

SolCasa A/T series

Transformerless PV

Grid-Connected Inverter



User Manual

Version 1.0

Table of Contents

ABOUT THIS MANUAL	1
<i>Compliances</i>	<i>1</i>
<i>Inverters covered by this manual.....</i>	<i>1</i>
<i>Storage of the Manual.....</i>	<i>2</i>
<i>Symbols Used</i>	<i>3</i>
INTRODUCTION	4
<i>Features</i>	<i>4</i>
<i>View of the Inverter</i>	<i>6</i>
INSTALLATION	8
<i>Unpacking the inverter</i>	<i>8</i>
<i>Installation Notes.</i>	<i>12</i>
<i>Typical Installation</i>	<i>15</i>
<i>Mounting the Inverter</i>	<i>16</i>
OPERATION	20
<i>General.....</i>	<i>20</i>
<i>Dual MPPT power divide configuration</i>	<i>24</i>
INVERTER Wi-Fi and RS 485 CONNECTION CONFIGURATIONS.....	25
<i>Inverter connection RS 485</i>	<i>25</i>
<i>Configuration using Wi-Fi (no internet)</i>	<i>26</i>
<i>Configuration with Wi-Fi (inside the inverter) (internet)</i>	<i>27</i>
<i>Configuration with Wi-Fi (inside the remote display) (internet)</i>	<i>28</i>
MAINTENANCE.....	29
<i>Cleaning maintenance</i>	<i>29</i>
<i>General maintenance</i>	<i>29</i>
VIEWING INFORMATION	30
<i>Built in display (Graphical).....</i>	<i>30</i>
<i>Local Monitoring with Smartphone or Tablet App</i>	<i>36</i>
<i>SolarMAN Portal.....</i>	<i>36</i>
<i>RS 485 connection</i>	<i>36</i>
APPENDIX.....	38
<i>Inverter Specifications</i>	<i>38</i>
<i>Connector details.....</i>	<i>43</i>
<i>Cables.....</i>	<i>45</i>
<i>Inverter Fault Codes.....</i>	<i>46</i>
<i>Service</i>	<i>47</i>

ABOUT THIS MANUAL

This manual follows the requirements of the European Low Voltage Directives, contains the safety instructions and conditions of acceptability for the end use system, which you must follow when installing, operating or servicing the unit. If ignored, physical injury or death may follow, or damage may occur to the unit. Read the instructions before you work on the unit. If you are unable to understand the dangers, warnings, cautions or instructions, contained in this manual then contact the manufacturer or an authorized service dealer before installation, operating or servicing the unit.

Compliances

Australia

AS 4777.2

AS 4777.3

AS/NZS 3100:2009 Inc. A1

Germany

VDE 0126-1-1/A1

VDE-AR-N4105

United Kingdom

G83/1-1

G59-2

General

IEC 62109-1

IEC 62109-2

EN 61000-6-2

EN 61000-6-3

EN 61000-3-3

EN 61000-3-11

EN 61000-3-2

Inverters covered by this manual

<i>SCA1500SNW</i>	<i>SCA2000SNW</i>	<i>SCA2500SNW</i>	<i>SCA2800SNW</i>	<i>SCA3000SNW</i>
<i>SCA1500SN</i>	<i>SCA2000SN</i>	<i>SCA2500SN</i>	<i>SCA2800SN</i>	<i>SCA3000SN</i>
<i>SCA1500SNW-S</i>	<i>SCA2000SNW-S</i>	<i>SCA2500SNW-S</i>	<i>SCA2800SNW-S</i>	<i>SCA3000SNW-S</i>
<i>SCA1500SN-S</i>	<i>SCA2000SN-S</i>	<i>SCA2500SN-S</i>	<i>SCA2800SN-S</i>	<i>SCA3000SN-S</i>

<i>SCT3200DDW</i>	<i>SCT3680DDW</i>	<i>SCT4000DDW</i>	<i>SCT4600DDW</i>	<i>SCT5000DDW</i>
<i>SCT3200DD</i>	<i>SCT3680DD</i>	<i>SCT4000DNW</i>	<i>SCT4600DD</i>	<i>SCT5000DD</i>
<i>SCT3200DNW</i>	<i>SCT3680DNW</i>	<i>SCT4000DD</i>	<i>SCT4600DNW</i>	<i>SCT5000DNW</i>
<i>SCT3200DN</i>	<i>SCT3680DN</i>	<i>SCT4000DN</i>	<i>SCT4600DN</i>	<i>SCT5000DN</i>

Storage of the Manual

The manual should be stored with other documents belonging to the installation and must be available to people authorized to work on the installation.

The contents of this manual will be periodically updated or revised if necessary.

Please check for revisions which can be downloaded from <http://www.sldpower.com>

Symbols Used

The following types of safety precautions and general information symbols are used in this manual. These important instructions should be followed during installation, operation and maintenance of the inverter.



DANGER

DANGER indicates a hazard with a high level of risk.



WARNING

WARNING indicates a hazard with a medium level of risk.



CAUTION

CAUTION indicates a hazard with a low level of risk.



NOTICE

NOTICE indicates additional information, emphasized contents or tips to help you solve problems or save time.

INTRODUCTION

Thank you for purchasing an SLD Power, grid connected inverter. Features of the SLD Power inverter are ahead of the field.

Features

Easy maintenance

Inverters need preventative maintenance especially when they are mounted in an area where they are subject to dust, insects, spiders and other environmental problems that can cause the heat sinking to become clogged thereby reducing the heatsink efficiency. This inverter can be cleaned easily without the need to remove it from its mounts. Other inverters should be serviced by qualified personnel just to clean the fan and heatsink.

Simple in its basic form

There are three LEDs to give you information about the status of the inverter.

An aural alarm can be connected to tell you if you have a non-self-clearing inverter failure.

The inverter can be mounted in areas where other inverters cannot be as the inverter is not restricted by the ability to view a display when the remote display is used.

There is no need for the internet, computer, wireless devices or smart phones in the basic configuration.

Statistics are stored, however not displayed if you have no display. The inverter stores over 10 years of statistics and the last 5 minor fault codes and the last 5 major fault codes.

Major fault codes are not overwritten by minor fault codes.

Note: Inverters are available with a display or no display. (Single MPPT models can be fitted with a two line display and Dual MPPT models can be fitted with a large display or a two line display.)

Reliability

Easy maintenance

Internal components are sourced from major brands.

Surge suppression devices are fitted on the AC side and the PV side to protect the electronics of the inverter.

With a basic unit there is no display to fail or to fade. (Units are available with a two line display, graphical display and/or a remote display.)

No buttons to fail on the unit without the display.

No fan

IP65

User functionality

Remote aural alert and a local aural alert with a built in graphical display.

Manual remote restart feature using the remote display

With the wireless option local monitoring is implemented using an application on your smartphone or tablet running either android or apple IOS. For PCs there is an optional application.

Remote display allows local monitoring and can monitor multiple inverters up to 10 connected together via the RS 485.

Wi-Fi can be fitted to the remote display or the inverter. (See the various Wi-Fi and display configurations.)

Connect to the internet, with the Wi-Fi option installed, to monitor your inverter remotely via portal monitoring using a web browser on your smartphone, tablet or computer. Up to 4 inverters can be monitored on the same RS 485 bus via the portal monitoring

Using the portal monitoring gives you graphical information, statistics and the ability to export “.csv files” and graphical information.

Ability to set the grid over-voltage and under-voltage in some countries where grid supply is affected by long power line runs resulting in poor quality mains. Remote country areas can suffer with these problems.

Optional remote display (with function buttons):

The owner can mount the remote display in a position suitable for monitoring usually inside the home.

Multiple inverters, up to 10 can be monitored from the remote display.

The remote display can be used to send a restart command to your inverter.

Connection of the remote display is done with RS 485. There is no need for an internet connection when this configuration is used.

With the optional display the history statistics and the last 5 minor fault codes and 5 major fault codes can be displayed.

Remote display has a built in aural alert for inverter faults that are non-self-clearing.

The aural alert feature can be turned off selectively when multiple inverters are used or turned off if you have a continuous alarm.

Using a remote display with Wi-Fi allows you to connect to the internet via wireless when your inverters are mounted outside your Wi-Fi connection range or where you have a poor Wi-Fi signal.

Wi-Fi inside the remote display also allows local monitoring with your smart phone or tablet. (Android and Apple) An optional PC application is also available.

Optional wireless:

The optional Wi-Fi allows local and remote monitoring of the inverter.

Wi-Fi can be installed in the remote display or the inverter.

Locally you can login to the inverter using an application on a smartphone or tablet or an option PC application.

With an internet connection you are able to remotely login to the inverter using SolarMAN a portal monitoring system with a web browser on a PC, smartphone or tablet or with an application on a smartphone or tablet.*

**SolarMAN supplies the portal monitoring of your inverter when connected to the internet.*

View of the Inverter



CAUTION

CAUTION The AC power should only be applied if the PV isolation switch is off

PV Isolation Switch

OFF position will disconnect the solar panel input (PV array) from the inverter's input.

ON position will connect the solar panel input (PV array) to the inverter's input. Switching on the PV input will power-up the processors inside the inverter that initialises, monitors and controls the inverter and the processor which controls the display and communication when PV $\geq$ 100volts.

PV inputs

There are 2 types of PV inputs.

1. *Single MPPT unit with a single input. (SCA 1500S, SCA 2000S, SCA 2500S, SCA 2800S, SCA 3000S)*
2. *Dual MPPT unit with two inputs. (SCT 3200, SCT 3680, SCT 4000, SCT 4600, SCT 5000)*

Wi-Fi Antenna

The built-in Wi-Fi is an option. It allows connection to a wireless router and/or local monitoring with a smartphone, tablet or PC. To allow monitoring with the smartphone or tablet you can download applications from the apple store or android store. PC monitoring is done with a web browser through the SolarMAN portal. (There is also an optional application available for the PC.)

RS485 connector

Used to connect to other inverters, VDE AR N4105 (power output controller) or a remote display.

Note if a Wi-Fi unit is fitted this connector is removed.

Multi-function connector

Used to connect a remote display. If the distance to the remote display is within 10 meters then this port can be used to power the remote display. The port can also be used as an RS 485 connection. It also has an Aural alarm output, USB data input/output for later enhancements and a Ground and +5volts out. (See cables in the appendix.)

Protective Earth connection

The inverter must be connected to a building protective earth. This point is used to connect the protective earth.

Grid connection

No Display

Status LED	Meaning
OFF:	The PV array voltage is less than 100V.
Flashing GREEN :	The inverter is in the standby mode. Standby mode is when the PV input voltage is below the start-up voltage (PV for the inverter to output AC power.
Solid GREEN :	The inverter is working normally.
Flashing RED :	The inverter is in a fault condition. When there is a fault condition the LED will flash a code which you can look up to tell you the type of fault. (See fault codes in Appendix) Some faults are self-clearing while the others require the attention of a serviceperson.

With display



Status LED	Meaning
POWER:	No light means the inverter PV array voltage input is less than 100Volts GREEN will mean that the PV array voltage is ≥ 100 volts
RUN:	No light means the inverter is in the standby mode. YELLOW will mean that the inverter is connected to the grid and has output.
FAULT:	No light means that there is no fault. RED will mean a fault has occurred.

