



Tigo Energy Intelligence



Tigo Energy Intelligence Battery Storage Installation and Operation Manual

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Safety Symbols

The following safety symbols are used in this Installation and Operations manual. Please review these symbols and their meanings before installing or operating the system.

Symbol	Explanation
	WARNING indicates a hazardous situation which, if not avoided, could result in serious injury or loss of life . AVERTISSEMENT indique une situation dangereuse qui, si elle n'est pas évitée, pourrait entraîner la mort ou des blessures graves.
	CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury and damage to the product . ATTENTION indique une situation dangereuse qui, si elle n'est pas évitée, pourrait entraîner des blessures mineures ou modérées.
	NOTE is used to address additional information about the section's subject matter. AVIS est utilisé pour traiter des pratiques non liées aux blessures corporelles.

On the battery enclosure:

Symbol	Explanation
	Risk of electrical shock Risque d'électrocution
	Risk of burn injuries Risque de brûlures
	Observe the operating instructions Respectez les instructions de service



Safety Information

Save these instructions.

	Warning! Read all instructions in this manual to reduce the risk of injury, damage, and loss of life.
	The equipment detailed in this document is to be installed and maintained by qualified personnel only.
	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 .
	Caution! This product must operate within the technical specifications of the datasheet.
	Damage caused by failure to follow the contents of the EI Battery Storage Installation & Operation Manual is not covered by the warranty.
	Note The battery enclosure is NEMA 4 rated. Unused conduit openings must be properly sealed and all connecting conduit requires the use of appropriate fittings for the application.
	Use only copper conductors, solid or stranded. Never use fine stranded conductors. All conductors must have a minimum temperature rating of 75°C.



EI Residential Solution Overview

The Tigo Energy Intelligence (EI) Battery provides energy resilience in the event of a grid outage and optimizes energy consumption based on rate plans for today's home energy needs. The Tigo EI Battery is the energy storage component of Tigo's Energy Intelligence Solution. Each enclosure contains three battery modules for a total capacity of 9.9kWh.

The Energy Intelligence Residential Solution

The EI Residential Solution includes the following components:

1. **EI Inverter** – The TSI-7.6K-US and TSI-11.4K-US inverters may be installed as grid-tied only or as an energy storage system when paired with the EI Battery. The inverter converts the PV array's DC energy to AC for use in the building and when paired with an EI Battery, acts as the battery management unit.
2. **TS4** – Tigo's MLPE, the TS4-A-F provides module-level rapid shutdown. The TS4-A-O provides module-level monitoring, rapid shutdown, and best-in-class module-level optimization with Tigo's patented Predictive IV.
3. **EI Battery** (optional) – The LFP battery is designed for use specifically with the EI Inverter. Up to four battery enclosures may be installed with the EI Inverters.
4. **EI ATS** (required when batteries are used) – The EI ATS is an automatic transfer switch that switches the home loads from grid + Solar/battery usage to solar/battery usage only when the grid goes down. This is a required component of any energy storage system when connected to the utility grid as it prevents the potential for dangerous backfeed on the utility's conductors.
5. **Energy Meter** – (optional / required when batteries are used) – The energy meter monitors the import and export of energy into the home's electrical system. This allows the inverter to determine when and how much energy is required from the battery to serve connected loads.
6. **Energy Intelligence** – Accessible through the web or mobile app, the EI Platform provides visibility into system and module performance. The EI mobile app is also used for commissioning the EI Residential Solution.

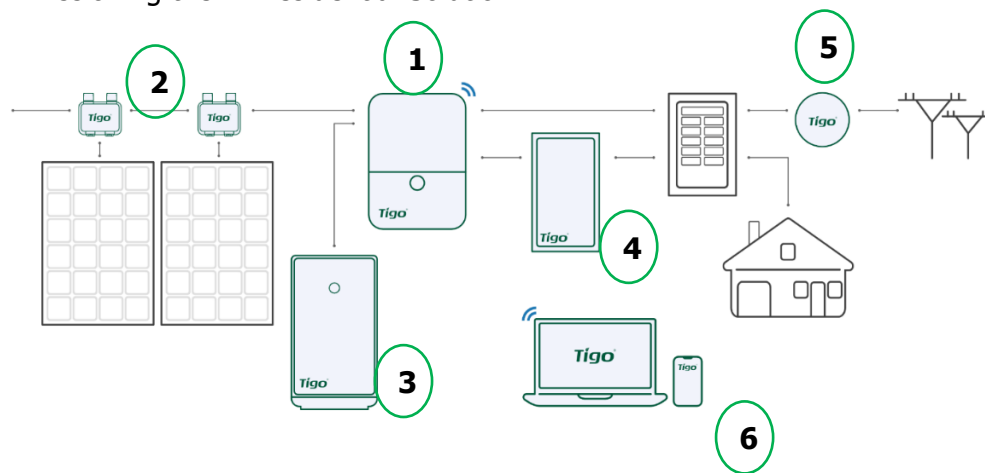


Figure 1 EI System Diagram



Transportation and Storage

When possible, transport the battery enclosure and battery modules in the original packaging, facing up and do not expose to inclement weather or unnecessary shocks and vibrations. If the original packaging cannot be used, a box of similar size, without damage, and can accommodate the weight of the battery enclosure and/or battery module may be used. Take precautions to ensure the packaging is fully closed and reasonably weather tight.

To store the battery enclosure, select a dry environment with ambient temperatures of -4°F to 113°F (-20°C – 45°C).

The battery modules may be stored in a dry location with an ambient temperature of -4°F to 113°F (-20°C to 45°C) and when installed within six months. This temperature range can be extended to -22°F to 140°F (-30°C to 60°C) if only storing the battery modules for 7 days.

Understanding this Document

This manual includes installation references to four separate components of the complete Energy Intelligence Residential Solution: inverter, battery, ATS and energy meter. Each of these components are required for the proper operation of the EI Battery.

Installation of the equipment can take place concurrently, although the EI Inverter is the hub of all equipment in this system. Where a workstream can split off from the main efforts of battery installation a QR code will be provided directing to the appropriate product's documentation.



Pre-Installation

When receiving delivery of the EI Battery, examine the packaging for damage. If the packaging appears to have damage through the box and into the contents, refuse delivery and notify the vendor immediately. If damage appears external only, open the box and inspect for any product damage and/or missing parts.

EI Battery Package Contents

Open the package and inspect the contents. The following components should be included. If anything is missing, please contact the vendor immediately.

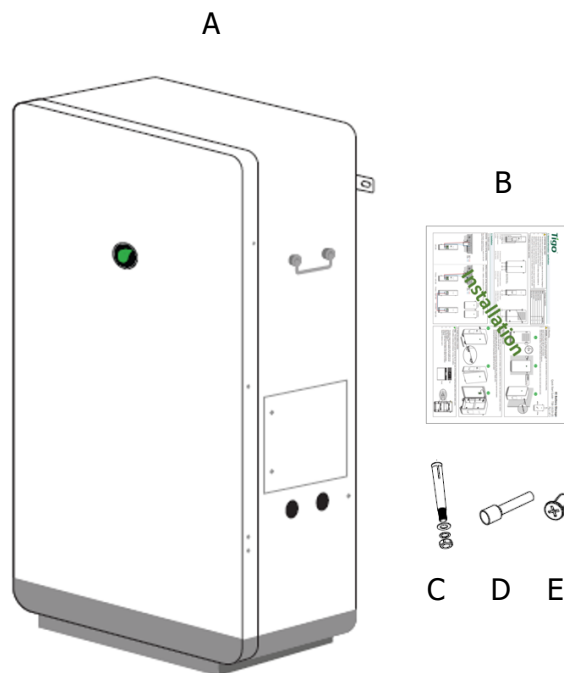


Figure 2 Package contents

Table 1 Package list

Item	Description	Quantity
A	Battery Enclosure	1
B	Quick Start Guide	1
C	Sleeve anchor	2
D	Wire ferrule	4
E	Safety-lock screws	6

Battery modules



Note:

The battery modules are shipped separately from the EI Battery enclosure. Three battery modules are installed in each EI Battery enclosure.

Inspect the battery module packaging upon receipt. If the box is damaged or rattles during transport this may indicate rough handling. Make a descriptive notation on the delivery receipt before signing. If obvious damage such as holes or serious impact, please contact Tigo.



