

SUN SYNK

THREE-PHASE HYBRID INVERTER

SUN-20 / 25 / 30 / 40 / 50K-SG01HP3-EU



DATASHEET

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1. PRODUCT INTRODUCTION

The Sunsynk Three-Phase Hybrid Inverter is a highly efficient power management tool that allows the user to hit those 'parity' targets by managing power-flow from multiple sources such as solar, mains power (grid) and generators, and then effectively storing and releasing power as and when utilities require.

INTERACTIVE

- Easy and simple to understand LCD display;
- Supporting Wi-Fi or GSM monitoring;
- Visual power flow screen;
- Frequency droop control;
- High-voltage battery;
- Highly efficient;
- Up to 16 inverters connected in parallel;

COMPATIBLE

- Compatible with mains electrical grid voltages or power generators;
- Support storing energy from diesel generators;
- 230V/400V Three-phase Pure Sinewave Inverter;
- Self-consumption and feed-in to the grid;
- Auto restart while AC is recovering;
- Maximum charging/discharging current of 37A;
- DC and AC couple to retrofit existing solar system;
- Compatible with a 48V low-voltage battery;

CONFIGURABLE

- Fully programmable controller;
- Programmable supply priority for battery or grid;
- Programmable multiple operation modes: on-grid/off-grid & UPS;
- Configurable battery charging - current/voltage based on applications by LCD setting;
- Configurable AC / solar / generator charger priority by LCD setting;
- 6 time periods for battery charging/discharging.

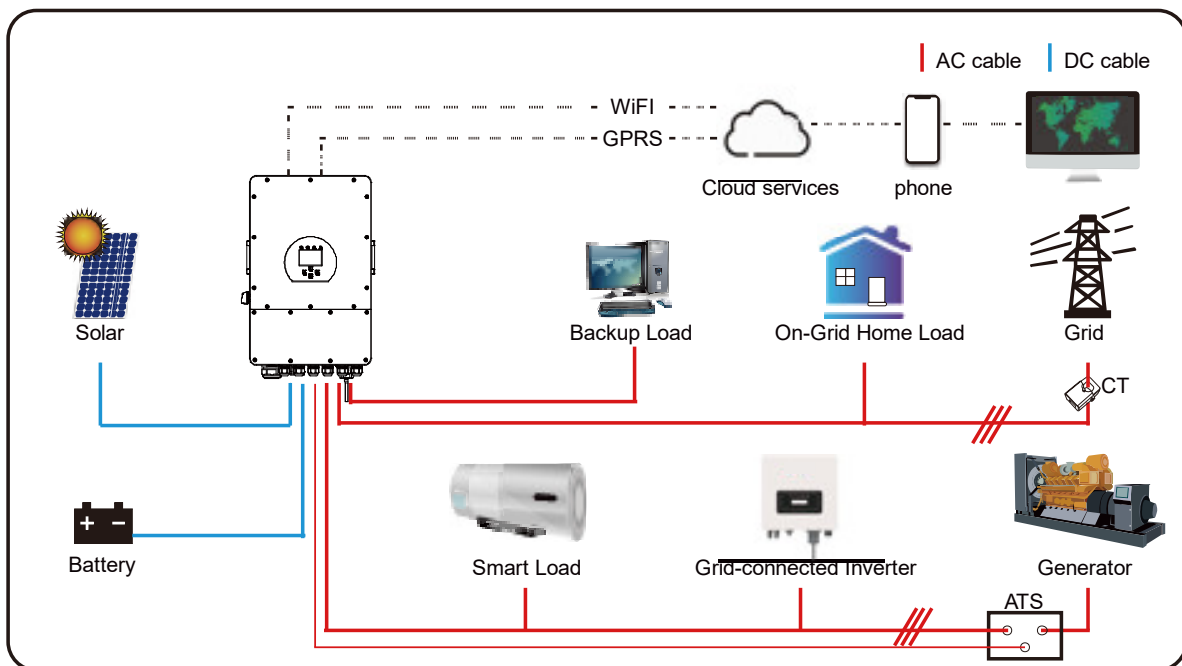
SECURE

- Overload/over-temperature/short-circuit protection;
- Smart battery charger design for optimised battery protection;
- Limiting function installed to prevent excess power overflow to grid;
- Isolation transformer design;

APPLICATIONS

- Marine (vessel power management);
- Power shedding (home/office/factory);
- UPS (fuel-saving systems);
- Remote locations with solar and wind generators;
- Building sites;
- Telecommunication;

The following diagram explains the basic application and architecture of this 3-Phase Inverter. The system is composed of solar panels, batteries, a generator or utility grid, normal loads, smart loads and monitoring systems.

