YASKAWA
SOLECTRIA SOLAR

SGI 225
SGI 250
SGI 266
SGI 300
SGI 500
SGI 500PE

INSTALLATION AND OPERATION MANUAL

Revision G

C ETL US LISTED
Intertek

IMPORTANT REGISTRATION AND WARRANTY INFORMATION

For warranty to become active, this inverter must be registered. To activate warranty and register inverter, please visit the link below.

www.solectria.com/registration

IMPORTANT SAFETY INSTRUCTIONS

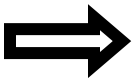
In this manual “inverter” or “inverters” refers to the inverter models: SGI 225, SGI 250, SGI 266, SGI 300, SGI 500, and SGI 500PE unless one of the specific models is noted.

This manual contains important instructions that shall be followed during installation and maintenance of the SGI inverter.

To reduce the risk of electrical shock and to ensure the safe installation and operation of the inverter, the following safety symbols are used to indicate dangerous conditions and important safety instructions:

WARNING: This symbol, along with the word “**WARNING**”, indicates a fact or feature important for the safety of the user and/or installer which can cause serious hardware damage if not applied appropriately.

CAUTION: This symbol, along with the word “**CAUTION**”, indicates an area where extreme caution must be used.



NOTE: This indicates a feature that is important either for optimal and efficient use or optimal system operation.

EXAMPLE: This indicates an example.

SAVE THESE INSTRUCTIONS

IMPORTANT SAFETY INSTRUCTIONS

- All electrical installations shall be performed in accordance with all applicable local electrical codes.
- The inverter contains no user-serviceable parts. Please contact Solectria or a Solectria authorized system installer for maintenance. See Appendix D for Solectria contact and assistance information.
- Before installing or using the inverter, please read all instructions and caution markings in this manual as well as those on the inverter and PV modules.
- Connection of the inverter to the electric utility grid must be completed after receiving approval from the utility company and must only be performed by qualified personnel.
- Completely cover the surface of all PV arrays with an opaque material before wiring them. PV arrays produce electrical energy when exposed to light and could create a hazardous condition.
- The inverter enclosure and disconnects must be locked (requiring a tool or key for access) for protection against risk of injury to persons. The enclosure includes a lockable handle and comes with a key. Keep the key in a safe location in case access to the cabinet is needed. A replacement key can be purchased from Solectria – A Yaskawa Company.

SAVE THESE INSTRUCTIONS

PRESCRIPTIONS DE SECURITE IMPORTANTES

- Tous les travaux d'installation électrique doivent être exécutés en conformité aux normes électriques locales.
- L'onduleur ne contient aucune pièce requérant un entretient effectué par l'utilisateur. Pour toute maintenance, veuillez consulter Solectria ou un installateur agrée par Solectria. Reportez-vous à l'annexe D pour des informations de contact et les installateurs autorisés.
- Avant d'installer ou d'utiliser l'onduleur, veuillez lire toutes les instructions et toutes les mises en garde présentes dans ce manuel, sur l'onduleur et sur les modules PV.
- Le raccordement du l'onduleur au réseau électrique ne doit être effectuée qu'après avoir obtenu une entente d'interconnexion de la compagnie locale de distribution électrique et uniquement par du personnel autorisé et qualifié.

  La surface de tous les capteurs PV doivent être recouverte entièrement d'un matériel opaque (noir) avant de procéder au câblage. Les capteurs PV exposés a la lumière produisent du courant électrique suffisant pour de créer une situation de risque.
- Le boîtier de l'onduleur et déconnexions doit être verrouillé (nécessitant un outil ou d'une clé d'accès) pour la protection contre les risques de blessures aux personnes. Le boîtier comprend une poignée verrouillable et est livré avec une clé. Gardez la clé dans un endroit sûr en cas l'accès au boîtier est nécessaire. Une clé de remplacement peut être acheté de Solectria – A Yaskawa Company.

CONSERVEZ CES INSTRUCTIONS

Table of Contents

1 Introduction

Thank you for purchasing a Solectria inverter. By following this manual the inverter can be installed and operated safely.

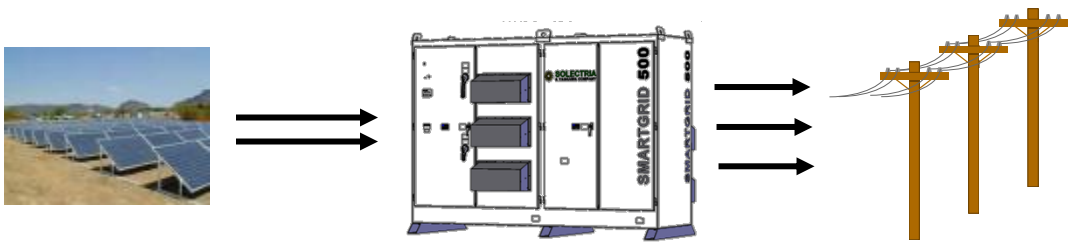
The SGI series of inverters are commercial, three-phase grid-tied PV inverters designed to be interconnected to the electric utility grid. These inverters are available in 225kW, 250kW, 266kW, 300kW, and 500kW power levels.

Feeding power into the grid involves conversion of the DC voltage from the PV array to grid compatible AC voltage by inverting DC to AC. This unit feeds power into a standard, three-phase commercial, industrial, institutional, or electrical utility facility's electrical system which is connected to the electrical grid.

Several options are available for the SGI series of inverter, including fused or breaker DC subcombiners, in a variety of combinations and current ratings; SolZone™ subcombiner DC current monitoring; intake air filtration; a stainless steel enclosure; SolrenView™ inverter direct monitoring; revenue grade monitoring; and SolrenView AIR cellular connections for monitoring options.

The inverter is comprised of an industrial enclosure containing electrical and electronic components. Standard equipment includes integrated DC and AC disconnects with handles that are accessible from outside of the enclosure.

In this document, the UI refers to the User Interface. This is comprised of a series of push buttons and an LCD on the front side of the inverter. The SolrenView DAS refers to the Data Acquisition System. This is the communication gateway for the inverter which communicates to the SolrenView web-based monitoring system and external data monitoring systems.



PV Array SGI Series Inverter Electrical Grid

Figure 1.1.—Grid-Tied Inverter Application

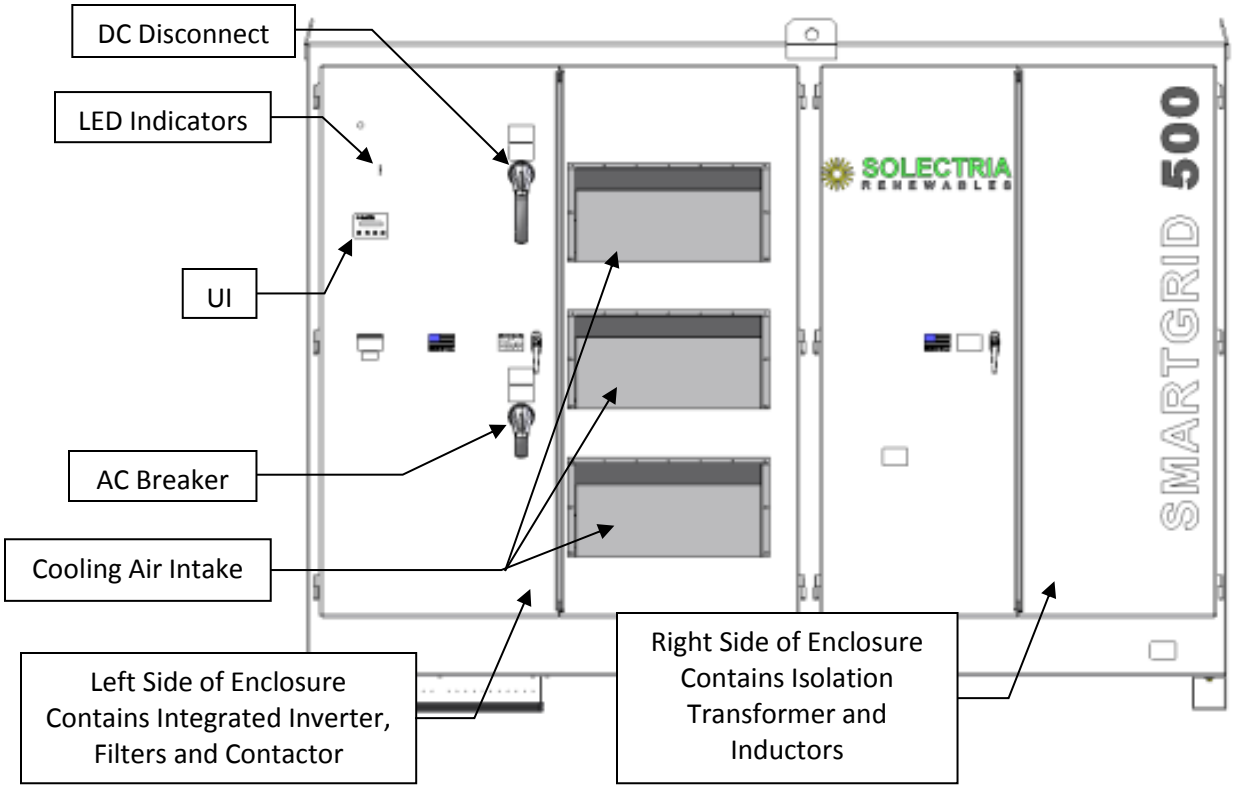


Figure 1.2 – The SGI Series of Inverter (Front)

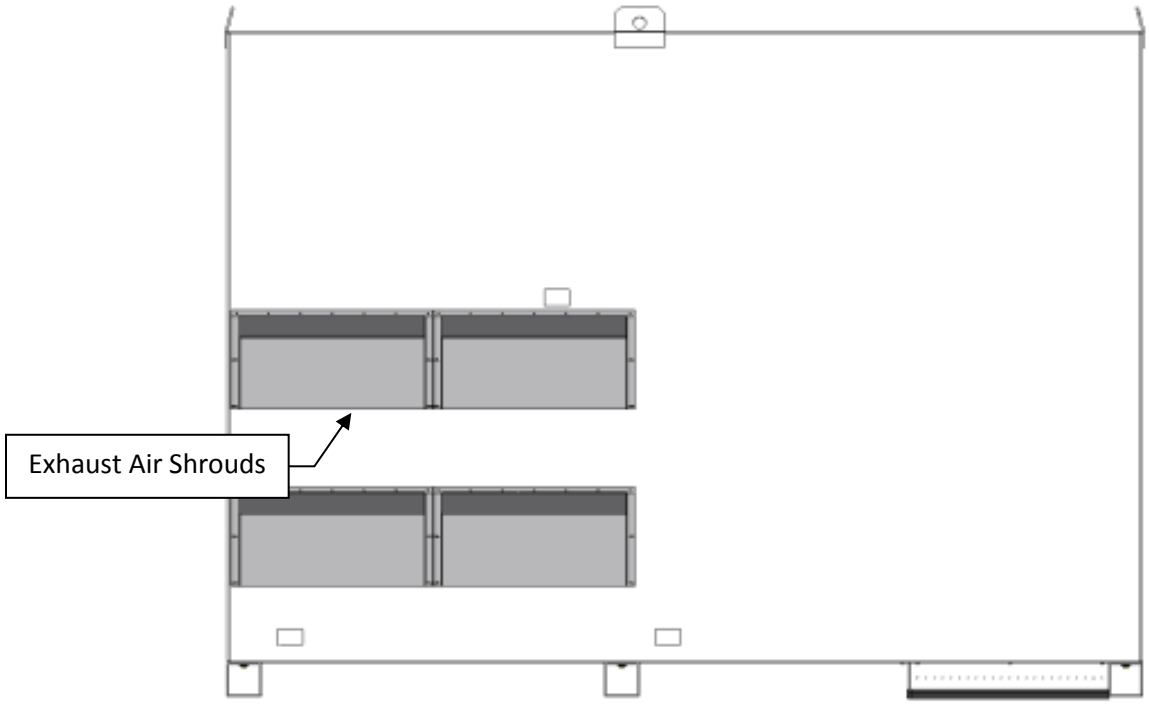
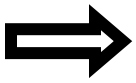
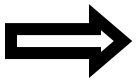


Figure 1.3 – The SGI Series of Inverter (Rear)

2 Site Preparation and Inverter Placement



NOTE: If the inverter is mounted outside, ensure that the enclosure doors remain closed during the installation process in case of rain or snow. Leaving these doors open during installation will void the warranty.



NOTE: It is recommended to store the inverter indoors before installation. If the inverter is to be stored outdoors before being installed and commissioned, care must be taken to avoid condensation inside the unit. Removing the protective shipping wrap and placing a small space heater inside the unit can help minimize the amount of condensation that can occur during onsite outdoor storage.

2.1 General Conditions for Inverter Installations

The inverter is a robust, ruggedized piece of industrial electrical equipment; however, certain criteria must be observed when planning for the installation of the inverter, as detailed below.

- The inverter can be mounted outdoors.
- The maximum life for the inverter can be achieved by mounting the unit in a clean, dry, and cool location.
- Install the inverter in an accessible location following local electrical codes for enclosure and disconnect door clearances and proximity to other equipment.
- Avoid installation in close proximity to people or animals, as there is an audible high-frequency switching noise.
- The ambient temperature must be at least -30°C but less than 50°C for full power, continuous operation. The inverter will automatically reduce power or may shut down to protect itself if the ambient air temperature rises above 50°C.
- Although the inverter is designed to function at full power continuously in ambient temperatures up to 50°C, for optimal inverter life and performance, do not mount the inverter in direct sunlight, especially in hot climates. If the unit must be mounted in direct sunlight, the installation of a metal sun-shield is recommended. It is recommended that the inverter is mounted on the north side of buildings or on the north side of a ground mount PV array.

2.2 Ventilation Requirements

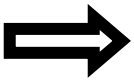
If the inverter will be installed in a utility vault or electrical closet, air circulation must be provided for sufficient heat dissipation. Adequate ventilation must be provided to maintain an ambient condition of less than 50°C. The ambient temperature should be kept as low as possible at all times for optimal inverter performance and life. The table below outlines the estimated heat loss of the SGI series of inverters at full output power operation.

Model	Heat Loss at Full Power
SGI 500PE	55,000 BTU/h
SGI 500	55,000 BTU/h
SGI 300	32,000 BTU/h
SGI 266	28,000 BTU/h
SGI 250	26,000 BTU/h
SGI 225	24,000 BTU/h

Table 2.1—Indoor Colling Requirements

2.3 Inverter Placement and Basic Dimensions

WARNING: Do not install on or over combustible surfaces or material.



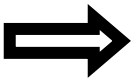
NOTE: The weight of the inverter will exert an additional load on the floor, roof, or pad where mounted. Verify proper load capacity of mounting surface with a qualified engineer. See Table 3.1 for inverter weights.

The correct mounting position for the inverter is vertical with the mounting feet on the floor. The clearances detailed below must be met when planning for the location of the inverter.

- A minimum distance of 18 inches (46 cm) must be clear *behind* the inverter for cooling air exhaust and service access. A clearance distance of 36 inches (91 cm) behind the inverter is highly recommended to aid in cleaning the exhaust screens.
- A minimum distance of 12 inches (30.5 cm) must be clear *above* the inverter for ventilation.
- A minimum distance of 6 inches (15 cm) must be clear to the *sides* of the inverter for ventilation.

WARNING: Do not install inverters in a manner such that one inverter's exhaust air could be taken in by another inverter's intake. This may result in overheating of the inverter.

The two figures that follow show the basic inverter dimensions and mounting locations.



NOTE: For more detailed drawings and additional views and dimensions, please refer to *Customer Interface Drawing, SGI 225-500PE* (DOCR-070257). Drawings are available in both .pdf and .dwg formats.

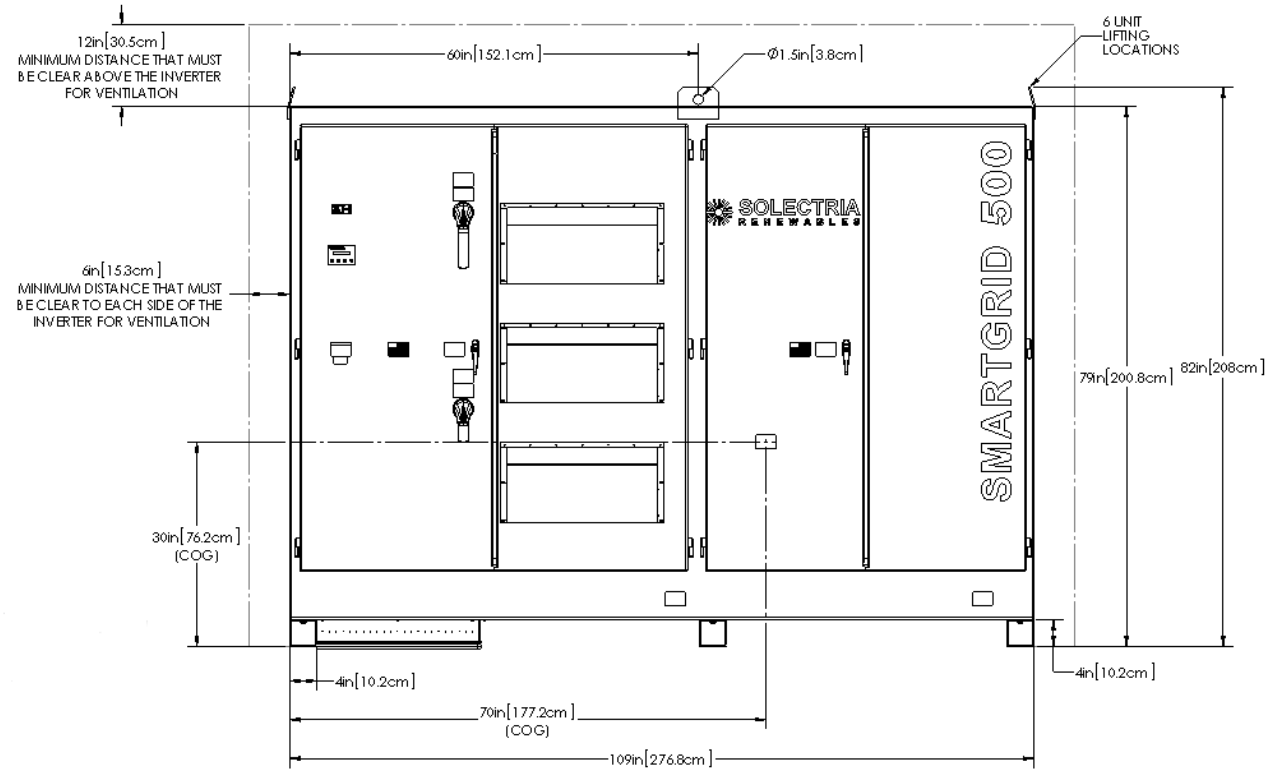


Figure 2.1—SGI 225-500 Series Dimensions (Front View)

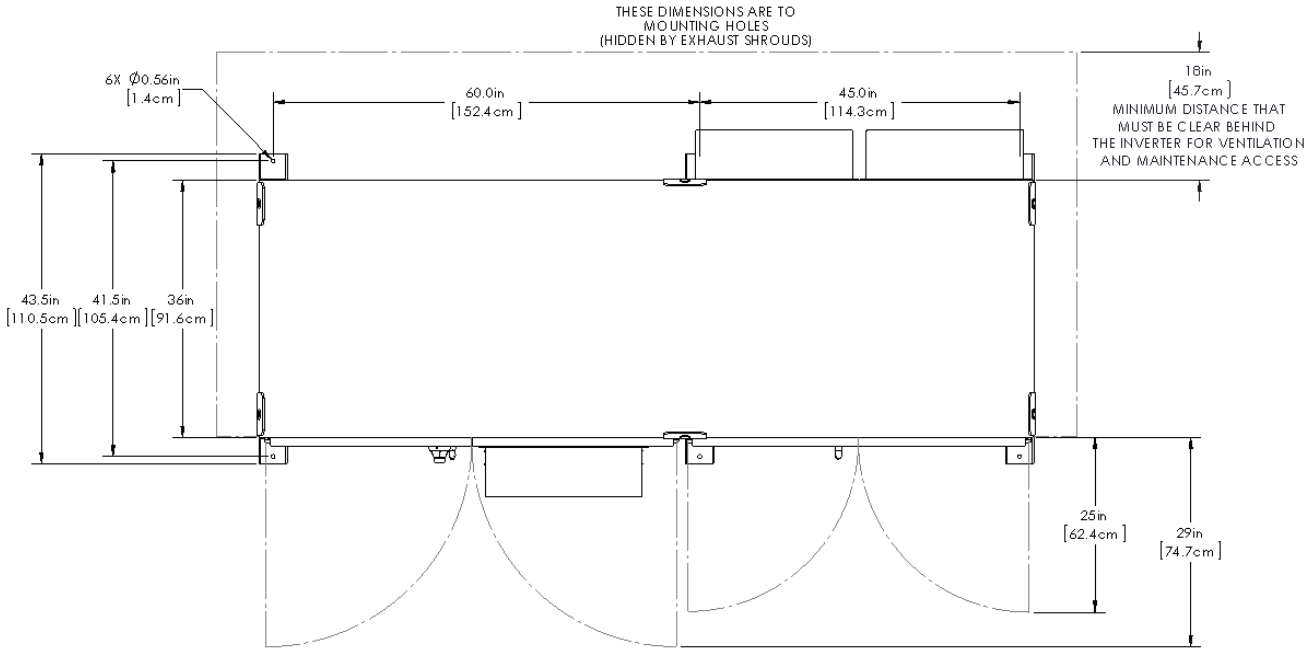


Figure 2.2—SGI 225-500 Series Dimensions (Top View)

2.4 DC and AC Conductor Entry Locations

DC and AC conductors must enter through the provided conduit cutout in the bottom of the inverter enclosure or through the alternate conduit entries as detailed in the figures below. Both DC and AC conductor terminations are located in the left side of the inverter. Alternative locations are the left enclosure wall for DC and back panel for AC.

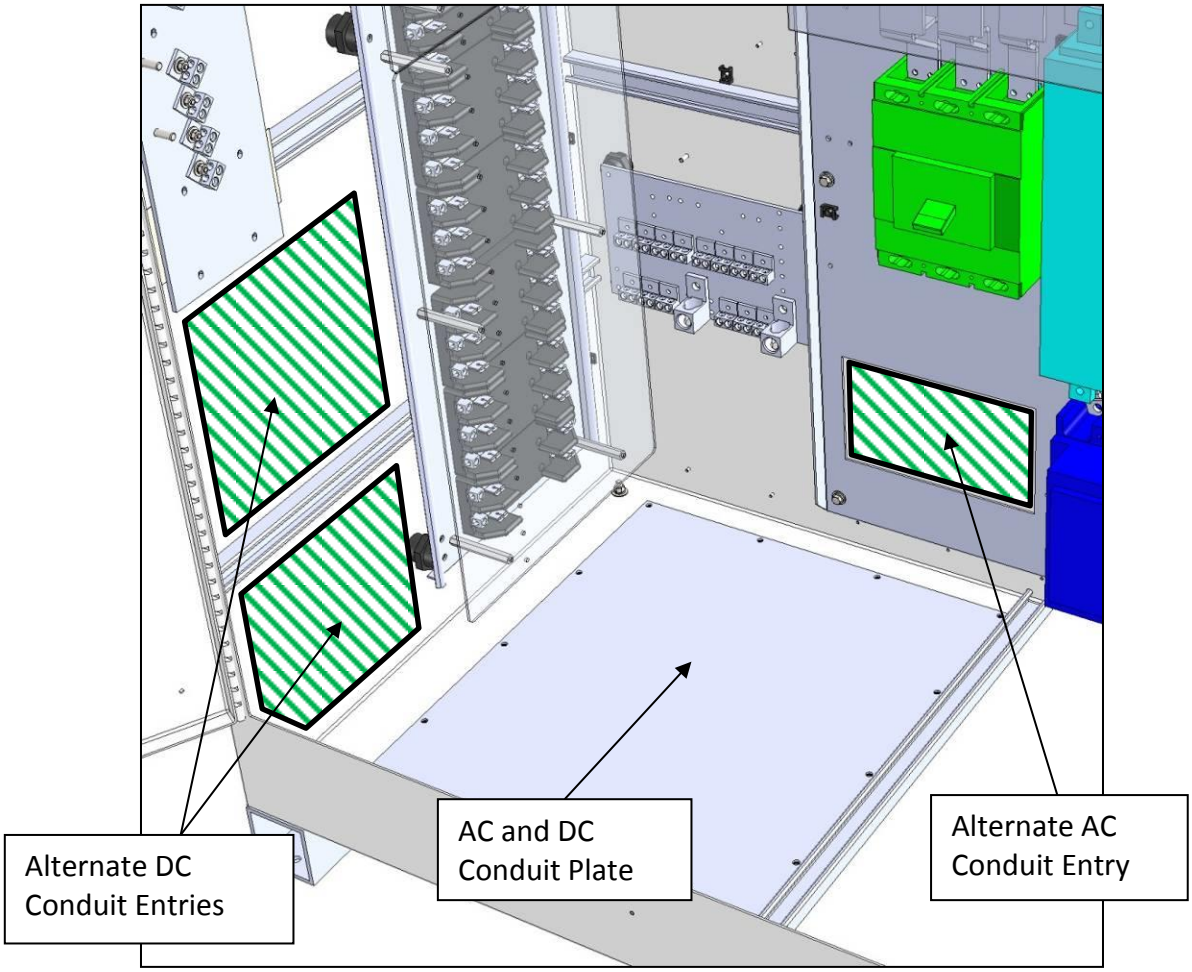


Figure 2.3—AC and DC Conduit Entry Locations

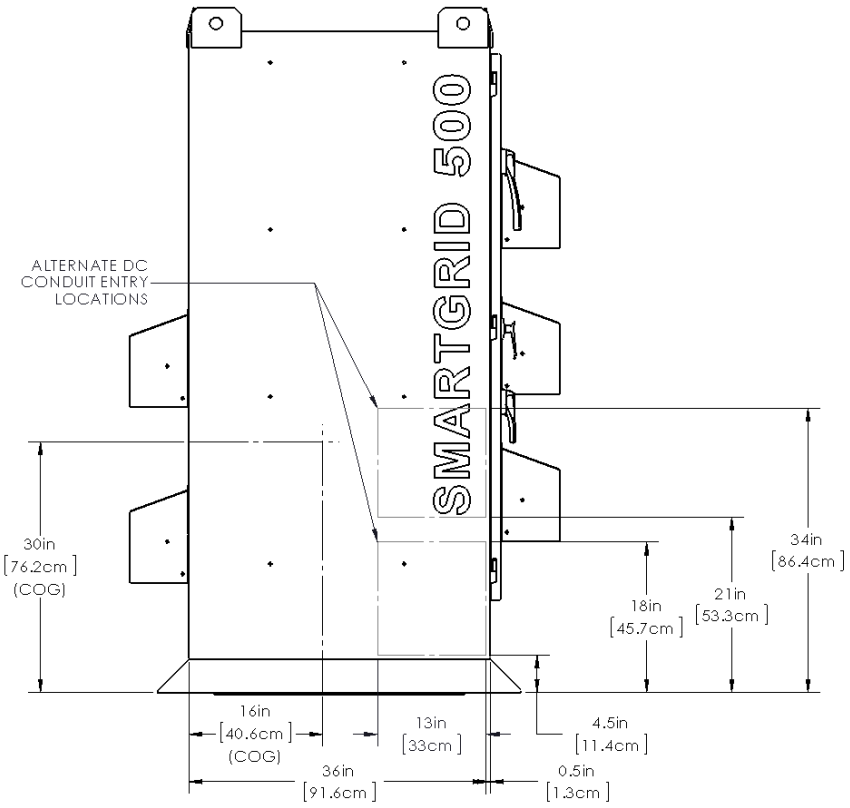


Figure 2.4—Alternate DC Conduit Entry Locations (Left Side View)

