



# Energy Intelligence (EI) Residential Solar Solution

## EU Installation Manual



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## Document Revision History

Version	Date	Changes
1.0	n/a	Initial version
1.1	20230216	Corrected TAP wiring table and three-phase earthing.
1.2	20250418	Added Tigo ESS Operation Mode under Commissioning section page 42.
1.3	20251202	Added Dynamic Rate section under Commissioning on page 45.

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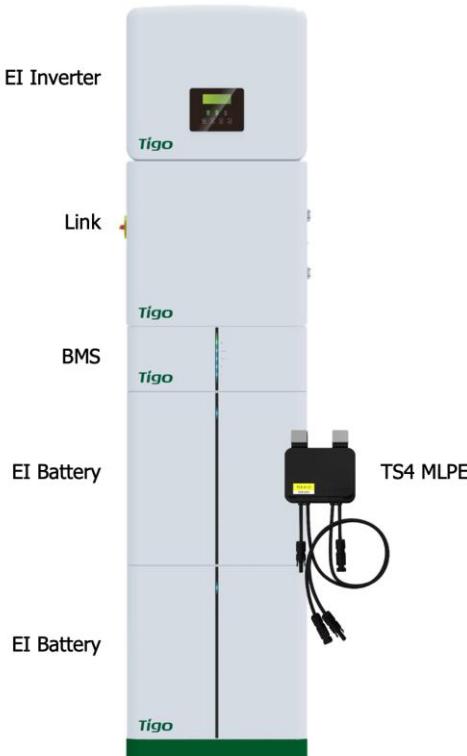
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## Overview

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

- **EI Inverter** – A single- or three-phase Tigo EI Inverter may be installed as grid tied only or as part of an energy storage system when paired with a Tigo EI Battery.
- **EI Link** – The inverter's link component provides a single connection location for communications and AC/DC wiring.
- **TS4 MLPE** – Tigo's module-level power electronic (MLPE) components optimize solar module performance and provide module-level monitoring and rapid safety shutdown. A Tigo Access Point (TAP) enables wireless communication with TS4 components with a wired connection to the inverter.
- **Battery management system (BMS)** – The BMS component provides protection, internal monitoring, and management electronics.
- **EI Battery** – Up to four lithium-iron-phosphate (LFP) EI batteries are designed for use specifically with the EI Inverter.

The **Tigo Energy Intelligence** Android/iOS mobile app enables easy system commissioning and provides comprehensive ongoing visibility into system and module performance.



## Safety

The EI system must be installed and maintained by qualified personnel in accordance with local electrical codes. In addition:

- Components must operate within the technical specifications listed in their [datasheets](#).
- Failure to follow instructions herein may cause equipment damage not covered by the warranty.
- Use only copper conductors rated 75°C or higher. Do not use fine-stranded conductors.
- Unused conduit openings must be properly sealed. Connected conduit must use appropriate fittings. Tigo EI product enclosures are rated IP65.
- Always wear appropriate PPE and use insulated tools.

These safety symbols appear in the manual:



A hazardous situation which could result in severe injury or loss of life.



A hazardous situation which could result in minor or moderate injury and damage to the product.



An important operational note.

These symbols 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.

## Pre-Installation

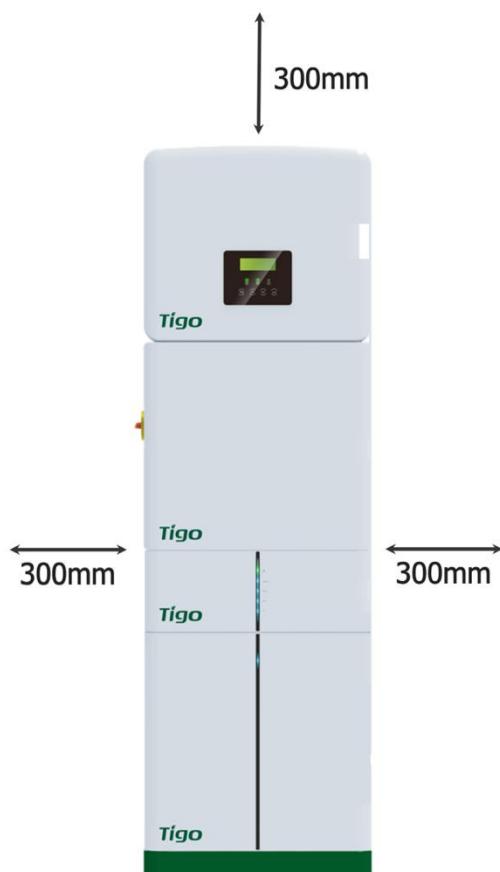
### Location

The default enclosure layout for an EI system is from the top down:

- Inverter
- Link
- Battery management system (BMS)
- Battery (one or two). Additional batteries may be placed to the right of the main cabinet.

Locate EI components:

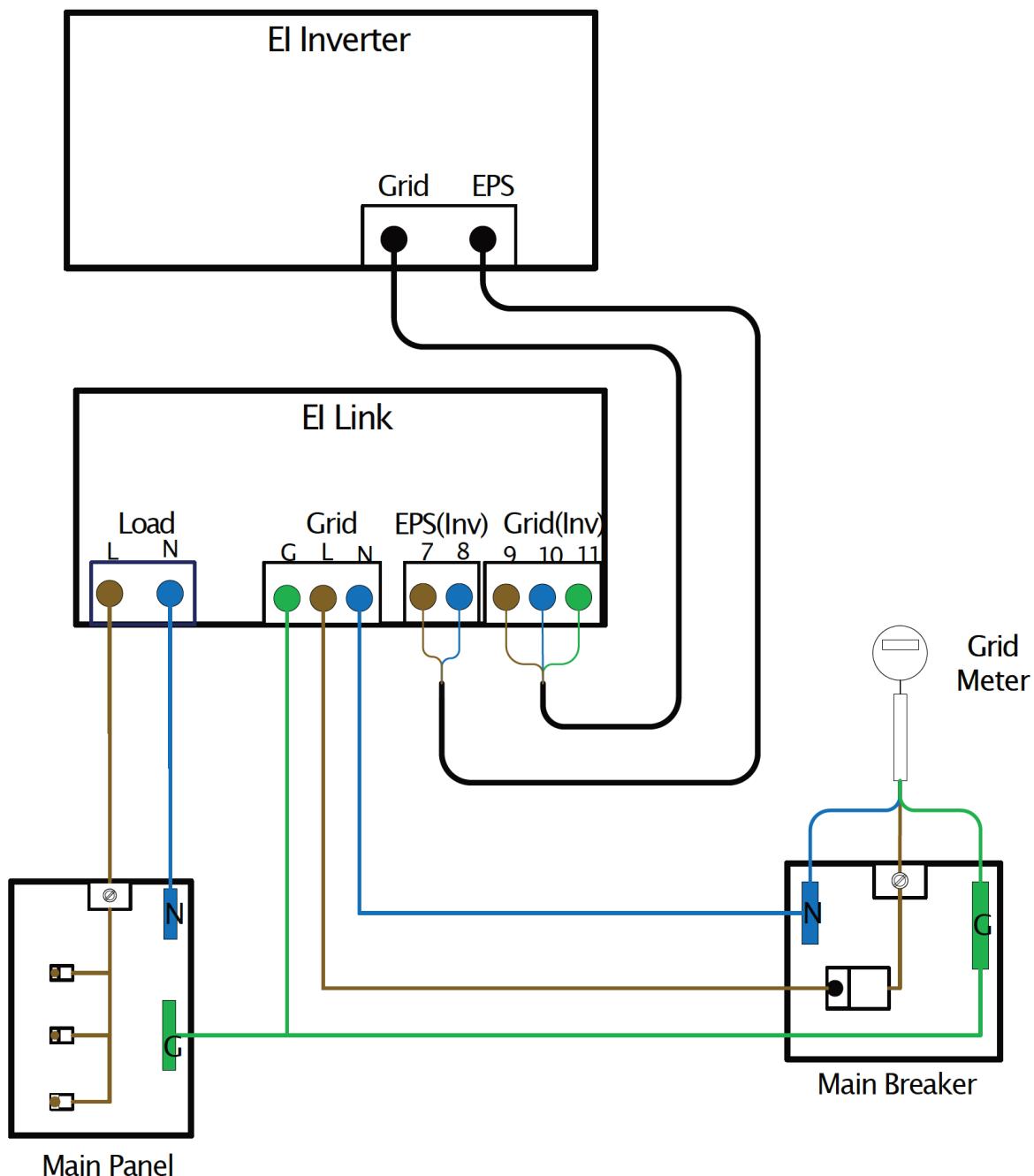
- In a well-ventilated, easily accessible location.
- On a flat surface against a solid wall without tilt.
- Sheltered from direct sunlight and precipitation. The ambient temperature should be below 50°C.
- Away from antennas or other sources of strong electromechanical interference.
- Above potential flooding.
- With a minimum 300mm clearance around the top and sides.

