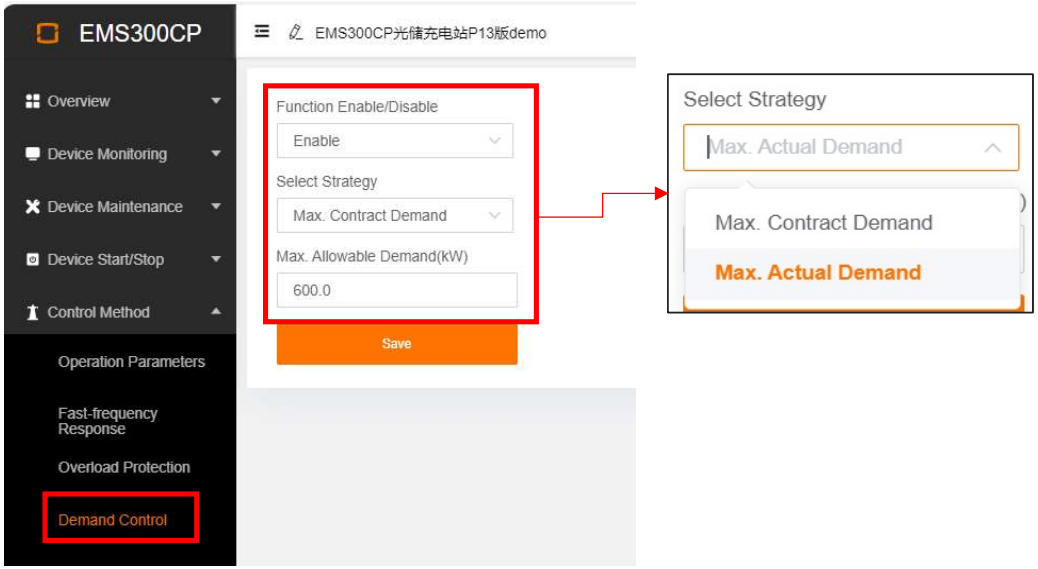
Time of Use – Peak/Valley Arbitrage

- When the customer has different rates for peak hours and for downstream hours, you must activate the time of use mode.
- You can create a daily schedule. Powerstack will schedule with a refresh rate of 30 minutes or 1 second.



Features EMS300CP
Demand Charge Control – Peak Shaving

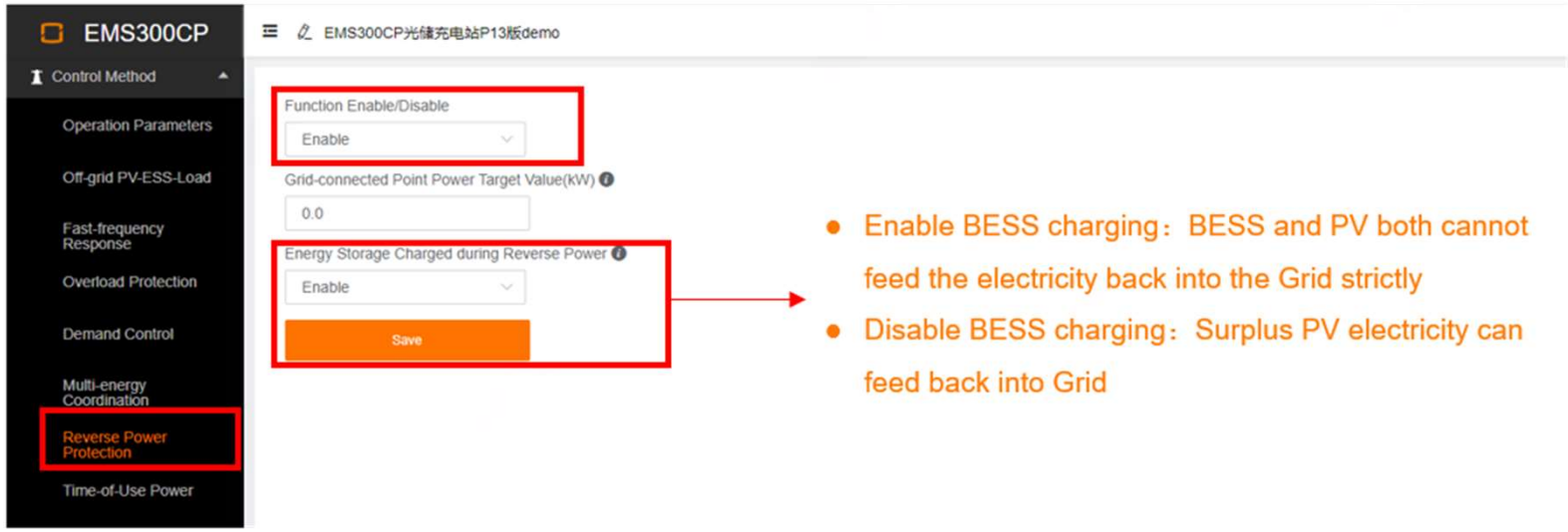
- When the customer pays a tariff for the maximum power in kW purchased from the grid (demand charge);
- Enable Demand Control mode;
- If the kW limit of purchase from the grid is fixed, select Max Contract Demand;
- If the commission is based on last month's value and the customer wants to dynamically reduce the commission, select Max Actual Demand.