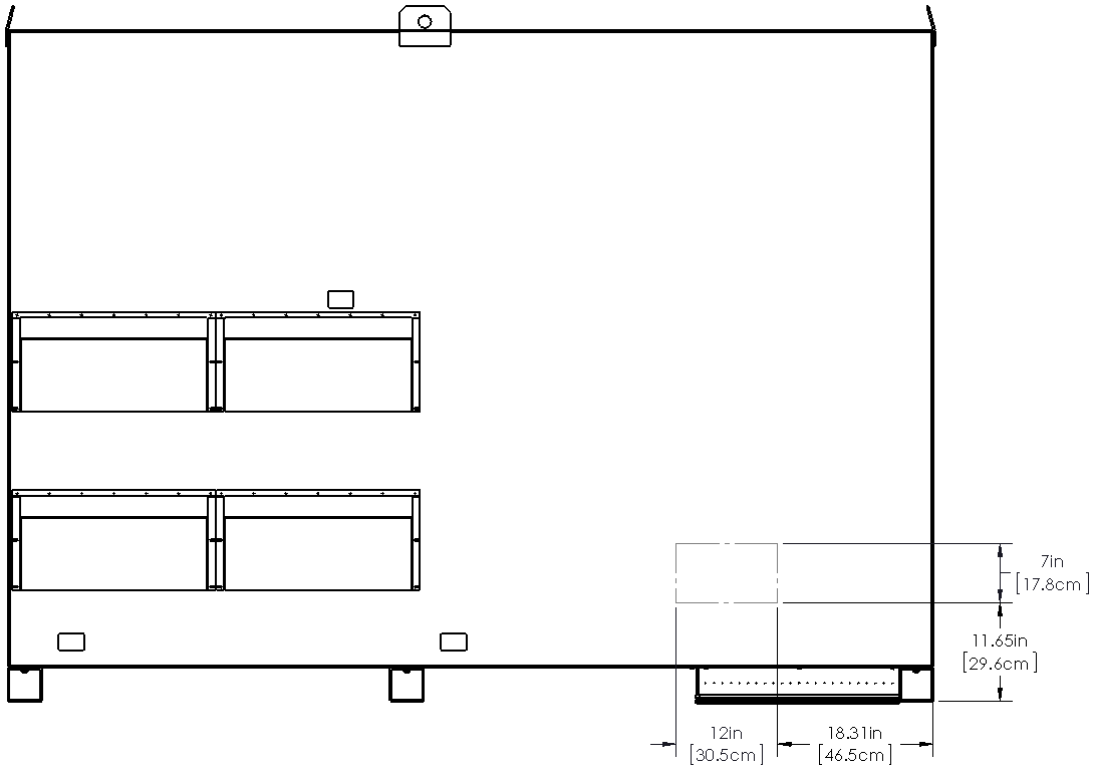


Figure 2.5—Alternate AC Conduit Entry Location (Rear View)

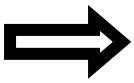
3 Installation

WARNING: Before installing the inverter, read all instructions and caution markings in this manual and on the inverter as well as on the photovoltaic modules.

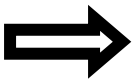
3.1 Checking for Shipping Damage

The inverter is thoroughly checked and tested rigorously before it is shipped. Even though it is bolted onto a rugged, oversized pallet for delivery, the inverter can be damaged during shipping by poor handling, trucking or transfer station activity.

Inspect the inverter thoroughly after it is delivered. If any damage is found, immediately notify the shipping company to make a claim. If there is any question about potential shipping damage, contact Solectria. Photos of the damage may be helpful in documenting potential shipping damage.



NOTE: Document damage on shipping papers with the truck driver. Immediately report damage to the shipping company.



NOTE: Do not remove packaging from the unit or remove the unit from pallet if damage is evident.

3.2 Removing Inverter from Pallet and Moving Inverter into Place

The inverter is shipped on an oversized shipping pallet. It is recommended to keep the inverter secured to the pallet and moved as close as possible to the final mounting location prior to removing the pallet.

Completely remove the hardware securing the inverter's feet to the pallet before lifting the inverter off of the pallet.

The center of gravity of the inverter is well to the right of center, as shown in Figure 2.1, and is marked with a label on the left door of the transformer enclosure (right half of the enclosure). The center of gravity may shift slightly based on power level and options ordered.

The base weight of each inverter power level is shown in the table below. The inverter weight will increase with the addition of factory options.

Inverter Model	Base Weight, Not Including Options	Base Shipping Weight, Not Including Options
SGI 225	5,170 lbs / 2,346 kg	5,380 lbs / 2,440 kg
SGI 300, 266, 250	5,650 lbs / 2,563 kg	5,860 lbs / 2,658 kg
SGI 500	6,980 lbs / 3,167 kg	7,190 lbs / 3,261 kg
SGI 500PE	7,107 lbs / 3,224 kg	7,317 lbs / 3,319 kg

Table 3.1—Inverter Weights

The inverter may be lifted from the bottom by a properly rated forklift or from the top lift tabs by a properly rated crane or other lifting device.

WARNING: The inverter may tip over if improperly moved or lifted, potentially causing damage to equipment, personal injury, or death.

WARNING: Proper rigging and lifting methods must be used to lift the inverter. Only trained and qualified personnel should operate lifting equipment.

The recommended forklift locations are shown in the figures below.

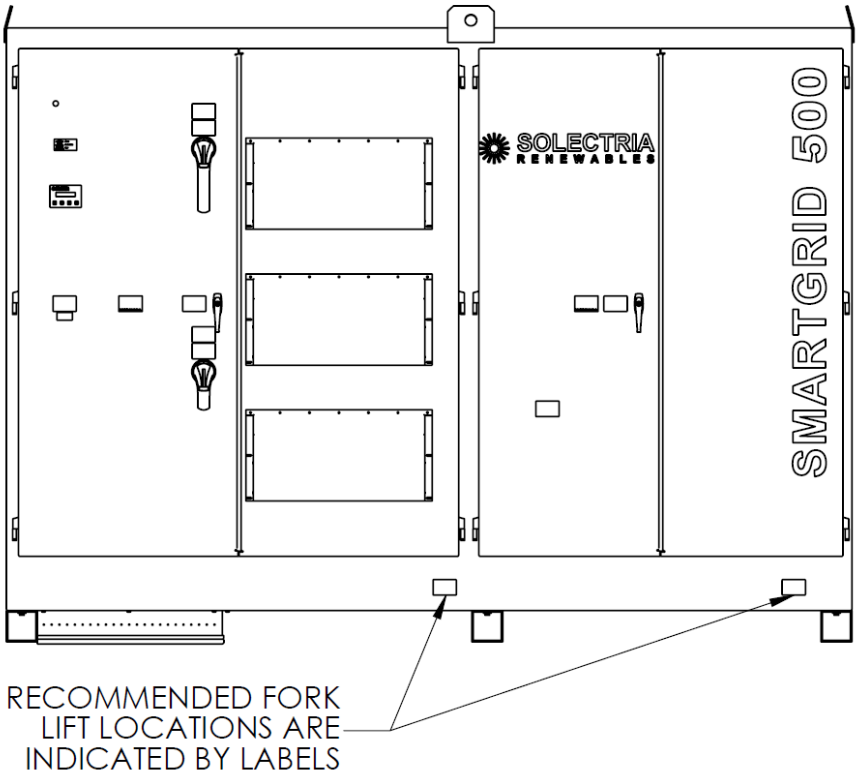


Figure 3.1—Forklift Lifting Positions (Front View)

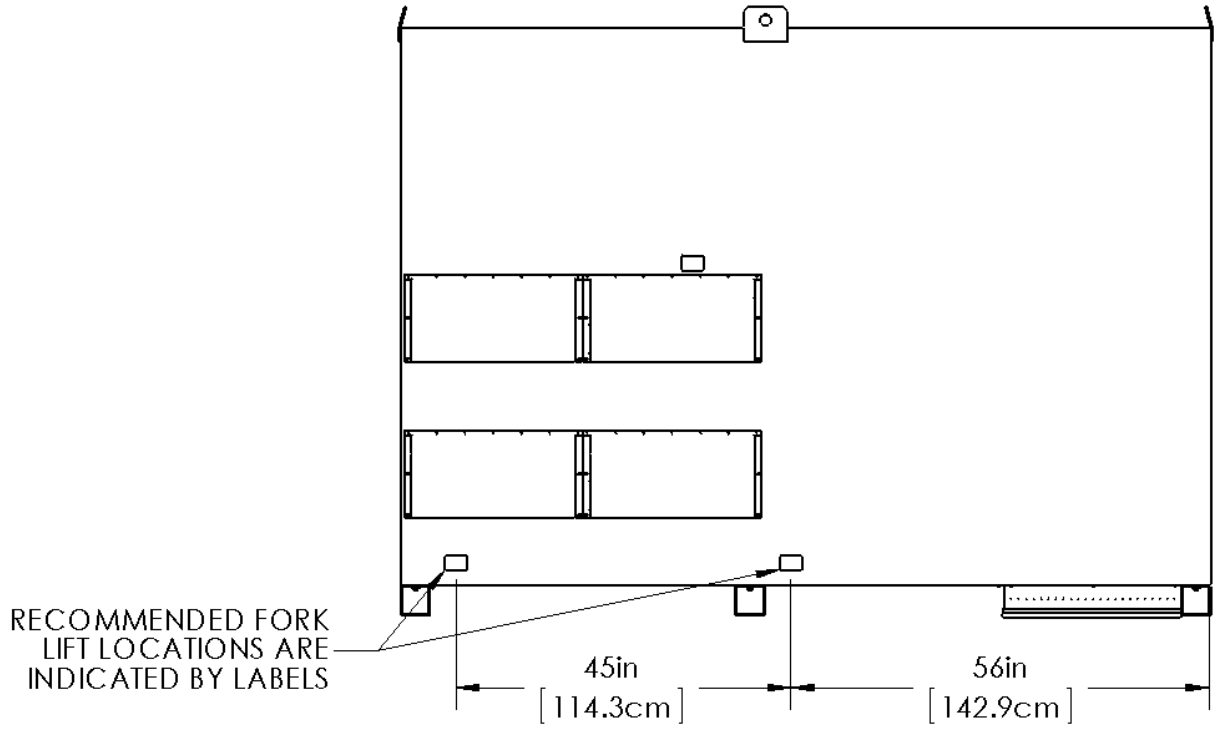


Figure 3.2—Forklift Lifting Positions (Rear View)

If lifting the inverter from the top, lift using vertical rigging connected to a properly rated lifting device. Vertical rigging must have a central rigging point at least 15 feet (4.5 m) above the inverter's roof.

WARNING: Failure to follow these lifting guidelines may result in structural damage to the inverter and will void the warranty.

WARNING: Do not lift the unit with rigging that spans the lifting tabs front to back; this method will result in permanent damage to the inverter and will void the warranty.

WARNING: All six lifting tabs must be used to lift the inverter. Never lift the inverter using only the four outer lifting tabs.

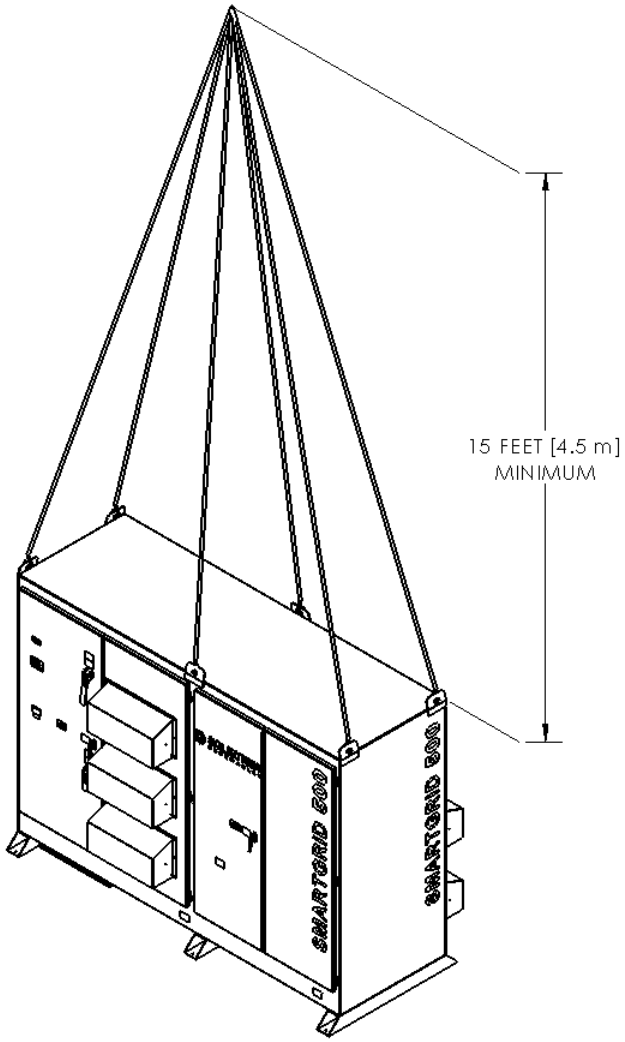


Figure 3.3—Recommended Single Point Lifting Method

3.3 Leveling the Inverter

The inverter must be mounted on a flat and level plane in order for proper operation of the doors, DC disconnect shaft, and AC breaker shaft. To check if the inverter is properly leveled, the top of each pair of doors should be aligned with one another and open smoothly without scraping the top of the enclosure. If the top edges are not aligned, the inverter must be leveled by placing aluminum shims under the appropriate mounting foot prior to securing the inverter.

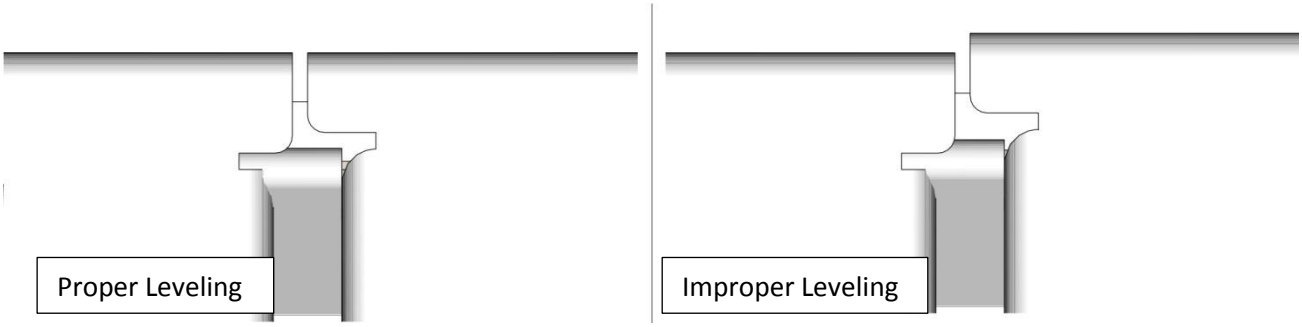


Figure 3.4—Proper and Improper Door Leveling

NOTE: Failure to properly level the inverter may cause damage to the enclosure, resulting in water infiltration or degradation of the enclosure and will void the warranty.

NOTE: Failure to properly level the inverter may cause damage to the operating mechanisms of the integrated DC disconnect or AC breaker.

3.4 Mounting the Inverter

The inverter includes mounting feet with six holes for the use of 1/2in hardware. The holes are on a rectangular pattern as shown in Figure 2.2. The inverter must be securely mounted to a rigid, structural surface. The use of hardware with corrosion resistance is recommended. The use of locking hardware is also recommended. Final hardware stack-up and torque should be determined by the qualified site engineer.

WARNING: The inverter may tip over if improperly mounted, potentially causing damage to equipment, personal injury, or death.

4 Ground Connections

WARNING: All electrical installations shall be performed in accordance with all applicable local electrical codes.

WARNING: Make sure to establish a solid connection from the inverter to the system grounds before proceeding to connect any DC or AC power wires.

4.1 Grounding Electrode Conductor (GEC)

Depending on the installation, a DC Grounding Electrode Conductor may be required. This conductor should be sized according to code requirements. Both a DC and AC GEC may be required at the inverter in some instances. Two lug positions are provided on the ground bond plate for the AC and DC grounding electrode conductors.

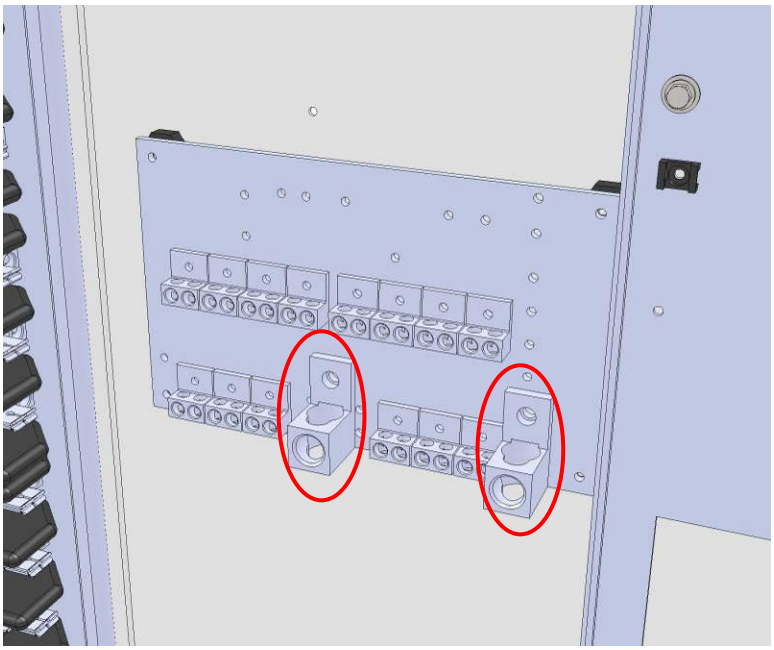


Figure 4.1—GEC Lug Positions (Section View Showing Back Wall on Left Side of Enclosure)

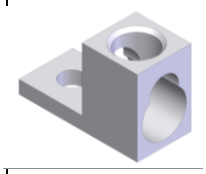
	Cu or Al Conductors Max. 1 x 1/0AWG-750kcmil 75°C Connections, 550 in-lbs 1 Wire per Lug	*or*	Cu or Al Conductors Max. 2 x 1/0AWG-300kcmil 75°C Connections, 550 in-lbs 2 Wires per Lug

Figure 4.2—Ground Lugs for GECs

4.2 Equipment Grounding Conductor (EGC)

The ground bond plate is also equipped with a number of provisions for equipment grounding conductors. In most instances, these will be used for the equipment grounds originating at the combiner boxes used to feed the subcombiner positions within the inverter.

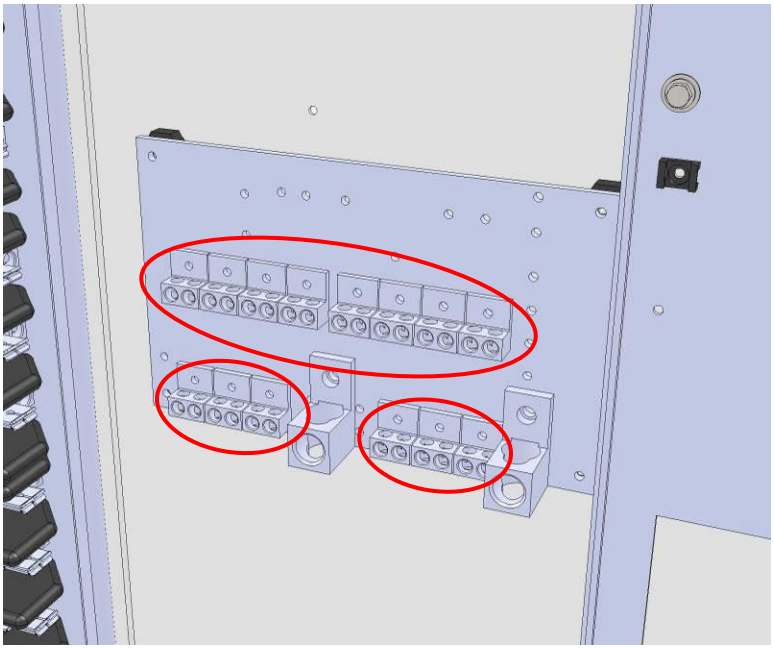


Figure 4.3—EGC Lug Positions (Section View Showing Back Wall on Left side of Enclosure)

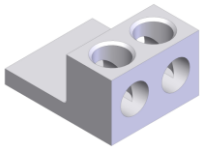
	Cu or Al Conductors Max. 28 x 14AWG-1/0AWG 75°C Connections, 50 in-lbs 1 Wire per Lug

Figure 4.4—Ground Lugs for EGCs

5 DC Connections

WARNING: All electrical installations shall be performed in accordance with all applicable local electrical codes.

WARNING: Before terminating DC conductors at the inverter, ensure that the conductors are de-energized.

WARNING: Before connecting the DC conductors from the PV array to the subcombiner, verify the polarity of the conductors.

WARNING: Before connecting the DC conductors of the PV array to the subcombiner, verify that the DC voltage is less than 600VDC. Any DC voltage over 600 will damage the inverter and void the warranty.

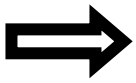
WARNING: Fuses in the inverter's ungrounded, fused subcombiner must only be replaced with the same type and rating (600VDC) fuses as originally installed.

For the DC connections, the SGI series of inverters must be ordered with either an integrated subcombiner populated with DC fuses or an integrated subcombiner populated with DC breakers. Many choices are available to meet any design constraint. The SGI series of inverters cannot be used without the internal subcombiner.

For the fused DC subcombiner option, six to thirty-two positions are available, with current ratings of 70A, 80A, 90A, 100A, 110A, 125A, 150A, 175A, 200A, 225A, 250A, 300A, 350A, and 400A.

For the breaker DC subcombiner option, six to sixteen positions are available, with current ratings of 110A, 125A, 150A, 175A, 200A, 225A, 250A, 300A, 350A, and 400A.

Either copper or aluminum wire may be used for the DC (PV) positive and negative conductors, although due to terminal size restrictions, aluminum wire may not be an option for all cases. As with any aluminum wire exercise best industry practices to ensure a reliable connection; thoroughly clean the conductor just prior to making the electrical connection and use an oxide inhibitor to prevent the formation of aluminum oxide.



NOTE: Not all of the fused positions will be used in all designs. In the case that not all of the positions will be used, the inverter will ship with spare fuses in the unused locations. The locations of the used and unused positions will be clearly labeled on the shield that covers the exposed terminals. The installer *must* follow the labeling for the used connections to ensure proper functionality of the inverter. Failure to follow the labeling may cause the inverter not to be able to sense the DC voltage, preventing the inverter from turning on.

The negative connections are bonded to the ground system within the inverter through the ground fault detection and interrupt (GFDI) circuit. The negative connections must not be bonded to the ground system at any other point. The positive connections must never be bonded to the ground system at any time.

WARNING: The negative connections must not be bonded to the ground system at any point outside of the inverter. This bond is made in the GFDI circuit that is integral to the inverter.

5.1 Fused Subcombiner, Positive Connections (Ungrounded)

For the *fused* subcombiner, 6 to 32 positions are available. The positions are located inside the enclosure, on the left side. The positions will be populated from the top down, as shown in the table below.

NOTE: Unless explicitly specified at the time of order, the positions will be populated top down with the highest amperage rated fuse to the lowest amperage rated fuse.

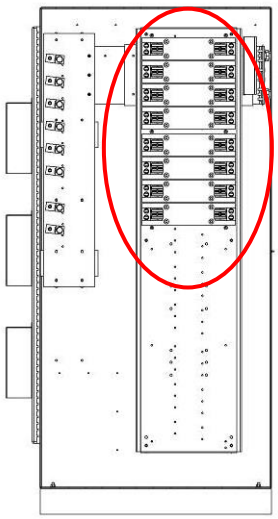
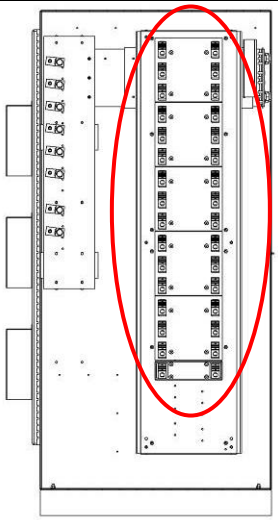
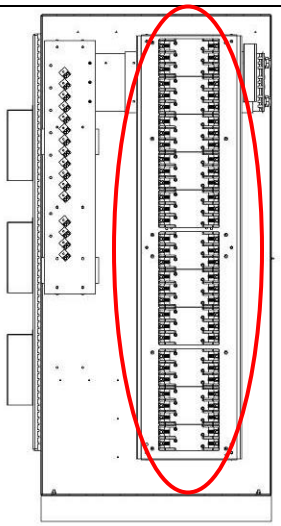
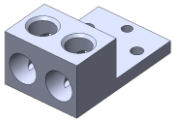
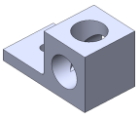
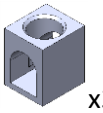
 SGI 500, 500PE: 8 Positions 225 – 400A 600VDC Fuses SGI 225-300: 6 Positions 225 – 400A 600VDC Fuses	 SGI 500, 500PE: 16 Positions 110 – 200A 600VDC Fuses SGI 225-300: 12 Positions 110 – 200A 600VDC Fuses	 SGI 500, 500PE: 32 Positions 70 – 100A 600VDC Fuses SGI 225-300: 24 Positions 70 – 100A 600VDC Fuses
 x8 or x6 Cu or Al Conductors Max. 16 x 2AWG-300kcmil 75°C Connections, 275 in-lbs 1-2 Wires per Fuse Position	 x16 or x12 Cu or Al Conductors Max. 16 x 2AWG-300kcmil 75°C Connections, 375 in-lbs 1 Wire per Fuse Position	 x32 or x24 Cu or Al Conductors Max. 32 x 6AWG-1/0AWG 75°C Connections, 100 in-lbs 1 Wire per Fuse Position

Table 5.1—Fused Subcombiner, Positive Positions and Connections

5.2 Fused Subcombiner, Negative Connections (Grounded)

The grounded subcombiner plate that accompanies the *fused* subcombiner is populated with a number of lugs of the appropriate size to match the wiring inputs of the fused subcombiner.

