

ENWALL Encap Storage System 8kWh 48V, Enserver 5kW User Manual P/N: ENW-8k-48-5k-X-X-X_1V0_GEN1 Version 1.0 | Revision 0 Release Date:23rd August 2024

ATTENTION

No part of this User Manual ("Manual") may be reproduced, or transmitted, in any form or by any means, without the prior written permission of ENERCAP POWER INDUSTRIES LLC ("ENERCAP" or the "Company"). Specifications in this Manual are subject to change without notice. While every attempt has been made to make the Manual accurate and up-to-date, users are cautioned that product improvements may cause the Company to make changes to specifications without advance notice. Users are encouraged to consult the Company or its Resellers before using the Manual. Neither the Company nor its Resellers shall be liable for any indirect, incidental, or consequential damages under any circumstances caused by reliance on the material presented, including, but not limited to, omissions, typographical errors, arithmetical errors or listing errors in the content material. The content of this Manual shall not be modified without the written authorization of the Company.

Document HISTORY

Issue 01 (2024-8-18)

First release

Table of Contents

Document HISTORY
SAFETY INSTRUCTIONS
SAFETY GUIDELINES
1.Personal Safety7
2.General Guideline7
3.ENWALL Module Operating Environment
4.ENWALL Module Cleaning8
5.Storage environment8
6.Disposal
INTRODUCTION
ENWALL Features
ENWALL DIMENSIONS:
BASIC SYSTEM ARCHITECTURE 11
ENWALL MODULE OVERVIEW 12
ENSERVER OVERVIEW 13
MECHANICAL INSTALLATION 14
MOUNTING INSTRUCTIONS 14
1.Installation Precaution 14
2.Location requirements: 14
ELECTRICAL INSTALLATION
1. ESS CONNECTION 16
1.1.CABLE SIZE:
1.2.STEPS TO CONNECT ESS: 17
2. GRID CONNECTION AND BACKUP LOAD CONNECTION
2.1. Precautions
2.2. CABLE SIZE 19
2.3. Steps to connect grid: 20
3. PV CONNECTION

	3.1. Precautions
	3.2. CABLE SIZE
	3.3. PV Module Selection: 23
	4. CT CONNECTION
	5. METER CONNECTION
	6. EARTH CONNECTION(MANDATORY)
	7. WIRING SYSTEM FOR ENSERVER 27
OP	ERATION
	POWER ON
	POWER OFF
	OPERATION AND DISPLAY PANEL
EN	VALL DISPLAY LCD
	DASHBOARD:
	GRAPH:
	ESS:
	LIST VIEW:
EN	SERVER LCD
	MAIN SCREEN
LCI	Ooperation flow chart
	SOLAR POWER CURVE
	CURVE PAGE-SOLAR & LOAD & GRID
	SYSTEM SETUP MENU
	BASIC SETUP MENU
	ESS SETUP MENU
	SYSTEM WORK MODE SETUP MENU
	GENERATOR PORT USE SETUP MENU
	DEVICE INFO SETUP MENU
Мо	de46
	MODE I:BASIC

Fau	It information and processing	49
	MODE IV: AC COUPLE	47
	MODE III: WITH SMART-LOAD	47
	MODE II: WITH GENERATOR	46

$\mathsf{S}_{\mathsf{AFETY}}$ instructions

SAFETY GUIDELINES

- 1. PERSONAL SAFETY
- Always wear proper personal protective equipment (eyes protection, gloves, and safety shoes).
- 2. GENERAL GUIDELINE
- Do not subject the ENWALL Module to strong impact.
- To reduce risk of electric shock, disconnect all wires before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
- Please strictly follow installation procedure when you want to disconnect AC or DC terminals.
- Please refer to "Installation" section of this manual for the details.
- Grounding instructions the ENWALL should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this ENWALL.
- Never cause AC output and DC input short circuited. Do not connect to the mains when DC input short circuits.
- Do not crush or puncture the ENWALL Module.
- Do not place the ENWALL Module near a heat source, such as a fireplace.
- Do not disassemble the ENWALL Module under any circumstances.
- Ensure precautions to prevent short-circuit under all circumstances.
- Do not touch the terminals with conductors while the ENWALL Module is charging. Serious burns, shock, or material fusing may occur.
- Protect surrounding electrical components from incidental contact.
- Do not drop the ENWALL Module. Internal damage may occur that will not be visible.
- In case the Module is physically damaged for any reason, do not install and energize the Module under any circumstances and immediately contact your Reseller.

3. ENWALL MODULE OPERATING ENVIRONMENT

- Location: Indoor/Outdoor
- Operating Temperature Range: -30°C to 70°C (For continuous operations outside this range, please consult your Resellers or Enercap).
- Operating Humidity: Non-Condensing
- 4. ENWALL MODULE CLEANING
- Disconnect the power before cleaning.
- 5. STORAGE ENVIRONMENT
- Do not store the ENWALL Module at temperature greater than 70°C.

6. DISPOSAL

- Do not dispose the ENWALL Module in fire.
- Do not dispose this ENWALL Module as unsorted municipal waste. Please use a separate collection facility or contact the supplier from whom this Module was purchased. Please make sure discarded electrical waste is properly recycled per applicable regulations to reduce environmental impact.

