

Installation Manual

Coral Smart Battery

SB14A

Part of the Pika Energy Island™





Coral Smart Battery

Serial Number:

RCP Number:

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Section 1: Introduction

About this manual

This Installation Manual provides instructions and recommendations for installing and commissioning the Pika Coral smart battery for simple, reliable energy storage with optional solar charging. Coral is a smart battery kit designed to work with the Pika Islanding Inverter and other REbus™- compatible components of the Energy Island system from Pika Energy.

This Installation Manual includes full details on installation, wiring, safety, inverter integration, and other key aspects of installing Coral. Please reference the Pika Islanding Inverter Operation Manual for complete information on user-configurable features including device settings and Operational Modes. Some information on user-configurable features is included here, but is comprehensively detailed in the Islanding Inverter Operation Manual.

Symbols used in this Manual

	WARNING: This indicates a fact or feature very important for the safety of the user to prevent injury or death and/or which can cause serious hardware damage if not applied appropriately.
	CAUTION: Presents information to prevent damage to this product
	EARTH GROUND SYMBOL

About the Coral SB14A

Each Coral is an efficient, easy-to-install Smart Battery kit that enables commonly-available deep cycle batteries to be used for efficient grid-connected, solar-coupled energy storage systems for backup power and other applications. Coral is designed to work seamlessly with Pika Energy's S2500 Series PV Link optimizers, and X7600 and X11400 Series Islanding Inverters to form the Pika Energy Island system for grid-tie solar-plus-storage.

All Pika Energy products use the REBus™ 380VDC nanogrid to connect energy sources, storage, loads and the grid. The REBus nanogrid automates the flow of power to enable plug-and-play setup and operation of Pika Energy equipment. For more information about REBus, visit pika-energy.com.

In the diagram below, a REBus compatible Pika Inverter is directly connected to PV Link optimizers and high voltage energy storage on the DC (REBus) line, shown to the left of the inverter. To the right of the inverter are AC lines: 240VAC or 208VAC for grid and home loads, and critical load support up to 50A.

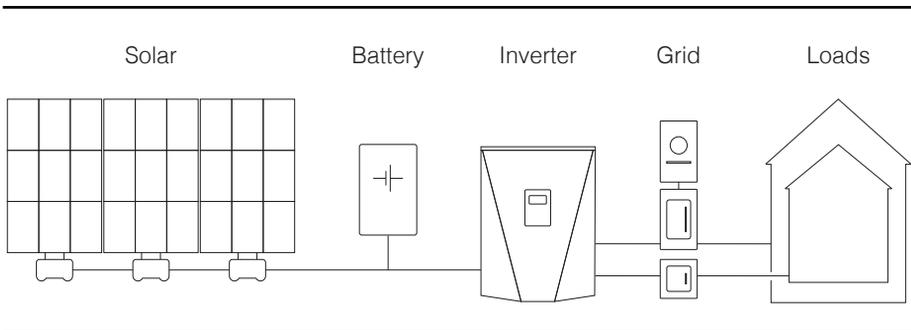


Fig 1. Example Energy Island

Battery Types

The Coral SB14A is designed to be used with Fullriver DC55-12 22NF deep cycle AGM batteries. Do not use flooded batteries, lithium batteries, or any other kind of battery in Coral, including any other kind of lead acid battery.

Refer to the manufacturer's documentation for information on the correct handling, storage, and use of your batteries.

Series Connection

Unlike conventional deep cycle battery systems, the batteries within Coral are wired entirely in series, creating a single string of batteries with a nominal voltage of 288V. This promotes efficiency and reduces line and conversion losses.

During assembly, the twenty four batteries are connected into substrings of 48V each. After the wiring tray is installed and the battery compartment is closed off, the six substrings are connected in series using touch-safe PV-type connectors. In this way, the installer is not exposed to live parts with greater potential than 48V.



WARNING: Follow battery stringing instructions exactly! Do not attempt to modify the battery stringing in any way. Incorrect connection can cause a short circuit.

Section 2: Safety instructions

IMPORTANT SAFETY INSTRUCTIONS. SAVE THESE INSTRUCTIONS!

The unit is to be wired using methods in accordance with the National Electrical Code, ANSI/NFPA 70, and other codes as applicable.

General Warnings



WARNING: DO NOT ATTEMPT TO SELF-INSTALL INVERTER. A QUALIFIED SOLAR INSTALLATION PROFESSIONAL OR ELECTRICIAN MUST INSTALL AND COMMISSION PIKA ENERGY EQUIPMENT. CONTACT PIKA ENERGY FOR A LIST OF AUTHORIZED INSTALLERS IN YOUR REGION.

SHOCK RISK: HIGH VOLTAGE ELECTRICITY

WARNING: To reduce the risk of injury, read all instructions and caution markings before installing SB14A. Consult installation documentation for all other REbus devices on the system.

WARNING: SB14A must be installed by trained and qualified technicians, and in accordance with all instructions.

WARNING: Electrical installation in the United States shall be done in accordance with all local electrical codes and/or the National Electrical Code (NEC), ANSI/NFPA 70.

WARNING: Electrical installation in Canada shall be done in accordance with all local electrical codes and/or the Canadian Electrical Code.

WARNING: Connecting the Pika Energy Island to the electric utility grid must only be done after receiving prior approval from the utility company and installation completed only by qualified personnel/licensed electrician(s).