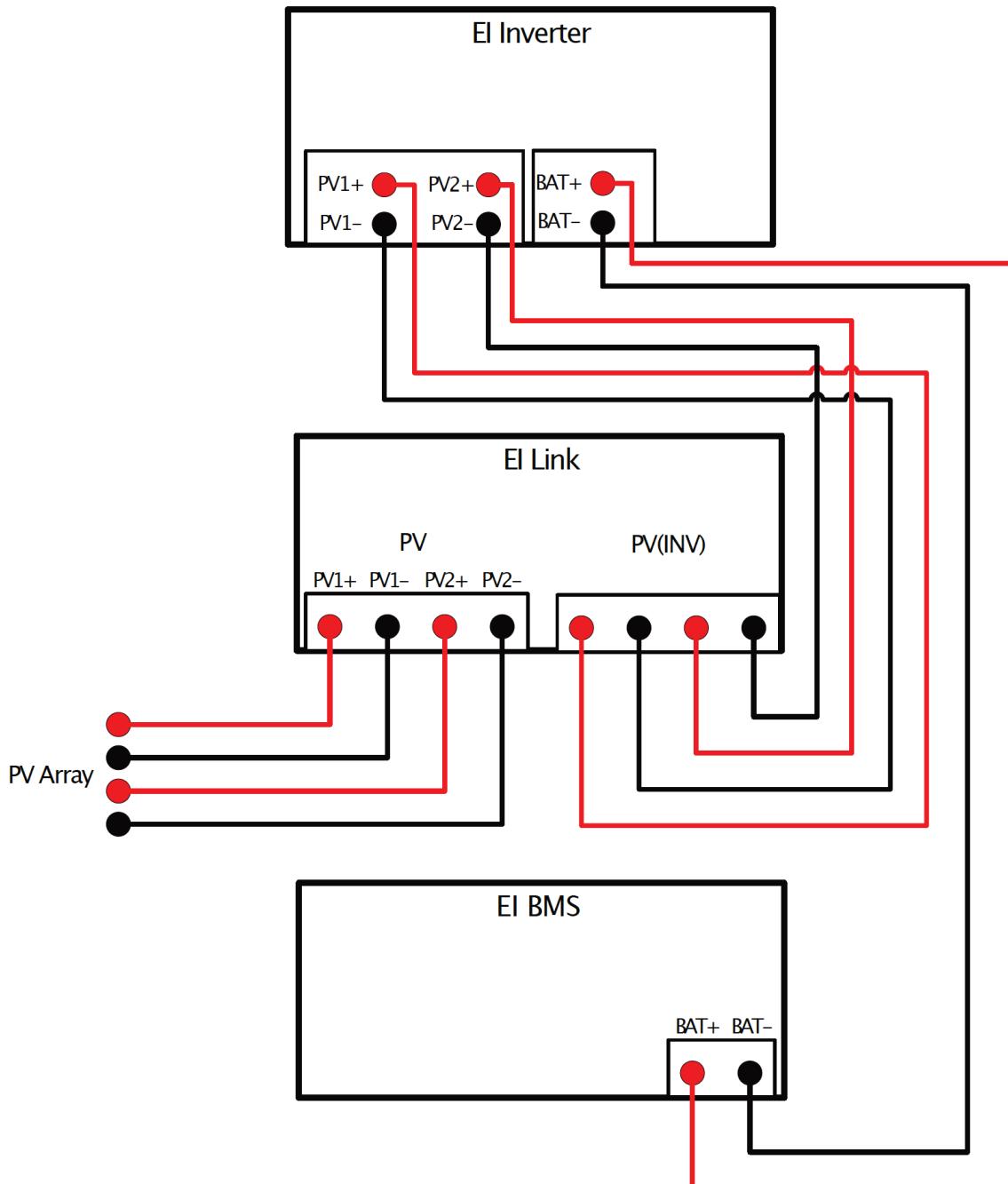


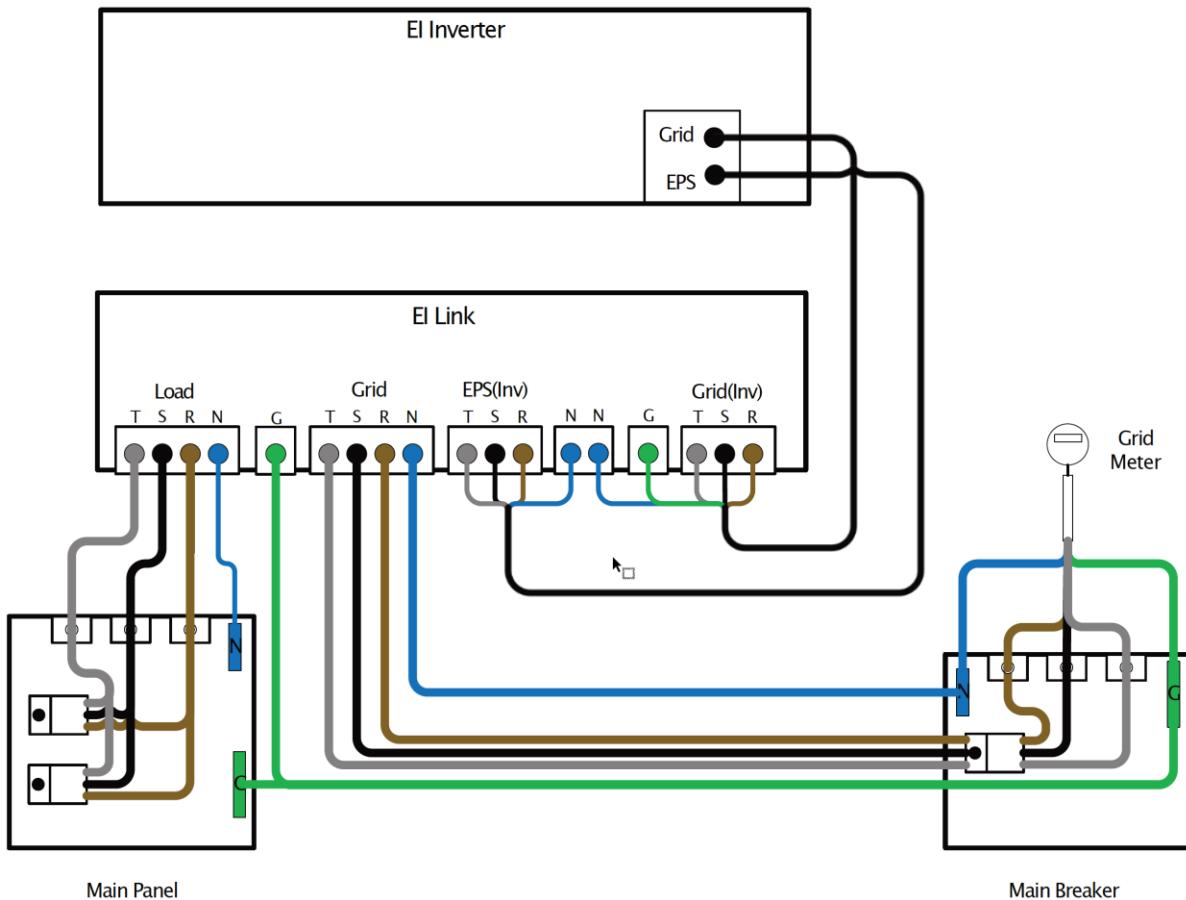
When installing multiple batteries, consider that expansion connections are on the right side of the main cabinet.

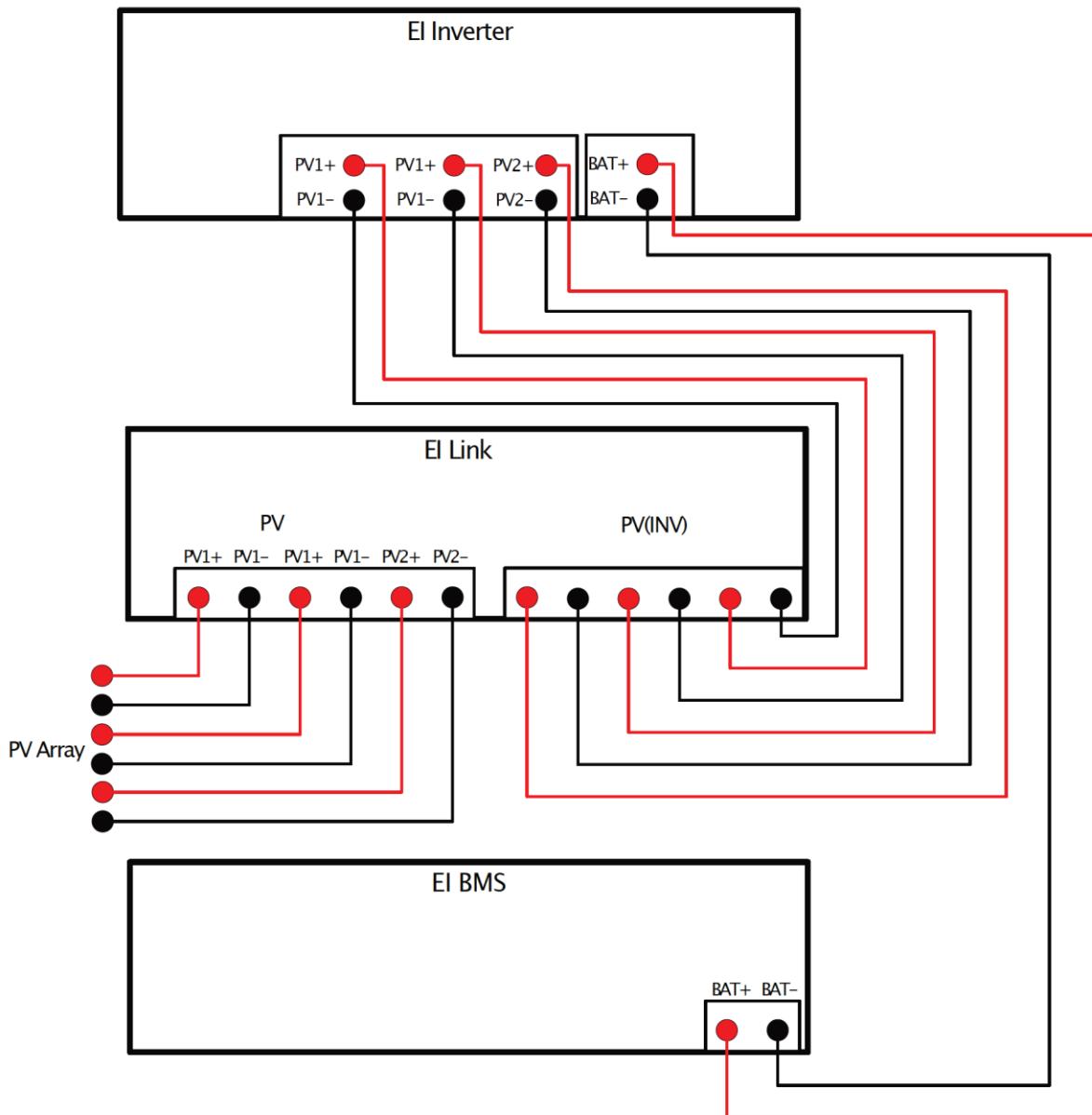
## Wiring Overview

### *Single-Phase AC Connections*



*Single-Phase DC Connections*

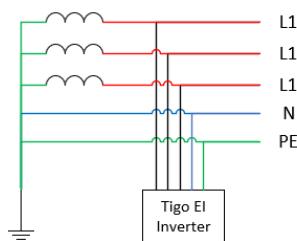
*Three-Phase AC Connections*


*Three-Phase DC Connections*

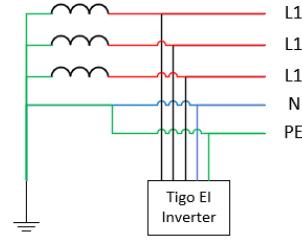
### Earthing

The EI solution requires TN-C/S or TT-C/S earthing. It does not support IT earthing.

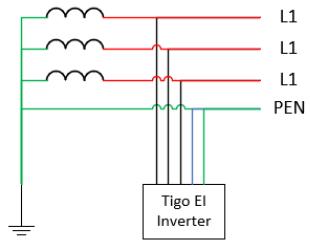
TNS 230V/400V



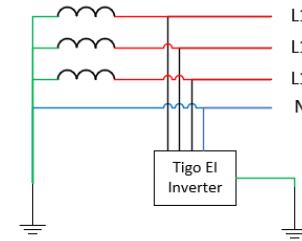
TNC-S 230V/400V



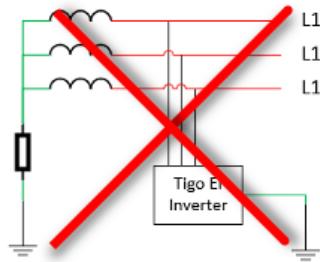
TNC 230V/400V



TT 230V/400V



IT 230V/400V/600V



# Installation

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To install the system, you will:

- Place Batteries
- Assemble and Mount the System Bracket
- Install the Inverter
- Install the Link
- Install TS4 MLPE
- Install the Tigo Access Point (TAP)
- Install the BMS
- Connect Batteries

## Place Batteries

The EI Battery package includes BMS components, battery components, and accessories.

### BMS

- BMS module
- BMS to inverter charging cable (+) (2.0 m)
- BMS to inverter charging cable (-) (2.0 m)
- BNS to battery module power cable (120 mm)
- BMS communication cable (2.2 m)
- COMM communication cable (200 mm)
- Tightening wrench
- Wall mounting bracket
- M5 screws (4)
- Flat washers (2)
- Grounding wire (150 mm)
- Lag bolts (2)
- Wall anchors (2)
- Wire protectors (2)
- Mounting base
- Safety manual

### Battery

- Battery
- Battery module power cable (690 mm)
- COMM communication cable (600 mm)
- M4 screws (2)
- Earthing wire (450 mm)
- Quick Start Guide

### Accessories

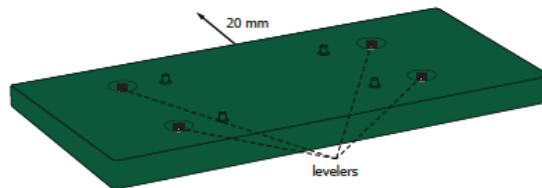
- Battery module power cable (1200 mm)
- Battery module COMM communication cable (1200 mm)

- Earthing wire (1200 mm)
- Battery base
- Cover brackets (2)
- Wire protector rings (4)
- M4 screws (8)
- Wall bracket accessories
- Battery module to BMS power cable (2500 mm, optional)

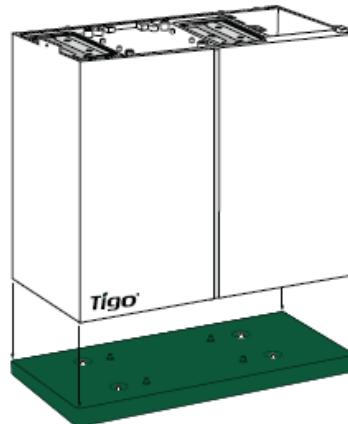
An EI system includes up to four batteries. The default configuration is to stack one or two batteries directly below the inverter, link, and BMS components. Because connections are on the right side of battery enclosures, additional batteries are most conveniently stacked to the right of the main cabinet.

To position one or more batteries:

1. Place the battery base 20mm from the wall and adjust levelers if necessary.

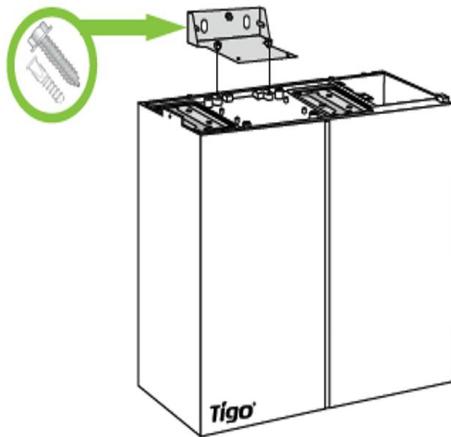


2. Place a battery on the base.

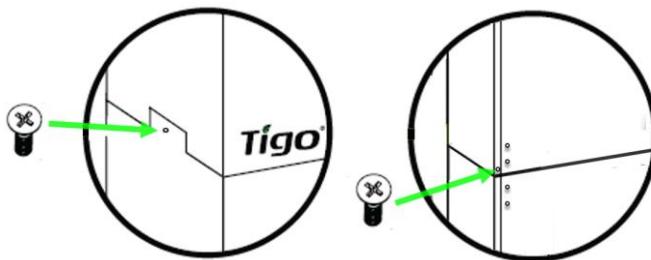


**Installation – Place Batteries**

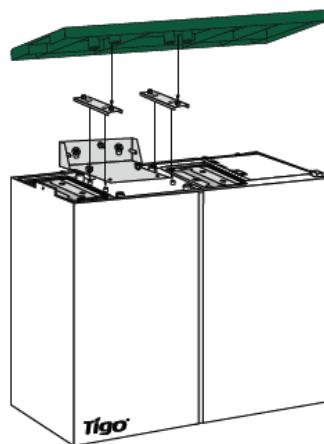
3. If installing a single battery, attach the battery bracket to the top of the battery and the wall. Ensure 20mm clearance between the wall and the battery enclosure.



4. If installing an additional battery, use two M4 screws to secure it on the left and right sides of the bottom battery.