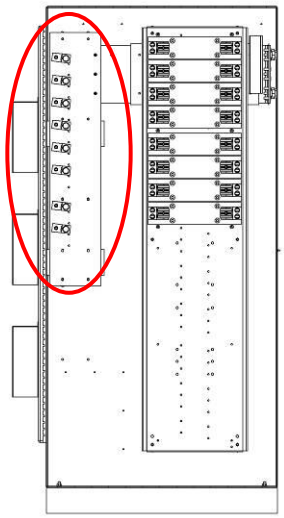
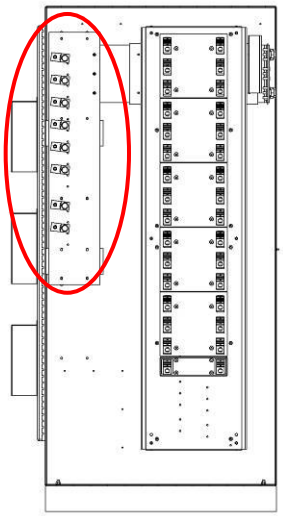
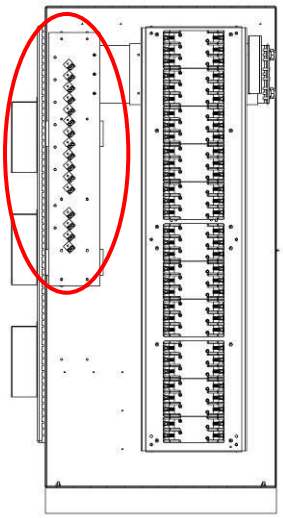
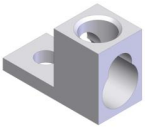
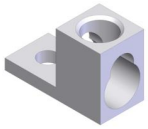
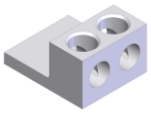
 SGI 500, SGI 500PE: 8 Positions 8 Lugs SGI 225-300: 6 positions 6 lugs	 SGI 500, SGI 500PE: 16 Positions 8 Lugs (2 Wires per Lug) SGI 225-300: 12 Positions 6 Lugs (2 Wires per Lug)	 SGI 500, SGI 500PE: 32 Positions 16 Lugs (Double Lugs) SGI 225-300: 24 Positions 12 Lugs (Double Lugs)
 x8 or x6 Cu or Al Conductors Max. 16 x 2AWG-300kcmil 75°C Connections, 550 in-lbs 1-2 Wires per Lug	 x8 or x6 Cu or Al Conductors Max. 16 x 2AWG-300kcmil 75°C Connections, 550 in-lbs 2 Wires per Lug	 x12 or x16 Cu or Al Conductors Max. 32 x 6AWG-1/0AWG 75°C Connections, 50 in-lbs 1 Wire per Lug Position

Table 5.2—Fused Subcombiner, Negative Positions and Connections

5.3 Breaker Subcombiner, Positive Connections (Ungrounded)

For the *breaker* subcombiner, 6 to 16 positions are available. The positions are located inside the enclosure, on the left side. The positions will be populated from the top down, as shown in the table below.

NOTE: Unless explicitly specified at the time of order, the positions will be populated top down with the highest ampacity breaker to the lowest ampacity breaker.

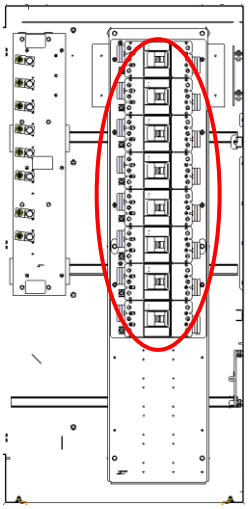
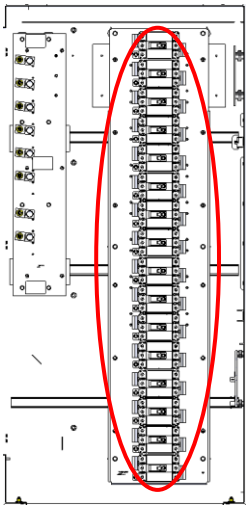
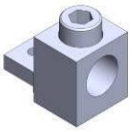
 SGI 500, SGI 500PE: 8 Positions 225 – 400A 600VDC Breakers SGI 225-300: 6 Positions 225 – 400A 600VDC Breakers	 SGI 500, SGI 500PE: 16 Positions 110 – 200A 600VDC Breakers SGI 225-300: 12 Positions 110 – 200A 600VDC Breakers
 Cu or Al Conductors Max. 8 x 4/0AWG-500kcmil 75°C Connections, 375 in-lbs (3/8” hex) 1 Wire per Breaker Position or Max. 16 x 2/0AWG-250kcmil 75°C Connections, 275 in-lbs (5/16” hex) and 375 in-lbs (3/8” hex) 2 Wires per Breaker Position	 Cu or Al Conductors Max. 16 x 2AWG-300kcmil 75°C connections, 275 in-lbs 1 Wire per Breaker Position

Table 5.3—Breaker Subcombiner, Positive Positions and Connections

5.4 Breaker Subcombiner, Negative Connections (Grounded)

The grounded subcombiner plate that accompanies the *breaker* subcombiner is populated with a number of lugs of the appropriate size to match the wiring inputs of the breaker subcombiner.

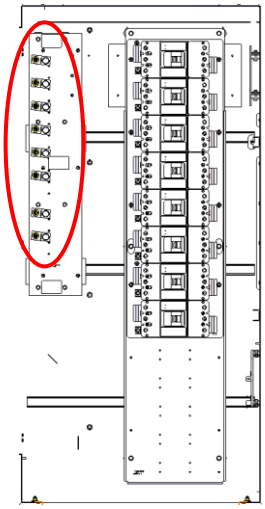
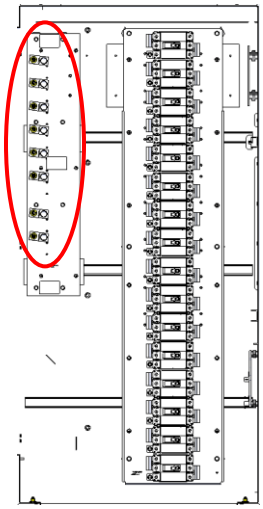
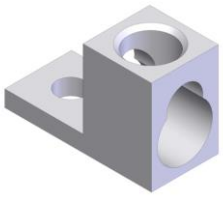
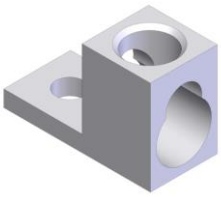
 SGI 500, SGI 500PE: 8 Positions 8 Lugs SGI 225-300: 6 Positions 6 Lugs	 SGI 500, SGI 500PE: 16 Positions 8 Lugs (2 Wires per Lug) SGI 225-300: 12 positions 6 lugs (2 Wires per Lug)
 x8 or x6 Cu or Al Conductors Max. 8 x 4/0AWG-500kcmil 75°C Connections, 550 in-lbs 1 Wire per Lug or Max. 16 x 2/0AWG-250kcmil 75°C Connections, 550 in-lbs 2 Wires per Lug	 x8 or x6 Cu or Al Conductors Max. 16 x 2AWG-300kcmil 75°C Connections, 550 in-lbs 2 Wires per Lug

Table 5.4—Breaker Subcombiner, Negative Positions and Connections

5.5 DC Breaker Damage Prevention

When tightening the DC breaker lugs use a wrench (positioned as shown below) to prevent rotation of the lug while connection is being torqued. This method should be applied when the lugs are installed as well as when they are torqued as part of on-going maintenance. This technique helps prevent damage to the breaker housing.

Figure 5.1—Lug Damage Prevention

6 AC Connections

CAUTION: All electrical installations shall be performed in accordance with all applicable local electrical codes.

The SGI series of inverters must be connected to the grid with three phase conductors and the appropriate AC grounding conductors. No neutral conductor is required for the inverter to operate. However, some utilities or jurisdictions may require that a neutral connection be made from the onsite electrical service directly to the inverter's transformer in order to meet their effective grounding requirements. Therefore, the installer may land a neutral conductor or a set of neutral conductors directly on the neutral terminal of the inverter's integrated transformer. The inverters are designed with a routing path through the inverter enclosure and a means for connecting these conductors to accommodate this requirement.

Either copper or aluminum conductors may be used, although due to terminal size restrictions, aluminum conductors may not be an option for all cases. As with any aluminum conductors, exercise best industry practices to ensure a reliable connection; thoroughly clean the conductor just prior to making the electrical connection and use an oxide inhibitor to prevent the formation of aluminum oxide.

Each SGI inverter includes an integrated AC breaker that serves as the connection point for the AC phase wiring to the onsite electrical service or grid connection. The integrated breaker will have different ratings depending on the inverter model.

Model	Ampere Rating	Interrupt Rating	100% Rated
SGI 225-480VAC	400A	25 kAIC	No
SGI 250-480VAC	400A	35 kAIC	No
SGI 266-480VAC	400A	35 kAIC	No
SGI 300-480VAC	400A	35 kAIC	Yes
SGI 500-480VAC	800A	65 kAIC	No
SGI 500PE-480VAC	800A	65 kAIC	No

Table 6.1—Factory Included AC Breaker Minimum Specifications

If the onsite electrical service connection is designed with an external overcurrent protection device (OCPD), it must be dedicated to the PV system and must be adequately rated for the current delivered by the inverter. The table below summarizes the inverter's required ampere rating for nominal 125% rated OCPDs; these ratings may change depending on the interconnect design and whether or not 100% rated OCPDs are used.

Model	Ampere Rating
SGI 225-480VAC	350A
SGI 250-480VAC	400A
SGI 266-480VAC	400A
SGI 300-480VAC	450A
SGI 500-480VAC	800A
SGI 500PE-480VAC	800A

Table 6.2—Nominal 125% Rated Building Backfeed OCPD Ampere Ratings

The grid impedance value at the connection point should be as low as possible to avoid an increase of the AC voltage to non-permissible values while the inverter feeds power to the grid. Designing for less than 1% AC phase-to-phase voltage rise is recommended. Minimizing wiring impedance also results in higher system efficiency.

Connect the building's three phase conductors into the bottom of the integrated AC breaker as shown below. Connect Phase A conductors to the leftmost position of the breaker, Phase B conductors to the middle position, and Phase C conductors to the rightmost position.

NOTE: Improper phase rotation will not damage the inverter; however, the inverter will not operate until the phase rotation is corrected to a clockwise rotation.

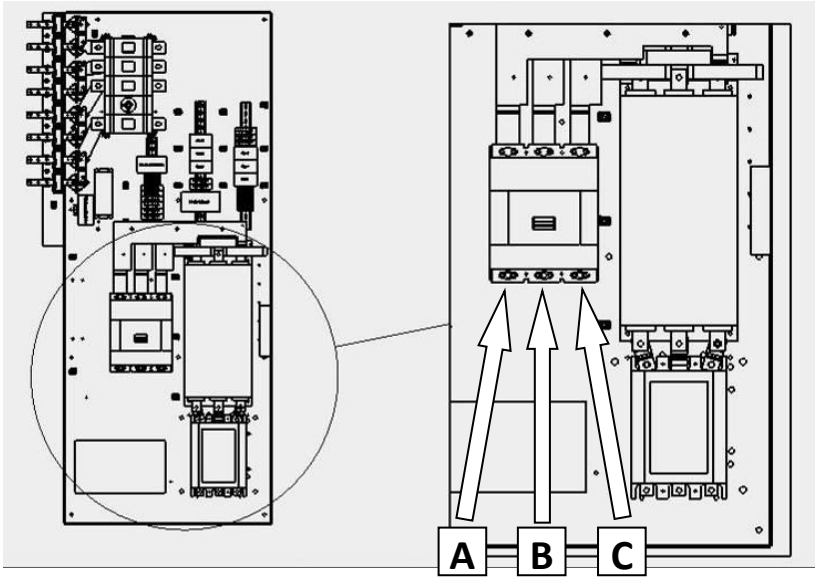


Figure 6.1—AC Phase Wire Connection Points

Use minimum 90°C (194°F) rated wire to connect to the inverter's integrated three-phase AC breaker. See NEC 310 regarding temperature ratings of wire. Follow local codes to determine minimum wire gauge and temperature rating of the wires. Voltage drop and other considerations may dictate that larger wire sizes be used.

Model	Maximum Number of Terminals per Phase	Minimum Wire Size	Maximum Wire Size	Terminal Torque
SGI 225-480VAC	2	3/0AWG	500kcmil	275 in-lbs
SGI 250-480VAC	2	3/0AWG	500kcmil	275 in-lbs
SGI 266-480VAC	2	3/0AWG	500kcmil	275 in-lbs
SGI 300-480VAC	2	4/0AWG	500kcmil	275 in-lbs
SGI 500-480VAC	3	250kcmil	400kcmil	375 in-lbs
SGI 500PE-480VAC	3	250kcmil	400kcmil	375 in-lbs

Table 6.3—Factory Included AC Breaker Phase Wire Size Limits

The table below describes the routing path and connection methodology for the optional neutral conductors that may be connected to the inverter's transformer to satisfy effective grounding requirements. The inverter enclosure is designed with a routing path to allow for proper bending space of these conductors, and therefore the path shown below should be followed. The transformer's neutral bar has also been designed with a set of holes to allow for various field connections such as a box lug or a crimped lug.

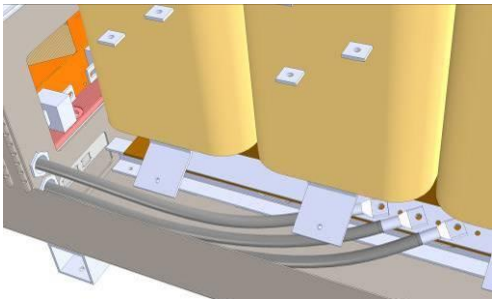
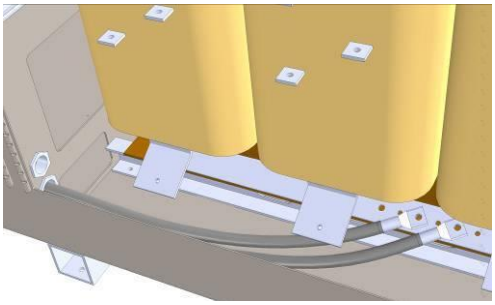
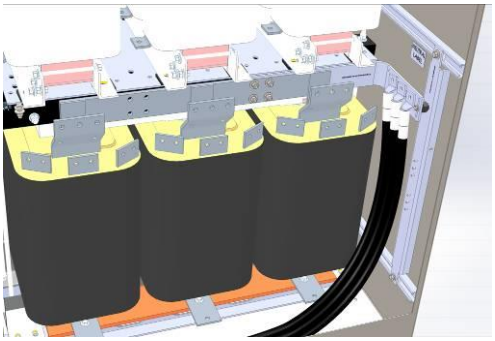
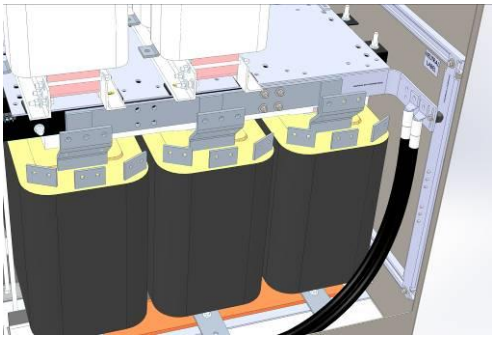
 SGI 500/PE Neutral Routing Path	 SGI 225-300 Neutral Routing Path
 SGI 500/500PE Neutral Landing Location	 SGI 225-300 Neutral Landing Locations
 SGI 500/500PE Alternate Transformer Neutral Location	 SGI 225-300 Alternate Transformer Neutral Location
Cu or Al Conductors Max. 3 x 1/0AWG-400kcmil 75°C Connections 3 x 1/2" Holes, 3 x 3/8" Holes 1 Connection per Hole	Cu or Al Conductors Max. 2 x 1/0AWG-500kcmil 75°C Connections 3 x 1/2" Holes, 3 x 3/8" Holes 1 Connection per Hole

Table 6.4—Optional Neutral Routing and Connections

7 Signal Connections

WARNING: Before conducting any maintenance or service on the inverter, the disconnect switches must be set to the OFF position (locked out) and the absence of voltage must be verified by qualified personnel. Do not rely on UI functions to stop the inverter, as a reset might cause it to start unexpectedly.

The terminal blocks for the Remote Shutdown connections are located on the back wall of the left side of the enclosure cabinet. The DAS, as well as the SolrenView AIR cellular modem and optional Multi-port Switch, are located on the inside of the leftmost door.

7.1 Remote Shutdown Wiring

The SGI series of inverters feature a remote shutdown input to allow for advanced remote command and control systems. The input required is an isolated 24VDC signal that is wired to the terminal blocks on the back panel of the inverter by the installer. Once the signal is activated, the inverter will slowly ramp down power and then disconnect from the grid. The inverter will not reconnect until the signal is removed. The remote shutdown feature will not result in an instantaneous shutdown of the inverter.

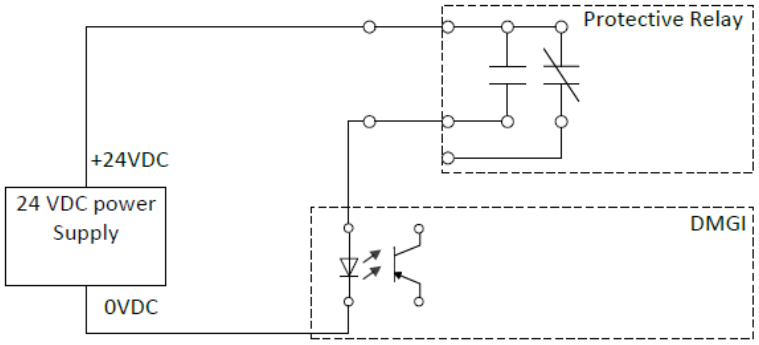


Figure 7.1—Remote Shutdown Conceptual Diagram

Maximum Shutdown Ramp Time	Nominal Input Voltage	Minimum Input Voltage	Maximum Input Voltage	Minimum Current Capability	Terminal Wire Size
4 s	24VDC	21.6VDC	26.4VDC	100mADC	26 – 14AWG

Table 7.1—Remote Shutdown Specifications

Locate a set of terminal blocks that are identified as Block 2 on the back panel of the inverter (refer to the diagram below). Wire the positive conductor to the leftmost position on Terminal Block 18. Wire the return conductor to the leftmost position on Terminal Block 19.

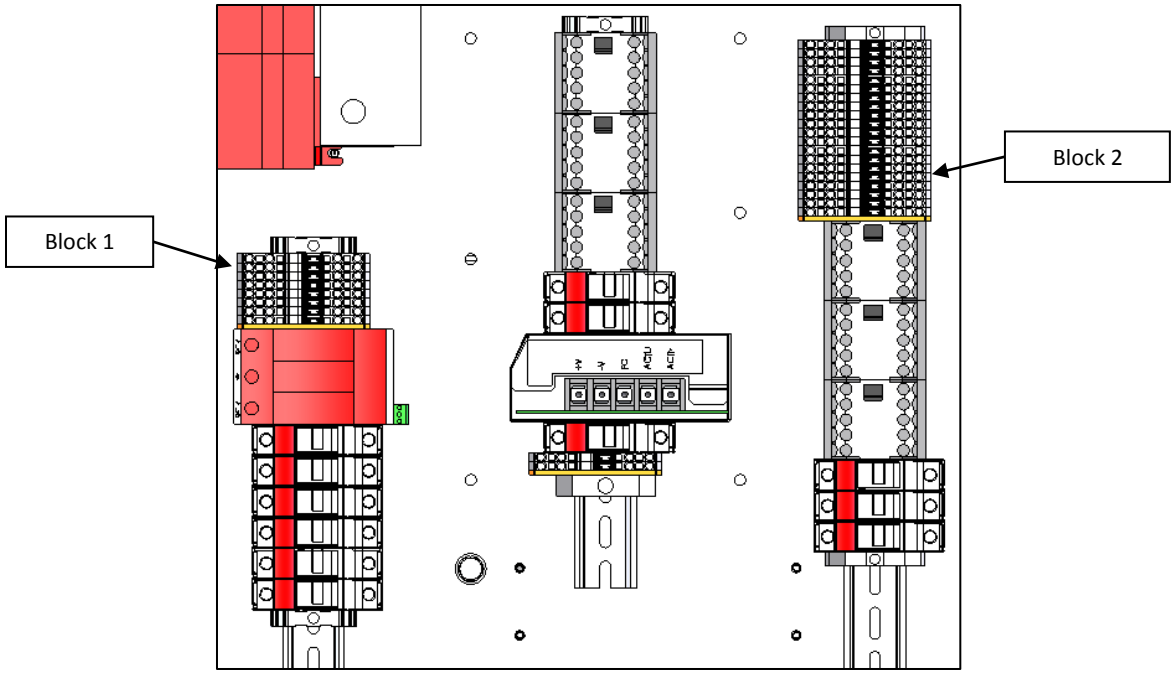


Figure 7.2—Terminal Block Locations

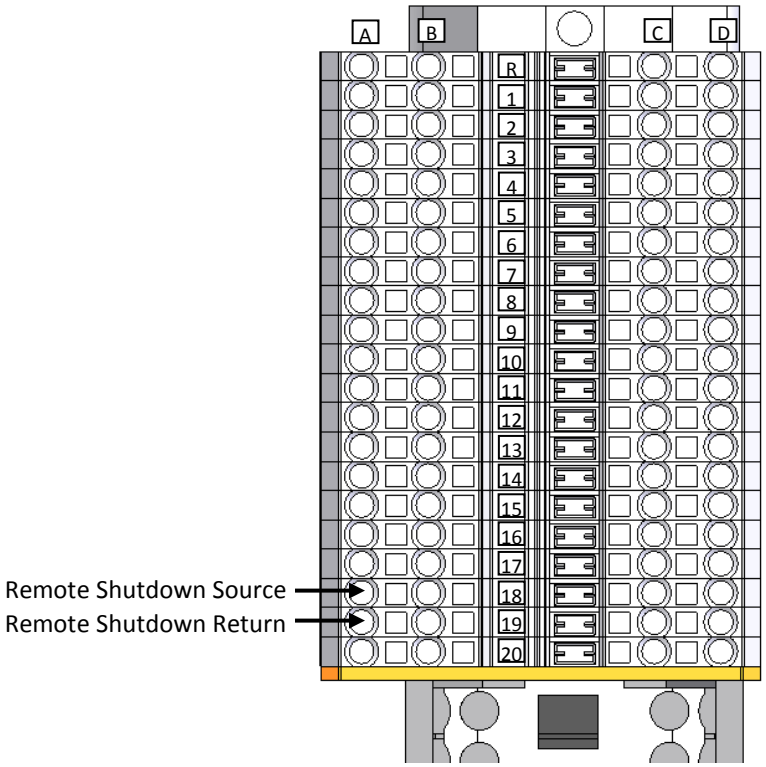


Figure 7.3—Remote Shutdown Wiring Locations on Terminal Blocks 18 and 19

7.2 SolrenView DAS Ethernet Connection

Before SolrenView web-based monitoring can function, the inverter must be connected to the internet. Customers ordering the SolrenView AIR option have network connectivity turned on in the factory; no additional steps are required.

The SolrenView Data Acquisition System (DAS) is located on the back of the leftmost door, as shown in the figure below. The Ethernet connection shown in Figure 7.4 is utilized with the SolrenView monitoring services to connect the SolrenView DAS to the internet.

