



Installation Manual

Energy Storage System (ESS)

Storion OF5

V1.1



IMPRINT

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1. Introduction

1.1 System Introduction

Storion OF5 is an energy storage system specifically developed for off-grid applications by AlphaESS. Storion OF5 is designed to be applied in DC coupling system with connection port available for generator as backup power source.

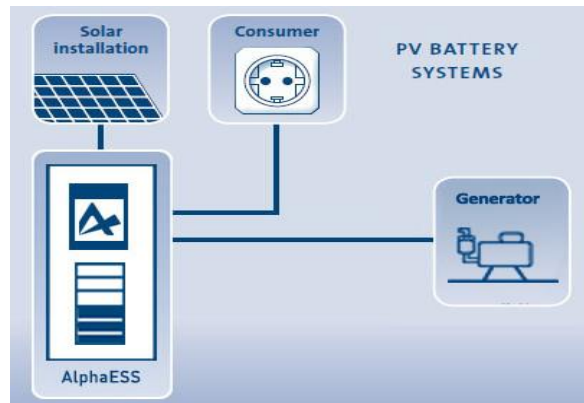


Figure 1. Storage OF5 connection diagram

1.2 General Precautions



Warning - electrical hazards

Please read through this manual carefully before operation.

- System should be installed indoor and kept away from water, high temperature, mechanical force and flames.
- Do not install the system in any environment of temperature below -10°C or over 50°C , and humidity over 80%.
- Do not touch the system with wet hands.
- Do not put any heavy objects on the top of the cabinet.
- Do not move the cabinet when it is already filled with battery modules.
- Place the cabinet vertically and slip-resistant in your transport vehicle.
- Secure the cabinet against tipping with restraining straps in your vehicle.
- Transport the cabinet with more than 1 person.
- Do not lay the cabinet on the backside.
- The transportation of **AlphaESS Storion OF5** must be made by the manufacturer or an instructed personal. These instructions shall be recorded and repeated.
- A certified ABC fire extinguisher with minimum capacity of 2kg must be carried along when transporting.
- It is totally prohibited to smoke in the vehicle as well as close to the vehicle when loading and unloading!
- Opening the outer packaging of the battery module by the driver or his

assistant is prohibited!

- For the exchange of a battery module, please request for new hazardous goods packaging if needed, pack it and let it picked up by the suppliers.
- The other transportation requirements of hazardous goods like ADR must be followed as well.
- Disconnect AC, DC and battery power from the inverter before attempting any maintenance!

1.3 Delivery Scope

Storage cabinet, battery modules and inverter will be delivered in three separate packaging units. The battery modules will be sent individually in extra security packages.

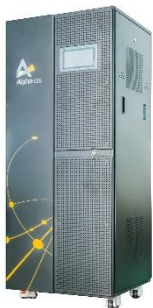
AlphaESS delivers a total system separately on site to client, this consists of:

ESS Cabinet	1(with super cable box)
battery	Some(M 4860,M48100,M48112-P)
Inverter	1 (AEV-5048)

1.3.1 ESS Cabinet

ESS Cabinet consists of:

- Cabinet(with cable or super cable box)
- MC4-PV-Plugs



a. Cabinet



c. MC4-PV-Plugs

Figure 2. Delivery Scope AlphaESS – storion OF5 Cabinet

1.3.2 Battery Module

Battery module (M4860, M48100, M48112-P) consists of:

- Battery (M4860, M48100, M48112-P)
- RJ45 cable
- Enclosure screws



a. M4860/M48100/M48112-P

b. RJ45 cable

c. Enclosure screws

Figure 3. Delivery Scope AlphaESS - Battery Modul

1.3.3 Inverter



Figure 4. Delivery Scope AlphaESS - Inverter

1.4 System Appearance



Figure 5. Storion OF5 – Details

Item	Components
1	Inverter (behind the front cover) AEV-5048
2	super cable box
3	Battery (1 to 4 M4860/M48100/M48112-P)
4	EMS screen

Behind the front door of the cabinet, there are the ON / OFF switches of the storage system and the system connections via the pre mounted super cable box:

Super cable box:

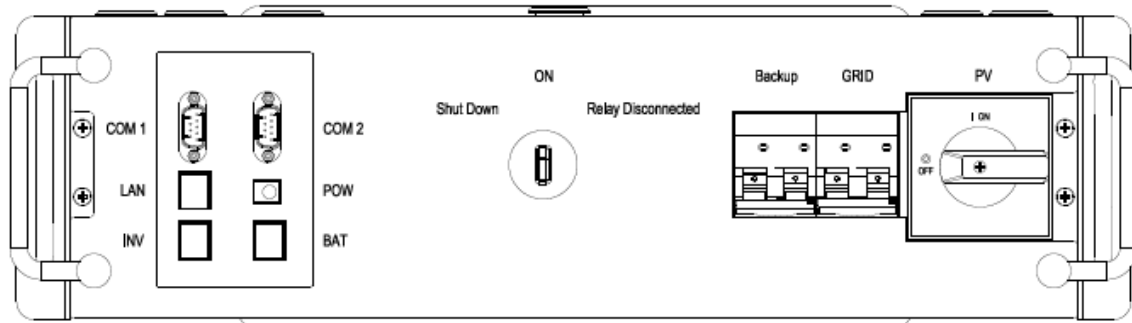


Figure 6. Super cable box – Front

COM1	EMS communication	BAT	Battery communication
COM2		ON	Battery Switch
LAN	EMS-Internet	Backup	AC Switch
POW	EMS Power	GRID	Generator on/off switch
INV	Inverter communication	PV	PV Switch

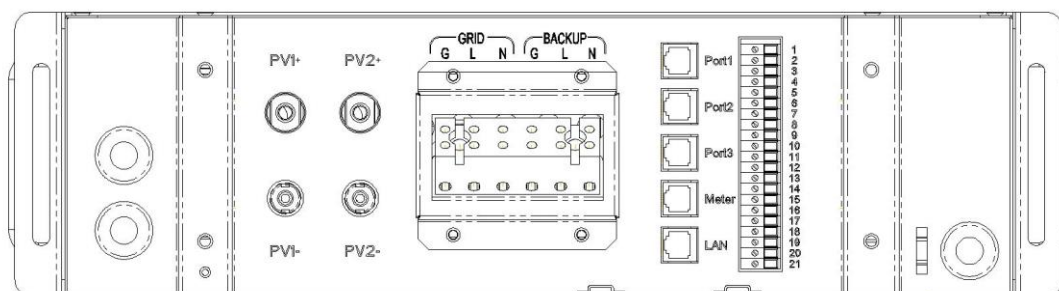


Figure 9. Super cable box- Back

PV1,PV2	PV Connector	METER	RS485 connection for meter
GRID/BACKUP	Terminal Board AC/GEN	LAN	Ethernet connection
Port1	Reserved	Port2/3	Communication port for dispatch
AUX 01 to 21	19-21 are dry contact, for start-stop diesel generator and other equipment. Others reserved.		

1.5 Liability Limitation

Any product damage or property loss caused by the following conditions AlphaESS does not assume any direct or indirect liability.

- Product modified, design changed or parts replaced without AlphaESS

authorization;

- Changes, or attempted repairs and erasing of series number or seals by non AlphaESS technician;
- System design and installation are not in compliance with standards and regulations;
- Failure to comply with the local safety regulations (VDE for DE, SAA for AU);
- Transport damage (including painting scratch caused by movement inside packaging during shipping). A claim should be made directly to shipping or insurance company as soon as the container/packaging is unloaded and such damage is identified;
- Failure to follow any/all of the user manual, the installation guide and the maintenance regulations;
- Improper use or misuse of the device;
- Insufficient ventilation of the device;
- The maintenance procedures relating to the product have not been followed to an acceptable standard;
- Force majeure (violent or stormy weather, lightning, overvoltage, fire etc.).
- Damages caused by any external factors.

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2. Installation

This manual carefully describes the basic steps on how to install and set up the AlphaESS storage system.

2.1 Installation Site and its Environment

The following sites are not allowed for installation:

- sites where the freezing point is reached, like garages, carports or other places
- sites with humidity over 80 % and condensation
- sites which are salty, where humid air can penetrate
- flooded areas
- earthquake areas –additional security measures are required here
- sites with ammonia containing environment
- sites that are higher than 2000 meters above the sea level
- sites with explosive atmosphere
- sites with direct sunlight
- sites with extreme change of ambient temperature
- wet rooms.

2.2 Inverter



Figure 10. Disassemble panel

Step1: Disassemble the back panel and 2 side panels, then carry them separately to site.

