Compatible with

ATS 200A

Tigo

Tigo EI
Residential Solar Solution
US Installation Manual (w/ATS 200A)

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Document Version History

Version	Date	Changes
1.0	20230614	Initial release
1.1	20231012	Added IMPORTANT SAFETY INFORMATION, corrected the name and shutdown description in the Rapid Shutdown Switch section, updated ATS Manual Bypass Switch instructions, and added Generator Operation Modes instructions and ATS Warning and Fault Codes.
1.2	20240414	Added EI Inverter Reset Button section. Reordered commissioning step for internet access in Select Equipment. Added Appendix C – Rule 21 Parameter Settings.
1.3	20240716	Update ATS scan section page 59

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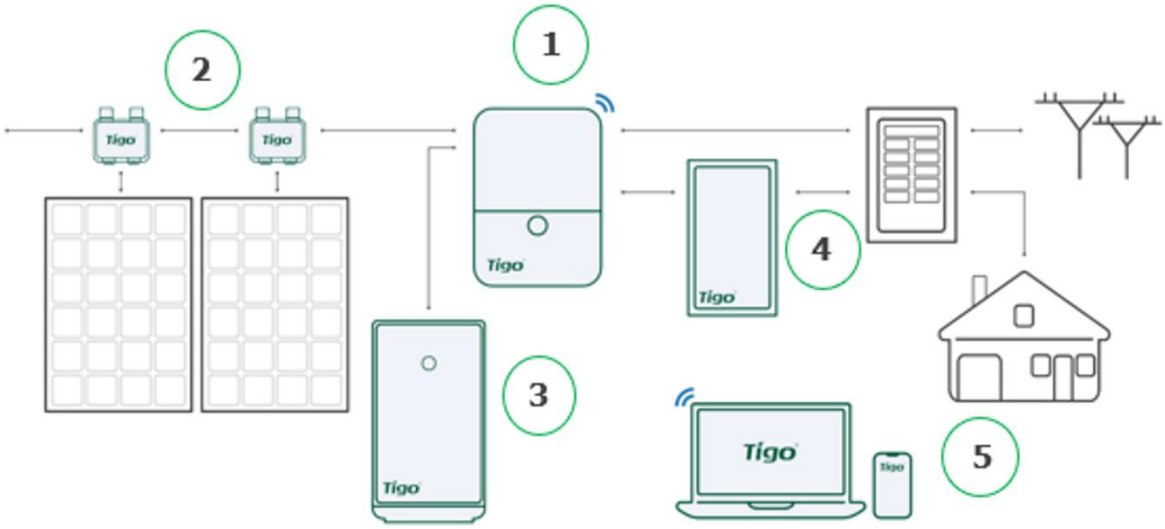
Overview

The Tigo EI Residential Solar Solution optimizes home energy consumption based on rate plans and today's energy needs. It's built with the following components:

1. **EI Inverter** – A 7.6kW or 11.4kW hybrid inverter may be installed grid-tied only or as part of an energy storage system (ESS) when paired with up to four Tigo EI batteries.
2. **TS4 MLPE** – Tigo's PV module-level power electronic (MLPE) components optimize solar module performance and provide module-level monitoring and rapid shutdown. A Tigo Access Point (TAP) with a wired connection to the inverter communicates with TS4 components wirelessly.
3. **EI Battery** – Up to four lithium-iron-phosphate (LFP) EI batteries are designed for use specifically with the EI solution.
4. **EI Automatic Transfer Switch (ATS)** – The ATS senses grid loss and safely switches from grid + solar/battery power to solar/battery power only. It also supports adding a generator to the solution.
5. The **Tigo Energy Intelligence** platform and mobile app enables easy system commissioning and provides comprehensive ongoing visibility into system and module performance.



This Manual

This manual provides instructions for installing the following components of a complete Tigo EI Residential Solution:

- EI Inverter
- EI ATS 200A
- EI Battery
- TS4 MLPE

If using an ATS 50A, refer to the *EI Residential Solar Solution US Installation Manual (w/ATS 50A)* on the tigoenergy.com Downloads page.

Special safety notifications in this manual are marked as follows:

DANGER!
A situation involves risk of death or personal injury.

CAUTION!
A situation risks damage to equipment or voiding warranty.

IMPORTANT SAFETY INFORMATION

SAVE THESE INSTRUCTIONS

Together, the Tigo EI Inverter with the provided rapid shutdown switch and TS4-A-O/S/F/2F MLPE enable a photovoltaic rapid shutdown system (PVRSS) as defined by NFPA 70, National Electrical Code (NEC).

Pushing the rapid shutdown switch button disconnects power to the inverter power-line communication (PLC) transmitter and any installed Tigo Access Points (TAP)s. This causes TS4 rapid shutdown devices to attenuate each solar module's DC output to below 30 V within 30 seconds per rapid shutdown requirements.

DANGER!
Pulling the switch button out restores power connections to the transmitter and TAPs and returns the PV system to normal operation.

If not installed with TS4-A-O/S/F/2F MLPE connected to all solar modules:

WARNING — THIS PHOTOVOLTAIC RAPID SHUTDOWN EQUIPMENT (PVRSE) DOES NOT PERFORM ALL OF THE FUNCTIONS OF A COMPLETE PHOTOVOLTAIC RAPID SHUTDOWN SYSTEM (PVRSS). THIS PVRSE MUST BE INSTALLED WITH OTHER EQUIPMENT TO FORM A COMPLETE PVRSS THAT MEETS THE REQUIREMENTS OF NEC (NFPA 70) SECTION 690.12 FOR CONTROLLED CONDUCTORS OUTSIDE THE ARRAY. OTHER EQUIPMENT INSTALLED IN OR ON THIS PV SYSTEM MAY ADVERSELY AFFECT THE OPERATION OF THE PVRSS. IT IS THE RESPONSIBILITY OF THE INSTALLER TO ENSURE THAT THE COMPLETED PV SYSTEM MEETS THE RAPID SHUTDOWN FUNCTIONAL REQUIREMENTS. THIS EQUIPMENT MUST BE INSTALLED ACCORDING TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

In addition:

- This manual contains important instructions for installation and maintenance of the Tigo EI Inverter, ATS 200A, and EI Battery.
- Installation must be performed by trained professionals only. Tigo does not assume liability for loss or damage resulting from improper handling, installation, or misuse of products.
- Before installing or using the Tigo system, please read all instructions and warning markings on the components and this installation manual.
- Check specifications for all components in the Specifications section of this manual.
- Components must operate within the technical specifications listed in their data sheets.
- Use only copper conductors rated 75 °C or higher. Do not use fine-stranded conductors.
- Unused conduit openings must be properly sealed and connected conduit must use appropriate fittings. Tigo EI product enclosures are rated IP65.
- Always wear appropriate PPE and use insulated tools.

- This product could expose the user to chemicals known to the State of California to cause cancer. For more information refer to www.P65Warnings.ca.gov.
- The inverter has no isolation transformer and it must be installed with an ungrounded PV array in accordance with NEC 690.35 and 690.43.
- To reduce risk of fire and shock hazard, install this device with strict adherence to National Electric Code (NEC) ANSI/NFPA 70 and/or local electrical codes. When the photovoltaic array is exposed to light, it supplies a DC voltage to the Tigo TS4 units and the output voltage may be as high as the PV module open circuit voltage (V_{OC}) when connected to the module. The installer should use the same caution when handling electrical cables from a PV module with or without the TS4 units attached.
- TS4-A-F and TS4-A-2F MLPE are shipped in the OFF position and will measure 0.6V at the output when the keep-alive signal is not present.
- Do not operate Tigo components if they have been physically damaged. Check existing cables and connectors, ensuring they are in good condition and appropriate in rating. Do not operate Tigo TS4 components with damaged or substandard wiring or connectors.
- Do not connect or disconnect TS4s under load. Turning off the inverter and/or the Tigo products may not reduce this risk. Internal capacitors within the inverter can remain charged for several minutes after disconnecting all power sources. Verify capacitors have discharged by measuring voltage across inverter terminals prior to disconnecting wiring if service is required. Wait 30 seconds after rapid shutdown activation before disconnecting DC cables or turning off the DC disconnect.
- Connectors from different manufacturers cannot be mated with each other.
- All AC and DC connections must use provided ferrules installed with an appropriate ferrule crimping tool.
- The capacity of a lithium-iron-phosphate (LFP) EI Battery module is 3.3 kWh and the nominal voltage 51.2 V.

DANGER!
The inverter DC disconnect switch must be OFF for five minutes before opening the inverter cover.

DANGER!
The ATS 200A service disconnect breaker must be OFF for five minutes before opening the ATS cover.

These symbols may appear on Tigo enclosures:

Risk of electrical shock.

Risk of burns.

Check the operating instructions.

Caution, the inverter may retain high voltage for up to five minutes after disconnection.

Avoid tampering.

Observe caution.

Grounding connection.

Pre-Installation

Location

EI enclosures are NEMA 4/IP65 rated for indoor and outdoor exposure. To optimize performance and extend service, locate the enclosures:

- In a well-ventilated, easily accessible location.
- On a flat surface against a solid wall with ≤15° tilt.
- Sheltered from direct sunlight and excessive moisture. The ambient temperature is ideally below 50 °C.
- Away from antennas or other sources of electromechanical interference.
- Above potential flooding.

Component Layout

Follow these guidelines when planning how to mount components:

Inverter

- As close as possible to the main service panel to minimize AC voltage drop.
- At least 3 m (36 in.) above the ground.
- With a minimum 300 mm (12 in.) clearance around the top and sides.

Rapid shutdown switch

- Adjacent the inverter and service entrance.
- Clearly visible and accessible to first responders and maintenance workers.

ATS

- Adjacent the inverter and service entrance.
- With a minimum 300 mm (12 in.) clearance around all sides.

Battery

- On level ground.
- With a minimum 914 mm (36 in.) side and top clearance from other system enclosures/objects.

Component Dimensions

Plan on accommodating the following approximate dimensions (width/height/depth):

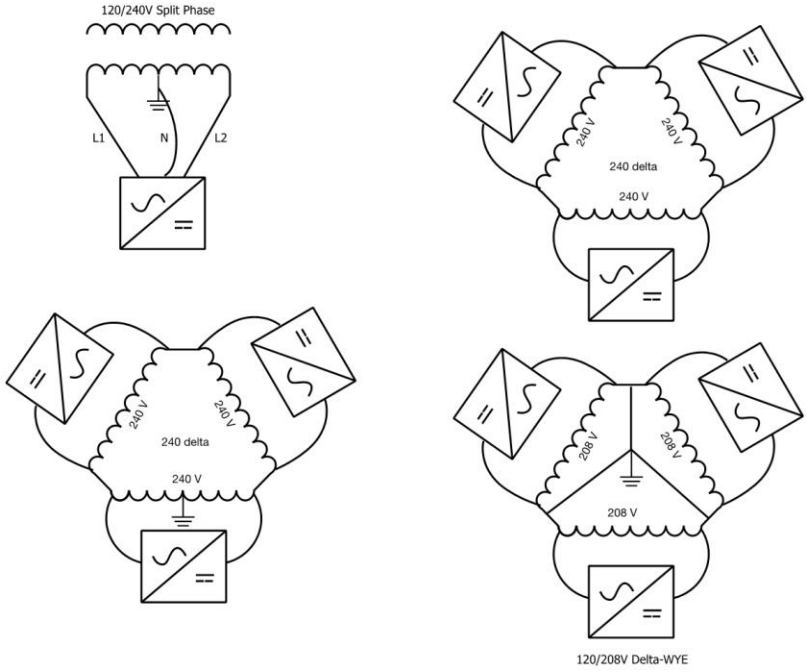
Component	Width/Height/Depth	Weight
Inverter 7.6 kW	400 x 570 x 170 mm (15.75 x 22 x 6.7 in.)	14.6 kg (32.3 lb.)
Inverter 11.4 kW	400 x 640 x 190 mm (15.75 x 25.2 x 7.5 in.)	20.5 kg (45.2 lb.)
ATS 200A	450 x 550 x 180 mm (17.7 x 21.7 x 7.1 in.)	29.7 kg (65.5 lb.)
Battery	650 x 1160 x 320 mm (25.6 x 45.7 x 12.6 in.)	140 kg (308.6 lb.)

Wiring Overview

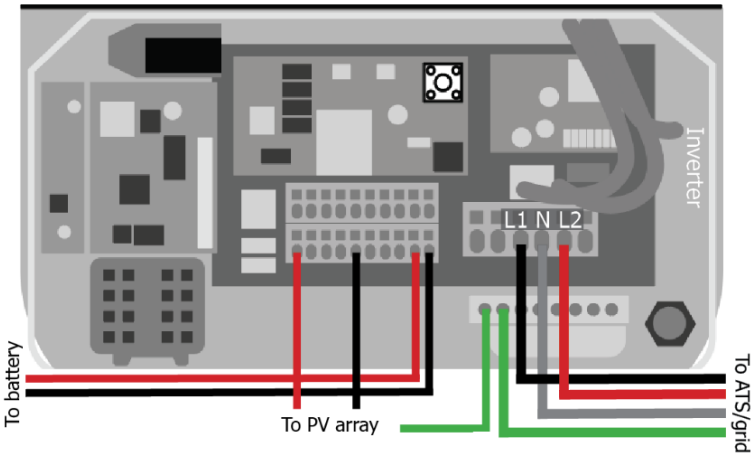
The EI system can operate on 208 or 240 V_{AC} at 60 Hz. For detailed wiring instructions, refer to the following EI Inverter, EI ATS, TAP and TS4 MLPE, and EI Battery sections.

Grid Connections

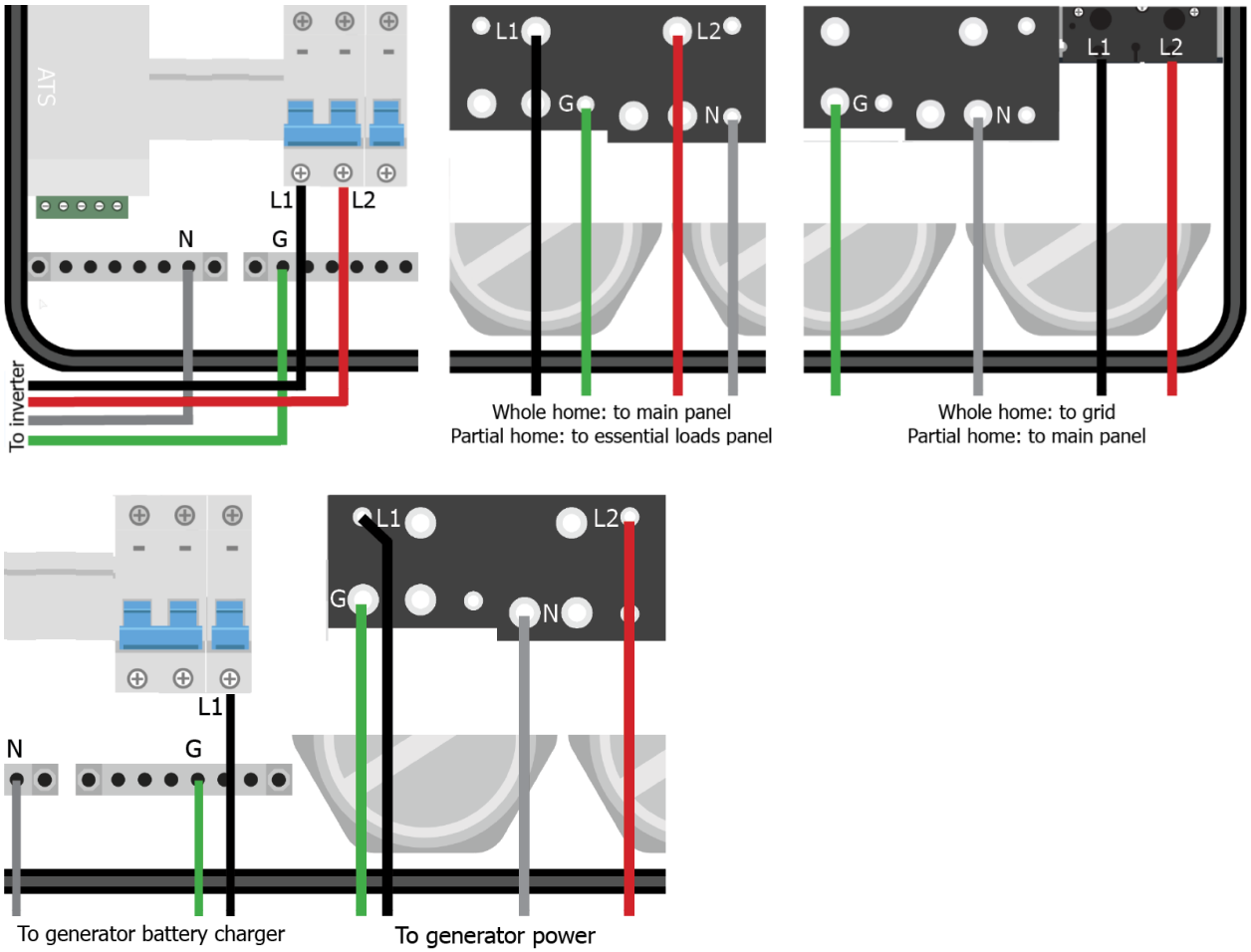
EI Inverters are grid-tied to the public utility grid and the grid voltage is chosen through the EI app. The following shows the types of grid connections supported by EI Inverters.



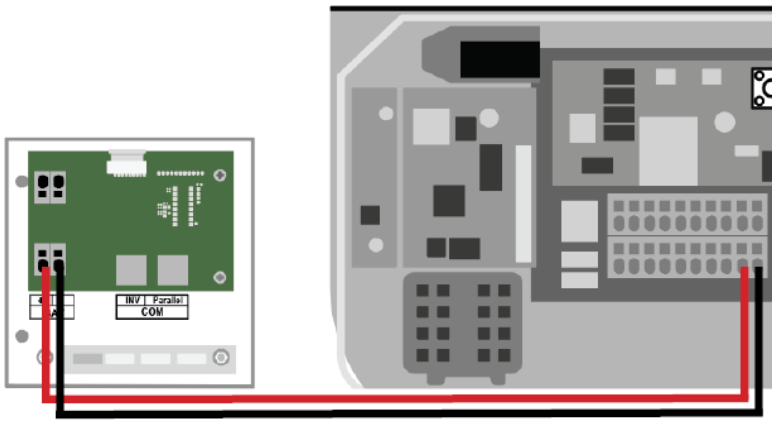
Inverter Power Connections



ATS Power Connections



Battery Power Connections



The EI Inverter

This section includes:

- Box Contents
- Enclosure Overview
- Mounting
- Communications Connections
- Power Connections
- Rapid Shutdown Switch

For detailed specifications, download the EI Inverter data sheet from the tigoenergy.com Downloads page.

Box Contents

The EI Inverter box includes:

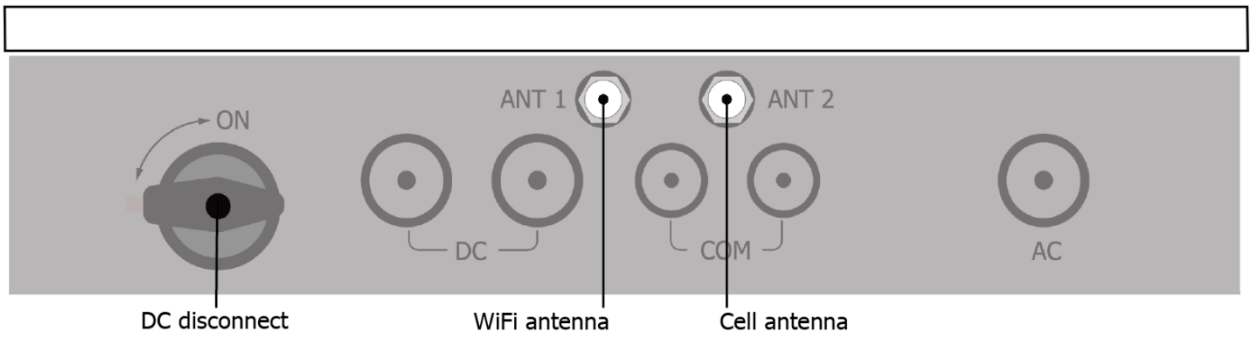
- EI Inverter
- Quick Start Guide
- Mounting bracket
- Tigo Access Point (TAP)
- Rapid Shutdown label
- Rapid shutdown switch
- DC wire ferrules (3.8 kW: 12, 7.6 kW:16, 11.4 kW:20)
- AC wire ferrules (5)
- 2-pin plug for 12V ATS communications connection (not included with all models)
- 3-pin plug for RS-485 ATS communications connection
- 6-pin plug for ATS communications connection (installed on the EI ATS)
- Grounding ring terminal
- Hex-head self-tapping screws (inverter mounting, 5)
- Philips-head screw (rapid shutdown switch mounting, 4)
- White wall anchors (inverter, 5)
- Green wall anchors (rapid shutdown switch mounting, 4)
- WiFi antenna
- Cellular antenna (only with cell-enabled models)
- .875 in. OD knockout for 0.5 in. plug with nut
- 1.375 in. OD knockout for 1 in. plug (2)
- 1.375 in. OD knockout for 1 in. plug with nut (2)

Enclosure Overview

MAC ID

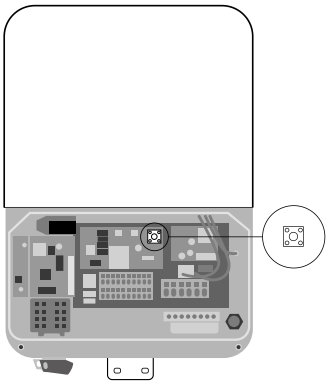
A label with the inverter's MAC ID and a tigoenergy.com QR code is located on the left side below the specifications label.