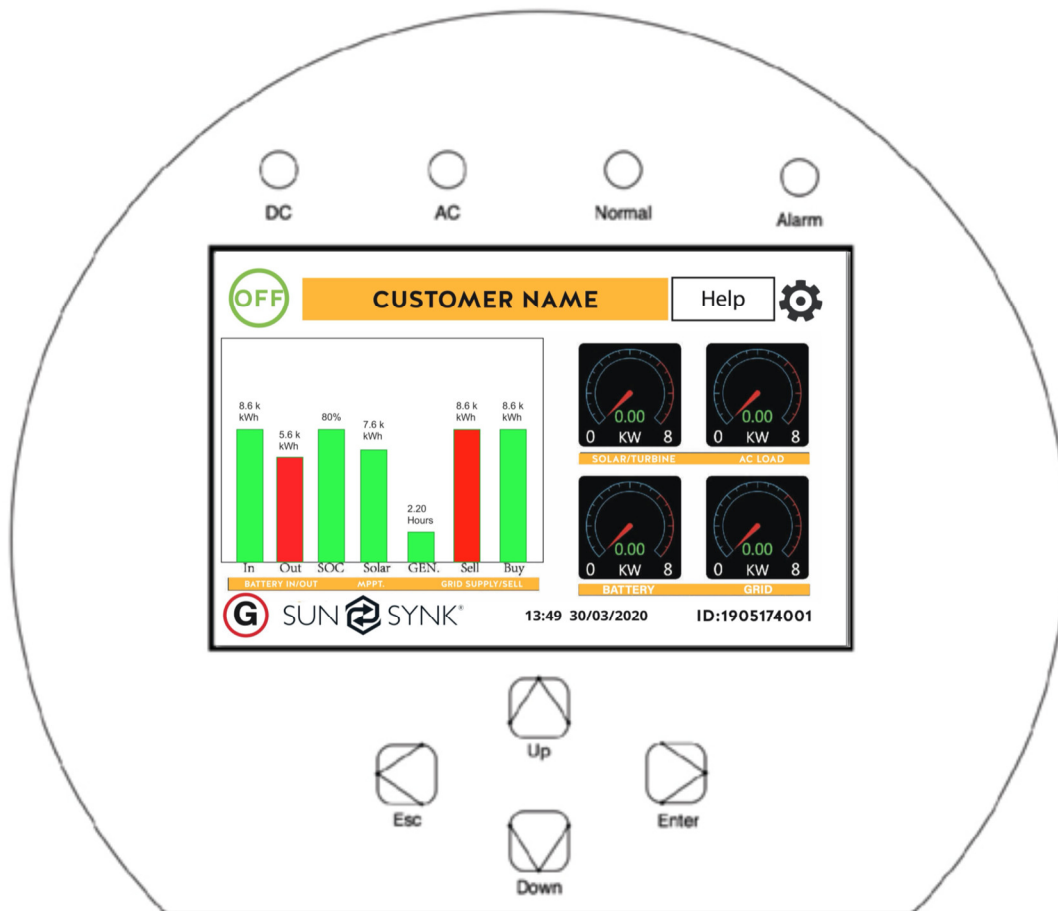


2. TECHNICAL SPECIFICATIONS

Model	SUN-20K-SG01HP3-EU	SUN-25K-SG01HP3-EU	SUN-30K-SG01HP3-EU	SUN-40K-SG01HP3-EU	SUN-50K-SG01HP3-EU
Battery Input Data					
Battery Type	Lead-acid or Lithium-ion				
Battery Voltage Range	200~600V				
Max. Charging Current	37A	37A+37A			
Max. Discharging Current	37A	37A+37A			
Charging Curve	3 Stages/Equalization				
Charging Strategy for Li-Ion Battery	Self-adaption to BMS				
PV String Input Data					
Max. DC Input Power	26000W	32500W	39000W	52000W	65000W
PV Input Voltage	1000V				
Start-up Voltage	160V				
MPPT Range	200~850V				
Full Load DC Voltage Range	360~850V	365~850V	435~850V	450~850V	
Rated DC Input Voltage	500V	625V	500V	500V	625V
PV Input Current	36A+36A		36A+36A+36A	36A+36A+36A+36A	
Max. PV I _{sc}	50A+50A		50A+50A+50A	50A+50A+50A+50A	
No. of MPPT Trackers	2		3	4	
No. of Strings Per MPPT Tracker	2+2		2+2+2	2+2+2+2	
AC Output Data					
Rated AC Output and UPS Power	20000W	25000W	30000W	40000W	50000W
Max. AC Power	22000W	27500W	33000W	44000W	55000W
AC Output Rated Current	30.3A	38A	45.6A	60.8A	75.8A
Max AC Output Current	45.4A	41.8A	50.1A	66.9A	83.3A
Max Continuous AC Passthrough	100A				
Power Factor	0.8 leading to 0.8 lagging				
Output Frequency and Voltage	50-60Hz; 3L/N/PE 220/380Vac; 230/400Vac				
Grid Type	Three Phase				
DC Injection Current (mA)	<0.5%1n				
Efficiency					
Max. Efficiency	97.6%				
MPPT Efficiency	97.0%				
Euro Efficiency	99.9%				
Protection					
PV Input Lightning Protection	Integrated				
Anti-islanding Protection	Integrated				

PV String Input Reverse Polarity Protection	Integrated
Insulation Resistor Detection	Integrated
Residual Current Monitoring Unit	Integrated
Output Over Current Protection	Integrated
Output Shorted Protection	Integrated
Output Over Voltage Protection	Integrated
Surge Protection	DC Type II / AC Type II