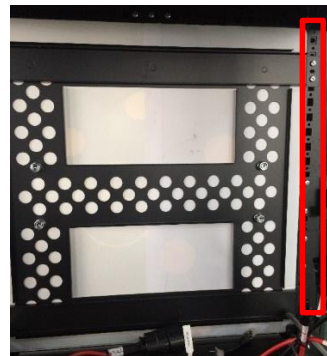


Figure 11. Remove the cable plugs and front panel

Step2: Remove all the cable plugs from the cable box and unscrew the bolts to take out the logo panel.



Figure 12. Take out the holder

Step3: Take out the holder from the cabinet and assemble the holder to the inverter.

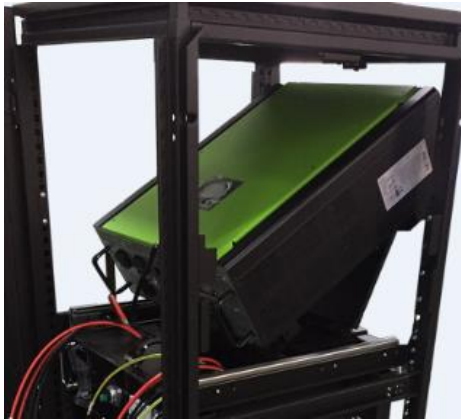


Figure 13. Assemble the holder to the cabinet

Step4: Assemble the holder in the cabinet and screw the holder to the cabinet.



Figure 14. Connection Inverter - Cable box

Step5: Connect the OUTPUT, GEN(if have), Battery, and MC4 PV plugs.

Step6: Screw the bolts and fasten the panel in the back of the cabinet.

Notice: Storion OF5 is a off grid system, GRID INPUT can not be connect.

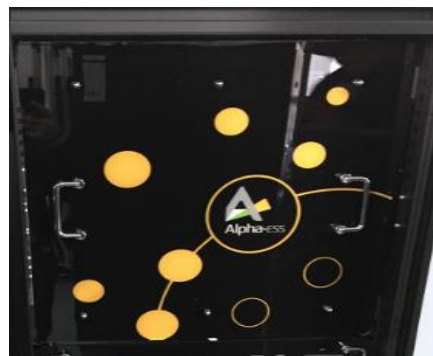


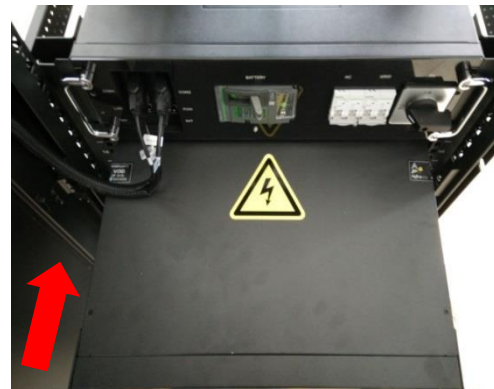
Figure 15. Screw the front panel back on

Step6: Connect all the cable plugs from the cable box and screw the front panel back on.

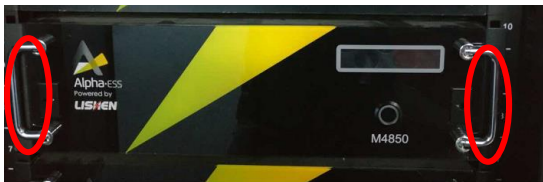
2.3 Battery Installation



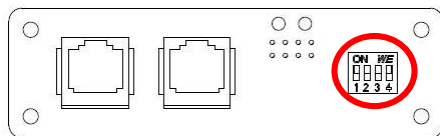
Step1: Check if all seals are intact.



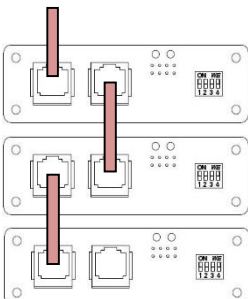
Step2: Slide the battery into the shelf without excessive force.



Step3: Screws the bolts to fasten the battery.



Step 5: Set the DIP switch 2 to "on" of the bottommost module and set the DIP switch 4 to "on" all the batteries.



Step 6: Connect battery communication and cable box/super cable box (RJ45).

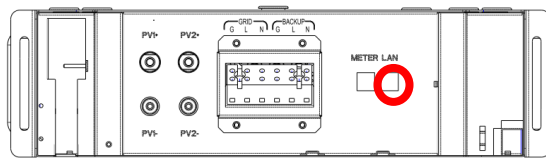


Step4: Connecting the modules,.



Step 7: Connect PV, GRID, BACKUP cables. GRID connect GEN (if have).

