Installation and Owner's Manual

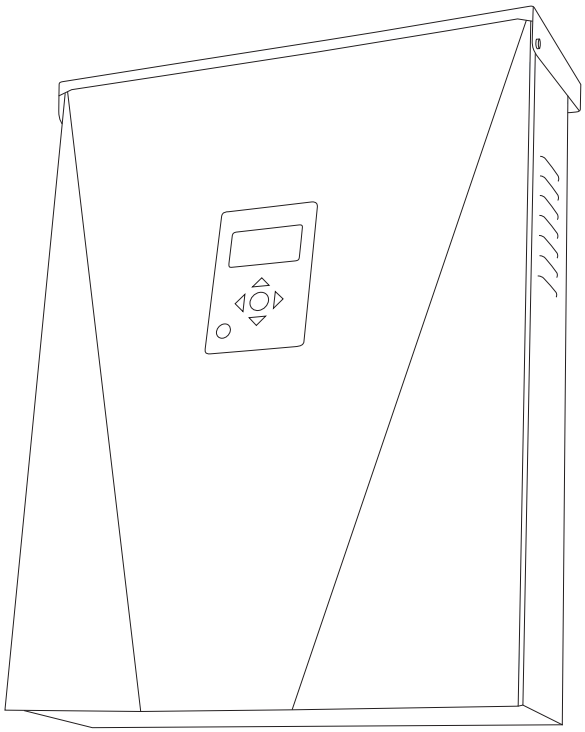
Generac PWRcell® Inverters

XVT076A03

XVT114G03

X7602

X11402



009954

⚠WARNING

Loss of life. This product is not intended to be used in a critical life support application. Failure to adhere to this warning could result in death or serious injury. (000209b)

Register your Generac product at:

https://pwrfleet.generac.com

1-888-GENERAC
(888-436-3722)

Para español, visita: http://www.generac.com/service-support/product-support-lookup

Pour le français, visiter: http://www.generac.com/service-support/product-support-lookup

SAVE THIS MANUAL FOR FUTURE REFERENCE

Use this page to record important information about your Generac Product

Record the information found on your unit data label on this page. See ***Serial Number Location***.

When contacting an Independent Authorized Service Dealer (IASD) or Generac Customer Service, always supply the complete model number and serial number of the unit.

Table 1: PWRcell Inverter Important Information

Unit Model Number	
Unit Serial Number	
Date Purchased	
Commissioning Date	

⚠WARNING

CANCER AND REPRODUCTIVE HARM

www.P65Warnings.ca.gov.

(000393a)

Section 1: Safety Rules & General Information

Section 2: General Information

Section 3: Location and Compliance

Section 4: Installing PWRcell Inverter

Section 5: Electrical Connections

Section 6: Commissioning

Section 1: Safety Rules & General Information

Introduction

Thank you for purchasing a Generac PWRcell® product. The Generac PWRcell Inverter is a storage-ready inverter that connects to the PV Link™ optimizers and PWRcell Batteries to form the Generac PWRcell system.

This manual provides instructions for installing the PWRcell Inverter, including mounting, wiring, and battery integration information.

The information in this manual is accurate based on products produced at the time of publication. The manufacturer reserves the right to make technical updates, corrections, and product revisions at any time without notice.

Read This Manual Thoroughly

⚠WARNING

Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury. (000100a)

If any section of this manual is not understood, contact the nearest Independent Authorized Service Dealer (IASD) or Generac Customer Service at 1-888-436-3722 (1-888-GENERAC), or visit ***www.generac.com*** for assistance. The owner is responsible for correct maintenance and safe use of the unit.

This manual must be used in conjunction with all other supporting product documentation supplied with the product.

SAVE THESE INSTRUCTIONS for future reference. This manual contains important instructions that must be followed during placement, operation, and maintenance of the unit and its components. Always supply this manual to any individual that will use this unit, and instruct them on how to correctly start, operate, and stop the unit in case of emergency.

Safety Rules

The manufacturer cannot anticipate every possible circumstance that might involve a hazard. The alerts in this manual, and on tags and decals affixed to the unit, are not all inclusive. If using a procedure, work method, or operating technique that the manufacturer does not specifically recommend, verify that it is safe for others and does not render the equipment unsafe.

Throughout this publication, and on tags and decals affixed to the unit, DANGER, WARNING, CAUTION, and NOTE blocks are used to alert personnel to special instructions about a particular operation that may be hazardous if performed incorrectly or carelessly. Observe them carefully. Alert definitions are as follows:

⚠DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

(000001)

⚠WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

(000002)

⚠CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

(000003)

NOTE: Notes contain additional information important to a procedure and will be found within the regular text of this manual.

These safety alerts cannot eliminate the hazards that they indicate. Common sense and strict compliance with the special instructions while performing the action or service are essential to preventing accidents.

How to Obtain Service

For assistance, contact the nearest Independent Authorized Service Dealer (IASD) or Generac Customer Service at 1-888-436-3722 (1-888-GENERAC), or visit ***www.generac.com***.

When contacting an IASD or Generac Customer Service, always supply the complete model and serial number of the unit as given on its data decal located on the unit. Record the model and serial numbers in the spaces provided on the front cover of this manual.

General Hazards

⚠DANGER

Electrocution. Do not wear jewelry while working on this equipment. Doing so will result in death or serious injury.

(000188)

⚠DANGER

Automatic start-up. Disconnect utility power and render unit inoperable before working on unit. Failure to do so will result in death or serious injury.

(000191)

⚠WARNING

Electrocution. Potentially lethal voltages are generated by this equipment. Render the equipment safe before attempting repairs or maintenance. Failure to do so could result in death or serious injury.

(000187)

⚠WARNING

Risk of injury. Do not operate or service this machine if not fully alert. Fatigue can impair the ability to operate or service this equipment and could result in death or serious injury.

(000215a)

⚠WARNING

Loss of life. This product is not intended to be used in a critical life support application. Failure to adhere to this warning could result in death or serious injury.

(000209b)

⚠WARNING

Equipment damage. Connecting inverter to electric utility grid must only be done after receiving prior approval from utility company. Failure to do so could result in equipment or property damage.

(000640)

⚠WARNING

Electric shock. Only a trained and licensed electrician should perform wiring and connections to unit. Failure to follow proper installation requirements could result in death, serious injury, and equipment or property damage.

(000155a)

⚠WARNING

Equipment damage. Only qualified service personnel may install, operate, and maintain this equipment. Failure to follow proper installation requirements could result in death, serious injury, and equipment or property damage.

(000182a)

⚠CAUTION

Equipment damage. Connect only to REbus-compatible devices to the DC bus. Never connect to any other DC power source. Connecting to other DC power sources could result in equipment damage.

(000598a)

- Connecting the PWRcell Inverter to the electric utility grid must only be done after receiving prior approval from the utility company.
- If this installation is in Canada, the installation shall be in accordance with the Canadian Electrical Code, Part I.
- Only competent, qualified personnel should install, operate, and service this equipment. Strictly comply to local, state, and national electrical and building codes. When using this equipment, comply with regulations established by the National Electrical Code (NEC), CSA Standard, and the Occupational Safety and Health Administration (OSHA), or the local agency for workplace health and safety.
- Protection against lightning surges in accordance with local electric codes is the responsibility of the installer.

NOTE: Lightning damage is not covered by warranty.

- Never work on this equipment while physically or mentally fatigued.
- Any voltage measurements should be performed with a meter that meets UL3111 safety standards, and meets or exceeds overvoltage class CAT III.

WARNING - This photovoltaic rapid shutdown equipment (PVRSE) does not perform all of the functions of a complete photovoltaic rapid shutdown system (PVRSS). This PVRSE must be installed with other equipment to form a complete PVRSS that meets the requirements of NEC (NFPA 70) section 690.12 for controlled conductors outside the array. Other equipment installed in or on this photovoltaic (PV) system may adversely affect the operation of the PVRSS. It is the responsibility of the installer to ensure that the completed PV system meets the rapid shutdown functional requirements. This equipment must be installed according to the manufacturer's installation instructions.

Follow all instructions included in this manual and use appropriate practices for all product wiring and installation.

Electrical Hazards

⚠DANGER

Electrocution. Water contact with a power source, if not avoided, will result in death or serious injury.

(000104)

⚠DANGER

Electrocution. PWRcell Battery front cover should be removed by a qualified technician only. Removing the front cover could result in death, serious injury, equipment or property damage.

(000604)

⚠DANGER

Electrocution. In the event of electrical accident, immediately shut power OFF. Use non-conductive implements to free victim from live conductor. Apply first aid and get medical help. Failure to do so will result in death or serious injury. (000145)

⚠DANGER

Electrocution. Turn battery disconnect OFF and de-energize REbus before touching terminals. Failure to do so will result in death, serious injury, equipment and property damage.

(000599)

⚠DANGER

Electrocution. Verify electrical system is properly grounded before applying power. Failure to do so will result in death or serious injury.

(000152)

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Section 2: General Information

Specifications

Description	Units	XVT076A03 X7602	XVT114G03 X11402
Max. cont. grid-tied AC power @ 122°F (50ºC)	kW	7.6	11.4
Max. cont. AC power in island mode without an external transfer switch[1]	kW	7.6	7.6*
Max. cont. AC power in island mode w/ external transfer switch and single 6 module battery cabinet[2]	kW	9.0	--
Max. cont. AC power in island mode w/ external transfer switch and 2 battery cabinets (8 modules minimum)[2]	kW	11.0	--
Peak motor starting current (2 sec)	A rms	50	
Normal output frequency AC	Hz	60	
Grid Voltage Line to Neutral (L-N)	VAC	120	
Grid Voltage Line to Line (L-L)	VAC	240	208
Peak efficiency	%	97.3	97.7
Optimal split phase imbalance for max. system performance	%	≤ 30	
Maximum Current Unbalance	%	--	0.14
CEC weighted efficiency	%	96.5	97.5
AC terminals wire size	AWG	14 to 6	
DC terminals wire size	AWG	18 to 6	
STOP terminals wire size	AWG	30 to 14	
Weight	lb (kg)	70.9 (32.1)	
Thermal management	–	forced convection	
Weatherization rating	–	NEMA Type 3R	
Enclosure Material	–	powder-coated steel	

Description	Units	Min	Nominal	Max
REbus voltage	V dc	360	380	420
REbus current	A dc			30†
REbus input short circuit current[3]	A dc			30
Max input circuit backfeed current (fault condition)	A dc			0
Output power factor rating AC (25%, 50%, 100% of rated power)	-	0.96	0.98	0.99
Operating voltage range AC, XVT076A03 / X7602 (L-N)	V rms	106	120	132
Operating voltage range AC, XVT076A03 / X7602 (L-L)	V rms	212	240	264
Operating voltage range AC, XVT114G03 / X11402 (L-N)	V rms	106	120	132
Operating output voltage range AC, XVT114G03 / X11402 (L-L)	V rms	184	208	228
Continuous output current AC grid-tied	A rms			32
Output controlled current grid-tied	A rms	0		32
Continuous output current AC islanded[1]	A rms			45
Synchronization Inrush Current	A rms/p-p			32.1 / 94.83
Output fault current duration	A / ms		50 / 2,000	
Protected Loads output overcurrent protection	A			50
Full Power operating ambient temperature range[4]	°F (°C)	-4 (-20)		+122 (+50)
Utility interconnection voltage and frequency trip limits and trip times	See ***Voltage and Frequency Trip Thresholds*** for more information.			
Trip voltage and frequency limits				
Trip voltage accuracy				
Trip time accuracy	%	2% +/- 2 cycles		

[1] In Island Mode, continuous current output is restricted to 32 A unless backup power is routed through an external transfer switch.

[2] Peak performance, values provided for 104º F (40º C)

[3] Rating for one DC input. Four total.

[4] Includes ambient temperature rising from inverter operation.

** In Island Mode, XVT114G03/X11402 produces 2 phases of 120 VAC L-N and 208 VAC (L-L) which results in lower power than when operating grid-tied.*

†Inverter limits its REbus current to adhere to its AC power rating. **Total REbus current capability from multiple REbus sources may safely exceed this value as the inverter safely limits the amount utilized.**

Serial Number Location

Refer to ***Figure 2-2*** to locate unit serial number (D). Record the information from this tag in ***Table 1: PWRcell Inverter Important Information*** on the inside front cover of this manual.

Unit Dimensions

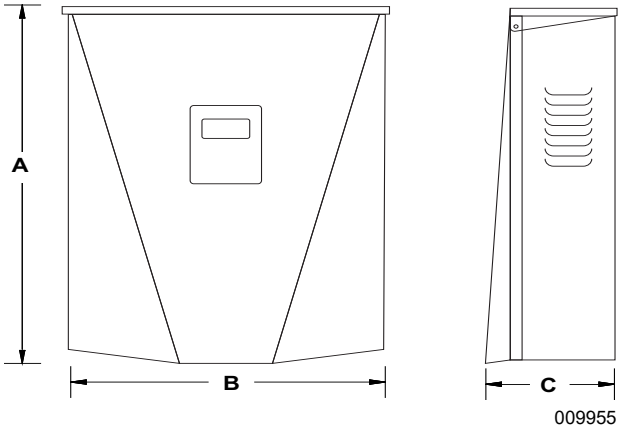

Figure 2-1. Unit Dimension

A 24-3/4 in (628 mm)
B 19-3/8 in (491 mm)
C 8-3/8 in (214 mm)

Component Locations

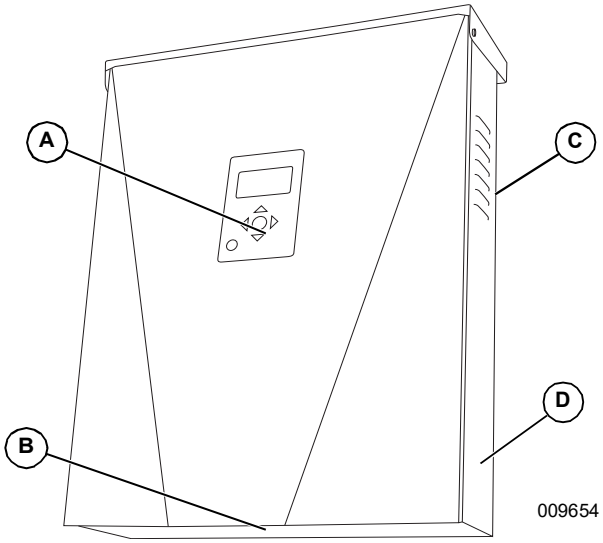

Figure 2-2. Component Locations

A Control Panel
B Intake Filter
C Exhaust Vent
D Serial Number Tag

About PWRcell Inverters

The PWRcell Inverter connects PV Link™ optimizers and PWRcell Batteries to form the PWRcell system for grid-interactive solar-plus-storage. Upon the loss of utility grid power, PWRcell Inverters disconnect from the grid and provide AC power to support protected loads when configured to do so. This capability is referred to as islanding. For more information, see ***Island Mode*** in ***Section 6:Commissioning***.

PWRcell Inverters use the REbus™ 380 VDC nanogrid to connect DC-coupled PWRcell devices. The REbus nanogrid automates the flow of power to enable plug-and-play setup and operation of PWRcell equipment. For more information about REbus, visit ***www.generac.com***. In ***Figure 2-3*** PWRcell Inverter (E) is directly connected to PV Link optimizers (B) and PWRcell Battery (C) on DC (REbus) lines (D). To the right of the inverter are AC lines: 120/240 VAC or 208 VAC for grid and home loads (G) and protected loads (H).

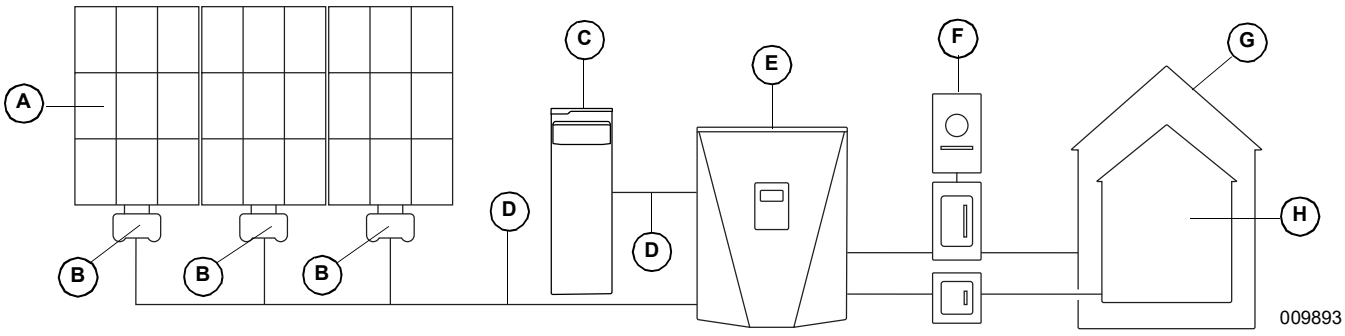

Figure 2-3. Generac PWRcell System Example

A Solar Panels
B PV Link
C PWRcell Battery
D REbus
E PWRcell Inverter
F Grid
G Loads
H Protected Loads

Inverter Control Panel

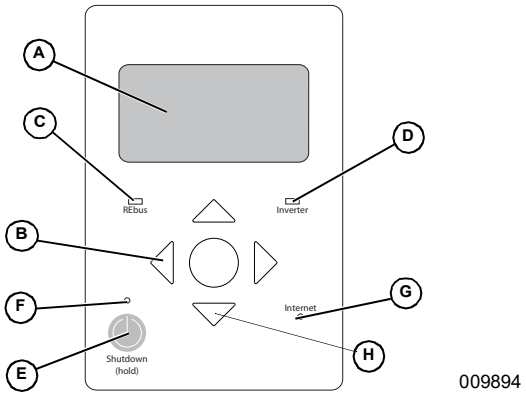

Figure 2-4. Inverter Control Panel

A LCD Display
B Navigation Keys
C REbus Status LED
D Inverter LED
E Shutdown Button
F Shutdown LED
G Internet LED
H Select

See ***Figure 2-4***. The PWRcell system is controlled through the PWRcell Inverter control panel. The inverter control panel is used for adjusting system settings and for interacting with devices.

REbus Status LED

REbus Status LED (C) communicates REbus nanogrid status through LED color.

LED Color	REbus Status
Green	All devices are enabled and functioning normally on REbus.
Yellow	One or more devices are disabled, or no devices are detected.
Red	A serious fault has been detected on a device or the REbus wiring.

Inverter Status LED

Inverter LED (D) communicates the status of the utility grid and / or inverter through LED color and state.

LED Color	Inverter Status
Green	Utility is connected and within normal operational voltage and frequency.
Green Blinking	Inverter is in Island Mode due to a utility service interruption. Utility is not within normal operational voltage and frequency.
Yellow	Inverter is disabled or powering up.
Yellow Blinking	Inverter is waiting to connect to the grid, in the process of connecting to REbus, or waiting to connect to REbus.
Red	Inverter is overloaded, or a serious fault has been detected on the inverter. Manual intervention is likely required before the equipment will resume operation.
No Light	Inverter is powered down.

Internet Status LED

Internet LED (G) is illuminated when the inverter has a connection to the Generac server. Internet LED (G) will slowly strobe when REbus Beacon is updating its firmware.

LED Color	Internet Status
Blue	Internet connected
Blue Strobing	Internet connected and Beacon firmware auto-update is in progress. **Note:** Do not power off the inverter or unplug REbus Beacon while update is in progress.
No Light	Not internet connected.

Shutdown Mode

⚠DANGER

Electrocution. Initiate a system-wide shutdown and turn the PWRcell DC Disconnect Switch OFF on all connected batteries before performing service. Failure to do so will result in death, serious injury, or equipment and property damage.

(000600)

NOTE: A loss of grid power will not de-energize REbus in a PWRcell system configured to enter Island Mode with enabled energy storage.

Shutdown button (E) activates a transition to shutdown mode.

Disabled PWRcell equipment limits output voltages to a safe level for servicing.

After pressing the Shutdown button and entering Shutdown Mode, the AC section of the inverter will still be powered, unless there is an active utility service interruption, or the AC solar backfeed breaker, AC solar disconnect, building AC disconnect, or main service breaker is shut off.

To enter shutdown, press and hold shutdown button (E).

In shutdown mode:

- The PWRcell Inverter will stop sourcing power to REbus, and immediately disable all communicating power sources on REbus by sending a system-wide system mode change signal.

NOTE: Successful signal transmission relies upon proper configuration of PLM channels across REbus devices (PV Links and Batteries).

- Shutdown LED (F) will illuminate.
- Inverter screen (A) will display REbus DC bus voltage and text indicting Shutdown mode has been initiated.

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Section 3: Location and Compliance

Location

When installing the PWRcell Inverter, consider the following:

- The unit can be installed in indoor or outdoor locations.
- If installing indoors, an external switch must be installed to be the PV rapid shutdown initiator, or additional DC disconnects must be sourced and installed on the PV circuits. See ***Photovoltaic Rapid Shutdown*** for more information.
- If installing outdoors, mount the unit near the utility service entrance to allow the inverter DC disconnects to be the compliant PV rapid shutdown initiators. See ***Photovoltaic Rapid Shutdown*** for more information.
- If using the inverter DC disconnects as the compliant PV rapid shutdown initiator(s), verify the height of the DC disconnects in the inverter do not exceed 6' 7" (2 m) to comply with NEC Article 404.8(A).
- The inverter installation location must meet the working space requirements in NEC Article 110.26.

Compliance

⚠DANGER

Loss of life. Property damage. Installation must always comply with applicable codes, standards, laws and regulations. Failure to do so will result in death or serious injury.

(000190)

⚠WARNING

Electrocution. Refer to local codes and standards for safety equipment required when working with a live electrical system. Failure to use required safety equipment could result in death or serious injury.

(000257)

⚠WARNING

Equipment damage. Only qualified service personnel may install, operate, and maintain this equipment. Failure to follow proper installation requirements could result in death, serious injury, and equipment or property damage.

(000182a)

Note on DC Wiring and the NEC

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

- NEC 690.31 for DC PV circuits in buildings
- NEC 215.12(C)(2) for correct DC wiring identification

Always adhere to applicable codes when marking and installing DC conductors. See ***Table 3-1: REbus DC Wiring Coloring Convention***. Mark or flag all conductors for their polarity as appropriate.

Table 3-1. REbus DC Wiring Coloring Convention

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

- It is recommended that REbus (+) conductors NOT be green, white, gray, blue, or black.
- It is recommended REbus (-) conductors NOT be green, white, gray, or red.

Photovoltaic Rapid Shutdown

The PV Link, SnapRS, and PWRcell Inverter are certified as Photovoltaic Rapid Shutdown Equipment (PVRSE). Review ***Table 3-2: PVRSS Requirements and PWRcell PVRSE*** to determine what PWRcell equipment is required to constitute an effective Photovoltaic Rapid Shutdown System (PVRSS). Refer to ***Generac PV Link & SnapRS Installation manual*** for more information on proper installation of those devices including commissioning instructions.

Table 3-2. PVRSS Requirements and PWRcell PVRSE

NEC Adoption	PVRSS Requirements (NEC 690.12)	Required PWRcell PVRSE*
2011 or older	No PVRSS requirements.	N/A
2014	Controlled conductors leaving array limited to not more than 30 volts within 10 seconds of rapid shutdown initiation.	Generac PV Link(s)
2017, 2020 and follows	Controlled conductors leaving array limited to not more than 30 volts within 30 seconds of rapid shutdown initiation. Controlled conductors located inside the array boundary (or not more than 1 m (3ft) from the point of penetration of the surface of the building) shall be limited to not more than 80 volts within 30 seconds of rapid shutdown initiation.	Generac PV Link(s), Generac SnapRS (one per PV module)

**Depending on approved method used, the PVRSS may include the Generac PWRcell Inverter but the inverter is not required for an effective PVRSS.*

Following PV rapid shutdown initiation, controlled conductors will be brought within the limits defined in NEC 690.12 as described in ***Table 3-2*** above. The controlled conductors include:

- REbus conductors connecting PV Link(s) to the PWRcell Inverter (conductors leaving the array).
- PV conductors between modules in PV Link PV substring (conductors inside the array boundary).

NOTE: AC conductors exiting and entering the inverter are not considered controlled conductors for this application.