INTRODUCTION

ENWALL is Enercap's latest integrated energy storage system designed for the home and light commercial facilities. ENWALL comes with Enercap's patent ENCAP and ENSERVER cutting-edge technology. The ENWALL system can be charged by the grid, solar, wind, or genset in either standalone grid-tied, standalone off-grid, grid-tied hybrid, or off-grid hybrid mode. It can switch automatically between modes as the need arises. Using the safest energy storage technology, the system can operate in very high or low temperatures without the need for heating or cooling and has a very high AC and DC round trip efficiency. ENWALL has a direct connection to PV, the Grid, Wind, or GENSETS. The system will automatically detect outages, can power your home or electric vehicle, and will charge as soon as any of the inputs is available. ENWALL will store energy for long periods without depletion of energy through idle discharge or thermal runaway of energy through idle discharge or thermal runaway.

ENWALL Features

- Built in 5kW Enserver and 8kWh Encap Module.
- Self-and feed-in to the grid.
- Auto restart while AC is recovering.
- Programmable supply priority for Energy Storage System (ESS) or grid.
- Programmable multiple operation modes: On grid, off grid and UPS.
- Configurable ESS charging current/voltage based on applications by LCD setting.
- Configurable AC/Solar/Generator Charger priority by LCD setting.
- Compatible with mains voltage or generator power.
- Overload/over temperature/short circuit protection.
- Smart ESS charger design for optimized ESS performance
- With limit function, prevent excess power overflow to the grid.
- Supporting WIFI monitoring and build-in 2 strings of MPP trackers
- Smart settable three stages MPPT charging for optimized ESS performance.
- Time of use function.

ENWALL DIMENSIONS:



BASIC SYSTEM ARCHITECTURE

The following illustration shows basic application of the ENWALL MODULE.

It also includes following devices to have a Complete running system.

- Generator or Utility
- PV modules

Consult with your system integrator for other possible system architectures depending on your requirements.

The ENWALL Module can power all kinds of appliances in home or office environment, including motor type appliances such as refrigerator and air conditioner.



ENWALL MODULE OVERVIEW

The ENWALL Module is a multi functional device, combining functions of 5kW enserver, 8kWh Energy Storage System (ESS), solar charger and ESS charger to offer uninterrupted power support. Its comprehensive LCD display offers user configurable and easy accessible button operation such as ESS charging, AC/solar charging, and acceptable input voltage based on different applications.



ENSERVER OVERVIEW



1: Enserver Indicators	7: Parallel port	13: PV input with two MPPT
2: LCD display	8: Function Port	14: ESS
3: Function Buttons	9: DRMs Port	15: Temperature sensor
4: ESS input connectors	10: Generator input	16: WiFi Interface
5: RS 485 Port	11: Load	17: fan
6: BMS 485/CAN Port	12: Grid	

This user manual is subject to change without notice and at the sole discretion of ENERCAP www.enercap.energy

MECHANICAL INSTALLATION

MOUNTING INSTRUCTIONS

1. INSTALLATION PRECAUTION

The ENWALL Module is designed for outdoor use(IP65), Please make sure the installation site meets below conditions:

Please AVOID direct sunlight, rain exposure, snow laying up during installation and operation. Before connecting all wires, please take off the metal cover by removing screws as shown below:

- Not in direct sunlight
- Not in areas where highly flammable materials are stored.
- Not in potential explosive areas.
- Not in the cool air directly.
- Not near the television Antenna or antenna cable.
- Not higher than altitude of about 2000 meters above sea level.
- Not in environment of precipitation or humidity(>95%)

Please AVOID direct sunlight, rain exposure, snow laying up during installation and operation.

2. LOCATION REQUIREMENTS:

Considering the following points before selecting where to install:

- Please select a vertical wall with load-bearing capacity for installation, suitable for installation
- on concrete or other non-flammable surfaces, installation is shown below.
- Install this enserver at eye level in order to allow the LCD display to be read at all times.
- The ambient temperature is recommended to be between -30~60oC to ensure optimal operation.
- Be sure to keep other objects and surfaces as shown in the diagram to guarantee sufficient heat dissipation and have enough space for removing wires.

For proper air circulation to dissipate heat, allow a clearance of approx. 50cm to the side and approx. 50cm above and below the unit. And 100cm to the front.



ELECTRICAL INSTALLATION

1. ESS CONNECTION

1.1. CABLE SIZE:

When selecting cables avoid these mistakes:

- Don't use cables with coarse strands.
- Don't use non-flexible cables.
- Don't use AC cables.



For a quick and general calculation for cables up to 5 meters use this formula:

Current / 3 = cable size in mm²

For example: if the current is 200A, then the cable needs to be: $200/3 = 66 \text{ mm}^2$

Our recommended DC ESS cable size that needs to be used for the ENWALL Module is as follows:

Enserver Capacity	ESS Capacity	Wire Size	Cable(mm ²)	Torque Value (max)
5kW	8kWh	2AWG	35	5.2Nm

1. All wiring must be performed by a professional person.

2. Connecting the ESS with a suitable cable is important for safe and efficient operation of the system. To reduce the risk of injury, refer to Chart 3-2 for recommended cables.

