HYSOLIS™

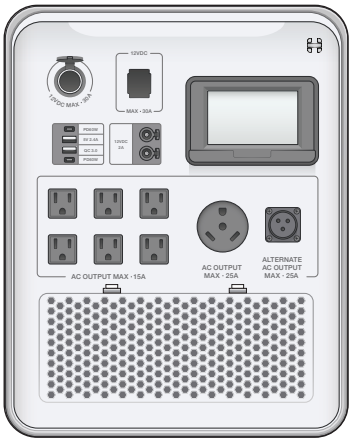
User Manual

Portable Solar Power Station

Apollo 5K

Contents

1.0 Introduction



Thank you very much for purchasing the Hysolis Apollo 5K unit! We designed this product to help grant you energy independence. We have the utmost confidence in this product's performance and quality. Please feel free to contact us at **Hysolis.com** if you have any questions. Enjoy using your Hysolis Apollo 5K, and may it positively affect your future endeavors!

The product has the following features:

- Dual-CPU Intelligent Control Technology manages energy input/output
- High-frequency pure sine wave output is clean and reliable for any load
- Wide input voltage range and consistent voltage output
- Three programmable working modes prioritize different energy needs:
    - **UPS mode:** Utility Power first, a.k.a. "Pass-through AC Power"
    - **AC Fast Charge (AC F.C.) mode:** 120V AC power Fast Charge, 600W-3,000W (5A - 25A) programmable
    - **Battery First mode:** The solar charges the battery and grid. AC Power is only used if battery is almost empty.
- Intelligent MPPT solar controller features over-charge & over-discharge protection, current limiting charging, and multiple other safety protections
- Battery over-voltage and low-voltage protection, overload protection, short circuit protection, over-temperature and under-temperature protection.
- A 4.3" touchscreen shows real-time running statuses at-a-glance
- Remote monitoring and control
- Compact and modular unit design for portability
- Smart Fan Control keeps the unit cool, safe, and reliable
- Multiple output power supply (120VAC/3000W, 12VDC/600W, 5VDC/120W)
- Unattended mode: If battery runs out, inverter auto-starts when solar power is available.

2.0 Safety

All personnel engaged with installation, use, or maintenance of this product must read, and understand the information in this manual. Please contact customer service if there are any questions before operating this product.

⚠ WARNING

- Inserting foreign objects into any of the product's port or ventilation holes may cause an electrical shock and result in death or serious injury. Never insert foreign objects into any of the product's port or ventilation holes.
- Improper connections between the unit and the power source may result in exposure to electricity and could result in death or serious injury. A licensed electrician is required to install the Apollo 5K as spacing installation involves connecting the wires from your home circuit breaker box to the Apollo 5K Wiring Box (optional purchase).
- Placement of the product near any heat sources may result in an explosion or toxic fumes and could result in death or serious injury. Never place and operate the product in an environment with flammable, explosive gas, or smoke.
- Operation of the product in wet conditions may conduct electricity and expose people and animals to electric shock resulting in minor injury or death. Always turn the power to the unit OFF if is operating in wet conditions. Let the unit dry completely and ensure the unit is in a safe environment before turning the power to the unit on.
- This product utilizes high voltage solar array to charge. Exercise extreme caution when handling high-voltage PV (solar) wires. Do not use if wires are damaged. Use included Solar Input Breaker to connect to Apollo.
- Voltage may be present on PV (solar) Input when inverter is in operation.

⚠ CAUTION

Only use a dry chemical powder fire extinguishing agent if the product is exposed to flame or fire. Using a wet chemical fire extinguisher can conduct electricity and cause an electric shock and may result in minor or moderate injury as well as damage the product.

NOTICE

- Ensure proper ventilation while in use and do not obstruct fan openings. Inadequate ventilation may cause permanent damage to the equipment.
- Vibrations and impacts during product operation may damage the unit and lead to poor connectivity to the hardware inside. Do not move the product during operation.
- Stacking anything on top of the power station either in storage or while in use may cause damage the product. Do not stack anything on the product.
- Replacement of the internal battery or any other components of product by anyone other than authorized personnel may result in damage to the product. Always have authorized personnel perform hardware maintenance.

3.0 Initial Inspection

NOTICE

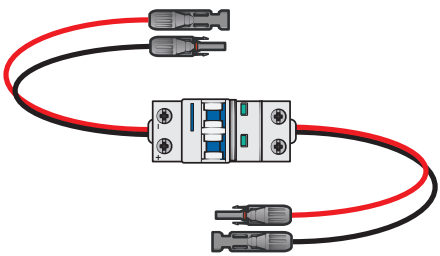
Inspect the product for damage during transit. Do **not** power the product ON.

Check the following items are in the box (**Note:** Cables are shipped separately in the accessories box):

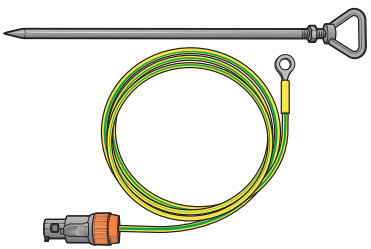
- AC charging cable

- DC charging cable

- Solar Input Breaker



- Ground cable and spike



- Wall-Outlet Adapter for AC charging cable
- User Manual
- Apollo 5K Unit

Report any damage to the product to the dealer and carrier. Contact Hysolis customer service regarding any missing items:

Phone: +1 (760) 410-5917

Email: support@hysolis.com

4.0 Product Features

4.1 Top Panel

1. Wireless Charger

   Note: The wireless charger can be used to charge compatible electronic devices.