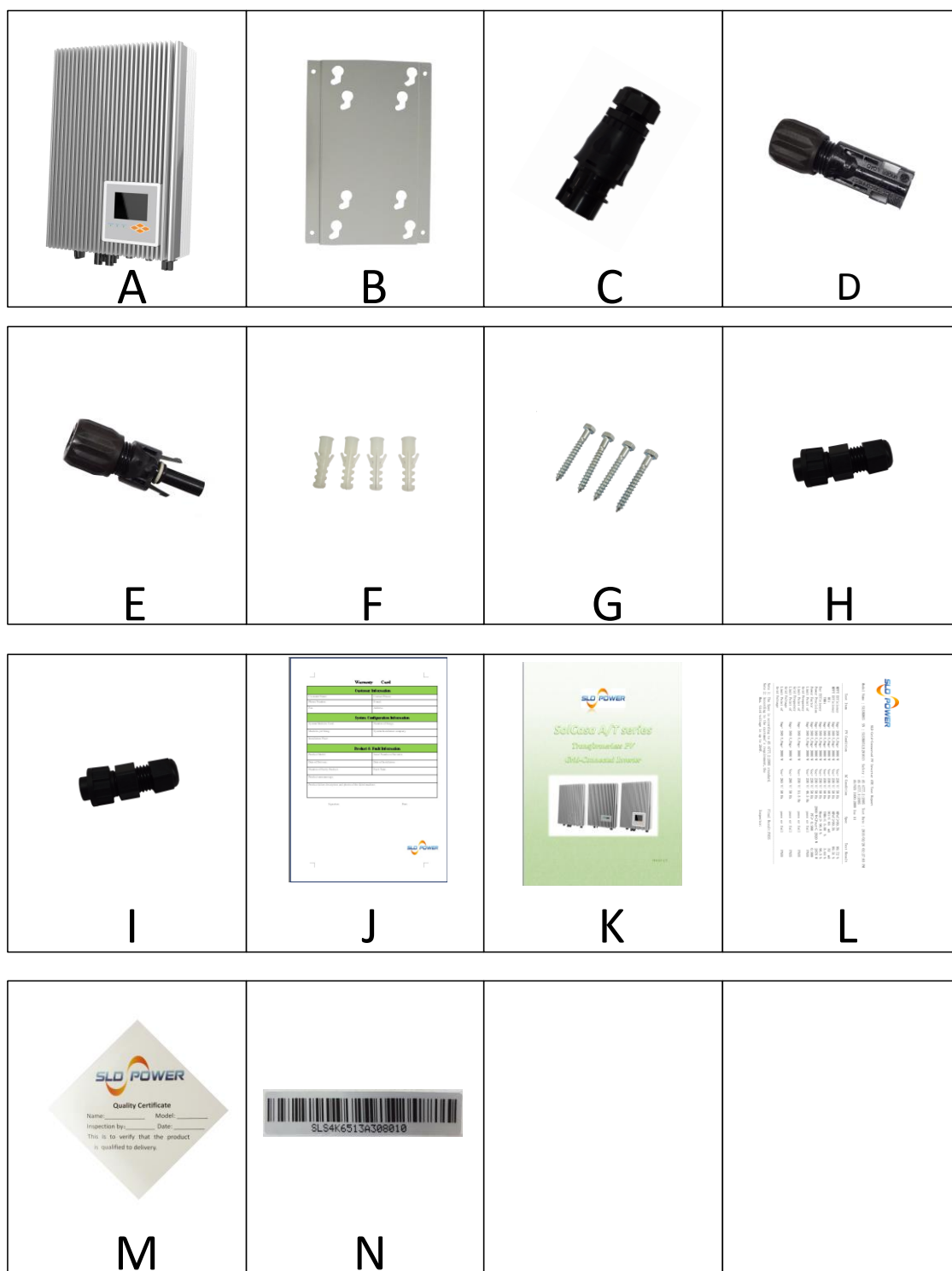
INSTALLATION

Unpacking the inverter

Delivered Items

<i>ITEM</i>	<i>Description</i>	<i>Number</i>	<i>Part number</i>
<i>A</i>	<i>SolCasa Inverter</i>	<i>1</i>	<i>Model number</i>
<i>B</i>	<i>Mounting back-plate</i>	<i>1</i>	
<i>C</i>	<i>AC Connector</i>	<i>1</i>	<i>M-S30 SD03 510 001 U (F)</i>
<i>D</i>	<i>DC Connector +ve</i>	<i>1 or 2</i>	<i>PV-100508-F (model dependant)</i>
<i>E</i>	<i>DC Connector -ve</i>	<i>1 or 2</i>	<i>PV 100508-M (model dependant)</i>
<i>F</i>	<i>Wall plugs</i>	<i>4</i>	
<i>G</i>	<i>Bolts for fixing back-plate</i>	<i>4</i>	
<i>H</i>	<i>Communication Connector</i>	<i>1</i>	<i>Singatron 2CT3032-W04300</i>
<i>I</i>	<i>Multi-function Connector</i>	<i>1</i>	<i>Singatron 2CT3032-W08300</i>
<i>J</i>	<i>Warranty Card</i>	<i>1</i>	
<i>K</i>	<i>Product manual</i>	<i>1</i>	
<i>L</i>	<i>Test report</i>	<i>1</i>	
<i>M</i>	<i>Quality Certificate</i>	<i>1</i>	
<i>N</i>	<i>Barcode with serial number</i>	<i>1</i>	

Picture of inverter and delivered items

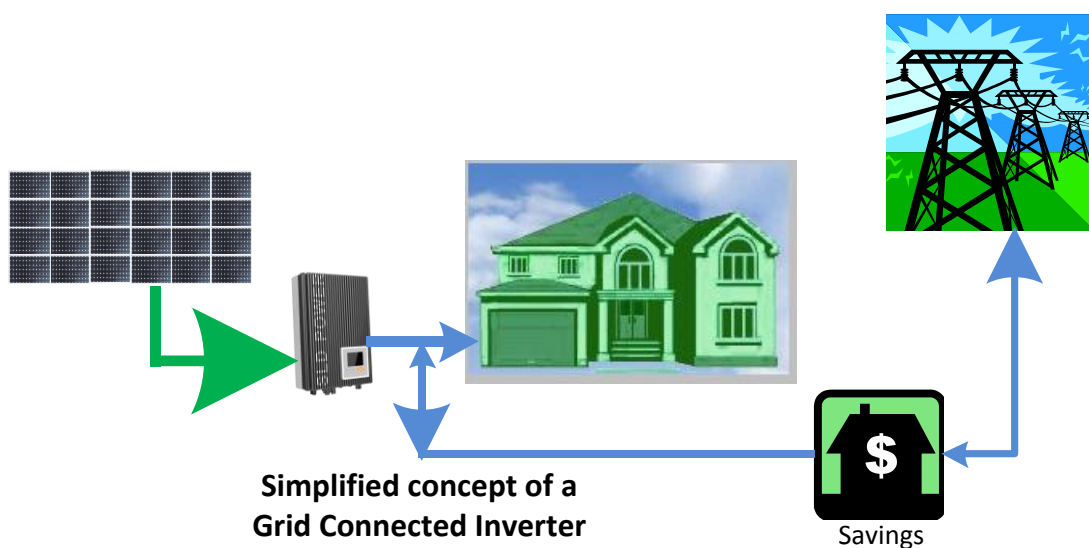


Overview of the installation



DANGER

After installation of a PV system, start-up of the unit (i.e. start of designated operation) is **PROHIBITED** until it is determined that the system meets all local and national regulations and has been inspected and approved by the local responsible authorities.



Technical rules and Intended use

Installation must be suited to the on-site conditions and comply with local regulations and technical rules. SolCasa inverters are designed to comply with transformerless PV grid-connected inverter safety rules.

Appropriate usage

The SolCasa is a PV inverter that converts DC current of PV arrays into an AC output and feeds it into the public power grid

SolCasa inverters can only be used as grid connected inverters. The inverter must only be connected to a public (local) power utility grid.

PV string inputs are required to be floating they cannot be positive or negative earthed.

If the PV array has an earth reference then this will not work with the SolCasa inverter. SolCasa inverters are transformerless.

Please identify the environment of the mounting position and SolCasa inverter(s) carefully before installation.

Site	Indoor or outdoor
Ambient temperature	−20 °C~+60 °C
Humidity	≤90%, no condensation
Degree of protection	IP65



DANGER

Danger to life due to high voltages in the inverter.

- All work on the inverter must be carried out by qualified personnel only.



CAUTION

Hot surface on unit.

- During operation, the upper case of the enclosure and the enclosure body may become hot.
- Only touch the lower enclosure area during operation.



CAUTION

Possible damage to health as a result of the effects of radiation.

- Do not stay closer than 20 cm to the inverter for any length of time.



NOTE

PV frames should be earthed to comply with the local requirements for grounding. SLD Power recommends connecting the PV frames and other electrically conductive surfaces in a manner which ensures continuous conduction to ground in order to have optimal protection of the system and personnel.

Installation Notes.

- PV panel frame's to be earth bonded.
- Inverter to have a mains isolation switch which must be clearly visible. It can be in the switchboard as long as the switch board is within 3 meters and is visible from the inverter. Check local regulations.
- The switchboard should have a lockable isolation switch with signage to inform persons that there are dual supplies feeding this switchboard. If it is installed in a system with sub switchboards there must be signage in the other switchboards to warn that there is power generating equipment other than grid mains supplying the switchboard.

Examples of signage (Check local regulations)



Explanation of Symbols

This section gives an explanation of all the symbols shown on the inverter and on the type label.

Symbol	Explanation
 30 minutes	Danger to life due to high voltages in the inverter. There is residual voltage in the inverter. The inverter requires 30 minutes to discharge. • Wait 30 minutes before you work on components inside the inverter.
	Beware hot surface. The inverter can become hot during operation. Avoid contact during operation.
	Danger of high voltages Danger to life due to high voltages. Warning dual supply
	No access for unauthorized personal.
	TUV certification
 WARNING Dual Supply Do not work on this inverter until it is isolated from both mains and on-site PV generation supplies	Warning that this inverter requires removal from the grid supply and the PV supply before any work is carried out on the inverter.
	Symbol for the marking of electrical and electronics devices according to Directive 2002/96/EC. Indicates that the device, accessories and the packaging must not be disposed as unsorted municipal waste and must be collected separately at the end of the usage. Please follow Local Ordinances or Regulations for disposal or contact an authorized representative of the manufacturer for information concerning the decommissioning of equipment.
	Protective conductor / Protective Earth (PE)
	Refer to the operating instructions
	CE mark is attached to the solar inverter to verify that the unit follows the provisions of the European Low Voltage and EMC Directives
DC+	DC terminal, indicating the polarity of the connection as positive.
DC-	DC terminal, indicating the polarity of the connection as negative.

Installation Warnings



DANGER

After installation of a PV system, start-up of the unit (i.e. start of designated operation) is **PROHIBITED** until it is determined that the system meets all local and national regulations and has been inspected and approved by the local responsible authorities.



DANGER

The installation and operation of SolCasa inverters can only be performed by qualified personnel.



