SUN SYNK

THREE-PHASE HYBRID INVERTER

DATASHEET

SUN-8K-SG04LP3 / SUN-10K-SG04LP3 / SUN-12K-SG04LP3

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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;
- Built-in 2 strings for 1 MPP tracker and 1 string for 1 MPP tracker;
- Smart settable 3-stage MPPT charging for optimised battery performance;
- Auxiliary load function;
- Parallel (coming soon) / multi-inverter function: grid-tied and off-grid;

COMPATIBLE

- Compatible with mains electrical grid voltages or power generators;
- Compatible with wind turbines;
- 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 190A (8kW), 210A (10kW), and 240A (12kW);
- 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;

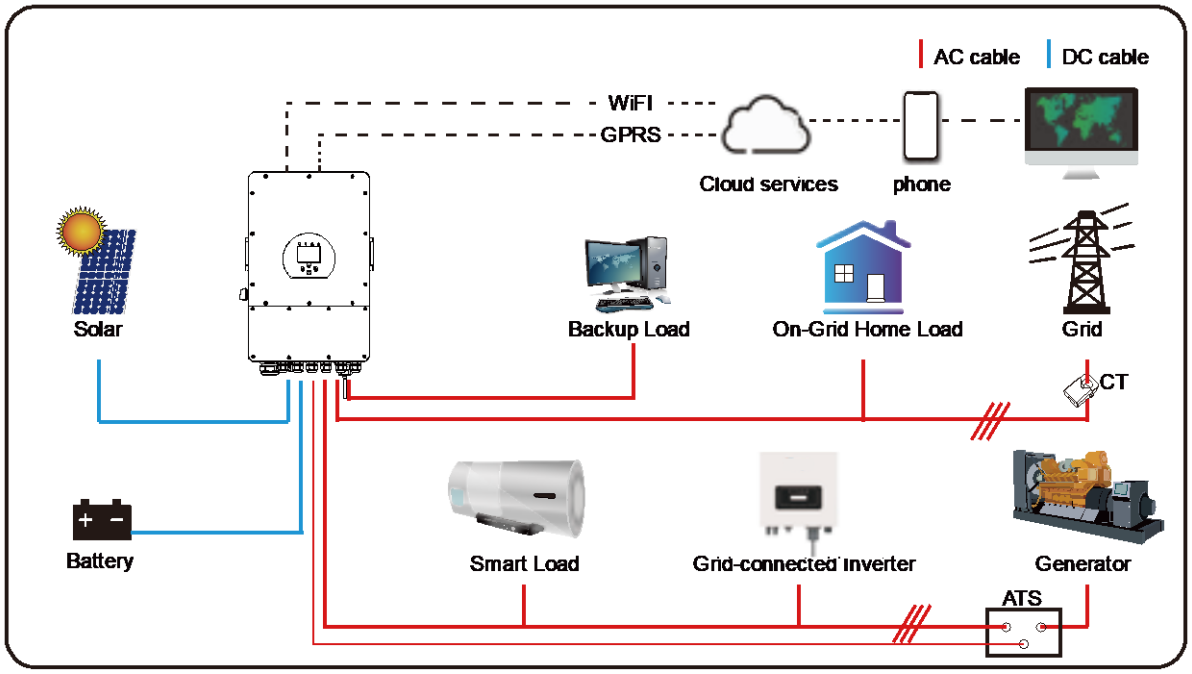
SECURE

- 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.

