BATTLE BORN®

Unstoppable Power Solutions

Product Manual and Installation Guide

Battle Born 2000w Inverter, Inverter/Charger

Models: BBI2000, BBIC2000

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Product Name and Model

- Battle Born 2000w Inverter
  - BBI2000
- Battle Born 2000w Inverter Charger
  - BBIC2000

Manufacturer Contact Information - Dragonfly Energy
775.622.3448 | info@dragonflyenergy.com | Dragonflyenergy.com

Customer Support - Battle Born
855.292.2831 | info@battlebornbatteries.com | Battlebornbatteries.com

Information About Your System

As soon as you open your product, record the following information and be sure to keep your proof of purchase.

Serial Number: _____

Purchased From: _____

Purchase Date: _____

Thank you for choosing Battle Born® products to meet your energy needs. We are committed to delivering advanced systems that provide reliable performance and long-term value.

This manual provides essential information for the installation, operation, and maintenance of your product. Whether you are a returning customer or using Battle Born for the first time, this guide is designed to help you achieve safe, efficient, and dependable performance.

If you have any questions or require further assistance, please contact our technical support team.

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> For additional information and the latest technical literature, please refer to our website: **battlebornbatteries.com**

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IMPORTANT SAFETY INSTRUCTIONS

1. IMPORTANT SAFETY INSTRUCTIONS - Save these instructions!

Before installing, configuring, or operating your Battle Born® 2000W Inverter/Charger, carefully review this manual and any safety information provided with your battery system. Understanding these precautions is critical to safe and reliable operation.

- This equipment complies with international standards and is intended only for the applications described in this guide.
- Never install or use the unit in areas where flammable gases, vapors, or dust may be present.
- Follow your battery manufacturer's recommendations to confirm compatibility and safe operation. Always adhere to the battery supplier's safety instructions.
- Only qualified personnel should perform electrical installation. All wiring must comply with national and local codes, including ANSI/NFPA 70 (U.S. National Electrical Code) and the Canadian Electrical Code, Part 1.
- The inverter/charger is a Class I device and requires a continuous connection to a protective ground. A dedicated external grounding point is provided on the chassis. Use a minimum of 1/0 AWG for grounding. If grounding integrity is ever in doubt, disconnect the unit from service and have it inspected by qualified personnel.
- Protect all connections with appropriately sized fuses or circuit breakers. Never substitute protection devices with components of another type.
- Confirm that the input voltage matches the configuration settings of the inverter/charger before energizing.
- Do not install or operate in wet, dusty, or poorly ventilated locations. Maintain clear airflow around the cooling vents and avoid exposure to heat sources, chemicals, or flammable materials.
- For transport and storage, disconnect all power sources. Store in a dry environment at temperatures between –20°C and 95°C (–4°F to 203°F). Always use the original packaging when shipping the unit.
- When using Battle Born Batteries with this 2000W inverter, a minimum battery bank of 200Ah or more is Required. Failure to adhere to this minimum bank size will result in damage to batteries not covered under the manufacturer's warranty.
- For other battery brands, please contact manufacturer for minimum battery bank requirements for use with a 2000W inverter.

WARNING

This product contains no user-serviceable parts. Do not remove covers or attempt internal servicing. Internal fuses are not user-replaceable. If service is required, contact an authorized Battle Born service provider.

CAUTION

Even when switched off, hazardous voltages may remain present at the terminals. Always disconnect both AC and DC sources before servicing.

Description

2. Description

2.1. Introduction

The Battle Born 2000w Inverter, Inverter/Charger are designed with integrated inverting and charging functions and power management features suitable for Recreational, Commercial and Fleet Vehicle, or Marine applications.

This manual covers two models:

- **BBI2000 -** Battle Born 2000w Inverter
- **BBIC2000 -** Battle Born 2000w Inverter Charger

Throughout this guide, both models may be referred to generally as the *Battle Born 2000W* or *Battle Born 2000W inverter/charger*. Features related to battery charging apply only to the Inverter/Charger model.

The inverter/charger provides up to **2000 watts of clean, pure sine wave AC output**, suitable for powering everyday electronics as well as demanding appliances. Typical loads include microwaves, televisions, entertainment equipment, power tools, and high-surge motor-driven devices such as residential refrigerators.

An **automatic transfer function** is built into the unit, allowing it to connect directly to a single-phase 120VAC source. When AC power is present, loads are supplied directly. If shore or generator power is lost, the inverter automatically switches to battery power. Output is delivered as a 120V single-phase supply.

Before installation and operation, please review this section carefully to familiarize yourself with the primary functions and capabilities of the Battle Born 2000W.

2.2. Key Features

2.2.1. Back-up (UPS Function)

If shore power is lost due to an outage, the Battle Born 2000W automatically supplies uninterrupted AC power to connected loads. Transfer time can be adjusted to provide near-instant switchover for sensitive equipment.

2.2.2. Comprehensive Protection

The Battle Born® 2000W Inverter/Charger includes multiple built-in safeguards designed to protect both your batteries and your connected equipment. These protections minimize unnecessary battery drain and help prevent damage caused by overloads, overheating, or unstable input power.

- **Selectable Low Battery CutOff (LBCO):** User-adjustable from 10.1–12.8 VDC, allowing you to set the shutdown threshold that best matches your battery system.
- **Low Voltage Shutdown Delay Timer:** Adjustable from 1–300 seconds, helping to prevent nuisance shutdowns during temporary voltage dips (such as engine cranking or other short high-demand events.)
- **Auto Shutdown Timer:** Can be programmed to automatically power down after 1–25 hours of operating under very light load conditions (<50W). This function helps prevent deep discharge of the battery bank. (See Configuration Settings for details.)
- **Over temperature Protection:** Inverter Mode, the unit will issue a warning if internal temperatures rise too high. If limits are exceeded, the inverter/charger shuts down automatically to protect itself.
- **Overload Alarm and Shutdown:** Inverter Mode monitors connected loads continuously. If power demand approaches maximum capacity, the unit provides a warning. If the demand exceeds limits, the inverter/charger safely shuts down. (See Error Codes and Troubleshooting for details.)

2.2.3. Configurable and Highly Flexible

The Battle Born® 2000W Inverter/Charger offers a wide range of configurable options, allowing you to tailor operation to the specific needs of your system. Nearly every protection feature described in the previous section can be adjusted by the user, giving you full control over performance and safeguards. (See Configuration Settings for detailed instructions on each parameter.)

Configurable AC Output Frequency and Voltage

- Factory default: **120 VAC, 60 Hz** (standard for North America).
- Adjustable to **50 Hz** for compatibility in regions outside the U.S. and Canada.
- Output voltage can be set to **108V, 110V, or 120V**, depending on application requirements.

Configurable AC Transfer Speed

- Two transfer speed settings are available for switching between Grid Mode and Inverter Mode.
  - **Normal Transfer:** Suitable for most household and recreational loads.
  - **Fast Transfer (UPS mode):** Provides quicker switchover for sensitive digital equipment such as computers or networking devices, reducing the risk of resets or interruptions.

2.2.4. Advanced Battery Charging

The Battle Born® 2000W Inverter/Charger features a **power-factor-corrected charger**, designed to use AC input power as efficiently as possible. By minimizing the current consumed by the charger itself, more capacity remains available for your connected AC loads.

Built-in Optimized Charge Algorithm

To ensure proper charging performance, the inverter/charger includes optimized multi-stage charging profiles for Flooded, Gel, AGM, Custom, and Lithium Iron Phosphate ($LiFePO_4$) batteries. These profiles provide the correct charging voltages and current limits to maximize battery performance and service life.

Manual Equalization (Flooded Batteries Only)

Over time, individual cells within flooded batteries can drift into uneven states of charge. This imbalance can reduce overall capacity and shorten battery life. The inverter/charger includes a manual equalization mode, which applies a controlled overcharge to rebalance cells and restore capacity. Equalization should only be used if recommended by the battery manufacturer.

Dead Battery Charging

The inverter/charger can begin charging batteries that have been shut down due to a low-voltage protection event, even if terminal voltage has dropped to below 9 VDC. This function helps recover batteries that have entered low-voltage disconnect but are still chemically healthy and capable of accepting a charge.

Note: This feature does not revive batteries whose cells have reached 0 VDC or have suffered irreversible damage. Batteries that are fully cell-depleted, chemically failed, or outside of manufacturer specifications cannot be recovered by any charger.

Dragonfly IntelLigence® Integration

When paired with Battle Born® $LiFePO_4$ batteries through the Dragonfly IntelLigence® system, charging is automatically optimized for maximum performance and extended lifespan. This advanced communication ensures the inverter/charger and battery work together seamlessly, delivering safe, efficient, and intelligent charging.

2.2.5 Integrated Control Options

The inverter/charger includes onboard control features for system flexibility:

- **Ignition Auto-On:** Automatically powers the unit on or off with the vehicle's ignition circuit or an external remote switch.
- **Ignition Lockout:** Prevents the inverter from operating unless a valid ignition signal is detected, reducing the risk of draining the starter battery when the engine is off.

2.2.6 Dual AC Outputs

The Battle Born 2000W provides two separate AC output circuits:

- **AC Out 1 (Primary):** Active in both inverter and grid modes, supplying continuous power to critical loads.
- **AC Out 2 (Secondary):** Active only when shore or generator power is available, intended for non-essential loads such as water heaters or other appliances that should not draw from the battery.

This design ensures that critical equipment remains powered while non-essential loads automatically disconnect during inverter operation.

2.2.7 Power & Load Management

The inverter/charger incorporates several advanced tools to balance input power and demand:

- **Power Control:** Limits charging current based on the input breaker size, ensuring that total current draw stays within safe limits while still supporting connected loads.
- **Inverter Assist:** Supplements shore or generator power with inverter output during temporary peak demand, preventing nuisance breaker trips. Once demand drops, the charger resumes charging the batteries.
- **Load Shedding:** An optional feature that can disconnect non-critical loads when demand exceeds available power, further reducing the chance of overload.

2.2.8 Stacking for Larger Systems

For higher-capacity systems, the inverter/charger supports stacking configurations:

- **Parallel Stacking:** Two or more units can be connected in parallel to create a larger single-phase system. For example, two units form a 120VAC, 12VDC 4kW system.

- Series Stacking: Two units can be connected in series to provide a 240VAC split-phase system suitable for powering large appliances such as washers, dryers, or HVAC equipment.

Stacking Guidelines:

- Only Inverter/Charger models (BBIC2000) may be stacked.
- Inverter-only models (BBI2000) cannot be stacked.
- Units must be identical in power rating.
- Up to four units may be combined in either parallel or series mode.

WARNING

Installation and configuration of stacked systems should only be performed by qualified electrical personnel. Incorrect stacking or wiring may damage equipment.

Installation

3. INSTALLATION

3.1 Location

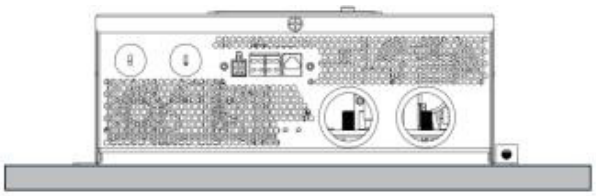
Install the Battle Born® 2000W Inverter/Charger in a dry, ventilated space. Do not mount in areas exposed to water spray, bilge water, or where flammable vapors may accumulate.

- Maintain at least **10 cm (4 in.) of clearance** around the fan and cable connection side for cooling airflow.
- Avoid placing the unit near flammable materials, chemicals, curtains, or other combustibles.
- Whenever possible, mount the unit close to the battery bank to minimize DC cable length and reduce voltage drop.
- Operating temperature range: **–20°C to 40°C (–4°F to 104°F)**. Higher temperatures may reduce service life or charging performance.

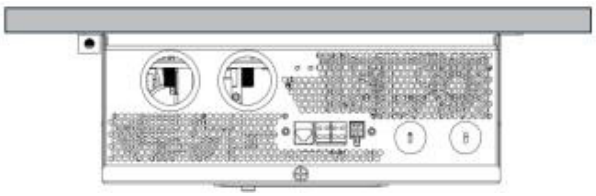
Mounting:

Mounting Orientation: Only the following mounting orientations are allowed.

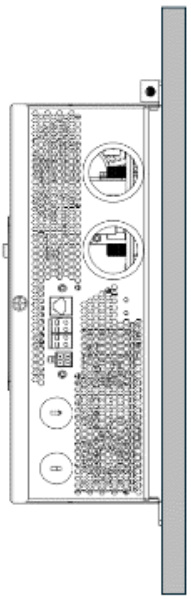
1. Horizontally:



2. Horizontally Upside Down:



3. Sideway on a Vertical Wall:

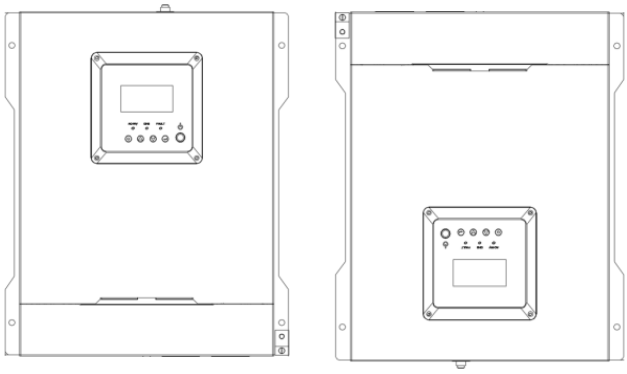


Installation Tip: Wall Mount vs. Deck Mount

As a further note, in most installations where the unit is mounted on a wall (instead of on a deck), the unit is to be mounted sideways (horizontally) on the wall. The control panel is removable and can be rotated 90 degrees so that, even when the unit is mounted sideways, the display can still be viewed vertically for ease of use.