NOTE: Depending on the installation conditions (panel type, ambient temperature, etc.), leakage current methods detailed in UL 1703, Section 21 may be used to indicate compliance with the stated limits as permitted by UL 1741, Section 93.1.2.

PVRSS Initiation

There are three approved methods for initiating PV rapid shutdown with PWRcell equipment. Each method effectively disconnects the PV input circuits from the inverter's internal DC bus. This disconnection is detected by the PV Links, which in turn interrupt the PV source circuits. Interruption of the PV source circuits opens SnapRS devices, isolating PV modules within the array. All three methods are considered suitable for installations where the inverter is located outside of a one-family or two-family dwelling. In most situations, only Method 2 (external switch) or Method 3 (installer-sourced DC disconnect) will be appropriate for installations where the Inverter is located inside of a one-family or two-family dwelling (where the external device is located outside of the dwelling near the utility service entrance). Appropriate signage and/or markings in compliance with NEC 690 must be provided by the installer.

Method 1 - PVRSS initiation via PWRcell Inverter DC disconnect(s) (outdoor installations)

1. Open the inverter lid.
2. Locate the PWRcell DC disconnects located to the left of the Generac Power Core.
3. Turn DC disconnects connected to PV sources to the OFF position.

Method 2 - PVRSS initiation via external switch connected to inverter STOP terminals (indoor and outdoor installations)

NOTE: If installation includes a PWRcell Battery, the battery must be equipped with external STOP terminals. Battery STOP terminals must be wired in series or parallel to the inverter STOP terminals. See ***PWRcell Battery Installation & Owner's Manual*** for more details.

1. A UL listed, 12 VDC, 1 A, lockable, weatherproof switch must be connected to the STOP terminals to use this method.

a. The switch must indicate ON and OFF positions, where the OFF position opens the STOP terminal circuit. STOP circuit terminals are normally closed.

2. Turn switch to the OFF position.
3. Upon initiation, the inverter display will read “Shutdown Initiated”.

See ***Section 5: Electrical Connections STOP Terminal Wiring (XVT Models Only)*** for installation instructions.

Method 3 - PVRSS initiation via installer-sourced DC disconnect(s) (indoor and outdoor installations)

1. A UL listed, lockable, weatherproof DC disconnect rated for at least 420 VDC and 30 A must be installed between the PV conductors leaving the junction box and the inverter DC inputs.

a. The switch must indicate ON and OFF positions, where the OFF position opens the PV circuit.

2. Turn DC disconnects to the OFF position.

NOTE: This equipment shall be installed and operated in an environment within the ratings and limitations of the equipment as published in these installation instructions.

PVRSS Self-Test

After commissioning, a PVRSS self-test can be performed to validate the functionality of the PVRSS using one of the methods described above. Alternatively, functionality of the PVRSS can be validated for a substring using the following instructions.

1. On the PWRcell Inverter control panel, press the right arrow key until the first PV Link device page appears.

NOTE: The device page display should read Disabled. If it does not read Disabled, press the center button and disable the PV Link.

2. Press the center button and select “Test PVRSS” to enter the ‘Testing PVRSS’ state. The display indicates ‘Testing PVRSS’ during the test process, which can take up to three minutes. Upon successful completion, the display will read ‘Test Success’.

Voltage and Frequency Trip Thresholds

This unit or system is provided with fixed trip limits and shall not be aggregated above 30 kW on a single point of common coupling.

All PWRcell Inverters are shipped from the factory in compliance with all UL 1741 requirements, including IEEE 1547. If permission to operate (PTO) is dependent on compliance to a specific utility standard, follow the steps covered in the ***Set Inverter Grid Compliance (optional)*** section in this manual.

Voltage Trip Thresholds

See ***Table 3-3*** for the default fixed voltage trip setpoints. All over voltage and under voltage trip conditions result in a 300-second restart delay time after the trip threshold has been exceeded for the listed number of cycles.

The inverter is disconnected from the grid during this 300-second delay.

Frequency Trip Thresholds

See ***Table 3-3*** for the default fixed frequency trip setpoints. All over frequency and under frequency trip conditions result in a 300-second restart delay time after the trip threshold has been exceeded for the listed number of cycles.

The inverter is disconnected from the grid during this 300-second delay.

Table 3-3. Voltage Trip and Frequency Thresholds

Voltage Trip Thresholds			Frequency Trip Thresholds		
Threshold	**Threshold (% of nominal)**	**No. of Cycles**	**Threshold**	**Threshold (% of nominal)**	**No. of Cycles**
OV4	999*	1	OF4	0**	1
OV3	130	1	OF3	0**	1
OV2	120	10	OF2	0**	1
OV1	110	60	OF1	0.5	10
UV1	88	120	UF1	0.7	10
UV2	50	10	UF2	0**	1
UV3	999*	1	UF3	0**	1
UV4	999*	1	UF4	0**	1

*Value of 999 indicates a disabled threshold for voltage trips.

**Value of zero indicates a disabled threshold for frequency trips.

Section 4: Installing PWRcell Inverter

Mounting Clearances

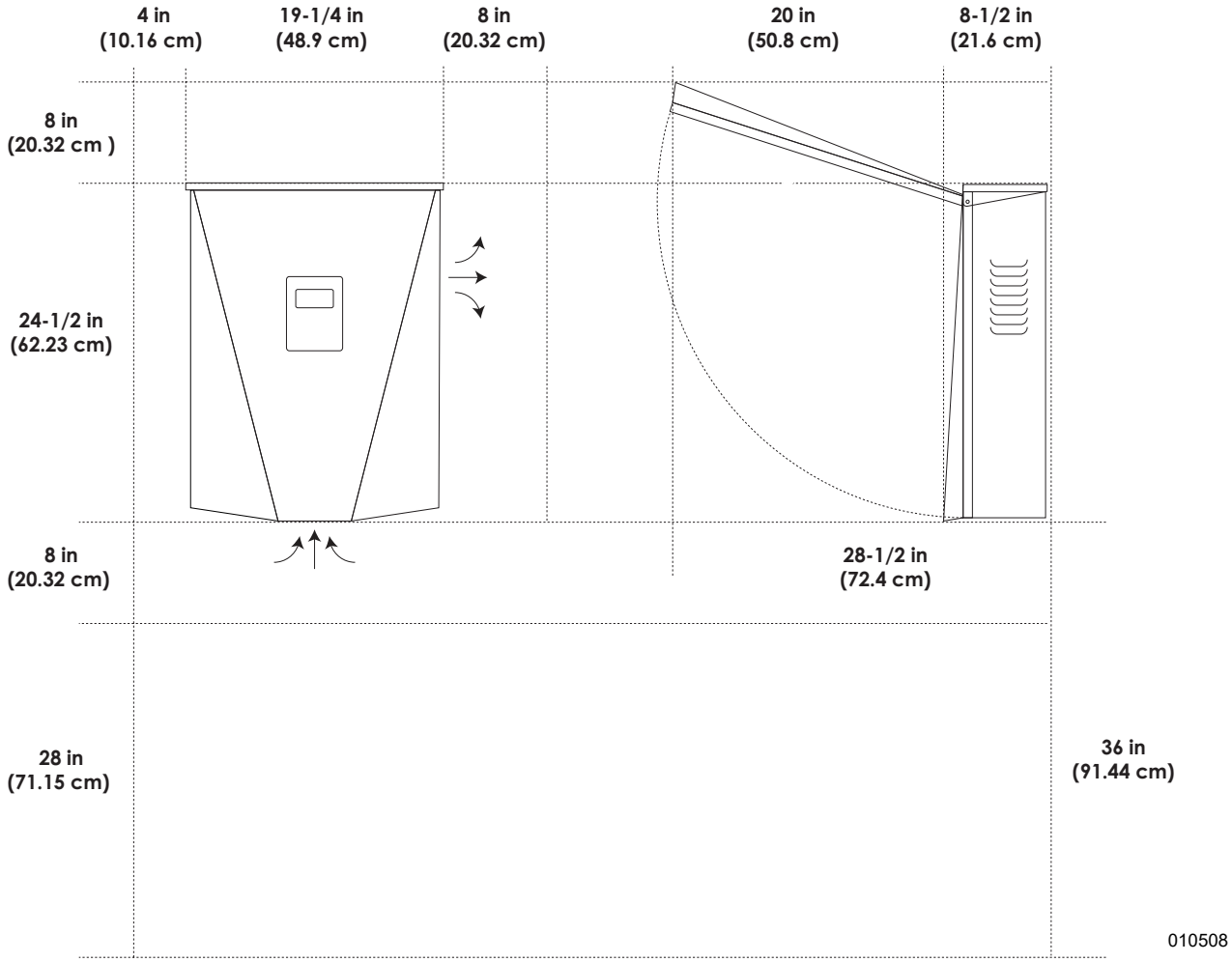


Figure 4-1. PWRcell Inverter Dimensions and Mounting Clearances

Mounting Bracket Dimensions

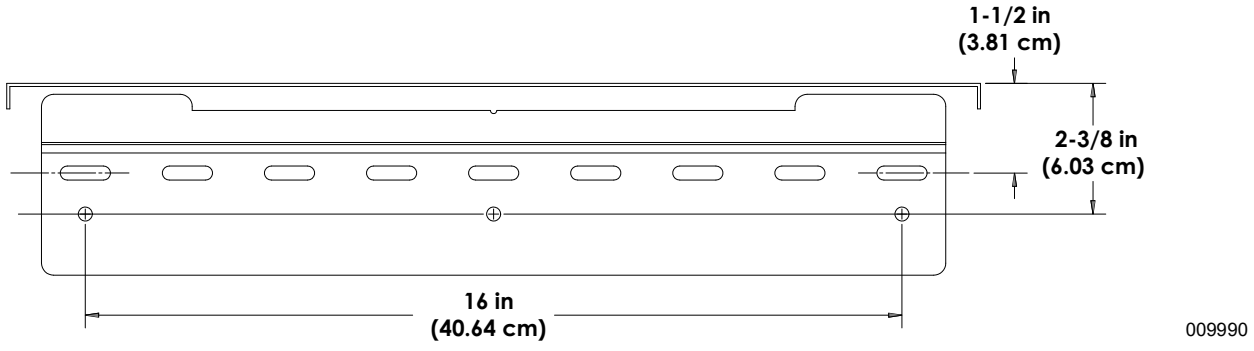


Figure 4-2. Mounting Bracket Dimensions

Mounting the Inverter

⚠CAUTION

Equipment damage. Mount inverter to a strong, stable surface. Never mount to drywall, plaster, or other non-structural wall treatments. Failure to mount inverter to a strong, stable surface could result in equipment or property damage.

(000641a)

1. Verify mounting location adheres to the following requirements:
   - Location must meet all PWRcell Inverter requirements listed in Section 3 of this manual. See ***Location and Compliance*** for more information.
   - Inverter must be mounted upright on a vertical wall.
   - Never obstruct intake or exhaust vents.
   - Never allow water to enter intake or exhaust vents.
   - Observe all mounting clearances. See ***Mounting Clearances***.
2. Secure mounting bracket mounting surface through mounting holes.
   - Fasteners must adequately secure the 62.7 lbs (28.4 kg) inverter weight to the wall.
   - Fasteners must be suitable for the mounting surface.
   - Fasteners must engage at least two studs or other structural members.
   - Mounting bracket has clearance holes for 1/4 in fasteners with slots to accommodate different stud spacings.
3. See ***Figure 4-3***. Insert mounting bracket tabs (A) into inverter body slot (B).

NOTE: ***Figure 4-3*** is for illustration purposes only.

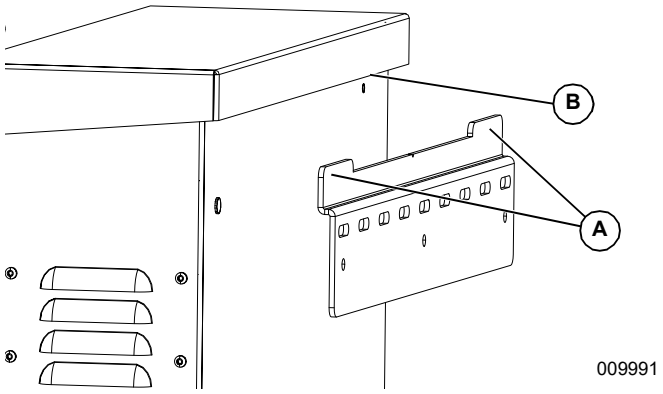


Figure 4-3. Mounting Inverter onto Bracket

4. See ***Figure 4-4***. Secure the bottom of the inverter to wall with two fasteners through mounting holes (C). Holes are spaced at 11 1/4 in. from each other. Use anchors or blocking as needed.

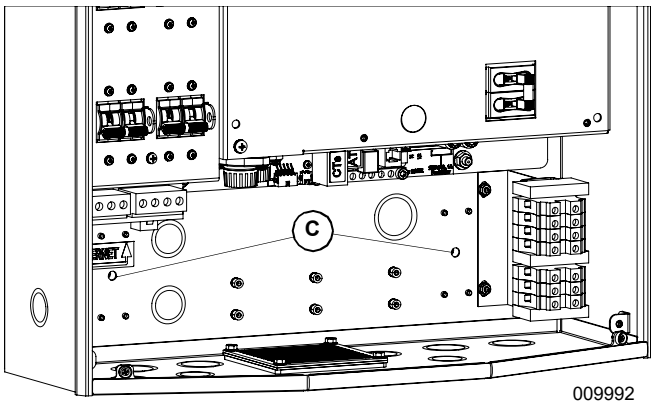


Figure 4-4. Mounting Holes

Section 5: Electrical Connections

Accessing Wiring Compartment

⚠ DANGER

Electrocution. Initiate a system-wide shutdown and turn the PWRcell DC Disconnect Switch OFF on all connected batteries before performing service. Failure to do so will result in death, serious injury, or equipment and property damage.

(000600)

⚠ DANGER

Electrocution. Verify all system voltages are safe before wiring. Disconnect all AC and DC sources of power before touching terminals. Failure to ensure no dangerous voltages are present on conductors and terminals before wiring will result in death or serious injury.

(000642)

See ***Figure 5-1***. To access the wiring compartment:

1. Open inverter front cover by lifting the bottom to horizontal (B) and pushing inward (C).
2. Locate wiring compartment cover (D).
3. Remove five M4X10 screws (E) and wiring compartment cover.
4. Verify all PWRcell DC and AC terminals are below 10V, using a multi-meter.

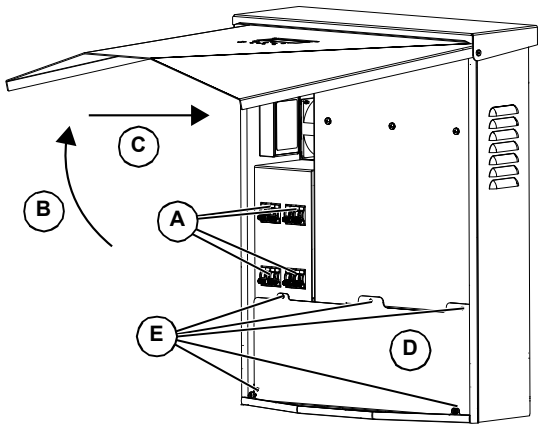


Figure 5-1. Wiring Compartment

PWRcell Inverter Wiring Compartment

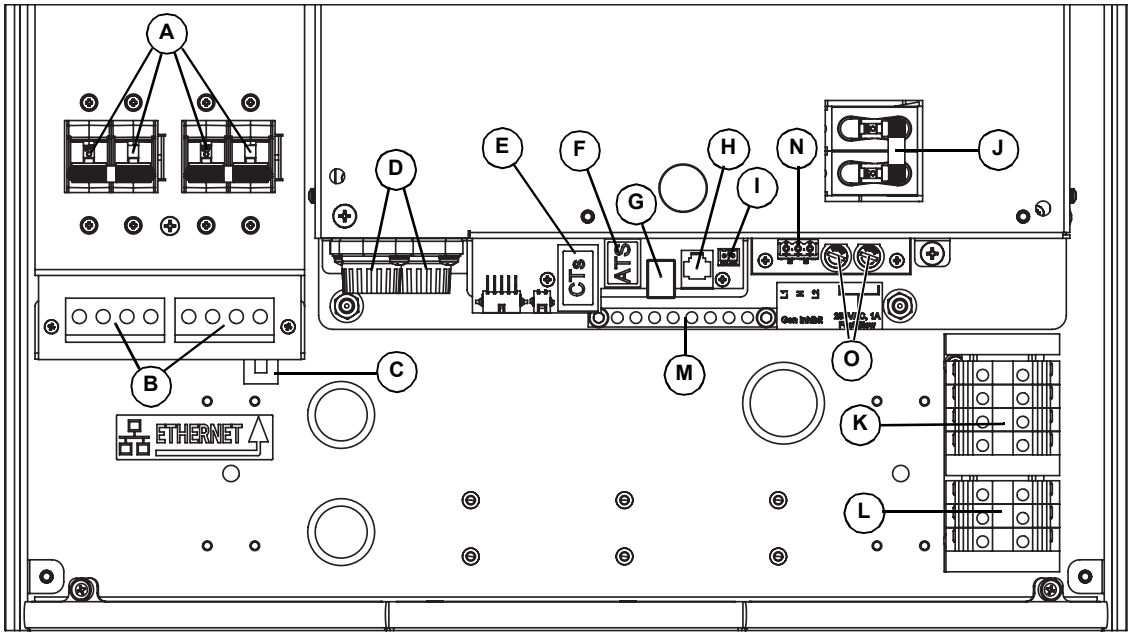


Figure 5-2. PWRcell Inverter Wiring Compartment (XVT Series)

A PWRcell DC Disconnects
B REbus Bi-directional DC Terminals
C Internet Connection
D DC Main Fuses
E Current Transformers (CTs) Accessory Ports
F Automatic Transfer Switch (ATS) Accessory Port
G REbus Beacon Port
H Authorized Generac Personnel Only
I STOP Terminals
J Protected Loads Disconnect
K AC Grid Connection Terminals
L Protected Loads Terminals
M Grounding Bar
N RGM PWR / Gen Inhibit (XVT Only)
O Fast Blow Mini Fuses 1 A 250 V (XVT Only)

Knockout Dimensions and Locations

NOTE: All knockouts are combination knockouts, except for the 1/4 in trade knockout at the top of the left side which is intended only for mounting an optional LTE modem antenna.

See ***Figure 5-3*** for knockout locations and ***Table 5-4*** for available knockout sizes and quantities.

When using knockouts:

- Install reducing washers to accommodate smaller conduit sizes.
- Install rain-tight or wet locations hubs in compliance with UL514B.

Table 5-4. Combination Knockout Size and Quantity

Combination Knockout Size	Quantity
3/4 in X 1 in	6
1/2 in X 3/4 in	7
0.575 in use only for LTE Modem Antenna	1

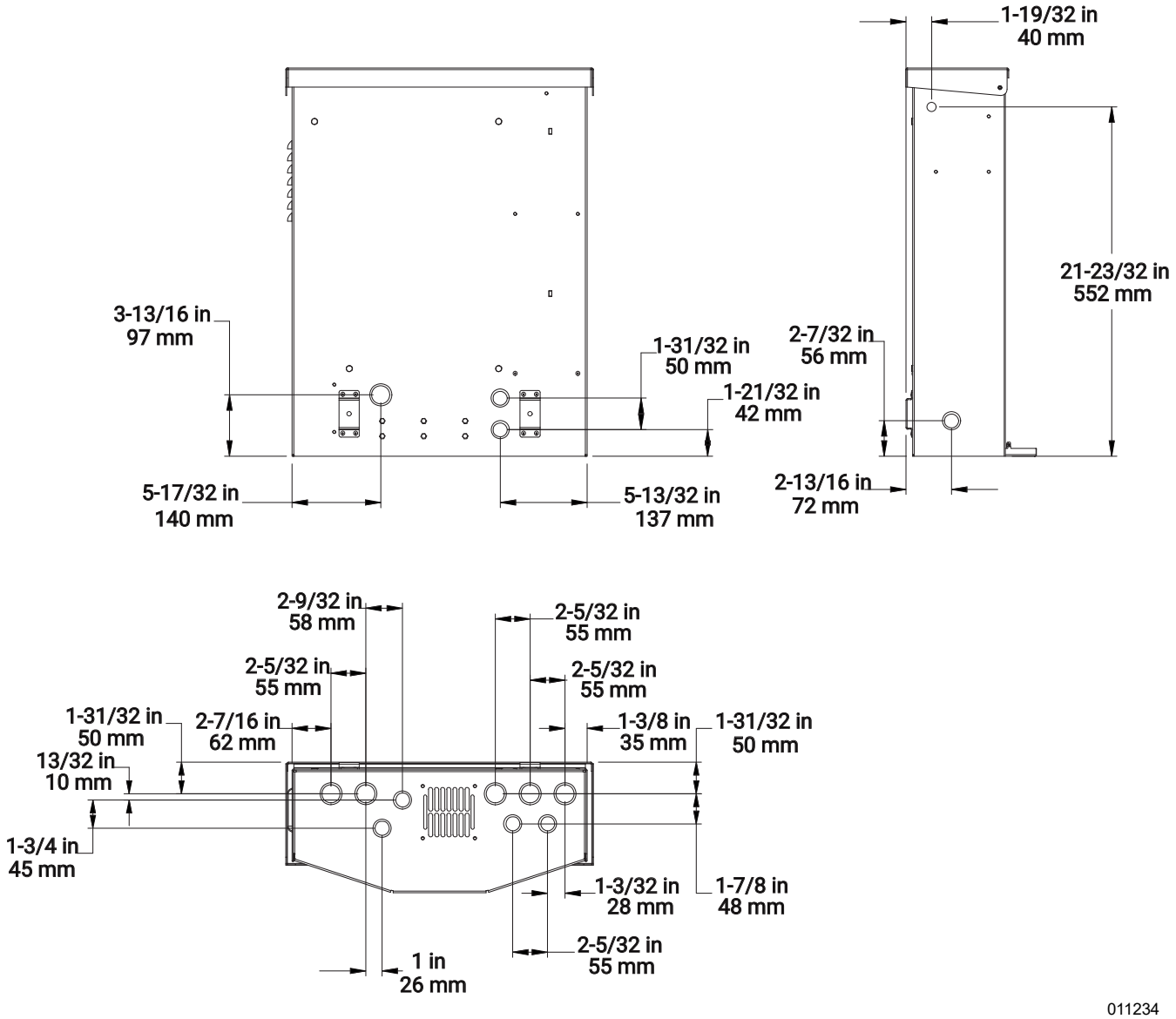


Figure 5-3. Knockout Locations

Wiring Guidelines

⚠DANGER

Electrocution. Verify all system voltages are safe before wiring. Disconnect all AC and DC sources of power before touching terminals. Failure to ensure no dangerous voltages are present on conductors and terminals before wiring will result in death or serious injury. (000642)

⚠DANGER

Electrocution. Turn battery disconnect OFF and de-energize REbus before touching terminals. Failure to do so will result in death, serious injury, equipment and property damage. (000599)

- The inverter shall be installed in accordance with NEC Article 705.
- Proper installation techniques must be employed to restrain service loops and to separate AC, DC, and isolated circuits.
- All conductors must be rated for at least 420 V.
- Always use wiring methods in accordance with National Electrical Code (ANSI/NFPA 70) or other applicable codes.
- Field terminals are for copper conductors only.
- Do not use field wiring leads smaller than 18 AWG.
- All field installed conductors within the unit are to be sized in compliance with NEC Article 310.
- Torque all terminals as specified in ***Table 5-5***.

Table 5-5. Terminal Torques

Wiring Terminal	Torque
AC terminals	13.3 to 15.9 **in-lb** (1.5 to 1.8 Nm)
DC terminals	12 **in-lb** (1.35 Nm)
Ground terminals	4 to 6 AWG: 45 **in-lb** (5 Nm) 8 AWG: 40 **in-lb** (4.5 Nm) 10 to 14 AWG: 35 **in-lb** (4 Nm)
STOP terminals	1.9 to 2.2 **in-lb** (0.22 to 0.25 Nm)

Grounding Bar Wiring

⚠CAUTION

Equipment damage. Never connect REbus conductors to ground. Connecting REbus conductors to ground could result in equipment or property damage. (000607a)

- Bond the inverter enclosure to the equipment grounding conductor of the normal power source power feeder.
- The grounding bar provides central grounding for up to 8 conductors.
- AC output circuits are isolated from the enclosure.
- AC system grounding, when required by Canadian Electrical Code, Part I, is to be done in the installation.
- The neutral conductor is not bonded to the equipment ground terminal bar within the enclosure.
- The inverter and its connected PV and battery sources are not separately derived systems.
- DC system grounding is critical for REbus communications. Ensure the following REbus devices have a low resistance wired connection back to the inverter grounding terminal bar:
  - PV Link
  - PWRcell Batteries
- Torque all terminals as specified in ***Table 5-6***.

