SAVANT
POWER SYSTEM

Savant Power System Deployment Guide - Sol-Ark

Document Number:	009-2222-01
Document Date:	December 2022
Document Supports:	da Vinci 10.1 or higher

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

- PKG-ESS600A-SOLARK36-HG76
- PKG-ESS400A-SOLARK24-HG38
- PKG-ESS200A-SOLARK12-HG19-NA
- PKG-ESS200A-SOLARK12-HG19-01
- PKG-ESS200A-SOLARK12-HG19-INT
- PKG-ESS800A-SOLARK48-HG76

Table of Contents

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

Read this document in its entirety before starting deployment of any product listed within. The following is the items relevant to a Savant Power System installation.

⚠️ **IMPORTANT!:** Unless stated otherwise, **all items listed in the Planning and Savant subsections of this checklist are required.** All third party equipment except for the Sol-Ark inverter is optional and must be installed according to the line diagram drawn and approved within the Savant Power Design Guide.

Planning

1. Stamped Engineering Plan According to Local Codes .... ☐
2. Completed Savant Power System Worksheet .... ☐

Savant Equipment

1. Smart Host (SHR-2000)... ☐
   OR
2. Pro Host or Super Pro Host (SVR-5100, SVR-7000S) .... ☐
   AND
3. Smart Controller (SSC-02485 or any controller with available R485 ports) .... ☐
4. Sol-Ark Main Inverter Communication Cable (064-0715-xx).. ☐
5. Sol-Ark Subordinate Inverter Communication Cable (064-0714-xx).. ☐
6. **OPTIONAL**: Smart Energy Monitor (SEM-2015)... ☐

Sol-Ark

1. Sol-Ark 12k inverter.. ☐
   OR
2. Sol-Ark 15k inverter.. ☐

HomeGrid

1. Stack'd Series Base... ☐
2. Battery Modules... ☐
3. Battery Module System (BMS).. ☐
4. **OPTIONAL:** HomeGrid Skybox .... ☐

2. Deployment Steps

1. Install ASCO Automatic Transfer Switch (Recommended) .... ☐
    See ASCO Automatic Transfer Switch (Recommended)

2. Wire & Install Sol-Ark Inverter .... ☐
    See Sol-Ark Inverter

3. Install & Configure HomeGrid Battery... ☐
    See HomeGrid Battery Stack

4. Install HomeGrid Skybox .... ☐
    See HomeGrid Skybox (Optional)

5. Wire Savant Equipment .... ☐
    See Savant

6. Complete Configuration .... ☐
    See Complete Configuration

3. Third Party Documentation

⚠️ **IMPORTANT!:** This document assumes the installer has read all relevant 3rd party documentation. Read all manufacturer documentation for all 3rd party products in use; which may include, but are not limited to:

ASCO ATS

–   PN. 381333-402B ASCO ATS Installation Manual

–   PN. 381333-400H   ASCO 300 Series D Frame Installation Guide

Sol-Ark

–   Sol-Ark 12k Manual

–   Sol-Ark 15k Manual

–   Battery Communications Integration Guide

–   DATA MONITORING PowerView Settings Guide (PV PRO)

4. ASCO Automatic Transfer Switch (Recommended)

An ASCO ATS is recommended, but not required to be installed to allow the system to switch between using and not using the Sol-Ark inverters automatically.

4.1. Overview
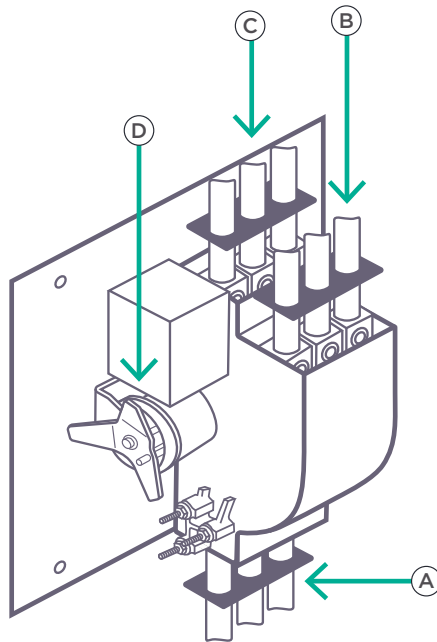
A	Live Load Terminals
B	Emergency Source Terminal
C	Normal Source Terminals
D	Maintenance Handle

4.2. Installation

Mounting

To mount the ASCO Automatic Transfer Switch, refer to the outline and mounting diagram shipped with the ASCO ATS and mount the transfer switch according to details and instructions shown in the ASCO ATS Installation manual. Mount it vertically to a rigid supporting structure. Level all mounting points by using flat washers behind the holes to avoid distortion of the transfer switch.

Power Cables

Test the conductivity of the power cables before installation. Then connect them to the appropriate terminal lugs on the transfer switch as shown on the wiring diagram provided with the transfer switch. Make sure that the lugs provided are suitable for use with the cables being installed. Standard terminal lugs are the solderless screw type and accept wire sizes listed on the drawings provided with the transfer switch. Remove surface oxides from cables by cleaning with a wire brush. When aluminum cable is used, apply joint compound to conductors. Tighten cable lugs to the torque specified on rating label.

4.3. Functionality Test

The functional test consists of two checks: manual operation and electrical operation. Do these checks in the order presented using the maintenance handle to avoid damaging the transfer switch.

Manual Operation

The maintenance handle on the transfer switch is for maintenance purposes only. Manual operation of the transfer switch should be checked before it is operated electrically. The weight marked **N** represents **Normal** and **E** represents **Emergency**.
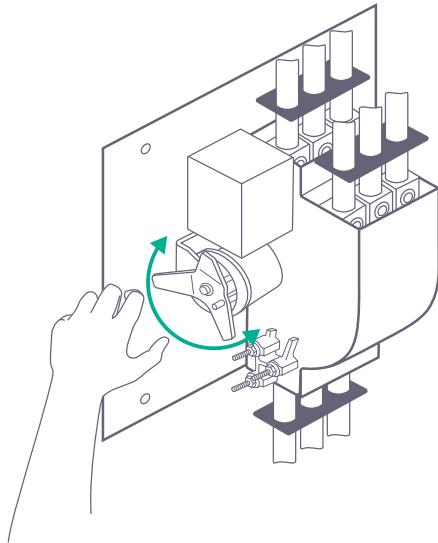
⚠️ **ELECTRIC SHOCK!:** All power must be off. All power sources and the load must be de-energized before performing a manual operation. Do not manually operate the transfer switch until both power sources are disconnected. Once disconnected, do the following:

1. Open both circuit breakers.
2. Open the enclosure door.
3. Grasp the attached maintenance handle and turn it as shown to manually operate the transfer switch.

   ⚠️ **IMPORTANT NOTE!:** If the maintenance handle does not operate smoothly, check for shipping damage or construction debris. **Do not energize a damaged transfer switch!**

4. Return the transfer switch to the Normal position.
   NOTE: If Normal and Emergency connections are reversed, this operation is also reversed.
5. For information on automatic operation of the ATS, see Appendix A: ASCO ATS Grid Loss Behavior.

4.4. Parameters

Once the ATS is confirmed to be fully functional, use the interface on the front of the enclosure to set the parameters for ATS. ATS parameters are listed in Appendix B: ASCO ATS Parameters.

5. Sol-Ark

5.1. Sol-Ark 15k Overview

Side View   **Front View**

Inside View
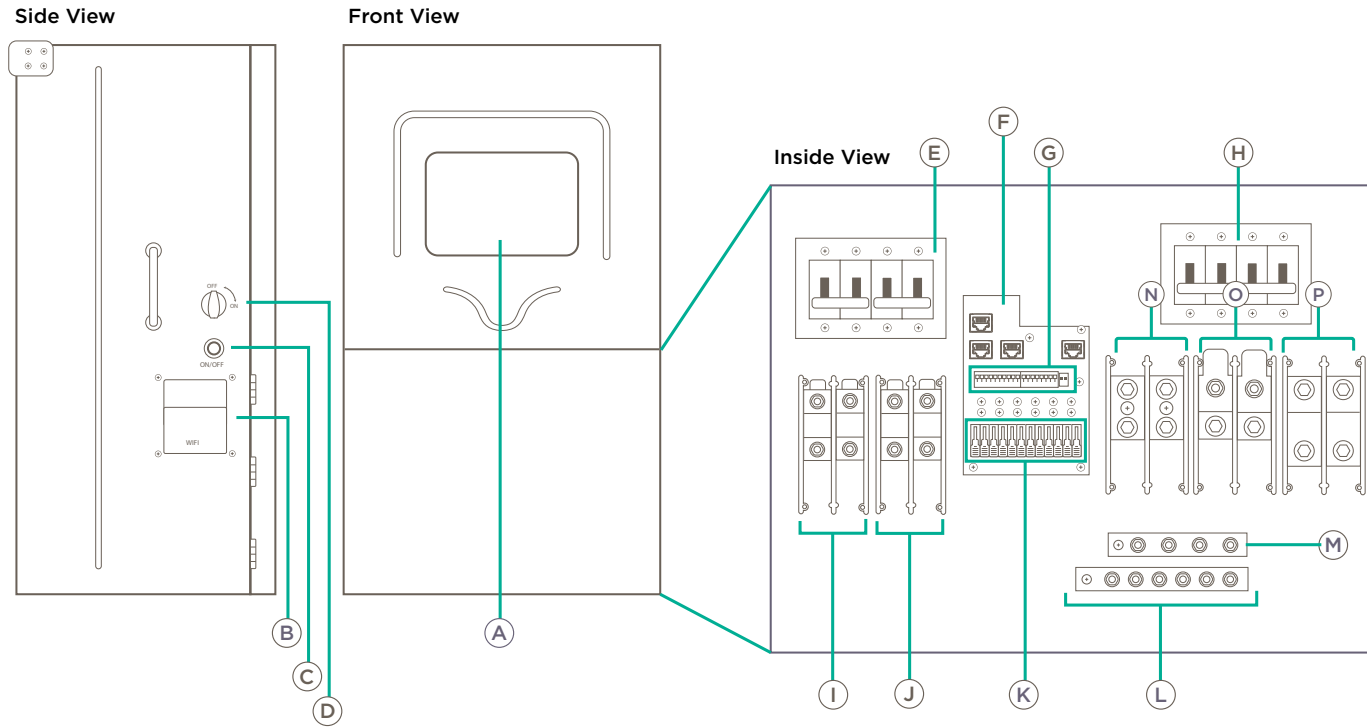
(A)	LCD Touch Screen
(B)	Wifi Dongle Enclosure
(C)	ON/OFF Button
(D)	PV Disconnect Switch
(E)	200A Battery Breaker
(F)	Communication Ports
(G)	Battery Sensor Inputs
(H)	200A Load Breaker