Certifications and Standards	
Grid Regulation	EN50549, AS4777.2, VDE0126, IEC61727, VDEN4105, G99, NBT32004, CEI0-21, NRS097, NBR16149/16150, RD1699
Safety EMC / Standard	IEC62109-1/-2, EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4
General Data	
Operating Temperature Range	-25~60°C, >45°C Derating
Cooling	Smart Cooling
Noise	<45dB
Communication with BMS	RS485; CAN
Weight	44.5kg
Size	647.5W × 537H × 303.5D
Protection Degree	IP65
Installation Type	Wall-Mounted
Warranty	5 years

3. DISPLAY

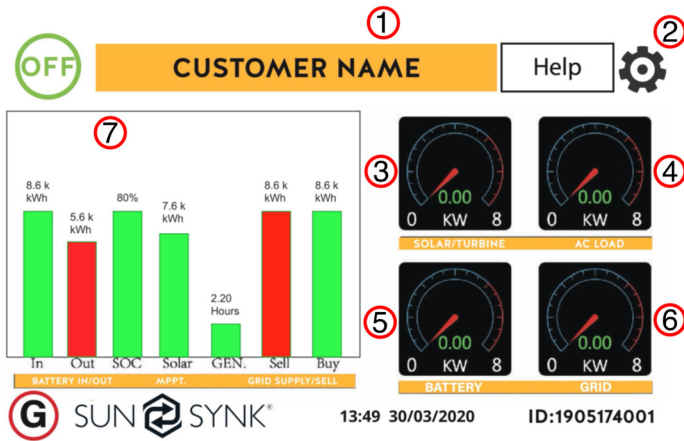


LED indicator		Meaning
DC	Green LED solid light	PV connection normal
AC	Green LED solid light	Grid connection normal
Normal	Green LED solid light	Inverter functioning normally
Alarm	Red LED solid light	Fault

Function Key	Description
Esc	To exit the previous mode
Up	Increase the value of a setting
Down	Decrease the value of a setting
Enter	Confirm setting change (If not pressed each time the setting will not be saved)

3.1. Home Page

Press the Esc button in any page to access the Home Page:



1. Customer name
2. Access settings menu page
3. Access solar history
4. Access system status page
5. Access system status page
6. Access grid history
7. Access system flow page

What this page displays:

- Total daily power into the battery (kWh).
- Total daily power out of the battery (kWh).
- SOC (State of charge of the battery) (%).
- Total daily solar power produced in (kWh).
- Total hourly usage of the generator (Time).
- Total daily power sold to the grid (kWh).
- Total daily power bought from the grid (kWh).
- Real-time solar power in (kW).
- Real-time load power in (kW).
- Real-time battery charge power in (kW).
- Real-time grid power in (kW).
- Serial number.
- Time date.
- Fault condition.
- Access stats pages.
- Access status page.
- Access fault diagnostic page.