DC Disconnect and Enclosure Knockouts



Reset Button

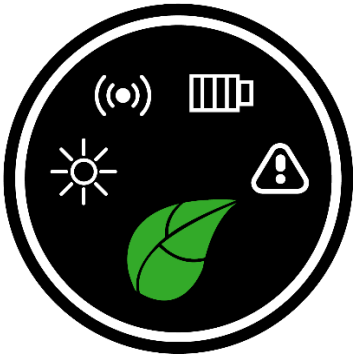
A reset button is located on the top right of the inverter's communications board. This button performs multiple functions as described below in Table 16.



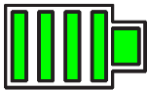
- To clear an arc fault notification, press the button for 3 – 5 secs.
- To run an arc fault self-test when no arc fault alarm is present, press the button for 3 – 5 secs.
- To reset communications to factory status, press the button for >10 secs.

Status Indicators

The status indicator LEDs in the center of the inverter front panel show the EI system's current operating conditions.



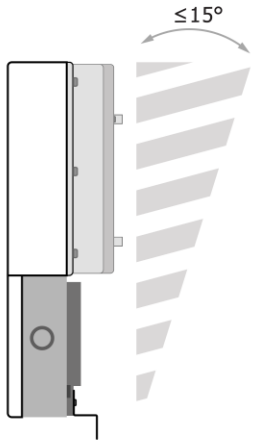
Symbol		Action	Description
	Power	Continuous	Feed in grid
		Flashing 3 sec. on/1 sec. off	DC on/AC off
		Flashing 1 sec. on/3 sec. off	DC off/AC on
		Flashing 0.5 sec. on/0.5 sec. off	Checking
		Flashing 2 sec. on/2 sec. off	Standby mode
		Off	Disconnected
	Communications	Continuous	4G/WiFi, local WiFi ok
		Flashing 0.5 sec. on/0.5 sec. off	Local WiFi connecting
		Flashing 1 sec. on/1 sec. off	4G/WiFi failure, local WiFi ok
		Flashing 1 sec. on/3 sec. off	Local WiFi failure, 4G/WiFi ok
		Off	Failure

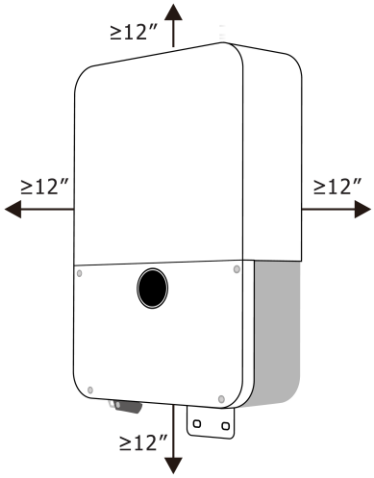
 Battery	Continuous	Operating normally
	Flashing 1 sec. on/3 sec. off	Low charge state
	Flashing 0.5 sec. on/0.5 sec. off	Fault detected
	Off	Disconnected
Fault	Continuous with audible alarm	Arc fault
	Continuous	Fault
	Flashing 1 sec. on/1 sec. off	Warning
	Off	No faults detected

Mounting

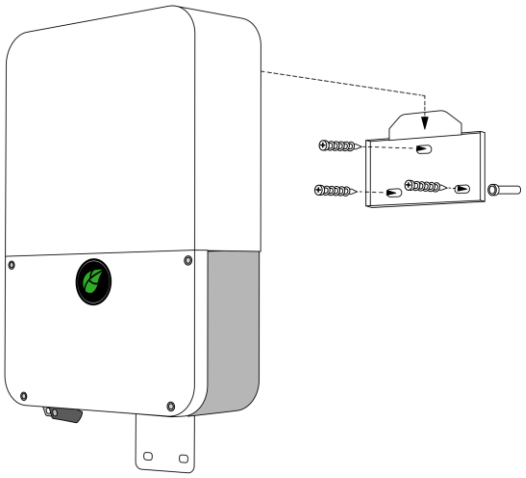
To mount the inverter:

1. Choose a location on a plumb wall with adequate clearance, free from direct sun and precipitation.

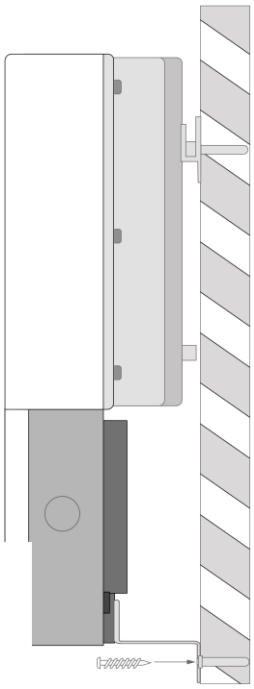




2. Affix the inverter top bracket using screws appropriate for the wall surface.



3. Hang the inverter on the bracket and affix the bottom bracket.



Communications Connections

CAUTION!
You must make communications connections to the TAP (if used), ATS, and battery for the EI system to operate as an energy storage system (ESS).

Inverter communications connections include:

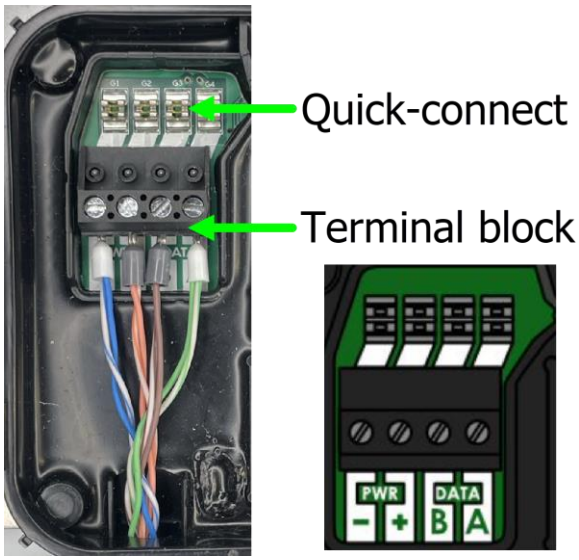
- An antenna to connect to a WiFi or cell network
- A wired connection to the TAP (if used)
- Wired connections to the ATS and battery

To connect an antenna:

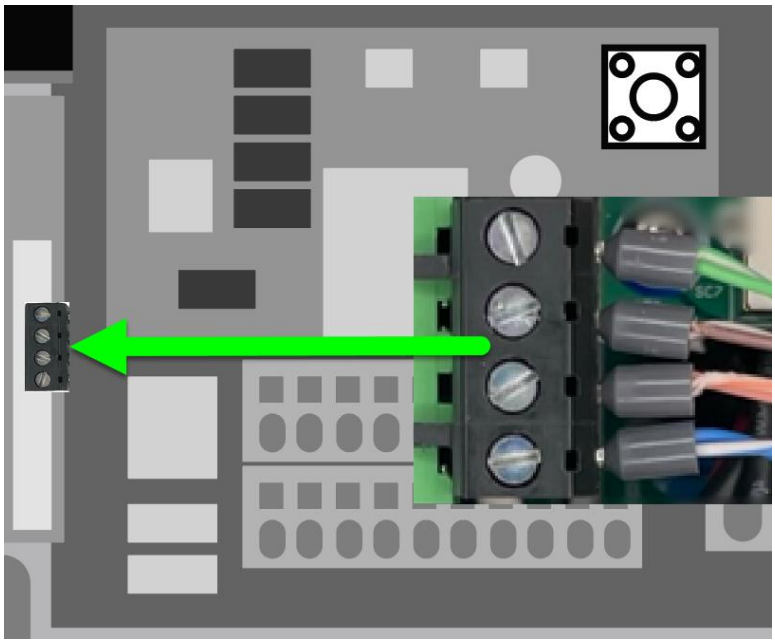
- Attach the provided WiFi or cell antenna to the appropriate inverter *ANT 1* (left, WiFi) or *ANT 2* (right, cell) port on the bottom of the inverter.

To connect to a TAP when used with TS4-A-O/S/M MLPE:

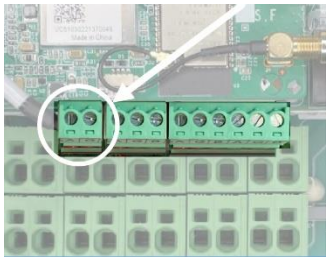
1. Prepare a 4-wire or CAT5/6 cable:
    - Shielded if running next to PV conductors
    - 20 – 18 AWG or CAT5/6 twisted pairs
    - Solid core
    - Cable outside diameter (OD) ⩽9 mm (.35 in.)
2. Connect the cable to the left side of the nearest TAP using either the quick-connect (4-wire) or the terminal block (4-wire or CAT5/6).



3. At the inverter, terminate the wires at the 4-pin TAP plug from bottom to top: –, +, Data B, Data A.



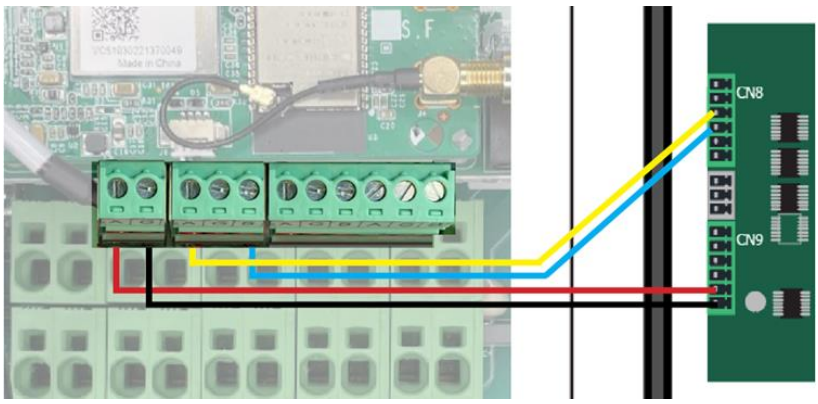
To connect to the ATS, first determine if your inverter has a two-pin *COM* power terminal socket. This image shows an occupied socket:



If absent, disregard 12 V cable instructions and only connect the two-wire RS-485 cable.

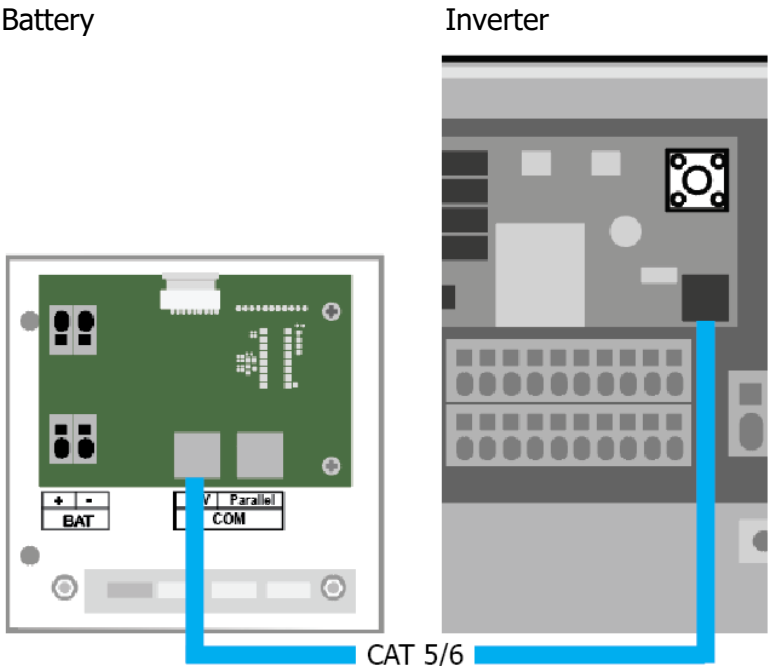
1. Prepare:
   - A two-wire 18–20 AWG 12 V cable
   - A two-wire RS-485 cable
2. Locate the 2-pin, 3-pin, and 6-pin plugs included in the EI Inverter and EI ATS box *Accessories* bags. The 2-pin plug is not included with models lacking a 2-pin socket.
3. At the inverter, connect the 12 V cable to the *+* and *–* terminals on the 2-pin plug and install the plug.
4. At the inverter, connect the RS-485 cable to the *A* and *B* terminals on the 3-pin plug and install the plug.
5. At the ATS, connect the 12 V cable to the *+12* and *GND* terminals on the 6-pin *CN8* plug and install the plug.
6. At the ATS, connect the RS-485 cable from the A terminal of the inverter 3-pin plug to the A terminal on the 6-pin *CN9* plug.
7. At the ATS, connect the RS-485 cable from the B terminal of the inverter 3-pin plug to the B terminal on the 6-pin *CN9* plug.
8. Install the plug.

Inverter ATS



To connect to the battery:

1. In the battery's inverter connection wirebox on the left side of the enclosure, plug a CAT5/6 cable into the *COM INV* terminal.
2. At the inverter, plug the cable into the battery COM terminal.



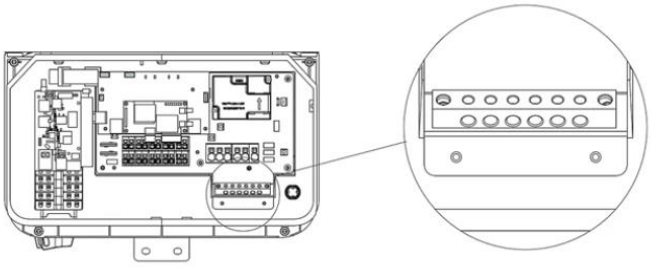
To connect COM cables to multiple batteries, refer to the EI Battery section.

Power Connections

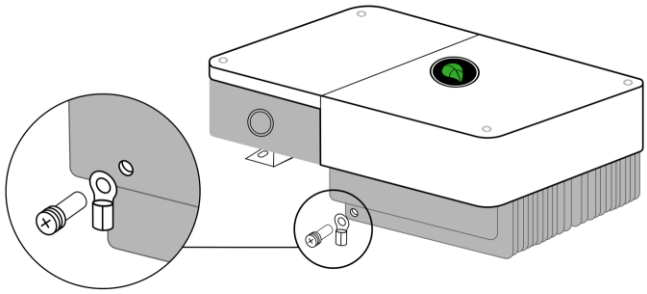
DANGER!
Ensure the inverter DC disconnect switch is OFF before making connections.

Grounding Points

Equipment grounding conductor (EGC):



Grounding electrode conductor (GEC):

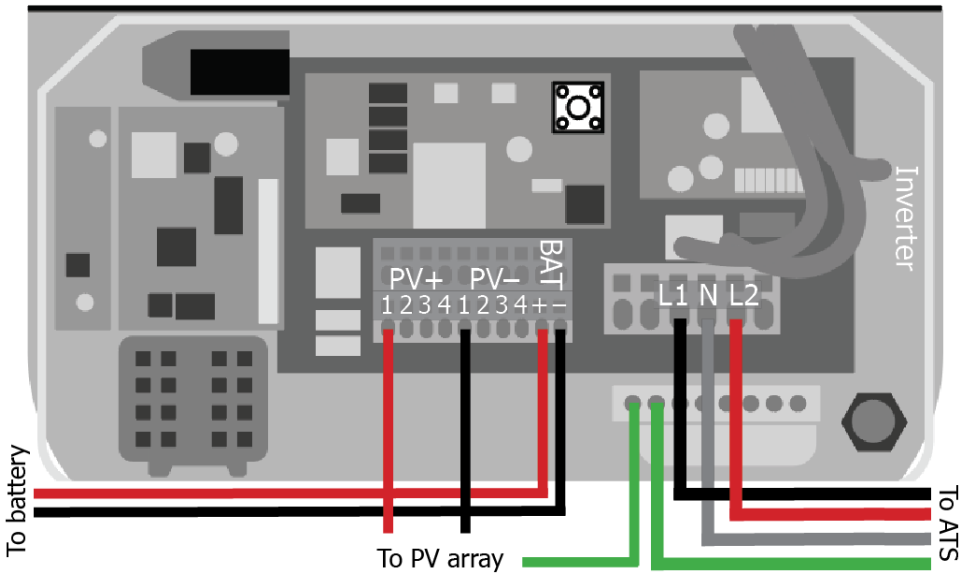


Wiring

Prepare ferruled conductors using copper, non-fine-stranded wire:

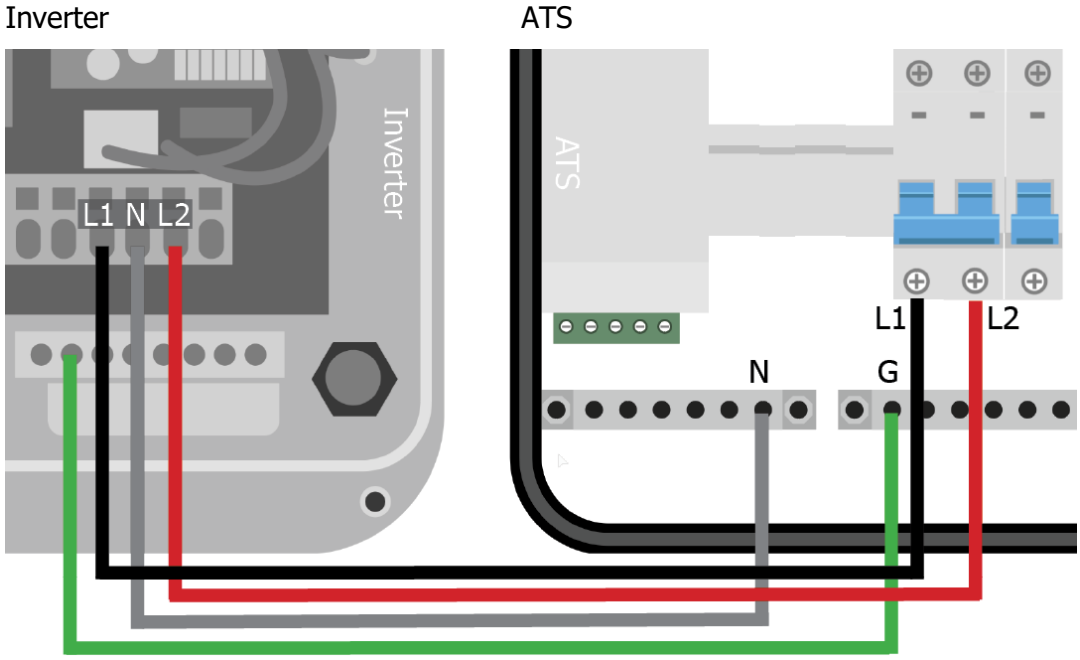
- Enclosure grounding: 10 – 8 AWG
- AC (grid or ATS): 8 – 6 AWG
- DC (PV): 12 – 8 AWG
- DC (battery): 12 – 8 AWG

CAUTION!
Always calculate conductor AWG based on wire length and current load.



To connect to the grid or ATS:

1. Connect conductors to the inverter ground bar and *GRID L1, N, and L2* terminals.
2. If not using an ATS/battery and connecting directly to the grid, terminate conductors at the main load/service panel:
    - 3.8 kW inverter: 20 A 2-pole breaker
    - 7.6 kW inverter: 40 A 2-pole breaker
    - 11.4 kW inverter: 60 A 2-pole breaker
3. Connect conductors to the *INV L1* and *L2* terminals and the ground bar.

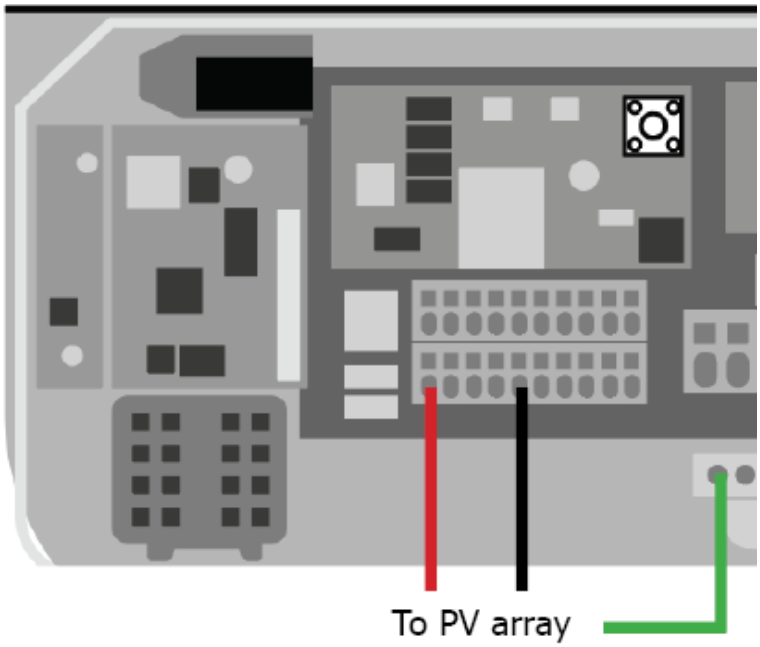


To connect PV strings:

1. Ensure TS4s are properly connected to their PV strings.

   CAUTION!
   The voltage of each PV string must be less than 600V_{DC}.
   Neither positive nor negative conductors can be grounded.