Handling the battery modules

The following requirements are to ensure the safe and proper handling, storage and transportation of the battery modules. These requirements must be followed. If conditions or applications outside of the defined list below are needed, contact Tigo for guidance.

- Use the battery modules under the specified charge and discharge conditions outlined in this document.
- Do not immerse the battery module in water. Do not submerge the module or wet the module.
- Abnormal charging current and voltage from damaged protective devices may cause a chemical reaction within the module, which may result in heat generation, explosion and even fire.
- Do not heat. Do not place the modules in fire. Do not use or leave in a location near fire, heaters, or high temperature sources. The heat can melt module insulation, damage safety vent result in overheating or explosion.
- Do not attempt to crush, drop or penetrate the battery module.
- DO not attempt to modify the battery module.
- Stop using the module if any color change or mechanical damage is detected during the assembling, charging, normal operation or storage.
- In case of leaks or smells, track to thermal source, remove source and clean with water.
- Do not place or leave the battery modules and equipment in the reach of children so no small pieces can be swallowed, or damage could occur. In case of ingestion, consult with a doctor immediately.
- Keep leaked electrolyte away from contact with eyes and skin. In case of leakage, immediately clean with water and seek help from a doctor. Serious damage can be caused due to delay of treatment.
- Do not connect the module with positive (+) and negative (-) terminals reversed.
- Do not short circuit. Do not let the module terminals (+ and -) contact a wire or any metal. In such a case, the module is short circuited and may generate excessive current which may result in heat or explosion.
- Do not throw or drop the module. Strong impact may damage the protective devices, which may cause an abnormal chemical reaction during the charge. This could result in heat generation or fire from the battery module.
- Do not drive a nail in, hit with a hammer, kick or stamp the module. N such case the module may be deformed and short circuited. This may cause heat generation, fire, or explosion.
- Do not solder the battery module. Heat applied during soldering may damage the insulation of the safety vent and mechanism. This may cause heat generation, fire, or explosion.
- Do not disassemble or alter the battery module. The module employs a safety mechanism and a protecting device in order to avoid danger. If the module is damaged it could result in heat, fire, or explosion.



- Stop charging after reaching specified charge time even if capacity is not reached. Nor use beyond the specified conditions and applications. Otherwise the module may cause heat, fire or an explosion.
- The battery module may have insufficient capacity after long periods of storage.
- Always install the battery modules inside the EI Battery enclosure.
- Read all instructions regarding battery module installation and operation to avoid damages.

Transporting the battery modules

The battery modules are classified as Class 9 dangerous goods under UN38.3 and shall be transported in accordance with UN38.3 and SN/T 0370.2-2009.

- Use a van-type vehicle. Platform and convertible vehicles are prohibited from transporting the battery modules. Prevent from direct sun exposure, rain, condensation and mechanical damage.
- To protect the modules from moving, falling or crash, straps and bubble bags shall be used during transportation. Specifically, straps are required for both short and long-distance transports. Short distance transport does not require bubble bags.
- Never transport along with explosive, flammable, or toxic materials.
- Do not stack more than four modules.
- Maintain temperature between -20°C and 45°C, 5-95% relative humidity.
- An extinguisher designed specifically for lithium batteries shall be installed in transport vehicles.
- A damaged box or rattling during transportation may indicate rough handling. If obvious damage is present, please contact Tigo immediately.

Storing the battery modules

If the battery modules must be stored prior to final delivery to the installation site, follow the requirements below for safe storage.

- Modules should be placed no higher than two meters from the floor.
- Modules with safety deficiencies shall be stored separately with a wall in between or in different fire zones than operational battery modules.
- Prevent electrical fire sources near the battery storage.
 - Electrical conduit, wiring, devices in the vicinity must be undamaged and in good working condition.
 - Use cold light source in warehouse. If spotlight is used, at least 1 meter clearance is required from flammable material.
- Smoking is prohibited. Smoking points should be reasonably designed with a fire-retardant wall separating the warehouse storage.
- Warehouse should employ rodent protective measures such as plugging holes and sealing door leaks to 10mm gap and expelling/exterminating when needed.
- Warehouse canopy must use fire retardant materials and prohibit flammable materials such as plastics and canvas.

- Warehouse should be equipped with fire detection and surveillance video kept for at least one month.
- Keep a dry, clean storage location with proper ventilation. Ensure a relative humidity of 5-95%. If ambient temperatures range from -30°C to 60°C the modules may store up to seven days. If temperatures range from -20°C to 45°C the storage may last for up to six months.
- Battery performance is vulnerable to chemical corrosion, strong acid, strong base, electrochemical corrosion, salt spray and radiation.
- **Fire extinguishers:**
 - The warehouse must be equipped with multiple varieties of battery fire extinguishers, including fire sand, blanket and powder extinguishers.
 - Micro fire station is recommended to be deployed with firefighter helmet, fire protection mask, safety gloves, and at least one set of first aid kit, including medical devices and drugs.
- **Smoke discharge:**
 - Equip 24-hour fan with failure alert. Fan should coordinate with smoke detector or gas concentration detector.
 - Ventilation capacity should not be less than 12 times per hour and fan speed should exceed 0.5m/s.
 - Fan portfolio includes axial flow fan on wall (effective distance less than 5m), fan with fixed air hose, mobile fan with flexible aluminum foil. Wall fan combined with mobile fan is recommended.
- **Fire retardant buildings:**
 - Warehouse and installation site should use level two fire retardant building materials like rock, steel plate, plasterboard, and iron rain-shed. Flammable materials like foam and plastics are prohibited.

**Note:**

The battery modules state of charge (SOC) is more than 30%. The module must be charged after 6 months of storage.

Tools & Items Needed for Installation

Table 2 Required Tools

Item	Needed for:
#2 Phillips screwdriver	Removing/replacing covers
1/8" flathead screwdriver	Terminating conductors
Pencil	Marking drill holes
Level	Mounting the equipment
Drill & 8mm drill bit*	Drilling pilot holes for mounting. *Bit size will depend on the mounting surface material and anchor sizes required.

EI Battery Overview

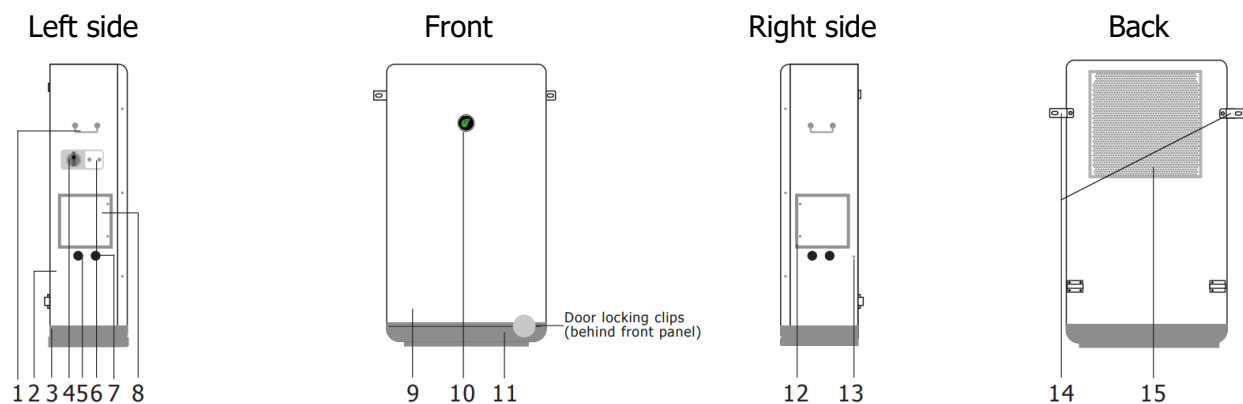
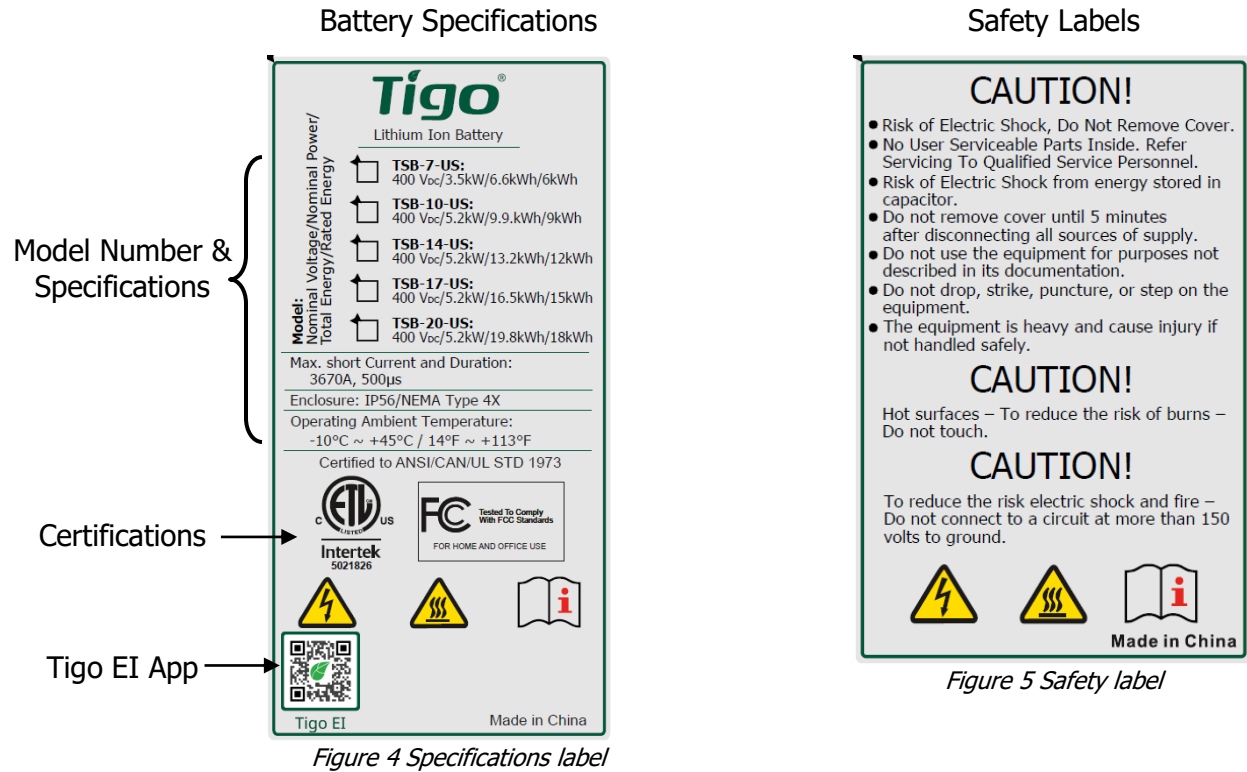