Features EMS300CP

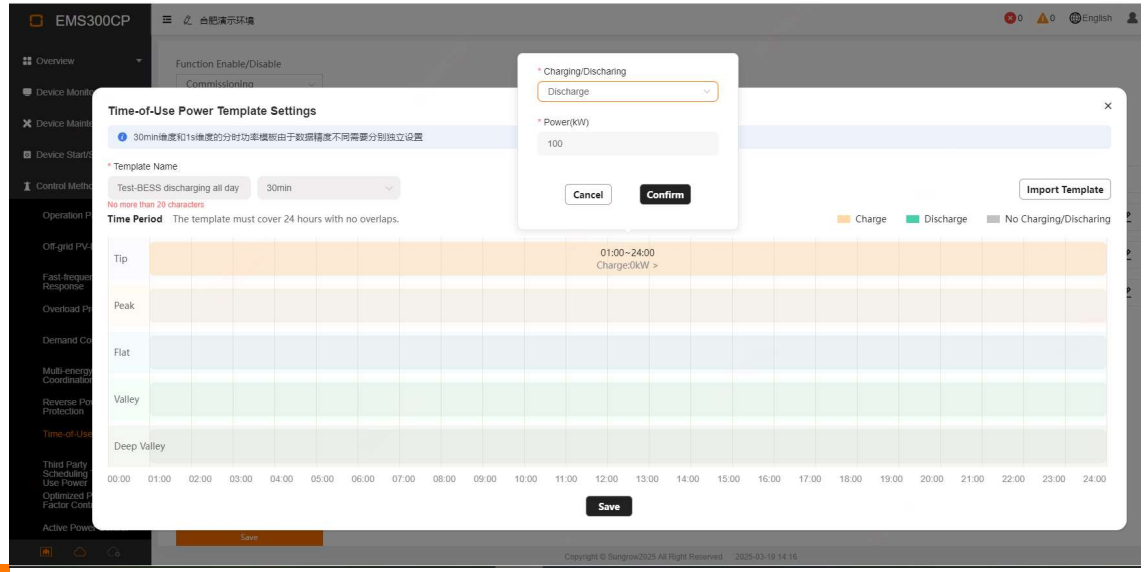
Zero-Export – Limitation of feeding into the grid

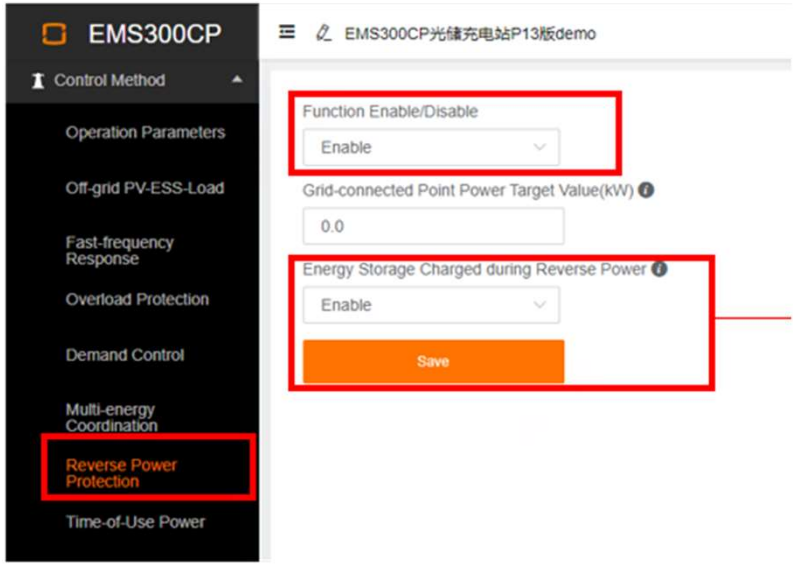
- EMS300CP cannot control third-party PV inverters;
- Activate feed-in restriction in "Reverse power protection";
- Activate BESS charging;
- 1.3 s response time max including meter data acquisition.



Features EMS300CP
Self-consumption

- Use case: self-consumption only, no feed-in limitations, no peak shaving, no energy arbitrage;
- Setup: First of all go to the time of use settings and enable 24h discharge, then go to "Reverse power protection" and set the target value of max Power at the AC connection point - enable BESS charging function.





Features EMS300CP
Retrofit with third-party inverters

- EMS300CP cannot control third-party inverters;
- Self-consumption and peakshaving are performed with the exact same steps;
- The meter at the PCC will see when there is power flow to the grid and recharge the BESS accordingly.

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TIME IS NOW