SAVANT
POWER SYSTEM

Savant Power System Wiring Guide

Wiring and Installation

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This document guides the installer through the process of wiring and configuring Savant Power System, and supports the following products:

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To access links to the topics within this document, click the corresponding entry in the table below.

Important Safety Information - Read First

Before installing, configuring, or operating any equipment, Savant recommends that each dealer, integrator, installer, etc. access and read all relevant technical documentation. Savant Power technical documentation can be located by visiting Savantpower.com. Vendor documentation is supplied with the equipment.

Read and understand all safety instructions, cautions, and warnings in this document and the labels on the equipment.

Safety Classifications In this Document

NOTE:	Provides special information for installing, configuring, and operating the equipment.
IMPORTANT!	Provides special information that is critical to installing, configuring, and operating the equipment.
CAUTION!	Provides special information for avoiding situations that may cause damage to equipment.
WARNING!	Provides special information for avoiding situations that may cause physical danger to the installer, end user, etc.

Electric Shock Prevention

ELECTRIC SHOCK!	The source power poses an electric shock hazard that has the potential to cause serious injury to installers and end users.
ELECTRICAL DISCONNECT:	The source power outlet and power supply input power sockets should be easily accessible to disconnect power in the event of an electrical hazard or malfunction.

Weight Injury Prevention

WEIGHT INJURY!	Installing some of the Savant equipment requires two installers to ensure safe handling during installation. Failure to use two installers may result in injury.

Safety Statements

All safety instructions below must be read, understood, and carefully followed under all applicable circumstances when working with any Savant equipment.

1. **Follow all input power ratings marked on product near power input!**
2. If fuse replacement is required, replacement fuse should match fuse rating marked on the product.
3. Do not use equipment near water.
4. Clean only with dry cloth.
5. Do not block any ventilation openings or install near any heat sources such as heat registers, stoves, radiators, amplifiers, etc.
6. Refer all servicing to qualified service personnel. Servicing is required when any part of the apparatus has been damaged in any way, or fails to operate normally for any reason.
7. Use only attachments/accessories specified by the manufacturer, following all relevant safety precautions for any such attachments/ accessories.
8. For applicable equipment, use the included power cord with the grounding prong intact to insure proper grounding of the device.
9. If the provided plug does not fit the desired outlet, contact a licensed electrician to replace the obsolete outlet.
10. Protect any power cord from being walked on, pinched, strained, or otherwise potentially damaged, especially at the outlet or device connections.
11. Disconnect any outlet powered apparatus from its power source during lightning storms or when unused for long periods of time.
12. To completely disconnect equipment from AC mains power, disconnect the power supply cord plug from the AC receptacle on the device.
13. For any hardwired or fixed in-wall apparatus, carefully follow all wiring diagrams and instructions. All electrical wiring and servicing should be performed by a properly licensed electrician.

1. Before You Begin

This document assumes the installer has read all relevant third party documentation. Read this document in its entirety before starting deployment of any product listed within. Ensure that the following items are available:

1. Smart Host (SHR-2000) ☐
   OR
2. Pro Host or Super Pro Host (SVR-5100, SVR-7000S) ☐
   AND
3. Smart Controller (SSC-0012 or any controller with available GPIO ports) ☐

   ⚠ **IMPORTANT NOTE!:** A **Smart Controller with RS485 ports** is required for all Sol-Ark deployments, regardless of Host type.

4. Panel Bridge Controller (PBC-1000) ☐
5. OPTIONAL: Smart Energy Monitor (SEM-2015) ☐

1.1. Power Source Considerations

Before starting installation, it is important to note if an energy storage system will be installed. The Savant Power System can be integrated with an automatic generator, battery, or microgrid energy storage system for a complete energy management experience. A device that produces energy within the Savant Power System is referred to as a **Power Source**. This Wiring and Install Guide includes instructions on how to integrate all three types of Power Sources. Review the following notes on specifications for Power Source compatibility before choosing a Power Source. Only one Power Source can be integrated at a time.

Savant

- ⚠ **IMPORTANT!:** All Savant Hosts **must be backed up by a Universal Power Supply** (UPS).

Generator Physical Requirements

- ⚠ **IMPORTANT!:** All Automatic Transfer Switches (ATS) must have **Auxiliary Position-Indicating Contacts** to connect to the GPIO terminals on the Savant Host or Smart Controller.
- Auxiliary Position-Indicating Contacts come standard on all commonly sold Generac Model residential ATS.
- Kohler residential ATS models RXT and RDT (300A and 400A) can be purchased as an accessory for Kohler model ATS under 300A. They can also be purchased as an accessory for ASCO ATS, and most other brands.
- When configuring an Savant Power System to work with a generator, the system needs to map the GPIO input to the ATS position. The ATS position can either be set to the **Utility Grid** or the **Emergency Backup** source.
- Review the generator-specific **ATS Operation & Installation** manual for information on the auxiliary contact position.

Generator ATS Mapping

- ATS position mapping is set using the **Grid Available when ATS GPIO is Low** checkbox within **Tools > Energy Manager**. For more information, see the **Savant Power System Deployment Guide - Racepoint Blueprint**.
- When the auxiliary contact is **closed**, the ATS GPIO is **Low**, indicating that the ATS is in the **Feed Input** position (Grid Available).
- When the auxiliary contact is **open**, the ATS GPIO is **High**, indicating that the ATS is in the **Emergency** position (Grid Unavailable).
- If the auxiliary contact in the open position, and the ATS GPIO is in the high position, the Automatic Transfer Switch (ATS) is in the **Grid** position. This means grid power is available.
- If the auxiliary contact in the closed position and the ATS GPIO is in the low position, the Automatic Transfer Switch (ATS) is in the **Standby** or **Emergency** position. This means Grid power is unavailable.

Solar

- Solar values must show negative for production.

2. Introduction

A **Savant Power System** functions by using an energy monitoring device to read live data provided by CT and VT connections. This information is then transmitted to the Host, which sends commands based on user input in the Savant Pro App or pre-configured settings within the Savant Power & Light App or Racepoint Blueprint. This information is presented to the user in the Savant Pro App, which in turn is used for accurate information and active control. To ensure that the correct data is transmitted, the system must be installed according to the diagrams listed within this document.

⚠ **IMPORTANT:** Complete sections 3 and 4. Skip all other sections that are unrelated to the specific installation type.

To successfully deploy a Savant Savant Power System, follow the steps listed below. This page can be used as a checklist to track progress as items are completed.