Table 5-6. Grounding Bar Wiring Terminal Specifications

Wire Size (AWG)	Torque
4 – 6	45 **in-lb** (5 Nm)
8	40 **in-lb** (4.5 Nm)
10	30 **in-lb** (4 Nm)

DC Wiring

⚠DANGER

Electrocution. Never touch terminals when inverter and PWRcell DC disconnects are ON. Doing so will result in death or serious injury.

(000686a)

⚠WARNING

Equipment damage. Obey polarity markings when connecting REbus devices. Reverse-polarizing DC circuits could result in equipment or property damage.

(000646)

⚠WARNING

Equipment damage. Do not connect raw, unregulated battery output to inverter. Connect only REbus-compatible batteries. Connecting batteries that are not REbus-compatible could result in equipment or property damage.

(000645)

⚠CAUTION

Equipment damage. Do not connect PV string output directly to inverter. PV must be connected via Generac PWRcell PV Link. Connecting PV output directly to inverter could result in equipment or property damage.

(000644a)

⚠CAUTION

Equipment damage. Connect only one wire to each DC wiring terminal. Doubling wires on a terminal could result in equipment or property damage.

(000647a)

⚠CAUTION

Equipment damage. Connect only to REbus-compatible devices to the DC bus. Never connect to any other DC power source. Connecting to other DC power sources could result in equipment damage.

(000598a)

NOTE: The inverter does not itself provide ground fault detection and interruption for PV circuits. PV GFDI is provided by Generac PV Links in a PWRcell system.

- Connect all REbus devices to the REbus bi-directional DC terminals.
- Each terminal is protected by a 30 A two-pole circuit disconnect.
- PWRcell DC disconnects indicate state and may be used to disconnect DC circuits.
- PWRcell DC disconnects disconnect both ungrounded DC conductors simultaneously.
- Torque all terminals as specified in ***Table 5-7***.

NOTE: Disable inverter before turning PWRcell DC disconnects to ON position.

Table 5-7. DC Wiring Terminal Specifications

Wire Size	Terminal Temp Range	Wire Min Temp Rating	Torque
18-6 AWG (.75-10 mm)	-40 to 266ºF (-40 to 130ºC)	194ºF 90ºC	12 **in-lb** (1.35 Nm)

STOP Terminal Wiring (XVT Models Only)

In the event the PWRcell Inverter will be installed indoors, or outdoors in a location far from the utility service entrance, an external switch may be installed and wired to the inverter's STOP terminals to be the compliant PV Rapid Shutdown initiator. See ***Section 3: Location and Compliance PVRSS Initiation*** for additional information.

NOTE: If installation includes a PWRcell Battery, the battery must be equipped with external STOP terminals. Battery STOP terminals must be wired in series or parallel to the inverter STOP terminals. See below and reference the ***PWRcell Battery Installation & Owner's Manual*** for more details.

For PV only installations without a PWRcell Battery:

1. Verify the PWRcell system is powered down.
2. Remove the jumper from the inverter STOP terminals.
3. See ***Figure 5-4***. Use 30 – 14 AWG two-conductor cable with insulation rated for 600 V to connect a switch that is lockable, UL listed, and rated for at least 12 VDC, 1 A (consider a standard single-pole light switch in a weather proof box with a lockable lever).

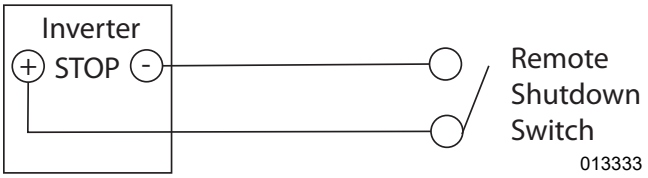


Figure 5-4. PV Only Remote Shutdown Switch Wiring

For Installations with a PWRcell Battery:

1. Verify the PWRcell system is powered down.
2. Remove the jumper from the inverter STOP terminals.
3. Remove the jumper for the battery STOP terminals.
4. See ***Figure 5-5*** and ***Figure 5-6***. Use 30 – 14 AWG two-conductor cable with insulation rated for 600 V to connect a switch that is lockable, UL listed, and rated for at least 12 VDC, 1 A (consider a standard single-pole light switch in a weather proof box with

a lockable lever). Wire the switch in series or parallel to the inverter and battery.

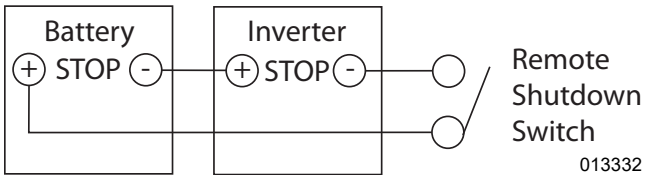


Figure 5-5. Remote Shutdown Switches Series Wiring

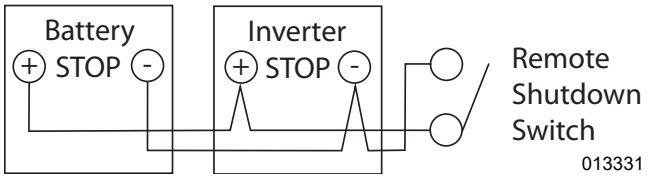


Figure 5-6. Remote Shutdown Switch Parallel Wiring

IMPORTANT NOTE: If polarity is wired incorrectly, neither device will see a STOP condition and it will not be possible to shutdown either device via the STOP terminals until the wiring is corrected.

AC Wiring

See ***Figure 5-7***. The installer is responsible for installing 40 A overcurrent protection for wiring to AC Grid Connection Terminals (A). The conductors shall be sized in accordance with NEC Article 705 for the utility power interconnection. All other conductors in the system shall be sized in accordance with NEC Article 310 and all other applicable NEC Articles.

NOTE: Class 2 low voltage cable shall be installed independent of other power conductors. See NEC 725.136 for additional information.

- See ***Figure 5-7***. The PWRcell Inverter is equipped with four AC grid connection terminals and three protected loads terminals.
- Use the top four terminals (A) for connection to the utility grid.

NOTE: Use L3 terminal (B) with 3-phase inverters only.

- Use the bottom three terminals (C) for protected loads output. See ***Protected Loads***.

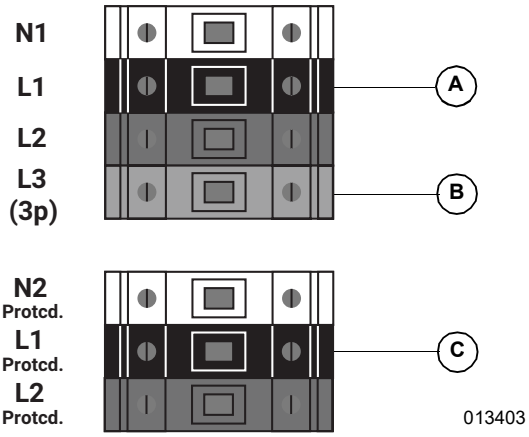


Figure 5-7. AC Wiring Terminals

- Torque all terminals as specified in ***Table 5-8***.

Table 5-8. AC Wiring Terminal Specifications

Wire Size	**10 to 6 AWG ($5.26\ mm^2$ to $13.3\ mm^2$)**
Terminal Temp Range	Up to 248ºF (120ºC)
Wire Min Temp Rating	194ºF (90ºC)
Torque	13.3 **in-lb** to 15.9 **in-lb** (1.5 Nm to 1.8 Nm)

Protected Loads

⚠CAUTION

Equipment damage. Never connect protected loads terminals to other sources of power, including any other inverter, the utility grid, or a generator. Doing so could result in equipment or property damage.

(000648a)

⚠CAUTION

Equipment damage. Never connect protected loads output from inverters in parallel. Doing so could result in equipment or property damage.

(000649a)

For systems equipped with energy storage, the inverter's protected loads terminals provide power during a grid outage.

NOTE: The protected loads terminals can only provide two phases of power in a three-phase system.

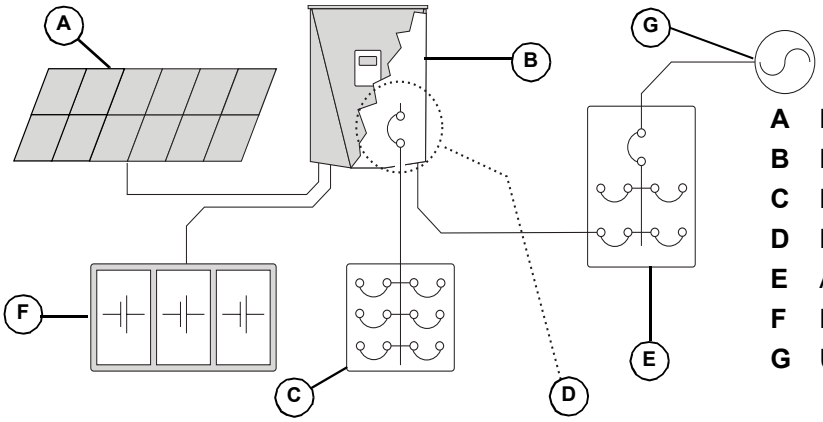
See ***Figure 5-8***. The PWRcell Inverter is configured to pass grid power from AC grid terminals through to the protected loads terminals so long as the Protected Loads Disconnect is in the ON position. This includes when the inverter is disabled. During a grid outage, internal relays inside the inverter isolate the AC grid connection and the inverter powers the protected loads only, using PV array and battery power. This transition takes place in a fraction of a second.

1. **To create a protected loads panel:** Connect the circuits that require backup to a subpanel.
2. Size subpanel loads to the 40 A OCPD for interconnection or the attached energy storage, whichever is the lesser of the two.
3. Connect this subpanel to the protected loads terminals in the inverter.
4. See ***Figure 5-8***. When configured to backup a protected loads subpanel the PWRcell Inverter can provide up to 7.6 kW of continuous power.
5. The inverter can surge up to 50 A for motor starting capabilities.

NOTE: Actual power output for protected loads during a grid outage will depend on system sizing for batteries and solar array.

NOTE: Backup power ratings are separate from the power ratings for PWRcell Inverters while grid connected, 7.6 kW and 11.4 kW respectively.

NOTE: Class 2 low voltage cable shall be installed independent of other power conductors. See NEC 725.136 for additional information.

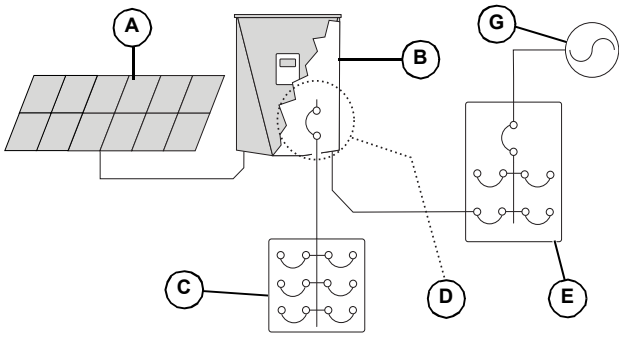


A PV Array
B PWRcell Inverter
C Protected Loads Panel
D Protected Loads Disconnect
E AC Main Panel
F PWRcell Battery
G Utility

009997

Figure 5-8. Single Inverter Backup Installation with Protected Loads Panel

NOTE: See ***Figure 5-9***. On systems that do not include battery storage but where battery storage is expected in the future, install a protected loads panel during inverter installation. The protected loads panel will be fed by the grid while the system operates in Grid Tie mode.



A PV Array
B PWRcell Inverter
C Protected Loads Panel
D Protected Loads Disconnect
E AC Main Panel
G Utility

009998

Figure 5-9. Configuration for Adding Batteries Later

Whole Home Backup

When configured to operate with a PWRcell ATS installed directly after the utility service meter, a PWRcell system can provide power to the entire main distribution panel during a utility service interruption. This configuration utilizes the PWRcell ATS controller as well as Smart Management Modules (SMMs) for load management.

In this configuration, the PWRcell Inverter will control the PWRcell ATS upon loss of utility voltage.

NOTE: This configuration is not suitable for three phase installations.

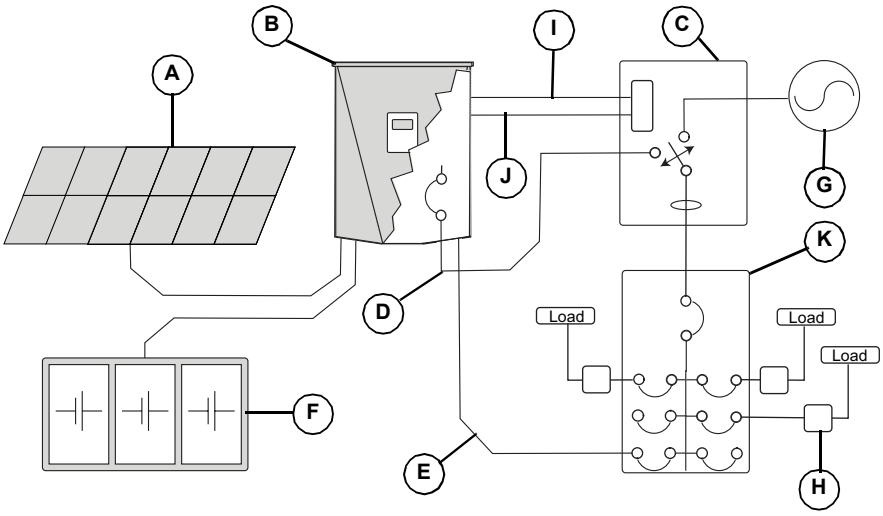
A PWRcell system configured to operate with a PWRcell ATS can accommodate up to 9 kW – 11 kW maximum continuous load. This requires at least 6 – 8 battery modules, respectively, to be installed in one - two PWRcell Battery cabinets. Please reference pertinent specifications for desired configuration.

NOTE: A qualified installer must ensure proper load management so as not to overload the optional standby power source in any whole home backup installation.

General Wiring Guidance:

1. See ***Figure 5-10***. Land service entrance conductors at the 'N' terminals of the PWRcell ATS.
2. Land new feeder conductors from the 'T' terminals of the PWRcell ATS to the Line side of the main distribution panel.
3. Land the PWRcell Inverter protected loads wiring to the 'E' terminals of the ATS.
4. Interconnect the PWRcell Inverter using a 40 A backfeed breaker in the main panel or a supply-side tap in the ATS with 40 A over current protection (OCPD) in between.
5. Run Cat 5 or Cat 6 from the PWRcell ATS Controller to the PWRcell Inverter for ATS controls.
6. Install CTs and Run Cat 5 or Cat 6 from the PWRcell ATS Controller to one of the inverter CT ports.
7. Install HVAC 24 V thermostat wiring at the PWRcell ATS Controller to manage HVAC loads.
8. Install SMMs on 240 V loads to manage additional large house loads.

NOTE: Class 2 low voltage cable shall be installed independent of other power conductors. See NEC 725.136 for additional information.



A PV Array
B PWRcell Inverter
C PWRcell ATS
D Protected Loads Wiring
E Inverter AC Grid Connection
F PWRcell Battery
G Utility
H SMM
I CTs
J ATS
K AC Main Panel

Figure 5-10. Whole Home Backup

The following is not supported with Whole Home Backup at this time:

- Parallel operation with other energy/battery storage solutions.
- Installations with other manufacturers' transfer switches.
- Support for 3(phase symbol) inverter installations.

AC Coupled PV

The PWRcell XVT076A03 Inverter unlocks the ability to couple with an existing AC coupled PV array for reliable energy storage with a PWRcell Battery.

NOTE: A PWRcell ATS must be installed between the AC feeder conductors, the distribution panel with the existing PV backfeed, and the PWRcell Inverter.

Features:

- Support for up to 7.68 kW AC coupled PV when in Island Mode during a utility service interruption.
- Leverages energy storage for Self Supply and Priority Backup applications.
- Supports systems with Export Limiting enabled.

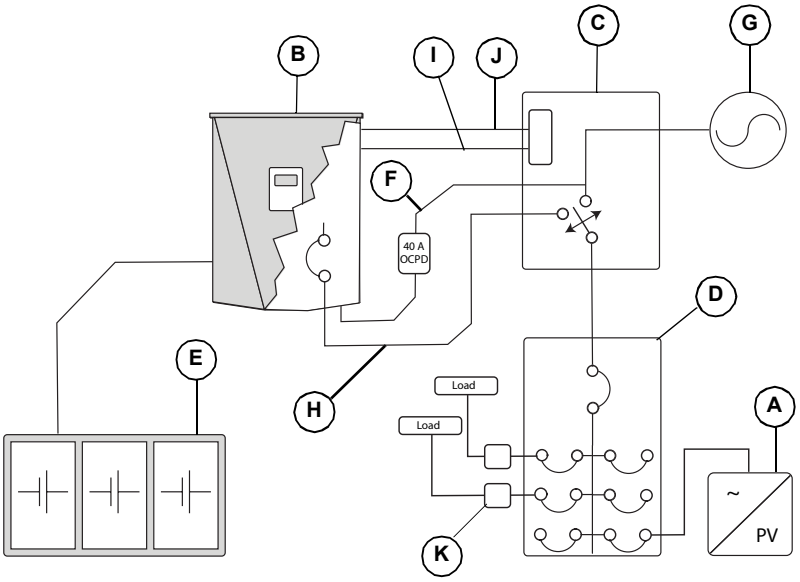
Requirements:

- PWRcell ATS must be installed to provide backup.
- M6 PWRcell Battery minimum (six battery modules).

General Wiring Guidance:

1. See ***Figure 5-11***. Land service entrance conductors at the 'N' terminals of the PWRcell ATS.
2. Land new feeder conductors from the 'T' terminals of the PWRcell ATS to the line side of the main distribution panel.
3. Land PWRcell Inverter protected loads wiring to the 'E' terminals of the ATS.
4. Interconnect the PWRcell Inverter using a 40 A backfeed breaker in the main panel or a supply-side tap in the ATS with 40 A over current protection (OCPD) in between.
5. Ensure AC coupled PV is interconnected using a backfeed breaker or a load-side tap in the main distribution panel.
6. Run Cat 5 or Cat 6 from the PWRcell ATS Controller to the PWRcell Inverter for ATS controls.
7. Install CTs and run Cat 5 or Cat 6 from the PWRcell ATS Controller to one of the inverter CT ports.
8. Install SMMs on 240 V loads to manage additional large house loads.

NOTE: SMMs may only be used with lockout switch in “Lockout Load on Generator” position for AC Coupled PV applications.



A AC Coupled PV System
B PWRcell Inverter
C PWRcell ATS
D AC Main Panel
E PWRcell Battery
F Inverter AC Grid Connection
G Utility
H Protected Loads Wiring
I ATS
J CTs
K SMM

Figure 5-11. AC-Coupled PV

The following is not supported with AC coupled PV at this time:

- Interaction with third-party data sources from other PV manufacturers.
- Additional metering of third-party PV.
- Parallel operation with DC coupled PV.
- Parallel operation with other energy/battery storage solutions.
- Installations with other manufacturers' transfer switches.
- Support for dynamic load shedding with SMM (priority return). Lockout will be supported.
- Support for three phase inverter installations.

Connecting Ethernet

IMPORTANT NOTE: Generac requires all PWRcell system components to be connected to the Internet and to maintain such connection throughout the warranty period. Internet connectivity is established via the PWRcell Inverter. By installing the PWRcell Inverter and connecting it to the Internet, Customer agrees that Generac may remotely monitor the use and condition of the system and update the system's firmware, as necessary, without further notice. If the PWRcell system loses Internet connection for an extended period, Generac may not be able to provide important remote upgrades. In such cases, Generac may not be able to honor the full warranty.

- See ***Accessing Wiring Compartment*** for the Inverter Ethernet port location.
- Use an appropriate cord grip or strain-relief connector when running Ethernet cable with a conduit.
- Cat 5 for Ethernet should not exceed 328 ft (100 meters) in length.
- Basic high speed broadband Internet service with 5 Mbps upload/download required.
- Inverters connected by a router to a DHCP network will automatically detect settings.
- For manual IP setup, see ***Configuring Static IP Settings***.

NOTE: It is the installer's responsibility to verify the Internet connection is reliable and secure. Generac recommends using a hardwired connection to provide Internet connectivity. Generac does not support using any wireless or power line carrier network devices. Use these devices at your own discretion.

NOTE: Ethernet cable run must be dedicated for the inverter. This cable may not be daisy-chained to another device, including another PWRcell Inverter.

NOTE: Class 2 low voltage cable shall be installed independent of other power conductors. See NEC 725.136 for additional information.

Configuring Static IP Settings

NOTE: For networks not configured for DHCP, use the MAC address to locate the device on the network.

To manually configure settings:

1. From the Beacon device page on the inverter screen, select the Installer Tool. See ***Access Installer Configuration Tool (optional)*** for more information.
2. After logging into the Installer Configuration Tool, select 'Beacon' from the menu.
3. Select Simple IP Network Settings. See ***Figure 5-12***.
4. Adjust any of the following network configuration information as needed.
   - Name
   - Config
   - Address
   - Netmask
   - Gateway
   - DNS1
   - DNS2
   - MAC
5. Press Submit to commit settings.

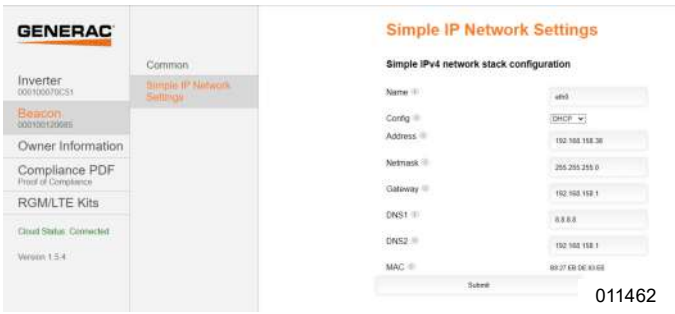


Figure 5-12. Configure Static IP Settings

NOTE: Contact your network system administrator to connect the PWRcell Inverter to a restricted network.

NOTE: Beacon must retain an Internet connection in order to use the PWRview mobile app.

Verifying Connectivity

NOTE: Use a laptop or other device to verify the Internet connection on the field installed Cat 5 cable.

For a successful connection the following must be valid:

- The Internet LED on the control panel must be lit.

NOTE: Wait at least 5 minutes after the blue light illuminates to be certain the connection is stable.

- The field installed Cat 5 cable must have a “hot” signal. Check male RJ45 ends for proper installation and confirm correct Ethernet ports at the inverter and router.
- The REbus Beacon must have a device page on the inverter control panel.
- See ***Figure 5-13***. The REbus Beacon must have a valid IP Address. Log on to the Beacon Installer Configuration Tool to verify. *See* ***Access Installer Configuration Tool (optional)***.

Figure 5-13. Verify IP Address

NOTE: After first installing, the REbus Beacon may need to receive automated updates to its firmware. This may cause the blue Internet LED to strobe while the Beacon updates, and this will interrupt the Installer Tool connection momentarily.

Current Transformers (CTs)

⚠CAUTION

Equipment damage. Only connect CTs provided by Generac. Never connect to any other CTs. Connecting to other CTs could result in equipment damage.

(000732)

Current transformers (CTs) are required to use Self Supply mode and to enable Import / Export Limiting capability. CTs also allow the inverter to provide information on utility consumption through the PWRcell Inverter control panel and the PWRview monitoring app.

Connecting Current Transformers

- See ***Figure 5-14***. Install CTs around the main service conductors between the service meter and point of interconnection with the inverter.
- Install one current transformer per phase:
  - Install two CTs for split phase grids.
  - Install three CTs for three-phase grids.