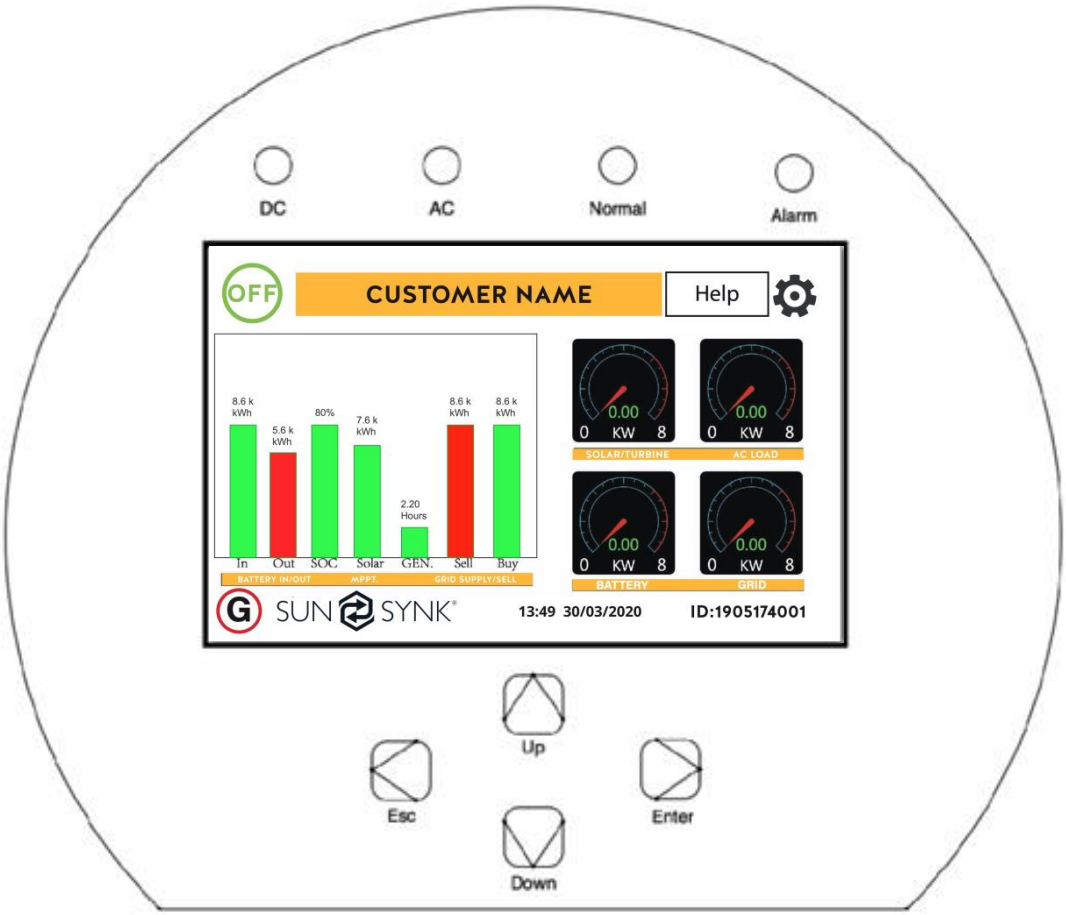


2. TECHNICAL SPECIFICATIONS

Model	SUN-8K-SG01LP3	SUN-10K-SG01LP3	SUN-12K-SG01LP3
Battery Input Data			
Battery Type	Lead-acid or Lithium-ion		
Battery Voltage Range	40~60V		
Max. Charging Current	190A	210A	240A
Max. Discharging Current	190A	210A	240A
Charging Curve	3 Stages/Equalization		
External Temperature Sensor	Optional		
Charging Strategy for Li-Ion Battery	Self-adaption to BMS		
PV String Input Data			
Max. DC Input Power	9880W	13000W	15000W
PV Input Voltage	450V (140V~1000V)		
MPPT Range	140V~800V		
Start-up Voltage	160V		
PV Input Current	12.5A+12.5A	25A+12.5A	25A+12.5A
No. of MPPT Trackers	2		
No. of Strings Per MPPT Tracker	1+1	2+1	2+1
AC Output Data			
Rated AC Output and UPS Power	8000W	10000W	12000W
Max. AC Power	8800W	11000W	13200W
Peak Power (off-grid)	2 times of rated power, 10 S		
AC Output Rated Current	11.6A	14.5A	17.4A
Max AC Output Current	12.8A	16A	19.1A
Max Continuous AC Passthrough	60A	60A	60A
Output Frequency and Voltage	50-60Hz; 230/400Vac (Three Phase)		
Grid Type	Three Phase		
Current Harmonic Distortion	THD<3% (Linear load<1.5%)		
Efficiency			
Max. Efficiency	97.6%		
MPPT Efficiency	97.0%		
Euro Efficiency	99.9%		
Protection			
PV Arc Fault Detection	Integrated (Except European Type)		
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	UL1741, IEEE1547, RULE21, VDE0126, AS4777, NRS2017, G98,G99, IEC61683, IEC62116, IEC61727		
Safety Regulation	IEC2109-1, IEC62109-2		