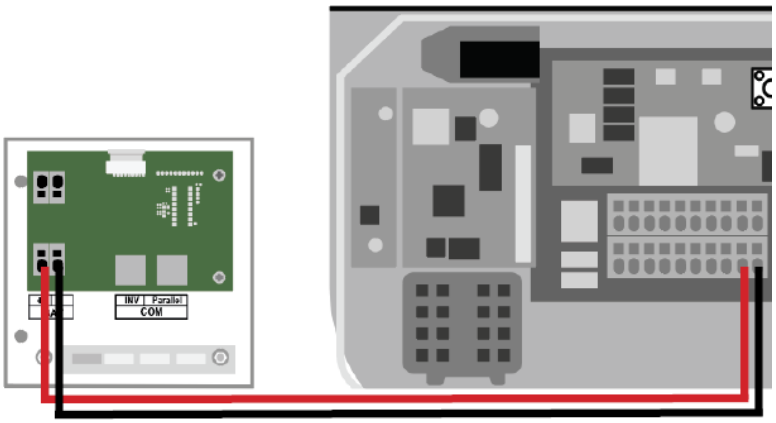
2. Connect conductors to the inverter:
   - 3.8 kW (2 MPPT) inverter: up to two strings
   - 7.6 kW (3 MPPT) inverter: up to three strings
   - 11.4 kW (4 MPPT) inverter: up to four strings
3. Connect the PV array rack EGC to the inverter EGC busbar.



To connect to a battery:

1. In the battery's inverter connection wirebox, connect two ≤2 m (79 in.) conductors to the *BAT+* and *BAT–* terminals.
2. Connect the conductors to the inverter *BAT+* and *BAT–* terminals.

Battery Inverter



For details on how to add more batteries, refer to the EI Battery section.

Rapid Shutdown Switch

Together, the Tigo EI Inverter with the provided rapid shutdown switch and TS4-A-O/S/F/2F PV rapid shutdown MLPE enable a photovoltaic rapid shutdown system (PVRSS) as defined by NFPA 70, National Electrical Code (NEC).

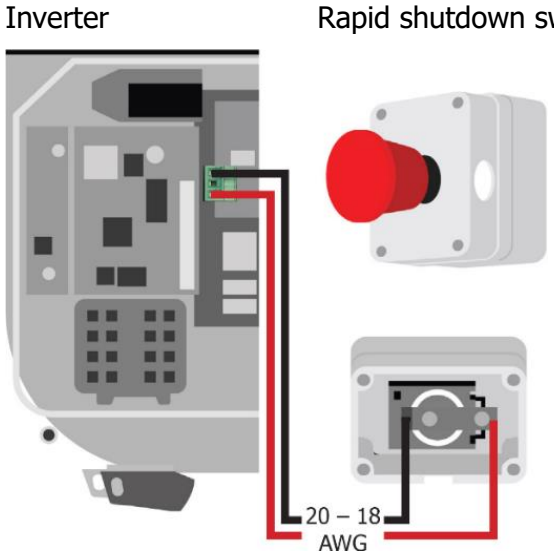
Pushing the rapid shutdown switch button disconnects power to the inverter power-line communication (PLC) transmitter and any installed Tigo Access Points (TAP)s. This causes TS4 rapid shutdown devices to attenuate each solar module's DC output to below 30 V within 30 seconds per rapid shutdown requirements.

CAUTION!
Use only the rapid shutdown switch provided with the Tigo EI Inverter.

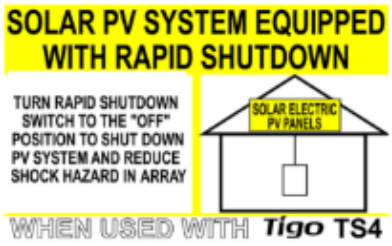
DANGER!
Pulling the switch button out restores power connections to the transmitter and TAPs and returns the PV system to normal operation.

To install the switch:

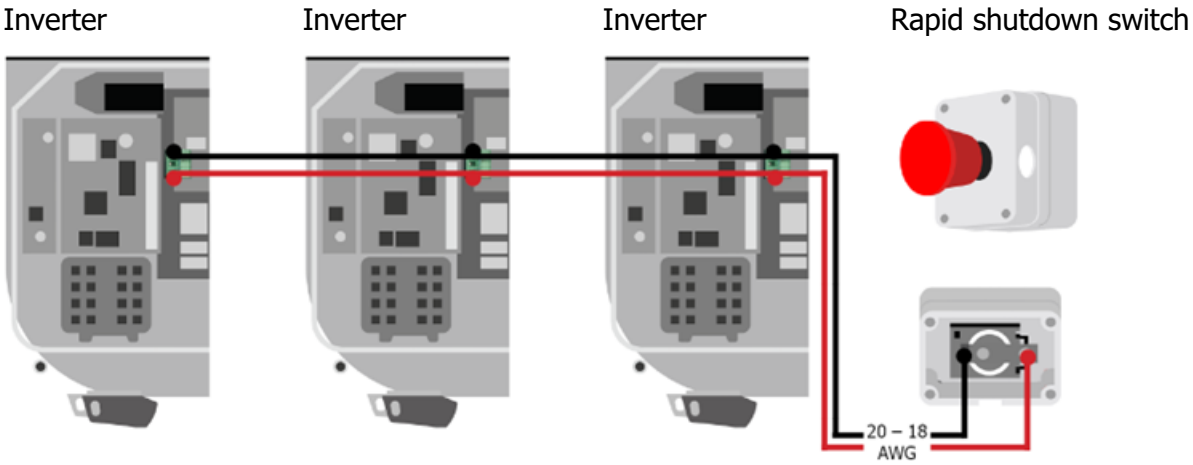
1. Mount the switch within 1 m (3 ft.) of the inverter or service entrance outside the residence.
   It must be clearly visible and accessible to first responders and maintenance workers.
2. At the inverter, remove the 3-pin connector from the CN14 port.
3. Connect two 22 – 18 AWG conductors to the 3-pin connector in positions *1* and *3* (position *2* is open). Polarity is not important.
4. Route the conductors to the switch and connect them to the two switch terminals.



5. Affix the rapid-shutdown-equipped label at the service equipment location.



To connect a switch to multiple inverters, daisy-chain two 20 – 18 AWG wires to connect inverter switch terminals to the rapid shutdown switch.



The EI Automatic Transfer Switch (ATS)

This section includes:

- Box Contents
- Enclosure Overview
- Mounting
- Wiring
- Service Disconnect Lock
- Manual Bypass
- Status Indicators

For detailed specifications, download the ATS data sheet from the tigoenergy.com Downloads page.

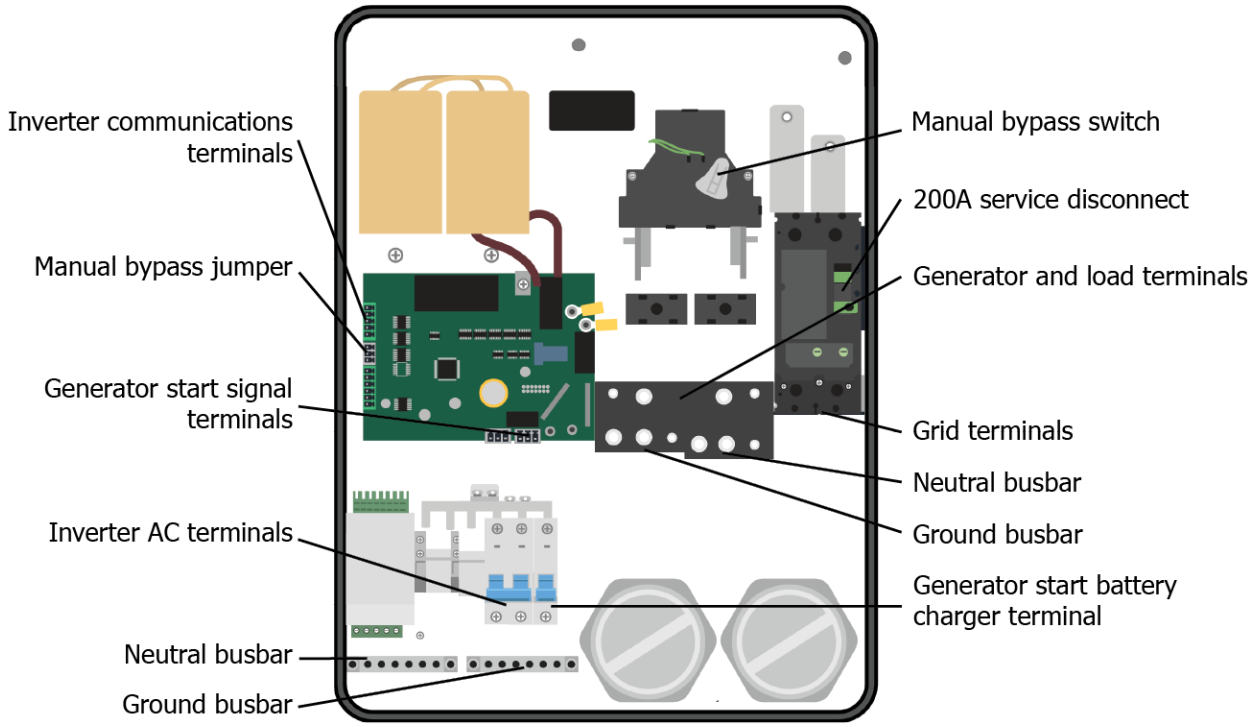
Some of the connections described in this section may duplicate instructions included in other component sections in this manual.

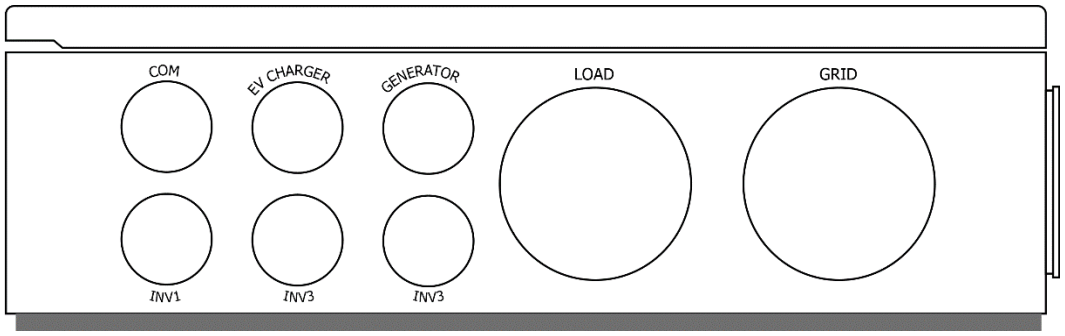
Box Contents

The ATS box includes:

- Quick Start Guide
- 3-pin plugs for communications and generator connections (2 w/TSS-200A-US-G)
- 3-pin plug with pins 1-3 jumped for manual bypass
- 6-pin plugs for communications (2)
- Bracket mounting screws (2)
- ATS-bracket hold-down screw
- 200 A circuit breaker lock plate with two screws

Enclosure Overview

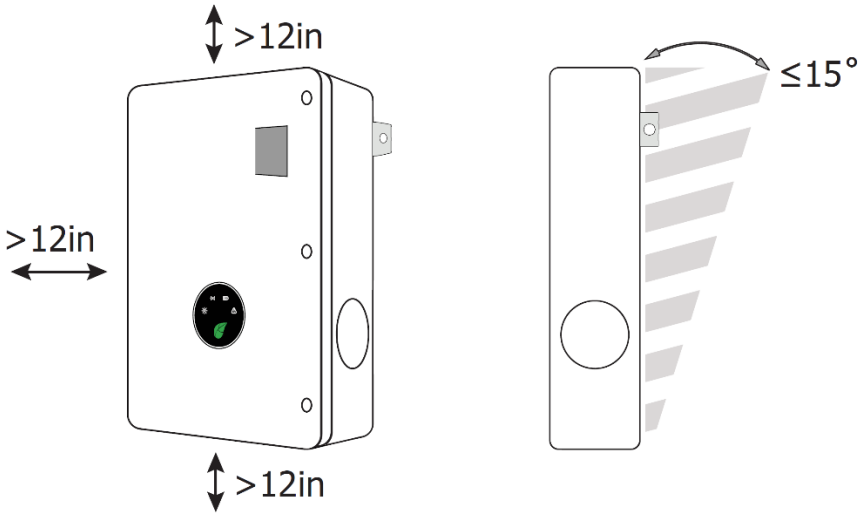




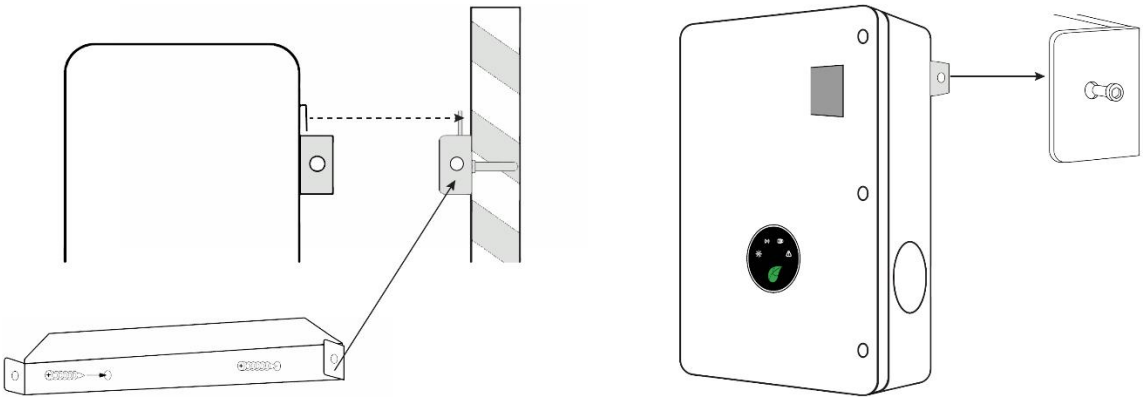
Mounting

To mount the ATS:

1. Choose a location on a plumb wall with greater than 12 in. clearance and free from direct sun and precipitation.

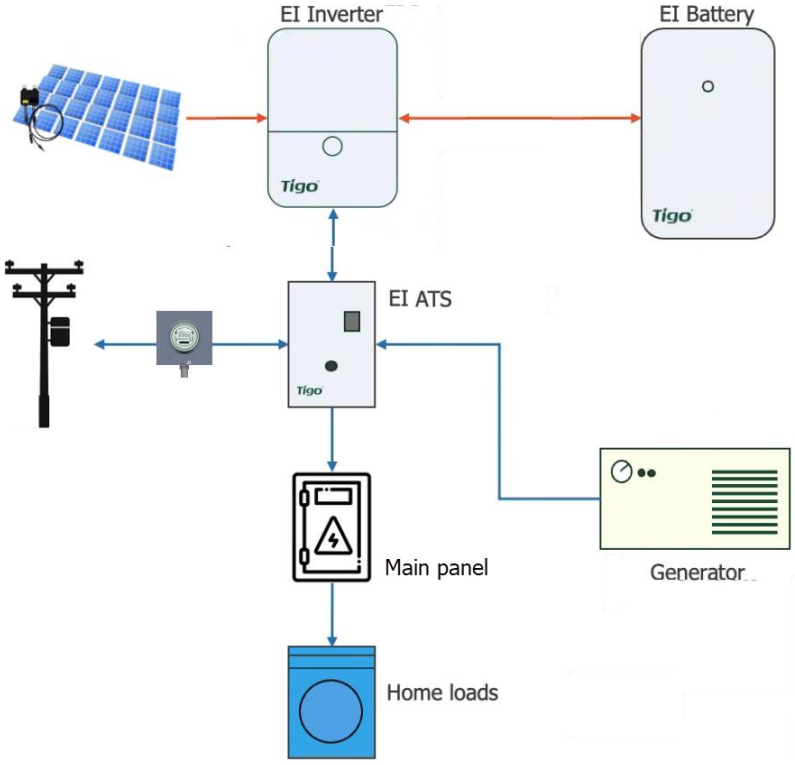


2. Use screws appropriate for the wall surface to affix the bracket, hang the ATS, and secure it with an M5 screw.

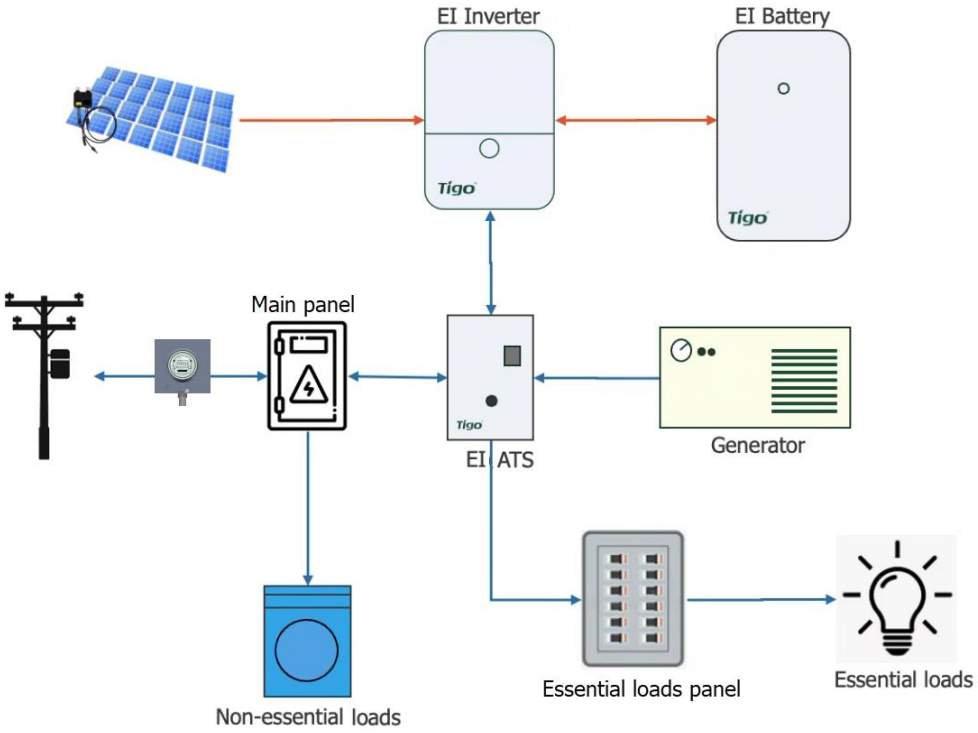


Wiring

The ATS connects to the grid, loads, and inverter and, if installed, a generator (TSS-200A-US-G only). A whole-home backup configuration:



A partial-home backup configuration:



Conductors must be ferruled copper, 90 °C rated, non-fine stranded:

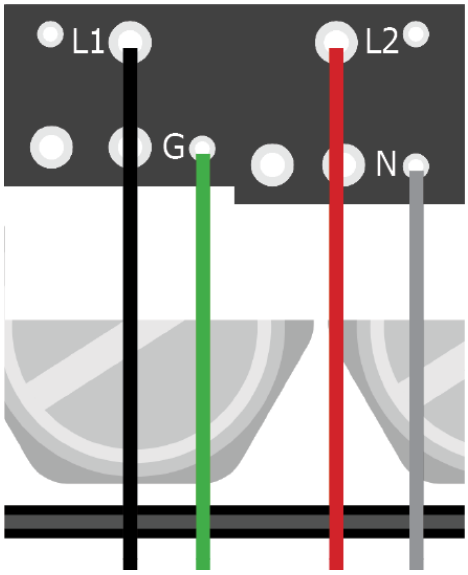
- ATS AC to load/grid: 1/0 – 4/0 AWG
- ATS AC to inverter: 8 – 6 AWG
- ATS AC to generator starter battery charger (TSS-200A-US-G only): 12 – 10 AWG
- ATS AC to generator (TSS-200A-US-G only): 4 – 1/0 AWG
- EGC: 8 – 6 AWG, insulated or bare

CAUTION!
Always calculate conductor AWG based on wire length and current load.

Load Connections

To connect the ATS to the main (whole-home backup) or essential loads (partial-home backup) panel:

1. Connect ground and neutral conductors to the ground and neutral bars and power conductors to the *LOAD L1* and *L2* terminals. Torque to 22.5 Nm.



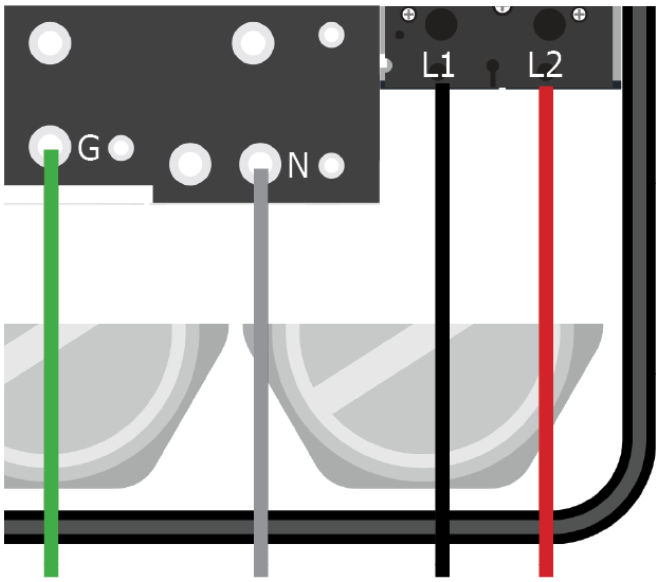
2. Terminate conductors at a main or essential loads panel.

Grid Connections

This connection carries power between the utility grid and the ATS. Direct connection to utility feeders or a line side may require coordination with the local utility.

To connect the ATS to the service entrance (whole-home backup) or main panel (partial-home backup):

1. At the ATS, connect ground and neutral conductors to the ground and neutral bars and power conductors to the *GRID L1* and *L2* terminals. Torque to 22.5 Nm.

