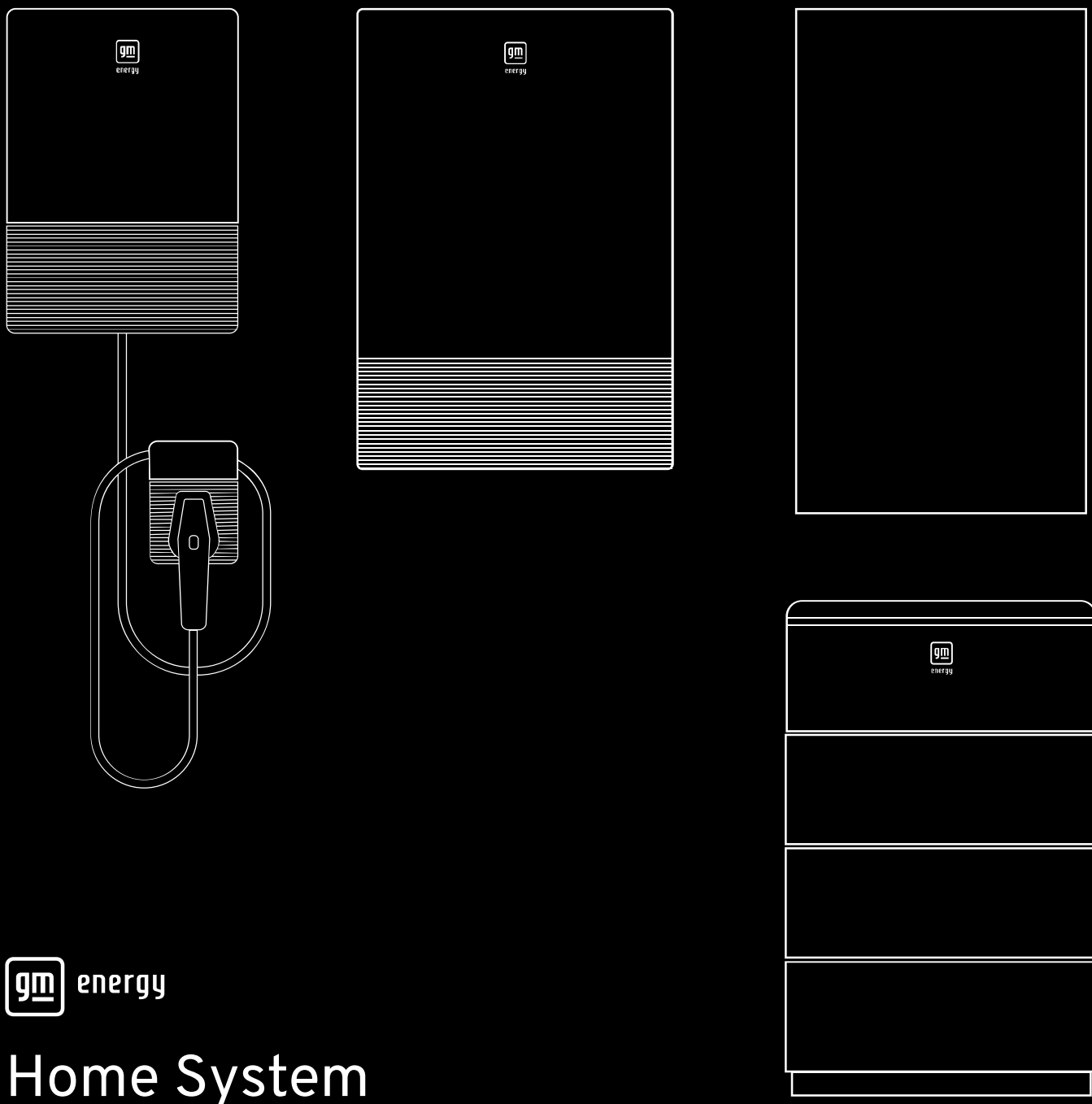


gm energy

Home System

Installation and Commissioning Manual

- GM Energy V2H Bundle
- GM Energy Storage Bundle
- GM Energy Home System

Version 01 - October 2024

SAFETY, WARNINGS, AND COMPLIANCE

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS – This manual contains important instructions for the GM Energy Home System and V2H Bundle (GM Energy PowerShift e1.19, GM Energy Inverter e1.11, GM Energy Home Hub e1.200, GM Energy Dark Start Battery Delta9.6V25Ah, GM Energy PowerBank e1.10, and GM Energy PowerBank e1.17) that should be followed during installation and maintenance.

	**DANGER!** Indicates a hazard with a high level of risk which will result in serious injury or death
	**WARNING!** Indicates a hazard that could result in injury or death
	**CAUTION!** Indicates a hazard that could result in property or equipment damage
	**PROTECTIVE EARTH GROUND:** Identifies terminals which are intended for connection to an external conductor for protection against electrical shock in case of a fault

WARNING! To ensure that GM Energy systems ("the system") will operate and perform safely and as intended, the system must be designed, installed, commissioned, and placed into operation only by qualified persons, and in compliance with all product requirements, including, but not limited to: equipment integrated as Listed and not exceeding capacities or ratings; equipment secured, fastened, and sealed as required; equipment components installed per National Electric Code ANSI/NFPA 70 requirements and best practices; equipment commissioned, provisioned, and tested as required; and end users oriented for proper operation.

DANGER! The installation, adjustment, commissioning, or repair of the system involves the risk of contact with potentially lethal voltages and currents. Read this entire guide before beginning the installation. Note and observe all warnings and remove all sources of energy prior to interfacing wiring or electrical panels.

WARNING! GM Energy systems should not be used as a primary or backup power source for medical equipment or any other products in which failure could lead to injury or loss of life.

CAUTION! If the equipment is damaged during installation, stop the installation, and contact the GM Energy Support Center at **1-833-64POWER**.

INTRODUCTION

This document describes the General Motors Energy (GM Energy) Home System, Energy Storage Bundle, and V2H Bundle installation steps along with requirements for installing and commissioning the following equipment:

- GM Energy PowerShift ("Charger")
- GM Energy Inverter ("Inverter" or "BDI")
- GM Energy Home Hub ("Home Hub" or "Hub" or "MID")
- GM Energy Dark Start Battery ("Dark Start Battery" or "DSB")
- GM Energy PowerBank ("PowerBank" or "ESS" or "Battery Pack")

NOTE: Manufacturer's Certification for GM Energy PowerBank Installation MUST be completed prior to installation or repair of the GM Energy PowerBank. For information on completing Manufacturer's Certification, please visit https://gmenergy.gm.com/for-home/installation-support.

NOTE The GM Energy V2H Bundle (GM Energy PowerShift Charger, GM Energy Inverter, GM Energy Home Hub, and GM Energy Dark Start Battery) can be integrated with the GM Energy PowerBank, DC Solar, and AC Solar provided that the Inverter firmware is version 1.1.7 or later. During commissioning, the Inverter will be forced to update. Always ensure the firmware on all devices are up to date. Additional documentation is available at https://gmenergy.gm.com/for-home/resources-and-support. For further information, please contact the GM Energy Support Center at 1-833-64POWER.

The following shows how the equipment is categorized and bundled:

Name	Equipment Included
GM Energy V2H Enablement Kit	• GM Energy Inverter • GM Energy Home Hub • GM Energy Dark Start Battery
GM Energy V2H Bundle	• GM Energy PowerShift Charger • GM Energy V2H Enablement Kit
GM Energy PowerShift Charger	• GM Energy PowerShift Charger
GM Energy Home System	• GM Energy PowerShift Charger • GM Energy Inverter • GM Energy Home Hub • GM Energy PowerBank
GM Energy Storage Bundle	• GM Energy Inverter • GM Energy Home Hub • GM Energy PowerBank

For more information on each component, please refer to the component installation manuals, as follows. These documents can be found at https://gmenergy.gm.com/for-home/resources-and-support.

- GM Energy PowerShift – GM Energy PowerShift Charger Installation Manual
- GM Energy Inverter – GM Energy Inverter Installation and Operation Manual
- GM Energy Home Hub – GM Energy Home Hub Installation and Operation Manual
- GM Energy Dark Start Battery - GM Energy Dark Start Battery Installation and Operation Manual
- GM Energy PowerBank – GM Energy PowerBank Installation Manual

The following diagram depicts the equipment layout when all components are installed, and the Hub is configured as the main service entrance (

Figure 1); this is a general system overview that includes optional components and is meant to show the connections between components. Actual configuration is dependent on the installation environment and house configurations; e.g., the dark start battery is not required if PowerBank is included in the system.

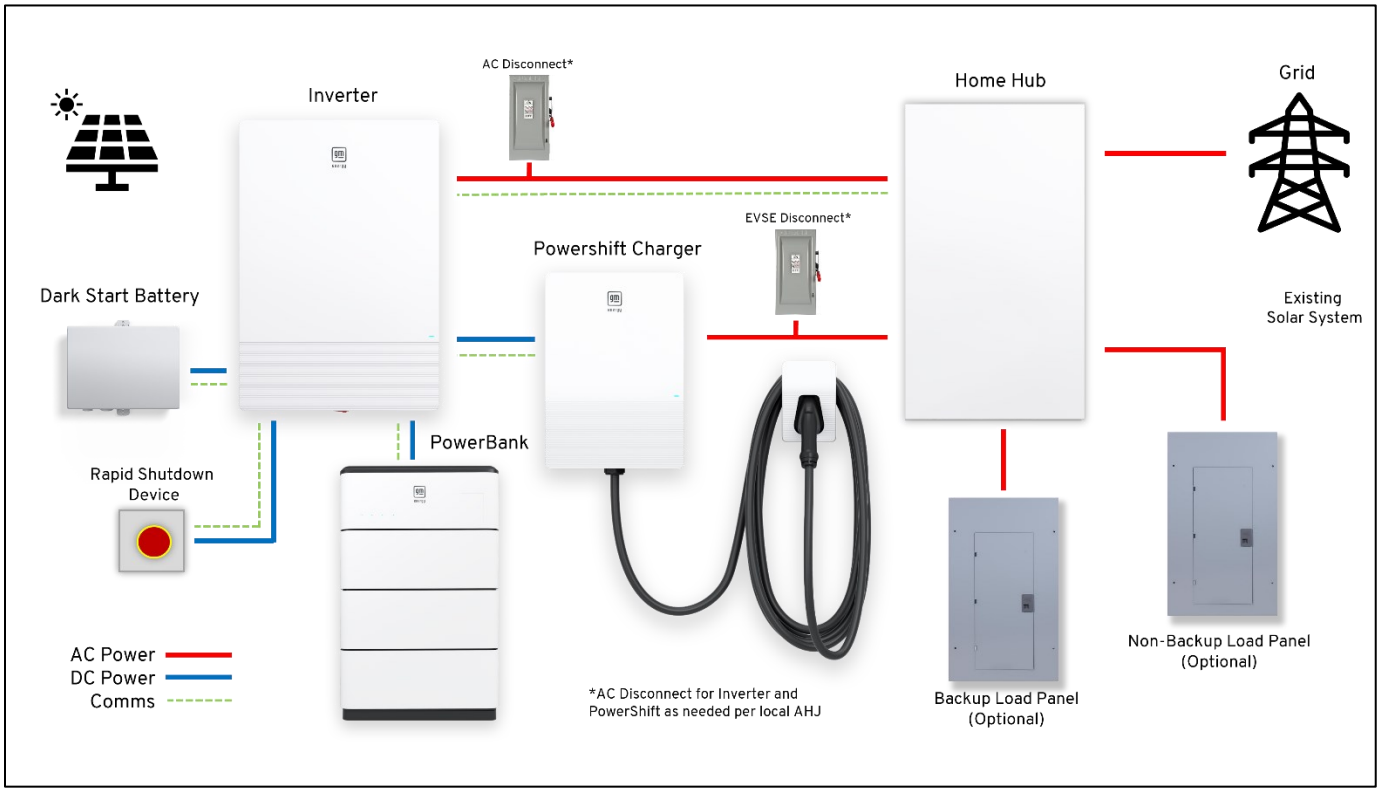


Figure 1: System Overview

Tools, Materials, and Fasteners

Personal Protective Equipment (PPE) for various conditions will be required, and all installers must adhere to all safety protocol. In addition to standard electrician and torque tools, a T20 Torx, a 9/32" deep socket, and Allen wrenches are also required. In addition, the installer shall provide all cables, conductors, and fasteners called out in subsequent sections of this guide. All these items must conform to GM Energy specifications.

Main Components

Component		Notes
GM Energy PowerShift Charger	Bi-directional Electric Vehicle Supply Equipment (EVSE)	Standalone AC charging up to 19.2 kW 14.8 × 20.9 × 6.3 in., 38.6 lb.
Inverter	Bi-directional inverter	20.9 × 30.7 × 7.5 in., 94.8 lb.
Dark Start	Dark Start Battery	15.2 × 13.7 × 2.5 in., 8.6 lb.
Home Hub	Microgrid interconnect device and panel(s)	20.5 × 35.8 × 7.56 in., 45.2 lb.
MSP	Main Service Panel	Existing equipment (as pictured). May be replaced by Home Hub depending on installation configuration
RSD	Rapid Shutdown Device	Also referred to as ESD (Emergency Shutdown Device).
Power Bank	Stationary Energy Storage System	e1.10: 21.1X33.6X13.8 in, 267.9 lb e1.17: 21.1X49.0X13.8 in, 423.5 lb

Equipment Requirements

The following sections summarize temperature, clearance, and distance between equipment requirements. See also the summaries in the respective Quick Installation Guide (QIG, included in the box of each piece of equipment).

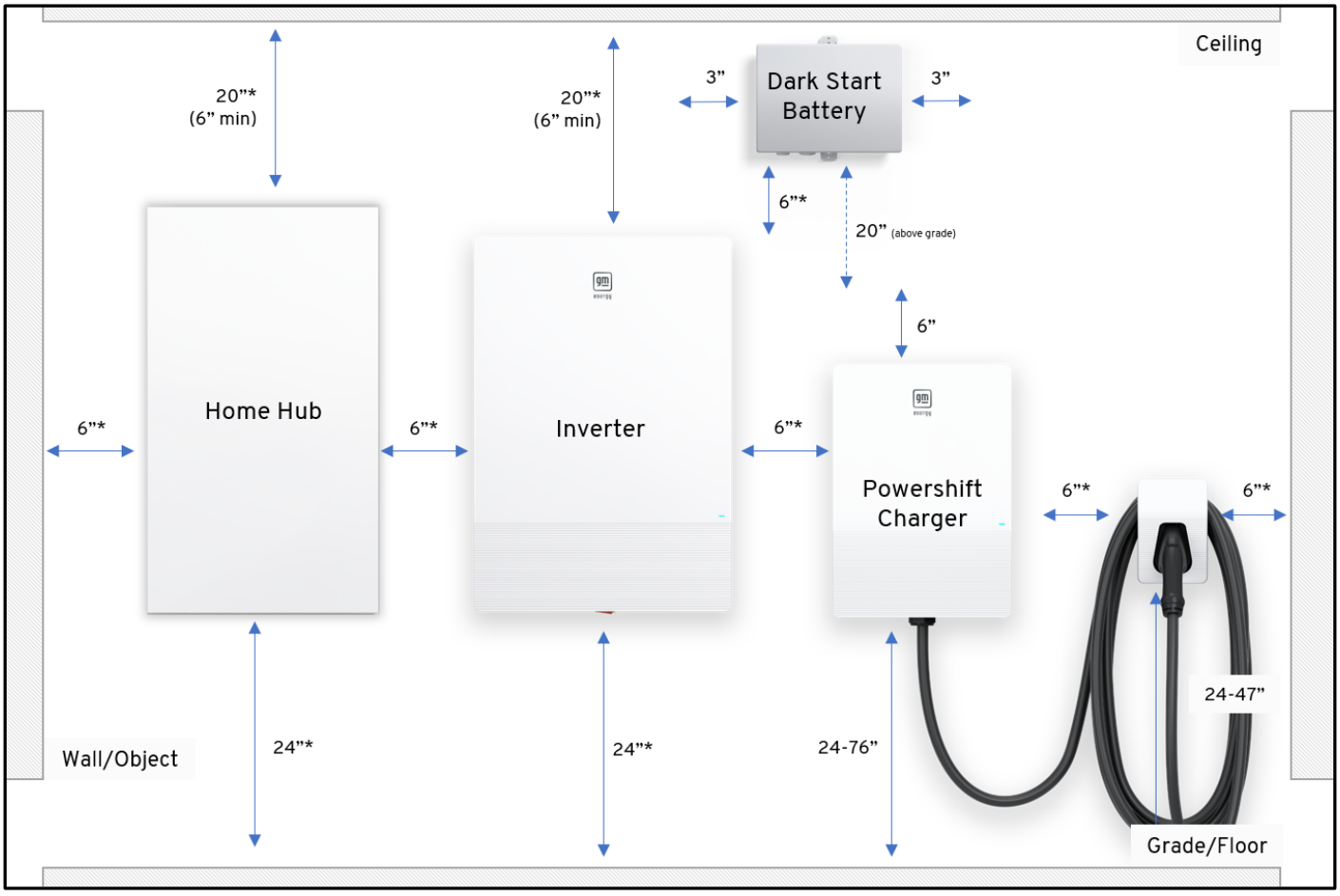
Temperature

<table>
<tr><th>Component</th><th>Min. Temp. (shipping/ storage)</th><th>Operating Min. Temp.</th><th>Operating Max. Temp.</th><th>Max. High Temp. (shipping/storage)</th></tr>
<tr><td>PowerShift Charger</td><td>−40°F (−40°C)</td><td>−40°F (−40°C)</td><td>122°F (50°C)</td><td>176°F (80°C)</td></tr>
<tr><td>Hub</td><td>−40°F (−40°C)</td><td>−4°F (−20°C)</td><td>122°F (50°C)</td><td>185°F (85°C)</td></tr>
<tr><td>Inverter</td><td>−40°F (−40°C)</td><td>−22°F (−30°C)</td><td>149°F (65°C); with derating above 113°F (45°C)</td><td>185°F (85°C)</td></tr>
<tr><td>Dark Start: Charge</td><td rowspan="2">−40°F (−40°C)</td><td>32°F (0°C)</td><td>113°F (45°C)</td><td rowspan="2">185°F (85°C)</td></tr>
<tr><td>Dark Start: Discharge</td><td>−4°F (−20°C)</td><td>122°F (50°C)</td></tr>
<tr><td>Powerbank: Charge</td><td rowspan="2">−22°F (−30°C) (for 7 days)
−4°F (−20°C) (for up to 12months)</td><td>14°F (−10°C)</td><td>122°F (50°C)</td><td rowspan="2">140°F (60°C) (for 7 days)
113°F (45°C) (for first 6 months)
86°F (30°C) (for 7 to 12 months)</td></tr>
<tr><td>Powerbank: Discharge</td><td>−4°F (−20°C)</td><td>122°F (50°C)</td></tr>
</table>

Sun shading is recommended for installation locations exposed to direct sunlight where ambient temperatures exceed 104°F (40°C).

Clearance

The minimum clearances shown in Figures 2 and 3 must be maintained (unless noted as recommendation) to limit equipment derating in certain operating modes, temperatures, and power levels. Refer to local regulations for additional guidance on mounting position.



*Dimension is recommendation

Figure 2: V2H Bundle Clearances

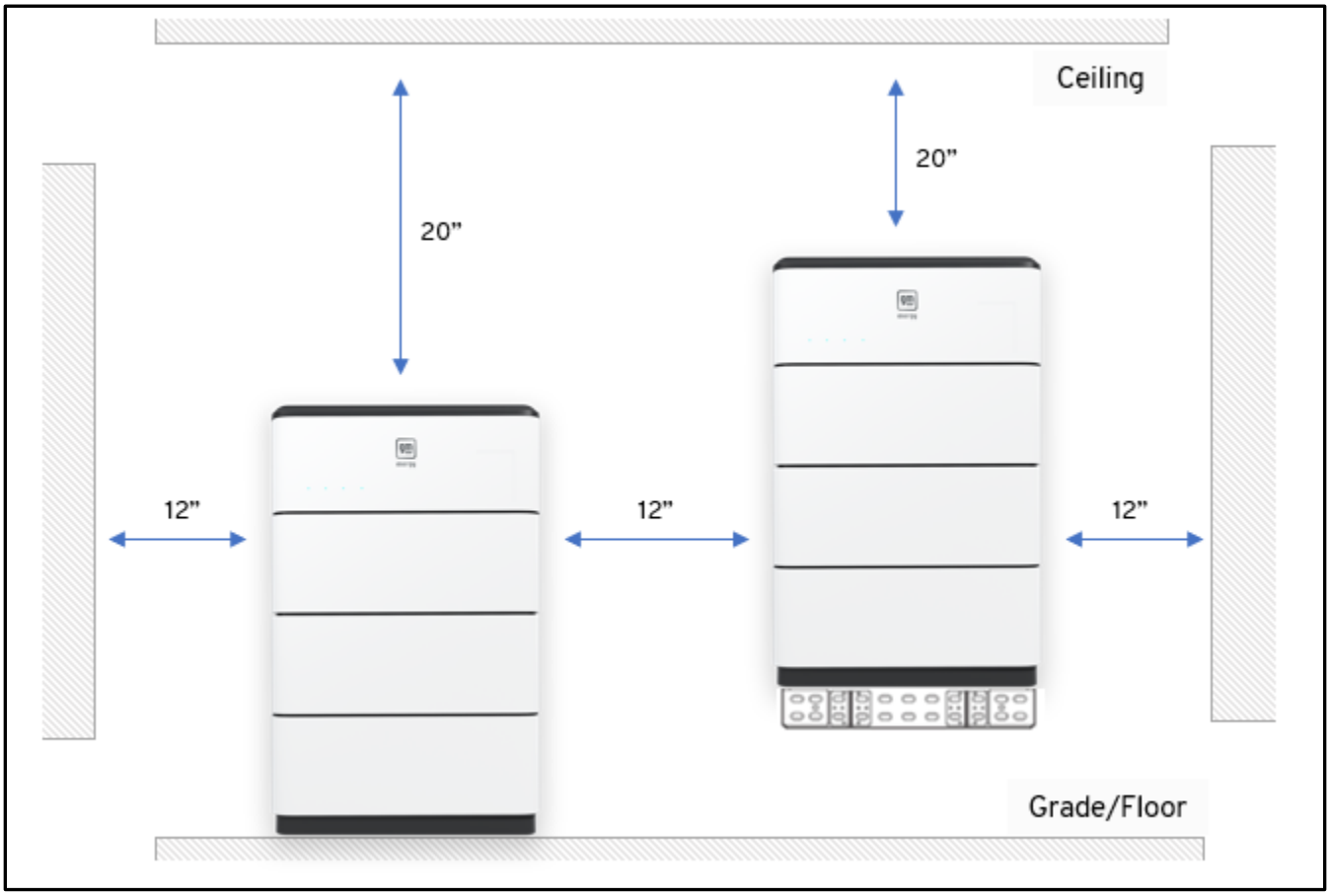


Figure 3: PowerBank Clearances for floor mounting and wall mounting.

Distance Between Components

The maximum distance between equipment determined by **conductor length**, not physical distance between components. Raceway (conduit) pathway and conductor length taken up *inside* the equipment must be considered:

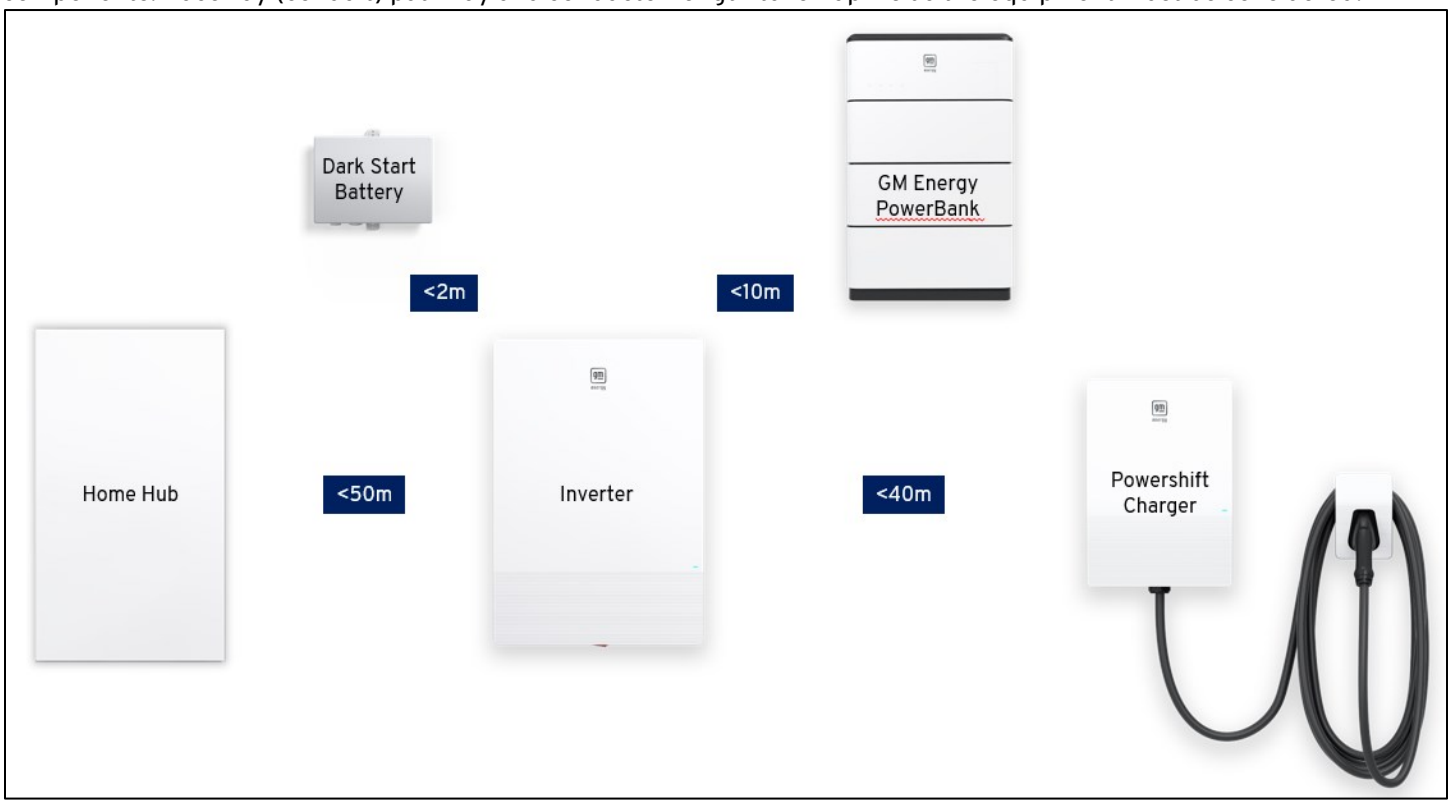


Figure 4: Maximum conductor length between components

	Conductor and Cable Maximum Distance	Minimum Conductor Sizing
Hub to Inverter	164’ (50 m)	• 240 VAC circuit: min. #6 Cu, Black, Red, White, #10 Green. • 12 VDC: #10 Cu, Black/Red. • Serial communication: min. #18, two twisted pairs.
Inverter to Charger	131’ (40 m)*	• DC power conductors: min. #8 Cu, Black, Red, Green. • Serial communication: min. #23 (#18 AWG recommended), twisted pairs.
Dark Start to Inverter	6.5’ (2 m) Integrated factory cable	*N/A Integrated Factory Cable*

Inverter to PowerBank	32’ (10m)	• DC power conductors: min. #10 Cu, Black, Red, #10 Green • Serial communication & 12VDC enable: min. #22

*Note: Usable Dark Start state of charge is reduced (less available time for dark start recovery) if the distance between Inverter and Charger exceeds 49’ (15 m).

Maximum Elevation

The components of the V2H Bundle are not to be installed in locations with an elevation of greater than 3000m above sea level. PowerBank can only function up to 2000m elevation.

Before You Begin

Upon arrival, evaluate the site:

1. Review the design and verify the actual physical details at the site:
   a. Adequate mounting surfaces and O.C. (on center) stud distance when applicable.
   b. Existing electrical system and points of interconnection.
   c. Ensure site is powered by 120/240 VAC service – never with 208 VAC service.
   d. Feeder/long conduit runs and backup circuits.
2. Verify equipment layout:
   a. Verify adequate space for equipment.
   b. Verify that wireway and conduit Balance of System (BOS) plan makes sense and is viable.
   c. Verify that Charger location will enable charge cable to reach vehicle charge port without creating tension at the charge cord connection to the vehicle.
3. Confirm adequate Wi-Fi signal strength at the determined mounting location of both the GM Energy PowerShift Charger and Home Hub.
   a. Signal strength of –75dB or greater at both locations is required in order to commission this system. A stronger Wi-Fi signal will be less negative, or closer to zero.
      i. Various free mobile and web apps will allow you to measure this value prior to installing the equipment. Once the system is wired up, signal strength can be measured through the PowerShift Install App for commissioning.
   b. If you measure insufficient Wi-Fi signal at either location, a range extender or booster may be required to ensure consistent cloud connectivity.
      i. If Wi-Fi signal is insufficient, a mobile hotspot may be used during commissioning. The system may then be connected to the home Wi-Fi network through the vehicle’s mobile app after commissioning.
4. Prepare equipment:
   a. Remove equipment from packaging, keeping track of all fasteners and screws.
   b. Remove covers and place in non-work area to avoid damage.
   c. Prepare knockouts and conduit fittings; and install any Hub accessories as necessary.

As the installation progresses, be prepared to capture necessary job closeout photos, keeping in mind that some photos can only be taken during the installation process. GM Energy provides recommendations of job closeout photos

to take in the Job Closeout section, as these may be beneficial for both the installer and GM Energy to best support the customer if they require service in the future. However, these photos are not required by GM Energy; please refer to your installation company if they require any specific closeout photos or information.

Installation Outline

GM Energy PowerShift Charger Only Install

For installation of the Charger only, please see the GM Energy PowerShift Charger Installation Manual available at https://gmenergy.gm.com/for-home/installation-support.

GM Energy Home System, GM Energy V2H Bundle or GM Energy Storage Bundle Install

Your actual sequence may vary based on site conditions and chosen workflow. The Hub and the Inverter have usable knockouts pre-drilled—you may NOT create any additional knockouts in the Hub or in the Inverter.

1. Attach mounting brackets to wall.
2. Mount equipment on brackets.
3. Remove equipment covers.
4. Prepare knockouts for raceways.
5. Install conduit (or bundled cables) between all equipment.
6. Install and terminate power conductors, communication cables, and control cables.
7. Migrate existing circuits into the Hub.
8. Verify that equipment is adequately secured to mounting surfaces, conduits appropriately sealed, and conductors and cables terminated properly.
9. Safeguard equipment for energization.
10. Conduct and record pre-commissioning checks and data.
11. Commission the equipment.
12. Verify all premises circuits are operational.
13. Reinstall all equipment covers and beauty covers.
14. Orient customer with equipment and any next steps.

Installations Involving a PowerBank

For any installation involving a PowerBank, please reference the PowerBank installation guide that is shipped with the PowerBank. This guide includes, but is not limited to, important safety information, instructions for assembly, details regarding conduit sizing and appropriate fasteners for mounting to floor or wall. Additional parts are required for wall mounting of the PowerBank, please see the PowerBank Details section of this document for ordering information.

CAUTION! If the equipment is damaged or leaking during installation, stop the installation, and contact the GM Energy Support Center at **1-833-64POWER**.

INSTALL COMPONENTS AND CONDUIT

Important! **Before you begin, read the instructions in the subsequent *Details* sections for each component as well!**

Install all components on load-bearing walls with framing members only. Do not violate environmental, clearance, or maximum distance requirements. *If you are only installing the Charger, the instructions for the other components do not apply!*

1. Carefully open each component's box. For the Charger, Home Hub, and Inverter, remove the mounting bracket.
2. Verify that the mounting location for each piece of equipment is made of a non-flammable material, provides enough clearance and spacing and is adequate for the mounting fasteners.
3. For the Charger and Hub, use the mounting bracket as a template to mark the holes (the center holes when mounting to a single stud), then level and mount each bracket to the wall in the designated location using the hardware described in Table 1. All fasteners must be stainless steel, and must land in the center of the stud. For the Hub, if mounting to drywall with studs, in addition to the two lag screws installed in the center of the bracket, install one *drywall anchor* in one of the holes left of center and one right of center.

CAUTION! Make sure a surface that is appropriate for the weight of each device is chosen, correct fasteners are used for the intended surface, and the bracket is secure before mounting any device.

4. For the Inverter, use the mounting bracket as a template to mark four holes between two studs (typically the four which are at 16″ o.c.), and then level and mount the bracket to the wall in the designated location using the hardware described in Table 1. All fasteners must be stainless steel, and must land in the center of the stud.

Verify equipment mounting location feasibility, and remove plugs and/or prepare knockouts and fittings (as required by conductor specifications) before mounting the equipment. Use only the factory entry locations and do not enlarge any. To remove a conduit plug, use a flat blade screwdriver to turn the plug while at the same time holding the nut on the inside of the wiring box.

For install locations exposed to water, use the appropriate water-tight fitting to match NEMA rating of unit. For install locations not exposed to water any NEC compliant fitting is allowed. Each wiring entry must allow for a 6″ wire loop *inside* the wiring chamber.

Raceways are required for the conductors, control cables, and communication cables that route between each piece of equipment. For example, the Rapid Shutdown Device (RSD) control cable from the Inverter must route in an appropriate raceway. *If you are only installing the Charger, only the 120/240 V circuit (with grounding conductor) is required.*

With two installers handling each component, mount the Charger, the Hub, and the Inverter on their respective brackets.

Remove covers to the equipment wiring chambers:

- Charger: using a T20 tool, remove the front cover by removing the two screws holding the bottom and then carefully prying the cover off; then remove the fourteen screws and carefully remove the inner cover.
- Hub: using a precision screwdriver (or 1/8 Allen wrench), gently pry open the cosmetic covers over the latches on the right side of the Hub, and then open the latches. With a T20 tool, loosen the three dead front screws on the left side, and then remove the three screws on the right side. Carefully pull the right side of the dead front toward you, then slide it to the right and remove it.
- Inverter: using a T20 tool, loosen the five lower wiring chamber cover retention screws and then remove the cover.

  Note: Hub Latch covers are optional.

Mount the Dark Start Battery directly to the wall surface, ensuring that the integrated cable exits from the *bottom* of the installed position.

Measure for, cut, route, and attach conduit between each component (adhering to NEC requirements). Depending on your conduit and wire routing plan, conductors and cables might enter from the back, side, or bottom of the equipment. If rear entry raceway holes will be used on the Charger, and you are installing the Charger outdoors, first apply a rainbow-shaped bead of sealant on the back of the Charger around the knockout.

After you have installed all appropriate fittings and raceways (conduit or tubing) route and pull all wiring into the Inverter, the Hub, and the Charger. Communication and control wires must be minimum #18 AWG; RS485 and CAN wires must be twisted pairs.