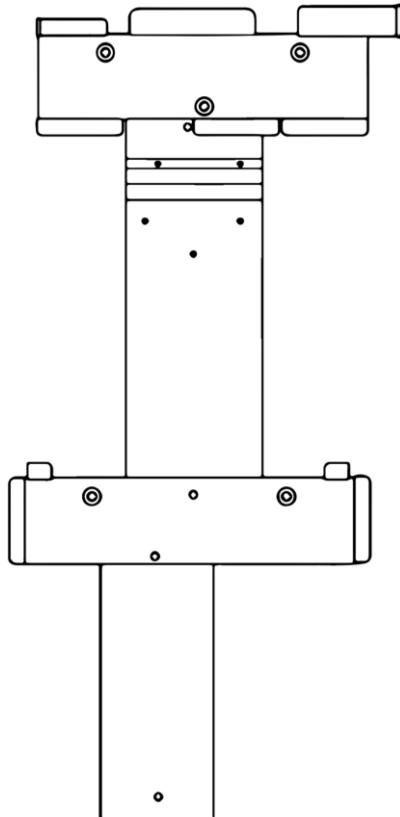
5. If installing one or more batteries to the right of the main rack, install a base.
6. Install two cover brackets on the top-most battery, place the top cover on the battery, and press down.



## Assemble and Mount the System Bracket

The single-phase system bracket includes two vertical wall-mounting plates and two horizontal component-mounting plates found in the inverter and link packages:

- EI Inverter package: horizontal inverter plate
- EI Link package: vertical link plate, horizontal link plate, and vertical BMS plate (single-phase only)

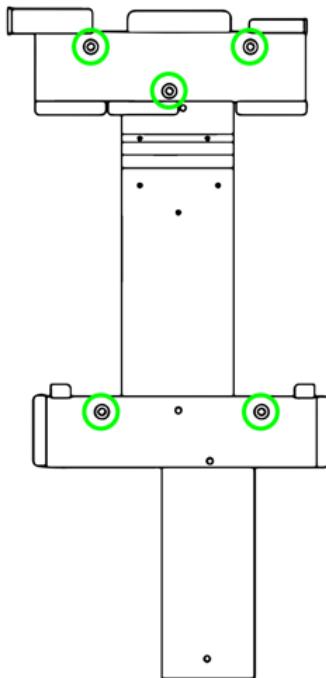


To assemble the system bracket, use M5 screws found in the inverter accessory box:

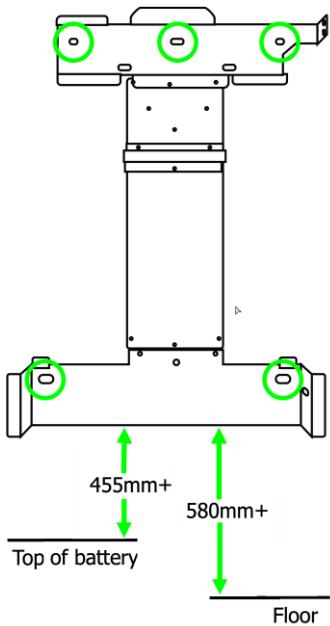
1. Attach the horizontal inverter plate onto the vertical link plate. The vertical plate will rest against the wall.
2. Attach the link horizontal plate onto the vertical link plate.
3. Single phase: Attach the link horizontal plate onto the vertical BMS plate.

To mount the system bracket:

1. Single phase: Attach the system bracket to the already-installed battery bracket.
2. Mount the system bracket to the wall using appropriate mounting hardware at the locations shown in the diagram. Ensure the vertical plates are plumb and the brackets are level.



Three phase: Mount the system bracket so that the bottom of the horizontal link plate has at least 455mm clearance above the floor or top of the battery.

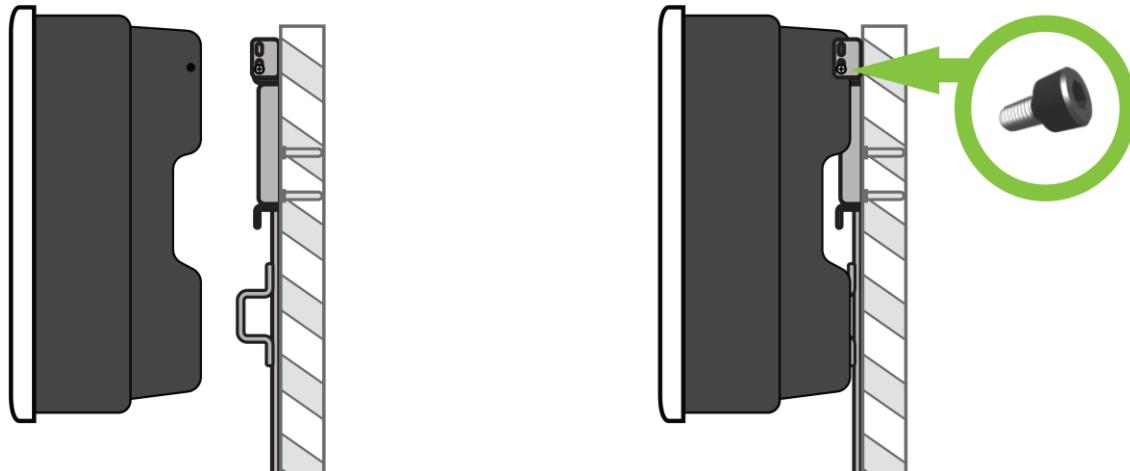


## Install the Inverter

The EI Inverter package includes:

- Inverter (single or three phase)
- Inverter horizontal mounting plate
- Wall anchor, washer, and lag bolt (3)
- M5 inner hex screw
- Waterproof RJ45 connectors (2 spares)
- RJ45 terminals (3, three phase only)
- Battery power cable connectors (2)
- Safety manual
- Quick Start Guide

To install the inverter, slide it onto the horizontal inverter plate and secure it using an M5 screw.



## Install the Link

The single-phase EI Link package includes:

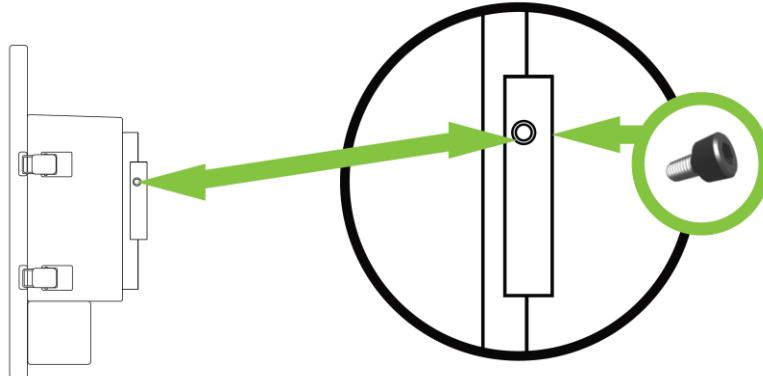
- Link module
- 6mm ferrules (5)
- 16mm ferrules (5)
- 16mm ring terminal
- Flange nuts (4)
- Wall anchor, washer, and lag bolt (2)
- Earthing wire
- Quick Start Guide
- Horizontal link mounting plate
- Vertical link mounting plate
- Vertical BMS plate
- Waterproof RJ45 connector (spare) 3
- CCA antenna
- Tigo Access Point (TAP)

The three-phase EI Link package includes:

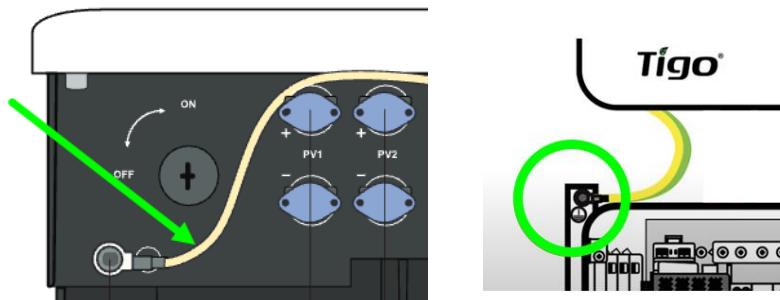
- Link module
- Vertical link mounting plate
- Horizontal link mounting plate
- 6mm ferrules (8)
- Flange nuts (2)
- Wall anchor, washer, and lag bolt (2)
- 16mm earthing terminal
- 16mm ferrules (10)
- Rubber plugs (2)
- Tigo Access Point (TAP)
- Waterproof RJ45 connector (3)
- CCA antenna
- Quick Start Guide

To install the link and connect it to the inverter:

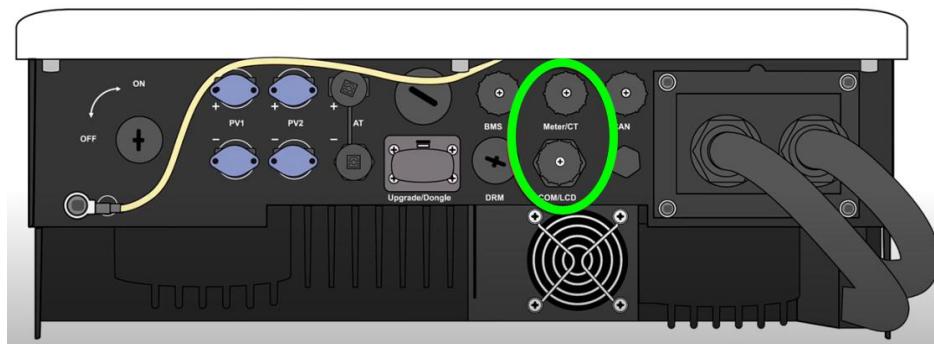
1. Crimp ends of all unterminated conductors with ferrules and earthing terminals and torque to 1.5Nm.
2. Slide the link onto the horizontal link plate and secure it using an M5 screw.



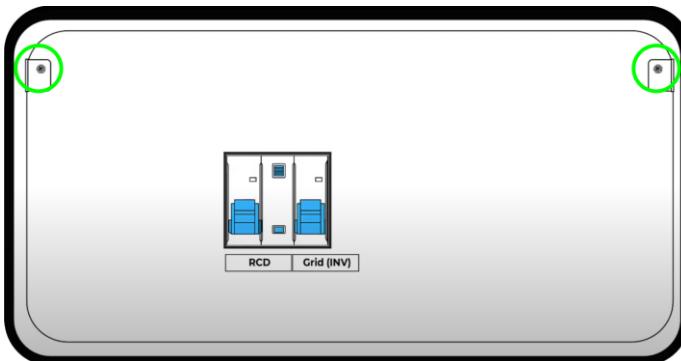
3. Connect the preinstalled inverter earthing cable to the link.



4. Connect the COM and CT cables to their respective connections at the bottom of the inverter and the link.

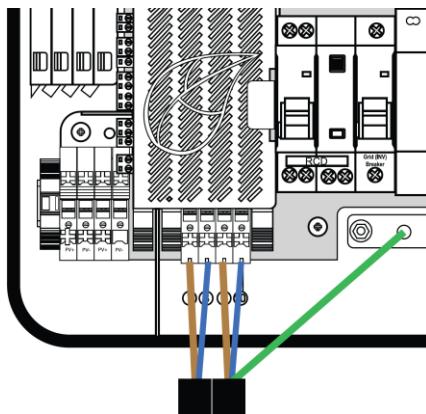


5. Remove the link safety cover.

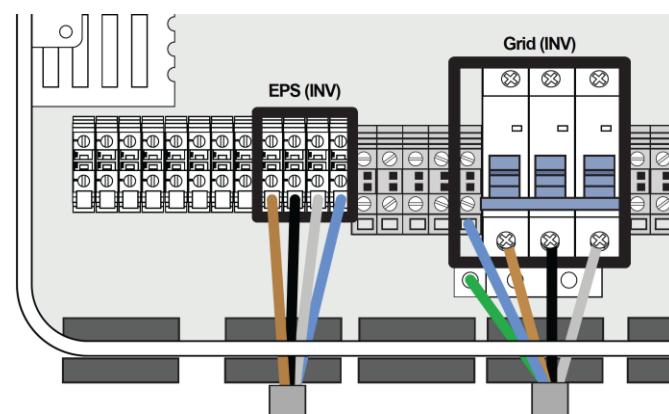


6. Run the preinstalled EPS (INV) and GRID (INV) cables from the inverter through their respective ports on the bottom of the link.

