

SUN SYNK

HYBRID PARITY (SUPER) INVERTER



DATASHEET

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All models fall into two cabinet / PCB types 3.6kW / 5.5kW (Small) and 8.8kW (Large):

5.5kW Type:

SUNSYNK-3.6K-SG01/03LP1

SUNSYNK-3.6K-SG02LP1

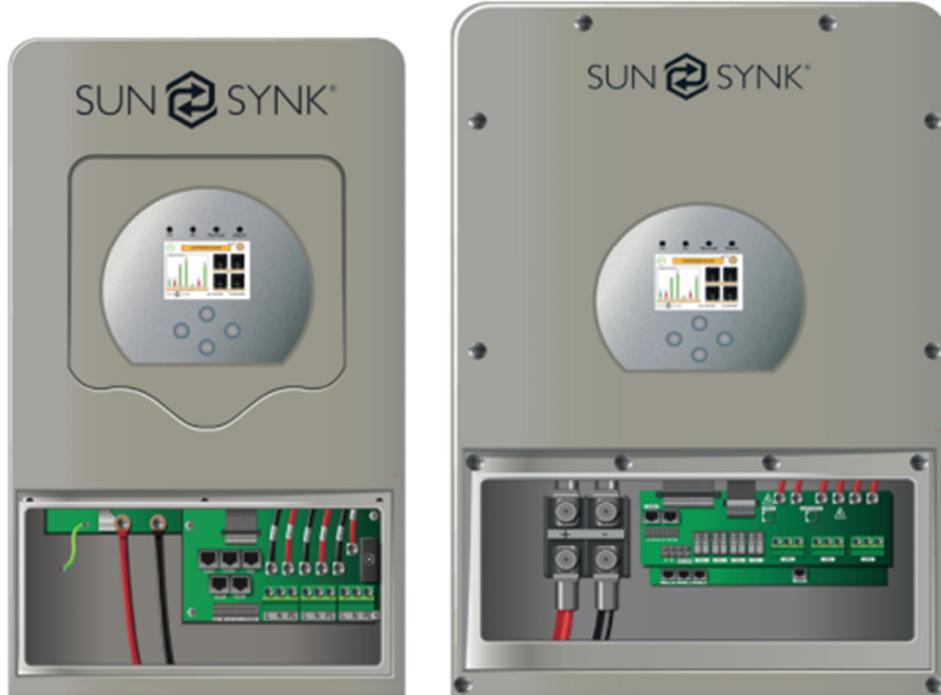
SUNSYNK-5K-SG01/03LP1

SUNSYNK-5K-SG02LP1

8.8kW Type

SUNSYNK-8K-SG01LP1

SUNSYNK-8K-SG02LP1



3.6kW / 5.5kW

8.8kW

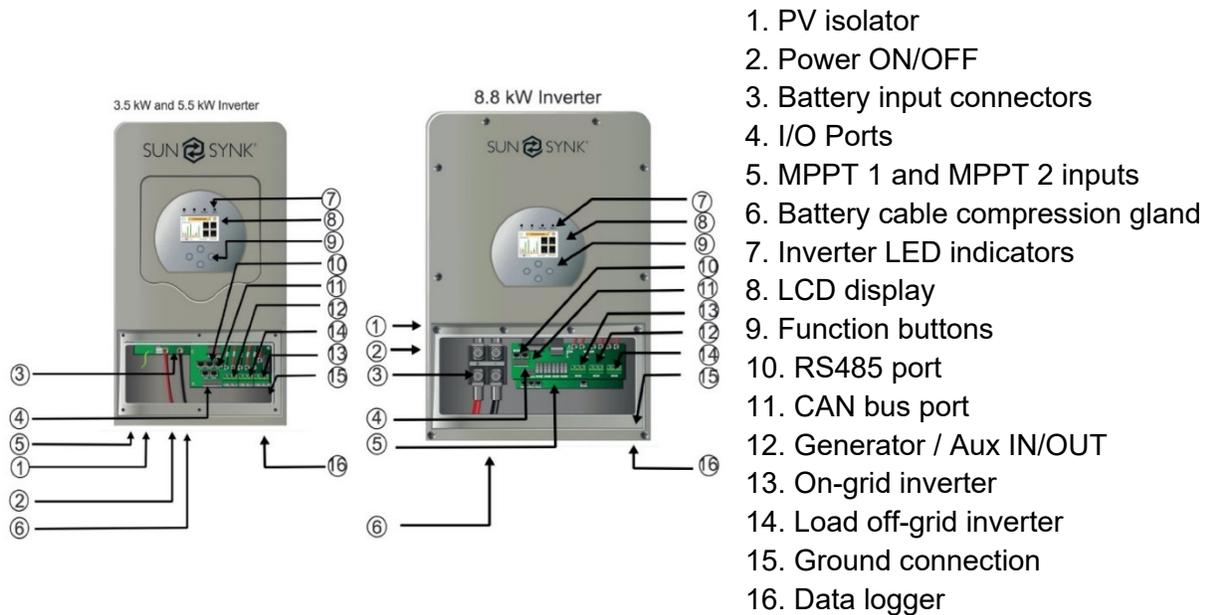
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1. PRODUCT INTRODUCTION

The Sunsynk Single-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.