The following mounting orientations are **NOT allowed**:

- Mounting the unit vertically on a wall with the cooling fan vent facing up or down is not permitted.



Mounting orientation (allowed):

- Horizontally (on a shelf or deck)
- Horizontally upside-down
- Side-mounted on a vertical wall

Not allowed:

- Vertical wall mount with vents facing up or down.

Marine installations:

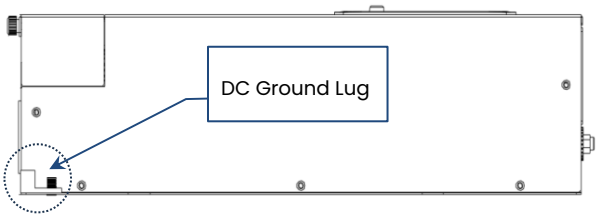
For added protection, a drip shield may be used to guard against incidental splashing.

ADDITIONAL SAFETY NOTES FOR INSTALLATION

- Only a qualified electrical technician should install this equipment. Always follow applicable electrical codes.
- The interior of the inverter/charger must remain accessible after installation. Do not block access panels or secure the unit in a way that prevents inspection or service.
- Each system must include a method of disconnecting both AC and DC circuits. If a circuit breaker is used as overcurrent protection, it may also serve as the disconnect. If fuses are used, separate disconnect switches will be required between the source and the fuses.
- **Battery Charging Caution:** Charge only approved battery types such as Lead Acid or $LiFePO_4$ rechargeable batteries. Attempting to recharge other types may cause damage or personal injury. Never attempt to recharge non-rechargeable batteries.
- Do not use attachments or accessories that are not recommended or supplied by Battle Born. Doing so may create risks of fire, electric shock, or injury.
- **DC Connection Precautions:** Connect and disconnect DC cables only after the inverter/charger is turned off and any external battery disconnect switches are in the OFF position.
- This inverter/charger is not designed for direct connection to a vehicle's starter battery system. It must be installed as part of a dedicated DC system that includes a house or service battery, appropriate overcurrent protection, and properly sized DC wiring. For details on cable gauge, fuse ratings, and connection procedures, see Section 3.3 Battery DC Connections.

3.2. Connection of Ground Cables

The Battle Born 2000w has a ground lug on the side of the unit as shown in the figure below. Follow the guidelines in DC Grounding Locations to connect the inverter/charger's chassis to the ground.



- The inverter charger unit DC ground lug must be connected to a grounding point—usually the vehicle's chassis or DC negative bus ground.

The DC ground lug or bolt must be tightened with a torque force of 23 in-lb (2.6 N-m). Apply an anti-corrosion compound to the copper wire prior to connecting to the DC ground lug.

Below is the recommended equipment ground cable size.

Ground Cable Requirements:

- For Vehicle & Marine installation: No. 8 AWG (2000W inverter charger)

Notes:

1. Based on US National Electrical Code NFPA70, Article 551, par. 551-20c and ANSI/RVIA LV, § 2-5.1.
2. Based on ABYC E-11 § 11.16 and A-31 § 31.6.5.

3.3. Connection of Battery DC Cables

WARNING

The wire sizes stated in this manual are only guidelines. Fusing is based on the gauge and length of the cable, which in turn depend on the load connected to the Inverter/Charger. Always comply with all local rules and regulations.

WARNING

Turn off the DC and AC power source during installation. Powered wires can spark when touching the Inverter/Charger DC or AC terminals.

DC cable requirements:

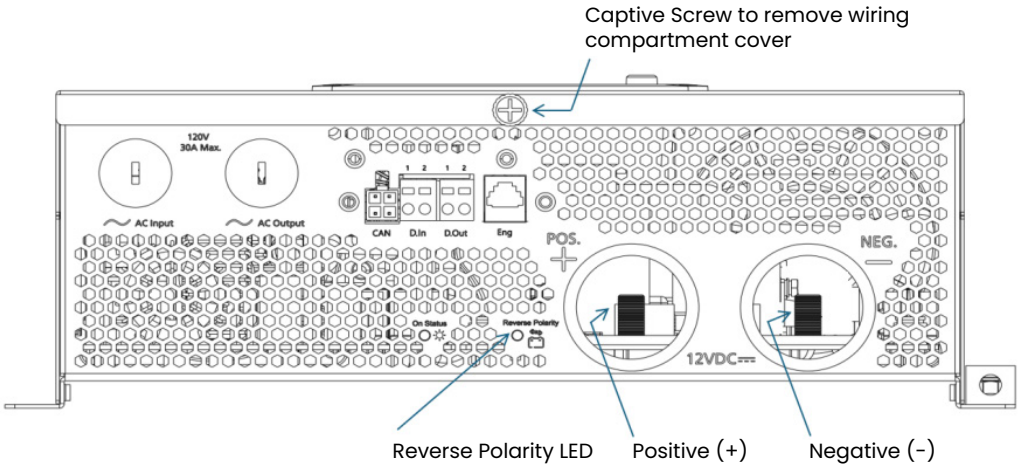
For safety and best performance, the minimum recommended DC cable requirements are listed below: (See table)

- The DC cables must be copper and rated 90°C (194°F) minimum.
- The cables should be terminated with lugs that fit the DC stud terminals (M8 bolt size).

Inverter/Charger	Cable Length < 2 meter (~6.5ft)	Cable Length 3-5 meter (10-16ft)	Recommended DC Fuse
2000W	2/0 AWG	4/0 AWG	250A

Note: cable length is between inverter/charger and battery.

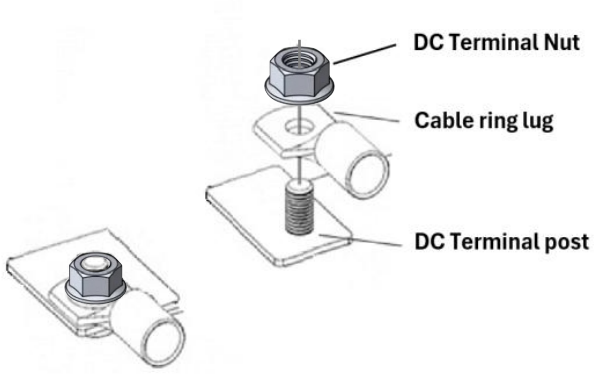
Figure below shows the DC end for your reference. The reverse polarity LED on the inverter unit will light up when the DC cables (positive & negative) are reversed during installation. Reversing the connections may void the warranty.



Procedure: To connect the DC Battery cables

1. Make sure the inverter/charger is off and no AC or DC source power is connected to the unit.
2. Remove the wiring compartment cover panel by loosening the captive nut panel screw.
3. Loosen the DC terminal nuts from the terminal bolts and set them aside for later.
4. Cable ring lug for M8 bolt terminal must be used at the end of the DC cables for proper connection to the inverter/charger.
5. Install a fuse and fuse holder in the cable that will be used for the positive side of the DC circuit. The fuse must:
   A. be as close to the battery positive terminal as possible
   B. be rated for DC circuit (see table above for fuse size reference)
   C. have an Ampere Interrupting Capacity (AIC) that exceeds the short-circuit current available from the battery (that is, Class T fuse)

6. Route the positive cable through the left side DC cable hole (installed strain relief clamp on cable) and attach the cable lug on the positive cable to the positive DC terminal on the inverter/charger. Run the cables next to each other to limit the electromagnetic field around the cables.
7. Install the cable with ring lug onto the DC terminal as shown below:



8. Tighten the DC terminal nut to the terminal bolt to a torque of 71–89 in-lb (8–10 N-m) of force. Do not overtighten. Make the connection snug enough so the cable lug does not move around on the DC terminal. Center it through the DC knockout hole and do not let it touch the edge.

Use a torque wrench with an insulated box spanner in order to avoid shorting the battery.

RECOMMENDED TORQUE: 10 NM (M8 NUT)

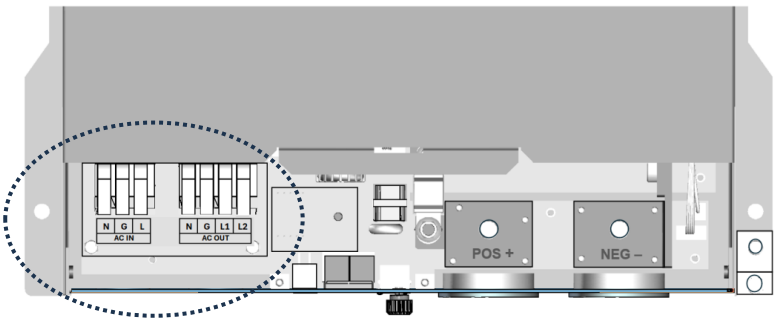
Avoid shorting the battery cables during installation.

3.4. Connection of the AC Cabling

ELECTRIC SHOCK AND FIRE HAZARDS

Make sure wiring is disconnected from all electrical sources before handling. All wiring must be done in accordance with local and national electrical wiring codes.

The AC terminal blocks can be found on the printed circuit board, see illustration below:



Do not reverse neutral (N) and line (L) when connecting the AC.

AC cable & breaker requirements:

The AC connections need to be made with three-wire 90°C (194°F) copper cable.

Inverter/Charger 2000W	AC-in	AC-out-1	AC-out-2
Rated Current	30 A	30 A	30 A
Recommend fuse of circuir breaker	30 A	30 A	30 A
Minimum Wire Gauge	AWG 10	AWG 10	AWG 10
Wire Stripping Length	12 mm (0.5 inch)	12 mm (0.5 inch)	12 mm (0.5 inch)

Ensure AC and DC power sources are turned off.

Connecting AC Wire:

Strip AC wire according to the recommendations in the table above. The unit is equipped with spring lock clamp terminal. Solid (Romex) wire can be inserted directly into each terminal slot in the closed locked position for quick installation.

AC-in

The AC input cable can be connected to the terminal block 'AC–IN'.

From left to right: "N" (neutral), "G" (ground), "L" (line)

The AC input must be protected by a fuse or magnetic circuit breaker rated at 30A or less. Ensure the required circuit breaker in the AC distribution panel supplying AC power to the unit is installed.

If the input AC supply is rated at a lower value, the fuse or magnetic circuit breaker should be downsized accordingly.

AC-out-1

The AC output cable can be connected directly to the terminal block 'AC-OUT'. From left to right: "N" (neutral) , "G" (ground), "L1" (Line 1) and "L2" (Line 2)

With its Inverter Assist feature the inverter charger can add up to 2kW (that is 2000 / 120 = 16.7A) to the output L1 during periods of peak power requirement. Together with a maximum input current of 30A this means that the output can supply up to 30A + 16.7A = 46.7A.

An earth leakage circuit breaker and a fuse or circuit breaker rated to support the expected load must be included in series with the output, and cable cross-section must be sized accordingly.

AC-out-2

A second output is available that disconnects its load in the Invert or Battery mode operation. On these terminals, equipment is connected that may only operate if Shore power AC voltage is available. AC Out 2 should be used for loads that are not critical and should not operate to drain the battery unnecessarily. (e.g. an electric boiler or an air conditioner). The load on AC-out-2 is disconnected immediately when the Inverter Charger switches to battery operation. After AC power becomes available on AC-in-1, the load on AC-out-2 will be reconnected with a delay of approximately 2 minutes. This is to allow the AC source like a genset to stabilize.

3.5. Optional Connections

A number of optional connections are possible:

3.5.1. Remote Control

The product comes with a detachable remote control panel from the unit.

The control panel can be left installed on the unit as a local control panel for the inverter and inverter charger. Alternatively, it can be removed from the unit and installed remotely as a remote control panel.

For local installed control panel, the panel can be rotated by 90 to 180 degree clockwise or counter-clockwise for different viewing orientation.

To install the control panel remotely:

1. Remove the control panel by removing the 4 screws at the corner of the control panel.
2. Route the supplied 25 ft RJ12 cable on your vehicle or vessel and connect one end of the RJ11 cable to the inverter unit and the other end to the back of the Remote Control Panel installed at the remote location.

