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HYPERION SINGLE PHASE

User Manual

Off-Grid Energy Storage System

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Preface

Hyperion Series Energy Storage System is a multi-functional power supply designed for residential and commercial projects. With built-in lithium battery, this system can provide uninterrupted and stable power supply during grid outages or power failure. Using solar power and in-built battery storage, the unit provides long lasting economic benefits to the user by reducing electricity bills. The Hyperion replaces diesel generators for power backup with an economical, non-environmentally polluting and noise free alternative.

Please read through this user manual before installing and operating the system.

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1 Introduction

1.1 Application

The Hyperion unit can be charged by solar panels, electricity grid or external generator to power the connected load. It has a built-in lithium battery for energy storage, a hybrid inverter and an intelligent energy management system that can be controlled remotely using a mobile application.

Hyperion has four working modes: SOL (Solar first), UEI (Utility first), SBU (Solar-Battery-Utility), SUB (Solar-Utility -Battery). These working modes are described below.

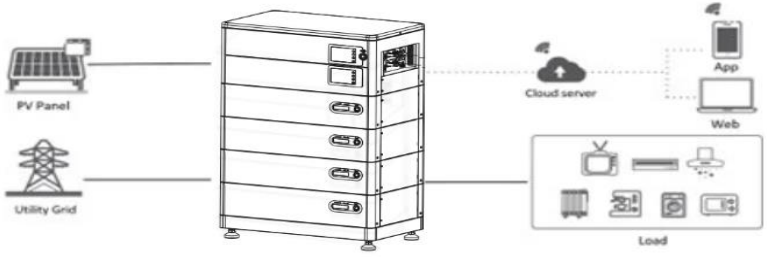
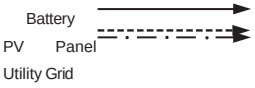
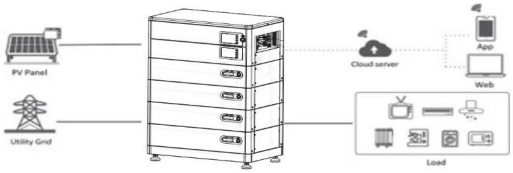
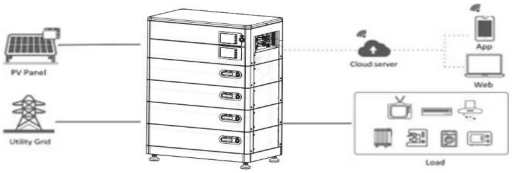


Figure 1 Hyperion Working Diagram

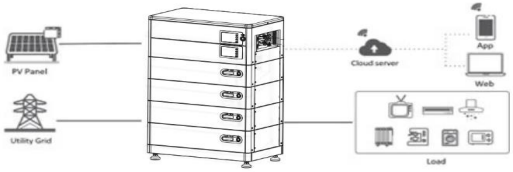
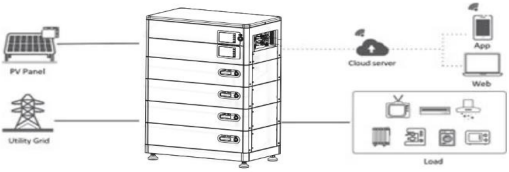
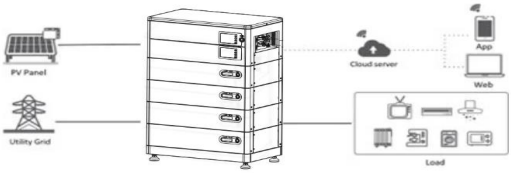
1.1.1 Working Modes

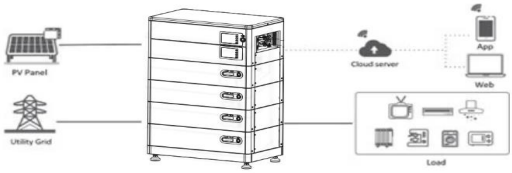
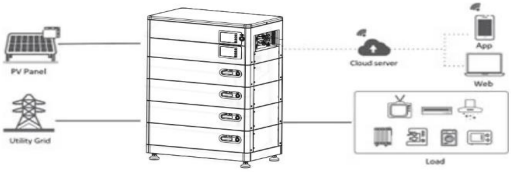
Index (example)	**Battery voltage too low:** Lower than the value of setting 12. **Battery voltage too high:** Higher than the value of setting 13. 

<table>
<tr><td rowspan="2">SOL (Solar first):

Solar energy provides power to the connected load as the first priority.</td><td>When solar power is greater than the consumption, and the battery capacity is low, solar PV will supply power to the load and charge the battery at the same time.
 
</td></tr>
<tr><td>When solar power is less than the consumption, and the battery capacity is high,
solar and battery supply power to the load at the same time.
 
</td></tr>
<tr><td>UEI (Utility first):

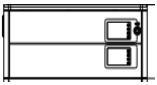
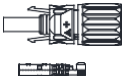
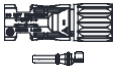
Utility gird will provide power to the load as the first priority.</td><td>The grid supplies power to the load and charges the battery when the battery capacity is low.</td></tr>
</table>

SBU (Solar-Battery-Utility): Solar energy provides power to the load as first priority.	When solar power is greater than the consumption, and the battery capacity is low, the solar will supply power to the load and charge the battery at the same time. 
	When solar power is less than the consumption, and the battery capacity is high, solar and battery supply power to the load at the same time. 
	When solar power is less than the consumption, and the battery capacity is low, grid power the load, solar charges the battery, and excess solar (if any) powers the load. 

SUB (Solar-Utility -Battery): Solar energy provides power to the load as first priority.	When solar power is greater than the consumption, and the battery capacity is low, solar power the load and charges the battery at the same time. 
	When solar power is less than the consumption, and the battery capacity is low, grid supplies power to the load, solar charges the battery, and excess solar (if any), powers the load. 

1.2 Components

After unpacking the package, please inspect the components based on the table below.

Inverter packing list			
			
Inverter* 1pc	RNB5.5-4L* 1pc	MC4 Connector (Male) *3pcs	MC4 Connector(female) *3pcs
			
Tube terminal red *4pcs	Tube terminal black *4pcs	Tube terminal yellow *1pcs	Wi-Fi module antenna *1pc
			
Grub screw (M4-8) *4 pcs	User Manual		

Battery packing list			
			
Battery module*1pc	Battery connection copper bar red *1pc	Battery connection copper bar black *1pc	Guide pin *4pcs
			
Network cable *1pc	Grounding cable *1pc	Grub screw (M4-8) *4 pcs	

Base packing list			
			
Base *1 pc	Guide pin *4pcs		

Power line		
		
Black negative wire *1pc	Red positive wire *1pc	

1.3 Hyperion Dimension

Length 620mm; width 365mm, base height 97mm, inverter height 255.5mm, single 100Ah battery module height 139mm.

The total height of the system is 97+365+139*N mm (N is the number of battery module).

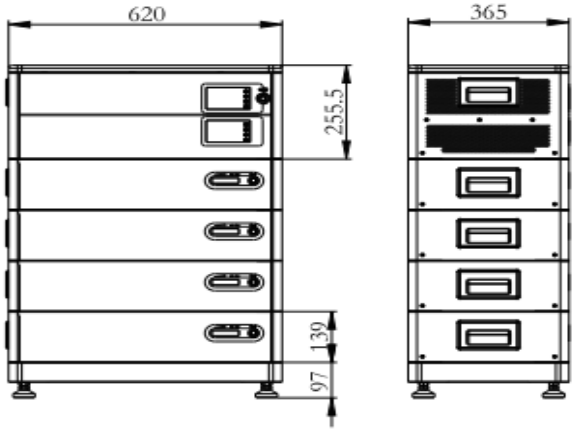


Figure 2 Hyperion Dimension

1.4 Quality Inspection

Before installation, please confirm that the packaging is intact, and after unpacking, check that all the parts are consistent with the packaging list and are in good condition.

Table 2 Quality Inspection

Operation	Warning
Check Package	No damage
Check Component	No loss or damage
Check built-in Accessory	No loss or damage

1.5 Label

	• **Danger:** Possibility of fatal voltage
	• **Warning:** Possibility of device damage or personal injury
	• **Warning:** Possibility of heat injury / burns.

1.6 Safety

This user manual includes safety introduction. Please read this manual carefully before installing, maintaining, and operating the equipment. The manufacturer will not be held responsible if you do not operate the unit in accordance with this manual and there is equipment damage or personal injury or death.