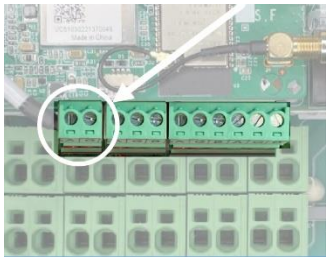


2. Terminate conductors at the service entrance or main panel.

Inverter Connections

The ATS connects to the inverter *COM* and *GRID* terminals.

To connect to the ATS COM terminals, first determine if your inverter has a two-pin *COM* power terminal socket. This image shows an occupied inverter socket.

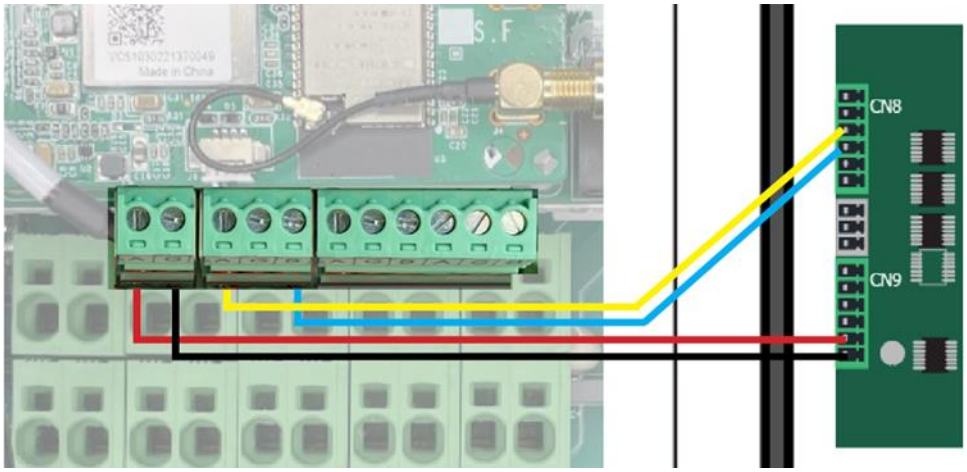


If absent, disregard 12 V cable instructions and only connect the two-wire RS-485 cable.

1. Prepare:
   - A two-wire 18–20 AWG 12 V cable
   - A two-wire RS-485 cable
2. Locate the 2-pin, 3-pin, and 6-pin plugs included in the EI Inverter and EI ATS box *Accessory* bags. The 2-pin plug is not included with all models.
3. At the inverter, connect the 12 V cable to the *+* and *–* terminals on the 2-pin plug and install the plug.
4. At the inverter, connect the RS-485 cable to the *A* and *B* terminals on the 3-pin plug and install the plug.
5. At the ATS, connect the 12 V cable to the *+12* and *GND* terminals on the 6-pin *CN8* plug and install the plug.
6. At the ATS, connect the RS-485 cable from the A terminal of the inverter 3-pin plug to the A terminal on the 6-pin *CN9* plug.
7. At the ATS, connect the RS-485 cable from the B terminal of the inverter 3-pin plug to the B terminal on the 6-pin *CN9* plug.

8. Install the plug.

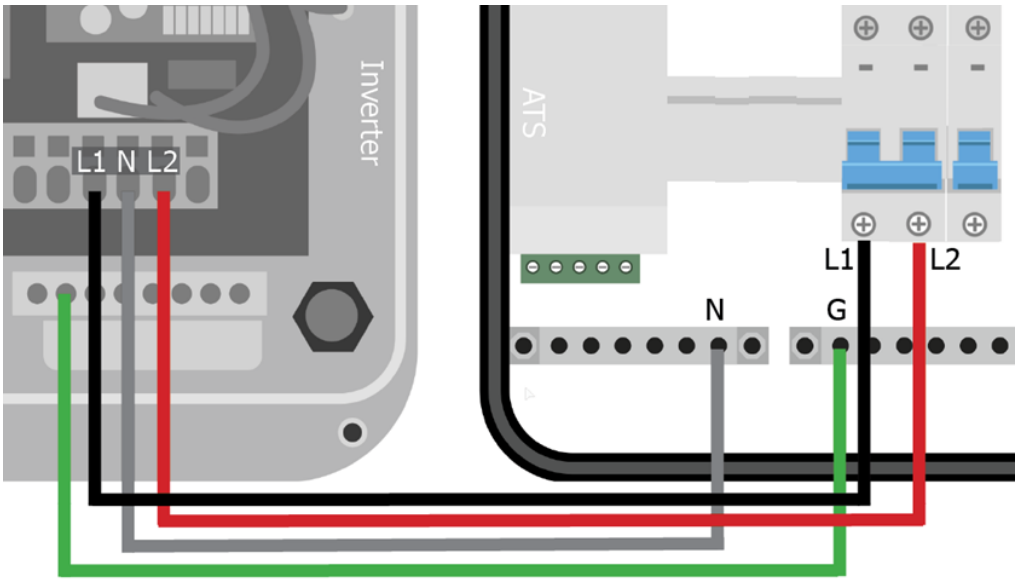
Inverter ATS



To connect to the inverter *GRID* terminals:

1. At the ATS, connect conductors to the *L1* and *L2* terminals and the neutral and ground busbars.
2. At the inverter, connect conductors to the *L1* and *L2* terminals and the ground busbar.

Inverter ATS



Generator Connections (TSI-200-US-G only)

The ATS can connect to a generator that meets these requirements:

- Pure sine wave output
- A two-wire start signal circuit
- Minimum capacity equal to inverter wattage; maximum capacity 24 kW. Recommended capacity is 2x inverter capacity (≤24 kW).

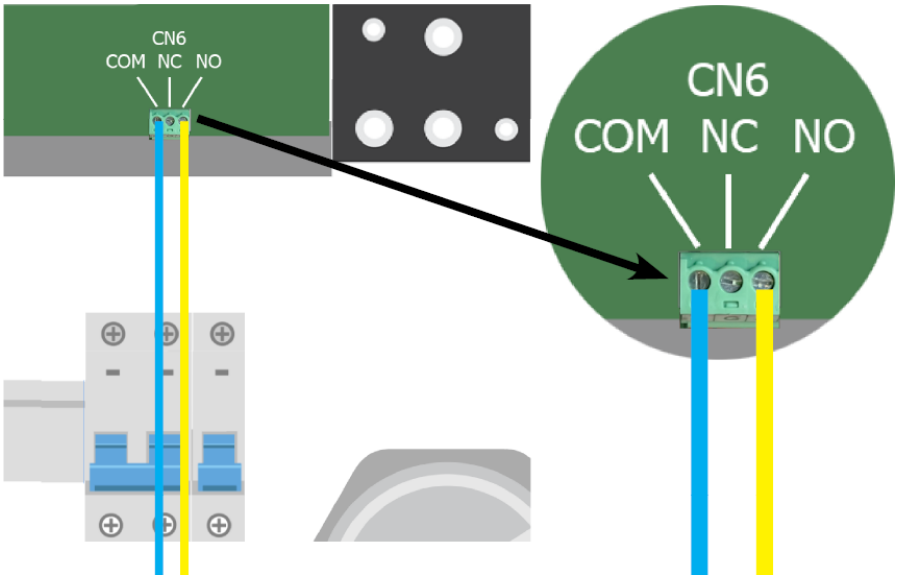
The ATS connects to the generator:

- Two-wire start signal connection
- Starter battery charger
- Power output terminals

Note: The generator must be configured in the EI mobile app during or after the commissioning phase. Refer to the Run the Tigo Energy Intelligence App section of this manual.

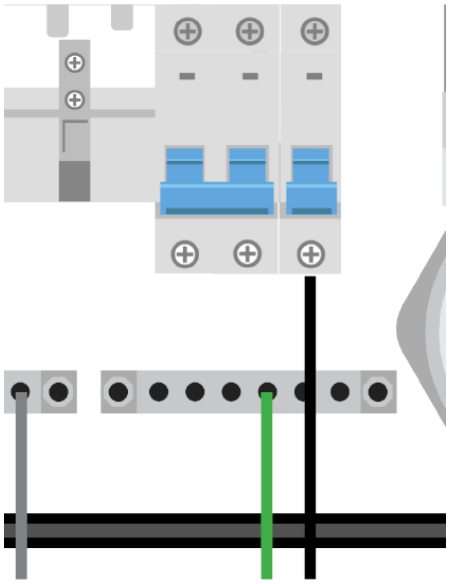
To connect the ATS to a two-wire start signal connection:

1. Connect two RS-485 wires to the outermost pins of the 3-pin plug included in the *Accessories* bag.
2. Install the plug.

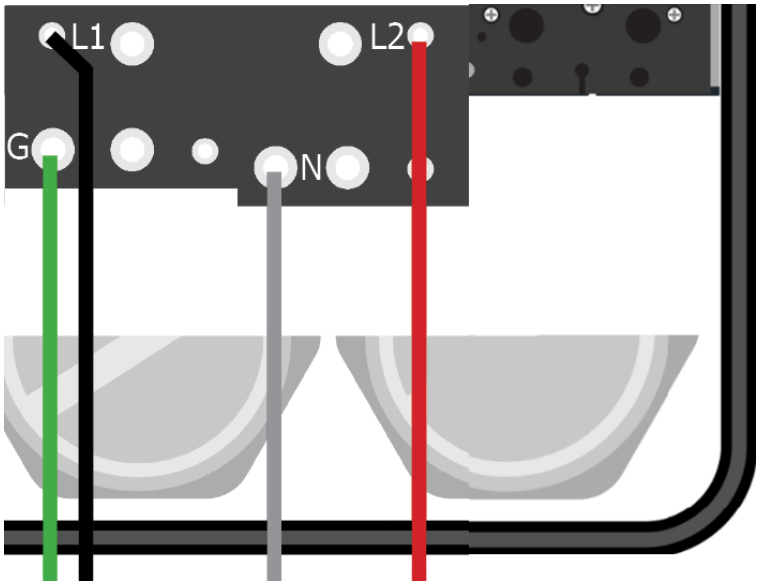


If the generator uses NC, change it to use NO.

To connect the ATS to a generator's starter battery charger, connect three 12 – 10 AWG conductors to the ATS generator maintenance breaker and neutral and ground busbars.



To connect the ATS to generator power output, connect four 4 – 1/0 AWG conductors to the ATS generator neutral and ground busbars and L1/L2 terminals.

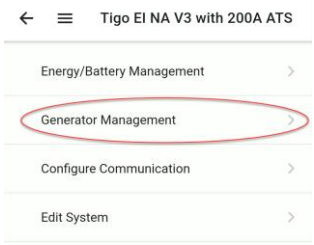


Generator Operation Modes

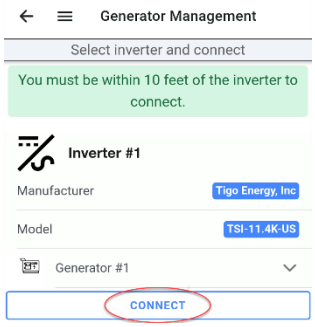
If the grid drops, the generator will be in *Auto* operation mode. It will start running if the battery state-of-charge (SOC) falls below 20% and will stop when the SOC reaches 95%. Generator power not used by loads will charge the battery.

While the grid is down, you can set additional *On* and *Pause* operation modes in the EI mobile app:

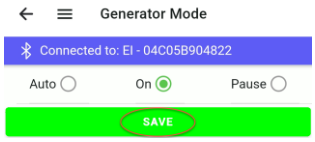
1. In the EI app, open the system with the connected generator and tap the Settings icon.
2. Tap *Generator Management.*



3. Select the inverter that controls the generator and tap CONNECT.



4. Select a generator mode and tap SAVE:

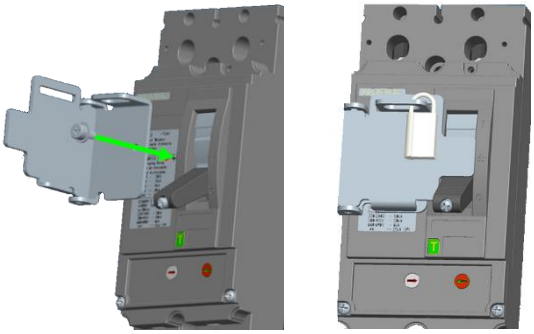


- *Auto* (default) – The generator starts if the battery state-of-charge (SOC) falls below 20% and stops when the SOC reaches 95%.
- *On* – The generator runs continuously to power loads and charge the battery. This mode can help if loads exceed the power available from the solar array and battery.
- *Pause* – The generator does not run until the *Auto* or *On* mode is set.

The initial generator operation mode when the grid drops is always *Auto*. *On* and *Pause* modes only take effect if they are set when the grid is down.

Service Disconnect Lock

To install the lock plate and screw (located in the ATS *Accessories* bag) on the 200A service disconnect, pull back or cut the label to reveal the lock plate screw hole and attach the plate.



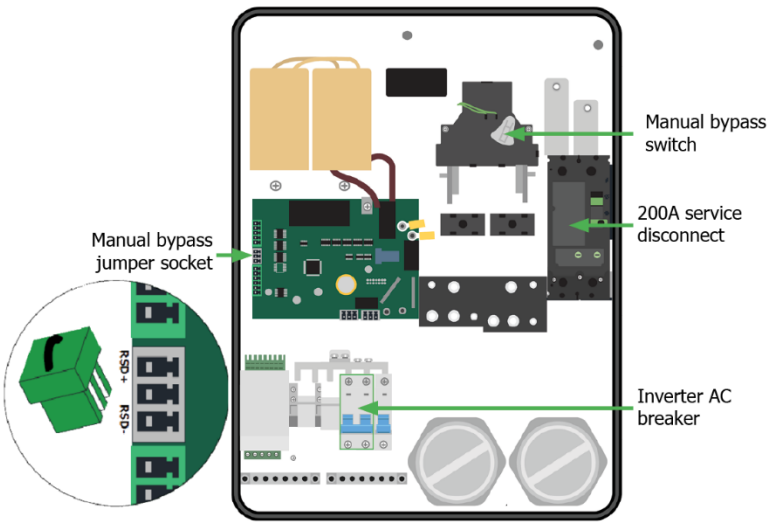
Manual Bypass Switch

This switch lets you provide full electrical service for homeowners while installing, commissioning, or maintaining a residential solar solution. It isolates inverter, battery, and PV components while routing power from the grid to the home service panel.

DANGER!
Before using the manual bypass switch, turn the 200 A service disconnect and the inverter AC breaker to OFF. Wait until no ATS LEDs show power before proceeding.

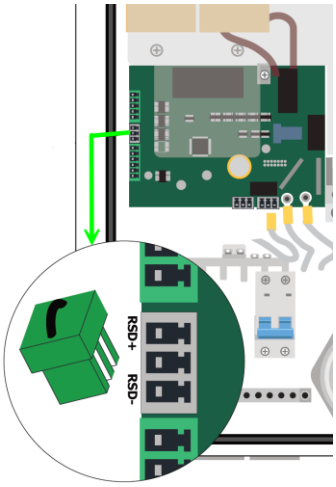
To avoid damaging equipment and to safely bypass the ATS, follow these instructions carefully with particular attention to:

- Installing the manual bypass jumper found in the ATS *Accessories* bag.
- Letting the ATS automatically reset the manual bypass switch during restart – it must not be manually reset.

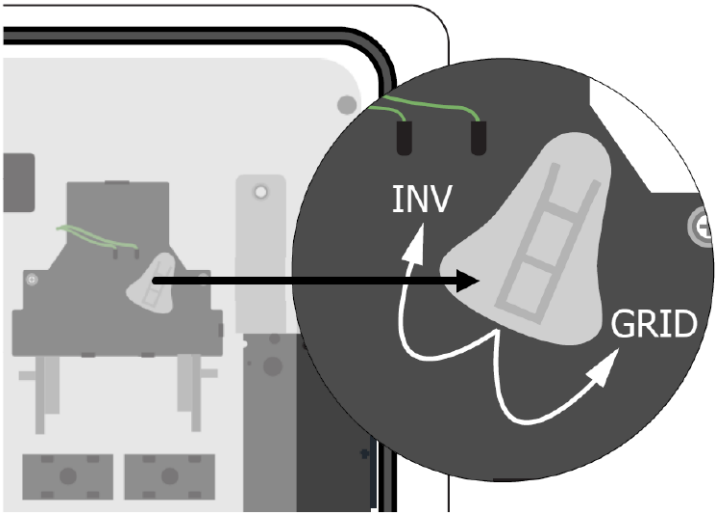


To manually bypass the ATS:

1. At the main service panel, turn the 2-pole breaker that connects the grid to the ATS to OFF.
2. Turn the inverter and battery DC disconnects to OFF.
3. At the ATS, turn the 200 A service disconnect and inverter AC breakers (see diagram) to OFF.
4. Locate the 3-pin manual bypass jumper in the *Accessories* bag that has pins 1 and 3 jumped.
5. Plug the jumper into the terminals labeled *RSD+* and *RSD-*.



6. Remove the black safety cover if necessary and turn the bypass switch to *GRID*.



7. Turn the inverter AC breaker to ON.
8. Turn the ATS 200 A service disconnect to ON.
9. Turn the inverter and battery DC disconnects to ON.

10. At the main service panel, turn the 2-pole breaker that connects the grid to the ATS to ON.
11. Ensure the rapid shutdown switch button is open (not depressed).

The ATS will route AC power from the grid terminals to the load terminals until you reverse the bypass procedure.

Reverse the Bypass Procedure

To reset the ATS to normal operation:

1. At the main service panel, turn the 2-pole breaker that connects the grid to the ATS to OFF.
2. Turn the ATS 200A service disconnect and inverter AC breakers to OFF.
3. Confirm that the inverter and battery DC disconnects are turned to OFF.
4. If needed, replace the black safety cover inside the ATS.
5. Remove the 3-pin manual bypass jumper and keep it for future bypass procedures.
6. At the main service panel, turn the 2-pole breaker that connects the grid to the ATS to ON.
7. Turn the inverter AC breaker to ON.
8. Turn the ATS 200 A service disconnect to ON.
9. Turn the inverter and battery DC disconnects to ON.
10. Ensure the rapid shutdown switch button is open (not depressed).

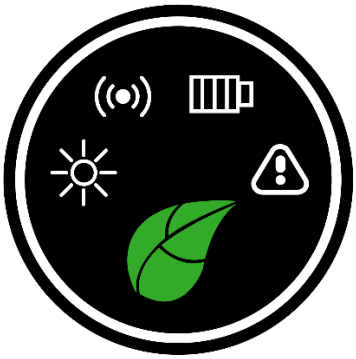
It may take several minutes for the inverter and ATS to automatically reset.

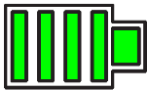
CAUTION!
Do not manually move the manual bypass switch to *INV*. Damage to the ATS may result. The switch moves automatically when the system is ready.

If the inverter does not start, force-start the battery by removing the start button cover and pressing until the green leaf status LED flashes rapidly.

Status Indicators

The status indicator LEDs on the front panel of the ATS show current operating conditions.



Symbol		Action	Description
	Grid	Continuous	Grid power on
		Off	Grid power off
	Communications	Continuous	Operating normally
		Flashing 0.5 sec. on/0.5 sec. off	Error
	System Status	Continuous	Operating on-grid
		Flashing 0.5 sec. on/0.5 sec. off	Operating off-grid w/battery and/or generator
	Fault	Off	Operating normally
		Flashing 0.5 sec. on/0.5 sec. off	Fault present
		Flashing 1 sec. on/3 sec. off	Loads exceed available power

The EI Battery

An EI system may include one, two, or four battery enclosures. This section includes:

- Box Contents
- Enclosure Overview
- Place and Prepare
- Connect to the Inverter
- Add Batteries

For detailed specifications, download the EI Battery data sheet from the tigoenergy.com Downloads page.

Some of the connections described in this section may duplicate instructions included in other component sections in this manual.

CAUTION!
Review the IMPORTANT SAFETY INFORMATION section of this manual before installing the battery.

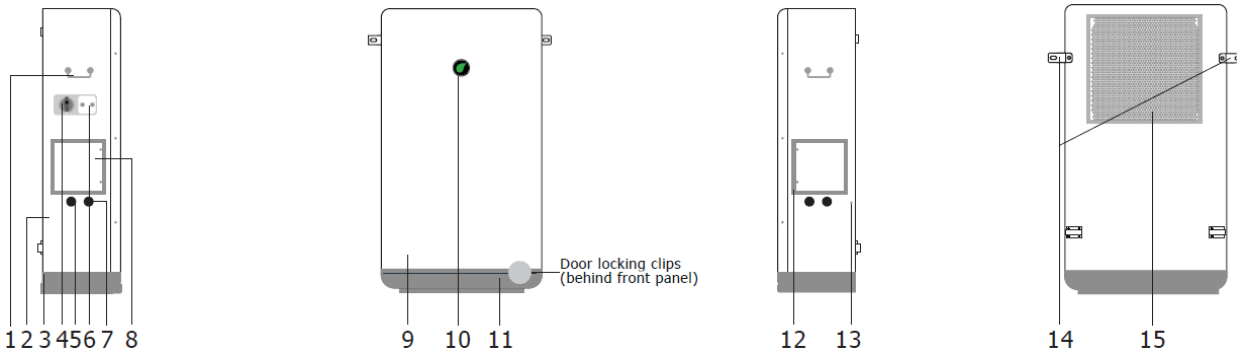
Box Contents

The EI Battery box includes:

- Battery enclosure
- Quick Start Guide
- Security screws (6)
- Sleeve anchors (2)
- Wire ferrules (4)

Battery modules are packaged separately and include two RJ45 terminators. One loose cable is included within the battery enclosure.