(I)	Battery Terminal Blocks (Positive)
(J)	Battery Terminal Blocks (Negative)
(K)	MPPT Inputs
(L)	Neutral Bus Bar
(M)	Ground Bus Bar
(N)	Generator Terminal Blocks
(O)	Load Terminal Blocks
(P)	Grid Terminal Blocks

5.2. Sol-Ark 12k Overview

Side View   **Front View**

Inside View
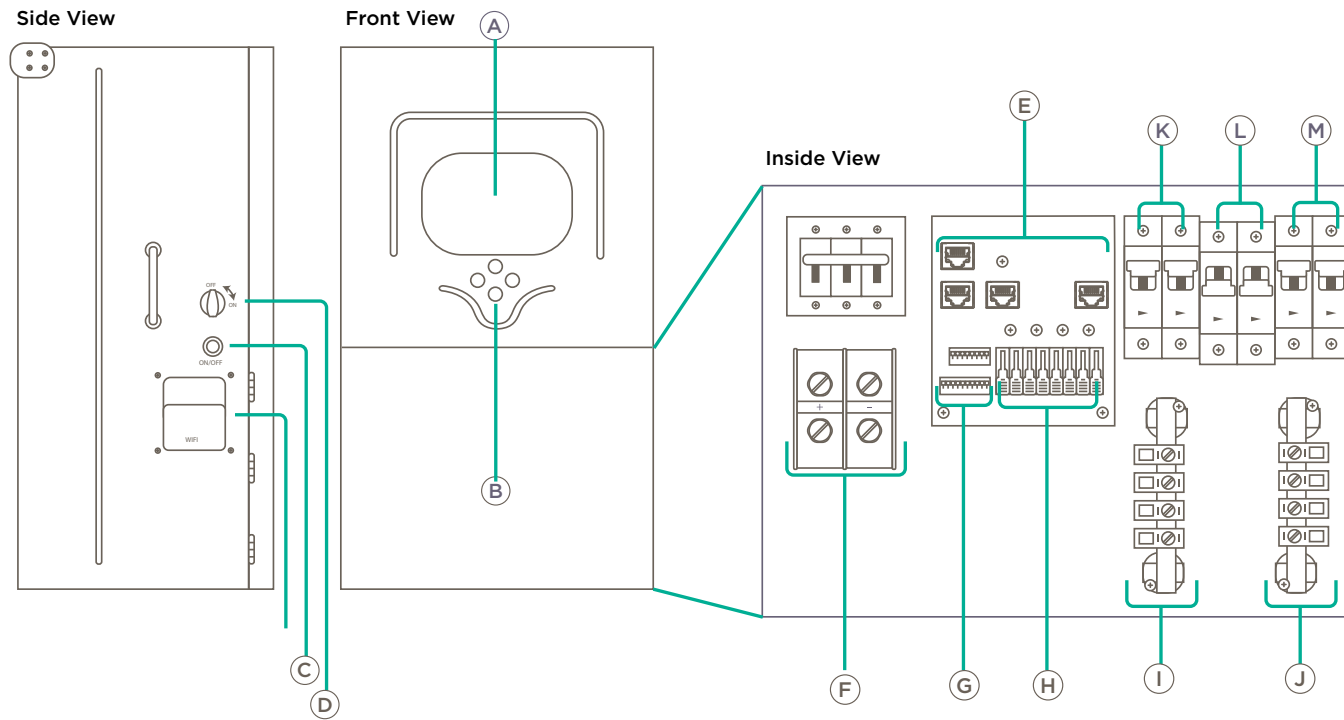
(A)	LCD Touch Screen	
(B)	Power ON/OFF and Controls	
(C)	WiFi Dongle Enclosure	
(D)	PV Disconnect Switch	
(E)	Battery Terminals	
(F)	Communication Ports	
(G)	Battery Temp, CT, and Generator Control Inputs	

|		
(H)	MPPT Inputs	
(I)	Neutral Bus Bar	
(J)	Ground	
(K)	Grid L1 & L2 Terminals	
(L)	Generator L1 & L2 Terminals	
(M)	Load L1 & L2 Terminals	

5.3. Mounting

The mounting location will already be detailed within the Savant Power System Design Guide. To mount the Sol-Ark 12k inverter, follow the steps below:

1. Affix a mounting board to studs using 6-8 screws.
2. Use multiple screws and washers to mount the French Cleat to the board or wall.
3. Mount the Sol-Ark inverter on the installed french cleat. Ensure Sol-Ark is level and sits properly.
4. Use two screws to attach the bottom mount.
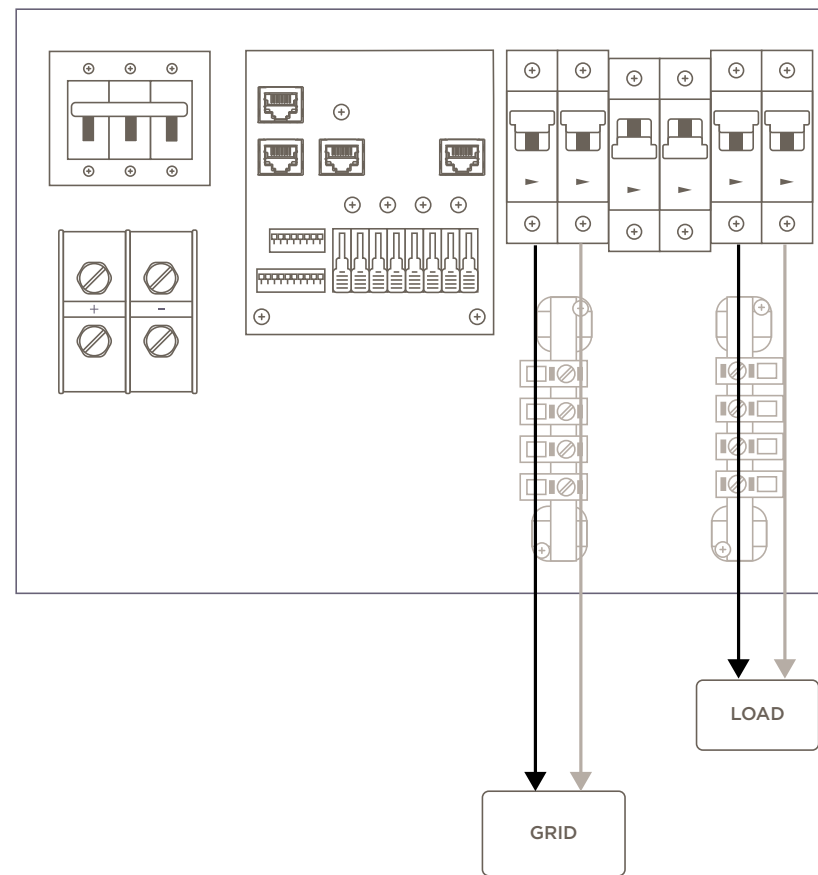
5.4. Wire Grid & Load (AC)

Wire the Grid and Load to the Grid input and the Load output terminals. Sites with multiple inverters must combine the inverters using busbars rated for the amperage to be passed.

Sol-Ark 15k
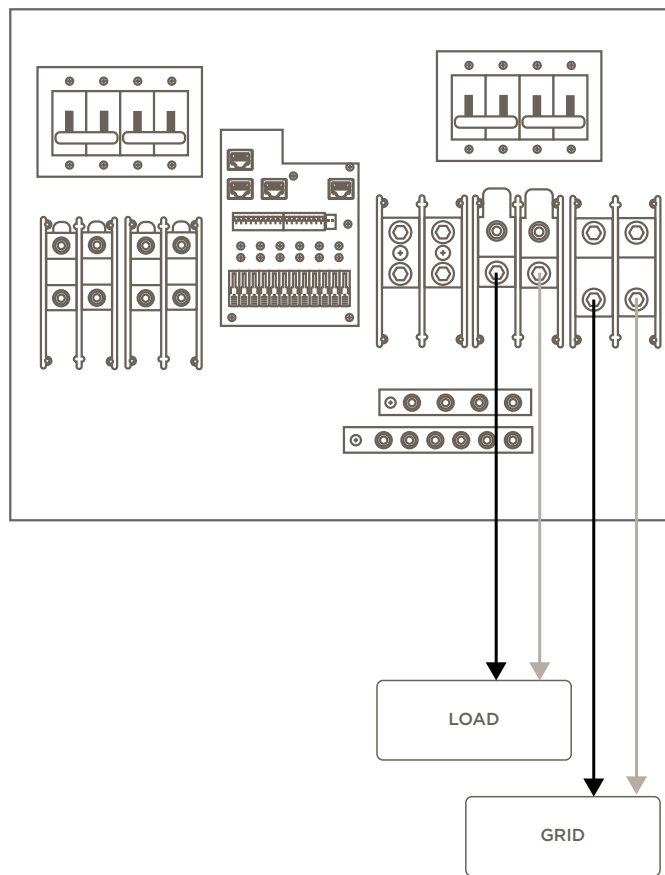
Sol-Ark 12k

5.5. Battery Wiring (DC Power)

Wire the Sol-Ark inverter(s) to the battery bank by following the steps below.

⚠ IMPORTANT!:

– Ensure the built-in battery disconnect is OFF while connecting batteries.

– For HomeGrid batteries, complete section 6 Homegrid before connecting battery cables or providing power to the BMS.

1. Install included toroids on battery input cables.

2. Wire all batteries through a DC combiner bus bar.

3. Wire the combiner into the battery terminals on the Sol-Ark inverter.

The image below uses the Sol-Ark 15k as an example, but the wiring is the same on the 12k, but with different battery terminal locations.

⚠ IMPORTANT NOTES!:

– ALL paralleled systems **MUST be connected and tap into to the same large battery bank**, each with its own cables attached. Taps in the diagram below are represented as as circles.