Note: this guide provides examples of black/white twisted pairs—*other colors are acceptable if and only if they meet the minimum specifications.*

Lag screws must be minimum 1/4″ × 1 1/2″. Pilot holes shall be 60–75% of the fastener diameter (e.g. if 5/16″ lag screw then 3/16″ pilot hole; if 1/4″ lag screw then 3/32″ pilot hole). Table 1 provides a summary of required mounting fasteners:

Wall Type	Component	Fastener (Quantity)	Notes
Sheetrock (drywall) with wood studs	Charger (Holster requires 2 of same fastener)	M8 × 60 mm (5/16″ × 2 3/8″) min. lags (qty. 2) into framing member. Charger and holster may be center mounted (one stud engaged)	7/32″ pilot hole
	Hub and Inverter* Blocking or plywood (minimum 5/8”) required	M6 × 76 mm (1/4″ × 3″) min. lags (Inverter min. qty. 4 at 16″ o.c.; Hub min. qty. 2 lags plus 2 anchors) Hub may be center mounted (one stud engaged); **Inverter may NOT be center mounted**	3/16″ pilot hole
	Hub, center mounted*	M6 × 38 mm (1/4″ × 1 1/2″) min. lags (qty. 2) into stud AND min. two #10 wall anchors at outer mounting plate holes	3/32″ pilot hole
Stucco	Charger (Holster requires 2 of same	M8 × 60 mm (5/16″ × 2 3/8″) min. lags (qty. 4)	7/32″ pilot hole
	Hub and Inverter* Must have 5/8” (or thicker) sheathing	M6 × 76 mm (1/4″ × 3″) min. lags (Inverter min. qty. 4; Hub min. qty. 2 lags plus 2 anchors)	3/32″ pilot hole
Sheathed wall with 3/4″ plywood	Charger (Holster requires 2 of same	M8 × 60 mm (5/16″ × 2 3/8″) min. lags (qty. 4)	7/32″ pilot hole
	Hub and Inverter*	M6 × 76 mm (1/4″ × 3″) min. lags (Inverter min. qty. 4; Hub min. qty. 2 lags plus 2 anchors)	3/32″ pilot hole
Concrete, hollow-block CMU, or red brick	Charger (Holster requires 2 of same fastener)	M8 × 60 mm (5/16″ × 2 3/8″) with anchors (qty. 4).	5/16″ masonry bit
	Hub and Inverter*	1/4″ × 2 3/4″ concrete screws (min. qty. 4)	3/16″ masonry bit pilot hole
All surfaces except concrete	Dark Start	M6 screws (qty. 2)	Included with DSB
Concrete		1/4″ × 1 1/2″ concrete screws (qty. 2)	3/16″ pilot hole

Table 1

*Hub and Inverter also require one M6 screw (and anchor) at each lower front corner.

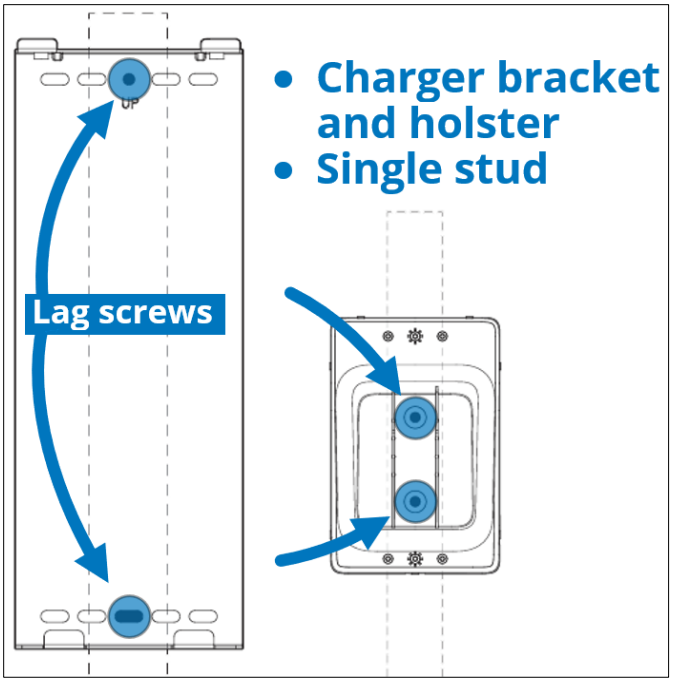


Figure 5: Fastener locations for Charger

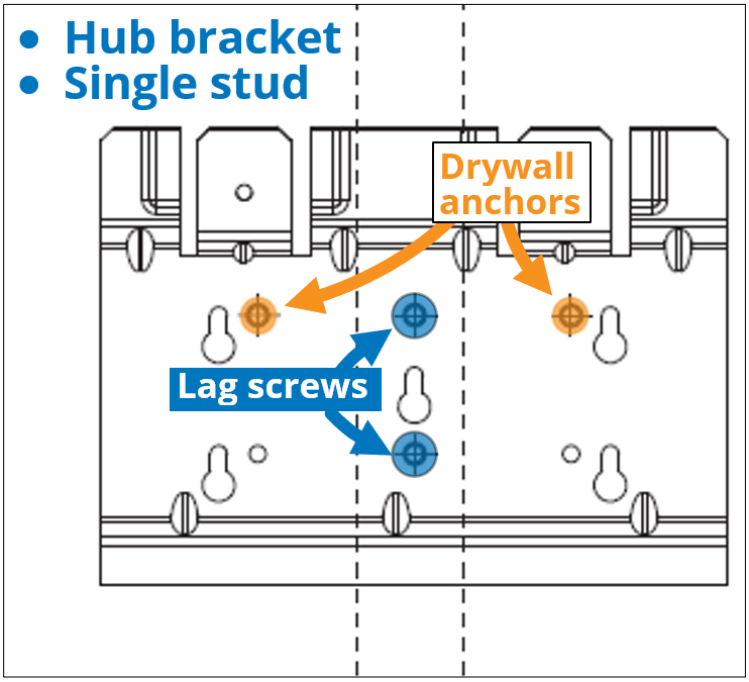


Figure 6: Fastener locations for Hub

Charger Details

Note: For some installations an AC disconnect may be required. Refer to local regulations for guidance.

The Charger has four options for raceway entry. The bottom left has a 1 1/4" threaded plug installed. The other three entry locations (bottom right, bottom left, and right rear) must be drilled out as needed. **Note that DC, AC, and adequately rated comm cables may be routed into the Charger in a single conduit.**

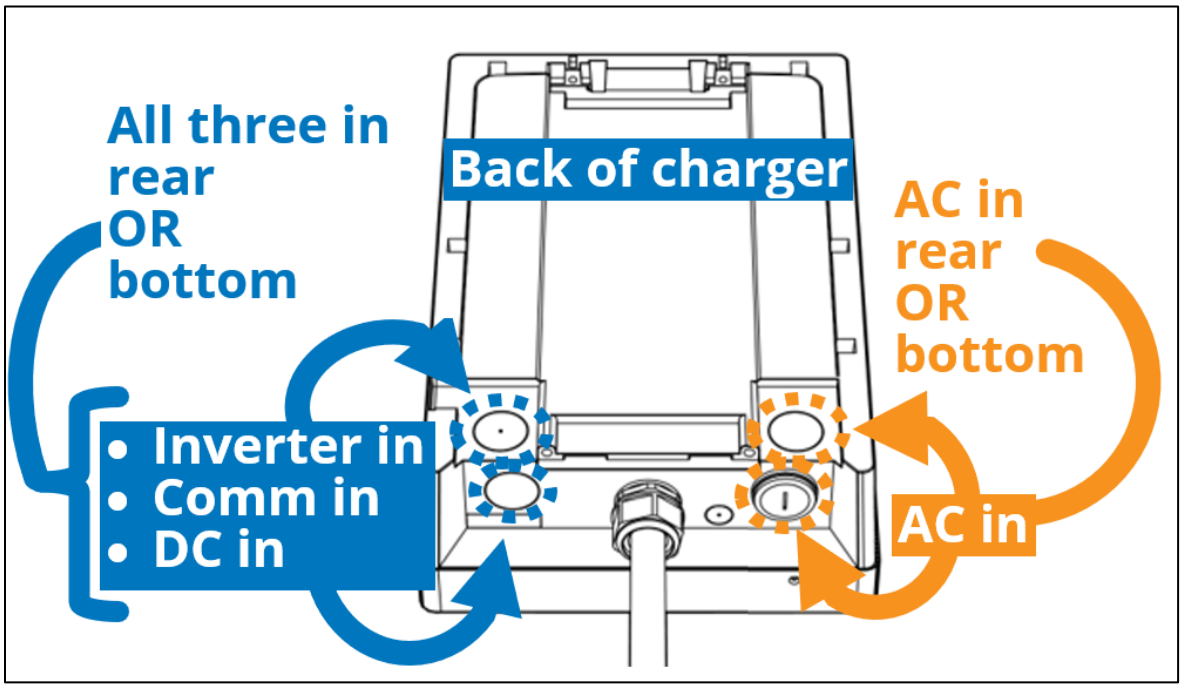


Figure 7: Charger raceway options

Secure the Charger to the mounting plate, using two Phillips flanged M6 screws at the top and two 3/8" Phillips bolts at the bottom, and then torque them to 17.4 in-lb.

Mount the Charger's holster assembly:

a. Release the front cover of the holster using the tabs at the bottom of each side, then remove the inner cover.

b. Mount the plug holder to the mounting surface using the hardware described in Table 1.

c. Attach the inner cover to the plug holder with two Phillips head flanged screws and torque each to 10.4 in-lb.

d. Reattach the front cover (it will click into place).

Coil the charging cord around the holster, and then insert the Charger nozzle into the holster.

Home Hub Details

The Home Hub has seven options for raceway entries.

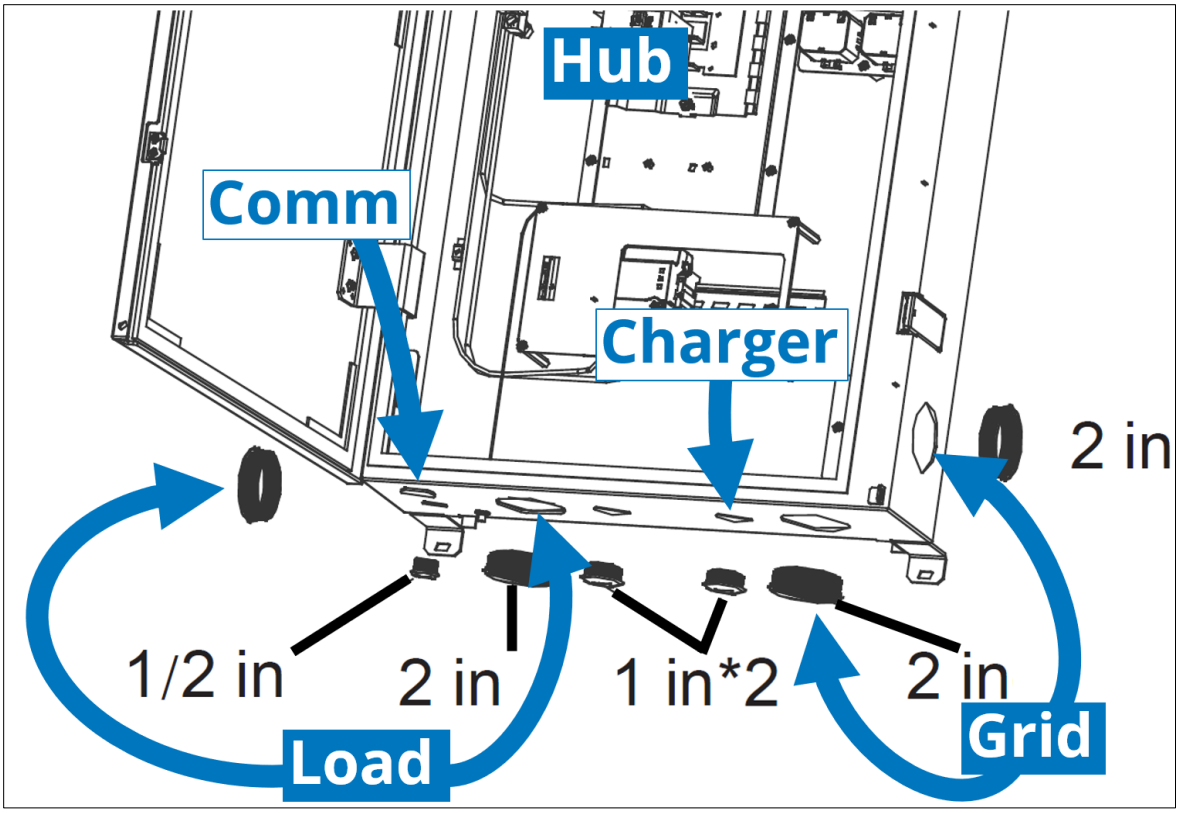


Figure 8: Home Hub raceway options

On the bottom are two 2", two 1", and one 1/2" entry locations. There is also one 2" on the left lower side and one 2" on the right lower side. The left 1" location is for the conduit coming from the Inverter. The left 1/2" location is for the conduit carrying the communication wires. Each location is pre-drilled and has a threaded plug. There are no entry locations on the back/rear.

The Home Hub may require installer-provided accessories such as a main breaker or an additional meter. If these are required, prepare them *before* mounting the Hub. Refer to Appendix C for further details on optional accessories.

After installing the Home Hub, install the antenna from the accessory bag onto the threaded port at the bottom left of the Hub, taking care not to block the antenna area with raceway conduit bodies. See Section 3.0 for full details on accessories.

Inverter Details

The Inverter has eight options for raceway entry.

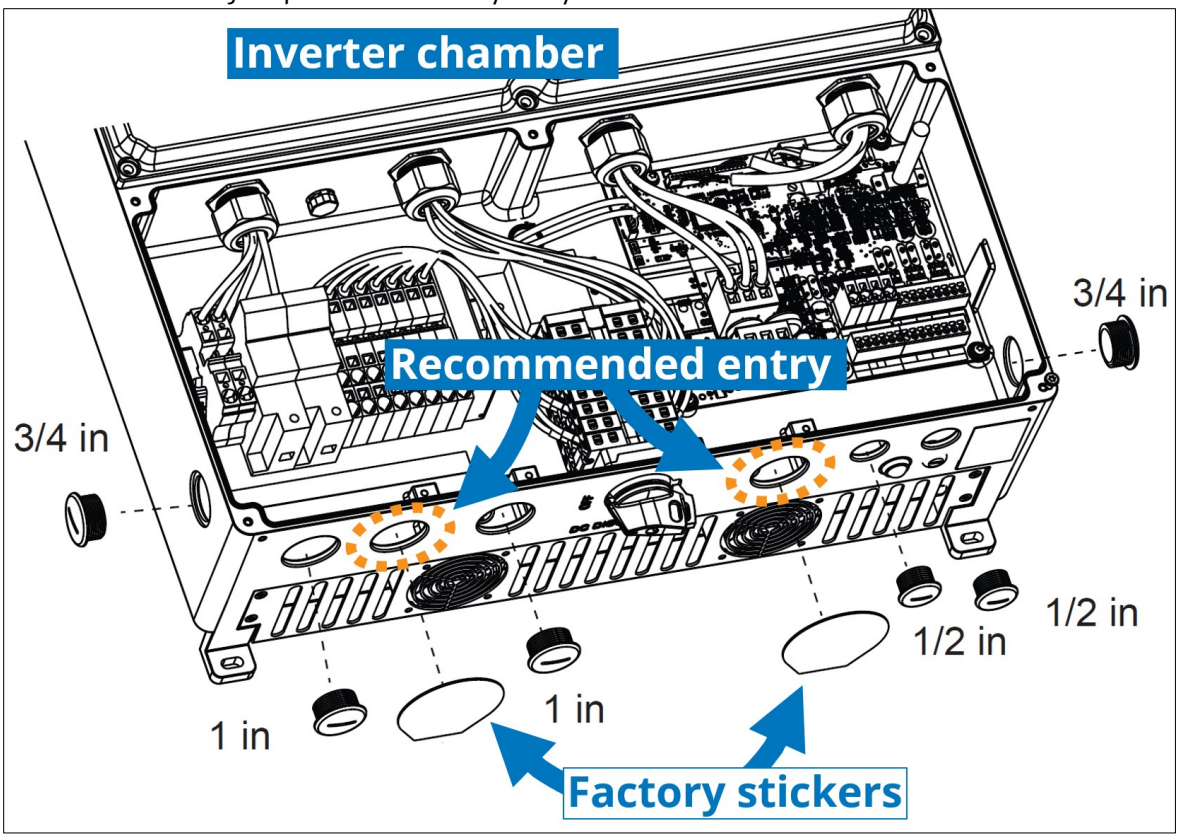


Figure 9: Inverter raceway options

On the bottom are four 1" and two 1/2" entry locations. There is also one 3/4" on the lower left side, and one 3/4" on the lower right side. **Two of the 1" locations have a sticker over them from the factory. These two with stickers are the recommended entry locations.** If you remove a conduit plug to use one of the 1" entries that does NOT have a sticker over it, use that conduit plug to replace a sticker. There are no entry locations on the back or on the top and remember the RSD circuit must be wired into the Inverter.

Dark Start Battery Details

The Dark Start Battery should be covered/protected from direct sunlight, rain, or snow when installed outdoors. Typically, any roof overhang is adequate. The dark start has a single 3/4" threaded connection for a cord grip or raceway fitting. For outdoor installations, conduit fittings must be watertight and rated NEMA 4, 4X, 6, or 6X. Fit the appropriate connector into the threaded connection.

You must mount the dark start close enough to the Inverter so that its attached cable can route and reach into the lower right wiring chamber of the Inverter. Position the Dark Start Battery so that the integrated cable is exiting from the bottom of the dark start. If and only if the dark start is installed indoors, you may mount the dark start such that the cable exits the left or right side, *but never the top.*

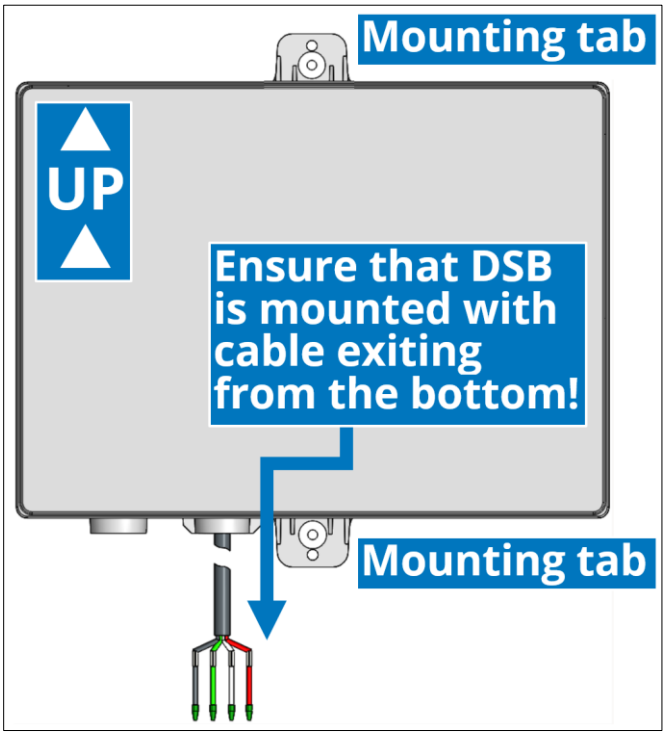


Figure 10: Dark start mounting

A NTP 3/4" threaded hole is provided at the cable outlet. Install an NTP 3/4" conduit fitting or cable gland at the wire egress of unit, torque it to 90–300 in-lb (10–39 N-m), and then route the cable into conduit or secure the factory cable to the mounting surface and route into the Inverter with an additional cable gland. If mounting outdoors, conduit fittings must be watertight and be NEMA 4 or higher. Ensure that the wire bend radius for the exiting cable exceeds 2 1/2" (64 mm).

PowerBank Details

A PowerBank can be installed as a floor or wall mounted product. Local jurisdiction requirements, customer preference and other site-specific constraints will drive the decision to floor or wall mount. For reference, the PowerBank weights are:

GM Energy PowerBank e1.10–10.6kWh: 121.5 kg (267.9 lb)

GM Energy PowerBank e1.17–17.7kWh: 192.1 kg (423.5 lb)

Floor Mounting

Please reference PowerBank manual for installation and assembly instructions.

Wall Mounting

Please reference PowerBank manual for installation and assembly instructions.

Separately sold/procured bracket kit will be required. Please note if wall mounting a 35.6kWh PowerBank, 2 brackets will be required.

GM Energy Preferred Installers will be able to indicate need for a mounting bracket directly to GM Energy. If you are not a Preferred Installer – or are one and did not indicate need at the outset – you may contact GM Energy Support Center at 1-833-64POWER to obtain one. If possible, this will be included with the shipment of the PowerBank; if the PowerBank has already shipped, the bracket will be sent as a separate shipment. Please reference PowerBank manual for installation and assembly instructions.

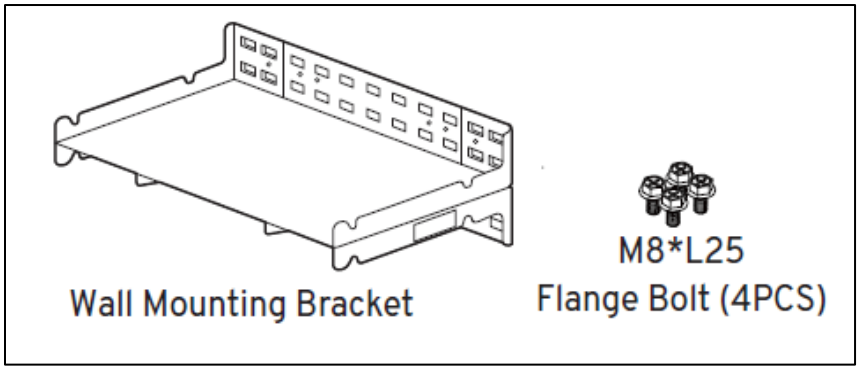


Figure 11: PowerBank Wall Mounting Bracket Accessory kit

Rapid Shutdown Device

Installation of the Rapid Shutdown Device (RSD) is highly recommended and required by national electric code for any installations with solar PV systems. Switch must be normally closed, outdoor rated, listed for 12 VDC, and must clearly indicate its ON and OFF positions. The RSD control circuit must be wired into the Inverter. See Appendix C for an example switch. It is recommended this switch be located near the home electric meter and be clearly labeled.

HUB CONFIGURATION AND ACCESSORIES

The Hub may require additional accessories to be installed depending on the system design. The following are included with the Hub:

- Hub
- Mounting plate
- Quick installation Guide
- Antenna
- Jumper kit: main service bonding jumper and two M4 screws
- Main breaker wiring kit: main service disconnect label and one M4 nut
- AC solar warning label
- PCS warning labels for CTs

The Hub may be used as the main service equipment, which will require the installation of a main breaker and neutral–ground bonding jumper inside the Hub. The Hub can be configured with an internal non-backup pan (typically for the Charger) which will require installing the Eaton 48INT125B accessory kit. The Hub features one internal, factory-installed energy meter. An additional energy meter must be added when integrating with existing AC solar inverters. **All electrical codes and standards must be followed when bonding neutral and ground.**

Installing the Hub as Main Service Equipment

The Hub includes an accessory kit which includes a neutral-to-grounding bonding strap (with hardware), and a MAIN SERVICE DISCONNECT label.

1. Using a T20 tool and M4 screws, install the bonding strap between the neutral bar and the back wall of the Hub. Torque the screws to 14 in-lb.
2. Using a 1/2" socket, remove the two chair lugs and then install the main breaker in their place, using two 1/4"-20 threaded nuts and a 7/16" socket. Torque each nut to 48 in-lb.
3. With a 9/32" deep socket, remove the main breaker housing flange nut, install the main breaker, and then reinstall the flange nut.

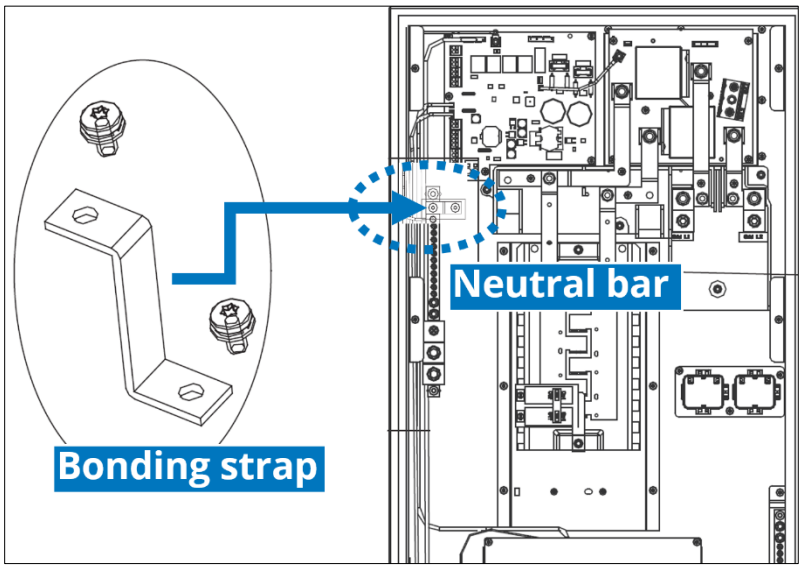


Figure 112: Location of bonding strap for main service panel

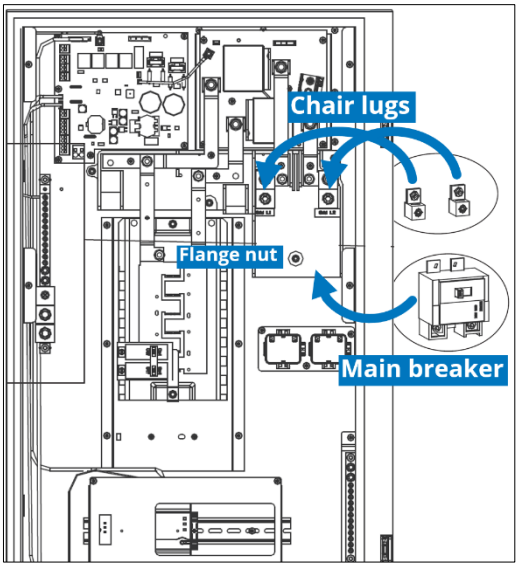


Figure 13: Location of main breaker installation

If the Hub will be used as the main service panel, affix the **MAIN SERVICE DISCONNECT** label on the Hub dead front above the opening for the main breaker.

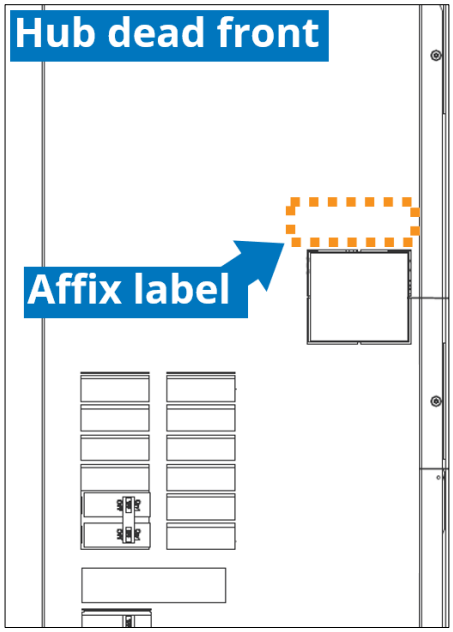


Figure 124: Location to apply MAIN SERVICE DISCONNECT label

The polarity of L1 and L2 is swapped inside Eaton CSR Series main breakers. Therefore, when wiring power conductors into the Hub (see Section 4.4), you must swap the position of the L1 and L2 conductors after installing the main breaker in the Hub, **and** swap the position of the CTs.

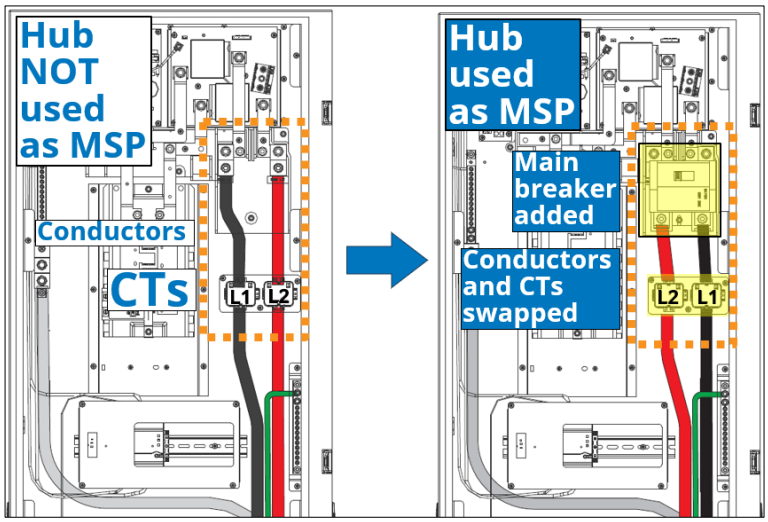


Figure 15: L1/L2 conductors and CTs to be swapped when main breaker added

Apply PCS warning labels to CTs during installation. Only in cases where the conductors in the Hub will be greater than or equal to (≥) AWG 1/0, you must remove the bracket that the CTs are attached to, remove the CTs from the bracket, and then attach the individual CTs to the conductors:

1. Unscrew the three M4 screws holding the CT bracket to the back wall of the Hub.
2. Connect the appropriate L1 and L2 conductors.
3. Cut the four small zip ties that secure the CTs to the bracket.
4. Remove the two CTs from the bracket.
5. Fit the L1 and L2 CTs around their respective conductors and attach each to the conductor with one zip tie below and one zip tie above.

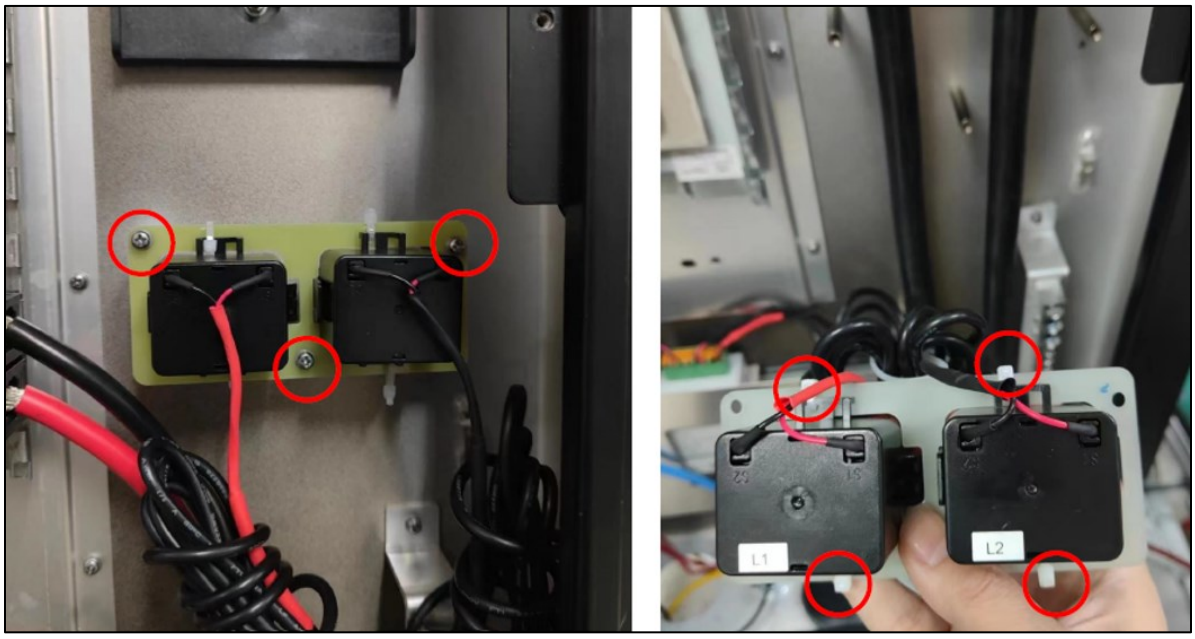


Figure 16: Location of CT bracket screws and zip ties holding CTs to bracket

Installing the Hub Downstream of Main Service Panel

When the Home Hub is not installed as main service equipment, the neutral-ground bonding should not be installed.

Additionally, when the Home Hub is not being installed as a main service panel, GM Energy recommends relocating the CTs for Meter 1 from the Home Hub to the main service entrance. Placing the CTs at the main service entrance enables monitoring of every load in the home for a superior customer experience. If the Home Hub and main service entrance are not co-located, you may need to relocate Meter 1 to a dedicated junction box or other enclosure adjacent to the main service entrance and extend its RS485 communications wiring to the Home Hub. Wiring distance between Home Hub and Meter 1 shall be a maximum for 300ft to ensure performance. If relocation is not feasible, it is permissible to leave CTs in place, although note that Meter 1 will then only measure the power to loads connected to the Home Hub. Always ensure Meter 1 is reading valid values in the PowerShift Install app during commissioning by comparing measured power to an external measurement tool.

Optional Non-Backup Panel

Hub-Integrated Charger Non-Backup Panel

If a Hub-integrated Charger non-backup pan is desired, then you must install a non-backup panel (load center) *in the Hub* in order to enable the integration of the Charger. Use only an Eaton 24INT125B-1 or equivalent.

1. Position the housing block (the smaller black piece) into the hole at the left side of the space below the central breaker area.
2. Fit the bussing block over the housing block.
3. Using a 5/16 nut driver, secure the two 10/32" screws into the Hub backplate.
4. Torque each screw to 25 in-lb and mark the connection with a paint pen.
5. Size the wires according to the amps value you will set the Charger to (see Section 4.2), and coach them to fit neatly along the inside of the Hub between the main Hub PCB connector and the busing lugs on the new non-backup load center.
6. Fabricate and install a 20" copper L1 (black) and a 20" copper **L2** (**red**) power conductor to route inside the Hub, from the main Hub PCB connector to the new non-backup panel:
    a. At the main Hub PCB connector side:

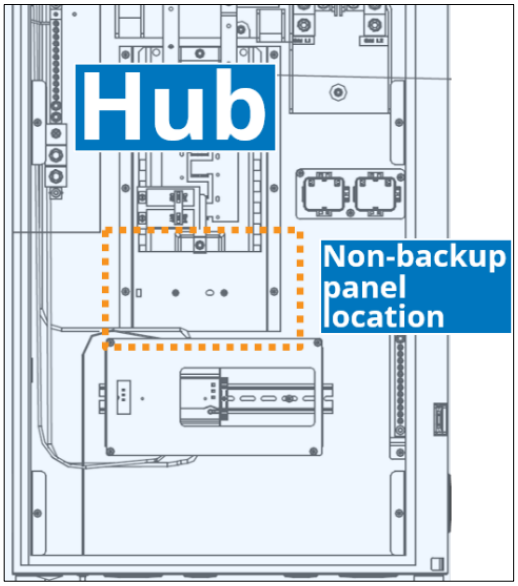


Figure 17: Location of non-backup panel in Hub

i. Strip 1/2″ of insulation from each conductor.
ii. Install the L1 (black) conductor into the **EVL1** terminal.
iii. Install the **L2** (**red**) conductor in the **EVL2** terminal.
iv. Torque each conductor in place to 35 in-lb and paint mark each.

b. At the non-backup panel side:
i. Strip 3/4″ of insulation from each conductor.
ii. Install the L1 (black) conductor into the upper lug.
iii. Install the **L2** (**red**) conductor into the lower lug.
iv. Torque each conductor to 45 in-lb and paint mark each.