1. (OPTIONAL) Choose Power Source ☐
   See Before You Begin
2. Understand and Install Savant Power System ☐
   See Basic System
3. Install Savant Power System Panel ☐
   See Power Module Installation
4. (OPTIONAL) Wire Power Source ☐
   See Automatic Generator Or Sol-Ark & HomeGrid

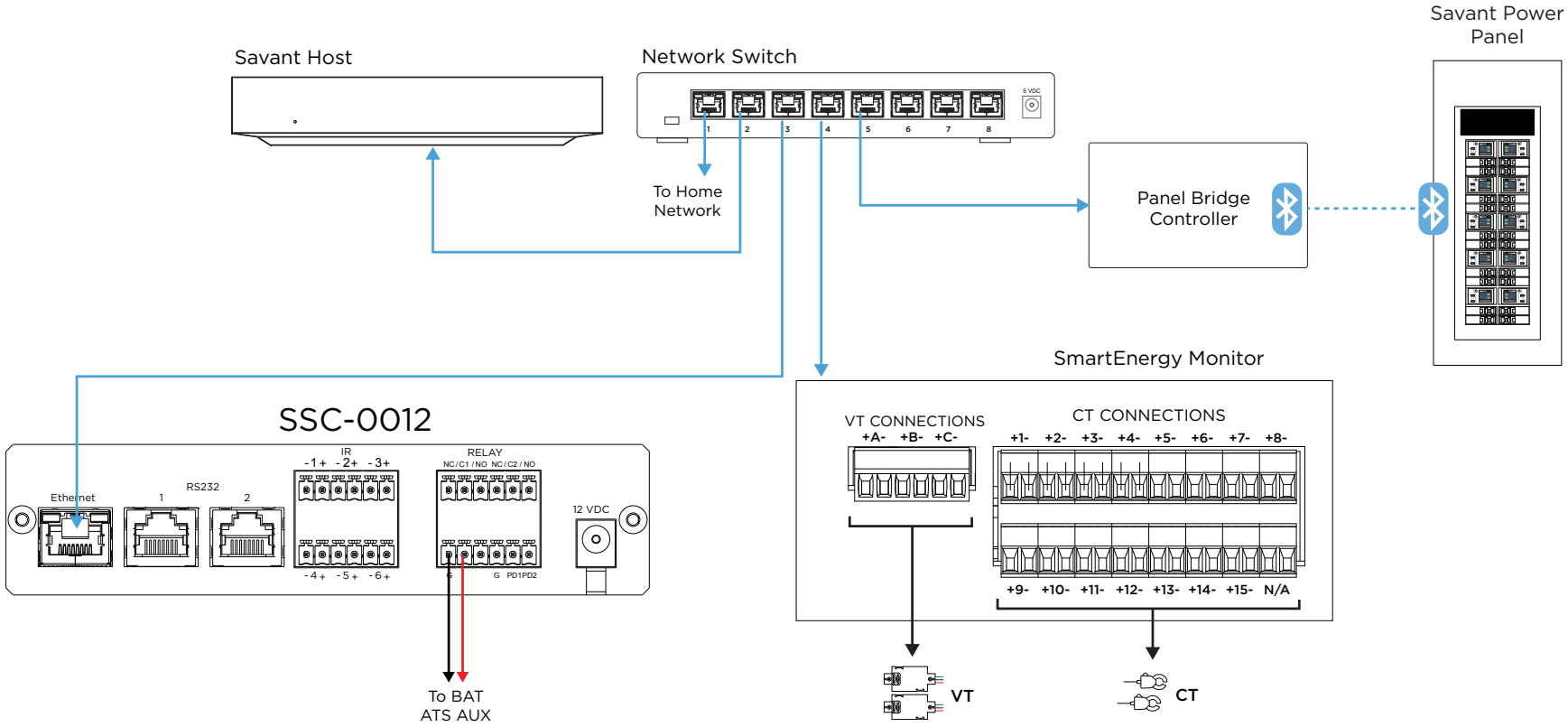
3. Basic System

The subsections within this section depict the basic communication pathway for a Savant Power System. This is the basis of all wiring diagrams beyond this point and can be used as a way to troubleshoot issues with deployment.

IMPORTANT!: For energy monitoring Power Systems with **no Power Sources**, choose the subsection below that is applicable to the Savant Host installed. Then complete section 3 according to the Power Modules installed. No further installation is required.

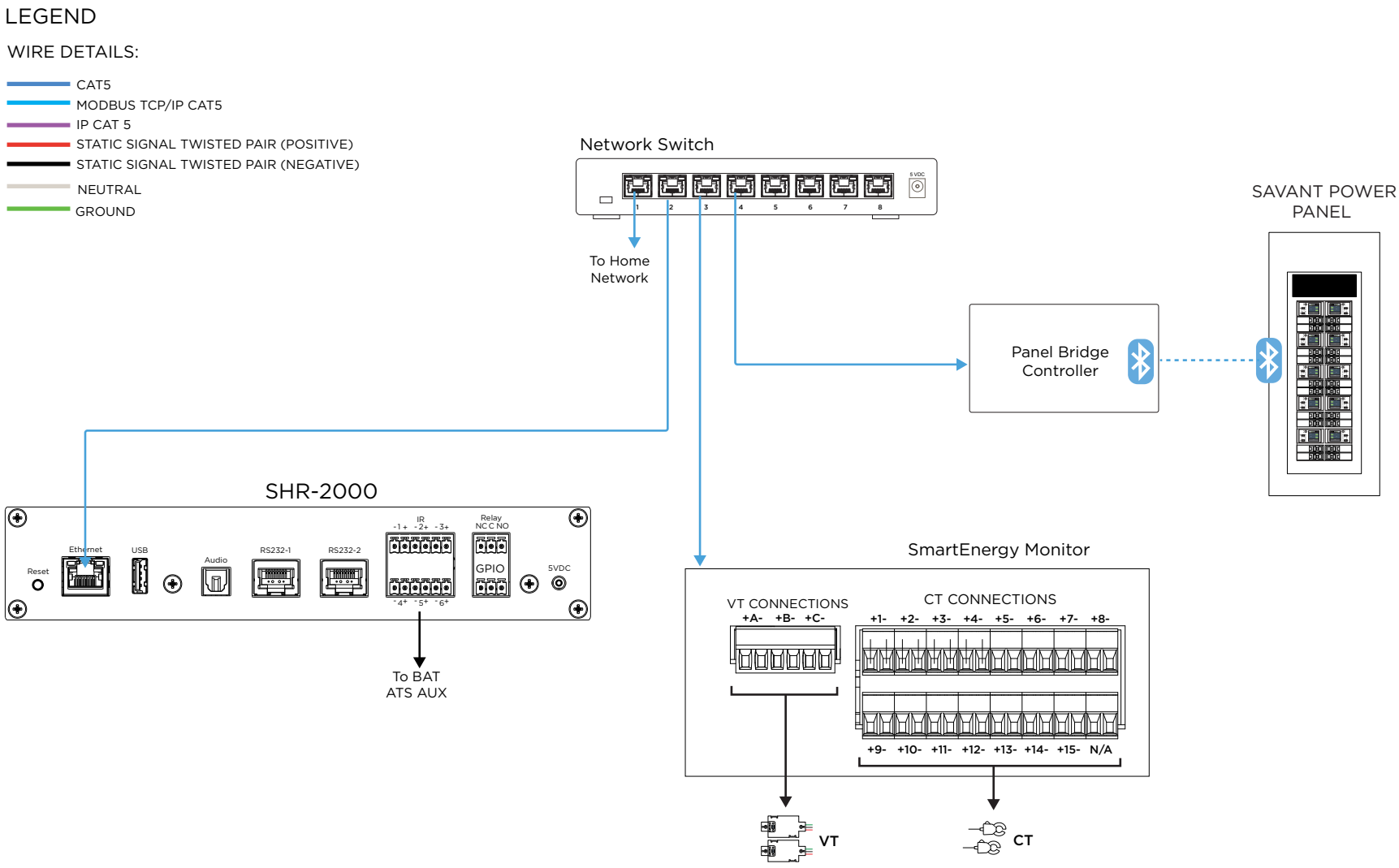
3.1. Savant Pro Host

- The **Savant Pro Host** is the brain of the Savant Power System, and is responsible for displaying live data to the Savant Pro App and transmitting user or installed configured commands to the correct device upon request.
- The **SSC-0012**, or any **Savant Controller** with a relay connection, is responsible for controlling the auxilliary contacts on the generator or battery ATS.
- **OPTIONAL:** The **Savant Smart Energy Monitor** is responsible for monitoring VT and CT connections and sending information to the Savant Host.
- The **Panel Bridge Controller** relays commands sent by the Host over Bluetooth to Power Modules.
- The **Savant Power Panel** contains all **Power Modules** paired with the Panel Bridge Controller and executes all commands sent to it.