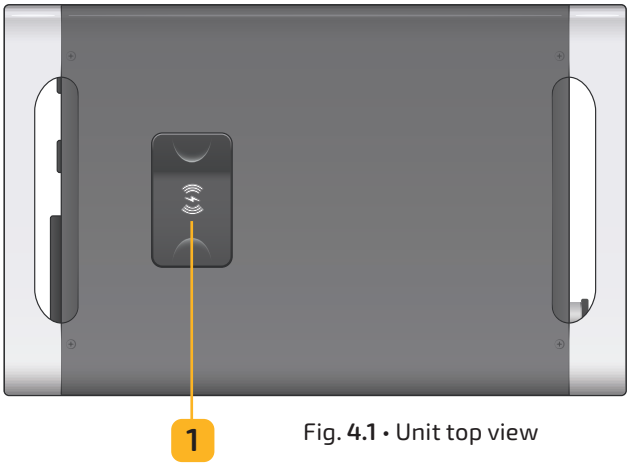


Fig. **4.1** • Unit top view

4.2 Front Panel

2. 12VDC Output 5210 Sockets (MAX 2A)
3. 12VDC Output Anderson Plug (MAX 30A)
4. 12VDC Output Cigarette Lighter Socket (MAX 10A)
5. 5VDC Output USB /TYPE C Charger
6. 120V AC Output NEMA 5-20R outlets (Max 20A)
7. 120V AC Output NEMA TT-30R Outlet (Max 25A)
8. 120V Alternate AC Output Outlet (Max 25A)
9. Touchscreen
10. Indicator Light
11. Air Vent (removable for cleaning)

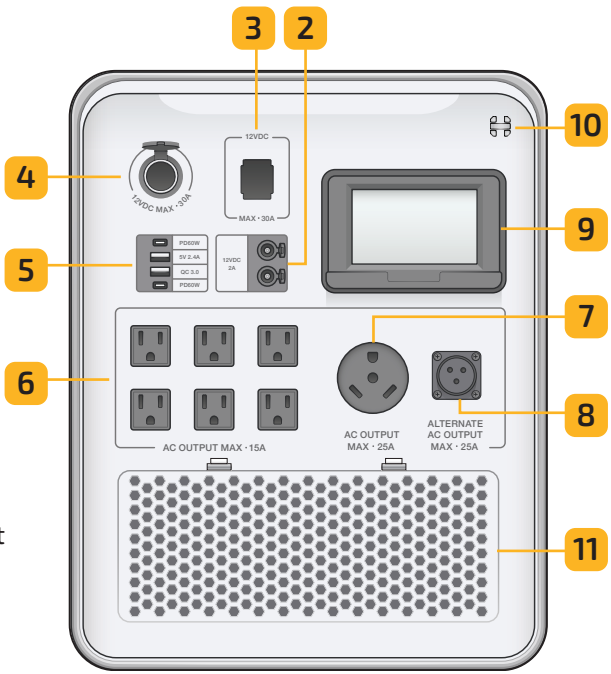


Fig. **4.2** • Unit front panel

4.3 Back Panel

12. 120V AC Input Port LP-28 (MAX 30A)
13. Inverter Reset Switch
14. AC Output parallel communication port (For AC output parallel set up)
15. Expansion Battery Port 1
16. Expansion Battery Port 2
17. AC Input Reset Switch
18. 12/24VDC Input Port (Max. 10A)
19. Power Switch (for Battery BMS)
20. Solar Input Port (Voc. Range 120V DC ~ 500V DC, Max. Charging Power 4,400W, Max. Total Input for Charging+Inverter 5,000W/18A)
21. BMS Working Status Indicator
22. Ground Port
23. BMS Reset Button

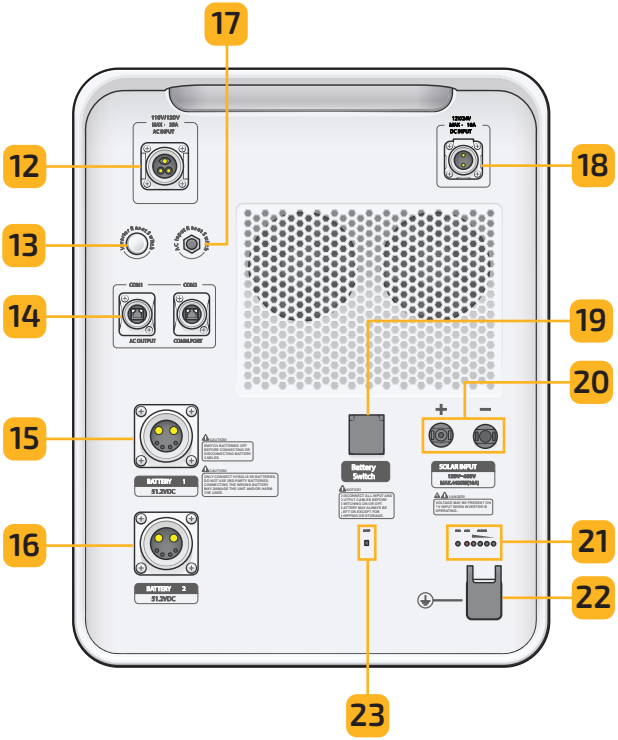


Fig. **4.3** • Unit back panel

4.4 Homepage UI Touchscreen

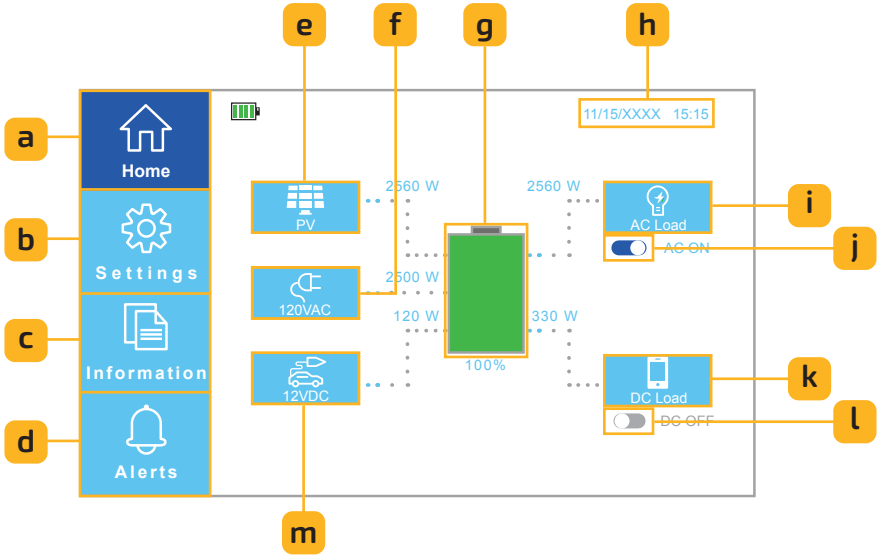


Fig. **4.4** • Homepage UI touchscreen features

a. **Homepage Button:** Press to return to the Homepage UI touchscreen
b. **Setting Screens Button:** Press to access the Settings screens
c. **Information Screens Button:** Press to access the Information screens
d. **Alert Screen Button:** Press to access the current Alert screen
e. **PV (solar) Button:** Press to access the PV Input information screen
f. **AC Button:** Press to access the AC Input information screen
g. **Battery Button:** Press to access the Battery information screen
h. **Date & Time:** Displays current Date and Time
i. **AC Load Button:** Press to access the AC Output information screen
j. **AC Output On/OFF Switch:** Toogle to turn AC Output ON or OFF
k. **DC Load Button:** Press to access the DC Output information screen
l. **DC Output ON/OFF Switch:** Toggle to turn DC Output ON or OFF
m. **DC Button:** Press to access the DC Charge information screen