1.2. STEPS TO CONNECT ESS:

Please follow below steps to implement ESS connection:

- 1. Please choose a suitable cable with correct connector which can well fit into the ESS terminals.
- 2. Use a suitable screwdriver to unscrew the bolts and fit the ESS connectors in, then fasten the bolt by the screwdriver, make sure the bolts are tightened with torque of 5.2 N.M in clockwise direction.
- 3. Make sure polarity at both the ESS and enserver is correctly connected.



This user manual is subject to change without notice and at the sole discretion of ENERCAP

4. In case of insects go into the enserver, Please make sure the enserver connector is fasten to waterproof position by twist it clockwise.

1. Installation must be performed with care.



2. Before making the final DC connection or closing DC breaker/ disconnect, be sure positive(+) must be connect to positive(+) and negative(-) must be connected to negative(-). Reverse polarity connection on ESS will damage the enserver.

2. GRID CONNECTION AND BACKUP LOAD CONNECTION

2.1. PRECAUTIONS

- Before connecting to the grid, a separate AC breaker must be installed between the enserver and the grid, and also between the backup load and the enserver. This will ensure the enserver can be securely disconnected during maintenance and fully protected from over current. For this ENWALL Module, the recommended AC breaker for backup load 3.6/5/6kW is 40A, 7.6/8kW is 50A. The recommended AC breaker for grid 3.6/5/6kW is 40A, 7.6/8kW is 50A.
- There are three terminal blocks with "Grid" "Load"and "GEN" markings. Please do not misconnect input and output connectors.



All wiring must be performed by a qualified personnel. It is very important for system safety and efficient operation to use appropriate cable for AC input connection.

2.2. CABLE SIZE

To reduce risk of injury, please use the proper recommended cable as below.

Enserver Capacity	Wire Size	Cable(mm ²)	Torque Value (max)
5kW	10AWG	6	1.2Nm

2.3. STEPS TO CONNECT GRID:

Please follow below steps to implement AC input/output connection:

1. Before making Grid, load and Gen port connection, be sure to turn off AC breaker or disconnecter first.

2. Remove insulation sleeve 10mm length, unscrew the bolts, insert the wires according to polarities indicated on the terminal block and tighten the terminal screws. Make sure the connection is complete.





Be sure that AC power source is disconnected before attempting to wire it to the unit.

3. Then, insert AC output wires according to polarities indicated on the terminal block and tighten terminal. Be sure to connect corresponding N wires and PE wires to related terminals as well.

4. Make sure the wires are securely connected.



Appliances such as air conditioner are required at least 2-3 minutes to restart because it is required to have enough time to balance refrigerant gas inside of circuit. If a power shortage occurs and recovers in short time, it will cause damage to your connected appliances. To prevent this kind of damage, please check manufacturer of air conditioner if it is equipped with time-delay function before installation. Otherwise, this enserver will trigger overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

3. PV CONNECTION

3.1. PRECAUTIONS

Before connecting to PV modules, please install a separately DC circuit breaker between enserver and PV modules. It is very important for system safety and efficient operation to use appropriate cable for PV module connection. To reduce risk of injury, please use the proper recommended cable size as below.

3.2. CABLE SIZE

To reduce risk of injury, please use the proper recommended cable size as below.

Enserver Capacity	Wire Size	Cable(mm ²)
5kW	12AWG	4



 To avoid any malfunction, do not connect any PV modules with possible current leakage to the enserver. For example, grounded PV modules will cause current leakage to the enserver. When using PV modules, please ensure the PV+ & PV of solar panel is not connected to the system ground bar.
 It is requested to use PV junction box with surge protection. Otherwise, it will cause damage on enserver when lightning occurs on PV modules.

3.3. PV MODULE SELECTION:

When selecting proper PV modules, please be sure to consider below parameters:

1) Open circuit Voltage (Voc) of PV modules not exceeds max. PV array open circuit voltage of enserver.

2) Open circuit Voltage (Voc) of PV modules should be higher than min. start voltage.

3)The PV modules used to connected to this enserver shall be Class A rating certified according to IEC 61730.

Enserver Model	5kW
PV Input Voltage	370V (125V~500V)
PV Array MPPT Voltage Range	150V-425V
No. of MPP Trackers	2
No. of Strings per MPP Tracker	1+1

4. CT CONNECTION





When the reading of the load power on the LCD is not correct,

please reverse the CT arrow.

Page 24/54

5. METER CONNECTION





This user manual is subject to change without notice and at the sole discretion of ENERCAP www.enercap.energy

6. EARTH CONNECTION(MANDATORY)

Ground cable shall be connected to ground plate on grid side this prevents electric shock. if the original protective conductor fails.



7. WIRING SYSTEM FOR ENSERVER

This diagram is an example for grid systems without special requirements on electrical wiring connection.





USER MANUAL

ENW-8k-48-5k-X-X-X-X_1V0_GEN1

This diagram is an example for application that Neutral connects together with PE in distribution box. Such as: Australia, New Zealand, South Africa, etc. (Please follow local wiring regulations!)



OPERATION

POWER ON

Once the ENWALL Module has been properly installed and the ENCAP Module are connected well, do the following steps:

- 1. Press the On (located on the left side of the enserver) to turn on the unit.
- 2. Turn On the breaker connected between the enserver and the ESS.