1.1. System Overview



INTERACTIVE

- Easy and simple to understand display
- Supporting Wi-Fi or GSM monitoring
- Visual power flow screen
- Smart settable 3-stage MPPT charging for optimized battery performance
- Auxiliary load function
- Parallel / multi invert function grid-tied and off-grid

COMPATIBLE

- Compatible with main electrical grid voltages or power generators
- Compatible with wind turbines
- 220V single phase, pure sinewave inverter
- Self-consumption and feed-in to the grid
- Auto restart while AC is recovering
- Auto earth bond feature (Via a relay)

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

SECURE

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

APPLICATIONS

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

TECHNICAL SPECIFICATIONS

2. TECHNICAL SPECIFICATIONS

Model No.	SUNSYNK-3.6K-SG01LP1 / SUNSYNK-3.6K-SG01LP3
Product Type	Hybrid Inverter
Enclosure	IP65
Ambient Temperature	-45°C ~ 60°C (>45°C derating)
Protection Level	Class I
Charge Mode	
Battery Voltage	48Vd.c (40Vd.c ~ 60Vd.c)
Battery Current	90Ad.c (max.)
AC Input Voltage	L/N/PE 220/230Va.c
AC Input Frequency	50/60Hz
AC Input Rated Current	16.4Aa.c
Max. AC Input Current	18Aa.c (max.)
Max. AC Input Power	3960W
Max. Apparent Output Power	3960VA
PV Input Voltage	370Vd.c (125Vd.c ~ 500Vd.c)
MPPT Input Voltage	150Vd.c ~ 425Vd.c
PV Input Current	13Ad.c + 13Ad.c
Max. PV Input Power	4680W
Max. PV Isc	17Ad.c + 17Ad.c
Utility-Interactive	
AC Output Voltage	L/N/PE 220/230Va.c
AC Output Frequency	50/60Hz
AC Output Rated Current	16.4Aa.c
Max. AC Output Current	18Aa.c (max.)
Max. AC Output Power	3960W
AC Output Rated Power	3960VA
AC Output Power Factor	0.8 leading to 0.8 lagging
Max. AC Isc	60Aa.c
Battery Discharge Voltage	40Vd.c ~ 60Vd.c
Battery Discharge Current	90Ad.c (max.)
Battery Discharge Power	3600W
Stand Alone	
AC Output Voltage	L/N/PE 220/230Va.c
AC Output Frequency	50/60Hz
AC Output Rated Current	16.4Aa.c
AC Output Rated Power	3960W
Max. Continuous AC Passthrough Current	35Aa.c
Peak Output Power	7200W (10 seconds)
Battery Discharge Voltage	40Vd.c ~ 60Vd.c
Max. Discharge Current	90A (max.)
Compliance	VDE-AR-N 4105:1028-11; DINVDE V 0124-100:2020-06; IEC/EN62109-1/2:2010; IEC/EN62109-1/2:2011

Model	SUNSYNK-3.6K-SG02LP1
Battery Input Data	
Battery Type	Lead-acid or Lithium-ion
Battery Voltage Range (V)	40~60V
Max. Charging Current (A)	90A
Max. Discharging Current (A)	90A
Charging Curve	3 Stages/Equalisation
External Temperature Sensor	Optional
Charging Strategy for Li-Ion Battery	Self-Adaptation to BMS
PV String Input Data	
Max. DC Input Power (W)	7000W
Voc Max. (V)	500V
MPPT Range (V)	150~425V
Full Load DC Voltage Range (V)	300~425V
Start-up Voltage (V)	125V
PV Input Current (A)	13A+13A
No. of MPPT Trackers	2
No. of Strings Per MPPT Tracker	1+1
AC Output Data	
Rated AC Output and UPS Power (W)	3600W
Max. AC Power (W)	3960W
Peak Power (off-grid)	2 times of rated power, 10 S
AC Output Rated Current (A)	16.4A
Max AC Output Current (A)	18A
Max Continuous AC Passthrough (A)	35A
Power Factor	0.8 leading to 0.8 lagging
Output Frequency and Voltage	50/60Hz; 220/230/240Vac (single phase)
Grid Type	Single Phase
Current Harmonic Distortion	THD<3% (Linear load<1.5%)
Efficiency	
Max. Efficiency	97.60%
MPPT Efficiency	96.50%
Euro Efficiency	99.90%
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
Certifications and Standards	
Grid Regulation	VDE 0126, AS4777, NRS2017, G98, G99, IEC61683, IEC62116, IEC61727, RD1699:2011, XP C15-712-3:2019-05
Safety Regulation	IEC62109-1, IEC62109-2
EMC	EN61000-6-1, EN61000-6-3
General Data	
Operating Temperature Range (°C)	-25~60°C, >45°C Derating

Cooling	Natural Cooling
Noise (dB)	<30
RS485; CAN	RS485; CAN
30kg	30kg
233 x 445 x 708 mm	233 x 445 x 708 mm
IP65	IP65
5 years	5 years