4.5 Homescreen UI Icons

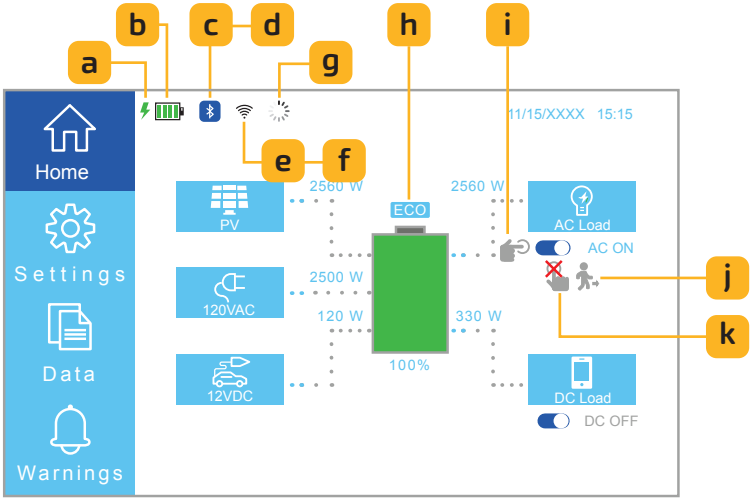


Fig. **4.5** • Homepage UI touchscreen icons

a. AC/DC Status: The unit is charging.

b. Battery Status Indicator: Battery charge level.

c. Bluetooth Indicator (connected): The unit is connected to Bluetooth.

d. Bluetooth Indicator (not connected): The unit is **not** connected to Bluetooth.

e. WiFi Status (connected): The unit is connected to a WiFi network.

f. WiFi Status (ready to connect): The WiFi settings have been reset and the device is ready to connect to a WiFi network.

g. WiFi Status (connecting): The unit is connecting to Bluetooth.

h. Energy Saver Mode Status: Energy saver mode is on.

i. Inverter Status (disconnected): The inverter is disconnected, click to power on the inverter.

j. Unattended Mode Status: Unattended mode is on.

k. Inverter Status (disconnected): Inverter may not be used when using AC F.C. mode greater than the default value.

5.0 Installation

Important! A licensed electrician is required to install the Apollo 5K in any hardwired fashion. An Apollo 5K Wiring Box (Optional Purchase) may be used in the installation. For all configurations, please consider the rated amperages of power sources, total loads, wires, and the Apollo 5K. Do not exceed limits.

The Apollo 5K factory default setting is “floating neutral” (i.e. the neutral and ground are unbonded.

The unit should be configured with floating neutral when connecting the load side of the Apollo to a separate ground (e.g. directly supplying power to a home breaker panel).

The unit may be configured with a neutral-ground bond, a.k.a. “bonded neutral”, which may be preferred for some off-grid applications. To bond the neutral to the ground, please follow instructions according to the label on the side panel of the Apollo as depicted in Fig. 5.1 and Fig. 5.2 below.

The Apollo ground port may be connected to a grounding rod, building rod, etc. by a qualified electrician. Ensure the Apollo neutral-ground is appropriately bonded or unbonded.

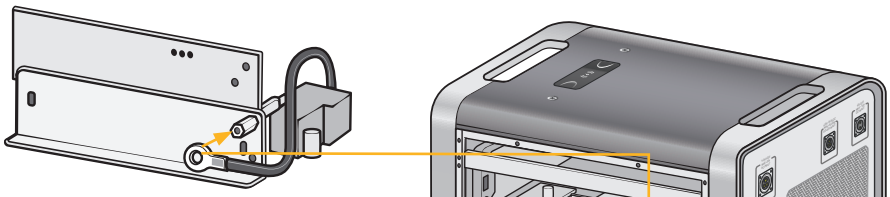


Fig. **5.1 Neutral-Ground Separated / Floating Neutral (Factory Default):** The Neutral wires to the plastic pole

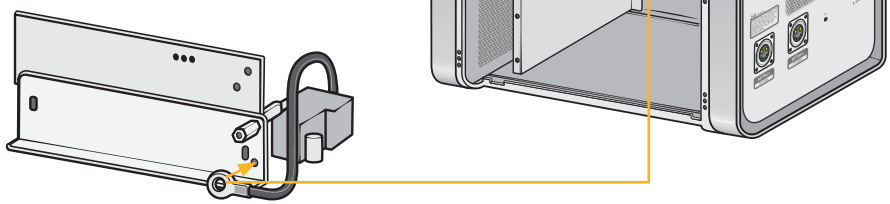


Fig. **5.2**
Neutral-Ground Bonded: The Neutral wires to the metal structure

5.1 Overview

There are two installation options. These include Single Unit setup and Multi-unit setup. Refer to the Apollo 5K Expandability Manual for Multi-unit setup instructions. The power sources for each option include:

- AC input (i.e. utility power or generator)
- DC input (i.e. automobile with DC output)
- PV input (i.e. solar photovoltaic panels)
- Both setups provide AC and DC output.

5.2 General Installation Guidelines

During transport, the unit may have warmed or cooled outside of its working temperature range. Moisture may have condensed on the unit. Ensure it is dry and within the proper temperature range before using.

- Do not use the product in a wet or dusty environment.
- Do not use anything flammable or explosive near the product.
- Do not cover or block the vents in the product.
- Maintain 4 inches (10cm) of clear space around the unit to have good heat dissipation.

5.3 Single Unit Options

This section provides an overview of the single unit options. It shows input power options (Fig. **5.3**), possible ouput capabilties, and describes the input and output power parameters for AC, DC, and PV (solar) input and AC, DC output.