	❖ Must be grounded before operation.
	❖ Do not open the covers. The electrical components and parts and components inside of the storage are electrostatic.
	❖ Only qualified trained electricians are allowed to operate the units. Ensure the unit is properly installed before operating the unit. ❖ Only qualified electricians are allowed to maintain, inspect, and replace the components in the product.
	❖ Do not remove any part or component of the unit without proper approval and supervision.

2 Installation

2.1 Device Overview

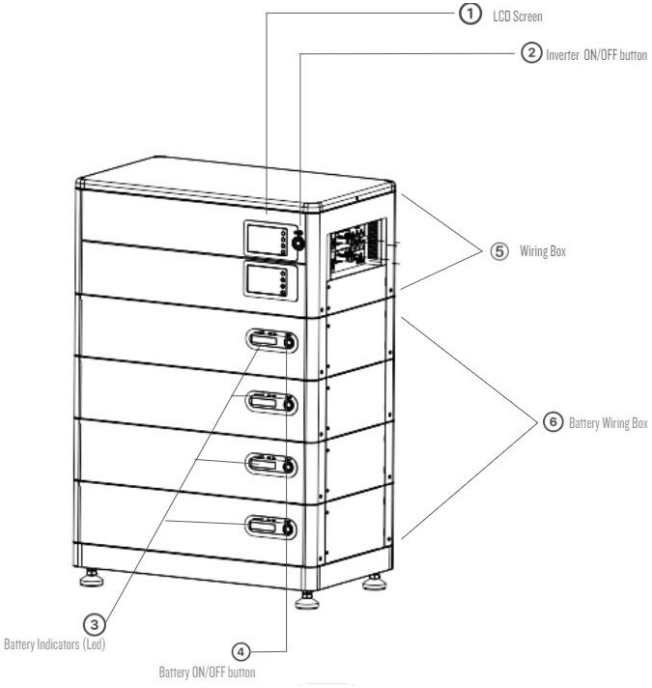


Figure 3 Device Overview

2.1.1 Device Carrying

⚠	**Warning!** **The device is very heavy, which may cause physical injury.** • Please note the device weight when moving or delivering the device. • Select a solid installation platform to place the product. • Use proper tools for installation. • Recommend at least two people to move and install.

2.1.2 Installation

The device shall be installed indoors and placed vertically in a safe and stable place.

Other objects around the Hyperion should be more than 200mm away to ensure proper ventilation.

The system has built-in battery modules which may be separated from the cabinet during transportation.

Please note the below requirements while handling the battery modules:

1) Only Professionals should operate the battery modules after reading the operating manual carefully.
2) Do not replace the battery module with a different model/brand/make.
3) Cut off all charging and load equipment before operating the unit.
4) Take off all metal ornaments (watches, rings, earrings etc.) before handling the unit.
5) Recommend wearing isolated gloves, anti-static shoes, or protective clothes for additional protection.
6) DO NOT use metal tools like screws, spanners etc.
7) DO NOT touch – or + pole of battery with any metal devices during operation.

Battery replacement and installation illustrated as follows:

Step 1: Take out the installation base from the packing case.

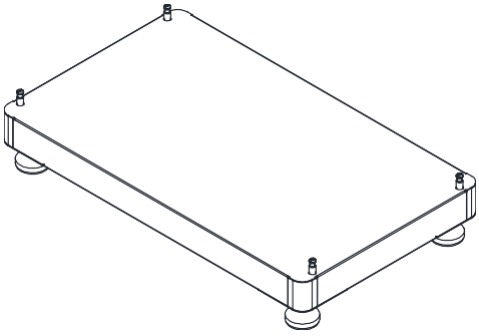


Figure 4 Installation base

Step 2: Remove all battery modules from the packing case and remove the small cover plates on both sides.

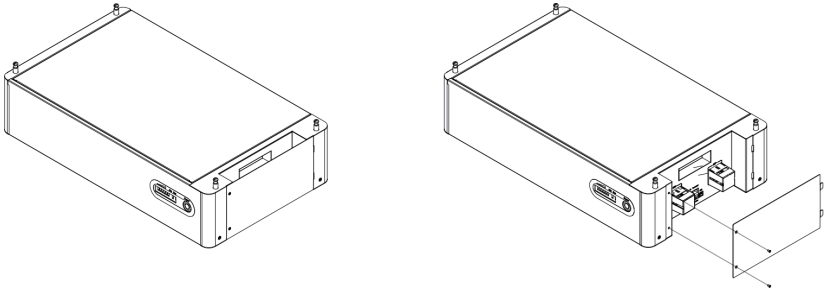


Figure 5 Remove the side cover case.

Step 3: Stack the batteries on the mounting base and fix them with fasteners.

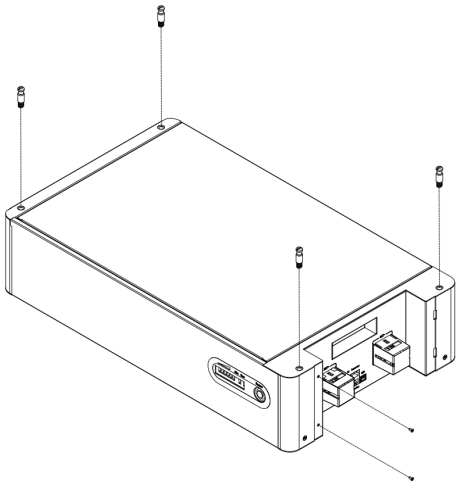


Figure 6 Install battery

Step 4: Install all battery strings in sequence.

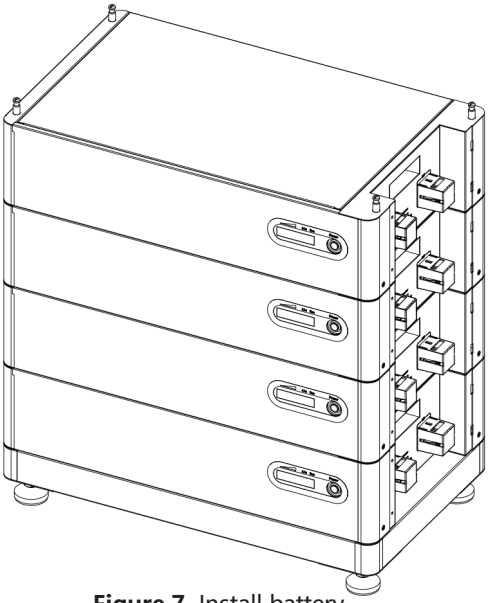


Figure 7 Install battery

Step 5: Install the inverter. The inverter is installed on the battery pack and installed in the same way as the battery.

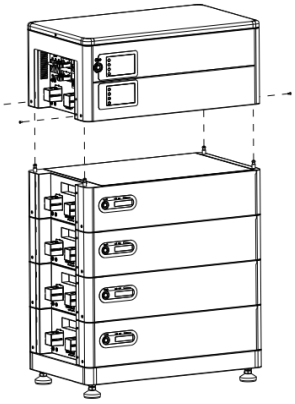


Figure 8 Install Inverter

2.2 Electric Installation

The Hyperion is ground mounted, should be placed on the ground vertically.

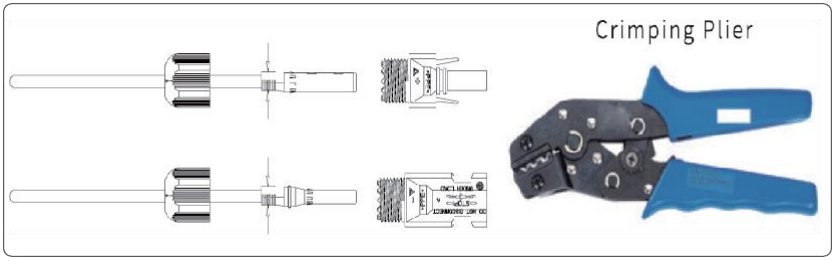
2.2.1 CABLING

PV cable assembling:

1.Strip the red and black 6AWG PV cables, insert them into the jacks and pins of the PV connector in the accessories, and press them with cramping pliers.

2.Insert the crimped cable into the plastic shell of the PV connector.

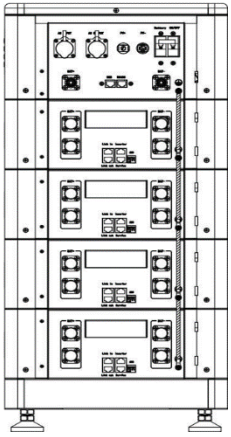
3.Tighten the plastic nut of the PV connector to fix the cable.