DANGER

Before installing or using the SolCasa inverter, please read all instructions and cautionary markings in the technical documents.



WARNING

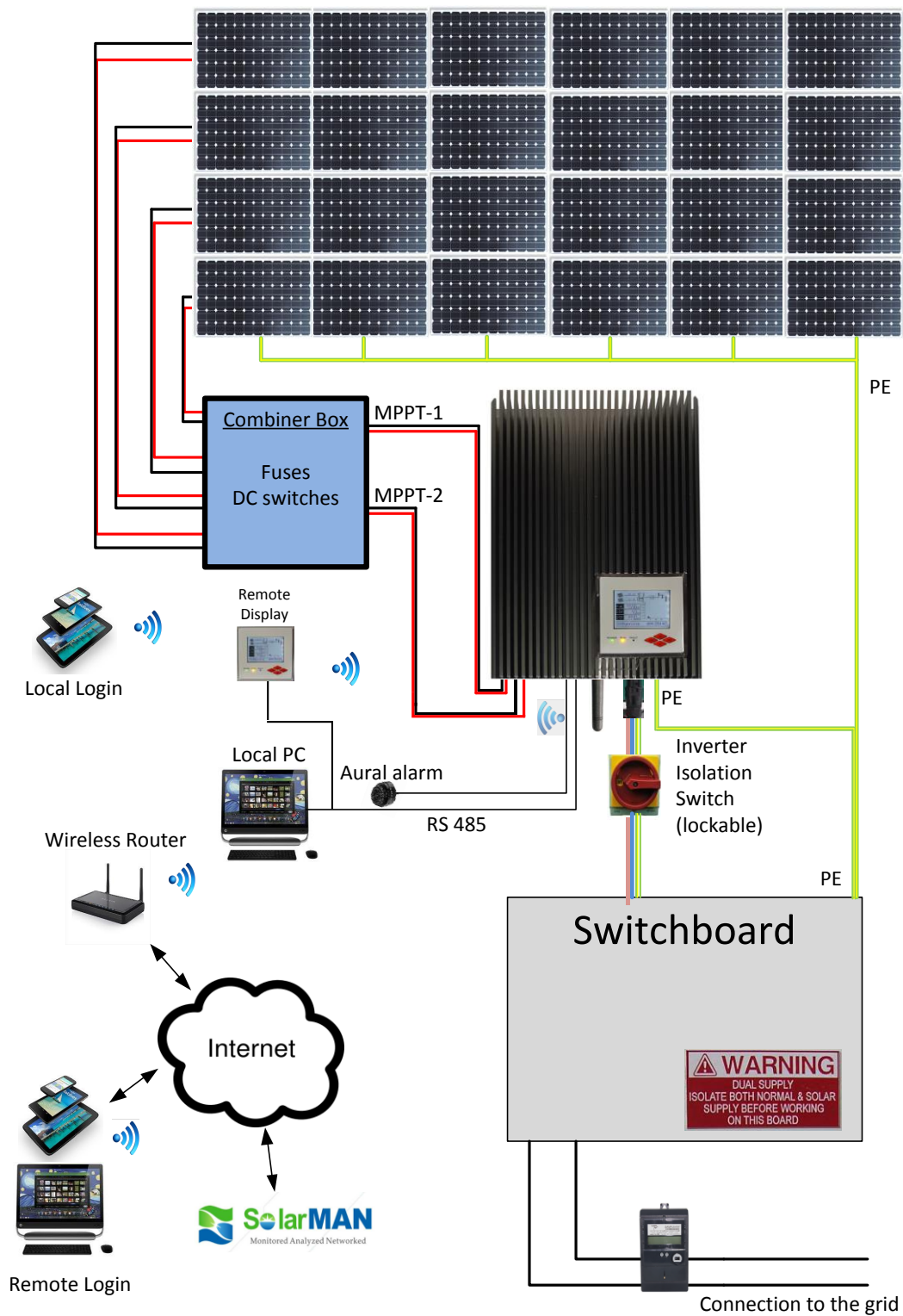
All electrical installations must be done in accordance with the local and National Electrical Code



NOTE

The device is intended for fixed installation only.

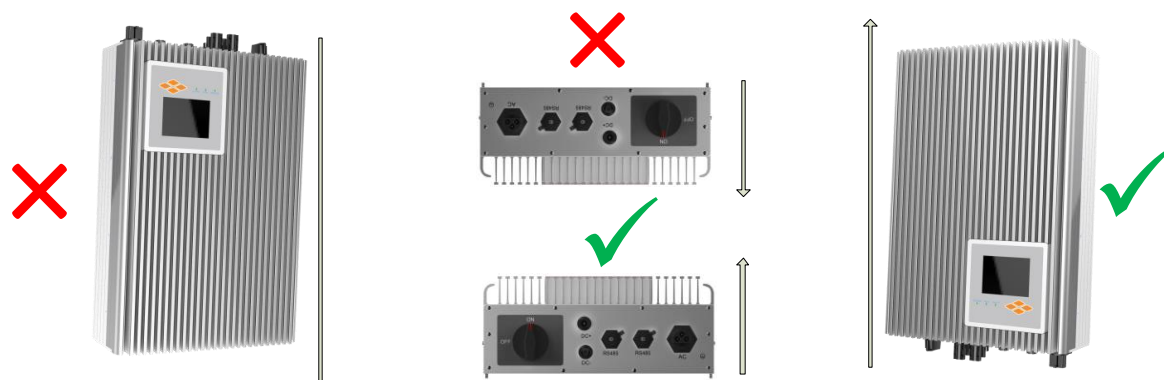
Typical Installation



REV.1.0	DESCRIPTION SLD General Block Diagram	DATE 30-July-2013	BY PB
---------	---------------------------------------	-------------------	-------

Mounting the Inverter

Positioning:



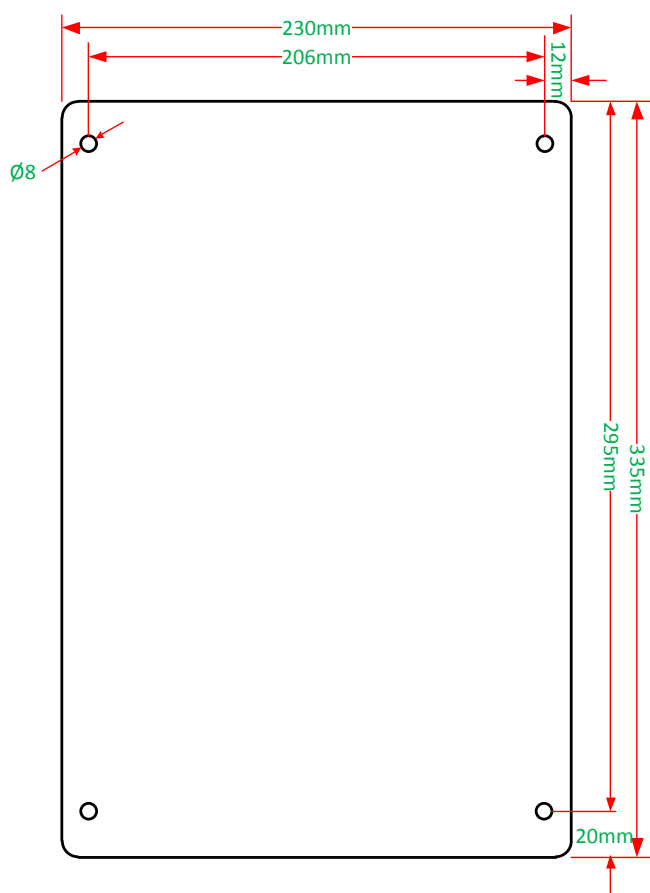
SLD inverters with the heatsink on the front can be mounted in areas that a tradition rear heatsink inverter cannot. Things to consider when mounting your inverter:-

- *Safety: Assess the occupational safety and health risks of the site*
- *Local regulations*
- *Indoor/ Outdoor*
- *Ambient environment.*
- *Proximity to your switchboard and to the PV arrays.*
- *Shaded*
- *Airflow around the heatsink.*
- *Mount vertically or tilted backward by max. 90°*
- *Adequate ventilation*
- *Determine cabling routes and lengths of runs. To determine cable size and also no cable loops that could have surge currents induced.*
- *How you will mount the inverter.*
- *Space for cabling running past and into the inverter.*
- *The surface the inverter will be mounted on. (non-flammable and able to support the weight of the inverter)*
- *Mounting of external devices e.g. isolation switches and combiner box. (PV isolation and fusing, surge protection, mains isolation, overload protection and additional surge protection.)*
Note: Inverter already has internal surge protection. PV inputs have MOVs and the AC has a combination of MOVs and a GDT. MOV = Metal Oxide Varistor GDT= Gas Discharge Tube
- *Wiring sizes minimum 4²mm. Installer must calculate sizes according to length of runs and other parameters that will reduce the wiring rating. Calculations should be for less than 2 Ω for the grid mains cabling. (anti-islanding) For PV wiring loss should be less than 1% at normal power.*

Check to make sure the installation site does not fall into any of the following conditions: If any do, then a risk assessment will be required.

- *Unsafe due to assessment of occupational health safety risks.*
- *The ambient temperature is outside the range of tolerable ambient temperature (-25°C to +60°C, -13°F to +140°F).*
- *Higher than the altitude of 2,000 m above sea level. Above 2000m the inverter output will be de-rated.*
- *Close to flammable materials or areas where flammable materials are stored.*
- *Prone to be damaged by sea water.*
- *Prone to be flooded or high levels of snow falls.*
- *Close to corrosive gas or liquid (for example, locations where chemicals are processed or stored).*
- *Exposed to direct sunlight or in an enclosure exposed to direct sunlight.*
- *Little or no air flow*
- *Mounted on a surface without suitable fire/heat rating.*
- *Mounted on a wall without suitable load holding capacity.*
- *High humidity.*
- *Sites considered unsafe because of local regulations.*
- *Confined space without adequate airflow.*
- *Area subject to sand or dust storms.*
- *Exposed to steam, vapour, or water.*
- *Near antenna and/or data cables.*

Inverter back-plate



Space required for mounting the inverter.

Inverter dimensions and mounting requirements						
Model No. Prefix	Dimensions LxW		Space above	Space below	Space to the left	Space to the right
SCA1500SN	399mm	290mm	35mm	29mm	30mm	40mm
SCA2000SN	399mm	290mm	35mm	29mm	30mm	40mm
SCA2500SN	419mm	290mm	35mm	49mm	30mm	40mm
SCA2800SN	419mm	290mm	35mm	49mm	30mm	40mm
SCA3000SN	419mm	290mm	35mm	49mm	30mm	40mm
SCT3200DD	540mm	325mm	80mm	125mm	47.5mm	57.5mm
SCT3680DD	540mm	325mm	80mm	125mm	47.5mm	57.5mm
SCT4000DD	540mm	325mm	80mm	125mm	47.5mm	57.5mm
SCT4600DD	540mm	325mm	80mm	125mm	47.5mm	57.5mm
SCT5000DD	540mm	325mm	80mm	125mm	47.5mm	57.5mm

Space above, space below, space to the left, and space to the right all refer to the edges of the backing-plate.

Before mounting the inverter plan your cable runs for entering into the inverter, cables that pass-by and other devices that need to be mounted near the inverter.