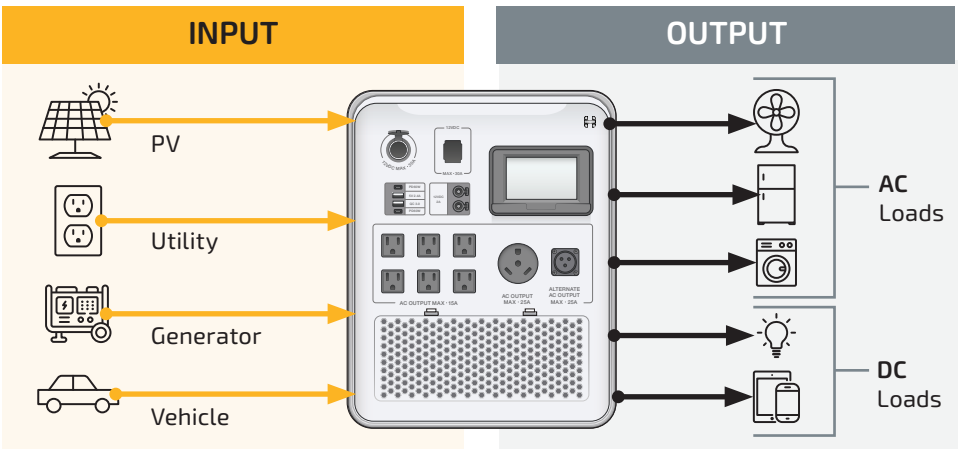


Fig. **5.3** Power options and output capabilities

5.3.1 Single Unit: 120V AC Input

Acceptable Voltage Range	65V~140VAC (for home appliances) 95V~140VAC (for computers)
Frequency	60Hz / 50Hz (auto-sensing)
Maximum Current	30A (3,600 watts)

Table **5.1** Single unit - 120V AC input power parameters

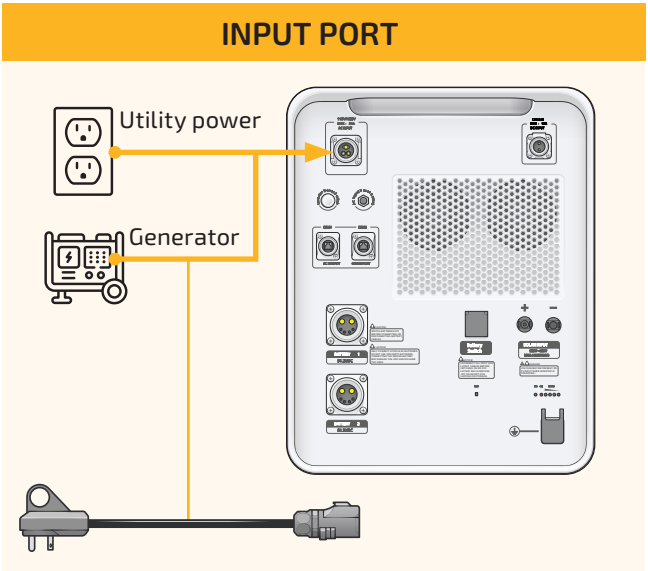


Fig. **5.4** Single unit - 120V AC input port and cable

5.3.2 Single Unit: 120V AC Output

Voltage Range	120VAC (+/-5%) 60Hz / 50Hz (auto sensing)
Wave Form	Pure sine wave
Rated Current	25A (3,000 watts) / Surge: 50A (6,000 watts)

Table **5.2** 120V AC output power parameters

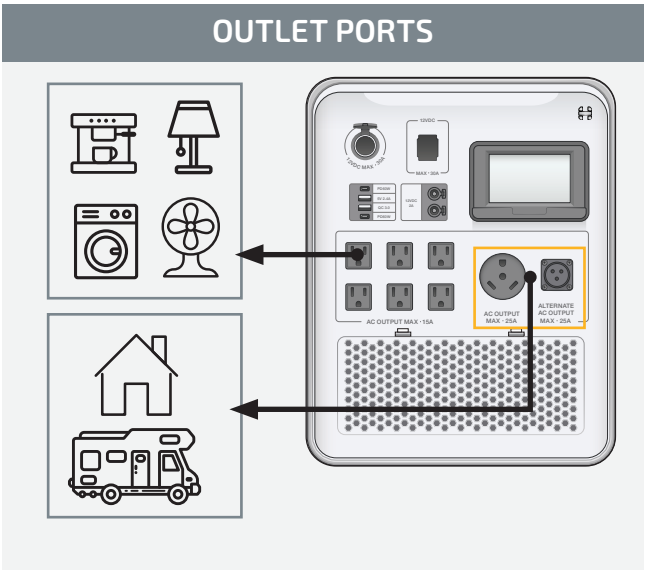


Fig. **5.5** 120V AC output ports

5.3.3 Single Unit: 120V DC Input

Acceptable Voltage Range	12VDC or 24VDC
Maximum Current	10A

Table **5.3** 120V DC input power parameters

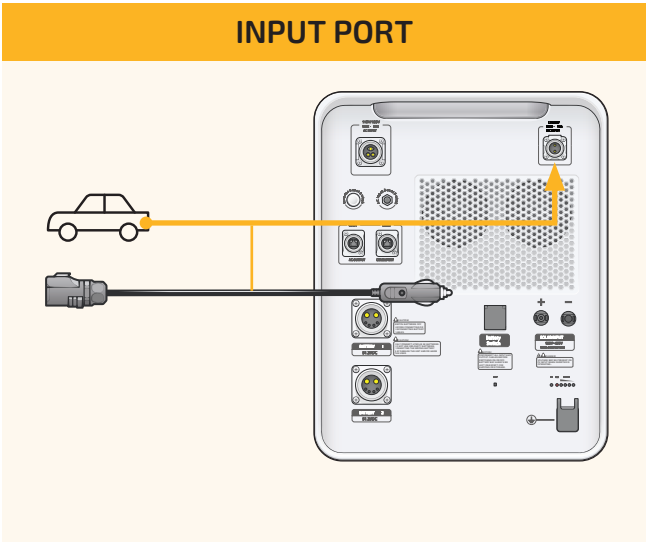


Fig. **5.6** Single unit - 120V DC input port and cable

5.3.4 Single Unit: 120V DC Output

Wireless Charger	Max 20W
12VDC Output Anderson Plug	Max 30A
12VDC Output Cigarette Lighter Socket	Max 10A
5VDC Output USB / TYPE C Charger	Max 100W
12VDC Output 5210 Sockets	Max 2A