Figure 3 Battery Enclosure Overview

- | | | |
|----------------------|----------------------------|--------------------------------|
| 1) Handle | 7) Communications knockout | 12) Battery expansion wire box |
| 2) Battery enclosure | 8) Inverter connection | 13) GEC/bonding terminal |
| 3) Base | wire box | 14) Mounting tabs |
| 4) Disconnect switch | 9) Front cover | 15) Heat sink |
| 5) DC knockout | 10) LED indicator | |
| 6) Power button | 11) Base front cover | |

EI Battery Labels

EI Battery labels provide the technical specifications of the product as well as important safety information. Additional information is available on these and other labels which will help with the commissioning and installation of the EI Battery.



The battery enclosure has a wire box door on each side. The *inverter connection wire box* (8) includes two labels specifying the battery output terminals for connection to the inverter and the communications ports.

+	-
BAT	

Figure 6 BAT-INV label

INV	Link in	Link out
COM		

Figure 7 BAT COM label

The *battery expansion wire box* (12) includes two labels specifying the battery expansion terminals for connection to additional EI Batteries and a communications port.

CAN
COM

Figure 8 CAN/COM label

+	-
BAT-Expansion	

Figure 9 BAT-Expansion label



EI Battery Weight and Dimensions

Table 3 Weight and Dimensions

Model	Dimensions (W x D x H)	Weight
TSB-10-US	25.6 x 12.6 x 45.7in (650 x 320 x 1160mm)	308.6lbs (140kg)
TSB-20-US	2pcs: 25.6 x 12.6 x 45.7in (650 x 320 x 1160mm) each	2pcs: 308.6lbs (140kg) each

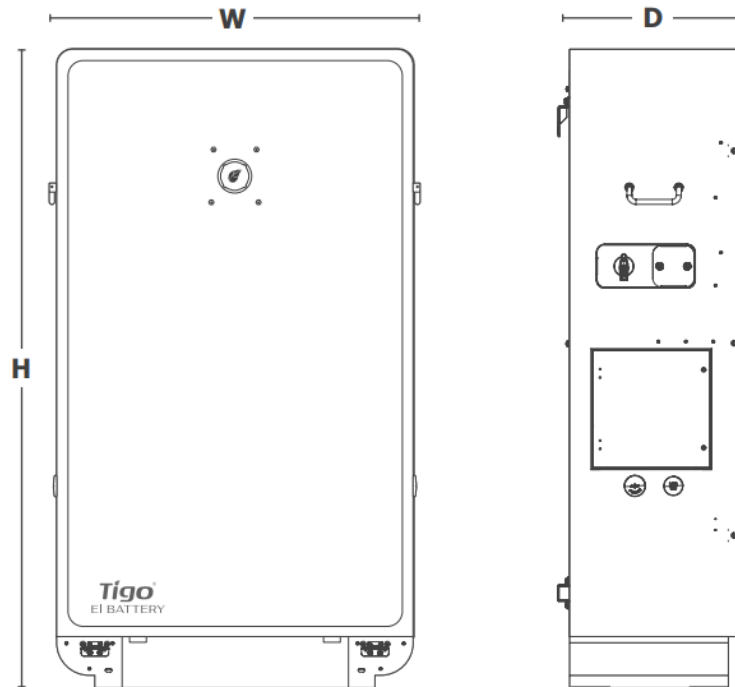


Figure 8 Battery enclosure dimensions

Selecting the Installation Location

The EI Battery enclosure's *Inverter connection wire box* (**8**) is on the left. Consider the conduit path between the left side of the EI Battery and the EI Inverter when choosing the installation location.

When multiple EI Batteries are being installed, consider the conduit path between the right sides of any two battery enclosures. The *Battery expansion wire box* (**12**) is located on the right side and the expansion connections occur between these wire boxes.



Installation requirements

The battery installation must comply with the following requirements.

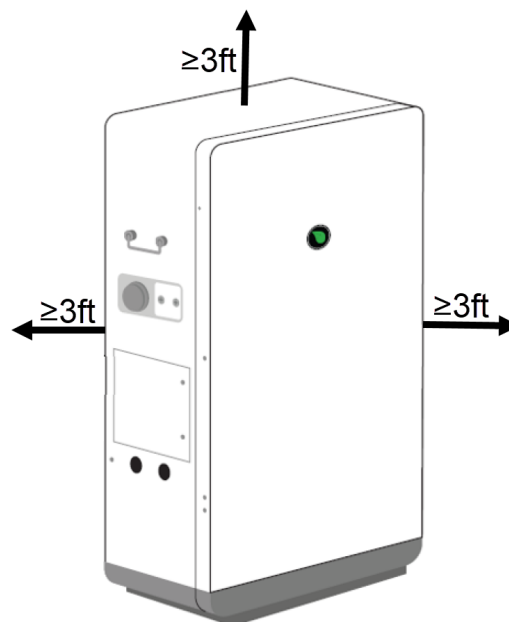
- Select a wall or solid vertical surface that can support the EI Battery.
- Select an installation location in which the LED display on the front cover will be easily viewed.
- Select a well-ventilated location sheltered from direct sunlight and rain.
- Do not install in cabinets; good ventilation ensures the heat will adequately escape.
 - The ambient temperature should be below 40°C for optimal operation.
- Do not install the battery enclosure on structures constructed of highly flammable materials.
- The humidity at the installation location must be 0-100% without condensation.
- The installation location shall always be accessible.
- Mount the battery enclosure vertically. Do not install horizontally, tilting forward, sideways or facing upside down.
- Do not install and operate the battery on or near easily flammable material.
- Ensure the EI Battery is out of reach of children.
- Do not cover or place items on the battery enclosure.
- Install in a location away from any antennas or any other sources of strong electromechanical interference.



Note:

If installing multiple battery enclosures, the battery expansion cables should not exceed a length of 6ft-7in. Space enclosures accordingly.

The minimum clearances shown below must be observed.