When mounting the inverter be sure to leave enough space on the right hand side as when you place the unit on the wall you have to slide the unit to the left so the unit will lock in so it cannot be accidentally knocked off the wall.

Use the back-plate to mark the position of the holes on the surface that your inverter will be mounted on, paying attention that the inverter is vertical. Then with a suitable 10mm drill, drill the 4 holes to mount the inverter. The depth of the holes should be slightly greater than 5 cm. Insert the supplied expanding wall plugs into each hole. The inverter back-plate can now be mounted on the wall with the supplied bolts.



WARNING

WARNING indicates a hazard with a medium level of risk.

*Note: 1. If you are **NOT** mounting the inverter on a solid masonry wall then you will have to use suitable bolts to mount the inverter.*

Note: 2. Mounting of the inverter should be on a wall able to support the weight of the inverter.

Note: 3. Mounting of the inverter should be on non-flammable material.

OPERATION

General

Overview of the inverter

The inverter is an electronic device that converts your solar panel array output to an AC voltage that can be fed into the local power grid. In order for this to happen there are strict regulations for the operation of the inverter to make it safe and compatible to the grid.

Powering on (switching on) and powering off the inverter

The inverter should have a PV ISOLATION SWITCH it is an option on the inverter or it will be located in the PV combiner box or mounted and labelled as the PV Isolation switch nearby the inverter.

The inverter should have a MAINS ISOLATION SWITCH which will be located close to the inverter either by itself or in a switchboard.

Before switching the inverter on; make sure the PV ISOLATION SWITCH is in the OFF position. This is not a strict rule, however for customers in Germany it will reduce the start-up time of the inverter.

Powering on the inverter

Switch the MAINS ISOLATION SWITCH to the ON position. Turn on the PV isolation switch. (See inverter start-up)

Powering off the inverter

Switch the PV ISOLATION SWITCH to the OFF position. Switch the MAINS ISOLATION SWITCH to the OFF position and the inverter will now be switched off.



NOTICE

NOTICE The inverter's internal processors board is powered from the PV array. The processors supply will not start until the PV ≥ 100 Volts.

Inverter start-up



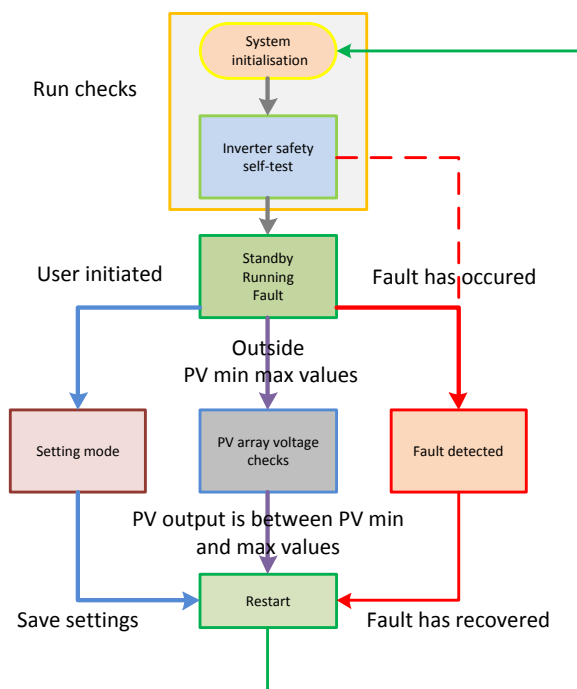
NOTICE

NOTICE The inverter will not go to the run mode until the $PV \geq 150V$. The inverter will not go back to standby until after the PV voltage falls to $PV \leq 110V$.

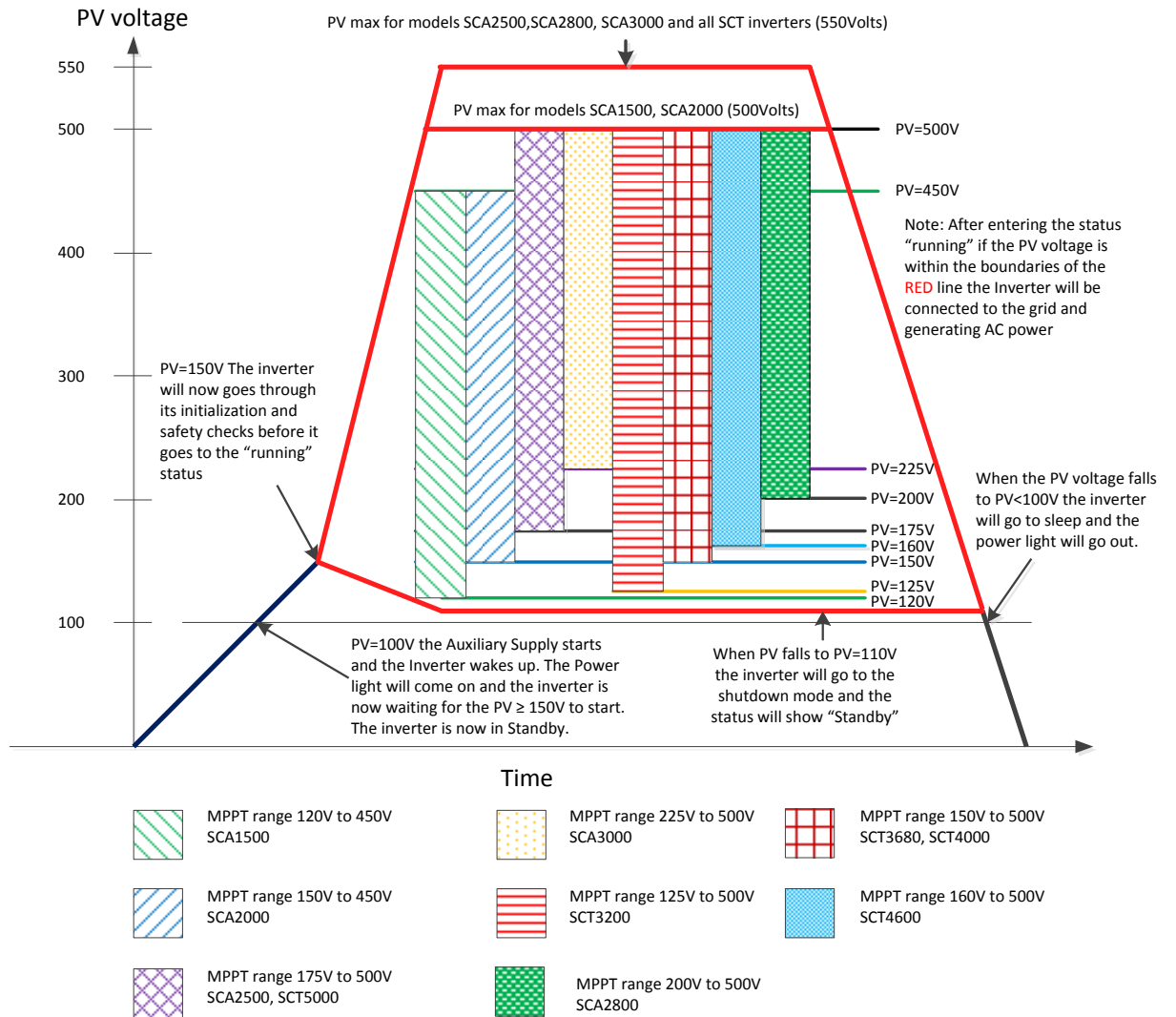
When you switch on the inverter (both AC and PV isolations switches closed) and the $PV \geq 100V$ then the display will light (remote and/or local) and the status of "Standby" will be displayed. Once the PV voltage rise to $PV \geq 150V$ a status of "Run Checks" will be displayed. You will also see a countdown on the display as the inverter progresses through checks to make sure the inverter is functioning correctly and that the grid voltage and frequency are within tolerance. If all is found to be ok then the inverter will start outputting AC and the status will go to "Running". The inverter will continue "Running" until $PV \leq 110V$ or a fault occurs.

1. Standby: if the PV voltage is below the start-up voltage of the inverter or the PV voltage has not fallen below $PV \leq 110V$ after start-up.
2. Running: if the PV voltage has been $PV \geq 150V$ and now has not fallen below $PV = 110V$.
3. Fault: if a fault has been detected during the start-up connecting phase (this phase is an initialization, self-test and the testing of the grid and PV array) or during operation. If a fault occurs a fault code will be displayed. Fault codes are in the appendix.

Simplified inverter operation Flow



PV VOLTAGE OPERATING RANGE for SLDPOWER INVERTERS



The bars represent the range of PV voltage that the MPPT works over for different types of inverters

Inverter fault interruption

1. If the inverter detects a short interruption it will measure the grid parameters and if they are within tolerance specified it will phase lock to the grid mains. "Running status is re-established quickly.
2. If the inverter detects a long interruption it will measure the grid parameters and if they are within tolerance specified it will do several checks before phase locking to the grid mains. **After a long interruption the inverter will take much longer to re-establish the "running" status**

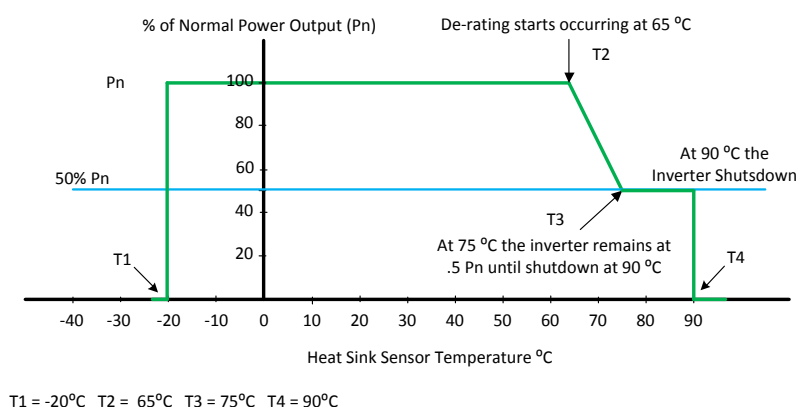
Viewing information

Information for your inverter is viewed in several ways. These will be described in the Viewing Information Chapter.

- From the built in display if fitted. Two types available. Two line display or a large graphical display.
- With a remote display installed.
- With a local PC, smartphone or tablet when the wireless option is installed in the inverter.
- With a PC, smartphone or tablet connected to the internet and the inverter is also connected to the internet via the wireless option and a wireless router.
- When the inverter is installed with no wireless and no display, information cannot be viewed, however the inverter will store 10 years of information internally and can be read anytime a display is connected. Only the last 5 **minor fault codes** and 5 **major fault codes** are stored in memory. For a list of major and minor fault codes see the Appendix.
- Information can be viewed simultaneously with the remote and local devices.

De-rating of the inverter output

The temperature of the heatsink is measured to insure that the inverter is protected. Above an ambient temperature of 45°C (note that at 45°C the temperature of the heatsink will be about 65°C at the normal output power of the inverter) the inverter will start to shut-down in a manner as shown in the diagram. The unit will not start until the heatsink temperature rises above -20°C.