WARNING: This equipment is NOT intended for use with life support equipment or other medical equipment or devices.

Safety Shutdown

The Pika Energy Island system can signal to connected devices on REbus to shut down and limit output voltage to a safe level. The red Safety Shutdown button on the front of Pika Islanding Inverter activates a Safety Shutdown. An external shutdown button may also be installed, given appropriate labeling. See the section titled “External Safety Shutdown Switch” in the Islanding Inverter Installation manual.

To enter a Safety Shutdown, press and hold the red button on the front of the inverter. The Safety Shutdown LED will illuminate and the LCD screen will indicate a Safety Shutdown has been initiated.

In a system configured to provide backup power, the DC bus will remain energized on loss of AC grid power. Upon entering a Safety Shutdown, a shutdown signal will be transmitted to all devices connected to REbus. In Safety Shutdown, the Islanding Inverter will disconnect from the grid, stop sourcing power to REbus, and immediately disable all sources on REbus by sending a global shutdown signal. All PV Link optimizers will disconnect their output. The Safety Shutdown LED will be illuminated to show that the inverter has entered a Safety Shutdown. DC bus voltage will be displayed on the inverter screen.



WARNING: UNLESS THE SYSTEM IS IN A SAFETY SHUTDOWN, LIVE VOLTAGE MAY BE PRESENT, EVEN WHEN THE POWER GRID HAS FAILED AND THERE IS NO SOURCE OF POWER FROM THE SOLAR PANELS. TO ENSURE THE DC BUS IS NOT POWERED, ALWAYS ACTIVATE SAFETY SHUTDOWN BEFORE PERFORMING EMERGENCY OR SERVICE WORK. ALWAYS USE A APPROPRIATELY RATED MULTI-METER TO VERIFY THAT NO VOLTAGE (AC OR DC) IS PRESENT.

Battery Safety

Exercise caution when handling lead acid batteries, and be aware of the hazards that are present. To avoid lead exposure, work in a well-ventilated space, and wash your hands after handling the batteries and before eating, drinking, or smoking. Refer to the battery manufacturer’s documentation for warnings, hazards, and safe handling instructions for your battery modules.



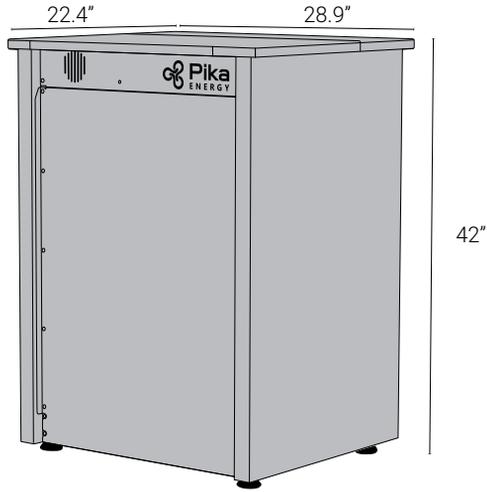
WARNING: Handle lead acid batteries carefully. Lead acid batteries present hazards including shock, fire, and lead exposure, among others. Consult manufacturer’s documentation for complete information and instructions

Section 3: Installing the Smart Battery

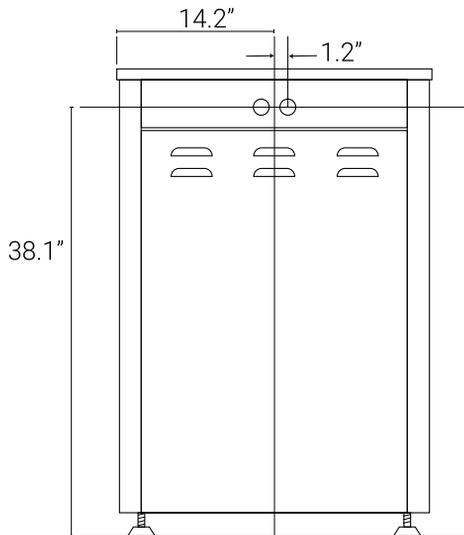
Getting to Know the Coral Smart Battery

The Coral SB14A is shipped from Pika mostly assembled. All wiring required to assemble the SB14A is included with much of it integrated into the structural side panels. This wiring is color-coded to help avoid assembly confusion and product damage resulting from miswiring.

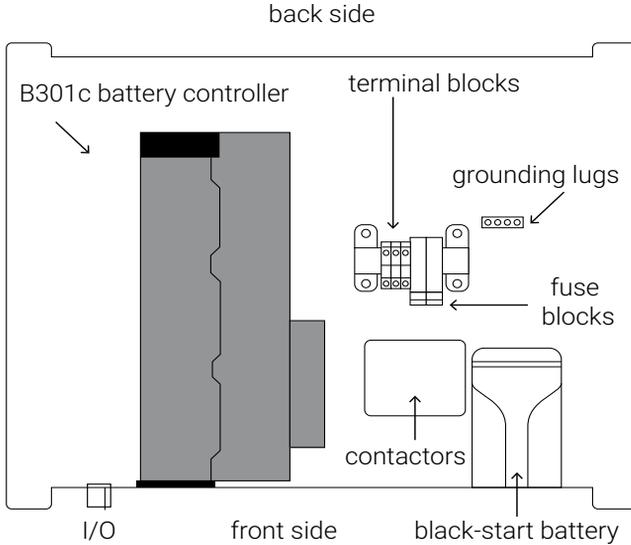
Included on the shipping pallet	
1	Coral battery cabinet with pre-installed wiring tray
6	Battery trays
6	Shelf joists
18	Battery jumpers
48	Terminal caps
1	Extra hardware kit
1	Installation Manual