Table **5.4** 120V DC output power parameters

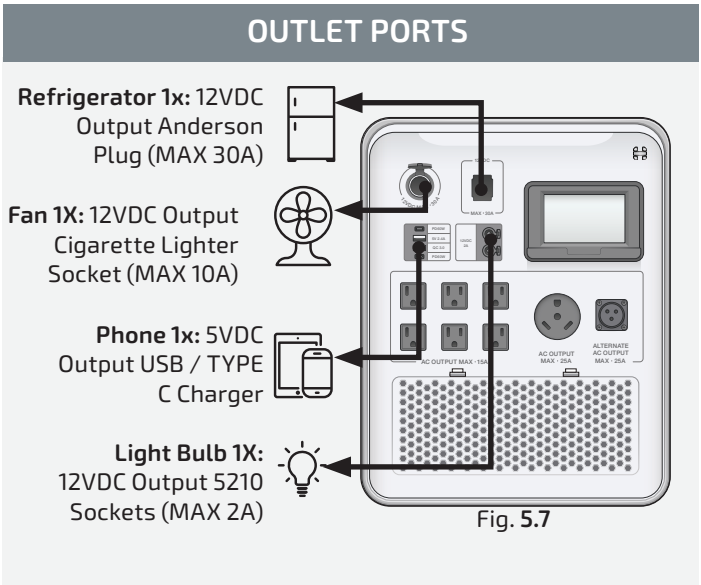


Fig. **5.7**

Fig. **5.7** Single unit - 120V DC output ports

5.3.5 Single Unit: PV (solar) Input

Solar MPPT Voltage Range	60VDC~500VDC
Maximum Solar Charging Power	4,400 watts
Maximum Solar Input Current	18A
Maximum Solar Input Power	5,000 watts*
Maximum MPPT Charge Current	DC 80A

* When Inverter is Active, some Solar Input Power may be used for Inverter Power

Table **5.5** PV input power parameters

N panels in series
(**Note:** always configure your array within the MPPT specifications (Table 5.5)

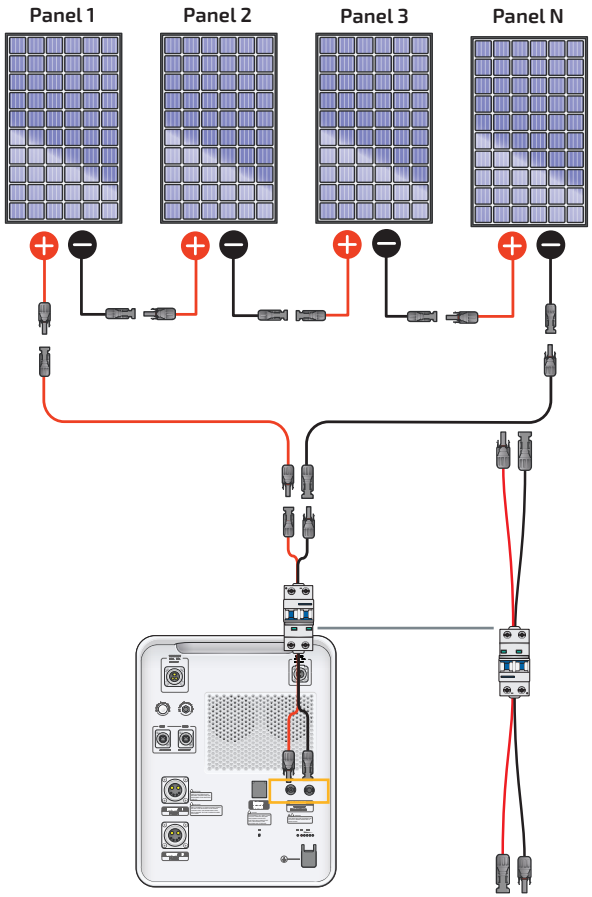


Fig. **5.8** Single unit - PV input port and cable (N panels)

Important! The Working Voltage must be within the Apollo's range of 60–500V.

The following tables provide reference calculations to demonstrate the behavior of wattage, voltage, and amperage with solar panels in a series array. The calculations are based on the voltage and wattage of the solar panel specifications of; 410W/37.1V (Table **5.6**) and 200W/20.4V (Table **5.7**).

The number of panels (i.e. 4–10, 7–20) multiply to produce the total voltage and power of the solar array. The total Open Circuit Voltage (Voc) and Short Circuit Current (Isc) must be within the unit's operating range between 60-500V and <=18A, respectively.

Solar Panel Specifications (For reference)	PV Array	Open Circuit Voltage	Working Voltage	Working Current	Total Power
• Pmax: 410W • Vmp: 30.6V • Imp: 13.4A • Voc: 37.1V • Isc: 13.9A	3 panels in series x 1 string	111.0V	92.0V	13.4A	1230W
	4 panels in series x 1 string	149.0V	122.0V	13.4A	1630W
	5 panels in series x 1 string	186.0V	153.0V	13.4A	2050W
	6 panels in series x 1 string	223.0V	184.0V	13.4A	2470W
	7 panels in series x 1 string	260.0V	214.0V	13.4A	2870W
	8 panels in series x 1 string	297.0V	245.0V	13.4A	3280W
	9 panels in series x 1 string	334.0V	275.0V	13.4A	3690W
	10 panels in series x 1 string	371.0V	306.0V	13.4A	4100W
	11 panels in series x 1 string	409.0V	337.0V	13.4A	4520W
	12 panels in series x 1 string	446.0V	367.0V	13.4A	4920W
	13 panels in series x 1 string	483.0V	398.0V	13.4A	5330W

Table **5.6** Example calculations based on 410W/37.1V

Note: The working current stays the same with each series array. Although the maximum total charging power is 4400W, you may safely "over-panel" the array up to 500V or approximately 5300W with 410W panels.