Dual MPPT power divide configuration

Dual MPPT models limit the maximum input power from each PV input in order to protect the inverters internal bus voltage from being exceeded. To achieve this aim the maximum input power from each PV array is limited in a ratio which is set under the parameters configuration menu. When setting up your PV arrays please pay attention to this table and select the appropriate Power Divide Ratio from the parameters menu..

Power Divide Ratio		Maximum input (PV1) W (PV2) W									
PV1 input	PV2 input	SCT3200DNW		SCT3680DNW		SCT4000DNW		SCT4600DNW		SCT5000DNW	
30	70	960	2240	1104	2576	1200	2800	1380	3220	1500	3500
35	65	1120	2080	1288	2392	1400	2600	1610	2990	1750	3250
40	60	1280	1920	1472	2208	1600	2400	1840	2760	2000	3000
45	55	1440	1760	1656	2024	1800	2200	2070	2530	2250	2750
50	50	1600	1600	1840	1840	2000	2000	2300	2300	2500	2500
55	45	1760	1440	2024	1656	2200	1800	2530	2070	2750	2250
60	40	1920	1280	2208	1472	2400	1600	2760	1840	3000	2000
65	35	2080	1120	2392	1288	2600	1400	2990	1610	3250	1750
70	30	2240	960	2576	1104	2800	1200	3220	1380	3500	1500

INVERTER Wi-Fi and RS 485 CONNECTION CONFIGURATIONS

Inverter connection RS 485

In this configuration the monitoring of the inverter is via a remote display mounted in a place suitable for the customer. E.g. Inside the home mounted on a wall. To add more inverters to this configuration simply daisy chain the inverters using the RS 485. Monitoring of up to 10 inverters with the remote display.

Inverter connection RS 485

The controller box is only required in countries that follow the German standard VDE-AR-N4105

4105
Controller box

RS 485



RS 485

Note: Inverters can be added using RS 485

Remote
Display



Configuration using Wi-Fi (no internet)

An inverter which is fitted with a Wi-Fi module can be monitored using an application on a smartphone or tablet. Applications are available for Android and iOS. Download from the Apple store, Android store or <http://www.solarmanpv.com/en-us/mobileapp.html>.

There are two applications:

1. An application to configure and diagnose your Wi-Fi module.
2. An application to monitor your inverter(s) locally or remotely.

After downloading the SolarMAN applications install the applications. To configure your wireless device follow the SolarMAN manual supplied with the wireless option. You should now be ready to login to your inverter using the SSID and password that you set. You are now ready to monitor your inverter locally

Note: You can monitor the inverter using an optional PC application.

Connecting to the inverter using Wi-Fi (No internet)

Local PC with optional software



Note inverters can be added using RS 485



Local Smartphones
Tablet devices



4105
Power Output
Controller box



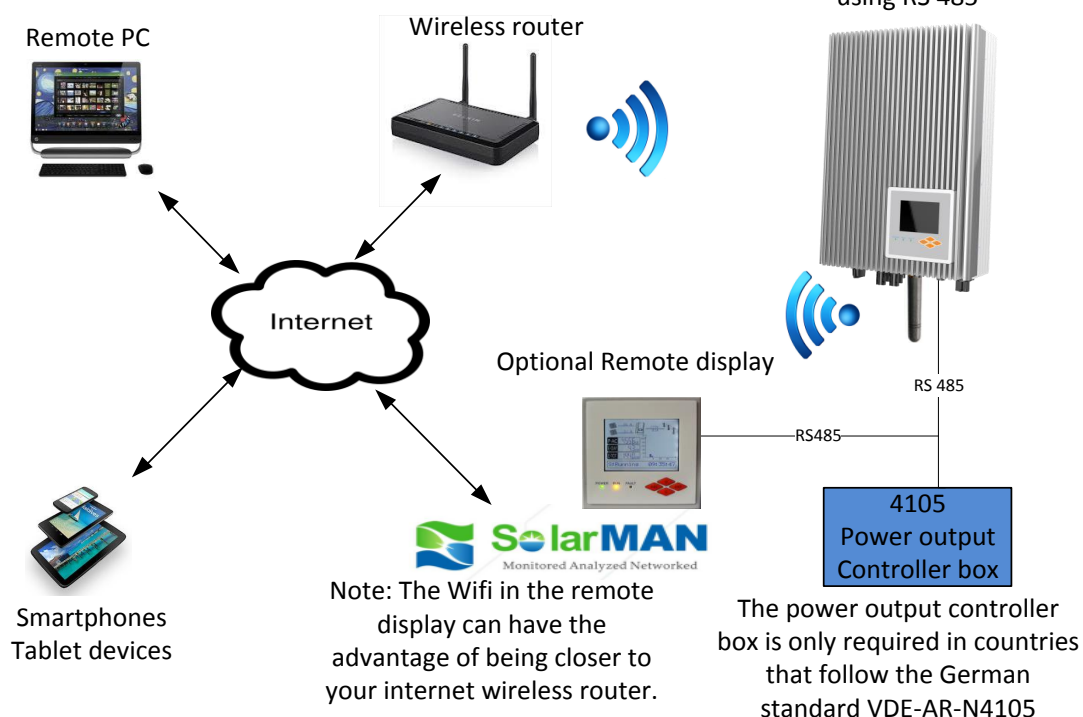
RS 485



The Power output controller box is only required in countries that follow the German standard VDE-AR-N4105

Wireless connection with remote monitoring via Solarman Portal

Note: Inverters can be added using RS 485



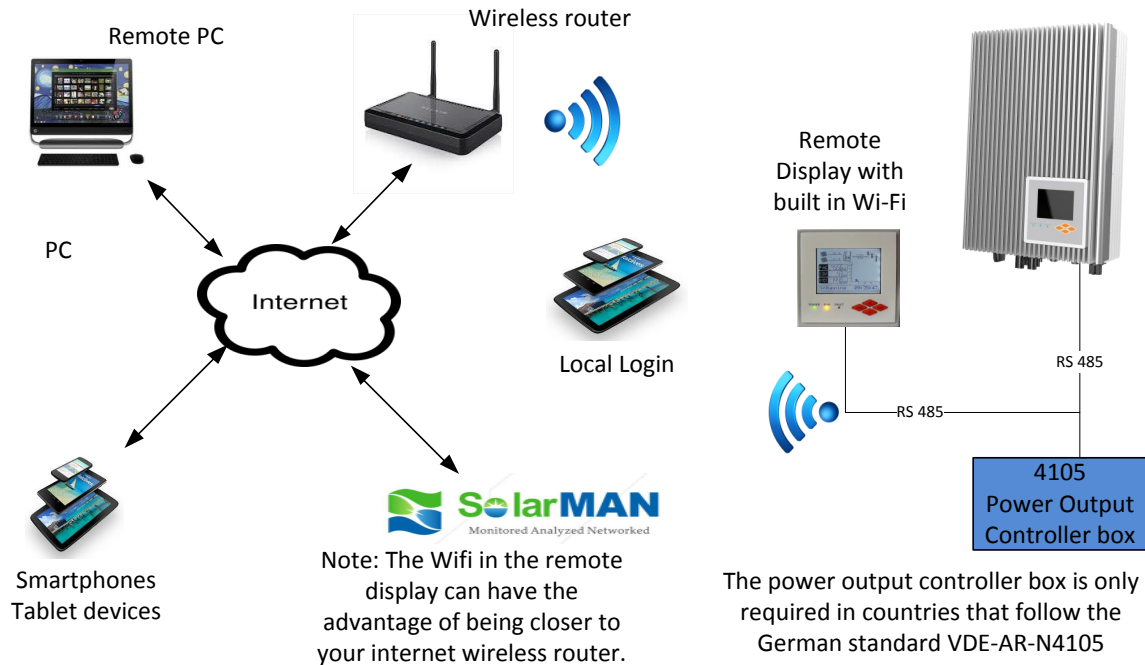
In this configuration you can monitor your inverter locally on the remote display or via the internet and the SolarMAN portal. To login remotely you can use a web browser or an application on your device.

Setup of this mode requires following the SolarMAN manual and establishing an account on the SolarMAN portal site.

Up to 4 inverters can be monitored thru the SolarMAN portal, if they are all on the one RS 485 bus

*Up to 10 inverters can be monitored thru the **remote display** if they are on the same RS 485 bus.*

Wireless connection with remote monitoring via Solarman Portal and a remote display with built-in Wi-Fi



In this configuration you can monitor your inverter(s) locally on the remote display, smart phone, tablet, local PC (with optional software) or via the internet and the SolarMAN portal. To login remotely you can use a web browser or an application on your device.

Setup of this mode requires following the SolarMAN manual and establishing an account on the SolarMAN portal site.

Up to 4 inverters can be monitored thru the SolarMAN portal, if they are all on the same RS 485 bus

*Up to 10 inverters can be monitored thru the **remote display** if they are on the same RS 485 bus.*

MAINTENANCE

Cleaning maintenance

With the unit OFF: (See powering off the inverter)

Switch off the unit and wait 30 minutes. After the heat sink is cooled down the heat sink fins on the front of the inverter can be cleaned using a long bristled brush. If necessary use warm soapy water to clean.

If any problems are found please contact your qualified service person.

General maintenance

Maintenance can be carried out by a qualified service person. If any repairs are required then only a qualified service person should do the repairs.

With the unit OFF: (See powering off the inverter)

Visually check cables, plugs, connectors, switches and connections to the inverter to make sure there are no damaged or deterioration of the covers and insulation or signs of heat damage around connectors.

After the heat sink is cooled down the heat sink fins on the front of the inverter can be cleaned using a long bristled brush. If necessary use warm soapy water to clean.

Check the operation of the switches. PV isolation and the inverters isolation sampling circuit breaker. (Installed by inverter installer) Shutdown the inverter by opening both the Grid mains isolation switch and the PV isolation switch. You can now turn on the PV isolation switch. If there is sufficient sun light the unit will come up in "standby". Close the Grid mains isolation switch and you should see the inverter run the "run checks" before the inverter goes to the "running" status.

Notes:

- 1. When doing checks for the PV and Grid isolation switches there needs to be sufficient sunlight that the PV array is ≥ 150 volts.*
- 2. German models will need 10 minutes before the inverter goes to the "running" status unless they turn the Grid isolation switch on first.*

Check the fault log to determine if there have been any faults that should be diagnosed as to why they are happening. (See Display flowchart and then look at the fault codes in the Appendix)

The inverter can now be left operating if no problems were found.