EMC	EN61000-6-1, EN61000-6-3, FCC 15 Class B
General Data	
Operating Temperature Range	-25~60°C, >45°C Derating
Cooling	Fan
Noise	<30dB
Communication with BMS	RS485; CAN
Weight	45kg
Size (Length x Width x Height)	673 x 462 x 265mm
Protection Degree	IP65
Installation Style	Wall-mounted
Warranty	5 years

3. DISPLAY

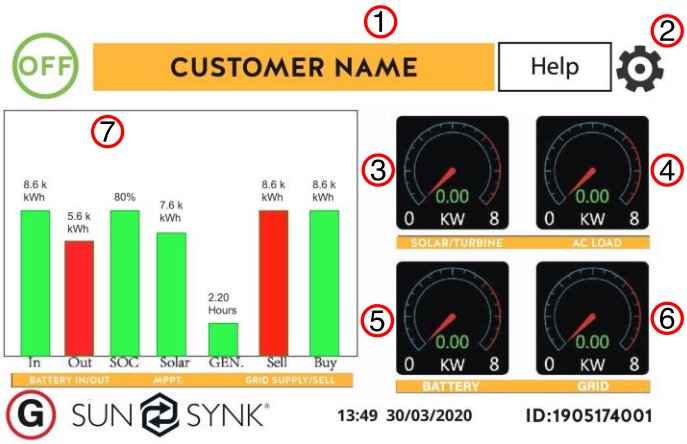


LED indicator		Meaning
DC	Green LED solid light	PV connection normal
AC	Green LED solid light	Grid connection normal
Normal	Green LED solid light	Inverter functioning normally
Alarm	Red LED solid light	Fault

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:

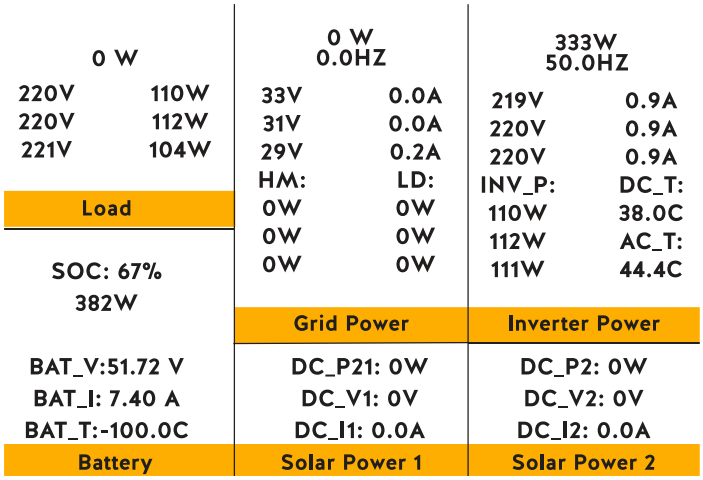
- Total daily power into the battery (kWh).
- Total daily power out of the battery (kWh).
- SOC (State of charge of the battery) (%).
- Total daily solar power produced in (kWh).
- Total hourly usage of the generator (Time).
- Total daily power sold to the grid (kWh).
- Total daily power bought from 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:

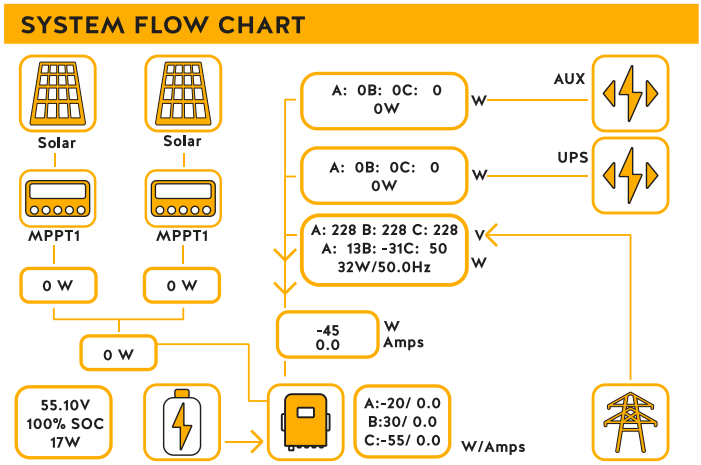
- Total solar power produced.
- MPPT 1 power/voltage/current.
- MPPT 2 power/voltage/current.
- Grid power.
- Grid frequency.
- Grid voltage.
- Grid current.
- Inverter power.
- Inverter frequency.
- Inverter voltage.



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

3.3. System Flow Page

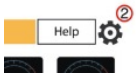
Access by clicking on the bar chart on the Home Page.



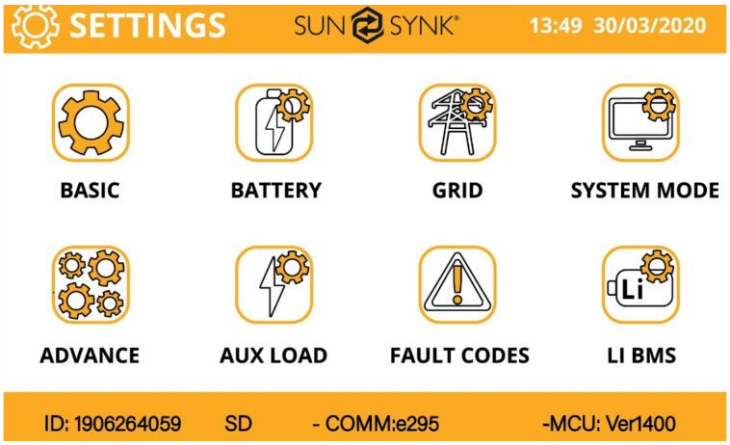
What this page displays:

- 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.



What this page displays:

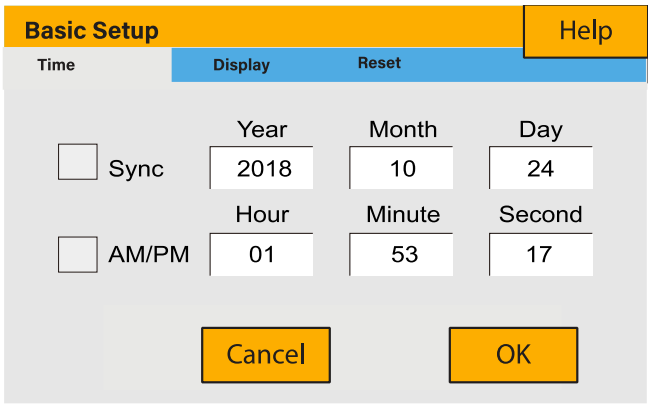
- Serial number.
- Software version.
- Time, Date, and MCU.

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’.



What this page displays:

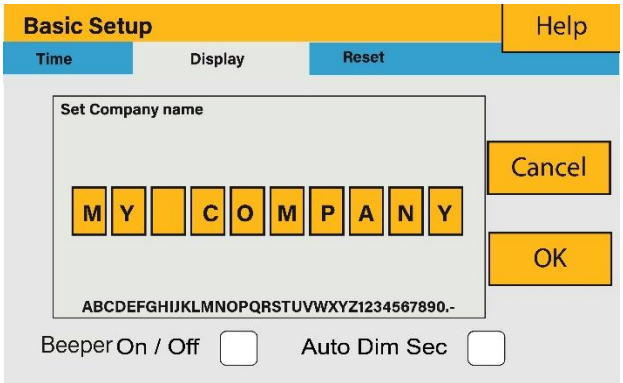
- Time.
- Date.
- AM/PM.

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’.