– The 15K reaches a max of 275A of battery charge/discharge if using both sets of battery terminals. If using one set of terminals, the max battery charge/discharge is 160A.
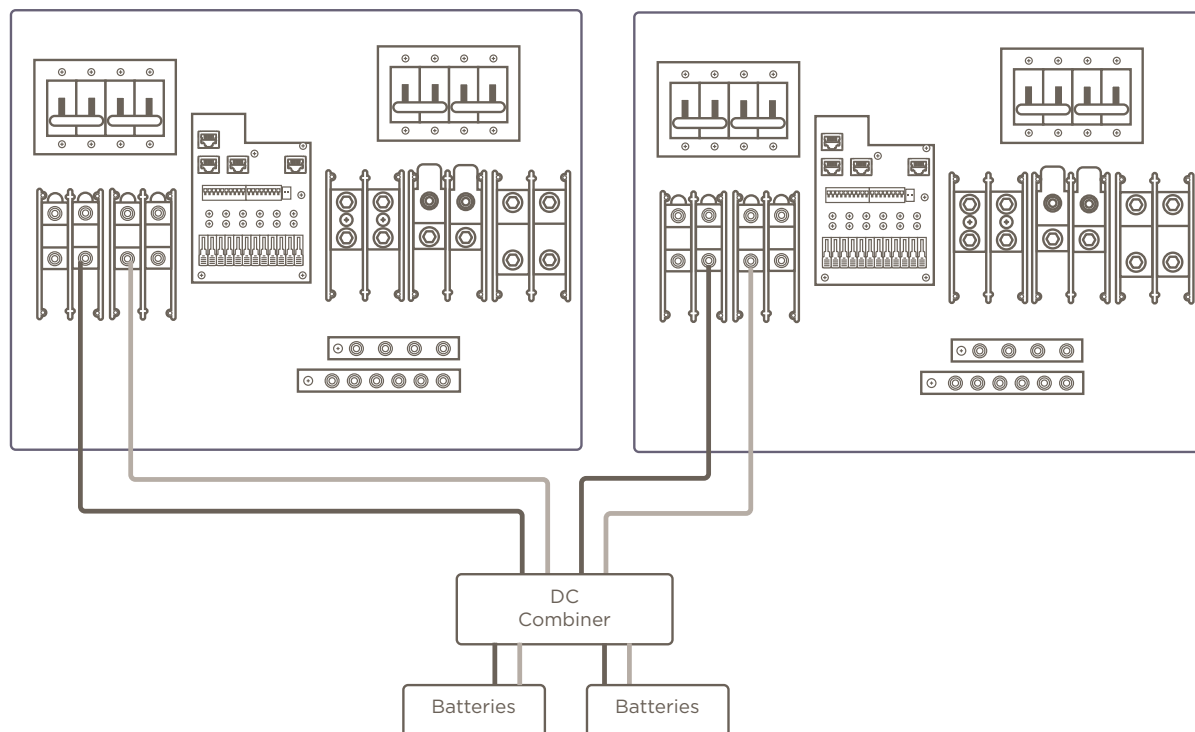
5.6. Battery Sensor and Accessory Placement

Next, wire the battery sensors from the installed batteries to the Battery Sensor inputs on the Sol-Ark inverter.
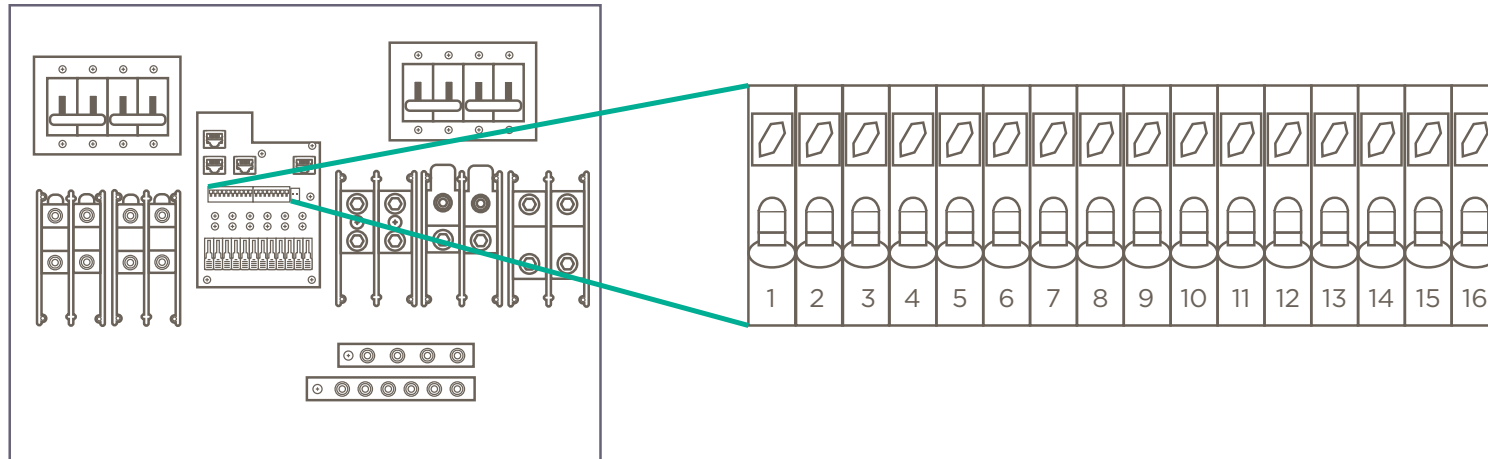
Sensor Pin	Polarity	Name	Use
1		Battery Temperature	Batt Temp Sensor has no polarity and is used for voltage correction when using lead acid batteries.
2			
3	+	CT 1	Current transformers used for limited to home mode and peak shaving. Polarity is important.
4	-		
5	+	CT 2	Current transformers used for limited to home mode and peak shaving. Polarity is important.
6	-		
7		Generator Start Relay	Two wire start for generators, simple open or closed relay.
8			
9		Generator On Relay	N/A
10			
11		Emergency Stop	Short these pins to initiate emergency stop. This will shut down AC output from the inverter and initiate rapid shutdown of the PV.
12			
13	+	Optional 12 Input Signal	N/A
14	+		
15		12V Power Supply for RSD Transmitters	12V power supply for RSD transmitters. Rated for a maximum of 1.2W (100mA @12V)
16			

5.7. Solar Panels (DC Power)

Once batteries have been installed and tested, wire the Solar Panels to the MPPT inputs on the inverter. The following diagrams shows the wiring for Sol-Ark inverters

Sol-Ark 15k

⚡ **ELECTRIC SHOCK!**: Ground the panel mounts and frames via 12AWG wire before continuing.
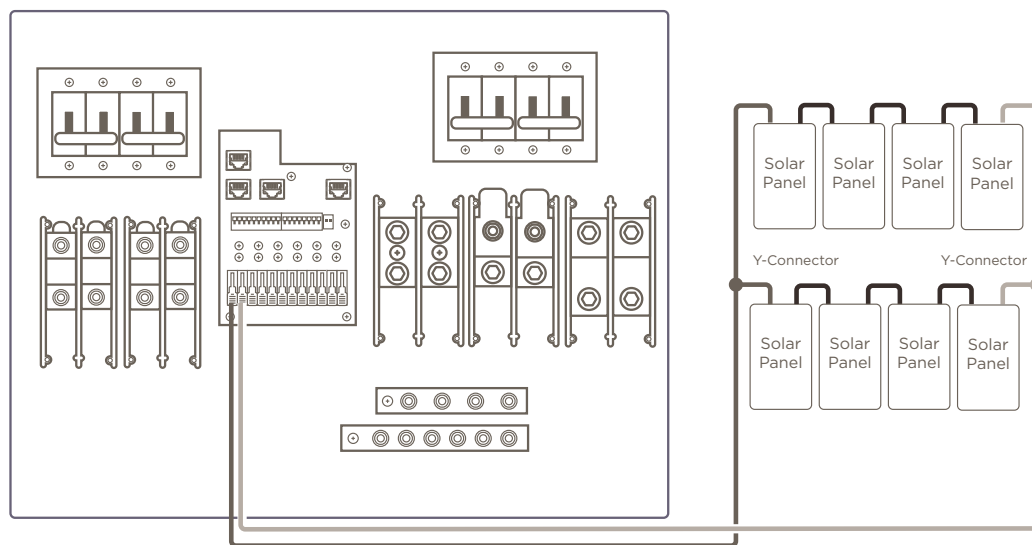
⚠️**IMPORTANT!:**

- Sol-Ark has triple MPPTs for three separate PV input pairs.
- If using Y-Connectors, run two strings in parallel, totaling 26A (self-limiting)
- **Maximum PV input** is 19.5kW (± 5%) / system | 6.5kW / MPPT | MAX 500VOC PV | MAX ISC /MPPT 26A (limiting to 26A)
- Damage will occur if PV VOC > 550V.
- Parallel strings per MPPT must be the same voltage.
- PV1 A/B must be the same voltage if using both strings.
- Panels on the same MPPT can face different directions.