3.2. Savant Smart Host

- The **Savant Pro Host** is the brain of the Savant Power System, and is responsible for displaying live data to the Savant Pro App and transmitting user or installed configured commands to the correct device upon request.
- Either a pair of relays on the rear of the Smart Host or another Smart Controller are responsible for controlling the Auxilliary Contacts on the generator or battery ATS.
- **OPTIONAL:** The **SmartEnergy Monitor** is responsible for monitoring VT and CT connections and sending information to the Savant Host.
- The **Savant Power Panel** contains all **Power Modules** paired with the Panel Bridge Controller and executes all commands sent to it.



3.3. (OPTIONAL) CT and VT Placement

CT (Current Transformer) and VT (Voltage Transformer) placement is critical for correct data transmission to the SmartEnergy Monitor.All Savant Prow Confirm that VT and CT wiring placements match the diagram and the table below.

Savant Power System with Generator

SEM CT	Physical Connection	Circuit Name	CT Size	Classification
1 / 2	ATS Normal Input	Grid Feed	250A	Feed
3 / 4	ATS Emergency Input	Generator Power	150A	Production

NOTE: Generator circuit CT rating is inverted.

Savant Power System with Schneider ESS

SEM CT	Physical Connection	Circuit Name	CT Size	Classification
1 / 2	ATS Input	Grid Feed	250A	Feed
3 / 4	ATS Output	Total Consumption	150A	Total Consumption

For more information on SEM-2015 wiring and configuration instructions, search the Savant Knowledgebase for the **Standalone Energy Monitoring Deployment Guide**.

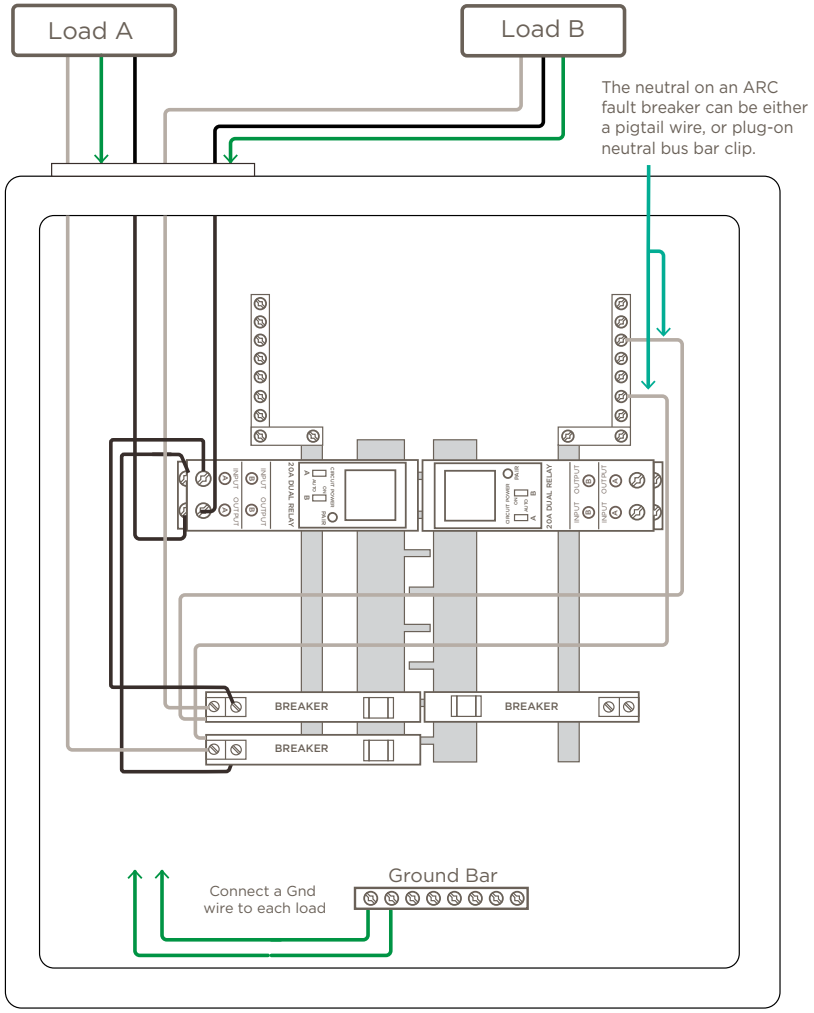
4. Power Panel Installation

A Savant Power Panel is a breaker panel with one or more Power Modules installed. A **Power Module** is a load monitoring and controlling device installed into electrical panels as easily as a circuit breaker. Power Modules communicate with the Savant Power System through the **Panel Bridge Controller** via Bluetooth. Review the wiring diagrams below and confirm that all proper physical installation has been completed before proceeding.

⚠ **IMPORTANT NOTE!: DO NOT CONNECT ANY** mission-critical loads such as medical devices to **ANY** Power Module.

4.1. 120V 20A Dual Relay Power Modules (GPM-QP2R20120-21)

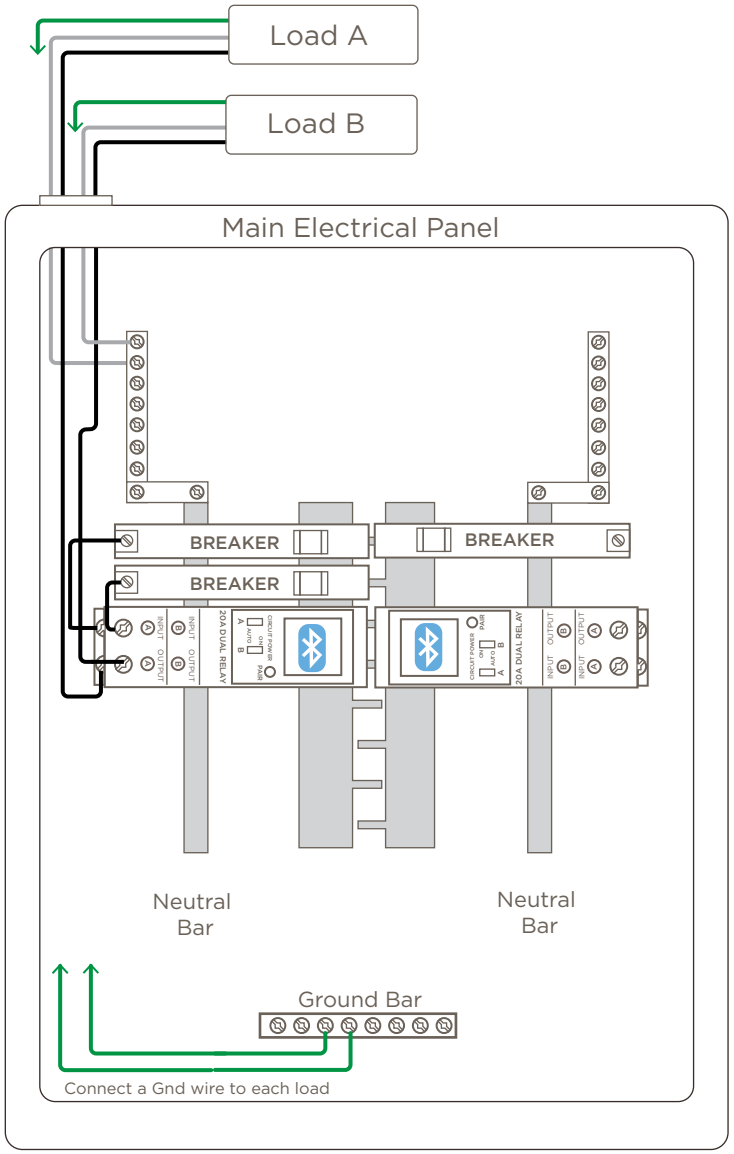
ARC Fault Breakers



⚠ **IMPORTANT NOTES!**

- The 120V 20A Dual Relay Power Modules switches on and off loads A and B.
- The main electrical panel contains ARC fault breakers. See the next page for the standard non-ARC fault breaker diagram.
- The diagram shows connections for both a **plug-on neutral** and **pigtail neutral wire** 120V 20A Dual Relay Power Modules. Make connections according to the type of breaker being installed.
- Neutral and ground wires on both load centers must be common.