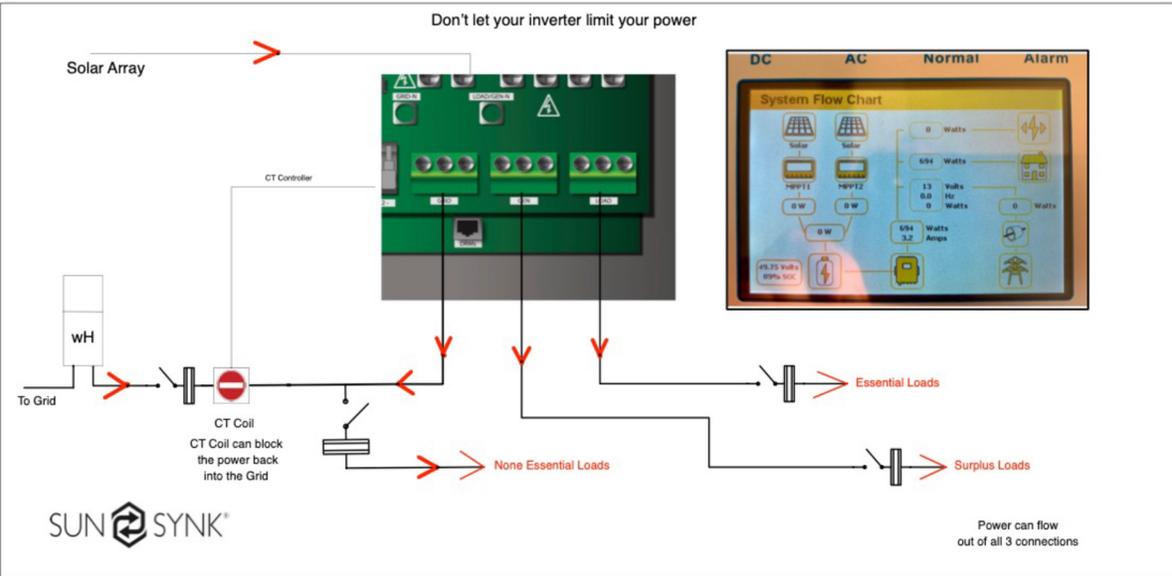
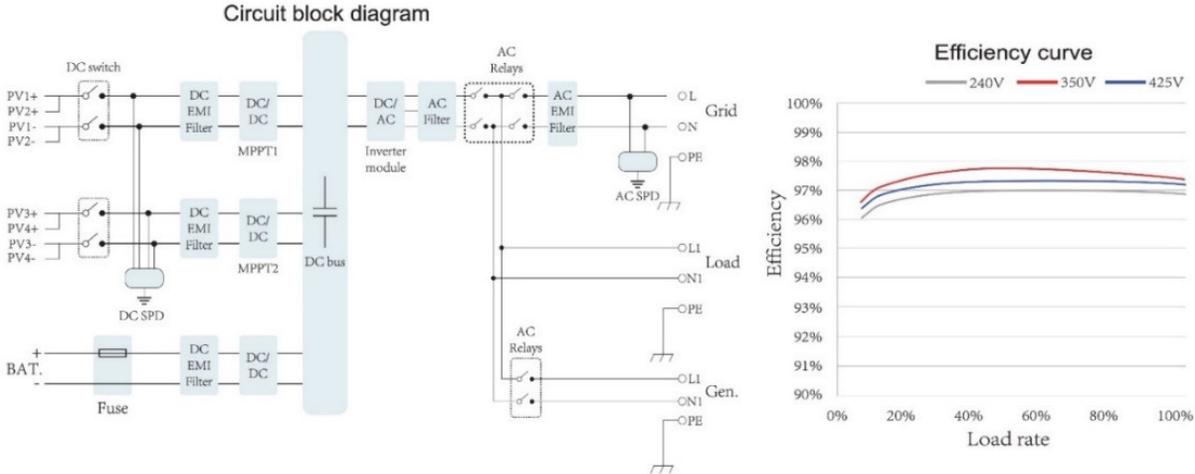
Model No.	SUNSYNK-5K-SG01LP1 / SUNSYNK-5K-SG01LP3
Product Type	Hybrid Inverter
Enclosure	IP65
Ambient Temperature	-45°C ~ 60°C (>45°C derating)
Protection Level	Class I
Charge Mode	
Battery Voltage	48Vd.c (40Vd.c ~ 60Vd.c)
Battery Current	120Ad.c (max.)
AC Input Voltage	L/N/PE 220/230Va.c
AC Input Frequency	50/60Hz
AC Input Rated Current	22.7Aa.c
Max. AC Input Current	25Aa.c (max.)
Max. AC Input Power	5500W
Max. Apparent Output Power	5500VA
PV Input Voltage	370Vd.c (125Vd.c ~ 500Vd.c)
MPPT Input Voltage	150Vd.c ~ 425Vd.c
PV Input Current	13Ad.c + 13Ad.c
Max. PV Input Power	6500W
Max. PV Isc	17Ad.c + 17Ad.c
Utility-Interactive	
AC Output Voltage	L/N/PE 220/230Va.c
AC Output Frequency	50/60Hz
AC Output Rated Current	22.7Aa.c
Max. AC Output Current	25Aa.c (max.)
Max. AC Output Power	5500W
AC Output Rated Power	5500VA
AC Output Power Factor	0.8 leading to 0.8 lagging
Max. AC Isc	75Aa.c
Battery Discharge Voltage	40Vd.c ~ 60Vd.c
Battery Discharge Current	120Ad.c (max.)
Battery Discharge Power	5000W
Stand Alone	
AC Output Voltage	L/N/PE 220/230Va.c
AC Output Frequency	50/60Hz
AC Output Rated Current	22.7Aa.c
AC Output Rated Power	5500W
Max. Continuous AC Passthrough Current	35Aa.c
Peak Output Power	10000W (10 seconds)
Battery Discharge Voltage	40Vd.c ~ 60Vd.c
Max. Discharge Current	120A (max.)
Compliance	VDE-AR-N 4105:1028-11; DINVDE V 0124-100:2020-06; IEC/EN62109-1/2:2010; IEC/EN62109-1/2:2011