Installation

	Caution For personal safety always wear appropriate PPE and use all safety precautions suitable for the working environment, including the use of insulated tools.
	Note: All electrical installations must be completed in accordance with all local electrical codes and the National Electric Code, NFPA 70 (NEC). For installation in Canada the installations must be completed in accordance with applicable Canadian standards. Before connecting the inverter to the power distribution grid, contact your local electric utility company. These connections may only be made by qualified personnel.

Mounting the EI Battery

Tools needed: Electric drill, 8mm bit hammer/mallet, level, pencil, socket wrench

Accessory parts needed: Sleeve anchors (C)

	Warning! Before drilling into the wall, inspect for existing electrical or plumbing installations to avoid electric shock or other injuries.
	Note The instructions below are for securing the enclosure to drywall. If another surface is used, use the appropriate hardware to securely mount the battery enclosure.

- 1) Before positioning the EI Battery in place, identify the **mounting tabs (14)** on the back of the enclosure. Place the EI Battery and rotate the mounting tabs 90° to the outside.

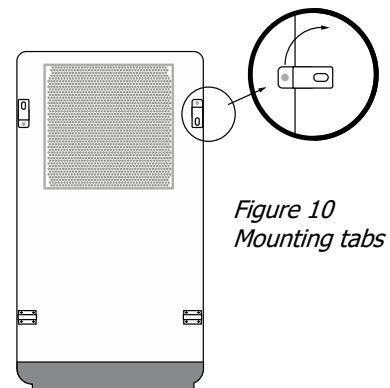


Figure 10
Mounting tabs

- 2) Mark holes through the mounting tabs for drilling. Drill 2in (5cm) deep holes with an 8mm bit.

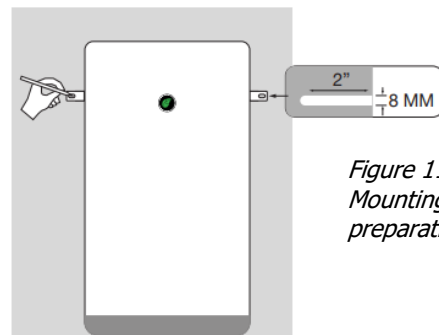


Figure 11
Mounting
preparation

- 3) Insert sleeve anchors in the pilot holes and assemble the anchor. Secure bolt and washers against the mounting tabs to secure to the wall.

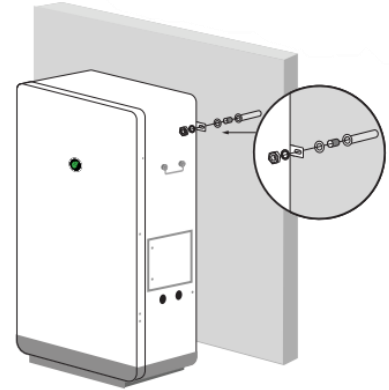


Figure 12 Securing the EI Battery

Removing the front cover

Tools needed: #2 Philips head screwdriver

- 1) Remove the lower *base plate* (11) and 6 screws (3 from each side) securing the *front cover* (9). Unlatch the two front cover locks from the bottom, as shown.

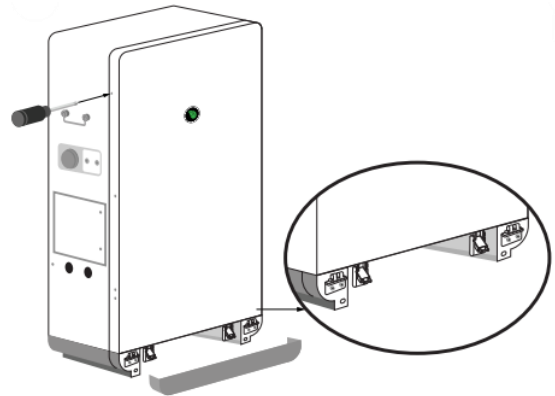


Figure 13 Base plate removal

- 2) Tilt cover up and CAREFULLY swing the front cover to the left, using caution to not pull ground or display wires.

	CAUTION! The front cover has a grounding wire and display cable attached to the interior. Use caution and detach wires before carefully attempting to remove the cover.
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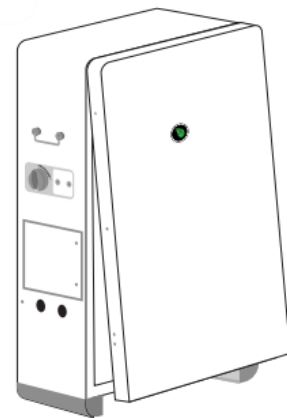


Figure 14 Front cover removal

- 3) Unscrew ground conductor and unplug the display cable then set front cover aside.

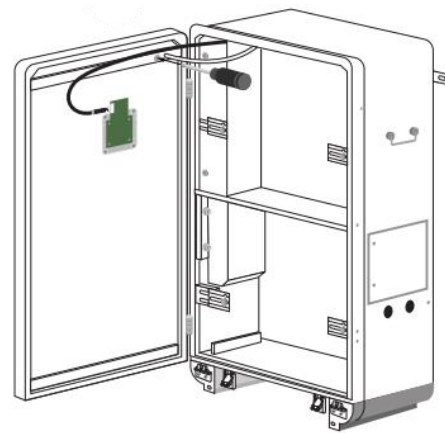


Figure 15 Display cable and ground connection

Battery module installation

Accessory parts needed: Battery modules (shipped separately, 3 per enclosure)

	WARNING! Danger to life from electric shock due to high voltages. High voltages are present in the DC cables and during the operation of the system. Do not install and operate the EI Battery on or near easily flammable material.
	CAUTION! Risk of burns due to hot surfaces. The surface of the battery enclosure can become very hot. During operation do not touch any portion other than the wire box compartment. Mount the EI Battery such that it cannot be inadvertently touched.
	CAUTION! Only make the internal battery connections when the battery EI Residential Solution will be ready to be turned on and begin charging the batteries. Never leave batteries connected without the ability to charge from the grid or PV power.

Unbox the battery modules to prepare for installation. The modules are shipped with enough charge to allow dark start. The battery module's power terminals face the right side of the EI Battery enclosure.

The battery cables are pre-installed and labeled inside the enclosure. These cables are tied inside the enclosure. These cable ties will need to be cut in order to make the required connections.

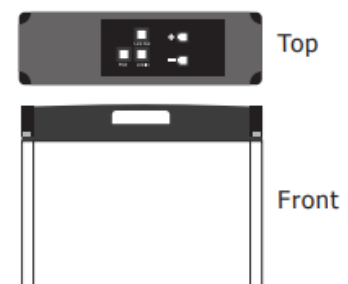


Figure 16 Battery modules



Note:

The battery module serial numbers will be needed later during the commissioning and warranty completion. The serial is provided on the battery module as well as its box. Note which battery is installed in each position on the respective box.

Place battery module in the enclosure then slide the brackets inward on each side of the battery and tighten the wingnuts to secure.

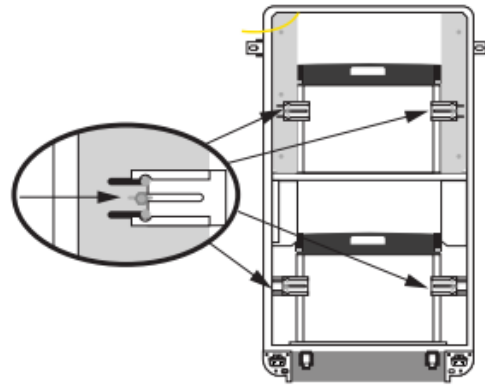


Figure 17 Mounting the battery modules

Wiring the battery modules (Battery enclosure 1)



CAUTION!

Do not reverse the positive and negative of the battery input terminals.



Note:

The battery conductors and communications cables are labeled and located inside the enclosure. Carefully cut cable ties and connect as shown. When properly installed a “click” will be heard.

Three types of cables are located inside the EI Battery enclosure:

- The **PCS** communication cable is used to connect the batteries to the Battery Management System (BMS) inside the EI Battery enclosure. Only one battery module 1 (upper battery) is connected directly to the BMS in a single EI Battery installation.
- The battery modules are connected in series by the **Link-In** and **Link-Out** communications cables.
- The battery modules are wired together for power using the **BAT+** and **BAT-** conductors.