POWER OFF

- 3. Turn Off the breaker connected between the enserver and the ESS.
- 4. Press the Off (located on the left side of the enserver) to turn off the unit.

OPERATION AND DISPLAY PANEL

The operation and display panel, shown in below chart, is on the front panel of the enserver. It includes four indicators, four function keys and a LCD display, indicating the operating status and input/output power information.

LED Indicator		Messages
DC	Green led solid light	PV Connection normal
AC	Green led solid light	Grid Connection normal
Normal	Green led solid light	Enserver operating normal
Alarm	Red led solid light	Malfunction or warning

Function Key	Description
Esc	To exit setting mode
Up	To go to previous selection
Down	To go to next selection
Enter	To confirm the selection

This user manual is subject to change without notice and at the sole discretion of ENERCAP www.enercap.energy

ENWALL DISPLAY LCD

The Monitoring LCD allows user to monitor and configure the ENWALL Module.

The first page on LCD is dashboard by default.

DASHBOARD:

The dashboard shows the info including Solar, Grid, Load and ESS. User can read the parametric values of daily solar energy, daily grid sell energy, daily grid buy energy, daily load energy, daily ESS charge and discharge energy. The screen is also displaying the energy flow direction by arrow.



GRAPH:

The graph screen shows the graphs of PV power, ESS power, grid power and load power.



ESS:

The ESS screen shows the dashboard of ESS. User can read parametric values of terminal voltage, terminal current, terminal temperature, remaining energy, maximum and minimum cell voltage. the mid screen of dashboard shows the SOC, charge and discharge status of the ESS.



LIST VIEW:

The list screen shows all the parameter values of Grid, ESS, Load and PV in the form of list.

Grid Current (A) 0.00 PV#1 Current (A) 0.00 Grid Power (W) 0.00 PV#1 Power (W) 0.00 Grid Relay (0/1) 0.00 PV#2 Voltage (V) 0.00 Grid Day Buy Energy (kWh) 0.00 PV#2 Voltage (V) 0.00 Grid Day Sell Energy (kWh) 0.00 PV#2 Power (W) 0.00 Grid Total Buy Energy (kWh) 0.00 Today PV Energy (kWh) 0.00 Grid Total Sell Energy (kWh) 0.00 Total PV Energy (kWh) 0.00	_
Grid Power (W) 0.00 PV#1 Power (W) 0.00 Grid Relay (0/1) 0.00 PV#2 Voltage (V) 0.00 Grid Day Buy Energy (kWh) 0.00 PV#2 Current (A) 0.00 Grid Day Sell Energy (kWh) 0.00 PV#2 Power (W) 0.00 Grid Total Buy Energy (kWh) 0.00 Today PV Energy (kWh) 0.00 Grid Total Sell Energy (kWh) 0.00 Total PV Energy (kWh) 0.00	
Grid Relay (0/1) 0.00 PV#2 Voltage (V) 0.00 Grid Day Buy Energy (kWh) 0.00 PV#2 Current (A) 0.00 Grid Day Sell Energy (kWh) 0.00 PV#2 Power (W) 0.00 Grid Total Buy Energy (kWh) 0.00 Today PV Energy (kWh) 0.00 Grid Total Sell Energy (kWh) 0.00 Total PV Energy (kWh) 0.00	
Grid Day Buy Energy (kWh) 0.00 PV#2 Current (A) 0.00 Grid Day Sell Energy (kWh) 0.00 PV#2 Power (W) 0.00 Grid Total Buy Energy (kWh) 0.00 Today PV Energy (kWh) 0.00 Grid Total Sell Energy (kWh) 0.00 Total PV Energy (kWh) 0.00	
Grid Day Sell Energy (kWh) 0.00 PV#2 Power (W) 0.00 Grid Total Buy Energy (kWh) 0.00 Today PV Energy (kWh) 0.00 Grid Total Sell Energy (kWh) 0.00 Total PV Energy (kWh) 0.00	
Grid Total Buy Energy (kWh) 0.00 Today PV Energy (kWh) 0.00 Grid Total Sell Energy (kWh) 0.00 Total PV Energy (kWh) 0.00	
Grid Total Sell Energy (kWh) 0.00 Total PV Energy (kWh) 0.00	
Total Load Energy (kWh) 0.00 Battery Temp. (C) 6453.60 Day Load Energy (kWh) 0.00 Day Battery Charge Energy (kWh) 0.00	
Day Load Energy (kWh) 0.00 Day Battery Charge Energy (kWh) 0.00	
Day Battery Disch. Energy (kWh) 0.00	
Total Battery Charge Energy (kWh) 0.00	
Total Battery Disch. Energy (KWh) 0.00	

This user manual is subject to change without notice and at the sole discretion of ENERCAP www.enercap.energy

SETTINGS



The setting page helps user to setup work mode for ENWALL Module.

Solar Sell: "Solar sell" is for Zero export to load or Zero export to CT: when this item is active, the surplus energy can be sold back to grid. When it is active, PV Power source priority usage is as follows: load consumption and charge ESS and feed into grid.

Max Solar Power: allowed the maximum DC input power.

Selling First: This Mode allows hybrid inverter to sell back any excess power produced by the solar panels to the grid. If time of use is active, the ESS energy also can be sold into grid.

The PV energy will be used to power the load and charge the ESS and then excess energy will flow to grid.