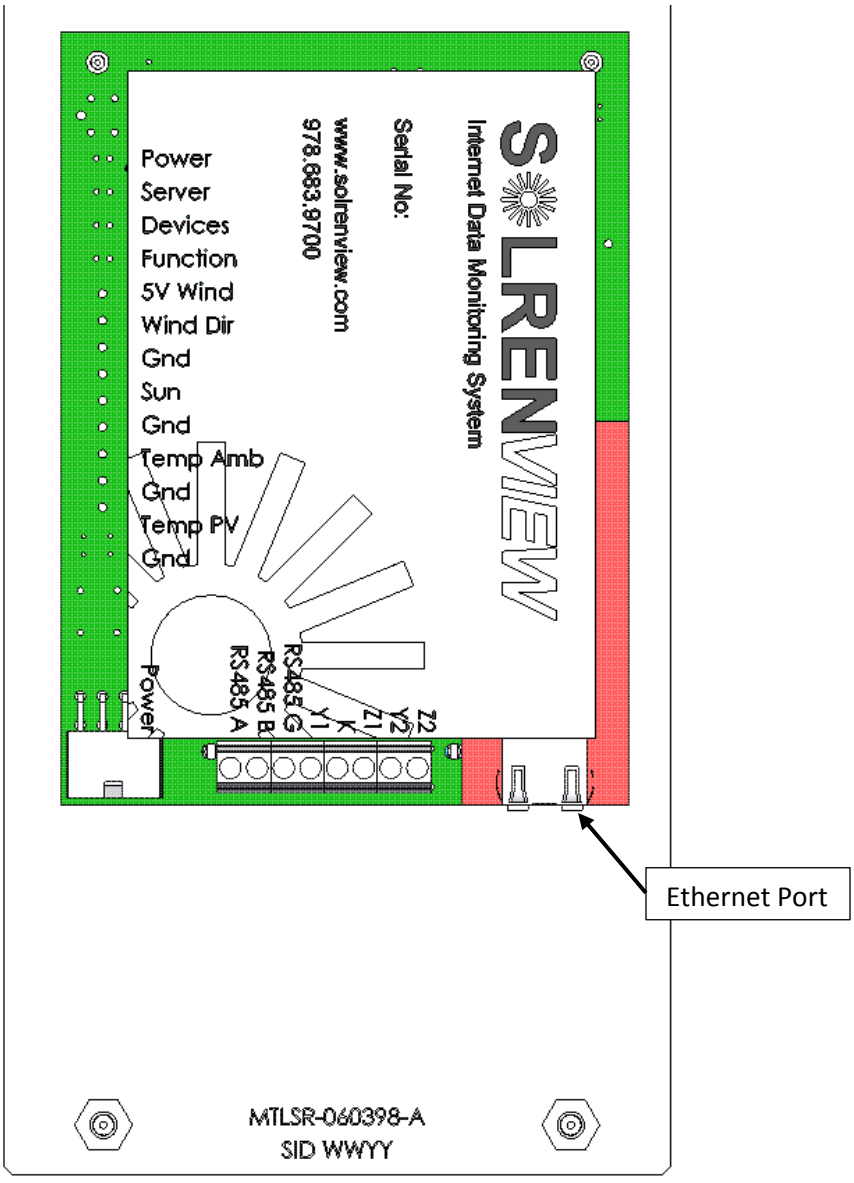


Figure 7.4—Ethernet Connection to the Back of the SolrenView DAS

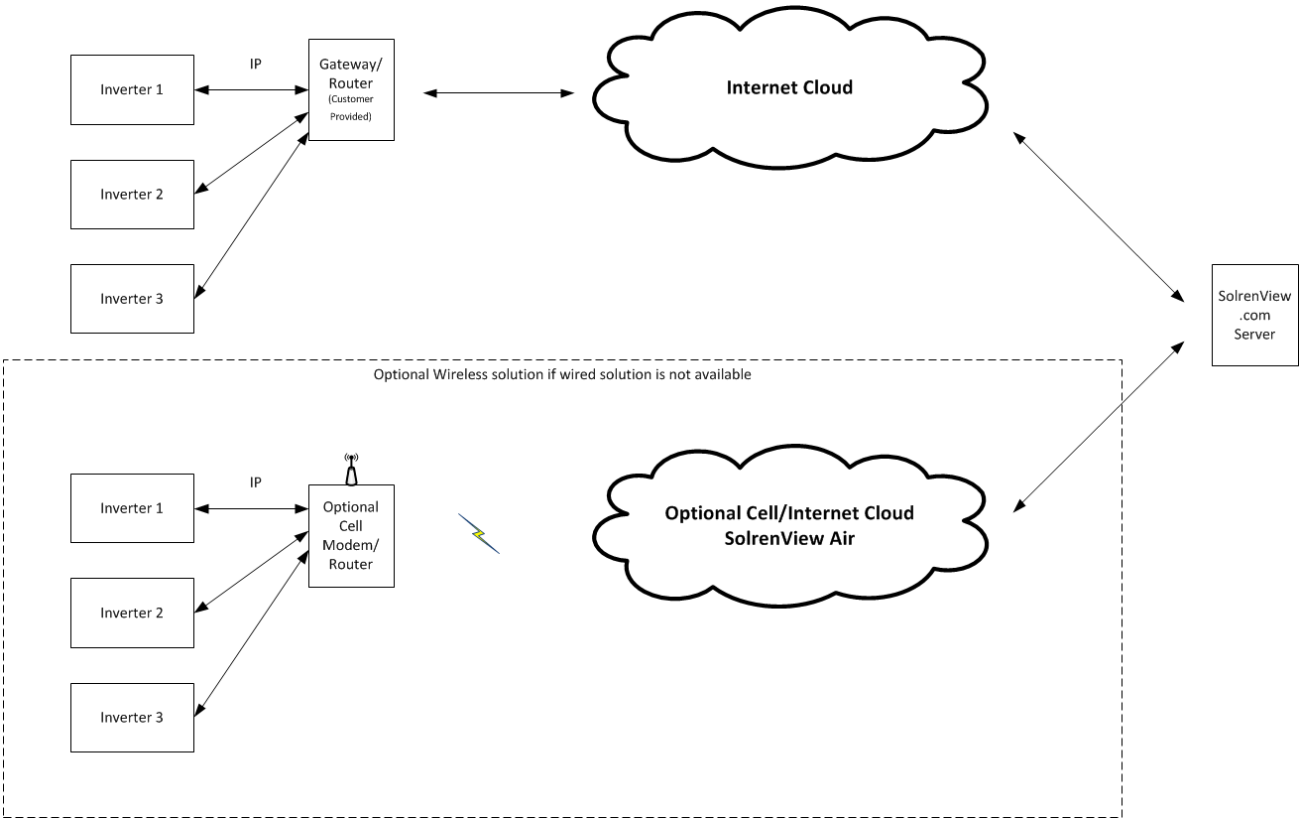


Figure 7.5—Block Diagram of the SolrenView Data Acquisition Infrastructure

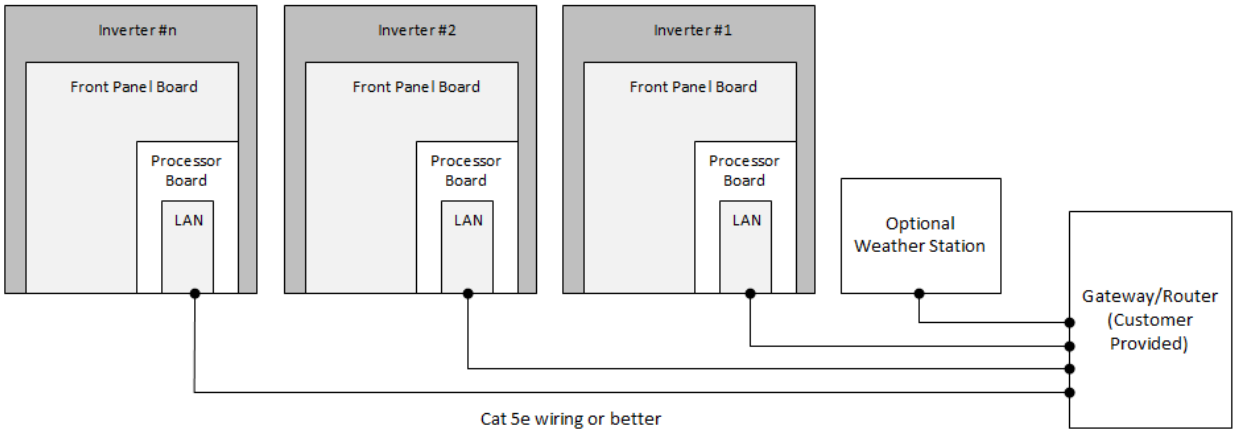
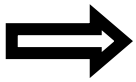


Figure 7.6—Typical SolrenView Data Acquisition Configuration

NOTE: The SolrenView Data Acquisition gateway should be provided by the customer.

NOTE: See Section 10.8 for information on how to configure the SolrenView connection.

1. Remove the plastic protective cover.
2. Plug a Cat 5e or better networking cable into Ethernet port (see Figure 7.4).



NOTE: The green link and yellow activity LEDs only light when the SolrenView DAS is powered.

3. Re-install the protective cover. Hand-tighten screws once shield is back in place; *do not torque*.

Use Cat5e or better Ethernet cable between the SolrenView DAS and the gateway/router. If molded cables cannot be used, suggest using network cable tester to ensure cable and crimp quality.

Gateway/Router Configuration:
The gateway/router should not require any special configuration as most gateways are already configured to support DHCP discovery and to allow outgoing traffic. In case the gateway is configured to restrict outgoing traffic, an outgoing rule must be added to allow the SolrenView Data Acquisition System (DAS) to connect to the SolrenView Monitoring data servers.

See Section 10.8 for more information on how to enable data monitoring with the SolrenView DAS.

7.3 SolrenView DAS to External DAS Modbus (RS-485) Connections

The SolrenView DAS is located on the back side of the leftmost door, as shown in the following figure.

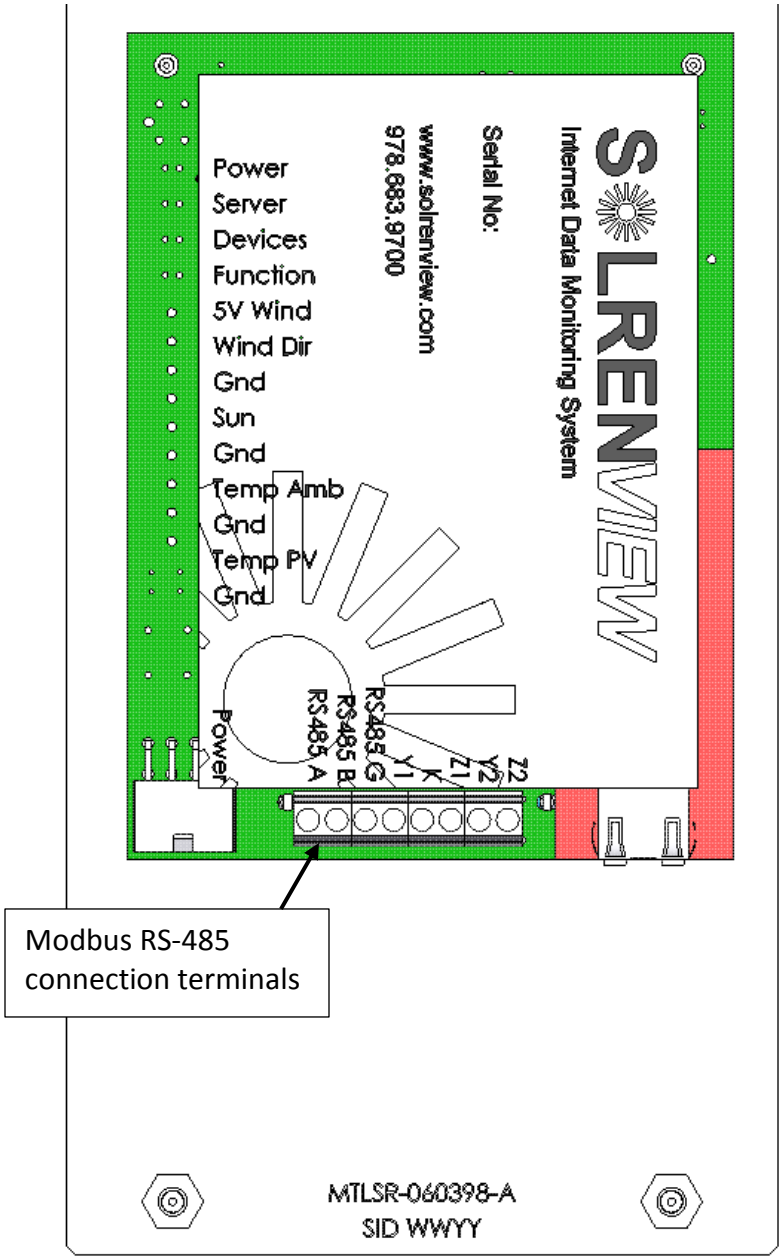


Figure 7.7—Modbus (RS-485) Connection for the SolrenView DAS

To ensure good and reliable communications between the external data monitoring system and the SolrenView DAS, it is important to follow these guidelines when wiring the RS-485 connections:

1. Shielded, twisted pair Modbus cable such as Belden 9841 must be used.
2. All devices on the RS-485 must be daisy chained.
3. Do not land the Modbus cable shield at the inverter. It should only be connected to GND in one location, typically at the external DAS.

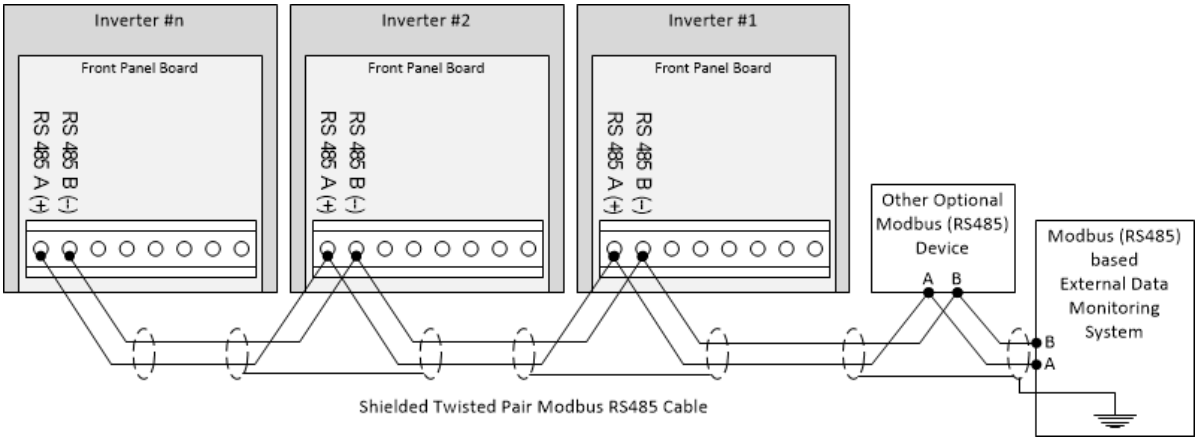


Figure 7.8—Typical External Data Monitoring System Modbus Connections

NOTE: When wiring in a daisy chain two wires must be landed in the same wire terminal for each device in the chain, excluding the devices at the end of the chain.

When connecting multiple devices, avoid the incorrect “Branch” (a), “Star” (b), and “T” (c) connection schemes (on the left) as thy will cause unwanted signal reflections that can disrupt the communication signals. Instead use connection schemes shown as correct (on the right).

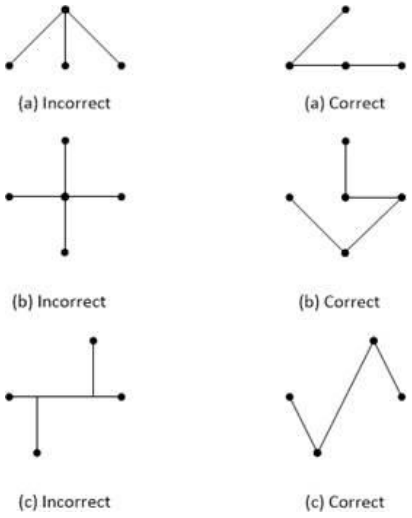


Figure 7.9—Correct (right) and Incorrect (left) Ways to Daisy Chain Inverters

1. To gain access to the SolrenView DAS, remove the plastic protective cover.
2. Connect the RS-485 wires to the A and B terminals on the DAS as shown in Figure 7.8. Torque the terminals to 4in-lbs.
3. The shields between the different cable legs need to be connected together to ensure shield continuity as shown in Figure 7.8. Do not connect the shield to the ground terminal on the SolrenView DAS.
4. The RS-485 cable shield should be grounded in one location only in order to avoid any ground loops, typically at the External Data Monitoring System.
5. Re-install the protective cover. Hand-tighten screws once shield is back in place; *do not torque*.

NOTE: Shielded, twisted pair Modbus cable such as Belden 9841 must be used.

7.3.1 Modbus Terminations

It is important that the Modbus be terminated correctly in order to minimize any bus reflections that could cause communications disruptions. The Solectria inverters provide DIP switches that allow one to turn the bus termination ON or OFF. The default setting from the factory has the external Modbus (RS-485) terminations turned OFF. The default OFF setting is appropriate for inverters that are in the “middle” of the daisy chain, where bus termination is not required (e.g., inverter #1 and #2 in Figure 7.8 above). Any inverter that is not at the end of the daisy chain should use the factory default setting with the termination turned OFF as shown in Figure 7.10.

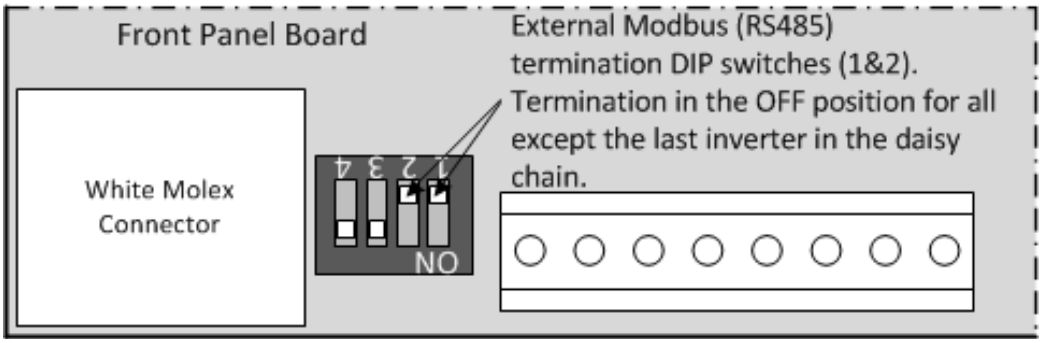


Figure 7.10a—External Modbus (RS-485) Termination Switches 1 and 2 in the OFF Position

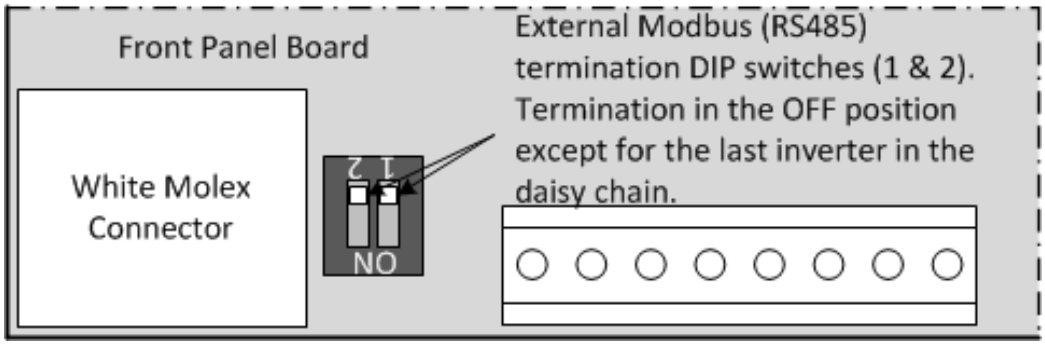


Figure 7.10b—External Modbus (RS-485) Termination Switches 1 and 2 in the OFF Position Rev 4 or newer boards.

Figure 7.10 shows the external Modbus (RS-485) termination switches (1 and 2) in the OFF position (pushed away from the edge of the board). Switches 3 and 4, closest to the white Molex connector, must always be in the ON position towards the edge of the board. Note: Switches 3 and 4 have been removed from Rev 4 and newer boards and are no longer applicable on rev 4 and newer boards.

If the inverter happens to be the last device in the Modbus (RS-485) daisy chain (where the bus physically ends) the external bus termination has to be turned ON (e.g., Inverter #n in Figure 7.8). That is done by pushing DIP switches 1 and 2 towards the edge of the board, as shown in Figure 7.11.

NOTE: It is important that any other device, inverter or other, does not have any termination turned ON, thereby loading own the Modbus (RS-485) unless it is the first device on the bus (e.g., the External Data Monitoring System).

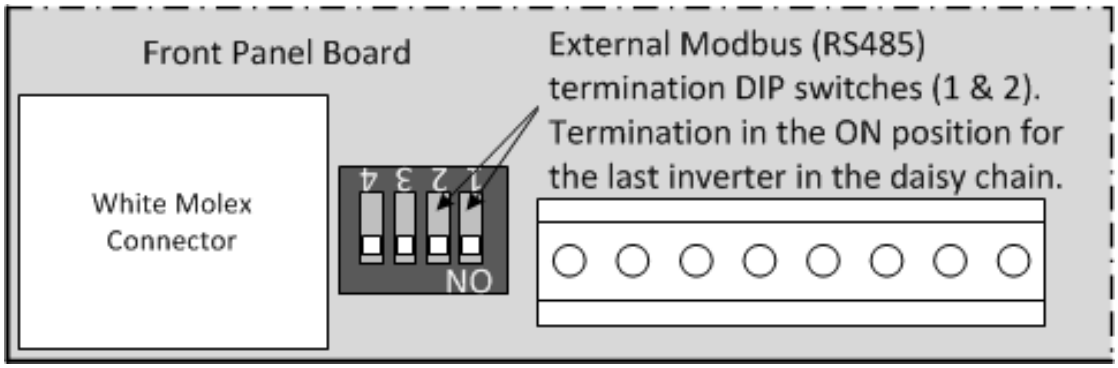


Figure 7.11a—External Modbus (RS-485) Termination Switches 1 and 2 in the ON Position

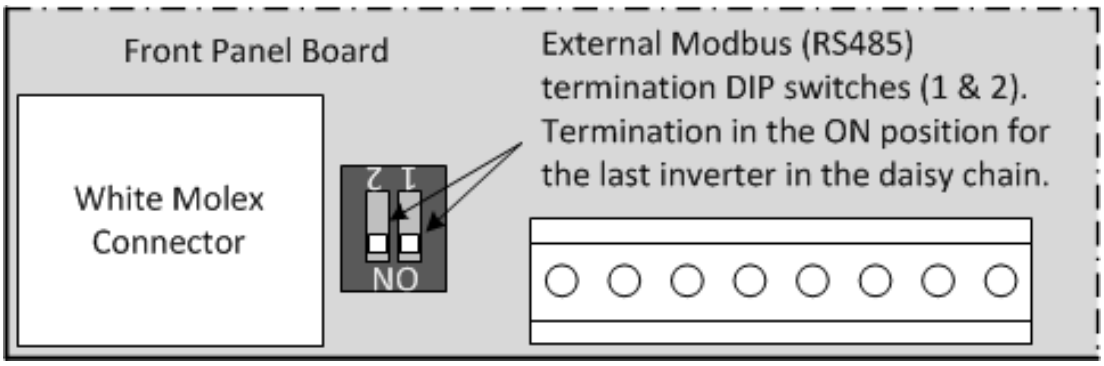


Figure 7.11b—External Modbus (RS-485) Termination Switches 1 and 2 in the ON Position. Rev 4 or newer boards.

Switches 3 and 4 (closest to the white Molex connector) should always be in the ON position, towards the edge of the board. Note: Switches 3 and 4 have been removed from Rev 4 and newer boards and are no longer applicable on rev 4 and newer boards.

8 Inverter Features and Options

8.1 DC Ground Fault Detection and Interruption

The DC grounded connections are internally bonded to the ground system through the DC Ground Fault Detection and Interruption (GFDI) circuit. When a single ground fault on an ungrounded circuit exceeding the pickup value is present in the PV array or in the DC wiring to the inverter, the internal DC GDFI breaker will trip and a ground fault will be signaled by means of a yellow LED and a message on the UI.

WARNING: The DC grounded connections must not be bonded to the ground system at any point outside of the inverter. The bond is made in the GFDI circuit that is integral to the inverted.

WARNING: In the event of a DC ground fault indication, normally grounded conductors and equipment may be energized and may pose a significant shock and/or fire hazard. DO NOT TOUCH any equipment including, but not limited to: the inverter, the PV array disconnects, the PV array combiners, the PV panels, or the PV racking system. The source of the ground fault must be located and eliminated by qualified personnel before proceeding.

The GFDI breaker is located inside the inverter, on the back wall of the left side of the inverter, as shown in the figure below.

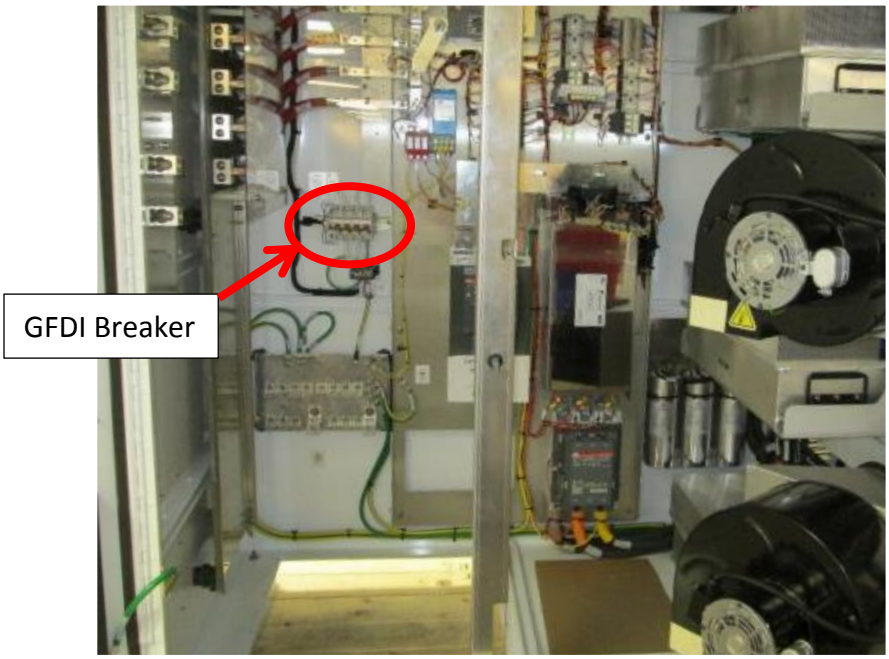
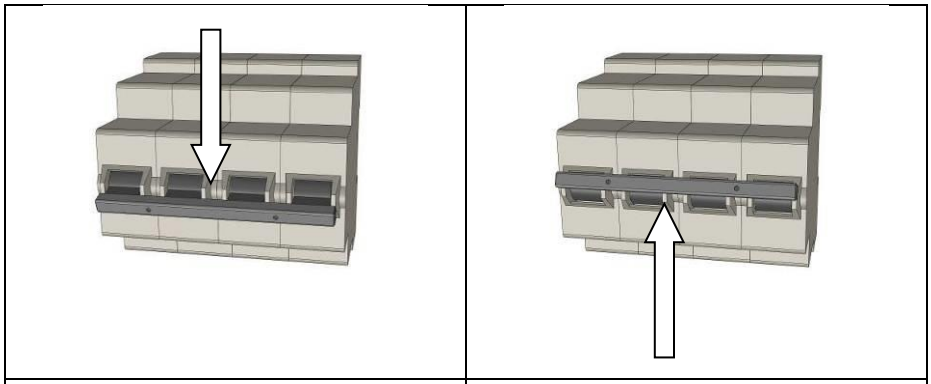


Figure 8.1—Location of GFDI Breaker

Once the ground fault has been found and eliminated, the GFDI breaker can be re-engaged. To re-engage the breaker, push the tie bar on the breaker all the way down, and then firmly engage it by pushing the tie bar up, as shown in the figure below.



Breaker TRIPPED DC GROUND FAULT INDICATED	Breaker ON NO GROUND FAULT DETECTED

Figure 8.2—Operating Positions of GFDI Breaker

	DC Ground Fault Current Pickup	Maximum Trip Time
SGI 225/250	4 A	1 s
SGI 266/300/500PE/500	5 A	1 s

Table 8.1—DC GFDI Specifications

WARNING: If the GFDI breaker trips upon connection of one or more combined strings, a ground fault in the array must be located and eliminated before proceeding. The DC ground fault is eliminated when the GFDI breaker can be engaged into its lever-up position and remain in that position. Failure to obey these instructions may cause the grounded conductor to rise to potentially unsafe voltage levels.