Standard non-ARC Fault Breakers



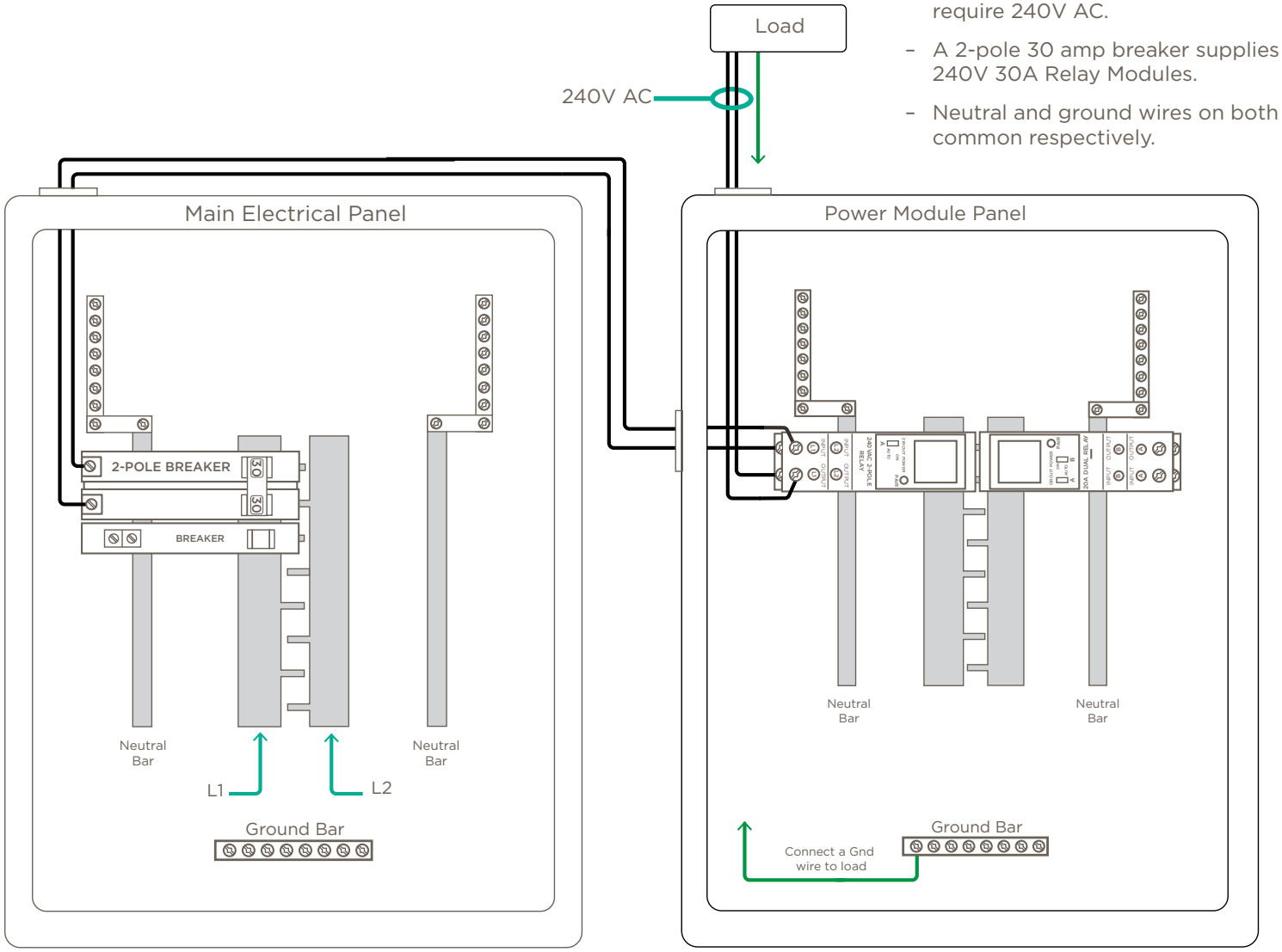
IMPORTANT NOTES!

- The 120V 20A Dual Relay Power Modules switches on and off Loads A and B.
- The main electrical panel contains standard non-ARC fault breakers. See the previous page for a diagram using ARC fault breakers.

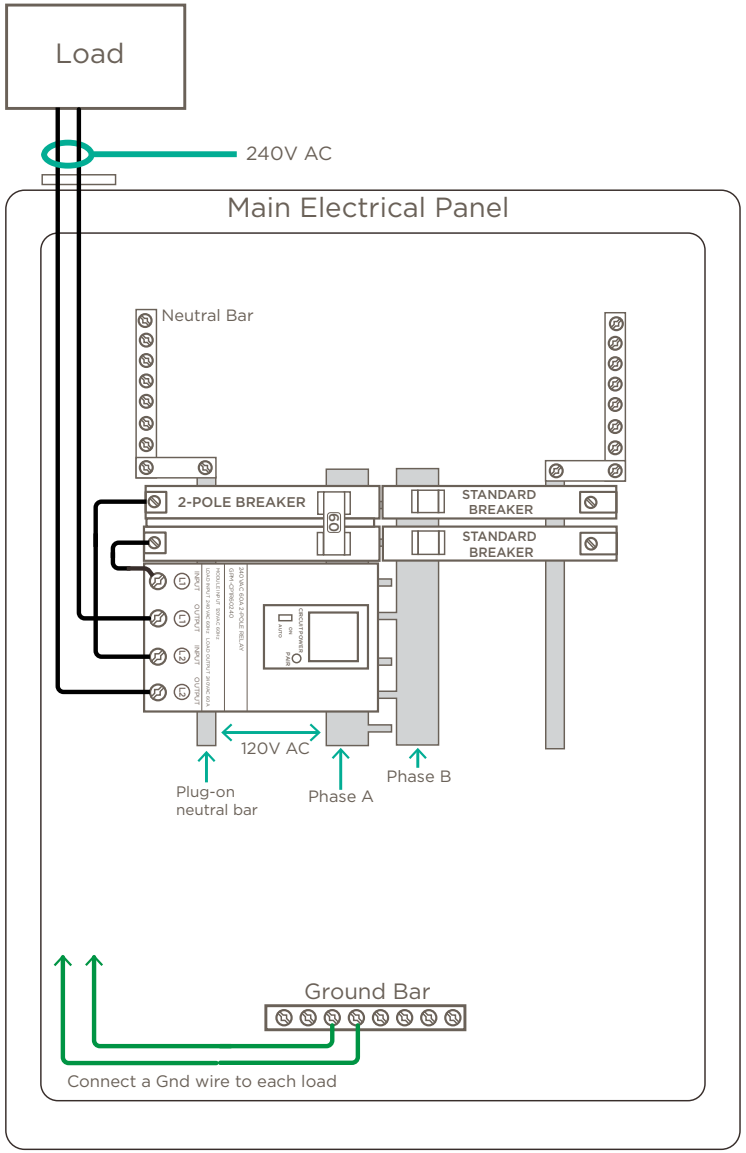
4.2. 240V 30A Savant Power Relay Modules (GPM-QP1R30240-21)

IMPORTANT NOTES!