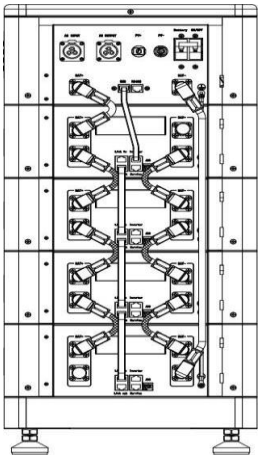
2.2.2 Battery Wiring Procedure

(1) Ensure all the batteries are switched off.

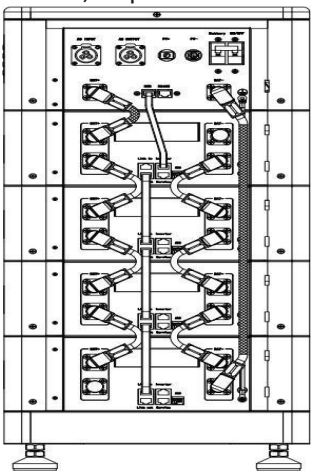
*Connect the ground wire (hatched line on the right as shown in the figure).



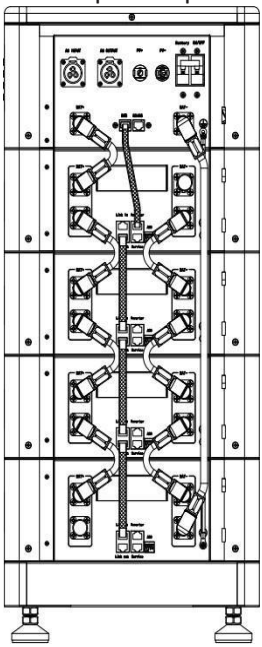
(2) Connect the battery to battery with 6AWG wire (thin), each battery is connected in parallel. The positive pole should be connected to the positive pole, and the negative pole should be connected to the negative pole (the line in the shaded part in the figure). You will hear a "click" if it is connected in place. When removing, press and hold the button on the right side of the cable head, to pull out.



(3) Connect the battery and inverter with 4AWG wire (thick), connect the positive pole of the first battery to the positive pole of the inverter, and connect the negative pole of the last battery to the negative pole of the inverter (the shaded line in the figure). You will hear a "click" if it is connected in place. When removing, press and hold the button on the right side of the cable head, to pull out.



(4) Connect the communication cable (BMS-Inverter) between the inverter and the battery and connect the communication cable (Link Out-Link In) between the batteries (the shaded line in the figure), if you hear a "click" sound, the connection is in place; when disassembling, press and hold the clip of the RJ45 port to pull it out.

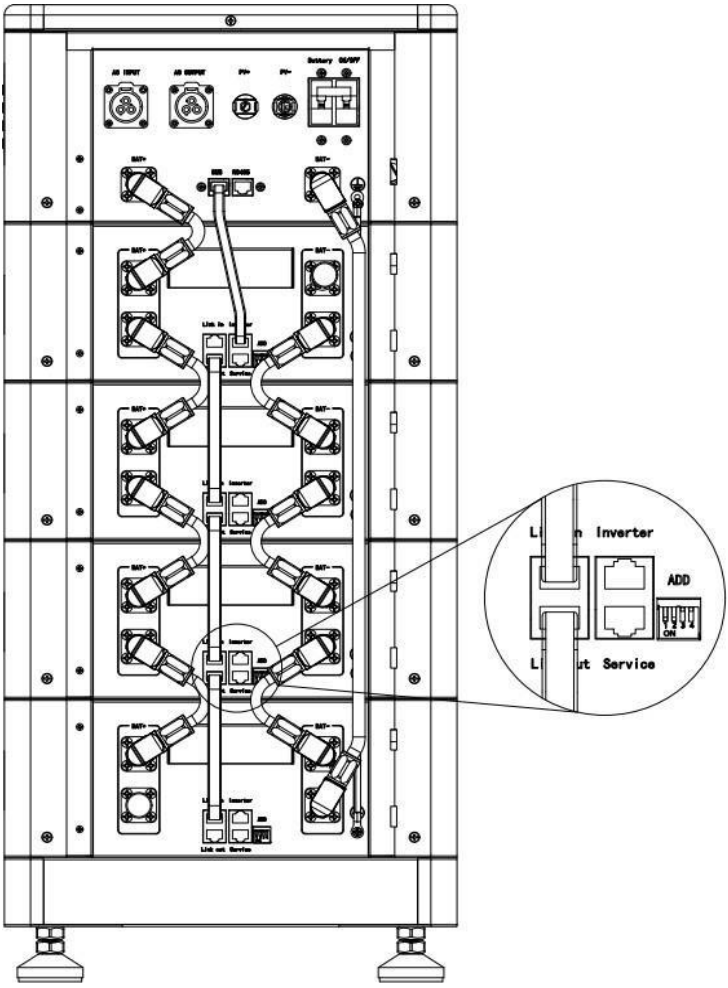


(5) Set the battery communication address. The address of battery that communicates with inverter must be 1, and next series of batteries should be 2,3,4....

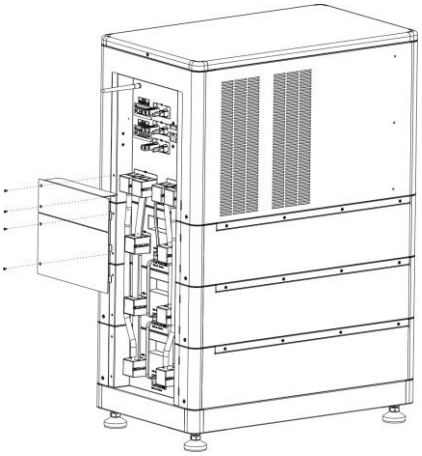
Below is the explanation of battery address and dip switch, 1 means ON, for example, if the battery address is 3, the pins 1 and 2 are ON, 3 and 4 keep off.

Pin / Address	1	2	3	4
1	1	0	0	0
2	0	1	0	0
3	1	1	0	0

4	0	0	1	0
5	1	0	1	0
6	0	1	1	0
7	1	1	1	0
8	0	0	0	1



(6) When the wire connection is done, install the side cover.



(7) Connect grid, PV, and load.

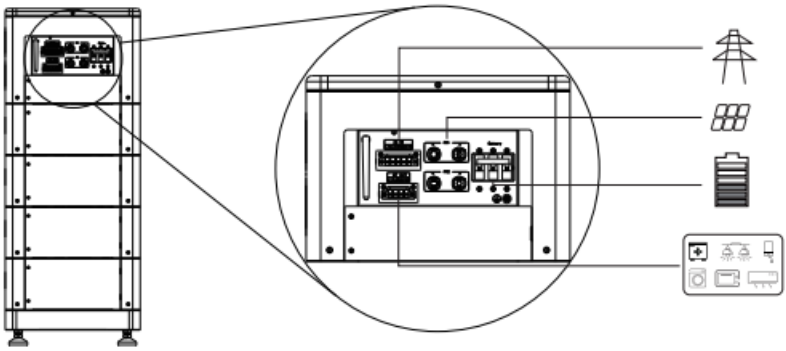


Table 3 Cable Size

Function	**Typical Power**		**Cable size**	**Torque**
Load	Hyperion	3kVA/5kVA	10AWG	1.4~1.6Nm
Grid		3kVA/5kVA	10AWG	1.4~1.6Nm
PV		3kVA/5kVA	10AWG	1.4~1.6Nm