WARNING: Even when the DC disconnect is in the off position, the ungrounded DC conductor leading up to the DC disconnect will remain live on the PV side as long as the PV modules are in daylight. The inverter side of the DC disconnect will also remain live after the disconnect has been shut off until 60 seconds after the LEDs turn off, as DC bus capacitors in the inverter discharge.

8.2 AC Ground Fault Detection

The SGI series of inverters are not equipped with AC ground fault protection. Refer to local electrical codes for requirements relate to AC ground fault protection for interconnected devices.

8.3 Lightning and Surge Protection

The SGI series is designed with certain protections against surges in voltage including certification to ANSI/IEEE 62.41/62.42. However, added protection and solid grounding provisions are important for best protection against utility surges and surges created by indirect lightning strikes.

The installation of a UL listed lightning arrester of the correct specification is recommended on both the DC and AC inputs of the inverter. This should be installed and wired using the manufacturer's installation instructions. This device gives important added protection from indirect lightning strikes and the resulting voltage surges that provide protection beyond the inverter's IEEE 1547 requirements.

The best protection against damage from lightning and other voltage surge sources is proper grounding of the system. When required by local codes, it is recommended to establish a grounding electrode system specifically for the PV array, located as close as practical to the array. It is also recommended to have the lightning protection system of the building checked and upgraded if needed before the PV system is installed. These added protections are especially important for areas prone to thunder storms and possible nearby lightning strikes. Although these added precautions will not guarantee that there will be *no* damage from lightning, they can help prevent or limit potential damage.

8.4 Stainless Steel Enclosure (Optional)

The stainless steel option is best for installation in harsh or marine environments. It houses the power stage system components in a 316-grade stainless steel enclosure for increased corrosion protection. In addition, all aluminum parts on the outside of the enclosure have a black anodized finish.

8.5 Intake Air Filter (Optional)

The intake air filter option is comprised of upgraded air intake housings that each accepts a 20in x 20in filter. Three different filters are available with the option. For the lightest-duty filtering environments and the longest time between cleanings, an economy aluminum mesh filter is available. For medium-duty filtering environments and moderate time between cleanings, an electrostatic MERV 6 filter is available with a peak arrestance of 82%. For the heaviest-duty filtering environments and the shortest time between cleanings, a premium electrostatic filter is available with a MERV 8 rating and peak arrestance of 94%.

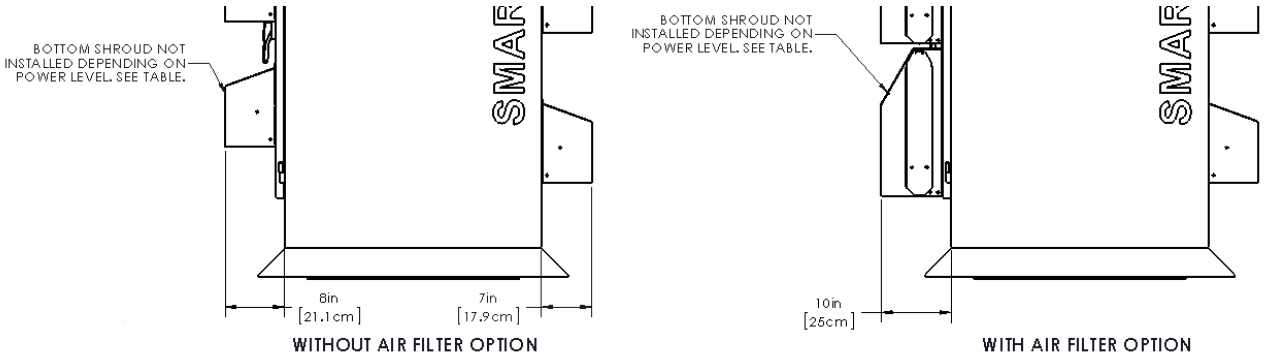


Figure 8.3—Dimensions With and Without Air Filter Option

It is recommended to inspect and clean the filters monthly for the first year of operation and adjust the maintenance schedule as necessary

NOTE: Failure to clean the filters on a timely basis will result in reduced airflow to the inverter, possibly resulting in the inverter going into a protective mode with reduced power output.

8.6 Revenue Grade Meter (Optional)

The SolrenView Revenue Grade Meter is a factory-integrated, Revenue Grade metering device that measures power and energy production at the AC output of the inverter and can be monitored through SolrenView monitoring services.

9 SolrenView™ Options and Features

The SGI series of inverters provides two ways to connect to the inverter. An Ethernet interface is utilized when the Inverter Direct Monitoring option is used. The other way to connect to the inverter is through a Modbus (RS-485) interface that can be used to connect external data monitoring systems to the inverter. The external data monitoring systems can access inverter data such as AC voltage, DC voltage, power, and energy production. For more information see Modbus documentation on the Solectria website.

9.1 Inverter Direct Monitoring (Optional)

SolrenView optional web based monitoring provides PV system owners with a highly accurate, real time monitoring solution to maximize the efficiency and profitability of their solar assets. The complete SolrenView Data Acquisition System (DAS) for the SGI inverter features inverter direct monitoring, revenue grade monitoring, SolZone™ sub-array current monitoring, kiosk view, and weather station monitoring. Alarms and alert messages can be sent via email or text message for quick response to abnormal conditions.

The DAS connects to the internet using an Ethernet broadband connection through the site supplied connection to a router. For sites with multiple inverters each inverter requires an independent Ethernet connection. See Section 7.2 for more detailed information.

9.2 SolrenView AIR Monitoring (Optional)

SolrenView AIR allows customers to take advantage of SolrenView web-based monitoring features when standard internet access is not readily available or in environments where network security is critical. The SolrenView DAS provides data to the fully-integrated cellular modem over the 4G cellular network. Remote solar fields, banks, government, schools, and agricultural locations are a few examples where cellular link is preferred.

If you have purchased the 4G cellular SolrenView AIR monitoring option, all of the hardware will be installed in the inverter and configured at the factory. The inverter will begin to report to the SolrenView server as soon as the inverter is commissioned with AC and DC power and a cellular signal is present. No additional installation, configuration steps, or external power supplies are necessary. SolrenView AIR 4G cellular device is provided by Verizon Wireless and is available in their network coverage areas. It is recommended to verify if service is available in the intended location before purchasing this option.

9.3 SolrenView AIR Multi-port (Optional)

Inverters equipped with the SolrenView AIR multi-port option include an Ethernet switch integrated into the inverter. One port is pre-wired to the SolrenView AIR Modem and a second port is pre-wired to the SolrenView DAS in the inverter. This leaves available ports for any other SolrenView device, such as an inverter data acquisition device or weather station. The multi-

port option is only for use with SolrenView monitoring devices. The customer is responsible for connective devices to the Ethernet switch.

9.4 SolrenView SolZone™ (Optional)

SolZone sub-array monitoring provides customers an extra level of granularity to view zone-by-zone production performance. SolZone compares DC currents of individual PV array zones against each other, allowing the detection of underperforming strings via a web browser. It also detects partial shading so that customers may evaluate how to improve their PV array output. SolZone is also compatible with many external data monitoring systems.

This option includes up to eight factory installed current transformers (CTs) on the inverter's DC inputs. The number of CTs will match the number of inputs on the DC combiner. The CTs measure the DC current from each of the array zones included in the DC combiner. The SolrenView DAS will collect the data from each of the CTs and will provide the data for SolrenView web-based monitoring or for 3rd party monitoring via Modbus. For an inverter with an eight position subcombiner, there is one zone per input. For inverters with a 16 position subcombiner, each zone represents a pair of inputs. For inverters with a 32 position subcombiner, each zone represents 4 inputs.

9.5 SolrenView Revenue Grade Monitoring (Optional)

The SolrenView Revenue Grade Monitoring option keeps track of lifetime energy produced by a customer's PV system. The Revenue Grade Monitoring option can be purchased by itself or in addition to Inverter Direct Monitoring. In addition to the monitoring service, the Revenue Grade Meter option must also be purchased.

9.6 Agency Reporting (Optional)

Solectria may also report the revenue grade totals to certain agencies for net metering reimbursement; this is an additional option if a customer chooses.

10 Inverter Control and Communication

Every Solectria three-phase commercial inverter includes a SolrenView™ DAS integrated into the inverter door. This device performs multiple functions including control, monitoring, data logging, and communications between the inverter and the outside world.

A user can configure, monitor, and control the inverter using the UI mounted on the front door. The UI consists of the display, four buttons, and set of LED indicators for power, ground fault, and error indication.

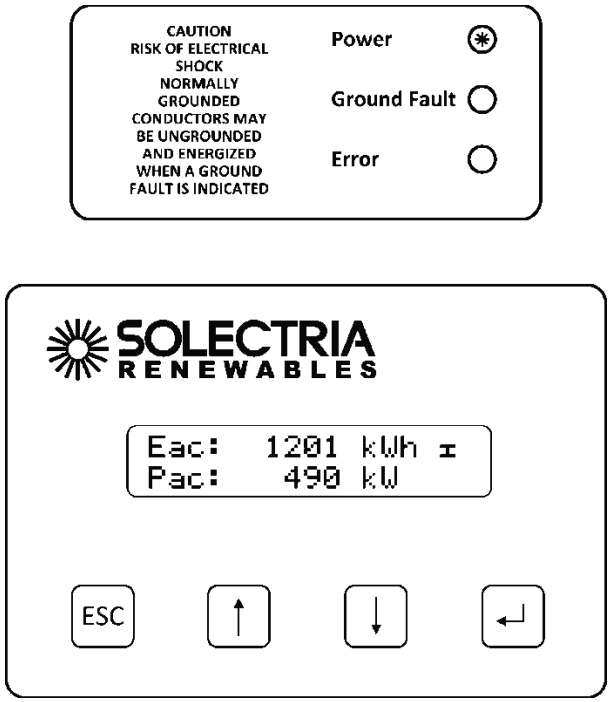


Figure 10.1—SolrenView UI (Front)

The SolrenView DAS, located on the back side of the UI (which can only be physically accessed when the inverter door is open), provides connectivity to the data monitoring system.

WARNING: SolrenView DAS connections must be made by qualified personnel only. To reduce the risk of electric shock, you should never attempt to open the inverter or perform any service or troubleshooting without prior training. Before attempting to service or troubleshoot the inverter, please read the entire manual.

10.1 LED Indicators

The LED indicators mounted on the inverter enclosure just above the UI give the installer and user a quick look at what state the inverter is in and if it is operating normally.

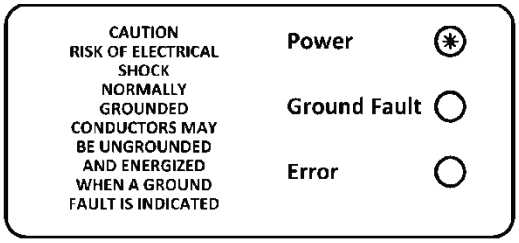


Figure 10.2—LED Indicators

Power—Green:
Solid green means the unit is outputting power and running normally. Flashing green is an indicator of other statuses and does not include abnormal operation.

Ground Fault—Yellow:
Indicates that a ground fault in the PV array has been detected and it must be located and repaired before the inverter will function.

WARNING: If the Yellow Ground Fault indicator is lit then normally grounded conductors may be ungrounded and energized. Do not touch the inverter as there is a risk of electrical shock.

Error—Red:
The inverter is not providing power due to an error or fault. The Red LED also turns on if the inverter is shut down using the keypad.

10.2 Button Description

The UI is controlled by four buttons that are integrated into the inverter door. These buttons are operated by momentarily pushing the center of the button

The buttons perform the following functions:

ESCAPE		To move up a level from the current menu. To cancel changing a data value. Hold for two seconds to STOP or START the inverter.
UP		To scroll up within the individual menu items. To increase a data value.
DOWN		To scroll down within the individual menu items. To decrease a data value.
ENTER		To enter into the selected menu. To begin to edit a data value. To accept a data value.

10.3 User Interface Menu Structure

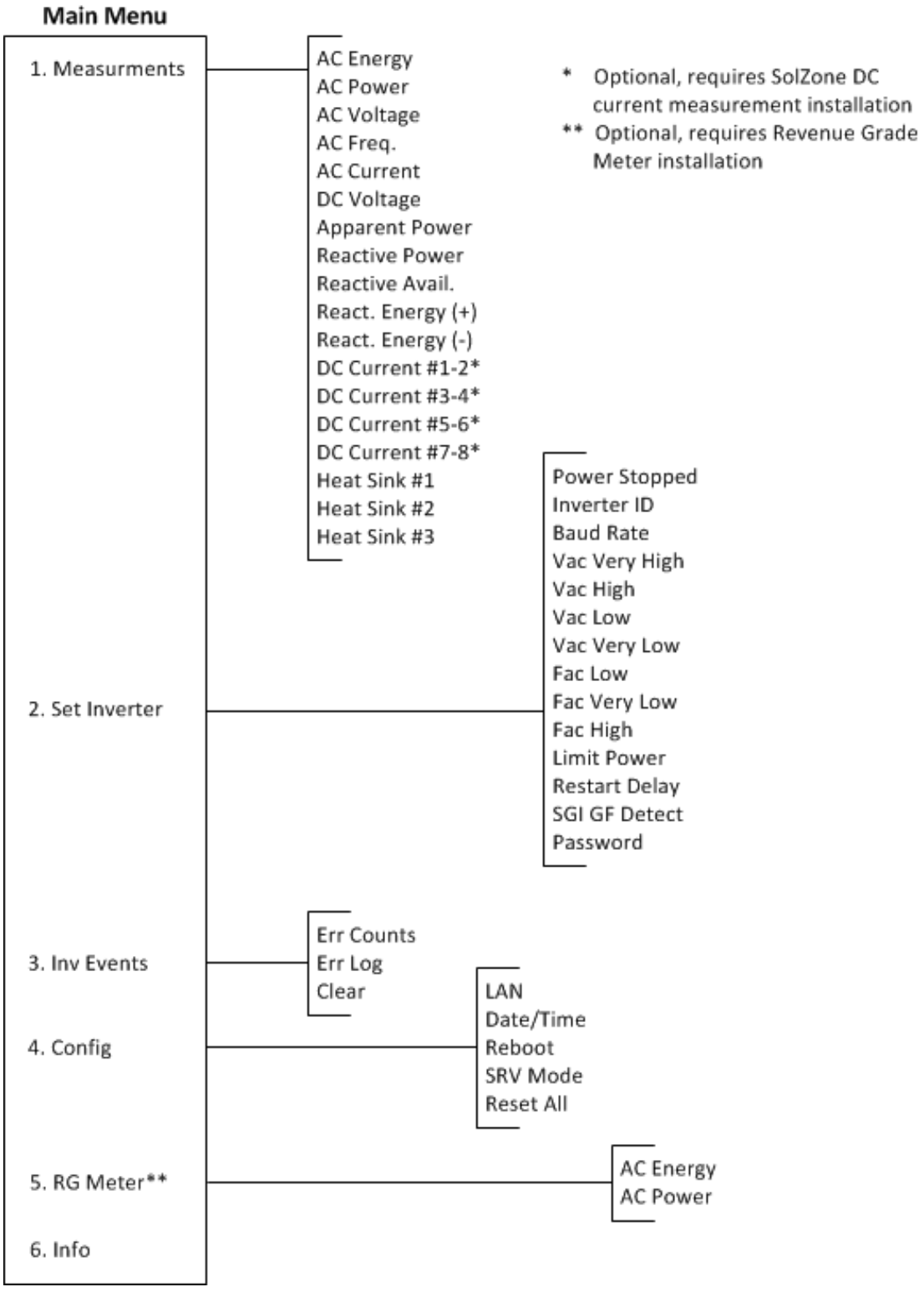
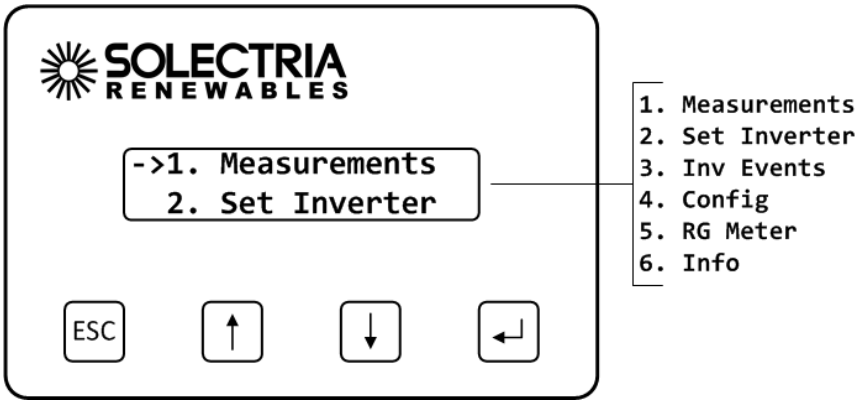


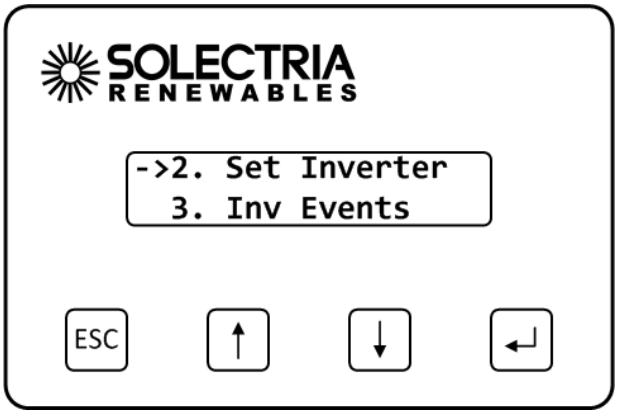
Figure 10.3—The LCD User Interface Menu Structure

10.4 Navigating the Menu Structure

The **Main Menu** allows the user to configure, monitor, and control inverter functions. The selected menu option is shown with an arrow on the left. Please note that the display only shows two menu options at a time and will scroll to show other options.



Press the **DOWN** or **UP** button to change the selected menu option, as indicated by the arrow. Note that the Revenue Grade Meter is optional and the "RG Meter" menu option appears only when one has been installed.



Press the **ENTER** button to activate the selected function or submenu.

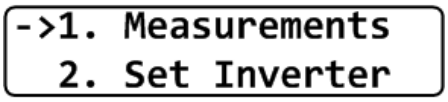
NOTE: All menus wrap around. Pressing the **UP** button when at the top of a menu will select the bottom-most menu option. Pressing the **DOWN** button when at the bottom of a menu will select the top-most menu option.

Main Menu

1. Measurements
2. Set Inverter
3. Inverter Events
4. Monitor
5. RG Meter (if installed)
6. Info

10.5 Inverter Measurements

From the **Main Menu**, select the **Measurements** function and then press the **ENTER** button.



This displays the data received from the inverter. Use the **UP** or **DOWN** buttons to scroll up and down through different measurement values. Press the **ESCAPE** button to return to the **Main Menu**.

Available Measurements

Measurement	Description
AC Energy	Cumulative AC Energy (kWh)
AC Power	AC Power output (W)
AC Voltage	AC Voltage, Three-phase (V)
AC Freq.	AC Frequency (Hz)
AC Current	AC Current, Three-phase average (A)
DC Voltage	DC Voltage (V)
Apparent Power	Apparent AC Power output (VA)
Reactive Power	Reactive AC Power output (VAr)
Reactive Avail.	Available Reactive AC Power output (VAr)
React. Energy (+)	Cumulative reactive energy generated (kVArh)
React. Energy (-)	Cumulative reactive energy received (kVArh)
DC Current #1-2	DC Current(A) #1-2 (Only available with SolZone)
DC Current #3-4	DC Current(A) #3-4 (Only available with SolZone)
DC Current #5-6	DC Current(A) #5-6 (Only available with SolZone)
DC Current #7-8	DC Current(A) #7-8 (Only available with SolZone)
Heat Sink #1	Heat Sink Temperature (°C) #1
Heat Sink #2	Heat Sink Temperature (°C) #2
Heat Sink #3	Heat Sink Temperature (°C) #3

Table 10.1—Available Measurements

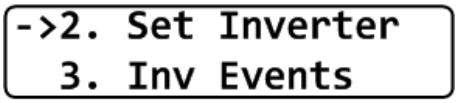
NOTE: DC Currents 1-8 are only available if the SolZone sub-array monitoring option is installed.

NOTE: The DC current number aligns to the customer input number on the DC combiner.

NOTE: Data for measurements is only available when the inverter is operating.

10.6 Inverter Settings

Many inverter functions can be controlled through the UI under the **Set Inverter** menu option. External data monitoring system Modbus (RS-485) settings can be viewed and modified, including inverter ID and Baud Rate. Inverter AC voltage and frequency trip settings can be viewed and modified as well.



The following table summarizes the **Set Inverter** menu options:

Menu Item	Description
Power Stopped	Temporarily disables the AC output of the inverter
Inverter ID	The Inverter Modbus ID
Baud Rate	Modbus (Serial port) Baud Rate (19200 or 9600)
Vac Very High	AC Voltage Critical High
	Vac Very High Voltage Trip Time (Not Changeable)
Vac High	AC Voltage High
	Vac High Voltage Trip Time
Vac Low	AC Voltage Low
	Vac Low Voltage Trip Time
Vac Very Low	AC Voltage Critical Low
	Vac Very Low Voltage Trip Time (Not Changeable)
Fac Low	AC Frequency Low
	Fac Low Frequency Trip Time
Fac Very Low	AC Frequency Critical Low (Not Changeable)
	Fac High Frequency Trip Time (Not Changeable)
Fac High	AC Frequency High (Not Changeable)
Limit Power	Limit AC Power Temporarily (%)
Restart Delay	Inverter Restart wait time in minutes/seconds
SGI GF Detect	Enables or disables SolrenView DAS to display GFD information.*
Password	4-digit pin code to set limits

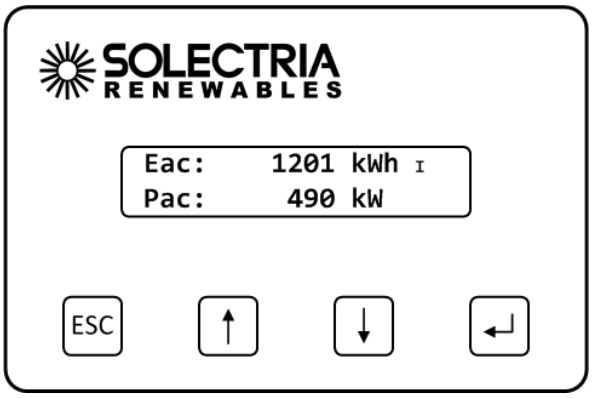
Table 10.2—Set Inverter Menu Options

NOTE: Data is only available when inverter is operating.

* Requires GFD wiring harness to work correctly. Do not enable GFD Detect if the wiring harness is not installed. SolrenView DAS will show GFD failure on the LCD if the harness is not installed.

10.6.1 Stopping and Starting the Inverter

WARNING: Before conducting any maintenance or service on the system, the inverter disconnect switches must be set to the OFF position, all sources of energy that connect to the inverter must be disconnected and locked out, and the absence of voltage must be verified by qualified personnel. Do not rely on the front panel UI functions to stop the inverter, as a reset might cause it to start unexpectedly.

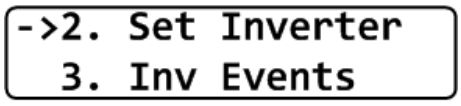


When shutting off the inverter for maintenance or non-emergency it is best to use the soft shutdown. This is activated by pressing and holding down the **ESCAPE** button for two seconds to **temporarily stop** the inverter if it is running. Then open the DC and AC disconnects to remove power to the inverter. Likewise, hold down the **ESPACE** button for two seconds **to initiate the inverter starting** if it is stopped.

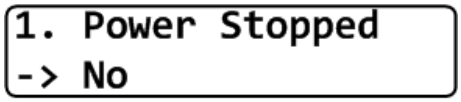
Alternatively, the inverter can be started and temporarily stopped by walking through the **Set Inverter** menu to turn the inverter on or off.

NOTE: The inverter will restart if the system power is cycled for any reason, if the system experiences certain fault conditions, or if it has been in that state for 8 hours.

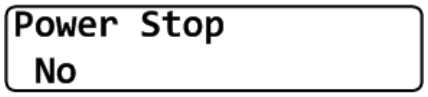
1. From the **Main Menu**, select the **Set Inverter** function and then press the **ENTER** button.



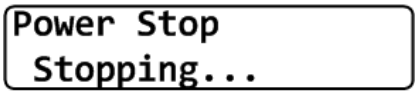
2. The **Power Stopped** status will be displayed, indicating the current (**Yes** or **No**) status.



3. Press the **ENTER** button. The display prompt will change to **Power Stop** and the setting can be modified. Press the **DOWN** button to change the setting to **Yes**.



4. Press the **ENTER** button to accept the setting, causing the inverter to shut down.



NOTE: To start the inverter, change the **Power Stop** setting in Step 3 to **No** instead of **Yes**.

NOTE: The inverter will be restarted if the system power is cycled for any reason, if the system experiences certain fault conditions, or if it has been in that state for 8 hours. The inverter will automatically start generating power in the morning when the sun rises.

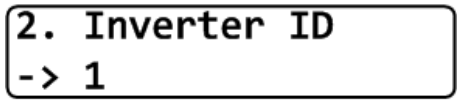
10.6.2 Setting the Inverter Modbus ID and Baud Rate

If External DAS is going to be connected to the inverter for data monitoring purposes, one has to make sure that each inverter and any other Modbus device in the Modbus daisy chain has a unique Modbus ID. The Modbus IDs should match what the external DAS is expecting. SGI inverters support Modbus IDs 1 through 16. One must also make sure that the inverter Modbus Baud Rate is configured correctly, either 9600 Baud or 19200 Baud.

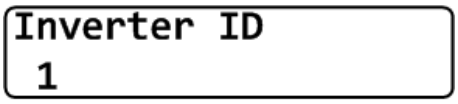
Setting the Inverter Modbus ID:

1. From the **Main Menu**, select the **Set Inverter** function and then press the **ENTER** button.

2. Next, select **Inverter ID** function on the **Set Inverter** submenu.



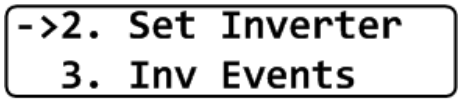
3. The **Inverter ID** settings will be displayed. Press **ENTER** to modify the setting. The Modbus ID value will flash, indicating that it can be changed. Press the **DOWN** and **UP** buttons to change the Modbus ID (1-16).



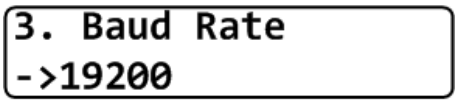
4. Press the **ENTER** button to accept the Inverter/Modbus ID setting. Pressing **ESC** will cancel the setting change.