3.2. Status Page

To access the Status page, click on the BATTERY or AC LOAD dial on the Home page.

What this page displays:

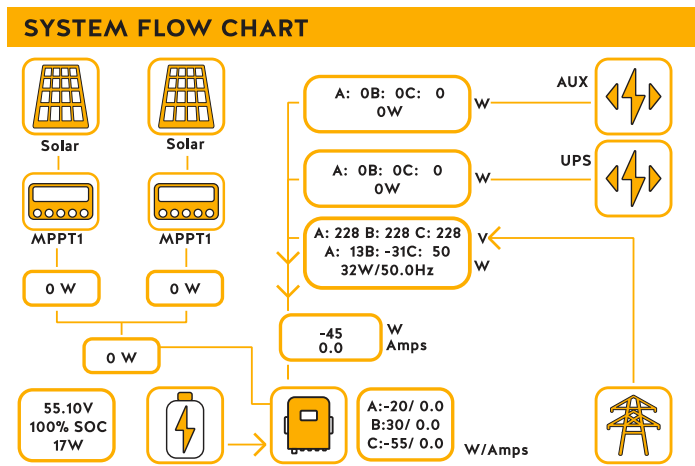
- Total solar power produced.
- MPPT 1 power/voltage/current.
- MPPT 2 power/voltage/current.
- Grid power.
- Grid frequency.
- Grid voltage.
- Grid current.
- Inverter power.
- Inverter frequency.
- Inverter voltage.

	0 W	0 W 0.0HZ	333W 50.0HZ
	220V 110W 220V 112W 221V 104W	33V 0.0A 31V 0.0A 29V 0.2A HM: 0W LD: 0W 0W 0W 0W 0W	219V 0.9A 220V 0.9A 220V 0.9A INV_P: 110W DC_T: 112W AC_T: 111W 44.4C
	Load		
	SOC: 67% 382W	Grid Power	Inverter Power
	BAT_V:51.72 V BAT_I: 7.40 A BAT_T:-100.0C	DC_P21: 0W DC_V1: 0V DC_I1: 0.0A	DC_P2: 0W DC_V2: 0V DC_I2: 0.0A
	Battery	Solar Power 1	Solar Power 2

- Inverter current.
- Load power.
- Load voltage.
- Battery power charge/discharge.
- Battery SOC.
- Battery voltage.
- Battery current.
- Battery temperature.

3.3. System Flow Page


Access by clicking on the bar chart on the Home Page.



What this page displays:

- The system flow.
- MPPTs power.
- Battery status.
- Power distribution to load or grid.

3.4. Setup Page

To access the Settings, click on the gear icon  on the right top of the navigation menu.

The 'SETTINGS' page header includes the 'SUN SYNK' logo, the time '13:49', and the date '30/03/2020'. Below the header is a grid of eight settings categories, each with an icon and a label:

- BASIC (gear icon)
- BATTERY (battery icon)
- GRID (power line tower icon)
- SYSTEM MODE (monitor icon)
- ADVANCE (three gears icon)
- AUX LOAD (lightning bolt icon)
- FAULT CODES (warning triangle icon)
- LI BMS (Li battery icon)

 At the bottom of the page, a status bar displays: ID: 1906264059, SD, - COMM:e295, and -MCU: Ver1400.

What this page displays:

- Serial number.
- Software version.
- Time, Date, and MCU.

What you can do from this page:

- Access the Basic Setup Page (press the BASIC icon).
- Access the Battery Setup Page (press the BATTERY icon).
- Access the Grid Setup Page (press the GRID icon).
- Access the real-time programmable timer/system mode (press the SYSTEM MODE icon).
- Access the advanced settings such as Wind Turbine (press the ADVANCE icon).
- Access the auxiliary load/smart load settings (press the AUX LOAD icon)
- Access the fault code register (press the FAULT CODES icon).
- Set up Li BMS (press the LI BMS icon).

3.5. Set Time (Clock)

To set time, click on the BASIC icon and then on 'Time'.