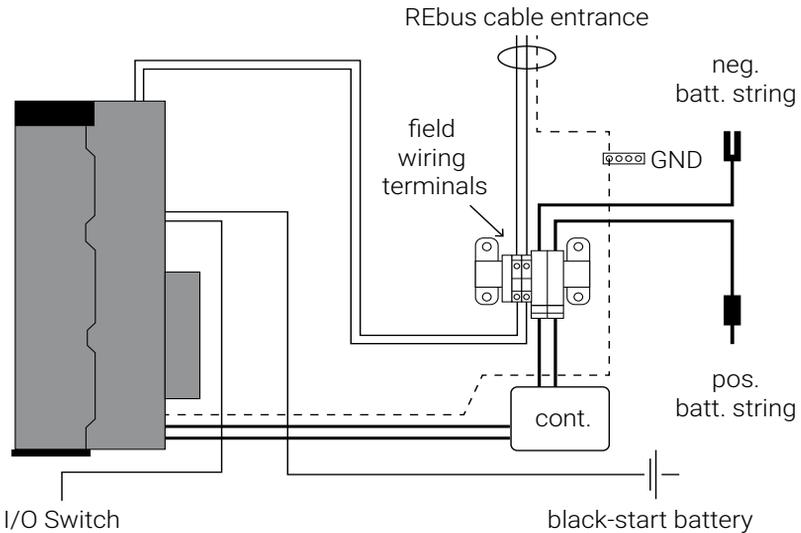
Overall product view



Rear view of Coral showing knockout locations



Wiring tray layout



Wiring tray wiring diagram

Location and clearances

The SB14A is designed to be installed in protected indoor locations only. Do not install where it will be subject to rain, ice, dripping or pooling water, or other environmental factors.

Do not expose Coral to extreme temperatures. Maintain an operating temperature between 23°F and 104°F (-5°C to 40°C).

Coral is designed to be installed in a clean, dry, well-ventilated location. Ensure that the minimum clearances of the table below are met. Do not allow bottom, front, or rear vents to become blocked.

Clearance	MINIMUM dimension
Back	1.5"
Sides	3"
Top	24"
Front	36"
Bottom	2"

Coral weighs approximately 1,100 lbs (500 kg) when completely assembled. Install only on a surface strong enough to support the load. If in doubt, consult a structural engineer or builder for advice.

Compliance

Install Coral in compliance with all applicable local codes. Only qualified persons should attempt to install Coral. Follow all instructions included in this manual and use appropriate practices for all product wiring and installation.

Note on DC Wiring and NEC

Some electricians or installers may be unfamiliar with DC wiring in a residential setting. Please note the following:

1. NEC 215.12(C)(2) for correct DC wiring coloring.
2. NEC 210.5(C)(2) for identification of DC conductors more than 50V.

Always adhere to applicable codes when marking and installing DC conductors.

For all REbus DC wiring please observe the following coloring convention. Mark or flag all conductors as appropriate.

Wire	Color
REbus + (RE+)	Red
REbus - (RE-)	Black or Blue
Ground (GND)	Green or bare

Grounding

Coral must be grounded according to local codes. When required, grounding is the responsibility of the installer.

Install grounding conductor to the lug marked with the inverted tree grounding symbol. For proper REbus communication, ensure the enclosure is securely bonded to the Islanding Inverter via the grounding bar in the Islanding Inverter wiring compartment.



WARNING: All REbus circuits are ungrounded. Never connect REbus leads to ground.

Assembly Sequence

Coral ships assembled on a standard pallet. Before beginning installation, remove protective packaging and inspect for damage and completeness. The batteries will ship separately.

The Coral Smart Battery is designed to be installable by one or two people without the need for heavy equipment. However, use caution when handling heavy parts and batteries. Lift heavy parts in teams if necessary to prevent injury. Use good ergonomics and posture when lifting the AGM batteries.

Prepare location and unwrap pallets

1. Clean away leaves or dust from the Coral location that might get pulled into the bottom intake vent.
2. Unwrap the Coral shipping pallet and remove the cardboard wrap from the Coral. [Pro tip: save the cardboard sheet to kneel on while working in the battery compartment.]
3. Unwrap the pallet of batteries. If the batteries are individually boxed, you may wish to unbox them now. Set aside and save the terminal fasteners packaged with the batteries.

Rough in REbus wiring

1. Rough in the field wiring between the Islanding Inverter and the Coral location.
2. See figure [figure] for knockout locations and dimensions.

Locate the unit and test conduit fittings

Pro tip: Take pictures with your smartphone as you disassemble the unit to help you with reassembly.

1. Carefully set the Coral unit in place and remove the top cover.
2. The top cover is in two pieces. Remove and save all of the M4 x 8mm screws attaching the cover pieces to the cabinet.
3. Remove both the front and rear top covers.
4. Remove knockouts as necessary and test fit all conduit and fittings.