Upper battery

- 1) Locate the cables labeled for the upper battery module and cut cable ties to free the cables.
- 2) Connect the **Upper Bat PCS** cable to the battery terminal labeled **PCS**.
- 3) Connect the **upper BAT link-out** cable to the battery port labeled **link-out**.
- 4) Connect the **upper BAT +** plug to the red battery terminal labeled **+**.
- 5) Connect the **upper BAT -** plug to the black battery terminal labeled **-**.

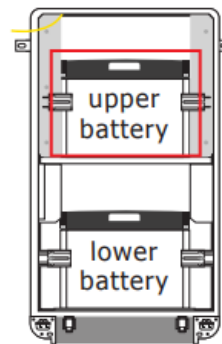


Figure 18 Upper battery module

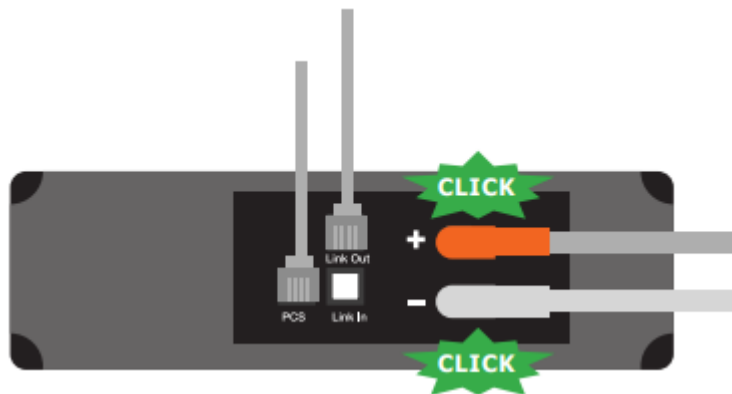


Figure 19 Upper battery connections

Lower batteries



Note:

IF INSTALLING ONLY ONE EI BATTERY ENCLOSURE, a terminating cap is required in the **CAN/COM** port in the right-side *battery expansion wire box (12)*. Do not remove this cap.

Inner battery

- 1) Locate the cables labeled for the lower battery modules and cut cable ties to free the cables.
- 2) Connect provided **lower inner BAT link-out** cable (loose cable) to the lower inner battery terminal labeled **link-out**.
- 3) Connect the opposite end of the **lower inner BAT link-out** cable from step 2 to the **link-in** terminal on the lower outer battery.
- 4) Connect the **lower inner BAT link-in** cable to the lower inner battery **link-in** terminal.
- 5) Connect the **lower inner BAT +** plug to the lower inner battery red terminal labeled **+**.
- 6) Connect the **lower inner BAT -** plug to the lower inner battery

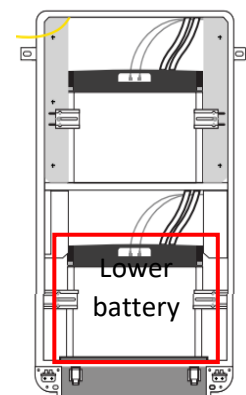


Figure 20 Lower battery modules

black terminal labeled -.

Outer battery

- 7) Connect the **lower outer BAT +** plug to the lower outer battery red terminal labeled +.
- 8) Connect the **lower outer BAT -** plug to the lower outer battery black terminal labeled -.
- 9) Connect the **lower outer BAT link-out** cable to the **link-out** terminal on the lower outer battery.

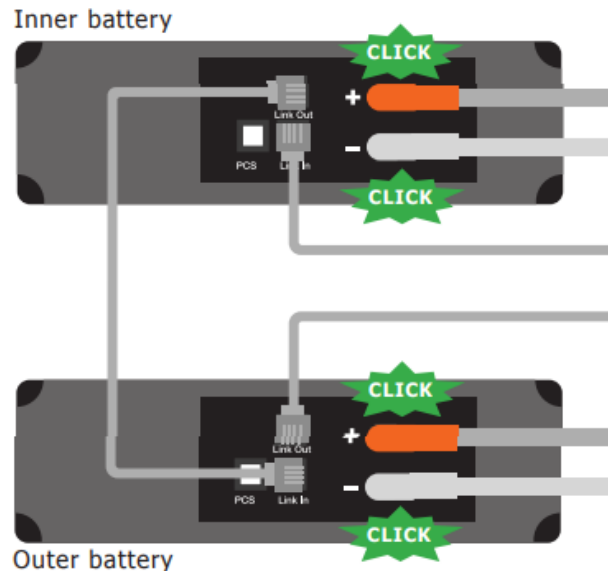


Figure 21 Lower battery connections

- 10) After all three batteries have been installed and connected, the *front cover* (9) can be replaced by following the steps to remove the cover in reverse order. **Remember to plug in the display cable and reconnect the EGC.** The 6 front cover screws should be torqued to 1Nm.



Wiring the battery modules (Battery enclosure 2)

If installing a second EI Battery enclosure complete the **power**, **Link-In** and **Link-Out** connections as described in the previous section.

EI Battery enclosure 1

Remove the terminating cap from the CAN/COM terminal in the *Battery expansion wire box* (12) and insert it in the Link-in terminal of battery module 1 (upper module/enclosure 1).

EI Battery enclosure 2

The terminating cap is inserted in the CAN/COM terminal in the *Battery expansion wire box* (12). **Do not remove this cap.**



In the next section, *Wiring the EI Battery – Battery expansion*, a communication cable is routed between the two enclosures. At the second enclosure this cable will terminate at the **Link-in** terminal of battery module 4 (upper module/enclosure 2).

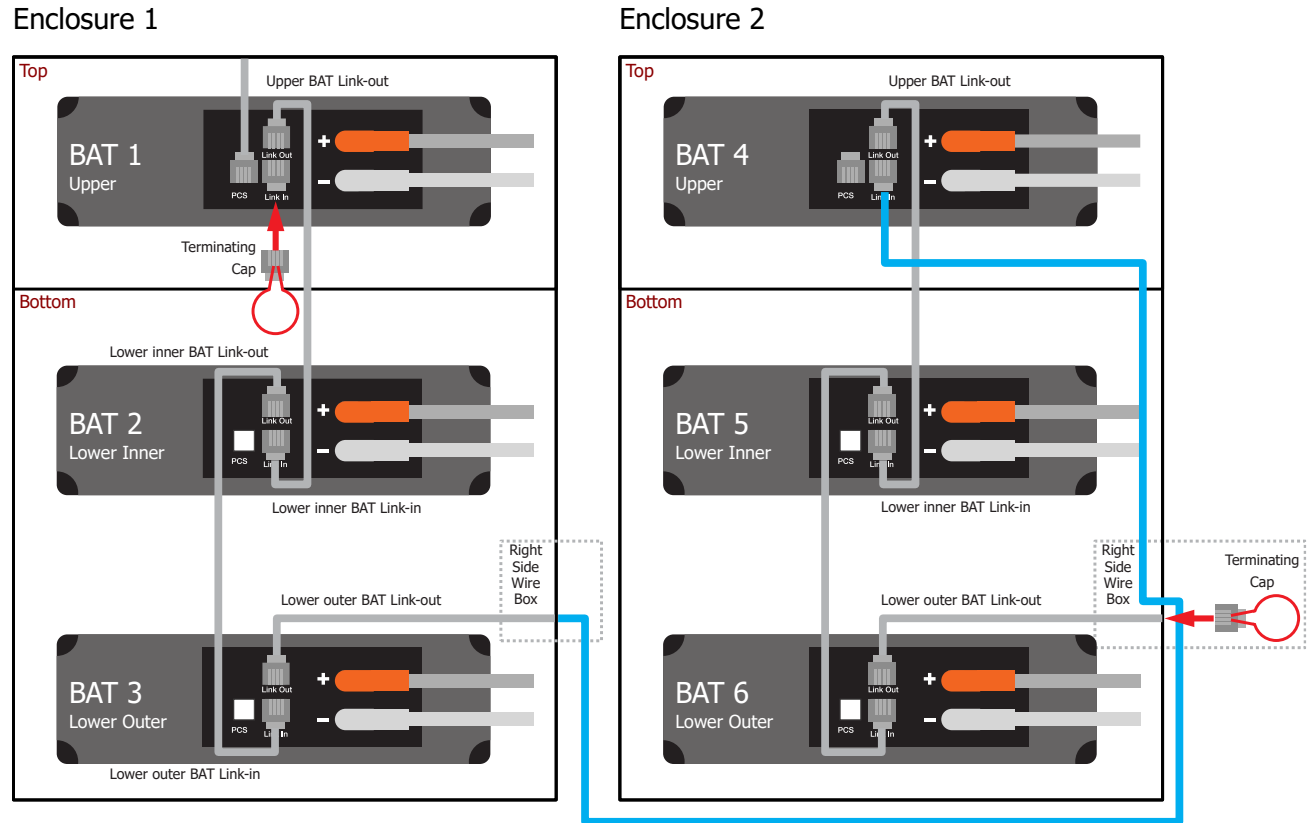


Figure 22 Battery module expansion wiring diagram

Wiring the EI Battery

	CAUTION! Risk of electric shock! Ensure the inverter and battery cabinet are completely powered off when performing these steps.
	Always wear appropriate PPE and use insulated tools.
	Make sure to connect the battery-inverter power conductors first and then connect the communications cable to the inverter.
	Note: To ensure a reliable connection always use wire ferrules (D) on the end of all conductors.