The screenshot shows the 'Basic Setup' page with a yellow header and a blue navigation bar containing 'Time', 'Display', and 'Reset'. A 'Help' button is in the top right. The 'Time' section is active. It features a 'Sync' checkbox, an 'AM/PM' checkbox, and input fields for Year (2018), Month (10), Day (24), Hour (01), Minute (53), and Second (17). 'Cancel' and 'OK' buttons are at the bottom.

What this page displays:

- Time.
- Date.
- AM/PM.

What you can do from this page:

- Adjust / set time.
- Adjust / set date.
- Adjust / set AM/PM.

3.6. Set Company Name / Beeper / Auto dim

To set company name click on the BASIC icon and then on 'Display'.

The screenshot shows the 'Basic Setup' page with 'Display' selected in the navigation bar. The 'Set Company name' section has a text input field containing 'M Y C O M P A N Y'. Below it is a keyboard layout with letters A-Z and numbers 0-9. 'Cancel' and 'OK' buttons are on the right. At the bottom, there are checkboxes for 'Beeper On / Off' and 'Auto Dim Sec'.

What this page displays:

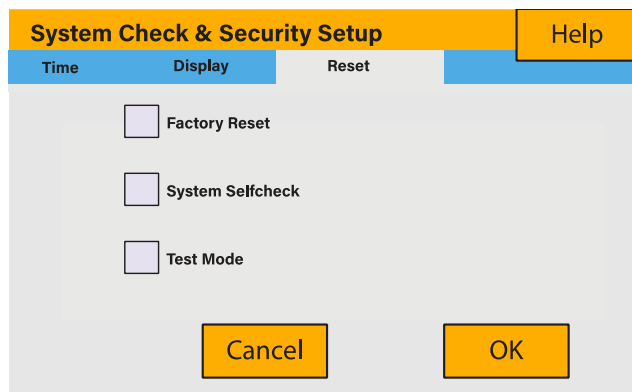
- Beeper status (ON/OFF).
- Installers names.

What you can do from this page:

- Set up your company name.
- Switch the beeper ON or OFF.
- Set the LCD backlight to auto dim.

3.7. Factory Reset and Lock Code

To set time, click on the BASIC icon and then on 'Reset'.



What this page displays:

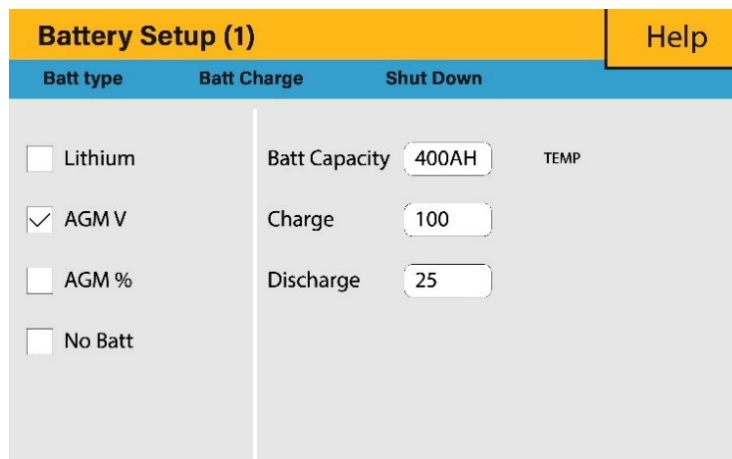
- Reset status.
- Whether the 'lock code' is used or not.

What you can do from this page:

- Reset the inverter to the factory settings.
- System diagnostics.
- Change or set the 'lock code'.

3.8. Battery Setup Page

To configure battery settings, click on the BATTERY icon and then on 'Batt type'.



What this page displays:

- Battery capacity in (Ah) – For non-BMS-batteries the range allowed is 0-2000Ah, while for lithium-ion the inverter will use the capacity value of the BMS.
- Max battery charge current (Amps).
- Max battery discharge current (Amps), which should be 20% of the Ah rating for AGM only. For Lithium, please refer to the battery manufacturer documentation. **Note:** This is a global max. discharge current for both 'grid-tied' and 'backup' modes of operation and if the current exceeds this value inverter will shut down with an overload fault.
- TEMPCO settings - Temperature coefficient is the error introduced by a change in temperature.

What you can do from this page:

- Use battery voltage for all settings (V).