7. Install an appropriately rated breaker. Recommended type is Eaton BR2*XXX*. Refer to Appendix C for availability.

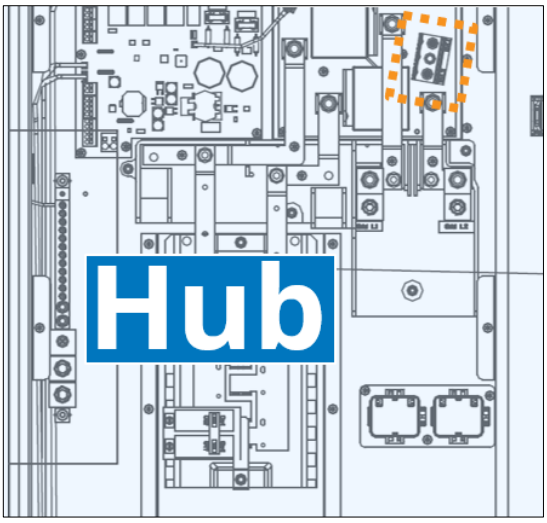


Figure 18: Location of main Hub PCB connector

Exterior Non-Backup Subpanel from Hub

If the design includes an exterior non-backup subpanel which originates from the Hub:

1. Install the external subpanel and route raceway from it to the Hub.
2. Route the subpanel feeder conductors through the raceway into the Hub:
   a. Size the conductors per rating.
   b. An exterior non-backup subpanel will require installation of the Hub-integrated Charger non-backup panel. Install branch breaker in Hub non-backup panel then route **L1** black and L2 red conductors to non-backup breaker. Terminate, torque, and paint mark terminations.
   Note: Do not feed an exterior subpanel directly from the main PCB connector (EVL1 & EVL2)
   c. Route, strip, terminate, torque, and paint mark the neutral (white) conductor into the neutral (N) bar.
   d. Route, strip, terminate, torque, and paint mark the grounding (green) conductor into the positive earth (PE) grounding bar.
3. In the exterior subpanel, power conductors must be wired into overcurrent protection device (OCPD):
   a. Route **L1** black and L2 red conductors into subpanel main breaker. Terminate, torque, and paint mark terminations.
   b. Route, strip, terminate, torque, and paint mark neutral (white) conductor into the neutral (N) bar.
   c. Route, strip, terminate, torque, and paint mark the grounding (green) conductor into the grounding bar. the positive earth (PE) grounding bar.

Optional Second Energy Meter (for AC Solar Integration)

Note: GM Energy Home system is compatible with external AC solar but does not control the AC solar. Compliance for utility interconnection must be facilitated through the installer of the external AC solar system. Existing solar can be wired into the backup or non-backup side of the Home Hub panel. Solar wired into the backup side of panel can charge a PowerBank or provide power to loads during an outage.

Do not rework existing solar system without proper communication with customer and/or the previous solar system installer as existing warranty may be affected.

To support new or existing AC solar, a second energy meter (accompanied by two secondary CTs) must be sourced and installed into the Hub. GM Energy Preferred Installers will be able to indicate the need for a meter directly to GM Energy. If you are not a Preferred Installer – or are one and did not indicate need at the outset – you may contact GM Energy Support Center at 1-833-64POWER to obtain one. If possible, this will be included with the shipment of the Enablement Kit; if the Enablement Kit has already shipped, the meter will be sent as a separate shipment.

1. Using a #2 Phillips screwdriver, remove the four screws and remove the metal meter cover from the lower section of the Hub.
2. Using a precision flat blade screwdriver, loosen the DIN rail retainer on the right side of the existing meter, and slide the retainer to the right of the DIN rail.
3. Install the second meter onto the DIN rail between the existing meter and the retainer.
4. Slide the retainer to the left to secure the second meter in position, and then tighten the retainer to the DIN rail.
5. Secure the CTs from the second meter around the L1 and L2 solar circuit conductors
    a. CTs must capture all solar generation, and are typically installed around the solar subpanel feeder circuit conductors.
    b. Orient the CTs to capture the flow of power in the correct direction (CT arrow should point away from solar inverter)
    c. Install the L1 CT around the L1 conductor, and the L2 CT around the L2 conductor.
6. Wire the second meter to the Hub controller board in the upper left of the Hub.
7. Re-install the metal meter cover.

NOTE: The L1/L2 voltage connection for the secondary meter on the Home Hub controller board is connected to grid-side (non-backup) voltage. If this connection is used, the meter will not be powered during a grid outage event. Using this connection will not impact AC solar installations connected to the non-backup side of the panel, but backup AC solar will not be monitored during a grid outage event, although power is still being provided to the home. To prevent this, two optional alternative wiring connections are available to installers:

- Option 1: Wire the L1/L2 connection for the secondary meter directly to a two-pole breaker on the backup panel. To minimize impact on total available breakers, it is recommended to use one side of a tandem breaker for this connection.

- Option 2: Splice a connection to the L1/L2 wire of an existing two-pole backup breaker, using connecting equipment appropriate for the rated amperage of the breaker.

WIRE THE COMPONENTS

Referring to the diagrams and respective tables in this section, land all pulled wires and conductors; either on terminal blocks, or by using the appropriate fasteners tightened to the correct torque value. Refer to the diagrams in this section for termination points, and to the tables that follow each diagram for wire information. **When you have completed the wiring, reinstall the covers for the Charger, the Inverter, and the Hub.**

Note: Ground ("G") connections are sometimes labeled "PE" for protective earth. These are equivalent for purposes of this guide.

Wire the GM Energy PowerShift Charger

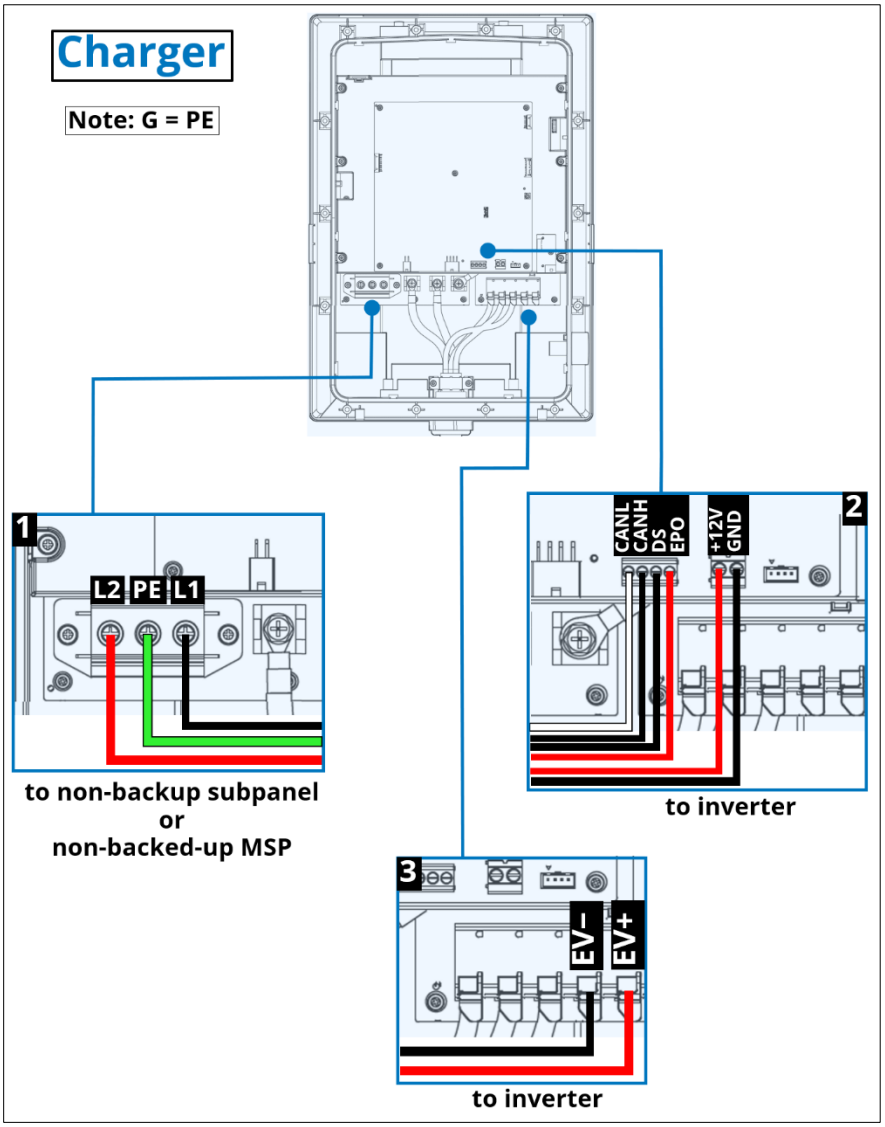


Figure 19: Charger wiring diagram

Charger Only

If the installation is for a standalone Charger only (no V2H Enablement Kit), route and install only the AC power circuit conductors.

Route the Charger wires through the conduit, and then strip, torque, and paint mark the wires (**L1, L2, PE**). Verify the connection firmly again. **Note:** Ensure that the Wi-Fi cable in the upper left remains secure and is not loosened when connecting the other wires.

The Charger L1/L2 wiring must comply with the NEC Standards adopted in your region; and the wire ampacity must be matched to the Charger DIP switch setting. **Note: Some installations may not be designed for the maximum rating of the Charger and thus may be designed with smaller gauge conductors which requires setting the DIP switches accordingly!** Always verify whether there are additional local wiring requirements such as AC disconnects and specific labeling!

It is recommended to crimp insulated ferrules on L1, L2, PE, EV–, and EV+ terminal end. Ferrules should be sized per conductor gauge. If ferrules are applied, strip the wires 0.71" (18mm)

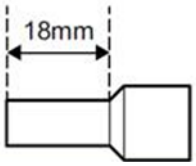


Figure 20: Wire strip length for ferrule crimping

Charger to Home Hub (non-backup panel)

When Charger is installed with V2H Enablement kit, the AC circuit can be routed into the non-backup panel in the Home Hub or a non-backup subpanel. See section titled Optional Non-Backup Panel above for details.

Charger to Inverter

From the Inverter, route the comm, control, and low-voltage wires into the Charger. Strip, terminate, torque, and paint mark the connections:

- Min. #18 AWG twisted pair for **CANL** and **CANH.**
- Min. #18 AWG for **DS** and **EPO.**
- Min. #10 AWG for **+12V** and **GND**.

From the Inverter, route minimum #8 AWG red and black conductors to the Charger. Strip, terminate, and paint mark the conductors into the **EV–** and **EV+** terminals.

Charger Wiring							
	Type	Qty.	AWG Size / Strip	Color	Torque if not terminal (in-lb)	Label	
1	**AC Charging Circuit**	3	2 8 2 0.75″	1 Red 1 Green 1 Black	33	**@Charger:** **L2** Red **PE** Green **L1** Black	**@Non-backup source equipment:** **L1** and **L2** into OCPD **PE** into grounding bar
2	**Comms and Control***	4	18 0.75″	1 White 2 Black 1 Red	3.5	**@Charger*:** **CANL** White **CANH** Black **DS** Black **EPO** Red	**@Inverter*:** **DS** Black **EPO** Red **CANH** Black **CANL** White
	12 VDC	2	10 0.75″	1 Red 1 Black	7	**@Charger:** **+12V** Red **GND** Black	**@Inverter:** **+12V** Red **GND** Black
3	**DC Power Circuit***	2	8 0.75″	1 Black 1 Red	N/A	**@Charger*:** **EV−** Black **EV+** Red	**@Inverter*:** **EV+** Red **EV−** Black

Table 2

*CANH / CANL, and DC Backup Power Circuit EV+ / EV− are in opposite positions at the Charger with respect to the Inverter

Set Charger Rating

There is a trio of DIP switches on a small red plate inside the Charger. For each switch, the lower position is a **0** and the upper position is a **1**. The *first* digit of the code is for the *leftmost* switch. The factory setting is **000**, and at this setting *the Charger will not function* and its LED will be solid red. **In accordance with the amperage specified for this install, and referencing the table below, carefully set each DIP switch to its correct position** (Table 3).

If the Charger is de-rated (installed less than 80 A continuous/100 A OCPD), the rating must be indicated on a label on the side of the Charger. For Setting 2 through Setting 7 in the following table, affix the label onto the left side of the Charger. Indicate on the label the **Charger Amps (AC)** value—**NOT** the **Breaker Amps** value.

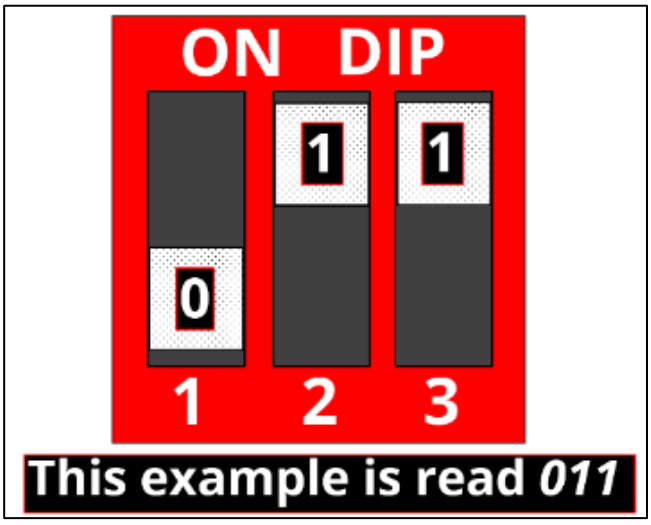


Figure 21: DIP switch setting example

WARNING! Using a charge level that exceeds the electrical circuit or electrical outlet capacity may start a fire or damage the electrical circuit. Ensure DIP switch settings align to Charger amperage and breaker amperage.

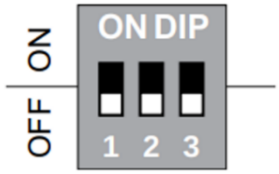
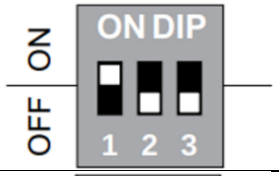
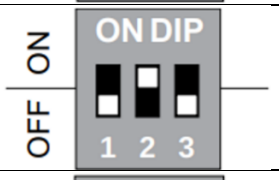
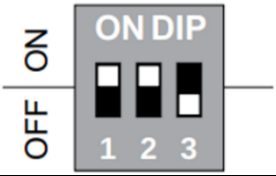
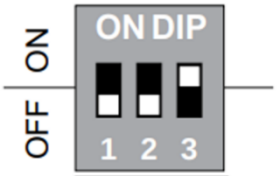
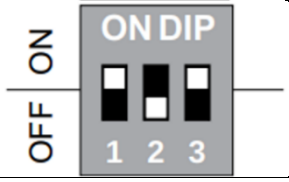
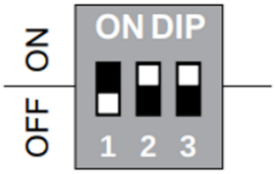
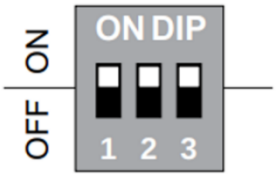
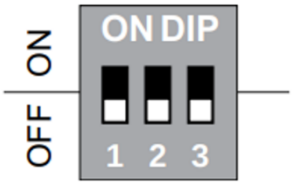
Max. AC output	Pin Configuration 1	2	3	Example	Circuit breaker amps
0A (default)	Off (0)	Off (0)	Off (0)		N/A
16A	On (1)	Off (0)	Off (0)		20
24A	Off (0)	On (1)	Off (0)		30
32A	On (1)	On (1)	Off (0)		40
40A	Off (0)	Off (0)	On (1)		50
48A	On (1)	Off (0)	On (1)		60
64A	Off (0)	On (1)	On (1)		80
80A	On (1)	On (1)	On (1)		100

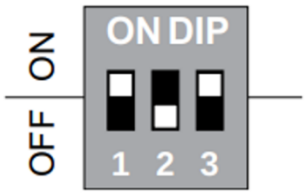
Table 3: DIP Switch Settings

Configuring DIP switches during initial installation

1. Open the black middle cover to view the DIP switch. By default, the DIP switch is set to 000.



2. Using Table 3 as a reference, set the DIP switch pins to the amperage of the installation. In this example, the maximum AC output is 48A.



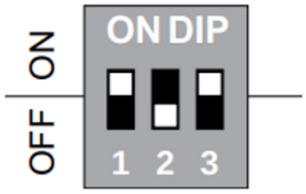
3. Turn on the breaker to power on the Charger. When the LED is solid white, plug the charging connector into the EV to start the charging.

4. DIP switch settings will be confirmed during the commissioning process near the end of installation.

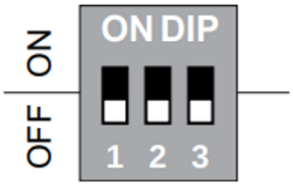
Changing output current after initial setup

In this scenario, the output current has already been set through the DIP switch. If the output current rating for the installation needs to be changed, follow the instructions below. In this example, the DIP switch setting is being changed from 48A to 80A.

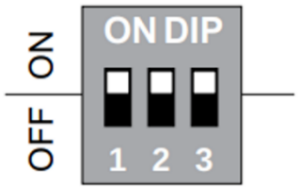
1. Deenergize the Charger and open the black middle cover to view the DIP switch pins. Here, the DIP switch setting is 101, corresponding to a 48A output current.



2. Adjust the DIP switch to the original factory default setting (i.e., 000). Energize the Charger to verify the LED shows solid red. If the output current setting is changed without reverting to factory default setting, the LED turns to blinking red once the Charger is powered back up, and the Charger will not charge. The alarm code will be displayed as EV4299, which can be checked in the commissioning app.



3. Deenergize the Charger again and set the DIP switch pins to the new amperage of the installation, using Table 3 as a reference. Here, the DIP switch setting is 111, corresponding to an 80A output current.



4. Turn on the breaker to power on Charger. When the LED is solid white, plug the charging gun into the EV to start the charging.
5. The installer can use the commissioning app to confirm that the DIP switch setting has been successfully changed.

Charger LED Behavior

For system alarm codes, refer to the GM Energy V2H System Troubleshooting Guide. The Charger LED is located on the lower right of the front cover (Table 4):

LED Behavior		Description
White	**BLINKING**	Charger is Initializing (at install or after reset)
	SOLID	Charger is Ready (unplugged)
Green	**BLINKING** (1 second on , 1 second off)	Active Charging
	BLINKING (1 second on , 4 seconds off)	Active Discharging
	SOLID	Charger is Ready (plugged in, not charging/discharging)
Blue	**SOLID**	Discharge Session Initializing
Yellow	**BLINKING**	Firmware Update in Progress
Red	**BLINKING**	Charger Error (refer to installation manual)
	SOLID	Installation Not Complete (DIP switch not set)

Table 4: LED Behavior

Wire the Inverter

Before beginning to wire the Inverter, ensure that no live voltages are present on PV input and AC output circuits, and verify that the DC disconnect on the bottom of the Inverter, the AC disconnect, and the dedicated AC branch circuit breaker are all in the OFF (open) position! If there is **no** rapid shutdown (RSD) switch installed, ensure that **RSD 1** and **RSD 2** are connected via a jumper (Figure 22, callout 5 and callout 9).

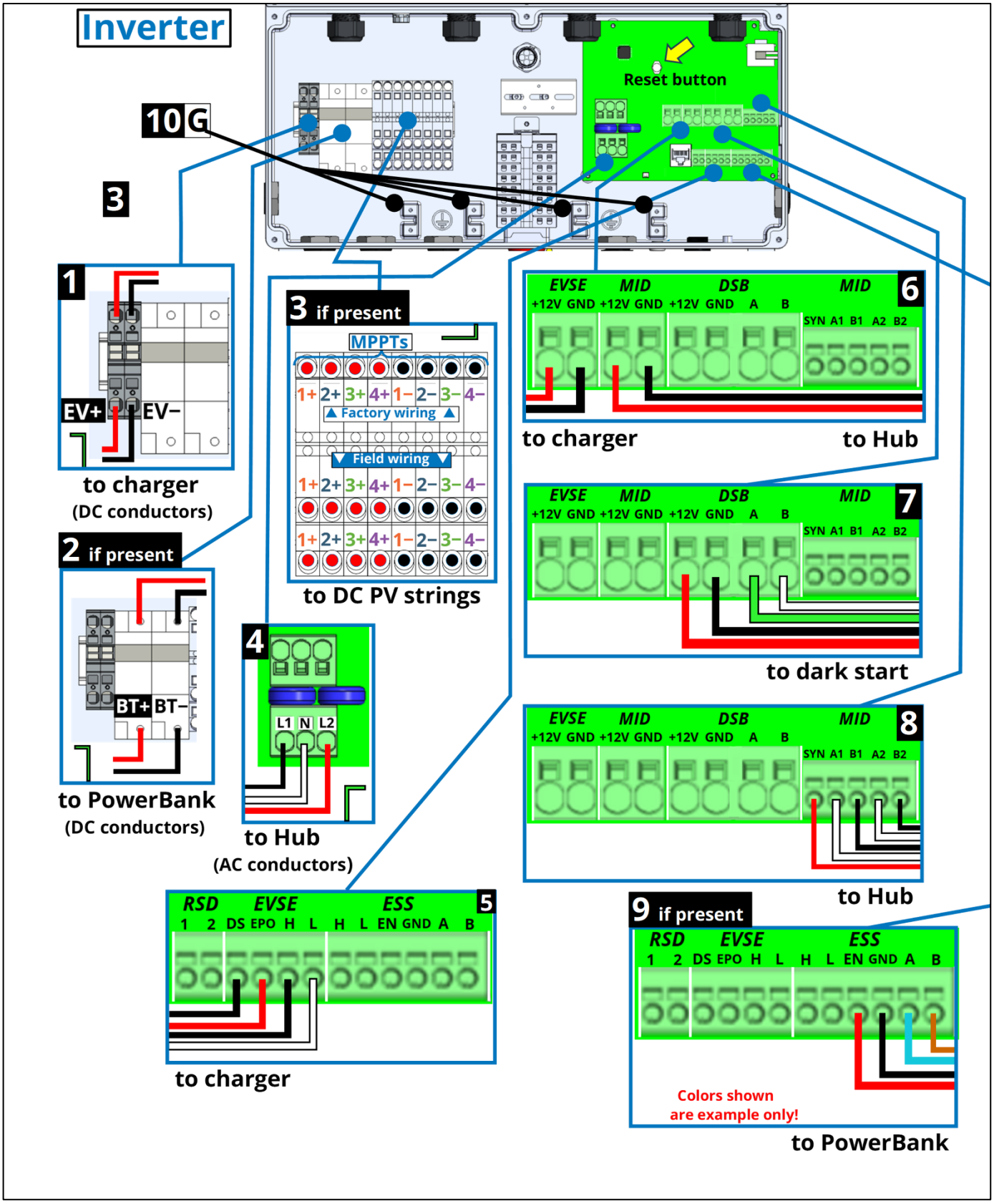


Figure 22: Inverter wiring locations

Conductors without a torque value are landed at lever attachments and therefore require no torque value. Ensure that you wire all the following connections (Figure 22 and Table 5):

	Inverter Wiring						
	Type	**Qty.**	**AWG Size**	**Strip Length / Torque IF APPLICABLE**	**Color**	**Label**	
1	**DC Charger**	2	8	0.75″	1 Red 1 Black	**@Inverter:** **EV+** Red **EV−** Black GND **Green**	**@Charger:** **EV+** Red **EV−** Black
2	**DC PowerBank (battery)**	2	8	0.5” 28 in-lb	*1 Red* *1 Black*	**@Inverter:** **HV BAT+ Red** **HV BAT− Black**	**@ESS:** **+POS Red** **−NEG Black**
3	**DC PV**	Varies	10 (typical)	0.5”	*Varies*	**@Inverter: [String number and polarity]**	**@Array: [String number and polarity]**
4	**Hub AC**	3 1	6 8	0.7” 0.5” (16 in-lb)	1 Black 1 Red 1 White 1 Green	**@Inverter:** **L1** Black **N** White **L2** Red **G** Green	**@Hub: L1 L2 breaker in the backup pan, N bar and Ground bar**
5	**Comm**	2 twiste d pair	Recommend: 18 (Acceptable: 14–23)	0.4”	1 Red 1 Black 1 Black/White twisted pair	**@Inverter** **EVSE*:** **DS** Black **EPO** Red **H** Black **L** White	**@Charger*:** **CAN L** White **CAN H** Black **DS** Black **EPO** Red
	RSD	2	12 to 18	0.5”	Any	**@Inverter :** **RSD 1 / RSD 2** Color and termination per RSD switch.	**If system does NOT have a Rapid Shutdown Device installed, RSD 1 and RSD 2 must be jumpered**
6	**9.6 VDC**	2	10	0.6″	1 Red 1 Black	**@Inverter** **EVSE:** **+12V** Red **GND** Black	**@Charger:** **+12V** Red **GND** Black
	9.6 VDC	2	10	0.6″	1 Red 1 Black	**@Inverter** **MID:** **+12V** Red **GND** Black	**@Hub:** **+12V** Red **GND** Black
7	**Comm**	4	14	0.6″ (factory stripped)	1 Black 1 Red 1 Green 1 White	**@Inverter** **DSB:** **+12V** Red **GND** Black **A** Green **B** White	**@DSB:** Factory wire connection. Add cable gland or raceway fitting.

8	**Comm**	4 (2 twisted pairs)	Recommend: 18 (RS485) Acceptable: 14–23	0.4"	1 Red Black/White Black/White	**@Inverter** **MID:** **SYN** **A1** White **B1** Black **A2** White **B2** Black	**@Hub:** **I/O** **A1** White **B1** Black **A2** White **B2** Black
9	**Comm**	6	Recommended: 18 (RS 485) acceptable 18-22	0.4"	Varies: 1 Gray 1 Yellow 1 Red 1 Black 1 Blue 1 Brown	**@Inverter:** **EN/GND/A/B**	**@ESS:** **ENABLE 12V/ENABLE GND/RS485 A+/RS485 B-**
10	**Ground for PV and DC PowerBank (battery)**	Varies	8	0.5" 16 in-lb.	Eight grounding terminals are near the bottom of the Inverter wiring chamber.	**@Inverter:** Green with spade connector recommended.	(Origination varies)

Table 5

NOTE: Terminations are not in same order (R to L) in each device.

Wire the Charger Connections

Each lead must have at least 6" **inside** the wiring box. Route, strip, terminate with a flat blade screwdriver at terminal lever, perform a tug test; and then paint mark the minimum #8 AWG red and black to the terminals. Route, strip, crimp on a spade terminal (recommended), terminate, torque; and then paint mark the green wire to the grounding point:

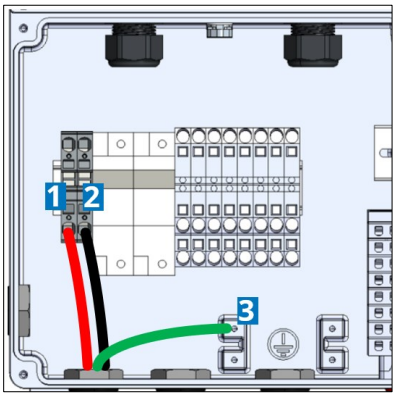


Figure 23: Inverter-Charger connections

	Wire	AWG Size	Strip Length / Torque IF APPLICABLE	Connection Point
1	Red	8	0.75″ 16 in-lb (1.8 N-m) (grounding)	Left terminal.
2	Black			Right terminal.
3	Green			Grounding point to the right of the conduit entry.

Table 6

Wire the AC Output Connections

Conduit from the AC disconnect (if present) or from the 60 A breaker in the Hub backup panel should already be installed. If an AC disconnect is required, then mount disconnect per code requirement.

WARNING: Risk of Shock and Fire - No internal bonding. DO NOT operate without connection to a wiring system with neutral to ground bonding.

Route wiring through conduit and verify that the exposed wires are at least 6″ to provide adequate strain relief. Strip, terminate with a flat blade screwdriver at terminal lever, perform a tug test; and then paint mark the minimum #6 AWG red, black, and white wires into the terminals. Route, strip, crimp on a spade terminal (recommended), terminate, torque; and then paint mark the green wire to the grounding point:

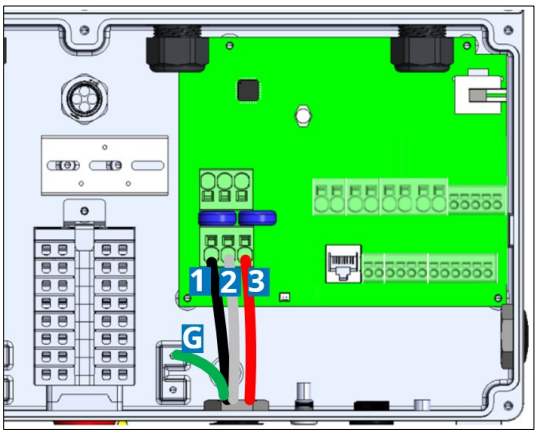


Figure 24: AC output connections

	Wire	AWG Size	Strip Length / Torque IF APPLICABLE	Connection Point
1	Black	6	0.75″	L1
2	White			N
3	Red			L2
G	Green	10	0.75″ 16 in-lb (1.8 N-m) (grounding)	Grounding point to the left of the conduit entry.

Table 7

If an AC disconnect is present, terminate the Inverter's AC output wires appropriately inside the AC disconnect. If there is no AC disconnect, appropriately terminate the output wires on the 60 A breaker in the Hub backup pan.

Wire the Low-Voltage DC Circuits

You should have already routed the #10 AWG red and black conductors from the Charger and the Hub, as well as the cabled conductors from the Dark Start.

Strip the Charger conductors and the Hub conductors, add insulated ferrules (recommended), insert a flat blade screwdriver into the lever release above the wire termination point and install the Charger conductors into the EVSE **+12V** and **GND** terminals; and the Hub conductors into the MID **+12V** and **GND** positions (Figure 25).

Remove the screwdriver from the lever release, verify with gentle tug test, then paint mark the connection point:

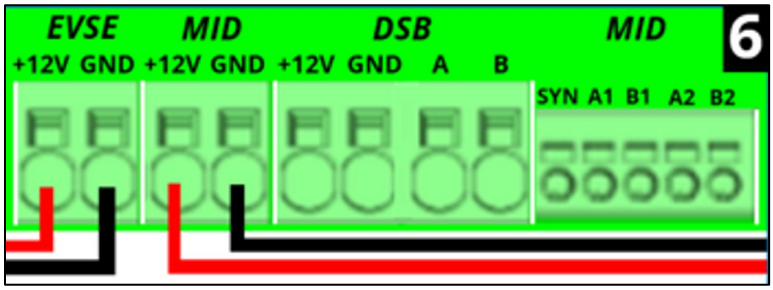


Figure 25: Low-voltage Charger and Hub DC connections

Remove the factory heat shrink on each of the four Dark Start conductors, then install each of those exposed conductors into the respective DSB terminals: **+12V, GND, A,** and **B**:

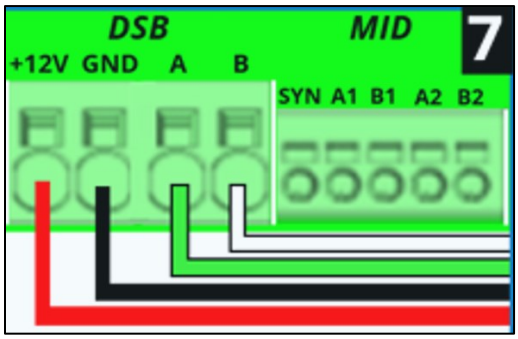


Figure 26: Low-voltage dark start DC connections

Wire the Comm and Control Wires

Note: Mark each twisted pair so that each is easily identifiable and distinguishable after installation.

For the Charger comm and control terminations at the Inverter: strip each wire, add ferrules (recommended), and install the following wires into the EVSE terminals: the **H** and **L** conductors routed between the Charger and the Inverter must be a twisted pair; the **DS** and **EPO** control wires are not required to be twisted pair, but may be twisted pair:

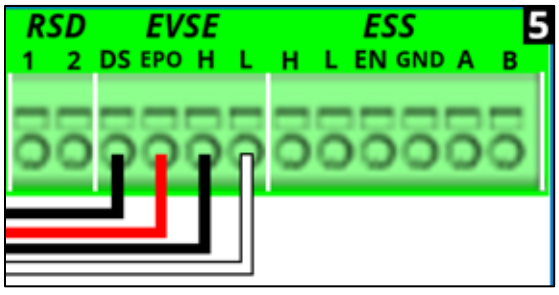


Figure 27: Charger communication connections

For the Hub comm terminations at the Inverter: strip, add ferrules (recommended), and install the following wires into the MID terminals: the **A1/B1** wires and **A2/B2** wires from the Hub must be twisted pairs. The single red SYN wire is required for direct grid feedback from the Hub to the Inverter in the system:

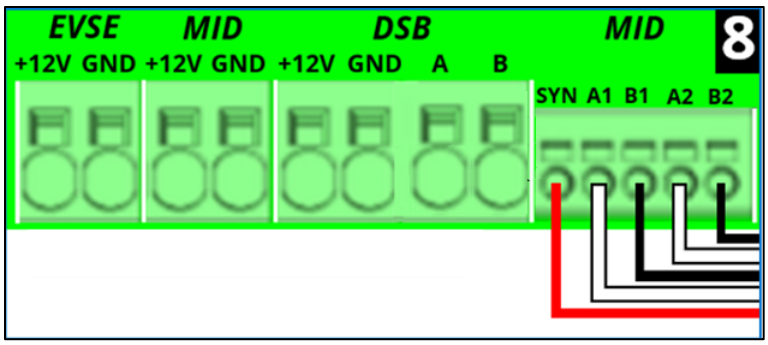


Figure 28: Hub communication connections

For the PowerBank comm terminations at the inverter: strip, add ferrules (recommended), and install the following wires into the ESS terminals: EN, GND, A and B.