3.5.2. Communications & Ignition Control

Battle Born HUB Connection

To connect your Battle Born HUB to the Battle Born 2,000W Inverter or Inverter Charger for communication, you will need two key components:

1. Battle Born Mini-Fit Jr to RJ45 Adapter (MFJRSPLIT)
2. Data Terminator (WSDTK)

Step-by-Step Instructions

1. Connect the Adapter: Plug the Mini-Fit Jr (MFJRSPLIT) side of the adapter directly into the corresponding port on your Inverter or Inverter Charger.
2. Connect the HUB: On one of the RJ45 ends of the adapter, run a communication cable (HUBWSADPT) directly to the CAN port on your Battle Born HUB.
3. Insert the Terminator: Insert the Data Terminator (WSDTK) into the other, unused RJ45 connector on the MFJRSPLIT adapter. This terminator is essential for proper CAN bus communication.

Note: After plugging in the can communication from the steps above, the Battle Born mobile app will immediately recognize that their is another device connected and add it to the dashboard.

CAN Communication Connection:

The product is equipped with a communication port (Comm) which enables CAN communication. The connector is a Molex 5557 series mini-fit connector. The CAN communication connection must be a three-wire connection. CAN-Low, CAN-Hi signals must all be connected to establish a stable noise-free communication connection. Connect the communication cable according to the pin-out diagram on Pg. 22.

The Battle Born 2000W currently supports a single user-selectable communication protocol, RVC.

For details on communication protocol configuration, see Configuration Setting section. The selected protocol will be indicated on the Control panel LCD display.

Ignition Control Signal Connection:

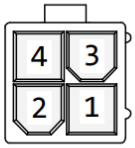
The Comm port also has an Ignition Control signal function. The Ignition Control feature allows the switching of the inverter/charger to be controlled with an external 12VDC signal. There are three Ignition Control settings:

1. **Auto ON -** This setting allows the inverter charger On/Off operation to work in tandem with the vehicle's ignition circuit when a valid ignition (12VDC) signal is constantly detected at the Ignition Control pin (pin 4).
2. **Lock Out –** In Lock Out setting, the inverter On/Off power button can operate the inverter charger only when a valid (12VDC) ignition signal is detected at the Ignition Control pin (pin 4).
   a. This feature is intended to inhibit inverter operation in the absence of a vehicle's (or vessel's) +12VDC ignition control signal.
   b. This feature can avoid unnecessary battery drain that would otherwise occur if the inverter/charger was operated without a charging source such as the vehicle alternator.
3. **OFF –** In OFF mode, the Ignition Control feature is disabled.

(See Configuration Setting section on how to configure the Ignition Control setting):

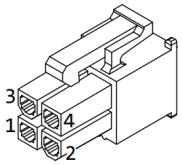
Molex Series 5557 mini-fit connector

RV-C Connector
(Receptacle on Inverter)



Molex p/n: 39-01-2040

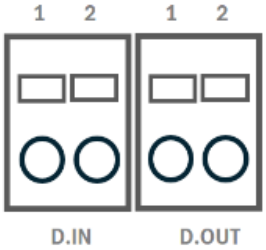
RV-C Plug
(Mating plug not included)



Molex p/n: 39-01-2041

Pin Out	Description
1	CAN H (high)
2	CAN L (low)
3	-
4	Ignition Control

3.5.3. Digital IN & OUT

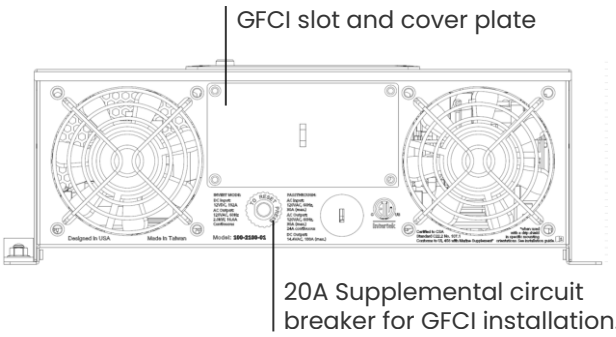


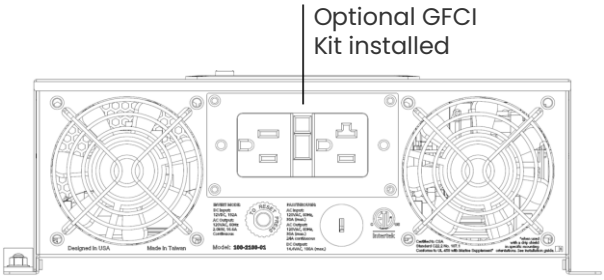
The product is equipped with two digital input ports and two digital output ports. At this time, the digital input ports and Digital Output 2 are not used by the system. Digital Output 1 is the only active port and is used for the Load Shed function. Digital outputs are open-collector digital switches with a maximum sink current of 200 mA.

3.5.4. GFCI Option

An optional (sold separately) GFCI kit (p/n: BBIGFCI) is available to add a GFCI receptacle to the Battle Born 2000w.

The GFCI slot is located at the back side or the fan side of the unit. Remove the GFCI cover plate by removing the four screws at the corners. Install the GFCI kit into the slot. There is a built-in 20A supplemental circuit breaker to work with the GFCI. Refer to the GFCI kit installation guide for instructions.





If an external GFCI is to be installed downstream from the hardwire AC output, the following GFCI will be compatible with the Battle Born 2000w: Mfg: Eaton/Cooper, Model: SFG20W.

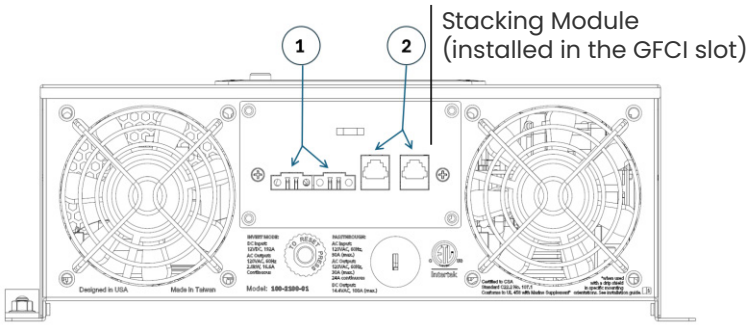
3.5.5. Stacked System Connection

To set up a stacked system, each unit of inverter charger in the system must have a stacking module installed in the unit. The stacking module is an optional module sold separately (p/n: BBICSTK).

When connecting the Battle Born 2000w units in a stacked system, the following requirements must be met:

- Up to a maximum of four units of the same power level can be connected in a stacked system.
- Only identical power level of inverter charger model can be stacked. Inverter only model cannot be stacked.
- The DC connection cables to the devices must be of equal length and cross-section.
- Place the Battle Born 2000w units close to each other, but allow at least 10cm (4") for ventilation around all sides between units.
- It is essential the negative battery terminal between the units is always connected. A fuse or circuit breaker is not allowed.
- A set of stacking cable of current must be connected between each unit:

1. Current sharing cable – daisy-chain between units.
2. Communication cable (RJ12 cable) – daisy-chain between units.



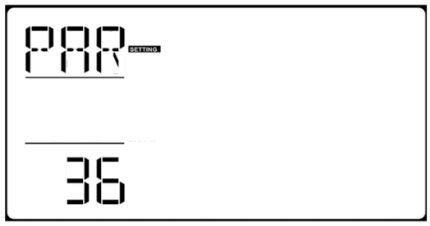
Installation Steps:

Configure the unit:

1. Make sure that the AC output and input of each inverter are not connected to other inverters.
2. Connect the DC input (i.e. battery) of each inverter one at a time and press the power button to power up the inverter charger unit. The control panel will light up.
3. Enter the Configuration Settings page (refer to section 5 in User Guide for detail), scroll to item 36 (Stacking configuration setting) to select the desired stacking mode:

Pin Out	Desription
DIS	Stacking mode disabled. The inverter charger is operating as a single standalone unit.
PAR	The inverter charger is set up to operate in parallel mode with other inverters, which must also have setting #36 = "PAR".
SL 1	The inverter charger is set up as the master unit with AC Line 1 (L1).
SL 2	The inverter charger is set up as the unit with AC Line 2 (L2) which is the split phase (i.e. 180° out of phase from L1) from L1.

Example:

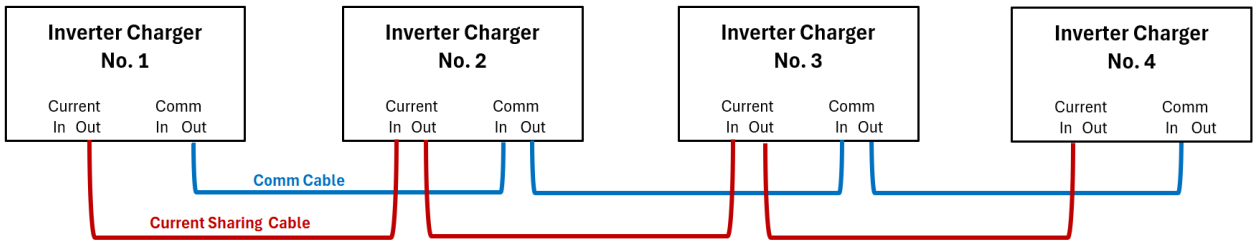


WARNING

The unit with Setting 36 = DIS (i.e. set as standalone operation), cannot be connected in any stacked configuration with other inverter chargers. The inverter charger may be damaged in doing so.

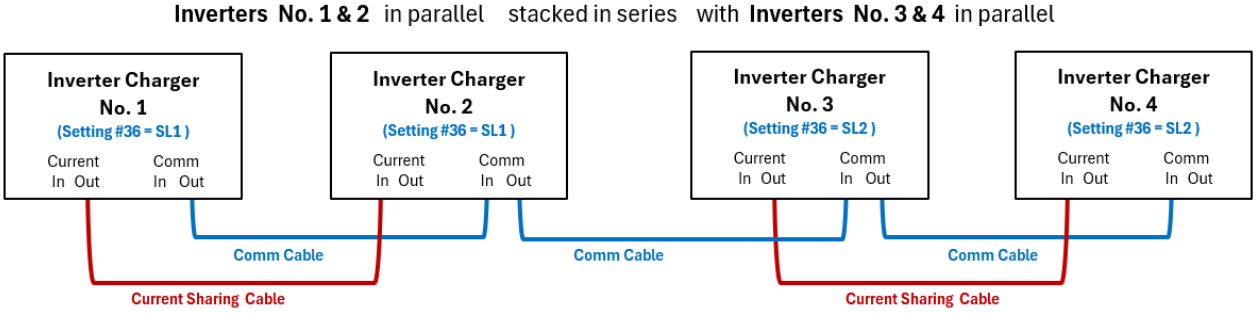
4. Power down the inverter charger. Disconnect the DC input or battery from the inverter charger and confirm that the inverter has been powered off and shut down.
5. After individually setting the stacking configuration (setting #36) to the desired mode for all inverter chargers, connect the parallel communication line (RJ45 type cable). Each inverter charger unit should be connected in a sequential daisy chained fashion. That is, from the Out port of the first unit to the In port of the second unit, and from the Out port of the second unit to the In port of the next unit, etc.
6. Connect the current sharing port between the inverters in parallel, using the provided current sharing cable in the similar sequential daisy chained fashion. The current sharing cable can only be connected to inverter chargers with the same current phase (i.e. same setting #36 value).

Parallel Mode: (Example of up to 4 inverter chargers can be in parallel)



Series Mode: (example of a series stacked of 2 sets of 2 parallel inverter chargers).

Note: Only Comm cable is connected between units in series (i.e. no current sharing cable).



WARNING

The current sharing cable can only be connected between units with the same stacking settings. (i.e. SL1 units cannot be connected to SL2 units with the current sharing cable).

7. Press the power button to start up the inverter charger and check the stacking icon is shown on the control panel display. If there is an inverter that does not show the stacking icon then check the configuration settings or repeat the configuration if needed and also, check to ensure the communication line is connected correctly.