2.4 Internet Connection



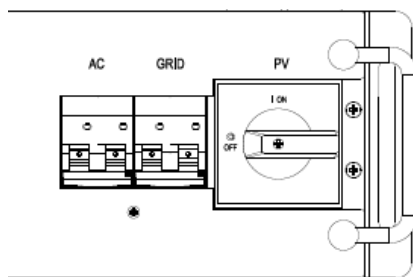
Connected to a router with a network cable. Plug it into the ethernet port at the backside of the system.

Note: OF5 system do not connect the meter.

3. Switch on the System

3.1 Switch on

System shall be turned on in the correct sequence to avoid any damage.



Step 1, turn on the PV switch on the cable box.

Step 2, If generator is applied, connect it to Grid ports and turn on the GRID switch; if not, then keep the GRID switch off.

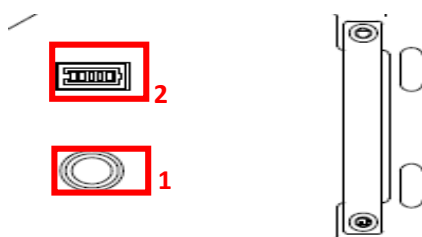
Step 3, Turn on the AC switch.

Note: the Grid switch is only used when a generator is applied.



Step 4, turn on the Battery switch.

Step 5, Press button 1 on all the batteries, and the indicator light 2 will be on.



3.2 Switch off

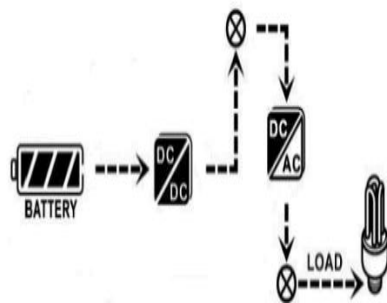
Step 1, Press button 1 on all the batteries, till the lights off.

Step 2, turn off the Battery switch.

Step 3, Turn off the AC switch.

Step 4, If generator is applied, turn off the GRID switch.

Step 5, turn off the PV switch on the cable box or super cable box.



The system may shut down itself to protect the batteries from over discharging in responding to the large loads. To restart the system, the sequence should be:

Step 1, Turn off all the battery modules and restart them;

Step 2, Open the front door and remove the front panel;

Caution, do not touch any metal parts of the inverter to avoid potential electrical shock.

Step 3, Press the button "ON" on the inverter shortly to light on the screen and then press it again for over 5 sec until the picture as shown on left appears on the screen.

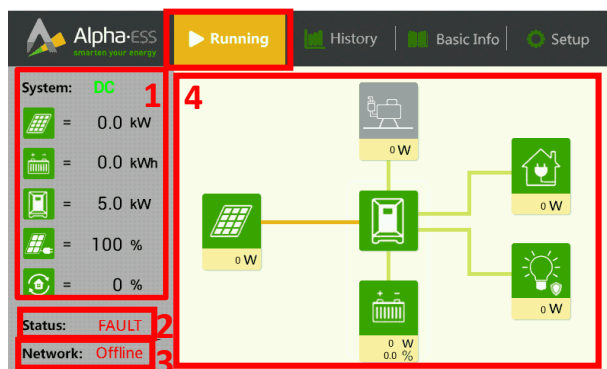
Step 4, Screw the front panel back on and lock the front door.

More information can be found in [M4860/M48100/M48112-P user manual](#).

4. EMS Installation

When the system turn on, EMS display will be light.

4.1 Home page



The information in running page includes:

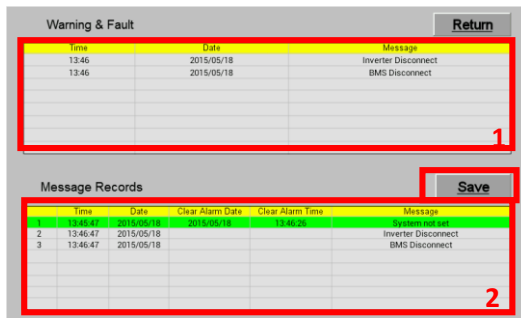
1: From top to bottom: PV size, battery capacity, inverter size, self-consumption rate and self-sufficient rate.