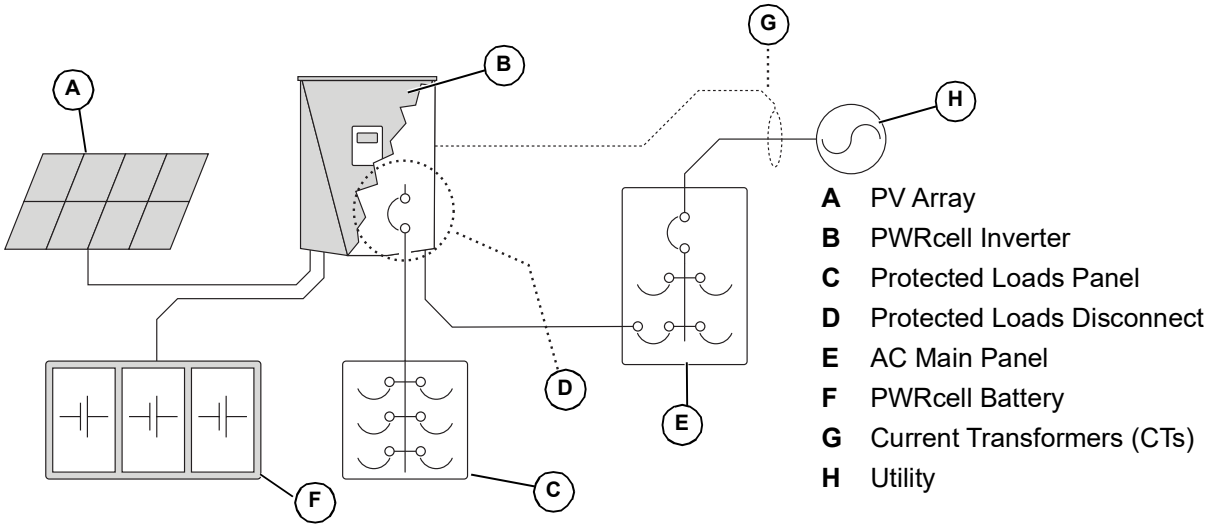


Figure 5-14. Connecting Current Transformers (CTs)

Connecting CTs to the Inverter

NOTE: Class 2 low voltage cable shall be installed independent of other power conductors. See NEC 725.136 for additional information.

1. See ***Figure 5-15***. Connect CT leads to RJ-45 Breakout Adapters with push terminals (M) or screw terminals (N) according to the label on the breakout adapter.

NOTE: Use yellow lead for CTx+ and use green lead for CTx-.

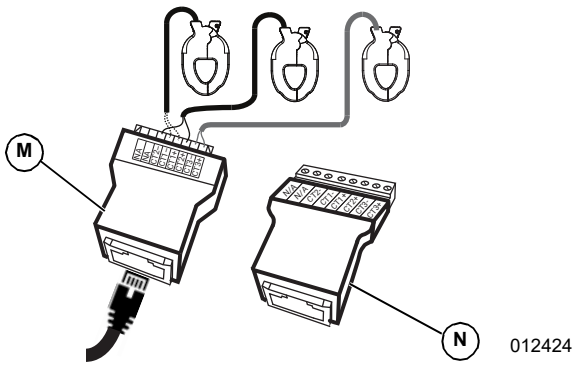


Figure 5-15. RJ-45 Breakout Adapter

NOTE: RJ-45 Breakout Adapter is included in the Generac PWRcell Kit.

NOTE: The connection between the RJ-45 Breakout Adapter and the inverter is made using an installer supplied Cat 5 cable.

Table 5-9. CT RJ-45 Pinout

Pin	Wire Color (T-568A)	Wire Color (T-568B)	Value
1	White / Green	White / Orange	CT3+
2	Green	Orange	CT3-
3	White /Orange	White / Green	CT2+
4	Blue	Blue	CT1+
5	White / Blue	White / Blue	CT1-
6	Orange	Green	CT2-
7	White / Brown	White / Brown	Not Used
8	Brown	Brown	Not Used

2. See ***Figure 5-16***. Connect Cat 5 cable to a CT accessory port (H).
   - CT accessory ports are double-stacked RJ-45 ports.
   - Either the top or bottom port may be used.
   - Both ports may be used when multiple sets of CTs are required.

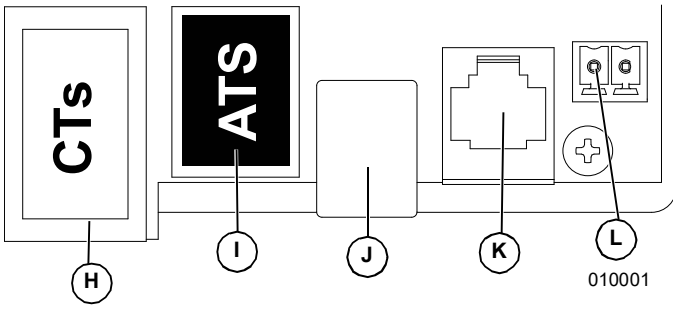


Figure 5-16. Accessory Ports

H Current Transformers (CTs) Accessory Port (RJ-45)

I Automatic Transfer Switch (ATS) Accessory Port (RJ-45)

J REbus Beacon Port (USB-B)

K Authorized Generac Personnel Only

L STOP Terminals

NOTE: When setting for Export Limiting or Zero Import, attach the label packaged with the CTs to the CTs.

Connecting Multiple Sets of CTs

When installing CTs, local factors may require multiple sets of CTs to fully measure the utility power being sent to the building.

Installing two sets of CTs:

- Use two pairs of CTs to measure services with two sets of feeder conductors. Use each pair of CTs to measure a pair of service conductors / feeders within the main panel.
- Connect CT1 from both sets to the same phase and CT2 from both sets to the second phase.
- See ***Table 5-10: Multiple CT Connection***. Connect Cat 5 cables from the adapters into the two CT accessory ports at the inverter.

NOTE: Make sure to use the same pinout and connections.

Table 5-10. Multiple CT Connection

CT	Service Phase and Wire Adapter	Adapter	Adapter Pins	CT Port Row Values
1-1	L1-1	1	4 and 5	Front Port
1-2	L2-1	1	3 and 6	Front Port
2-1	L1-2	2	4 and 5	Back Port
2-2	L2-2	2	3 and 6	Back Port

Connecting CTs to Multiple PWRcell Systems / Inverters

When an installation has multiple PWRcell Inverter systems, either:

- Run a set of CTs for each inverter.
- Run a set of CTs to one inverter and run a Cat 5 cable from the spare CT port within that inverter to either CT port within the second inverter.

NOTE: One set of CTs may be utilized for up to two inverters.

When running separate sets of CTs for each inverter, the load value displayed on each inverter screen will be the total load measured by the CTs.

When daisy-chaining two inverters, the total measured value is shared evenly between the inverters.

NOTE: Daisy-chaining CTs between two inverters for distributed load-share is most applicable when each inverter has a battery attached. Otherwise, this configuration may not be necessary or desirable.

To daisy-chain a CT signal:

1. Connect and calibrate a set of CTs to the first inverter.
2. Run a new Cat 5 cable between the spare CT accessory port of the first inverter to either CT accessory port on the second inverter.
3. Set GridParInvrtrs to a value of 2. See ***Table 5-11*** below.

NOTE: Running a new Cat 5 cable between inverter CT ports prior to calibration in Step 1 may cause calibration issues.

CT Calibration

- Install CTs before powering ON the inverter.
- The inverter automatically detects CTs when turned ON.
- Once CTs are detected, a utility pole icon will appear on the lower right corner of the home screen power flow diagram. Verify operation by noting power flow.
  - To calibrate CTs, navigate to the inverter device page, access the menu, and select the Calibrate CTs option.
  - Watch the screen carefully for transient validation of CTs. When the CT calibration process has been successfully completed, the inverter LCD screen will provide feedback showing ct cal success. Otherwise, the screen will show ct cal = X, where the value of X can be found in ***Table 5-12: Automatic Detection Troubleshooting Table***.

– CT1 must be connected to Line 1.
– CT2 must be connected to Line 2.
– CT3 must be connected to line 3 (for three phase applications).
– All CTs must be orientated in the same relative direction.
– In certain scenarios, additional setpoint modifications may need to be made. See ***Table 5-11: CT Setpoints*** for more information.

Table 5-11. CT Setpoints

Setpoint	Behavior	Default	Units
CalOverride	• Overrides CT calibration. • When set to OFF, the inverter will automatically detect the direction and number of CTs present. • When set to ON, the inverter will assume correct CT installation and will use the readings as is.	OFF	N/A
CTTurnsRatio	• Turns ratio of the CTs installed. • Default turns ratio of 1,500 is compatible with included clamp type CTs • If installation restriction requires larger accessory CTs, set point shall be adjusted to 3,000. Verify turns ratio of CTs before modifying this setting.	1,500	Turns
GridParInvrtrs	• Allows two inverters to share one set of CTs. • If set to “1” only one inverter should be using a single set of CTs. • If set to “2” two inverters can share one set of CTs.	1	N / A

Table 5-12. Automatic Detection Troubleshooting Table

Event Name	Event Code	Description
ct cal = 1	0x8061	Line 1 doesn’t have a valid CT calibration
ct cal = 2	0x8062	Line 2 doesn’t have a valid CT calibration
ct cal = 3	0x8063	Line 1 & 2 don’t have a valid CT calibration
ct cal = 4	0x8064	Line 3 doesn’t have a valid CT calibration
ct cal = 5	0x8065	Line 1 & 3 don’t have a valid CT calibration
ct cal = 6	0x8066	Line 2 & 3 don’t have a valid CT calibration
ct cal = 7	0x8067	Line 1 & 2 & 3 don’t have a valid CT calibration
ct cal = 9	0x8069	Line 1 has multiple CTs on it (or a CT is on the neutral wire)
ct cal = A	0x806A	Line 2 has multiple CTs on it (or a CT is on the neutral wire)
ct cal = B	0x806B	Lines 1 and 2 have multiple or missing CTs on them (or a CT is on the neutral wire)
ct cal = C	0x806C	Line 3 has multiple CTs on it (or a CT is on the neutral wire)
ct cal = D	0x806D	Lines 1 & 3 have multiple or missing CTs on them (or a CT is on the neutral wire)
ct cal = E	0x806E	Lines 2 & 3 have multiple or missing CTs on them (or a CT is on the neutral wire)
ct cal = F	0x806F	Lines 1 & 2 & 3 have multiple or missing CTs on them (or a CT is on the neutral wire)
ct cal success	0x8070	Calibration was successful

Other Accessories

PWRcell ATS

A Generac PWRcell ATS can be integrated into the PWRcell installation to facilitate alternate backup power configurations. Refer to the PWRcell ATS Manual for additional information regarding configurations and installation instructions.

NOTE: Improper installation of a PWRcell ATS can result in an objectionable current path through a paralleled neutral connection. Reference NEC 250.6. The neutral conductor for the inverter AC Grid Connection circuit is not required to be installed to the point of common coupling with the utility as permitted by the exception in NEC 200.3. Follow the PWRcell ATS installation manual for proper installation. The installer is responsible for compliance with applicable national, state, and local codes.

Service RJ-11 jack (C) is for use by authorized Generac personnel only. Never connect any device to this jack without direct instructions from Generac Technical Service.

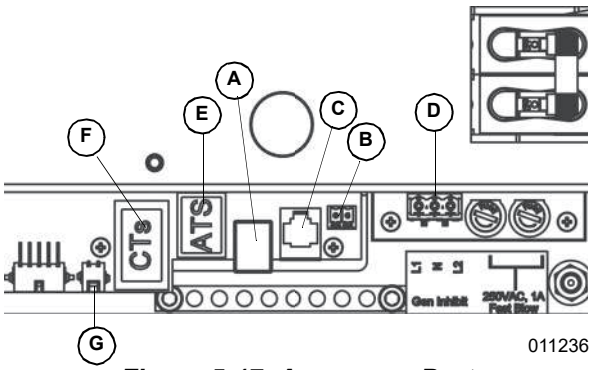


Figure 5-17. Accessory Ports

- **A** REbus Beacon USB-B Jack
- **B** STOP Terminals
- **C** Authorized Generac Personnel Only
- **D** RGM PWR Gen Inhibit
- **E** Automatic Transfer Switches (ATS) Accessory Port
- **F** Current Transformers (CTs)
- **G** LTE Modem Power Connector

Load Management Options

Load management systems are designed to work together to prevent the PWRcell system from being overloaded by large appliance loads when islanded. Load management options for PWRcell include the PWRcell ATS Controller and Smart Management Module (SMM).

When utilizing these load management solutions be sure to select the appropriate value for the “EnaLoadShed” setpoint. This setpoint is accessible through the Mod. Settings menu via the inverter device page as shown in ***Figure 5-18***. Select a value of “1” if using SMMs to shed load. Select a value of “2” if using the PWRcell ATS Controller (with or without SMMs) to shed load.

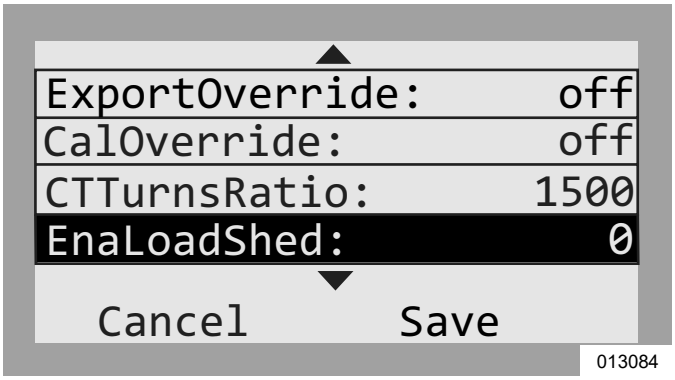


Figure 5-18. Mod Settings Menu

If this setpoint is not set to either 1 or 2 respectively, the devices will not operate correctly with the system. In addition, be sure to thoroughly read and understand each load management device manual before installation.

Section 6: Commissioning

Commissioning the System

IMPORTANT: If multiple PWRcell Inverters are installed, refer to ***Commissioning Multiple Inverter Systems***. Do not turn on AC power to more than one inverter at a time.

Before commissioning the system:

- Verify all wiring terminations are tight and secure.
- Perform pre-commissioning checks detailed by the ***Generac PWRcell Commissioning Quick Start Guide***.
- Verify AC voltage is within the specified range for system configuration.
  - 240 V split-phase (108–130 VAC Line to Neutral)
  - 208 V 3-phase (108–130 VAC Line to Neutral)
- Verify DC wiring field terminations are secure and polarity is correct.
- Verify DC disconnects for all connected devices are turned ON.

Commissioning steps:

1. Connect to High Speed Broadband Internet.
2. Register System.
3. Connect PWRcell Inverter to AC Power.
4. Select Inverter System Mode.
5. Configure Inverter Settings.
6. Enable REbus Devices.
7. Test Island Mode.
8. Configure Time of Use (optional).
9. Access Installer Configuration Tool (for steps 10 – 11).
10. Set Inverter Grid Compliance (optional).
11. Set Import / Export Compliance (optional).

Connect to High Speed Broadband Internet

Refer to ***Connecting Ethernet*** for more information.

Register System

NOTE: If the system will not be connected to the Internet, installer will not be able to take advantage of PWRfleet, the customer will not have access to the PWRview app, and the warranty will be limited to five years. Contact Generac at 1-888-ACTIVATE to complete the registration.

NOTE: Registering an inverter automatically registers all REbus system components connected to that inverter.

Every REbus-enabled device can be monitored from the PWRfleet fleet management platform and the PWRview™ online monitoring system and mobile app.

To register a system for PWRview monitoring:

1. See ***Figure 6-1***. Locate the serial number and registration code on the registration decal on the front of the inverter. This information will be required for registration.
2. Navigate to **https://pwrfleet.generac.com** or, if using a mobile device, scan the QR code on the registration decal and use the “Register at PWRfleet” URL provided.
3. Follow the on-screen prompts to complete the profile.

012615

Figure 6-1. Registration Decal

Connect PWRcell Inverter to AC Power

IMPORTANT: If multiple PWRcell Inverters are installed, refer to ***Commissioning Multiple Inverter Systems*** in place of this commissioning step. Do not turn on AC power to more than one inverter at a time.

Turn ON main AC backfeed to power-up the inverter.

See ***Figure 6-2***. On power-up, the home screen will appear on the control panel LCD with the system mode listed at the top of the home screen.

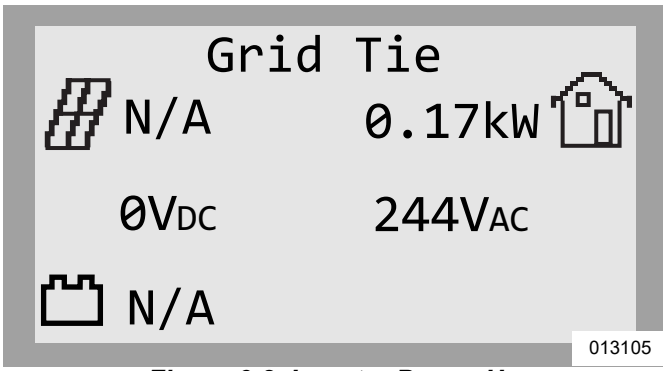


Figure 6-2. Inverter Power-Up

NOTE: If grid power is temporarily not available to commission the PWRcell system and the system includes a PWRcell Battery, performing what is called a “Blackstart” can be used to start the system from the battery. See the ***Generac PWRcell Battery Installation and Owner's Manual*** for instructions.

NOTE: Generac does not currently support autonomous, off grid installations with PWRcell equipment.

Select Inverter System Mode

NOTE: See ***System Modes Overview*** for more information.

NOTE: For systems with a PWRcell Battery, select a backup system mode. Do not select Grid Tie mode.

To select a system mode:

1. See ***Figure 6-2***. While viewing the home screen press the center button.
2. See ***Figure 6-3***. A list of system modes will be displayed with the current mode marked with an asterisk.

NOTE: The list of system modes may not include all those shown in ***Figure 6-3***.

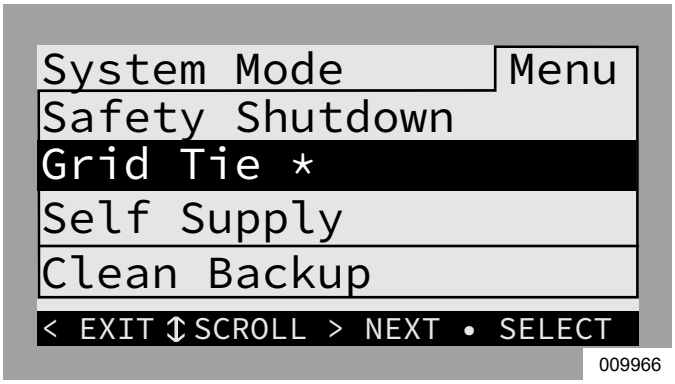


Figure 6-3. Selecting System Modes (1 of 3)

3. See ***Figure 6-4***. Use the up and down arrows to highlight the desired mode and press the center button to select.

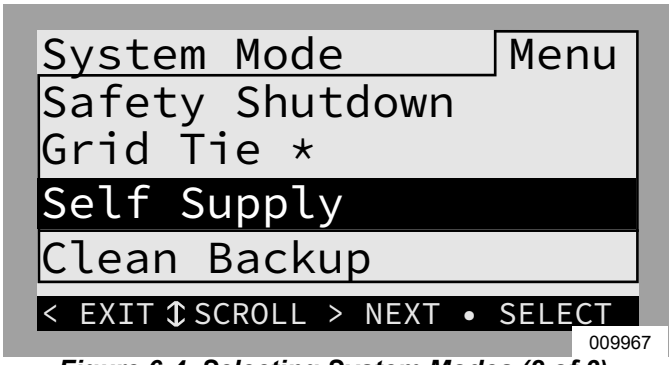


Figure 6-4. Selecting System Modes (2 of 3)

4. See ***Figure 6-5***. Arrow right and press the center button to select Confirm.

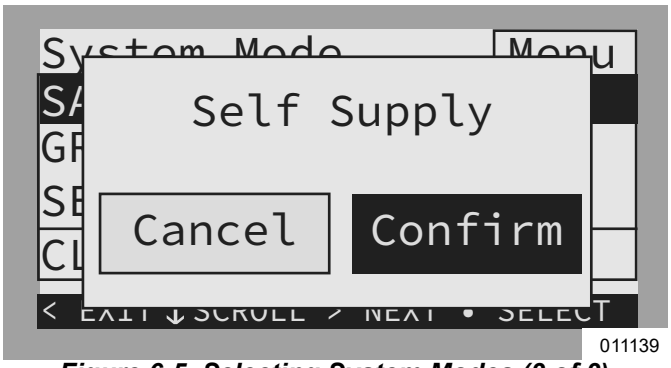


Figure 6-5. Selecting System Modes (3 of 3)

5. See ***Figure 6-6***. Verify the mode listed at the top of the home screen is the desired mode.

Figure 6-6. Selecting System Modes (4 of 4)

Configure Inverter Settings

Adjusting Inverter Settings

1. See ***Table 6-1***. Navigate to the inverter device page using the right arrow key (next page right of the home screen).
2. Push the center button.
3. Select Mod. Settings using the down arrow to scroll and the center button to select.
4. Scroll through the settings using the up / down arrow keys.
5. Use the center button to select a setting.
6. Use the up / down arrow keys to change the value of a setting.
7. Use the center button to deselect a setting.
8. Scroll down and save all changes before exiting the Mod. Settings menu.
9. Select Mod. Settings again to verify changes were saved.

Table 6-1. Inverter Settings

Setpoint	Range	Default	Description
PLM_Channel	0 – 12	1	Channel for REbus communications. All devices in a system must use the same channel (except REbus Beacon). Do not set equipment to channel 0 unless performing ***Commissioning Multiple Inverter Systems***.
TargMaxImprtP	-30,000 to +30,000 Watts	0	Maximum Threshold for importing power before the battery will discharge in Self Supply Mode to offset.
TargMinImprtP	-30,000 to +30,000 Watts	0	Minimum power import maintained by charging the battery from the grid in Self Supply Mode.
EnaIslanding	on / off	on	Allows system to go into island mode, providing backup power during a utility service interruption. Turn this setting off for PV only installations.
NumTranSwtchs	0 / 1 / 2	0	Defines the number of external automatic transfer switches installed and enables transfer switch controls. For AC Coupled PV, this must be 1.
ExtTransVolt	80 – 140 Volts	95	Minimum voltage from the utility that must be present for the inverter to reconnect back to the grid. If an ATS is installed, this will be the voltage required for the inverter to control the ATS back to the normal (utility) position.
ExportOverride	on / off	off	Formerly called Zero Export, this setting will inhibit the PWRcell system from exporting power to the grid. This setting is for temporary use and will not satisfy CRD200 Import Only Compliance. See ***Set Export Override (optional)***.
CalOverride	on / off	off	Overrides inverter logic for automatic detection of included Generac current transformers (CTs).
CTTurnsRatio	1,500 – 3,000 Turns	1,500	Allows a different turns ratio to be set for specific CTs.
EnaLoadShed	0 / 1 / 2	0	Select 1 if using SMM devices to shed loads. Select 2 if using the PWRcell ATS Controller to shed loads (with or without SMMs).
GridParInvrtrs	1 – 2	1	This setting allows for two inverters to share one set of CTs. Set to 2 if daisy chaining CTs between two inverters.
ACPVPower	0 – 7.6 kW	0	Power rating of the attached AC coupled PV array. If no AC coupled PV array is attached leave at 0. Set this value to the cumulative power rating of all AC coupled PV systems connected to this inverter. This value must not exceed 7.6 kW. An incorrect higher value will result in insufficient charging of the batteries, an incorrect lower value will result in the possibility of an over-voltage event.
GenPower	0 – 24 kW	0	Reserved for future functionality.
GenCtrlMode	0 / 1 / 2	0	Reserved for future functionality.

Configuring with PWRcell Batteries

Systems with the PWRcell Battery must have the “EnaIs-landing” setpoint set to ‘on’ in order to enter Island Mode for backup. This setpoint is accessible through the Mod. Settings menu via the inverter device page.

Verify the PWRcell Inverter protected loads disconnect is in the ON position.