Pro Tip: Don't fully install the fittings yet. You will remove the wiring tray in the next step.

Pro Tip: Remember that the Coral will weigh about 1,100 lbs (500 kg) when complete. Make sure you can make all final connections without moving or rocking the unit.

Remove wiring tray

1. Remove and save the eight M4 x 8mm screws attaching the walls of the wiring tray to the side panels.
2. Remove and save the six locknuts attaching the floor of the wiring tray to the front and back bulkheads.
3. Remove the wiring tray by lifting it straight up out of the cabinet. Set the tray aside.

Pro Tip: Use an assistant to help you remove the wiring tray.

Remove front bulkhead and interior shelving

1. Remove the front bulkhead. The bulkhead is secured with ten M4 x 8mm screws.
2. One shelving joist is installed for shipping. Remove the joist by removing the two 1/4-20 KEP nuts.
3. Remove and set aside the bundle of battery trays, the battery jumpers, the aluminum joists, and the hardware kit.

Level the cabinet

1. With the level on the rear sleeper, adjust the rear feet until the sleeper is level.
2. Place the level diagonally across the sleepers and adjust one front foot to be level with the back feet.
3. Place the level across the front sleeper and adjust the last leveling foot until the level reads true.
4. Tighten the jam nuts to hold the leveling feet in place.

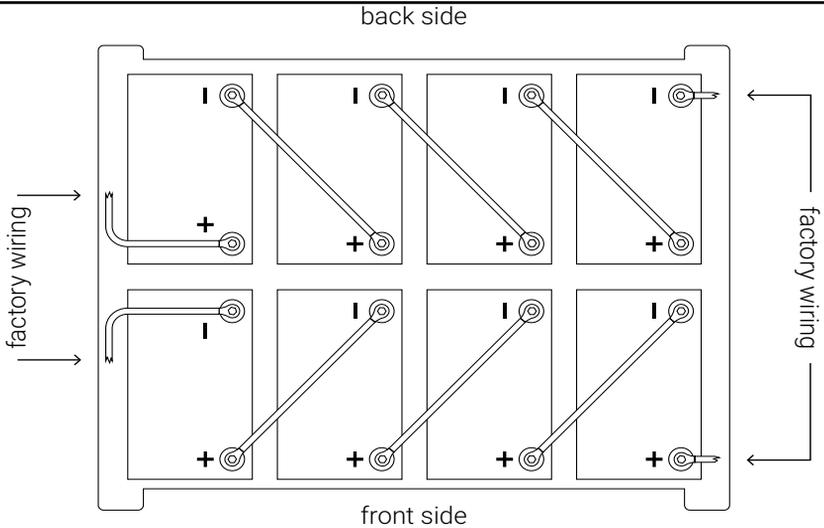
Prepare the first string of batteries

1. Slide a terminal cap over the ring terminal of each cabinet-integrated battery lead. Slide the cap back so that the terminal is accessible.
2. Place a battery tray on the bottom shelf in the rear position. It should nest between the joists.
3. Place a battery in each end pocket, then fill in the center.
4. The batteries should be oriented with their negative terminals toward the back of the cabinet.
5. Scrub each battery terminal with a wire brush to remove corrosion, and swab with battery terminal protectant.

Pro Tip: Use good practices, including appropriate PPE and good workspace ventilation, to avoid lead exposure. Always wash your hands after handling lead acid batteries and before eating, drinking, or smoking.

Connect the first string

The layout of batteries and their attachment scheme is the same for each level and is depicted below. Make careful note of the orientation of the batteries and the direction of the jumpers.



Configure and wire each level of batteries in this manner



CAUTION: Always make sure the ring terminal is in direct contact with the battery terminal. Never put a washer, nut, or other hardware between the ring terminal and the battery terminal. This may cause a high-resistance connection.

1. Fasten the ring terminal of the brown battery lead to the negative terminal of the far right hand battery using the fasteners supplied with the batteries.
 - i. Apply battery terminal protectant to the fasteners before installation.
 - ii. Torque fastener to 8.5 N-m (75 in-lbs).
2. Slide the rubber terminal cap over the ring terminal to completely cover all conductive parts.
3. Install the blue lead to the positive terminal of the far left hand battery in the same way.
4. Slip a rubber terminal cap onto each end of each short battery jumper. Install the jumpers to string the batteries in series. Pull the caps over the terminals once the fastener is torqued.



WARNING: Follow the wiring diagram and instructions exactly. Miswiring can cause a dangerous short circuit. A SHORT-CIRCUIT ON THE BATTERY STACK MAY CAUSE A DANGEROUS ARC OR FIRE.

Install second string of batteries

1. Place a new battery tray in the front section of the bottom shelf and fill it with batteries.
2. Place batteries on the ends, then fill in the middle.
3. As with the back string, the negative terminals should be towards the back of the cabinet.
4. Clean and prepare the battery terminals in the same way as before.
5. Connect the cabinet-integrated leads to each end.
 - i. The left hand lead connects to the negative terminal.
 - ii. The right hand lead connects to the positive terminal.
6. Install the battery jumpers to form the string.
 - i. Remember to use the rubber terminal caps! Pre-install one on the end of each jumper, then pull them over the terminal when the fastener is torqued.
7. The front stringing pattern should be a mirror image of the back row.
 - i. Match the diagram exactly.