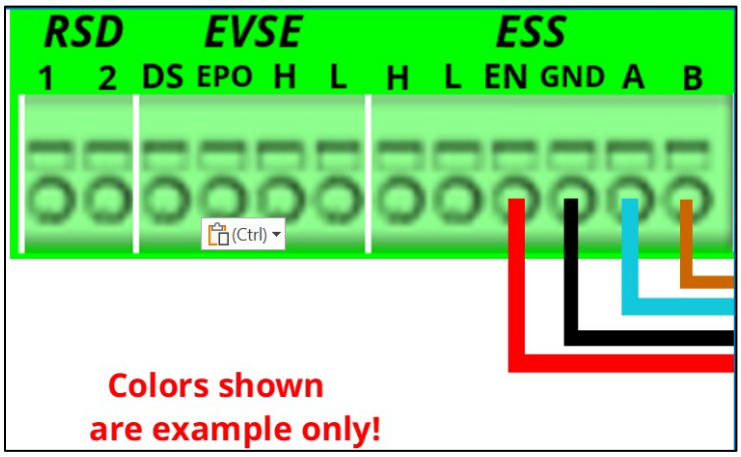


Figure 29: PowerBank communication connections

Wire the RSD Switch

The RSD two-wire 12 VDC circuit shall be wired to a normally closed switch, so that when the switch is in the on position, the circuit is closed. When the switch is in the OFF position, the circuit must become open. Wiring will vary based on the switch selected by the installer. If a RSD circuit is not installed, the RSD **1** and **2** terminals must be shorted with a jumper wire (Figure):

Please note that the RSD will shut down the GM Home System and will activate the Photovoltaic Rapid Shutdown System (PVRSS) if the home is equipped with DC Solar. (See section “Wire the PVRSS (Photovoltaic Rapid Shutdown System)”). Do not leave the RSD in a shutdown state for reasons other than safety shutdown scenarios. To leave system in a deactivated state, shut down all other applicable disconnects (AC disconnect, BDI breaker, DC solar disconnect, ESS breakers).

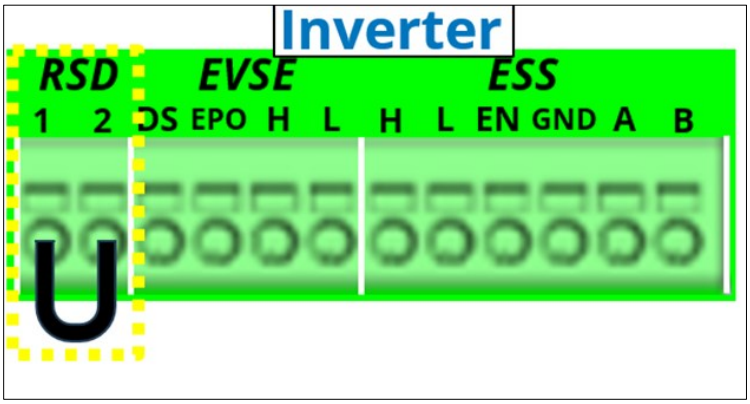


Figure 30: RSD connection

Wire the DC Solar Circuits

Perform the steps in this section only if DC solar circuits are part of the system. Do not connect any solar circuit leads to ground unless the inverter is already connected to ground.

Review the following system specifications and considerations for solar panel selection and string design:

- Calculate the number of solar panels to be connected in each string based on the maximum allowable voltage (480V without PowerBank, 450V with PowerBank), minimum startup voltage (120V) and current ratings of MPPT channel (15A) for the inverter.
- Choose between series or parallel connections based on above voltage/current requirements and shading conditions.
- Maximum DC/AC ratio supported by Inverter is 1.3. Therefore, power capacity of solar system should not exceed 15kW.

The inverter has an on/off switch on its bottom face (Figure 31). If it is not already OFF, turn the switch to the left to turn it OFF and then lock it out. Please note that this switch disconnects the solar from the inverter, but it does not activate the PVRSS; high voltage DC can still be present at the terminals shown in Figure .

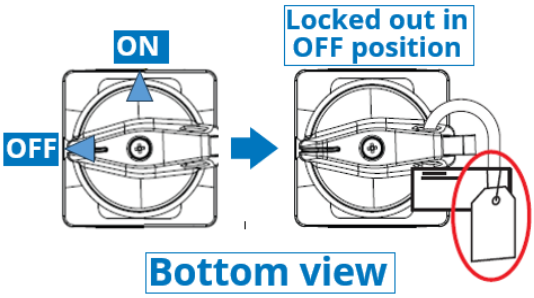


Figure 31: Solar Disconnect Switch

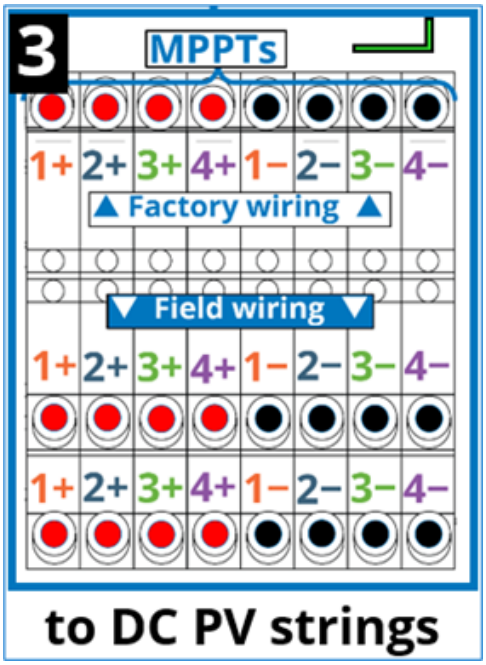


Figure 32: PV string connection inside Inverter

All solar circuit conductors must be copper wire only and sized per requirements. Conductors must each be 10 AWG copper, and each end must be stripped 1/2″. Route wiring through conduit and verify that the exposed wires are at least 6″ to provide adequate strain relief.

Beginning with terminal **1+** and incrementing by one for each solar circuit, connect the positive lead of each circuit to a terminal, to a maximum of four. Beginning with terminal **1–** and incrementing by one for each solar circuit, connect the negative lead of each circuit to a terminal, to a maximum of four (Figure 32).

Wire the PVRSS (Photovoltaic Rapid Shut Down System)

The GM Energy inverter is listed with an AP Smart PVRSS, which is compliant with the module level rapid shutdown requirement per NEC.

Transmitter Model: AP Smart Transmitter-PLC-1P, this must be procured through GM Energy. GM Energy Preferred Installers will be able to indicate need for a PVRSS transmitter directly to GM Energy. If you are not a Preferred Installer – or are one and did not indicate need at the outset – you may contact GM Energy Support Center at 1-833-64POWER to obtain one. If possible, this will be included with the shipment of the Enablement Kit; if the Enablement Kit has already shipped, the PVRSS transmitter will be sent as a separate shipment.

Compatible Rapid Shutdown Device Models:

1. AP Smart RSD-S-PLC-A
2. AP Smart RSD-S-PLC-B
3. AP Smart RSD-D-15-1000
4. AP Smart RSD-D-20-1000
5. AP Smart RSD-D-25-1000
6. AP Smart RSD-D-15-1500
7. AP Smart RSD-D-20-1500
8. AP Smart RSD-D-25-1500

GM Energy does not supply RSDs. Installers are responsible for procurement of compatible PVRSS RSDs.

Carefully read and follow below procedure to install the transmitter inside Inverter:

1. Remove the green terminal from the transmitter.
2. Use a flat blade screwdriver to connect the harness for the 12 V power supply to the transmitter, according to the polarity markings on the transmitter; and then torque to 1.8 in-lb (0.2 N-m).
3. Connect the terminals of the CT wire to the other side of the transmitter. Use a flat blade screwdriver to loosen the factory DIN bracket and slide it to the right.
4. Snap the transmitter onto the DIN rail and then lock the red buckle of transmitter.
5. Slide the factory bracket back toward the transmitter until it contacts the transmitter and then torque the factory bracket screw to 2.7 in-lb (0.3 N-m).
6. Connect the 12 V power supply harness to the three-pin connector on the inverter board.
7. Route all of the **PV–** wires through the CT and then land them in the respective **PV–** terminals with a 3 mm flat blade screwdriver.

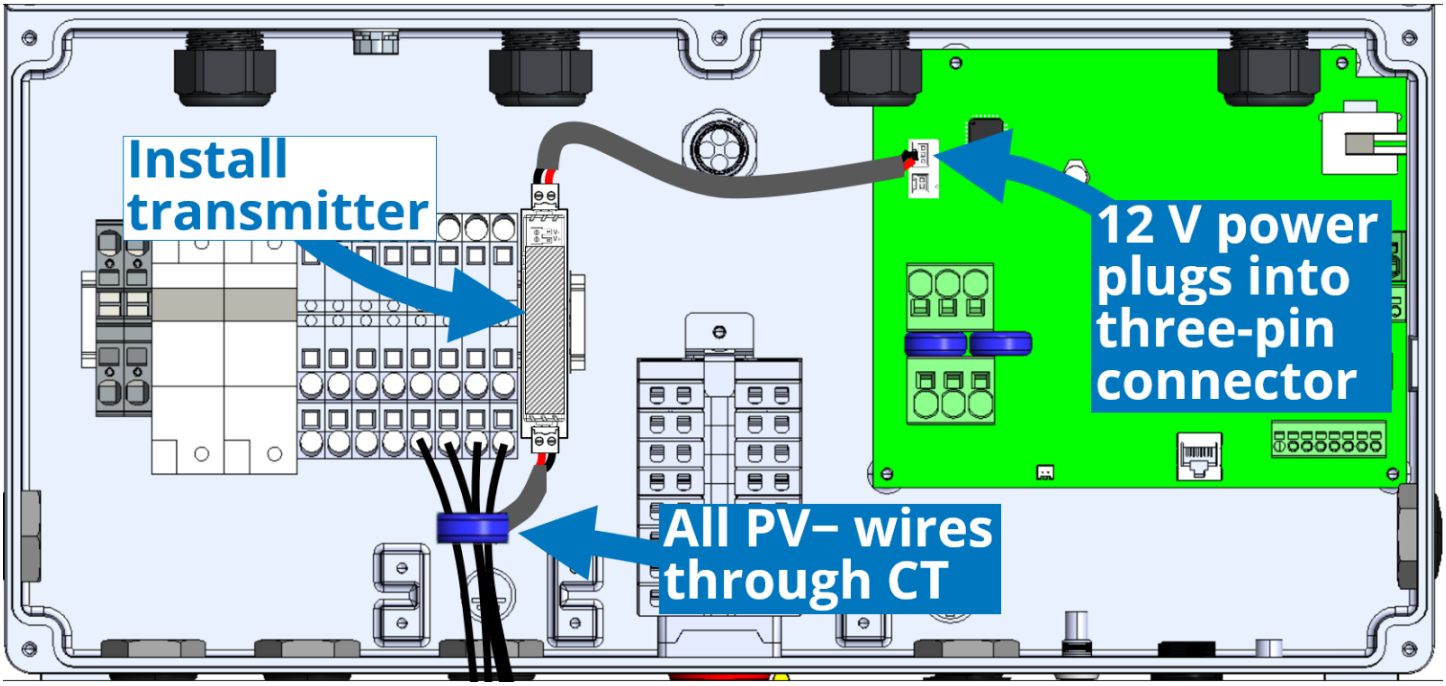


Figure 33: AP Smart PVRSS transmitter installation in Inverter

Wire the PowerBank to Inverter

Perform the steps in this section only if a PowerBank battery is part of the system. Route the wiring through conduit and verify that the exposed wires are at least 6″ to provide adequate strain relief. Connect the black, red, and green wires (Figure 34 and Table 8). **Note:** The factory installed fuses in the holders are Eaton BUSSMAN FWP-50A 14F.

	Wire	AWG Size	Strip Length / Torque IF APPLICABLE	Connection Point
1	Red	8	1/2″ Spade terminal recommended on grounding conductor (16 in-lb 1.8 N-m)	Left side of battery fuse holder.
2	Black			Right side of battery fuse holder.
3	Green			Grounding lug to the right of the conduit entry.

Table 8

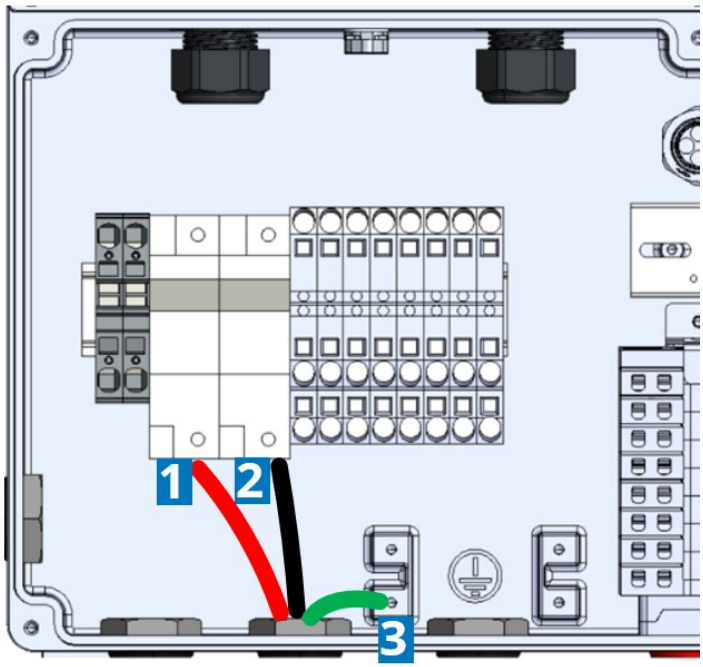


Figure 34: Powerbank connections in Inverter

For systems that include a PowerBank, you must install a 6 V battery in the inverter. 6V batteries will be included in the shipment of any PowerBank purchase. (Figure 35):

1. Move the wiring to access the two screw holes in the center of the back wall in the inverter wiring compartment.
2. Attach the battery assembly to the back wall with two M4 screws, torquing each to 12.4 in-lb (1.4 N-m).
3. Connect the battery harness to the two-pin port on the Inverter board.

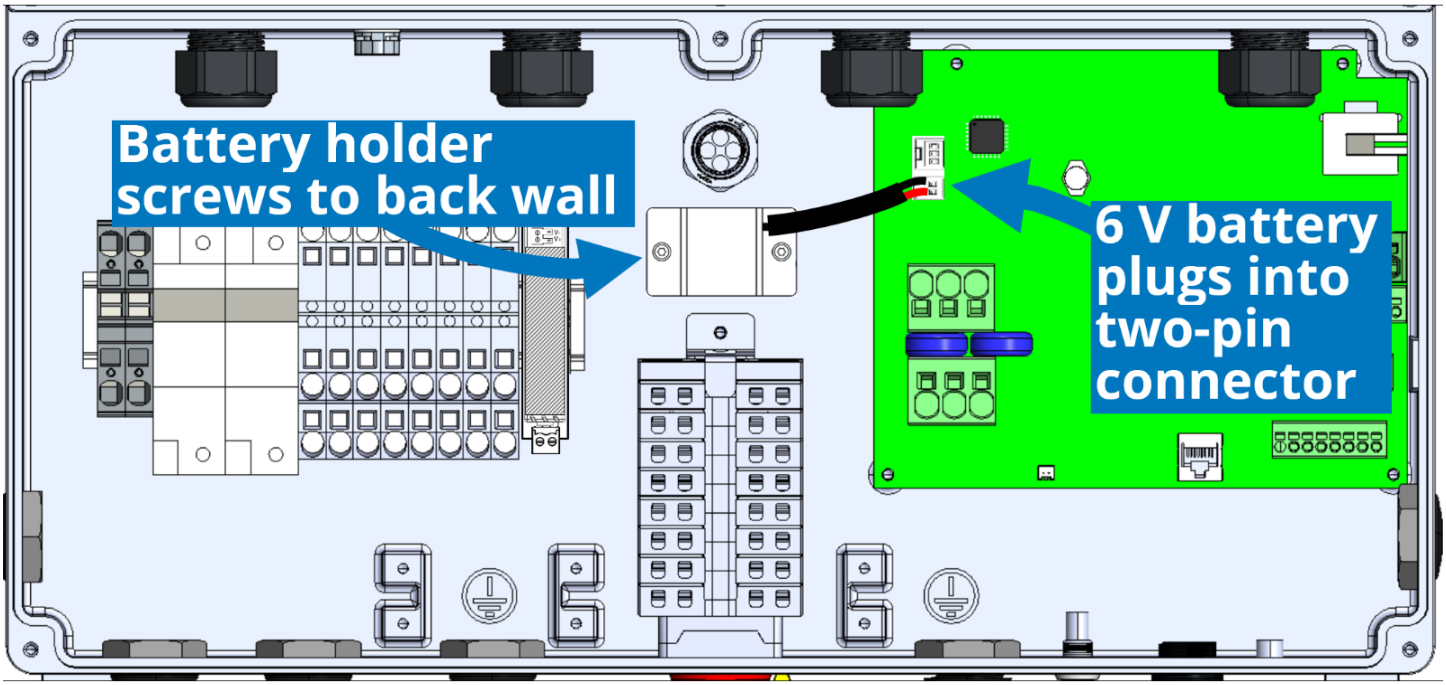


Figure 35: 6V battery installation

Inverter LED Behavior

The Inverter LED is located on the lower right of the front cover (Table 9).

LED Behavior		Description
White	BLINKING (1 second on / 1 second off)	Inverter firmware update is in progress
	BLINKING (1 second on / 4 seconds off)	Deep Sleep Mode
	SOLID	Inverter is initializing
Green	BLINKING (1 second on / 1 second off)	Charge/discharge is initializing
	BLINKING (1 second on / 4 seconds off)	Inverter is idle (standby)
	SOLID	Inverter is operating normally (is converting power)
Yellow	BLINKING (1 second on / 1 second off)	Fault is present in Dark Start or in PowerBank
	BLINKING (1 second on / 4 seconds off)	Inverter warning
	SOLID	Equipment alarm
Red	BLINKING (half second on / half second off, then 2 seconds on / half second off)	Overcurrent protection fault is present
	BLINKING (1 second on / 1 second off)	Ground fault is present
	SOLID	Arc fault is present

Table 9

The Inverter reset button has the following function (Table 10):

Function	Action
Arc reset	Press for 5 seconds to clear arc fault

Table 10

Wire the Hub

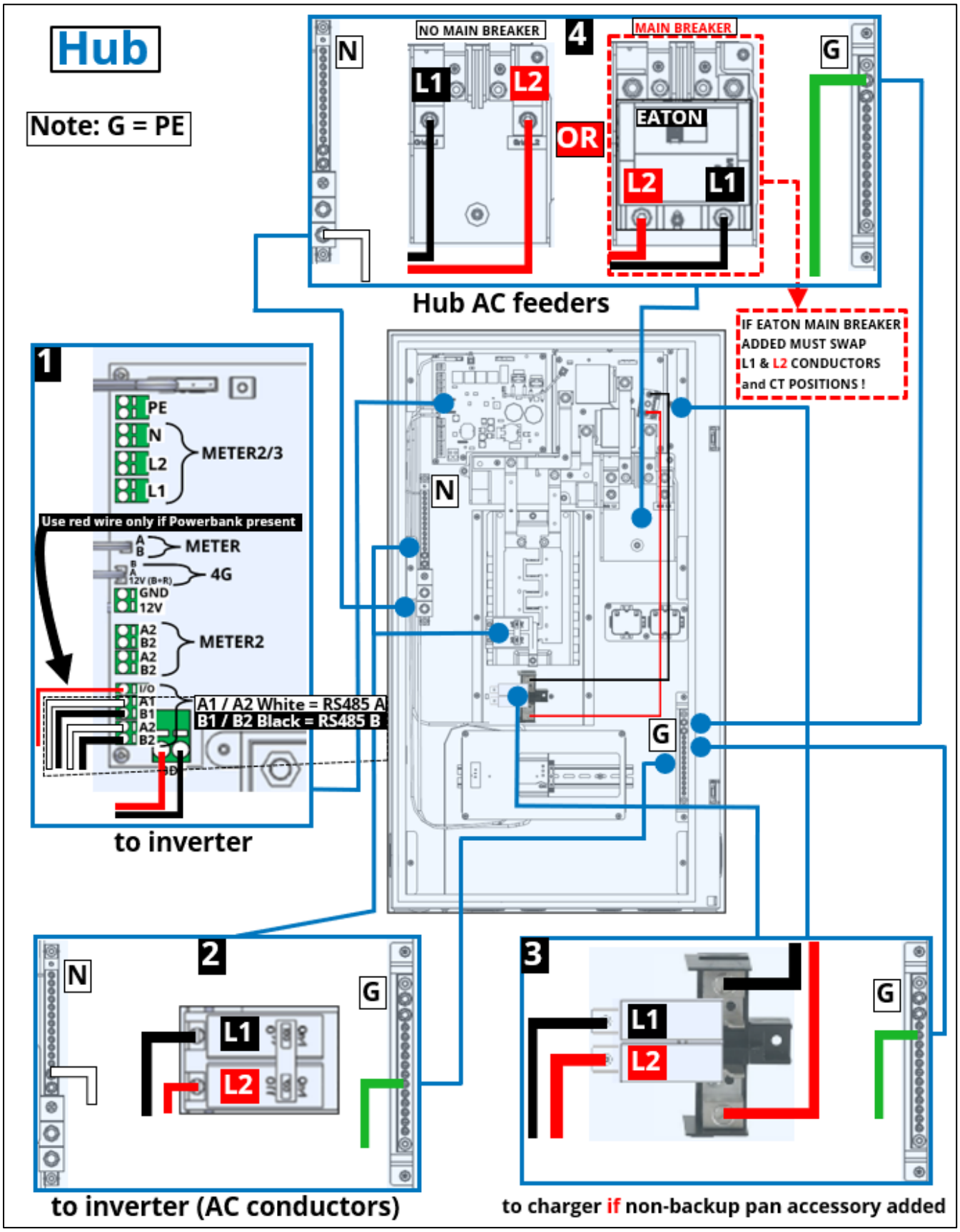


Figure 36: Home Hub wiring locations

	Hub Wiring						
	Type	**Qty.**	**AWG Size**	**Color**	**Strip Length / Torque (in-lb)**	**Label**	
1	**Inverter Comm**	4	**14–23 (RS485)**	2 Black / White twisted pairs 1 Red	**0.4”**	**@Hub:** **I/O** Red **A1** White **B1** Black **A2** White **B2** Black	**@Inverter:** **SYN** Red **A1** White **B1** Black **A2** White **B2** Black
	Inverter 12 V DC	2	**10**	1 Black 1 Red	**0.6”**	**@ Hub:** **+12V** Red **GND** Black	**@Inverter MID:** **+12V** Red **GND** Black
2	**Inverter AC**	4	**none given**	1 Red **L1** 1 Black **L2** 1 White **N** 1 Green **PE**	Per breaker	**@ Hub:** Red and black to breaker White to neutral bar Green to ground bar	**@Inverter:** **L1** Black **N** White **L2** Red **Ground bar** Green
3	**Hub main PCB connector to Hub Non-Backup Pan (if added)***	2	**3-2 (copper only)**	1 Black **L1** 1 Red **L2**	0.71” 35 in-lb @ main PCB connector 45 in-lb @ NBU pan accessory	**@Hub:** Red from lower main PCB connector to lower non-backup pan lug Black from upper main PCB connector to upper non-backup pan lug	
	AC from Charger	3	**2 2 14-4**	1 Red **L2** 1 Black **L1** 1 Green **PE**	0.71” 45 in-lb for L1/L2 20 in-lb for 14-10 PE, 25 in-lb for 10-4 PE	**@Hub:** Black to upper L1 of breaker Red to lower L2 of breaker Green to ground bar	**@Charger:** **L2** Red **PE** Green **L1** Black
4	**Hub AC feeders**	4	**#6-250 kcmil #6-250 kcmil 14-2/0 14-2/0**	1 Red **L2** 1 Black **L1** 1 White **N** 1 Green **PE**	1.25” Breaker lugs & neutral main lug: 275 for 3/0– 250 kcmil 94 for #3–2/0 45 for #6–4	**@Hub:** Black L1 to **L** breaker lug Red L2 to **R** breaker lug *IF EATON MAIN BREAKER:* Black L1 to **R** breaker lug Red L2 to **L** breaker lug White to neutral bar Green to ground bar	**@Inverter:** **L1** Black **N** White **L2** Red **Ground bar** Green
Large Neutral & Ground Lugs torque: 45 for #14–8 110 for #6–4 150 for #3–2/0 Strip length 0.55”				**Small Neutral & Ground Lugs torque:** 20 for #14–10 25 for #8–4 Strip length 0.55”			Neutral & Ground bars have a main, a large, and a small lug size; but Ground bar lacks a main.

Table 11

*Prepare one copper 20″ **black L1** and one copper 20″ **red L2** conductor for this internal Hub connection. Size the wires per the Charger amps rating (set via DIP switches in Charger). Maximum is 2 AWG for 80 A rating.

Allow for sufficient clearance when routing wires near Home Hub dead front cover hinge locations.

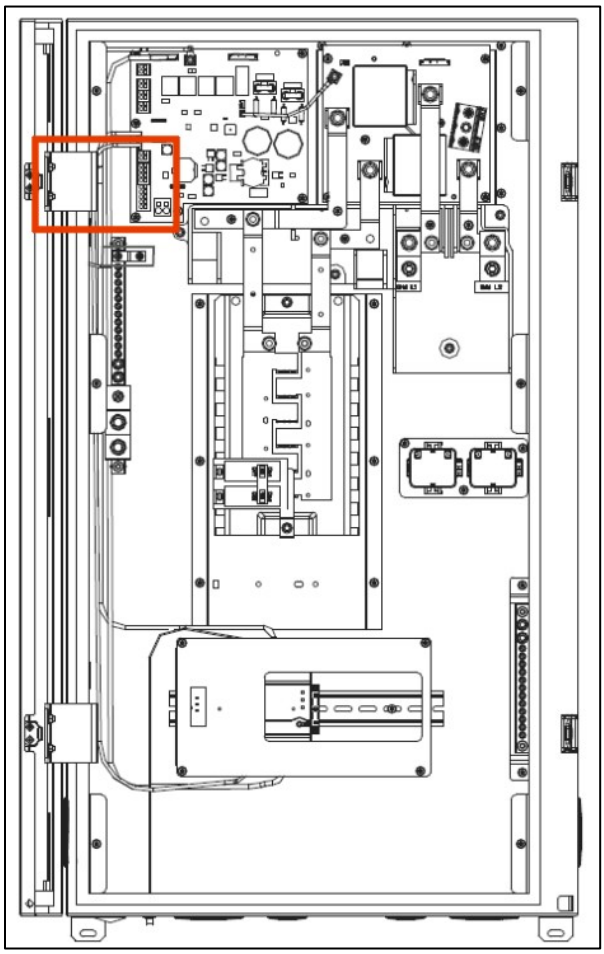


Figure 37: Callout for Home Hub hinge keep out zone

Hub–Inverter Power Wire Connection

Use only 90°C copper wire for Inverter wiring.

1. Install 1″ conduit into the left 1″ conduit hole on the bottom of the Hub.
2. Pull the Inverter power wires **from the Inverter** through this conduit into the Hub.
3. Strip and tighten the AC conductors (**L1, L2, N, G**) according to and Table 11.

Grid Power Wire Connection

Depending on your conduit strategy, attach conduit and a watertight conduit fitting to either the 2″ **Grid** knockout on the bottom right OR the 2″ **Grid** knockout on the side. Pull the Hub AC feeders (black **L1**, red **L2**, green ground, and gray neutral/PE) wires through the conduit into either of the 2″ entries, and then strip 1.25” from each end. Land the wires and tighten as per Table 5. Table 12 shows the wiring information for the connections shown in Figure 38.

	Terminal	Wire Gauge (AWG)	Wire Strip Length (in.)	Tool	Torque for Wire Size (in-lb / N-m)
A	Grid and load main lug	6–250 kcmil	1.25”	5/16″ hex	• 275 / 31 for 3/0–250 kcmil • 94 / 11 for #3–2/0 AWG • 45 / 5 for #6–4 AWG
B	Neutral main lug				
C	Neutral and ground lug (large)	14–2/0	0.55”	3/16″ hex	• 45 / 5 for #14–8 AWG • 110 / 12.5 for #6–4 AWG • 150 / 17 for #3–2/0 AWG
D	Neutral and ground lug (small)	14–4	0.55”	5 mm slotted	• 20 / 2.3 for #14–10 AWG • 25 / 2.8 for #8–4 AWG

Table 12

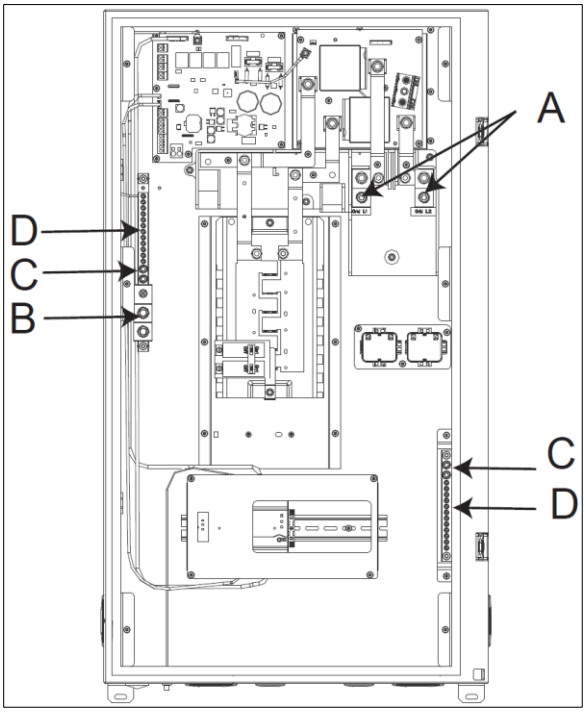


Figure 38: Home Hub grid power connections

Note: Torque circuit breaker terminals to values specified on the breakers. Terminals other than breaker terminals & EVL1/EVL2 are suitable for 60/75ºC AL/CU wire. Breaker terminals are suitable for wire as marked. Communication wires may not be tied to power wires.

Communication Wire Connection

Refer to Figure 36 and Table 11:

1. For RS-485 **A1, B1, A2,** and **B2,** use provided 14 AWG wire and strip 3/8″ from the wire ends.
2. For **12V** and **GND**, use provided 14 AWG and strip 3/8″ from the wire ends.

Wire the Dark Start

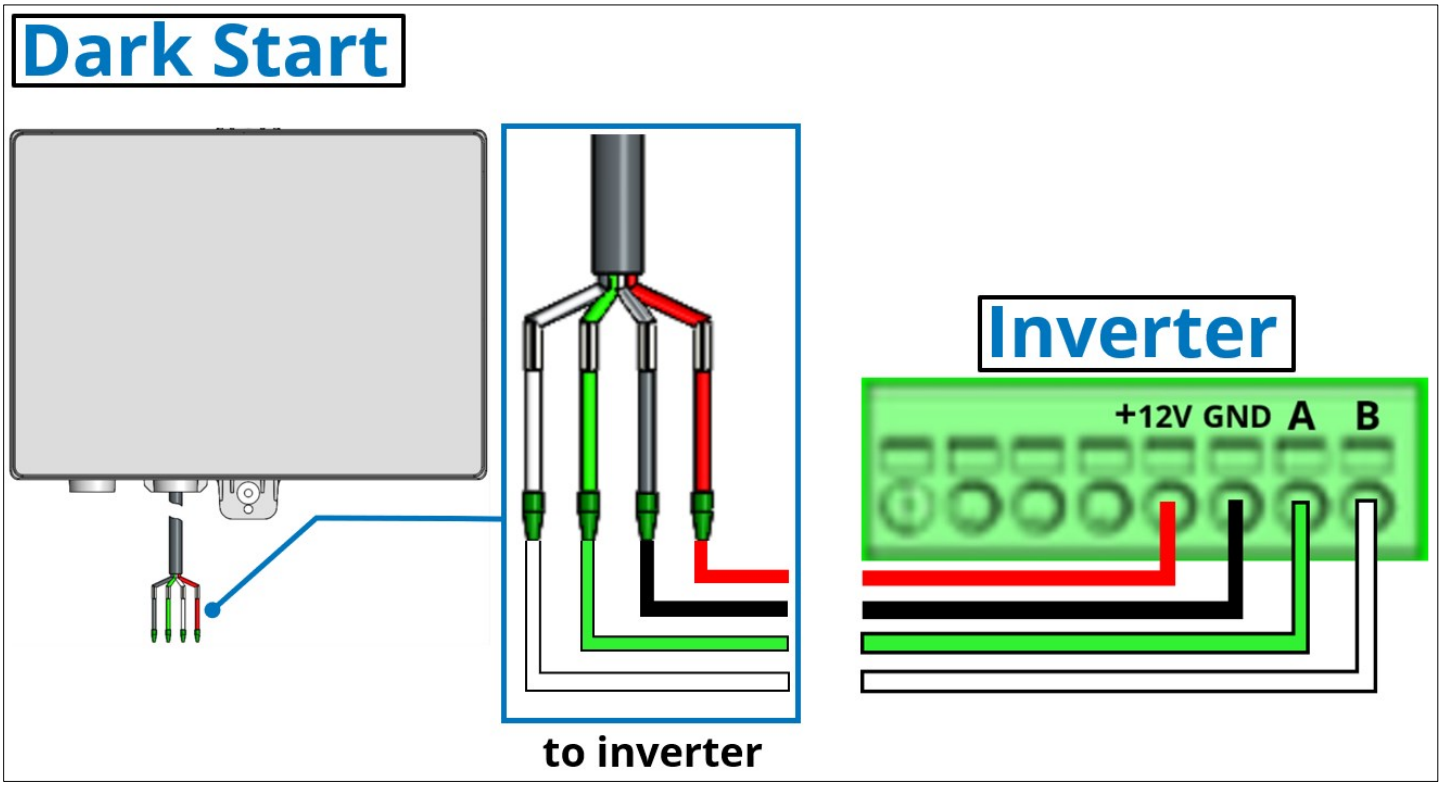


Figure 39: Dark start wiring connections

The wires on the factory-integrated cable are pre-stripped. Insert the following wires into the following terminals (Figure 39 and Table 13):

Wire	Terminal
Red	**+12V**
Black	**GND**
Green	**A**
White	**B**

Dark Start Wiring						
Type	**Qty.**	**AWG Size**	**Color**	**Torque if not terminal**	**Label**	
Comm	4	14	1 Black 1 Green 1 White 1 Red	Lever attachment on Inverter side (no torque required).	**@Dark Start:** N/A (integrated)	**@Inverter:** **GND** Black **A** Green **B** White **+12V** Red

Table 13

Wire the PowerBank

Below are wire specifications for the PowerBank

	Cable Type	Max Wire Length
Communication Cable	0.326~1.646mm2 (18~22AWG/Cable Outer Diameter of Jacket Ø5~6mm (Ø 0.2~0.24"))	35ft(10m)
Power Cable	8mm$_2$ (8~10AWG/Cable Outer Diameter Ø6~7mm (Ø 0.24~0.28"))	35ft(10m)

Copper wire rated for 600V or higher is recommended for power cable.