Verify Battery Disconnect Switch on the PWRcell Battery is ON.

NOTE: Reference the PWRcell Battery Installation and Owner’s Manual for advanced battery settings.

Set Export Override (optional)

NOTE: This feature requires CTs to be properly installed and calibrated prior to use. For more information on CT calibration, see ***Current Transformers (CTs)***.

NOTE: This feature is NOT intended to serve as a means of achieving compliance to utility interconnection requirements. To set for zero export compliance or export limiting, see ***Set Import / Export Compliance (optional)***.

This feature is suitable as a simple and easy option for systems pending permission to operate (PTO) where the utility does not specify a requirement for the system to be powered-off or otherwise disabled pending approval. When enabled, Export Override allows the user to restrict inverter export such that excess power is not sent back to the grid. The system limits solar power generation to match power consumption measured by the PWRcell CTs. Using the Inverter control panel, a user can find this feature on the “Mod. Settings” sub-menu for the inverter.

Set for Peak Shaving (optional)

The TargMaxImprtP and TargMinImprtP setpoints allow the building to deliberately import power from the grid within certain limits. This is useful for specialized applications, such as avoiding peak demand charges.

These setpoints are relevant to Self Supply mode only, and are only used for specific applications. See ***Table 6-2: Self Supply Setpoints***.

Table 6-2. Self Supply Setpoints

Setpoint	Description	Default	Units
TargMaxImprtP	**Target Maximum Import Power** • Maximum power imported from the grid at any point. • When the overall building load exceeds this setpoint, the inverter will supply additional power from the battery and solar array to keep grid import power below this level. • This maximum is not guaranteed. If insufficient battery and solar power is available to cover the load, then the grid will supply the additional power.	0	W
TargMinImprtP	**Target Minimum Import Power** • Use this setpoint to charge the battery from the grid. • If the overall building load is less than this setpoint, the inverter will import power to the battery to keep the grid import power up to the setpoint. • If the building load is above the setpoint, the inverter will stop importing additional power to charge the battery. • This minimum is not guaranteed. Once the battery is full, grid import power may fall below this level.	0	W

Set for AC Coupled PV (optional)

IMPORTANT NOTE: This feature requires the inverter firmware version to be 13760 or greater. Refer to ***Verifying Inverter Firmware Version*** for instructions. This feature requires the PWRcell Battery firmware version to be 12980 or greater. More information on requesting a firmware update can be found online at ***https://www.generac.com/resources-and-tools/ce-installer-resources/installation-resources***.

NOTE: For more information about the AC Coupled PV configuration and equipment compatibility, refer to ***AC Coupled PV***.

NOTE: For more information on inverter settings, refer to ***Table 6-1: Inverter Settings***.

1. At the home screen, press the center button and select Self Supply or Priority Backup system modes for operation with AC Coupled PV.
2. From the home screen, use the right arrow key to navigate to the inverter device page.
3. Push the center button to access the inverter device main menu.
4. Navigate to “Mod. Settings” using the down arrow key and use the center button to select.
5. Use the down arrow key to navigate to the setting 'NumTranSwtchs.'
6. Select the setting using the center button.
7. Use the up / down arrow keys to change the value. For AC Coupled PV, change this value to '1'.

8. Deselect the setting using the center button.
9. Use the down arrow key to navigate to the setting 'ACPVPower.'
10. Select this setting using the center button.
11. Use the up / down arrow keys to change the value corresponding to the AC power export rating of the AC coupled PV system. If multiple PV systems are AC coupled, this value is the sum of the AC power export ratings of the systems.

IMPORTANT NOTE: The maximum allowable power value is 7.6 kW; Do not integrate AC coupled PV system(s) with cumulative rated AC power export in excess of 7.6 kW.

12. Deselect the setting using the center button.
13. Use the down arrow key to navigate to the bottom of the “Mod. Settings” menu and select 'Save' using the center button to save settings changes.

Enable REbus Devices

⚠DANGER

Electrocution. Never enable any device during an installation or while wires are exposed. Doing so will result in death, serious injury, or equipment or property damage.

(000627a)

NOTE: All PWRcell devices are enabled and configured individually through the PWRcell Inverter control panel.

Following installation, the inverter must be enabled before all other REbus devices.

To enable the inverter:

1. See ***Figure 6-7***. Use the right arrow key to scroll to the inverter device page.
2. Verify inverter status reads disabled.

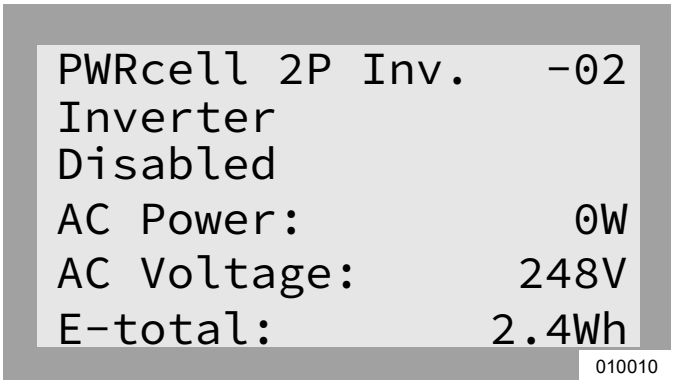


Figure 6-7. Enabling Inverter (1 of 4)

3. Press the center button.
4. See ***Figure 6-8***. Highlight Enable and press the center button.

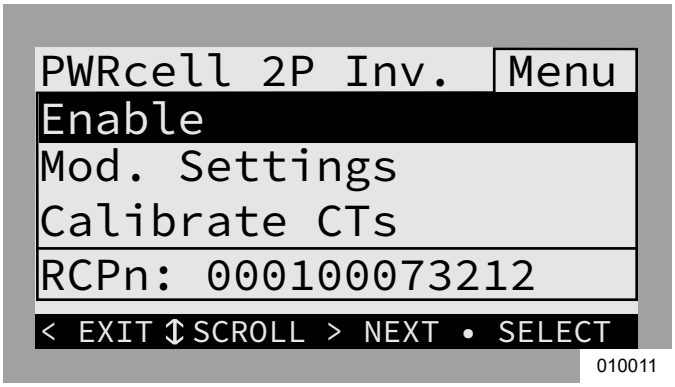


Figure 6-8. Enabling Inverter (2 of 4)

5. See ***Figure 6-9***. Arrow right and press center button to Confirm.

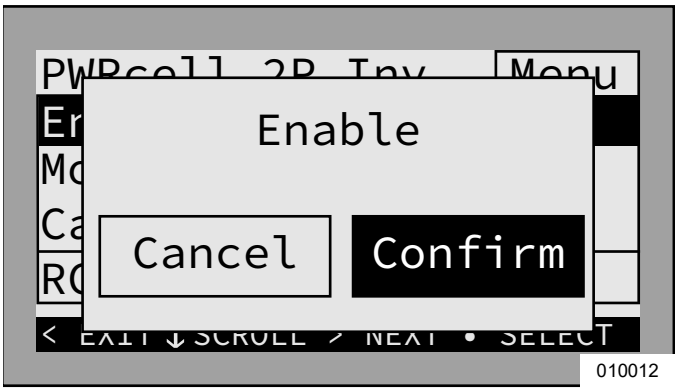


Figure 6-9. Enabling Inverter (3 of 4)

6. See ***Figure 6-10***. The inverter is enabled. It will create voltage at the DC terminals and begin communicating with connected REbus devices.

NOTE: Upon enabling the inverter high voltage will be present at the REbus DC terminals and all REbus DC wiring where the DC disconnects are turned ON for those circuits.

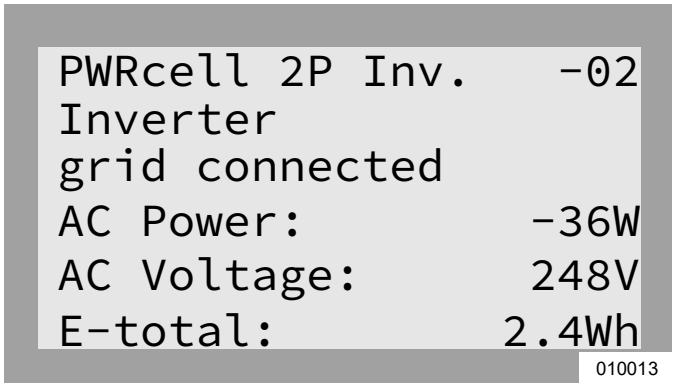


Figure 6-10. Inverter Enabled (4 of 4)

7. Enable all other REbus devices connected to the system by repeating steps 1 – 5 for each device. For further commissioning instructions for REbus devices, see their respective installation manuals.

Test Island Mode

To test Island Mode, AC power to the inverter must be disconnected. If configured to provide backup power to a protected loads subpanel, this may be accomplished by turning OFF the solar backfeed breaker or solar AC disconnect. If configured to operate with a PWRcell ATS, AC power must be disconnected to the inverter and the ATS to testing islanding.

- Ensure inverter setting “EnaIslanding” is set to 'on.'
- Ensure Protected Loads breaker at the inverter Power Core is in the ON position.
- Ensure system is set to an appropriate system mode (e.g., Clean Backup, Priority Backup, Self Supply).

NOTE: Exact electrical system configurations will vary. It is up to the operator to perform this test accurately for the configuration onsite.

NOTE: Per UL 1741, the PWRcell Inverter may require five minutes upon recovery from a grid outage or islanding event before exporting power.

Configure Time of Use (optional)

REbus Beacon allows the PWRcell system to manage energy production and storage over the course of the day. This is called Time of Use (TOU) energy management. To take advantage of this functionality, the PWRcell system must include a PWRcell Battery and a reliable connection to the Internet via an Ethernet connection to a router.

NOTE: Enable and setup the REbus Beacon for TOU scheduling only. Otherwise, do not enable the REbus Beacon.

Configuring and Running a TOU Schedule

1. See ***Figure 6-11***. Navigate to the Beacon device page and press the center button to enter the device menu.

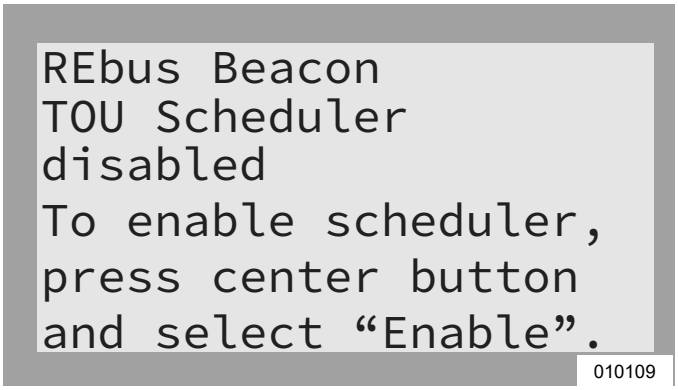


Figure 6-11. Configuring TOU Schedule (1 of 4)

2. See ***Figure 6-12***. Use the up and down arrows to highlight Mod. Settings and press the center button to enter the settings menu.

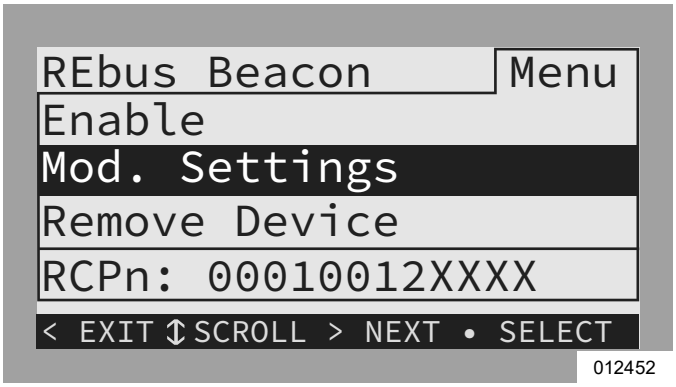


Figure 6-12. Configuring TOU Schedule (2 of 4)

3. See ***Figure 6-13***. Use the up and down arrows to highlight Access Code and press the center button to select.
4. Use the up and down arrows to set the Access Code to 57, and press the center button.

NOTE: The access code is valid for five minutes. After five minutes, the access code must be entered again to enable changes.

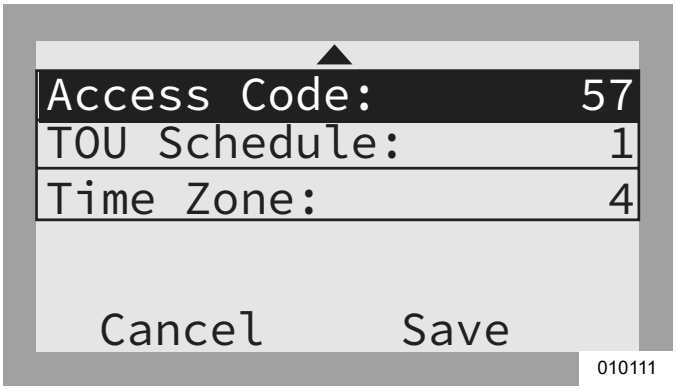


Figure 6-13. Configuring TOU Schedule (3 of 4)

5. Use the up and down arrows to highlight TOU Schedule and press the center button to select.
6. Use the up and down arrows to adjust the TOU Schedule code. Once the desired value is set, press the center button to exit edit mode.

NOTE: See the latest Time of Use Program Guide for current TOU schedule values. The program guide is available at **https://www.generac.com/resources-and-tools/ce-installer-resources/installation-resources.**

7. Set the Time Zone to the desired location based on ***Table 6-3: Time Zone Codes***. Once the desired value is set, press the center button to exit edit mode.

Table 6-3. Time Zone Codes

Time Zone	Units
UTC	0
US / Eastern	1
US / Central	2
US / Mountain	3
US / Pacific	4
US / Alaska	5
US / Hawaii	6
US / Arizona	7
US / Puerto Rico	8

8. See ***Figure 6-14***. To commit changes to all entries, highlight Save and press the center button.

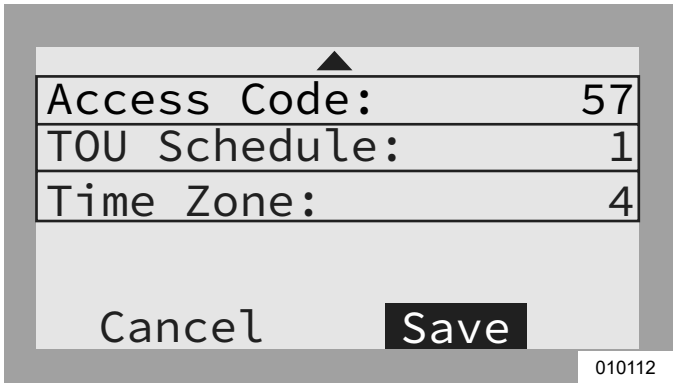


Figure 6-14. Configuring TOU Schedule (4 of 4)

See ***Figure 6-15*** and ***Figure 6-16***. When enabled, the LCD will alternate between a TOU Scheduler Running Screen and a Current System Mode screen. Both screens will display the time until the next system change and the mode the system will change to. The TOU Schedule name will be listed at the bottom of the device page.

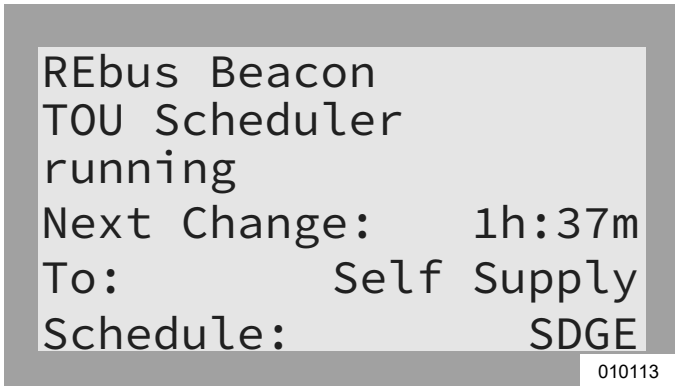


Figure 6-15. Running.

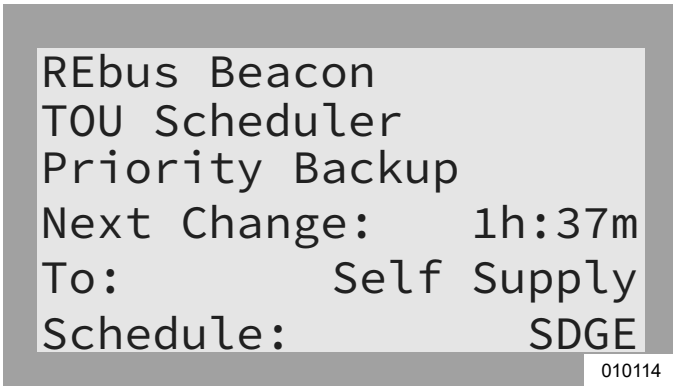


Figure 6-16. Current System Mode.

See ***Figure 6-17*** and ***Figure 6-18***. On the home page, the text above the power flow diagram will alternate between Scheduler Active and the current system mode.

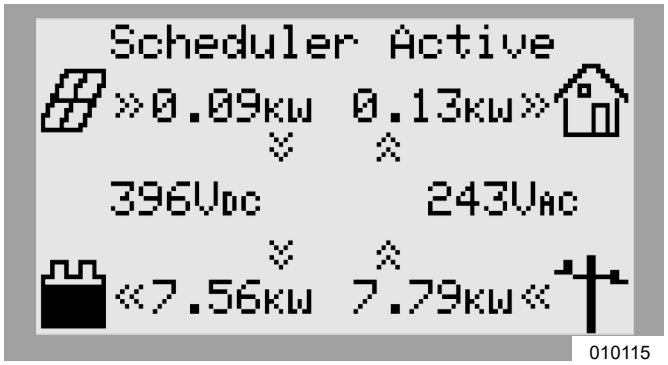


Figure 6-17. Scheduler Active

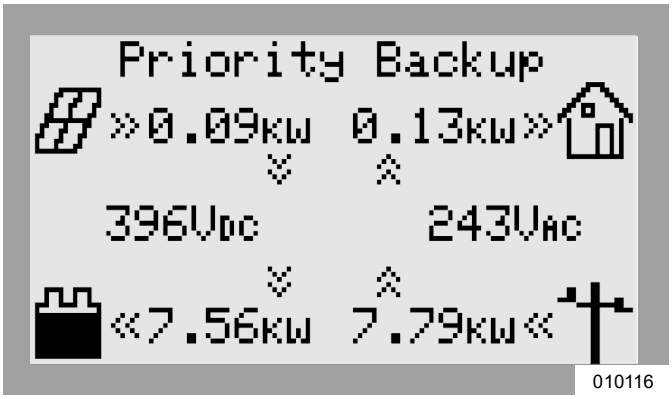


Figure 6-18. Current System Mode

Enabling Beacon TOU

Once the TOU Schedule is set, the scheduler will automatically enable itself and begin running. However, if the scheduler becomes disabled for any reason, follow the instructions below to re-enable the scheduler:

1. See ***Figure 6-19***. Navigate to the Beacon device page and press the center button to enter the device menu.

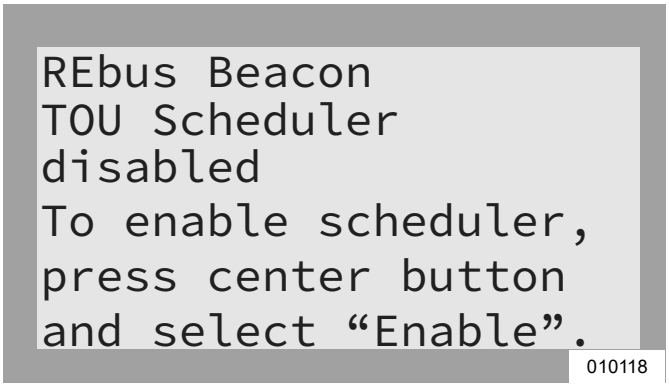


Figure 6-19. Enabling Beacon (1 of 2)

2. Highlight Enable and press the center button.
3. See ***Figure 6-20***. Arrow right to Confirm and press the center button.

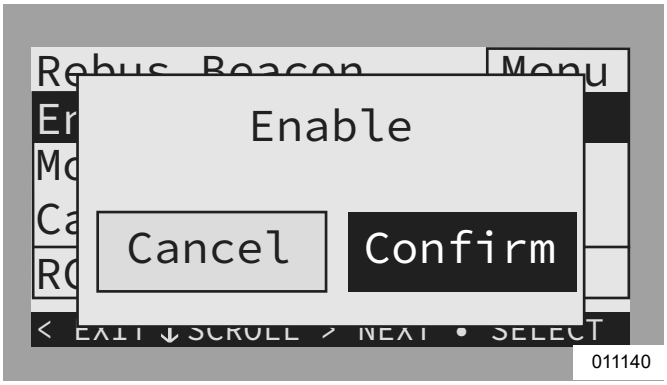


Figure 6-20. Enabling Beacon (2 of 2)

Disabling Beacon TOU

The scheduler can be disabled at any time. To disable the scheduler:

1. See ***Figure 6-21***. Navigate to the Beacon device page and press the center button to enter the device menu.

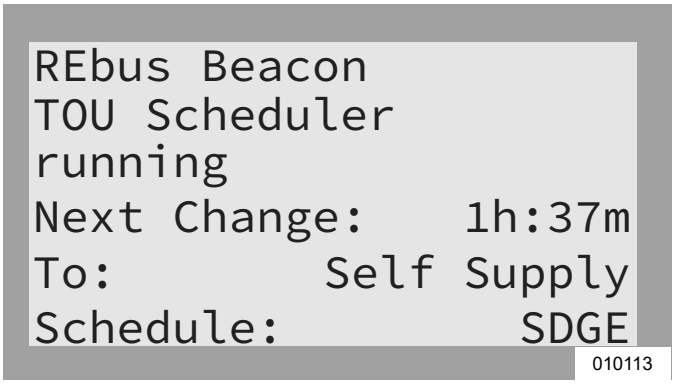


Figure 6-21. Disabling Beacon (1 of 3)

2. Highlight Disable and press the center button.
3. See ***Figure 6-22***. Arrow right to Confirm and press the center button.

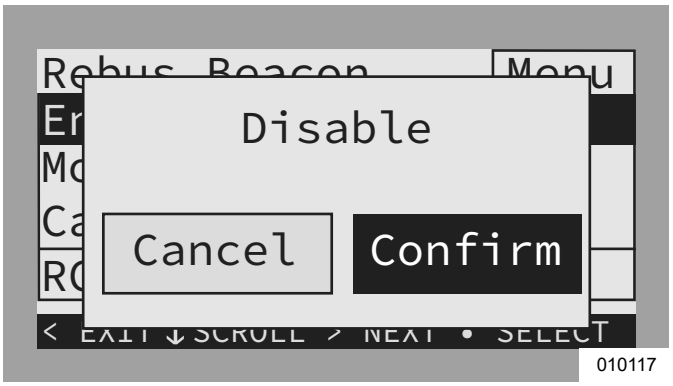


Figure 6-22. Disabling Beacon (2 of 3)

4. See ***Figure 6-23***. The status line on the Beacon device page will read Disabled.

NOTE: The system will remain in the current system mode until the mode is changed manually or the scheduler is re-enabled.

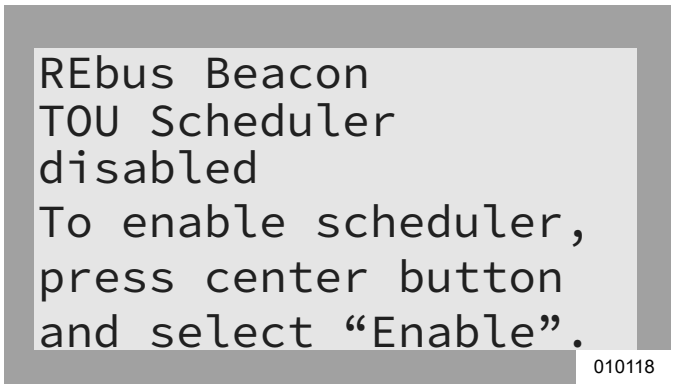


Figure 6-23. Disabling Beacon (3 of 3)

Temporarily Overriding the TOU Scheduler

The scheduler can be temporarily overridden at any time without disabling it. A manual override will apply until the next regularly scheduled system mode change.