- Use battery SOC for all settings (%).
- No battery: tick this box if no battery is connected to the system.
- BMS setting.
- Active battery - This feature will help recover a battery that is 100% discharged by slowly charging from the solar array. Until the battery reaches a point where it can charge normally.

3.9. Battery Discharge Page

To configure inverter's shutdown settings, click on the BATTERY icon and then on 'Shut Down'.

What this page displays:

- Inverter shutdown voltage set as either a voltage or %.
- Inverter low battery warning set as either a voltage or %.
- Restart voltage set as either a voltage or %.

What you can do from this page:

- Adjust battery shut down (voltage or %)
- Adjust low battery warning (voltage or %)
- Adjust restart (voltage or %)

3.10. Setting Up a Lithium Battery

To set up a lithium-ion battery, click on the BATTERY icon and visit the 'Batt Type' column.

What this page displays:

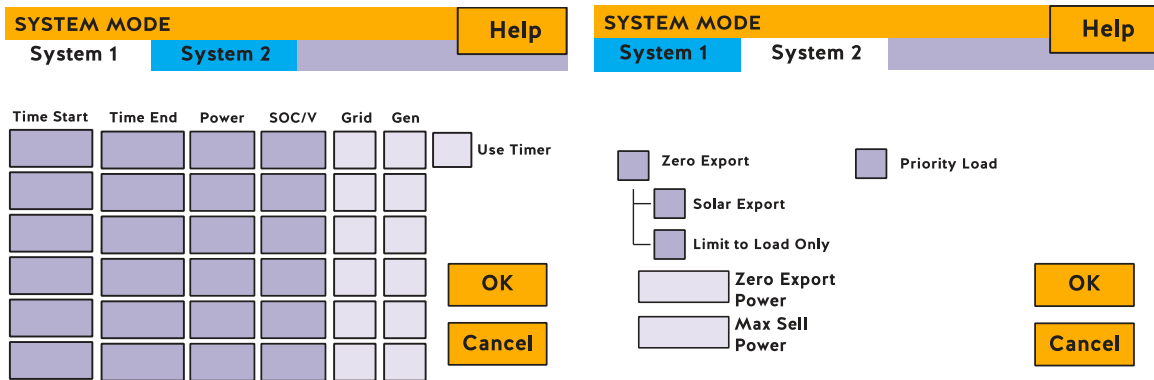
- This information will only display if the 'Lithium' option is selected under 'Batt Type'.
- The type of communication protocol.
- Approved batteries.

What you can do from this page:

- Set up your lithium battery.

3.11. Program Charge / Discharge Times

To set 'Charge' and 'Discharge' times, click on the 'System Mode' icon after clicking on the gear icon.



What this page displays:

- A setting to prevent the inverter exporting power to the grid - 'Zero Export'.
- The ability to limit power supply to only the household loads - 'Solar Export'.
- Set the power limits to supply only the loads connected to the LOAD port - 'Priority to Load Only'.

What you can do from this page:

- Set a real time to charge or discharge the battery.
- Choose to charge the battery from the grid or generator.
- Limit export power to the grid.
- Set the unit to **charge** the battery from the grid or generator ticking 'Grid' or 'Gen' and set what times this needs to occur.
- Set the time to **discharge** the unit to the load or export to the grid by unticking 'Grid' and 'Gen'.

3.12. Grid Supply Voltage and Frequency – Grid Supply Page

On the Settings Menu, click on the GRID icon.

What this page displays:

- Grid frequency setting
- Grid type (normally 230V three-phase)

What you can do from this page:

- Change grid's frequency setting (normally 50 Hz)
- Set the Maximum Grid Input Voltage ('Grid Vol High')

- Set the Minimum Grid Input Voltage ('Grid Low')
- Set the Maximum Grid Frequency ('Grid Hz High')
- Set the Minimum Grid Frequency ('Grid Hz Low')
- ✓ Select the correct Grid Type in your local area, otherwise the machine will not work or be damaged.
- ✓ Select the correct Grid Frequency in your local area.