Battery expansion

Tools needed: #2 Philips screwdriver, wire cutter, crimping tools; O-type terminal and RJ-45
*Accessories parts needed: Wire ferrules (**D**), RJ-45 connector, CAT5/6, 8-6AWG conductors*

	Note: This section applies to systems with multiple battery enclosures.
	Battery expansion cables should not a length of exceed 6ft-7in.

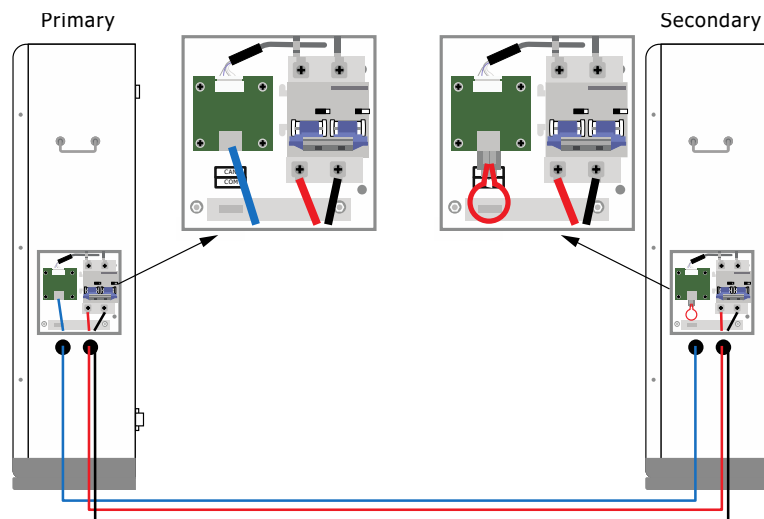


Figure 23 EI Battery expansion

- 1) Using a Philips screwdriver, loosen the 2 captive screws on the expansion wire box (**12**) on the right side of each enclosure.
- 2) Install 2 conduits from the right side of Primary to the right side of Secondary for the DC conductors and communication cable. Use appropriate conduit fittings to provide a water-tight seal.

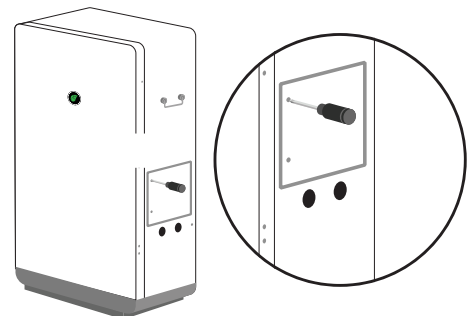


Figure 24 EI Battery expansion preparation

DC Conductors

- 3) Route two 8-6AWG conductors (black/red) through the BAT-Expansion conduit.
 - a. Use a crimping tool to crimp a *wire ferrule (D)* to the end of each conductor.

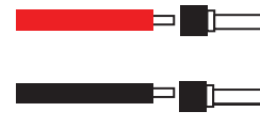


Figure 25 Conductor preparation

- 4) Connect **BAT-Expansion +** from Primary to **BAT-Expansion +** of Secondary.
- 5) Connect **BAT-Expansion -** from Primary to **BAT-Expansion -** of Secondary.

+	-
BAT-Expansion	

Figure 26 BAT-Expansion label

Communication cable

- 6) Route one CAT5/6 cable through the COM-Expansion conduit.
 - b. Use a crimping tool to crimp an RJ-45 connector on each end of the cable. CAT5/6 cables have 8 wires (four twisted pairs). Two wiring standards exist: T-568B and T-568A, as shown below. Either standard may be used, as long as both ends of the cable use the same wiring standard.

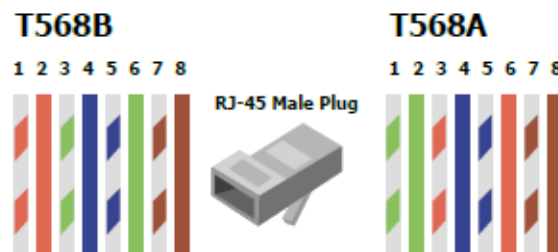


Figure 27 Data cable wiring standards

Table 4 T568A and T568B wiring standards

RJ45 Pin #	Wire Color		Signal	Function
	T568B	T568A		
1	White/Orange	White/Green	Enable +	Battery wake-up signal
2	Orange	Green	Enable -	
3	White/Green	White/Orange	CANL	Battery CAN communication
4	Blue	Blue	CANH	
5	White/Blue	White/Blue	GND	GND
6	Green	Orange	Received	NC
7	White/Brown	White/Brown	RS485B	Battery RS485 communication
8	Brown	Brown	RS485A	

- 7) Connect the CAT5/6 cable to the **CAN/COM** terminal in the primary EI Battery's *battery expansion wire box (12)*.
- 8) At the secondary battery enclosure, the CAT5/6 cable enters the

CAN
COM

Figure 28 CAN/COM label

battery enclosure and terminates in the Link-in terminal of the upper battery module (**BAT 4** in the *Battery module expansion wiring diagram*).

- 9) Confirm the terminating cap is inserted in the **CAN/COM** terminal of the secondary battery's *battery expansion wire box* (**12**).
- 10) Close the *battery expansion wire box* (**12**) on each battery enclosure. Screw the two provided screws per wire box back into place with a torque of 1Nm to re-seal the wire box.

Connecting the EI Battery to the EI Inverter

Tools needed: #2 Philips head screwdriver, wire cutter, crimping tools; wire ferrule and RJ-45
Accessories parts needed: Wire ferrules (D), 10-8AWG conductors, RJ-45 connectors, CAT5/6 cable



Note:

This section corresponds with *Battery Connections* and *Battery Communications Connections* in the EI Inverter Manual.



EI Inverter

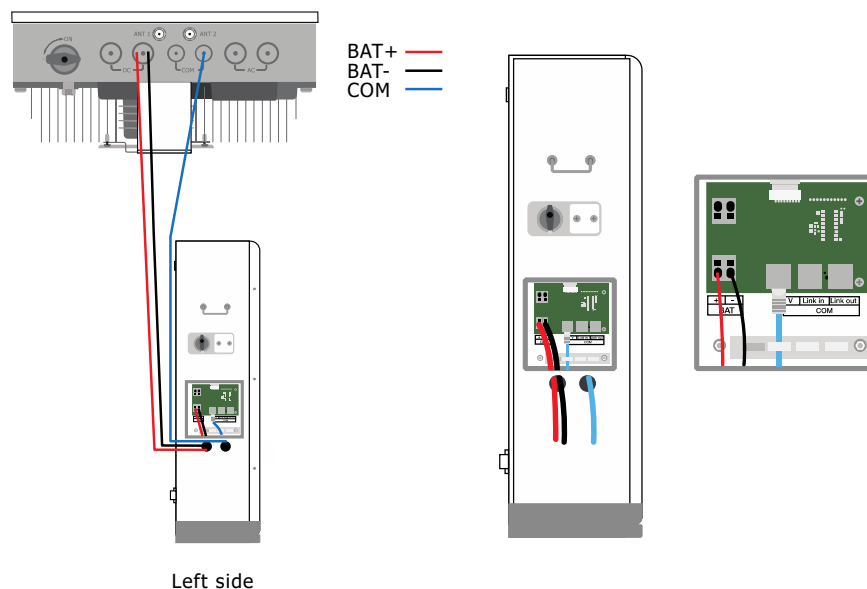


Figure 29 EI Battery - EI Inverter connections

1. Using a Phillips screwdriver, loosen the two captive screws of the Primary EI Battery's *Inverter connection wire box* (**8**).
2. Remove the two waterproof knockouts (**5**), (**7**) at the bottom of the left side of the enclosure. Connect two conduits from the battery enclosure to the inverter. Use appropriate water-tight fittings.