   The stacking icons are:

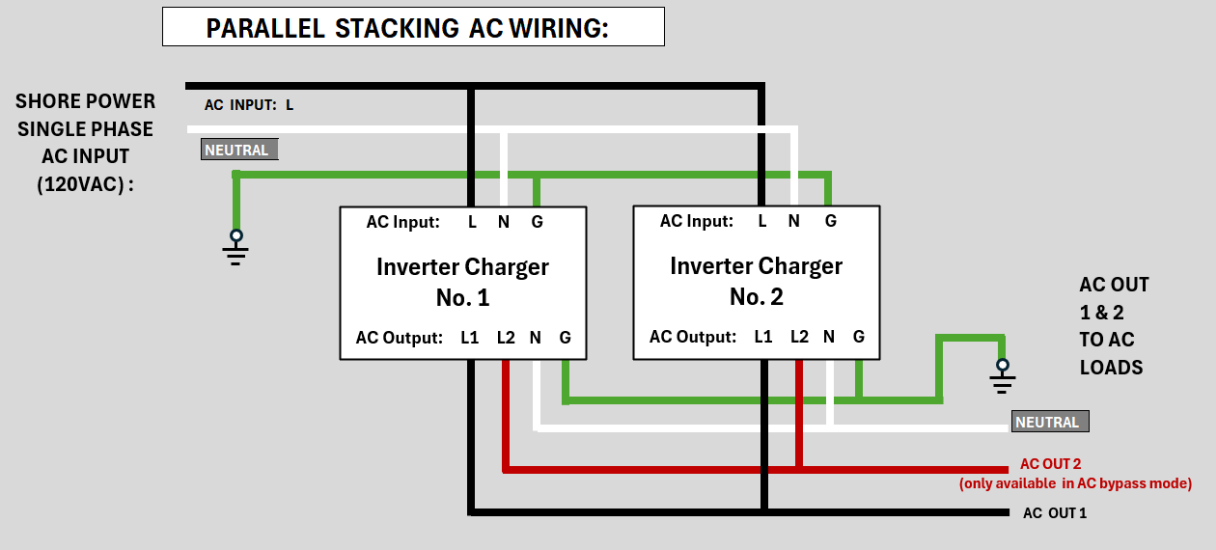
   a. Unit set to parallel

   b. Unit set to Series

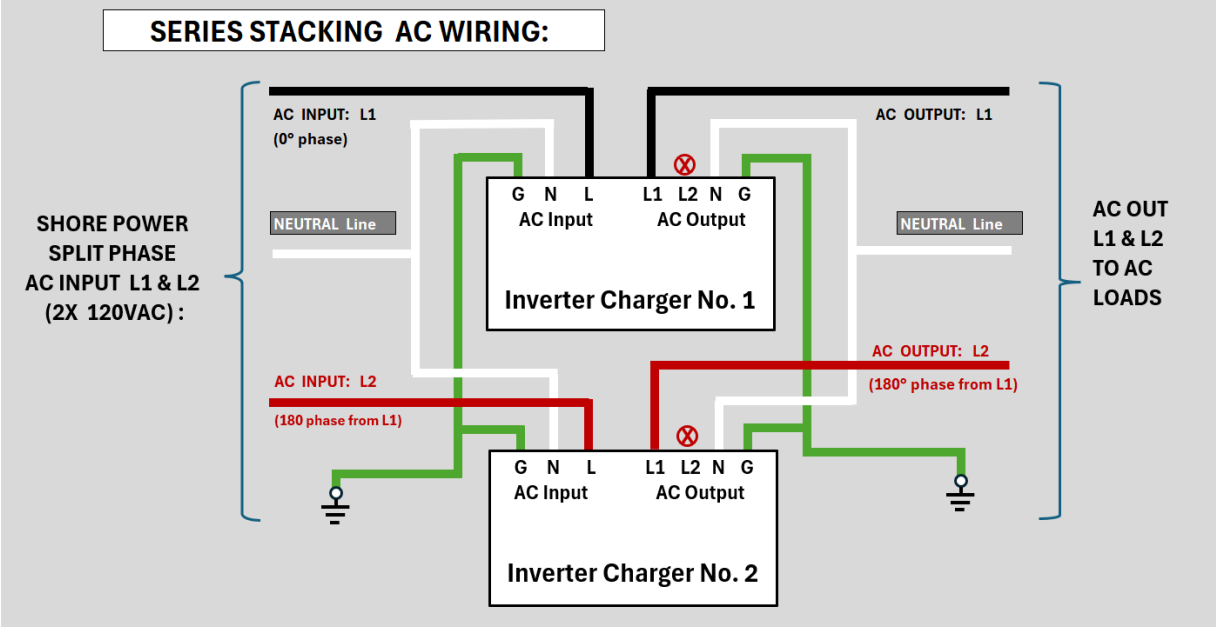
   Below the stacking icon, a letter “M” will be shown for the master unit and a letter “S” for the slave unit.

8. **Connecting AC Wires:** Make sure all inverters are power down before making any AC wiring connections.

   a. **Parallel mode:** On each of the AC input & AC output sides, connect the AC Hot line (L) between parallel inverters with the same phase together and connect the AC Neutral (N) between parallel inverters. See parallel wiring diagram below:



a. **Series mode:** Follow series wiring diagram below. Connect only the N line of inverters of different phases together. Do not connect the L lines of inverter with different phases together. AC input line phase must be the same as the inverter (i.e. AC Input L1 must be connected to Inverter with L1 and not to L2). AC Out 2 of each inverter in series mode will not be used.



9. Power on all inverter chargers to operate the stacked system.

Operation

4. Operation

4.1 Turning the Inverter Charger ON

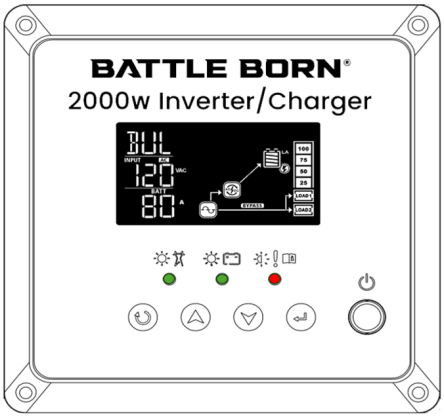
The Battle Born® 2000W Inverter/Charger can be switched on by any of the following methods:

1. Press the **On/Off** button on the control panel
2. Apply a valid 12VDC ignition signal if Ignition Control is set to AUTO or LOCK-OUT
3. Connect qualified AC input power — the unit will turn on automatically

When switched to 'on', the Battle Born 2000w is fully functional. When powered on, the status LED will illuminate, the display panel will turn on, and the inverter/charger will operate in either Grid Mode (shore or generator AC present) or Invert Mode (battery power).

4.2 Remote Control Panel

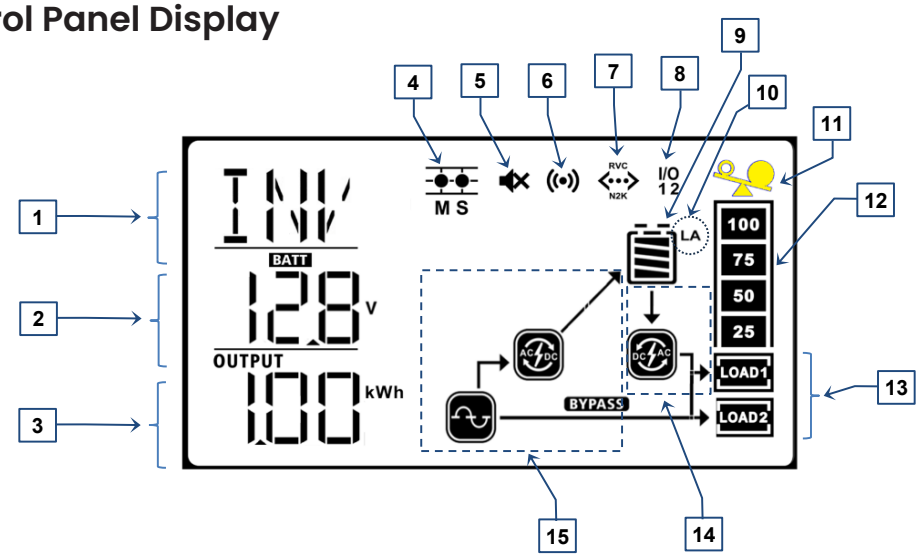
The Battle Born 2000w comes with a detachable control panel that can be mounted in a remote location.



1		ESCAPE or RETURN to previous menu
2		Scroll UP key for screen or parameter value scrolling up
3		Scroll DOWN key for screen or parameter value scrolling down
4		To ENTER (OK) Configuration mode or Confirm (OK) setting value.
5		Turns Inverter to ON or to Standby

1		**GRID MODE:** Solid green indicates Grid Mode. Shore power AC is available.
2		**INVERT MODE:** Solid green indicates Invert Mode (Battery mode). AC output is supplied from battery.
3		**FAULT & ERROR:** Flashing Red indicates a warning. Solid Red indicates a fault (error). See Error code tables for details.

4.3 Control Panel Display



	Display Item	Description
1	Status Field 1	Display the inverter, charger operating states, Error code and Setting values.
2	Status Field 2	Battery or AC Input states & values in voltage, amp or %SOC.
3	Status Field 3	Display AC Output loads info, Output to battery charging info (e.g. Battery Volt, current. %SOC).
4	Stacking Icon	Parallel Stacking (M=master, S=Slave) Series Stacking
5	Audible Alarm Icon	Alarm audio on or off.
6	Wireless Comm	Bluetooth communication indicator (active).
7	CAN Comm icon	Indicate CAN Communication: e.g. RV-C or N2K (NMEA2000).
8	Digital Output Icon	-
9	Battery Level Icon	Indicate battery bar level indicator.
10	Battery Type	LA – represent all Lead Acid, AGM, GEL types of batteries LI – represent Lithium battery.
11	AC Overload Icon	Indicator an AC overload condition.
12	AC Load Level Icon	AC output load level indicator.
13	AC Output 1 & 2 Icon	Indicator AC Output 1 & 2 are connected or active.
14	Inverter Mode Icon	Indicate Inverter mode is active.
15	Charger & Bypass Icons	Indicate Grid mode bypass and/or charger active.

4.4. Operating in Grid Mode

Auto Transfer Operation Between Grid & invert Mode:

The inverter charger is equipped with an automatic transfer switch that switches operation between Grid mode, where AC shore power (or generator AC) is available and Inverter Mode, when AC input source is absence and AC output is provided by the inverter.

When there is AC input power (shore power) available, the Battle Born 2000w has a 20-second AC qualification period to ensure the stability of the shore power before switching to Grid Mode and starts drawing power from the AC source.

The operating mode indicator will change to grid mode and the green Status LED for grid mode will light up

When an AC voltage is connected to the 'AC in' terminal, AC power will be switched through to the 'AC out' terminals, if the AC voltage is qualified within transfer specifications. AC input qualification will take about 1 second to allow AC input to be stabilized. The inverter will switch off, the 'mains on' LED will light up, and the charger commences charging.

If the voltage at the 'AC-in' terminal is rejected, the inverter will switch on. The unit will operate and provide AC output in Invert Mode, provide the battery level is within operating limits.

NOTE: When only the charger function is required, ensure that the switch is switched to 'charger only'. This prevents the inverter from being switched on if the mains voltage is lost, thus preventing your batteries from running flat.

In Grid Mode, the Control Panel LCD screen displays information related to AC bypass or charger operation.

Press the Scroll buttons to move up or down from screen to screen.

Press (ESC) to return to the home screen.

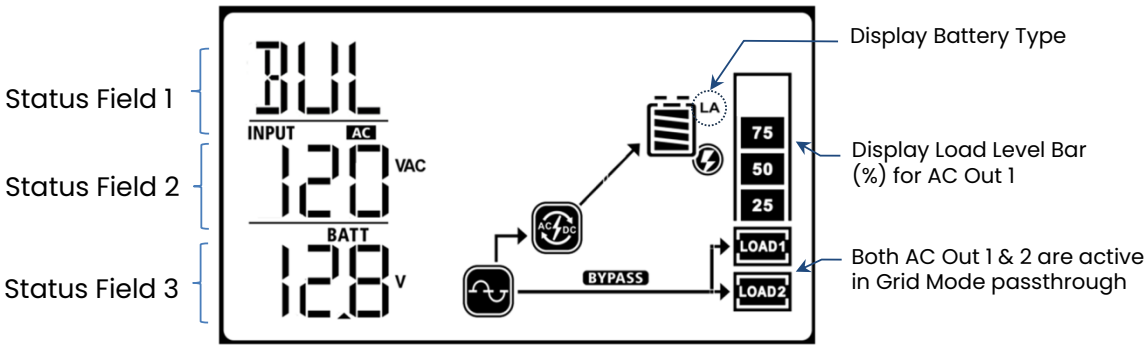
NOTE: After one minute of inactivity in the other screens, the LCD will go back to the home screen.

The screen below is the Screen 1 of 5 of Grid mode operation:

Charger States, AC Input Voltage (VAC) and Battery Voltage (Vdc) are shown. This is the home screen.

The screen below is the Screen 1 of 5 of Grid mode operation:

Charger States, AC Input Voltage (VAC) and Battery Voltage (Vdc) are shown. This is the home screen.