2.3 LED indication

LED status

<table>
<tr><td rowspan="2">Battery Status</td><td rowspan="2">Protection, alarm / normal</td><td>RUN</td><td>ALM</td><td colspan="4">Capacity</td><td>Description</td></tr>
<tr><td>Green</td><td>Red</td><td>Green</td><td>Green</td><td>Green</td><td>Green</td><td></td></tr>
<tr><td>Off</td><td></td><td>Off</td><td>Off</td><td>Off</td><td>Off</td><td>Off</td><td>Off</td><td>All off</td></tr>
<tr><td rowspan="2">On</td><td>Normal</td><td>Flash 1</td><td>Off</td><td colspan="4" rowspan="2">Based on capacity</td><td>No charging or discharging</td></tr>
<tr><td>Warning</td><td>Flash 1</td><td>Flash 3</td><td>PACK low voltage</td></tr>
<tr><td rowspan="4">Charge</td><td>Normal</td><td>ON</td><td>Off</td><td colspan="4" rowspan="2">Based on capacity, the highest-level LED flashes (flash 2), the other SOC lights is on all the times.</td><td></td></tr>
<tr><td>Warning</td><td>ON</td><td>Flash 3</td><td></td></tr>
<tr><td>Over Charge</td><td>On</td><td>Off</td><td>On</td><td>On</td><td>On</td><td>On</td><td rowspan="2">Stop charging</td></tr>
<tr><td>Over Temp/Current、Failure</td><td>Off</td><td>On</td><td>Off</td><td>Off</td><td>Off</td><td>Off</td></tr>
<tr><td rowspan="4">Discharge</td><td>Normal</td><td>Flash 3</td><td>Off</td><td colspan="4" rowspan="2">Based on capacity, the highest-level LED flashes, the other SOC lights is on all the times.</td><td></td></tr>
<tr><td>Warning</td><td>Flash 3</td><td>Flash 3</td><td></td></tr>
<tr><td>Over Discharge</td><td>Off</td><td>Off</td><td>Off</td><td>Off</td><td>Off</td><td>Off</td><td rowspan="2">Stop discharging</td></tr>
<tr><td>Over Temp/Current、Failure</td><td>Off</td><td>On</td><td>Off</td><td>Off</td><td>Off</td><td>Off</td></tr>
<tr><td>Failure</td><td></td><td>Off</td><td>On</td><td>Off</td><td>Off</td><td>Off</td><td>Off</td><td>Stop charging and discharging</td></tr>
</table>

SOC status

<table>
<tr><td colspan="2">Status</td><td colspan="4">Charge</td><td colspan="4">Discharge</td></tr>
<tr><td colspan="2"></td><td>L1</td><td>L2</td><td>L3</td><td>L4</td><td>L1</td><td>L2</td><td>L3</td><td>L4</td></tr>
<tr><td rowspan="4">Capacity</td><td>0~25%</td><td>Flash 2</td><td>Off</td><td>Off</td><td>Off</td><td>On</td><td>Off</td><td>Off</td><td>Off</td></tr>
<tr><td>25%~50%</td><td>On</td><td>Flash 2</td><td>Off</td><td>Off</td><td>On</td><td>On</td><td>Off</td><td>Off</td></tr>
<tr><td>50%~75%</td><td>On</td><td>On</td><td>Flash 2</td><td>Off</td><td>On</td><td>On</td><td>On</td><td>Off</td></tr>
<tr><td>75%~100%</td><td>On</td><td>On</td><td>On</td><td>Flash 2</td><td>On</td><td>On</td><td>On</td><td>On</td></tr>
<tr><td colspan="2">Run</td><td colspan="4">On</td><td colspan="4">Flash 3</td></tr>
</table>

Flash description:

Flash 1: 0.25s on/3.75s off

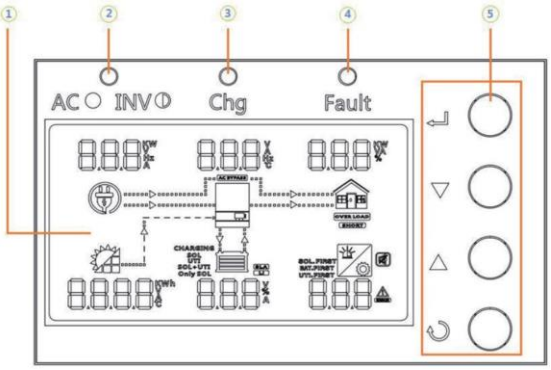
Flash 2: 0.5s on /0.5s off

Flash 3: 0.5s on, 1.5s off

3 Operation

3.1 LCD Display

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



① LCD Display
② Status Indicator
③ Charging Indicator
④ Fault Indicator
⑤ Function Buttons

Figure 14 LED Display

Table 4 LED Indicator

LED Indicator			Messages
AC / INV	Green	Solid On	Output is powered by utility.
		Flashing	Output powered by battery or PV in battery mode.
CHG	Green	Solid On	Battery is fully charged.
		Flashing	Battery is charging.
⚠ FAULT	Red	Solid On	Fault in the inverter.
		Flashing	Warning in the inverter.

Table 5 Function Button

Function Button	Description
ESC	To exit setting mode
UP	To go to previous selection
DOWN	To go to next selection
ENTER	To confirm the selection in setting mode or enter setting mode

3.2 LCD Display Icons

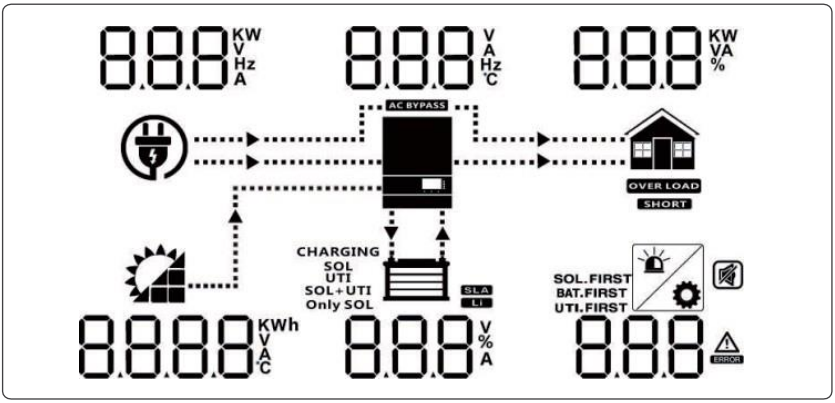


Figure 15 Display Icons

Table 6 Icon Information

Icon	Description
AC Input Information	
	AC input icon
	Indicates AC input power, AC input voltage, AC input frequency, AC input current.
AC BYPASS	Indicates AC power loads by bypass.

Icon	Description
PV Input Information	
	PV input icon
	Indicates PV input power, voltage, current, etc.
Output Information	
	Inverter Icon
	Indicates output voltage, current, frequency, Inverter temperature.
Load Information	
	Load Icon
	Indicates power of load, power percentage of load.
	Indicates overload happened.
	Indicates short circuit happened.
Battery Information	
	Battery Icon
	Indicates battery voltage, energy percentage, battery current.
	Indicates SLA battery
	Indicates Lithium battery
	Indicates charging source priority: Solar first, Utility first, Solar and utility, or only solar

Icon	Description
Other Information	
SOL.FIRST BAT.FIRST UTI.FIRST	Indicates output source priority: Solar first, Utility first, SBU mode or SUB mode.
	Indicates warning code or fault code.
	Indicates a warning or a fault is happening.
	Indicates it is during setting values.
	Indicates the alarm is disabled.

Table 7 Battery information

In AC mode, battery icon will present battery capacity		
Battery Status		SOC < 25%
		25%≤SOC < 50%
		50%≤SOC < 75%
		75%≤SOC
In AC mode, battery icon will present battery charging status.		
Status	**Battery SOC**	**LCD Display**
Constant current mode/Constant voltage mode	SOC < 25%	4 bars will flash in turns.
	25%≤SOC < 50%	Bottom bar will be solid, and the other three bars will flash in turns.
	50%≤SOC < 75%	Bottom two bars will be solid, and the other two bars will flash in turns.
	75%≤SOC	Bottom three bars will be solid, and the top bar will flash in turns.

3.3 LCD Setting

After pressing and holding the ENTER button for 3 seconds, the unit enters the setting mode. Press "UP" or "DOWN" button to select setting programs. Then, press "ENTER" button to confirm the selection or ESC button to exit.