Solar Panel Specifications (For reference)	PV Array	Open Circuit Voltage	Working Voltage	Working Current	Total Power
• Pmax: 200W • Vmp: 20.4V • Imp: 9.8A • Voc: 24.3V • Isc: 10.2A	4 panels in series x 1 string	97.0V	82.0V	13.4A	800W
	5 panels in series x 1 string	122.0V	102.0V	13.4A	1000W
	6 panels in series x 1 string	146.0V	122.0V	13.4A	1200W
	7 panels in series x 1 string	170.0V	143.0V	13.4A	1400W
	8 panels in series x 1 string	194.0V	163.0V	13.4A	1600W
	9 panels in series x 1 string	219.0V	184.0V	13.4A	1800W
	10panels in series x 1 string	243.0V	204.0V	13.4A	2000W
	11 panels in series x 1 string	267.0V	224.0V	13.4A	2200W
	12 panels in series x 1 string	292.0V	245.0V	13.4A	2400W
	13 panels in series x 1 string	316.0V	265.0V	13.4A	2600W
	14 panels in series x 1 string	340.0V	286.0V	13.4A	2800W
	15 panels in series x 1 string	365.0V	306.0V	13.4A	3000W
	16 panels in series x 1 string	389.0V	326.0V	13.4A	3190W
	17 panels in series x 1 string	413.0V	347.0V	13.4A	3400W
	18 panels in series x 1 string	437.0V	367.0V	13.4A	3600W
	19 panels in series x 1 string	462.0V	388.0V	13.4A	3800W
	20 panels in series x 1 string	486.0V	408.0V	13.4A	4000W

Table **5.7** Example calculations based on 200W/20.4V

6.0 Operation

The following section describes the power options and touchscreen operation of the unit.

6.1 Power-on Options

To enable battery power, press the ***Battery Switch*** on the back of unit.
Note: Make sure all cables are disconnected first.

6.1.1 Battery Power

Note: Switch off the battery for long periods of inactivity, for shipping, or for storage. **Important!** Make sure all cables are disconnected before switching the unit off.

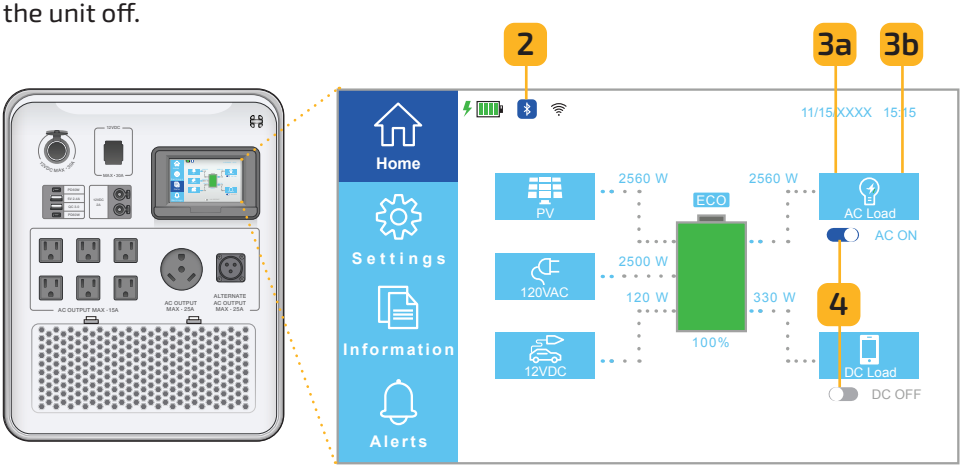


Fig. **6.1** Battery power setup

1. With all cables disconnected, press the ***Battery Switch*** to connect the battery. Touchscreen will light up.
2. Wait until the Bluetooth signal is ready.
   Note: Bluetooth icon is highlighted blue.

3a. Press ***AC Output*** once to turn on the Inverter.
Note: The AC switch will toggle to ON then OFF.

3b. Press ***AC Output*** again to turn on the Inverter.
Note: AC Output is now enabled.

4. Turn ***AC Output*** or ***DC Output*** on/off as needed.

6.1.2 AC Power

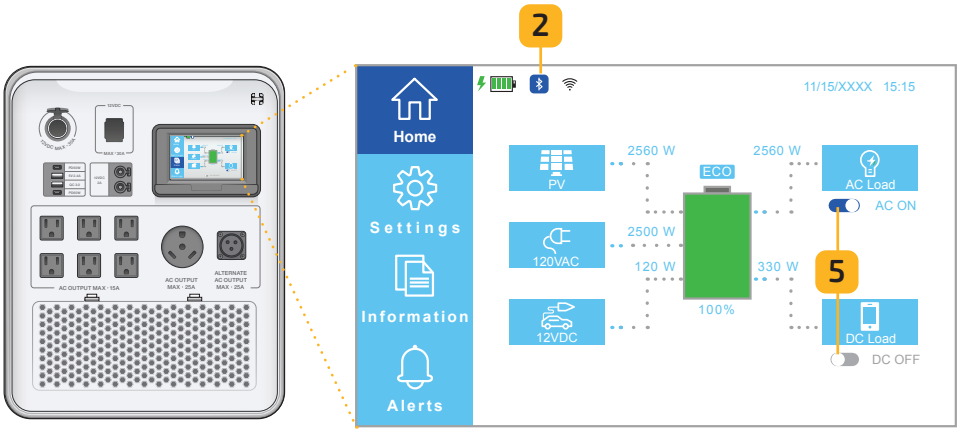
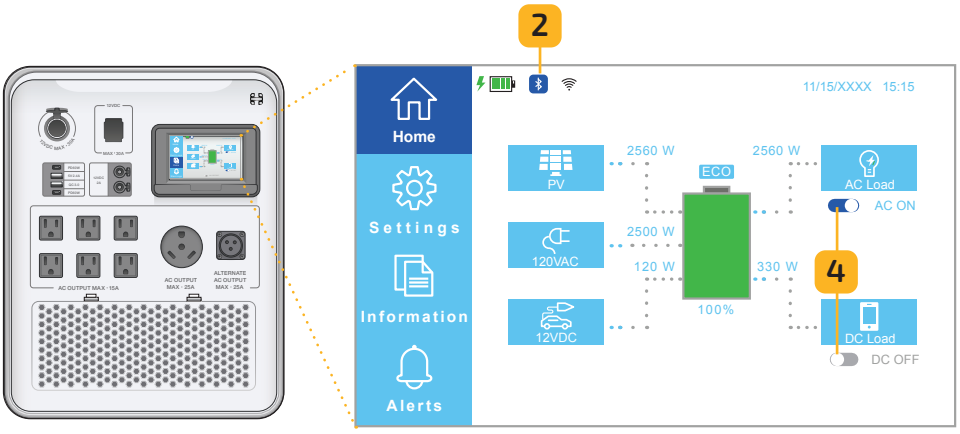


Fig. **6.2** AC power setup

1. With all cables disconnected, press the ***Battery Switch*** to connect the battery. Touchscreen will light up.
2. Wait until the Bluetooth signal is ready. **Note**: Bluetooth icon is highlighted blue.
3. Plug the ***AC charging cable*** into the AC Input port.
4. Plug the ***AC charging cable*** to the 110V/120V power source. **Note:** The inverter will be started automatically.
5. Turn ***AC Output*** or ***DC Output*** on/off as needed.