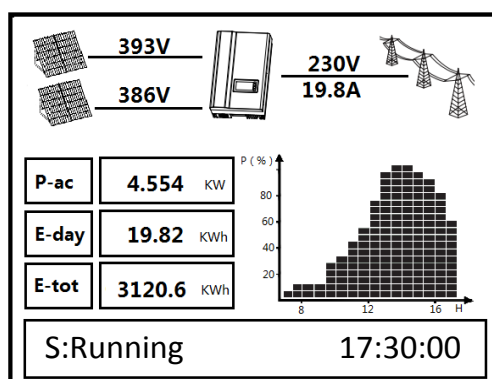
VIEWING INFORMATION

Built in display (Graphical)

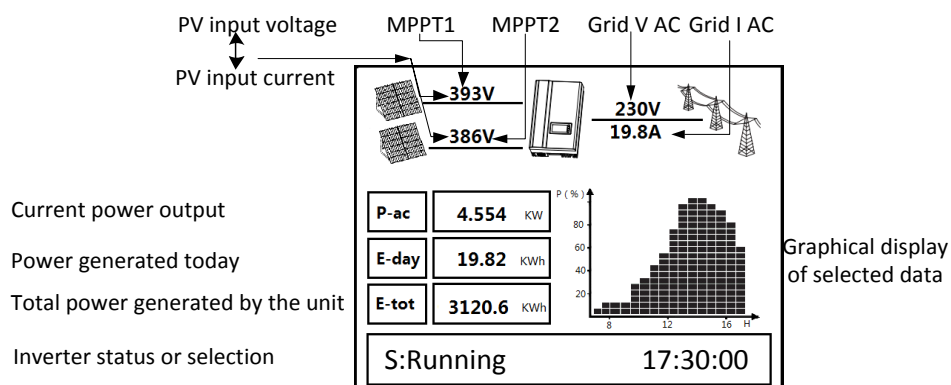
The graphical display is an option that can display information stored in the inverter. The information is displayed in tabular and graphical formats.

The password for the user menu is **2353**

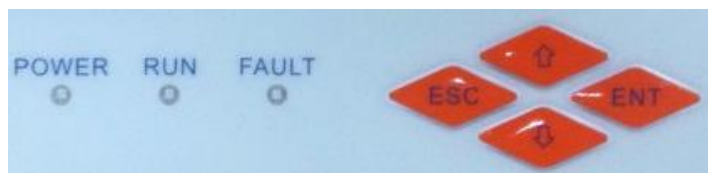
The Screen



Information displayed on the screen



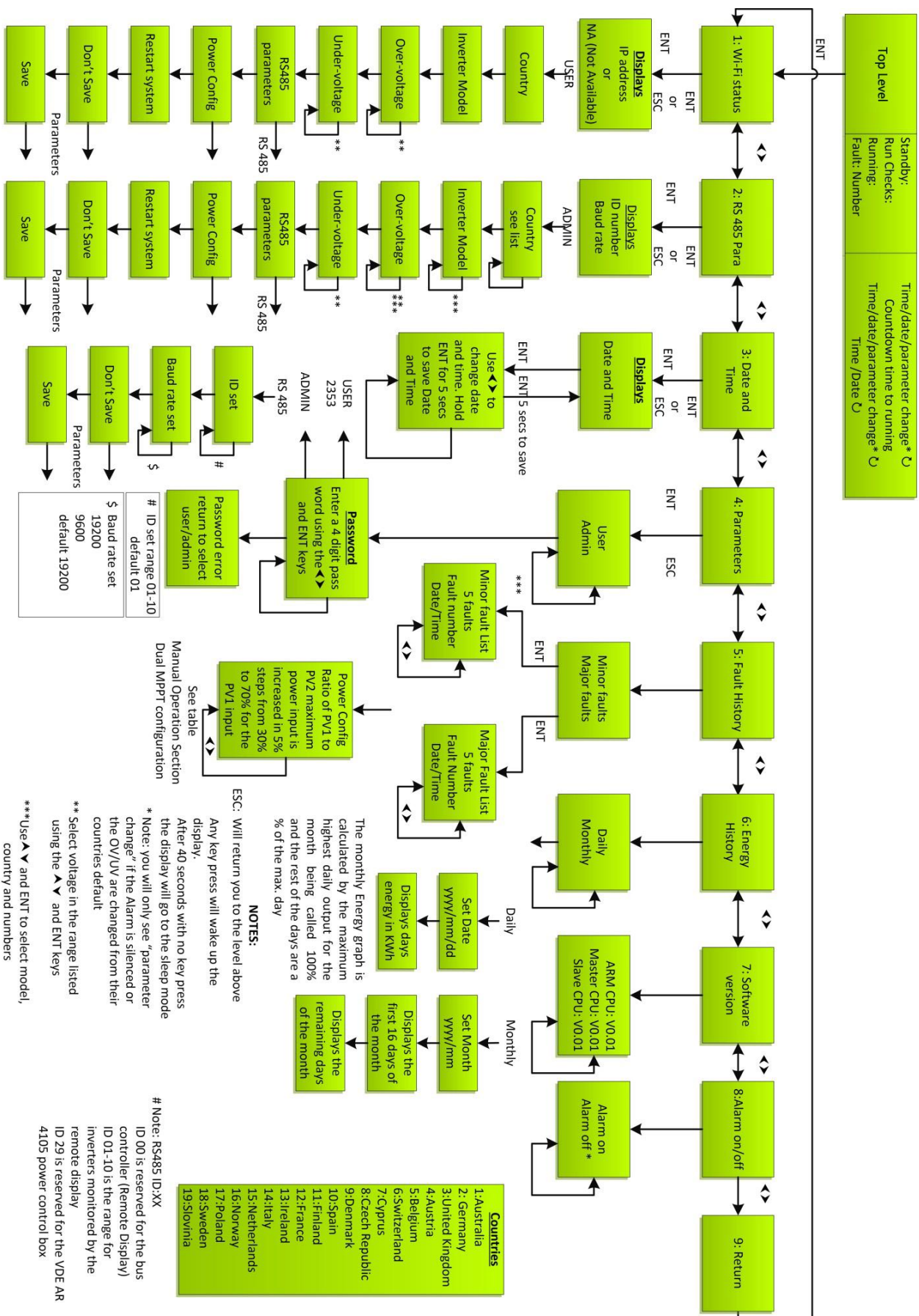
The screen also has four buttons that controls the information you can display.



ENT	Select an item or menu
ESC	Steps you back one level of a menu
▲	Moves up a menu item or increment
▼	Moves you down a menu item or decrement
POWER	Green when the unit Powers up PV ≥100Volts
RUN	Yellow when the inverter is connected to the grid
FAULT	Red if the inverter is in a fault condition.

Built-in Graphical Display

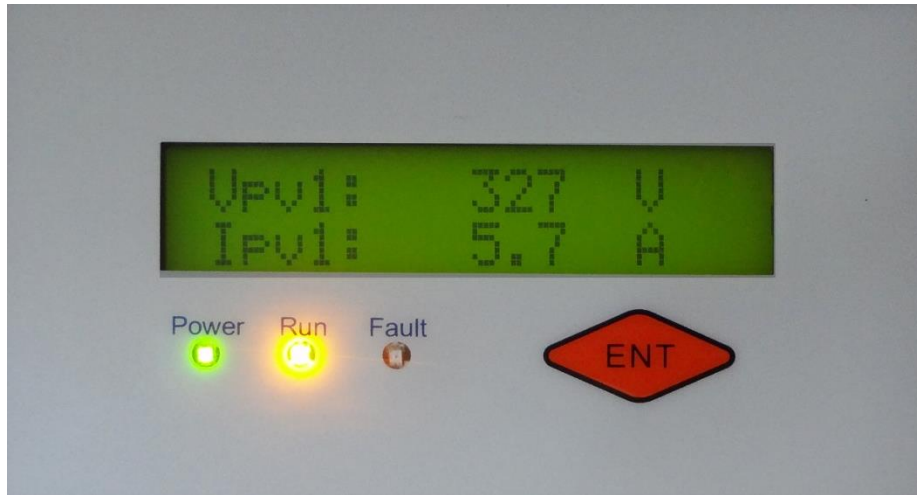
Built-in display Flow Chart (graphical)



Built-in two line display

The two line display has one key the ENT button. To manipulate the display either press the ENT key with a short press or for longer than two seconds.

The USER password is **2353**



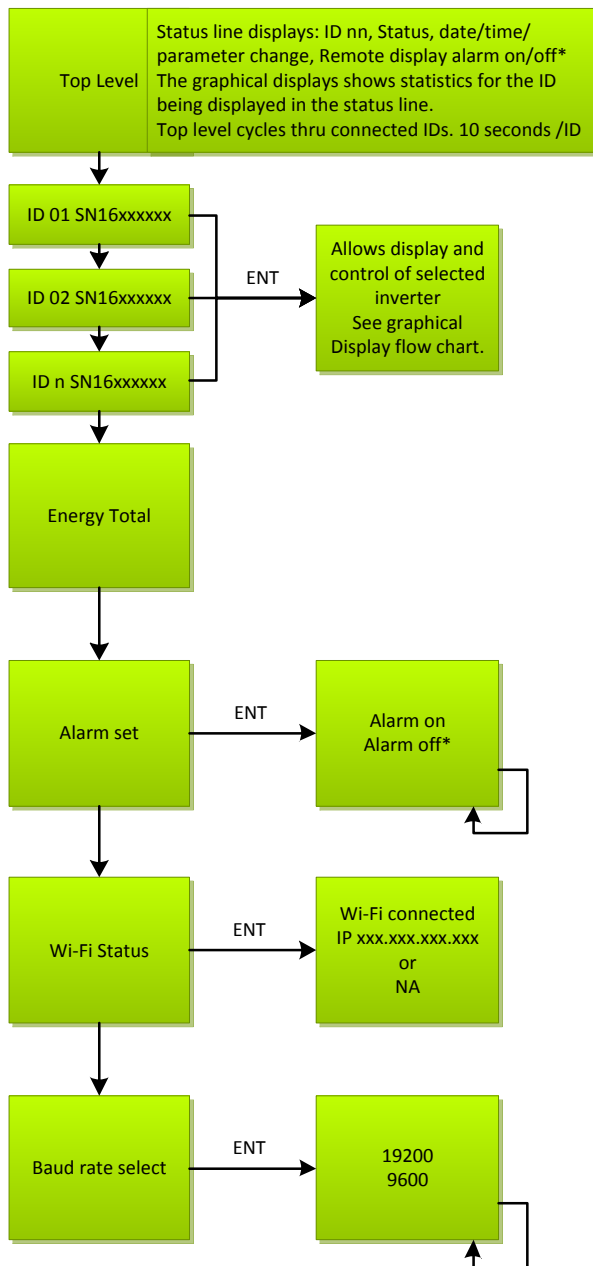
Remote Display

The remote display is functionally the same as the Graphical Display except it has the ability to monitor up to 10 inverters.

1. It has its own built in Aural alarm.
2. A remote reset can be sent to any of the monitored inverters.
3. Alarms from individual inverters can be turned off and on
4. The built in Alarm can also be silenced.
5. The remote display can be powered from an inverter or by a local power supply.
6. The remote display can have an optional Wi-Fi.
7. With the Wi-Fi in the remote display there is no need to have a Wi-Fi in your monitored inverters.
8. When the Wi-Fi is fitted in the remote display it is usually closer to a Wi-Fi access point so as you system can be monitored from the internet.



Remote Display Flowchart



Note: When an individual inverter is selected alarms from other inverters will still show on the fault light and as an Aural alarm

* When the local alarm has been silenced an "X" on the end of the status line will be displayed when the screen is at the top level

ESC will take you back to the Top Level

A maximum of 10 inverters can be monitored. The inverters must have sequential IDs i.e. 01-10

The display will return to the top level after 40 seconds if no key is pressed.

Aural alarm 1 second tone every 2 minutes.

Local Monitoring with Smartphone or Tablet App

Local monitoring is available with the wireless option installed in the inverter or remote display. In order to monitor using your smartphone or tablet you first need to download the SolarMAN application from the apple or android stores, and install them.