Pro Tip: As you build up the rows of batteries, it will be increasingly hard to retrieve dropped fasteners from the bottom of the cabinet. We provide some extras just in case, but work methodically to avoid losing too many.

Install the joists for the second level

1. Install the four (4) joists for the second tier using 8 each of the 1/4"-20 KEP nuts provided.
2. Thread the nuts onto the studs, but do not tighten.
3. Square the unit by measuring the width of the back of the unit and adjusting the front of the unit to match.
4. Hold the side panels in place to maintain square and tighten the fasteners to 6.8 N-m (60 in lbs).

Install the rest of the strings

1. The middle and top shelves of batteries are installed in exactly the same way as the bottom shelf, with the exception of the battery temperature sensor.
2. One of the short battery jumpers has a temperature sensor attached. It comes attached to the inside wall of the cabinet. Install this special jumper on the second shelf, in the front string of batteries. Install it between the two leftmost batteries, with the sensor package closest to the center of the cabinet.
3. Remember to:
 - i. Clean and swab each terminal.
 - ii. Torque each fastener.
 - iii. Install each rubber terminal cap.

Install front bulkhead and wiring tray

1. Reinstall the front bulkhead panel using ten M4x8mm machine screws.
 - i. Start all screws in their holes, then torque to 1.7 N-m (15 in-lbs).
2. Install the wiring tray.
 - i. Gather all the loose ends of the pre-installed leads (including the temperature sensor leads) out of the cabinet and drape them out of the way. You may choose to use tape or spring clamps to keep them in place.
 - ii. Holding the wiring tray by its front and back flanges, lower the tray into the cabinet.
 - iii. Insert the six threaded studs on the front and back bulkheads into the matching holes in the bottom of the tray. Install a KEP nut onto each stud but do not tighten yet.
 - iv. The walls of the wiring tray attach to the side panels using eight M4x8mm screws. Start all eight screws, then torque to 1.7 N-m (15 in-lbs).
 - v. Tighten the six KEP nuts and torque to 1.7 N-m (15 in-lbs).

Install REbus field wiring

1. Install all conduit fittings and pull wire.
2. Install REbus wiring.



WARNING: Put the Islanding Inverter into a Safety Shutdown before installing any wiring. Ensure the voltage has dropped to a safe level before touching terminals.

- i. Connect the RE+ and RE- wiring to the corresponding terminal blocks.
- ii. Strip wires and torque the terminal blocks according to the table below.

Specification	Min	Max	Units
Allowable wire size	20	6	AWG
Torque	13.3 (1.5)	15.9 (1.8)	lb-in (N-m)
Strip length	3/8 (10)		in (mm)

3. Install the equipment grounding conductor to the lug marked with the inverted tree grounding symbol.
4. At the Islanding Inverter, install the RE+ and RE- conductors to the RE+ and RE- terminals in the Islanding Inverter wiring compartment.



The wiring tray ground lug must be bonded to the Islanding Inverter ground bar for proper REbus communication.

Connect battery temperature sensor

1. The leads from the battery temperature sensor (BTS) feed up from the cabinet along with the battery leads.
2. Connect the BTS leads to the mating BTS pigtail coming from the electronics package.

Connect substrings



WARNING: Once the substrings are connected, high voltage will be present at the terminals of the fuse holders. Use insulated tools and do not touch any of the terminals or disconnect the fuses after this point in the assembly process.

1. Pull the ends of the colored battery lead wires back into the wiring tray.
2. Connect the 3 pairs of color-coded wiring on the left side of the unit.
 - i. Yellow to yellow, blue to blue, green to green.
3. Connect the 2 pairs of color-coded wiring on the right side.
 - i. Orange to orange, purple to purple.
4. Connect the red and black string leads to the matching red and black wires attached to the fuse holders.
 - i. Red to red, black to black.
5. Connect the small red quick connect to the blackstart battery positive red terminal.
 - i. This ships from the factory unplugged to prevent battery discharge.

Check voltages



WARNING: Shock risk. Use appropriately rated tools to measure voltage.

WARNING: Do not short the battery leads or terminals.

1. Measure the voltage at the terminals of the fuse holders.
 - i. Ensure that the battery wiring voltage polarity is correct with reference to "Wiring tray wiring diagram" on page 12.
 - ii. The battery string voltage should read between 240Vdc-320Vdc.

Install top covers

1. Install the rear cover first using four M4x10 screws.
 - i. Start the screws in their holes, but do not tighten.
2. Install the front cover.
 - i. Tilt the cover to 60 degrees and slide toward the rear cover to engage the interlocking features of the covers.
 - ii. Once engaged, lower the front cover to horizontal.
 - iii. Insert an M4 x 10 screw in each hole.
3. Align the covers neatly and tighten all fasteners to 1.7 N-m (15 in-lbs).

Section 4: Commissioning

Before commissioning Coral, ensure that all field wiring is correct and that the top covers have been secured.

Pro tip: Refer to the Pika Islanding Inverter Operation Manual for complete information on enabling the inverter and using the display and keypad, as well as information on the different Operational Modes and their uses. Note that the system must be in one of the Storage Interactive operational modes before the battery will operate.