6.1.3 PV (solar) Power



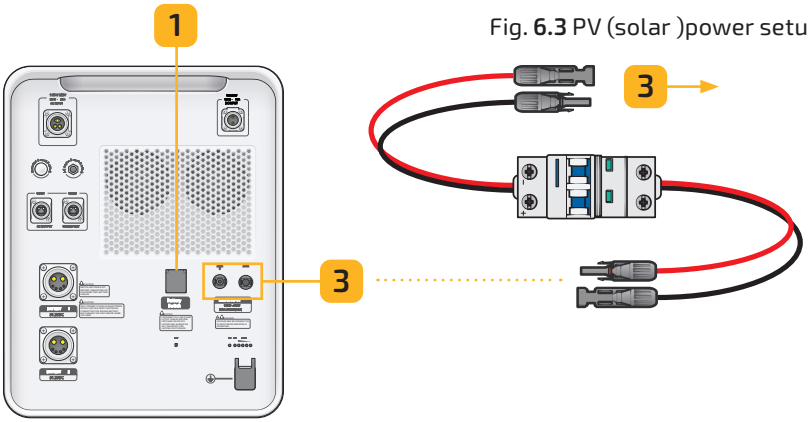


Fig. **6.3** PV (solar)power setup

1. With all cables disconnected, press the ***Battery Switch*** to connect the battery. Touchscreen will light up.
2. Wait until the Bluetooth signal is ready. **Note**: Bluetooth icon is highlighted blue.

   Important! Ensure the Apollo 5K system is grounded when connecting a full-sized solar array.

   Grounding can be done via the ground port on the back of the unit using the included ground rod and cable or by simply connecting the unit's AC Input to a wall outlet in the home.
3. Plug into solar power (Voc. Range 60V DC ~ 500V DC, Max. Charging Power 4,400W, Max. Input 5,000W/18A) using the included ***Solar Input Breaker***.

   Connect all cables when Breaker is in the OFF position. After cables are connected, flip Breaker ON. **Note:** The inverter will be started automatically.
4. Turn ***AC Output*** or ***DC Output*** on/off as needed.

6.1.4 Turn the Power OFF

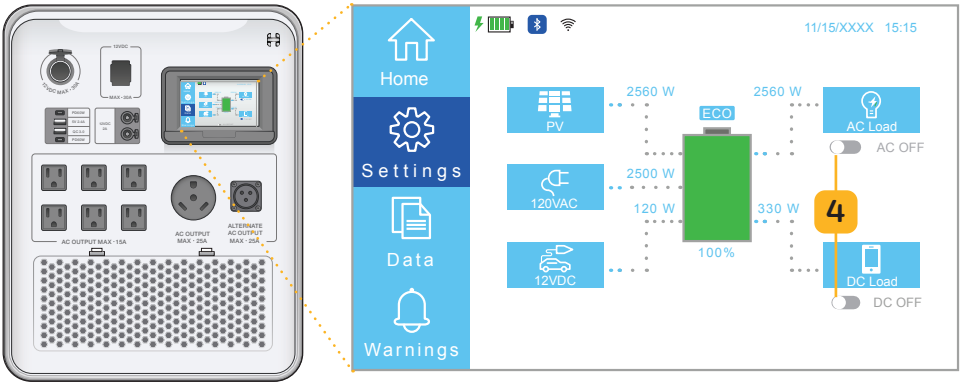
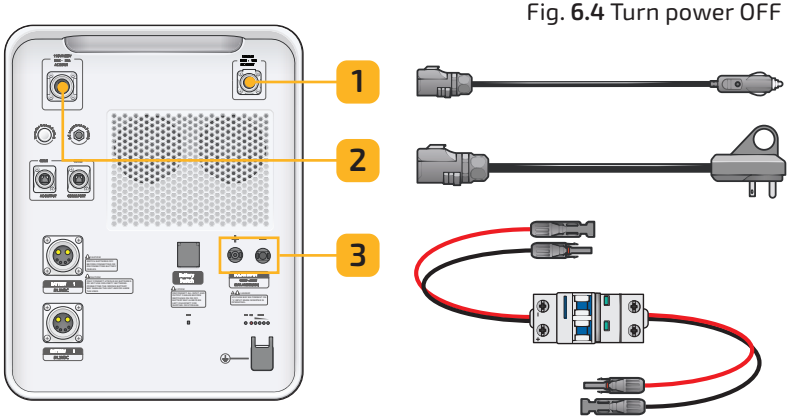


Fig. **6.4** Turn power OFF



1. Disconnect ***DC*** Input.
2. Disconnect ***AC*** Input.
3. Disconnect ***Solar*** Input.
4. On the touchscreen, switch the AC Output and DC Output to the OFF position.

   Note: You do **not** need to turn the ***Battery Switch*** OFF. You may leave the ***Battery Switch*** ON.

   Important! If you wish to switch the battery off for long periods of inactivity, storage, or transport, make sure all cables are disconnected before pressing the ***Battery Switch*** off.

6.2 Touchscreens

The touchscreens provide information or settings for operation. The Home, Data, and Warnings touchscreens provide information on the operation of the unit. The Settings touchscreens are used to customize the unit's settings (Fig. **6.5**). The following sections will explain each touchscreen. **Note**: See Section 8 for Error Codes.

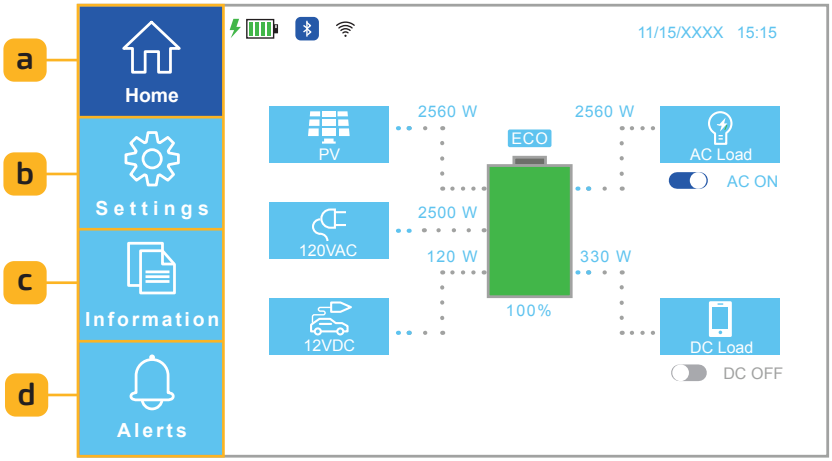


Fig. **6.5** Homepage UI screen

a. **Home Touchscreens:** Select to see real-time information on the AC input, AC output, DC input, DC output, PV (solar) input, and the battery status.

b. **Settings Touchscreens:** Select to set the settings for the Working Mode, Energy Saver, Unattended Mode, Parallel Mode, Language, Display Settings, and WiFi.

c. **Information Touchscreens**: Select to see information about the product, the power generated by the different sources, and view the alert history.

d. **Alerts Touchscreen:** Select to see the current error code and time.