You can now login to your inverter locally by connecting to the SSID of your inverter Wi-Fi and entering your password. Note: You are able to change the SSID and password with the SolarMAN tools application that is available for download as well. It can also be changed using a PC login. The IP address for the Admin of your wireless device is 10.10.100.254. You will see a screen that you can now enter the user name and the password. User name is **admin** and the password is **admin**.

SolarMAN Portal

With an internet connection you can setup a portal connection with SolarMAN. To setup an account you will need to follow the supplied Wi-Fi handbook. Then go to the SolarMAN portal <http://www.solarmanpv.com/portal/> website. At the website select register and follow the instructions. Once you have setup your account you can then login to your account and monitor your inverter/s from anywhere you can connect to the internet.

Monitoring can be via the smartphone or tablet applications or from a PC using a web browser. When you connect using the web browser you are able to download graphical files and .csv files.

RS 485 connection



NOTICE

The RS 485 connection should be installed by a person with knowledge of computers and RS 485.

1. The RS 485 connection is used for connecting multiple inverters together.
2. Connect a remote display.
3. Connect a VDE AR N4105 power output controller box.

On a RS 485 bus each device has its own unique identification number ID. The remote display since it is a controller has the ID 00. By default all inverters are set to an ID 01. If multiple inverters are used then through the remote or local display, the ID of an inverter can be changed.

RS 485 ID range is 00-31.

1. ID 00 is used for the remote display or a controller like a PC
2. The remote display monitors a maximum of 10 inverters. The inverters needs to be addressed in the range 01 -10.
3. If your inverter has a VDE AR N4105 power output controller box attached to the RS 485 bus its ID will be ID 29(this is a reserved address)

Multiple inverter connection



APPENDIX

Inverter Specifications

Single MPPT models

Model	SCA1500SNW	SCA2000SNW	SCA2500SNW	SCA2800SNW	SCA3000SNW
DC Input Data					
Max. PV-generator power	1750W	2250W	2750W	3050W	3250W
Max. DC voltage	480V	480V	550V	550V	550V
Start voltage	150 V	150 V	150 V	150 V	150 V
PV Input Operating Voltage Range	110-450V	110-450V	110-550V	110-550V	110-550V
MPPT voltage range	120-450 V	150-450 V	175-500 V	200-500 V	225-500 V
Turn-off DC voltage	110 V	110 V	110 V	110 V	110 V
Max. DC current	15 A	15 A	15 A	15 A	15 A
Absolute Maximum Total PV Array Short Circuit Current	18.8 A	18.8 A	18.8 A	18.8 A	18.8 A
Number of DC connections	1	1	1	1	1
Number of MPPT trackers	1	1	1	1	1
DC-connection	MC4 or Amphenol Helios				
DC-switch	Optional				
AC Output Data					
AC connector	Plug-in connector (Amphenol S30 SD03 S10 001 U (F))				
Power connection	Single phase				
Nominal AC power	1500W	2000W	2500W	2800W	3000W
Max. AC power	1650W	2150W	2700W	3000W	3200W
Nominal AC voltage	180 - 270V				
Nominal AC frequency	50 / 60 Hz				
Nominal AC current	6.5A	8.7A	10.9A	12.2A	13.0A
Max. AC current	7.2A	9.3A	11.7A	13.0A	13.9A
Power factor	>0.99				
THD of AC current	< 3%	< 3%	< 3%	< 3%	< 3%
Power consumption at night	≈0W	≈0W	≈0W	≈0W	≈0W
Power consumption at standby	<5 W	<5 W	<5 W	<5 W	<5 W
Efficiency					
Max. efficiency	97.0%	97.0%	97.2%	97.2%	97.4%
Euro efficiency	96.0%	96.2%	96.3%	96.3%	96.5%
MPPT adaptation efficiency	>99.5%				

Model	SCA1500SNW	SCA2000SNW	SCA2500SNW	SCA2800SNW	SCA3000SNW
Safety Equipment					
DC insulation monitoring	Integrated				
Earth fault protection	Integrated				
Mains monitoring	Integrated				
Earth fault current monitoring	Integrated				
Islanding effect monitoring	Integrated				
AC I/P surge protection	MOVs and GDT integrated GDT= Gas Discharge Tube				
PV I/P surge protection	MOVs integrated MOV=Metal Oxide Varistor				
General Data					
LCD display	Two Line Display (Optional Remote Display)				
Communication	Wi-Fi , RS485				
Multi-function connector	RS 485, USB data(future enhancement), Aural alarm o/p, +5volts o/p, Sgnd.				
RS 485 connector	RS 485 signals				
Dimensions (L*W*H) [mm]	399x290x118		419x290x118		
Net weight [kg]	15kg		16kg		
Installation environment	Indoor / outdoor				
Mounting information	Wall mount				
Operating temperature	-20 °C to +60 °C(above 45 °C progressive de-rating occurs)				
Relative humidity	95%, no condensation				
Site altitude	Up to 2000m above sea level before de-rating occurs				
IP protection type	IP 65				
Isolation type	Transformerless				
Cooling concept	Free convection				
Noise level	<25 dBA				

Dual MPPT models

Model	SCT3200DNW	SCT3680DNW	SCT4000DNW	SCT4600DNW	SCT5000DNW
DC Input Data					
Max. PV-generator power	3460W	4000W	4350W	4800W	5350W
Max. DC voltage	550V	550V	550V	550V	550V
Start voltage	150 V	150 V	150 V	150 V	150 V
PV Input Operating Voltage Range	110-450V	110-450V	110-550V	110-550V	110-550V
MPPT voltage range	125-500 V	150-500 V	150-500 V	150-500 V	150-500 V
Turn-off DC voltage	110 V	110 V	110 V	110 V	110 V
Max. DC current	12 A	15 A	15 A	15 A	15 A
Absolute Maximum Total PV Array Short Circuit Current	15 A	18.8 A	18.8 A	18.8 A	18.8 A
Number of DC connections	2	2	2	2	2
Number of MPPT trackers	2	2	2	2	2
DC-connection	MC4 or Amphenol Helios				
DC-switch	Optional				
AC Output Data					
AC connector	Plug-in connector (Amphenol S30 SD03 S10 001 U (F))				
Power connection	Single phase				
Nominal AC power	3200W	3680W	4000W	4600W	5000W
Max. AC power	3400W	3800W	4200W	4600W	5200W
Nominal AC voltage	180 - 270 V				
Nominal AC frequency	50 / 60 Hz				
Nominal AC current	13.9A	15.7A	17.4A	20.0A	21.7A
Max. AC current	14.8A	16.5A	18.3A	20.0A	22.6A
Power factor	0.95 leading ~ 0.95 lagging				
THD of AC current	< 3%	< 3%	< 3%	< 3%	< 3%
Power at night	≈0W	≈0W	≈0W	≈0W	≈0W
Power at standby	<5 W	<5 W	<5 W	<5 W	<5 W
Efficiency					
Max. efficiency	97.4%	97.5%	97.5%	97.6%	97.6%
Euro efficiency	96.5%	96.8%	96.8%	97.0%	97.0%
MPPT adaptation efficiency	>99.5%				
Safety Equipment					
DC insulation monitoring	Integrated				
Earth fault protection	Integrated				
Mains monitoring	Integrated				
Earth fault current monitoring	Integrated				
Islanding effect monitoring	Integrated				
AC I/P surge protection	MOVs and GDT integrated GDT= Gas Discharge Tube				
PV I/P surge protection	MOVs integrated MOV=Metal Oxide Varistor				

Model	SCT3200DNW	SCT3680DNW	SCT4000DNW	SCT4600DNW	SCT5000DNW
General Data					
LCD display	Yes, Remote Display (optional)				
Communication	RS 485, Wi-Fi (optional)				
Multi-function connector	RS 485, USB data(future enhancement), Aural alarm o/p, +5volts o/p, Sgnd.				
RS 485 connector	RS 485signals				
Dimensions (L*W*H) [mm]	540x325x130				
Net weight [kg]	21				
Installation environment	Indoor / outdoor				
Mounting information	Vertical or Horizontal				
Operating temperature	-20 °C to +60 °C(above 45 °C progressive de-rating occurs)				
Relative humidity	95%, no condensation				
Site altitude	Up to 2000m above sea level before de-rating occurs				
IP protection type	IP 65				
Isolation type	Transformerless				
Cooling concept	Free convection				
Noise level	<25 dBA				

Wi-Fi Option Specifications

General	
Max. number of inverters	1
Remote communication	WiFi(802.11 b/g/n)
WiFi frequency	2.412GHz-2.484GHz
WiFi communication range	400m in outdoor open area without obstruction
Status display	3 LEDs
Data access	WiFi point-to-point Remote server
WiFi transmitting power	802.11b/g/n:+20dBm/+18dBm/15dBm(Max) Configurable by users
WiFi receiving sensitivity	802.11b: -89dBm 802.11 g: -81dBm 802.11 n: -71dBm
External antenna	External:I-PEX connector
	Internal:Board antenna
Data collection intervals	5minutes(Default) 1-15minutes(Optional)
Data interface	UART : 12000bps - 57600bps/RS485/RS232
Memory	1-16M (Optional)
Preferences setting	Web Server
Firmware updates	Wireless
Electrical	
Working voltage	DC 3.3V/DC 5V/DC 5.5-25V (+/-5%)
Working current	170mA~300mA(@3.3V)
Environmental	
Operating temperature	-25~+85°C
Storage temperature	-40~+125°C
Storage humidity	<40%
Operating humidity	10%-90% Relative humidity, no condensation
Physical	
Dimension(L*W*H)	25mm*40mm*3mm
Other	
Warranty	5 years
Certificates	FCC,CE

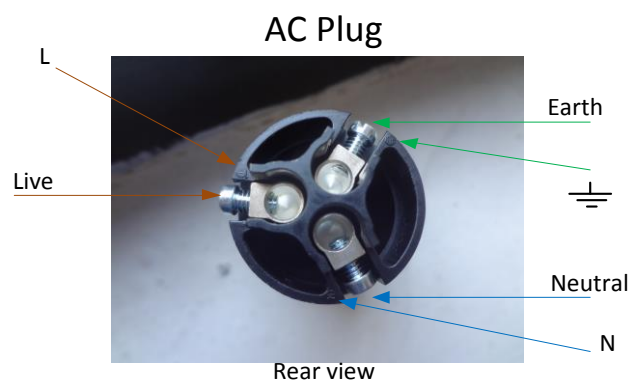
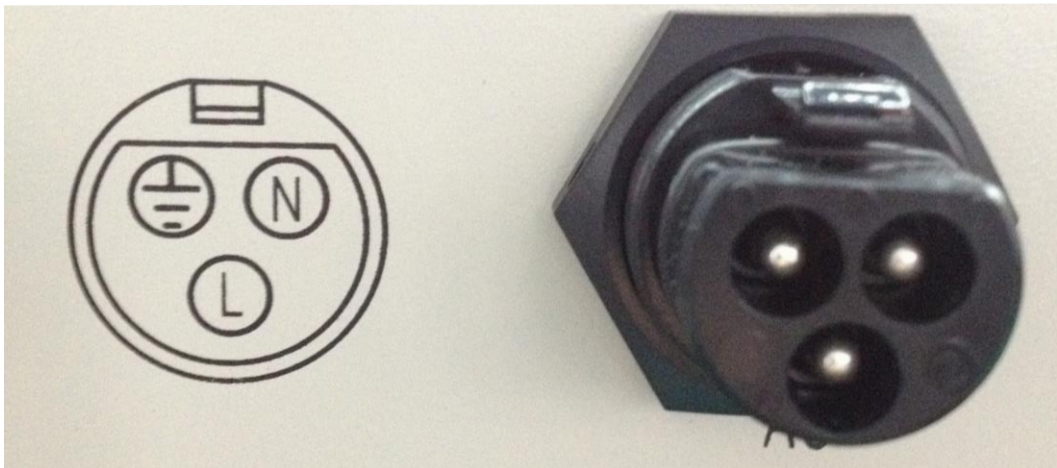
Connector details

AC connection

The inverter is equipped with a water-proof direct plug-in connector for the AC connection at the bottom of the inverter. Plug supplied.