Setting the Inverter Modbus Baud Rate:

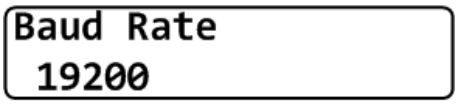
1. From the **Main Menu**, select the **Set Inverter** function and then press the **ENTER** button.



2. Next, select **Baud Rate** function on the **Set Inverter** submenu.



3. The **Baud Rate** setting will be displayed. Press **ENTER** to modify the setting. The Baud Rate value will flash, indicating that it can be changed. Press the **DOWN** and **UP** buttons to change the Modbus Baud Rate (9600, 19200).

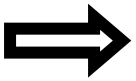


4. Press the **ENTER** button to accept the Baud Rate setting. Pressing **ESC** will cancel the setting change.

10.6.3 Changing Voltage and Frequency Trip Settings

The inverter is designed to operate within certain voltage and frequency ranges, as specified by the utility. When the inverter senses that the inverter and/or grid are outside any of these ranges, the inverter ceases exporting power. This action is referred to as an “inverter trip”. See Table 10.2 for more information on which inverter trip setting can be adjusted.

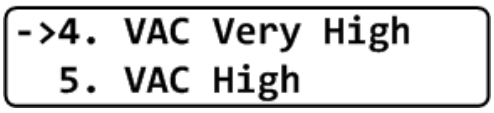
Inverter trip settings that can be reviewed include:



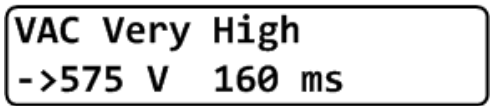
NOTE: Prior to changing trip settings, the password must be entered through the UI. See Section 10.6.6 for details on entering the password.

1. To change trip settings, fist select **Set Inverter** on the **Main Menu**:

2. Next, select e.g. **VAC Very High** function on the **Set Inverter** submenu:



3. The **VAC Very High** settings will be displayed. Press **ENTER** to modify the setting. The voltage value will flash, indicating that it can be changed. Press the **DOWN** and **UP** buttons to change the voltage setting. Voltage is entered in V (Volts).



4. Press the **ENTER** button to accept the voltage setting change.

5. If the trip time is adjustable, it will flash to indicate that it can be changed. Press the **DOWN** and **UP** buttons to change the trip time setting.

6. Press the **ENTER** button to accept the trip time setting change.

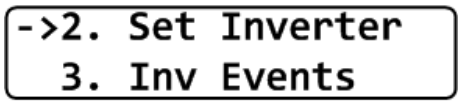
7. Repeat steps 2-6 for each trip setting to be modified.

10.6.4 Setting Inverter Temporary Power Limit

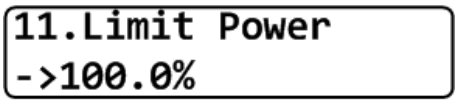
The temporary power limit overrides the standard system power generation and limits it to the maximum power generated as a percentage of the nameplate rating.

To set the Power Limit, use the UI to perform the following actions:

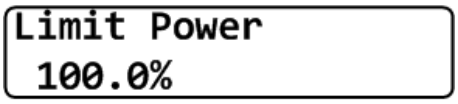
1. Select **Set Inverter** from the **Main Menu**.



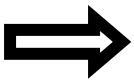
2. Select **Limit Power** and press **ENTER**.



3. Use the **UP** and **DOWN** buttons to input the desired percentage (%). Press **ENTER** to accept the limit. Then use the **UP** and **DOWN** buttons to adjust the 1/10 % increments.



4. The new Power Limit takes immediate effect.



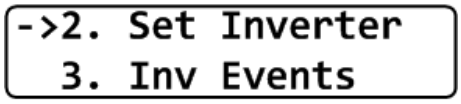
NOTE: If the inverter power is cycled for any reason or if the inverter experiences certain fault conditions, the temporary limiting mode will be reset. The limit will be reset overnight. Stopping power generation using the UI Stop Power function to stop power generation does not reset the Power Limit.

10.6.5 Enabling SolrenView DAS Ground Fault Detection

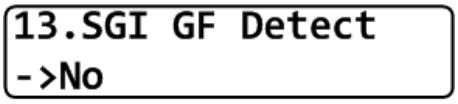
If the inverter is equipped with Ground Fault Detection wiring harness, the SolrenView DAS has the ability to indicate ground faults on the LCD. This indication is in addition to the yellow Ground Fault LED on the front panel (see Section 10.1 LED Indicators).

To enable the SolrenView DAS ground fault detection:

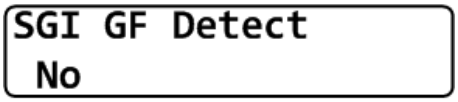
1. Select **Set Inverter** from the **Main Menu**.



2. Select **SGI GF Detect** and press **ENTER**.



3. Use the **UP** and **DOWN** buttons to change the GF Detect to **Yes**. Press **ENTER** to accept the change.

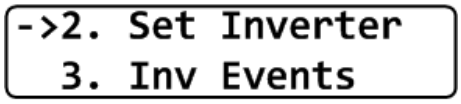


NOTE: Requires GFD wiring harness to work correctly. Do not enable GFD if the wiring harness is not installed. SolrenView DAS will show GFD failure on the LCD if the harness is not installed.

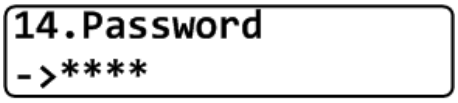
10.6.6 Accessing Password Protected Functions

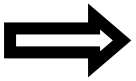
Certain menu functions can only be accessed after the four digit password (or PIN) is entered through the UI.

1. Select the **Set Inverter** submenu from the **Main Menu**.



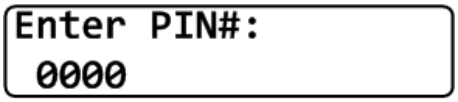
2. Select the **Password** function at the bottom of the **Set Inverter** submenu and press **ENTER**.

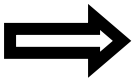




NOTE: This option can quickly be accessed by pressing the **UP** button from the top of the **Set Inverter** submenu, as the menu wraps around.

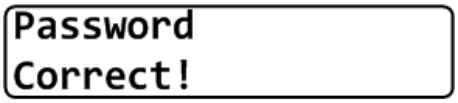
3. Press the **ENTER** button to begin entering the default password (PIN).





NOTE: The factory default PIN is 0000 and should be changed to prevent unauthorized inverter configuration.

4. Specify each of the four PIN digits one at a time. Press the **UP** button to increment the digit. Press the **DOWN** button to decrement the digit. Press the **ENTER** button to accept the digit. Press the **ESCAPE** button to cancel PIN entry at any point. When the fourth digit is entered the PIN entry will be evaluated and the "Password Correct" message will flash if the PIN is verified.



5. The **Password** screen will be shown again. Press **ESCAPE** twice to return to the **Main Menu**.

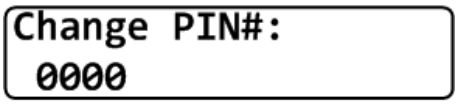
10.6.7 Changing the Inverter Password

The inverter password ensures that unauthorized users are not able to access certain menu functions.

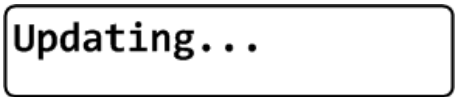
NOTE: The default password (0000) should be changed on commissioning. Please use a password that you can easily remember. Solectria does NOT provide a master password to reset the unit.

1. Enter the inverter password (PIN) as shown in Section 10.6.6.

2. Once the current password has successfully been entered, the password can be changed by pressing the **ENTER** button from the **Password** screen (Second time allows changing the PIN).



3. Specify each of the four password digits one at a time. Press the **UP** button to increment the digit. Press the **DOWN** button to decrement the digit. Press the **ENTER** button to accept the digit. Press the **ESCAPE** button to cancel the password entry. When the fourth digit is entered the password entry will be changed.



4. The **Password** screen will be shown again. Press **ESCAPE** twice to return to the **Main Menu**.

10.7 Inverter Events Logs

The inverter keeps track of various events and errors through error logging and cumulative counters.

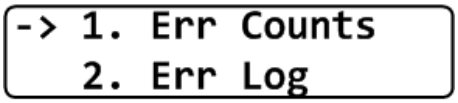
Menu Item	Description	
Err Counts	*Displays cumulative counters for each supported event / error, with the highest error count shown first.*	
Err Log	*Displays events (change of state) with the earliest event shown first.*	
Clear	*Clear History Options:*	
	None:	*Default, does nothing.*
	Err Counts:	*Clears the Inverter Error event counts.*
	Err Log:	*Clears Inverter Error events.*
	All:	*Clears both error counts and events.*

Table 10.3—Error Logs and Counts in Inverter Events Menu

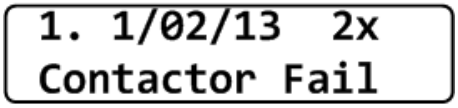
10.7.1 Display Error Counts

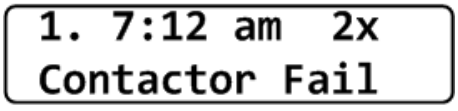
1. Select **Inv Events** from the **Main Menu** and press **ENTER**.

2. Select **Err Counts** from the **Inv Events Menu** and press **ENTER**.



3. The Error Counts are displayed in order of occurrence, with the most frequent error displayed at index position 1. In this example the most frequent error is Contactor Failure; two contactor fail events were logged with the last one logged on Jan 02, 2013 at 7:12 am.





The data format is index number, date/time, and number of occurrences on the first line. The second line is the type of the event.

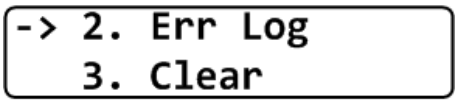
4. Press the **DOWN** button to see the next Error Count entry. If no Count data is recorded, the date and time that the Counts were last cleared is displayed.

5. Press the **ESCAPE** button to return to the **Inv Events Menu**.

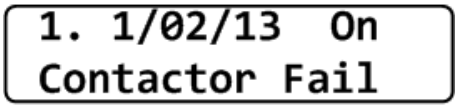
10.7.2 Displaying Error Logs

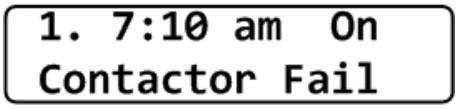
1. Select **Inv Events** from the **Main Menu** and press **ENTER**.

2. Select **Err Logs** from the **Inv Events Menu** and press **ENTER**.



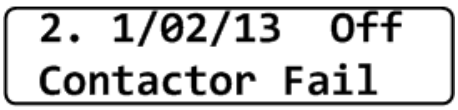
3. The most recent **Error Log** entry is displayed at index position 1.

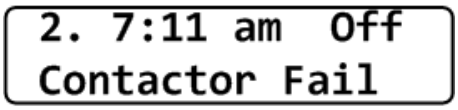




The data format is index number, date/time, and event state on the first line. When the error first is asserted the event state is shown as "**On**". When the error ceases the event state is shown as "**Off**". The second line is the type of the event.

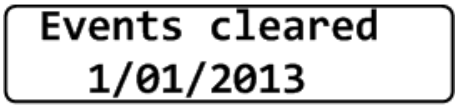
4. Press the **DOWN** button to see the next event stored in the log.

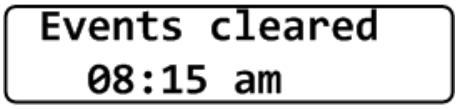




In this example, the inverter asserted a Contactor Fail error on Jan 01, 2013 at 7:10 am and ceased to assert the Contactor Fail error on Jan 01, 2013 at 7:11 am.

5. If not events are recorded, the date and time that the events were last cleared is displayed.





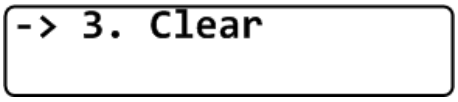
6. Press the **ESCAPE** button to return to the **Inv Events** menus.

NOTE: Press the **UP** button from the Error Log index 1 to see the most recent error logged.

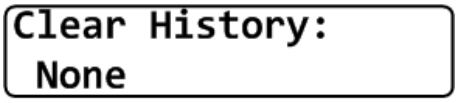
10.7.3 Clearing Error Counts or the Log

1. Select **Inv Events** from the **Main Menu** and press **ENTER**.

2. Select **Clear** from the **Inv Events Menu** and press **ENTER**.



The **Clear History** prompt will be shown. Select the type of history to be cleared by pressing the **UP** and **DOWN** buttons. Press **ENTER** to clear the history based on one of these settings. Press the **ESCAPE** button to cancel.



History Clearing Options:
None: History is not cleared.
Err Log: Clears the Error Log only.
Err Counts: Clears the Error Counts only.
All: Clears the Error Counts and Error Log.

10.7.4 Event List

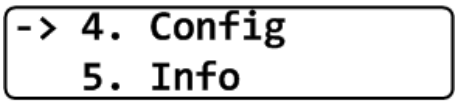
The following events are logged and counted:

- AC Contact Open
- AC Frequency High
- AC Frequency Low
- AC Islanding
- AC Voltage High
- AC Voltage Low
- Contactor Err
- CT Failure
- DC GND FAULT
- DC Voltage High
- Desat Error
- DMGI Overtemp
- Fan Life Reached
- IGBT Overtemp
- MAG Fail
- Min Vmpp Reached
- MOV Fault
- NTC Failure
- Open Phase
- Power Derated
- Power Stage Failure
- Power Stage Failure
- Vsense Err

10.8 Configuring the Inverter Data Acquisition System

The inverter Data Acquisition System (DAS) can be configured through the UI under the **Config** menu option.

LAN, Date/Time, SRV Monitoring Mode, DAS Reset, and DAS Reboot can be viewed and modified.

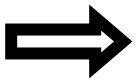


Menu Item	Description
LAN	Local Area Network (Ethernet) configuration. Applicable only for SolrenView monitoring, not used with third-party monitoring.
DHCP Mode	Turn DHCP mode on or off
Static/Fallback IP	If DHCP is turned on, this is then used as the fallback IP
Gateway IP	IP address of LAN's default gateway
Netmask	Subnet mask
Date/Time	Manual date and time set. Date and Time setting is disabled when SolrenView Monitoring is enabled. In that case, the SRV DAS synchronizes its time to the SolrenView Server times.
Reboot	Reboots the SRV DAS
SRV Mode	This starts the transmit process necessary for SolrenView monitoring. Note: There is no need to enable SRV Mode when using third-party monitoring service. Enabling SRV Mode when the SolrenView data monitoring service has not been purchased is not recommended.
Reset All	Settings are cleared to factory defaults. Caution: This will also clear Revenue-grade KYZ counters.

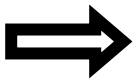
Table 10.4—Configuration Menu Options

10.8.1 LAN/Ethernet Connection

Connection to the Internet and to the SolrenView web-based monitoring service requires functioning TCP/IP connection. This connection runs over twisted pair Ethernet wiring and requires certain configurations to properly operate. See Sections 7.2, 10.8.1 through 10.8.5, and 10.8.8 for details on establishing Ethernet connectivity. By default, the SolrenView DAS should automatically configure TCP/IP addresses from a network router by using the DHCP protocol. In certain cases it may be necessary to override or manually configure the TCP/IP settings.



NOTE: The network router must 10BASE-T compatible.



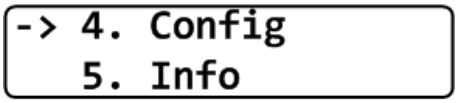
NOTE: Units that contain a multi-port SolrenView AIR option contain an Ethernet switch that allows for multiple units to connect to the single cellular gateway. In the event that the unit containing the multi-port hardware is power cycled, all other units connected to the Ethernet switch must also be power cycled to reestablish the network connection.

10.8.2 Automatically Configuring Network Settings

When shipped from the factory, the SolrenView DAS uses DHCP to configure the TCP/IP settings. If the SolrenView DAS has been changed to use a static IP address, the following instructions will explain how to turn DHCP back on:

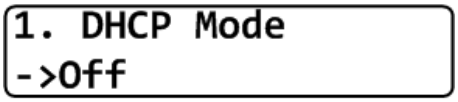
To configure the SolrenView DAS to use DHCP:

1. Select **Config** from the **Main Menu** and press **ENTER**.

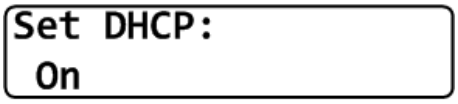


2. Select **LAN** from the **Config Menu** and press **ENTER**.

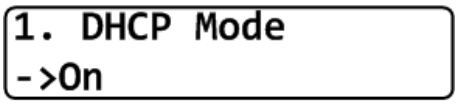
3. Select the **DHCP** function and press **ENTER** to edit this setting.



4. Press the **DOWN** button to turn **DHCP Mode On** and press **ENTER** to save this setting.

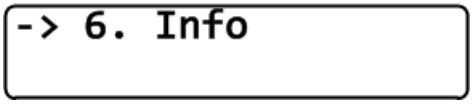


5. The **DHCP Mode** setting will now show **On**.

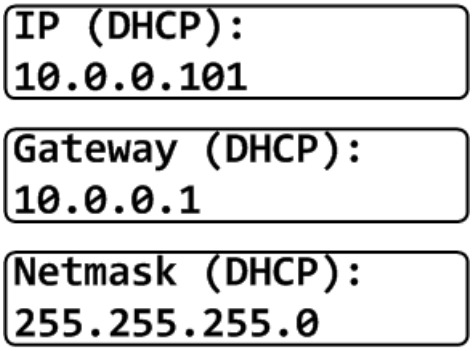


10.8.3 Viewing Current TCP/IP Settings

1. Select the **Info** function on the **Main Menu** and press **ENTER**.



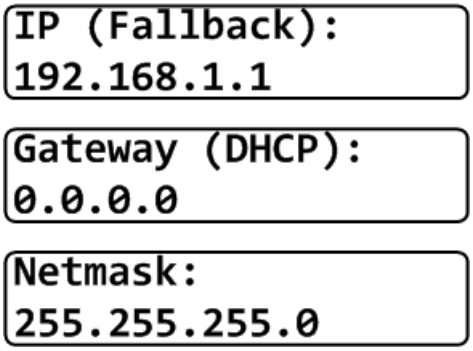
2. Information on the inverter will be displayed including the IP, gateway, and Netmask settings. Press **ENTER** to hold the display on the item of interest.



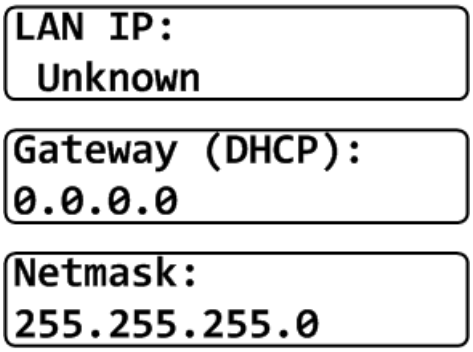
In the above example, the IP address, gateway, and Netmask values are automatically set through the DHCP service. The exact values displayed will depend on the configuration of the network, but typically are in one of three ranges:

10.0.0.0	–	10.255.255.255
192.168.0.0	–	192.168.255.255
172.16.0.0	–	172.31.255.255

3. If the network is working on the Ethernet protocol level but the SolrenView DAS is unable to obtain settings through the DHCP service, the following will typically be displayed:



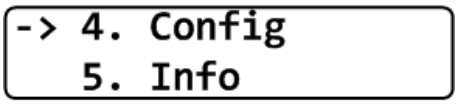
4. If the network is not working at the Ethernet protocol level, e.g. if the twisted pair Ethernet cable is not plugged in, the following will be displayed:



10.8.4 Setting Fallback IP Address

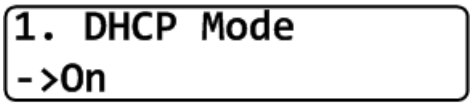
When the SolrenView DAS is set to use DHCP but is unable to acquire an IP address lease, it will "fallback" to using a specified IP address after a few seconds.

1. To specify a fallback IP, first select **Config** on the **Main Menu** and press **ENTER**.

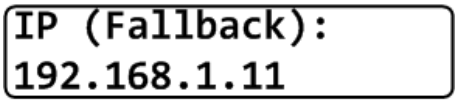


2. Select **LAN** from the **Config Menu** and press **ENTER**.

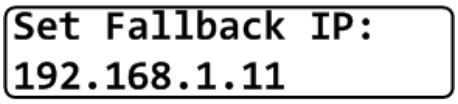
3. Confirm that the **DHCP Mode** setting shows **On**. The **Fallback IP** is only available when DHCP is turned on.



4. Press the **DOWN** button to show the **Fallback IP** setting.

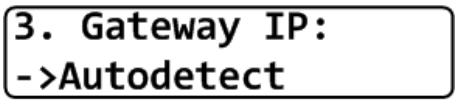


5. To change the **Fallback IP**, press **ENTER**.



6. Specify each of the four octet values (0-255), one at a time. Press the **UP** button to increment the octet. Press the **DOWN** button to decrement the octet. Press **ENTER** to accept the octet. Press **ESCAPE** to cancel entry at any point. When the fourth octet is entered the entry will be saved.

7. Press the **DOWN** button to show the **Gateway IP** setting.



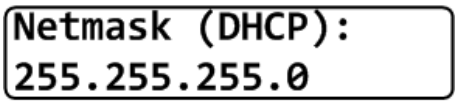
8. To change the Gateway, press **ENTER**.

9. When DHCP is on, the Gateway can either be auto-detected or manually specified.

10. To configure the SolrenView gateway to auto-detect the gateway from the DHCP server, select the "**Autodetect**" option using the UI. **Autodetect** is the special gateway value of 0.0.0.0.

11. To configure the SolrenView gateway to use a manual gateway, specify each of the four octet values (0-255), Press the **UP** button to increment the octet. Press the **DOWN** button to decrement the octet. Press **ENTER** to accept the octet. Press **ESCAPE** to cancel entry at any point. When the fourth octet is entered, the entry will be saved.

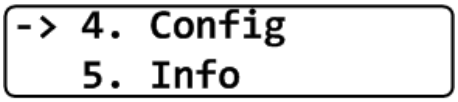
12. Press the **DOWN** button to access the **Netmask** setting. Change in the same manner that the Fallback IP was modified.



10.8.5 Manually Configuring Network Settings

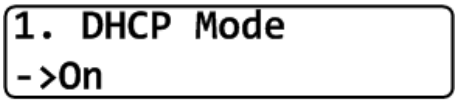
To manually configure network settings:

1. Select **Config** from the **Main Menu** and press **ENTER**.



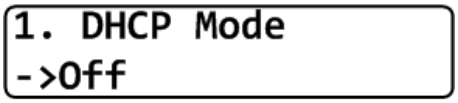
2. Select **LAN** from the **Config Menu** and press **ENTER**.

3. Select the **DHCP** function and press **ENTER** to edit this setting.

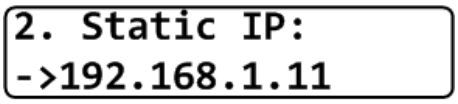


4. Press the **DOWN** button to turn **DHCP Mode Off** and press **ENTER** to save this setting.

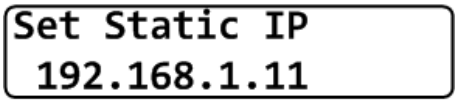
5. The **DHCP Mode** setting will now show **Off**.



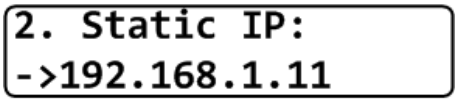
6. Press the **DOWN** button to access the **Static IP** setting.



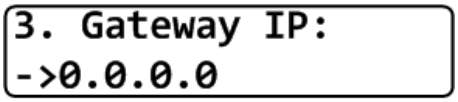
7. Press **ENTER** to modify the **Static IP** value.



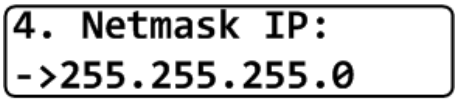
8. Specify each of the four octet values (0-255), one at a time. Press the **UP** button to increment the octet. Press the **DOWN** button to decrement the octet. Press **ENTER** to accept the octet. Press **ESCAPE** to cancel entry at any point. When the fourth octet is entered, the entry will be saved.



9. Press the **DOWN** button to access the Gateway setting. Change in the same manner that the **Static IP** was modified.



10. Press the **DOWN** button to access the **Network IP** setting. Change in the same manner that the **Static IP** was modified.



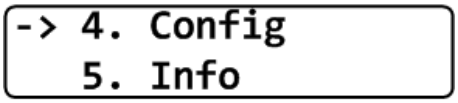
10.8.6 Date and Time Configuration

When the SolrenView web-based monitoring service is purchased and functioning, it is normally not necessary to set or maintain the time on the inverter. The time will automatically be set and adjusted based on the inverter's time-zone.

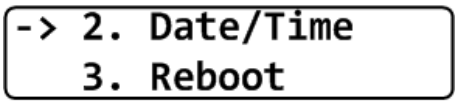
NOTE: The date is only editable if **SRV Mode** is off.

To view the date and time:

1. First select **Config** on the **Main Menu** and press **ENTER**.

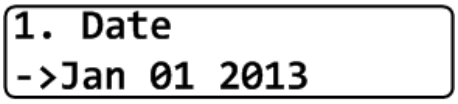


2. Select the **Date/Time** option on the **Config Menu** and press **ENTER**.



3. The current date will be displayed. If the date can be modified, an arrow will appear just before the month.

NOTE: The date is only editable if **SRV Mode** is off. When **SRV Mode** is on, both the date and time are automatically set.

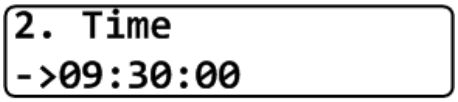


4. Press **ENTER** to begin changing the date. The month will flash, indicating that this portion of the date can be changed with buttons. Press the **UP** button to increment the month and the **DOWN** button to decrement the month. Press **ENTER** to accept the month. Press **ESCAPE** to cancel and return to the menu.

5. The day will flash indicating that this portion of the date can be changed with the buttons. Press the **UP** button to increment the day of the month and the **DOWN** button to decrement the day of the month. Press **ENTER** to accept the day value. Press **ESCAPE** to cancel and return to the menu.

6. The year will flash, indicating that this portion of the date can be changed with the buttons. Press the **UP** button to increment the year and the **DOWN** button to decrement the year. Press **ENTER** to accept the year value and save the date to the SolrenView unit's memory. Press **ESCAPE** to cancel and return to the menu.