Sol-Ark 12k
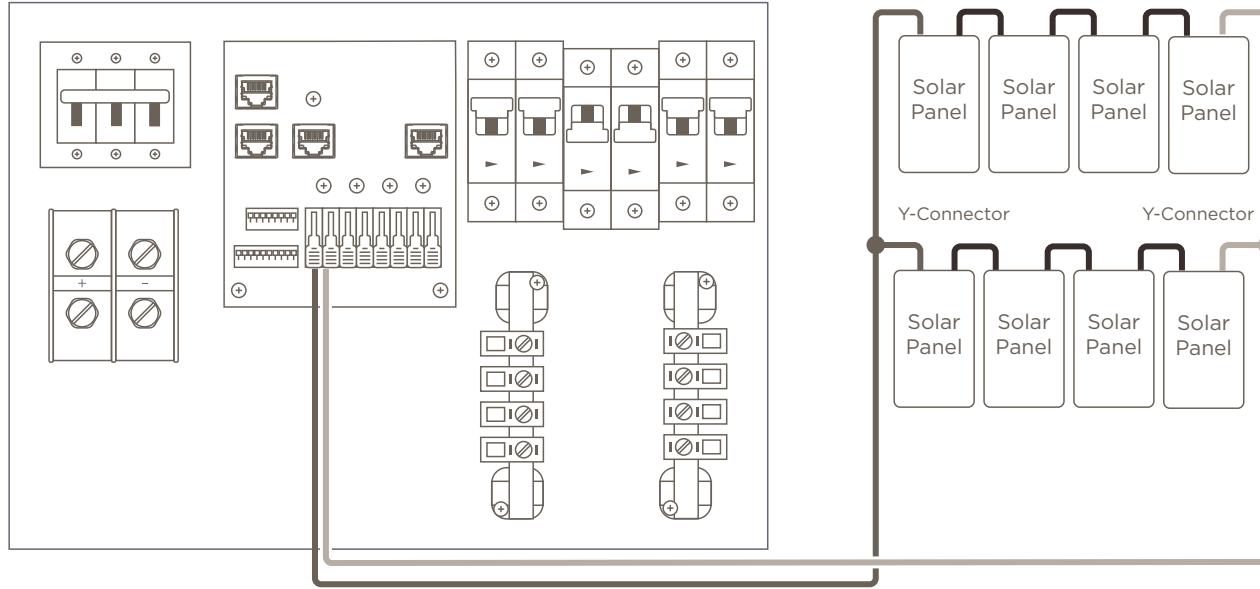
IMPORTANT NOTES!:

- **Max PV input:** 13,000W(+/- 5%) per system (6,500W per MPPT) PV = 500 Vdc Max.
- **Maximum PV input** is 19.5kW (± 5%) / system | 6.5kW / MPPT | MAX 500Vdc PV | MAX ISC /MPPT 26A (limiting to 26A)
- Damage will occur if PV VOC > 550V.
- Parallel strings per MPPT must be the same voltage, PV1A/B must be the same voltage if both are used.
- It is OK if panels for panels on the same MPPT to face different directions.
- Panel frame grounding can be done to any ground in the home. Mounts usually bond frames together, so only one ground wire is needed.

Ethernet Dongle

The Ethernet Dongle allows the inverter to communicate with the ethernet network.

1. Open the dongle enclosure.

2. Connect the Sol-Ark to the internet by wiring an ethernet cable through the hole in the enclosure and plug it into the RJ45 port.
   NOTE: If a wired connection is unavailable, the ethernet dongle can be used as a wireless connection.

3. Plug the dongle in, noting the last five digits of the serial number.

4. Reassemble the dongle housing and plug dongle into Sol-Ark, and secure it with screws. The dongle will flash red and green lights if installed correctly.
   NOTE: A green light indicates network connectivity. A red light indicates on and operating as normal.

5. Download the Pro PV App using an iOS or Android device.

6. Connect to the access point containing the last five digits of the dongle serial number.

7. Register the dongle via the Pro PV app or www.mysol-ark.com.

PV Pro App

The PV Pro App provides realtime data and troubleshooting tools. Savant recommends creating both a company installer account and a customer viewer. When registering the ethernet dongle and creating a plant, it is important to be aware of the visibility of the plant:

– If the plant is created using the customer account, the customer will have access to the plant by default and the integrator will have to request access.

– If the account is created by the integrator, the integrator will have access to the plant by default and the customer will have to request access.

– For more information on creating a plant, see the Sol-Ark Manual **Remote Monitoring Setup** section.

Parameters

The parameters of the Sol-Ark inverter must be set manually according to the equipment installed onsite. TheSee Appendix B: Sol-Ark Parameters for all necessary parameters.

Wi-Fi Stick
P/N: EESW-D200-00
S/N: E470 119 7 0046
KEY: QRGQ QQSR VXLR UQMD

OFF
ON

ON/OFF

WIFI
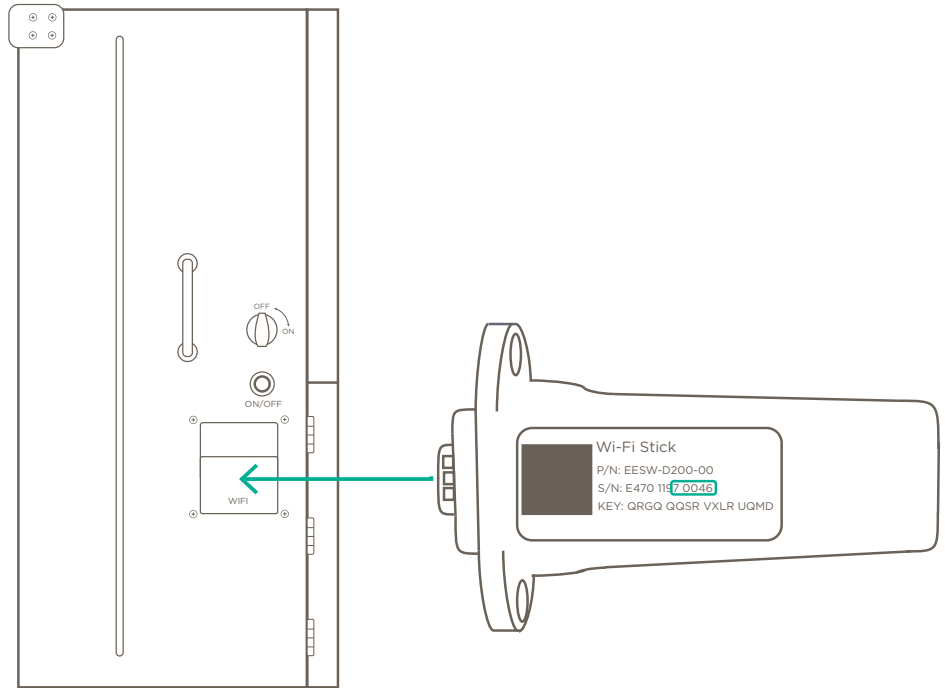
6. HomeGrid Battery Stack

6.1. Installation

Physical installation of the HomeGrid Stack'd series batteries must be completed on a level, unobstructed surface.

IMPORTANT: Do **NOT** connect the BMS to any energized cabling during this step.

1. Place the Stack'd base on the floor.
2. Remove black sticker on bottom of the first Battery Module.
3. Stack the battery module onto the base.
4. Remove both side covers for the installed module.
5. Repeat steps 2-4 with remaining modules.
6. Place the Battery Monitoring System (BMS) ontop of the stack, with no power connected to it.
7. Remove the top and side covers of the BMS.

To the bottom right is an example with four battery modules.
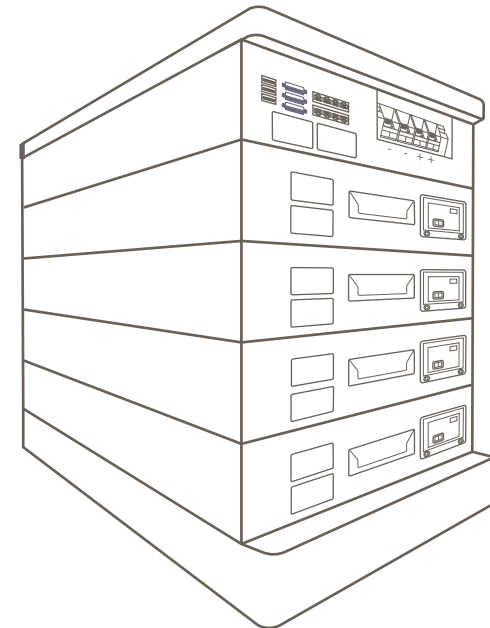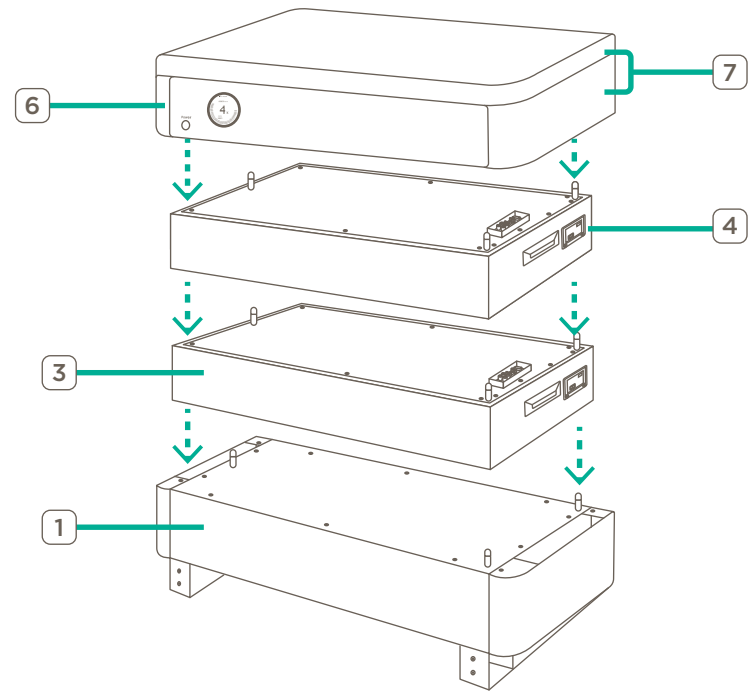
6.2. Configuration

Battery Addressing

The BMS and all Battery Modules must have their address configured according to its position within the battery stack. The diagram below shows an example of four modules in a stack, but the maximum height of a stack is 8 modules The table next to the diagram shows the dial code switch position per position within the stack.

For information on multiple battery stacks, see the HomeGrid Manual.