Commissioning Coral consists of three steps:

1. Power on the Islanding Inverter.
2. Select the correct Operational Mode for the system and enable the inverter.
 - i. From the home screen, press the center button to bring up the list of available Operational Modes.
 - ii. Use the keypad to select and confirm the desired mode.
3. Power on and enable Coral.
 - i. Turn on the REbus breaker for Coral.
 - ii. Toggle the switch on Coral's front panel to the "ON" position.
 - iii. Press the right arrow key on the inverter keypad until you see the B301c device page.
 - iv. Press the center button, select "Enable", and confirm.

The battery will immediately begin charging or discharging depending on its state of charge, the availability of energy on the bus, and the selected Operational Mode.

Section 5: System Operation

Front Panel LED

Coral features a front panel LED. The state of the LED indicates Coral's status as given in the following table.

LED Color	State Description	Solid/Blinking
Green	Enabled, Charging	Solid
Green	Enabled, Discharging	Slow pulse
Green	Initializing, Enabled	Blinking
Yellow	Waiting	Solid
Yellow	Disabled	Blinking
Red	Error State	Blinking

Section 6: Operating Modes, Charging Parameters, and Setpoints

Coral's internal control electronics come pre-programmed for the safe and effective charge and discharge of the battery string. It is not necessary to set or change any charging parameters, voltages, or setpoints.

The Pika Energy Island supports multiple Storage Interactive system modes. For complete information on the different system modes and how to select them, consult the Islanding Inverter Operation Manual.

Section 7: Powering the Nanogrid Without Utility Power

Power Search Mode

If other sources of power to the REbus Nanogrid are deprioritized or fail, the Coral battery will maintain REbus voltage by sourcing power as necessary. This will continue until the battery State of Charge (SoC) reaches a minimum reserve setpoint at which point Coral will enter Power Search Mode. In this mode, the Coral battery spends most of its time in a very low power sleep state. Every 15 minutes, Coral will wake up, bring up the REbus Nanogrid and check for potential sources of power (e.g. PV Link). After 30 seconds, if no source of charging power comes online, the Coral will return to deep sleep to conserve power. Once Coral depletes its reserve of power, it will not energize the REbus Nanogrid. Another source of power is necessary to energize REBUS.

To prevent Coral from entering Power Search Mode, initiate a Safety Shutdown using the inverter controls, or toggle the switch on the front cover of Coral to the "Off" position.

Blackstart

Under normal operation, with Coral enabled and the Islanding Inverter interacting with the utility grid, Coral will source and sink power to the REbus nanogrid as defined by the Operational Mode. Upon loss of utility power, Coral will immediately begin providing backup power to the REbus Nanogrid.

However, if Coral is disabled or the front panel switch is "Off" at the time at the utility grid loses power, then the REbus nanogrid will de-energize and all REbus devices will power down. In this state, no REbus devices can source or sink power and the Islanding Inverter cannot provide backup power to the AC Critical Loads until the user manually performs a Blackstart.

To Blackstart, turn the switch to the ON position. If Coral was enabled at the time that the system was powered down and the battery has sufficient charge, the front panel LED will flash green. After initialization is complete, then Coral will automatically energize REbus and begin supporting REbus and AC loads, and charging from other sources if available (such as PV Link).

If the front panel LED flashes yellow, this means Coral was disabled at the time that the REbus Nanogrid was powered down. Without another source of REbus power (such as the power grid

or another REbus smart battery), an unlock sequence is necessary to enable Coral. Coral cannot energize the REbus nanogrid until it is enabled using this sequence.

To manually enable the Coral battery when REbus is de-energized:

1. Turn the power switch to ON.
2. If the unit is disabled, the front LED will flash yellow for 3 seconds.
3. While the LED is still flashing, turn the switch to the OFF position.
4. Repeat steps 1-3 three times.
5. On the fourth power up the front panel LED will flash green to indicate that the battery is enabled. If sufficient battery charge is available, the REbus Nanogrid will energize and Coral will begin operating normally.

To avoid the need for a Blackstart, always keep Coral enabled, connected to REbus, and with the front power switch in the "On" position.

Section 8: Warranty

This Pika Energy, Inc. Limited Warranty covers defects in workmanship and materials of the below-listed products (each a “Product” and collectively the “Products”) for the applicable warranty period set out below:

- i. S2501 PV Link substring optimizer
- ii. X7601/X7602/X11402 Islanding Inverter
- iii. SB14A Coral Smart Battery (batteries not included)
- iv. SB10P Harbor Smart Battery (batteries not included)
- v. SB15P Harbor Smart Battery (batteries not included)

Intended (normal) Use

Your Product is strictly constructed according to approved safety requirements. Improper use may lead to lethal hazards for operators and/or damage to Product and property. Your Product is certified to comply with appropriate UL standards, and includes important safety features. Your Product must be used strictly in accordance with the Product-specific installation and operation manuals (each such use an “Intended Use”). Improper use or modification of the Product may result in serious property damage, personal injury or death.

Any use other than the specified intended use shall be deemed improper use, and may result in property damage, personal injury or death. Pika is not liable for damage or injuries caused by improper use. Damage caused by improper use is at the sole risk of the operator.

A licensed electrician or other similarly qualified person must obtain all necessary permits and agreements from the system owner’s local government and utility company for a legal and code-compliant installation of Pika Energy systems.

REBUS™ INPUT ONLY!