7. After modifying the date, the new date will be shown. Press the **DOWN** button to proceed to the time.



8. Press **ENTER** to begin changing the time. The format is HH:MM:SS and hours are shown in 24 hour format. The hour will flash, indicating that this portion of the time can be changed with the buttons. Press the **UP** button to increment the hour and the **DOWN** button to decrement the hour. Press **ENTER** to accept the hour value. Press **ESCAPE** to cancel and return to the menu.

9. The minute will flash, indicating that this portion of the time can be changed with the buttons. Press the **UP** button to increment the minutes and the **DOWN** button to decrement the minutes. Press **ENTER** to accept the minute value. Press **ESCAPE** to cancel and return to the menu.

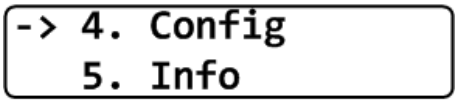
10. The second will flash, indicating that this portion if the time can be changed with the buttons. Press the **UP** button to increment the seconds and the **DOWN** button to decrement the seconds. Press **ENTER** to accept the second value and save the time to the SolrenView unit's memory. Press **ESCAPE** to cancel and return to the menu.

10.8.7 Rebooting the SolrenView Data Acquisition System

On a rare occasion it may be necessary to reboot the SolrenView DAS. Note that rebooting the SolrenView DAS does not reboot the inverter core or shutdown the inverter for any period of time.

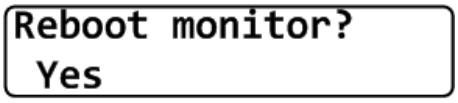
To reboot SolrenView DAS:

1. First select **Config** on the **Main Menu** and press **ENTER**.



2. Select the **Reboot** option from the menu and press **ENTER**.

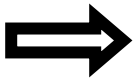
3. The **Reboot** monitor prompt will be shown. Press **ENTER** to reboot the SolrenView DAS. Press **ESCAPE** to cancel and return to the menu.



10.8.8 Turning SolrenView Monitoring On

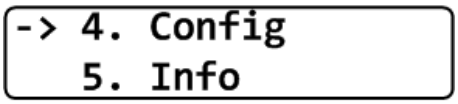
Before the optional SolrenView web-based monitoring can function, the inverter must be networked to the Internet—see Section 7.2 and Sections 10.8.1 through 10.8.5 for more details. As explained in Section 9.1, data logging is one of the main functions of the SolrenView DAS. This option is turned on with the **SRV Mode** setting. Once enabled, the SolrenView DAS will periodically update various operational values and send this data to the SolrenView web-based monitoring service.

If **SRV Mode** is turned on and the DAS is unable to transfer data to the monitoring service, then data will accumulate in a queue on the SolrenView DAS. This queue is stored in non-volatile flash memory. After a few weeks the data queue will become full and the oldest data will be lost, so it is important to establish Internet connectivity soon after inverters are commissioned.



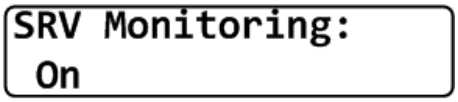
NOTE: There is no need to enable **SRV Mode** when using third-party monitoring service. Enabling **SRV Mode** when the SolrenView.com data monitoring service has not been purchased is not recommended. The **SRV Mode** cannot be turned off once it has been turned on, while the SRV DAS is connected to the server. This is to prevent unintentional monitoring service disconnect. Contact Solectria Customer Support to disable the service.

1. To enable SolrenView.com data monitoring, first select **Config** on the **Main Menu** and press **ENTER**.



2. Next, select **SRV Mode** function on the **Config Menu** and press **ENTER**.

3. The **SRV Monitoring** function will be displayed. Press **ENTER** to modify the setting. Press the **DOWN** button to change the setting to **On**.

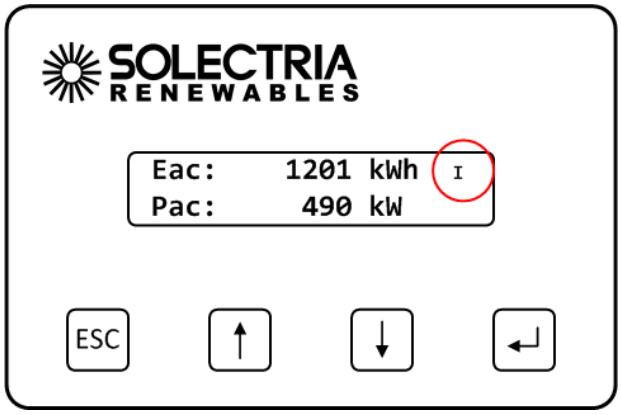


4. Press **ENTER** to accept the setting change.

5. Contact Solectria Customer Support to enable the optional SolrenView web-based monitoring.

NOTE: Contact Solectria Customer Support to have the optional Monitoring Service activated.

An "**I**" will be shown on the LCD screen in the upper right corner confirming Internet connection to the Solectria Monitoring servers.



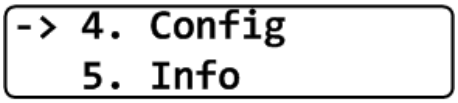
10.8.9 Resetting the SolrenView Data Acquisition System to Factory Defaults

It may be necessary to reset the SolrenView DAS to factory defaults. This does not reset the inverter core or shutdown the inverter for any period of time.

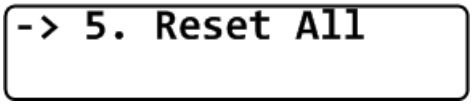
NOTE: Resetting the SolrenView DAS will also clear events, revenue-grade KYZ counters and SolrenView.com data queue. Caution should be used with this function to avoid data loss.

To reset the SolrenView DAS:

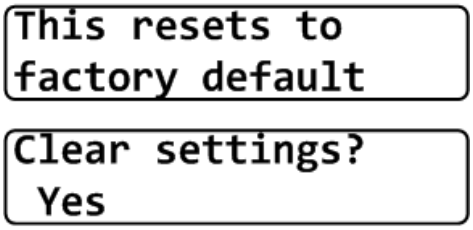
1. First select **Config** on the **Main Menu** and press **ENTER**.



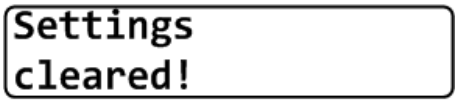
2. Select the **Reset All** option from the menu and press **ENTER**.



3. A message warning that the SolrenView gateway is about to be set to factory defaults is shown. Press the **ESCAPE** button to cancel the reset.



4. Select the **Yes** option under Clear settings to reset the SolrenView gateway to factory defaults. The **Reset Storage** screen will appear for a moment.

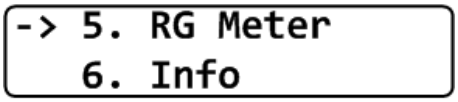


10.9 Revenue Grade Metering

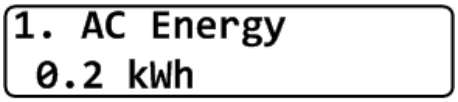
The SolrenView Revenue Grade Metering option is a factory-integration of a Revenue Grade metering device that measures power and energy production at the AC output of the inverter. The power and energy production information can be monitored through the SolrenView monitoring services and is used in conjunction with the optional Agency Reporting service Solectria can provide.

With the SolrenView Revenue Grade Monitoring option the inverter keeps track of lifetime energy and power produced by the inverter.

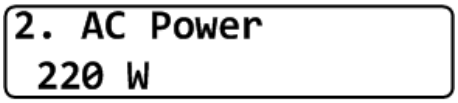
1. To display the inverter lifetime energy and/or power production, first select **RG Meter** on the **Main Menu** and press **ENTER**:

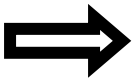


2. The inverter Lifetime energy production is displayed.



3. Press the **DOWN** button and the lifetime Power Production will be displayed.





NOTE: The RG Meter is an optional installation. The RG Meter Menu item is invisible unless a Revenue Grade Meter is installed.

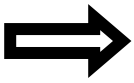
10.10 Preparing the Inverter for Modbus (RS-485) Communications

In order for the SolrenView DAS to start communicating with the external data monitoring system, the following configuration steps must be taken:

1. Turn the Modbus termination on for the last inverter in the daisy chain as shown in Section 7.3.1.
2. Set the inverter Modbus ID to the same ID as required by the external data monitoring system.
3. Set the inverter baud rate to the same baud rate as required by the external data monitoring system.
4. Configure the SRV mode to OFF as shown in Section 10.8.8, disabling SolrenView Web-based Monitoring.

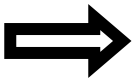
11 Commissioning the Inverter PV System

At this point the inverter should be mounted, all connections are made and the inverter is ready for power to be applied.



NOTE: Make sure all tools, parts, etc. are removed from the vicinity of the inverter before turning on.

WARNING: Make a final check of all AC and DC wiring to the inverter and in the system before turning on.



NOTE: With the PV modules connected and inverter disconnects still off, perform a final check of the PV voltage and polarity once more using a digital volt meter and probing the positive (+) and negative (-) PV connections. Verify clockwise AC phase rotation for L1, L2, L3 using a phase rotation meter.

11.1 Turning the Inverter On

To turn on the inverter, adhere to the following steps:

1. Turn on the dedicated three-phase circuit breaker or disconnect at the building service.
2. Turn on the inverter's DC disconnect using the handle on the front door.
3. Turn on the inverter's three-phase AC breaker using the handle on the front door.
4. Watch the LED indicators for initialization (green and red LEDs on), then a slow blinking green LED followed by a faster blinking green LED. Watch the UI for prompts and system status.
5. Listen for contactor closing (inverter on-line).
6. Listen for slight 60 Hz hum (transformer on-line).
7. Following the blinking green LED and high frequency switching sound you should see a solid green LED. This confirms that the inverter is operating normally. The UI will show the AC Power (PAC), Energy (EAC), current and voltage as well as DC voltage.

11.2 System Startup

The control electronics will be active as soon as the DC voltage reaches 300VDC. The inverter will go on-line with the utility three-phase grid when the DC voltage first exceeds 390VDC (strike voltage). Next, the inverter will load the array, bringing the DC voltage down from 390VDC to not less than 300VDC. Once there is enough PV power to back feed three-phase AC power, power switching will automatically feed power to the grid.

12 Troubleshooting and Maintenance

Although the inverter is designed for many years of power production there may be instances where messages may be displayed on the UI. For ease of diagnostics most messages are displayed as an error message. This section provides guidelines for troubleshooting and routine maintenance of your inverter.

WARNING: These troubleshooting and maintenance instructions are for use by qualified personnel only. To reduce the risk of electric shock, you should never attempt to open the inverter enclosure doors or perform any service or troubleshooting without prior training. Before attempting to service or troubleshoot the inverter, please read the entire manual.

12.1 Inverter Messages

Text on UI	In Event Log (Y/N)	Description	Corrective Action
Pac: XXXX W Power Derating	Y	The inverter is in derating mode. Can be caused by high input power, high temperature, and AC line impedance.	Check string sizing, ambient temp, fans operating, vents are clear, AC wire sizing.
Pac: XXXX W MOV Fault	Y	A high voltage transient has occurred from the AC grid voltage. Usually from lightning.	The inverter will need to be inspected and serviced by an authorized service provider.
Pac: XXXX W AC Volt High	Y	The AC grid voltage is exceeding the high limit.	Measure the actual VAC compared to the LCD display VAC. If VAC is greater than acceptable limits inverter will restart when normal.
Pac: XXXX W AC Volt Low	Y	The AC grid voltage is less than the low limit.	Measure the actual VAC compared to the LCD display VAC. If VAC is less than acceptable limits inverter will restart when normal.
Pac: XXXX W AC Freq High	Y	The AC grid frequency is exceeding the high limit.	If possible measure the frequency or contact local utility provider.
Pac: XXXX W AC Freq Low	Y	The AC grid frequency is less than the low limit.	If possible measure the frequency or contact local utility provider.
Contactor Fail 987-683-9700	Y	The AC contactor or sensing circuit has failed.	Turn off the inverter and contact Solectria. The inverter may need to be serviced by an authorized service provider.
CT Failure 987-683-9700	Y	An internal failure has occurred in one or more of the cores.	Turn the DC and AC off, restart the inverter. The inverter may need to be inspected and serviced by an authorized service provider.
Thermal disc. 987-683-9700	N	The AC contactor is open when it is being commanded to be closed.	Turn off the inverter and contact Solectria. The inverter may need to be serviced by an authorized service provider.

NTC Failure 987-683-9700	Y	The internal temperature sensor has failed.	Turn the DC and AC off, restart the inverter. The inverter may need to be inspected and serviced by an authorized service provider.
IGBT Overtemp 987-683-9700	Y	The internal temperature is exceeding operational limits.	Turn the DC and AC off, let the inverter cool to ambient temperature and restart the inverter.
Desat Error 987-683-9700	Y	Internal component sensing fault.	Turn the DC and AC off, restart the inverter. The inverter may need to be inspected and serviced by an authorized service provider.
DC GND Fault Check DC Wiring	Y	A ground fault has been detected in the PV array.	DO NOT TOUCH any equipment (including, but not limited to: the inverter, the PV array disconnects, the PV array combiners, the PV panels, the PV racking system). Immediately contact the installer or another qualified person to locate and repair the source of the ground fault.
VAC Low Reconnecting	N	The inverter had a “UL event” and is in the 5 minute wait period.	Wait for the inverter to restart.
Pac: XXXX W Waiting for grid	N	Grid voltage may not be present.	Check for grid voltage.
Reverse phasing & restart PVI!	N	The VAC grid connection phasing does not match the inverter.	Change the phase wire positions at the inverter connection on the grid side.
Pac: XXXX W Min Vmpp reached	Y	The power point tracking has been reached.	The inverter will hold the Vmpp at this level until it increases.
AC Contact Open 987-683-9700	Y	The AC contactor is open when it is being commanded to be closed.	Turn off the inverter and contact Solectria. The inverter may need to be serviced by an authorized service provider.
Vsense Err 987-683-9700	Y	An internal failure of the voltage sensing circuit has occurred.	Turn off the inverter and contact Solectria. The inverter may need to be serviced by an authorized service provider.
Open Phase 987-683-9700	Y	One of the AC phases is not present at the inverter.	Verify that there is AC voltage on all phases at the inverter and all fuses are intact.
MAG Failure 987-683-9700	Y	An internal failure of one of the magnetic components.	Turn off the inverter and contact Solectria. The inverter may need to be serviced by an authorized service provider.
Pac: XXXX W PS Fail	Y	An internal failure of the master power stage.	Turn off the inverter and contact Solectria. The inverter may need to be serviced by an authorized service provider.
Pac: XXXX W DMGI Overtemp	Y	One of the internal power stages has exceeded its temperature limit.	Turn off the inverter and contact Solectria. The inverter may need to be serviced by an authorized service provider.

12.2 Troubleshooting

12.2.1 Steps to Perform When PV System is Not Functioning

- Check inverter LED indicator status and UI for inverter status and error messages.
- Check to ensure that inverter is connected to AC power.
- Ensure that no 24VDC remote shutdown signal is applied to the inverter.
- Check for *clockwise* phase rotation of AC power connections.
- Check to ensure that DC (PV) input is connected.
- Verify proper polarity of DC (PV) positive (+) and negative (-) input pairs.
- Verify PV string Maximum Power Point Voltage at design high temperature and PV string sizing.
- Verify open circuit voltage at design low temperature and ensure it is compatible with inverter input voltage specifications.
- Check all internet fuses to see if any are open.
- Check status of GFDI breaker.
- Verify that both the AC and DC disconnects are closed.
- Contact installer or Solectria if malfunction persists.

12.2.2 If Contacting Solectria for Assistance, Please Provide the Following:

- Inverter Model Number/Part Number.
- Inverter Serial Numbers.
- Short Description of Problem (UI messages, when problem started, how often problem occurs, under what conditions the problem occurs).
- Design Information (PV modules, string sizing, output power, short-circuit current, and open circuit voltage string layout).

NOTE: See **Appendix D** for Solectria contact information

12.2.3 Some Specific Problems that can be Identified Quickly

GFDI Problem: If the LED indicators and UI show a ground fault problem and the GFDI breaker is tripped, the fault in the PV array or wiring must be found and the GFDI breaker reset.

Unit Overheating, Power Derating, or Unit Not Outputting Power: If the power output is lower than normal and there is a UI indication of power derating due to high temperature, check the following:

- Is the ambient temperature above 50°C?
- Check the insect screens in the front louver grill or air filters on the main enclosure door for clogging from dust, pollen, and debris.
- Fan not running, blocked, or slow:
  - Check the fan fuses inside the main enclosure.
  - Check the fan relay, including overload device, inside the main enclosure.
  - Check the fan and make sure it spins freely.
  - Check that the fan is directing air into the intake baffles.
- No grid sensing:
  - Check if grid sensing fuses are blown inside the main enclosure. If so, contact Solectria (do not replace fuses, as this represents an abnormal failure)
- No LED indications when the AC is energized. If the grid voltage and DC voltage is present and no response from inverter is evident:
  - Verify AC and DC voltages are within proper ranges.

12.3 Preventative Maintenance

WARNING: These maintenance instructions are for use by qualified personnel only. To reduce the risk of electric shock, you should never attempt to open the inverter enclosure doors or perform any service or maintenance without prior training. Before attempting to service the inverter, please read the entire manual.

For most installations, preventative maintenance should be performed once every 12 months. If the inverter is installed in harsh environments, the frequency of some items should be increased. For the air intake filter, however, it is recommended that they be inspected and cleaned monthly for the first year of operation and then have the maintenance schedule adjusted as necessary.

Installation Specifics	Visual Inspection	Clean Front Screen and Rear Louvers	Clean the Air Intake Filter	Verify Electrical Connections	Verify Signal Connections
Inside & climate controlled	Once per 12 months	Once per 12 months	Once per 1 month	Once per 12 months	Once per 24 months
Outside covered	Once per 12 months	Once per 6 months	Once per 1 month	Once per 6 months	Once per 12 months
Outside exposed	Once per 6 months	Once per 6 months	Once per 1 month	Once per 6 months	Once per 12 months
Outside harsh environment	Once per 3 months	Once per 3 months	Once per 1 month	Once per 6 months	Once per 12 months
Outside extremely harsh environment	Once per 1 month	Once per 1 month	Once per 1 month	Once per 6 months	Once per 12 months

Figure 12.1—Preventative Maintenance

A harsh environment is defined as *any* of the following conditions:

- Excessive temperature (hot or cold)
- Desert area with sand or other debris constantly in contact with the inverter
- Areas with excessive pollen or dust
- Indoors, if located in an area with airborne particles
- Coastal regions exposed to salt water

12.4 Intake Louver Vent Cleaning

WARNING: The intake louver vent must be cleaned only when the inverter is off and both AC and DC disconnect switches are off. The absence of dangerous voltages must be verified by qualified personnel before performing any service.

Intake louver vent cleaning is recommended at the intervals specified in Section 12.3. Consider cleaning the intake louver vent during the early morning or late evening so little or no energy generation is lost.

Method 1: Remove the shroud by removing all Philips Pan Head #2 machine screws around the shroud (sides and top only, do not remove bottom screws), and remove the shroud. Without removing the vent, use a powerful vacuum and clean entire louver vent/screen.

Method 2: Remove the shroud by removing all Philips Pan Head #2 machine screws around the shroud (sides and top), and remove the shroud. Next, remove the raining bottom screws holding the louver vent onto the inverter. Use compressed air from the back (insect screen) side of the louver vent/screen unit to remove all debris.

Re-assemble, putting all the screws in *loosely* first and then tighten snugly (do not over-tighten).

12.5 Air Filter Cleaning

WARNING: The intake louver vent must be cleaned only when the inverter is off and both DC and AC disconnect switches are off. The absence of dangerous voltages must be verified by qualified personnel before performing any service.

All of the available filters are washable and can be reused. For the economy filter, flush the filter with clean water and a dilute mixture of a mild soap and water. Rinse the filter thoroughly and allow it to air dry completely before replacing. For either of the electrostatic filters, begin by flushing the filter with clean water. Remove stains with a spray application of ZAP Electrostatic Air Filter Cleaner. Do not use any other type of soap or cleaner. Rinse thoroughly and allow it to air dry completely before replacing.

To remove the filter for inspection, cleaning, or replacement, perform the following steps:

1. Loosen the two screws on the cover plate located on the right side of the intake housing.

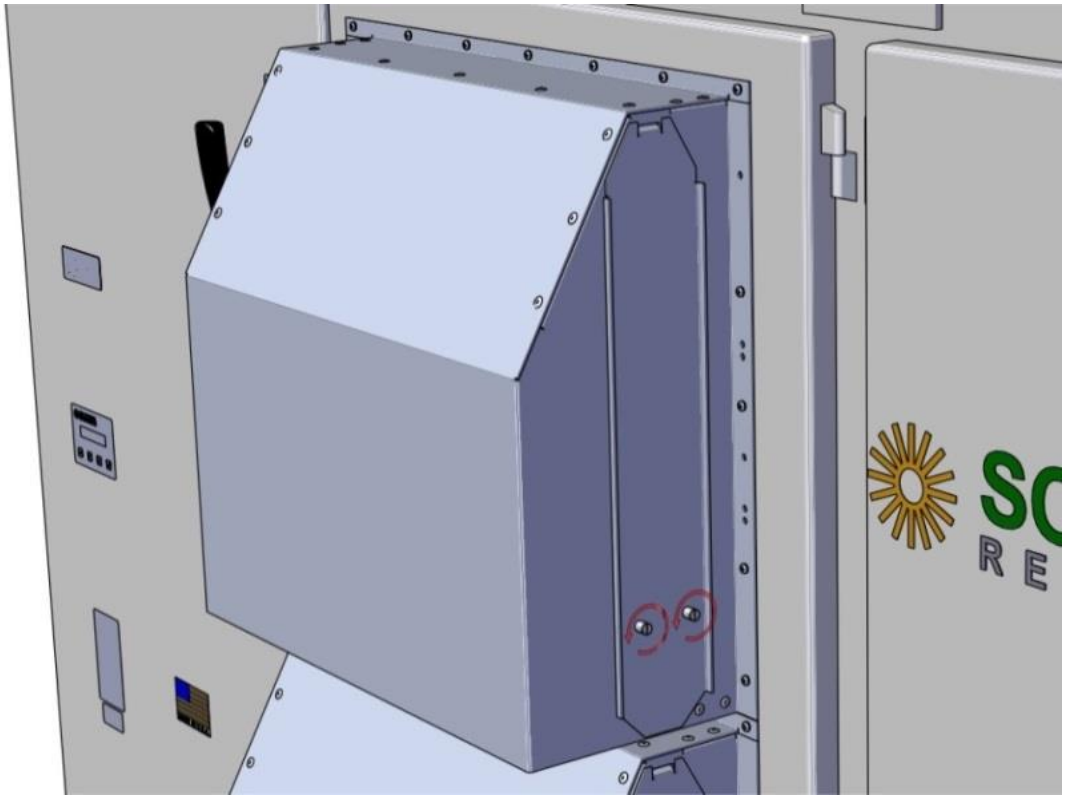
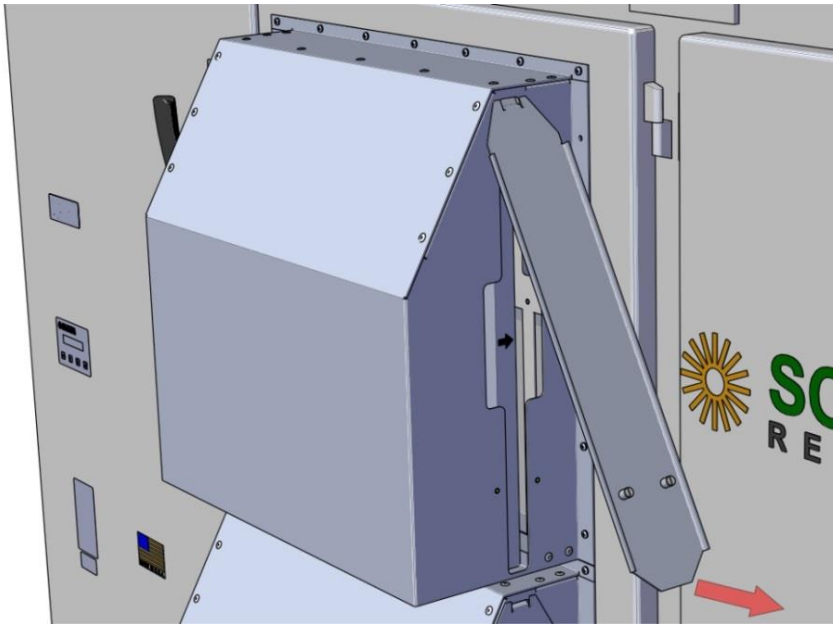


Figure 12.1—Loosen Filter Screws

2. The screws will remain captured in the cover plate. Swing the cover plate up and pull it out of the air intake housing.



Filter 12.2—Swing Cover Plate Up and Remove

3. Finally, slide the dirty filter out of the housing.

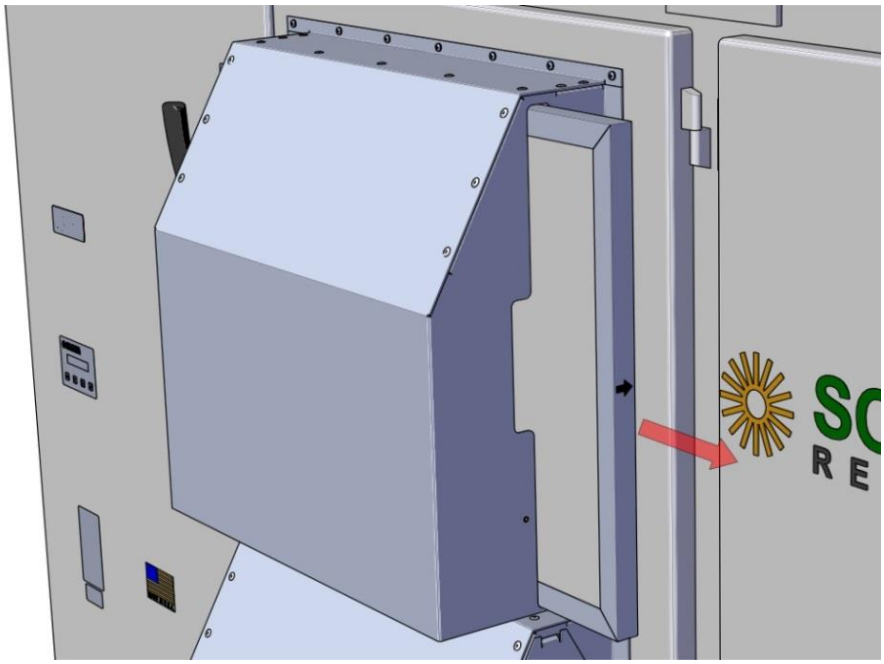


Figure 12.3—Slide Filter Out

To install a filter begin by:

1. Sliding the clean filter into the air intake housing. Be sure to note the air flow direction arrow on the filter. The arrow should be pointed toward the inverter.