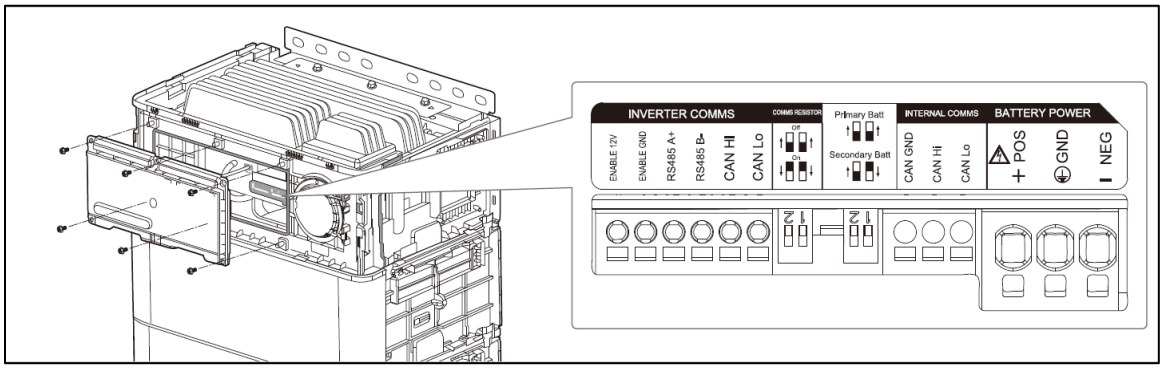


Figure 40: PowerBank Wiring Locations

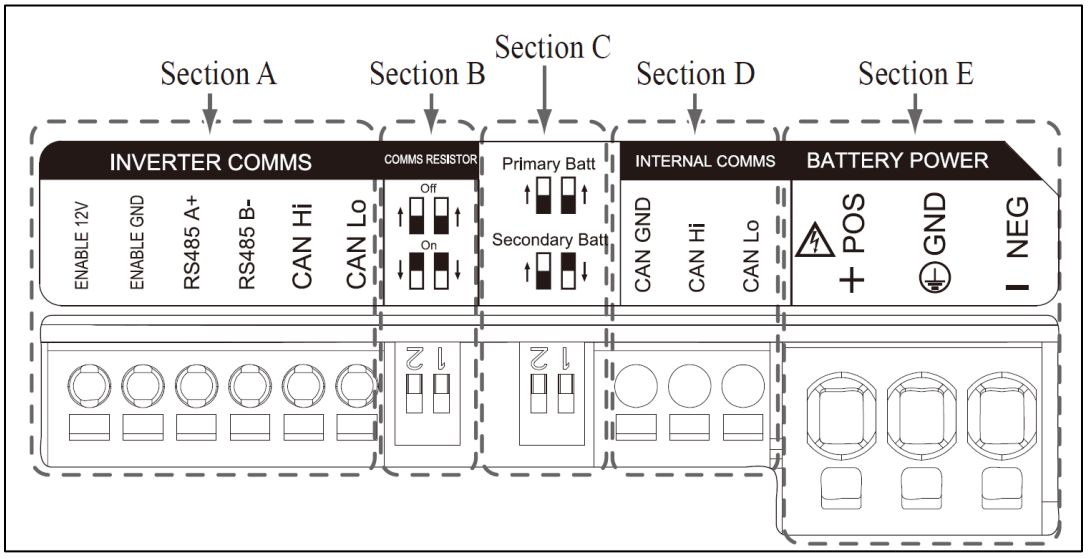


Figure 41: PowerBank Cable connections

- Section A : Inverter communication port including CAN/RS485 and Enable line.
- Section B : Dip switch for setting communications resistor (Not used for communication to GM Energy Inverter).
- Section C : Dip switch for setting primary/secondary Battery Packs.
- Section D : Do not connect internal communication port.
- Section E : Battery power port including positive/negative pole and ground.
  (POS: power terminal plus, NEG: power terminal minus, GND: ground)

NOTE. For parallel PowerBank installation, a junction box is required. Also, the primary and secondary unit will have to be designated. Please refer to Section 6.2 of PowerBank Installation Manual for detailed instructions.

Section A: Inverter Communication Port

Max. cable length: 10m (32ft)
Cable type : 0.326~1.646mm2 (18~22AWG)

a) Strip each communication cable by 10mm. (0.4").
b) Crimp ferrules to each cable.

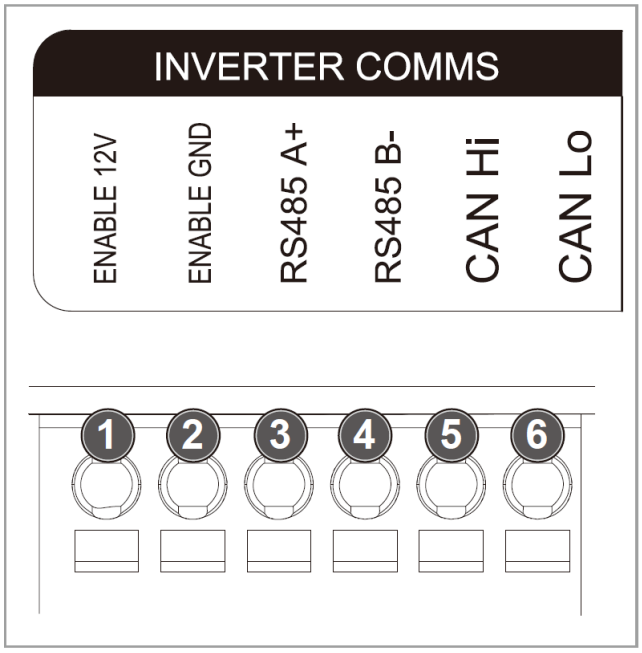


Figure 42: Cable connections

c) Connect the Enable 12V positive line to terminal. ❶
d) Connect the Enable ground wire to terminal. ❷
e) Select the inverter communication method, CAN or RS485
RS485 : Terminal ❸ & ❹
CAN : Terminal ❺& ❻
NOTE: For connection to GM Energy Inverter, utilize only RS485 communications

Section B&C: DIP Switch Setting

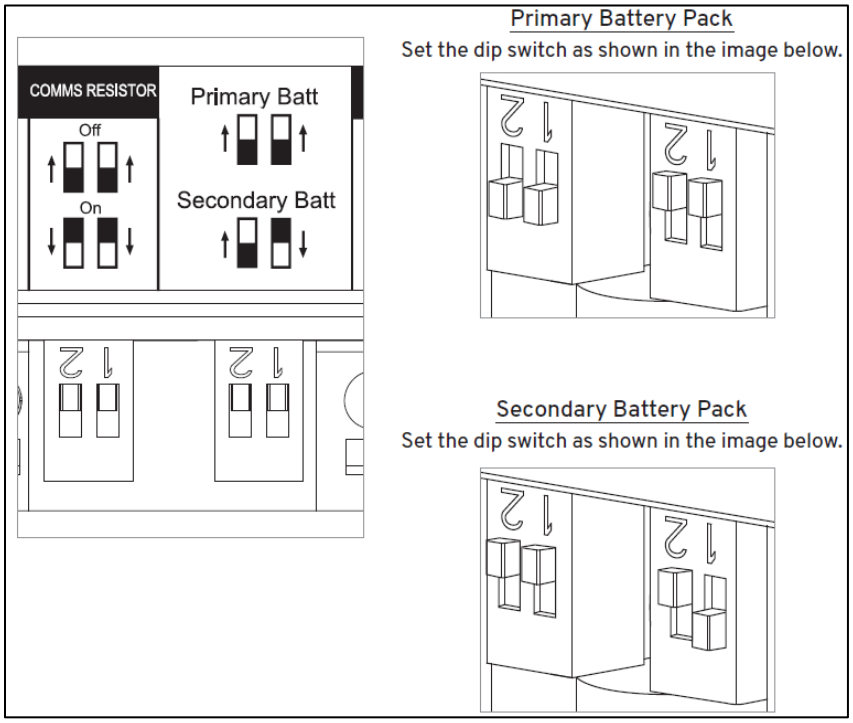


Figure 43: PowerBank Comms DIP Switch Setting

Note: When installing a single PowerBank, set the DIP switch to Primary Battery Pack setting per figure above.

Install Covers

If you will not complete pre-commissioning electrical and wiring checks and commissioning before leaving the site, install and properly torque all equipment covers as detailed below.

Component	Steps
PowerShift	Install the middle cover and torque the fourteen M4 ×12 mm Torx screws to 10.4 in-lb. Install the front cover and torque the two M4 ×12 mm Torx screws to 10.4 in-lb.
Hub	Install the dead front, secure each door clasp, and close the cosmetic clasp covers.
Inverter	Install the Inverter wing box cover and torque the five M4 x 14 mm Torx screws to 18 in-lb. Install the front cover and torque the two M4 x 9 mm Torx screws to 10.4 in-lb. Additional force on top corners of beauty cover may be required for proper fit onto Inverter box.
PowerBank	Reattach and torque the 6 screws of wiring cover properly. Ensure circuit breaker cover is completely sealed by pressing cover with sufficient force. Reattach front cover and ensure all 8 attachment points snap into place.

TESTING AND COMMISSIONING

After all equipment is installed, it is critical that you safely verify all electrical work, energize and then verify voltage throughout the system, commission the system, and configure the equipment.
GM Energy recommends printing the System & Voltage Checks, found in Appendix H. After all elements of the system installation are verified, and after commissioning is complete and system operation is verified (for example, the RSD switch operation has been verified), take a photograph of the completed sheet for job closeout records.

DANGER! Circuits will be energized and tested, and will remain ON (live) during these activities. Working with this equipment can expose individuals to severe electrical shock hazards. Only qualified persons with appropriate PPE in accordance with NFPA 70E may perform this work.

WARNING! This section describes verification requirements for wiring terminations and electrical voltage checks. Prior to beginning, you must ensure that all energy sources have remained de-energized and have had lock out tag out procedures executed.

This section describes the following sequence of work:

1. Verifying electrical and wiring terminations.
2. Verifying low-voltage conductors and communication cables.
3. Pre-commissioning preparation.
4. Commissioning and configuration.

Verify Electrical and Wiring Terminations

Before you begin, there must be no LED lights illuminated in the Hub, the Inverter, or the Charger. If all AC sources are de-energized and locked out, and there is still one or more LEDs that are illuminated, open (turn OFF) the rotary PV DC disconnect on the bottom of the Inverter and power OFF PowerBank. Wait 5 minutes for the Inverter to dissipate any possible stored energy.
Prior to energizing electrical equipment, review the electrical installation of raceways/conduits, conductors, and any OCPD. Verify that raceways/conduits are adequately sealed and secured for the specific type and environment; that all OCPDs have been installed according to design and permit; and that each is securely seated into their busbar tabs.

For the steps in this section, regarding circuit conductors, the instruction to "verify" means you must ensure ALL of the following:

- All conductors and OCPDs are installed per requirements.
- All wires have been routed, coached, and secured so that there is no forceful pressure/bias on them or on any respective terminal lug.
- No wiring is subject to a crush or pinch hazard—for example, the Hub hinge area and covers.
- Any spliced wires are in an appropriate enclosure, securely spliced (crimped, splice blocks torqued, or wire nuts twisted), and fully insulated.
- Any non-metallic (NM) bundled cables are appropriately concealed.
- Any relocated multi-wire branch circuits remain paired and bundled with their neutral and ground circuit wires.
- A pull test is performed on de-energized conductors at each terminal location.
- All conductors for each circuit have been torqued.

- All terminal lugs have been paint marked after each is torqued.
- Labeling of new and of any relocated conductors and/or circuits have been preserved and transferred correctly.
- Charger DIP switches are set, and Charger is properly labeled for its maximum current rating.

Additionally, for installations that include the Charger and V2H Bundle, verify that the:

- Hub main breaker and bonding are installed correctly.
- CTs are correctly installed (or correctly re-located).

Best Practice: The same individual should properly torque and then paint mark all connections.

Verify Communications and Low-Voltage Wiring

For installations that include the Charger and V2H Bundle, proceed to Appendix H and print the System & Voltage Checks (S&VC) form.

- Verify that all 12 VDC conductors are #10 AWG and terminated into the correct 12V and Ground terminals.
- Verify that all RS-485 and CAN cables are of adequate conductor size, and are wired into the proper terminals.
- Verify that all control cables (DS, EPO, and RSD/ESD) are of adequate conductor size and are wired into the proper terminals.
- After verifying these conductors and cables, check the appropriate boxes in the LV DC & Comm Cables section of the form.

Measure and Record System Details and Voltages

Establish safe working zones and don PPE. Systematically energize the utility service to MSP/main breaker, premises circuits, and all installed equipment.

As equipment is energized, verify 120/240 V and Phase A/Phase B polarity, and record all system values and measurements on the sheet. Compare L1/L2 current and power measurements from commissioning app to readings from an external meter to ensure that the commissioning app is accurately communicating power consumption data.

Reinstall Covers

Reinstall and properly torque all equipment covers:

Component	Steps
PowerShift	Install the middle cover and torque the fourteen M4 ×12 mm Torx screws to 10.4 in-lb. Install the front cover and torque the two M4 ×12 mm Torx screws to 10.4 in-lb.
Hub	Install the dead front, secure each door clasp, and close the cosmetic clasp covers.
Inverter	Install the Inverter wing box cover and torque the five M4 x 14 mm Torx screws to 18 in-lb. Install the front cover and torque the two M4 x 9 mm Torx screws to 10.4 in-lb. Additional force on top corners of beauty cover may be required for proper fit onto Inverter box.
PowerBank	Reattach and torque the 6 screws of wiring cover properly. Ensure circuit breaker cover is completely sealed by pressing cover with sufficient force. Reattach front cover and ensure all 8 attachment points snap into place.

WARNING! To reduce the risk of electrical shock or serious injury, double check that covers are properly assembled and fastened to ensure high voltage is not accessible.

Commissioning, Device Replacement, and Maintenance

This section walks you through the steps to commission or perform maintenance on a GM Energy V2H Bundle.

Before beginning this process, please ensure you have completed all necessary steps documented above in this manual.

Visit https://gmenergy.gm.com/for-home/installation-support to download the most recent PowerShift Install commissioning app.

For the intent and purpose of this section the following equipment will be referenced as the following below and in the PowerShift Install commissioning app:

- GM Energy PowerShift Charger: EVSE
- GM Energy Inverter: BDI
- GM Energy Home Hub: MID
- GM Energy Dark Start Battery: DSB
- GM Energy PowerBank: ESS

Pre-Commissioning Systems Check

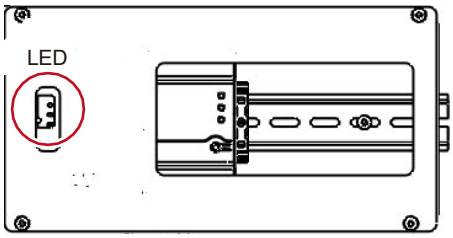
Power on all systems

- Verify the breaker feeding the MID is closed and valid grid voltage is available to energize the MID. LED on the BDI and EVSE should be on.
    - Energize all circuits within the MID including the BDI and EVSE.
- For installations including the EVSE, ensure the Charger connector is in the holster and not plugged into the vehicle.

LED Status Verification

Verify the relevant components of the system are in the following LED state before commissioning the system, please reference the LED guide in this manual if needed.

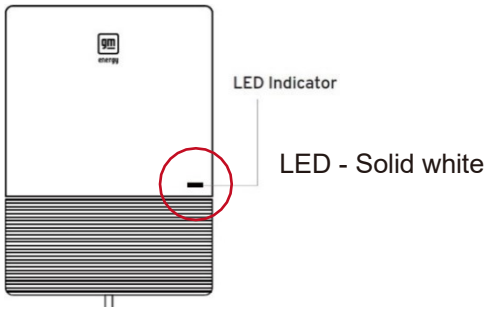
DC1 (Data collector inside of MID)

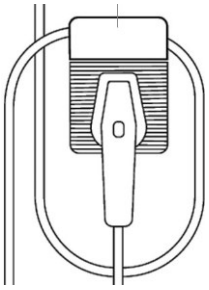


LED Indicator:

- System Ready: Solid Green
- Inverter Comm: Green Blinking
- Internet Comm: Off

EVSE



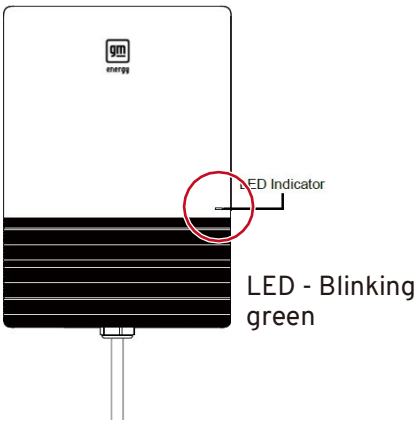


Charge Connector:

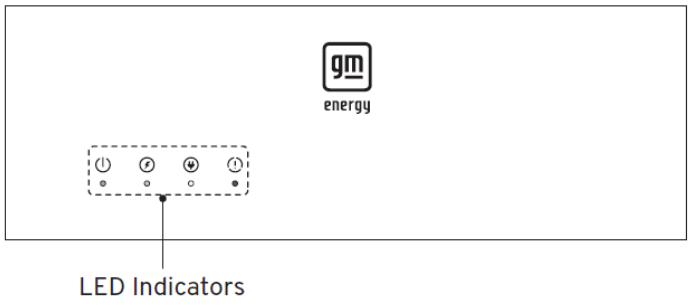
Keep connected to Holster. Do not plug-in to EV

If the Charger's indicator LED is red, this indicates that the DIP switch has not been configured. Please set the DIP switch before proceeding. Reference the "Set Charger Rating" for further instructions.

Inverter



PowerBank

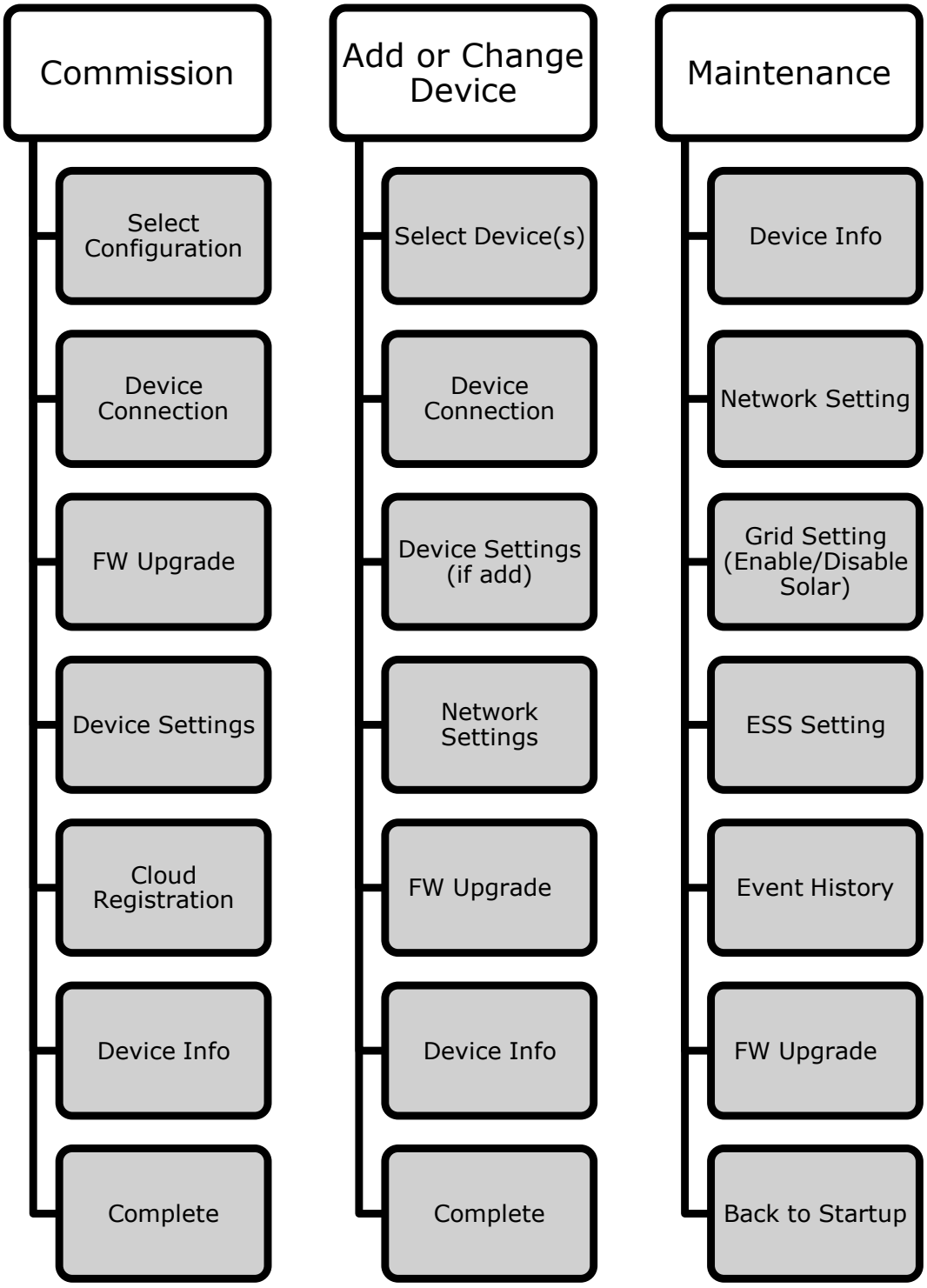


Power LED: Green

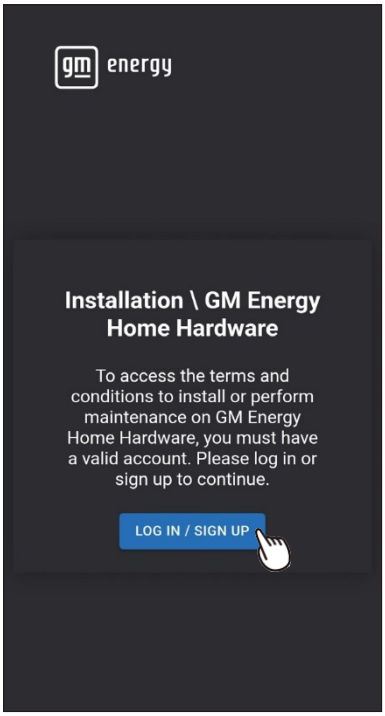
Commissioning Process

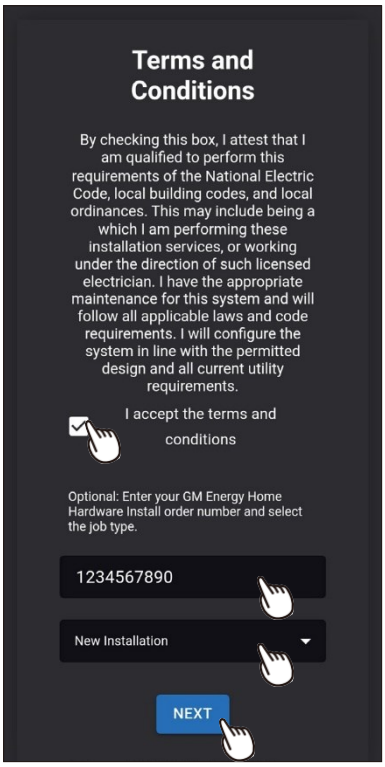
App flow

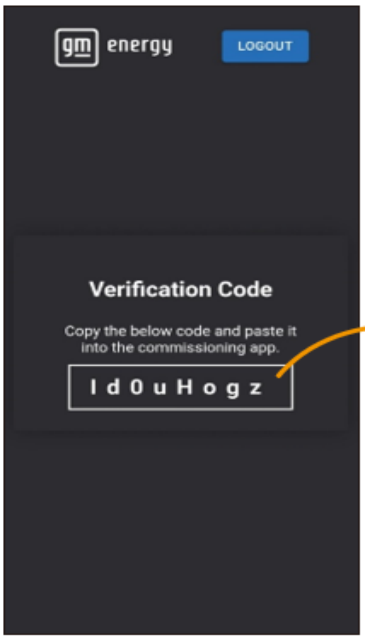
Please refer to the flow below for expected commissioning steps. Note: DC and AC Solar are enabled/disabled via Maintenace section post new commissioning. Solar is not part of the Add Device process.



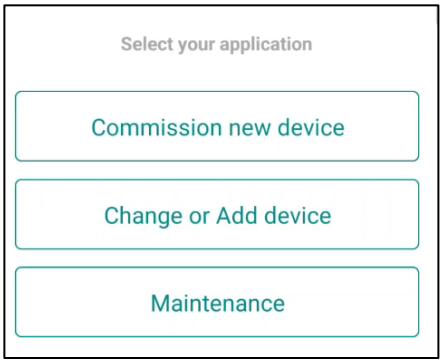
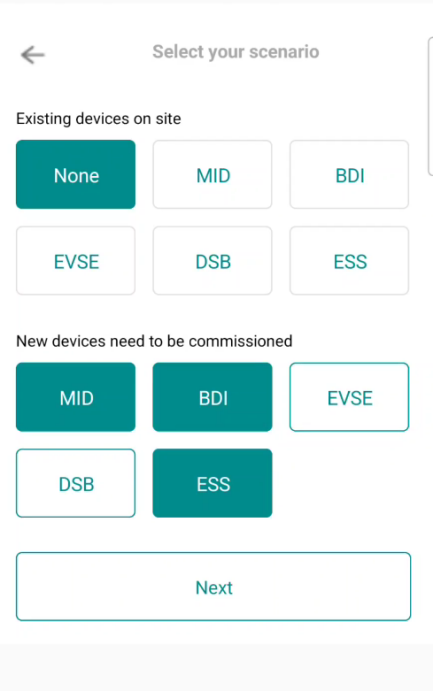
LOGIN

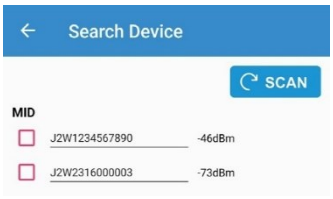
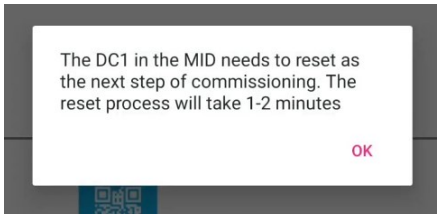
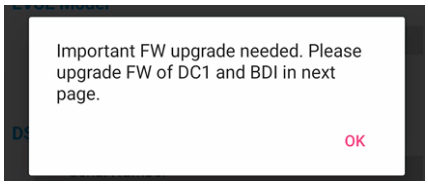
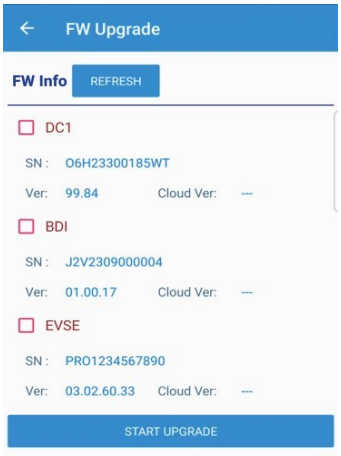
Steps		
1	Open the PowerShift Install App If you are commissioning the equipment for the first time or performing maintenance, you will need to set up an account and agree to the terms and conditions. If you do not have an existing account, refer to the link below to start the process to obtain a login code. https://euss-prod.musea2.azure.ext.gm.com	
2	Navigate to the GM Energy installer website. https://euss-prod.musea2.azure.ext.gm.com If you are commissioning the equipment for the first time or performing maintenance, you will need to set up an account and agree to the terms and conditions.	

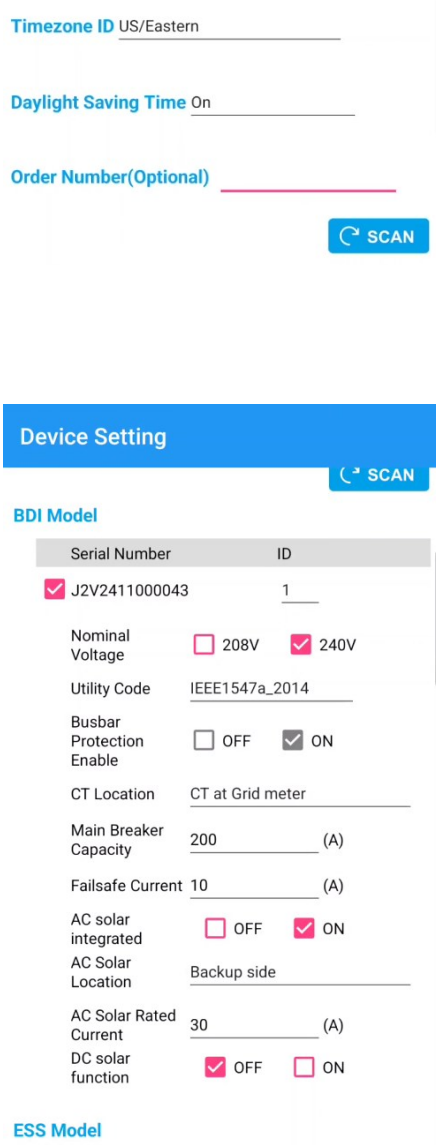
3	This is the GM Energy Installer website sign in page. Sign in using user credentials. If you do not have an existing account, follow the prompt to create a new account. Each installer must create their own GM account; this is separate from the customer's account.	
4	Read the Terms and Conditions. In order to proceed, you must accept these. Input the GM Energy hardware order number if available. Note: Customers will have received the order number as part of the receipt of their purchase. Select installation type. For new installs, select "New Installation" Click "Next" to proceed.	

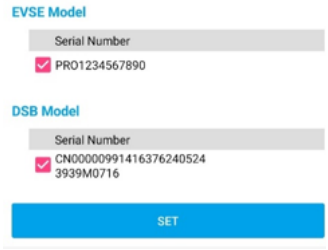
5	A Verification code will be generated. Copy the code as instructed.	
6	Return to the PowerShift Install app. Paste the code and click login.	

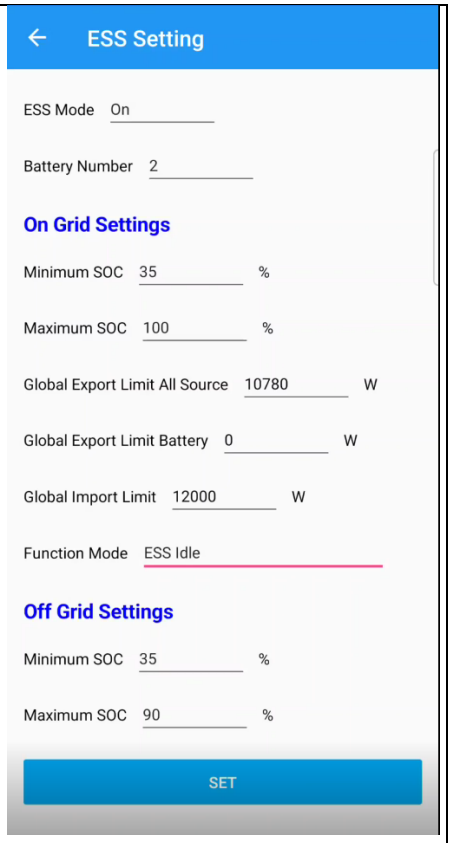
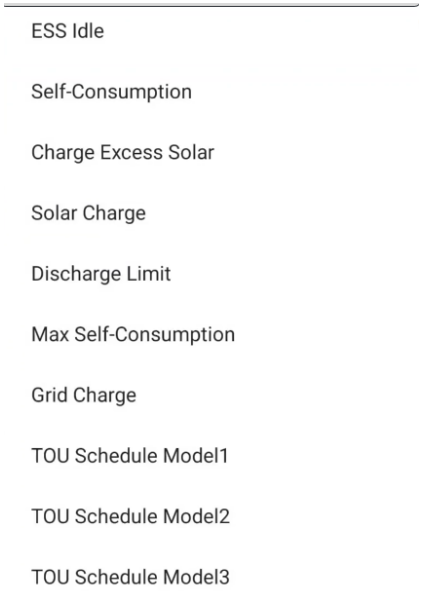
SYSTEM COMMISSIONING

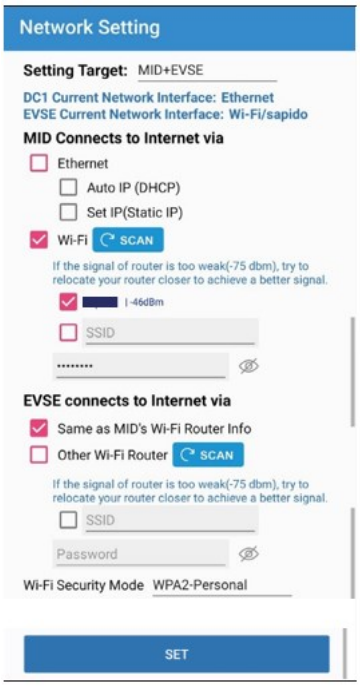
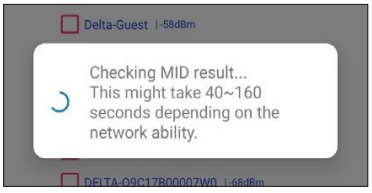
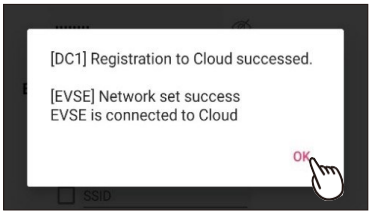
Steps		
1	Select “Commission new device”	
2	Under “Existing devices on site”: Select “None” if installing a new Charger or Home System. Under “New devices to be commissioned”: select the appropriate hardware. PowerShift Charger Only: EVSE V2H Bundle: MID, BDI, EVSE, and DSB Home System: MID, BDI, EVSE, ESS Energy Storage Bundle: MID, BDI, ESS (example image on right)	

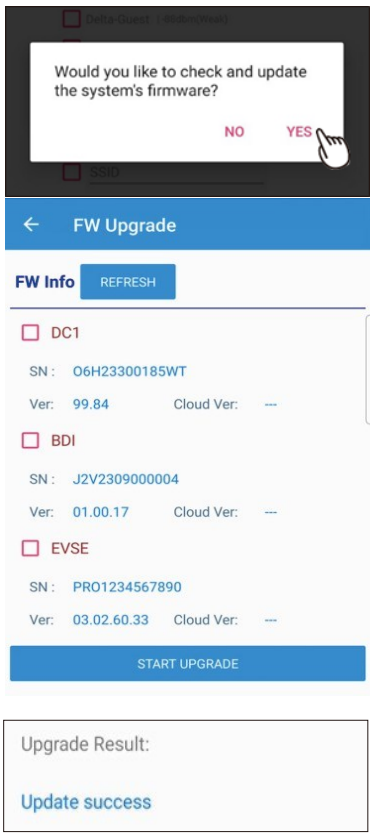
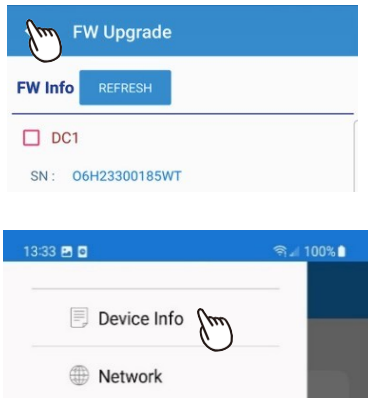
3	Search for the target device as prompted. Target Device = MID for GM Energy V2H Bundle, Home System, or Energy Storage System Commissioning Target Device = EVSE for GM Energy PowerShift Charger Only installs Ensure the serial number matches the physical serial number on the product (found on the bottom of each hardware). This process automatically connects the App to the Wireless signal generated by the target device. If the target device does not populate automatically (only an option for Android devices), then the user will need to add the device manually. The device serial number can be found at the bottom of the EVSE and MID. Input the MID Serial number if commissioning a Bundle. Input EVSE Serial Number if commissioning EVSE only. Both EVSE and MID have QR codes that can be scanned at the bottom of each hardware. This QR code is also available on the Quick Installation Guide for the EVSE and MID that comes packaged with the hardware. Note: Depending on the setup, the MID/DC1 may need to begin by completing a reset. This process will take 1-2 minutes and will take you to the next step of the process once complete.	  
4	If device firmware is out of date you will be directed to update before being able to continue with commissioning. Note: this step is required to continue with commissioning. Click Refresh to search for most recent FW updates. If the “Cloud Version” shows a more recent version available, select device(s) requiring updates and Start Upgrade. Note: DC1 refers to the data collector module in the MID. Device upgrades can be selected as desired (must be completed individually). Please do not close the app during the FW update(s). These may take up to 15 minutes. The following message should pop up once the Update is complete:	  

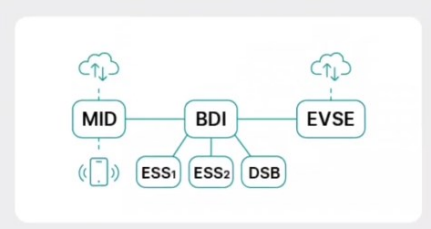
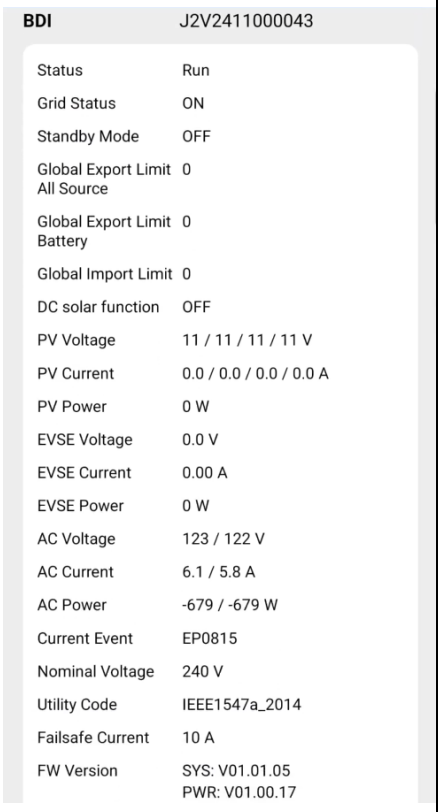
5	**Timezone ID:** Choose the timezone of the installed location of the hardware. Choose the city or US timezone most applicable to your location. **Daylight Saving Time:** Enable this option ON if the area the hardware is installed follows daylight savings time. Note: Most locations should enable this setting ON. **Order Number:** If available, please enter the order number associated with this hardware. Doing so is beneficial to facilitate an easier setup for the customer in their vehicle's mobile app post commissioning. Note: Customers will have received the order number as part of the receipt of their purchase. Set up the BDI Device Settings. **Nominal Voltage:** Incoming Line to Line AC Voltage at installation site. - **240V** for Split phase service (Default) - **208V** for Three phase service **Grid Code:** Grid code settings at installation location. Please confirm the required grid code settings with the customer's electric utility provider. The following options are available as a drop down in the commissioning app: - **IEEE 1547_2013** for Mainland US - **IEEE 1547a_2014** for Mainland US (Default) - **UL1741SB_CA** for California - **UL1741SB_HECO** for Hawaii Note: Custom grid code settings can be configured using the grid setting page in the Maintenance section of this app. Refer to **Appendix D Electrical Diagram Examples with App PCS Settings** for various installation setups and recommended CT location settings and for more details on Main Breaker ratings, AC, or DC solar configurations. **CT Location:** Meter 1 current transformer (CT) location. - **CT at Grid meter (Recommend):** CTs located at main feeders from grid meter. This selection should be used if the CTs monitor every load in the home. CTs will be in MID if used at main service entrance or relocated to main panel if MID is used downstream of main panel - **CT at MID (Partial Load Monitoring):** CTs located at main feeders of MID. This is used only when not all home loads are able to be monitored by the CT placement. - **Single Power Source output limit:** This limits the output current from the Inverter to avoid exceeding generation backfeed current limits.	