Model	SUNSYNK-5K-SG02LP1
Battery Input Data	
Battery Type	Lead-acid or Lithium-ion
Battery Voltage Range	40~60V
Max. Charging Current	120A
Max. Discharging Current	120A
Charging Curve	3 Stages/Equalisation
External Temperature Sensor	Optional
Charging Strategy for Li-Ion Battery	Self-Adaptation to BMS
PV String Input Data	
Max. DC Input Power	6500W
PV Input Voltage	370V (100V~500V)
MPPT Range	150~425V
Full Load DC Voltage Range	300~425V
Start-up Voltage	125V
PV Input Current	13A+13A
No. of MPPT Trackers	2
No. of Strings Per MPPT Tracker	1+1
AC Output Data	
Rated AC Output and UPS Power	5000W
Max. AC Power	5500W
Peak Power (off-grid)	2 times of rated power, 10 S
AC Output Rated Current	20.8A
Max AC Output Current	22.0039A
Max Continuous AC Passthrough	35A
Power Factor	0.8 leading to 0.8 lagging
Output Frequency and Voltage	50/60Hz; 220/230/240Vac (single phase)
Grid Type	Single Phase
Current Harmonic Distortion	THD<3% (Linear load<1.5%)
Efficiency	
Max. Efficiency	97.60%
MPPT Efficiency	97.00%
Euro Efficiency	99.90%
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
Certifications and Standards	
Grid Regulation	VDE 0126, AS4777, NRS2017, G98, G99, IEC61683, IEC62116, IEC61727, RD1699:2011, XP C15-712-3:2019-05
Safety Regulation	IEC62109-1, IEC62109-2
EMC	EN61000-6-1, EN61000-6-3
General Data	
Operating Temperature Range	-25~60°C, >45°C Derating
Cooling	Fan
Noise	<30dB

Communication with BMS	RS485; CAN
Weight	30kg
Size (Length x Width x Height)	233 x 445 x 708 mm
Protection Degree	IP65
Warranty	5 years