What this page displays:

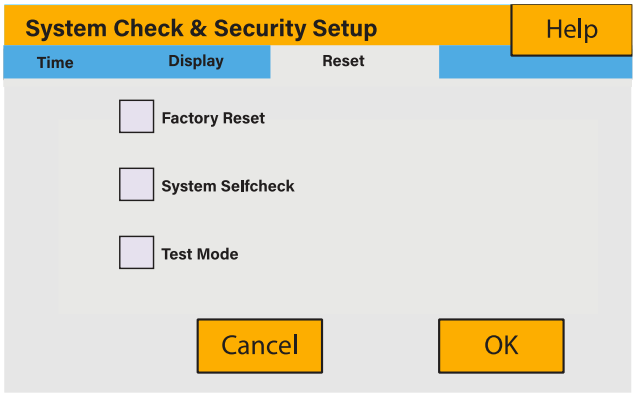
- Beeper status (ON/OFF).
- Installers names.

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:

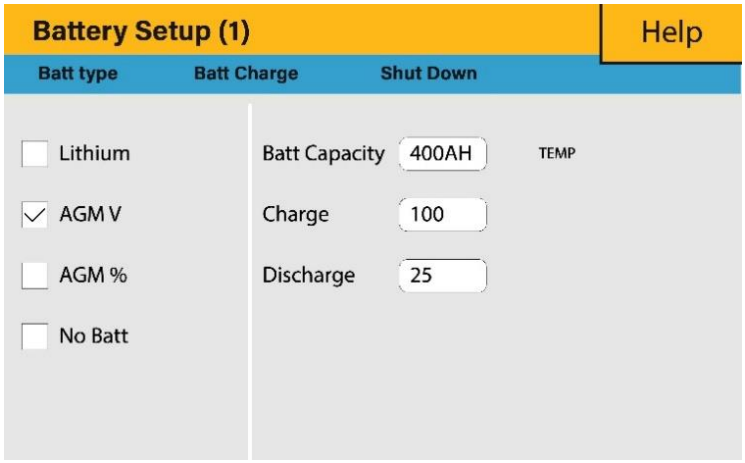
- Reset status.
- Whether the ‘lock code’ is used or not.

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 user 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.

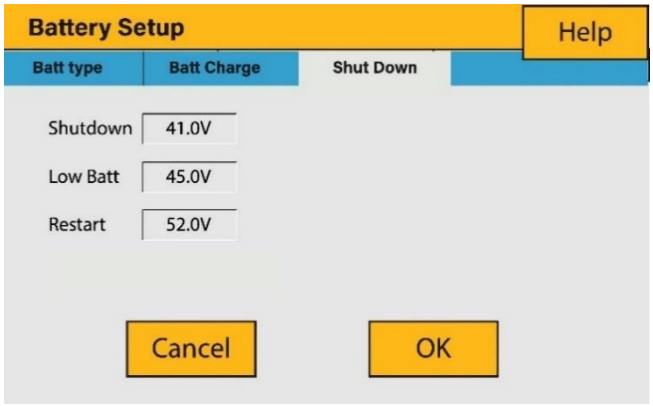
What you can do from this page:

- 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 changing from the solar array. Until the battery reaches a point where it can change 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:

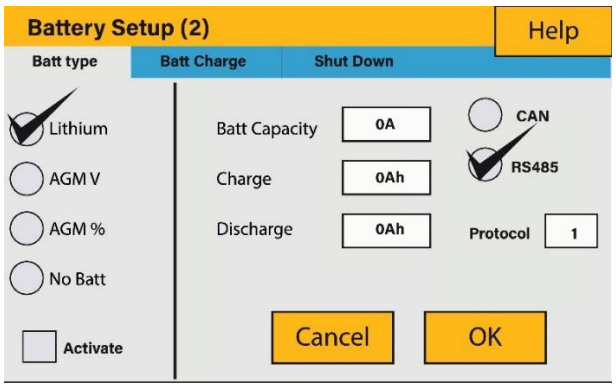
- Inverter shutdown voltage set as either a voltage or %.
- Inverter low battery warning set as either a voltage or %.
- Restart voltage set as eithera voltage or %.