2: System Status (Normal/Fault)

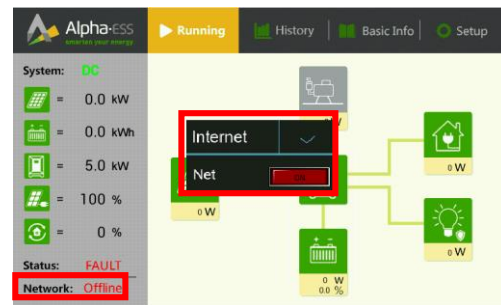
3 : Internet Status (Online/Offline)

4: Running Diagram

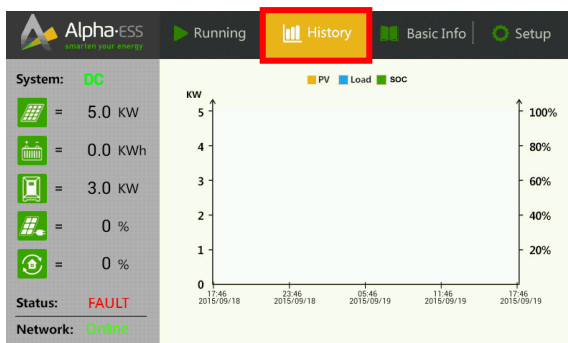
Note: the load of GRID is always display 0, because it is an off grid system.



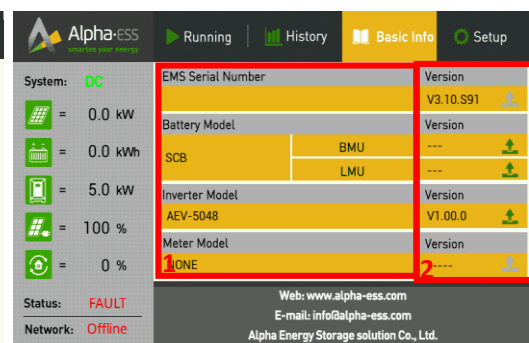
Click the status can see the message, The upper list (1) shows current errors and warnings; the lower list (2) shows already solved errors and warnings. The error information can be saved by pressing the button „Save in the USB or SD card.



Click the field “Network” to switch the internet connection of your storage system on or off. Please make sure your system is connecting the internet.



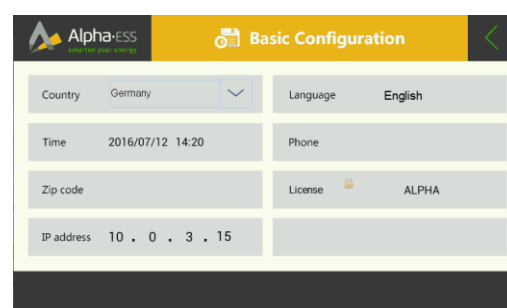
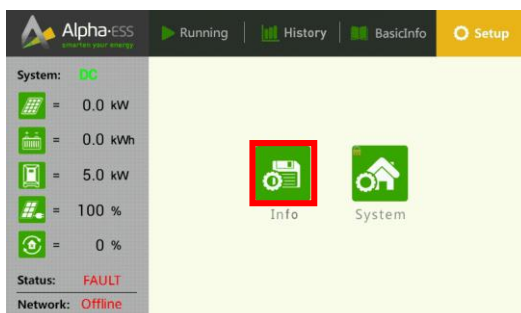
“History” shows 24 hours of history data for “PV”, “Load”, and “SOC” before the current time.



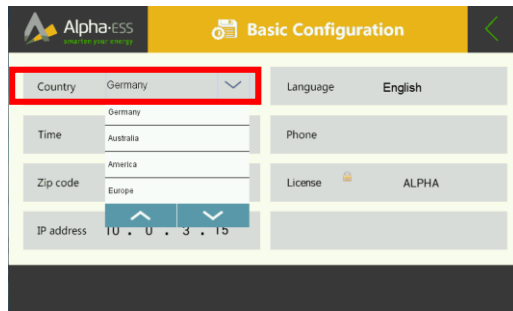
The “Basic Info” section shows the component models of your systems (1) and their Firmware version (2). You can click the button to update the BMU and LMU.

4.2 Set up

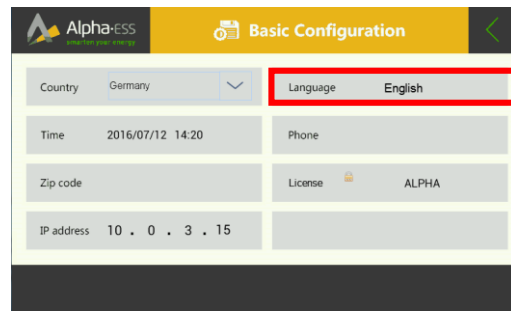
When the EMS start first, you will set up the basic configuration and system.