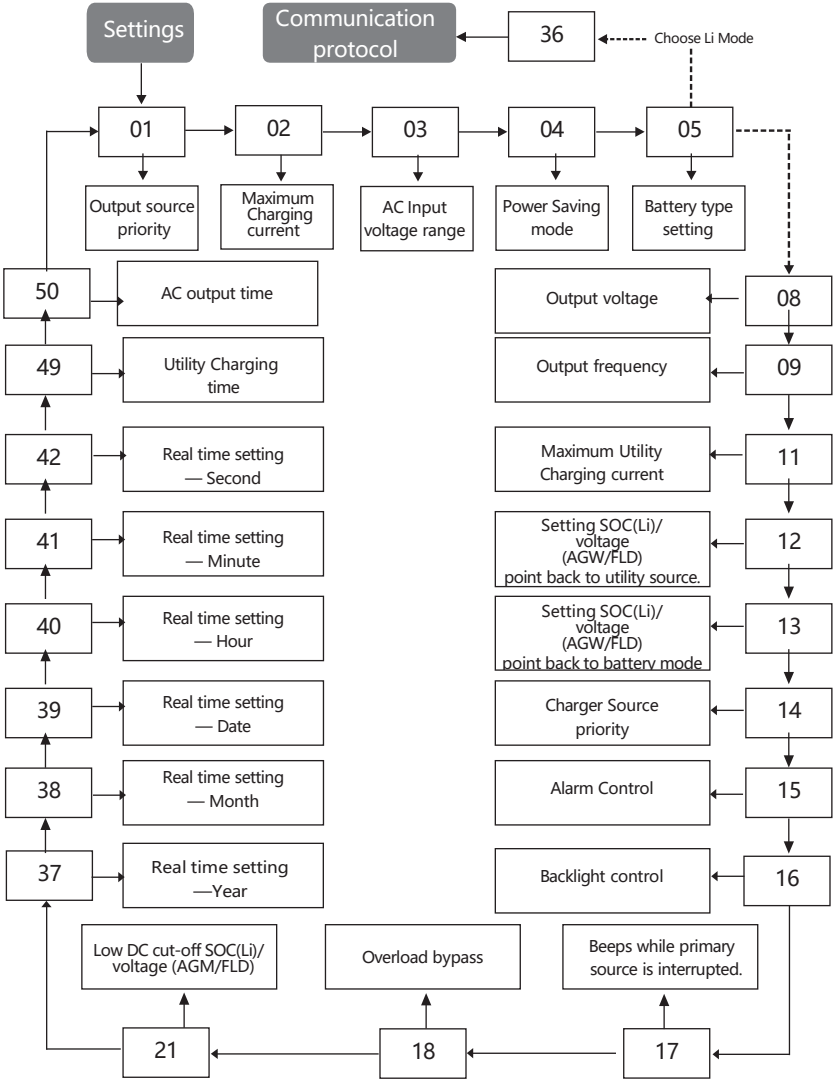
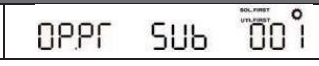
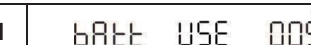
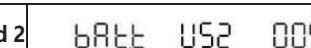
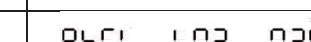
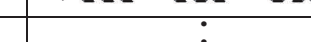
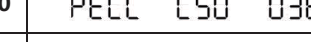
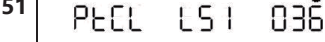


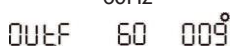
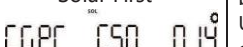
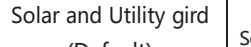
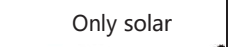
Table 8 Setting Program

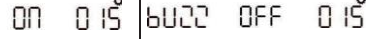
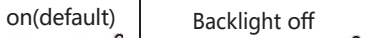
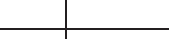
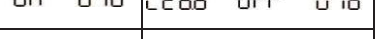
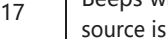
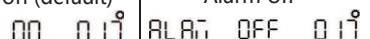
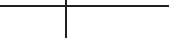
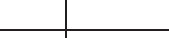
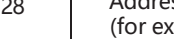
Program	Description	Setting option	
01	**Output source priority selection:** To configure load power source priority	**Solar First**	
		Solar energy provides power to the load as first priority. If solar energy is not sufficient to power the connected load, battery energy will supply power to the load at the same time. Utility grid provides power to the load only when: -Solar energy is not available, or -Battery voltage drops to low-level warning voltage or the setting point in program 12.	
		Utility First	
		Utility grid will provide power to the load as first priority. Solar and battery energy will provide power to the load only when utility power is not available.	
		SBU Priority (Default)	
		Solar energy provides power to the load as first priority. If solar energy is not sufficient to power the connected load, battery energy will supply power to the load at the same time. Utility grid provides power to the load only when battery voltage drops to either low-level warning voltage or the setting point in program 12.	

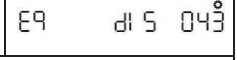
Program	Description	Setting option	
		SUB Priority	
		Solar energy provides power to the load as first priority. If solar energy is not sufficient to power the connected load, solar and utility grid will supply power to the load at the same time. Battery provides power to the load only when solar energy is not sufficient and there is no utility power supply.	
03	**AC input voltage range**	**Appliances (default)**	
		If selected, acceptable AC input voltage range will be within 90∽280Vac.	
		UPS	
		If selected, acceptable AC input voltage range will be within 170∽280Vac.	
		Generator	
		If selected, acceptable AC input voltage range will be within 90∽280Vac. In this mode, the max charging current is 30A.	
04	**Power saving mode enable/disable**	**Disable (default)**	
		If disabled, the on/off status of inverter output will not be affected even if the connected load is low or high.	
		Enable	
		If enabled, the inverter output will be off when connected load is low or not detected.	

Program	Description	Setting option	
05	**Battery type**	**AGM**	
		Flooded	
		Lithium (Default)	
		Only suitable when communicating with BMS	
		User-defined	
		If "User-Defined" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 19, 20 and 21.	
		User-defined 2	
		Suitable when lithium battery is without BMS communication. If "User-defined 2" is selected, battery charge voltage and low DC cut-off voltage can be set up in program19, 20 and 21. It is recommended to set to the same voltage in program 19 and 20 (full charging voltage point of lithium battery). The inverter will stop charging when the battery voltage reaches this setting.	
36	**RS485 communication protocol**	**Protocol 1**	
		Protocol 2	
		⋮	⋮
		Protocol 50	
	CAN communication protocol	**Protocol 51**	
		Protocol 52	
		⋮	⋮
		Protocol 99	

Program	Description	Setting option	
NOTE 1: When the battery type is set as "LI" in program 05, the setting option 12, 13, and 21 will change to display percentage (%). With "LI" type battery, the maximum charge current can't be modified by the user. When the communication fails, the inverter will cut off the output. If communication with the battery is lost, you can set the battery type to "USER" for emergency, and then contact the installer.			
12	Setting SOC point back to utility source when selecting "SBU priority" or "Solar first" in program 01.	b2AC 50 012	Default 30%, 20%~50% Settable
13	Setting SOC point back to battery mode when selecting "SBU priority" or "Solar first" in program 01.	AC2b 95 013	Default 65%, 30%~100% Settable
21	Low DC cut-off SOC, if "LI" is selected in program 05, this program can be set.	CUEU 20 021	Default 10%, 5%~30% Settable
NOTE 2: When the inverter is cut-off, it must charge by solar or utility until the SOC> setting 21+10%, then the inverter will restart.			
06	Auto restart - overload	Restart Disable (Default) LdrS dIS 006	Restart Enable LdrS ENA 006
07	Auto restart - overheating	Restart Disable (Default) EnrS dIS 007	Restart Enable EnrS ENA 007

<table>
<tr><th>Program</th><th>Description</th><th colspan="2">Setting option</th></tr>
<tr><td rowspan="3">08</td><td rowspan="3">Output voltage</td><td>230V(Default)
  </td><td>220V
  </td></tr>
<tr><td>240V
  </td><td>208V
  </td></tr>
<tr><td colspan="2">*This setting is only available when the inverter is in standby mode (Switched off).</td></tr>
<tr><td rowspan="2">09</td><td rowspan="2">Output frequency</td><td>60Hz
  </td><td>50Hz (Default)
  </td></tr>
<tr><td colspan="2">*This setting is only available when the inverter is in standby mode (Switched off).</td></tr>
<tr><td>11</td><td>Maximum utility charging current.</td><td colspan="2"> 
10K: Default 30A, 0A~60A Settable*3
15K: Default 30A, 0A~80A Settable*3</td></tr>
<tr><td rowspan="4">14</td><td rowspan="4">Charger source priority:
To configure charger source priority</td><td colspan="2">If this off grid solar inverter is working in Line, Standby or Fault mode, Charger source can be programmed as below:</td></tr>
<tr><td>Solar First
  </td><td>Solar energy will charge batteries as first priority. Utility will charge battery only when solar energy is not available.</td></tr>
<tr><td>Solar and Utility gird (Default)
  </td><td>Solar energy and utility grid will both charge battery.</td></tr>
<tr><td>Only solar
  </td><td>Solar energy will be the only charger source regardless of the utility availability.</td></tr>
</table>