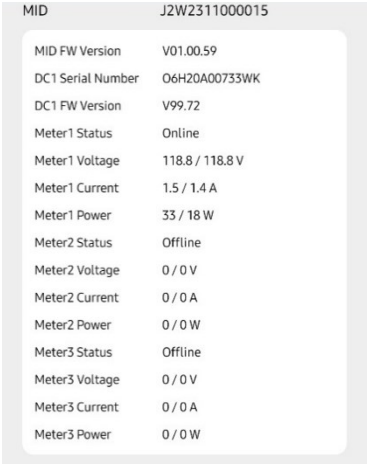
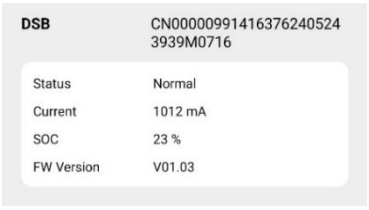
	Failsafe Current: Failsafe current refers to maximum current the Inverter may export to MID when PCS meters do not function properly. Installer must calculate failsafe current in accordance to 120% rule. Calculation given below - Failsafe current = 1.2*busbar capacity – main breaker rating – AC solar breaker rating (if applicable) Confirm EVSE Model (if applicable) Confirm DSB Model (if applicable) Confirm ESS Model(s) (if applicable) Note: if correct equipment does not show up, hit “Scan” in upper right corner.	

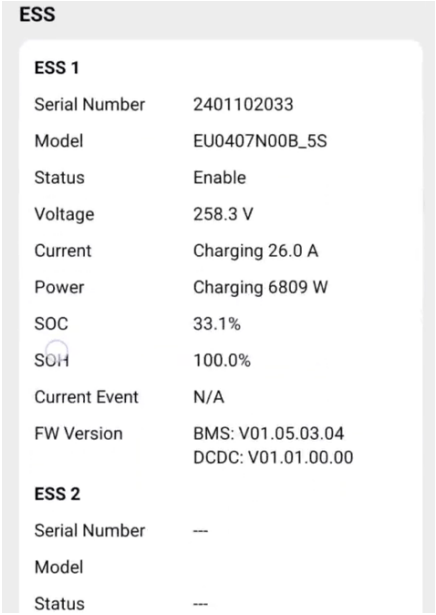
6	ESS Settings (if applicable for installation): **ESS Mode:** Defaults to ON **Battery Number:** Confirm the number of ESS is correct (1-2) On Grid Settings: **Minimum SOC:** Defaults to 35% **Maximum SOC**: Defaults to 100% **Global Export Limit All Sources:** This value limits the export power from the system, including all generation sources. Set this value in accordance to approved export capabilities per interconnection agreement. **Global Export Limit Battery:** This value limits the export power specifically from ESS. Set this value in accordance to approved export capabilities per interconnection agreement. Note: If the interconnection permit is for “Import Only” or “No Exchange” set this value to 0 W. **Global Import Limit:** This value limits the ESS grid charge capabilities. Set this value in accordance to approved grid import capabilities per interconnection agreement. Note: If the interconnection permit is for “Export Only” or “No Exchange” Set this value to 0 W. **Function Mode:** Set this value to either grid charge or solar charge (if solar is present). Note: The customer will be able to change the mode in their user app once permission to operate is granted. Off Grid Settings: **Minimum SOC:** Defaults to 35% **Maximum SOC**: Defaults to 90%	 

7	Connect to Wi-Fi. Select Target MID+EVSE at the top if not already pre-populated. Scan for the desired Wi-Fi network, and use the appropriate Wi-Fi credentials. Note: Re-scan if initially the desired Wi-Fi network does not show up or move wifi router and/or extender closer to the hardware. If end user Wi-Fi credentials are not available, a personal hot-spot may be used for commissioning purposes. After the installer leaves the site, please inform the user the hardware will lose internet and the user can later use their vehicle's mobile app (myChevrolet, myBuick, myGMC or myCadillac) to connect their hardware to their home Wi-Fi router to regain internet connectivity to their hardware. If EVSE is within range of the same Wi-Fi network, then select "Same as MID's Wi-Fi Router info", if not, scan for other network and input separate credentials for that secondary network. Click SET to proceed to the next step. Note: If wifi connectivity is not strong, this step may need to be repeated if error initially occurs.	
8	Once completed, the a success message should pop up. Click Ok to proceed to the next step. This may take up to 160s to complete. Please do not close the app while the devices are connecting.	 

9	Check for System Firmware updates. Click Refresh to search for most recent firmware updates. If the “Cloud Version” shows a more recent version available, select device(s) requiring updates and Start Upgrade. Note: DC1 refers to the data collector module in the MID. Please do not close the app during the firmware update(s). These may take up to 15 minutes. The following message should pop up once the Update is complete. Note: The EVSE firmware update will ask the user to connect to the EVSE to complete the firmware update, please update the DC1 and BDI first. Post EVSE firmware update, reconnect to the MID by selecting maintenance.	
10	To complete commissioning after a firmware update, navigate to the “Device Info” Page by selecting it from the list of options in the left corner.	
11	Review the device info image and data checks below to confirm commissioning is complete and successful.	

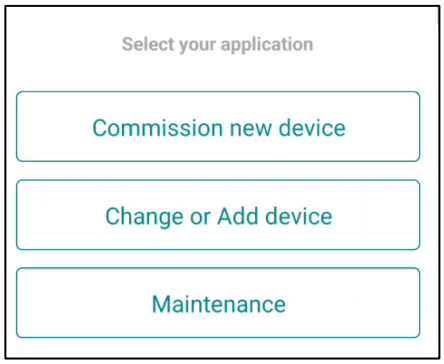
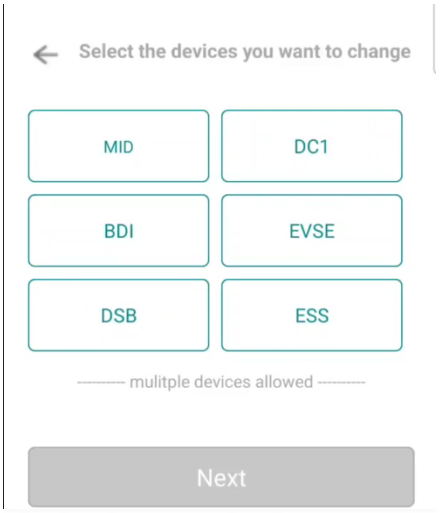
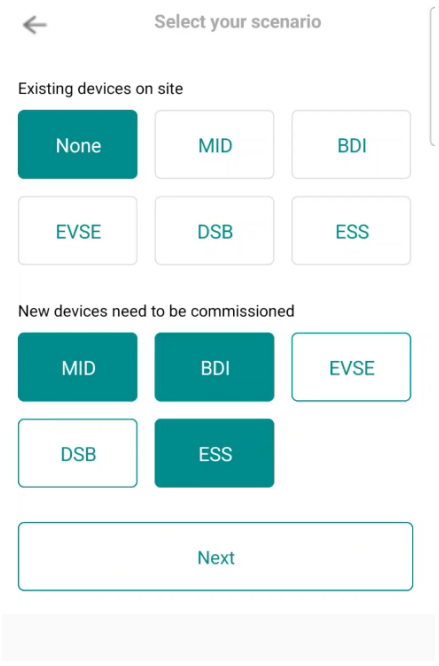
12	Confirm Cloud and hardwired connections: The image will show green connections if complete; a disconnected device will display gray. Red text will display with the type of error in the connectivity of the system if disconnected due to a fault. Please go to maintenance section of network settings and try to connect the system again. If further issues occur, contact GM Energy Customer Support Center at 1-833-64POWER.	
13	Confirm BDI Setup: Status: Confirm status is not in alarm or fault. Standby Mode: Default is off. This mode can be used if a AHJ and/or Utility has not approved the system to operate yet. This mode can be changed to “ON” in the maintenance section of this app via the “Grid Setting” page (see steps below in maintenance section of this manual). If selected “ON” the installer will need to return to the site to disable Standby Mode once AHJ/Utility approval is granted or the customer can contact GM Energy Customer Support Center at 1-833-64POWER to remotely update this mode. Please confirm with the AHJ and/or utility, as applicable, whether they will allow system operation prior to inspection and/or PTO (permission to operate); requirements may vary by system setup and AHJ/utility. Note: A screenshot of the BDI device setting screen with Global Import and Export limits may be needed for final application submittals. DC PV Voltage, Current, Power: Confirm accurate values. EVSE Voltage, Current, Power: Confirm accurate values. AC Voltage, Current, Power: Confirm accurate values. Current Event: Note EP0810 is an acceptable event code. If any other event code is present, you can go to “Event History” in the Maintenance portion of this app to see more details about this error. Nominal Voltage and Utility Code: Confirm previous selections from BDI setup. If any questions on how to troubleshoot a fault, please contact GM Energy Customer Support Center at 1-833-64POWER.	

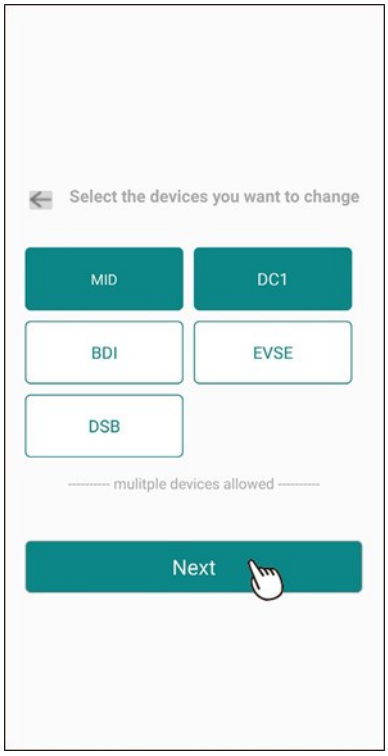
14	Confirm EVSE setup (if applicable): EVSE Voltage, Current, Power: Confirm accurate values. HW Dip Switch: Confirm this is reading the proper value set. Current Event: EV0000 is an acceptable event code. If any other event code is present, you can go to “Event History” in the Maintenance portion of this app to see more details about this error. If any questions on how to troubleshoot a fault, please contact GM Energy Customer Support Center at 1-833-64POWER.	
15	Confirm MID setup: Meter 1: Confirm this is online and reading the grid (or partial loads) properly by checking voltage, current, power. If possible, check values are accurate using a multimeter or other external measurement device. Meter 2: If this system was installed with AC Solar check the status and voltage, current, and power readings to confirm accurate readings. If possible, check values are accurate using a multimeter or other external measurement device. Meter 3: Should read 0 for this system. NOTE: Meter status should show online with proper values, if shown offline or values are not accurate, check the meter and CT connections.	
16	Confirm DSB setup (if applicable): Status: confirm this is showing “normal”. Current: confirm current reading is accurate. SOC: confirm reading is non-zero. DSB will ship below 100% SOC. Positive current should be seen when below 80%.	

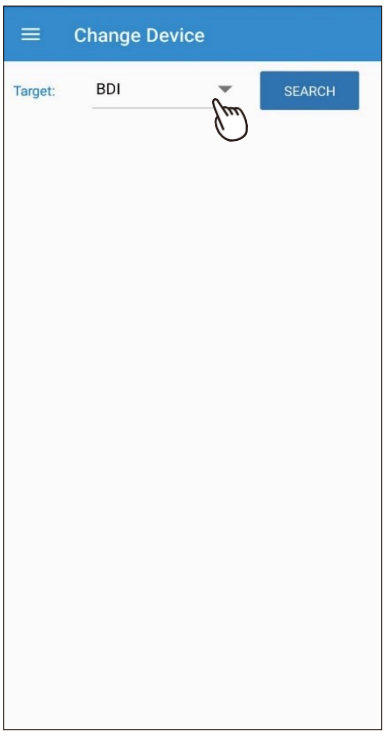
17	Confirm ESS (1 and/or 2) setup (if applicable). Confirm Status is showing “enable”. Confirm accurate readings of Voltage, Power, SOC, and SOH.	
18	Functional Checks: If the system is safely installed per the previous installation manual requirements above and already approved to operate at this point, the installer can test functionality of system. If the user’s EV is available confirm the following: Charging. Attempt to charge the vehicle and/or the ESS. Confirm the EVSE and/or ESS status on the “Device Info” page shows charging. Discharging: Attempt a discharge by flipping the main circuit breaker. Confirm the EVSE and/or ESS shows discharging on Device Info page. Note: Customer must setup EV discharge settings in their vehicle mobile app (myChevrolet, myBuick, myGMC or myCadillac). Discharge requirements can be found in the customer’s GM Energy user guide available at the following website: https://gmenergy.gm.com/for-home/resources-and-support.	

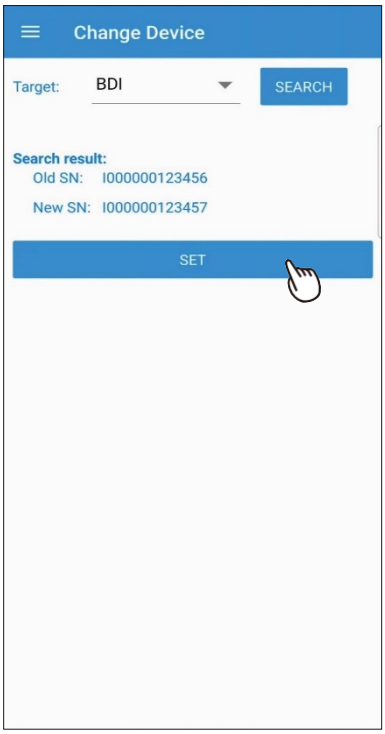
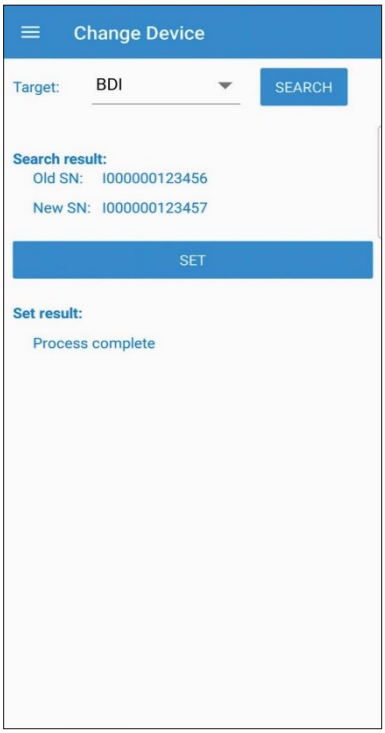
CHANGE or ADD DEVICE

This function will be used when a component of the system is replaced or added. If you are enabling AC or DC solar to the system, skip to the Maintenance section below.

Steps		
1	Select “Change or Add device” Please use this step if replacing a device that was previously installed or adding devices to a previously commissioned system.	
2	Select your scenario for changing a device or adding a device. Change Device- select the devices you have replaced and newly installed. Add device: select the device existing on the site and to be newly commissioned.	 

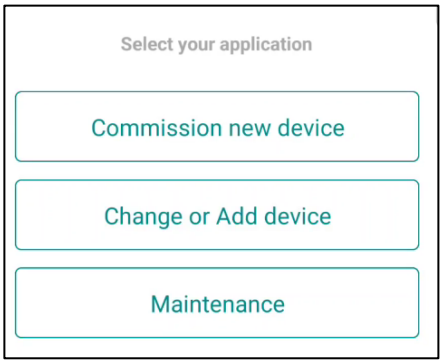
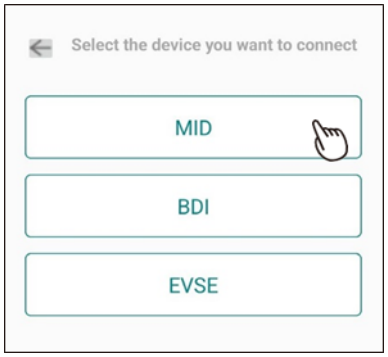
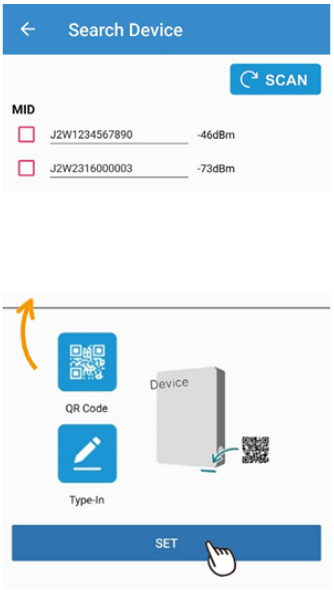
3	For EVSE only replacements (No GM Energy V2H Bundle), the following screen will appear. Please enter the serial number of the prior EVSE which has now been replaced. The previous EVSE should be uninstalled and the new EVSE should be connected, fully installed, and ready to be commissioned at this step.	
4	For GM Energy V2H Bundle hardware replacement. The following screen will appear. Please select the product(s) which will be replaced. The previous hardware should be uninstalled and the new hardware should be connected, fully installed, and ready to be commissioned at this step. Note: as part of a repair process, the DC1 may be replaced without replacing the entire MID. Every MID replacement will auto select the DC1 to update as well.	

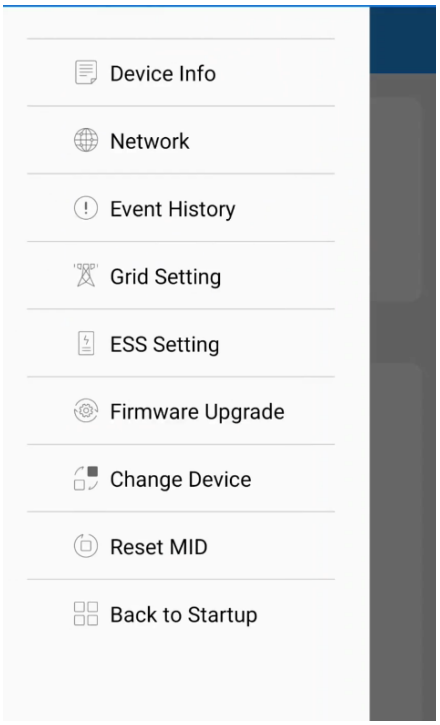
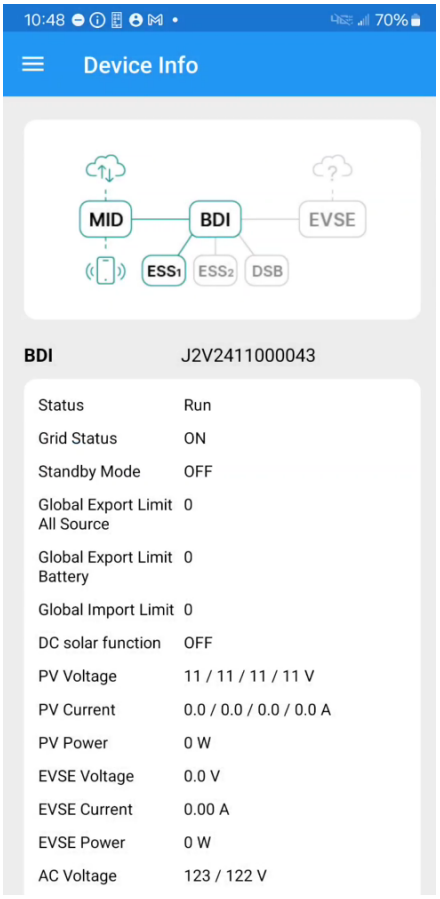
5	Search for the target device as prompted. Ensure the serial number matches the physical serial number on the product. The device serial number can be found on the bottom of the device. If serial number does not populate above or you are performing the install on iOS device you will need to scan the QR code or type in the serial number to continue. Note: Only the EVSE and MID have QR codes. If replacing a BDI, ESS, or DSB, you must scan the MID, as instructed, to connect to the system .	
6	Select each device you are replacing one by one next to the Target input box. Then select search to scan for the old and new devices.	

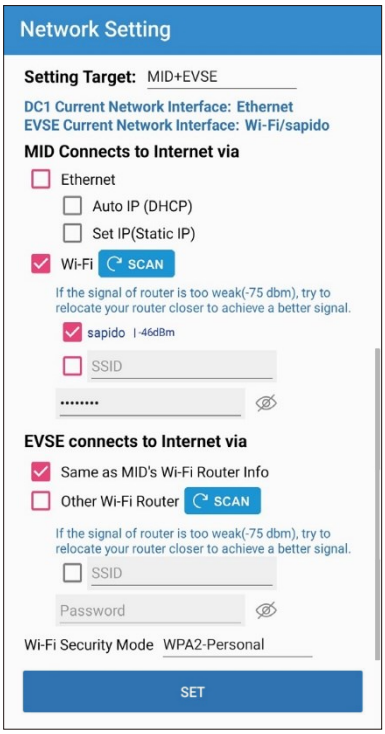
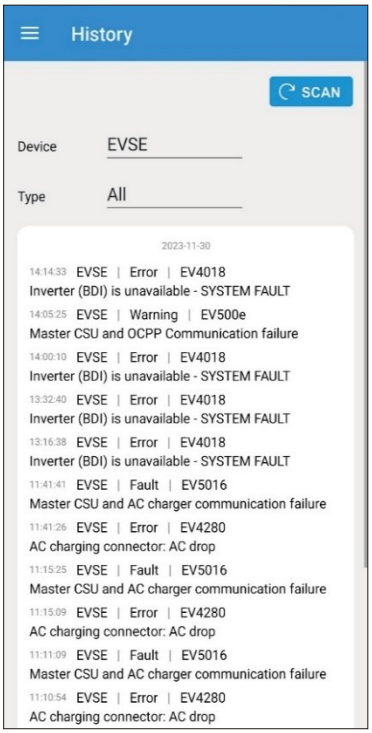
7	Proceed with Device change. Confirm Old Serial number and New Serial numbers are accurate. Click SET to continue. For GM Energy V2H Bundles, all settings are saved in the MID, therefore replacing the BDI, DSB or EVSE requires no additional setting requirements. You can still edit settings as needed by going into the maintenance portion of this app.	
8	Finish Device change. The following message should pop up once device change is successful. Follow Steps 5 -18 under System Commissioning in the above section as applicable for new or changed device settings as necessary. If further questions, contact GM Energy Customer Support Center at 1-833-64POWER.	

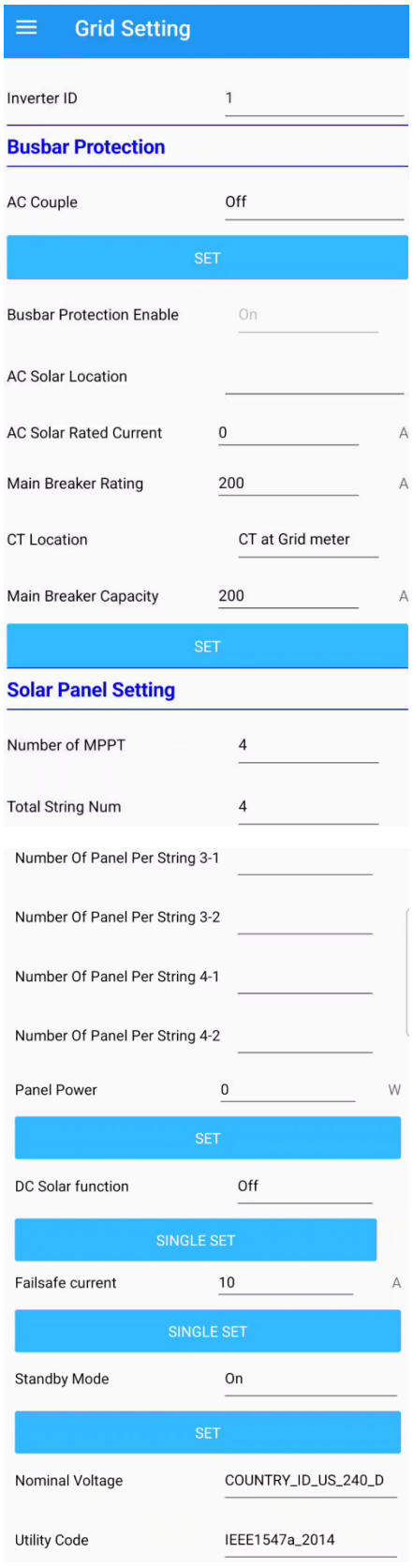
MAINTENANCE

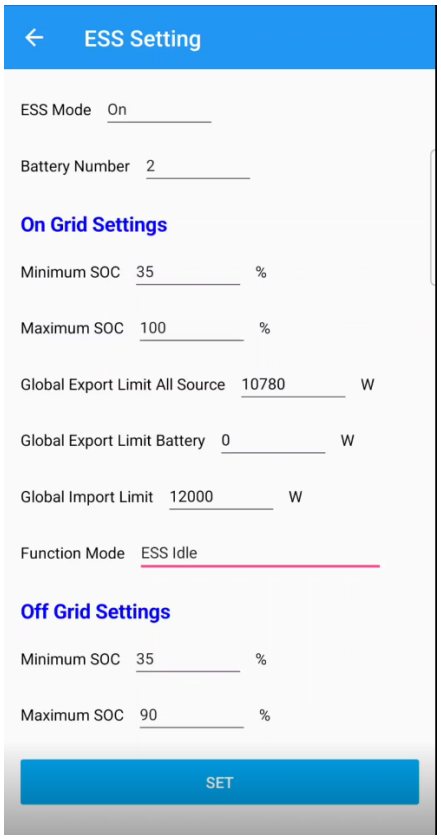
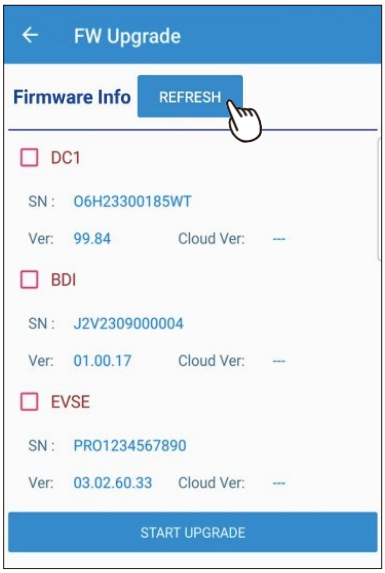
Please reference this section if performing maintenance or service on a system. You may use this to view the system configuration for troubleshooting purposes, perform firmware upgrades, or update device settings. If you are replacing a component of the system, please refer to the Change Device section, above.

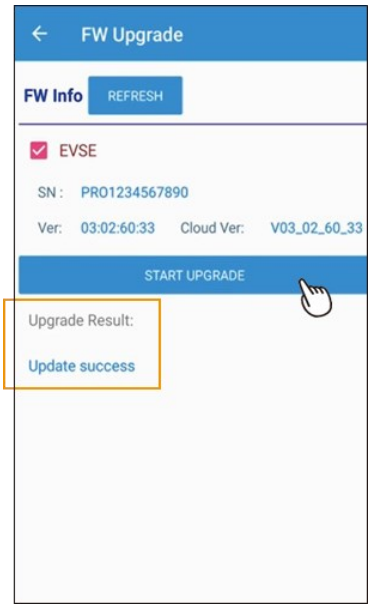
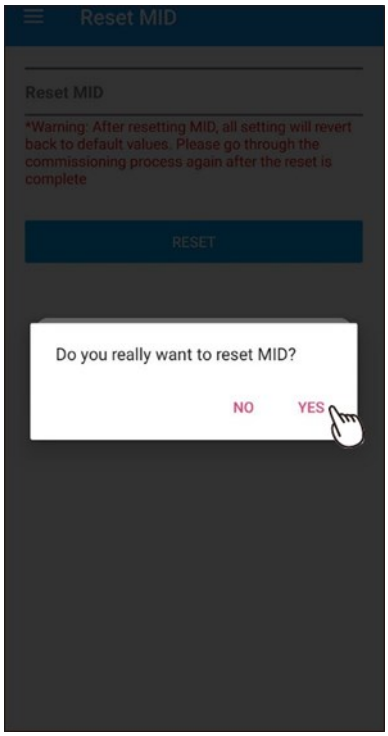
Steps		
1	Select “Maintenance” This allows the user to monitor device properties and alter device settings.	
2	Select “EVSE” if viewing settings for an EVSE-only system. Select “MID” if viewing GM Energy V2H Bundle settings. Note: Direct BDI connections are not needed for standard maintenance.	
3	Select target device. Ensure the device serial number is displayed correctly.	

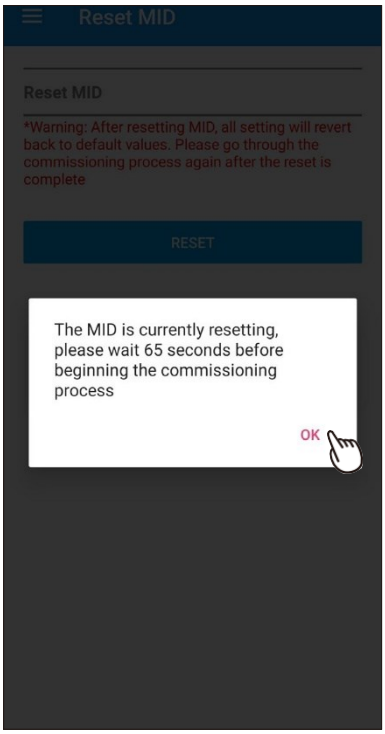
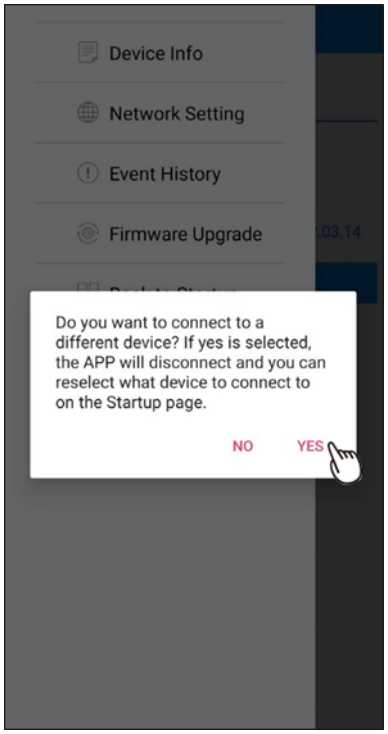
4	Maintenance Menu: Please access the maintenance menu by selecting the icon at the top left of the screen. Select the target setting you wish to view or alter.	
5	Device info: Displays device connection status and real-time system information. Connection Status: Monitor the connection status of device and internet. - Notes (1) The connected device will display green (2) The disconnected device will display gray System Status: Monitor real-time system values of connected devices or any event codes (faults, errors, etc.).	

6	Network Setting: Manage device internet network settings.	
7	Event History: Show the event history by device or event type (Fault, Error, Warning, etc.)	