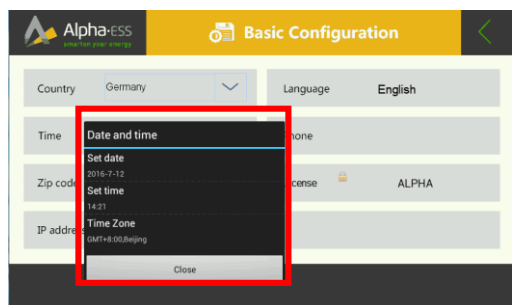
Click the info button to set up the basic configuration.



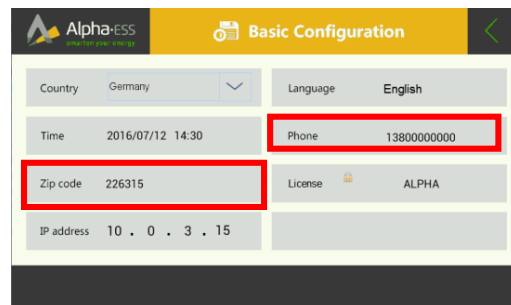
Step1: Press "Country" to set the country of the installation site.



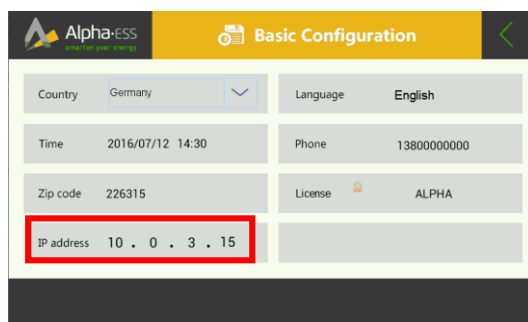
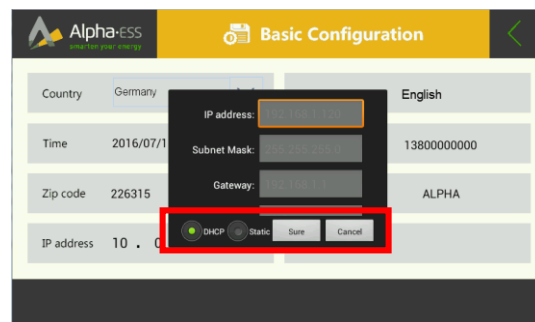
Step2: Press "Language" to set the language.



Step3: Press "Time" to set the date, time, zone, then click the "Close"



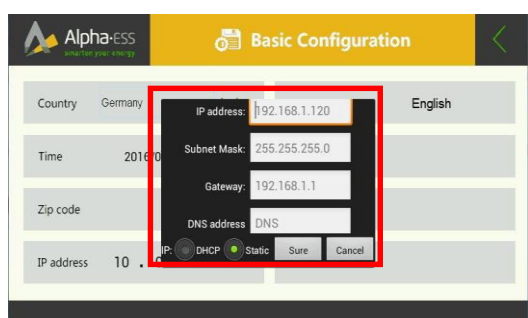
Step4: Press "Phone" and "Zip code" to set the phone number and zip code.

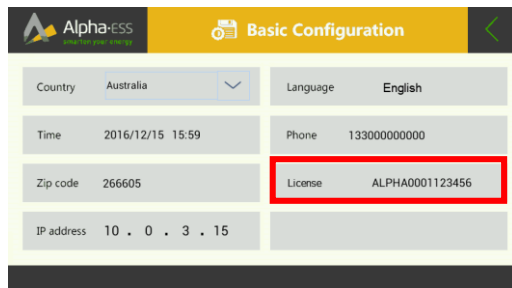



Step5: Click on "IP address" to configure the IP address of the system.

Note: if you choose (DHCP), Confirm input (depending on the router settings) with "Sure".

If you select Static IP, please make sure the following information is filled: IP address, subnet Mask, Gateway, DNS address.

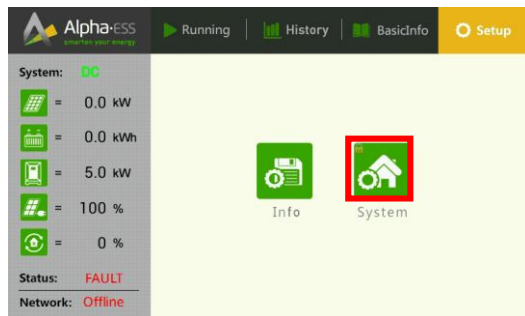




Country	Australia	Language	English
Time	2016/12/15 15:59	Phone	13300000000
Zip code	266605	License	ALPHA0001123456
IP address	10 . 0 . 3 . 15		

Step6: Click "License" to set the license.