Address	1	2	3	4
BMS	ON	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
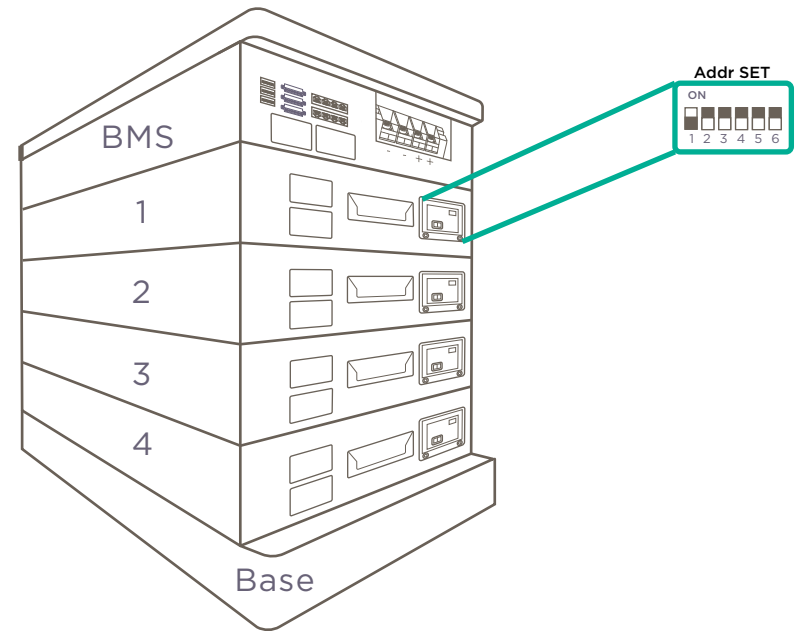
Wire Battery Monitoring System

1. Install included bus bars onto the Battery Monitoring System Battery terminals.

2. Connect the battery power cables to the bus bar to the Sol-Ark inverter.

3. Connect the communication cable to the ports detailed in section 5.8 Communication.
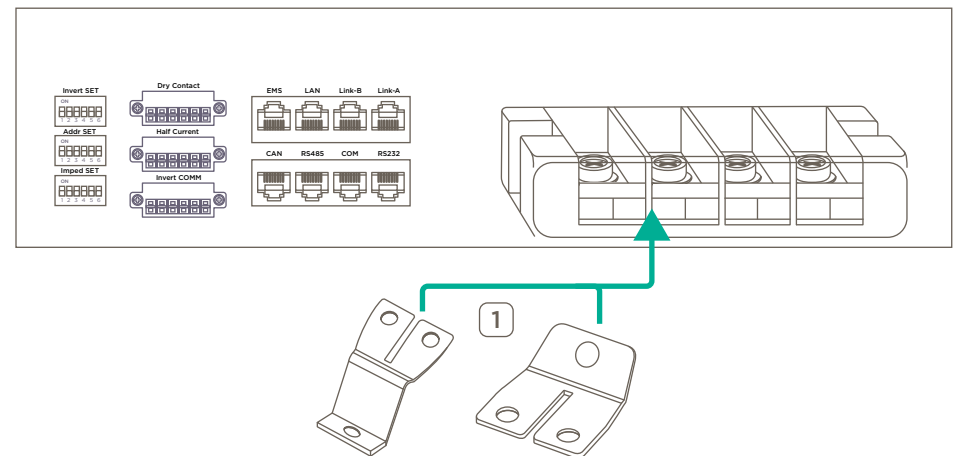
Detect Inverters

To prompt the HomeGrid battery stack to detect all installed inverters, set the **Inverter SET** dial positions on the BMS to the following:

Inverter Set Dial Positions					
1	2	3	4	5	6
ON	OFF	OFF	OFF	OFF	OFF

Detect Batteries

1. Set all inverter switches on the BMS to ON. The BMS will display the number 63. After 2-3 minutes, the quantity of batteries installed will display.

2. **Parallel Battery Stacks Only:** Flip **Dial Code Switch 1** on the BMS to OFF with all other Dial Code switches ON. The BMS will display the number 62. After 2-3 minutes, the quantity of battery stacks installed will display.

3. Configure all battery stacks for specific inverter outlined in the HomeGrid manual. The switch positions shown are for a SolArk inverter.

Inverter Set Dial Positions					
1	2	3	4	5	6
ON	OFF	ON	ON	OFF	OFF

4. Assemble the fixing brackets into one long strip, using one bracket per battery module installed.

5. Mount the fixing in the middle of the left-hand side of the system as shown to the right.
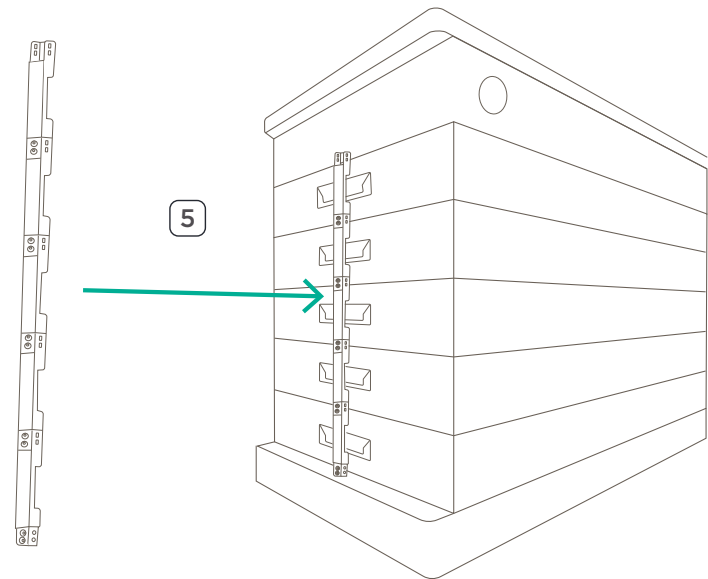
7. HomeGrid Skybox (Optional)

The Skybox can be used to monitor the state of the Homegrid batteries. Once section 6 Homegrid Battery Stack has been completed, follow the steps below:

7.1. Overview
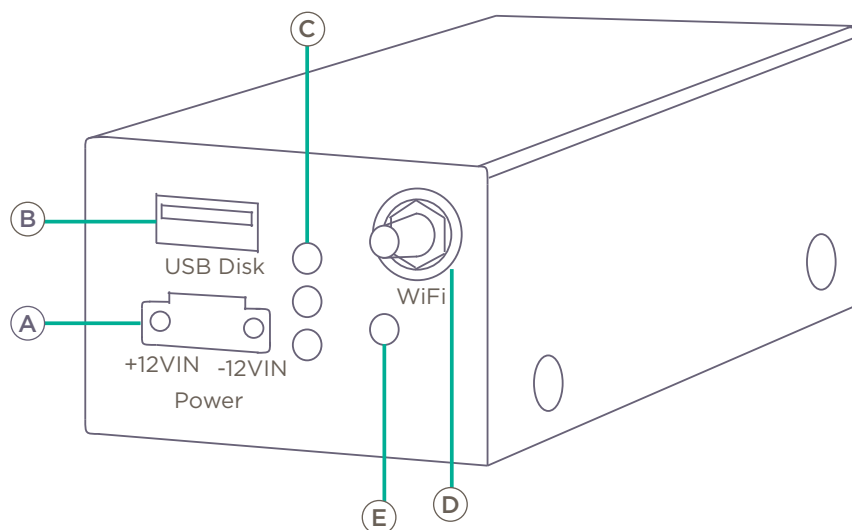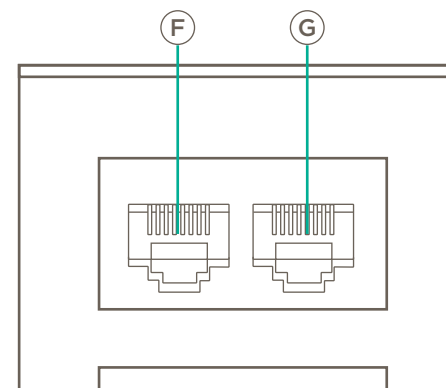
Rear View

Front View

Ⓐ	12V Power Supply
Ⓑ	USB Port
Ⓒ	Status LEDs
Ⓓ	WiFi Antenna
Ⓔ	Button
Ⓕ	RS232 Port
Ⓖ	CANBUS/RS485 Port

Status LEDs	
Red	**Solid Red:** Power is ON **OFF:** Power is OFF.
Green	**Solid Green:** No Wifi connection **Flashing (1s on, 1s off):** Connected to Wifi, no connection to HomeGrid server.
Blue	**OFF:** Normal behavior. **Fast Blink (0.2s on, 0.2 off):** Upgrading firmware.

7.2. Installation

1. Mount the Skybox on the top or side of the BMS using the included magnet.

2. Once the Skybox is in a location where its front panel can easily accessed, use the included auxilliary power cable to connect it to the auxilliary power port of the BMS.

3. Confirm the red status led is ON.

4. Onced the device is Skybox is powered up, remove the cap from the wifi antenna.

5. Tighten the bolt around the base of the antenna and rest the antenna in a location with wireless reception.

⚠️**IMPORTANT!:** For information on upgrading the firmware of the Skybox, see the Skybox Firmware Upgrade Guide on the Savant Community.

Dry Contact

Auxilliary Power

USB Disk

WiFi

+12VIN -12VIN
Power
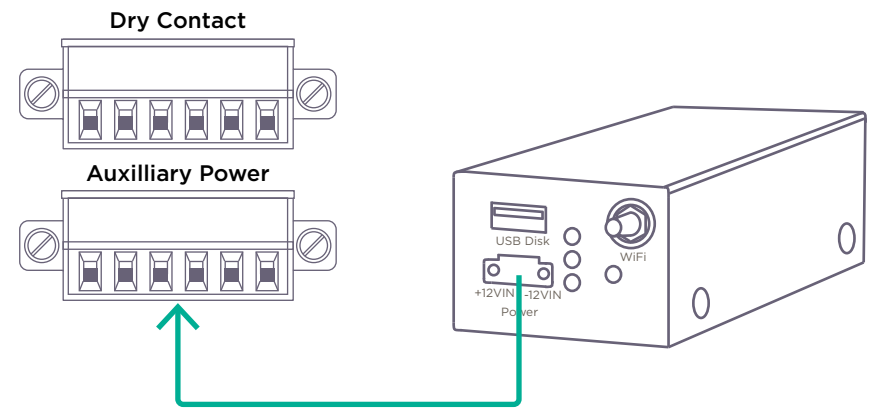
8. Savant

System Wiring

1. Provide power to the Host or Director using a UPS.

2. Connect all Savant devices to the network. Example ethernet wiring is described to the right.
   NOTE: All devices must be on the same subnet.

3. **SEM ONLY:** Wire CT and VT connections to the loads to be monitored.

   The diagram to the right shows the basic Savant wiring for the Savant Power System.

   ⚠️ **IMPORTANT NOTES:**

   – For deployments with multiple inverters, multiple controllers may be needed. However only a single Host is supported.