Display Field	Display Status Values	Display Info
Status Field 1	BUL ERROR code number	While in Grid Mode and the Charger is ON, display Charger States: • BUL – Bulk • ABS – Absorption • FLT – Float • EQL – Equalization INV – indicate Inverter is in Invert Mode Display an Error code if there is a fault: (see Error Code table in Sec 7)
Status Field 2	AC Input (VAC)	AC Input Voltage %SOC is only available with Battle Born Lithium battery with communication integration.
Status Field 3	BATT (V) %SOC	Battery Voltage DC volts in Charge Mode State of charge value shown on the BB2K display*
Battery Type	LA LI	LA - represent all Lead Acid, AGM, GEL types of batteries LI - represent Lithium battery

***Note:** The SOC shown on the display may differ from the SOC shown in the Battle Born App. These values are calculated using different methods and are not synchronized.*

Grid Mode Screen	**Status Feild 1** Operation Mode	**Status Feild 2** Operation Mode	**Status Feild 3** Operation Mode
Screen 1 of 5	**BUL, ABS, FLT -** Charger states	AC Input Voltage (VAC)	BAT Voltage (V)
Screen 2 of 5	**BUL, ABS, FLT -** Charger states	AC Input Voltage (VAC)	BAT Charging Current (A)
Screen 3 of 5	**BUL, ABS, FLT -** Charger states	AC Input Current (A)	AC Load Current (A)
Screen 4 of 5	**BUL, ABS, FLT -** Charger states	AC Input Current (VAC)	AC Input Frequency (Hz)
Screen 5 of 5	**Firmware Version -** Inverter	**Firmware Version -** Remote Control Panel	**Firmware Version -** Communication Card

4.4.1 Operating in Grid Mode

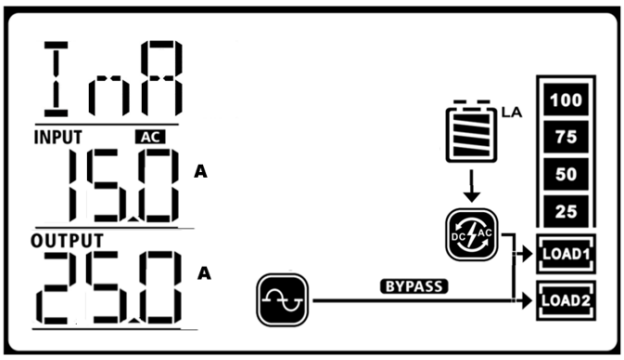
In Grid mode, AC load demand may temporarily peak and exceed the available shore power AC source for a short period of time, which often results in tripping the AC shore breaker. In Inverter Assist mode the Battle Born 2000w will compensate for insufficient generator, shore or grid power with power from the battery by turning the inverter on to supplement power to the AC loads on AC Out 1 & 2.

The inverter/charger enters into this mode of operation if Inverter Assist mode is enabled and the AC current drawn from the AC input exceeds 80% of the selected AC Input Breaker current setting for 1 second. (and the battery must be above LBCO level at Inverter Assist Voltage setpoint or SOC at or above Inverter Assist SOC setpoint).

The inverter will support AC input source (shore power or generator) by supplying power to loads to AC output until the total AC load current (AC shore input plus inverter output) drops below 60% of the selected breaker current rating for 1 to 1.5 seconds. Then the inverter will turn off.

During Inverter Assist Mode the Control Panel will display:

- Both the Grid Bypass icons and the inverter DC/AC icon.
- The charger icon will not be shown as the charger is reduced to zero already during Inverter Assist mode.
- The status fields will display INV and the inverter information. The power OUTPUT shows the amount of inverter output power supplied to assist the AC loads.



4.5. Battery Charger

The Battle Born® 2000W Inverter/Charger uses a multi-stage charging algorithm to ensure safe and efficient charging whenever qualified AC power is available. The charging profile depends on:

- Selected Battery Type
- Temperature setting (Hot/Warm/Cold)
- State of Charge

Although the inverter/charger supports multiple battery chemistries, it is optimized for Lithium Iron Phosphate ($LiFePO_4$) batteries.

4.5.1. Lithium Batteries (Recommended)

For Battle Born® LiFePO4 batteries, select LFP as the battery type. This setting is also compatible with most lithium iron phosphate batteries from other manufacturers. Always confirm charging requirements with the battery manufacturer, and use the Custom profile if different values are required.
Preset Charging Values for LiFePO4:

- Absorption: 14.4 V
- Float: 13.6 V

Note: Float voltage is designed to maintain the battery safely without overcharging. If external charging devices are connected (solar, alternator, etc.), appropriate charge management must be included.

Dead Battery Charging:

The inverter/charger can begin charging batteries that have been shut down due to a low-voltage protection event, even if terminal voltage has dropped to below 9 VDC. This function helps recover batteries that have entered low-voltage disconnect but are still chemically healthy and capable of accepting a charge.

Note: This feature does not revive batteries whose cells have reached 0 VDC or have suffered irreversible damage. Batteries that are fully cell-depleted, chemically failed, or outside of manufacturer specifications cannot be recovered by any charger.

4.5.2. Lead Acid Batteries (AGM, Gel, Flooded)

Lead acid batteries are charged using a three-stage algorithm, with an optional fourth equalization stage for flooded types:

1. Bulk Stage
   - Constant current is applied until the absorption voltage is reached.
2. Absorption Stage
   - The charger switches to constant voltage. Current decreases as the battery fills.
   - Transition to Float occurs when:
     a. Current falls below the Absorption Exit Current (default 10A, adjustable 2–50A).
     b. The Minimum Absorption Time has elapsed (default 1h, adjustable up to 6h).
   - If DC loads remain connected, current may never fall below the set threshold; in that case, the unit will stay in Absorption until the minimum time is reached.
3. Float Stage
   - Lower voltage is applied to maintain a full charge.
   - The charge cycle restarts at Bulk if interrupted.
4. Equalization (Flooded Only)

   A. Manual mode, not available for sealed (AGM or Gel) batteries.

   B. Controlled overcharge helps rebalance cells and restore capacity.

   C. Parameters: 10A constant current, rising to 16VDC, for 1 hour.

Temperature Compensation (Lead Acid Only):

The Battle Born 2000W inverter/charger does not support an external battery temperature sensor. For lead-acid batteries, temperature compensation is handled manually through the unit's front panel settings. Users can select Cold, Normal, or Hot to adjust charging behavior based on the approximate battery temperature. This selection is required to ensure proper charging of lead-acid batteries, particularly sealed or maintenance-free designs.

Preset Absorption and Float voltages:

Battery Type	Preset Absoption Voltage (for various battery temperature settings)			Preset Float Voltage
	HOT	WARM	COLD	
Flooded	14.0V	14.4V	14.8V	13.5V
Gel	13.8V	14.2V	14.6V	13.8V
AGM	14.0V	14.3V	14.6V	13.4V
LFP	14.4V			13.6V
Custom	14.6V (default)			13.4V (default)
	(Custom Type: absorption & float configurable range: 12.0V to 18.0V)			

4.6. Operating in Invert Mode

The Battle Born 2000w is in Inverter Mode when all the following conditions exist:

- Inverter power button is ON (down position) or ignition auto-on is activated
- Shore power is not presently available
- Battery has sufficient energy level.

When switching to Inverter Mode, there are two modes of automatic transfer: Appliance – transfer will switch in 20ms

1. UPS – transfer will switch in 10ms.
2. See Configuration section for details.

NOTE: Do not set to UPS transfer mode if motor loads are connected to AC output, otherwise it may cause damage to the transfer switch. Instead, set transfer mode to Appliance mode for motor or high inductive loads.

Inverter operation means that DC battery power is presently being converted to utility grade AC power, powering equipment and appliances connected to the AC output terminal of the unit. The green status LED lights on the remote panel indicate the Battle Born 2000w is using the battery to power the equipment and appliances. The battery icon and inverter symbol will also be shown on the Control panel LCD display.

The Battle Born 2000w has two AC output terminals: AC Out 1 & AC Out 2. When operating in Invert Mode, only AC Out 1 is active and AC Out 2 is inactive. Loads connected to AC Out 2 will not be supported during Invert Mode.

During Battery Mode, the Control Panel LCD screen displays information related to inverter operation.

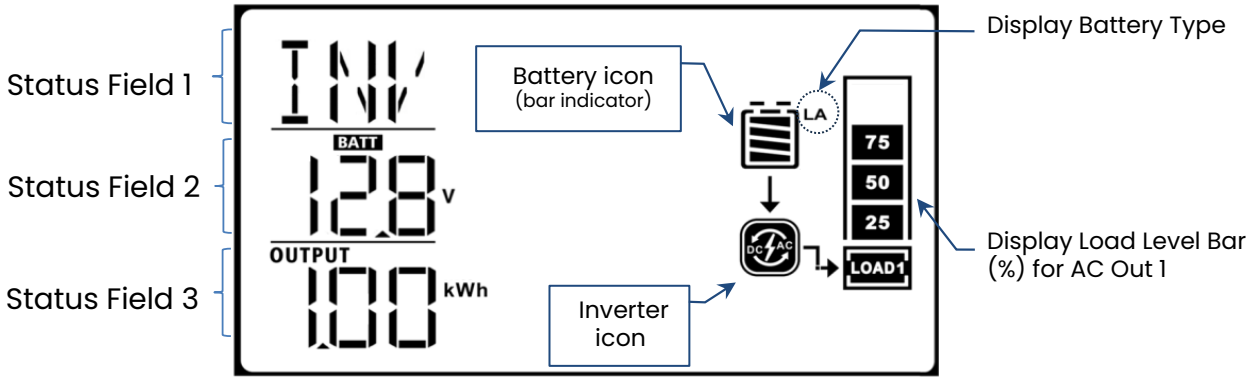
- Press the Scroll buttons to move up or down from screen to screen.
- Press (ESC) to return to the home screen.

NOTE: After one minute of inactivity in the other screens, the LCD will go back to the home screen.

The screen below is the Screen 1 of 5 of Invert mode operation:

Inverter States, Battery Voltage (V) and Load Wattage (KW) are shown. This is the home screen of Invert Mode.

For Lithium battery with communication integrated (i.e. Battle Born Intelligent battery), %SOC will be displayed.



Display Field	Display Status Values	Display Info
Status Field 1	INV ERROR code number	INV – indicate Inverter is in Invert Mode Display an Error code if there is a fault: (see Error Code table in Sec 7)
Status Field 2	BATT Voltage BATT %SOC (0%-100%)	Battery Voltage State of charge value*
Status Field 3	OUTPUT (kWh) OUTPUT (V)	Inverter Output Power in kWh or Wh Inverter Output Voltage (VAC)
Battery Type	LA LI	LA - represent all Lead Acid, AGM, GEL types of batteries LI - represent Lithium battery

***Note:** The SOC shown on the display may differ from the SOC shown in the Battle Born App. These values are calculated using different methods and are not synchronized.*

In Inverter Mode, Status Field 1 will show INV and Status Field 2 & 3 will vary in different screen pages.

Invert Mode Screen	**Status Feild 1** Operation Mode	**Status Feild 2** Information Display	**Status Feild 3** Information Display
Screen 1 of 5	**INV** - Indicate Inverter mode	BATT Input Voltage (V)	AC Output Power (KW)
Screen 2 of 5	**INV** - Indicate Inverter mode	BATT Input Voltage (V)	AC Output Power (VAC)
Screen 3 of 5	**INV** - Indicate Inverter mode	BATT Input Voltage (V)	AC Output Load Current (A)
Screen 4 of 5	**IzNV** - Indicate Inverter mode	BATT Input Voltage (V)	AC Output Frequency (Hz)
Screen 5 of 5	**Firmware Version** - Inverter	**Firmware Version** - Remote Control Panel	**Firmware Version** - Communication Card

While operating in Invert Mode, there are many configurable features.

4.6.1. Power Save Mode

The Power Save mode reduces the no load power and battery consumption by the inverter charger by putting the inverter to sleep but monitoring load output draw. The inverter will come on when a load of 25W or greater is detected.

NOTE: Some load types can cause Power Save mode to not work correctly. Power Save will not work with loads with less than 25 watt threshold. Another problematic load type is devices that cannot be detected by Power Save load sensing. Many fluorescent lights are common examples.

By function, Power Save mode cannot work with clocks and timers or devices that need power 24 hours a day. Examples of devices with timers include cable TV boxes, coffee makers with brew timers, refrigerators, and freezers with defrost timers. Examples of devices that need power 24 hours a day include telephone answering machines, alarm systems, motion detection lights, and some thermostats.

If there are problematic loads that are not working, then disable Power Save mode.

4.6.2. Inverter Charger Operating Parameters

Power Output

The Battle Born 2000w can deliver up to 2000 watts of continuous utility grade sine wave AC power. The wattage rating applies to resistive loads such as incandescent lights

DC Input Voltage & Low Battery Cut Off (LBCO) Shutdown

The Battle Born 2000w will operate within a DC input voltage range from LBCO to 18.0 VDC. LBCO voltage is a configurable parameter with a user definable range of 10.0 to 12.8VDC. Assuming the battery is full, the inverter/charger will operate until battery voltage goes past below LBCO and LBCO Shutdown delay timer.

When the battery drops to LBCO level, the buzzer sounds a single one- second low battery alarm beep and the LCD screen shows error code E01 & a “LOW” indicator will show beside the battery icon. After LBCO Shutdown delay timer runs out, the unit shuts down inverter output. The buzzer stops beeping and the LCD screen shows error code E01.

After a LBCO shutdown and when the battery voltage is recovered above LBCO+0.2 volt, the inverter will restart automatically and continue to operate.

Instant Low Voltage Shutdown:

There is an instant Low Voltage Shutdown at 9.0 volt. If and when the battery drops to 9.0 volts for two seconds, the unit will shut down inverter output instantly and completely. LCD screen turns off completely.

High Voltage Shutdown:

The Battle Born 2000w is equipped with a DC input over voltage protection. When the DC input voltage exceeds the high voltage shutdown limit of 18.0 volt, the unit will shut down inverter output. An error code E02 will be displayed on the LCD screen and the fault LED will turn on in the Control panel.