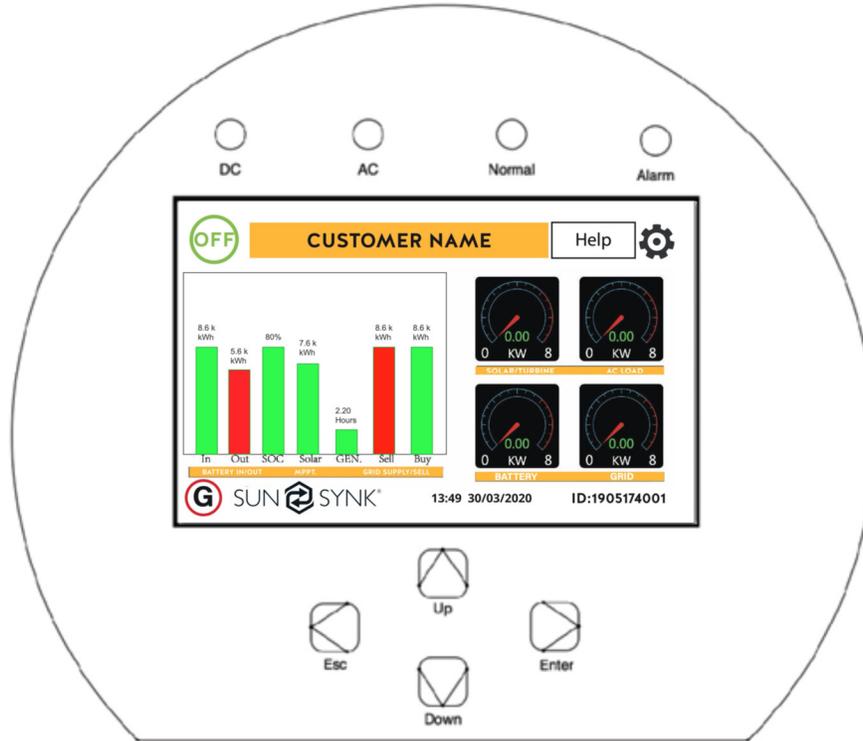
Model No.	SUNSYNK-8K-SG01LP1 / SUNSYNK-8K-SG03LP1
Product Type	Hybrid Inverter
Enclosure	IP65
Ambient Temperature	-45°C ~ 60°C (>45°C derating)
Protection Level	Class I
Charge Mode	
Battery Voltage	48Vd.c (40Vd.c ~ 60Vd.c)
Battery Current	190Ad.c (max.)
AC Input Voltage	L/N/PE 220/230Va.c
AC Input Frequency	50/60Hz
AC Input Rated Current	36.4Aa.c
Max. AC Input Current	40Aa.c (max.)
Max. AC Input Power	8800W
Max. Apparent Output Power	8800VA
PV Input Voltage	370Vd.c (125Vd.c ~ 500Vd.c)
MPPT Input Voltage	150Vd.c ~ 425Vd.c
PV Input Current	22Ad.c + 22Ad.c
Max. PV Input Power	10400W
Max. PV Isc	28Ad.c + 28Ad.c
Utility-Interactive	
AC Output Voltage	L/N/PE 220/230Va.c
AC Output Frequency	50/60Hz
AC Output Rated Current	36.4Aa.c
Max. AC Output Current	40Aa.c (max.)
Max. AC Output Power	8800W
AC Output Rated Power	8800VA
AC Output Power Factor	0.8 leading to 0.8 lagging
Max. AC Isc	145Aa.c
Battery Discharge Voltage	40Vd.c ~ 60Vd.c
Battery Discharge Current	190Ad.c (max.)
Battery Discharge Power	8000W
Stand Alone	
AC Output Voltage	L/N/PE 220/230Va.c
AC Output Frequency	50/60Hz
AC Output Rated Current	36.4Aa.c
AC Output Rated Power	8800W
Max. Continuous AC Passthrough Current	50Aa.c
Peak Output Power	16000W (10 seconds)
Battery Discharge Voltage	40Vd.c ~ 60Vd.c
Max. Discharge Current	190A (max.)
Compliance	VDE-AR-N 4105:1028-11; DINVDE V 0124-100:2020-06; IEC/EN62109-1/2:2010; IEC/EN62109-1/2:2011

2.1. System Diagram



3. OPERATION

3.1. 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)

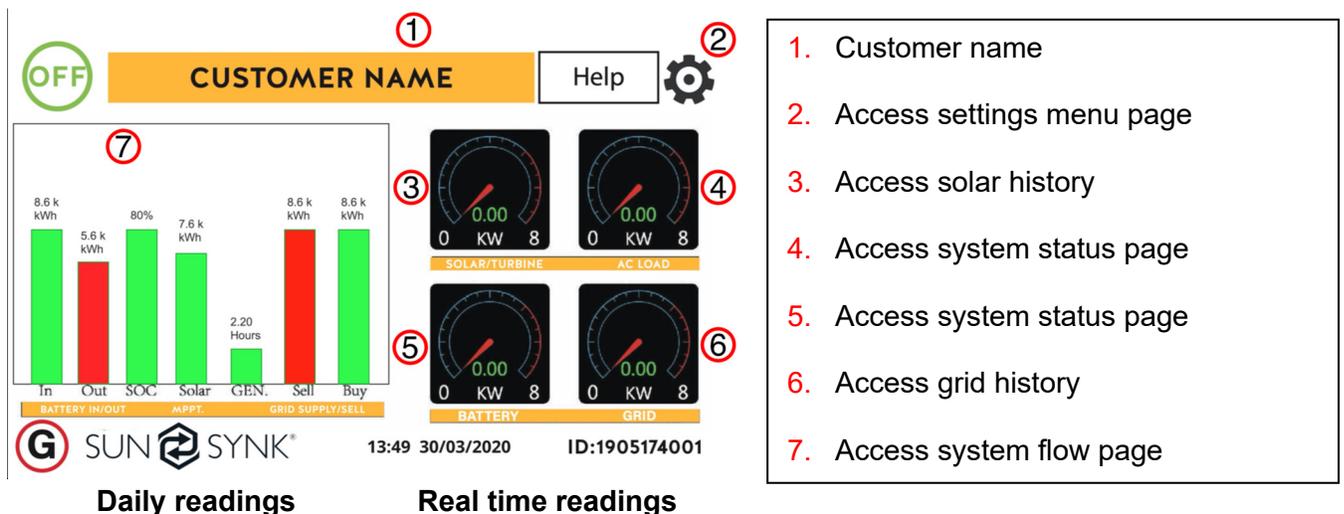
3.2. Switching ON/OFF

Once the inverter has been correctly installed and the batteries have been connected, press the ON/OFF button (located on the left side of the case) to activate the system.

When the system is connected without a battery but connected with either PV or grid and the ON/OFF button is switched off, the LCD will still illuminate (display will show off). In this condition, when switching on the ON/OFF button and selecting 'No Battery', the system can still work.

3.3. Home Page

Press the Esc button 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.

3.4. 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.