Enclosure Overview



1 – Handle
2 – Battery enclosure
3 – Base
4 – Disconnect switch
5 – DC knockout
6 – Power button
7 – Communications knockout
8 – Inverter connection wirebox

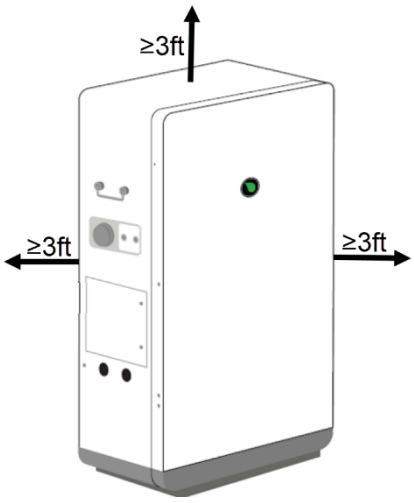
9 – Front cover
10 – LED status indicator
11 – Base front cover

12 – Battery expansion wirebox
13 – GEC/bonding terminal
14 – Mounting tabs
15 – Heat sink

Place and Prepare

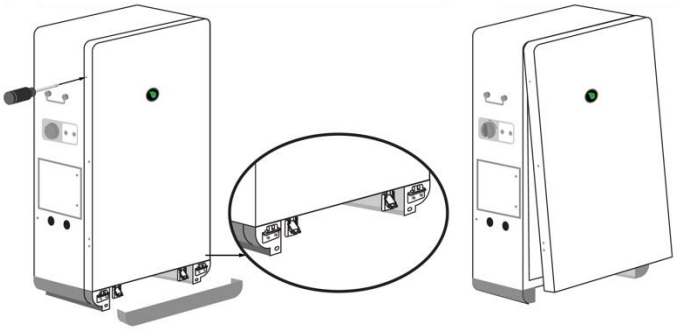
To place and prepare a battery:

1. Choose a location with:
    - A level floor.
    - A plumb wall.
    - Minimum 914 mm (3 ft.) clearance side-to-side and top.
    - No direct sun or precipitation.

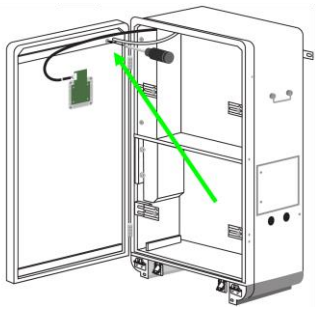


2. If mounting against a wall, affix the two side tabs.

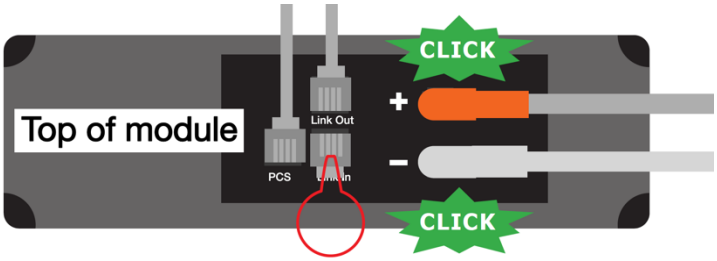
3. Remove the front panel screws and two locking clips behind the base cover and open the enclosure.



4. Detach the display and ground cables.



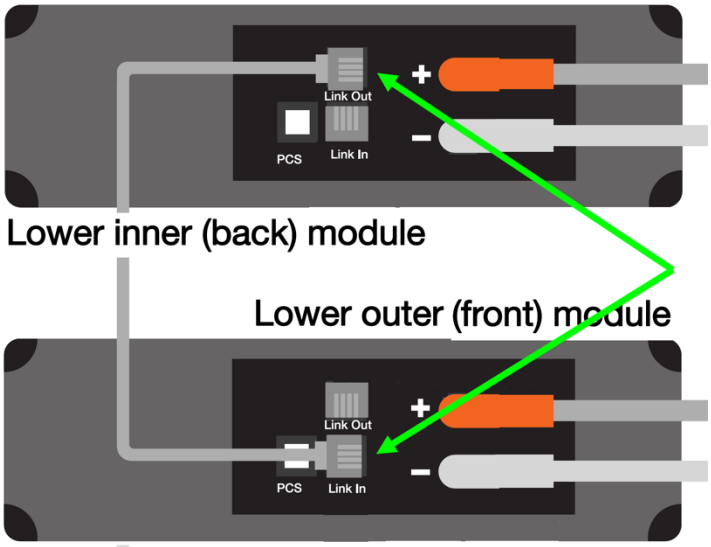
5. Place one battery module in the upper section and two modules in the lower section with the power terminals on the right side.
6. Secure the modules with the brackets attached to the enclosure.
7. In the upper section, connect the cables labeled *PCS*, *Upper bat Link-Out, Upper bat+* (red), and *Upper BAT–* (black) to their respective terminals.



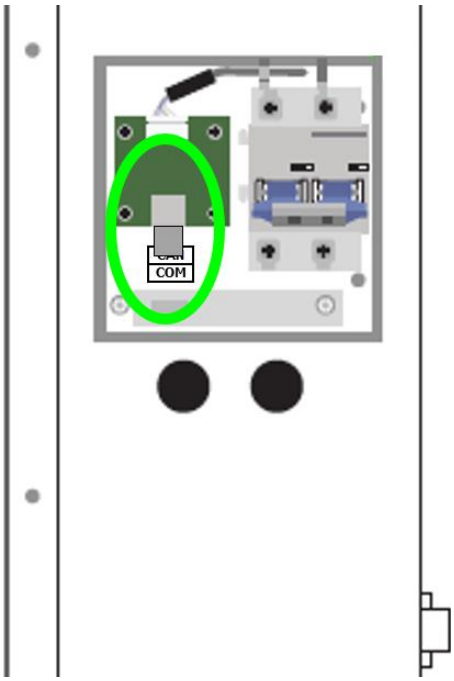
8. Insert an RJ45 terminator in the *Link In* terminal.

   The accessory bag in the battery module package includes two terminators.

9. In the lower section, connect the loose *Lower inner bat Link-Out* cable to the inner (back) module *Link Out* terminal and the outer (front) module *Link In* terminal.



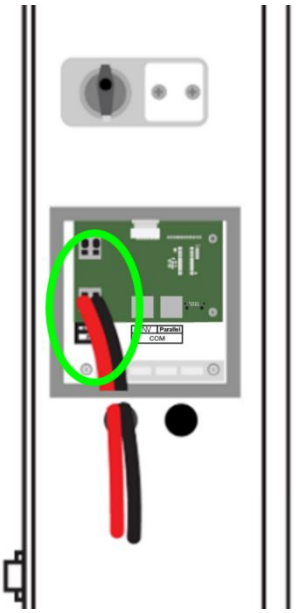
10. Connect the other cables according to their labels.
11. Insert an RJ45 terminator in the *CAN/COM* port located in the battery expansion wirebox on the enclosure right side.



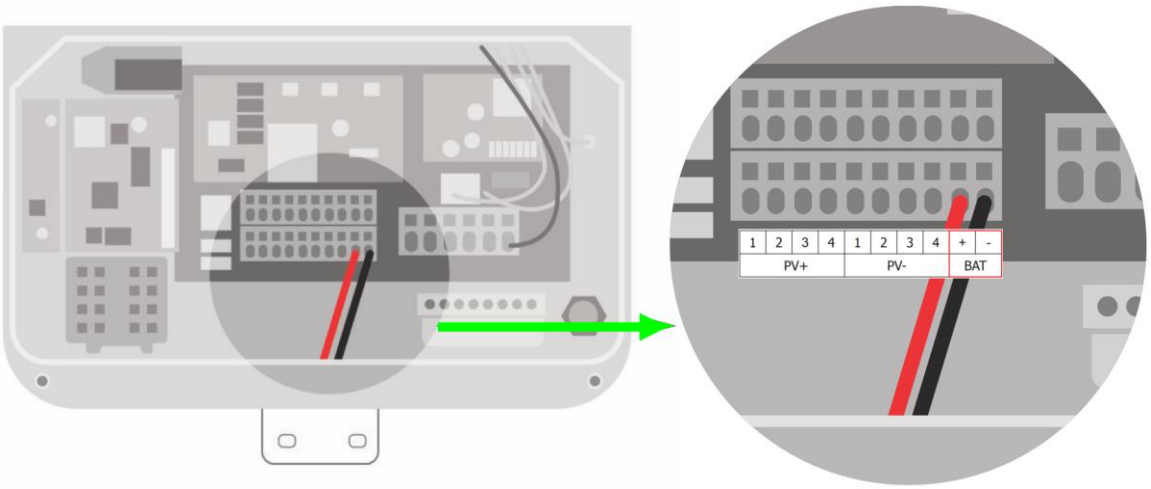
Connect to the Inverter

To connect battery power conductors to the inverter:

1. In the inverter connection wirebox on the enclosure left side, connect two ≤2m/6’7in conductors to the *BAT+* and *BAT–* terminals.

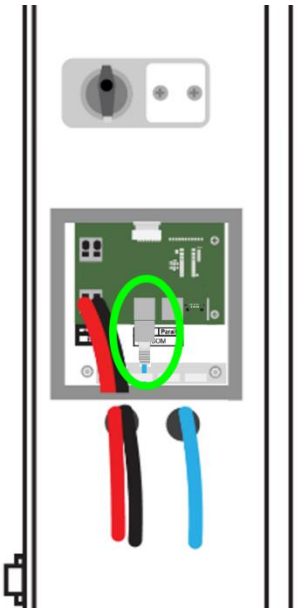


2. Connect the conductors to the inverter *BAT+* and *BAT–* terminals.

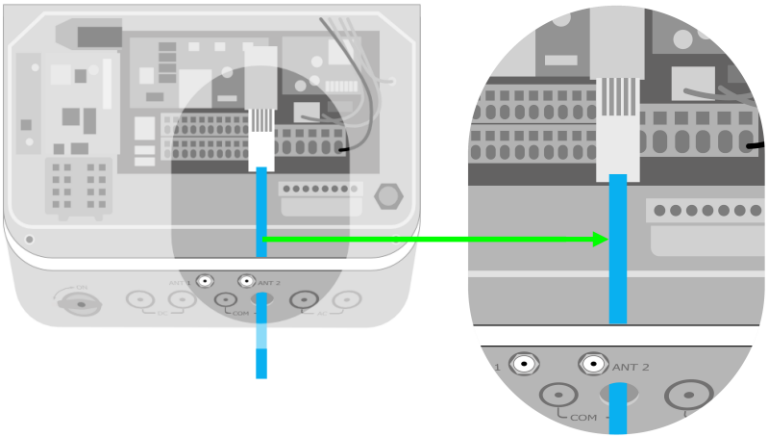


To connect the battery COM cable to the inverter:

1. In the battery inverter connection wirebox, plug the COM cable into the *COM INV* port.



2. Plug the cable into the inverter battery *COM* port.



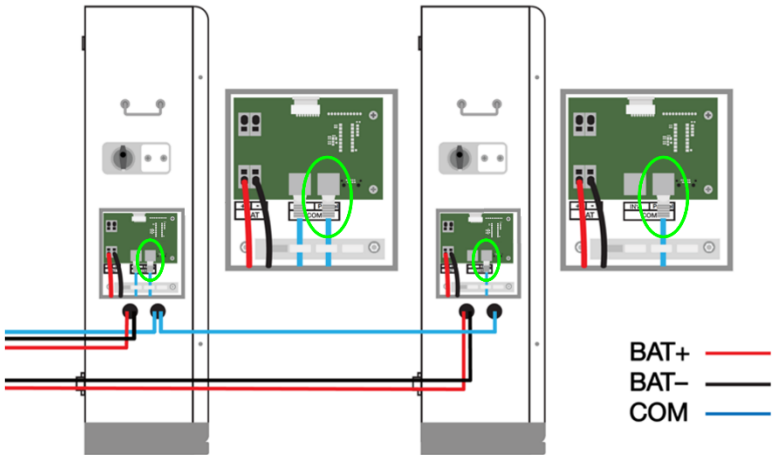
Add Batteries

You may add:

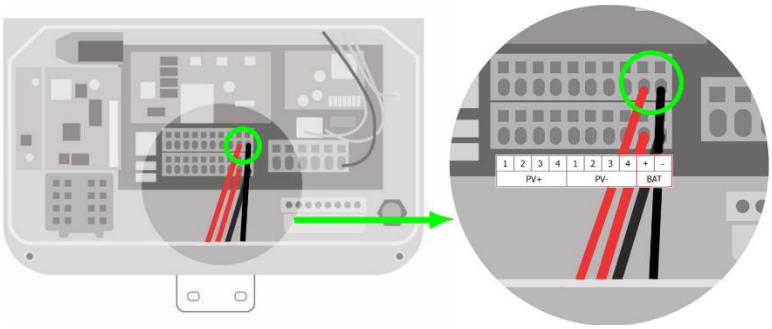
- One or three more batteries using a parallel connection.
- One battery using a serial connection (legacy installations only).

To add one battery in parallel:

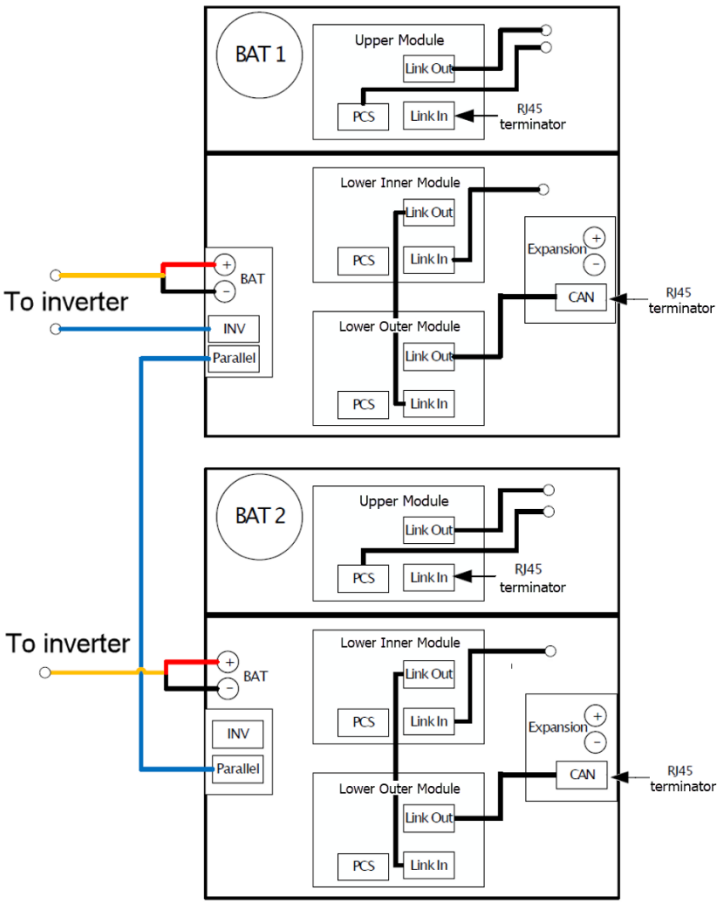
1. In the battery expansion wireboxes, connect an RJ45 (CAT5/6 T586B) cable from the battery #1 *COM Parallel* plug to the battery #2 *COM Parallel* plug.



2. Connect two ≤2.5 m (93 in.) conductors between the battery #2 BAT+ and BAT– terminals and the inverter BAT terminals.

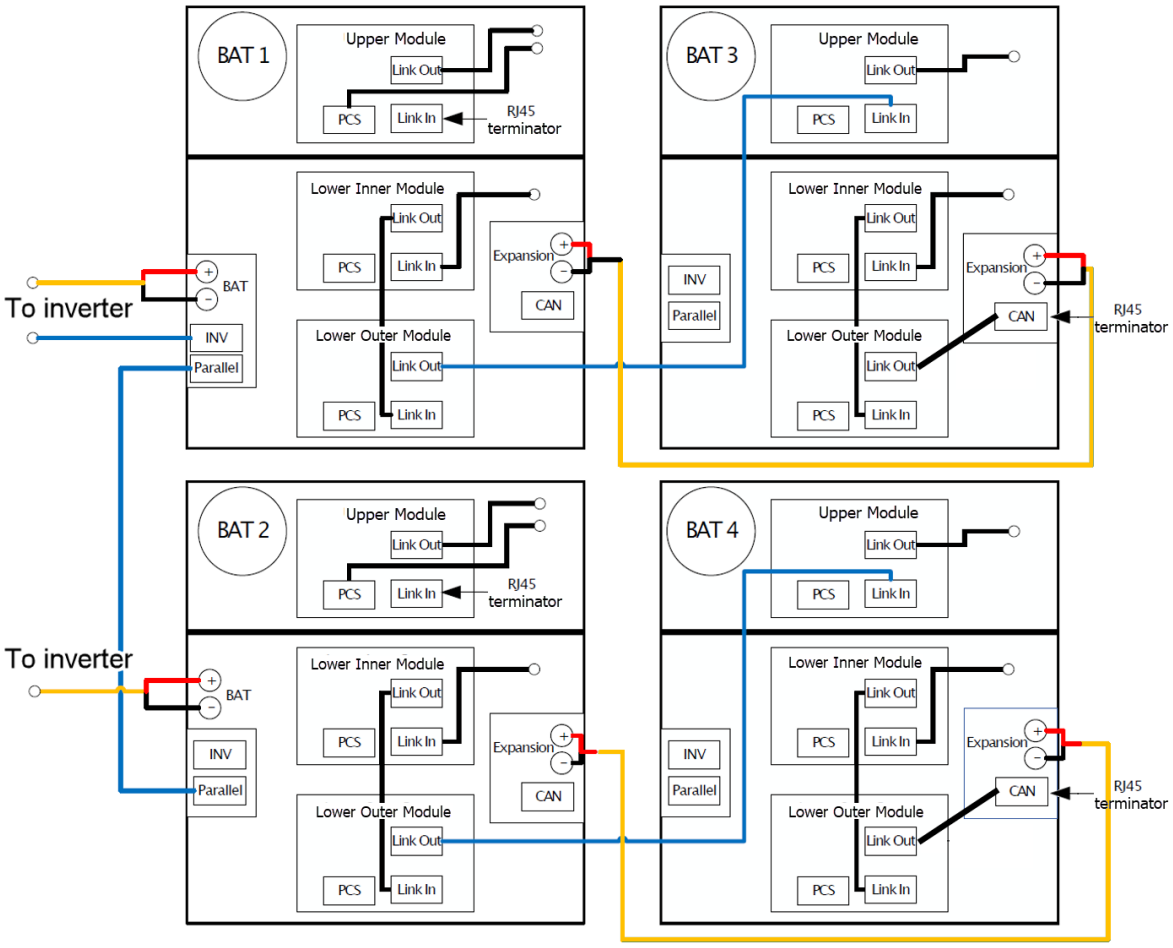


12. In the battery expansion wireboxes, connect a terminator to each CAN/COM terminal.



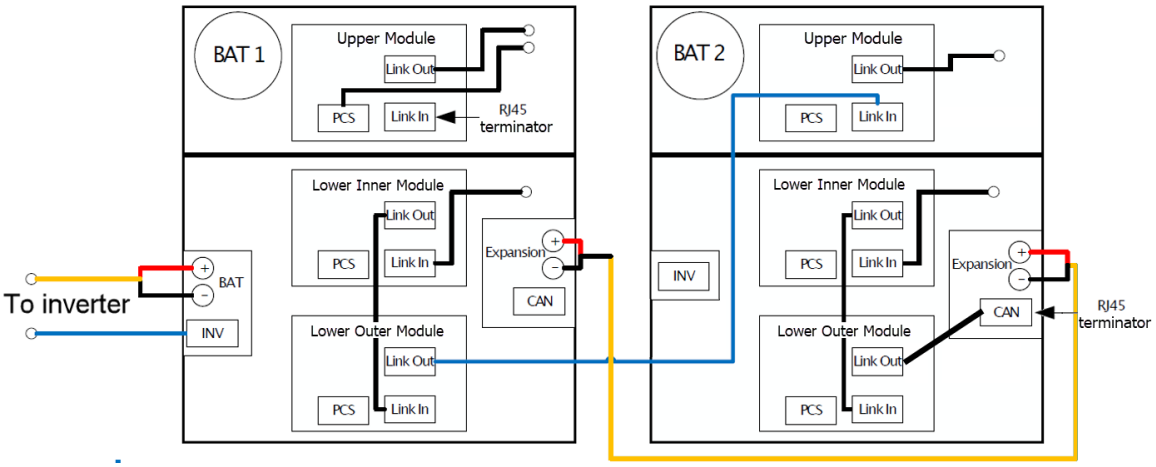
To add three batteries in parallel:

1. In the inverter connection wireboxes, connect a COM cable between the battery #1 and battery #2 *COM Parallel* RJ-45 ports.
2. Inside the battery enclosures, connect a COM cable from the battery #1 lower outer module *COM Link Out* plug to the battery #3 upper module *COM Link In* plug.
3. Inside the battery enclosures, connect a COM cable from the battery #2 lower outer module *COM Link Out* plug to the battery #4 upper module *COM Link In* plug.
4. In the battery expansion wireboxes, connect power conductors between the *BAT+* and *BAT–* terminals on batteries #1 and #3.
5. In the battery expansion wireboxes, connect power conductors between the *BAT+* and *BAT–* terminals on batteries #2 and #4.
6. In the battery expansion wireboxes, connect terminators to CAN/COM terminals on batteries #3 and #4.