NOTE: Although the Battle Born 2000w is equipped with over-voltage protection, it can still be damaged if input voltage exceeds 18.0 volts.

Overload Conditions

There are two kinds of overload conditions – an overload warning and an overload shutdown.

1. Overload Warning – When the Battle Born 2000w's AC load is approximately 100 W below the overload shutdown limit of rated watts, the audible alarm beeps once and the LCD screen shows a warning code E04. The Overload icon will also be displayed:
2. Overload Shutdown – When the Battle Born 2000w's AC load increases to near ~2100 W (Battle Born 2000w), the audible alarm beeps every five seconds for one minute and the LCD screen shows an error code E03. The Status LED turns solid RED

High Surge Loads

Some induction motors used in freezers, pumps, and other motor- operated equipment require high surge currents to start. The Battle Born 2000w may not be able to start some of these motors even though their rated steady state current draw is within the inverter/charger's limits. The unit will shut down and indicate an overload shutdown.

Over-temperature Conditions

During inverter operation, when the Battle Born 2000w's internal temperature starts to approach its preset shutdown limit, the display will show error code E07. If the over-temperature condition persists, the display will show error code E04. The Status LED turns solid RED and the inverter/charger will shut down to prevent damage to the inverter/charger and protect the battery from being over-discharged

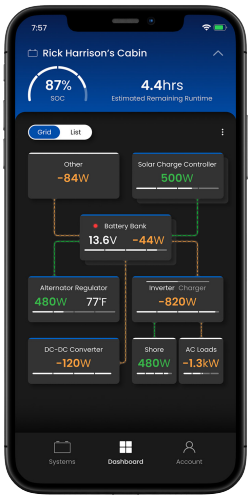
4.7 Battle Born® Mobile App

The Battle Born® 2000W includes Bluetooth connectivity for use with the Battle Born® Mobile App **when the inverter/charger is connected through the Battle Born® HUB.** The app allows users to monitor and adjust supported settings from a compatible iOS or Android device.

The Battle Born® Mobile App can be downloaded here:

- Apple App Store
- Google Play Store

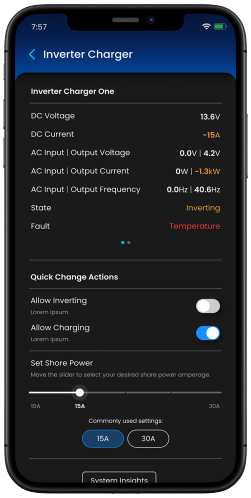
The Battle Born Mobile App provides comprehensive monitoring and control for your Inverter or Inverter Charger, ensuring you have real-time visibility into your power system.



Dashboard Overview

The main dashboard offers a quick status check:

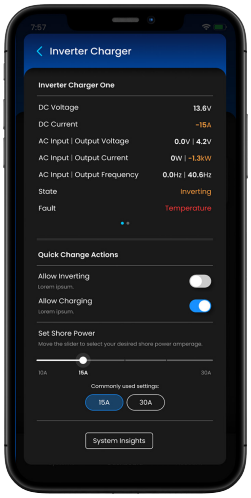
- AC Loads / Charging Watts: Displays the power flow:
  - Negative Orange: Represents AC Loads (power being consumed).
  - Green: Represents Charging watts (power being supplied).
- **CAN Communication Status:** An indicator confirms successful communication between the HUB and the Inverter/Inverter Charger. The flashing LED can be either orange or red indicating a fault and its severity (red is more severe) based on communication status from the unit to the HUB.



Inverter/ Inverter Charger Overview Tab

Selecting the Inverter or Inverter Charger on the dashboard brings you to a detailed Overview Tab with the following information:

- **DC Voltage:** Shows the DC input voltage supplied from the battery bank to the inverter.
- **DC Power:** Indicates the amount of DC power being drawn from or supplied to the inverter.
  - Negative values reflect power consumption during inverting.
- **AC Input | Output Voltage:** Displays the AC voltage of incoming shore/generator power and the AC voltage supplied to connected loads.
- **AC Input | Output Power:** Shows the AC power coming in (if present) and the AC power being delivered to connected loads.
- **AC Input | Output Frequency:** Indicates the AC frequency (Hz) for both incoming power and the inverter's output.
- **State:** The current operational mode, such as: Inverting, Charging, Pass-Through, Standby, or Idle.
- **Fault:** Will display an alert if a system fault is detected.



Quick Change Settings

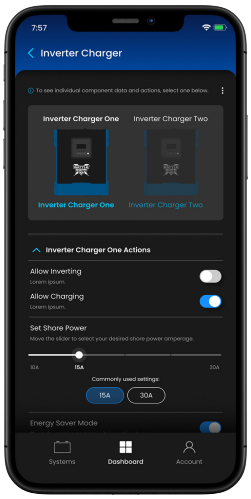
These controls allow you to instantly manage the inverter's core functions:

Allow Inverting:

- Enables or disables the inverter's ability to draw power from the battery bank to supply AC loads.
- Turning this off prevents battery discharge.
- Important Note on Pass-Through: Even when inverting is disabled, the unit will still provide AC Pass-Through when shore or generator power is present. Loads are powered by the incoming AC source, not the batteries.

Allow Charging:

- Enables or disables the charging function of the inverter/charger.
- Disabling this can stop incoming charge current, allowing you to manage battery power usage.



Set Shore Power:

- Allows you to specify the shore power or generator service connected (e.g., 30A, 50A).
- This setting enables the inverter/ inverter charger to use its Power Control features to supplement the limited shore/generator power with battery power if needed.

System Insights

- **Function:** Selecting this opens the advanced diagnostic view.
- **Content:** Displays detailed electrical data, system conditions, and technical parameters for troubleshooting and system setup refinement.

Note: Some features listed above may be greyed out or unavailable for Inverter Only (BBI2000) models.

4.7.1 HUB-Connected Smart Load Management

When used with the Battle Born® HUB, the inverter/charger supports smart load-shedding based on battery SOC. The HUB communicates RVC reduced-load commands to the inverter to automatically limit AC loads during low-battery conditions.

RVC uses two reduced-load levels:

- Disable non-critical loads
- Disable critical loads

These actions help preserve battery life and are only active when the HUB is connected.

Configuration

This section is intended mainly for stand-alone applications.

WARNING

Settings may only be changed by a qualified electrical engineer.

Read the instructions thoroughly before implementing changes.

When making Configuration settings change, the AC input must be removed (open the AC input breaker) and the Battle Born 2000w powered with a DC source (battery).

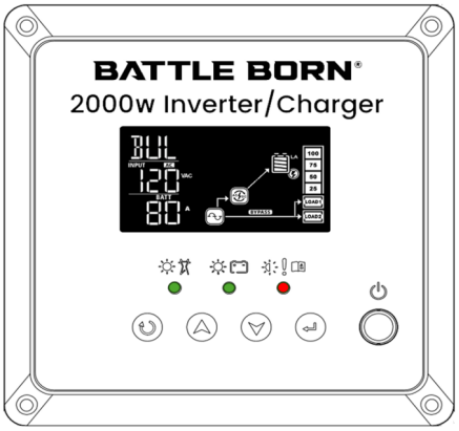
5.1. Configuration Settings

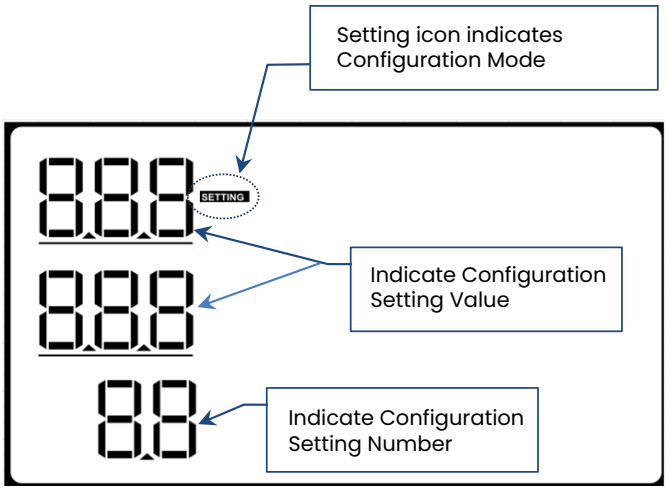
On delivery, the Battle Born 2000w is set to standard factory default values. In general, these settings are suitable for single-unit operation. This section describes the configuration settings of the Battle Born 2000w.

Possibly, the standard battery charging voltage is not suitable for your batteries! Refer to the manufacturer's documentation, or to your battery supplier!

5.1.1. Configuration Mode

1. To enter the Configuration mode to change setting values, press and hold the ↵ ENTER (OK) button for three seconds
2. Press the UP & DOWN buttons to scroll through and view the different settings.





5.1.2. Adjust Configuration Settings:

To change the default value to a different value and to save the change:

1. Press and hold the ENTER (OK) button for three seconds to enter the Configuration mode.
2. Press the UP & DOWN arrow buttons to scroll through the different settings.
3. Press the ENTER (OK) button to select a setting to change its value. Also press, to select a sub-setting, if applicable.
4. Press the UP & DOWN arrow buttons to change the setting to the desired value.
5. Press the ENTER (OK) button to confirm the change.
6. Repeat the previous steps to set other settings.
7. Press the ESC button to exit the Configuration mode.

Alpha text configuration setting values will be displayed in the Status field 1. Numeric configuration setting values are displayed in the Status field 2.

5.2. Configuration Settings List:

Setting Name	Setting Number	Default Value	Range of Values	Description
Inverter Ignition Control	01	OFF	OFF LOK AUT	1. OFF – the Ignition Control feature is disabled. 2. Lock Out (LOK) – In Lock Out setting, the inverter On/Off power button can operate the inverter charger only when a valid (12VDC) ignition signal is detected at the Ignition Control 3. Auto ON (AUT) – This setting allows the inverter charger On/Off operation to work in tandem with the vehicle's ignition circuit when a valid ignition (12VDC) signal is constantly detected at the Ignition Control pin
LBCO Voltage	02	10.5	10.0 to 12.8	The voltage setting value can be adjusted by 0.1 increments. The inverter is able to recover automatically at LBCO voltage +0.2 volts.
LBCO Shutdown Delay Timer	03	300	1 to 300	When the range is from 1 to 20, the timer setting value can be adjusted by 1-second increments. When the range is from 20 to 300, the timer setting value can be adjusted by 10-second increments.
LBCO Recovery Voltage	04	13.1	12.0 to 16.0 and OFF	The range is from LBCO voltage + 0.2 to 16, adjusted by 0.1 increments. Selecting OFF or a higher value than the battery's actual fully-charged voltage level will disable the auto-recovery feature. You may manually reset the inverter/charger when the low battery cut off event occurs.
Auto Shutdown Timer (in Power Save Mode)	05	25	OFF, 1 to 25	The Auto Shutdown Timer is an adjustable countdown timer (from 1 to 25 hours) that automatically shuts down inverter operation to reduce battery discharge after a period of inverter inactivity (defined as AC load remaining below approximately 50W during the time out period). The timer range is from 1 to 25, adjusted by 1-hour increments. The next setting after 25 is OFF.
Power Save Mode (Search Mode)	06	DIS	ENA (Enable) DIS (Disable)	With the Power Save mode (also called load sensing or search mode) enabled, the inverter/charger reduces no load battery consumption by monitoring the AC output and turning on the inverter only when the load is greater than 25W.
Output Frequency	07	60	60 50	After changing the output frequency setting, turn the unit off and then on again, in order for the change to take effect.
Output Voltage	08	120	120 110 108	The inverter output voltage can be configured to different voltage levels: 108VAC, 110VAC & 120VAC.

Setting Name	Setting Number	Default Value	Range of Values	Description
Inverter Output Power Limit	09	2.0	0.1 to 2.0	The wattage setting value can be adjusted by 100-watt increments. Use with Inverter Output Power Limit Timer especially when pairing with a lithium ion battery. 0.1 is equivalent to 100 watts.
Inverter Output Power Limit Timer	10	300	1 to 300	When the range is from 1 to 20, the timer setting value can be adjusted by 1-second increments. When the range is from 20 to 300, the timer setting value can be adjusted by 10-second increments. Use with Inverter Output Power especially when pairing with a lithium-ion battery. The timer is automatically disabled if the maximum Inverter Output Power limit is selected.
Transfer Mode	11	APL	APL (Appliance) UPS (UPS)	Selecting APL- appliance sets the transfer time from line to battery to 20 ms. Selecting UPS (uninterruptible power supply) sets the transfer time from line to battery to 10 ms. **NOTE:** Do not connect motor loads when in UPS transfer mode.
Utility AC Under Voltage Level	12	90	85 to 110	AC Input under voltage level range from 85 to 110 VAC. This is the AC Input qualification low limit.
Inverter Shutdown Recovery	13	MAN	AUT (auto-restart) MAN (manual restart)	The inverter shuts down when there is an over temperature, overload, and short circuit condition. Selecting ATO (auto-restart) will allow the inverter/charger to recover automatically from a shutdown up to three times maximum. Selecting MAT (manual restart) allows the user to restart the inverter/charger by performing a manual reset, that is, by acknowledging the restart via the display panel.
Audible Alarm	14	AON	AON (Audible) AOF (Mute)	The alarm beeps once every 5 s, when set to AON.
Battery Type	20	FLD	FLD (Flooded) AGM (AGM) GEL (Gel) CUS (Custom) LFP (LiFePO4)	LFP (LiFePO4) is a pre-set battery type that requires a compatible with Battle Born Lithium battery with BMS. For custom battery settings, use CUS (Custom) battery type with parameters set according to your battery manufacturer's specifications.
Battery Temperature	21	HOT	FLD (Cold) WRM (Warm) HOT (Hot)	Selecting Cold from Warm will increase charger voltage by 0.4V. Selecting Cold from Hot will increase charger voltage by 0.8V.
Charger Settings				
Custom Absorption Voltage	22	14.6	12.0 to 18.0	The voltage setting value can be adjusted by 0.1 increments. Available only when custom battery type is selected.