SB14A is designed to accept regulated direct current (DC) from REbus compatible devices (e.g. Pika PV Link S2501, REbus-compatible wind turbines) into grid-compatible alternating current (AC). DO NOT CONNECT PHOTOVOLTAIC MODULES DIRECTLY TO THE REBUS™ INPUTS OF THE SB14A INVERTER. DOING SO WILL VOID THE WARRANTY AND MAY DAMAGE THE INVERTER.

Any use other than the specified intended use shall not be deemed intended or normal use, and

may result in property damage, personal injury or death. Pika is not liable for damage or injuries caused by unintended use. Damage caused by unintended use is at the sole risk of the operator. "Intended use" shall also include adherence to the operating and installation instructions.

A trained and authorized installer must obtain all necessary permits and agreements from the system owner's local government and utility company for a legal and code-compliant installation of Pika Energy systems.

Pika Energy Factory Limited Warranty

1. **What Does this Limited Warranty Cover?** Pika Energy warrants that, during the applicable Warranty Period (defined below), the Product will be free from material defects in design, workmanship and materials, provided that Product is installed and operated according to the Product Installation Manual and is used in the normal course for the purpose for which it is intended (the "Limited Warranty").
2. **How Long Does this Limited Warranty Last?**
 - i. **S2501 PV Link sub-string optimizer:** The "Warranty Period" for the Pika Energy S2501 PV Link sub-string optimizer is twenty-five (25) years. The Limited Warranty commences on the earlier of either a) the date of Product installation or b) three [3] months after Pika Energy ships the Product.
 - ii. **X7601/X7602/X11402 Islanding Inverter:** The Warranty Period for the Pika Energy Islanding Inverter is ten (10) years. The Limited Warranty commences on the earlier of either a) the date of Product installation or b) three [3] months after Pika Energy ships the Product. The Warranty Period may be extended for the X7601/X7602/X11402 Islanding Inverter by purchasing extended warranty protection pursuant to Pika Energy's then-current terms. *Warranty extension for the X7601/X7602/X11402 Islanding Inverter must be purchased before or on the day of system commissioning.*
3. **To Whom Does This Limited Warranty Apply?** This Limited Warranty applies to the buyer of the Product who has purchased from an authorized seller for use in accordance with the Intended Use ("Buyer"). All warranties, including the Limited Warranty, are void with respect to any Pika Energy Product purchased from an unauthorized seller. The Limited Warranty may be transferred from Buyer to any bona fide assignee or subsequent purchaser from Buyer, and will remain in effect for the time period remaining under the warranty, provided that the Product are not transferred outside its original country of installation. Any re-installation must be done in accordance with Product-specific installation and operations manual.

- 4. What Remedies Does Pika Energy Provide?** In the event that the Product does not conform to the Limited Warranty during the Warranty Period, Pika Energy will, as its sole and exclusive obligation and your sole and exclusive remedy:
- i. repair or replace, in Pika Energy's sole discretion, defective components or assemblies; and (ii) pay two-way standard shipping charges for defective components or assemblies via freight carrier and method selected by Pika Energy, provided that the shipping origination and destination sites are located within the contiguous United States. This Limited Warranty does not cover any other costs, including costs related to Buyer's employees and contractors for repair or replacement activities. If Pika Energy elects to repair or replace any defective Product, Pika Energy will, at its option, use new and/or reconditioned parts in repairing or replacing the defective Product. Pika Energy reserves the right to use parts or products of original or improved design in the repair or replacement of defective Products. If Pika Energy repairs or replaces a defective Product, the Limited Warranty will continue with respect to the repaired or replacement product for the remainder of the original Warranty Period or ninety (90) days from the date of Pika Energy's return shipment of the repaired or replacement product, whichever is later.
- 5. What is Excluded from this Limited Warranty?** The Limited Warranty does not cover, and Pika Energy will not be responsible for, any of the following:
- i. Shipping damage or damage caused by mishandling by the freight carrier and any such damage is the responsibility of the freight carrier;
 - ii. Equipment, materials, supplies or components which are separate from the Products, whether or not supplied by Pika Energy, such as batteries, battery modules, battery management systems, cables, fuses, wires and connectors. Some components may carry their own manufacturer warranty;
 - iii. Pika Energy equipment that has been installed or operated not in strict conformance with the Pika Energy Installation and Operating Manuals, including not ensuring sufficient ventilation for the Product;
 - iv. Pika Energy equipment that has been installed in combination with equipment, items or materials not permitted by the Pika Energy Installation and Operating Manuals or in violation of local codes and standards;
 - v. Pika Energy online performance monitoring dashboard;
 - vi. Pika Energy equipment that has been modified without prior factory approval;
 - vii. Repairs or shipments performed prior to obtaining Pika Energy Return Material Authorization ("RMA").
 - viii. Damage resulting from use of equipment not supplied by Pika Energy;