To temporarily override the scheduler:

1. Navigate to the system home page.
2. Press the center button.
3. Select the desired temporary system mode.

When the scheduler has been overridden:

- Temporary Override will display on the home page, alternating with the words Scheduler Active and the name of the current system mode.
- See ***Figure 6-24***. Running, Overridden will display on the Beacon device page.

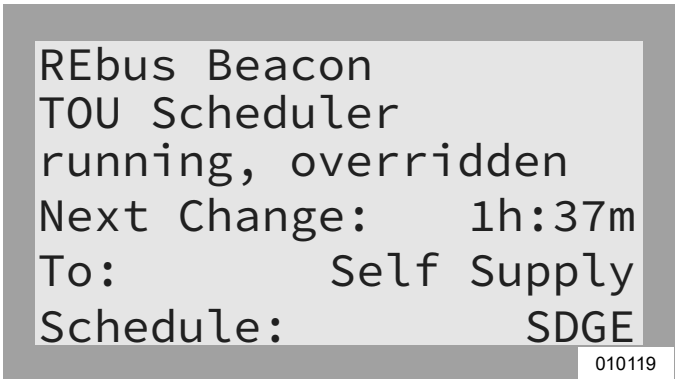


Figure 6-24. Overriding Scheduler

- The countdown timer on the Beacon device page will indicate the remaining time until the next mode change.

After the next scheduled mode change, the scheduler will resume normal operation.

Disabling the TOU Scheduler in Anticipation of a Grid Outage

In the event of an impending storm and potential outage, top off the battery by disabling the scheduler and switching the system mode to priority backup or clean backup mode.

To disable the TOU Scheduler:

1. Navigate to the Beacon device page and disable the scheduler. See ***Disabling Beacon TOU*** for more information.
2. Navigate to the system home page and change the system mode to a backup-only mode, such as Priority Backup or Clean Backup.
3. Once the emergency has passed, re-enable the scheduler. See ***Disabling Beacon TOU*** for more information.

NOTE: If Priority Backup mode is not listed with the other system modes, the system installer may have removed the mode to comply with utility rules. Some utilities do not permit a battery to charge from the grid.

Access Installer Configuration Tool (optional)

The Installer Configuration Tool allows configuration and provisioning of Generac PWRcell systems from a smartphone or laptop. The interface allows installers to configure basic settings, set inverter compliance, generate a compliance report, and understand system performance. The interface is only available on Generac PWRcell systems with a REbus Beacon installed. Close proximity to the Beacon is required for use. It is not possible to access this tool remotely. 45 minutes after being activated, the Beacon's WIFI signal will time out and may need to be reactivated.

NOTE: All PWRcell Inverters come with a REbus Beacon pre-installed.

How to Access the Installer Configuration Tool

1. Navigate to the Beacon device page on the PWRcell Inverter control screen and press the center button.
2. Select Installer Tool from the menu and click Confirm. This will activate the Beacon's Wi-Fi network.
3. Use a smartphone or laptop to connect to the Wi-Fi network SSID titled: REbus_Beacon_xxxx where xxxx is the last 4 digits of the Beacon's RCP number.

NOTE: The Beacon's RCP number can be found on the front of the Beacon located inside the inverter, as well as on the Beacon device page through the inverter's screen. To find this number through the inverter's screen press the center button on the Beacon device page. The RCP number will be displayed at the bottom of the menu screen.

4. Type in the password (labeled "CODE") for the REbus Beacon's Wi-Fi network.

NOTE: The code for the REbus Beacon's Wi-Fi network is located on the back of the Beacon inside of the inverter. The Beacon is mounted on the upper left-hand sidewall of the inverter housing. Unstick the Beacon to view the code labeled on the back.

NOTE: Where utility requirements contain provisions for security against adjusting compliance settings, consider removing code label for the Beacon after successful commissioning.

5. See ***Figure 6-25***. Open a web browser on a smartphone or laptop and enter 10.10.10.10 for the browser URL. The installer tool will appear in the browser.

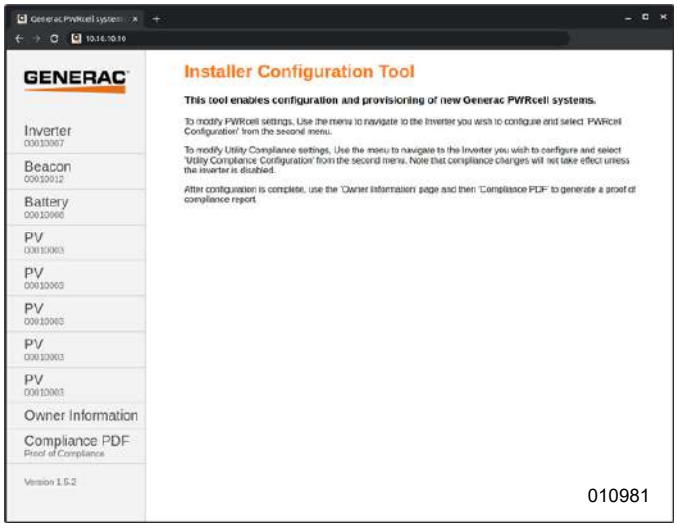


Figure 6-25. Installer Configuration Tool

Configuring Basic PWRcell Settings

NOTE: To customize basic settings, the inverter must be disabled. Before disabling the inverter, ensure all REbus devices have first been disabled. Settings changes will not be applied if the inverter is enabled.

1. Select Inverter from the menu.

NOTE: If using a smartphone, open the menu by clicking the hamburger icon in the upper-right corner of the screen. Laptop users will see the menu displayed on the left side of the screen.

2. Select PWRcell Configuration.
3. See ***Figure 6-26***. To adjust a setting, click on it, select the desired change, and click Submit. Any changes selected to be made, will not be implemented unless Submit is selected at the end.

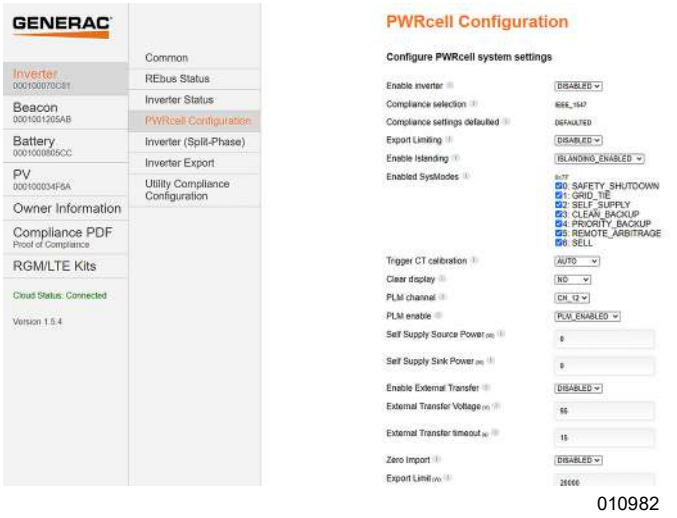


Figure 6-26. PWRcell Configuration

Most device settings can be adjusted through the inverter's screen with the exception of the following settings, which can only be adjusted though the Installer Configuration Tool:

- **Enabled SysModes.** Allows installers the option to disable system modes, such that they cannot be enabled through the inverter control screen. To disable a system mode, tap the checkbox to uncheck the box for that mode. Click Submit to save.
- **Clear Display.** Allows installers to wipe the screen of any unwanted devices being retained by the memory card in the screen module. Select Clear and click Submit. The screen will go blank and test its LEDs. Allow time for the screen to reload before accessing.
- **Export Limiting.** CRD200 Import Only compliance to limit export or achieve zero export. See ***Export Limit***.
- **Zero Import.** CRD200 Export Only compliance to remove the ability of the battery to charge from the grid. See ***Zero Import***.

Verifying Inverter Firmware Version

Some features, such as those found in ***Set Import / Export Compliance (optional)***, require inverter firmware that may not come default to the unit installed. The firmware version of an inverter can be verified using the Installer Configuration Tool. To verify the inverter firmware version in the Installer Configuration Tool, select the 'Common' submenu option under the "Inverter" object as shown in ***Figure 6-27***.

Figure 6-27. Verifying Inverter Firmware

The information populated upon selecting the 'Common' sub-menu option lists the manufacturer, model, version, and serial number for the inverter. The value displayed for 'Version' contains the hardware version and firmware version of the inverter displayed as the sequence of numbers separated by an underscore. Where an "H" represents the hardware version and an "F" represents the firmware version, the value shown for 'Version' would be "HHH_FFFFF.

Set Inverter Grid Compliance (optional)

NOTE: The inverter must be disabled before changing utility compliance settings. Before disabling the inverter, ensure all REbus devices have first been disabled. Compliance settings changes will not be applied if the inverter is enabled.

By default, all Generac PWRcell Inverters ship in compliance with IEEE 1547 to meet UL 1741. If the system needs to be configured to comply with a different grid interconnection standard, activate the new configuration via the Installer Configuration Tool. See ***Access Installer Configuration Tool (optional)*** for more information.

1. To set an inverter to comply with a utility's requirements, navigate to the drop-down menu in the upper right-hand corner of the Installer Configuration Tool home page and select Inverter from the drop-down menu.
2. See ***Figure 6-28*** Click on Utility Compliance Configuration and select the appropriate utility compli-

ance standard from the menu at the bottom of the page. Click Submit to apply the compliance standard. The settings entered will not take effect until the Submit button has been clicked.

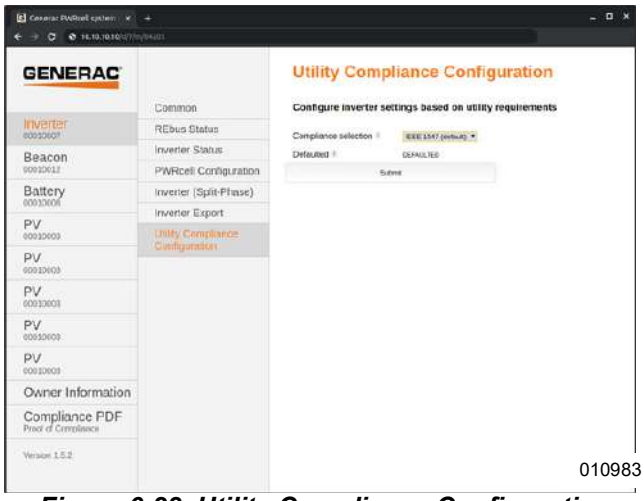


Figure 6-28. Utility Compliance Configuration

NOTE: Verify the Compliance Selection field shows the desired compliance rule after clicking Submit.

NOTE: For multi-system sites, compliance must be set on each inverter separately through each respective Beacon.

Proof of Compliance

See ***Figure 6-29***. The Compliance PDF validates whether the system has been set up to conform to a utility compliance ruleset. Please double check that the system is configured properly by observing the 'In compliance with' line in the PDF. If the utility requires proof of correct configuration, save this PDF and send it to the utility. It is recommend to keep a copy on file as well.

1. To generate a proof of compliance PDF, click on the Compliance PDF tab in the navigation menu.
2. Click on Download Report.
3. A new window will open in the browser with the report. Verify the information is correct and save the document or send via email.

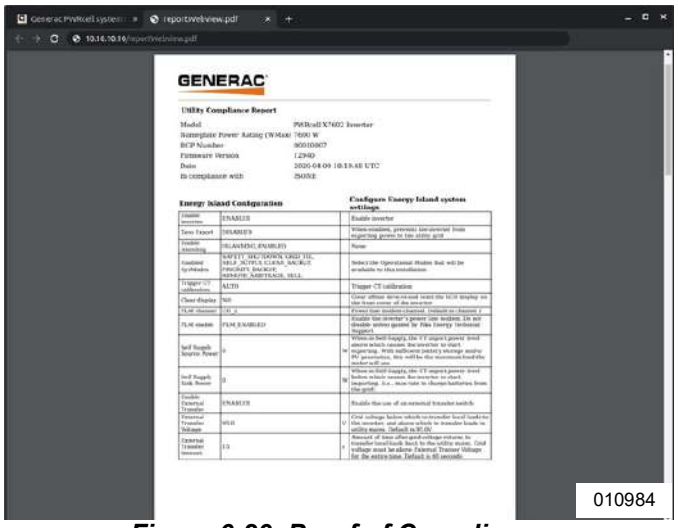


Figure 6-29. Proof of Compliance

Set Import / Export Compliance (optional)

By default, all Generac PWRcell Inverters ship without restrictions on import and export. Utility interconnection requirements may require the system to restrict or limit its ability to import or export power from or to the Utility grid. There are two PCS CRD200-compliant settings for PWRcell equipment: Zero Import and Export Limit.

NOTE: These settings are only available for inverter firmware version 13290 or greater. See ***Verifying Inverter Firmware Version*** for more details. To request a firmware update, please call 1-855-395-7841.

NOTE: Import / Export compliance settings rely upon proper CT functionality. Ensure CTs placement is correct for the system configuration, and ensure CTs are calibrated and functioning. See ***Current Transformers (CTs)*** for more information.

Zero Import

(CRD200 Export Only compliance): allows the battery to export power to a connected utility grid but will not allow the battery to be charged from the utility grid. In Zero Import, the battery will only be charged by connected DC PV power sources.

NOTE: Zero Import is one-time settable. Once set, some utilities may require the request to unset this setting to come from the utility. To unset Zero Import, please contact Generac PWRcell Technical Support.

How to set:

1. Navigate to the inverter device page.
2. Disable inverter if enabled.
3. Access the Installer Configuration Tool through the REbus Beacon. See ***Access Installer Configuration Tool (optional)***.
4. Once logged onto the Installer Configuration Tool, select "Inverter."

5. From the Inverter menu select “PWRcell Configuration.”
6. See ***Figure 6-30.*** Uncheck Priority Backup from the “Enabled SysModes” list.
7. Find the Zero Import setting and select “ENABLED”.
8. Click the “Submit” button at the bottom of the page.
9. Be sure to generate a compliance report once all compliance settings have been set. See ***Proof of Compliance*** section for more information.

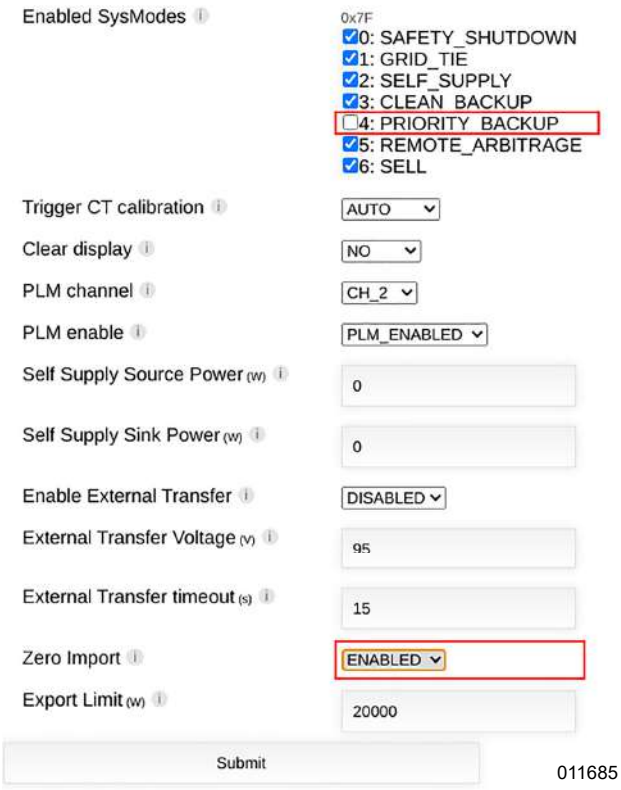


Figure 6-30. Zero Import

Export Limit

(CRD200 Import Only compliance): allows a qualified installer to restrict the export to a connected utility grid and set an Export Limit value. When the Export Limit value is set to 0, this setting functions as a “Zero Export” mode or CRD200 Import Only mode. For this setting's value to be active, the setting Export Limiting must be ENABLED.

NOTE: Export Limiting is one-time settable. Once set, some utilities may require the request to unset this setting to come from the utility. To unset Export Limiting, please contact Generac PWRcell Technical Support.

NOTE: Export Limit setting can only be decreased from its current value. To reset the value of this setting, please contact PWRcell Technical Support.

How to set:

1. Navigate to the inverter device page.
2. Disable inverter if enabled.
3. Access the Installer Configuration Tool through the REbus Beacon. See ***Access Installer Configuration Tool (optional)***.
4. Once logged onto the Installer Configuration Tool, select “Inverter.”
5. From the Inverter menu select “PWRcell Configuration.”
6. See ***Figure 6-31***. Find the Export Limiting setting and select “ENABLED”.
7. Scroll to the bottom and locate Export Limit.
8. Change the setting value. If Zero Export is necessary, make this value 0 (watts).
9. Click the “Submit” button at the bottom of the page.
10. Be sure to generate a compliance report once all compliance settings have been set. See ***Proof of Compliance*** section for more information.

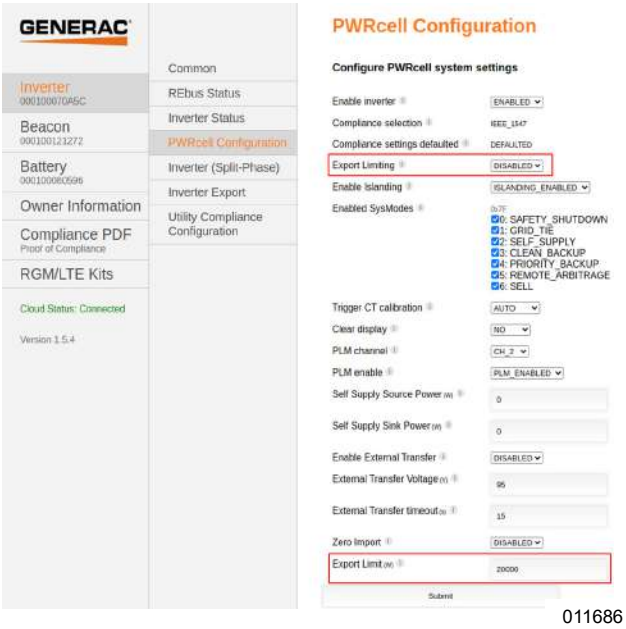


Figure 6-31. Export Limit

NOTE: These settings are included in the Compliance PDF. See ***Proof of Compliance*** section for more information.

Commissioning Multiple Inverter Systems

NOTE: Do not energize two or more inverters before commissioning. Energizing two or more inverters prior to commissioning will result in crosstalk.

PWRcell Inverters are manufactured with some common default parameters. One of these default parameters is the default Power Line Modem (PLM) channel. PWRcell Inverters use the PLM channel to communicate with and send commands to REbus-powered devices. In this way, a PWRcell Inverter behaves like a master device. If two or more master devices are communicating on the same PLM channel, REbus devices become unable to respond properly to the intended master device and the master devices will attempt to provide control for the other, often leading to communication and reporting issues. This is referred to as cross-talk.

How to identify PLM Crosstalk

Cross-talk can be easily identified by navigating to the device pages on an inverter control panel. If two inverter device pages exist, crosstalk has occurred. Similarly, if any REbus devices from one inverter show up on another, crosstalk has occurred.

NOTE: To differentiate one inverter device page from another, confirm the RCP numbers via the device page sub-menu.

NOTE: It is recommended to keep a list of which REbus devices are connected to specific inverters at multi-system sites.

Multiple Inverter System Pre-Commissioning Checklist

Before commissioning multiple inverter systems, confirm the following:

- Inverter systems (including PV Links and PWRcell Batteries) have been installed per manufacturer instructions and to local and state code requirements.
- PWRcell Batteries have their Battery Disconnect switches in the OFF position.
- PWRcell Inverters are powered off with no voltage present at their AC Grid terminals. Use an appropriately rated multi-meter/voltmeter to verify if AC voltage is present at the AC Grid terminals.

NOTE: To determine if the inverter is powered off, check the inverter control panel and the system backfeed breaker. When powered-off, the inverter control panel will be blank and the inverter backfeed breaker will be OPEN.

Multiple Inverter System Commissioning Procedure

NOTE: Throughout this process, it is important that only one inverter is energized at any time. If two or more inverters are energized at any point during this process, the inverters will cross-talk. To resolve crosstalk, see ***PLM Crosstalk Recovery Procedure***. After resolving crosstalk, the commissioning process will need to be restarted for the cross-talked inverters.

1. Close the AC backfeed breaker to supply AC power to one PWRcell Inverter AC Grid Input/Output Terminals. This will allow the inverter to energize and illuminate the Inverter control panel.
2. Perform ***Commissioning the System*** steps 1 – 5.
3. Modify the PWRcell Inverter PLM Channel to 0 in the inverter ‘Mod. Settings’ menu.

NOTE: PLM Channel 0 is a universal channel. Only use for inverters during programming. Do not set REbus devices to channel 0. Do not leave inverter on channel 0.

4. Choose a channel from 2 – 12 to use as the only number for addressing all devices on the system. The goal is to address the system to its own unique channel across all devices.

NOTE: Do not leave any device, including the inverter, on channel 0 or channel 1 by the end of the process.

5. Use arrow keys to navigate to all REbus devices (expect REbus Beacon) to change the PLM channel.
6. Access Mod. Settings for each device and change the PLM channel to the chosen channel (step 4) for that system. See device installation manual for specific instructions.
7. Modify the PLM channel setpoint for the PWRcell Inverter to match the PLM channel its REbus devices were set to in the previous step.

NOTE: Be sure to click Save at the bottom of the menu after modifying the channel on each device.

8. Turn off the inverter.

NOTE: It may take a few seconds for the inverter screen to power off due to capacitance in the Power Core. Wait until the screen goes blank before energizing the next inverter.

9. Once the inverter is powered down, proceed to the next inverter and repeat steps 1 – 9.
10. After programming each system separately, restore AC power to all PWRcell Inverters by closing their AC backfeed breakers, enable the inverters, and all REbus devices.
11. Finish commissioning of inverter systems by performing ***Commissioning the System*** steps 7 – 11. Optional steps may be skipped if not applicable.

PLM Crosstalk Recovery Procedure

For each PWRcell Inverter that has crosstalked, perform the following procedure to clear the foreign devices from the display after the multi-inverter system has been properly commissioned:

1. Power down all but one inverter.
2. Access the Installer Configuration Tool.
3. Navigate to the Inverter and select PWRcell Configuration.
4. Select Clear Display to wipe the screen of that inverter of unwanted devices from other systems on site.
5. Follow steps 1 – 8 for Multiple Inverter System Commissioning. See ***Multiple Inverter System Commissioning Procedure*** for more information.
6. Proceed to next crosstalked inverter and repeat this procedure.

Section 7: System Operation

General Information

The PWRcell system is a flexible, highly customizable system that can be configured in a number of ways to meet customer needs. Correct system configuration requires selecting the right equipment and the correct system mode for the system.

All REbus devices are configured and controlled through the Generac PWRcell Inverter. Connected devices will appear on the LCD display.

Operation and User Interface

See ***Figure 7-1***. Generac PWRcell is controlled through the PWRcell Inverter control panel. The inverter control panel is used for adjusting system settings and for interacting with devices.

- Use left and right arrows (A) to navigate between pages.

Press center button (B) on a device page to select or deselect device settings.

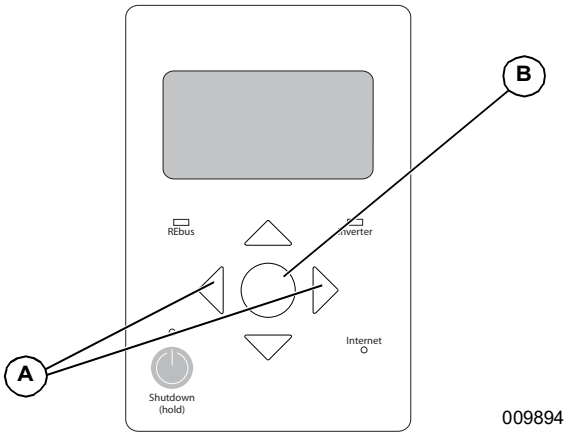


Figure 7-1. Inverter Control Panel

Home Screen

See ***Figure 7-2***. The power flow display on the home screen illustrates the flow of power in the system. As power is generated, stored, and consumed, animated arrows indicate the flow and direction of power. System AC and DC voltage levels are displayed near the center of the screen. The current system mode is displayed at the top of the screen.