- The 240V 30A Relay Module is used to switch loads that require 240V AC.
- A 2-pole 30 amp breaker supplies the 240V AC to the 240V 30A Relay Modules.
- Neutral and ground wires on both load centers must be common respectively.



4.3. 240V 60A Relay Module (GPM-CP1R60240-21)



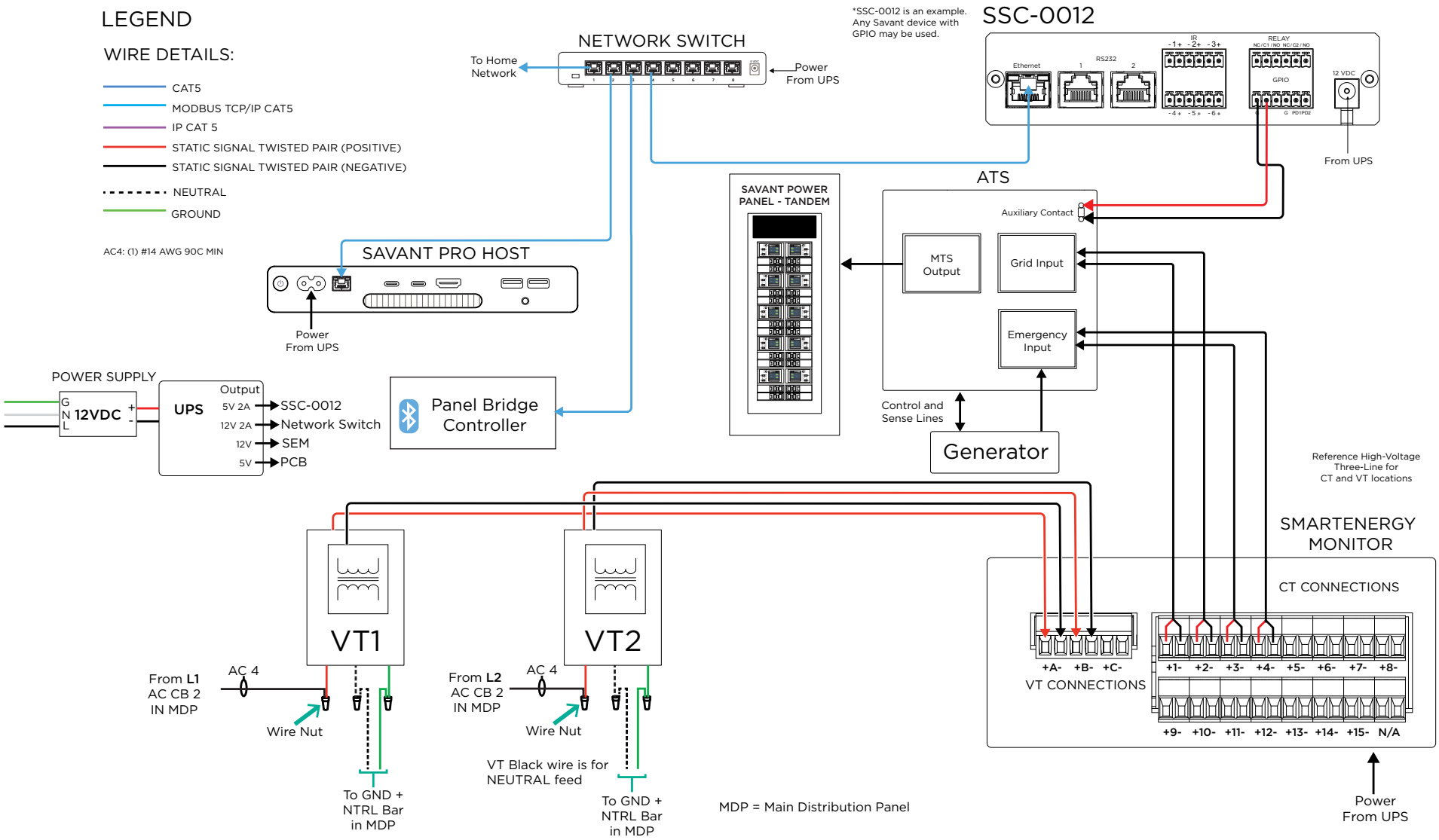
IMPORTANT NOTE!:

- The 240V 60A Relay Module can accept up to a #4 AWG wire.