Single phase:



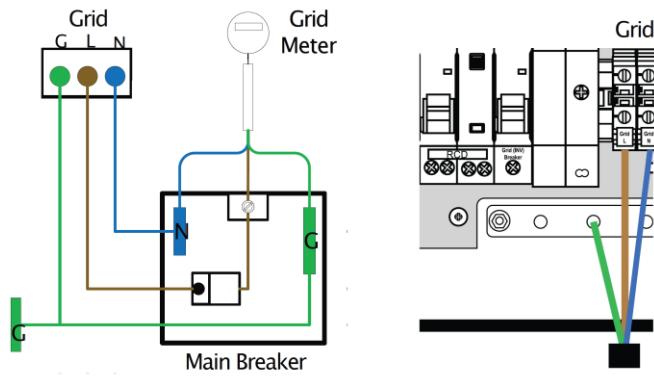
Three phase:



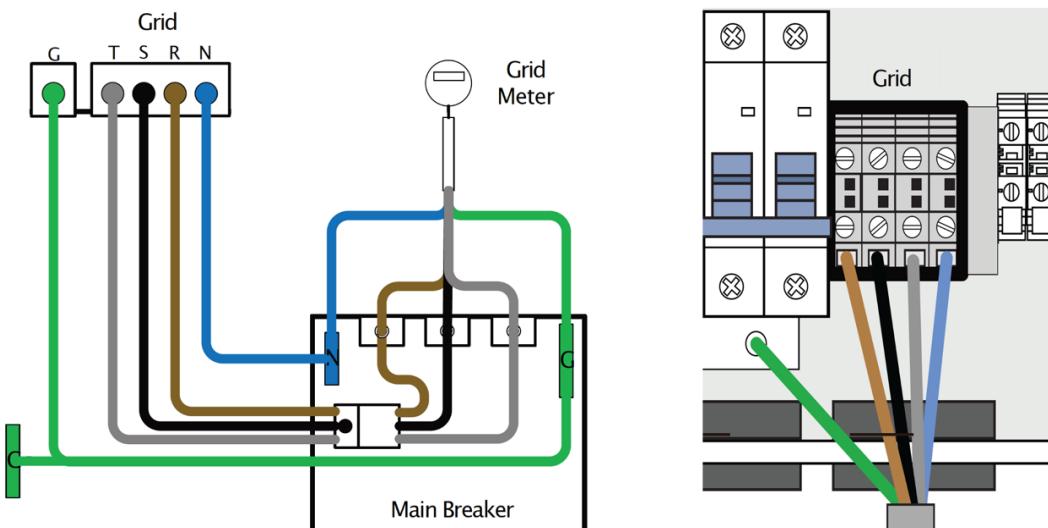
7. Connect the GRID (INV) earthing wire to the link earthing bar.

To make link AC connections:

1. Single phase: Connect conductors from a breaker on the house main breaker panel to link grid terminals.



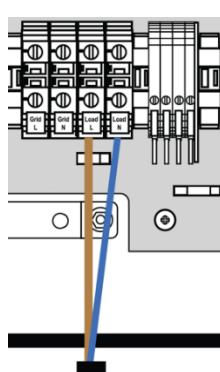
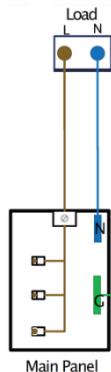
Three phase:



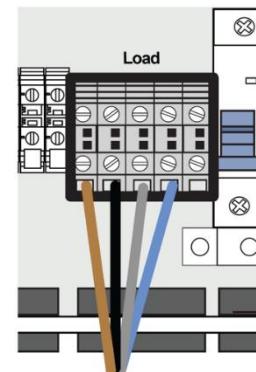
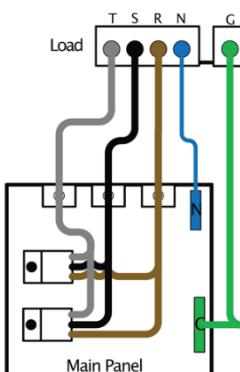
2. Connect the GRID earthing wire to the link earthing bar.

3. Connect conductors from a breaker on the house breaker panel or backup load panel to the link LOAD terminals.

Single phase:

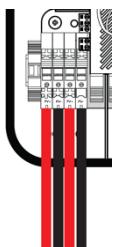


Three phase:

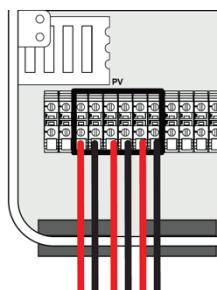


To connect PV strings to the link, run the PV conductors through the link PV port and connect them to their respective PV + and – terminals.

Single phase:

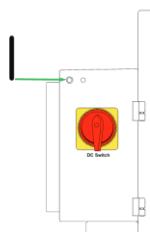


Three phase:

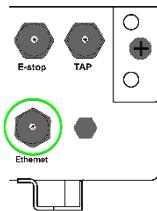


To enable the Cloud Connect Advanced (CCA) data hub:

1. If using Wi-Fi, screw the CCA antenna into the link.



2. If using a wired network connection, connect the cable to the Ethernet port on the bottom of the link.



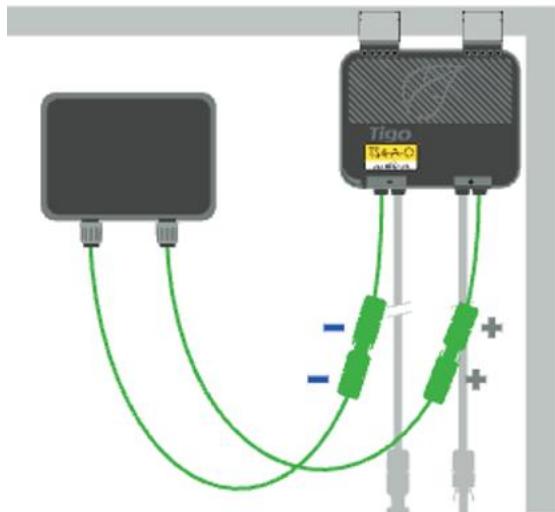
**Install TS4 MLPE**

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

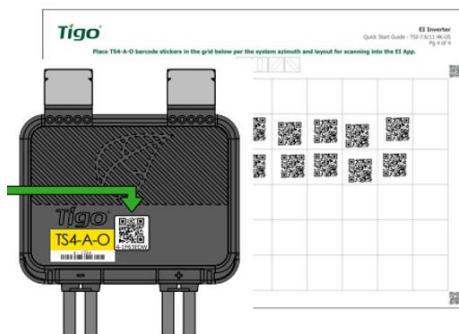
1. Attach a TS4 device to a PV module frame using silver clips. If using frameless modules, remove the clips and bolt the TS4 directly to the PV rail with M8 bolts. No additional earthing is required.



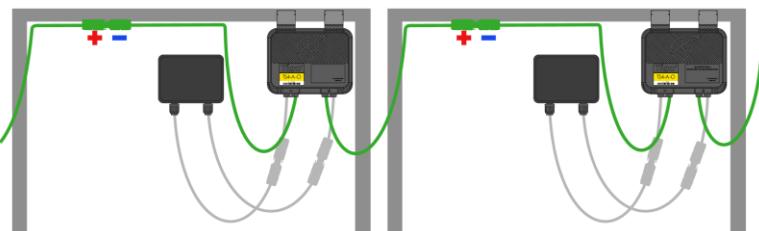
You must connect the shorter TS4 input leads to the PV modules first. Failure to do so can damage the TS4 unit.



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. 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.



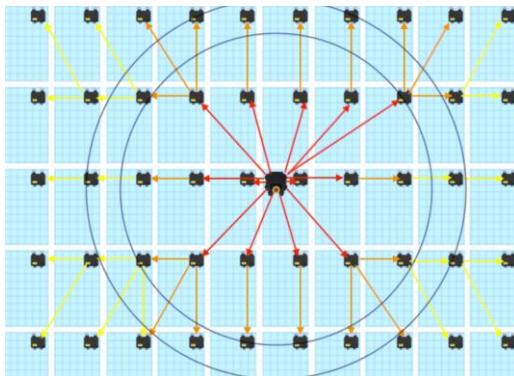
4. For TS4 installation data specific to your Tigo MLPE (TS4-A, TS4-M, etc.), scan the following QR code:



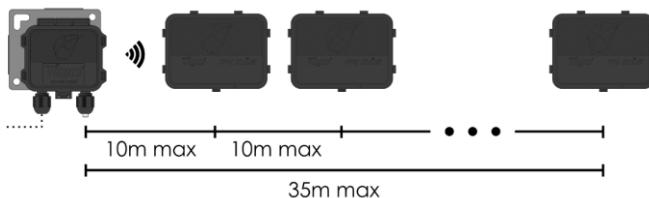
## Install the Tigo Access Point (TAP)

A TAP wirelessly communicates with TS4 devices to gather data and perform rapid shutdowns. The TAP connects to the link via a T568B-scheme 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.

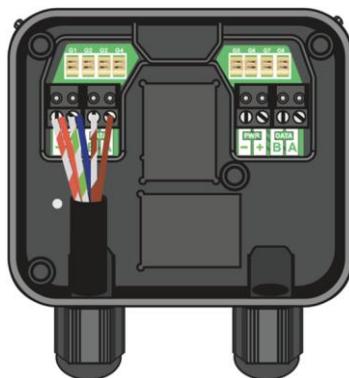


The TAP communicates directly with any TS4 within 10m. Each TS4 can relay data to and from another TS4 within 10m. The TAP can communicate with any TS4 within 35m.



To install a TAP using a T568B-scheme CAT5/6 cable:

1. Connect cable wires to the left side of the TAP using either the quick-connect or the terminal block.

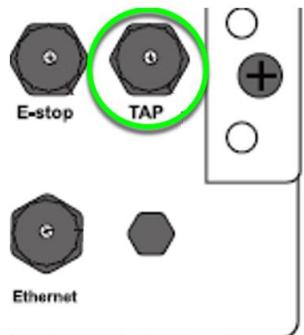


Wire Colors	TAP Terminal
Orange + Orange-striped	PWR-
Blue + Green-striped	PWR+
Brown-striped	Data B
Brown	Data A
Green, Blue-striped	Not used

2. 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.
3. Attach the TAP to the PV module the same way as the previous step for the TS4. For frameless modules, remove the silver clips and bolt directly to the rail.

**Installation – Install the Tigo Access Point (TAP)**

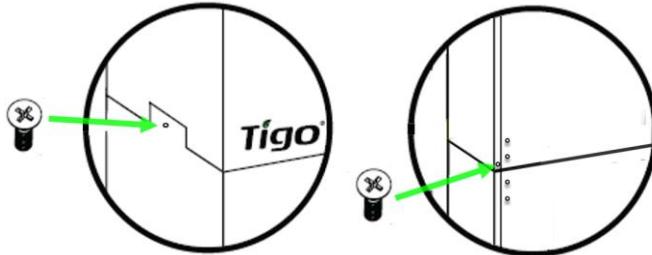
4. Run the CAT5/6 cable to the link and connect the RJ45 plug to the TAP port on the bottom of the link.



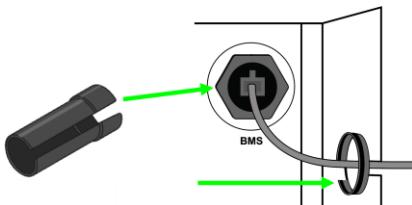
## Install the BMS

To install the BMS to manage up to four EI batteries:

1. Place the BMS on the top-most battery underneath the link.
2. Secure the BMS using the provided M4 screws on the left and right side.

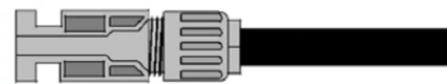
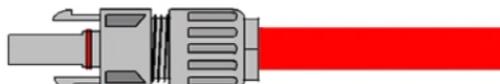


3. Open the wire box doors on the right side of the BMS and the battery.
4. Use the tightening tool to tighten connections and install ring protectors on knockouts.



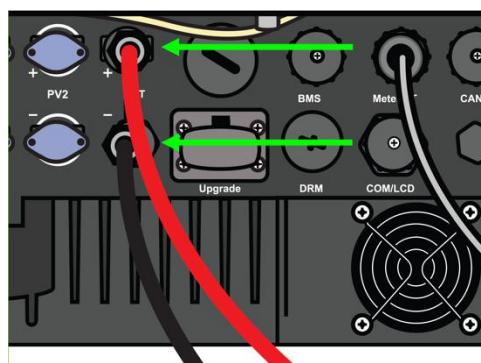
To connect the BMS to the inverter:

1. Strip 15mm of insulation off each of the battery charging cables (found in the BMS box) and crimp on their Phoenix Contact MC4 connectors.

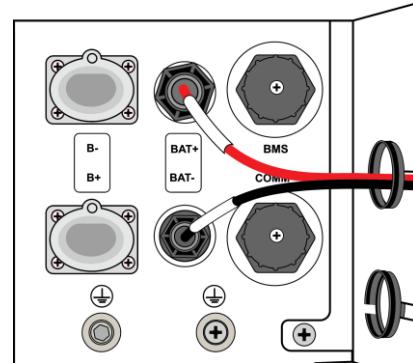


2. Connect one end of the prepared battery charging cables to their respective inverter BAT ports and the other end to the BMS BAT ports.