AC cable should be copper 4²mm minimum. Calculations are required to determine the resistance between the switchboard and the inverter which is required to be less than 2Ω. This is required for the anti-islanding to function correctly.

The AC connector supplied is able to take wire sizes 2.5²mm to 6²mm. The connector type is an Amphenol S30 SD03 S10 001 U (F)



Amphenol Helios H4 connector

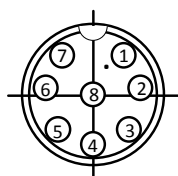


CAUTION

- 1) The connector must be isolated and disconnected from the power supply during the assembling or disassembling process.
- 2) Do not disconnect under load.
- 3) The use of PV cable is recommended.
- 4) The use of tin plated cable is recommended.
- 5) The connectors are IP68 rated

Multifunction connector

Singatron 2CT3032-W08300



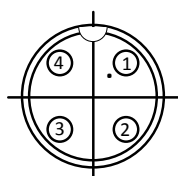
Pin Assignments
Plug Front View

1:RS 485 -	5:USB D+
2: RS 485 +	6:SGND
3:+5V	7:Alarm Output
4:USB D-	8:Not connected

Pin 3 +5 volts can supply a maximum of 500mA.

RS 485 connector

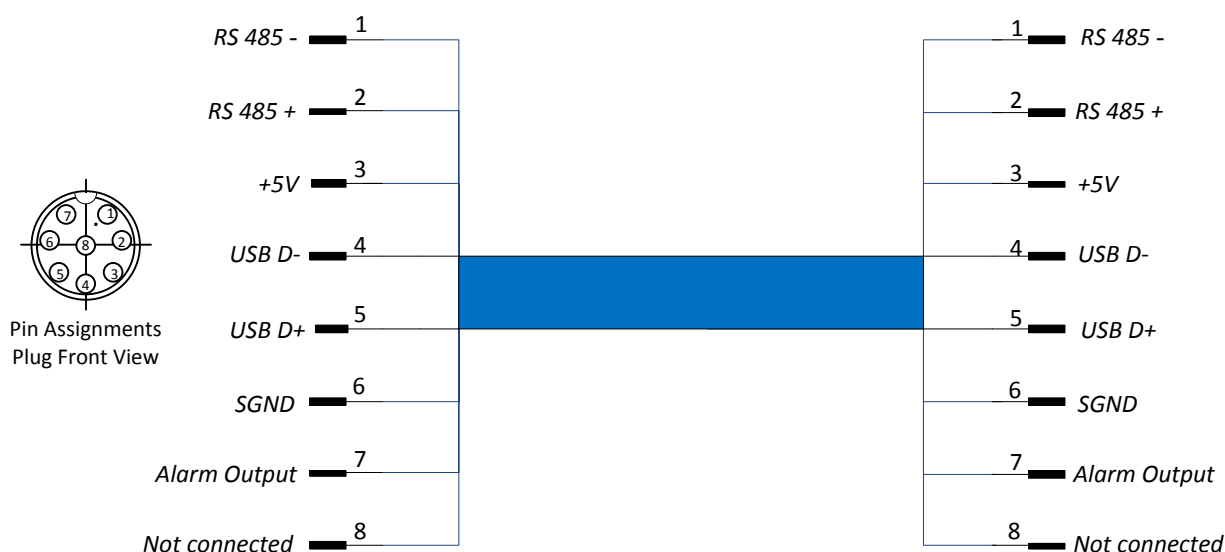
Singatron 2CT3032-W04300



Pin Assignments
Plug Front View

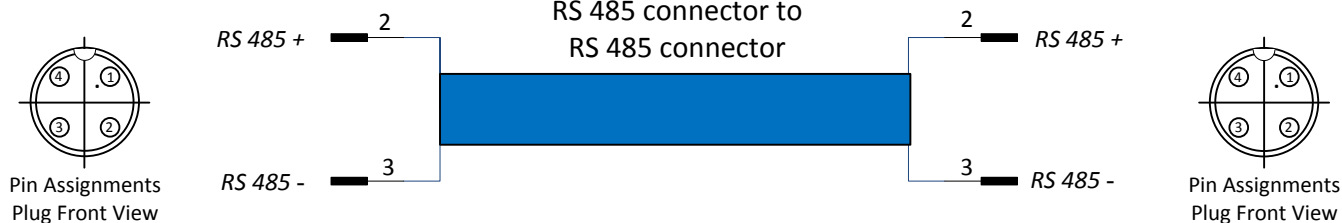
1: Not connected	3: RS 485 -
2: RS 485 +	4: Not connected

Multi function cable



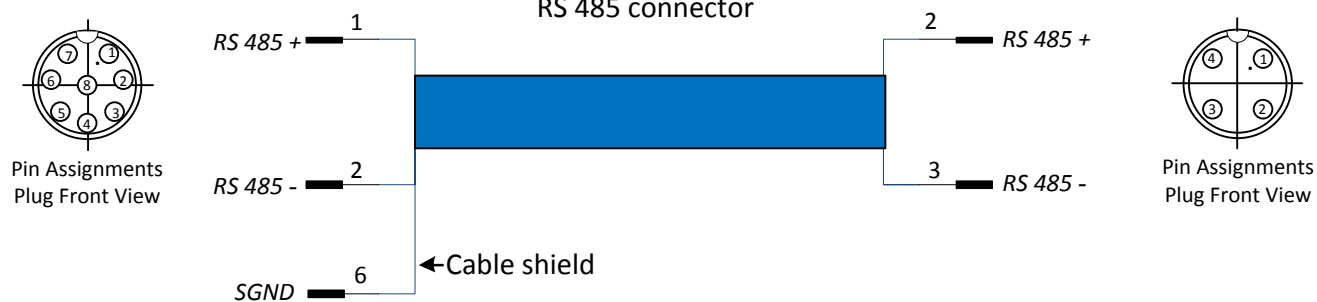
RS 485 cable

RS 485 connector to RS 485 connector



RS 485 cable

Multi function connector to RS 485 connector



Note:

1. Cables that are installed outside should have a UV stabilised outer sheath.
2. Cables should be twisted pairs with a shield.
3. The multi-function cable is normally used with the remote display, it can also be used for the remote alarm or RS485 connection. A future enhancement will be also used as a USB port to update firmware.

Inverter Fault Codes

Fault code	Description		
1	Bus voltage: overvoltage	Hardware	<u>MAJOR</u> Any fault from this group will be listed in Major Faults table
2	Grid current: overcurrent		
3	PV1 current: overcurrent		
4	PV2 current: overcurrent		
5	PV1 reverse current: overcurrent		
6	PV2 reverse current: overcurrent		
7	IGBT driver protection		
8	DC offset on AC output exceeded		
9	Leakage current: overcurrent	Grid problems or Operating temperature faults (Recoverable)	<u>MINOR</u> Any fault will be listed as Minor
10	Over temperature		
11	Grid voltage: abnormal		
12	Grid frequency: abnormal		
13	Frequency change: abnormal	Hardware	<u>MAJOR</u>
14	EEPROM fault		
15	FLASH fault.	Hardware	<u>MAJOR</u>
16	A to D offset abnormal	Hardware	<u>MAJOR</u>
17	Earth fault	No earth connection	<u>MAJOR</u>
18	Grid LN transposition	AC output connection problem	<u>MAJOR</u>
19	MOV fuse fault	Hardware	<u>MAJOR</u>
20	Insulation resistance fault		
21	RCMU fault		
22	AC relays fault		
23	DSP-DSP communication error	Connection error or hardware fault	<u>MINOR</u>
24	ARM-DSP communication error		
25	COMM-Display CPUs communication error		
26	WIFI communication error		
27	COMM CPU Program checksum error	Program corruption: update firmware	<u>MAJOR</u>
28	Display CPU Program checksum error		
29	Master CPU Program checksum error		
30	Slave CPU Program checksum error		
31	PV1 voltage sampling circuit fault	Sampling circuit fault Master and Slave DSP results are different.	<u>MAJOR</u>
32	PV1 current sampling circuit fault		
33	PV2 voltage sampling circuit fault		
34	PV2 current sampling circuit fault		
35	Bus voltage sampling circuit fault		
36	Grid frequency sampling circuit fault		
37	Grid voltage sampling circuit fault		
38	Grid current sampling circuit fault		
39	Leakage current sampling circuit fault		
40	Temperature sampling circuit fault		

Warranty

SLD Power Co., Ltd offers a 5 years warranty service for SolCasa series inverter. The warranty period is from the date of installation. However the longest period will not exceed 66 months from the date of delivery of the inverter.

During the warranty period, SLD Power Co., Ltd guarantees normal function of the SolCasa inverter. If there are faults within our responsibility, we will provide maintenance free of charge.

During the warranty period, if inverter fails or constantly has an error code, please contact your dealer or installation contractor.

The followings are not included in the scope of warranty:

- *SolCasa inverter is used for other than the purpose it is designed for.*
- *Installed incorrectly or not conforming to regulations.*
- *Improper usage*
- *Modification of the inverter without authority;*
- *Damage because of external factors or the majeure force (such as lightning, over-voltage, bad weather, fire, earthquake, tsunami and so on);*
- *Poor ventilation;*
- *Not installed to comply with relevant safety regulations;*
- *Transportation damage.*
- *Technical inquiry*

If you have any technical problems concerning our products, you can contact us via: www.sldpower.com service. We require the following information in order to provide you with the necessary assistance:

Model of your inverter

Serial number

Type and number of PV modules connected

Displayed fault messages from the inverter fault history. Both major and minor faults.

Country the inverter is installed in.

Agent from which the inverter was purchased.

Contact details



Wuxi SLD Power Technology Co., Ltd.

ADD: NO.201, Jinshan Road, Jiangyin, Wuxi 214400, China.

Tel: +86 510 8699 0086

Fax: +86 510 8160 2143

Email: service@sldpower.com

Website: www.sldpower.com

European local service center



3XL SolarSolutions BV

ADD: Haarlemmerstraatweg 73E, 1165 MK Halfweg, The Netherlands

Tel: +31 (0) 6 42 46 92 46

Email: service@3xl-solarsolutions.com

Website: www.3xl-solarsolutions.com