8	**Grid Settings:** **Busbar Protection:** Refer to Commissioning System Step 5 (BDI Settings) for details. Confirm any specific grid settings with the local AHJ and Utility. Refer to **Appendix D Electrical Diagram Examples with App PCS Settings** for specific details on different configurations, busbar and breaker ratings, and AC and/or DC solar setting details. **AC Couple:** Off= no AC solar is integrated with system , ON =if AC solar is integrated with system using the second Acrel Meter. **(DC) Solar Panel Settings:** These settings are only applicable to a DC solar setup. These should be left blank if no DC solar is integrated with system. **DC Solar Function:** This can be turned "OFF" or "ON" depending on if DC solar is integrated at the site. **Failsafe Current:** Failsafe current refers to maximum current the Inverter may export to MID when PCS meters do not function properly. Installer must calculate failsafe current in accordance to 120% rule. Calculation given below - Failsafe current = 1.2*busbar capacity – main breaker rating – AC solar breaker rating (if applicable) **Standby Mode:** Default is off. This mode can be used if a AHJ and/or Utility has not approved the system to operate yet. This mode can be changed to "ON" in the maintenance section of this app via the "Grid Setting" page (see steps below in maintenance section of this manual). If selected "ON" the installer will need to return to the site to disable Standby Mode once AHJ/Utility approval is granted or the customer can contact GM Energy Customer Support Center at 1-833-64POWER to remotely update this mode. Please confirm with the AHJ and/or utility, as applicable, whether they will allow system operation prior to inspection and/or PTO (permission to operate); requirements may vary by system setup and AHJ/utility. **Nominal Voltage, Utility Code:** Refer to "Commissioning System" section of this app Step 5 (BDI Settings) for details.	

9	ESS Setting: See step 6 of System Commissioning for details on these settings.	
10	Firmware Upgrade: Monitor and upgrade device firmware versions. Click “Refresh” to search for recent Firmware versions. Select the device(s) requiring an upgrade and “Start Upgrade”.	

10	The update process should take a few minutes, and upon completion the following message should appear.	
11	Reset MID: Factory reset device to default settings. This process will delete all configuration settings previously installed on the target device. Click “Yes” to proceed with factory reset. Click “No” to cancel reset and exit.	

12	The MID reset usually takes a few minutes to complete. Upon completion, the user will be redirected to the commissioning menu. Note: If an MID reset occurs, the user must re-commission the system to the appropriate settings before leaving the site.	
13	Back to Startup: Click “Yes” to exit the Maintenance menu and return to the Home screen.	

PRE-PTO LEAVE STATE AND JOB CLOSEOUT

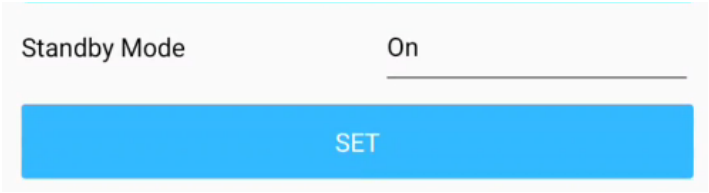
Pre-PTO Leave State

After commissioning is successful (confirmed cloud connections, hardware statuses, settings, and readings checked), leave the system in a state that is compliant with all local requirements imposed by the utility, AHJ, or other regulatory body.

There are two GM Energy recommended leave states; Standby Mode and Manual Disconnect.

Standby Mode

The installer should leave the system in standby mode if the utility or AHJ allows for remote activation of the system once PTO (Permission to Operate) is granted. As mentioned in the maintenance section of the commissioning process, Standby Mode can be activated by the installer in the PowerShift Install commissioning app. When Standby Mode is ON, the Inverter will not operate. The PowerShift Charger will remain operable for charging. When PTO is granted, the customer can contact the GM Energy Customer Support Center at 1-833-64POWER to remotely turn Standby Mode OFF and enable full operation of the system.



Manual Disconnect

The Installer should follow the instructions below to disconnect the system from the grid if the utility or AHJ does not allow for remote activation prior to PTO.

- Turn the **AC disconnect** (between Home Hub and Inverter) and/or the Inverter circuit breaker inside the Home Hub to the OFF position
- Turn the **DC solar disconnect** switch (on bottom of Inverter) to the OFF position
- Turn the **PowerBank/ESS breaker** (inside the BCU) to the OFF position. If two are ESS present, ensure both breakers are turned to the OFF position.
- Turn any newly installed **AC solar breakers** to the OFF position and follow any pre-PTO instructions of third-party solar inverter

When PTO is granted, the customer should contact the GM Energy Customer Support Center at 1-833-64POWER for instructions to activate their site. Installers may also come back on-site to activate the site by completing the following:

- Ensure vehicle is unplugged and all breakers listed above are in their off position before proceeding.
- Turn the **PowerBank/ESS breaker** (inside the BCU) to the ON position.
- Turn the **AC disconnect** (between Home Hub and Inverter) to the ON position.
- Turn the **DC solar disconnect** switch (on bottom of Inverter) to the ON position.
- Turn any newly installed **AC solar breakers** to the ON position and follow any pre-PTO instructions of third-party solar inverter.
- Activation of system fully may take more than a minute after all breakers are ON.

The installer is responsible for informing the customer of the state of their system upon job closeout and any instructions to return the system to operating state after PTO is granted.

Job Closeout

For installations that include the Charger and V2H Bundle, it is recommended to complete the System & Voltage Checks Form, available in Appendix H: System & Voltage Checks Form, with technician names legibly recorded and date and time entered. GM Energy recommends taking the following photos for your closeout record. Be aware, certain photos can only be taken mid-install, as noted below; others should be taken before covers are fastened to reduce time spent.

Photos for V2H Bundle, ESS Bundle & Home System

Typical Photo	Reason
Main service panel (cover removed, all wiring terminations visible)	Quality control.
Main service panel (cover on, all labeling legible)	Quality control.
Load center 1 (if applicable, cover removed, all wiring terminations visible)	Quality control.
Load center 1 (if applicable, cover on, all labeling legible)	Quality control.
Additional load center (if applicable, cover removed, all wiring terminations visible)	Quality control.
AC disconnect (if required, cover removed, fuses legible)	Required if MSP and Hub are not in same space and accessible.
Solar System (if present, include any subarrays)	Confirm array layout.
Consumption CTs (any additional premises CT's must be captured)	Verify installation.
	Verify orientation and wiring.
Hub (top half, cover removed, top back-up section with all wiring, terminations, and breakers visible) **Capture additional CT configurations if applicable.**	Verify Eaton Breaker and backup breaker torque/phasing.
	Verify busbar breakers.
	Verify ground bonding strap (if installed), and grounding terminations and torque.
	Verify PCB wiring connections.
	Verify non-factory wiring workmanship (field wiring).
	Verify consumption CTs orientation.
Home Hub (bottom half, cover removed, bottom non-backup with all wiring, terminations, and conduit entry points visible)	Verify conduit entry and wiring workmanship.
	Verify DC1 and secondary meter wiring.

Home Hub (entire enclosure, two feet away with cover removed)	Quality Control.
Inverter (two feet away with cover removed, all wiring terminations visible)	Verify conduit entry and wiring workmanship.
	Verify grounding.
	Verify terminations (L1/L1, comms, DC, solar, PowerBank).
Inverter (closeup of wiring box, cover removed, all wiring terminations visible)	Verify communication wiring, and DC, L1/L2, and ESS/DSB communications terminations.
Electrical equipment (two feet away, showing all electrical enclosures with covers on) **Multiple photos may be necessary if equipment is in different locations.**	Conduit workmanship, entries, and weep holes.
	Equipment layout and clearances.
	Must capture dark start, Inverter, Hub, MSP, PowerBank, and subpanels; and conduit, and conduit gutter boxes.
Gutter boxes (cover removed, showing all wiring)	Verify NEC compliance and wiring workmanship.
Charger (cover removed, all wiring terminations visible, showing conduit/wire entry points)	Verify wiring workmanship and terminations; verify conduit entries.
Charger (cover removed, showing DIP switch settings)	Verify DIP switch setting.
PowerBank(s) (BCU cover removed)	Verify wiring and primary/secondary dip switch.
PowerBank(s) (covers on, showing mounting bracket if applicable)	Quality Control.
System & Voltage Checks form (filled out)	Verify systems checks completed.
	As-built documentation for records.

APPENDIX A: PRODUCT DATASHEETS

Please refer to GM Energy website for product data sheets at https://gmenergy.gm.com/for-home/resources-and-support.

APPENDIX B: DESIGN GUIDELINES

General System Design Guidelines

- Determine Charger breaker size:
  - If available, use Green Button data/usage data to size Charger breaker as large as possible without triggering a main panel upgrade (MPU).
  - Otherwise, perform traditional NEC load calculations and determine largest breaker possible without triggering MPU.
- Determine loads being backed up:
  - Prioritize single-pole circuits, lighting, and plugs.
  - No individual load greater than 40 A (based on Inverter rating).
    - No individual load with an LRA (Locked Rotor Amperage) than 62 A.
      - Soft starters may be installed to reduce startup current of inductive loads (such as air conditioners) although performance is not guaranteed.
  - Follow guidance for interior located subpanels having potentially disqualifying loads:
    - If they can be easily routed out via exterior (such as an AC unit with an exterior disconnect), add notes to enable inclusion in scope of work.
    - Otherwise, subpanel is disqualified for backup.
- Choose appropriate Hub interconnection method based on existing panel limitations, and load calculation of circuits being relocated:
  - Branch breaker
  - Hub as Main Service Entrance
    - May require using non-backup panel, limited to 110 A.
  - Use appropriate resources to determine max. branch breaker/lug kit compatibility.
  - NEC 705 rules apply: 120% rule, sum of breakers, or PCS to protect MSP busbar.
    - Prioritize using PCS whenever possible and avoid relocating non-backup loads out of MSP.
- Hub backup panel limited to 200 A total (125 A max. branch breaker).
  - Must use Eaton BR or BQ type breakers.
  - Backup panel in Hub contains 12 single pole breaker spots. One dual pole 60A breaker is pre-installed for Inverter.
  - The pre-installed 60A breaker in the Hub must be used for the Inverter. Do not replace this breaker unless replacing with a breaker of the same or similar model.
  - Ensure no single load exceeds 40A continuous rated current. Loads that cannot be powered by Inverter during an outage should be landed on a non-backup panel.
  - Larger branch breakers can be used to feed a subpanel. For breakers with an amperage of 100A or greater, it is recommended that a breaker hold-down kit (part number BRHDK125) be applied to the breaker.
- Equipment placement:
  - Place Charger in the preferred location for vehicle charging:
    - Site survey team will specify vehicle location.
    - Reference the **Maximum Wire Run** chart for wire runs.

        - Always place Dark Start Battery near Inverter.
    - Add RSD or AC disconnect as needed for the 60 A Inverter circuit:
        - If Hub is in garage or in a non-accessible location:
            - add AC disconnect outside if NEC 2020.
            - add RSD switch outside if NEC 2023.
        - If Hub is placed in an accessible location, no RSD or AC disconnect is required.

- CT placement: reference CT decision tree and diagrams. Apply PCS warning labels to CTs during installation.

Third-Party Generator Compatibility

GM Energy has identified multiple configurations that support installations with automatic transfer switch (ATS) Generators and manual transfer switch (MTS) Generators. Installations outside of approved configurations may result in damage to the third-party Generator and/or the GM Energy equipment and may impact the customer's warranty coverage. Please see the GM Energy limited warranty for more details.

The GM Energy Home system can be integrated with a residential Generator if installed per the guidelines outlined in this section. With either option, a UL certified transfer switch is required to ensure there is no back feed of the Generator to the grid or GM Energy Home Hub. The transfer switch must be delayed transition or open transition type. The Generator integration scenarios include the Generator either downstream of the Home Hub or on a separated circuit originating at the service entrance. Generator must not be placed upstream of the Home Hub.

Note: The Generator integration options are to act solely as guidelines for installation. These guidelines do not supersede any local, state, or national regulations, codes and laws. The installer is responsible for ensuring safe and compliant installations.

1. **Flexible Source Backup**
   - Generator is downstream of Home Hub's backup panel. House loads on "flexible backup" panel are powered by either the GM Energy Home system or the Generator.
   - Vehicle and/or PowerBank is default source of backup power for the home. If the vehicle is not providing backup power and/or the PowerBank energy is depleted, the home loads can be switched to Generator backup automatically via ATS (automatic transfer switch) or manually via MTS (manual transfer switch).
   - A transfer switch (automatic or manual) must be installed between the Home Hub panel and a flexible source back up panel. The transfer switch must be configured such that the Home Hub and Generator are always powering loads independently and never on the same electrical bus.
   - Note, additional non-backup panel(s) upstream of the Home Hub are also allowed if needed (not pictured). Additional sub panel(s) downstream of the GM Energy Home Hub and Flexible backup panels are also if needed (not pictured.)

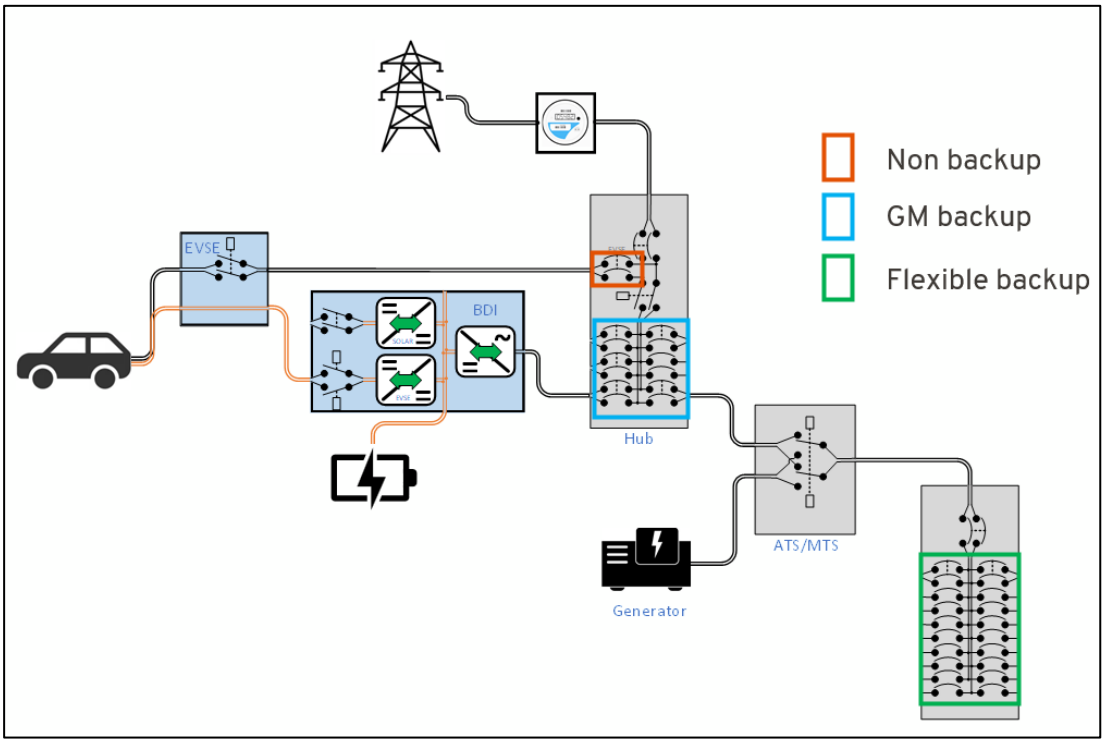


Figure 44: Example setup of a Flexible Source Backup Generator configuration

2. **Fixed Split Backup**
   - Generator and the loads powered by the Generator is electrically separate from the GM Energy system and the loads powered by the GM Energy Home system.
   - The loads to be backed up by either system are decided upon install and are only able to be changed by reworking the installation.
   - The Generator and GM Energy Home Hub must be downstream from the service entrance.
   - A Generator backup panel and GM Home backup panel must be installed on parallel branches downstream of the service entry.
   - A transfer switch (automatic or manual) must be installed between the service entry and Generator backup panel to ensure no back feed is possible to the grid.
   - Note, additional non-backup panel(s) downstream of the main service entrance are allowed if needed (not pictured). Additional sub panel(s) downstream of the GM Energy backup and Generator backup panels are also allowed as well if needed (not pictured).

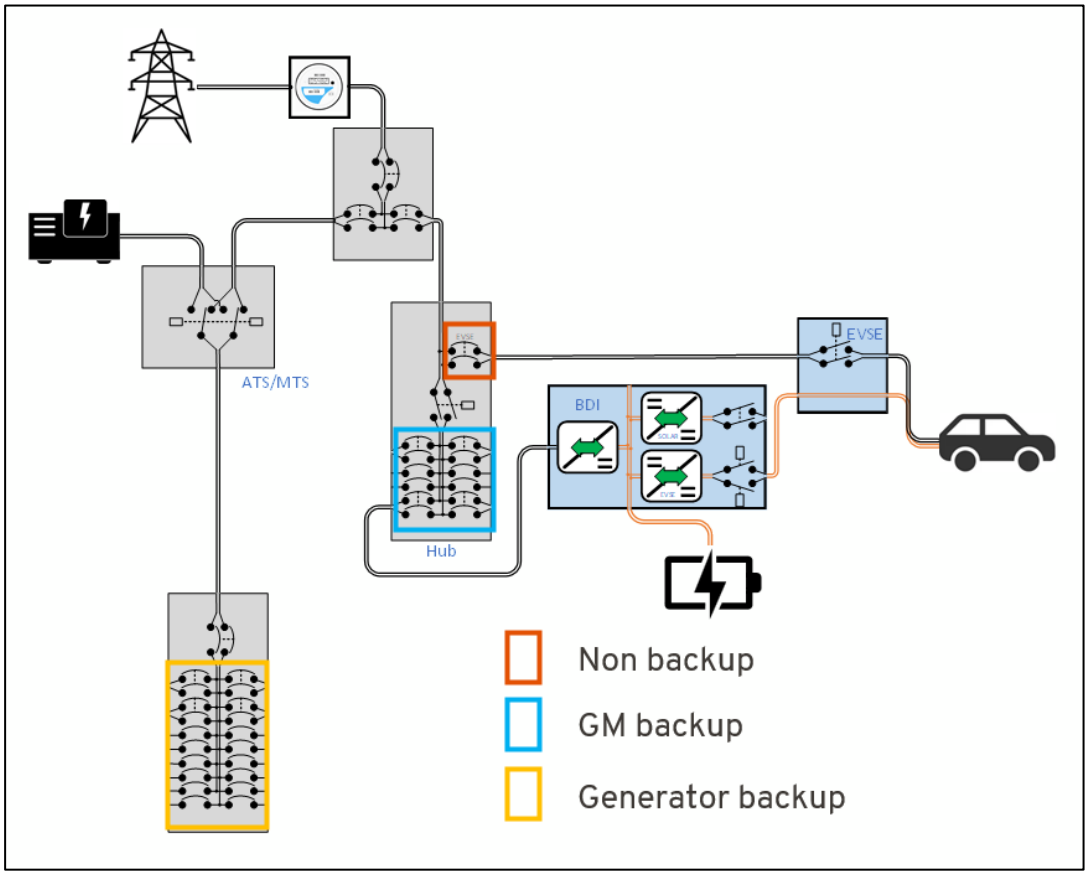


Figure 45: Example setup of a Fixed Split Back-up Generator configuration.

Third-Party Battery Storage Compatibility

GM Energy prohibits installation of a GM Energy Home System, Energy Storage Bundle and V2H Bundle with any new or existing 3rd Party ESS/Home battery. Violation of this policy impacts the GM Energy limited warranty and may result in damage to 3rd party ESS and/or GM Energy equipment. Please see the GM Energy limited warranty for more details.

A new or existing 3rd party ESS/Home battery does not preclude the installation of a stand-alone GM Energy Powershift Charger.

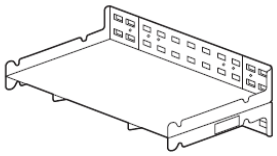
APPENDIX C: ACCESSORIES

Installer-Procured Accessories

Recommendations and links provided for convenience. Always reference the most current manufacturer installation guides for the most up-to-date requirements.

<table>
<tr>
<td>PowerBank Wall Mounting Brackets:

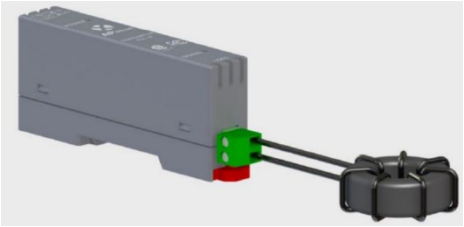
GM Energy Preferred Installers will be able to indicate need for this component directly to GM Energy.

If you are not a Preferred Installer – or are one and did not indicate need at the outset – you may contact GM Energy Support Center at 1-833-64POWER to obtain one.</td>
<td> 
Wall Mounting Bracket
 
M8*L25
Flange Bolt (4PCS)</td>
</tr>
<tr>
<td>Secondary Meter (for integration with existing solar):

GM Energy Preferred Installers will be able to indicate need for this component directly to GM Energy.

If you are not a Preferred Installer – or are one and did not indicate need at the outset – you may contact GM Energy Support Center at 1-833-64POWER to obtain one.</td>
<td>  </td>
</tr>
<tr>
<td>PVRSS Transmitter (for integration with new DC solar):

GM Energy Preferred Installers will be able to indicate need for this component directly to GM Energy.

If you are not a Preferred Installer – or are one and did not indicate need at the outset – you may contact GM Energy Support Center at 1-833-64POWER to obtain one.</td>
<td>  </td>
</tr>
<tr>
<td>Hub Main Breaker (100 A, 125 A, 150 A, 175 A, or 200 A), CSR (25 kAIC):
https://www.eaton.com/us/en-us/skuPage.CSR2200N.html
https://www.eaton.com/us/en-us/skuPage.CSR2175NSR12.html
https://www.eaton.com/us/en-us/skuPage.CSR2150N.html
https://www.eaton.com/us/en-us/skuPage.CSR2125N.specifications.html
https://www.eaton.com/us/en-us/skuPage.CSR2100BM.html</td>
<td rowspan="2">  </td>
</tr>
<tr>
<td>Hub Main Breaker (100 A, 125 A, 150 A, 175 A, or 200 A), BW (10 kAIC):
https://www.eaton.com/us/en-us/skuPage.BW2200.html
https://www.eaton.com/us/en-us/skuPage.BW2150.html
https://www.eaton.com/us/en-us/skuPage.BW2175.html
https://www.eaton.com/us/en-us/skuPage.BW2100BM.specifications.html</td>
</tr>
</table>

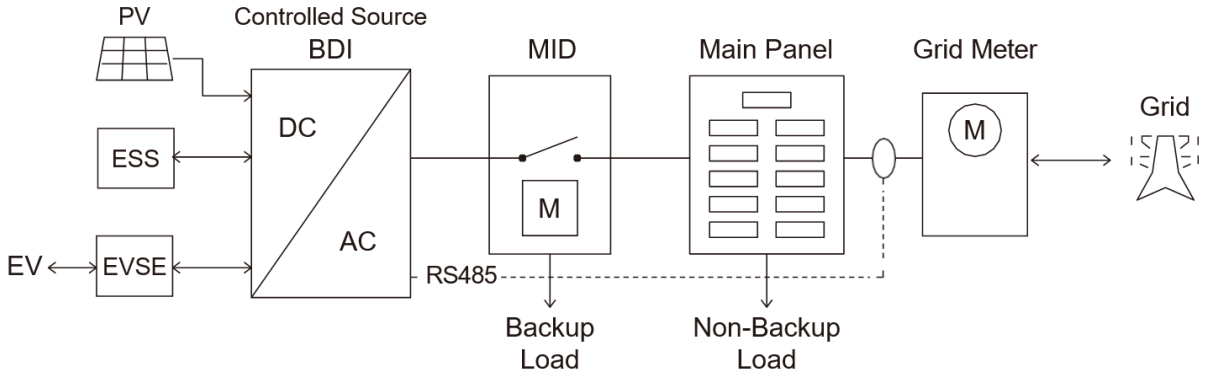
Required rubber covers for Hub Main Breaker: https://www.eaton.com/us/en-us/skuPage.TICSR300C.html https://www.platt.com/p/0318924/eaton/terminal-insulator-kit-breaker-type/786676037150/cutticsr300	
The recommended examples of Rapid Shutdown Devices (RSD) are: **IMO** SI16-PEL64R-2 enclosed DC switch: https://imoautomation.com/imo_us_usd_view/enclosed-dc-switch-ip66.html **Eaton** switch consisting of: • M22S-ST-GB10: https://datasheet.eaton.com/datasheet.php?model=216499&locale=en_GB • M22-WRK: https://www.eaton.com/us/en-us/skuPage.M22-WRK.html • M22-KC10: https://www.eaton.com/us/en-us/skuPage.M22-KC10.html • M22-I1-PG: https://www.eaton.com/us/en-us/skuPage.M22-I1-PG.html **Note:** The RSD must be assembled in an outdoor-rated enclosure, visible at point of interconnection to clearly indicate ON and OFF positions, and be labeled appropriately. See Section 2.5.	 
Non-backup breaker pan, 48INT125B: https://www.eaton.com/us/en-us/skuPage.48INT125B.html https://www.platt.com/p/0847536/eaton/oem-br-loadcenter-interior/786679094136/cut48int125b	
600 V rated communications cable (required if sharing raceway): https://www.belden.com/products/Cable/Tray-TC-Cable/3088A (1 pair) https://www.belden.com/products/cable/tray-tc-cable/1048a (2 pair) https://www.digikey.com/en/products/detail/belden-inc/3088A-01010000/8122257?s=N4IgTCBcDaIMwAYAcSCCIC6BfIA https://www.digikey.com/en/products/detail/belden-inc/1048A-0107500/8122194?s=N4IgTCBcDaIlwAYAsAOAgiAugXyA	

APPENDIX D: ELECTRICAL DIAGRAMS

D.1 Electrical Diagram Examples and App PCS Settings

CT1 at Service Entrance – Partial Home Backup, Whole Home Monitoring

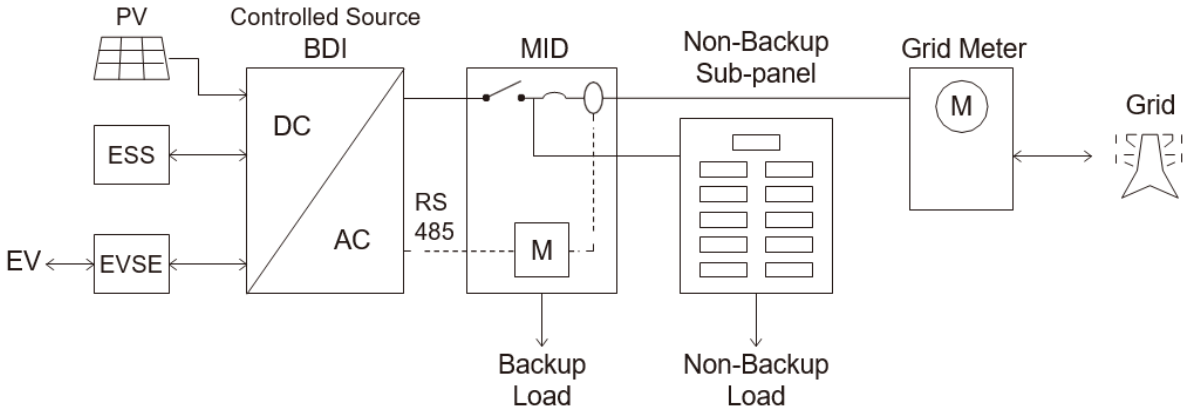
Relocate the CT1 meter from MID to the grid entrance to real time monitor the grid current of all home loads. Inverter will reduce power output to ensure the current on busbars do not go above 80% of its rated capacity. The main busbar capacity must be set in the commissioning app properly for this setup.



Commissioning App Setting	Input
CT location	CT1 at Grid Connection
Main busbar rating	0 – 200 A The busbar rating of the main panel upstream of the MID. Note: 200A is the maximum value for this field. Please record 200A if busbar capacity is 200A or greater.
Failsafe Current	Installer must calculate failsafe current in accordance with NEC 120% rule. Failsafe current = 1.2*busbar rating – main breaker rating – AC solar breaker rating (if applicable)

CT1 at Service Entrance – Whole Home Backup, Whole Home Monitoring

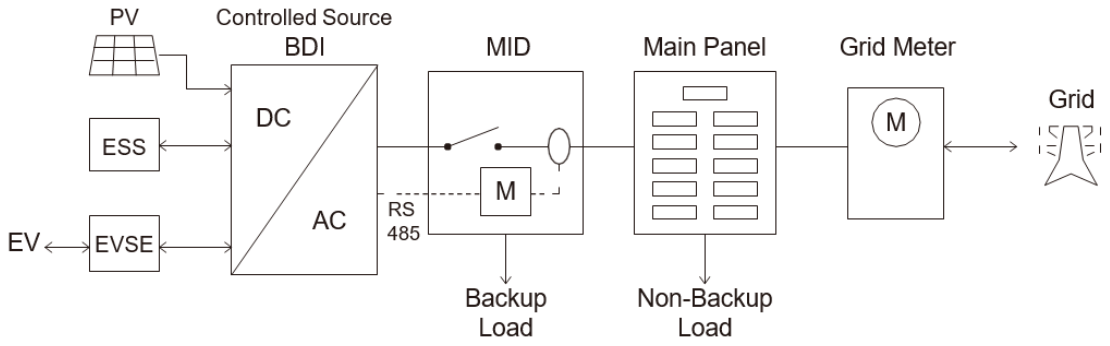
CT1 meter is left in MID although L1 and L2 need to be swapped as main breaker reverses polarity. Inverter will reduce power output to ensure the current on busbars do not go above 80% of its rated capacity. The main busbar capacity must be set in the commissioning app properly for this setup.



Commissioning App Setting	Input
CT location	CT1 at Grid Connection
Main busbar rating	0 – 200 A The minimum busbar rating of all load panels. Note: 200A is the maximum value for this field. Please record 200A if busbar capacity is 200A or greater.
Failsafe Current	Installer must calculate failsafe current in accordance with NEC 120% rule. Failsafe current = 1.2*busbar rating – main breaker rating – AC solar breaker rating (if applicable)

CT1 at MID – Partial Home Backup, Partial Home Monitoring

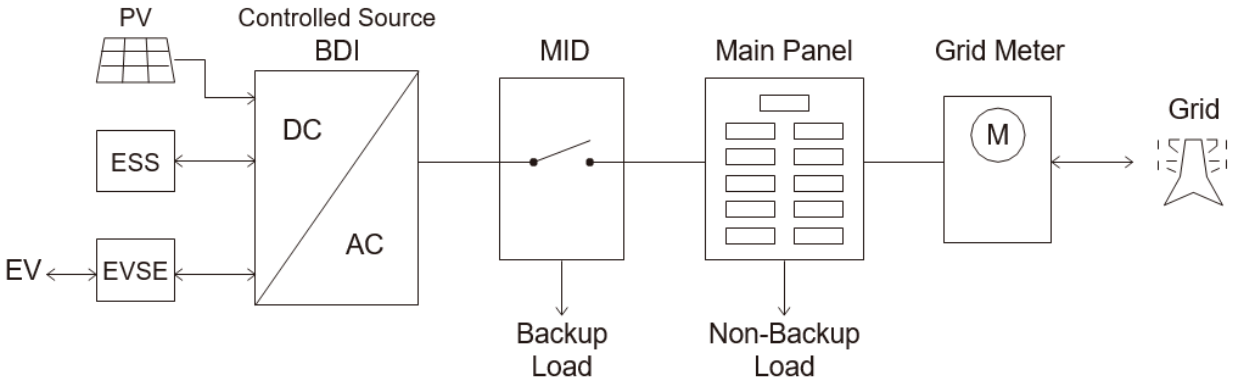
If the CT1 meter cannot be placed at the grid connection, the CT1 meter can be left in the factory-installed location. Safety limits are calculated automatically using the main busbar capacity, main breaker rating and AC solar breaker rating (if applicable). Ensure all values are set correctly.



Commissioning App Busbar Settings	Input
CT location	CT at MID (partial load monitoring)
Main busbar capacity	The busbar rating of the main panel upstream of the MID. Note: 200A is the maximum value for this field. Please record 200A if busbar capacity is 200A or greater.
Main breaker rating	The main breaker at grid service entrance. Note: 200A is the maximum value for this field. Please record 200A if busbar capacity is 200A or greater.
Failsafe Current	Installer must calculate failsafe current in accordance with NEC 120% rule. Failsafe current = 1.2*busbar rating – main breaker rating – AC solar breaker rating (if applicable)

CT1 not Utilized for PCS Busbar Protection – BDI Output Limit

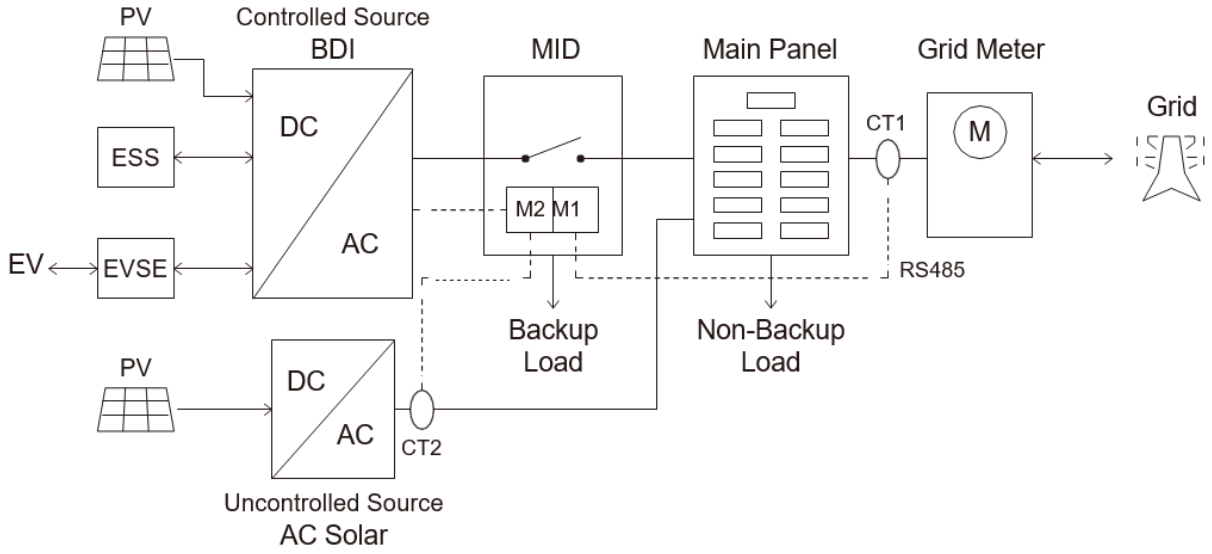
If the CT1 meter cannot be placed at the grid connection or PCS busbar control is not applicable in installed location, the installer can calculate and input a single source output limit for the Inverter. This mode will not rely on any meter reading for busbar protection. Ensure inverter limit is set to obey NEC busbar protection.