Power source priority for the load is as follows:

1. Solar Panels.

2. Grid.

3. Batteries (until programmable % discharge is reached).

Grid Peak-shaving: when it is active, grid output power will be limited within the set value. If the load power exceeds the allowed value, it will take PV energy and ESS as supplement. If still can't meet the load requirement, grid power will increase to meet the load needs.

Max. sell power: Allowed the maximum output power to flow to grid.

Zero-export Power: for zero-export mode, it tells the grid output power. Recommend to set it as 20-100W to ensure the hybrid inverter won' t feed power to grid.

ENSERVER LCD

MAIN SCREEN

The LCD is touchscreen, below screen shows the overall information of the enserver.



- The icon in the center of the home screen indicates that the system is in Normal operation. If it turns into "comm./FXX", it means the enserver has communication errors or other errors, the error message will display under this icon(FXX errors, detail error info can be viewed in the System Alarms menu).
- 2. At the top of the screen is the time.
- System Setup Icon, Press this set button to enter into the system setup screen which includes Basic Setup, ESS Setup, Grid Setup, System Work Mode, Generator port use, Advanced function and ESS info.
- 4. The main screen showing the info including Solar, Grid, Load and ESS. It is also displaying the energy flow direction by arrow. When the power is approximate to high level, the color on the panels will change from green to red.
 - PV power and Load power always keep positive.
 - Grid power negative means sell to grid, positive means get from grid.
 - ESS power negative means charge, positive means discharge.

LCD operation flow chart



SOLAR POWER CURVE



This is Solar Panel detail page. 1. Solar Panel Generation. 2. Grid Tie Power: when there's a string enserver AC couple at the grid or load side of hybrid enserver and there's a meter installed for the string enserver, then the hybrid enserver LCD will show the string enserver output power on its PV icon. Please make sure the meter can communicate with the hybrid enserver successfully. 3. Voltage, Current, Power for each MPPT.

4. Solar Panel energy for Day and Total.







This is Enserver detail page.
1. Enserver Generalon.
2. 0.0Hz: frequency aller DC/AC.
Voltage, Current, Power for each Phase.
3. *DC-T: mean DC-DC temperature, AC-T: mean Heat-sink temperature.
*Note: this part info is not avaiable for some LCD FW.

This is Load detail page.

- 1. Load Power.
- 2. Voltage, Power for each Phase.
- 3. Load consumption for Day and Total.

When you check "Selling First" or "Zero export to Load" on system work mode page, the information on this page is about backup load which connect on Load port of hybrid enserver.

When you check "Zero export to CT" on system work mode page, the information on this page is including backup load and home load.

Press the "Energy " button will enter into the power curve page.

This is Grid detail page.

1. Status, Power, Frequency.

- 2. L: Voltage for each Phase
- CT: Power detected by the external current sensors LD: Power detected using internal sensors on AC grid in/out breaker
- 3. BUY: Energy from Grid to Enserver, SELL: Energy from Enserver to grid.

Press the "Energy " bullon will enter into the power curve page.

Batt	This is ESS detail page.
Stand-by	
SOC: 36%	
U:50.50V	
I:-58.02A	
Power: -2930W	
Temp:30.0C	

CURVE PAGE-SOLAR & LOAD & GRID



Solar power curve for daily, monthly, yearly and total can be roughly checked on the LCD, for more accuracy power generation, please check on the monitoring system. Click the up and down arrow to check power curve of different period.

SYSTEM SETUP MENU



BASIC SETUP MENU



Factory Reset: Reset all parameters of the enserver. Lock out all changes: Enable this menu for setting parameters that require locking and cannot be set up. Before performing a successful factory reset and locking the systems, to keep all changes you need to type in a password to enable the setting. The password for factory settings is 9999 and for lock out is 7777.

Pas	PassWord				
		XXXX	DEL		
	1	2	3		
	4	5	6		
	7	8	9		
	CANCEL	0	ОК		

Factory Reset Password: 9999 Lock out all changes Password: 7777 System selfchek: After ticking this item, it needs input the password. The default password is 1234

ESS SETUP MENU



ESS capacity: it tells hybrid enserver to know your ESS bank size.

Use Batt V: Use ESS Voltage for all the settings (V).

Use Batt %: Use ESS SOC for all the settings (%).

Max. A charge/discharge: Max ESS charge/ discharge current(0-120A for 5kW model). No Batt: Tick this item if no ESS is connected to the system.

Active ESS: This feature will help recover a ESS that is over discharged by slowly charging from the solar array or grid.

Disable Float Charge: The enserver will keep the charging voltage at the current voltage when the BMS charging current requested is 0. It is used to help prevent ESS from being overcharged.



This is ESS Setup page.

1. Start =30%: Percent S.O.C at 30% system will AutoStart a connected generator to charge the ESS bank.

A = 40A: Charge rate of 40A from the allached generator in Amps.

Gen Charge: uses the gen input of the system to charge ESS bank from an attached generator. Gen Signal: Normally open relay that closes when the Gen Start signal state is active.

2. This is Grid Charge, you need select. Start =30%: No use, Just for customization. A = 40A: It indicates the Current that the Grid charges the ESS. Grid Charge: It indicates that the grid charges the ESS. Grid Signal: Disable.