   – For deployments without a panel bridge controller and using a Director, the Power Modules are paired to the Director using the Power & Light app. For more information, see the Savant Power & Light Deployment Guide.
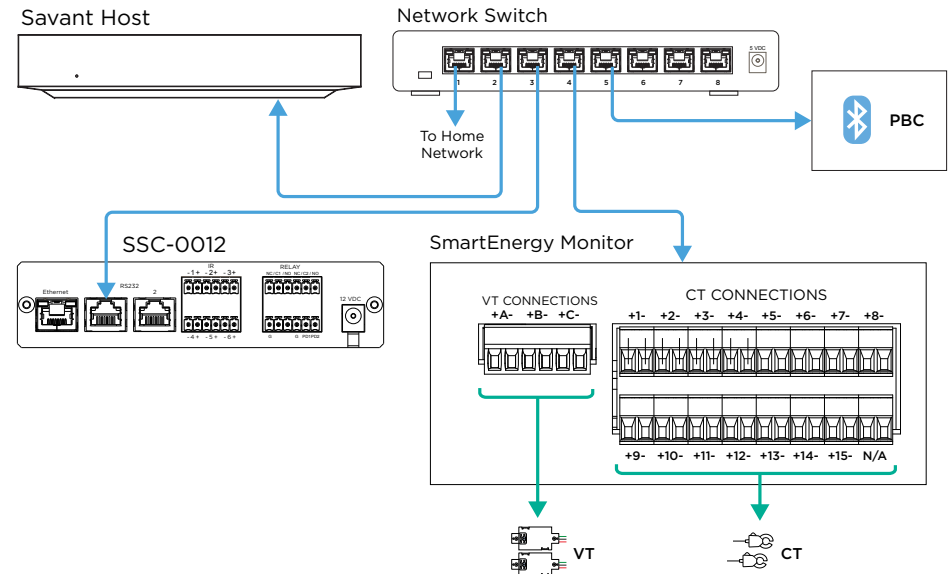
Communication Cable

1. Plug the male end of the **Inverter Communication Cable (Sol-Ark)** into the **CANBUS** port of inverter.

2. Use CAT5 ethernet cable to connect the CANBUS port of the Inverter Communication Cable (Sol-Ark) to the HomeGrid Battery Stack.

3. **SSC-002485 Only:** Plug in the RS232 Phoenix connector to the relay ports of the SSC-002485.

4. Connect the RS232 port of the **Inverter Communication Cable (Sol-Ark)** to the RS232 port of the Savant Controller. To the right is an example wiring configuration.

5. Parallel Inverters: Connect the male end of each adapter cable to each subordinate inverter.

6. Connect the female end of each adapter cable to additional Savant Controller RS232 ports.

   NOTE: For systems that require custom wiring considerations, see Appendix D: Custom V2 Y Cable.
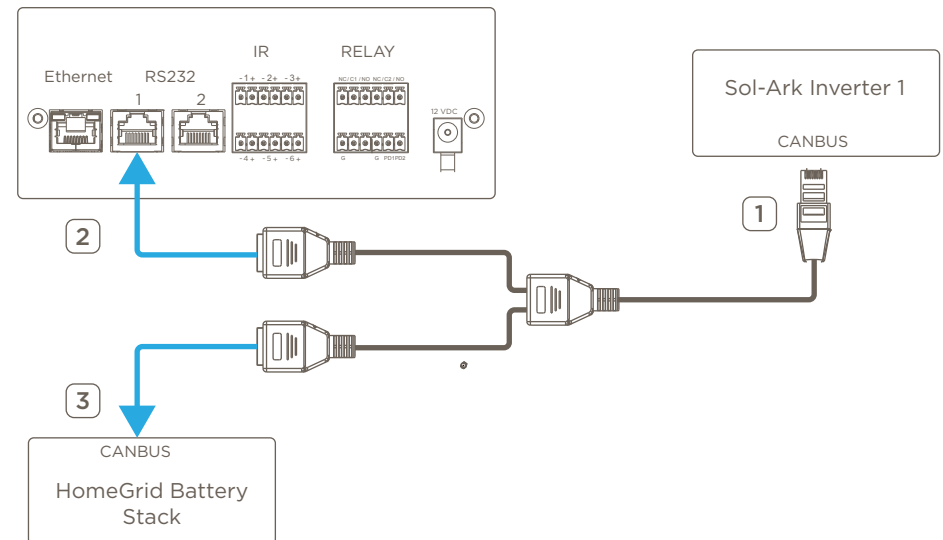
8.1. Power Modules

Wiring

Power Modules are as easy to install as a normal breaker. Install the Power Modules depending on the quantity of loads monitored and controlled by individual breakers. For more information on Power Module wiring, see the Savant Power Module Deployment Guide.

Pair Modules to Director

Pairing Power Modules using a Director or a Savant Panel Bridge Controller are two different processes. Only complete one of these processes.

1. For each Power Module, press and hold the **PAIR** button for 3 seconds.

2. Confirm that the **Gear** icon displaying on each Power Module LCD screen.

3. On the front of the Director, firmly press the PAIR button.

4. Confirm the Director is in **Association** Mode by the Status LED alternating between red and green continuously.

5. Pairing is complete when all Savant Power Modules have the gear icon replaced with a Bluetooth ⓑ icon and the status LCD of the Director is solid green.

   ⚠ **IMPORTANT!:** This process takes between 2-5 minutes.

6. Once the Power Modules are paired, switch all Power Modules from AUTO to **ON** mode using the Circuit Power switch. All connected circuits will energize.
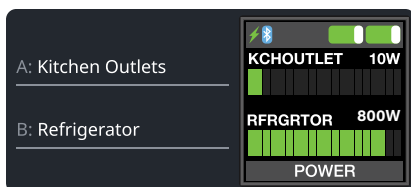
Pair Modules to Panel Bridge Controller

Follow **section Pair Added Modules** in the Savant Power & Light App Deployment Guide on the **Savant Community**.

NOTE: For systems not using a Director or the Savant Power & Light app, follow **section 7.3 Companion Modules Pairing to PBC - RDM Tab** in the Panel Bridge Controller and Dimming-Relay Module Deployment Guide.
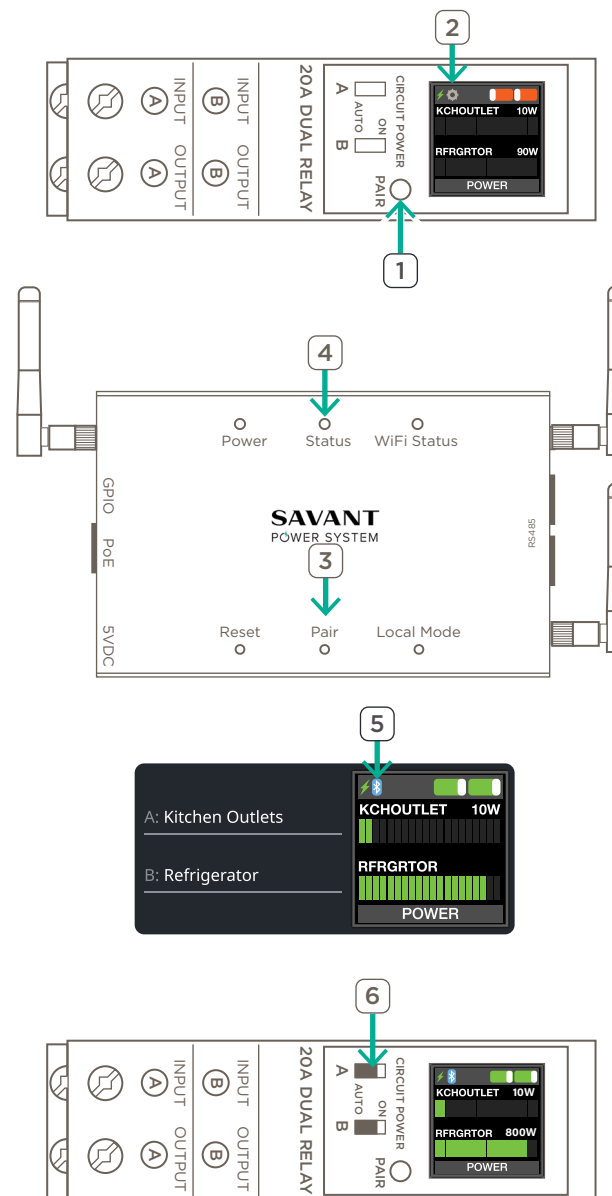
8.2. Module Configuration

Configuring the Power Modules consists of entering Module Data using the PAIR button. **Module Data** consists of four parts:

Slot	The slots a Power Module occupies within the Power Module Panel.
Bluetooth Address	Bluetooth information for the Power Module
Circuit Name	Name of each circuit controlled by its respective Power Module Channel.
Room Name	The name of the room the circuit provides power to as it is represented in the Savant App.

Room and Circuit names are configured on a per-channel basis. A **Channel** is the relay within Power Module that controls the circuits associated with the slots the Power Module is installed into. Dual relay Power Modules have **Channel A** and **Channel B**, while single relay modules have only **Channel A**. The image below shows the process of configuring the Room Name, Circuit Name, and Slot Numbers of dual-relay Power Module.