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:

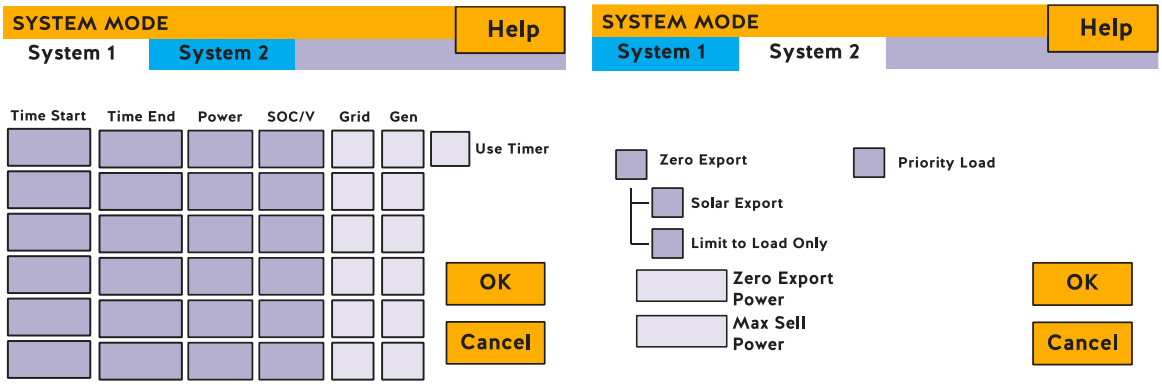
- This information will only display if the 'Lithium' option is selected under 'Batt Type'.
- The type of communion protocol.
- Approved batteries.

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:

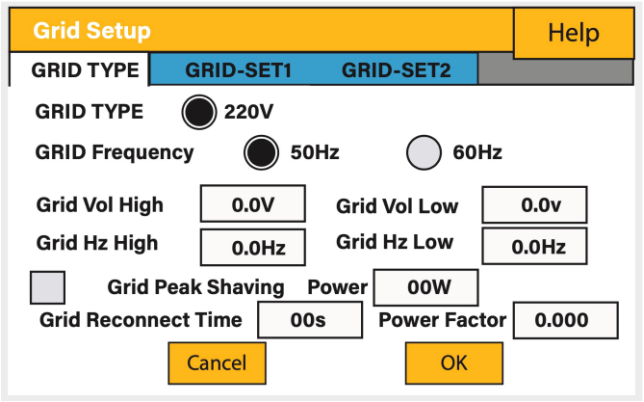
- A setting to prevent the inverter exporting power to the grid - ‘Zero Export’.
- The ability to limit power supply to only the household loads - ‘Solar Export’.
- Set the power limits to supply only the loads connected to the LOAD port - ‘Priority to Load Only’.

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)

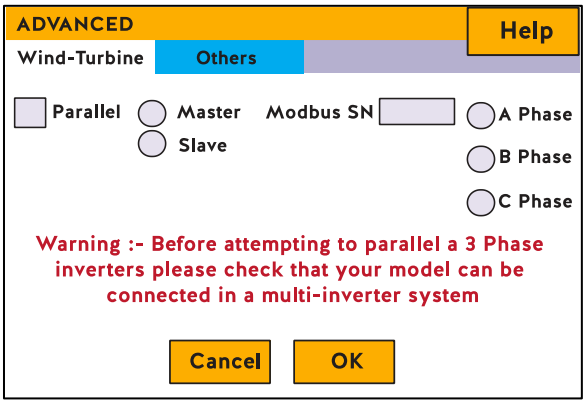
What you can do from this page:

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

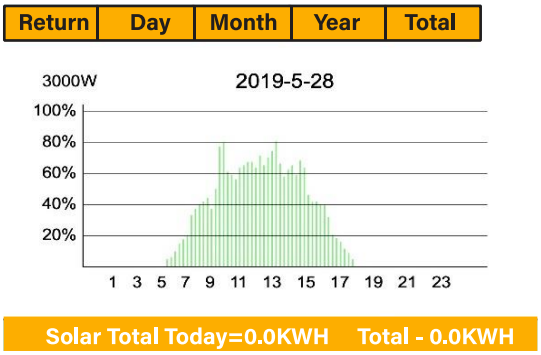
✓ Select the correct Grid Frequency in your local area.