4.3 System set up

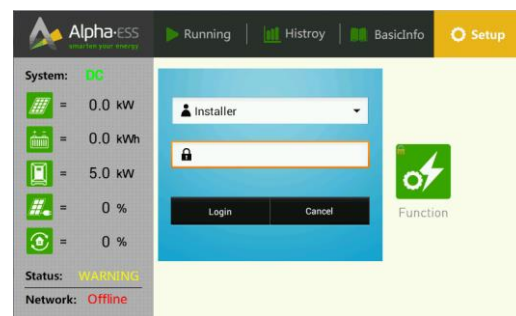


System: DC

- 0.0 kW
- 0.0 kWh
- 5.0 kW
- 100 %
- 0 %

Status: FAULT
Network: Offline

Info System



System: DC

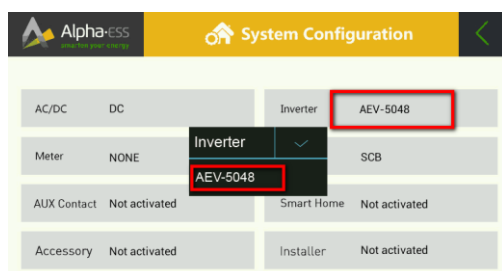
- 0.0 kW
- 0.0 kWh
- 5.0 kW
- 0 %
- 0 %

Status: WARNING
Network: Offline

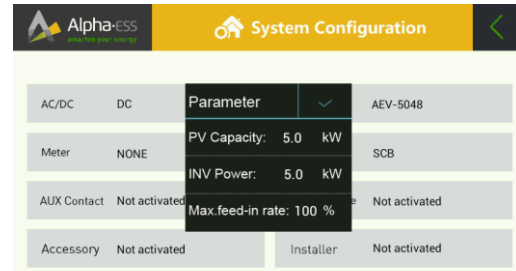
Installer

Login Cancel

Step1: Press "System" and input the password to enter the system display.

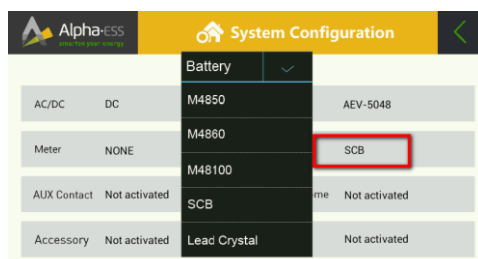


AC/DC	DC	Inverter	AEV-5048
Meter	NONE	SCB	
AUX Contact	Not activated	Smart Home	Not activated
Accessory	Not activated	Installer	Not activated

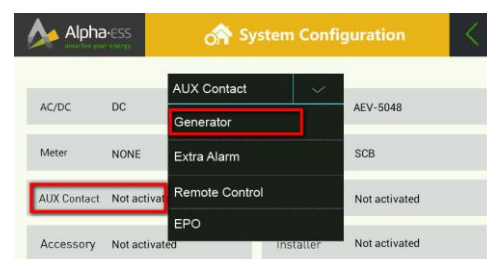


AC/DC	DC	Parameter	AEV-5048
Meter	NONE	PV Capacity: 5.0 kW	SCB
AUX Contact	Not activated	INV Power: 5.0 kW	
Accessory	Not activated	Max.feed-in rate: 100 %	
		Installer	Not activated

Step2: Press "Inverter" to choose inverter model and press the inverter model to set up PV capacity, inverter power and Max output.