6.2.1 Home Information Touchscreen

When selecting the ***Home*** button on the Homepage UI touchscreen you can find real-time information on the AC input, AC output, DC input, DC output, PV (solar) input, and the battery status. Select the appropriate button to see the desired information. (Fig. **6.6**).

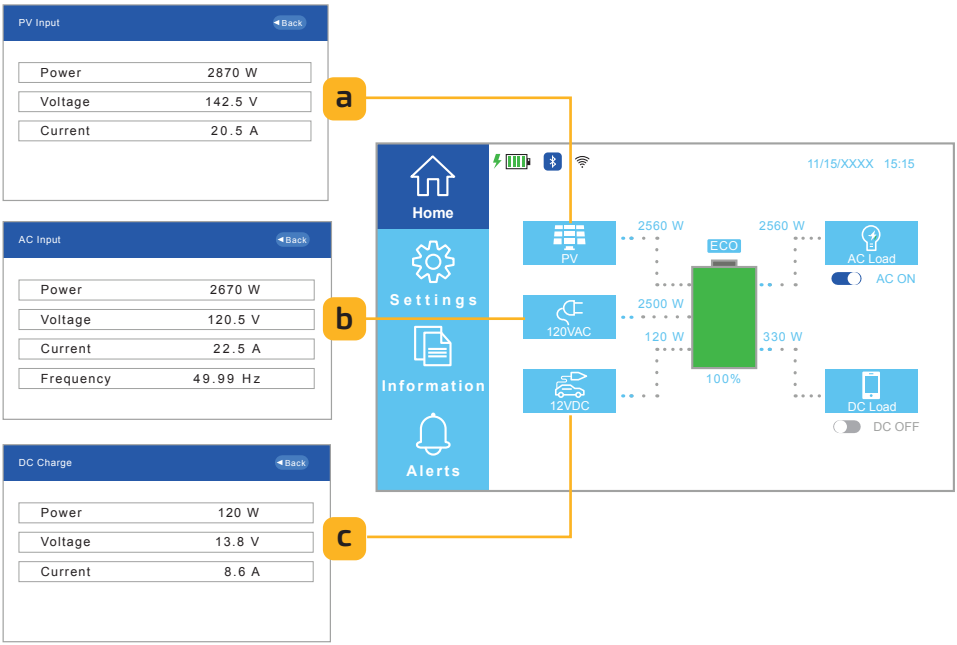


Fig. **6.6** Information screens

a. **PV (solar) Input Information:**
Selecting the ***PV (solar)*** button on the Homepage UI touchscreen will show the real-time running status of Power, Voltage, and Current.

b. **AC Input Information:**
Selecting the ***120VAC*** button on the Homepage UI touchscreen will show the real-time running status of Power, Voltage, Current, and Frequency.

c. **DC Input Information:**
Selecting the ***12VDC*** button on the Homepage UI touchscreen will show the real-time running status of Power, Voltage, and Current.

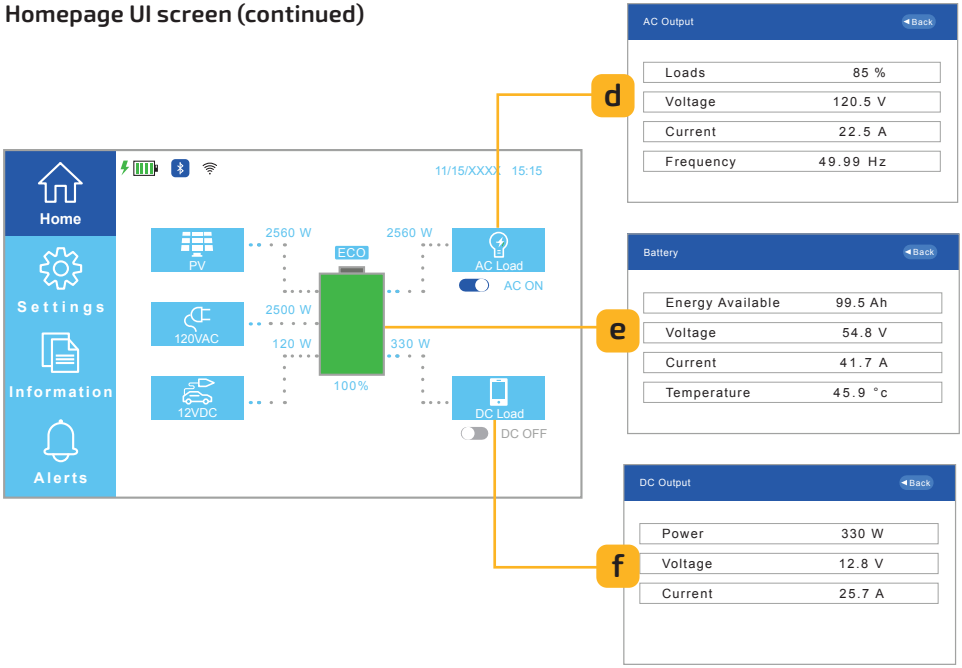


Fig. **6.7** Information screens

d. **AC Output Information:**
Selecting the ***AC Load*** button on the Homepage UI touchscreen will show the real-time running status of Loads, Voltage, Current, and Frequency.

e. **Battery Information:**
Selecting the ***Battery*** button on the Homepage UI touchscreen will show the real-time running status of the Energy Available, Voltage, Current, and Temperature.

f. **DC Output Information**:
Selecting the ***DC Load*** button on the Homepage UI touchscreen will show the real-time running status of Power, Voltage, and Current.