Inverter BAT ports :

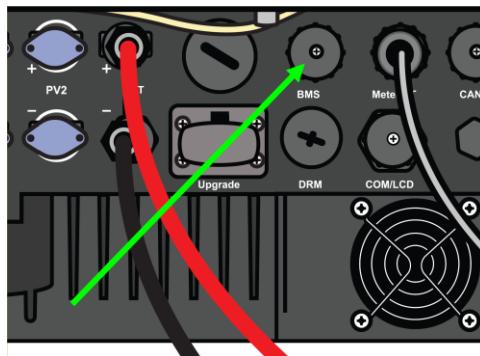


BMS BAT ports :

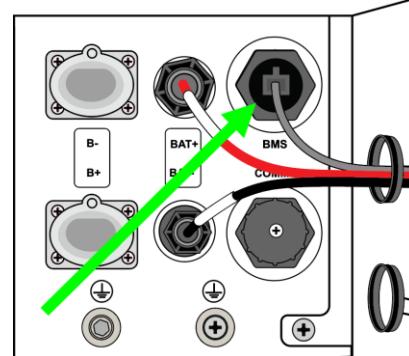


3. Connect one end of the BMS COM cable to the inverter BMS port and the other end to the BMS port labeled BMS.

Inverter BMS port for COM cable:



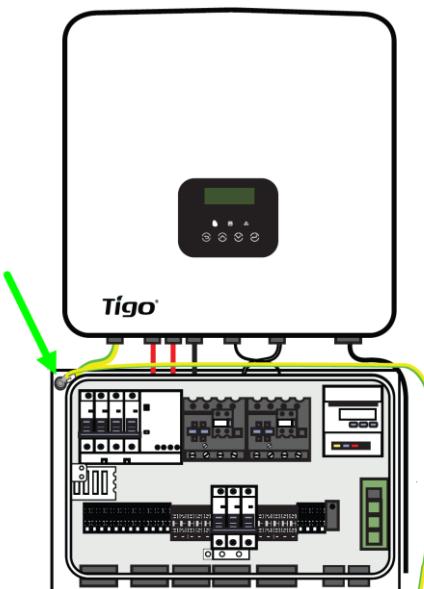
BMS port for COM cable:



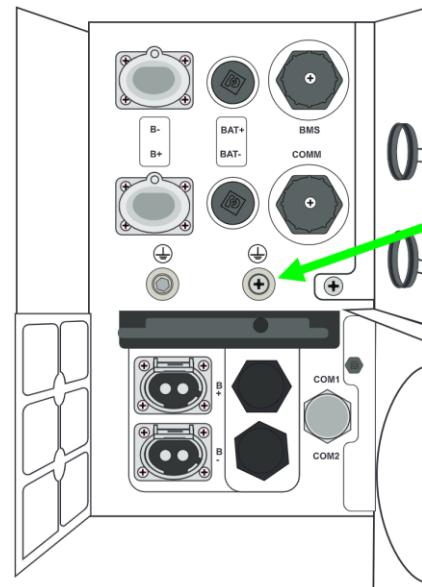
Three-phase systems only: connect an earth cable to the link.

- Prepare and connect an earth cable between the link and BMS earth connections.

EI Link earth connection:



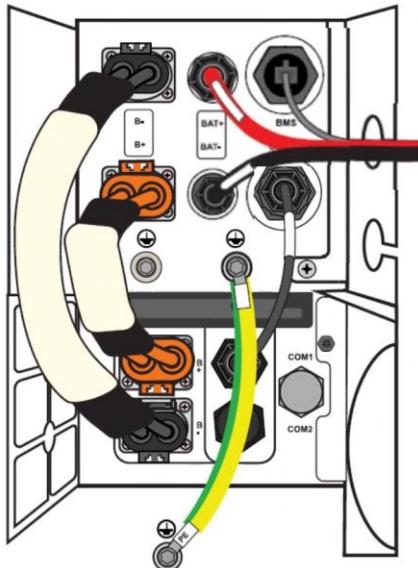
BMS earth connection:



## Connect Batteries

To connect the BMS to a single battery:

1. Connect the COMM cable to the BMS COMM port and the battery COM1 port. Ensure it clicks into place.
2. Connect the power cables from the BMS B+ and B- ports to their respective battery B+ and B- ports. Note their different lengths and connect them as shown. Ensure all click into place.
3. Connect the earthing cable from the BMS to the battery. Torque to 2.5 NM.



To connect to four batteries:

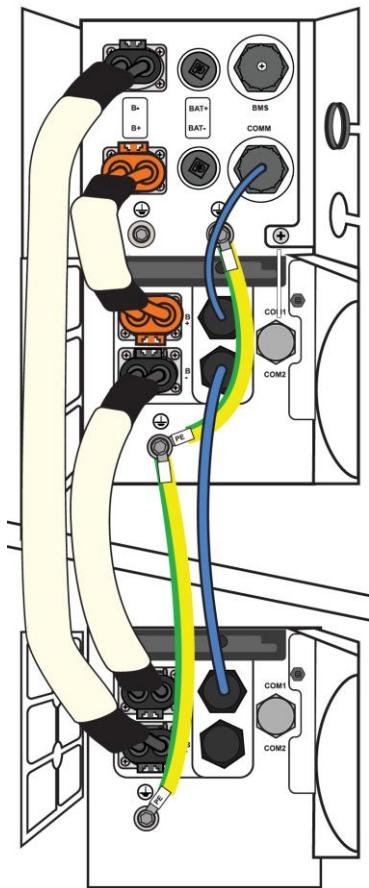
1. Connect an earthing cable between all enclosures.
2. Connect the shortest power cable between the BMS B+ port and the first B+ battery port.



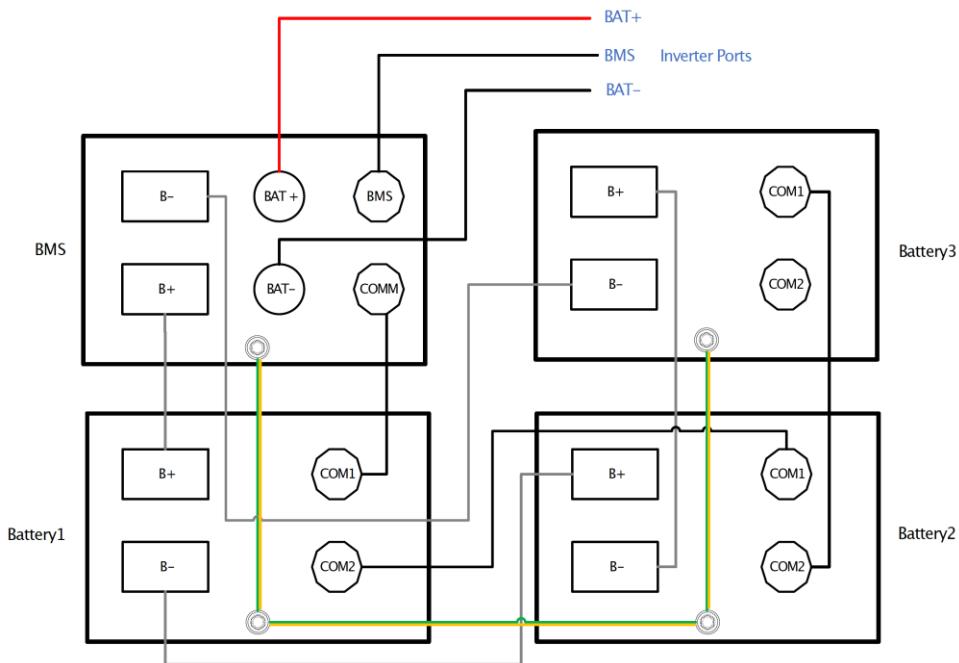
The BMS B+ and B- ports are in opposite positions than the battery B+ and B- ports.

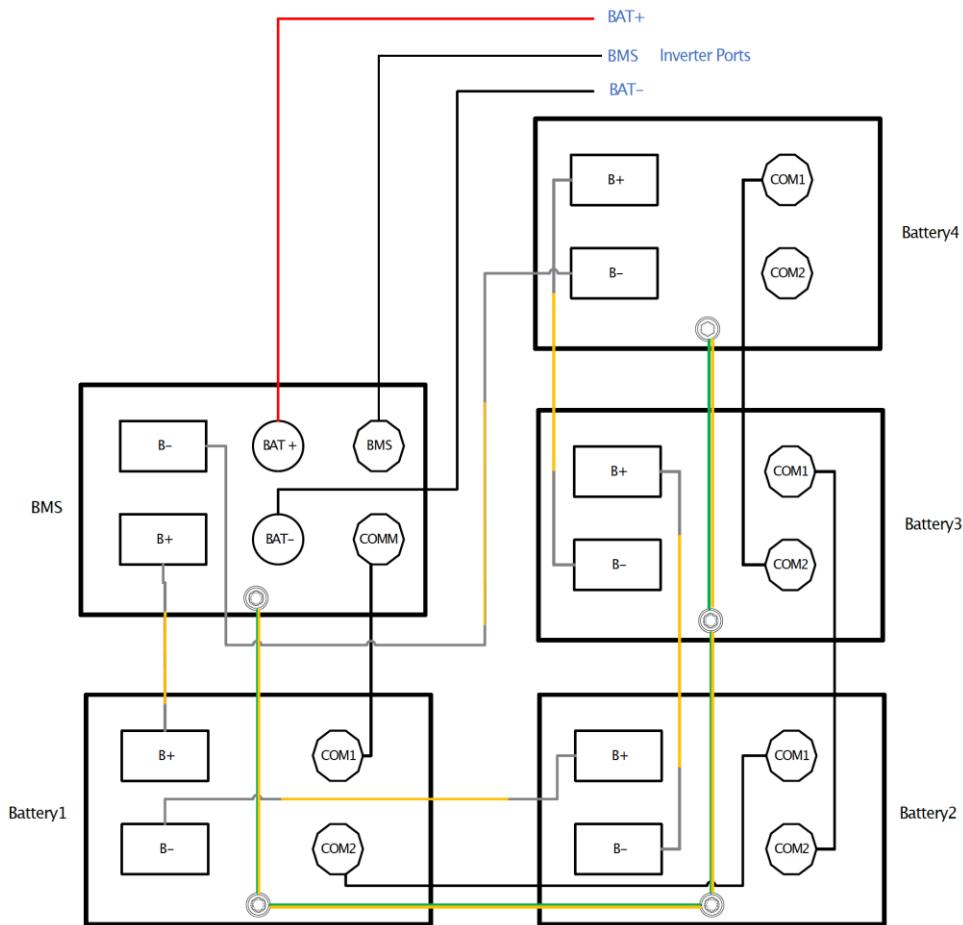
3. Connect the longest power cable between the BMS B- port and the last battery B- port.
4. Connect a power cable between the first battery B- and the next battery B+ port. Repeat for each subsequent battery.
5. Connect a COM cable between the BMS COMM port and the first battery COM1 port.
6. Connect a COM cable between the first battery COM2 port and the next battery COM1 port. Repeat for each subsequent battery.

The following example shows a two-battery setup:



Three-battery setup:



**Four-battery setup:**


# Commissioning

Commissioning must be performed by a licensed electrician or other qualified person in accordance with local, national, and regional 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, double-check:

- Inverter-link connections:
  - CT
  - COMM
  - EPS (INV)
  - GRID (INV)
- AC/DC connections to breaker panels.
- Battery power and COM cables.
- Earthing cables and connections.
- Conduit attachments are sealed and bonded where necessary.
- Unused conduit openings are fitted with waterproof caps (provided) or were left unopened.
- The battery power switch and all other power sources connecting to the system are OFF.

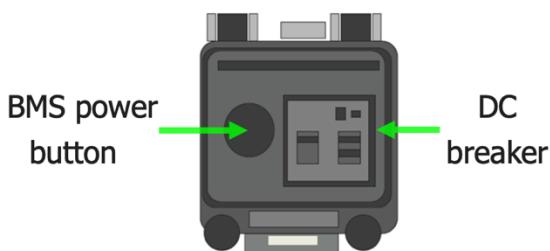
## Power On the System



Ensure grid voltage is within 220/240V.

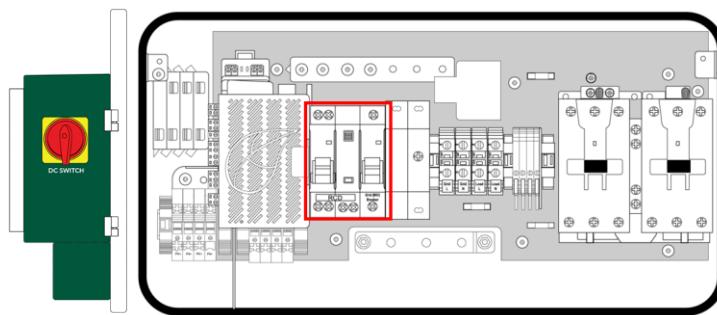
To power on the system for the first time:

1. Turn on the DC breaker located on the side of the BMS.



2. Press the BMS power button to start the battery.

3. Turn on the DC switch on the left side of the link.



4. Turn on the RCD and GRID (INV) breakers in the link.
5. Turn on AC power to the link at the service disconnect.
6. Ensure the E-Stop button (if used) is not in the stopped position.

## Run the Tigo Energy Intelligence App

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

Scan this QR code to download the app.



To run the Tigo EI app and commission the system, carefully complete all the following steps. If you want help, contact Tigo support within the app or via [support@tigoenergy.com](mailto:support@tigoenergy.com).

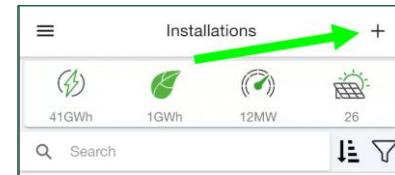
- Set System Info
- Select Equipment
- Configure Layout
- Configure Communication
- System Access
- Complete Commissioning

### *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 sent to verify your email address.



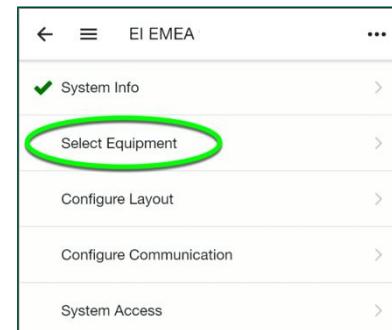
2. Tap + to configure a new system.