Setting Name	Setting Number	Default Value	Range of Values	Description
Custom Float Voltage	23	14.6	12.0 to 18.0	The voltage setting value can be adjusted by 0.1 increments. Available only when custom battery type is selected.
Charger Current	24	100	5 to 100	This limits the maximum charge current from the charger. The current setting value can be adjusted by 5A increments.
Charger Ignition Control	26	OFF	OFF (OFF) AUT (Auto-ON)	See *Description of Ignition Control Features* on page 21. Ignition Control feature is functional for both inverter and the charger.
Equalize Charging for Flooded Battery	27	ENA	ENA (Enable) DIS (Disable)	This setting is only available when Flooded battery type is selected. It allows only one hour of equalize charging once.
AC Input Breaker for Power Control (Load Share)	28	30	5 to 30	The AC Input Breaker setting define the available shore power breaker size. This is used for Power Control Mode and Load Shed Mode feature to prioritize the AC load support.
Power Control mode	30	ENA	ENA (Enable) DIS (Disable)	The Power Control (Load Share) mode feature prioritizes the AC load by reducing the charge current in order to maintain the total input current to less than the load share setting. Must set AC Input Breaker (no. 28) for this feature to work.
Load Shed Mode	31	DIS	ENA (Enable) DIS (Disable)	If the Load Shed Mode is enabled, it can shed non-critical load by turning ON Digital Output 1 to control an external relay to switch AC loads connected to AC Output 2 line. Dig Out 1 is a open collector Dig I/O sinking up to 200mA of current. Note: a user installed external relay is required to achieve this function.
Comm Protocol	32	RVC	RVC, N2K	For unit with CAN communication feature, the user can select one of two communication protocols: RVC for RV application and N2K (NMEA2000) for marine application.
Inverter Assist Mode	33	DIS	ENA (Enable) DIS (Disable)	In Grid mode, AC load demand may temporarily peak and exceed the available shore power AC source for a short period of time, which often results in tripping the AC shore breaker. If Inverter Assist mode is enabled, the Battle Born 2000w will compensate for insufficient generator, shore or grid power by turning the inverter on to supplement power to the AC loads on AC Out 1 & 2. Must set AC Input Breaker (no. 28) for this feature to work.

Setting Name	Setting Number	Default Value	Range of Values	Description
Absorption Exit Current	34	10	2 to 50	During the absorption stage, when the charge current falls below this Absorption Exit Current, the charger will exit absorption and transition to float when the Minimal Absorption Time is reached.
Minimal Absorption Time	35	1	0 to 6	Even when the charger falls below the Absorption Exit Current, the charge will remain in absorption stage until the Minimal Absorption Time is reached. If the charger current does not reach the Absorption Exit current level, the charger will still exit absorption when the Minimal Absorption Time is reached.
Stacking	36	DIS	DIS, PAR, SL 1, SL2	Stacking Mode: DIS = Single system operation (not stacked) PAR = Parallel stacked SL1 = Serial stacked L1 unit SL2 = Serial stacked L2 unit
Reset all settings to their default values	99	DEF	NoC (No change, as is) DEF (default)	NoC refers to No Change to current settings. Choose DEF to restore all settings to their default values.

Maintenance

6. Maintenance

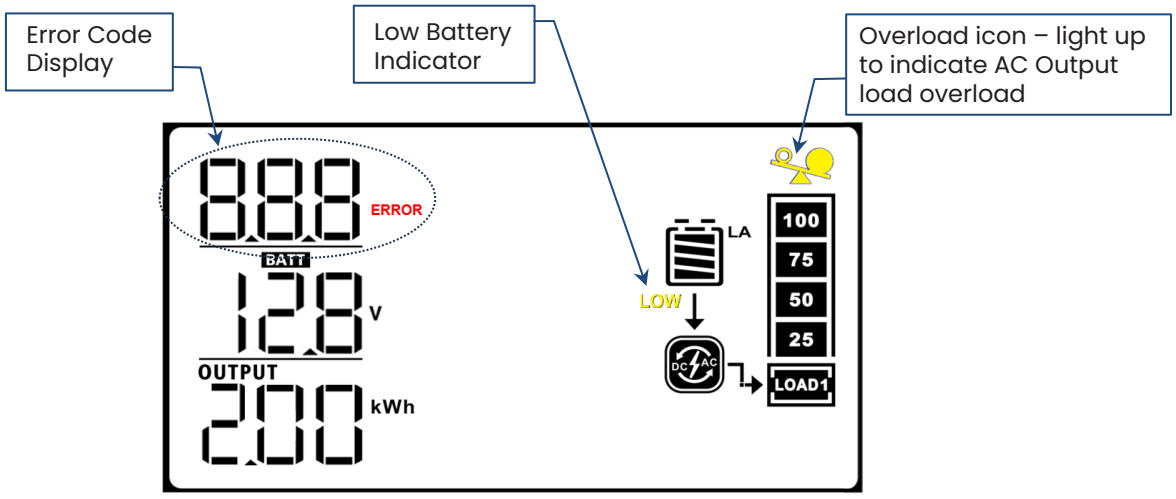
The following periodic maintenance steps will be sufficient to keep the Battle Born 2000W in good operational condition:

- Keep the equipment clean. With all sources of power off, clean the exterior of the unit with a damp cloth to prevent the accumulation of dust and dirt.
- Ensure that the DC cables are secure and all fasteners are tightened according to specifications.
- Verify that ventilation openings remain unobstructed and free of dust or debris when installed with proper clearance.

Error Code and Troubleshooting

7. Error Code and Troubleshooting

With the procedures below, most errors can be quickly identified. If an error cannot be resolved, please refer to your Battle Born supplier.



Audible Alarm

When there is a warning or fault, an error code will be displayed on the control panel LCD screen and an audible alarm will sound. The audible alarm can be configured to be On or Muted.

Refer to the Configuration settings section for adjustment instruction.

- Audible alarm for warning: The unit beeps once when a warning condition is detected.
- Audible alarm for error: The unit beeps once every 5 s for 1 min.

To mute the alarm, press any one of the function buttons on the Control panel.

The alarm is automatically muted after 1 min. But the error code continues to be displayed until the error is cleared.

To manually reset the alarm:

1. Press the Power button to turn it to Standby (from a down position to up) and press again to turn it On to reset an active alarm and clear the error.
2. If the Inverter Ignition Control is set to auto-on, toggle the ignition signal to clear the alarm and error.
3. Toggle the AC input power to force the transition between grid mode and battery mode. This action clears the alarm and error.

7.1. Error Code List

Error Code	Operating Mode	Problem	Solution
E01	Battery mode (inverting)	Low battery voltage shutdown is imminent depending on the setting. For lithium battery with %SOC, Low battery is at 10%.	Check battery status and recharge if necessary. Check for proper DC cable sizing. Check for loose connections and tighten if necessary.
E02	Battery mode (inverting)	High battery voltage shutdown > 18.0 volts DC	Check for external charging sources, such as a PV charger and an over voltage alternator. Disconnect, if necessary.
E03	Battery mode	AC output overload warning. When the Battle Born 2000w AC load is approximately 100 W below the overload shutdown limit of rated watts, the audible alarm beeps once and the LCD screen shows a warning code E03.	Reduce the loads connected to the AC outlet of the unit.
E04	Battery mode	AC output overload shutdown When the AC load increases to near ~2100 W, the audible alarm beeps every five seconds for one minute. Some induction loads like motors require high surge currents to start. The Battle Born 2000w may not be able to start some of these motors even though their rated steady state current draw is within the operating limits. The unit will shut down and indicate an overload shutdown.	Reduce the loads connected to the AC outlet of the unit. Check appliances that have high-surge ratings and disconnect if necessary.
E06	Battery mode & Grid mode	Over-temperature alarm and fan lock warning alarm. During inverter operation, when the Battle Born 2000w's internal temperature starts to approach its preset shutdown limit, warning error code E06 is displayed.	Reduce the loads connected to the AC outlet of the unit. Check that the ventilation grille is not blocked. Check for ambient temperature and move the unit to a cooler location whenever possible. Check the fan for any obstruction and remove it.
E07	Battery mode & Grid mode	Over-temperature shutdown. when the unit's internal temperature reaches the preset shutdown limit, the inverter charger will be shutdown.	Reduce the loads connected to the AC outlet of the unit. Check that the ventilation grille is not blocked. Check for ambient temperature and move the unit to a cooler location whenever possible.

Error Code	Operating Mode	Problem	Solution
E08	Battery mode & Grid mode	Fan lock error	If there is no issue with the fan, disconnect the unit from its DC and AC power sources, then reconnect, and then restart the unit. If error detection persists, contact customer service.
E10 to E19	Battery mode & Grid mode	Internal hardware error	If error detection persists, contact customer service.

7.2. Troubleshooting

Problem	Possible Cause	Solution
No output voltage. The status LED is red.	AC shore power is not available or out of operating range and the inverter/charger has shut down with the LCD screen showing one of the following error codes:	
	Low input voltage (error code E01)	Verify the unit is connected to a 12V battery. Check the DC connections and the cable. Recharge the battery.
	High input voltage (error code E02)	Verify the unit is connected to a 12V battery. Check the voltage regulation of the external charging system (if any).
	Unit overload or AC output short circuit (error code E03)	Reduce the load. Make sure the load does not exceed the output rating.
	Thermal shutdown (error code E04) Unit over heated. Ventilation blocked	Allow the unit to cool off. Reduce the load if continuous operation is required. Make sure the inverter/charger's ventilation openings are not blocked.
No output voltage is shown in the LCD screen but the green status LED for Battery mode is illuminated.	Circuit breaker on the AC load panel or AC output disconnect has tripped.	Reset the circuit breaker or check the AC output disconnect circuits.
	Battery voltage is too low to start inverting. LCD screen may show DC voltage as 000.	Check DC connections and cable. Recharge battery.
	GFCI (when installed) has tripped or supplementary breaker has tripped.	Check load and reset the GFCI or supplementary breaker.

Problem	Possible Cause	Solution
No output voltage is shown in the LCD screen and neither of the green status LEDs (for Grid mode and Battery mode) is illuminated.	AC shore power is not available or out of operating range and the inverter/charger is OFF.	Check AC shore power. Turn the inverter/charger ON.
	AC shore power is not available, and the inverter/charger is OFF due to a longer than 30s shutdown	Check AC shore power and battery voltage. Turn the inverter/charger ON and look at the LCD screen for any error code. (See error code list in Sec 7.1)
No output voltage. The status LED is not lighting up.	Ignition lock (ACC) signal is not present.	If the ignition control feature is in use, ensure the vehicle's ignition is On and the control panel switch on the front of the Battle Born 2000w is On.
The fan turns on and off during Grid mode.	The battery is discharged. AC pass-through current is high.	Do not be alarmed, the unit is performing normally.
The fan turns on and off during inverter mode.	The inverter is running continuously at high power.	Do not be alarmed, the unit is performing normally. The fan is activated automatically.
Alarm does not sound when an error is encountered.	Alarm is turned OFF.	See Turning the Audible Alarm ON or OFF in Configuration Setting section. (Setting No. 14)

Technical Specifications

8. Technical Specifications

Battle Born 2000w Inverter, Inverter/Charger

Inverter

Output voltage options	120, 110, 108 VAC
Continuous power	2000W @40°C with output derated above 104°F (40°C)
Continuous current	16.7 A
Surge power (5 sec)	4000 W
Frequency	60 (or 50) Hz
GFCI protection	customer-provided
Wave Shape	True Sine Wave
Peak efficiency	91%
Full load efficiency	≥86%
DC INPUT:	
Operating voltage range	From LBCO voltage to 18.0 VDC
Maximum non-operating voltage	25.2 VDC
Nominal voltage	12.0 VDC
Nominal current at full load	192 ADC

Charger (for Inverter Charger model only)

AC INPUT:	
Operating voltage range	85–140 VAC
Safe non-operating voltage range	up to 240 VAC
Full load maximum current	24 Amps
Nominal frequency	60 (or 50) Hz
Power factor at full charge	> 98%
DC OUTPUT FOR CHARGING	
Nominal voltage	12.0 VDC
Min battery voltage for charging	0.0 VDC
Max output voltage	18.0 VDC (custom battery type)
Nominal output current	User selectable: 5 to 100Ah
Charger current derating	May reduce charger current based on ambient temperature.
Efficiency at nominal output	91%