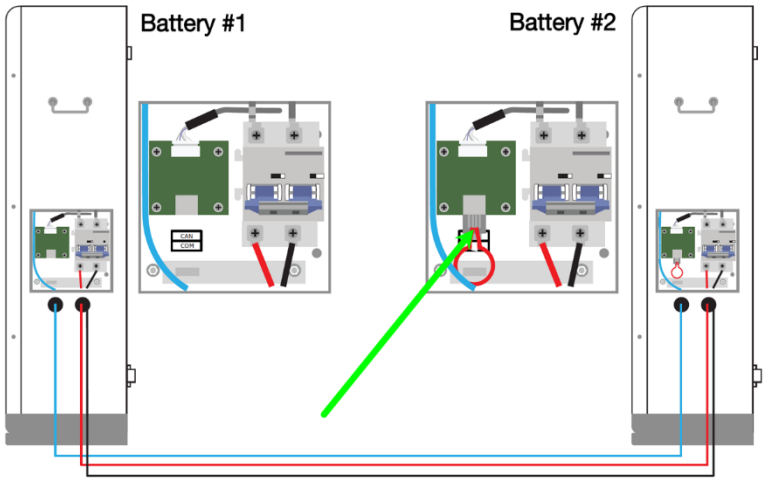


To add one battery with a serial connection (EI Battery part number 603-00000-***10*** only):

1. Inside the battery enclosures, connect a COM cable from the battery #1 lower outer module *COM Link Out* plug to the battery #2 upper module *COM Link In* plug.
2. In the battery expansion wireboxes, connect conductors between the *BAT+* and *BAT–* terminals on batteries #1 and #2.

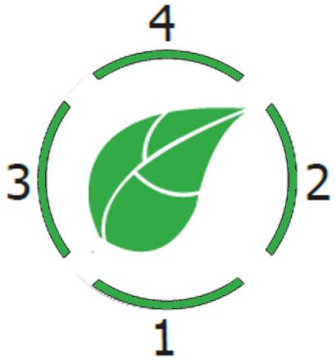


3. Insert a terminator in the battery #2 battery expansion wirebox CAN/COM terminal.



Status Indicators

The green leaf and encircling four bars indicate the battery operating condition.



The leaf indicates battery status:

Status	Leaf
Standby	Flashing green (0.5 sec. on/2s off)
Charging	Continuous green
Discharging	Continuous green
Alarm	Flashing green (0.5 sec. on/0.5 sec. off, 0.5 sec. on/2s off)
Fault	Flashing red (1 sec. on/1 sec. off)
Upgrade	Flashing yellow (1 sec. on/1 sec. off)
Forced power on	Flashing green (0.1 sec. on/0.1 sec. off)
Forced shutdown	Flashing red (0.1 sec. on/0.1 sec. off)

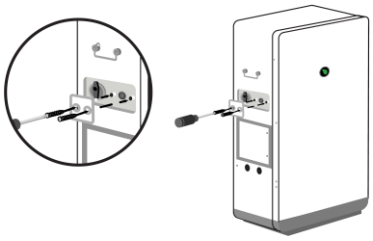
LEDs indicate battery charge:

Charging	Discharging
≤25% – 1 flashes; 2, 3, 4 off	≤25% – 1 on; 2, 3, 4 off
≤50% – 1 on, 2 flashes; 3, 4 off	≤50% – 1, 2 on; 3, 4 off
≤75% – 1, 2 on, 3 flashes; 4 off	≤75% – 1, 2, 3 on; 4 off
≥75% – 1, 2, 3 on; 4 flashes	≥75% – 1, 2, 3, 4 on

Forced Start/Shutdown

To force-start or shut down the battery:

1. On the left side of the battery enclosure, remove the power button cover.



2. To force-start the battery, press the power button for 10 sec.

   The leaf status indicator starts flashing green (0.1 sec. on/0.1 sec. off).

3. To force a shutdown, press the power button for 10 sec.

   The leaf status indicator starts flashing red (0.1 sec. on/0.1 sec. off).

4. Reinstall the cover.

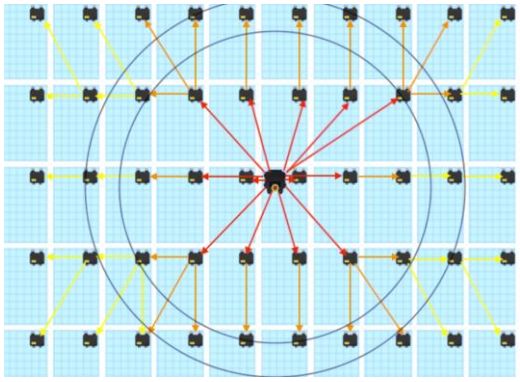
TAP and TS4 MLPE

Install the Tigo Access Point (TAP)

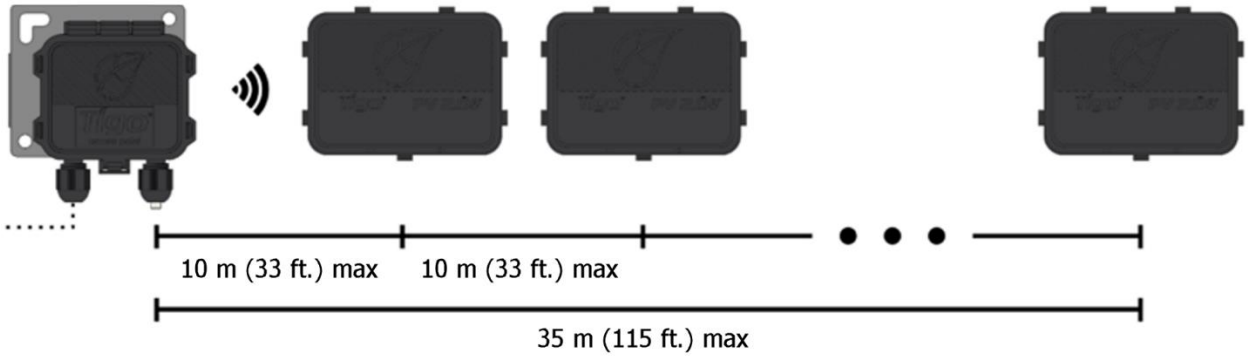
Installations equipped with TS4-A-O/S MLPE require a wired TAP connection to the inverter.

A TAP wirelessly communicates with TS4 devices to gather data and perform rapid shutdowns. The TAP connects to the link via a 4-wire or CAT5/6 cable.

Install the TAP centrally in an array for best coverage. Ensure there are no obstructions that may interfere with the TAP signal to other TS4 units in the array. If the array has multiple roof planes, you may need to install another TAP.

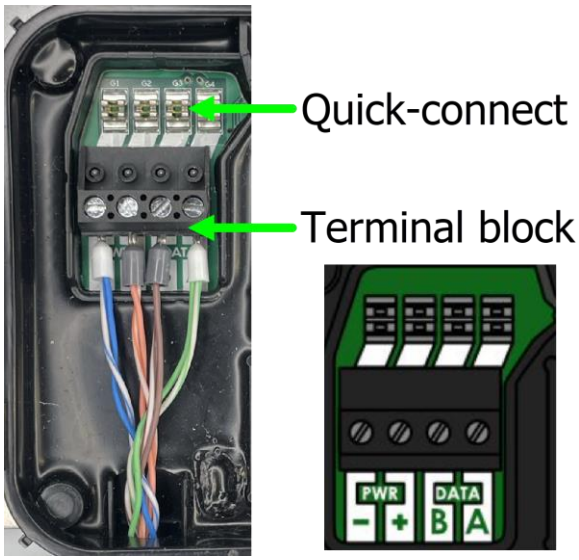


The TAP communicates directly with any TS4 within 10 m (33 ft.). Each TS4 can relay data to and from another TS4 within 10 m (33 ft.). The TAP can communicate through relays to any TS4s within 35 m (115 ft.).



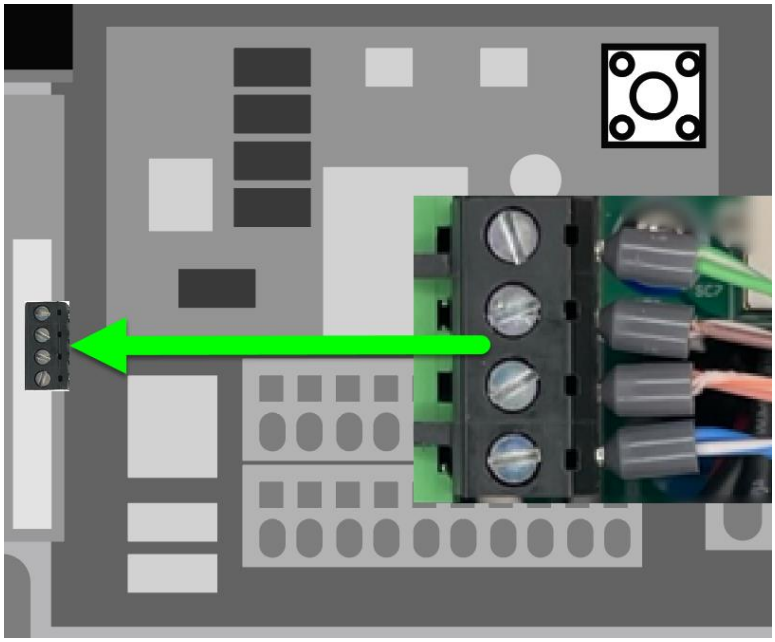
To install a TAP:

4. Prepare a 4-wire or CAT5/6 cable:
    - Shielded if running next to PV conductors
    - 20 – 18 AWG or CAT5/6 twisted pairs
    - Solid core
    - Cable outside diameter (OD) ⩽9mm (.35in)
5. Connect cable wires to the left side of the TAP using either the quick-connect (4-wire) or the terminal block (4-wire or CAT5/6 twisted pairs).



6. Use the right-side terminals to connect a cable to another TAP. If there is only one TAP, leave the terminating jumper in the right-side terminal block.
7. Attach the TAP to the PV module. For frameless modules, remove the silver clips and bolt directly to the rail.

8. Run the CAT5/6 cable through the inverter left COM knockout and connect to the 4-pin connector.



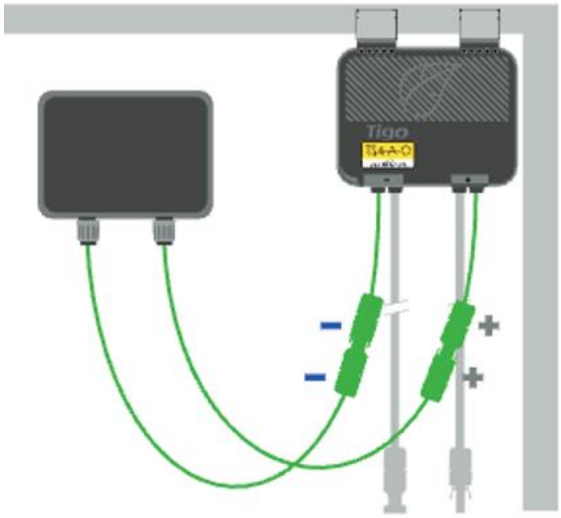
Install TS4 MLPE

To install TS4 devices and map them for the Tigo Energy Intelligence app:

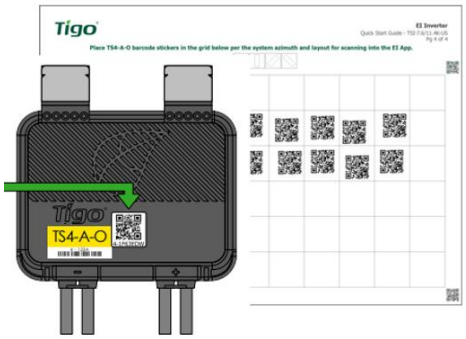
1. Attach a TS4 device to a PV module frame using the silver clips. If using frameless modules, remove the clips and bolt the TS4 directly to the PV rail with M8 bolts. No additional earthing is required.

If frame thickness ≤35 mm (1.4 in.), install the module with the TS4 label facing the PV module.

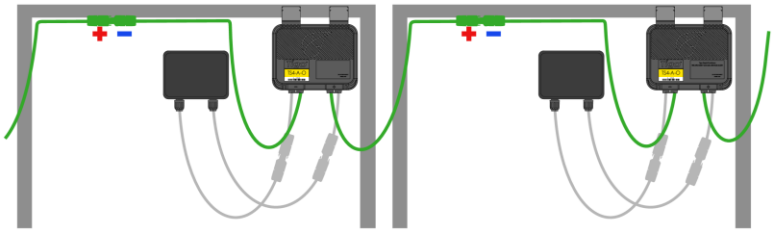
CAUTION!
You must connect the shorter TS4 input leads to the PV modules first. Failure to do so can damage the TS4 unit.



2. Remove the barcode sticker on the TS4 and place it on the PV array map located at the end of the EI Inverter Quick Start Guide or in a TS4 box. Ensure the sticker matches the physical location of the module on the roof.



3. Connect the longer set of TS4 output cables to the neighboring TS4 to create a string.



4. For installation data specific to your TS4 (TS4-A-O/S/M), visit the Tigo Downloads page:

Commissioning

Commissioning must be performed by a licensed electrician or other qualified person in accordance with the latest local and NEC code requirements.

To commission the system, you will:

- Check Connections
- Power On the System
- Run the Tigo Energy Intelligence App

Check Connections

Before powering on the system, ensure:

- PV and grid voltages are within specifications for your inverter model.
- A Wi-Fi connection is accessible.
- Power and communications connections are secure at the inverter, ATS, rapid shutdown switch, battery, and service and load panels.
- Module racks, metal conduit, and enclosures are properly grounded.
- Unused enclosure knockouts are sealed.

Power On the System

If the ATS is manually bypassed, restore automatic operations. Refer to the ATS Manual Bypass Switch section.

To power on the system:

1. Turn the two ATS breakers and the inverter and battery DC disconnects to ON.
2. Turn on disconnects/breakers between the grid and the ATS.
3. Ensure the rapid shutdown switch button is not engaged.
4. If the inverter does not start, force-start the battery by removing the start button cover and pressing until the green leaf status LED flashes rapidly.
5. Ensure Bluetooth is enabled on your mobile device, open the Tigo EI app, and tap + to create a new system.
6. Open *Select Equipment*, tap *Scan*, and select the EI inverter.

   If the inverter does not turn on, press and hold the battery power button for 10s. If the inverter status LEDs continue to flash red and it does not start, contact Tigo support.

Run the Tigo Energy Intelligence App

The Tigo EI app for Android and iOS mobile devices enables fast system commissioning and provides comprehensive visibility into system and module performance.

Scan one of these QR codes to download the app.

EI App – Android

EI App – iOS

To run the Tigo EI app and commission the system, first ensure Bluetooth is enabled on your mobile device.

Do not try to select your system using your mobile device's Bluetooth settings. The EI app will automatically connect to your system.

The EI app organizes the commissioning process into five steps:

- Set System Info
- Select Equipment
- Configure Layout
- Configure Communication
- System Access

The commissioning process will vary depending on your particular installation, and the following instructions may not completely address your needs. Visit the tigoenergy.com Help Center for more extensive instructions.

Set System Info

1. Open the app and log in (existing users) or enroll.

   If you enroll in a new account, respond to the email message sent to verify your email address.

2. Tap + to configure a new system.

3. Enter the system name and turn on date and tap *Next*.

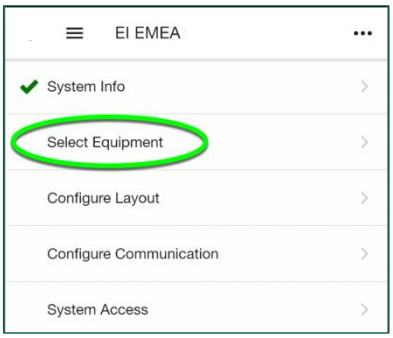
4. Confirm your location and tap *Create –>* to save the system information.

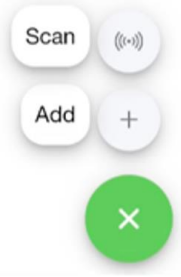
Select Equipment

1. Tap *Select Equipment*.
2. Tap *Scan* to let the app scan for EI components such as the inverter and battery.

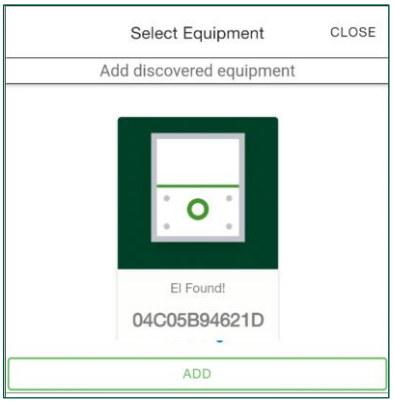
   Tap *Add* to configure components manually.

   The first component discovered is the EI Inverter or, in some cases, the Cloud Connect Advanced (CCA) component.

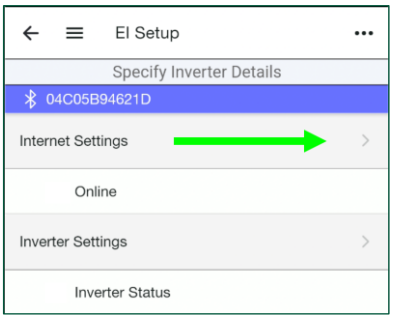




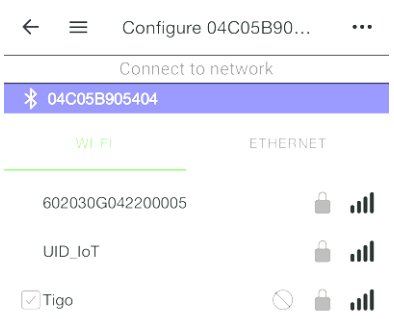
3. After a component is discovered or entered manually, tap *Add*.



4. Tap *Internet Settings* and connect to the customer's WiFi network.



5. Drag the screen down to refresh the list of networks.

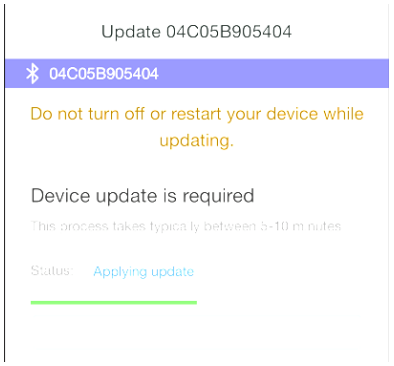


6. Perform updates as needed.
   As you progress through the commissioning process, symbols will show which areas need attention and which are complete:

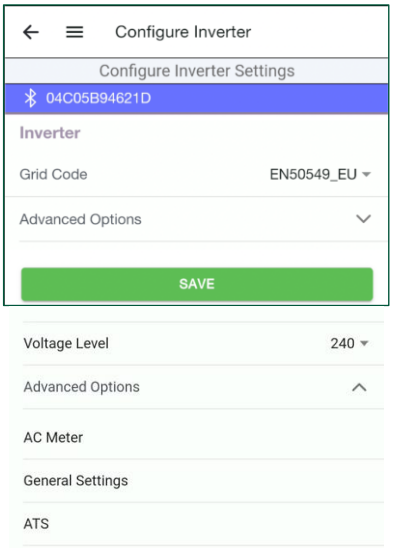
   ✔ – Section is complete and passes all checks.

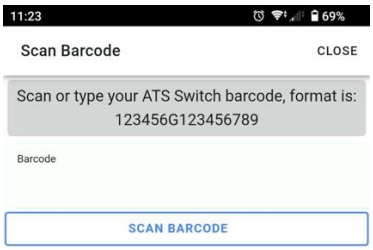
   ⚠ – Section has not been completed.

   ⚠ – A fault requires correction.



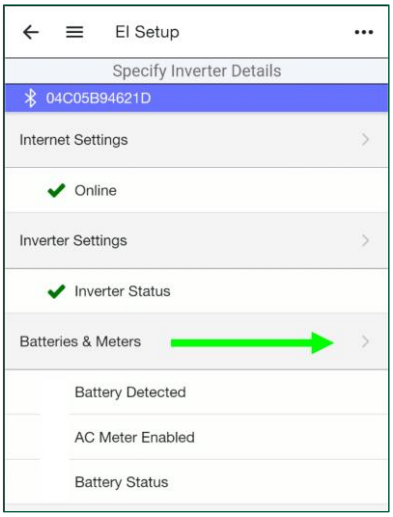
7. Tap Inverter Settings, select the *Grid Code*, configure *Advanced Options,* and tap *Save*.
8. In the Advanced Options, tap "ATS" if an ATS is installed. Skip this step if not.
9. Tap "+" to add an ATS and scan the serial number on the side of the ATS using your phone camera.
10. After adding the ATS, you can add a "Generator" if supported.





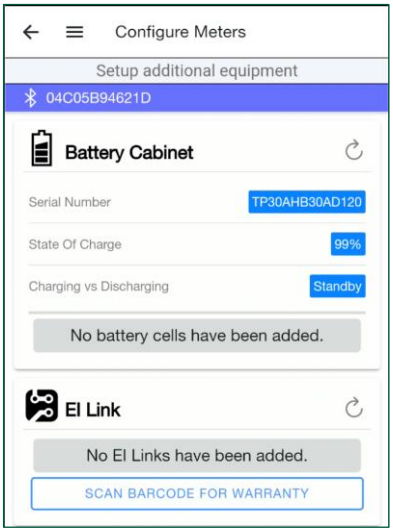
11. Configure *AC Meter, Battery Settings*, and *Main Breaker Limit* options as needed.