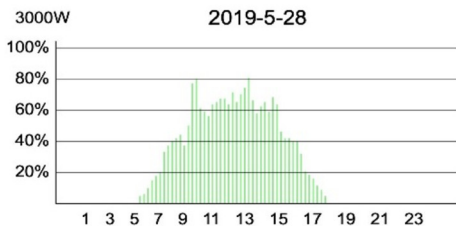
Vol

3.13. Advanced Settings for Paralleling Inverters (UNDER DEVELOPMENT)

3.14. Solar Power Generated

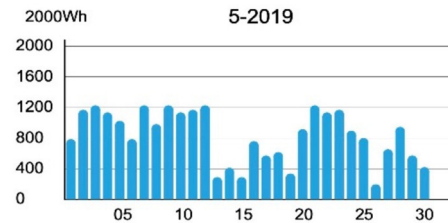
This page shows the daily, monthly, yearly, and total solar power produced. Access this page by clicking on the 'Solar/Turbine' icon on the Home Page.

Return	Day	Month	Year	Total
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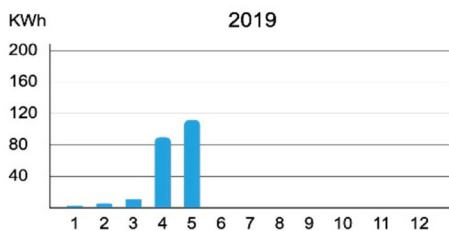
Solar Total Today=0.0KWH Total - 0.0KWH

Return	Day	Month	Year	Total
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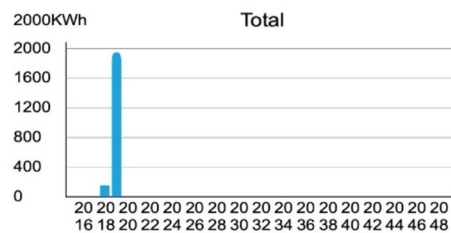
Solar Total Month=0.0KWH Total - 0.0KWH

Return	Day	Month	Year	Total
--------	-----	-------	------	-------



Solar Total Year=0.0KWH Total - 0.0KWH

Return	Day	Month	Year	Total
--------	-----	-------	------	-------

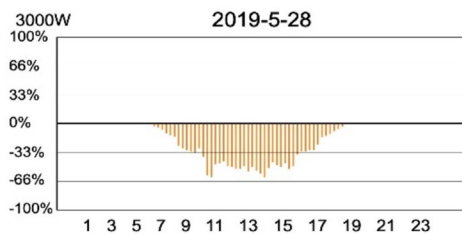


Solar / Turbine Power Total :- 135.20 kWh

3.15. Grid Power

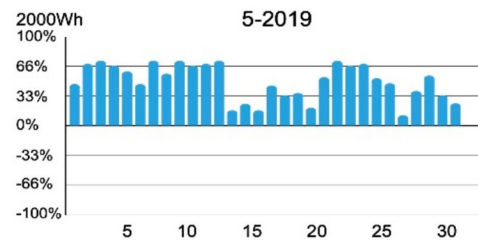
This page shows the Daily / Monthly / Yearly and total grid power export or consumed. Access this page by clicking on the 'Solar/Turbine' icon on the home page.

Return	Day	Month	Year	Total
--------	-----	-------	------	-------

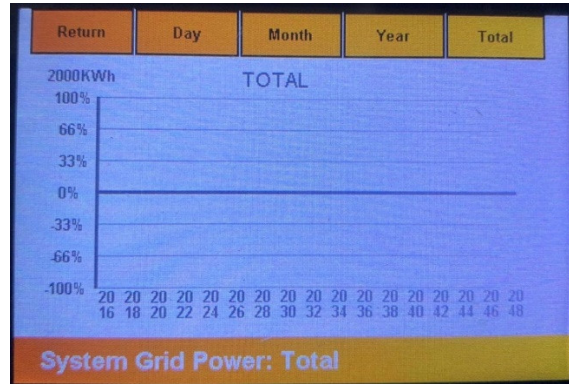
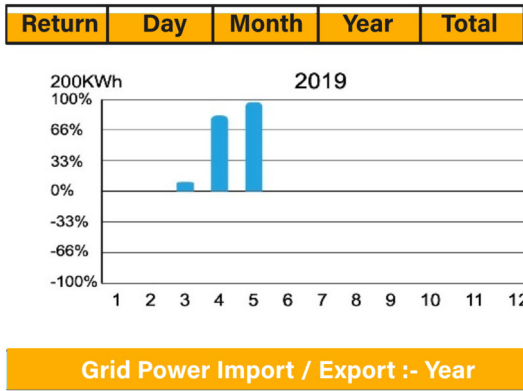


Grid Power Import / Export :- Day

Return	Day	Month	Year	Total
--------	-----	-------	------	-------



Grid Power Import / Export :- Month



3.16. Advanced Settings for Wind Turbine

To configure wind turbine settings, click on the ADVANCE icon.