2 TAP PAIR TO BEGIN ON-DEVICE SETUP. SELECT THE ROOM FOR CHANNEL A

3 SELECT CIRCUIT NAME FOR CHANNEL A

4 CHANNEL A IS CONFIGURED

5 SELECT ROOM FOR CHANNEL B

6 SELECT CIRCUIT NAME FOR CHANNEL B

7 CHANNEL B IS CONFIGURED

8 SELECT SLOT GROUP

9 SELECT SLOT NUMBER
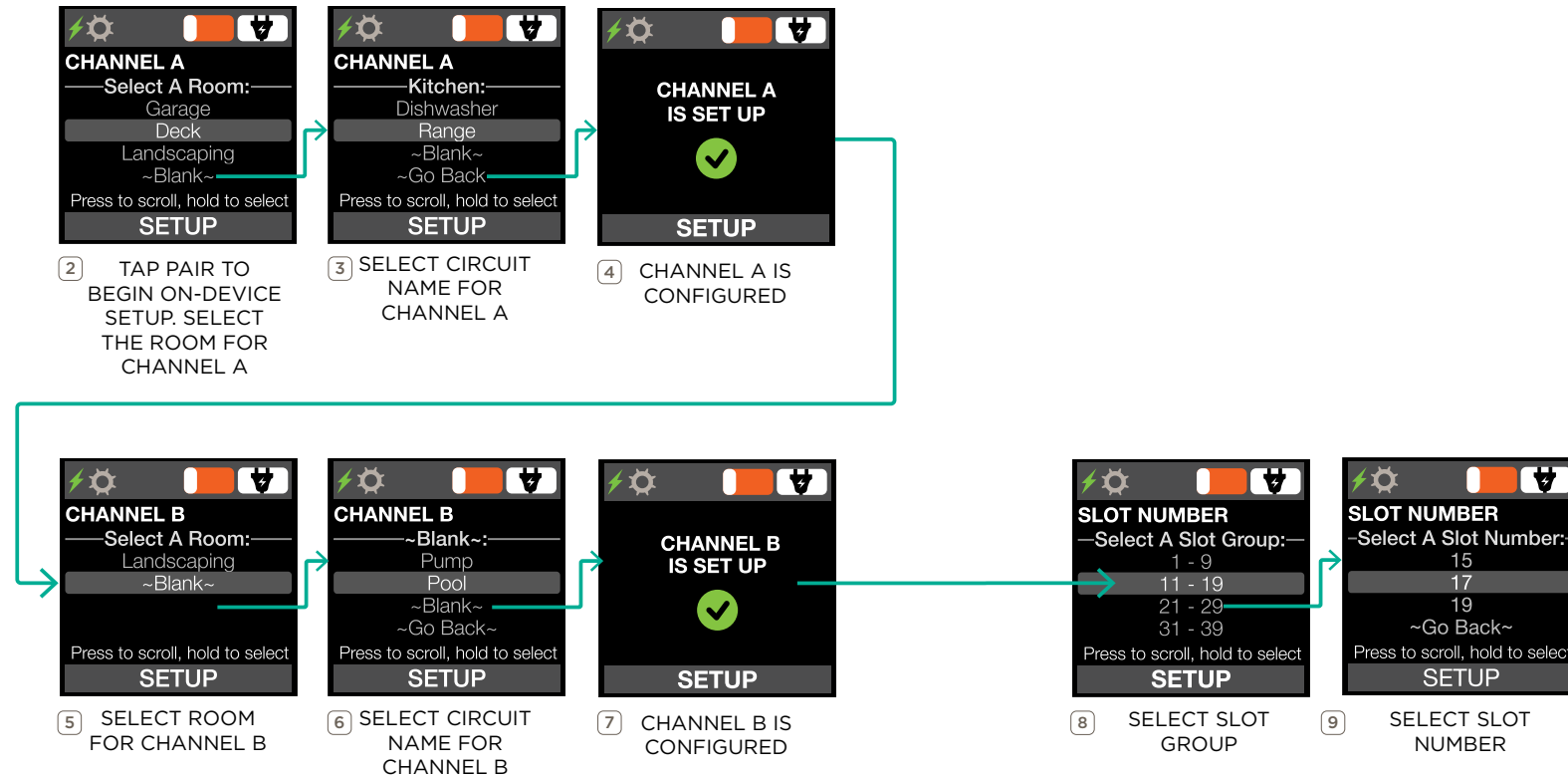
9. ⚠️Complete Configuration ⚠️

At this point in the configuration, all physical installation has been completed. **No further steps are required unless integrating the Savant Power System into a larger Savant system or configuring Energy Scenes**.

– **IMPORTANT!:** To integrate the Savant Power System into a larger Savant System, switch all Power Modules into AUTO mode. Then follow the steps listed in the **Savant Power Integration Guide** on the Savant Knowledgebase.

Appendix A: ASCO ATS Grid Loss Behavior

The behavior of the ASCO ATS when access to the normal source is lost described below.

LEGEND
- 🟢 LIGHT ON
- ⭕ LIGHT OFF
- ⏳ TIME DELAY

(Generator Source) runs unloaded for Feature 2E time delay

Generator stops

Feature 31N time delay, if used

1 Normal source acceptable Load on Normal

Normal source unacceptable

6 Load switched back to Normal source

Load on Normal light comes on

Observe the indicator lights

STATUS MESSAGES

⚠ ⭕
Auto ⭕

NORMAL SOURCE ACCEPTED   LOAD ON NORMAL   LOAD ON EMERGENCY   EMERGENCY SOURCE ACCEPTED

2 Automatic start of emergency source

All lights off

Emergency source starting

Feature 31G time delay, if used

Feature 3A time delay, if used

5 Normal source acceptable

Normal source accepted light come on

Waiting for Normal source to return

Feature 31M time delay, if used

3 Emergency acceptable

Emergency accepted light come on

Feature 2B time delay, if used

Feature 31F time delay, if used

Load on emergency light comes on

4 Electrical loads switched to emergency source

Appendix B: ASCO ATS Parameters

The ASCO ATS parameters can be accessed using the front panel of the enclosure.

⚠️ **IMPORTANT!: This section is informational only.** The settings in this section are example parameters using a single ATS for a single inverter for a 200A service. Ensure all settings are configured according to the equipment onsite and the approved three line diagram designed in the Savant Power System Design Guide.

Voltage and Frequency Settings

Description	Settings	Savant Setting % of Nominal	Adjustment Range increments of 1%	Display Screen
Normal Source Voltage	Dropout	94%	70 to 98	N Volt DO
	Pickup	96%	85 to 100	N Volt PU
	Other Voltage Trip	off	off, 102 to 116	N Volt OV
	Unbalance Dropout	20%	5 to 20	N VUnb DO
	Unbalance Pickup	10%	3 to 18	N VUNB PU
Emergency Source Voltage	Dropout	75%	70 to 98	E Volt DO
	Pickup	85%	85 to 100	E Volt PU
	Over Voltage Trip	off	off, 102 to 116	E Volt OV
Normal Source Frequency	Dropout	85%	85 to 98	N Freq DO
	Pickup	86%	86 to 100	N Freq PU
	Over Frequency Trip	off	off, 101 to 111	N Freq OF
Emergency Source Frequency	Dropout	85%	85 to 98	E Freq DO
	Pickup	95%	86 to 100	E Freq PU
	Over Frequency Trip	off	off, 101 to 111	E Freq OF

Timer Settings

Feature	Timer	Savant Setting	Adjustment Range	Display Screen
1C	override momentary Normal source outages	1	0 to 6 sec see NOTICE below	N Fail (1C)
1F	override momentary Emergency source outages	1	0 to 6 sec see NOTICE below	E Fail (1F)
2B	transfer to Emergency (if Normal fails)	0	0 to 60 min 59 sec	N to E N Fail (2B)
	transfer to Emergency (if just a test)	0:05	0 to 60 min 59 sec	N to E Test (2B)
2E	engine cooldown	5 minutes	0 to 60 min 59 sec	Cool Down (2E)
3A	Retransfer to Normal (if Normal fails)	30 minutes	0 to 60 min 59 sec	E to N N Fail (3A)
	Retransfer to Normal (if just a test)	30 seconds	0 to 9 hours 59 min 59 sec	E to N Test (3A)
31F	Normal to Emergency pre-transfer signal	0	0 to 5 min 59 sec	N to E PreX (31F)
31G	Emergency to Normal pre-transfer signa	0	0 to 5 min 59 sec	E to N PreX (31G)
31M	Normal to Emergency post-transfer signal	0	0 to 5 min 59 sec	N to E PosX (31M)
31N	Emergency to Normal post-transfer signal	0	0 to 5 min 59 sec	E to N PosX (31N)
Inphase	inphase transfer	0	0 to 3 sec	Inphase
Fail accept maximum	failure to accept Emergency source alarm	0	0 to 6 sec see NOTICE below	E Accept Fail

General Settings

Parameter	Sub Level	Savant Settings
Date & Time	Time	hh:mm:ss
	Date	day mm/dd/yy
	Format	US
	Daylight Savings Time	Off
Communication - RS485 Port (optional Accessory 11BE)	Baud Rate	9600
	Device Adress (Dev Addr)	1
	Protocol	Modbus
	Emulate Grp1	no
Display	Language	English
	Contrast	15
	Baclight	ON
	Volt Label	Vab/bc/ca
	Source 1/2	no

Feature Settings

Feature	Savant Setting	Display Screen
Bypass Normal to Emergency transfer Feature 31 upon connected source failure	yes	BP N to E F31 N Fail
Bypass Emergency to Normal transfer Feature 31 upon connected source failure	no	BP E to N F31 E Fail
Commit to transfer	yes	Commit Transfer
Bypass delayed-transition transfer upon a source failure	no	BP DTTS Src Fail
Inphase monitor enable	no	Inphase On
Load Shed Inphase enable	no	Load Shed Inphase
Fail Accept Timer	no	Fail Accept Timer
External Feature 6B	no	Ext. Feature 6B
External Feature 17	no	Ext. Feature 17
Feature 6DL enable	no	Feature 6DL
Serial Feature 17 enable	no	Serial Feature 17
Normal Voltage Unbalance enable	no	Volt Unbalance
Emergency Voltage Unbalance enable	no	Volt Unbalance
Phase Rotation	disabled	Phase Rotation
Controller Output contact OP1 (select one)	yes	Feature 31
	no	Common Alarm
	no	NR2
	no	Not In Auto
Relay Expansion Module Output contact OP2 (select one)	no	Feature 31
	yes	Common Alarm
	no	NR2
	no	Not In Auto
	no	1G
Relay Expansion Module Output contact OP3 (select one)	no	Feature 31
	no	Common Alarm
	no	NR2
	yes	Not In Auto

Appendix C: Sol-Ark Parameters

Sol-Ark Menu Tree

The parameters of the Sol-Ark inverter are set within of menus, separated into the decision tree listed below:

Display
- Brightness
- Beep
- Auto Dim

Time
AM/PM	Day	Seasons
Time Sync	Hour	
Year	Minute	
Month	Second	

Advanced
Solar Arc Fault On	Clear Arc Fault
Generation Limit Power	Load Limit Power
Grid Peak Shaving	CT Ratio
Auto Detect Home Limit Sensors	UPS Time

Factory Reset
- Factory Reset
- Lockout All Changes
- System Self Check
- Test Mode

Parallel
- Parallel
- Master/Slave
- Modbus SN
- Phase A/B/C

Basic Setup

Battery Setup

Battery
Battery Capacity	Use Battery % Charged
Max A Charge	No Battery
Max A Discharge	BMS Lithium Battery
TEMPCO	Activate Battery
Use Battery V Charged	

Charge
Start V	Absorption V
Start %	Equalization V
Gen/Grid Charge A	Equalization Days
Float V	Equalization Duration
Gen Excersise Cycle	Gen Force

Discharge
- Shutdown V/%
- Low Battery V/%
- Restart V/%
- Battery Resistance
- Battery Empty

Smart Load
- Use Gen Input as Smart Load
- Use Gen Input for AC Coupling
- AC Couple on Load Site
- Smart Load On & Off V/%
- Smart Load PV Watts

Grid Setting

Limiter
- Grid Sell
- Limited Power to Home
- Limited Power to Load
- Time of Use

Sell Control
General Standard	Power Factor
UI1742 & IEE1547	Gen Connect to Grid Input
UL1741SA	Zero-Export Power Buffer
Grid Reconnect Time	

Grid Input
- Grid Frequency
- Grid Type
- Protect Parameters

Frequency Volt
- L/HVRT
- L/HFRT

Power Factor
- Q(V)
- FW
- VW
- Normal Ramp Rate
- Soft Start Ramp Rate

System Alarms
- Alarm Codes

Sol-Ark Parameters

⚠️ **IMPORTANT!: This section is informational only.** The settings in this section are example parameters using a single ATS for a single inverter for a 200A service. Ensure all settings are configured according to the equipment onsite and the approved three line diagram designed in the Savant Power System Design Guide.