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

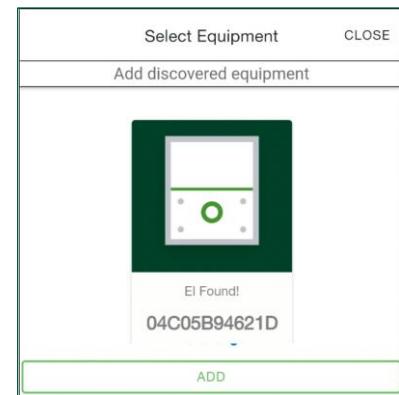
1. Tap *Select Equipment*.



2. On the next screen, tap the Add icon and then tap *Scan*.
  - The app will scan for EI components such as the inverter and battery.
  - You will enter some components manually.

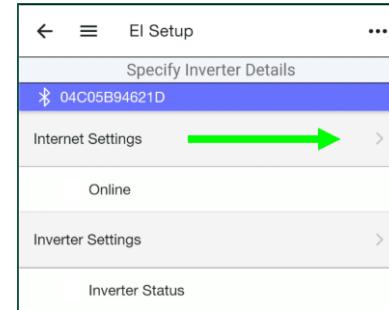


3. Tap *Add*.

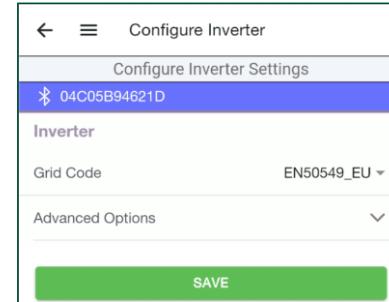


4. Tap *Internet Settings* and connect to the customer's Wi-Fi or Ethernet network.

- You may need to drag the screen down to refresh the list of networks.

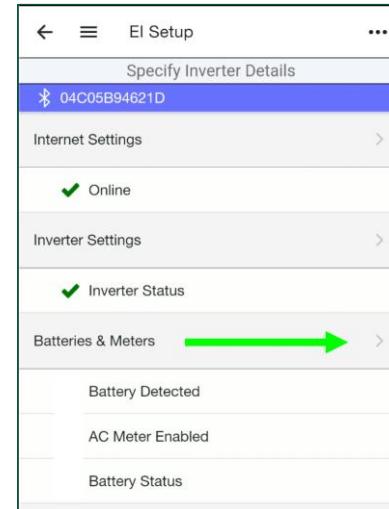


5. Tap *Inverter Settings*, enter the *Grid Code* and configure *Advanced Options*, and tap *Save*.



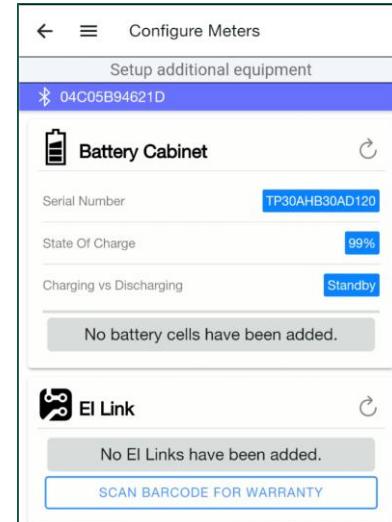
6. Configure *AC Meter*, *Battery Settings*, and *Main Breaker Limit* options.

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

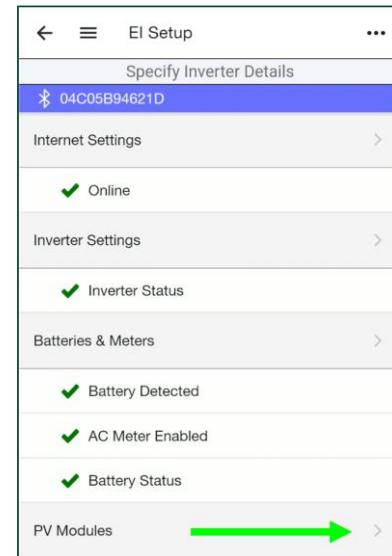


8. Tap *SCAN BARCODE FOR WARRANTY* and use your smartphone camera to capture all equipment bar codes including the link.

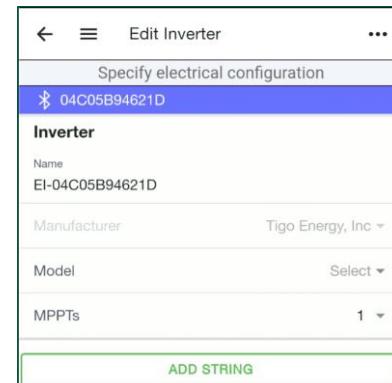
- You may scan either bar codes on enclosures or on boxes.



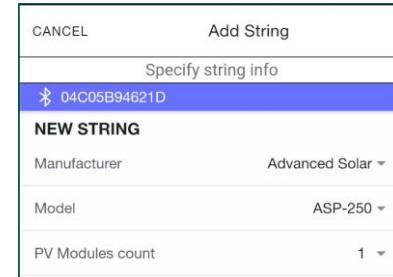
9. Tap the back arrow and tap *PV Modules* to set up the PV array and Tigo TS4 devices.



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

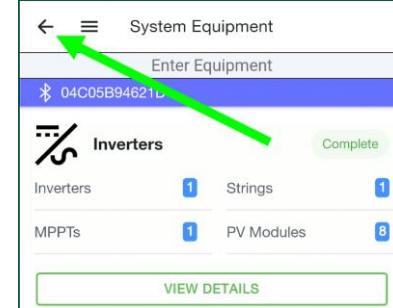


11. Select a *Manufacturer*, *Model*, and *PV Modules count* and tap *Save*.

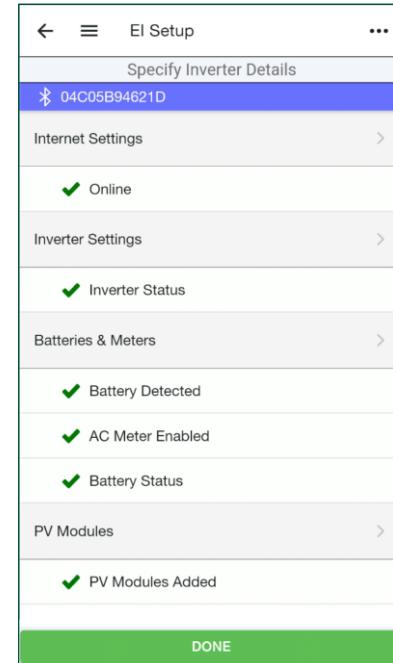


12. Repeat these steps for as many strings as needed and tap *Done*.

13. Review your entries and tap the back arrow.

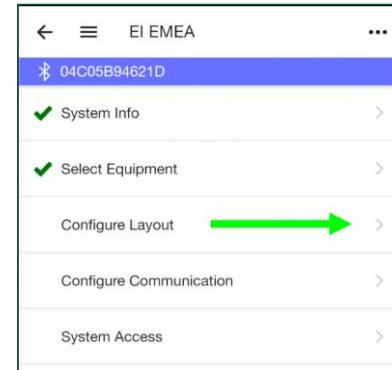


14. On the *EI Setup/Specify Inverter Details* screen, tap *Done* to return to the primary commissioning screen.

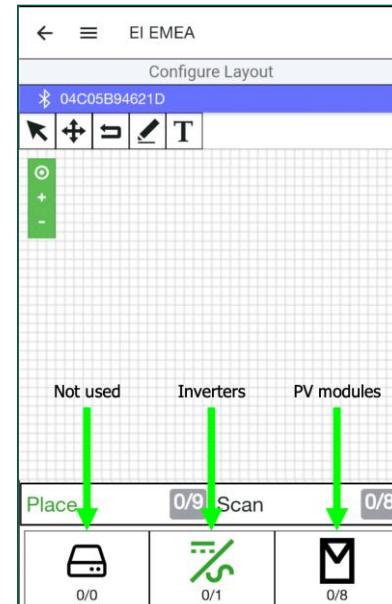


### Configure Layout

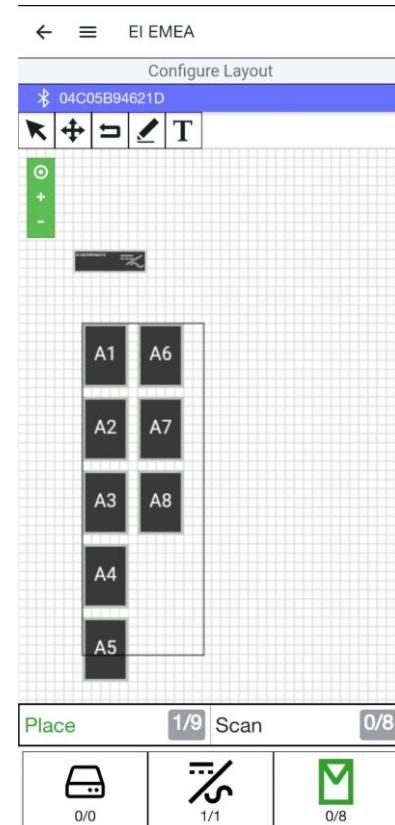
1. Tap *Configure Layout* to map equipment items on a layout grid.



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.



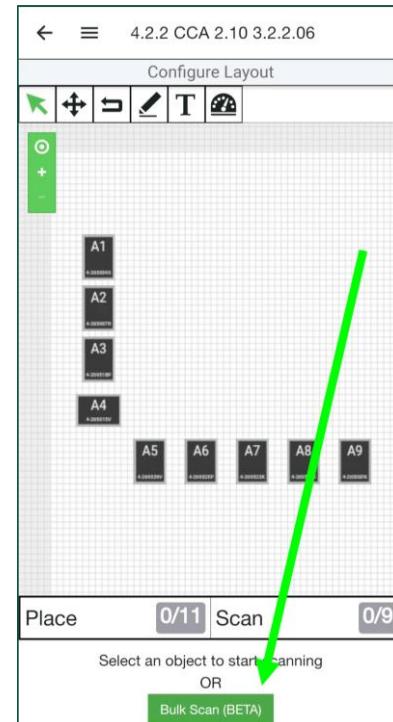
3. Drag the PV module icon to the layout grid to place all detected modules at once. Otherwise, tap the icon and then tap the grid to place them individually.
  - Arrange the modules carefully to reflect their actual layout on a roof or field. Tap a module to change its portrait/landscape orientation.



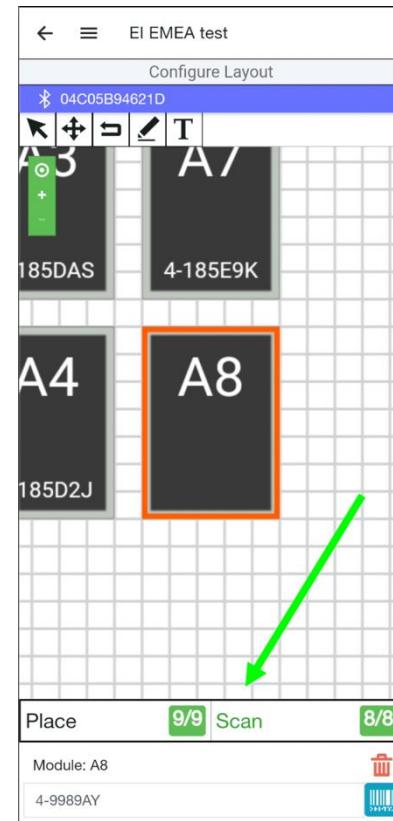
4. Choose a method to identify TS4 devices attached to PV modules.
  - If, during installation, you affixed barcode/QR code stickers from each TS4 to the array map included in the EI Inverter Quick Start Guide, you may use the Bulk Scan method.
  - If TS4s are still conveniently accessed, you may scan 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.

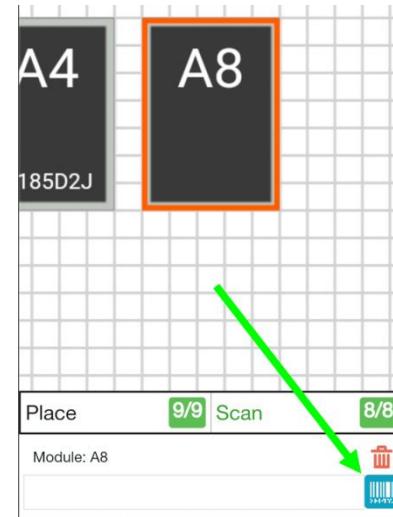
- If the array map is large and one photo does not successfully capture all labels, repeat the process to take several smaller photos of the map.



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



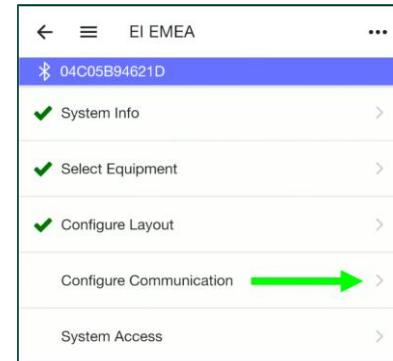
- To manually enter TS4 data, tap the module in the layout grid, tap the blue barcode icon, and enter the code.



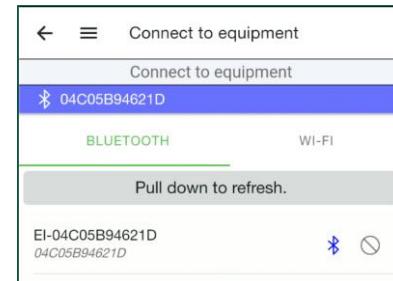
- Verify that all modules are oriented consistently – portrait or landscape. Tap a module repeatedly to alternate orientation.
- Tap the back arrow to return to the commissioning screen.