What this page displays:

- If one or both of the MPPTs are connected to a wind turbine.

What you can do from this page:

- Select the MPPT to be used as a turbine input.

Advance (2)
Help

Wind Turbine
Multi-inverter

DC1 for WindTurbine

DC2 for WindTurbine

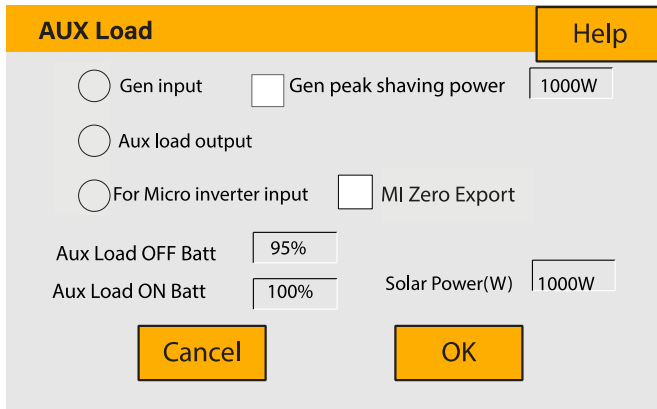
V1	0V	0.0A	V7	0V	0.0A
V2	0V	0.0A	V8	0V	0.0A
V3	0V	0.0A	V9	0V	0.0A
V4	0V	0.0A	V10	0V	0.0A
V5	0V	0.0A	V11	0V	0.0A
V6	0V	0.0A	V12	0V	0.0A

OK

Cancel

3.17. Advanced Settings for Auxiliary Load

To configure Auxiliary Load (previously known as “smart load”) settings, click on the AUX LOAD icon.



What this page displays:

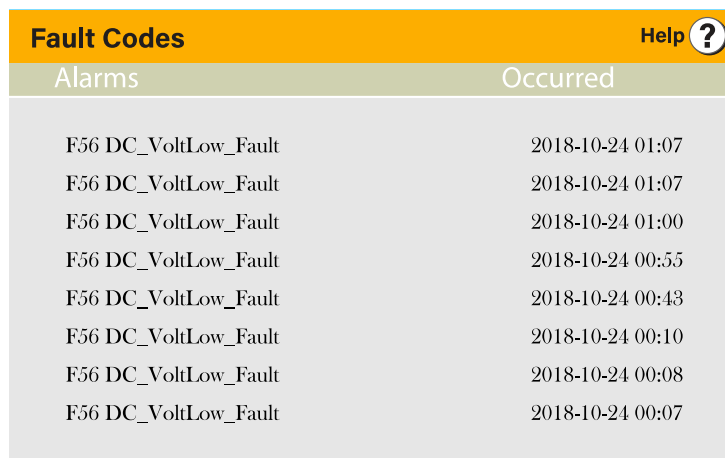
- Use of the Gen (Aux) input or output.

What you can do from this page:

- Set up a generator input.
- Set up an auxiliary (smart) load.
- Set up Peak Power Shaving.
- Use an additional inverter or micro inverter.

3.18. Fault Codes

To check the fault codes click on the FAULT CODES icon on the settings menu.



Alarms	Occurred
F56 DC_VoltLow_Fault	2018-10-24 01:07
F56 DC_VoltLow_Fault	2018-10-24 01:07
F56 DC_VoltLow_Fault	2018-10-24 01:00
F56 DC_VoltLow_Fault	2018-10-24 00:55
F56 DC_VoltLow_Fault	2018-10-24 00:43
F56 DC_VoltLow_Fault	2018-10-24 00:10
F56 DC_VoltLow_Fault	2018-10-24 00:08
F56 DC_VoltLow_Fault	2018-10-24 00:07

For more information, training videos, software upgrades, help line, forum please refer to <http://www.sunsynk.com> - Tech Support (Do not forget to register first on the website).



Sunsynk



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