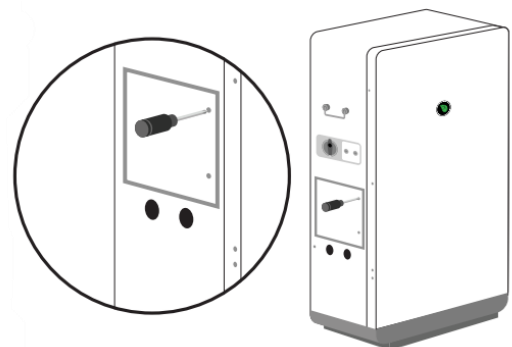


Figure 30 Inverter connection preparation

DC conductors

3. Prepare two conductors (10-8AWG) and route through the BAT-INV conduit (5).
 - a. Use a crimping tool to crimp a *wire ferrule (D)* to the end of each conductor.
4. Verify the BAT-switch is in the OFF position
5. Insert the BAT-INV conductors into the terminals of **BAT+** and **BAT-**.

Figure 31 Inverter connection preparation



Figure 32 Conductor preparation

+	-
BAT	

Figure 33 BAT output label

Communication cable

6. Route the CAT5/6 communication cable through the INV-communications conduit (7).
 - a. Use an RJ-45 crimping tool to crimp an RJ-45 connector at each end of the CAT5/6. Reference *Table 4* for wiring standards T568A and T568B.
7. Insert the RJ-45 connector into the **INV** **COM** port.
8. Once complete, replace the wire box covers and torque the screw to 1Nm.

INV	Link in	Link out
COM		

Figure 34 INV-COM label



Commissioning

The EI Battery uses the Tigo EI mobile App to commission the system. If not already downloaded on a mobile device, scan the QR code to access the latest EI app for Android and iOS. This QR code is also located on the side of the battery on the specifications label.



	Caution! High voltages in the PV system. Risk of serious injury due to electric shock. Only electrically qualified personnel may perform work on the PV system.
	Warning! Read all instructions, cautions and warnings for the EI Battery and connected devices. Installation and commissioning must be performed by a licensed electrician or other qualified person in accordance with local, state and National Electric Code ANSI/NFPA 70 requirements.

Pre-power Check

Use the following checklist before powering on the EI Residential Solution.

Table 5 Pre-power checklist

✓	Item	Acceptance
	Communications Cable	The communications cable is labeled and properly connected to both the inverter and battery communications terminals.
	Battery power conductors	The battery power conductors are labeled and properly connected to the inverter and battery terminals.
	GEC/bonding	If required , the GEC/bonding conductor is properly connected
	Expansion wiring	If multiple batteries are installed , BAT-Expansion+/BAT-Expansion- conductors and communications cable are properly connected.
	Conduit connections	All conduit attachments are sealed and bonded, where necessary.
	Unused conduit openings	Any unused conduit openings are fitted with waterproof caps (provided) or were left unopened.
	Disconnect switches	The BAT-switch and all other switches connecting to the EI Battery are OFF.
	Installation environment	An appropriate installation space, meeting the criteria of the <i>Installation requirements</i> , has been chosen and the environment is left clean and accessible.



Torque Table

Table 6 Torque table

EI Battery front cover (9)	1.0Nm
Inverter connection wire box (8)	1.0Nm
Battery expansion wire box (12)	1.0Nm
Mounting anchors	1.0Nm
BAT-Expansion terminals	1.0Nm
BAT-INV terminals	1.0Nm

Powering on the EI Solution

	Warning! Before powering on this system, ensure the appropriate PPE is being used, including insulated tools.
	Note: All other components of the EI Battery Storage system, including the energy meter must be installed for the system to operate.

1. Turn ON the disconnect switch (4) above the *Inverter connection wire box* (8).
2. If multiple batteries installed, turn on the BAT-Expansion breaker in the Battery expansion wire box (12). Otherwise, skip this step.
3. Turn on the inverter and wait 10 seconds for the inverter to send the wake-up signal. Observing the LED indicator of the battery enclosure, confirm the battery system enters the discharge state (center leaf is lit green). The battery storage system has been successfully started.
4. Use the EI mobile app to commission the system. Set the battery to charge to >60%.

	Note: All grid settings, modes of operation, and communications preferences take place in the Energy Intelligence App. This communication occurs between the mobile device and the EI Inverter. The inverter communicates all settings/modes of operation to the EI Battery.
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LED Status

The front cover of the EI Battery includes an LED status indicator. This indicator is comprised of two parts, the center Leaf indicator (**A**) and the Ring indicator (**B1-B4**). The Leaf indicator indicates status of the battery, and the Ring indicator indicates the battery power.

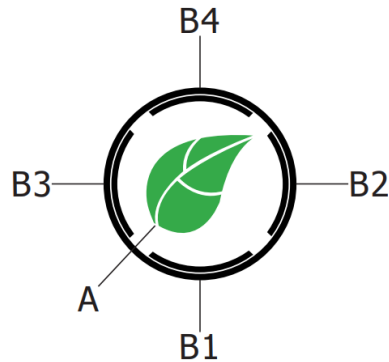


Figure 35 LED indicator

These LEDs communicate different messages by the blinking of the different icons.

Table 7 LED Messages

Status	LED	Light display
Standby state	Leaf	Flashing green (0.5 seconds on, 2 seconds off)
	Ring	Power $\leq 25\%$, LED B1 is on, LED B2/3/4 are off
		Power $\leq 50\%$, LED B1/2 are on, LED B3/4 are off
		Power $\leq 75\%$, LED B1/2/3 are on, LED B4 are off
		Power $> 75\%$, LED B1/2/3/4 are on
Charge state	Leaf	Steady green
	Ring	Power $\leq 25\%$, LED B1 flashes, LED B2/3/4 are off
		Power $\leq 50\%$, LED B1 is on, LED B2 flashes, LED B3/4 are off
		Power $\leq 75\%$, LED B1/2 are on, LED B3 flashes, LED B4 is off
		Power $> 75\%$, LED B1/2/3 are on, LED B4 flashes
Discharge state	Leaf	Steady green
	Ring	Power $\leq 25\%$, LED B1 is on, LED B2/3/4 are off
		Power $\leq 50\%$, LED B1/2 are on, LED B3/4 are off
		Power $\leq 75\%$, LED B1/2/3 are on, LED B4 are off
		Power $> 75\%$, LED B1/2/3/4 are on
Alarm state	Leaf	Green light flashes (0.5 seconds on, 0.5 seconds off)
	Ring	Power $\leq 25\%$, LED B1 is on, LED B2/3/4 are off
		Power $\leq 50\%$, LED B1/2 are on, LED B3/4 are off
		Power $\leq 75\%$, LED B1/2/3 are on, LED B4 are off
		Power $> 75\%$, LED B1/2/3/4 are on

Fault state	Leaf	Red light flashes (1 second on, 1 second off)
	Ring	Power $\leq 25\%$, LED B1 is on, LED B2/3/4 are off
		Power $\leq 50\%$, LED B1/2 are on, LED B3/4 are off
		Power $\leq 75\%$, LED B1/2/3 are on, LED B4 are off
Upgrade state	Leaf	Yellow light flashes (1 second on, 1 second off)
	Ring	Power $\leq 25\%$, LED B1 is on, LED B2/3/4 are off
		Power $\leq 50\%$, LED B1/2 are on, LED B3/4 are off
		Power $\leq 75\%$, LED B1/2/3 are on, LED B4 are off
Manual forced power ON	Leaf	Green light flashes (0.1 second on, 0.1 second off)
	Ring	Power $\leq 25\%$, LED B1 is on, LED B2/3/4 are off
		Power $\leq 50\%$, LED B1/2 are on, LED B3/4 are off
		Power $\leq 75\%$, LED B1/2/3 are on, LED B4 are off
Manual forced OFF	Leaf	Red light flashing (0.1 second on, 0.1 second off)
	Ring	Power $\leq 25\%$, LED B1 is on, LED B2/3/4 are off
		Power $\leq 50\%$, LED B1/2 are on, LED B3/4 are off
		Power $\leq 75\%$, LED B1/2/3 are on, LED B4 are off
		Power $> 75\%$, LED B1/2/3/4 are on

Powering Off the EI Solution

	CAUTION – Risk of Shock and burns! Wait 5 minutes after complete system shutdown has been initiated before servicing the battery. Always wear appropriate PPE when servicing the system.
	• Ensure the battery shutdown command is sent from the EI mobile app. The app command prevents the inverter from entering backup mode. • Power off battery system after the inverter has shut down. • Shut down grid, PV, and battery completely.