Program	Description	Setting option	
		If this off grid solar inverter is working in Battery mode or Power saving mode, only solar energy can charge the battery. Solar energy will charge battery if its available and sufficient.	
15	Alarm Control	Alarm on (default) 	Alarm off 
16	Backlight control	Backlight on(default) 	Backlight off 
17	Beeps while primary source is interrupted	Alarm on (default) 	Alarm off 
18	Overload bypass	Bypass Disable 	Bypass enable (Default) 
		When enabled, the unit will transfer to line mode if overload in battery mode.	
28	Address setting (for expansion)	No need to set, keep as default	
37	Real time setting---Year		Default 2018, Range 2018-2099
38	Real time setting---Month		Default 01, Range 01-12
39	Real time setting---Date		Default 01, Range 01-31
40	Real time setting---Hour		Default 00, Range 00-23
41	Real time setting---Minute		Default 00, Range 00-59
42	Real time setting---Second		Default 00, Range 00-59

Program	Description	Setting option	
43	Battery equalization	Battery equalization enabled. 	Battery equalization disabled (default) 
		If "flooded" or "user-Defined" is selected in program 05, this program cannot be changed.	
44	Battery equalization voltage		Default 58.4V, 48.0V-58.4V Settable
45	Battery equalized time		Default 60Min, 5min-90min Settable
46	Battery equalized timeout		Default 120Min, 5min-90min Settable
47	Equalization interval		Default 30 days, 5days-90days Settable
48	Equalization activated immediately	Equalization activated immediately ON 	Equalization activated immediately OFF (default) 
		If equalization function is enabled in program 43, this setting can be changed. If "ON" is selected in this program, it activate battery equalization immediately and the LCD display will show "E9" . If" OFF "is selected, it will cancel equalization function until the next activated equalization time based on program 47 setting.	

Program	Description	Setting option	
49	Utility grid charging time	0000 (Default) 	Set the time the utility grid. Can charge the battery. Use 4 digits to represent the time period. The first two digits represent the time when utility grid starts to charge the battery, (setting range is from 00 to 23), and the last two digits represent the end time to charge the battery, (setting range is from 00 to 23). (e.g., 2320 represents start time as 23:00 that ends the next day 20:59)
50	AC output time	0000 (Default) Allow inverter to power the load all day run. 	The time inverter can power the load. Use 4 digits to represent the time. The first two digits represent the time when inverter starts to power the load, (setting range is from 00 to 23), and the lower two digits represent the time when inverter ends powering the load, setting range is from 00 to 23. (e.g., 2320 represents start time as 23:00 that ends the next day 20:59)
02/19/20/22/23/24/43/ 44/45/46/47/48		No need to set, keep as default	

3.4 Display Information

The LCD display information can be changed by pressing the "UP" or "DOWN" key. The selection information changes in the following order: voltage, frequency, current, power, firmware version.

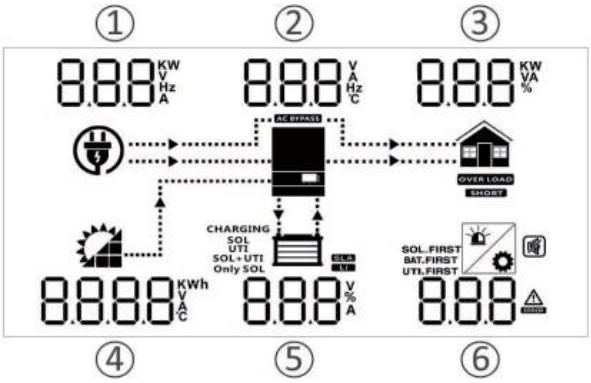


Figure 16 Display Information

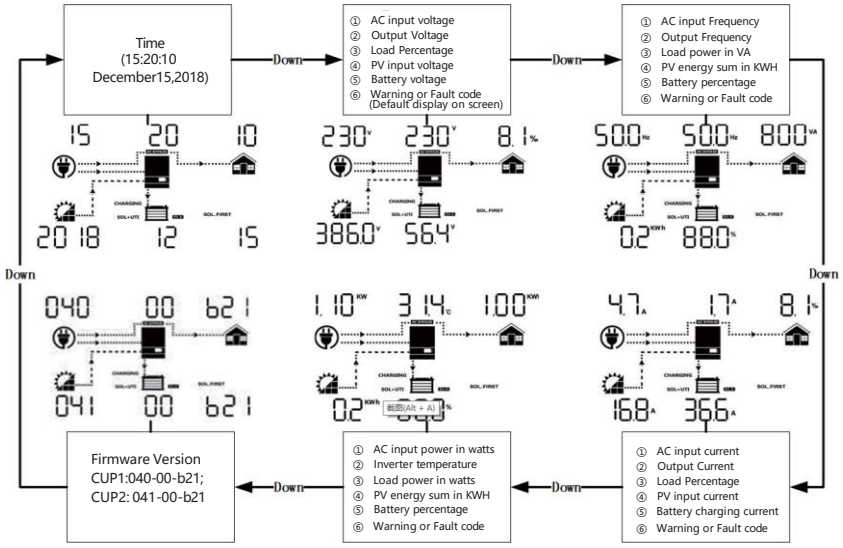
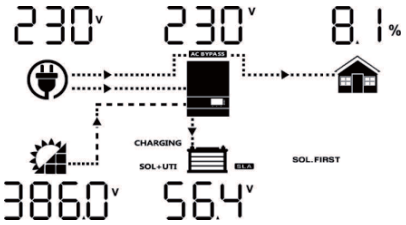
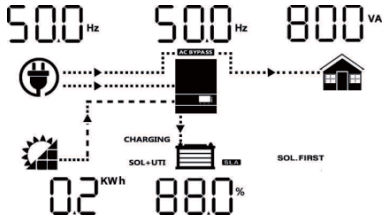
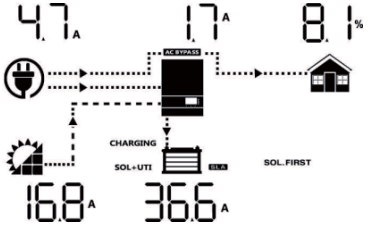
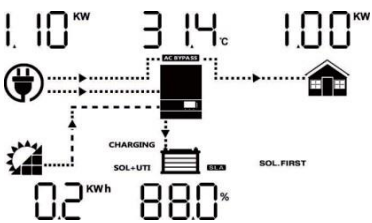
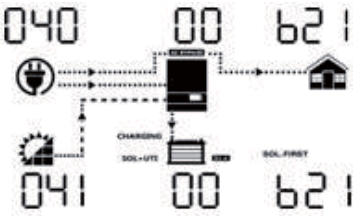
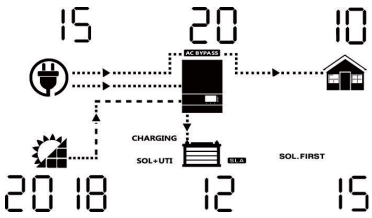


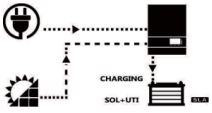
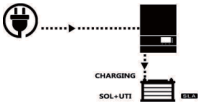
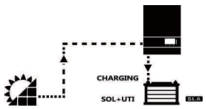
Table 9 Display Information

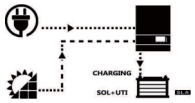
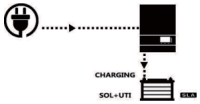
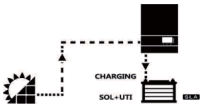
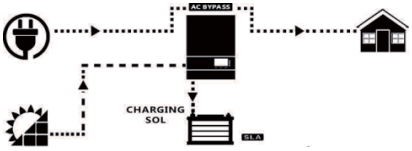
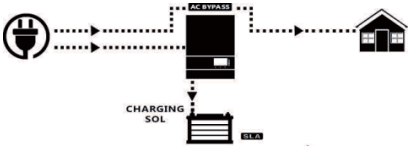
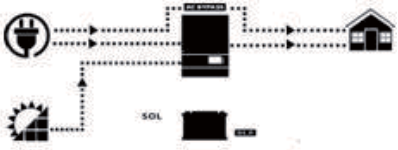
Setting Information	LCD display
① AC input voltage ② Output Voltage ③ Load Percentage ④ PV input voltage ⑤ Battery voltage ⑥ Warning or Fault code (Default display on screen)	
① AC input Frequency ② Output Frequency ③ Load power in VA ④ PV energy sum in KWH ⑤ Battery percentage ⑥ Warning or Fault code	
① AC input current ② Output Current ③ Load Percentage ④ PV input current ⑤ Battery charging current ⑥ Warning or Fault code	
① AC input power in watts ② Inverter temperature ③ Load power in watts ④ PV energy sum in KWH ⑤ Battery percentage ⑥ Warning or Fault code	
Firmware Version CUP1:040-00-b21; CUP2: 041-00-b21	