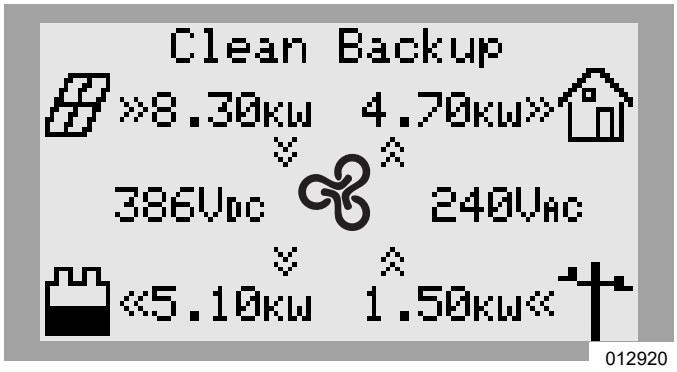


Figure 7-2. Home Screen

Home Screen Icons

	Represents the PWRcell Inverter.
	Represents the cumulative production of the solar array connected to PV Links.
	Represents PWRcell Batteries, if installed.
	Represents house loads including backup loads or AC Coupled AV if installed.
	Represents the Utility Grid when CTs are successfully calibrated. This icon will not appear on the home screen if CTs are not calibrated.

Activating the System Post Permission to Operate (PTO)

After a PWRcell system has been installed, it will need to be inspected and granted permission to operate (PTO). A PWRcell system may be left in one of two states while it awaits PTO:

1. **System Operating**: making power with 'Export Override' turned 'on' to restrict the system from exporting to the utility grid.
2. **System Disabled**: not making power with inverter and all components in a disabled state (inverter screen may still be illuminated).

NOTE: For systems with a battery and a protected loads panel, the inverter's grid connection should be closed with its 2-pole 40 A over current protection device in the ON position and the Protected Loads Disconnect in the inverter in the ON position. This will allow the protected loads panel to remain powered should the system be disabled awaiting PTO.

Activating Post PTO: System Operating

1. From the home page on the inverter control panel, use the right arrow key to navigate to the inverter device page.
2. Press the center button to access the inverter device main menu.
3. See ***Figure 7-3***. Use the down arrow key to scroll to “Mod. Settings.”
4. Select “Mod. Settings” using the center button.
5. See ***Figure 7-4***. Use the down arrow key to scroll to 'Export Override' and select using the center button.
6. Use the up/down arrow keys to change the value of 'Export Override' from 'on' to 'off.'
7. Use the center button to deselect 'Export Override.'
8. Scroll to the bottom of the “Mod. Settings” menu and select 'Save' to save the changes.

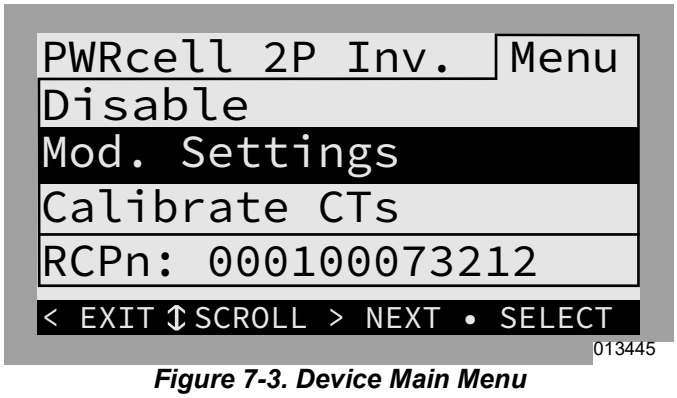


Figure 7-3. Device Main Menu

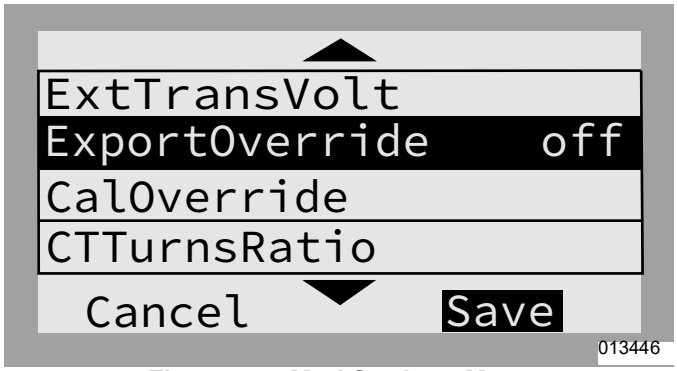


Figure 7-4. Mod Settings Menu

Activating Post PTO: System Disabled

1. Ensure the inverter is powered ON with the screen illuminated.
   a. If the inverter is powered OFF, close the 2-pole 40 A over current protection device for the inverter's AC grid connection by turning the breaker or disconnect to the ON position.
2. Lift the inverter lid and confirm the occupied DC Disconnects on the left-hand side of the inverter are in the ON position.
3. For systems with battery backup, ensure the Protected Loads Disconnect is in the ON position.
4. With the screen illuminated, from the home page on the inverter control panel, press the center button to access the system modes menu.
5. See ***Figure 7-5*** and ***Figure 7-6***. Use the up/down arrow keys to scroll to the desired system mode and select using the center button. See ***Select Inverter System Mode*** for further instructions. See System Modes Overview for details on functionality.

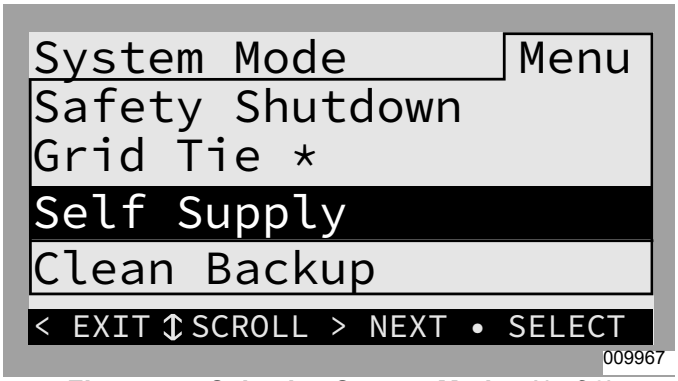


Figure 7-5. Selecting System Modes (1 of 2)

Figure 7-6. Selecting System Modes (2 of 2)

6. Enable REbus devices beginning with the inverter.
7. See ***Figure 7-7***. From the home page on the inverter control panel, use the right arrow key to navigate to the inverter device page.
8. See ***Figure 7-8***. Press the center button to access the inverter device main menu.
9. See ***Table 7-9***. Select “Enable” and 'Confirm' to enable the inverter.

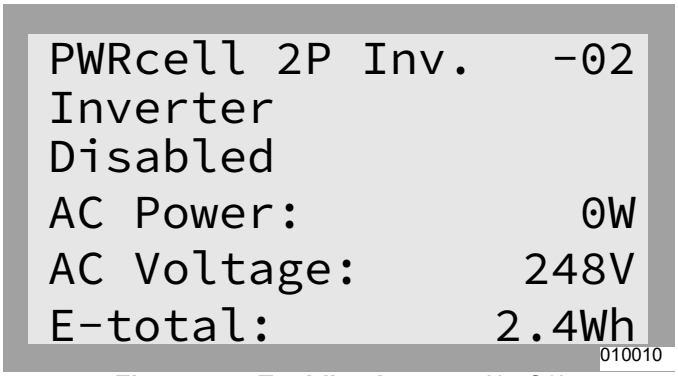


Figure 7-7. Enabling Inverter (1 of 3)

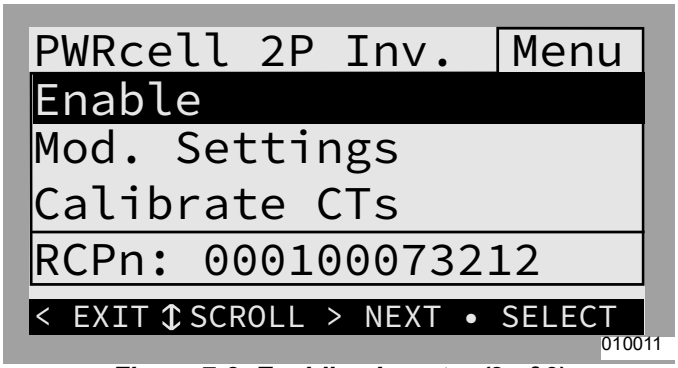


Figure 7-8. Enabling Inverter (2 of 3)

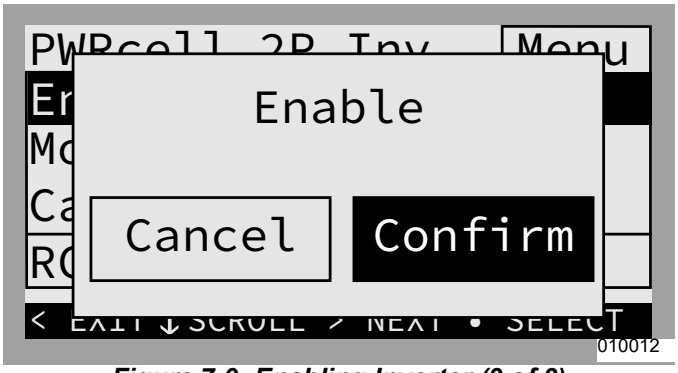


Figure 7-9. Enabling Inverter (3 of 3)

10. Once the inverter is enabled and in state, “grid connected,” scroll right and enable each PV Link and PWRcell Battery, repeating the process just performed for the inverter. See ***Figure 7-10***, ***Figure 7-11***, and ***Figure 7-12***. Also see Section 6: ***Commissioning Enable REbus Devices*** for more information.

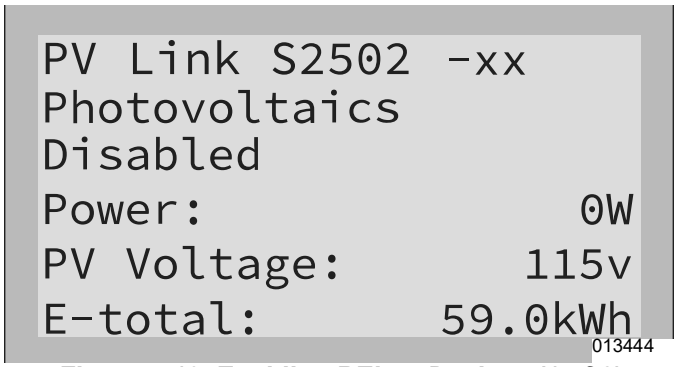


Figure 7-10. Enabling REbus Devices (1 of 3)

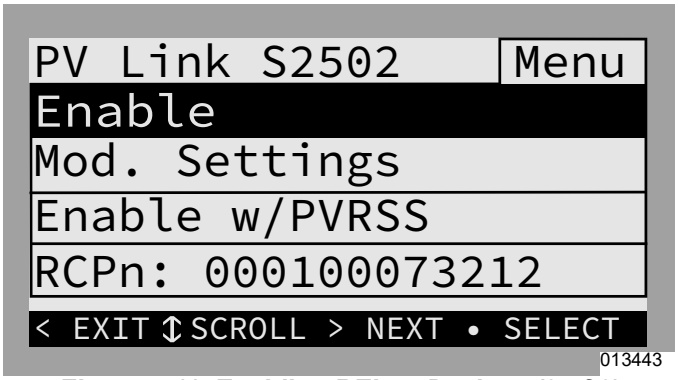


Figure 7-11. Enabling REbus Devices (2 of 3)

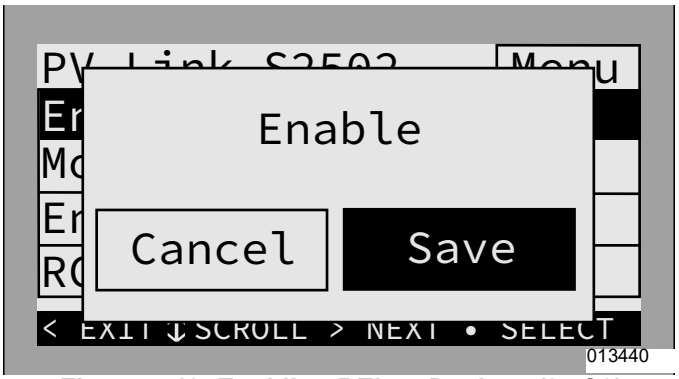


Figure 7-12. Enabling REbus Devices (3 of 3)

a. Notice there will be multiple pages of S2502 PV Links. Watch the horizontal cursor at the top of each page to indicate a new page. Press the center button on a device to reference its RCPn and confirm the device ID.

11. See ***Figure 7-13***. Confirm PV Links are in state, "making power."

a. See ***Figure 7-14***. If the PV Link goes directly to "low sun," disable the device and select "Enable w/PVRSS."

b. If the PV Link still goes directly to "low sun," contact the Independent Authorized Service Dealer (IASD) who installed the system.

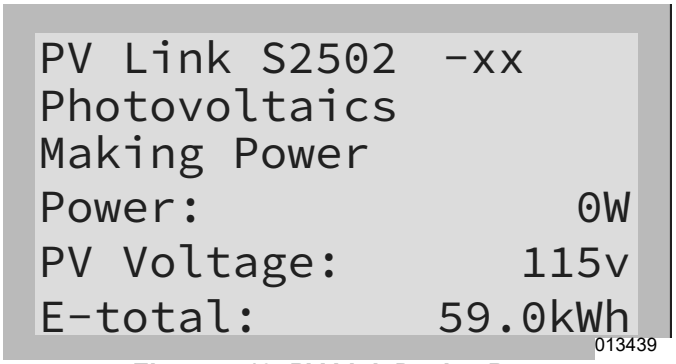


Figure 7-13. PV Link Device Page

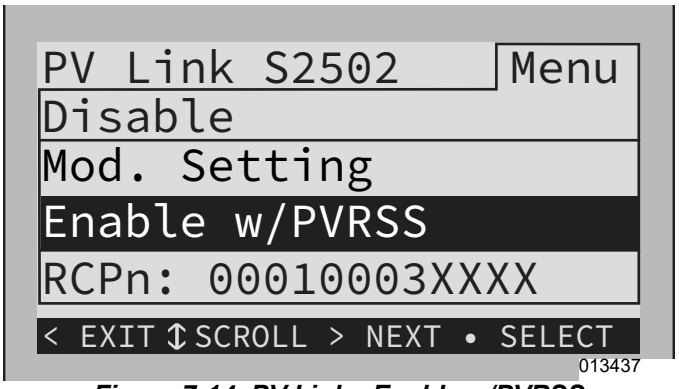


Figure 7-14. PV Link - Enable w/PVRSS

12. Confirm PWRcell Batteries are in state "standby," "charging," or "discharging" (state will depend on system mode selected).

NOTE: It is only necessary to enable the REbus Beacon if setting the system to operate on a Time of Use (TOU) schedule. See Section 6: ***Commissioning Configure Time of Use (optional)*** for more information.

Confirm Inverter Settings

Once the system is activated, confirm the system mode, and navigate to the inverter device page. Press the center button to access the "Mod. Settings" menu for the inverter, and confirm the settings are set correctly for the system installed.

PV Only System

– System mode should be "Grid Tie."

– See ***Figure 7-15*** and ***Figure 7-16***. Inverter "Mod. Settings:"

o 'EnaIslanding' should be 'off.'

o All other settings should be at their default values.

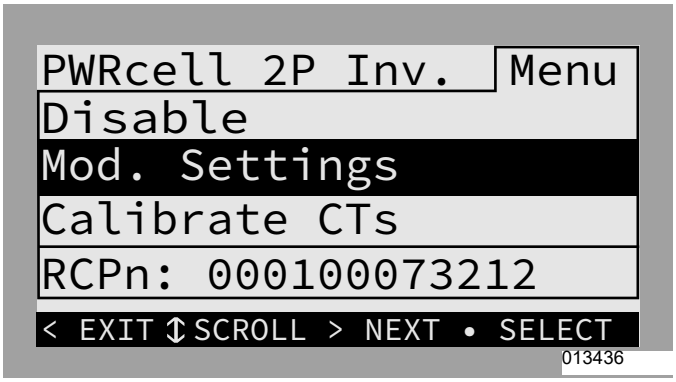


Figure 7-15. PV Only System (1 of 2)

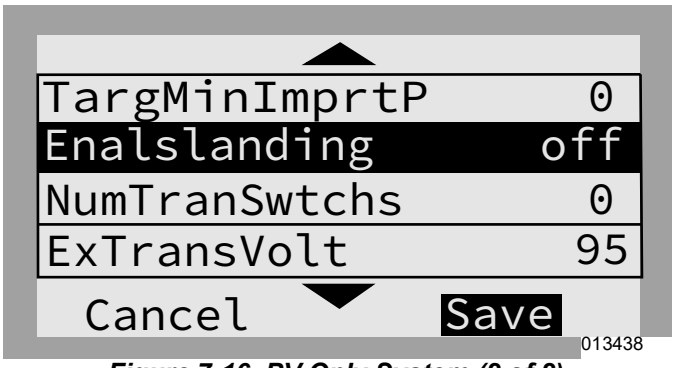


Figure 7-16. PV Only System (2 of 2)

PV + Battery w / a Protected Loads Panel for Partial Home Backup

– System mode should be Self Supply, Clean Backup, or Priority Backup.

– See ***Figure 7-17*** and ***Figure 7-18***. Inverter "Mod. Settings:"

o 'EnaIslanding' should be 'on.'

o All other settings should be at their default values.

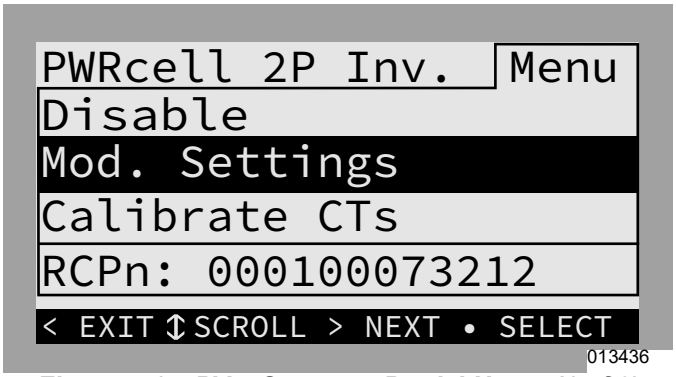


Figure 7-17. PV + Storage - Partial Home (1 of 2)

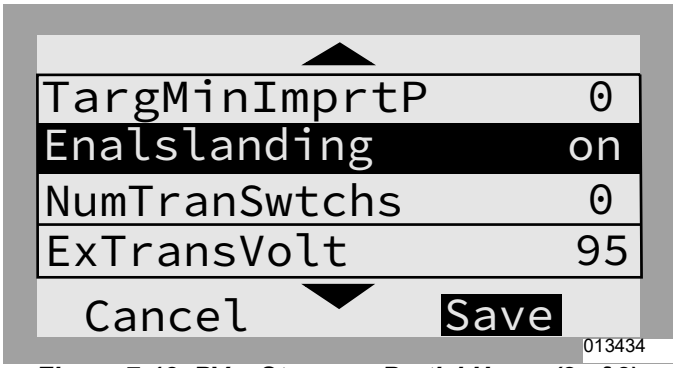


Figure 7-18. PV + Storage - Partial Home (2 of 2)

PV + Battery w / a PWRcell ATS and SMMs for Whole Home Backup

- System mode should be Self Supply, Clean Backup, or Priority Backup.
- See ***Figure 7-19***, ***Figure 7-20***, and ***Figure 7-21***. Inverter “Mod. Settings:”
  - o 'EnaIslanding' should be 'on.'
  - o 'NumTranSwtchs' should be '1.'
  - o'EnaLoadShed' should be '1' for SMMs only and '2' for SMMs + PWRcell ATS Controller for HVAC controls.
  - o All other settings should be at their default values.

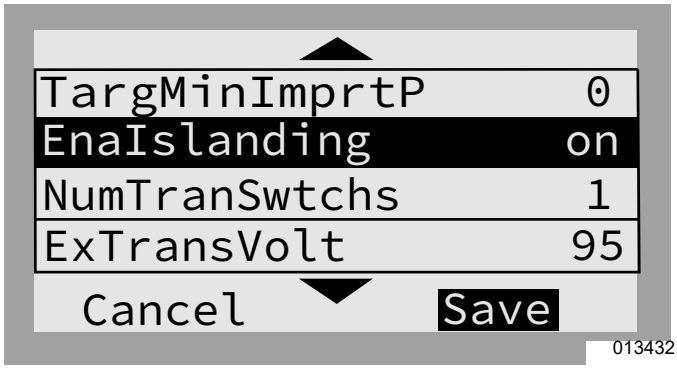


Figure 7-19. PV + Storage - Whole Home (1 of 3)

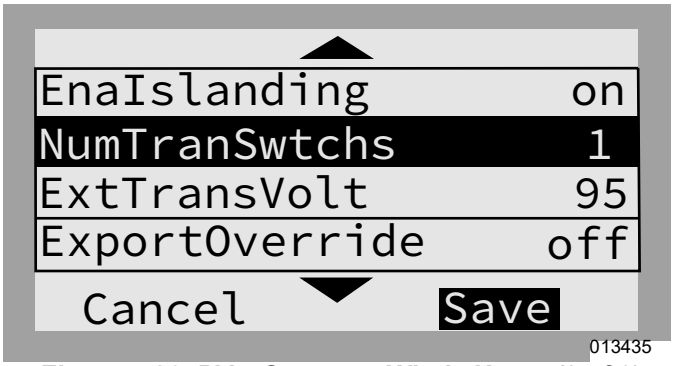


Figure 7-20. PV + Storage - Whole Home (2 of 3)

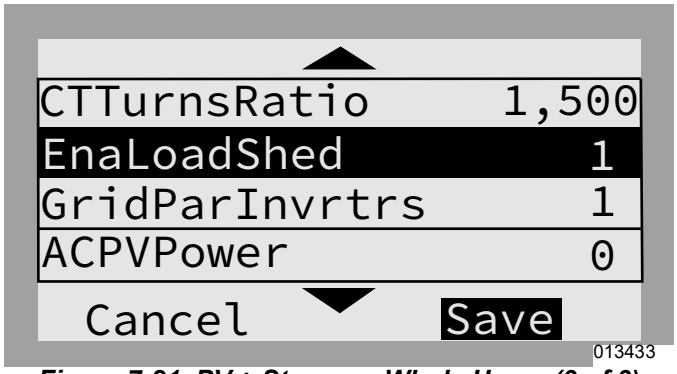


Figure 7-21. PV + Storage - Whole Home (3 of 3)

AC PV + Battery w / a PWRcell ATS and SMMS

- System mode should be Self Supply or Priority Backup.
- See ***Figure 7-22***, ***Figure 7-23***, ***Figure 7-24***, and ***Figure 7-25***. Inverter “Mod. Settings:”
  - o 'EnaIslanding' should be 'on.'
  - o 'NumTranSwtchs' should be '1.'
  - o'EnaLoadShed' should be '1' for SMMs only and '2' for SMMs + PWRcell ATS Controller for HVAC controls.
  - o 'ACPVPower' should be equivalent to the PV array installed.
  - o All other settings should be at their default values.