- ix. Damage due to abuse, misuse or negligence of the installer or end user;
 - x. Force majeure (including overvoltage, lightning, storm, re, action of third parties), or other events beyond Pika Energy's reasonable control or not arising from normal operating conditions. Damages due to improper installation, including but not limited to lack of proper grounding; or
 - xi. Incidental or consequential damages.
 - xii. This Limited Warranty does not cover superficial or cosmetic defects, including marks, scratches, or dents, which do not influence the proper functioning of the Product.
6. **How Does State Law Apply?** This Limited Warranty gives you specific legal rights. You may have additional rights that vary from state to state.
7. **How Does a Customer Obtain Warranty Service?** To obtain repair or replacement service, credit or refund (as applicable) under this Limited Warranty, the customer must comply with the Return Merchandise Authorization Number (RMA) policy and procedure, as outlined in the Operation Manual. To obtain warranty service, contact Pika Energy. Send email to service@pika-energy.com or call 207-887-9105. Additional instructions on the RMA process are set forth in Product Installation and Operating Manuals.
8. **Disclaimer and Limitation of Warranties and Liability. THE LIMITED WARRANTY IS PIKA ENERGY'S SOLE AND EXCLUSIVE WARRANTY AND EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT AND TO THE FULLEST EXTENT PERMITTED BY LAW, PIKA ENERGY MAKES NO WARRANTY, REPRESENTATION OR COVENANT, EXPRESS OR IMPLIED, AS TO ANY MATTER WHATSOEVER, INCLUDING, WITHOUT LIMITATION, THE PRODUCTS, AND THE DESIGN OR CONDITION OF ANY PRODUCT. TO THE FULLEST EXTENT PERMITTED BY LAW, PIKA ENERGY SPECIFICALLY DISCLAIMS, WITHOUT LIMITATION, ANY STATUTORY WARRANTIES, EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NONINFRINGEMENT. PIKA ENERGY NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER OBLIGATIONS OR LIABILITIES IN CONNECTION THE PRODUCTS.**

Because performance varies by season and location, Pika Energy does not guarantee a specific level of productivity. Pika Energy does not warrant or represent that the Product does not infringe any intellectual property rights of third parties. No employee, agent, dealer, or other person is authorized to offer warranties on behalf of Pika Energy. Pika Energy reserves the right to make design changes, improvements and additions to its products without obligation to install such in products previously manufactured.

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Warranty Effective 2016-03-18

Section 9: Troubleshooting

Smart battery not recognized by inverter

Check that inverter is enabled and REbus is operating. Make sure that the correct DC breaker is on and that all connections are secure. Measure voltage at the REbus terminals; there should be at least 360V between RE+ and RE-.

Battery remains in state "Waiting"

Check that the Islanding Inverter is in a Storage Interactive mode. If the system is in Grid Connect mode or any other non-Storage Interactive mode, the inverter will not allow the battery to become fully enabled.

Smart battery does not source or sink power to bus

Check the battery main fuses.

To check the fuses, follow these steps:

1. Disable smart battery from inverter console.
2. Shut off DC breaker to battery.
3. Toggle power switch on front of battery to off position.
4. Remove top covers from Coral.
5. Measure voltage at input terminals and output terminals of fuse block. If the voltage is different between the input and output terminals, one or more fuses has blown.
6. Replace fuses if necessary. Information on replacement fuses may be found in the Technical Reference section, below.

Section 10: Maintenance

Once per year, inspect the unit and its surroundings. Do not allow leaves, dust, snow, or other debris to accumulate near or under Coral. Ensure that the bottom, back, and front vents are clear at all times. Do not stack anything on top of the unit, store anything under it or beside/behind it in a way that violates the clearances defined in this manual.

Every five years, a qualified technician should inspect the unit internally and check the batteries for visible corrosion.

End of Life

In most cases, after the battery bank reaches the end of its life, Coral may be restocked with fresh batteries.

Once Coral reaches the end of its useful life, most parts may be recycled. The aluminum enclosure and internal copper wiring may be recycled or sold for scrap. The wiring tray containing the electronics may be disposed of as e-waste.

Lead acid batteries are recyclable and may have considerable value. Refer to the battery manufacturer's documentation for more information on disposing of lead acid batteries, or contact your local battery distributor.

Section 11: Technical Reference

Replaceable fuses are as follows:

Fuse	Manufacturer/Part number	Ratings
Main battery fuses	Ferraz A60Q40-2	40A, 600V
String protect fuse	Ferraz A60Q40-2	40A, 600V
Black Start battery Fuse	TBD	TDB

Technical Support Information

Support department hours: 9AM to 5PM Eastern Standard Time Zone, Monday – Friday
(excluding holidays)

Phone: (207) 887-9105

Email: support@pika-energy.com

Section 12: Product Specifications

Specification	SB14A	Unit
Max Power	±8000	W
Max REbus™ Current	±24	A
Power Converter Efficiency (max)	99%	-
Max Battery Voltage	±180	V
Range of Battery Voltage	±100 to ±180	V
Max Continuous Battery Current	±30	A
Short Circuit Battery Current	40	A
Max REbus™ Voltage	±210	VDC
Standby Power Consumption (max)	3	W
Sleep Power Consumption	<1	W
Communications	REbus (Power Line Carrier)	-
Remote Monitoring	Via REview™ Internet Dashboard	-
Protection Features	Over/under voltage, overtemp, over-current, battery temp	-
Weight (unloaded, loaded)	130, 1200	lb
Dimensions (H x W x D)	42 x 28.9 x 22.4	in
Operating Temp. Range (min/max)	-5 to 40	°C
Pika Equipment Limited Warranty	10	years
Battery Pack Specification		
Compatible Battery Type and Voltage	24 @ Deep cycle AGM, sealed, 12V, Group 22, 50-55Ah	-
Battery String Voltage (nominal)	288	VDC
Maximum String Current	±30	A



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