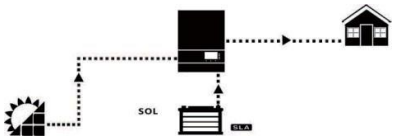
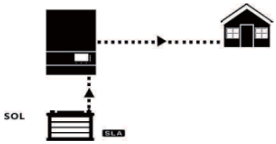
Setting Information	LCD display
Time (15:20:10, December 15, 2018)	

3.5 Operating Mode

Table 10 Operating mode description

Operation mode	Description	LCD display	
Standby Mode / Power Saving Mode **Note:** *Standby mode: The inverter is not turned on yet but currently, the inverter can charge the battery without any AC output. *Power saving mode: If enabled, the inverter output will be switched off.	No output is supplied by the unit, but it still can charge the battery.	Charge by utility and PV energy 	Charging by utility 
		Charging by PV energy 	No charging 

<table>
<tr><th>Operation mode</th><th>Description</th><th colspan="2">LCD display</th></tr>
<tr><td rowspan="2">Fault Mode
Note:
* Fault mode: Overheating, short circuit etc.</td><td rowspan="2">PV energy and utility can charge the battery.</td><td>Charge by utility and PV energy
 
</td><td>Charging by utility grid
 
</td></tr>
<tr><td>Charging by PV energy
 
</td><td>No charging
 
</td></tr>
<tr><td>Utility grid Mode</td><td>The unit will provide output power from the mains. It can also charge the battery in line mode.</td><td colspan="2">Charging by PV energy
 
</td></tr>
<tr><td></td><td></td><td colspan="2">Charging by utility grid
 
</td></tr>
<tr><td></td><td></td><td colspan="2">No battery connected
 
</td></tr>
</table>

Operation mode	Description	LCD display
Battery Mode	The unit will provide output power from battery and PV power	Power from battery and PV power 
		Battery from battery power only 

3.6 Monitoring

For data monitoring, please refer to the "APP Operation Guide" manual.

4 Maintenance

4.1 Fault Code

Fault Code	Fault Event	Icon on
01	Fan is locked	
02	Over temperature	
03	Battery voltage is too high	
04	Battery voltage is too low	
05	Output short circuited	
06	Output voltage is too high	
07	Overload time out	
08	Bus voltage is too high	
09	Bus soft start failed	
11	Main relay failed	
51	Over current or surge	
52	Bus voltage is too low	
53	Inverter soft start failed	
55	Over DC voltage in AC output	
56	Battery connection is open	
57	Current sensor failed	
58	Output voltage is too low	
80	CAN fault	
81	Host loss	

4.2 Warning Indicator

Warning Code	Warning Event	Audible Alarm	Icon flashing
01	Fan locked when inverter is on	Beep 3 times every second	
02	Over temperature	Beep once every second	
03	Battery over charged	Beep once every second	
04	Low battery	Beep once every second	
07	Overload	Beep once every 0.5 second	
10	Output power derating	Beep once every 3 second	
12	Solar chargers stop due to low battery	Beep once every second	
13	Solar chargers stop due to high PV voltage	Beep once every second	
14	Solar chargers stop due to overload	Beep once every second	
15	Parallel input utility grid different	Beep once every second	
16	Parallel input phase error	Beep once every second	
17	Parallel output phase loss	Beep once every second	
18	Buck over current	Beep once every second	
19	Battery disconnects	No beep	
20	BMS communication error	Beep once every second	
21	PV power insufficient	Beep once every second	
22	Parallel forbidden without battery	Beep once every second	
25	Parallel inverters' capacity different	Beep once every second	
33	BMS communication loss	Beep once every second	
34	Cell over voltage	Beep once every second	

Warning Code	Warning Event	Audible Alarm	Icon flashing
35	Cell under voltage	Beep once every second	
36	Total over voltage	Beep once every second	
37	Total under voltage	Beep once every second	
38	Discharge over voltage	Beep once every second	
39	Charge over voltage	Beep once every second	
40	Discharge over temperature	Beep once every second	
41	Charge over temperature	Beep once every second	
42	Mosfet over temperature	Beep once every second	
43	Battery over temperature	Beep once every second	
44	Battery under temperature	Beep once every second	
45	System shut down	Beep once every second	

4.3 Specification

Model	Hyperion	
Battery		
Rated Voltage	51.2V	
Voltage Range	44.8~57.6V	
Depth Of Discharge [DOD]	95% (MAX) / 80% (default)	
Max. Discharge Current	70A X 2	100A X 2
Max. Charge Current (AC+PV)	80A X 2	100A X 2
Max. Charge Current (AC)	30A(0~60A Adjustable) X 2	30A(0~80A Adjustable) X 2
AC Output (Backup)		
Rated Power	7000W	10000W
Output Voltage	208/220/230/240Vac ± 5%	
Output Frequency	50/60Hz ± 1%	
Max Output Current	16A X 2	22.7A X 2
Rated Current	15.2A X 2	21.7A X 2
Peak Power [1]	14000W	20000W
Over Load Ability [1]	Battery Mode (Battery Max Output Current > 200A) : 10s@110~130% Load 5s@ > 150%Load	
Output Wave	Pure Sine Wave	
Peak Efficiency (Battery Mode)	> 90%	
Transfer Time	20ms	
AC Input		
Input Sources	L+N+PE	
AC Input Voltage Range	170~280Vac	
Rated Input Voltage	230Vac	
AC input frequency	50/60Hz	
PV Input		
Max PV Input Power	4500W/4500W	6000W/6000W
Max. PV Input Voltage	450Vdc	
MPPT Voltage Range	120~430Vdc	
Max. DC Input Current	18A	
Max. DC Short Circuit Current	20A	
General Data		
Range of working temperature	Charge: 0℃~50℃/Discharge: -10℃~55℃	
Optimal working temperature range	20℃~30℃	
Storage temperature	-15℃~60℃	
Humidity	20-95% non-condensing	
Cooling strategy	Fan	
Weight	35kg	35kg
Dimension [W x H x D]	620*255.5*365mm	620*255.5*365mm
Enclosure protection rating	IP20	
Communication	Wi-Fi (Optional)	
Certificate	CE, UN38.3, TUV mark	

[1]More than two batteries need to be connected to satisfy.

Battery Module	
Electrical Parameter	
Battery Type	LiFePO4
Battery Capacity per Kit [Wh]	5120
Usable Energy [Wh]	4600
Rated Voltage [V]	51.2
Voltage range [V]	44.8-57.6
Max. Charging and Discharging Rate	100A
Depth Of Discharge [DOD]	≤90%
Cycle Life(25℃,0.5C)	≥6000 times,80% Capacity retention
Scalability	Yes (up to 40.96kWh)
General Data	
Communication Mode	RS232/CAN2.0
Operating Temperature Range	0~50°C (Charge)/-10~50°C(Discharge)
Storage Temperature Range	-15°C~60°C
Cooling Method	Natural Convection
Altitude	<1000m
Ambient Humidity	20-95% non-condensing
Noise[dBA]	<25
Ingress Protection	IP20
Dimension [W x H x D]	620*139*365mm
Weight	46.7kg

4.4 Trouble Shooting

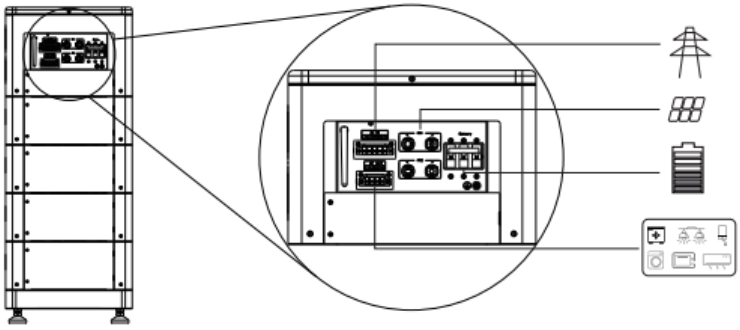
Problem	LCD/LED/Buzzer	Explanation / Possible cause	What to do
Unit shuts down automatically during start up process.	LCD/LEDs and buzzer will be active for 3 seconds and then turn off.	The battery voltage is too low (<setting in program 5)	1. Re-charge battery. 2. Replace battery.
No response after power on.	No indication.	1. The battery voltage is too low. 2. Battery polarity connected in reverse.	1. Check if batteries and the wiring are connected well. 2. Re-charge battery. 3. Replace battery.
	Input voltage displayed as 0 on the LCD and the green LED is flashing.	Input protector is tripped	Check if AC breaker is tripped and AC wiring is connected well.