General

AC INPUT:	
Operating voltage range	85–140 VAC
Safe non-operating voltage range	up to 240 VAC
Full load maximum current	24 Amps
Nominal frequency	60 (or 50) Hz
Power factor at full charge	> 98%
DC OUTPUT FOR CHARGING	
Nominal voltage	12.0 VDC
Min battery voltage for charging	0.0 VDC
Max output voltage	18.0 VDC (custom battery type)
Nominal output current	User selectable: 5 to 100Ah
Charger current derating	May reduce charger current based on ambient temperature.
Efficiency at nominal output	91%

Enviromental

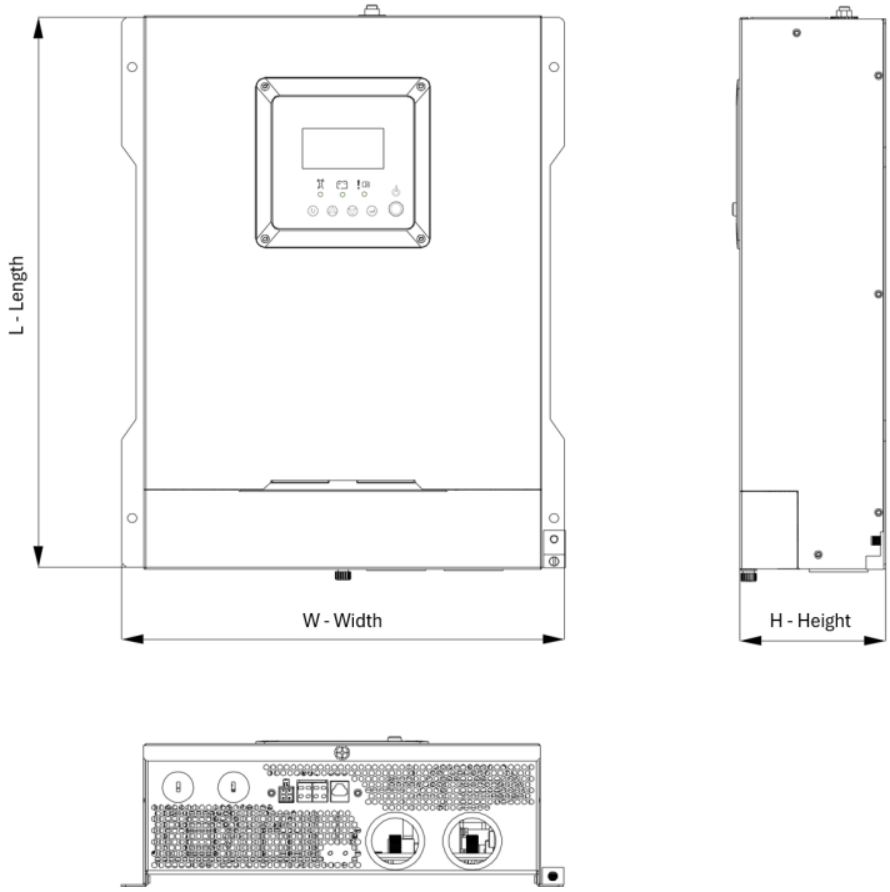
Operating Temperature Range	-4 –140°F (-20 –60°C), with output derated above 104 °F (40°C)
Storage Temperature Range	-40 –203°F (-40 –95°C)
Humidity: Operation/Storage	5–95% RH, non-condensing

PHYSICAL

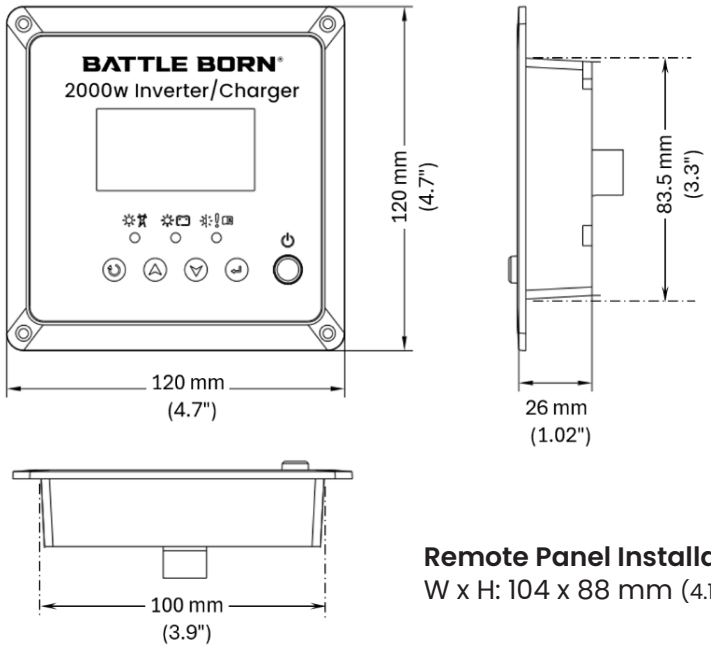
Battle Born 2000w Inverter L x W x H (includes flanges)	14.6" x 12.0" x 4.0" (390mm x 306mm x 101mm)
Battle Born 2000w Inverter Charger L x W x H (includes flanges)	16.1" x 12.0" x 4.0" (410mm x 306mm x 101mm)
Net Weight Battle Born 2000w Inverter Battle Born 2000w Inverter Charger	 16.7 lbs (7.6 Kg) 18.9 lbs (8.6 Kg)

Certifications

Product Safety	ETL-listed complies to CSA 107.1 UL458 and UL458 Marine Supplement
EMI	CFR 47, (FCC Part 15) Subpart B, Class B



Remote Panel Dimensions

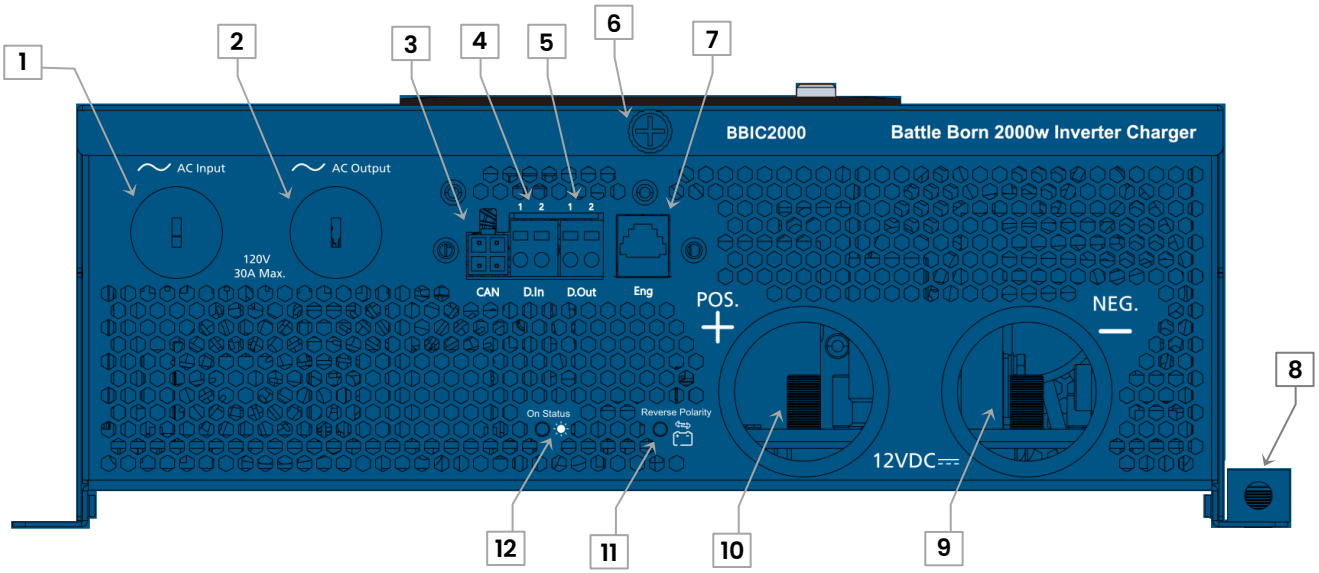


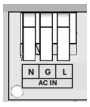
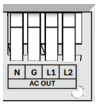
Remote Panel Installation Cut Out:
W x H: 104 x 88 mm (4.1" x 3.46")

Appendix

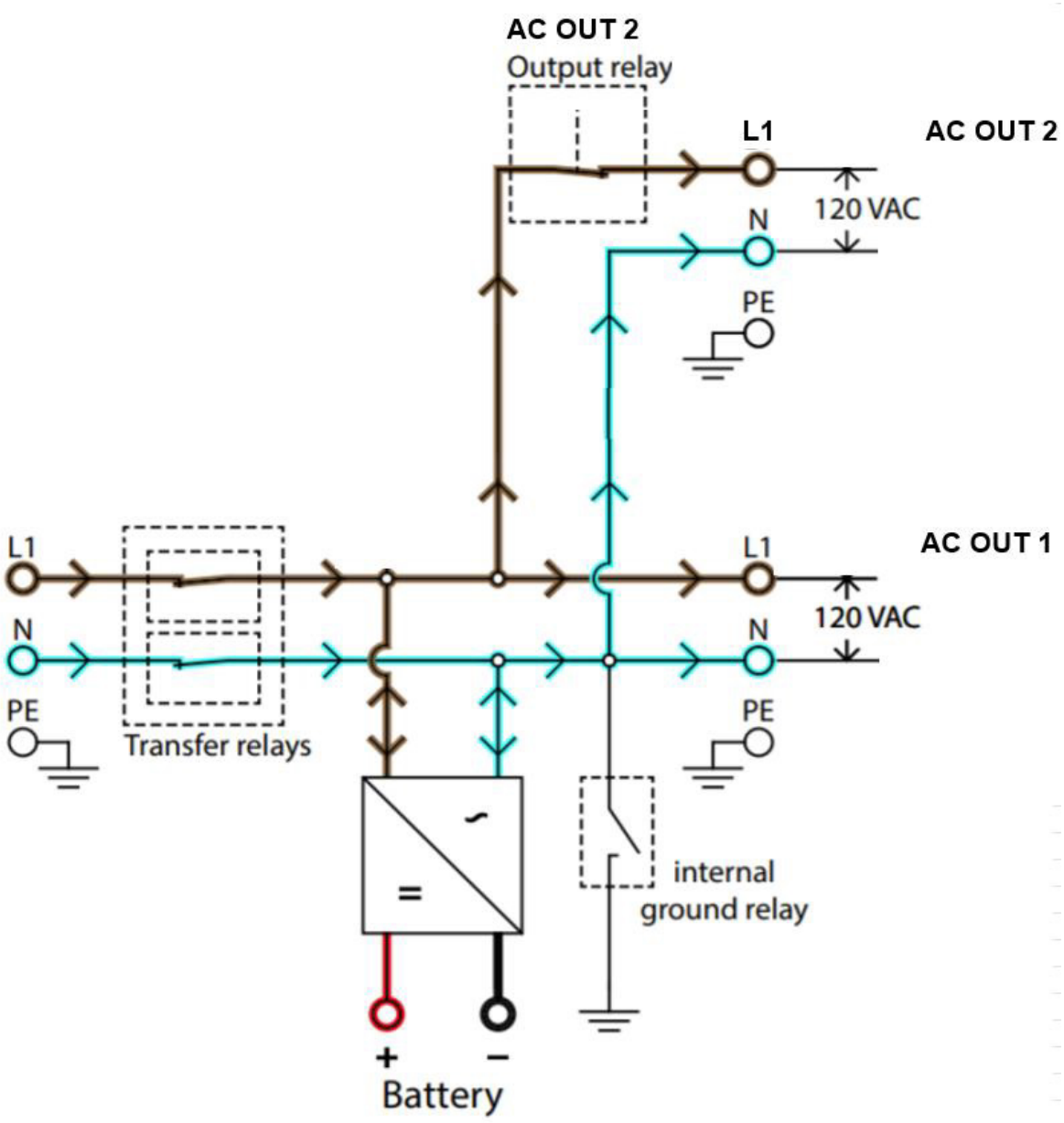
Appendix

Appendix A. Connection Overview



1	 **AC Input connection - From left to right:** N (neutral), G (ground), L (line)
2	 **AC Output connection - From left to right:** N (neutral), G (ground), L (line)
3	CAN Communication & Ignition Control (see Sec 3.5.2 CAN Communication Connection for details)
4	Digital Input 1 & 2
5	Digital Input 1 & 2
6	Screw to unlock wiring compartment
7	Factory diagnostic port
8	Primary ground connection (G) - M8 bolt
9	Battery Negative (-) connection - M8 bolt
10	Battery Positive (+) connection - M8 bolt
11	Reverse Polarity LED indicator
12	Inverter power ON status LED

Appendix B. Power Flow Block Diagram



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Unstoppable Power Solutions