### Configure Communication

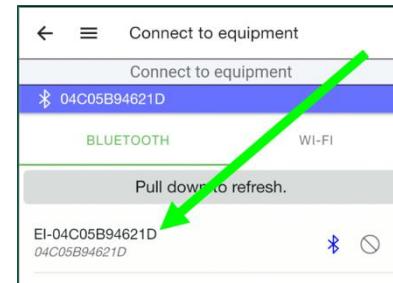
- Tap *Configure Communication* to enable Bluetooth communication for the Discovery process.
  - Ensure your smartphone has Bluetooth enabled but do not pair the inverter using your smartphone, *Settings*. Only pair using the Tigo EI app as shown in the following step.



- Pull down the screen to refresh the list.
  - A prompt will appear when the app successfully pairs with the inverter.

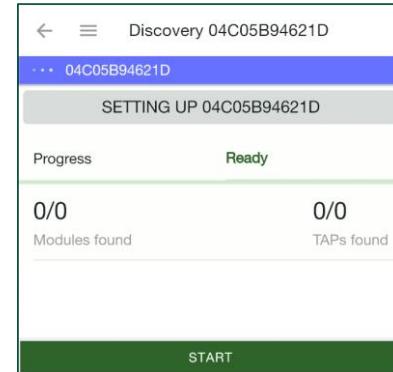


3. Tap the inverter serial number with the Bluetooth symbol.



4. Tap *START* to begin the Discovery process.

- The Discovery process establishes direct communication between the inverter and individual TS4s that were mapped in the Tigo app.
- The process may take up to 10 minutes depending on the strength of the internet connection.

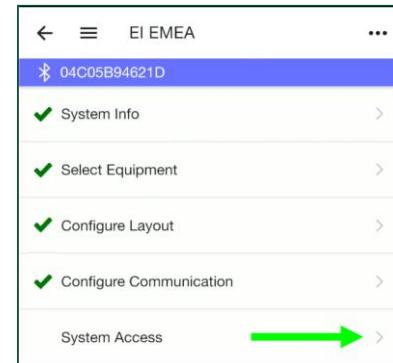


5. When finished, the number of modules/TAPs placed should match the numbers found. For example, 16/16.

If not and the number is something like 14/16, check that all TS4s and TAPs are properly connected and that no TS4s are more than 10m from a TAP. Then repeat the Discovery process.

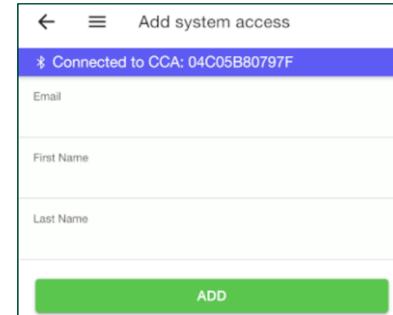
### *Set Up System Access*

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.

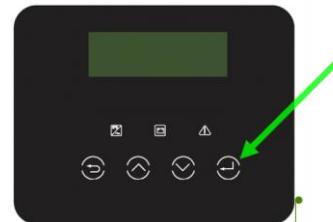




### *Complete Commissioning*

Press and hold the inverter LCD “Enter” button for five seconds to set it to normal operation mode.

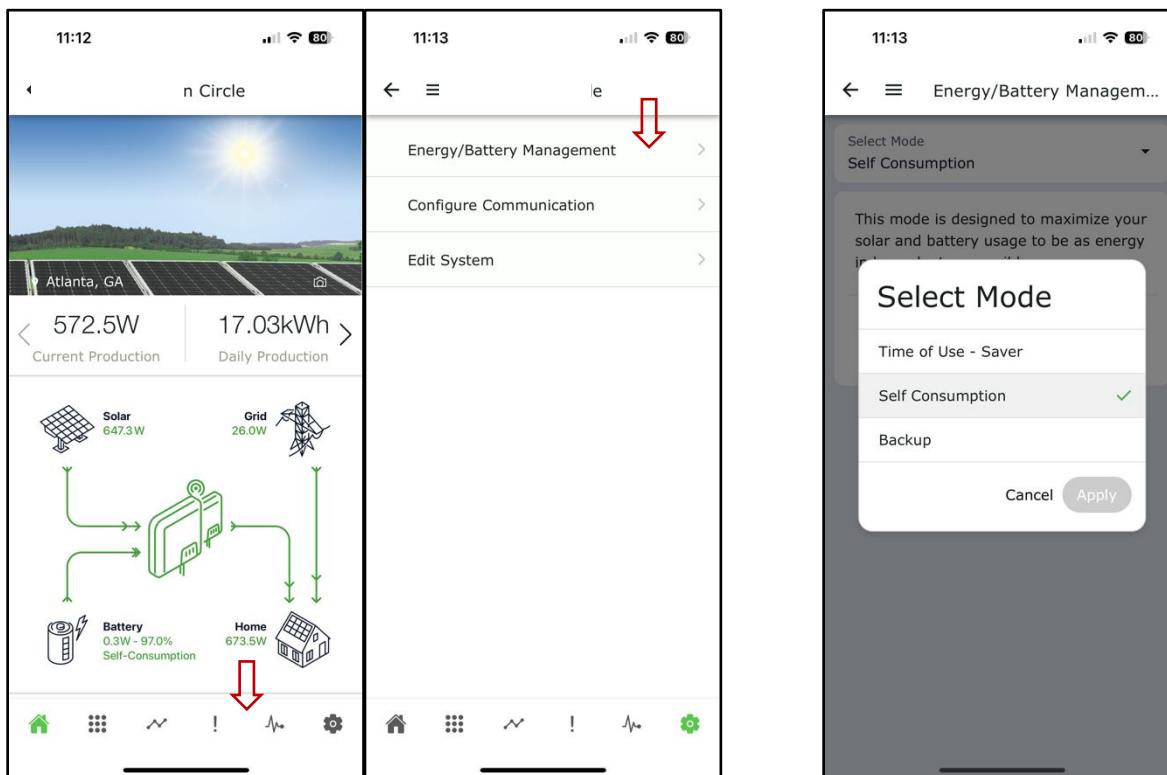
This completes the commissioning process.



### Tigo ESS Operation Mode

There are three operation modes for Tigo EI solution, self-consumption, backup and time-of-use. Users can configure them either in Tigo EI App or Tigo EI web portal. The steps are as below:

- Step 1: Click the setting icon  at the lower right corner.
- Step 2: Click Energy/Battery Management
- Step 3: In the “Select Mode” window, choose one of the operation mode, then click “Apply”.



### Self-Consumption

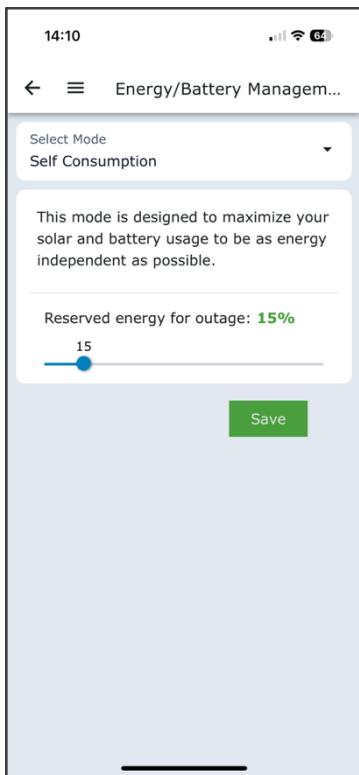
Self-consumption is designed to maximize your solar and battery usage to be energy independent as much as possible.

In this mode, when PV is available, it first powers the loads, then charges the battery with any surplus, and finally exports to the grid after battery reaches its limit (either full SOC or max charging rate). If the zero-export limit is enabled, no power is fed back to the grid.

When PV is insufficient, the battery powers the loads until it reaches the level of reserved energy for outage (set in Tigo App by user) or reaches max discharge rate. Once the battery reaches this limit, the grid supplies power to the loads. Grid power will not charge the battery if the battery SOC is higher than the level of reserved energy for outage.

### User setting:

The only parameter users need to configure is the “Reserved energy for outage”, which is the SOC level they wish to reserve for unexpected power outages.



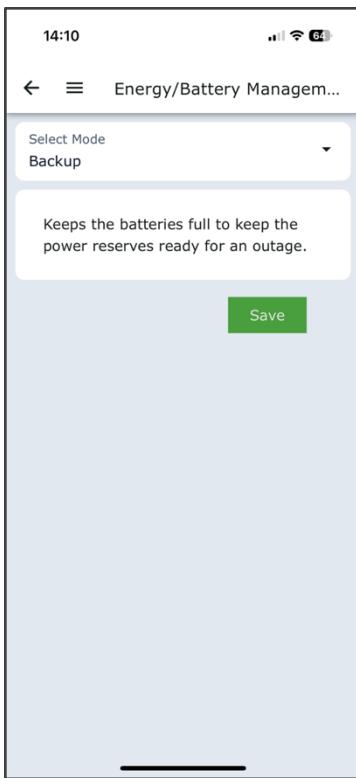
### Backup

Users select this mode to prepare for anticipated power outages by charging the battery to 100% SOC. Once fully charged, the battery maintains 100% SOC and remains on standby until grid power is lost. This mode is commonly used in areas prone to frequent outages, where the ESS functions as a UPS to ensure uninterrupted power supply.

In this mode, PV power and AC power (if PV is insufficient) to support the load and max battery charging until the limit is reached (either full SOC or max charging power). The battery does not discharge to support the load while the grid is available. Instead, it maintains 100% SOC, ready for a power outage.

### User setting:

No user settings are required for the backup mode. The Tigo ESS defaults the maximum battery SOC to 100%, ensuring the battery is charged to full capacity as quickly as possible and remains on hot standby.



### Time of Use – Saver

Time-of-Use mode is designed to avoid using power from grid during peak times when the electricity charge is high. The ESS behaves differently during peak times and off-peak times.

#### 1. Peak Time Periods:

During these periods, PV power is prioritized to support the load, and the battery is discharged as needed to minimize grid usage, avoiding high-tariff periods. Grid power is only drawn if the battery SOC falls below the level of “reserved energy for outage” or its max discharge rate can’t support all the loads.

#### 2. Off-Peak Periods:

During off-peak times, PV power is prioritized to support the load, and extra PV will be used for charging the battery. Battery will not discharge to support the load. Grid power will be drawn if PV is insufficient to support the load, but grid power will not charge the battery unless the “Charge Battery From Grid” is enabled.

#### 3. Charge Battery From Grid

Once this option is enabled, it allows to charge battery to 100% with energy from the grid during a specified time window.

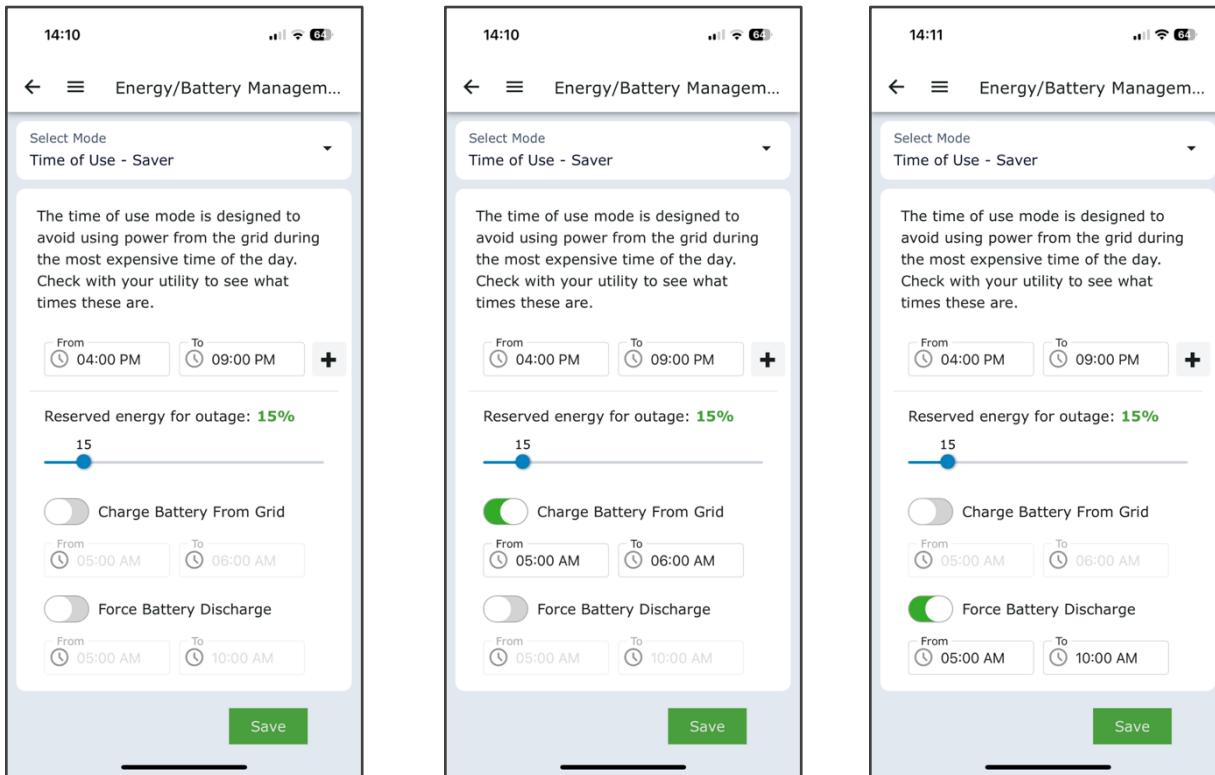
#### 4. Force Battery Discharge

Forces the battery to discharge at full power during a specified time window. Battery power and PV support the load first, with any excess exported to the grid. This option is typically used when utilities offer high feed-in tariffs as rewards.