0 Watts 0.00 V 0.00 Amps 0.0 C	0 watts 0 Hz 0 Volts 0.0 Amps CT:0Watts LD: 0Watts	0 Watts 0.00 Volts 0.0 Amps
Battery	Grid Power	Solar Power 1
0 watts 0 Hz 0 Volts 0.0 Amps DC:100.0 C AC:100.0 C	0 Watts 0.00 Volts 0.0 Amps	0 Watts 0.00 Volts 0.0 Amps
Inverter Power	Load Power	Solar Power 2

Solar Column: Shows total PV (Solar) power at the top and then details of each of the two MPPT's below L1 & L2 voltage.

Grid Column: Shows grid total power, frequency, voltage, and current. When selling power to grid the power is negative. When consuming from the grid the power is positive. If the sign of the grid and HM (home) powers are not the same when the PV is disconnected and the inverter is only taking energy from the grid and using the CT connected to Limit-2, then please reverse the polarity of the CT coil. **Important:** See Section 4.6 ('Connecting the CT coil').

Inverter Column: Showing inverter total power, frequency, L1, L2, voltage, current, and power.

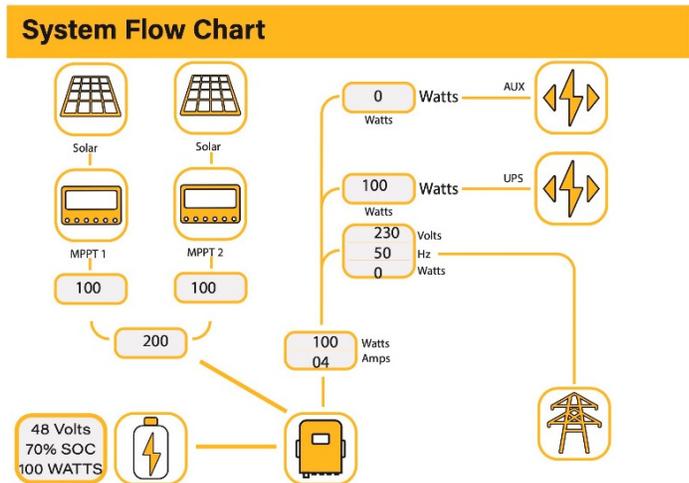
Load Column: Showing total load power, load voltage, and power on L1 and L2.

Battery Column: Showing total power from the battery, battery SOC, battery voltage, battery current (negative means charge, positive means discharge) battery temperature (shows zero if the battery temperature sensor is not connected). DC transformer temperature and AC heatsink temperature (When the temperature reaches 90°C it will display in red and the performance of the inverter will start deteriorating when it reaches

110°C. Subsequently, the inverter will shut down to allow it to cool and reduce its temperature.

3.5. System Flow Page

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

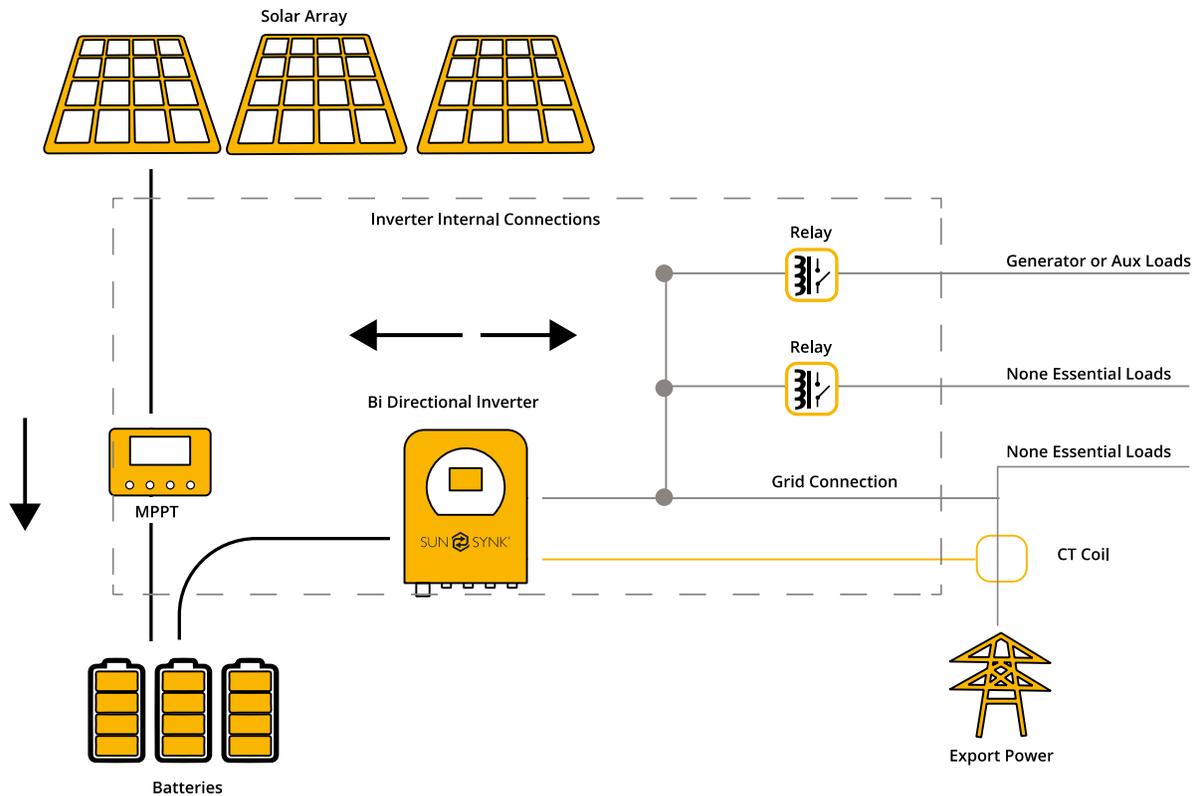


What this page displays:

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

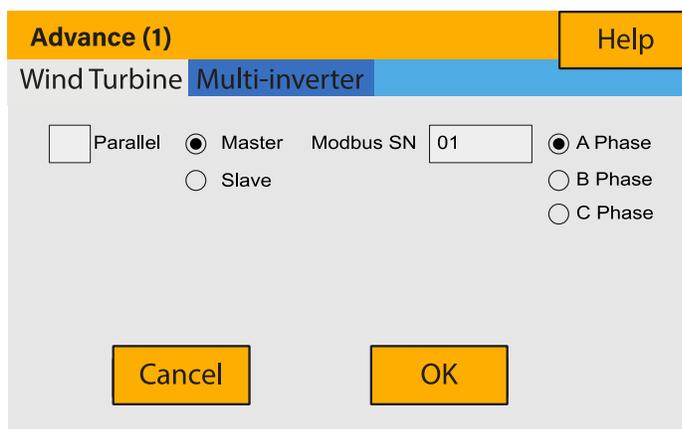
To better understand the functioning of your system, take a look at the figure bellow:

1. The PV modules charge the batteries.
2. When the batteries reach a specific level (programmable) the battery power is fed into the inverter.
3. The inverter can then supply power to the grid (export or no export), load, and auxiliary or smart load.
4. CT coil controls the export power.



3.6. Advanced Settings for Paralleling Inverters

To configure multi-inverter settings, click on the ADVANCE icon.



What this page displays:

- If the inverter operates as a master or a slave.
- Modbus Device ID – ‘Modbus SN’ that must be unique for each inverter connected to the bus/wire.

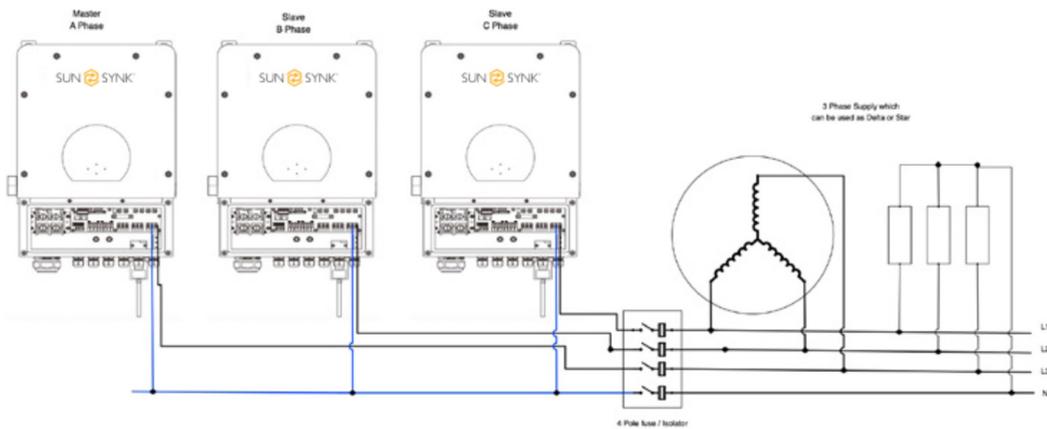
What you can do from this page:

- Set the inverter as a master or slave per bus/wire.
- Set the phase in which the inverter will be paralleled.
- Set the Modbus SN for

The Sunsynk parity inverter can be wired standalone or where more power is required it can be connected in parallel either single or 3 phase configuration. The maximum number of inverters that can be paralleled in a single phase utility grid is three (10.8kW, 16.5kW, and 26.4kW for the 3.6kW, 5.5kW, and 8.8 kW model, respectively) and the maximum number that can be paralleled in a three phase utility grid is nine (32.4kW, 49.5kW, and 79.2kW for the 3.6kW, 5.5kW, and 8.8 kW model, respectively).

To parallel six inverters in a three phase utility grid is necessary to set three inverters as master and three as slaves:

- Phase A: Master A and Slave A
- Phase B: Master B and Slave B
- Phase C: Master C and Slave C



For stability, all the batteries need to be connected in parallel. It is recommended a minimum cable size of 50mm diameter with fuse isolators to each inverter.

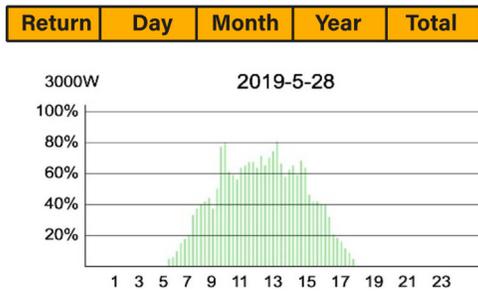
Each invert will require a fuse isolator with surge protection and each group circuit will require an RCD. If the batteries as supplying power to the main load during the outage then a change over switch will also be required or a split load can be used.