3. Gen Force: When the generator is connected, it is forced to start the generator without meeting other conditions.

Generator

Freq:50.0Hz

Power: 1392W

L1: 228V

ENW-8k-48-5k-X-X-X-X_1V0_GEN1



Today=0.0 KWH Total =2.20 KWH This page tells the PV and diesel generator power the load and ESS.

This page tells generator output voltage, frequency, Power. And, how much energy is used from generator.

Battery SettingLithium Mode00Shutdown10%Low Batt20%Restart40%

Lithium Mode: This is BMS protocol. Shutdown 10%: It indicates the enserver will shutdown if the SOC below this value. Low Batt 20%: It indicates the enserver will alarm if the SOC below this value. Restart 40%: ESS voltage at 40% AC output will resume.



- 1. There are 3 stages of charging the Ballery .
- 2. This is for professional installers, you can keep it if you do not know.

3. Shutdown 20%: The enserver will shutdown if the SOC below this value.

Low Batt 35%: The enserver will alarm if the SOC below this value.

Restart 50%: Ballery SOC at 50% AC output will resume.

This user manual is subject to change without notice and at the sole discretion of ENERCAP

SYSTEM WORK MODE SETUP MENU

System Work Mode				
Selling First 32000 Max Solar Power				
● Zero Export To Load 🖌 🔽 Solar Sell	vvork Mode1			
O Zero Export To CT ☑ Solar Sell				
Max Sell Power 32000 Zero-export Power 20				
Energy pattern 🔽 BattFirst 📃 LoadFirst				
Grid Peak Shaving 28000 Power				

Work Mode

Selling First: This Mode allows hybrid Enserver to sell back any excess power produced by the solar panels to the grid. If time of use is active, the ESS energy also can be sold into grid.

The PV energy will be used to power the load and charge the ESS and then excess energy will flow to grid.

Power source priority for the load is as follows:

- 1. Solar Panels.
- 2. Grid.

3. Batteries (until programmable % discharge is reached).

Zero Export To Load: Hybrid Enserver will only provide power to the backup load connected. The hybrid Enserver will neither provide power to the home load nor sell power to grid. The built-in CT will detect power flowing back to the grid and will reduce the power of the Enserver only to supply the local load and charge the ESS.



Zero Export To CT: Hybrid Enserver will not only provide power to the backup load connected but also give power to the home load connected. If PV power and ESS power is insufficient, it will take grid energy as supplement. The hybrid Enserver will not sell power to grid. In this mode, a CT is needed. The installation method of the CT please refer to chapter 3.6 CT Connection. The external CT will detect power flowing back to the grid and will reduce the power of the Enserver only to supply the local load, charge ESS and home load.



Solar Sell: "Solar sell" is for Zero export to load or Zero export to CT: when this item is active, the surplus energy can be sold back to grid. When it is active, PV Power source priority usage is as follows: load consumption and charge ESS and feed into grid.

Max. sell power: Allowed the maximum output power to flow to grid.

Zero-export Power: for zero-export mode, it tells the grid output power. Recommend to set it as 20-100W to ensure the hybrid Enserver won' t feed power to grid.

Energy Pattern: PV Power source priority.

Batt First: PV power is firstly used to charge the ESS and then used to power the load. If PV power is insufficient, grid will make supplement for ESS and load simultaneously.

Load First: PV power is firstly used to power the load and then used to charge the ESS. If PV power is insufficient, Grid will provide power to load.

Max Solar Power: allowed the maximum DC input power.

Grid Peak-shaving: when it is active, grid output power will be limited within the set value. If the load power exceeds the allowed value, it will take PV energy and ESS as supplement. If still can't meet the load requirement, grid power will increase to meet the load needs.

System Work Mode						
Grid Charge	Gen		<mark>/</mark> Time Time	Of Use Power	Batt	Work
		01:00	5:00	32000	160V	Mode2
		05:00	9:00	32000	160V	
\checkmark		09:00	13:00	32000	160V	
\checkmark		13:00	17:00	32000	160V	
\checkmark		17:00	21:00	32000	160V	
\checkmark		21:00	01:00	32000	160V	

System Work Mode					
Grid Charge ^{Gen}	N	<mark>/</mark> Time	Of Use Power	Batt	
	01:00	5:00	5000	80%	Work Mode2
	05:00	8:00	5000	40%	
	08:00	10:00	5000	40%	
	10:00	15:00	5000	80%	
	15:00	18:00	5000	40%	
	18:00	01:00	5000	35%	

Time of use: it is used to program when to use grid or

generator to charge the ESS, and when to discharge the ESS to power the load. Only tick "Time Of Use" then the follow items (Grid, charge, time, power etc.)

will take effect.

Note: when in selling first mode and click time of use,

the ESS power can be sold into grid.

Gen charge: utilize diesel generator to charge the ESS in a time period.

Time: real time, range of 01:00-24:00.

Note: when the grid is present, only the "time of use" is ticked, then the ESS will discharge. Otherwise, the ESS won't discharge even the ESS SOC is full. But in the off-grid mode (when grid is not available, Enserver will work in the off-grid mode automatically).

Power: Max. discharge power of ESS allowed. Batt(V or SOC %): ESS SOC % or voltage at when the action is to happen.