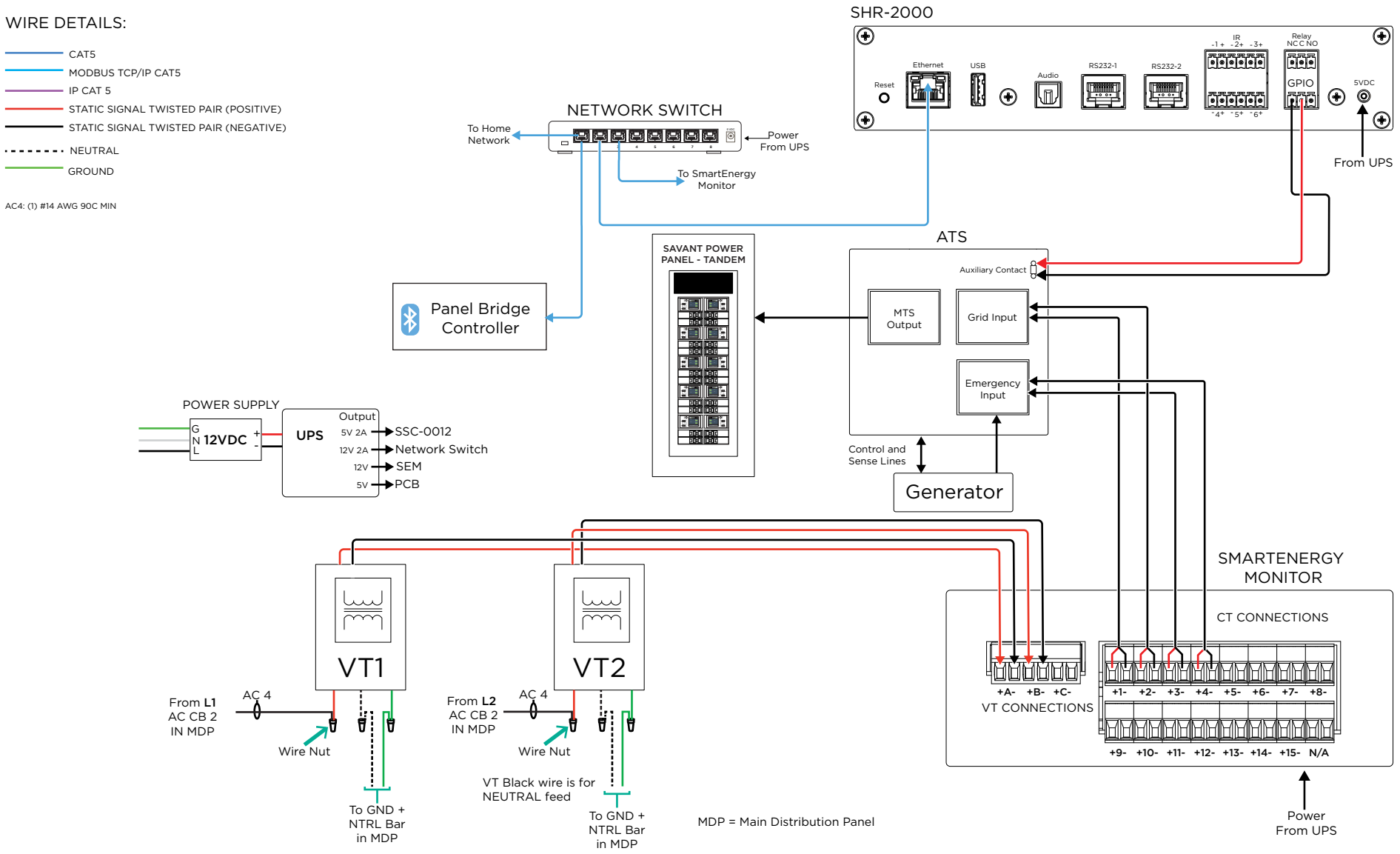
5. Automatic Generator

This section presents uses the diagrams presented in Basic Energy Monitoring Wiring to integrate an Automatic Generator into a Savant Power System. After physically installing a system using the applicable the diagram within this section as reference, see the **Savant Power System Deployment Guide - [Racepoint Blueprint]** to begin programming using a Savant Development Environment (SDE).

5.1. Pro Host with Generator



5.2. Smart Host with Generator



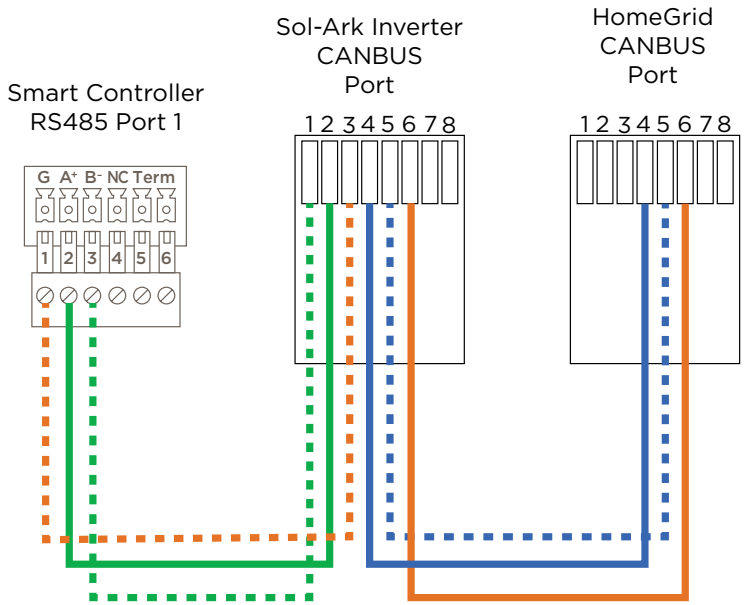
6. Sol-Ark & HomeGrid

This section provides all relevant information regarding integrating one or more Sol-Ark inverters into a Savant Power System. Complete section 6.1 regardless of the quantity of inverters or batteries to be installed. Then choose the applicable subsection afterwards and wire the Power System accordingly.

6.1. Savant - Sol-Ark Wiring

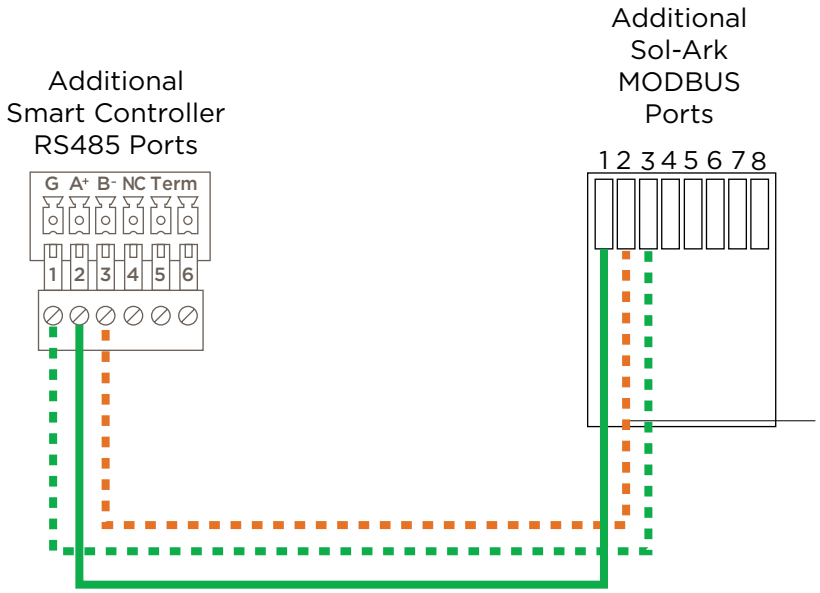
The Master Sol-Ark Inverter communicates with both the Savant Smart Controller and the first HomeGrid battery using a single, spliced RS485 cable. Additional Sol-Ark inverters only require communication to the Savant Smart Controller using an additional RS485 cable connected to each MODBUS port. Wire these cables according to the diagrams described below:

Master Inverter CANBUS Wiring



Smart Controller RS485 Port	Sol-Ark Inverter CANBUS Port	HomeGrid CANBUS Port
GND (1)	3	
A+ (2)	2	
B- (3)	1	
4		4
5		5
6		6