- The CT coils used to limit export power must only be connected to the master. Therefore, if six inverters are paralleled, three CT coils will be required.
- Connect a RJ45 communication cable between each inverter; the order is not important since both sockets are the same, so there is no IN or OUT.
- Each phase must only have one master and the others set to slave.
- Each inverter must have a unique Modbus number.
- The maximum length of the communication cables is 2 meters (do not exceed this value)
- All batteries must be connected in parallel and the MPPTs must be kept separate.

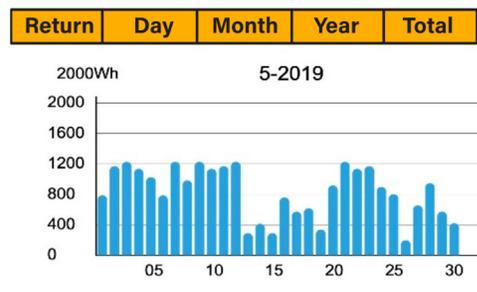
If you need further help please refer to the Sunsynk website where you will find training videos and Frequently Asked Questions www.sunsynk.com. From here you can also update the inverter operating system if required. In most cases, our inverters are fine as they are and no upgrades are needed.

3.7. Solar Power Generated

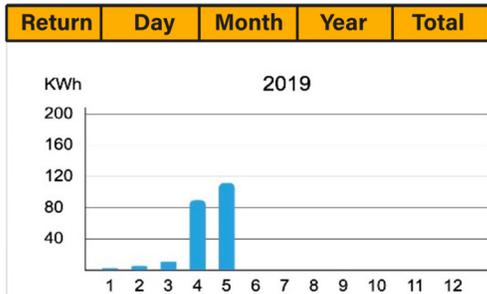
This page shows the daily, monthly, yearly, and total solar power produced. Access this page by clicking on the 'Solar/Turbine' icon on the Home Page.



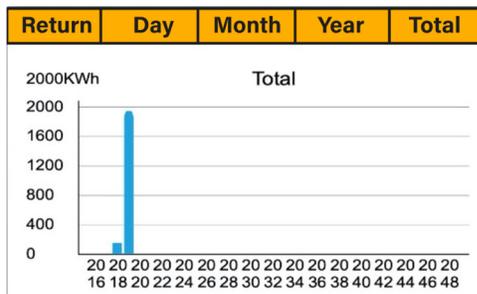
Solar Total Today=0.0KWH Total - 0.0KWH



Solar Total Month=0.0KWH Total - 0.0KWH



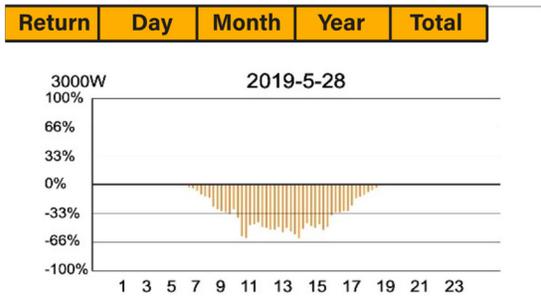
Solar Total Year=0.0KWH Total - 0.0KWH



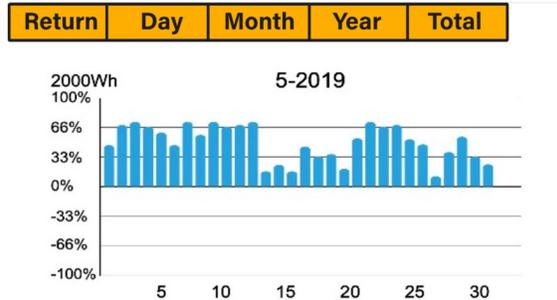
Solar / Turbine Power Total :- 135.20 kWh

3.8. Grid Power

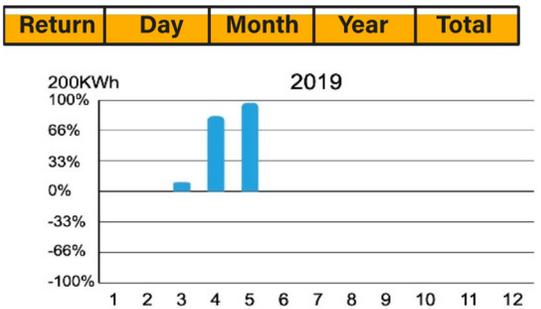
This page shows the Daily / Monthly / Yearly and total grid power export or consumed. Access this page by clicking on the 'Solar/Turbine' icon on the home page.



Grid Power Import / Export :- Day



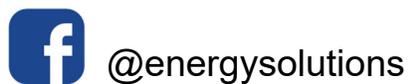
Grid Power Import / Export :- Month



Grid Power Import / Export :- Year



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).



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Audio Training manuals on Apple Pod Cast and Spotify

Full training support, manuals and videos on www.sunsynk.com



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