For example

During 01:00-05:00, if ESS SOC is lower than 80%, it will use grid to charge the ESS until ESS SOC reaches 80%.

During 05:00-08:00, if ESS SOC is higher than 40%, hybrid Enserver will discharge the ESS until

the SOC reaches 40%. At the same time, if ESS SOC is lower than 40%, then grid will charge the ESS SOC to 40%.

During 08:00-10:00, if ESS SOC is higher than 40%, hybrid Enserver will discharge the ESS until the SOC reaches 40%.

During 10:00-15:00, when ESS SOC is higher than 80%, hybrid Enserver will discharge the ESS until the SOC reaches 80%.

During 15:00-18:00, when ESS SOC is higher than 40%, hybrid Enserver will discharge the ESS until the SOC reaches 40%.

During 18:00-01:00, when ESS SOC is higher than 35%, hybrid Enserver will discharge the ESS until the SOC reaches 35%.



It allows users to choose which day to execute the setting of "Time of Use".

For example, the enserver will execute the Time of use page on Mon/Tue/Wed/Thu/Fri/Sat only.

GENERATOR PORT USE SETUP MENU



Generator input rated power: allowed Max. power from diesel generator.

GEN connect to grid input: connect the diesel generator to the grid input port.

Smart Load Output: This mode utilizes the Gen input connection as an output which only receives power when the ESS

SOC and PV power is above a user programmable threshold.

e.g. ON: 100%, OFF: 95%: When the PV power exceeds 500W, and ESS bank SOC reaches 100%, Smart Load Port will switch on automatically and power the load connected. When the ESS bank SOC < 95% , the Smart Load Port will switch off automatically.

Smart Load OFF Batt: ESS SOC at which the Smart load will switch off.

Smart Load ON Batt: ESS SOC at which the Smart load will switch on. simultaneously and then the Smart load will switch on.

On Grid always on: When click "on Grid always on" the smart load will switch on when the grid is present.

Micro Inv Input: To use the Generator input port as a micro-Enserver on grid Enserver input (AC coupled), this feature will also work with "Grid-Tied" Enservers.

Micro Inv Input OFF: when the ESS SOC exceeds setting value, Microinveter or grid-tied Enserver will shut down.

Micro Inv Input ON: when the ESS SOC is lower than setting value, Microinveter or grid-tied Enserver will start to work.

AC Couple Fre High: If choosing "Micro Inv input", as the ESS SOC reaches gradually setting value (OFF), during the process, the microEnserver output power will decrease linear. When the ESS SOC equals to the setting value (OFF), the system frequency will become the setting value (AC couple Fre high) and the MicroEnserver will stop working.

MI export to grid cutsoff: Stop exporting power produced by the microEnserver to the grid. Note: Micro Inv Input OFF and On is valid for some certain FW version only.



Ex_Meter For CT: when in Three phase system with CHNT Three phase energy meter (DTSU666), click corresponding phase where hybrid enserver is connected. e.g. when the hybrid enserver output connects to A phase, please click A Phase.

Meter Select: select the corresponding meter type according to the meter installed in the system. Grid Side INV Meter2: when there's a string enserver AC couple at the grid or load side of hybrid enserver and there's a meter installed for the string enserver, then the hybrid enserver LCD will show the string enserver output power on its PV icon. Please make sure the meter can communicate with the hybrid enserver successfully.







- ATS: It is related with ATS port voltage. it is better in ATS ON "uncheck" posilon.
- Low Noise Mode: In this mode, enserver will work in "low noise mode".

Low Power Mode<Low Batt: if selected and when ESS SOC is less then "Low Bat" value, the selfconsumption power of enserver will be from grid and ESS simultaneously. If unselected, the selfconsumption power of enserver will be mainly from grid.

DEVICE INFO SETUP MENU

012001 AIN:Ver 0-52	Flash 13-0717	
Occurred		Dovice
2019-03-11	15:56	Info
2019-03-08	10:46	
2019-03-08	10:45	
	012001 AIN:Ver 0-52 Occurred 2019-03-11 2019-03-08 2019-03-08	012001 Flash AIN:Ver 0-5213-0717 Occurred 2019-03-11 15:56 2019-03-08 10:46 2019-03-08 10:45

This page show Enserver ID, Enserver version and alarm codes.

HMI: LCD version MAIN: Control board FW version

USER MANUAL

Mode I:BASIC



MODE II: WITH GENERATOR



This user manual is subject to change without notice and at the sole discretion of ENERCAP www.enercap.energy

MODE III: WITH SMART-LOAD



MODE IV: AC COUPLE









The 1st priority power of the system is always the PV power, then 2nd and 3rd priority power will be the ESS bank or grid according to the settings.

The last power backup will be the Generator if it is available.

Fault information and processing

Error code	Description	Solutions
F08	GFDI _Relay_Failure	 1. When enserver is in Split phase (120/240Vac) or three-phase system (120/208Vac) system, the backup load port N line needs to connect ground; 2. If the fault still exists, please contact us for help
F13	Working mode change	 When the grid type and frequency changed it will report F13; When the ESS mode was changed to "No ESS" mode, it will report F13; For some old FW version, it will report F13 when the system work mode changed; Generally, it will disappear automatically when shows F13; If still same, and turn off the DC switch and AC switch and wait for one minute and then turn on the DC/AC switch; Seek help from us, if can not go back to normal state.
F18	AC over current fault of hardware	AC side over current fault 1. Please check whether the backup load power and common load power are within the range; 2. Restart and check whether it is in normal; 3. Seek help from us, if can not go back to normal state.