Commissioning App Busbar Setting	Input
CT location	Single source output
Inverter Limit Current	0 - 48 A Set this value in accordance to the 120% rule for busbar protection.

CT1 at Service Entrance, CT2 in Non-Backup – Partial Home Backup, Whole Home Monitoring

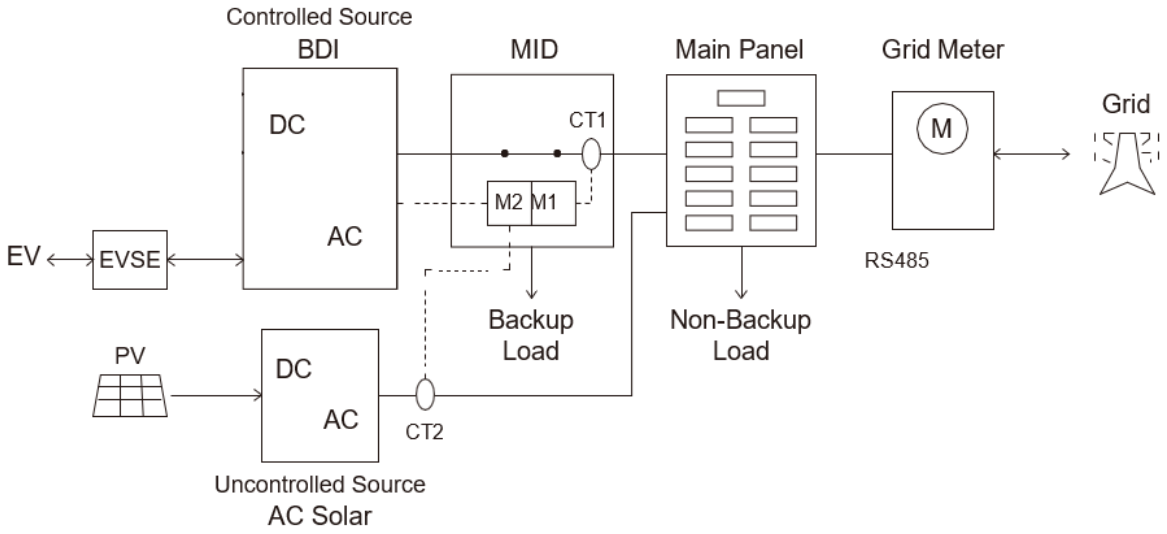
Relocate the CT1 meter from MID to the grid entrance to real time monitor the grid current. Additionally place meter 2 CTs at the output of the AC solar onto the main panel. Inverter will reduce power output to ensure the current on busbars do not go above 80% of its rated capacity. Ensure all values are set correctly.



Commissioning App PCS Settings	Input
CT location	CT1 at Grid Connection
Main busbar rating	0 – 200 A The busbar rating of the main panel upstream of the MID. Note: 200A is the maximum value for this field. Please record 200A if busbar capacity is 200A or greater.
AC Solar breaker rating	If home is equipped with Solar system that does not feed directly into the GM Energy Inverter, select AC Solar “yes” and record solar breaker rating. Note: Please also select whether the AC solar breaker feeds into the backup load panel or non-backup load panel. The above configuration shows AC solar located in the non-backup panel.

CT1 at MID, CT2 in Non-Backup – Partial Home Backup, Partial Home Monitoring

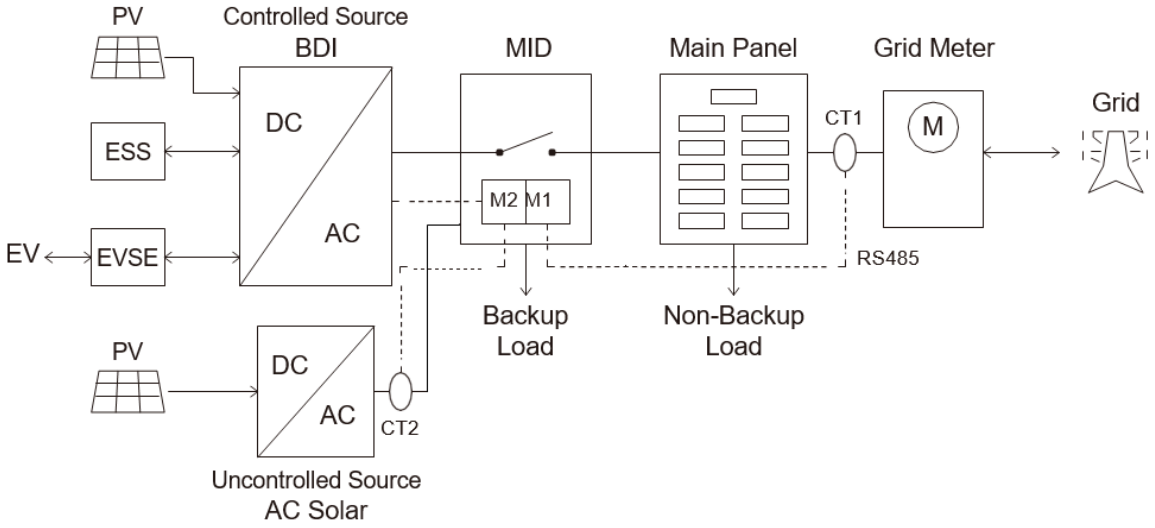
For this setup, CT1 meter is left in the factory installed location inside the MID and CT2 is placed at the existing solar. Safety limits are calculated automatically using the main busbar capacity, main breaker rating and AC solar breaker rating (if applicable). Ensure all values are set correctly.



Commissioning App PCS Settings	Input
CT location	CT at MID (partial load monitoring)
Main busbar capacity	The busbar rating of the main panel upstream of the MID. Note: 200A is the maximum value for this field. Please record 200A if busbar capacity is 200A or greater.
Main breaker rating	The main breaker at grid service entrance. Note: 200A is the maximum value for this field. Please record 200A if busbar capacity is 200A or greater.
AC Solar breaker rating	If home is equipped with Solar system that does not feed directly into the GM Energy Inverter, select AC Solar “yes” and record solar breaker rating. Note: Please also select whether the AC solar breaker feeds into the backup load panel or non-backup load panel. The above configuration shows AC solar located in the non-backup panel.

CT1 at Service Entrance, CT2 in Backup – Partial Home Backup, Whole Home Monitoring

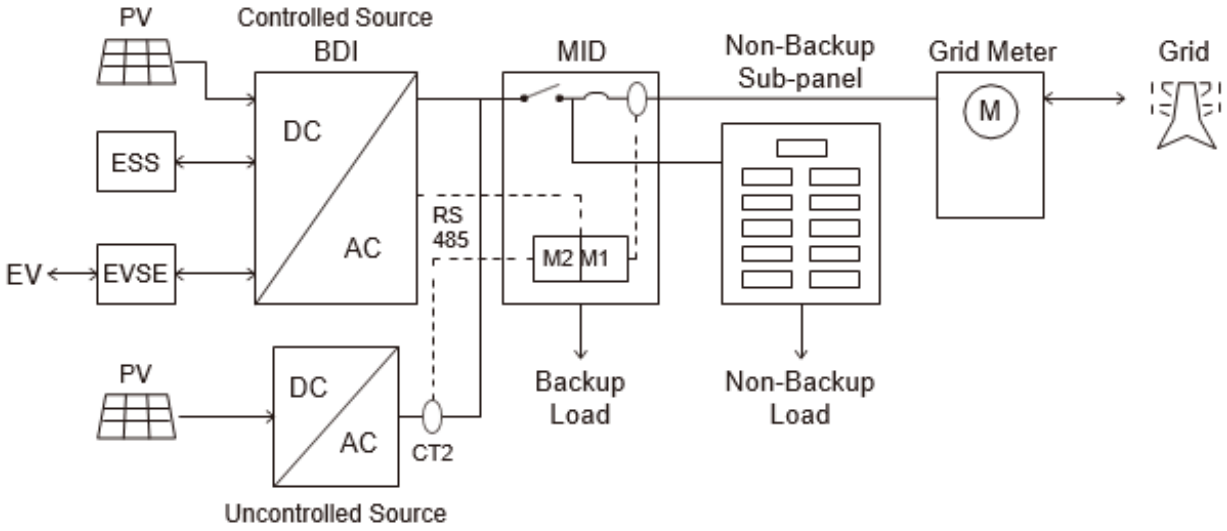
For this setup, relocate the meter 1 CTs from MID to the grid entrance to real time monitor the grid current. Additionally place meter 2 CTs at the output of the AC solar in the MID. Inverter will reduce power output to ensure the current on busbars do not go above 80% of its rated capacity. Ensure all values are set correctly.



Commissioning App PCS Settings	Input
CT location	CT1 at Grid Connection
Main busbar rating	0 – 200 A The busbar rating of the main panel upstream of the MID. Note: 200A is the maximum value for this field. Please record 200A if busbar capacity is 200A or greater.
AC Solar breaker rating	If home is equipped with Solar system that does not feed directly into the GM Energy Inverter, select AC Solar “yes” and record solar breaker rating. Note: Please also select whether the AC solar breaker feeds into the backup load panel or non-backup load panel. The above configuration shows AC solar located in the non-backup panel.

CT1 at Service Entrance, CT2 in Backup – Whole Home Backup, Whole Home Monitoring

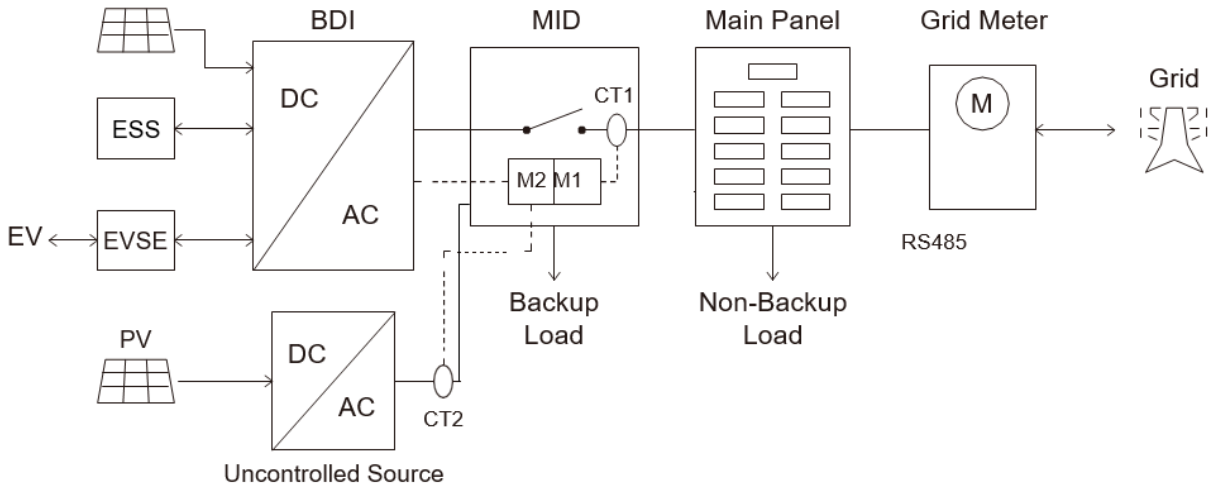
For whole home backup setup, the CT is left in MID although L1 and L2 need to be swapped as main breaker reverses polarity. Additionally place meter 2 CTs at the output of the AC solar in the MID. Inverter will reduce power output to ensure the current on busbars do not go above 80% of its rated capacity. Ensure all values are set correctly.



Commissioning App PCS Settings	Input
CT location	CT1 at Grid Connection
Main busbar rating	0 – 200 A The busbar rating of the main panel upstream of the MID. Note: 200A is the maximum value for this field. Please record 200A if busbar capacity is 200A or greater.
AC Solar breaker rating	If home is equipped with Solar system that does not feed directly into the GM Energy Inverter, select AC Solar “yes” and record solar breaker rating. Note: Please also select whether the AC solar breaker feeds into the backup load panel or non-backup load panel. The above configuration shows AC solar located in the non-backup panel.

CT1 at MID, CT2 in Backup – Partial Home Backup, Partial Home Monitoring

For this setup, CT1 is left in the factory installed location inside the MID and CT2 is placed at the existing solar output. Safety limits are calculated automatically using the main busbar capacity, main breaker rating and AC solar breaker rating. Ensure all values are set correctly.



Commissioning App PCS Settings	Input
CT location	CT at MID (partial load monitoring)
Main busbar capacity	The busbar rating of the main panel upstream of the MID. Note: 200A is the maximum value for this field. Please record 200A if busbar capacity is 200A or greater.
Main breaker rating	The main breaker at grid service entrance. Note: 200A is the maximum value for this field. Please record 200A if busbar capacity is 200A or greater.
AC Solar breaker rating	If home is equipped with Solar system that does not feed directly into the GM Energy Inverter, select AC Solar “yes” and record solar breaker rating. Note: Please also select whether the AC solar breaker feeds into the backup load panel or non-backup load panel. The above configuration shows AC solar located in backup panel.

APPENDIX E: OPERATION AND MAINTENANCE

E.1 De-Energize and Lockout/Tagout the System

Before working on or servicing any system components, power source(s) must be removed from the equipment (de-energize), and then locked in the OFF position with a tag identifying the individual's name, date, and contact information.
For installations that include only the Charger, de-energize the Charger by turning OFF (opening) the OCPD (circuit breaker) that powers the Charger.
A lockout/tagout (LOTO) device can be affixed to the breaker handle; or, if the OCPD is in an electrical panel with a lockable door, the door can serve as the means of LOTO.
If an AC disconnect was installed in series with the power circuit, open the disconnect and apply the LOTO steps.
If additional work or service will be performed on any premises with GM Energy equipment, care must be taken to de-energize and create a safe physical working space with respect to all energy sources.

Perform the following in the order presented:

E.1.1 Charger

Remove the charging connector from the vehicle, and then LOTO the AC circuit as described in Section E.1 (OCPD or AC disconnect if present).

E.1.2 Inverter, PowerBank and Solar

1. Verify that the charging connector is removed from the vehicle.
2. In the Hub, turn OFF (open) the two-pole 60 A OCPD (circuit breaker) labeled ***BDI Inverter***. LOTO the OCPD handle.
3. If DC solar is installed into the inverter, rotate the red rotary switch on the bottom face of the inverter to the OFF position. LOTO the rotary switch handle.
4. If a stationary PowerBank ESS is installed, move the circuit breaker switch to the OFF position.

E.1.3 Hub

1. Verify that the two-pole 60 A circuit to the Inverter is OFF (open) and is LOTO.
2. If a main breaker was installed in the Hub, turn OFF (open) the Hub main breaker by moving the handle to the left, and then LOTO the breaker handle.
3. If a main breaker is not present in the Hub, turn OFF (open) the Hub feeder power source circuit (meter AC disconnect, or feeder OCPD at upstream electrical equipment). After this disconnect is open, or the OCPD is open (OFF), LOTO the disconnect; or LOTO the breaker handle; or close the equipment door and LOTO the door in its closed position.

To re-energize, perform the steps in Section E.1.1, E.1.2, and E.1.3 in reverse order.

E.2 Field-Replaceable Components

Before performing work on GM Energy products ensure proper guidance has been given from the GM Energy Support Center. For any questions, contact 1-833-64POWER.

Note: For some of the procedures in this appendix, the customer's vehicle will be required to fully test and verify the replacement process. Recommissioning using the PowerShift Install application and verifying operation of the system will be required.

E.2.1 Charger

This section outlines the troubleshooting and replacement procedures for the Charger. It may need to be reset, may require new firmware to be downloaded, or simply may be defective and need replacement.

This overview does not include all the steps in the actual procedure:

1. If the charger will be replaced under warranty, the replacement charger/component will be shipped to the customer's home.
2. Upon arrival at the site, service personnel must coordinate planned site activity with homeowner and clearly communicate the duration of time that power to the premises will be off.
3. Perform site arrival inventory and evaluation.
4. Ensure no installation issues are present that can remedy issue before part replacement.
5. Replace the Charger.
6. Perform the "change device" function through the commissioning app and perform post-commissioning system & voltage checks.
7. Prepare an RMA for shipping and complete any job closeout procedure (or through other approved method).
8. Ship the defective Charger back to the supplier using the original shipping box and return label provided.
9. Inform the homeowner of the work performed and of any next steps.

Note: Some charger components, like the charger cable, may be replaced separately.

E.2.2 GM Energy Home Components (PowerBank Inverter, Hub, and Dark Start)

This section outlines the troubleshooting and replacement procedures for the Inverter, the Hub, and the Dark Start. These components may need to be reset, may require new firmware to be downloaded, or simply may be defective and need replacement.

This overview does not include all the steps in the actual respective procedures:

1. If the component will be replaced under warranty, the replacement charger/component will be shipped to the customer's home.
2. Upon arrival at the site, service personnel must coordinate planned site activity with homeowner and clearly communicate the duration of time that power to the premises will be off.
3. Perform site arrival inventory and evaluation.
4. Ensure no installation issues are present that can remedy issue before part replacement.
5. Replace the component.
6. Perform the "change device" function through the commissioning app and perform post-commissioning system & voltage checks.
7. Prepare an RMA for shipping and complete job closeout activity (or other approved method).

8. Ship the defective component back to the supplier using the original shipping box and return label provided.
9. Inform the homeowner of the work performed and of any next steps.

APPENDIX F: TROUBLESHOOTING

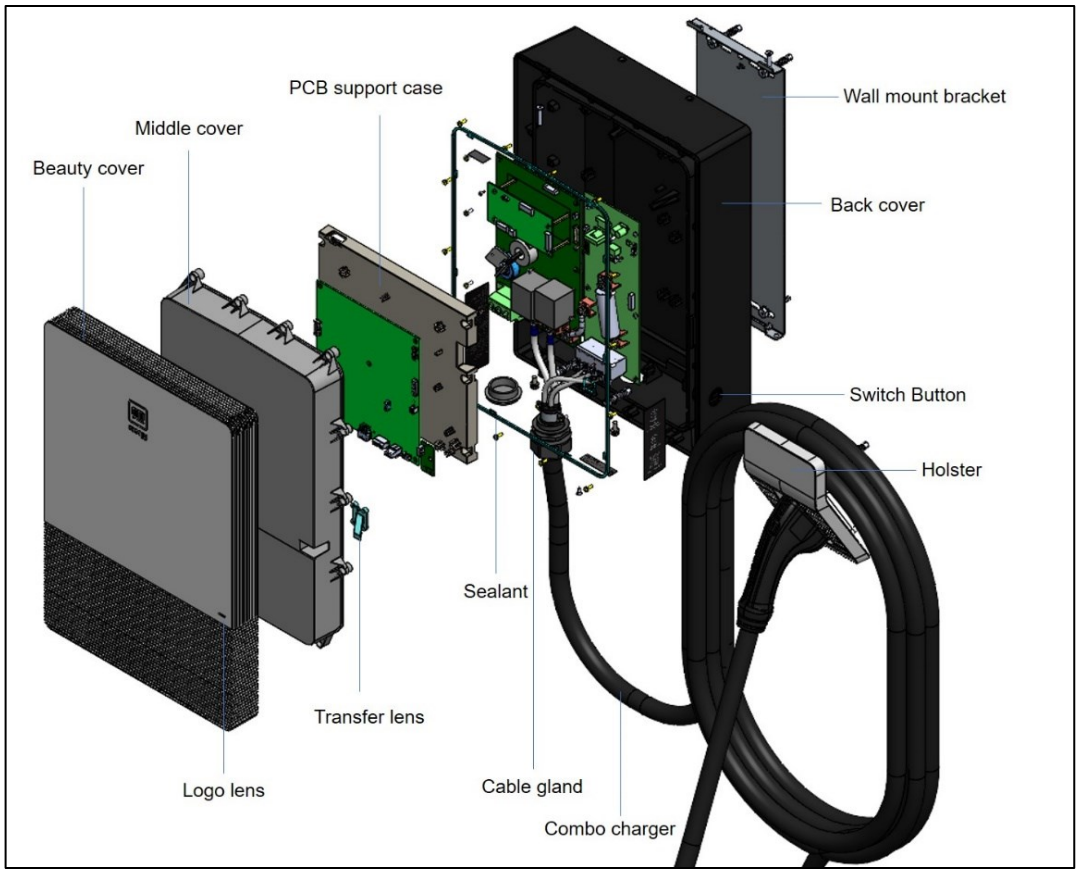
Troubleshooting information is available at https://gmenergy.gm.com/for-home/resources-and-support.

For additional Troubleshooting, call the GM Energy Support Center at 1-833-64POWER.

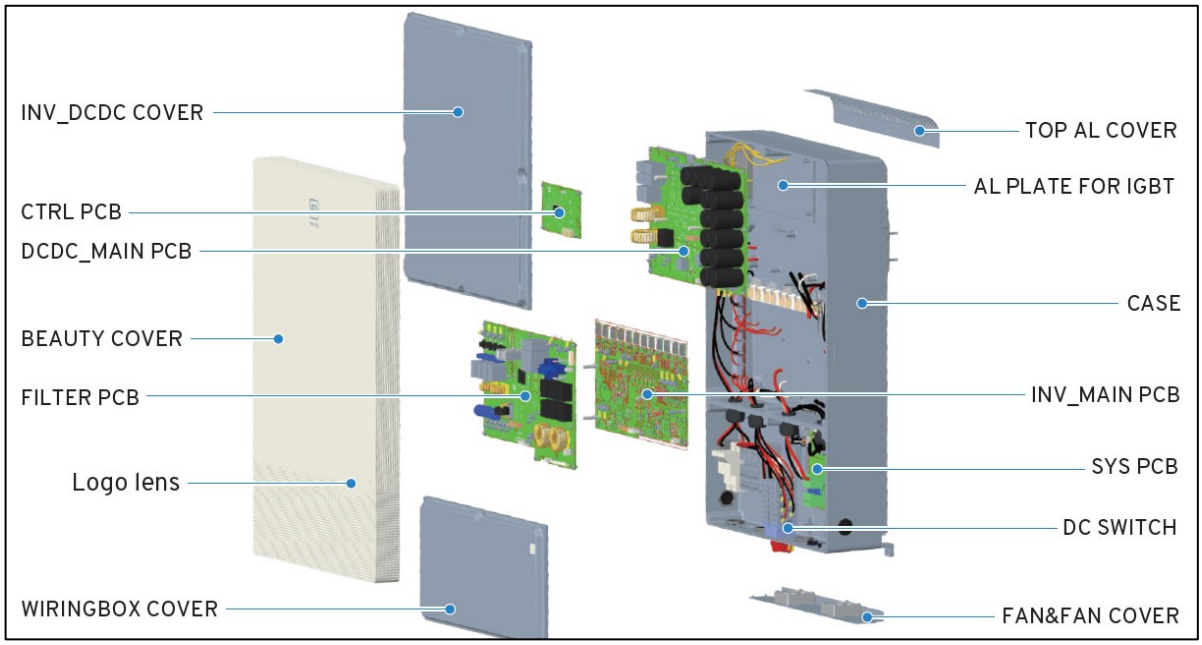
APPENDIX G: EXPANDED VIEW

These diagrams show the individual parts of the Charger, Inverter and the Hub.

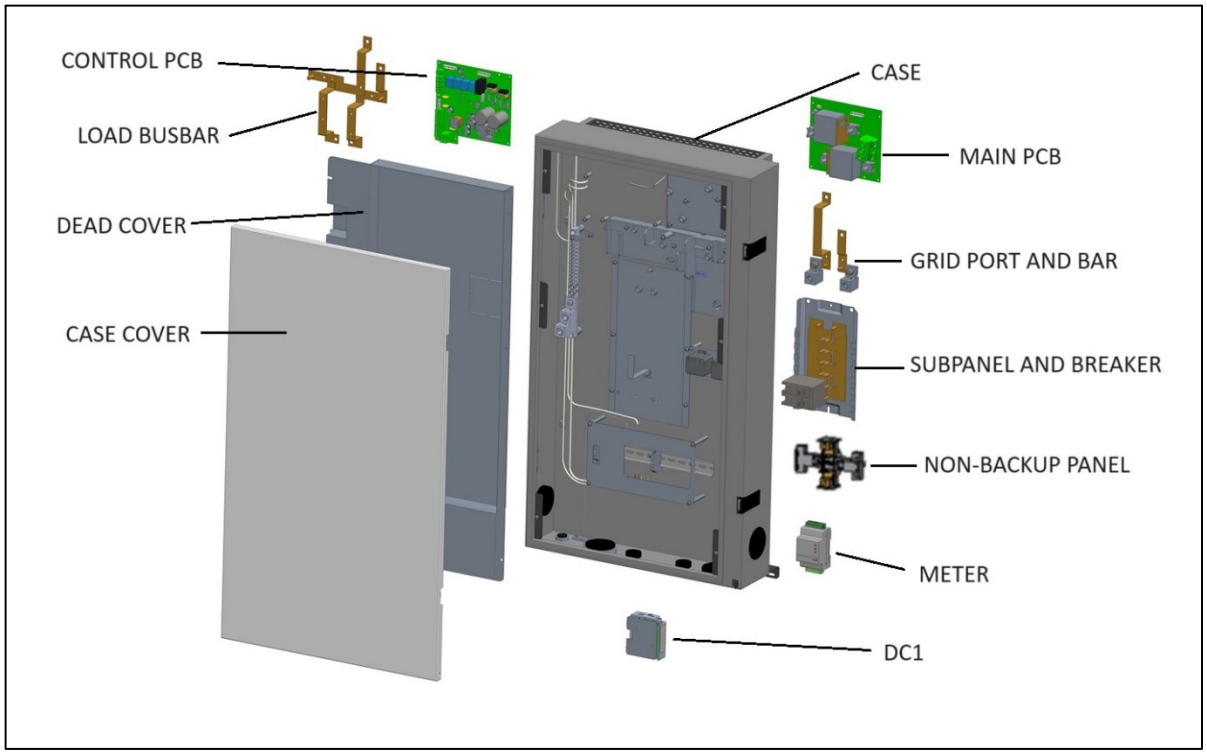
Charger



Inverter

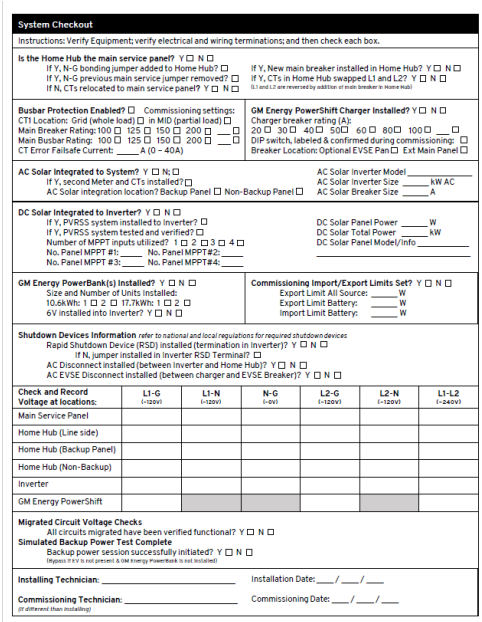


Hub


CONTROL PCB
LOAD BUSBAR
DEAD COVER
CASE COVER
CASE
MAIN PCB
GRID PORT AND BAR
SUBPANEL AND BREAKER
NON-BACKUP PANEL
METER
DC1

APPENDIX H: SYSTEM & VOLTAGE CHECKS FORM

Print the **System & Voltage Checks** form, ensure that all values and markings are recorded on the it, and then left in a place future installers/electricians can access.



System Checkout

Instructions: Verify Equipment; verify electrical and wiring terminations; and then check each box.

Is the Home Hub the main service panel? Y ☐ N ☐
- If Y, N-G bonding jumper added to Home Hub? ☐
- If Y, N-G previous main service jumper removed? ☐
- If N, CTs relocated to main service panel? Y ☐ N ☐
- If Y, New main breaker installed in Home Hub? Y ☐ N ☐
- If Y, CTs in Home Hub swapped L1 and L2? Y ☐ N ☐
  (L1 and L2 are reversed by addition of main breaker in Home Hub)

Busbar Protection Enabled? ☐ Commissioning settings:
CT1 Location: Grid (whole load) ☐ in MID (partial load) ☐
Main Breaker Rating: 100 ☐ 125 ☐ 150 ☐ 200 ☐ ___ ☐
Main Busbar Rating: 100 ☐ 125 ☐ 150 ☐ 200 ☐ ___ ☐
CT Error Failsafe Current: ____ A (0 – 40A)

GM Energy PowerShift Charger Installed? Y ☐ N ☐
Charger breaker rating (A):
20 ☐ 30 ☐ 40 ☐ 50 ☐ 60 ☐ 80 ☐ 100 ☐ ___ ☐
DIP switch, labeled & confirmed during commissioning: ☐
Breaker Location: Optional EVSE Pan ☐ Ext Main Panel ☐

AC Solar Integrated to System? Y ☐ N; ☐
- If Y, second Meter and CTs installed? ☐
- AC Solar integration location? Backup Panel ☐ Non-Backup Panel ☐
- AC Solar Inverter Model _____
- AC Solar Inverter Size _____ kW AC
- AC Solar Breaker Size _____ A

DC Solar Integrated to Inverter? Y ☐ N ☐
- If Y, PVRSS system installed to Inverter? ☐
- If Y, PVRSS system tested and verified? ☐
- Number of MPPT inputs utilized? 1 ☐ 2 ☐ 3 ☐ 4 ☐
- No. Panel MPPT #1: ____ No. Panel MPPT#2: ____
- No. Panel MPPT #3: ____ No. Panel MPPT#4: ____
- DC Solar Panel Power _____ W
- DC Solar Total Power _____ kW
- DC Solar Panel Model/Info _____

GM Energy PowerBank(s) Installed? Y ☐ N ☐
- Size and Number of Units Installed:
- 10.6kWh: 1 ☐ 2 ☐ 17.7kWh: 1 ☐ 2 ☐
- 6V installed into Inverter? Y ☐ N ☐

Commissioning Import/Export Limits Set? Y ☐ N ☐
- Export Limit All Source: _____ W
- Export Limit Battery: _____ W
- Import Limit Battery: _____ W

Shutdown Devices Information *refer to national and local regulations for required shutdown devices*
- Rapid Shutdown Device (RSD) installed (termination in Inverter)? Y ☐ N ☐
- If N, jumper installed in Inverter RSD Terminal? ☐
- AC Disconnect installed (between Inverter and Home Hub)? Y ☐ N ☐
- AC EVSE Disconnect installed (between charger and EVSE Breaker)? Y ☐ N ☐

Check and Record Voltage at locations:	**L1-G** (~120V)	**L1-N** (~120V)	**N-G** (~0V)	**L2-G** (~120V)	**L2-N** (~120V)	**L1-L2** (~240V)
Main Service Panel						
Home Hub (Line side)						
Home Hub (Backup Panel)						
Home Hub (Non-Backup)						
Inverter						
GM Energy PowerShift						

Migrated Circuit Voltage Checks
All circuits migrated have been verified functional? Y ☐ N ☐

Simulated Backup Power Test Complete
Backup power session successfully initiated? Y ☐ N ☐
(Bypass if EV is not present & GM Energy PowerBank is not installed)

Installing Technician: _____ Installation Date: ___ / ___ / ___

Commissioning Technician: _____ Commissioning Date: ___ / ___ / ___
(if different than installing)

System Checkout

Instructions: Verify equipment; verify electrical and wiring terminations; and then check each box

Is the Home Hub the main service panel? Y ☐ N ☐
- If Y, N-G bonding jumper added to Home Hub? ☐
- If Y, N-G previous main service jumper removed? ☐
- If N, CTs relocated to main service panel? Y ☐ N ☐
- If Y, New main breaker installed in Home Hub? Y ☐ N ☐
- If Y, CTs in Home Hub swapped L1 and L2? Y ☐ N ☐ (L1 and L2 are reversed by addition of main breaker in Home Hub)

Busbar Protection Enabled? ☐ Commissioning settings:
CT1 Location: Grid (whole load) ☐ in MID (partial load) ☐
Main Breaker Rating: 100 ☐ 125 ☐ 150 ☐ 200 ☐ ___ ☐
Main Busbar Rating: 100 ☐ 125 ☐ 150 ☐ 200 ☐ ___ ☐
CT Error Failsafe Current: _____ A (0 – 40A)

GM Energy PowerShift Charger Installed? Y ☐ N ☐
Charger breaker rating (A):
20 ☐ 30 ☐ 40 ☐ 50 ☐ 60 ☐ 80 ☐ 100 ☐ ___ ☐
DIP switch, labeled & confirmed during commissioning: ☐
Breaker Location: Optional EVSE Panel ☐ Ext Main Panel ☐

AC Solar Integrated to System? Y ☐ N; ☐
- If Y, second Meter and CTs installed? ☐
- AC Solar integration location? Backup Panel ☐ Non-Backup Panel ☐

AC Solar Inverter Model _____
AC Solar Inverter Power _____ kW AC
AC Solar Breaker Size _____ A

DC Solar Integrated to Inverter? Y ☐ N ☐
- If Y, PVRSS system installed to Inverter? ☐
- If Y, PVRSS system tested and verified? ☐
- Number of MPPT inputs utilized? 1 ☐ 2 ☐ 3 ☐ 4 ☐
- No. Panel MPPT #1: _____ No. Panel MPPT#2: _____
- No. Panel MPPT #3: _____ No. Panel MPPT#4: _____

DC Solar Panel Power _____ W
DC Solar Total Power _____ kW
DC Solar Panel Model / Info _____
_____

GM Energy PowerBank(s) Installed? Y ☐ N ☐
- Size and Number of Units Installed:
- 10.6kWh: 1 ☐ 2 ☐ 17.7kWh: 1 ☐ 2 ☐
- 6V installed into Inverter? Y ☐ N ☐

Commissioning Import / Export Limits Set? Y ☐ N ☐
- Export Limit All Source: _____ W
- Export Limit Battery: _____ W
- Import Limit Battery: _____ W

Shutdown Devices Information (refer to national and local regulations for required shutdown devices)
- Rapid Shutdown Device (RSD) installed (termination in Inverter)? Y ☐ N ☐
  - If N, jumper installed in Inverter RSD Terminal? ☐
- AC Disconnect installed (between Inverter and Home Hub)? Y ☐ N ☐
- AC EVSE Disconnect installed (between charger and EVSE Breaker)? Y ☐ N ☐

Check and Record Voltage at locations:	L1-G (~120V)	L1-N (~120V)	N-G (~0V)	L2-G (~120V)	L2-N (~120V)	L1-L2 (~240V)
Main Service Panel						
Home Hub (Line side)						
Home Hub (Backup Panel)						
Home Hub (Non-Backup)						
Inverter						
GM Energy PowerShift						

Migrated Circuit Voltage Checks
- All circuits migrated have been verified functional? Y ☐ N ☐

Simulated Backup Power Test Complete
- Backup power session successfully initiated? Y ☐ N ☐
  (Bypass if EV is not present & GM Energy PowerBank is not installed)

Installing Technician: _____ Installation Date: ____ / ____ / ____

Commissioning Technician: _____ Commissioning Date: ____ / ____ / ____
(if different than installing)