### User setting:

Users need to configure the following settings for this mode:

- Peak time window. Click the “+” button to add a second peak time. The off-peak time is beyond peak time.
- Reserved energy for outage.
- Optional “Charge battery from grid” and “Force battery discharge” time window.



## Dynamic Rate

Dynamic Rate mode is designed to optimize the behavior of the Tigo EI system in presence of electricity contract based on dynamic electricity rates (or tariffs).

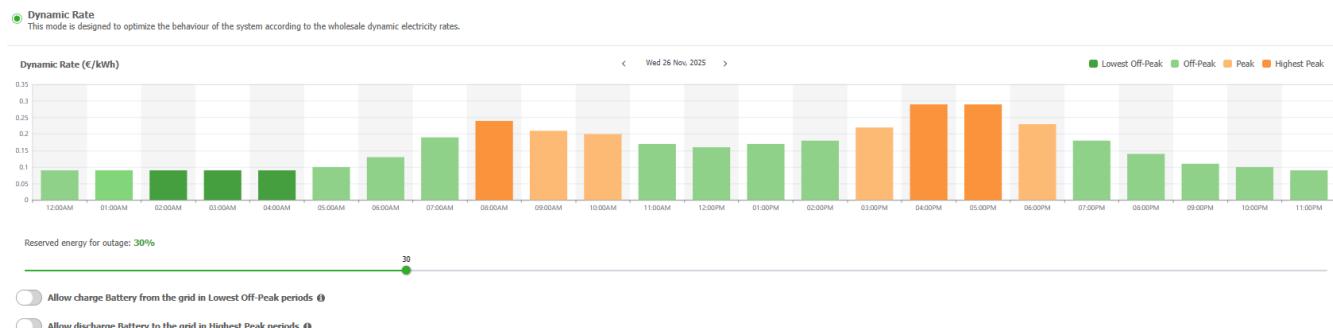
In several countries, electricity providers offer dynamic energy tariffs that change every day: hourly, half-hourly or different time period based on supply and demand on the wholesale electricity market.

The wholesale rates shown in Tigo EI do not include additional charges and taxes but are useful to identify cheap or expensive electricity periods; the final price trend for the system owner will be like the wholesale one.

With dynamic rates, Peak periods and Off-Peak periods change every day.

Tigo EI system can automatically recognize “Peak periods” (expensive periods) and “Off-Peak periods” (cheap periods) and behave accordingly every day.

Dynamic rates are specific and change per country. Tigo EI system detects the wholesale tariffs for the specific country of installation of the system and operates accordingly.



### 1. Peak Time Periods:

During Peak Time periods, PV power is prioritized to support the load, and the battery is discharged as needed to minimize grid usage, avoiding high-tariff periods. Grid power is only drawn if the battery SOC falls below the level of “reserved energy for outage” or its max discharge rate can’t support all the loads.

Among the Peak Periods, Tigo EI identifies the “Highest Peak” periods (most expensive hours of the day).

### 2. Off-Peak Time Periods:

During Off-Peak Time periods, PV power is prioritized to support the load, and extra PV will be used for charging the battery. Battery will not discharge to support the load. Grid power will be drawn if PV is insufficient to support the load, but grid power will not charge the battery unless the “Charge Battery From Grid” is enabled.

Among the Off-Peak Periods, Tigo EI identifies the “Lowest Off-Peak” periods (cheapest hours of the day).

### 3. Allow Charge Battery From Grid

This option is disabled by default; once this option is enabled, it allows to charge battery to 100% with energy from the grid during the self-recognized “Lowest Off-Peak” periods.

### 4. Allow Discharge Battery to the Grid

This option is disabled by default; once this option is enabled, battery is allowed to discharge at full power during the self-recognized “Highest Peak” periods. Battery power and PV support the load first, with any excess exported to the grid. This option is typically used when utilities offer high feed-in tariffs as rewards.

#### **User setting:**

- “Reserved energy for outage”: select a specific battery SOC percentage (optional)
- Optional enable of “Allow Charge battery from grid in Lowest Off-Peak periods” toggle. Users do not need to select the specific time periods, Tigo EI automatically will do it during the identified Lowest Off-Peak periods.
- Optional enable of “Allow Discharge Battery to the grid in Highest Peak periods”. Users do not need to specify the time periods, Tigo EI automatically will do it during the identified Highest Peak periods.
- Two toggles can be enabled/disabled independently.

Reserved energy for outage: **20%**

20

Allow charge Battery from the grid in Lowest Off-Peak periods ⓘ

Allow discharge Battery to the grid in Highest Peak periods ⓘ

Dynamic Rate mode is available in specific countries. Refer also to Tigo support articles in the resource center for latest updates and country availability.

## Reference

This section includes the following topics:

- Torque Table
- Status LCD
- Power Off the System
- Decommissioning
- Maintenance
- Error Codes

## Torque Table

Tighten connections to the following specifications:

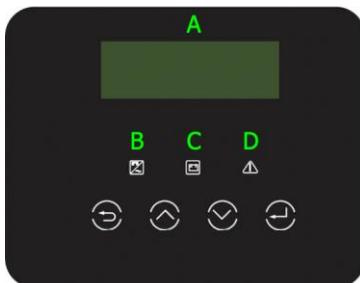
Link ground	2.5Nm
Link GRID (INV)	1.5Nm
TAP	0.34Nm
Link EPS (INV)	1.5Nm
Link earth bus	1.5Nm
Link PV	1.5Nm

## Status LCD

The front of the inverter includes LED indicators to monitor system status.



Do not use the inverter LCD display to make system changes other than commissioning. Perform all operational changes with the Tigo EI mobile app.



<b>A</b>	LCD screen	Inverter error code display. Off: fault state.
<b>B</b>	Blue LED	Solid: normal state or in EPS mode. Flashing: checking state or the system switch is off.
<b>C</b>	Green LED	Off: Battery is not communicating with the inverter. Solid: Battery communication is normal. Flashing: Battery communication is normal and idle.
<b>D</b>	Red LED	Off: operation is normal. Solid: fault state.

## Power Off the System



Wait five minutes after complete system shutdown before servicing the battery.

To power off the system:

1. Turn off the AC disconnect switch between the inverter and the service entrance.
2. Turn off the RCD and GRID (INV) breakers in the link.
3. Turn off the DC breaker on the left side of the link.
4. Press and hold the BMS power button for 10s to shut down – ensure LEDs on battery modules are off.
5. Turn off the BMS DC breaker.

## Decommissioning



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

To decommission the system:

1. Turn off the system according to the Power Off the System procedure listed above.
2. Contact [support@tigoenergy.com](mailto:support@tigoenergy.com) to deactivate the system in the Tigo database.

Follow these precautions with the battery:

- Pack the battery in the original packaging or equivalent carton. Secure them with tension belts when possible.
- Store the battery in a dry location with ambient temperatures of -30°C to 50°C and relative humidity of 0-100% for up to three months.
- Avoid storage near flammable or toxic substances.
- Recycle or dispose of a battery in compliance with local regulations.

## Maintenance

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

- Clean surfaces with damp cloth. 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. This will ensure proper ventilation and maximum performance.

## Error Codes



Qualified personnel must only perform troubleshooting.

Error codes appear on inverter and battery displays. The inverter LCD display also includes LEDs that signal various conditions. Refer to the *Status LCD* topic for details.

The Tigo EI app chat function enables real-time help from a Tigo service agent for the issue you are experiencing. For error codes not listed or if any problem persists, [contact Tigo support](#).

### Inverter Codes

Code	Fault	Tigo Fault	What To Do
IE 001	TZ protect fault	Overcurrent fault	1) Wait to see if the system returns to normal. 2) Disconnect PV+/PV- and batteries, then reconnect.
IE 002	Grid lost fault	Grid lost fault	Wait to see if power returns and the system reconnects. Then check if the grid voltage is within normal range.
IE 003	Grid volt fault	Grid voltage fault	Wait to see if power returns and the system reconnects. Then check if the grid voltage is within normal range.
IE 004	Grid freq fault	Grid frequency fault	Wait to see if power returns and the system reconnects.
IE 005	PV volt fault	Pv voltage fault	Check the output voltage of the PV modules. If string voltage is greater than 600V <sub>DC</sub> , shut down the system and troubleshoot the strings.
IE 006	Bus volt fault	Bus voltage fault	Restart the inverter and check if V <sub>oc</sub> is in the normal range. If string voltage is greater than 600V <sub>DC</sub> , shut down the system and troubleshoot the strings.
IE 007	Bat volt fault	Battery voltage fault	Check if battery input voltage is in normal range.
IE 008	AC10M volt fault	Grid voltage fault	The system should return to normal when the grid returns to normal.
IE 009	DCI OCP fault	DCI overcurrent protection fault	Wait for the system to return to normal.
IE 011	SW OCP fault	Software detection of overcurrent fault	Wait for the system to return to normal. If it doesn't: 1. Shut down photovoltaic, battery and grid connections. 2. Restart the inverter.

Code	Fault	Tigo Fault	What To Do
IE 012	RC OCP fault	Overcurrent protection fault	Check DC input and AC output impedance and wait for the system to return to normal.
IE 013	Isolation fault	Insulation fault	1. Wait for the system to return to normal. 2. Check wire insulation for damage.
IE 014	Temp over fault	Temperature fault	Check if ambient temperature exceeds the equipment limits. If exceeded, move or shade equipment. See installation requirements.
IE 015	Bat Con Dir fault	Battery connection fault	Check for reversed battery input lines.
IE 017	EPS (off-grid) overload fault	EPS (off-grid) overload fault	Shutdown the device drawing excessive power and restart the inverter.
IE 018	Overload fault	On-grid mode overload fault	Shutdown the device drawing excessive power and restart the inverter.
IE 019	PV conn dir fault	PV direction fault	Check if PV input lines are reversed.
IE 020	BatPowerLow	Battery power low fault	1. Shutdown the device drawing excessive power and restart the inverter. 2. Charge the battery to a level higher than the minimum protection capacity or protection voltage.
IE 021	Low temp	Low temperature fault	Check if the ambient temperature is too low.
IE 023	Charger relay fault	Charge relay fault	Restart the inverter.
IE 024	BMS lost	Battery communication fault	Check communication cables between the battery and the inverter are properly connected.
IE 025	Inter comms fault	Internal communication fault	Shut down the PV array, battery, and grid and reconnect the system.
IE 026	Fan fault	Fan fault	Check for foreign matters that could cause the fan to function improperly.
IE 027	Earth relay fault	EPS (off-grid) earth relay fault	Restart the inverter.
IE 028	Internal error	Internal error	Shut down the PV array, battery, and grid and reconnect the system.

Code	Fault	Tigo Fault	What To Do
IE 029	RCD fault	Residual current device fault	1. Check DC input and AC output impedance. 2. Disconnect and reconnect PV+/PV- and batteries.
IE 030	EPS (off-grid) relay fault	EPS (off-grid) relay failure	Disconnect and reconnect PV+/PV-, grid, and batteries.
IE 031	Grid relay fault	Electrical relay failure	Disconnect and reconnect PV+/PV-, grid, and batteries.

### Battery Codes

Code	Fault	Tigo Fault	What to Do
BE 11	BMS_Circuit_Fault	Battery – circuit failure	Restart the battery.
BE 12	BMS_ISO_Fault	Battery – insulation failure	Check that the battery is properly earthed and restart the battery.
BE 14	BMS_TempSen_Fault	Battery – temperature sensor failure	Restart the battery.
BE 17	BMS_Type_Unmatch	Battery – type failure	Use the Tigo EI app to upgrade the BMS software.
BE 18	BMS_Ver_Unmatch	Battery – version mismatch failure	Use the Tigo EI app to upgrade the BMS software.
BE 19	BMS_MFR_Unmatch	Battery – manufacturer not matching fault	Use the Tigo EI app to upgrade the BMS software.
BE 20	BMS_SW_Unmatch	Battery – hardware and software mismatch failure	Use the Tigo EI app to upgrade the BMS software.
BE 21	BMS_M&S_Unmatch	Battery – master slave control mismatch	Use the Tigo EI app to upgrade the BMS software.
BE 22	BMS_CR_NOREspond	Battery – charging request not responding	Use the Tigo EI app to upgrade the BMS software.

Code	Fault	Tigo Fault	What to Do
BE 23	BMS_SW_Protect	Battery – slave software protection failure	Wait for the Tigo EI app to finish updating BMS firmware.
BE 30	BMS_AirSwitch_Fault	Battery – air switch failure	If the battery breaker is ON, contact Tigo support.

## Specifications

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

## Warranty

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

## Customer Support

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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](#).
- Call +39 0550245175

Support hours are Monday – Friday, 9am – 1pm and 2pm – 6pm CET.

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.