		DC side ever everent fault
		De side over current lauit
		1. Check PV module connect and ESS
		connect;
		2. When in the off-grid mode, the enserver
		startup with big power load, it may
E20	DC over current fault of the	report F20. Please reduce the load power
120	hardware	connected;
		3. Turn off the DC switch and AC switch and
		then wait one minute,then turn on the DC/
		AC switch again;
		4. Seek help from us, if can not go back to
		normal state.
		Please contact your installer for help.
F22	Tz_EmergStop_Fault	
		Leakage current fault
	AC leakage current is transient over current	1. Check PV side cable ground connection.
F23		2. Restart the system 2~3 times.
		3. If the fault still exists, please contact us
		for help.
		PV isolation resistance is too low
		1. Check the connection of PV panels and
		enserver is firmly and
50 /	DC insulation impedance	correctly;
F24	failure	2. Check whether the PE cable of enserver
		is connected to ground;
		3. Seek help from us, if can not go back to
		normal state.

		1. Please wait for a while and check whether	
		it is normal;	
		2. When the hybrid in split phase mode, and	
500	The DC busbar is	the load of L1 and load of L2 is big different,	
F26	unbalanced	it will report the F26.	
		3. Restart the system 2~3 times.	
		4. Seek help from us, if can not go back to	
		normal state.	
		1. When in parallel mode, check the parallel	
		communication cable	
		connection and hybrid enserver	
		communication address setting;	
F20	Parallel CANBus fault	2. During the parallel system startup	
FZ9		period, enservers will report F29. when all	
		enservers are in ON status, it will disappear	
		automatically;	
		3. If the fault still exists, please contact us	
		for help.	
	AC Overcurrent fault	1. Check the backup load connected, make	
		sure it is in allowed	
F34		power range;	
		2. If the fault still exists, please contact us	
		for help.	
		No Utility	
		1. Please confirm grid is lost or not;	
		2. Check the grid connection is good or not;	
F35	No AC grid	3. Check the switch between enserver and	
		grid is on or not;	
		4. Seek help from us, if can not go back to	
		normal state.	

		1. Check the hybrid enserver working status.
		If there's 1 pcs
		hybrid enserver is in OFF status, the other
F41	Parallel system stop	hybrid enservers
		may report F41 fault in parallel system.
		2. If the fault still exists, please contact us
		for help.
		Grid voltage fault
		1. Check the AC voltage is in the range of
		standard voltage in
		specification;
F42	AC line low voltage	2. Check whether grid AC cables are firmly
		and correctly
		connected;
		3. Seek help from us, if can not go back to
		normal state.
		Grid frequency out of range
		1. Check the frequency is in the range of
		specification or not;
F47	AC over frequency	2. Check whether AC cables are firmly and
		correctly connected;
		3. Seek help from us, if can not go back to
		normal state.
		Grid frequency out of range
		1. Check the frequency is in the range of
		specification or not;
F48	AC lower frequency	2. Check whether AC cables are firmly and
		correctly connected;
		3. Seek help from us, if can not go back to
		normal state.

		ESS voltage low
		1. Check whether ESS voltage is too low;
		2. If the ESS voltage is too low, using PV or
F56	DC busbar voltage is	grid to charge the
	too low	ESS;
		3. Seek help from us, if can not go back to
		normal state.
		1. it tells the communication between hybrid
		enserver and ESS
		BMS disconnected when"BMS_Err-Stop" is
		active;
F58	BMS communication fault	2. if don't want to see this happen, you can
		disable
		"BMS_Err-Stop" item on the LCD;
		3. If the fault still exists, please contact us
		for help.
	ARC fault	1. ARC fault detection is only for US market;
		2. Check PV module cable connection and
F63		clear the fault;
		3. Seek help from us, if can not go back to
		normal state.
		Heat sink temperature is too high
		1. Check whether the work environment
	Heat sink high tomporature	temperature is too high;
F64	failure	2. Turn off the enserver for 10mins and
		restart;
		3. Seek help from us, if can not go back to
		normal state.

Under the guidance of our company, customers return our products so that our company can provide service of maintenance or replacement of products of the same value. Customers need to

pay the necessary freight and other related costs. Any replacement or repair of the product will cover the remaining warranty period of the product. If any part of the product or product is replaced by the company itself during the warranty period, all rights and interests of the replacement product or component belong to the company.

Factory warranty does not include damage due to the following reasons:

Damage during transportation of equipment

I Damage caused by incorrect installation or commissioning

Damage caused by failure to comply with operation instructions, installation instructions or maintenance instructions

I Damage caused by attempts to modify, alter or repair products

Damage caused by incorrect use or operation

Damage caused by insufficient ventilation of equipment

I Damage caused by failure to comply with applicable safety standards or regulations

Damage caused by natural disasters or force majeure (e.g. floods, lightning, overvoltage, storms,

fires, etc.)

In addition, normal wear or any other failure will not affect the basic operation of the product. Any external scratches, stains or natural mechanical wear does not represent a defect in the product.