12. Tap and configure *Batteries & Meters* options.

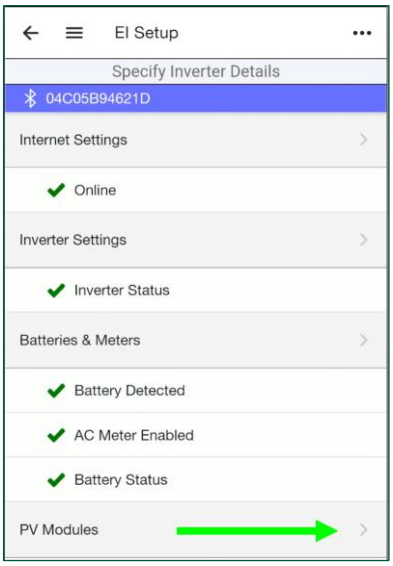


13. Tap *SCAN BARCODE FOR WARRANTY* and use your smartphone camera to capture all equipment bar codes.

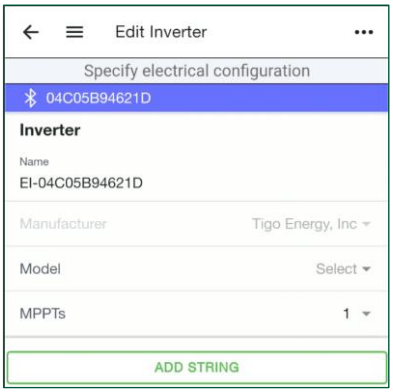
    You may scan bar codes located on enclosures or on boxes.



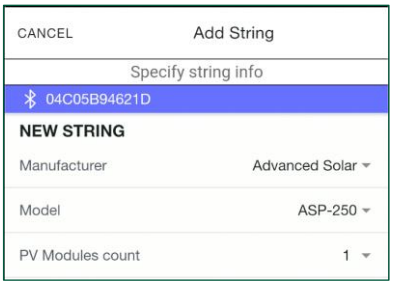
14. Tap the back arrow and tap *PV Modules* to set up the PV array and Tigo TS4 devices.



15. Edit inverter settings and tap *ADD STRING*.

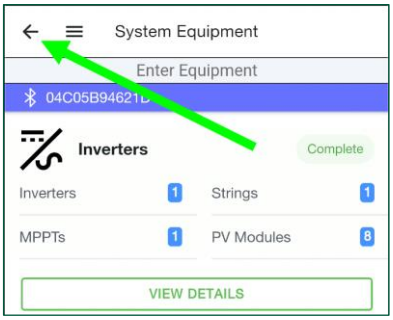


16. Select a *Manufacturer, Model*, and *PV* Modules count and tap *Save*.

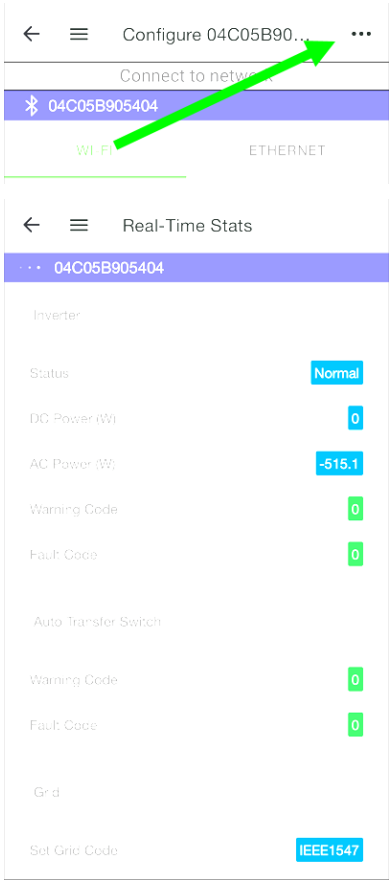


17. Repeat these steps for as many strings as needed and tap *Done*.

18. Review your entries and tap the back arrow.



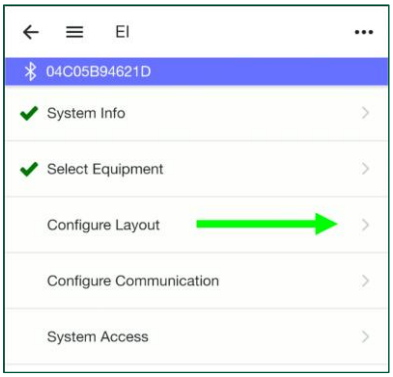
19. Check your system information at any time by tapping the three-dot icon and selecting *Real-Time Data*.



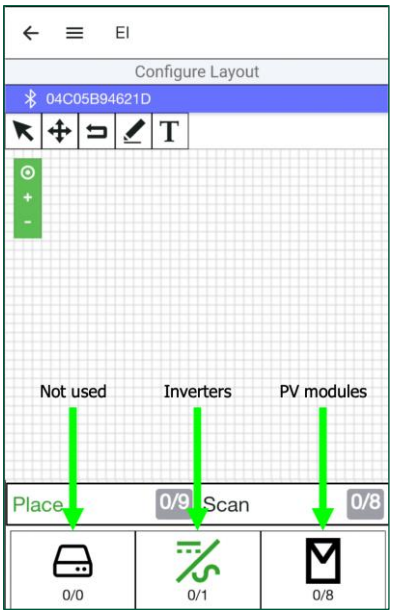
Configure Layout

1. Tap *Configure Layout* to map equipment items on a layout grid.

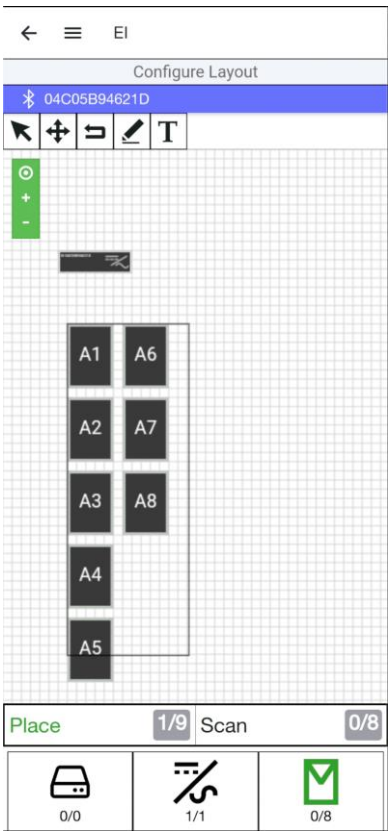
   You may also configure layout using a large monitor via the EI portal. Click Tigo EI Login at www.tigoenergy.com and use your EI app credentials. However, you can only complete commissioning using the mobile app.



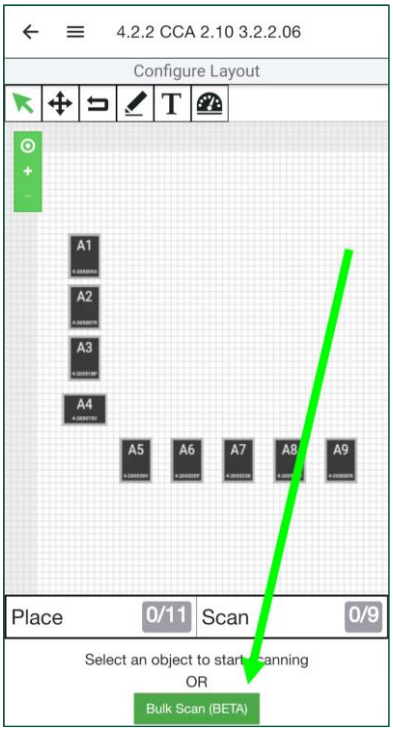
2. Tap the inverter icon at the bottom of the screen and then tap the location in the layout grid to place it.
    - The numbers below the equipment icons show the number of devices placed on the grid over the number detected.
    - Once placed, you may drag a device to adjust its location as needed.



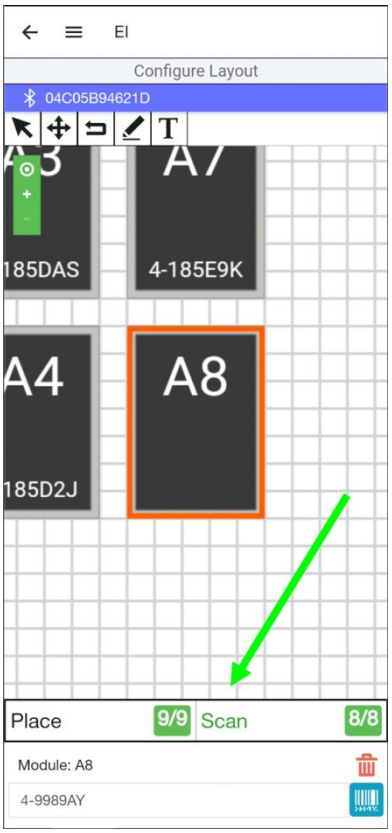
3. Drag the PV module icon to the layout grid to place multiple modules. Otherwise, tap the icon and then tap the grid to place them individually.
    - Arrange the modules carefully to reflect their actual layout on a roof or field. Tap a module to change its portrait/landscape orientation.



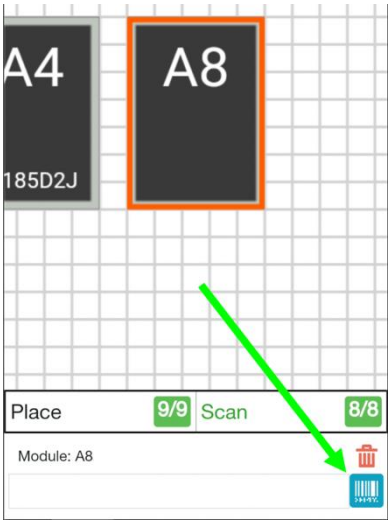
4. Choose a method to identify TS4 devices attached to PV modules.
    - If, during installation, you affixed barcode/QR code stickers from each TS4 to the array map included in the EI Inverter Quick Start Guide, you may use the Bulk Scan method.
    - You may scan each TS4 barcode/QR code with your smartphone.
    - You may enter codes manually.
5. To use the Bulk Scan method, tap *Bulk Scan* and take a photo of a completed TS4 array map.
    - If the array map is large and one photo does not successfully capture all labels, repeat the process to take several smaller photos of the map.



6. To scan TS4 labels individually, tap a PV module in the layout grid and then tap *Scan*.



7. To manually enter TS4 data, tap the module in the layout grid, tap the blue barcode icon, and enter the code.



8. Verify that all modules are oriented consistently – portrait or landscape. Tap a module repeatedly to alternate orientation.

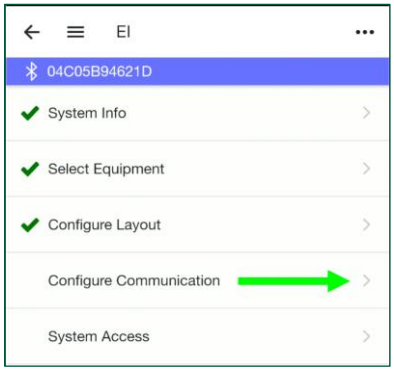
9. Tap the back arrow to return to the commissioning screen.

Configure Communication

1. Tap *Configure Communication*.

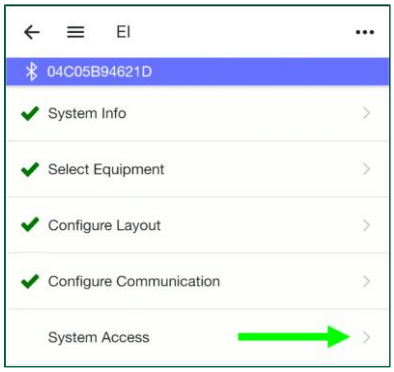
   Bluetooth communication has already been established and the WiFi option is not yet implemented.

2. Tap the back arrow to return to the commissioning screen.

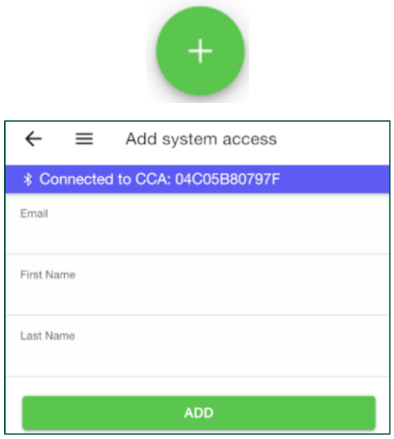


Set Up System Access

1. Tap *System Access* to set access permissions.



2. Tap the Add icon to enter data for whoever will be accessing the system such as the installer and system owner.



Reference

This section includes the following topics:

- Error Codes
- Decommissioning
- Maintenance
- Customer Support
- Specifications
- Warranty

Error Codes

To view error codes, open the EI app and navigate to the *Select Equipment > Inverters > View Details> Configure Inverter Details* screen and tap *Connect*.

CAUTION!
Shut down the system before checking PV module or system wiring.

If you are unable to resolve an error, visit the Tigo Help Center.

Inverter Warning Codes

Code #	Description	Suggestions
203	PV1 or PV2 circuit short	1. Check PV panel polarity. 2. Restart the inverter.
204	Disconnect function abnormal	1. Shut down the system. 2. Check disconnect wiring.
205	PV1 or PV2 boost broken	Restart the inverter.
207	USB over-current	1. Unplug the USB disk or monitor. 2. Re-access USB disk or monitor after shutdown.
401	Inverter to energy meter abnormal communication	1. Check if the meter is on. 2. Check the inverter and the meter connection is normal.
404	EEPROM abnormal	Restart the inverter.
405	The firmware version is not consistent	Update inverter to the latest firmware version.

Inverter Fault Codes

Code #	Description	Suggestions
402	Output high DCI	Restart the inverter.
404	Bus sample fault	Restart the inverter.
405	Relay fault	Restart the inverter.
408	Over temperature	Restart the inverter when the ambient temperature of the inverter is lower than 60 °C.
409	String voltage has exceeded 560V_{DC}	Restart the inverter.
411	DSP communicates M3 abnormal	1. Restart the inverter. 2. If the problem still exists, update the DSP and M3 firmware. 3. Change the DSP or M3 board.
417	The data sampled by the DSP and redundant M3 are not the same.	Restart the inverter.
420	GFCI fault	Restart the inverter.

ATS Warning Codes

Code #	Error	Possible Issues	Suggestions
608 （1）	Abnormal communication	• The communication cable between the inverter and the ATS is loose. • The communication lines of the inverter and the ATS are reversed. • The inverter software does not match the ATS software	• Check whether the software versions of the inverter and the ATS match. • After shutting down, check the communication wiring with the ATS.
608 （2）	The ATS grid relay is faulty	The grid relay signal line of the ATS is loose or faulty.	Check the ATS grid relay signal line and restart the system.
608 （3）	The ATS generator relay is faulty	The generator relay signal line of the ATS is loose or faulty.	Check the ATS generator relay signal line and restart the system.
608 （4）	System on-grid current overload	ATS off-grid split-phase load power exceeds the rated value.	• Check whether the split phase load exceeds the rated value. • Reduce split phase load.
608 （5）	Off-grid split-phase current overload of the system	The internal temperature of the ATS is too high.	Reduce split phase load.
608 （6）	Internal overheating of ATS	The fan signal cable of the ATS is loose.	Reduce the load and restart the system.
608 （7）	Fan failure of ATS	The fan of the ATS is damaged.	• Check the fan wiring after shutdown. • If necessary, replace the fan.

Code #	Error	Possible Issues	Suggestions
608（8）	Abnormal start of generator	Generator control signal wire is loose.	• Restart the system. • Check whether the generator has started. • Check the generator control signal line. • Check whether the generator voltage is normal.
610	Abnormal off-grid split-phase voltage	Generator input voltage is abnormal.	• Restart the system. • Check whether the software versions of the inverter and the ATS match. • Check whether the N line between the ATS and the inverter is connected. • Check whether the SYN transformer access relay is abnormal.
700	Abnormal fan activity	The fan or wiring is damaged.	• Shut down and check fan wiring. • If necessary, replace the fan.
701	Abnormal start of generator	Generator control signal wire is loose.	• Restart the system. • Check whether the generator has started. • Check the generator control signal line. • Check whether the generator voltage is normal.

ATS Fault Codes

Code #	Error	Possible Issues	Suggestions
610	Abnormal off-grid split-phase voltage	Generator input voltage is abnormal.	• Restart the system. • Check whether the software versions of the inverter and the ATS match. • Check whether the N line between the ATS and the inverter is connected. • Check whether the SYN transformer access relay is abnormal.
700	Inverter communication fault	Inverter and ATS communication is not normal.	Shut down and check communication.
701	Grid relay fault	The grid relay is malfunctioning.	Restart the ATS and inverter.
702	Generator relay fault	The generator relay is malfunctioning.	Restart the ATS and inverter.
703	Grid overload		Shut down and check load.
704	Split-phase load overload		Reduce split-phase load.
705	Over temperature	The ATS temperature is outside normal operating range.	Restart the ATS and inverter.

RECENT ATS FAULT CODES?

Code #	Fault	Description	Suggestions
608-1	Abnormal communication	• The communication cable between the inverter and the off-grid box is loose. • The communication lines of the inverter and the off-grid box are reversed. • The inverter software does not match the off-grid box software.	3. Check whether software versions of the inverter and the off-grid box match. 4. After shutting down, check the communication wiring with the off-grid box. 5. If the fault message still exists, contact the manufacturer.
608-2	The grid relay of the off-grid box is faulty.	The grid relay signal line of the off-grid box is loose.	6. Restart the system. 7. Check the off-grid box grid relay signal line.
608-3	The generator relay of the off-grid box is faulty.	The generator relay signal line of the off-grid box is loose	8. Restart the system. 9. Check the off-grid box generator relay signal line.
608-4	System on-grid current overload.	The L1-L2 load of the off-grid box exceeds the rated value.	10. Check whether the load exceeds the rated value. 11. Reduce the load.

Code #	Fault	Description	Suggestions
608-5	Off-grid split-phase current overload.	Off-grid box off-grid split-phase load power exceeds the rated value.	1. Check whether the split phase load exceeds the rated value. 2. Reduce split-phase load.
608-6	Internal overheating of off-grid box.	The internal temperature of the off-grid box is too high.	1. Restart the system. 2. Reduce the load.
608-7	Fan failure of off-grid box.	The fan signal cable of the off-grid box is loose.	1. Check the fan wiring after shutdown. 2. Replace the fan.
608-8	Abnormal generator start.	The fan of the off-grid box is damaged.	1. Restart the system. 2. Check whether the generator has started. 3. Check the generator control signal line. 4. Check whether the generator voltage is normal.
610	Abnormal off-grid split-phase voltage.	• The inverter software does not match the off-grid box software. • The inverter detects that the voltage difference between L1-N and L2-N is too large when off-grid. • The N wire of the inverter and the N wire of the off-grid box are not connected.	1. Restart the system. 2. Check whether software versions of the inverter and the off-grid box match. 3. Check whether the N line between the off-grid box and the inverter is connected. 4. Check whether the SYN transformer access relay is abnormal. Check version matches.

System Fault Codes

Code #	Error Message	Description	Suggestions
201	Residual I high	Leakage current too high	Restart the inverter.
202	PV voltage high	The DC input voltage is exceeding the maximum tolerable value.	1. Disconnect the DC switch immediately. 2. Check the voltage of each PV string with a multimeter.
203	PV isolation low	Insulation problem	1. Check if the panel enclosure is grounded properly. 2. Check if the inverter is grounded properly. 3. Check if the DC breaker is wet. 4. Check the impedance of PV + and PV – between ground (>25KΩ or 550KΩ (VDE 0126)).
300	AC V out range	The utility grid voltage is out of permissible range.	1. Switch off the DC disconnect. 2. Check AC wiring especially the neutral and ground wires. 3. Verify grid voltage is within tolerances. 4. Restart the inverter.
302	No AC connection	No AC connection The inverter does not detect grid voltage.	1. Check AC wiring connections. 2. Check the status of the AC breaker.
303	PE abnormal	Neutral and PE voltages exceed 30V.	1. Check neutral and PE voltages. 2. Check AC wiring. 3. Restart the inverter.
304	AC F out range	Utility grid frequency out of permissible range.	1. Switch off the DC disconnect. 2. Check AC wiring especially the neutral and ground wires. 3. Verify grid frequency is within allowable tolerance (59.3 to 60.8 Hz). 4. Restart the inverter.
407	Auto test failed	The EI Inverter initial auto test has failed.	1. Restart the inverter. 2. Repeat auto test. 3. Check all connections and wiring. 4. Check DC, AC, and battery voltage readings and if Grid selection in the app matches the actual Grid reading. 5. Check the firmware version and update if needed.
500	BMS COM fault	BMS not able to communicate properly with the inverter.	1. Check RS485 cable connection. 2. Check if the battery is sleeping.

Decommissioning

CAUTION!
Wait five minutes after complete system shutdown for enclosures to cool before disassembling the system.

To decommission the system:

1. Turn off the system by reversing the procedure listed in the Power On the System section.
2. Contact support@tigoenergy.com to deactivate the system in the Tigo database.

Follow these precautions with the battery modules:

- Pack modules in the original packaging or equivalent carton.
- Store modules in a dry location with ambient temperatures of -30 ºC to 50 ºC and relative humidity of 0 to 100% for up to three months.
- Do not store near flammable or toxic substances.
- Recycle or dispose of battery modules in compliance with local regulations.

Maintenance

Any operational problems or external damage must be evaluated by a qualified service technician. In addition:

- Clean surfaces with a damp cloth only. Never use solvents or abrasives.
- Maintain proper clearances around all enclosures to ensure proper air circulation.
- Check enclosures quarterly and remove any insects and rodent nests.

Specifications

Max. input current per MPPT(I_{MP}/I_{SC})	13.5 A/16.9 A

Download comprehensive specifications for all Tigo products from the Tigoenergy.com Downloads (www.tigoenergy.com/downloads) page.