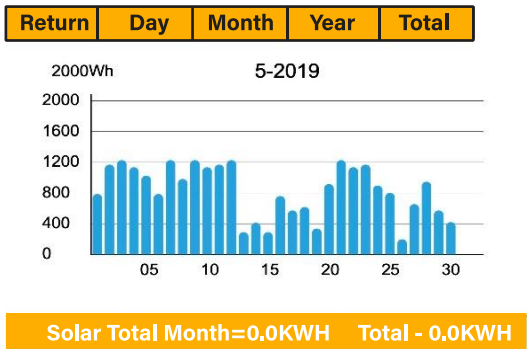
3.13. Advanced Settings for Paralleling Inverters (UNDER DEVELOPMENT)

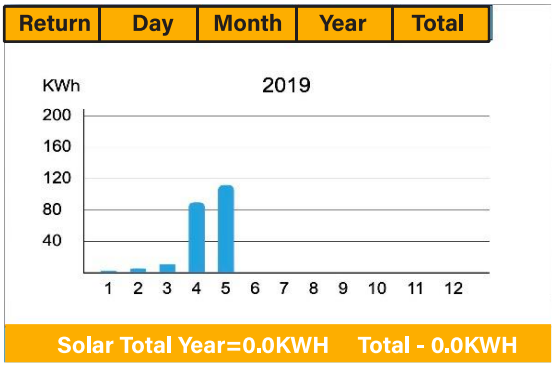


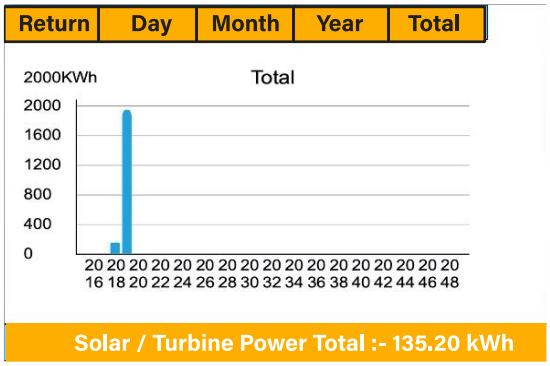
3.14. Solar Power Generated

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.