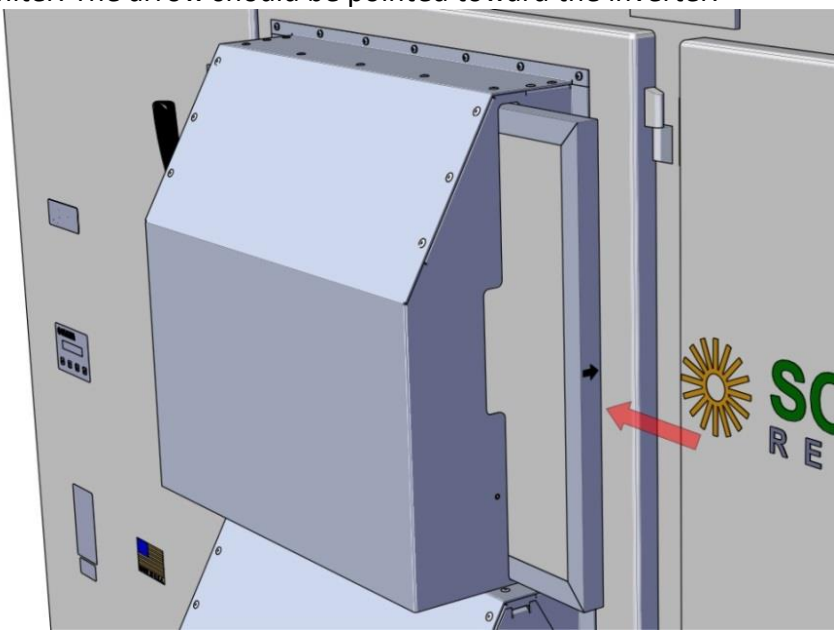


Figure 12.4—Slide Filter In

2. Now, install the cover plate by inserting the tab into the top of the air intake filter housing and then rotating the cover plate down to meet the air intake housing.

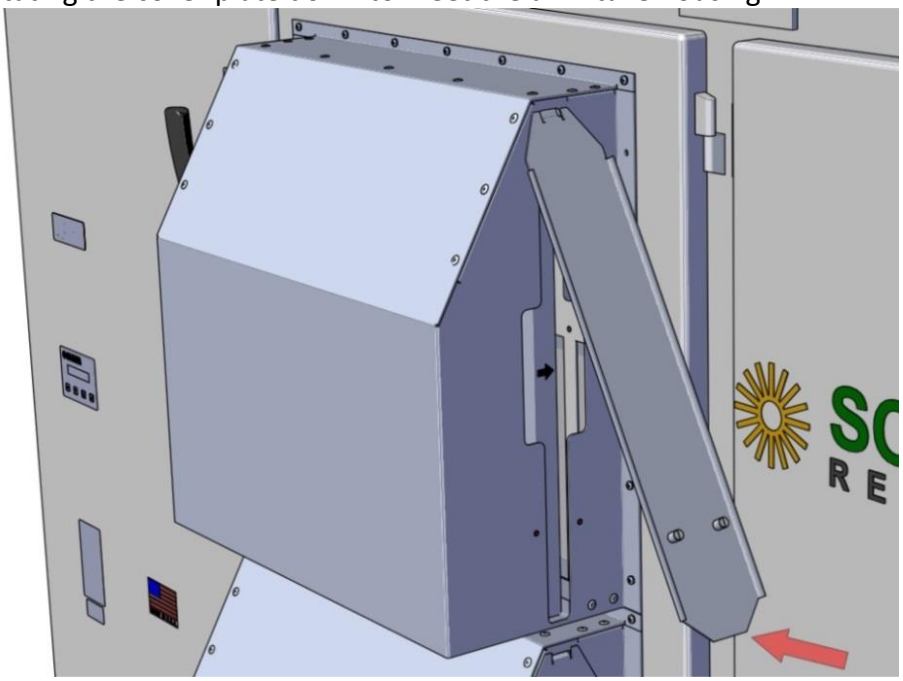


Figure 12.5—Install Cover Plate

3. Secure the two screws in the cover plate.

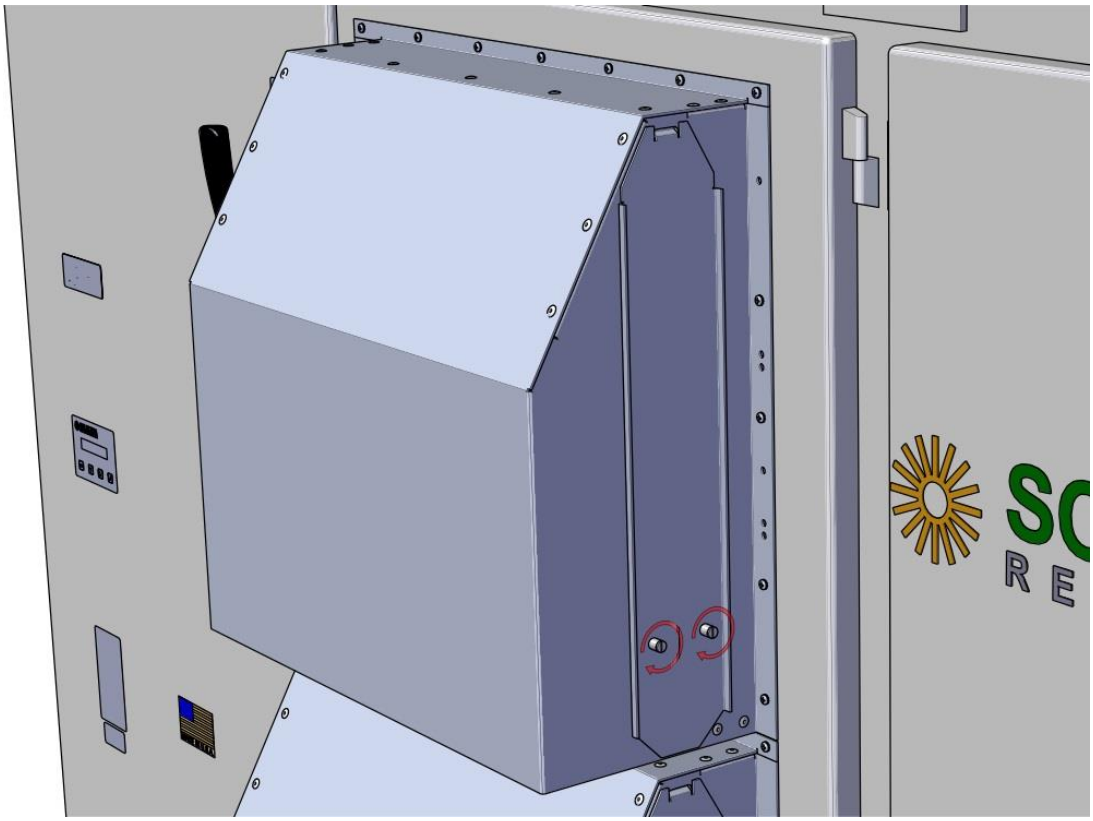


Figure 12.6—Secure Filter Screws

12.6 Opening Main Enclosure, DC Disconnect Switch, and AC Disconnect Switch

WARNING: The inverter should only be opened by authorized and qualified service personnel.

WARNING: If the inverter is outdoors, only open the inverter when it is clear and dry outside. As with any electrical system, do not work on it if there is potential for an electrical storm.

WARNING: Both DC and AC switches must be in the OFF position then wait 5 minutes after the LED indicators are off before opening as the capacitors on the internal bus are still discharging at this time.

WARNING: DC input wiring from the array may be energized even with the inverter OFF and the DC disconnect switch OFF.

WARNING: AC output wiring may be energized even with the inverter OFF and the AC breaker open.

Normally the main enclosure DC and AC disconnect switches will not have to be opened for any reason by the user. If opening the unit is necessary, follow these guidelines:

1. Use the SolrenView™ UI to temporarily disable the power output by pressing and holding the **ESCAPE** button for 5 seconds.
2. Disconnect the inverter from DC power to ensure that live DC is not entering the inverter.
3. Switch off DC disconnect.
4. Switch off AC disconnect.
5. Watch until all LED indicators have been off for 5 minutes allowing the capacitors to discharge.
6. Open handle on door (use key if locked).

Before closing the main enclosure, always check for any signs of problems such as corrosion, loose parts, insect or animal infestation, excessive dirt/dust, or overheated or deformed/aged-looking parts.

13 Product Warranty & RMA Policy

The Solectria Warranty Policy and RMA Policy are available at the following web location: http://solectria.com/support/documentation/warranty-information/grid-tied-inverter-warranty-letter/

14 Technical Data

Input (DC) from PV array:

- Maximum open circuit voltage of PV array is 600V DC

WARNING: Local electrical codes must be followed to calculate the maximum number of PV modules allowed for a maximum inverter open circuit voltage (OCV) of 600V DC in extreme cold temperatures for the installation location.

The open circuit voltage of PV modules depends on the cell temperature and the solar irradiation. The highest open circuit voltage occurs when the PV modules are at the coldest temperature and in bright sun.

Because the PV modules also have a reduction in voltage at high cell temperatures, you must make sure the MPPT voltage of the strings will not drop below the minimum inverter DC input voltage in very hot temperature conditions.

Both the maximum open circuit voltage (OCV) when at cold extreme and minimum MPPT voltage when at hot extreme can be calculated for a PV module using its specification sheet. PV module string sizing can then be used to determine how many modules can be used in a string. Visit http://solectria.com/support/string-sizing-tool/ to use Solectria's interactive string sizing tool.

14.1 DC Input Specifications

Specification	SGI 225	SGI 250	SGI 266	SGI 300	SGI 500	SGI 500PE	Unit
Operating voltage range	300-600						VDC
Input voltage MPPT range	300-500						VDC
Strike Voltage	390						VDC
Maximum input current	768	853	908	1026	1721	1712	ADC
Continuous input current	768	853	908	1026	1721	1712	ADC
DC voltage measurement accuracy	+/- 2						%
Max continuous input power	230.5	256	272.5	308	516.5		kW
Maximum open circuit voltage	600						VDC
Absolute Maximum open circuit voltage	625						VDC
DC current measurement accuracy (SolZone option only)	+/- 2						%
DC Ground Fault Trip Setting	4		5				ADC

Table 14.1—DC Input Specifications

14.2 Output AC Specifications

The inverters are designed to feed power into a standard 60Hz, three-phase AC utility service provided within a facility by a transformer with a rating of not less than the rating of the inverter(s) connected to it.

Specification	SGI 225	SGI 250	SGI 266	SGI 300	SGI 500/ 500PE	Unit
Operating AC Voltage Range	88 – 110%					VAC
Turn-On AC Voltage Range	92% – 105%					VAC
Default Over/Under Voltage Trip Points and Times	per IEEE Std 1547-2003, Table 1 or utility specific order codes					
Over Voltage Trip Magnitude adjustability	100% - 120%					Vnom
Under Voltage Trip Magnitude adjustability	50% - 100%					Vnom
Over/Under Voltage Trip Time adjustability	0.1 – 30					sec
Voltage Measurement Accuracy	± 2					%
Operating Frequency	57.0-60.5					Hz
Under Frequency Trip Time adjustability	0.16 – 300					sec
Frequency measurement accuracy	± 0.1					Hz
Maximum Rated Output Current (208VAC) external transformer	624	693	738	832	1388	Arms
Maximum Rated Output Current (208VAC) internal transformer	624	693	738	N/A	N/A	Arms
Maximum Rated Output Current (480VAC)	271	301	320	360	602	Arms
Maximum Rated Output Current (600VAC)	-	240	-	-	-	Arms
Short Circuit Current Contribution						
Utility Short Circuit Current Output (480VAC) *duration of 10 line cycles*	271	301	320	360	602	Arms
Peak Short Circuit Current Output (480VAC) *duration of less than 300 microseconds*	27	36	36	36	60	kApk
AC Current Measurement Accuracy	± 3					%
AC real power and energy measurement accuracy	± 5					%
Total Harmonic distortion (THD, @ full power)	< 3					%
Power Factor	Unity, >0.99					
Anti-islanding protection	per UL1741 / IEEE1547 / CSA22.2#107.1					
Peak Efficiency	98.0	98.0	98.0	98.0	97.9/ 98.3*	%
CEC Weighted Efficiency	97.5	97.5	97.5%	97.5%	97.0/ 97.5*	%
* 97.5% for SGI 500PE-480 only						

Table 14.2—AC Output Specifications

14.3 Other Specifications

Specification	SGI225	SGI250	SGI266	SGI300	SGI500	SGI500PE	Unit
DC Ground Fault Protection	Per UL 1741						
DC Ground Fault Current Withstand	Certified in UL 1741 testing to 3.2kADC, components rated to 25kADC						
DC Fuse Subcombiner Range	70A-400A Fuses Available, 6-24 poles				8-32 poles		
DC Breaker Subcombiner Range	110-400A Breakers Available, 6-12 poles				8-16 poles		
DC Disconnect (Integral)	Break Load Rated						
Operational Ambient Temperature	-40 to 50 (Full Power)						°C
Storage Temperature	-40 to 70						°C
Cooling Design	Automatic Forced Convection						
Inverter Enclosure	Base Model: Powder Coated Mild Steel Optional: Grade 316 Stainless Steel						
Protection Rating	Rain Proof per UL1741, NEMA 3R						
Switching Electronics Enclosure	IP-62 (Sealed Design)						
Inverter Weight without Options	5,170		5,650		6,980	7,107	lbs
	2,345		2,562		3,157	3,224	kg
Shipping Weight without Options	5,380		5,860		7,190	7,317	lbs
	2,440		2,658		3,224	3,319	kg
Heat Loss at Full Power	24,000	26,000	28,000	32,000	55,000		BTU/h
Sound Pressure Level (A-Weighting)	< 68 at 1m < 60 at 5m < 57 at 10m						dBA

Table 14.3—Other Specifications

14.4 AC Output Power as a Function of DC Input Voltage

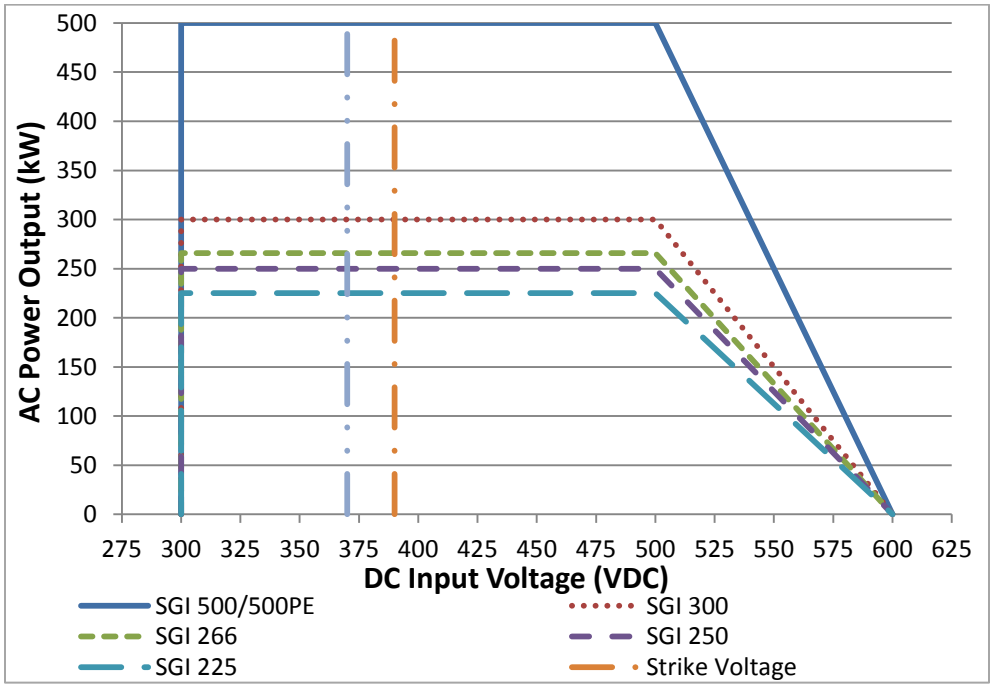


Figure 14.1—AC Output Power of SGI Series Inverters

14.5 Overall AC to DC Conversion Efficiency

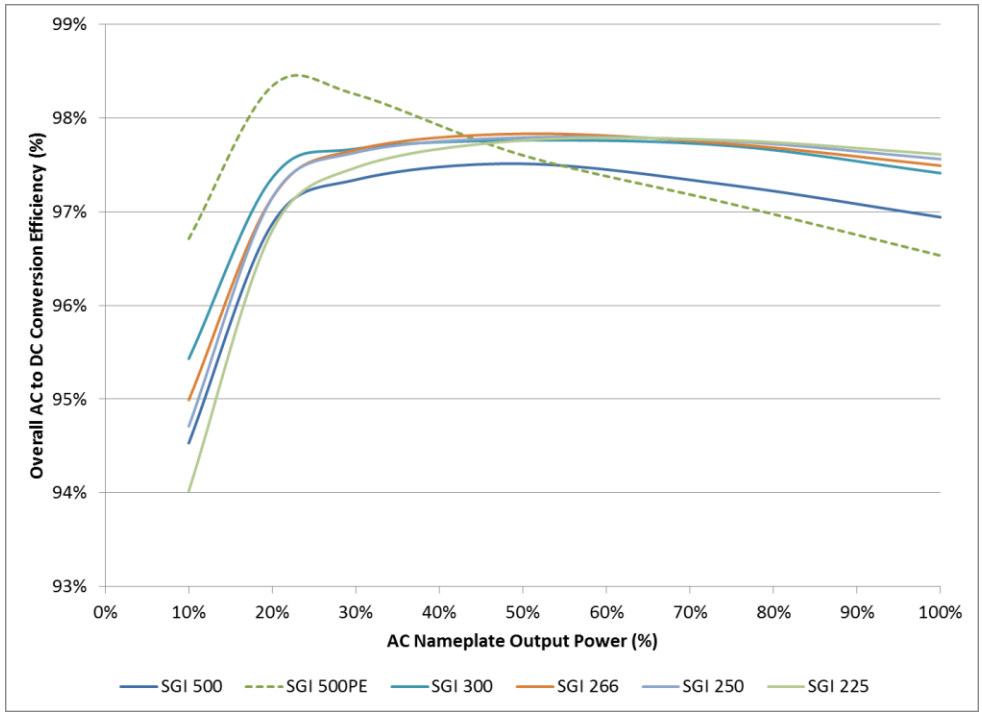


Figure 14.2—Efficiency of SGI Series Inverters at 360VDC Input and 25°C Ambient Temperature

14.6 Internal Circuit Diagram

The basic power flow within the SGI series of inverters is shown in the simplified one-line diagrams below. Note that the GFDI circuit is not depicted.

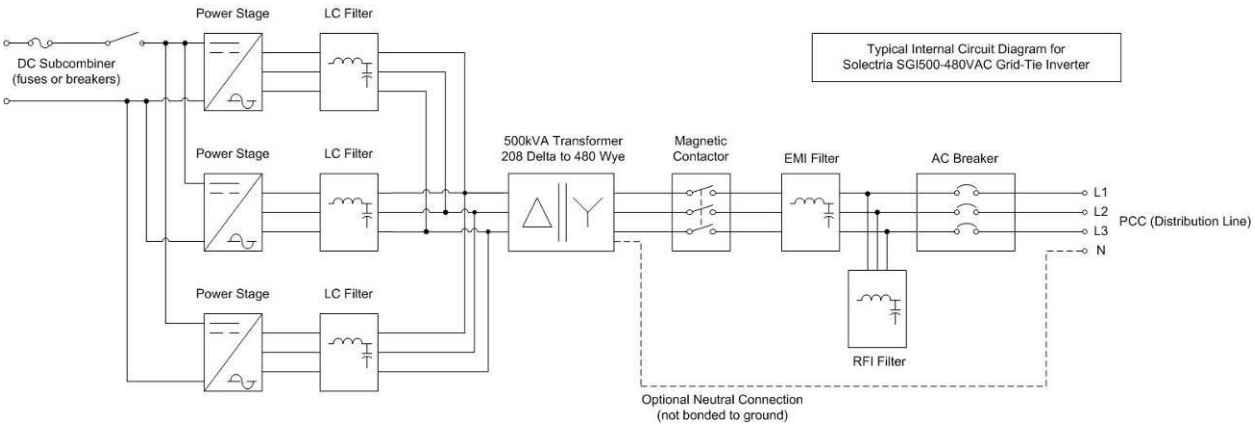


Figure 14.3—Simplified Internal Circuit Diagram for SGI 500-480VAC Grid-Tied Inverters

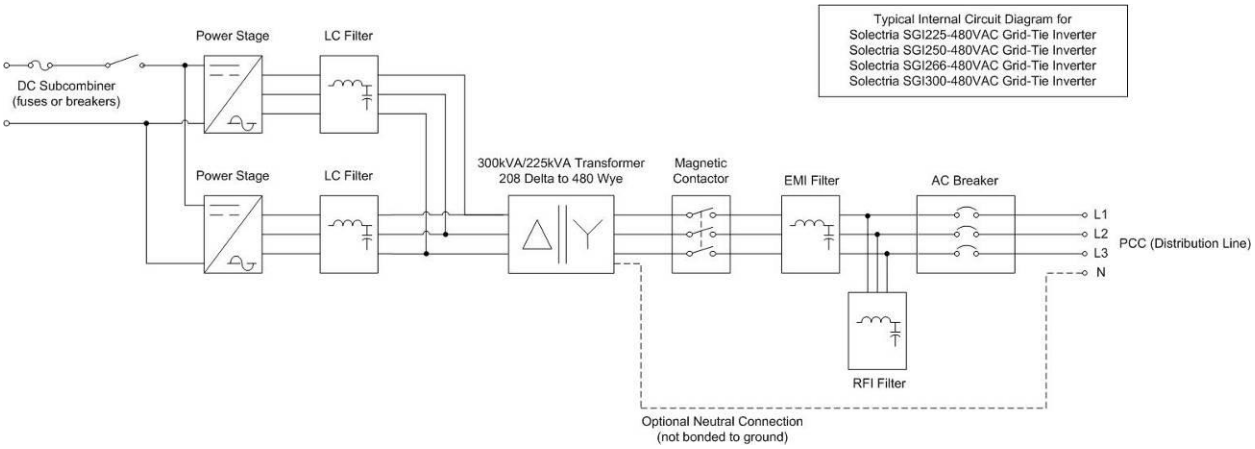


Figure 14.4—Simplified Internal Circuit Diagram for SGI 225-480VAC through SGI 300-480VAC Grid-Tied Inverters

15 Appendices

15.1 Appendix A—SGI 225-500PE Data Sheet

Please visit:
http://solectria.com/support/documentation/inverter-datasheets/sgi-225-250-266-300-500pe-3-ph-central-inverters/

15.2 Appendix B—String Sizing Tool

Please visit:
http://solectria.com/support/string-sizing-tool/

15.3 Appendix C—Customer Interface Drawings

Please visit:
http://solectria.com/support/documentation/drawings/sgi-225-500pe-customer-interface-drawing/ for the pdf file or
http://solectria.com/support/documentation/drawings/sgi-225-500pe-customer-interface-drawing-dwg/ for the dwg file

15.4 Appendix D—Contact Information

Yaskawa – Solectria Solar
360 Merrimack Street
Building 9, 2nd floor
Lawrence, Massachusetts 01843
USA

Tel:	978.683.9700
Fax:	978.683.9702
Sales/General info:	inverters@solectria.com
Customer Support:	service@solectria.com
Website:	www.solectria.com

15.5 Appendix E—Authorized Distributors

Please visit:
http://solectria.com/products/how-to-buy/

15.6 Appendix F—UL1741 / IEEE 1547 / CSA22.2#107.1 Listing Letter

Intertek

AUTHORIZATION TO MARK

This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report. This authorization also applies to multiple listee model(s) identified on the correlation page of the Listing Report.

This document is the property of Intertek Testing Services and is not transferable. The certification mark(s) may be applied only at the location of the Party Authorized To Apply Mark.

Applicant:	Solectria Renewables, LLC 360 Merrimack Street Bldg 9, Floor 2 LAWRENCE, MA 01843	**Manufacturer:**	Solectria Renewables, LLC 360 Merrimack Street Bldg 9, Floor 2 LAWRENCE, MA 01843
Address:		**Address:**	
Country:	USA	**Country:**	USA
Contact:	Michael Zuercher-Martinson	**Contact:**	Michael Zuercher-Martinson
Phone:	(978) 683-9700	**Phone:**	(978) 683-9700
FAX:	(978) 683-9702	**FAX:**	(978) 683-9702
Email:	Michael@solren.com	**Email:**	Michael@solren.com

Party Authorized To Apply Mark: Same as Manufacturer
Report Issuing Office: Cortland, NY 13045

Control Number: *3058249* **Authorized by:** Steven Condie
for William T. Starr, Certification Manager

C ETL LISTED US
Intertek

This document supersedes all previous Authorizations to Mark for the noted Report Number.

This Authorization to Mark is for the exclusive use of Intertek's Client and is provided pursuant to the Certification agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Authorization to Mark. Only the Client is authorized to permit copying or distribution of this Authorization to Mark and then only in its entirety. Use of Intertek's Certification mark is restricted to the conditions laid out in the agreement and in this Authorization to Mark. Any further use of the Intertek name for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. Initial Factory Assessments and Follow up Services are for the purpose of assuring appropriate usage of the Certification mark in accordance with the agreement, they are not for the purposes of production quality control and do not relieve the Client of their obligations in this respect.

Intertek Testing Services NA Inc.
165 Main Street, Cortland, NY 13045
Telephone 800-345-3851 or 607-753-6711 Fax 607-756-6699

Standard(s):	UL 1741, Standard for Safety Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources- 2nd Edition, Issued 2010/01/28 CSA C22.2 #107.1General Use Power Supplies Issued:2001/09/01 Ed:3
Product:	Grid-tied Inverter
Models:	SGI 500, SGI 300, SGI 266, SGI 250, SGI 225 SGI 500PE, SGI-499PE, SGI-499, SGI- 249 Note: PE means "premium efficiency"

ATM for Report 100042079CRT-001a Page 1 of 1 ATM Issued: 22-Oct-2012
ED 16.3.15 (18-Jun-12) Mandatory