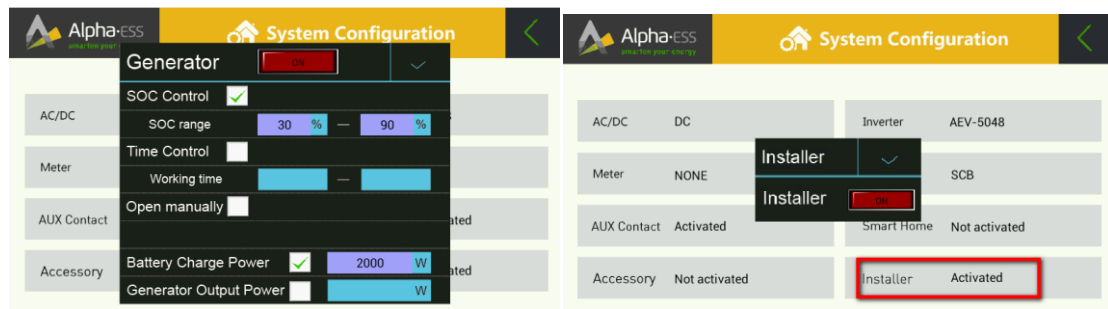
AC/DC	DC	Battery	AEV-5048
Meter	NONE	SCB	
AUX Contact	Not activated	Lead Crystal	Not activated
Accessory	Not activated		



AC/DC	DC	AUX Contact	AEV-5048
Meter	NONE	Generator	SCB
AUX Contact	Not activated	Extra Alarm	
Accessory	Not activated	Remote Control	Not activated
		EPO	Not activated
		Installer	Not activated

Step3: Press "Battery" to choose battery model, if you use super cable box please choose SCB.

Step4: Press "AUX contact" then choose generator to set generator automatic start if you connect the generator.



Step5: Press “ON/OFF” to set generator automatic start model.

Step6: Press “Installer” to enter debug model. Then you enter the system display no need password.

Note: SOC Control: when real-time SOC less than start up set value, generator start up. when real-time SOC more than start up set value, generator stop.

Time control: Set the start time of the generator. SOC Control and Time control cannot work at the same time.

Open manually: if you choose this model, Press “ON”, the generator will start.

Battery Charge Power: set up battery charge power.

Generator Output Power: if you need this model, generator for the load first.

5. Online Monitoring

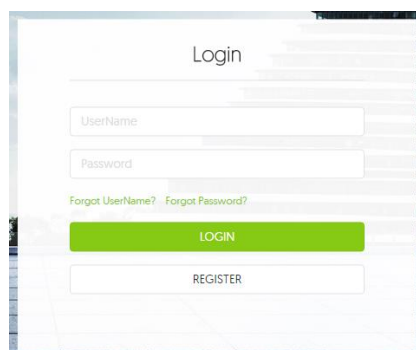
You have to create a new account on our webserver for the normal monitoring. Also, a part of our warranty is based on this connection to our webserver. The data before the registration would not be retained on the webserver.

So please use the following steps:

Open the portal www.alphaess.com.

Please fill in “Username”, “PassWord ” and click “Login”, if you have registered.

If not, please register as the following steps



Register

User Type * S/N

End user

* Username

* Password * Confirm Password

* Country Province/State City

Address * Zip Code

* Language * Contacts * Contact Number

English

* E-mail

Time zone

[UTC+12:00] International Date Line West

☒ Communitarily upgrade?

☐ Read and accept<<Terms and Conditions>>

[SIGN UP NOW](#) [Back](#)

In this form, all blanks marked with an asterisk must be filled out.

More detailed information can be obtained in [Online Monitoring Webserver installation Manual](#).

6. Annex

6.1 Datasheet – AlphaESS Storion-OF5

System			
Model	Storion-OF5		
Phase	Single Phase		
Display	7 Inch Touch LCD		
Communication	Ethernet		
Operating Temperature Range	0℃ ~ 40℃		
Humidity	15% ~ 85%		
Protection Level	IP21		
Dimension (W x D x H)	610 x 650 x 1630 mm		
Weight	150 kg (Without Battery)		
Warranty	5 Years		
Inverter Model	AEV-5048		
Nominal Output Power	5000W		
Grid Output Voltage Range	208/220/230/240 Vac		
Grid Frequency	50/60 Hz		
Max. Input PV Power	10 kW		
Max. Input PV Voltage	900 V		
Max. Input PV Current	2*10 A		
Safety	IEC 62109-1&-2, IEC 62040-		
System Configuration			
Cabinet	Storion-OF5		
Battery Module	M4860	M48100	M48112-p
DOD	90%		
Installed Capacity	3/6/9/12 kWh	4.8/9.6/14.4/19.2kwh	5.38/10.76/16.14/21.52kwh
Usable Capacity	2.7/5.4/8.1/10.8 kWh	4.32/8.64/12.96/17.28kwh	5.38/10.76/16.14/21.52kwh
Cycle Life	≥ 8000	≥ 6000	
Warranty	5 Years Product Warranty, 10 Years Performance Warranty		