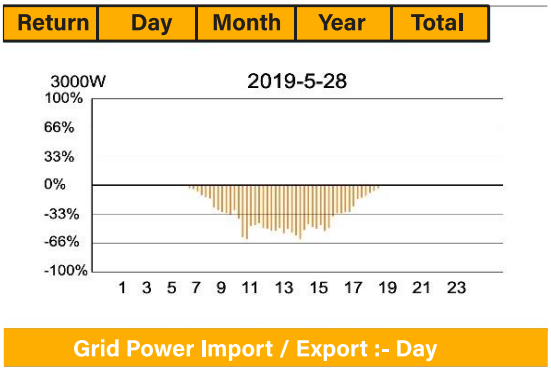


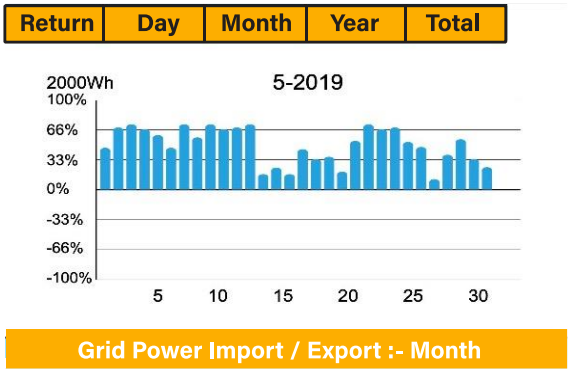


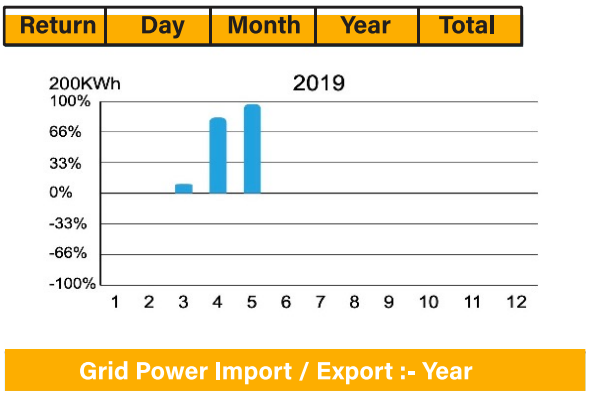


3.15. Grid Power

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.







3.16. Advanced Settings for Wind Turbine

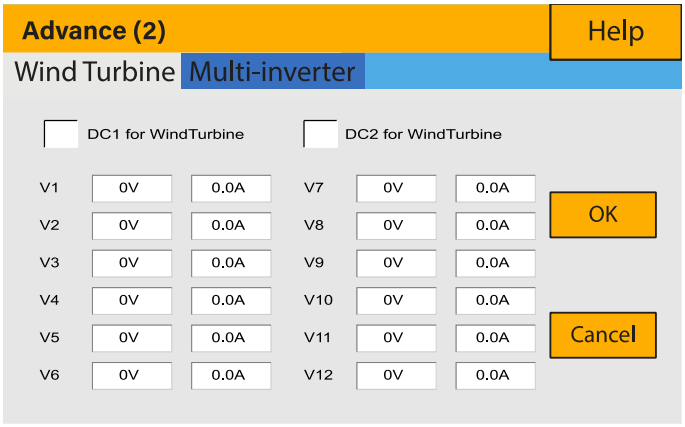
To configure wind turbine settings, click on the ADVANCE icon.

What this page displays:

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

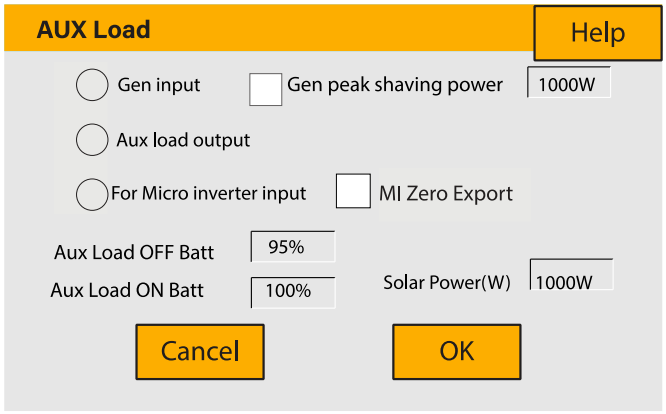
What you can do from this page:

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



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:

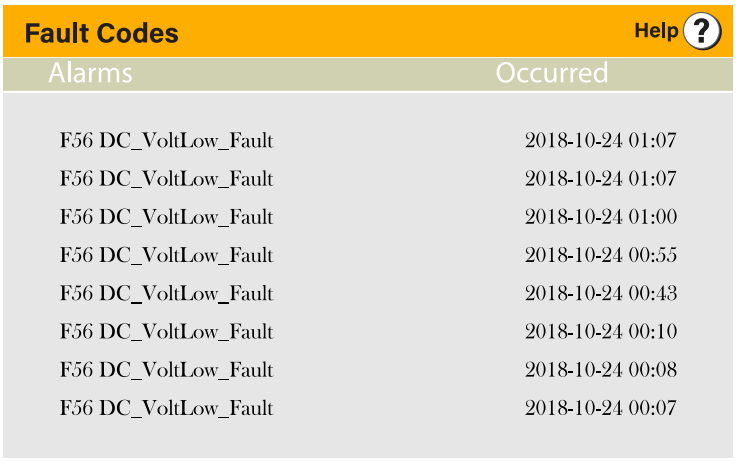
- Use of the Gen (Aux) input or output.

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 te fault codes click on the FAULT CODES icon on the settings menu.



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