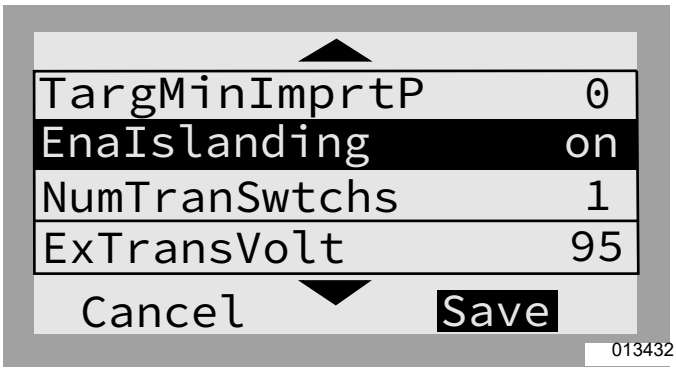


Figure 7-22. ACPV + Battery with a PWRcell ATS and SMMs

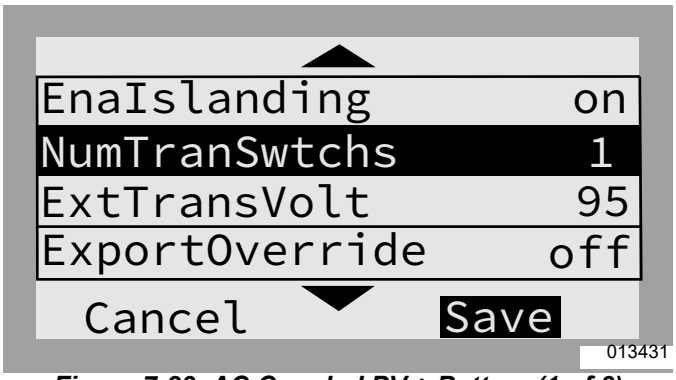


Figure 7-23. AC Coupled PV + Battery (1 of 3)

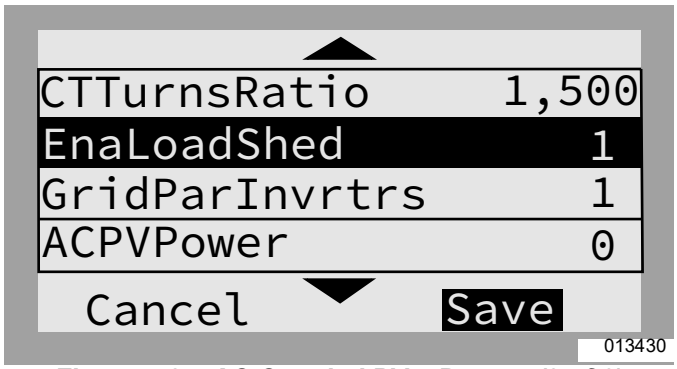


Figure 7-24. AC Coupled PV + Battery (2 of 3)

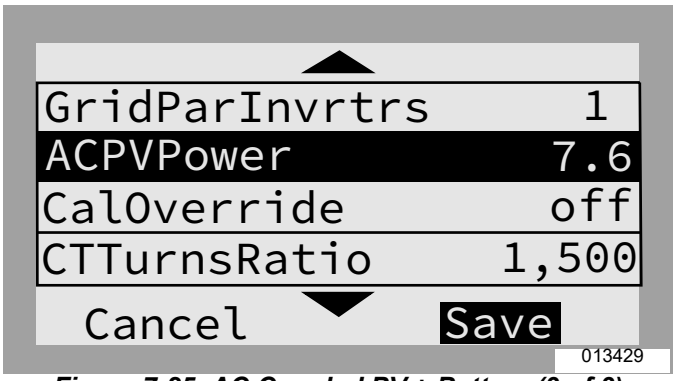


Figure 7-25. AC Coupled PV + Battery (3 of 3)

NOTE: Contact the Independent Authorized Service Dealer (IASD) who installed the system if unsure of how to proceed with any of the actions above.

System Modes Overview

Generac PWRcell offers several system modes for various installation configurations, markets, and applications. Connected REbus devices work together to manage the distribution of power based on the selected system mode. Some modes interact with PWRcell Batteries to store power and/or balance production and consumption. See ***Table 7-1*** and ***Table 7-2*** for an overview of available system modes.

Table 7-1. Grid Connected Inverter System Modes

Priority	Grid Tie	Self Supply*	Clean Backup	Priority Backup*	Sell
1	Support local loads.	Support local loads with PV and batteries.	Charge batteries from PV only.	Charge batteries from PV.	Exports maximum amount of power using any energy available.
2	Export to grid.	Charge batteries from PV.	Support local loads with PV.	Charge batteries from grid.	Charge batteries from excess PV energy.
3	–	Export to grid.	Export to grid.	Support local loads with PV.	–
4	–	–	–	Export to grid.	–

Suitable for AC Coupled PV. In this application, PV energy is generated by the AC Coupled PV system only. For more information, see **AC Coupled PV.*

Table 7-2. Optimal System Mode for Goal

Goal	Optimal Inverter Configuration
Net-metering solar energy without a battery.	Grid Tie
Use grid as little as possible.	Self Supply
Keep batteries charged using only solar power.	Clean Backup
Keep batteries charged as much as possible.	Priority Backup
Export maximum power including stored energy.	Sell

Grid Tie

In Grid Tie mode, the PWRcell Inverter functions as a conventional grid-tied inverter system. The system powers local loads and when generation exceeds load demand, excess power is exported to the utility for net metering and other credits.

NOTE: Grid Tie is intended for use with systems that do not include a PWRcell Battery. For systems where a PWRcell Battery will be connected at a later date, operate in Grid Tie mode until the battery is installed.

Self Supply

NOTE: This feature requires CTs to be properly installed and calibrated prior to use.

In Self Supply mode, the inverter prioritizes powering local loads first using solar and/or stored power. This mode is optimal in markets where net metering is unavailable or unfavorable, making battery-stored power more economically attractive than power from the utility grid.

See ***Figure 7-26***. If more power is being produced by the solar array than is needed by local loads, the inverter stores the energy in the battery for later use.

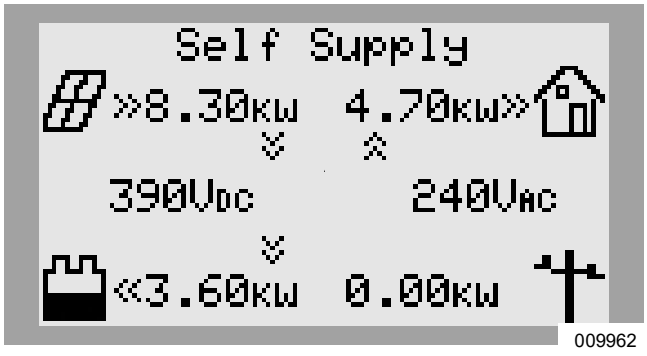


Figure 7-26. Self Supply (1 of 3)

See ***Figure 7-27***. When the battery is full and a surplus of power is available, that surplus is exported to the grid.

Figure 7-27. Self Supply (2 of 3)

See ***Figure 7-28***. When local demand exceeds available solar power, the battery will discharge to offset the demand. If the building requires more power than the battery and solar can provide, the excess demand is drawn from the grid.

Operating in Self Supply mode, the battery will discharge on a daily basis to the minimum reserve setting on the PWRcell Battery. The setting MinSocRsrv comes default set to 30 percent. This means a system operating in Self Supply, while grid connected, will only use up to 70 percent of the battery's stored capacity, leaving at least 30 percent available for Island Mode in the event of a utility service interruption.

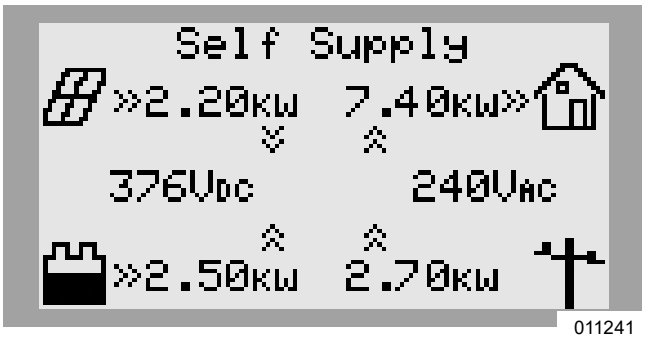


Figure 7-28. Self Supply (3 of 3)

Clean Backup

NOTE: Grid power is not used to charge batteries in this mode.

See ***Figure 7-29***. In Clean Backup mode, the inverter prioritizes keeping the battery charged and ready for a grid interruption using solar power only. If the battery is not fully charged, the inverter uses all available solar power to charge the battery. PWRcell Batteries will not export to grid in this system mode.

See ***Figure 7-30***. When the battery is fully charged, solar power will flow to local loads and the grid.

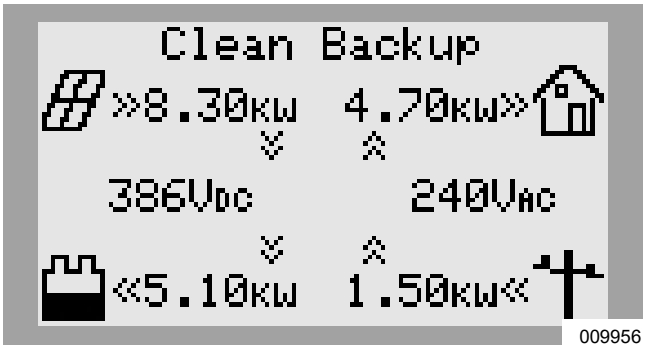


Figure 7-29. Clean Backup (1 of 2)

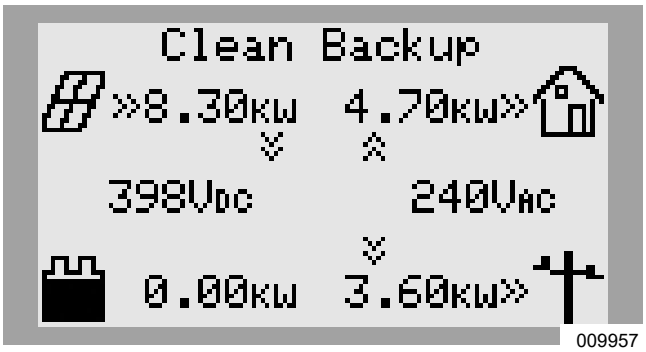


Figure 7-30. Clean Backup (2 of 2)

See ***Figure 7-32***. If there is a utility service interruption while operating in Clean Backup, the system will enter Island Mode. Protected loads will be supported by solar and battery power. If enough solar power is available, solar will simultaneously charge the battery and support the loads.

Priority Backup

In Priority Backup mode, the inverter prioritizes keeping batteries charged and ready for grid interruption using solar or grid power. If the battery is not fully charged, all available solar power is used to charge the battery. When the available solar power is lower than the battery input power rating, the inverter uses grid power to expedite battery charging. PWRcell Batteries will not export to grid in this system mode.

See ***Figure 7-31***. If solar and grid power are available, both can charge the battery. The system displays the amount of power being drawn from the grid and the amount of power being consumed by local loads before reaching the battery.

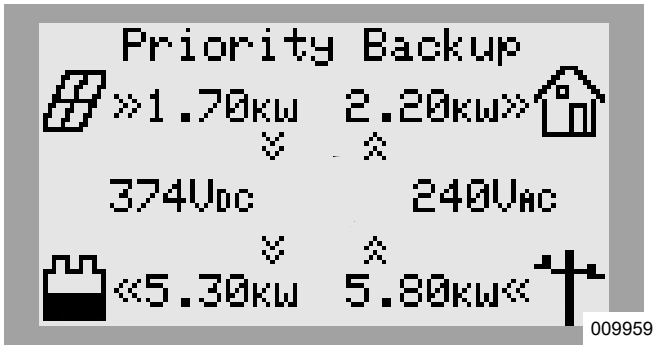


Figure 7-31. Priority Backup

See ***Figure 7-32***. If there is a utility service interruption while operating in Priority Backup, the system will enter Island Mode. Protected loads will be supported by solar and battery power. If enough solar power is available, solar will simultaneously charge the battery and support the loads.

Remote Arbitrage

This system mode is only to be enabled and configured for Distributed Energy Resource (DER) aggregation for the purposes of explicit control of a PWRcell system via IEEE 2030.5 communication protocol.

By default, this system mode is not enabled or selectable via the inverter control panel. If this system mode is enabled and selected without proper configuration, the inverter will not export AC power through its AC Grid Connection terminals. By default, in the event of an outage in this system mode, local loads connected to the Protected Loads terminals may be supported by available PV and ESS power depending on the configuration of the PWRcell system and inverter settings.

Sell

Sell mode sets the system to export all available DC power to the grid up to the rated grid-tied output maximum. Available power from solar is exported first, followed by stored energy from the battery. When exporting power, connected batteries discharge to the grid until their state of charge reaches the MinSocRsrv setpoint. Once a battery is depleted to this point, it will not charge again until either of the following are true:

- Solar production exceeds the inverter rated grid-tied output power maximum.
- The inverter system mode is changed to a system mode prioritizing battery backup.

See the ***Generac PWRcell Battery Installation Manual*** for more information.

Island Mode

In the event of a grid outage, the PWRcell Inverter enters Island Mode. While in Island Mode, the inverter disconnects from the utility grid and powers the building from the REbus nanogrid. In a typical solar-plus-storage configuration, this means all REbus-connected batteries will work together with the PV links to supply power to REbus. The inverter will pull power from REbus to provide AC power to protected loads.

In Island Mode, the inverter will display “Islanding” on the home screen and a status of “islanded” on the inverter device page. Herein, use of islanding and islanded refer to Island Mode.

Figure 7-32. Island Mode

NOTE: To enter Island Mode, the inverter setpoint, “EnaIslanding”, must be set to ‘on’ (default value) and the system mode can not be set to Grid Tie.

NOTE: If EnaIslanding is set to “off” when an outage occurs, the inverter will disconnect from the grid and enter Standby state if DC power is available from REbus devices. If DC power is not available from REbus devices, the inverter will power off. Backup loads will not be powered.

Table 7-3. Island Mode AC Short Circuit Current Contribution

Peak AC short-circuit current contribution	370 A p-p
Peak output fault current duration	300 us
Peak output RMS fault current	125 A rms
Max 3-Cycle RMS output fault current	47.7 A rms
Max fault current duration (Current limit in overload 32 A rms)	6.23 s

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Section 8: Maintenance

Service

⚠DANGER

Electrocution. Verify all system voltages are safe before wiring. Disconnect all AC and DC sources of power before touching terminals. Failure to ensure no dangerous voltages are present on conductors and terminals before wiring will result in death or serious injury. (000642)

⚠DANGER

Electrocution. Initiate a system-wide shutdown and turn the PWRcell DC Disconnect Switch OFF on all connected batteries before performing service. Failure to do so will result in death, serious injury, or equipment and property damage. (000600)

For any servicing needs, contact the nearest Independent Authorized Service Dealer (IASD), contact Generac PWRcell Technical Support at 1-855-635-5186, or call Generac Customer Service at 1-888-436-3722 (1-888-GENERAC), or visit ***www.generac.com***.

Accessing Wiring Compartment

To access the wiring compartment:

1. Initiate an inverter shutdown.
2. Allow DC voltage to drop to below 10 VDC.
3. See ***Figure 8-1***. Open all PWRcell DC Disconnects (A). Verify DC voltage reported on LCD screen has dropped to below 10 VDC.
4. Disconnect AC Grid source from inverter. Wait for Inverter LCD screen to turn off.
5. Open inverter front cover by lifting the bottom to horizontal (B) and pushing inward (C).
6. Locate wiring compartment cover (D).
7. Remove five M4X10 screws (E) and wiring compartment cover.
8. Verify all PWRcell DC and AC terminals are below 10 V.

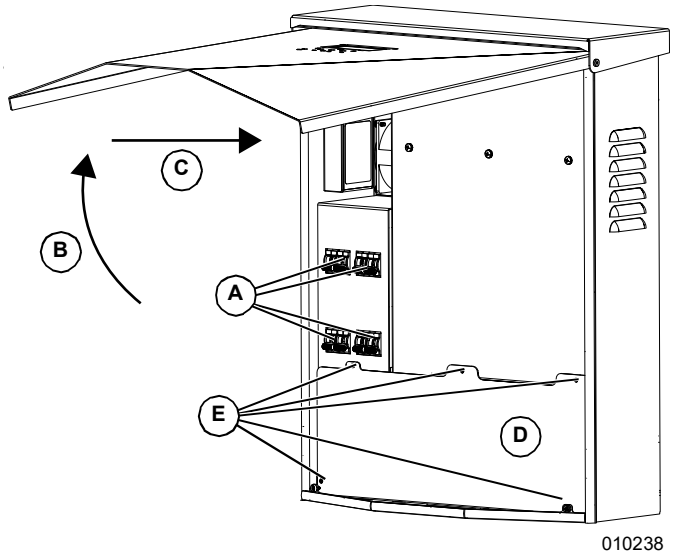

Figure 8-1. Wiring Compartment

Replacing Fuses

⚠CAUTION

Equipment damage. Never replace a fuse with a different size or style. Doing so will void the inverter warranty and could result in equipment or property damage. (000653a)

⚠CAUTION

Equipment damage. Never remove DC fuses under load. Removing DC fuses under load could result in equipment or property damage. (000652a)

Two main fuses are installed between the Power Core and the PWRcell DC Disconnects. See ***Accessing Wiring Compartment*** for location.

If a main fuse has blown, determine the root cause of the issue before replacing it. For assistance, contact the nearest Independent Authorized Service Dealer (IASD), contact Generac PWRcell Technical Support at 1-855-635-5186, or call or Generac Customer Service at 1-888-436-3722 (1-888-GENERAC), or visit ***www.generac.com***.

To replace a fuse:

1. Initiate an inverter shutdown. See ***Shutdown Mode*** for more information.
2. See ***Figure 8-1***. Open all PWRcell DC Disconnects (A). Verify DC voltage reported on LCD screen has dropped to below 10 VDC.
3. Disconnect all sources of AC and DC Power.
4. Remove wiring compartment cover. See ***Accessing Wiring Compartment***.
5. See ***Figure 8-2***. Locate DC fuse holders (B).
6. Using a multi-meter, verify all PWRcell DC and AC terminals are below 10 V.
7. Press fuse holder up and turn counterclockwise to release.
8. Remove fuse from fuse holder and check for continuity using a multi-meter.
9. Insert replacement fuse into fuse holder.
10. Reinstall fuse holder. Turn clockwise until tight.

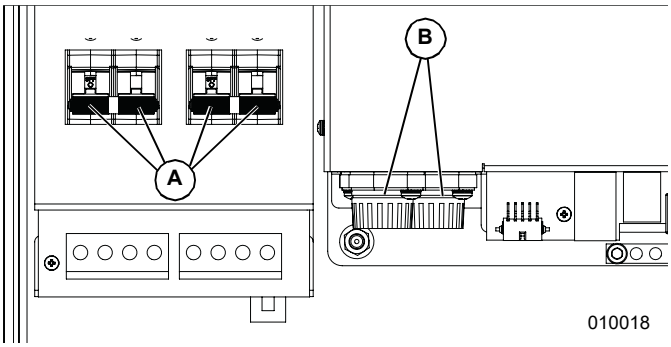

Figure 8-2. Removing Wiring Compartment Cover

Annual Maintenance

On an annual basis:

- Clean the exterior of the enclosure with a soft cloth.
- Ensure surrounding area is free of leaves, pet hair, or other debris that could obstruct airflow in or out of the unit.
- Inspect the unit. Look for conditions that could hinder performance or safety, such as (but not limited to):
  - Blocked vents
  - Dirty intake filter
  - Loose/missing hardware
  - Loose or broken electrical connections.

Inspecting Vents

See ***Figure 8-3***. Verify intake vent (A) and exhaust vent (B) are clear at all times.

Cleaning Intake Filter

See ***Figure 8-3***. Clean intake filter (A) with a soft brush or vacuum cleaner. If air filter is damaged or becomes difficult to clean contact the nearest Independent Authorized Service Dealer (IASD) or Generac Customer Service at 1-888-GENERAC (1-888-436-3722) or visit ***www.generac.com*** for a replacement filter.

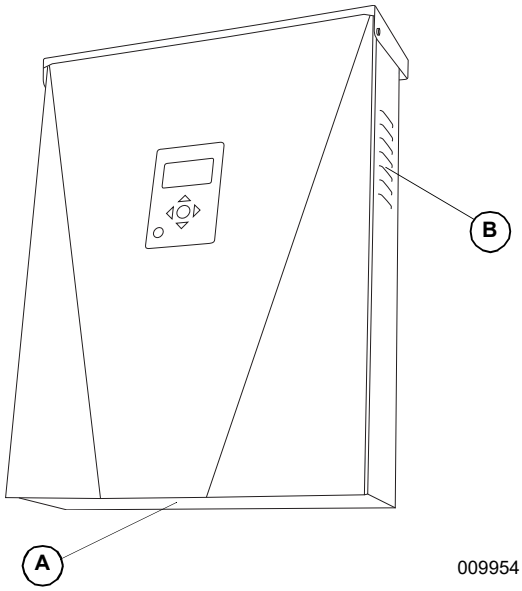

Figure 8-3. Intake Vent and Exhaust Vent

Section 9: Troubleshooting

General Troubleshooting

Some of the more common problems are listed in the table below. This information is intended to be a check or verification that simple causes can be located and fixed. It does not cover all types of problems. Procedures that require in-depth knowledge or skills should be referred to an Independent Authorized Service Dealer.

Table 9-1. General Troubleshooting Guide

Problem	Possible Cause	Solution
System will not exit Shutdown	External shutdown button depressed	Release external shutdown button.
	No jumper between STOP terminals	Verify jumper is in place between STOP terminals.
CTs will not calibrate	Loose connection	Check CT wiring.
		Trigger manual CT calibration from the inverter device menu.
No REbus Beacon device page	Beacon USB cable not connected	Verify the USB cable is correctly connected to the Beacon and also to the Beacon accessory port in the inverter wiring compartment. Inspect exposed sections of cable for damage.
	Beacon wrap-around cable not connected	Verify the short wrap-around cable is plugged into Beacon, from one port to the other.
Inverter isn't connected to server	Inverter not connected to the Internet	Verify the inverter is connected to the Internet via a router.
During an extended or multi-day grid outage, the system turned OFF overnight (i.e. the screen went blank).	The battery may have discharged to its Minimum State of Charge (SoC) and gone to sleep. See Sleep Mode in the PWRcell Battery Owner's Manual.	Wait until grid power returns or until the sun rises. In an extended outage, the battery will perform a power search every hour for four minutes (default). Once solar power is detected during a power search, the battery will keep the system awake and begin charging/powering loads. See Power Search and reference the Battery Status LED in the PWRcell Battery Owner's Manual.
Utility grid power went out; backup loads are not being powered; inverter screen is ON.	The protected loads disconnect on the inverter Power Core may be in the OFF position.	Turn the inverter protected loads disconnect to the ON position.
Utility grid power went out; backup power is cycling on and off; Inverter screen is powered ON.	This could be due to an overload condition where having too many house loads on at one time has caused the inverter to protect itself by purposely blacking out and cycling on at an increasing interval.	Inverter LED will be alternating at an interval- blinking green, then solid red. The home screen and the inverter device page will show "Islanding" or "Islanded" respectively, alternating with "Island Overload." Reduce house loads to recover from this condition.
Utility grid power went out; backup loads are not being powered; screen went blank.	The battery may not have been properly connected or fully commissioned prior to the outage. Reference Battery Status LED table in PWRcell Battery Owner's manual for confirmation of battery state/ functionality.	Contact Independent Authorized Service Dealer (IASD) for service.
Utility grid power has been restored after an outage; backup loads are not being powered; screen is ON.	REbus sources are depleted or not available (battery / PV Links). The inverter assumed worst case scenario and protected itself from overload.	Cycle the inverter backfeed breaker OFF/ON. If problem persists, contact Independent Authorized Service Dealer (IASD) for service.

If problems persist, contact the nearest Independent Authorized Service Dealer (IASD), contact Generac PWRcell Technical Support at 1-855-635-5186, or call Generac Customer Service at 1-888-436-3722 (1-888-GENERAC).

Overload Behavior

Table 9-2. Overload Behavior

Island Overload Event	Cause	Behavior	Solution
Overload on Voltage (vulnerable when battery has low SoC)	Motor load has demanded additional current for starting causing voltage to drop below allowable threshold.	– If inverter output voltage drops below 114 V, inverter will attempt to shed any loads connected to SMMs by dropping frequency. – If the inverter drops below 96 V for more than 6 sec (loads will brown out during this time), the system will blackout all loads.	– Turn OFF motor loads – Reduce house loads as necessary
Overload on Current (most vulnerable to this condition when system does not have an external ATS)	Cumulatively, there is too much load on the inverter system.	– If inverter experiences current greater than 35 amps L-N, the inverter will prevent transfer back to the grid and system will stay islanded. – If inverter experiences current greater than 35 amps for more than 15 seconds it will blackout and attempt to power loads at an increasing interval between attempts, starting at 20 sec up to a maximum of one hour.	– Reduce house load

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