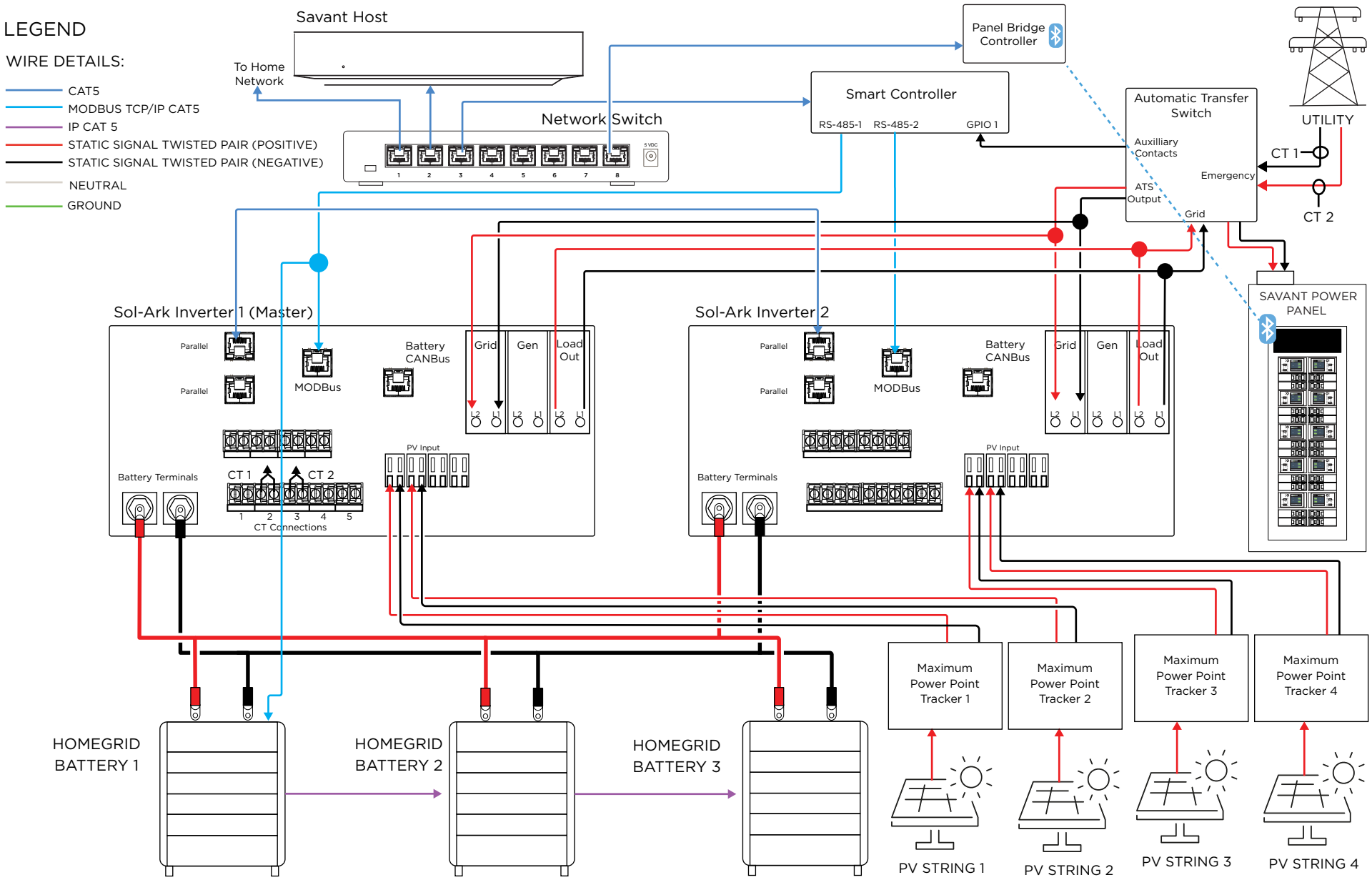
Additional Inverter CANBUS Wiring



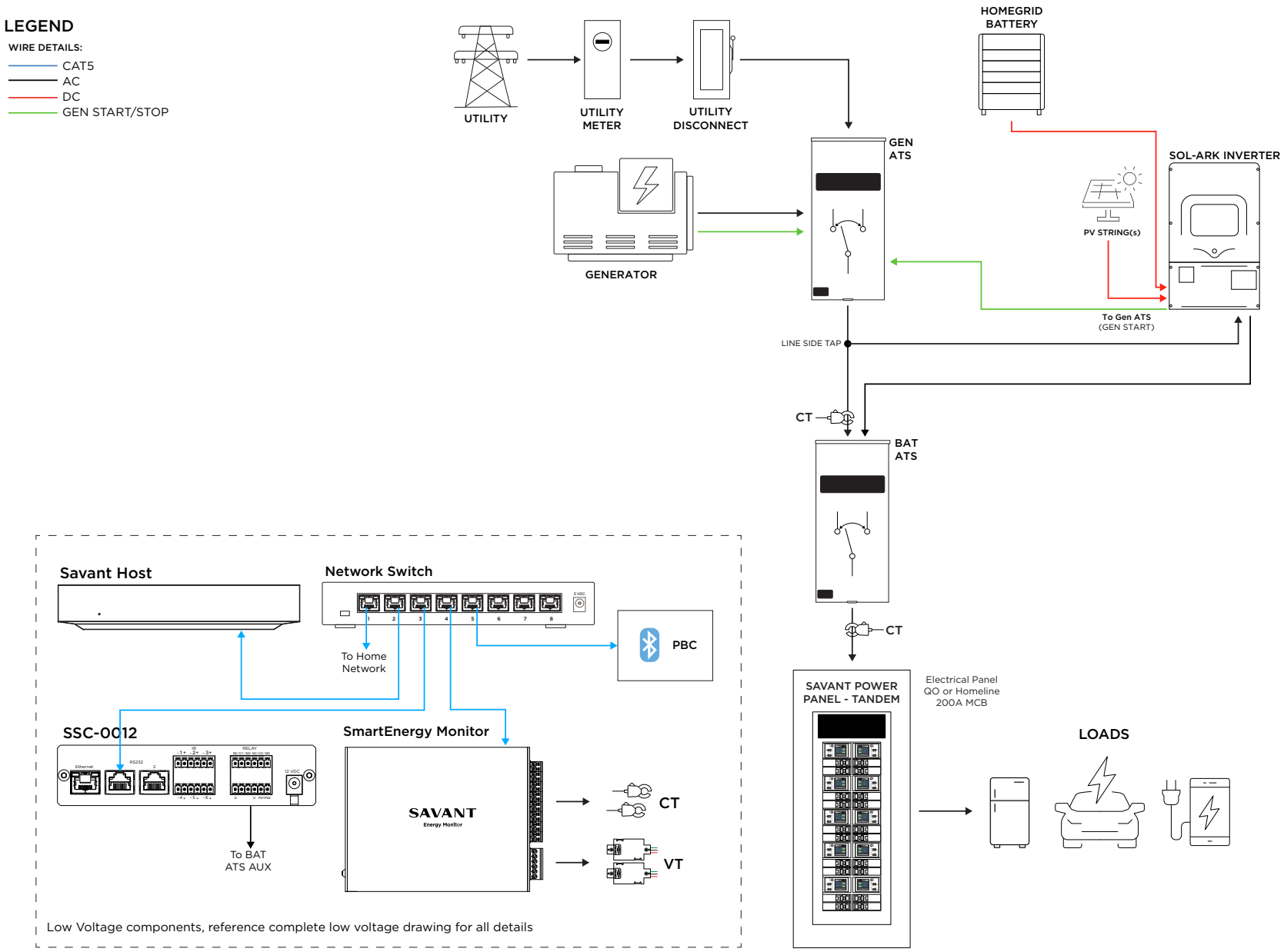
Smart Controller RS485 Port	Sol-Ark Inverter CANBUS Port
GND (1)	3
A+ (2)	1
B- (3)	2

6.2. Sol-Ark Low Voltage Dual Inverter & Battery (AC)

The spliced cabling depicted in section 6.1 is represented as a purple dot, while the additional MODBUS cabling is represented as a blue line. For low-voltage, AC Power Systems, install the Power System as below. Then review the **Savant Power System Deployment Guide - [Racepoint Blueprint]**.