Mains exist but the unit works in battery mode.	Green LED is flashing.	Insufficient AC power. (Shore or Generator)	1. Check if AC wires are too thin and/or too long. 2. Check if generator (if applied) is working well or if input voltage setting is correct. (UPS appliance)
	Green LED is flashing.	Set "Solar First" as the priority of output source.	Change output source, priority to Utility first.
When the unit is turned on, internal relay is switched on and off repeatedly.	LCD display and LEDs are flashing	Battery is disconnected.	Check if battery wires are connected properly.
Buzzer beeps continuously and red LED is on.	Fault code 01	Fan fault	Replace the fan.
	Fault code 05	Output short circuited.	Check if wiring is connected well and remove abnormal load.
	Fault code 02	Internal temperature of inverter component is over 100°C.	Check whether the air flow of the unit is blocked or whether the ambient temperature is too high.
	Fault code 03	Battery is over-charged.	Return to repair center.
		The battery voltage is too high.	Check if spec and quantity of batteries meet requirements.

Problem	LCD/LED/Buzzer	Explanation/Possible cause	What to do
Buzzer beeps continuously and red LED is on.	Fault code 06/58	Output abnormal (Inverter voltage below than 190Vac or is higher than 260Vac)	1. Reduce the connected load. 2. Return to repair center
	Fault code 07	Overload error. The inverter is overloaded at 110% for longer than permissible.	Reduce the connected load by switching off some equipment.
	Fault code 08/09/53/57	Internal components failed.	Return to repair center.
	Fault code 51	Over current or surge.	Restart the unit, if the error occurs again, please return to repair center.
	Fault code 52	Bus voltage is too low.	
	Fault code 55	Output voltage is unbalanced.	
	Fault code 56	Battery is not connected properly, or fuse is burnt.	If the battery is connected well, please return to repair center.

4.5 Activation

If you accidentally discharge the battery capacity to zero and can't turn it on, you need to activate it by connecting PV or Utility grid to recharge and reuse the battery.



4.6 Overview of the Active Fire Extinguisher Module

Equipment Overview

The fire safety device is an automatic fire extinguisher that uses thermal aerosol as its extinguishing agent. It operates through thermal activation and quickly releases the thermal aerosol extinguishing agent upon detecting signs of a fire. This rapid response is designed to control and extinguish fires effectively.

Item	Parameter	Item	Parameter
Activation Method	Thermal Activation	Activation Temperature	≥170°C
Operating Temperature Range	-30°C to +70°C	Dimensions	103mm*75mm*11mm
Operating Relative Humidity	≤95% RH	Effective Protection Volume	0.3 m^3
Discharge Time	≤5s	Time After Discharge	≤1s
Oxidizing Agent Name and Content	Potassium Nitrate, Potassium Perchlorate 50%~58%	Service Life	10 years

Working Principle

When the ambient temperature reaches or exceeds 170°C, the thermal activation component of the fire safety device automatically activates, triggering the release of the thermal aerosol extinguishing agent. The extinguishing mechanism of thermal aerosol primarily operates in two ways:

1. Cooling Effect through Endothermic Decomposition: The thermal aerosol absorbs a significant amount of heat during combustion, thereby reducing the temperature in the fire area.

2.Chemical Inhibition in Gas and Solid Phases: During combustion, the thermal aerosol produces substances with chemical inhibitory effects. These substances disrupt the chain reaction of combustion, effectively suppressing the spread of the fire.

Activation Timing

When the ambient temperature around the fire safety device reaches or exceeds 170°C, the device's thermal activation component will

automatically trigger, releasing the thermal aerosol extinguishing agent.

Protective Function

The fire safety device is primarily used to protect the space or equipment within its immediate range, preventing the spread of fire and minimizing further damage. It can effectively safeguard an area of approximately 0.4m². Through its unique extinguishing mechanism, the thermal aerosol extinguishing agent can quickly and effectively control and extinguish fires, thereby protecting the target area from fire damage.

UCANESS App - Hyperion Wi-fi Connectivity

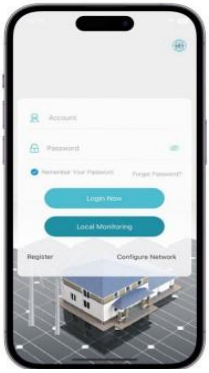
1. Register an account

If you do not have a UCANESS account, please open the UCANESS APP and click the "Register" button on the login page to enter the registration process.

During registering, you need to check the "Terms of Service and Privacy Policy", input the username and email, and set your account login password.

Click the "Verification Code" button to send verification to your email. Go to your email and input the verification code, and then click the "Register" button.

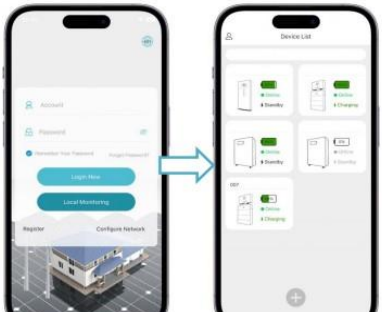
Your registration will be completed successfully.



2. Account Login

Click UCANESS APP and go to the login page.

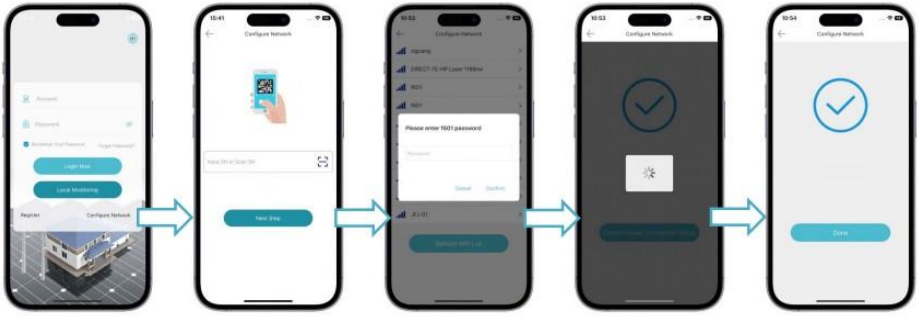
Input your registered account number and password and click the "Login" button to acces the online "Device List" page



1. Network Configuration

If you want to monitor the device in WiFi mode, you need to configure the network for the device first. Please follow the below steps:

Click "Configure Device Network ➔ Enter or scan to identify SN (Serial Number) ➔ Select the network and enter the correct password ➔ Check the network connection status of the device ➔ Click Done
(Note: The device must be powered on and Bluetooth should not be connected to any other device)



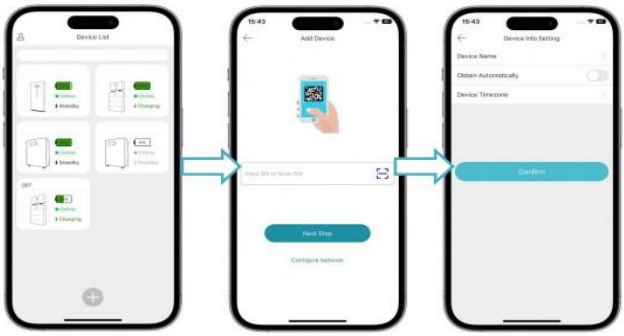
UCANNES App – Hyperion Wifi Connectivity

2. Adding device

After the device is connected to a network, click the ⊕ button in the device list.

Enter or scan the identification SN code on the add device page and click Next Step. Enter the device information setting page to set the device name and time zone and click OK to Confirm.

(Note: The device should be powered on and the Bluetooth should not be connected to any other device)



1. Device home page

On the device home page, you can monitor the total power generated/utilized from energy storage, utility grid, Solar PV, and the load through the energy flow diagram.

In the energy overview module, the daily total value and cumulative total value of the energy storage output, grid output, solar PV output and load consumption can be monitored.

Click "Data Report" on the setting page to enter the data report page, which displays the chart information according to the day, month, year, and total to date.

(Note: Click the legend to show/hide the corresponding item information in the chart)