Warranty

Download comprehensive warranty information from the Tigoenergy.com Downloads (www.tigoenergy.com/downloads) page.

Customer Support

The Tigo support team is available by:

- Chatting with a tech through the Tigo EI app.
- Submitting a ticket from the Tigo EI app.
- Submitting a ticket through the Tigo Help Center.
- Calling +1 408 402 0802.

Support hours are Monday – Friday, 7am – 6pm PST.

In addition, the Tigo Community web forum is an important 24/7 resource where solar technicians learn, share, and collaborate.

When you contact Tigo support for installation or operational assistance:

- If the system is commissioned and connected to the internet, Tigo will have component-level data to help understand and resolve the issue.
- If you have not yet commissioned the system, you'll need to know your System ID as well as serial and model numbers for the inverter, battery, and MLPE components relevant to your issue.

Support will need:

- A description and history of the problem.
- Any relevant error codes.
- A procedure for reproducing the problem, if possible.
- Grid and DC input voltage (for inverters).
- Ambient weather conditions.
- If module-level monitoring was not installed or was improperly mapped, you may be asked for the module manufacturer, model, wattage, V_{OC}, V_{MP}, I_{MP}, and the number of modules in each string.

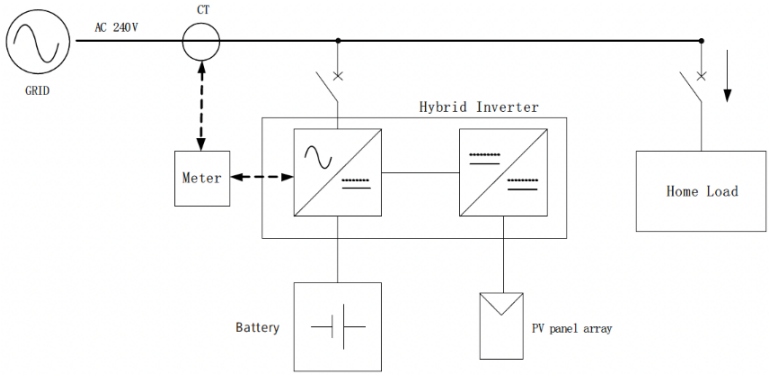
Appendix A – UL 1741 PCS CRD Section 208 Information

The major system elements making up the Tigo power control system (PCS) include:

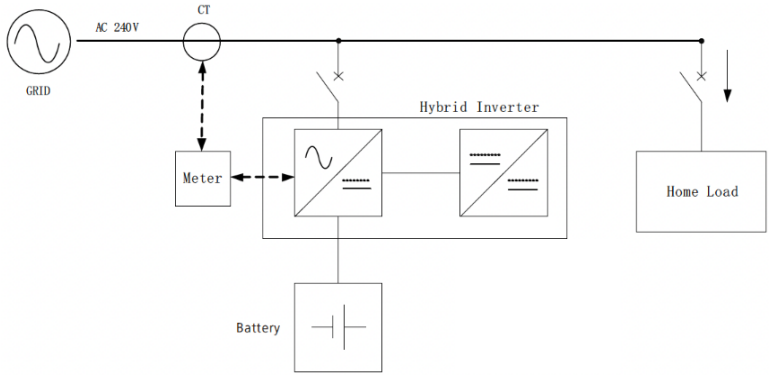
- A hybrid inverter: TSI-3.8K-US, TSI-7.6K-US, or TSI-11.4K-US
- A smart energy meter built into the inverter
- A GO Battery (one TGM-30 battery management system plus one-to-six TGB-5.0 battery modules)

Integrations

A DC-coupled integration is shown below:



An AC-coupled integration is shown below:

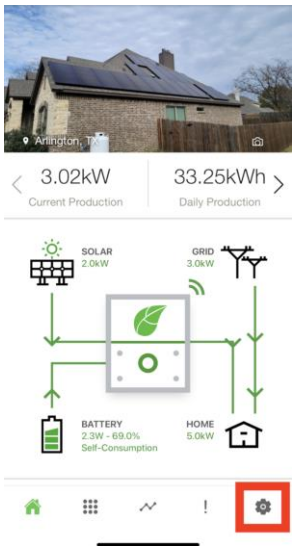


The Tigo PCS supports the following operational modes:

- Time of Use
- Self-Consumption
- Backup
- Zero Export

To set a mode and adjust settings:

1. Open the Tigo Energy Intelligence mobile app.



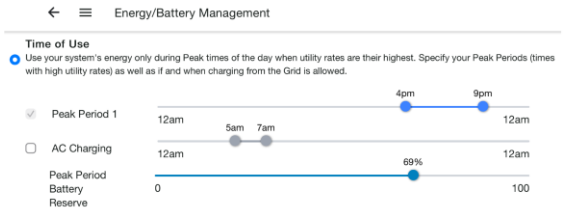
2. Tap the Settings icon.

Time of Use

This mode controls when the grid may be used to charge the battery.

To configure *Time of Use* settings:

1. Select *Energy/Battery Management > System Behavior > Time of Use*.



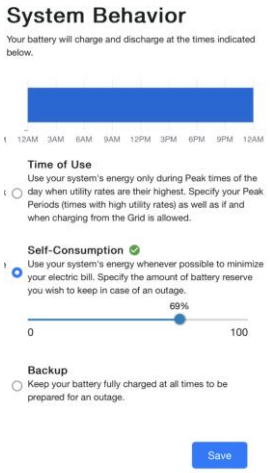
2. Adjust the sliders to set when utility rates are highest, when the battery can be charged from the grid, and a desired battery reserve during peak periods (how much energy to save in case of grid failure).

Self-Consumption

This mode controls the battery reserve to enable minimizing grid usage.

To configure *Self-Consumption* settings:

1. Select *Energy/Battery Management > System Behavior > Self-Consumption*.



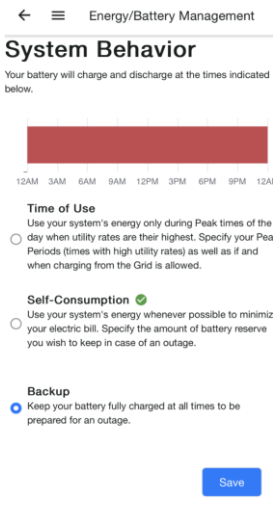
2. Adjust the slider to set a desired battery reserve (how much energy to save in case of grid failure).

Backup

This mode controls the battery reserve to enable maximizing backup energy in case of an outage.

To configure *Backup* settings:

1. Select *Energy/Battery Management > System Behavior > Backup*.



2. Tap the *Backup* control.

Zero Export

This inverter setting enables or disables sending energy to the grid.

To configure *Zero Export* settings:

1. Select *Edit System > Select Equipment > Inverter > View Details > Connect > Inverter Settings > Grid Code > Advanced Options > AC Meter*.

2. Toggle off the *Export Power Allowed* setting.

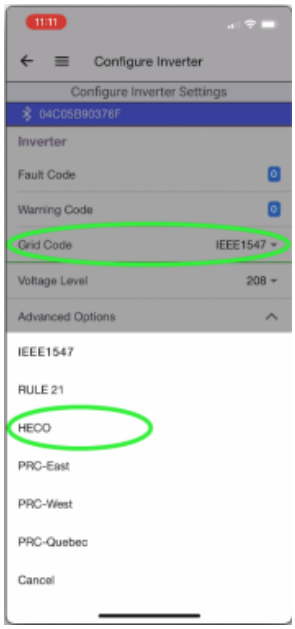
Appendix B – Configuring HECO Requirements

The Hawaiian Electric Company's (HECO) tariff Rule No. 14 Section H concerns the interconnection of distributed generating facilities operating in parallel with the company's electric system.

To configure the inverter for HECO requirements, you must set voltage levels and disable sending energy to the grid with the *Zero Export* setting.

To set voltage levels:

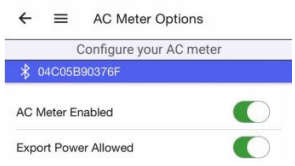
1. Open the Tigo Energy Intelligence mobile app.
2. Select *Settings > Edit System > Select Equipment > Inverter > View Details > Connect > Inverter Settings > Grid Code > Advanced Options > HECO*.



3. Select *Advanced Options > Voltage Level* and set appropriate levels.

To configure *Zero Export* settings:

1. Open the Tigo Energy Intelligence mobile app.
2. Select *Settings > Edit System > Select Equipment > Inverter > View Details > Connect > Inverter Settings > Grid Code > Advanced Options > AC Meter*.

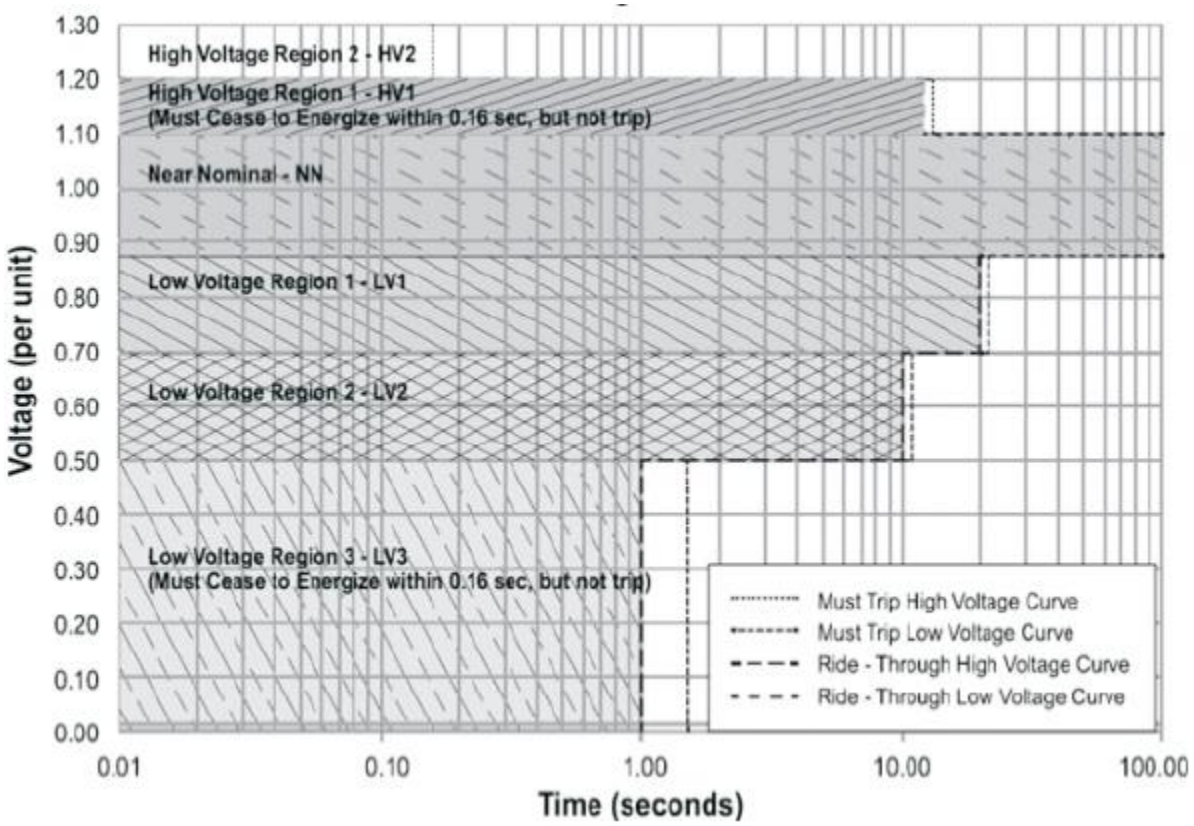


3. Toggle off the *Export Power Allowed* setting.

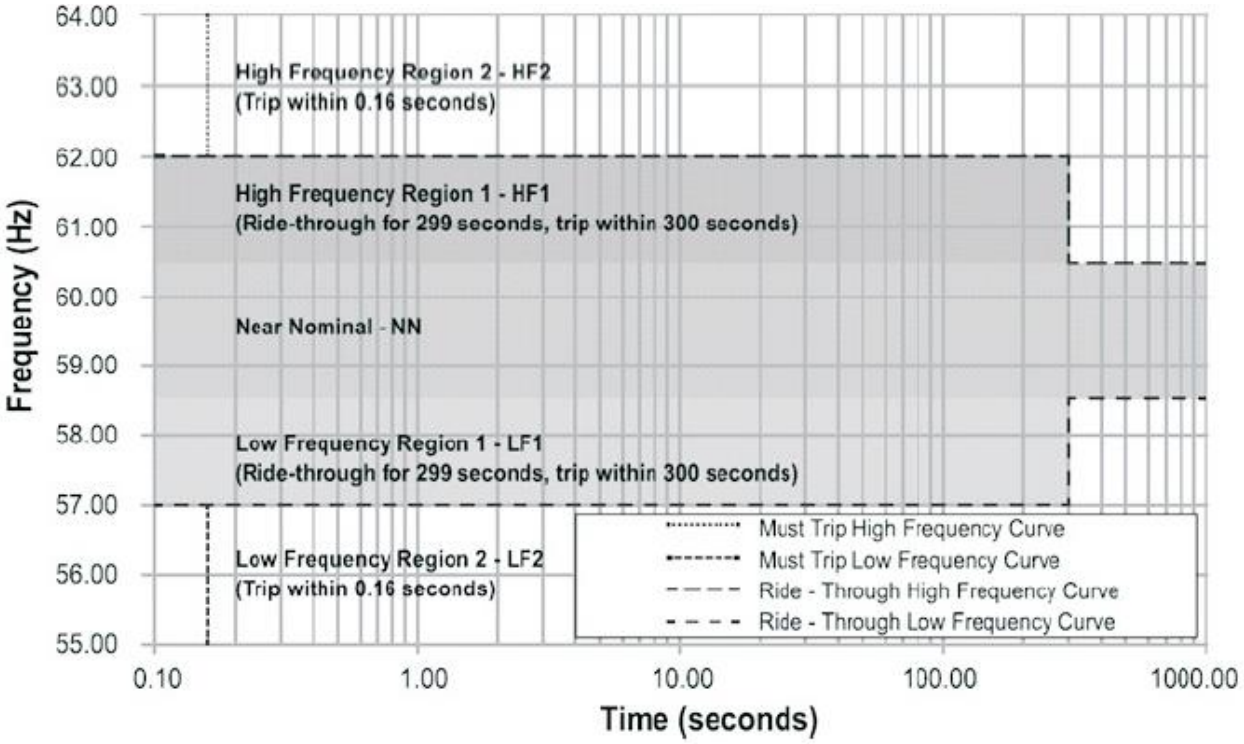
Appendix C – Rule 21 Parameter Settings

The EI Inverter includes a preset grid code for California Rule 21 (R21) settings. The following section describes the default settings required for Rule 21 compliance.

Voltage Ride-Through



	Voltage (% of nominal)	**Trip Time**	**Mode**
High voltage 2	V ≥120	160 msec.	N/A
High voltage 1	110 <V <120	13 sec.	Momentary cessation
Near nominal	88 ≤V ≤110	N/A	Continuous operation
Low voltage 1	70 ≤V <88	21 sec.	Mandatory operation
Low voltage 2	50 ≤V <70	11 sec.	Mandatory operation
Low voltage 3	V <50	1.5 sec.	Momentary cessation



	R21 Setting (Hz)	Adjustable Max/Min	Trip time	Mode
High frequency 2	62.0	64/62	160 msec.	N/A
High frequency 1	60.5	62/60.1	300 sec.	Mandatory operation
Low frequency 1	58.5	59.9/57	300 sec.	Mandatory operation
Low frequency 2	57	57/53	160 msec.	N/A

Normal and Soft Start Ramp Rates

Ramp rate is the rate at which the inverter increases its energy production. Normal ramp rate (RR) is the ability to increase output during normal operation. Soft start (SS) is the increase in production when the inverter reconnects to the grid after the grid has lost power. The maximum output current per second is adjustable for both RR and SS per the chart below.

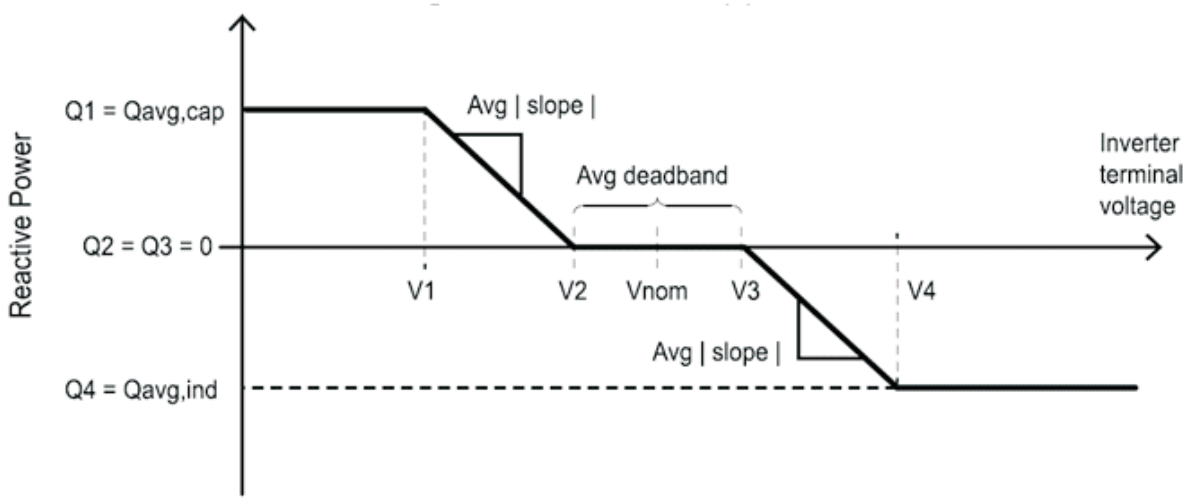
Power Output Increase Rate	Range of Adjustability	
	Minimum	Maximum
RR	1% I_{NOM}/s	100% I_{NOM}/s
SS		

Fixed Power Factor

Power Factor	Range of Adjustability		Default Setting
	Minimum	Maximum	
Inductive	0.85	1	1
Capacitive			

Dynamic Volt/VAR

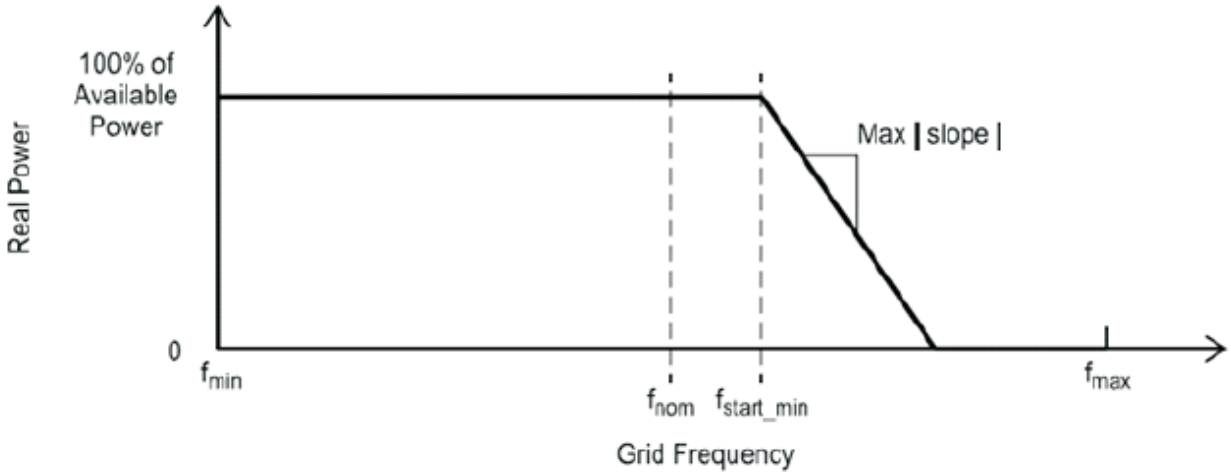
The EI Inverter can provide dynamic reactive power compensation per the table and graph below.



Volt-VAR Parameter	Default Value	Range of Adjustability	
		Minimum	Maximum
V2	0.92 V_{NOM}	0.90 V_{NOM}	1.05 V_{NOM}
Q2	0	0	60% of nameplate apparent power
V3	1.08 V_{NOM}	0.95 V_{NOM}	1.10 V_{NOM}
Q3	0	0	60% of nameplate apparent power
V1	0.90 V_{NOM}	0.80 V_{NOM}	1.03 V_{NOM}
Q1	48.4% of nameplate apparent power	0	60% of nameplate apparent power
V4	1.10 V_{NOM}	0.97 V_{NOM}	1.18 V_{NOM}
Q4	48.4% of nameplate apparent power	0	60% of nameplate apparent power

Frequency-Watt (FW)

The EI Inverter can reduce the real power production as a function of system frequency as detailed below.



Parameter	Range of Adjustability	Default Setting
Overfrequency	60.017 – 61 Hz	60.036 Hz
K of ([Pn/(60*K of %)]/Hz	2 – 7	5
Response time	50 msec. – 3 sec.	60 msec.

Voltage-Watt (VW)

The EI Inverter can reduce the real power production as a function of measured voltage, as detailed below.

Volt-Watt Parameter	Default Value	Adjustable Range	
		Minimum	Maximum
V1	1.06 V_{NOM}	1.03 V_{NOM}	1.10 V_{NOM}
P1	Pre-disturbance	N/A	N/A
V2	1.1 V_{NOM}	1.04 V_{NOM}	1.10 V_{NOM}
P2	P_{MIN}	P_{MIN}	P_{RATED}
Delay time	3 sec.	0.5 sec.	60 sec.