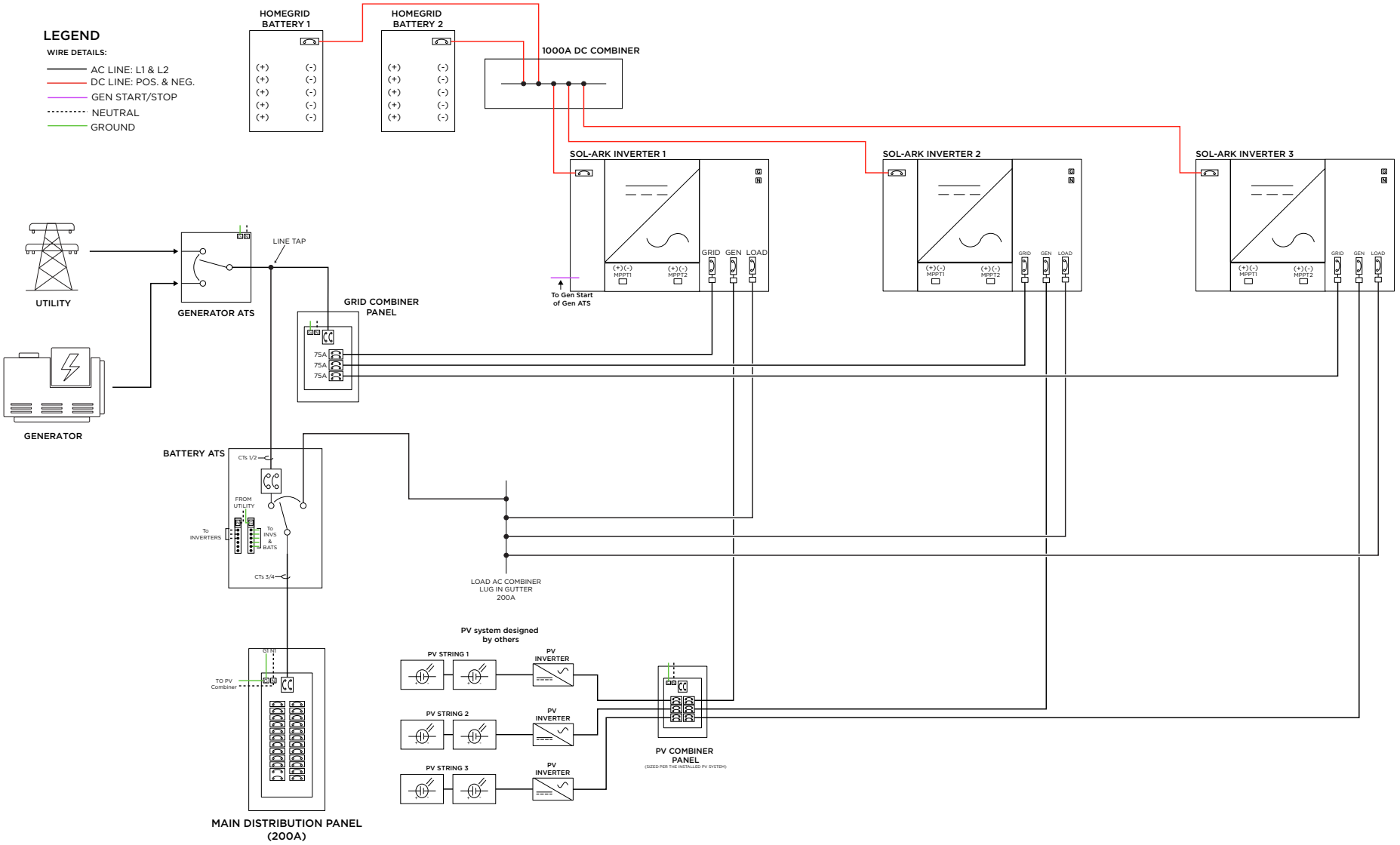


6.3. Sol-Ark & HomeGrid Single Battery & Inverter (DC)



6.4. Sol-Ark & HomeGrid Multiple Batteries and Inverters (AC Coupled Solar) Example Drawing

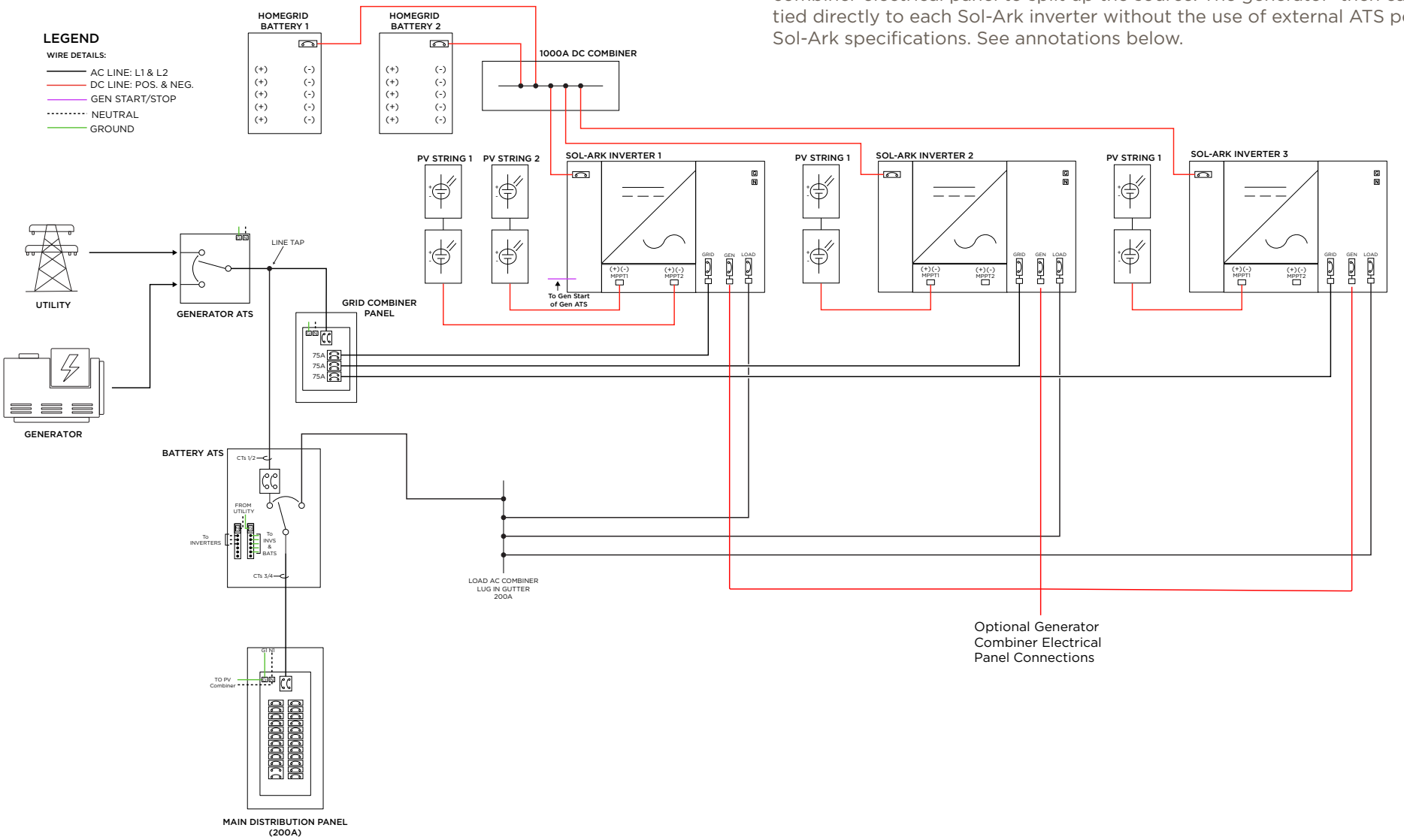
IMPORTANT NOTE!: A 2000A battery combiner busbar is required when connecting more than 5 Sol-Ark 12k inverters and 3 HomeGrid battery stacks.



6.5. Sol-Ark & HomeGrid Multiple Batteries and Inverters (DC Coupled Solar) Example Drawing

IMPORTANT NOTES!:

- A 2000A battery combiner busbar is required when connecting more than 5 Sol-Ark 12k inverters and 3 HomeGrid battery stacks.
- When a PV is DC coupled, a generator can be brought into a generator combiner electrical panel to split up the source. The generator then can be tied directly to each Sol-Ark inverter without the use of external ATS per Sol-Ark specifications. See annotations below.



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