1. Open the EI App and send the "System Shutdown" command.
2. Open/turn off the AC disconnect switch between inverter and the service entrance.
3. Open/turn off the DC disconnect switch at the bottom of the inverter.
4. Power off the battery

Forced start/shutdown

The EI Battery includes a Power button (6). This button is used to turn on the battery system when no PV is available, to force a shutdown during normal operation, or to perform a functional test during commissioning.

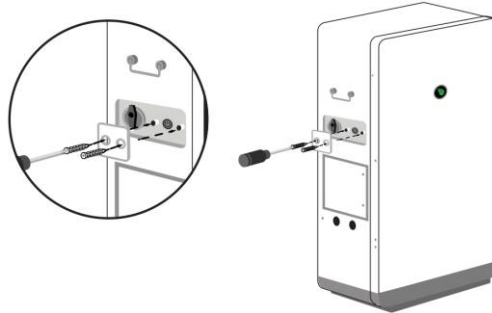


Figure 36 Forced start/shutdown

- 1) Using a Philips screwdriver, remove the screws from the cover of the forced start power button (6).

To perform a functional test during commissioning:

- 2) Power ON:
 - a. Press and hold the Power button (6) for 6 seconds. The internal battery modules will awaken, and LED indicator will light up.
 - b. Press and hold for 10 seconds until the Leaf quickly flashes. The DC output voltage is now turned on.
- 3) Power OFF:
 - a. Press and hold Power button (6) for 10 seconds until the Leaf quickly flashes. The DC output voltage is now turned off.

To turn on the battery system when no PV is available:

- 2) Turn ON the disconnect switch (4) above the *Inverter connection wire box* (8).
- 3) If the battery system includes more than one enclosure, turn on the BAT-Expansion switch in each enclosure's *BAT-Expansion wire box* (12)
- 4) Press and hold *Power button* (6) for 10 seconds while watching the LED indicators and release the Power button once the Leaf begins quickly flashing green.
- 5) Wait 10 seconds and confirm the LEDs indicate the system is entering the Discharge state.

To force shutdown the battery system:

- 2) Press and hold *Power button* (6) for 10 seconds. Observe the LED indicators and release the Power button once the Leaf changes from green light to quickly flashing red.
- 3) Wait 10 seconds and confirm the LEDs indicate the system is entering the Standby state.
- 4) Turn OFF the BAT-switch in the *Inverter connection wire box* (8).

Replace the Power button cover when complete.



After Installation

Congratulations, the EI Solution has been installed!

Cleaning and Care

If the EI Battery is dirty, a clean, damp cloth can be used to wipe down the front surface. Never use cleaning agents (e.g., solvents or abrasives).

Maintain proper clearances throughout the lifetime of the system to ensure proper air circulation.

Maintenance

If external damage is ever seen or reported, the installer or O&M company must investigate and contact Tigo.

Troubleshooting



Troubleshooting should only be performed by qualified personnel. The end user should always contact the company who installed their Tigo EI system for troubleshooting.

If an issue does arise, many times it can be resolved by understanding and addressing the error code provided. The first level of communication is the LEDs on the front cover. Refer to Table 14, to decipher the LED Code.

If more information is required to understand the issue, open the EI mobile app to read the error code and description. Use the chat function within the EI mobile app to get real-time help on the issue you are experiencing.

Your Tigo Customer Support contact

Contacting technical support may be required to assist with your installation or maintenance. If the system is commissioned, Tigo will have component-level data to help understand and resolve the issue. If the PV modules are not monitored, or the inverter is not communicating, additional information will be required.

Please be prepared to provide the following information if the inverter is not communicating to the Cloud.



From the battery:

- Serial number
- Model number
- Error message from EI app/error code from LEDs
- Description of the issue
- Can the error be reproduced? If so, how?
- Has the problem occurred previously?

From the inverter:

- Serial number
- Model number
- Error message from EI app / error code from LEDs
- Description of the issue
- Grid voltage
- DC input voltage
- Can the error be reproduced? If so, how?
- Has the problem occurred previously?
- What is/was the ambient conditions when this error occurred?

In addition to the inverter, the following information from the PV modules may be necessary. If the inverter is not communicating, or module-level monitoring was not installed, please provide the following:

- Manufacturer and model of the PV modules
- Module wattage
- Module Voc
- Module Vmp
- Module Imp
- Number of modules in each string

The Tigo Customer Support Team can be contacted in multiple ways:

- Chatting with a Customer Support tech through the EI App.
- Submitting a ticket directly in the Tigo EI mobile App.
- Submitting a ticket through the Help Center: [Submit a request – Tigo Help Center \(tigoenergy.com\)](https://tigoenergy.com)
- Call 1-408-402-0202 (phone), 1-408-402-0805 (WhatsApp)
 - Support hours:
Monday – Friday
7:00am – 6:00pm PST (10:00am – 9:00pm EST)

You can always [Ask the Community](#). The Community is a web forum consisting of peers to learn, share, and collaborate.



Seek Advice



Learn



Collaborate



Ask
Questions



Share
Experiences



Offer Ideas

Discover the Community by clicking the link above or scan the QR code with a smart device.



Decommissioning



WARNING – Risk of burns!

Wait 5 minutes before disassembling until the enclosure has cooled.

1. Disconnect the battery, as described in *Powering off the EI Solution*.
2. Remove all conductors entering the battery enclosure, ensuring the exposed conductors are protected/safe.
3. Remove the conduit fittings.
4. Disconnect the internal conductors and cables connecting the individual battery modules.
5. Remove the battery modules.
6. Unscrew the mounting bolts from the wall and slide out from the wall.

Packing the battery

When possible, pack the battery and battery modules in the original packaging and secure them with tension belts.

If this is not an option, find an equivalent carton. This box must be capable of being completely closed and constructed to support the weight and size of the battery.

Do not stack more than four battery modules.

Storing the EI Battery and battery modules

Store the EI Battery in a dry place where ambient temperatures do not exceed -4°F to 113°F (-20°C to 45°C). The battery modules may be stored in a dry location with ambient temperatures of -4°F to 113°F (-20°C to 45°C) and relative humidity of 5-95% for up to six months.

The battery modules must not be stored with flammable or toxic elements. See "Battery module" section for the full list of storage, handling and transportation requirements.



Disposing of the battery

Do not dispose of any battery or accessory with household waste. Comply with local and state regulations for disposing of electronic waste.



Warranty

The warranty of the EI Battery is 10 years or 6,000 cycles, whichever occurs first. The warranty document can be found at

<https://www.tigoenergy.com/product/ei-battery>





Specifications

System Data	10	20
Number of battery modules in parallel	3	6
Battery Capacity	9.9kWh	19.8kWh
Max. charge/discharge power	5000W/5000W	
Max. charge/discharge current	14.3A@360V	
Battery Type	Lithium Iron Phosphate (LFP)	
Nominal Voltage	400V	
Operating voltage range	360V ~ 550V	
IP Protection	IP56/NEMA Type 4	
Installation	Floor and Wall installation	
Operating temperature	-10°C ~ +45°C (14°F ~ 113°F)	

Systems Features

DC-DC RTE	94.4%
DoD	90%
Cycle life	> 6000 cycles
BMS monitoring parameters	SOC, System voltage, current, cell voltage, cell temperature, PCBA temperature measurement
Communication port	RS485/CAN
Warranty	132 Months

Battery module data

Battery capacity	3.3kWh
Nominal voltage	51.2V
Operating voltage range	48V ~ 57.6V
Max. Charging/Discharging Current	0.5C/0.66C
Cycle Life	> 6000 cycles
Operation temperature	-10°C ~ +50°C (14°F ~ 122°F)
Dimensions without base (W x D x H)	445 x 131 x 399.6mm (17.52 x 5.16 x 15.73in)
Weight	30kg / 66.14lb

Certifications

UL 1973, UL 9540, FCC part 15 class B



Additional resources



tigoenergy.com

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