Battery Setting	
Battery Capacity(0-9999Ah)	400
Max A Charge (0 -185A)	125
Max A Discharge(0~185A)	150
Batt Empty V(41-63V)	48
Batt Resistance(0~6000mΩ)	8
Batt charging efficiency(0~100%)	99
Batt Shutdown %(0-100%)	8
Batt Low %(0-100%)	25
Batt Restart(0-100%)	45
Batt Shutdown V(40.00-60.00V)	NA
Batt Low V(40.00-60.00V)	NA
Batt Restart(40.00-60.00V)	NA
Activate Battery	ENA

System Work Mode	
Work Mode	Limited to Home
Solar sell	DIS
Max Sell Power(0 ~ 11000W)	9000
Energy pattern	Load First
Time Of Use	DIS

Basic Setting	
ARC Setup	ENA
ARC Clear	
Time Syncs	ENA
BEEP	DIS
AM/PM	DIS
Auto Dim	ENA
Factory Reset	

Smart Load	
Mode	Generator Input
Gen connect to grid input	DIS

Float V (40-62V)	
BMS Lithium Batt Mode(0-20)	0
Grid Charge	ENA
Grid Start %(10-90%)	30
Grid Start A(0-185A)	125
Gen Charge	DIS
Grid Signal	ENA
Gen Signal	ENA
Gen Force	DIS
Equalization Days(0-90)	NA
Equalization Hours(0-10)	NA
Absorption V(40-63V)	NA
Equalization V(40-63V)	NA
TEMPCO(mV/Cell)	NA

Advanced Setting	
Gen peak-shaving	DIS
Gen peak-shaving power(1000-16000W)	8000
Grid peak-shaving	DIS
DRM	DIS
Backup Delay (0-300S)	49
CT ration(200-8000)	2000 : 1
Grid peak-shaving power(1000-16000W)	8000
Parallel	DIS
Equipment mode	Master
Modbus SN(1-16)	1
Phase	A
Auto Detect Home Limit Sensors	DIS
Bms_Err_Stop	DIS

Grid Setting	
Grid Mode	UL1741SA
PF	1
Reconnection Time(1-600S)	30
Grid Frequency	60
Grid Type	120/240 Split phase
Grid Vol High(180.0-270.0V)	265
Grid Vol Low(180.0-270.0V)	185
Grid HZ High(45.00-65.00Hz)	62
Grid Hz Low(45.00-65.00Hz)	57
Inverter output voltage(V)	120/240V
Zero export power(0-500W)	20
GEN connect to Grid input	DIS
L/HVRT	DIS
L/HFRT	ENA
HF2 (45-65HZ)	62
HF1 (45-65HZ)	60.5
LF1 (45-65HZ)	58.5
LF2 (45-65HZ)	57
HF2 Time (0-300S)	0.16
HF1 Time (0-300S)	299
LF1 Time (0-300S)	299
LF2 Time (0-300S)	0.16
Q(V)	DIS
FW	DIS
VW	DIS
Normal Ramp rate(1-100%/s)	10
Soft Start Ramp rate(1-100%/s)	10
DC 1 for WindTurbine	DIS
DC 2 for WindTurbine	DIS

Appendix D: Custom V2 Y Cable Wiring

The Savant Power System requires communication between the Sol-Ark Inverter and the Savant Director using the V2 Y Cable described in the Communication part of section 8 Savant. However, when custom wiring considerations are required, it is possible to create a custom Y Cable using standard CAT5 cabling. Use the Parent diagram for the Parent Sol-Ark inverter and the Child Diagram for any additional Sol-Ark inverters.
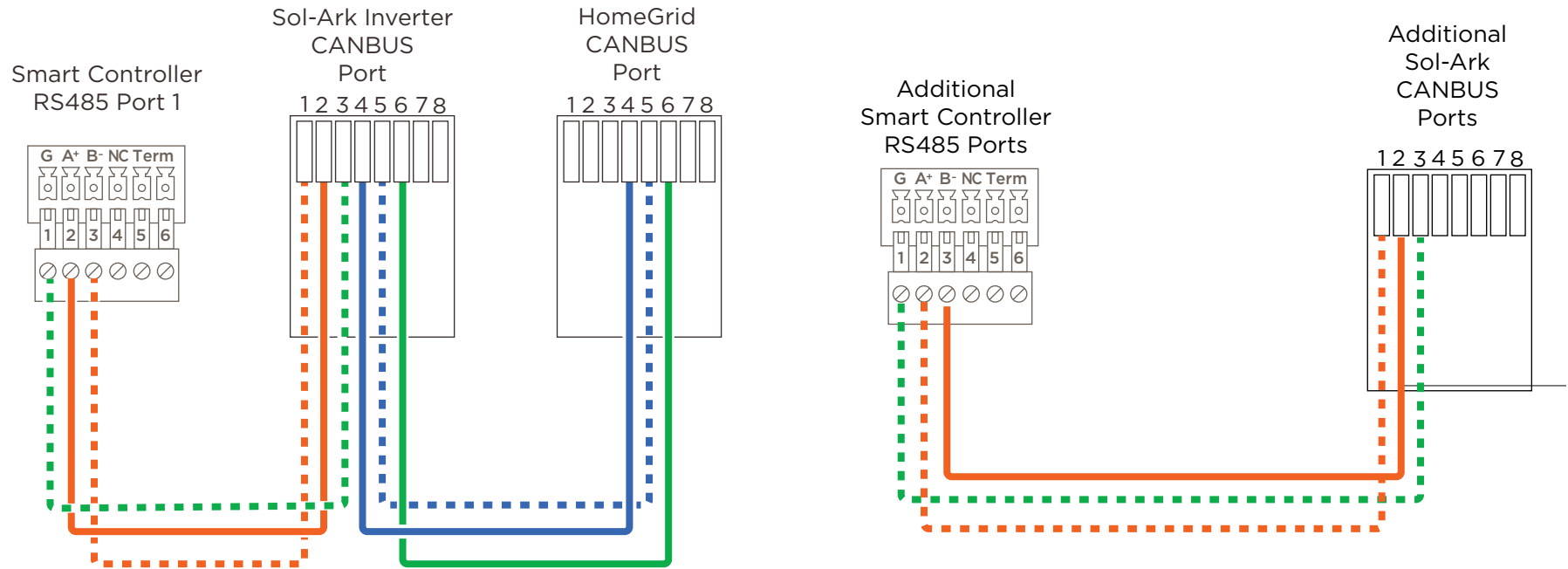
Smart Controller Port 1	Sol-Ark CANBUS Port	HomeGrid CANBUS
1	3	
2	2	
3	1	
	4	4
	5	5
	6	6

Smart Controller	Sol-Ark CANBUS Port
1	3
2	1
3	2

Important Notice

Disclaimer

Savant Systems, Inc. reserves the right to change product specifications without notice, therefore, the information presented herein shall not be construed as a commitment or warranty.

Savant Systems, Inc. shall not be liable for any technical or editorial errors or omissions contained herein or for incidental or consequential damages resulting from the performance, furnishing, reliance on, or use of this material.

Patents

Certain equipment and software described in this document is protected by issued and pending U.S. and foreign patents.

All products and services are trademarks or registered trademarks of their respective manufacturer.

Coypright

This document contains confidential and proprietary information protected by copyright. All rights reserved. Copying or other reproduction of all or parts of this document is prohibited without the permission of Savant Systems.

Trademarks

© 2022 Savant Systems, Inc. All rights reserved. Savant, Savant app, TrueImage, Savant Host, Now You Can, RacePoint Blueprint, Single app Home, TrueCommand, TrueControl, and the Savant logo are trademarks of Savant Systems, Inc.

AirPlay, apple, AirPort Express, AirPort Extreme, apple TV, apple Remote Desktop, FireWire, iMac, iTunes, iPad, iPad mini, iPad Air, iPhone, MacBook, Mac and OS X are trademarks or trade names of apple Inc. iOS is a trademark of Cisco®. Android, Google, Google Play, and other Google marks are trademarks of Google, Inc. Wi-Fi is a registered trademark of the Wi-Fi Alliance®. HDMI® is a trademark of HDMI Licensing, Inc. MOTU® is a registered trademark of Mark of the Unicorn, Inc. Luxul is a registered trademark of Luxul Wireless. NETGEAR®, the NETGEAR Logo and ProSAFE are trademarks of NETGEAR, Inc. Extreme™ is a trademark of Extreme Networks, Inc.

All other brand names, product names, and trademarks are the property of their respective owners.

Technical and Sales Support

Savant Power, Inc. is dedicated to providing prompt and effective support in a timely and efficient manner.

– To contact Savant Power Support, access the Savant Customer Community and enter a support Case ticket.

– To contact Savant Sales, visit Savant.com and select Contact Us to locate a local sales representative in your area.