



12K-2P-LL HYBRID INVERTER

QUICKSTART GUIDE



12K-2P-LL Installation QuickStart

CONTENTS

12K-2P-LL Overview.....	1
Before You Start	2
Step 1. Confirm all items are in the box.	2
Step 2. Set up MySolArk.	3
Step 3. Prepare the site.	4
Step 4. Mount inverter to surface with proper hardware.....	5
Step 4b. Install the LCD Sunshade (outdoor installations only)	6
Inverter Wiring	7
Step 5. Connect inputs and outputs.	7
Step 6. Check the wiring area.	8
Step 7. Integrate batteries with Inverter.	9
Step 8. Check Polarity and Voltage.	10
Step 9. Connect Battery Communication Cables	11
Step 10. Turn the inverter ON.....	12
Set Up Batteries	13
Step 11. Set up battery communications.	13
Step 12. Check battery communications.....	14
Check Inverter Setup.....	15
Step 13. Check PV wiring polarity.....	15
Step 14. Confirm Grid AC Voltage.	16
Step 15. Check Grid Parameters.....	17
Step 16. Check Load AC voltage.	18
Step 17. Test Island Mode.	19
Set Up Wi-Fi	20
Step 18. Connect the Dongle.	20
Step 19. Create the plant.....	21
Step 20. Check LED status of Dongle.	22

12K-2P-LL Installation QuickStart

Step 21. Check network stability.....	23
Step 22. Check system performance.	24
Software Updates	25
Considerations for Parallel Systems.....	26
MORE INFORMATION.....	27
Mounting the Sol-Ark (Step 4 Details).....	28
Inverter General Description (Step 5 Details).....	29
Connection Requirements (Step 6 Details)	34
Step 10 Details	37
Battery Setup screens (Step 11 Details)	38
Connecting PV Modules (Step 12 Details)	44
Check Grid Parameters (Step 15 Details)	46
Test Island Mode (Step 17 Details)	50
Alternate Method for Connecting to Wi-Fi using IP Address (Step 18 Details) ...	51
Create a Plant on MySolArk (Step 19 Details)	53
System Work Modes (Step 22 Details)	55

12K-2P-LL Installation QuickStart

Disclaimer

This QuickStart Guide offers a brief installation and commissioning overview for the Sol-Ark 12K-2P-LL Hybrid Inverter. It is not intended to, and should not, replace the [12K-2P-LL Installation Manual](#) or to address all matters referred to in the Manual.

This product may be dangerous if improperly configured, installed or operated. You are urged to read and review the full Manual, including applicable data sheets, and to visit the Sol-Ark Knowledge Hub at www.sol-ark.com to learn more fully about this product.

The information included in this QuickStart Guide is subject to, and qualified by, the information set forth in the Manual, including important disclaimers and warnings that limit or exclude Sol-Ark's liability.

See the Commissioning and Programming sections of this QuickStart Guide for details, including advanced configurations, necessary to meet the requirements or needs for system performance.

About this guide

This QuickStart guide provides the essential steps for installing a Sol-Ark inverter. This guide is divided into two parts:

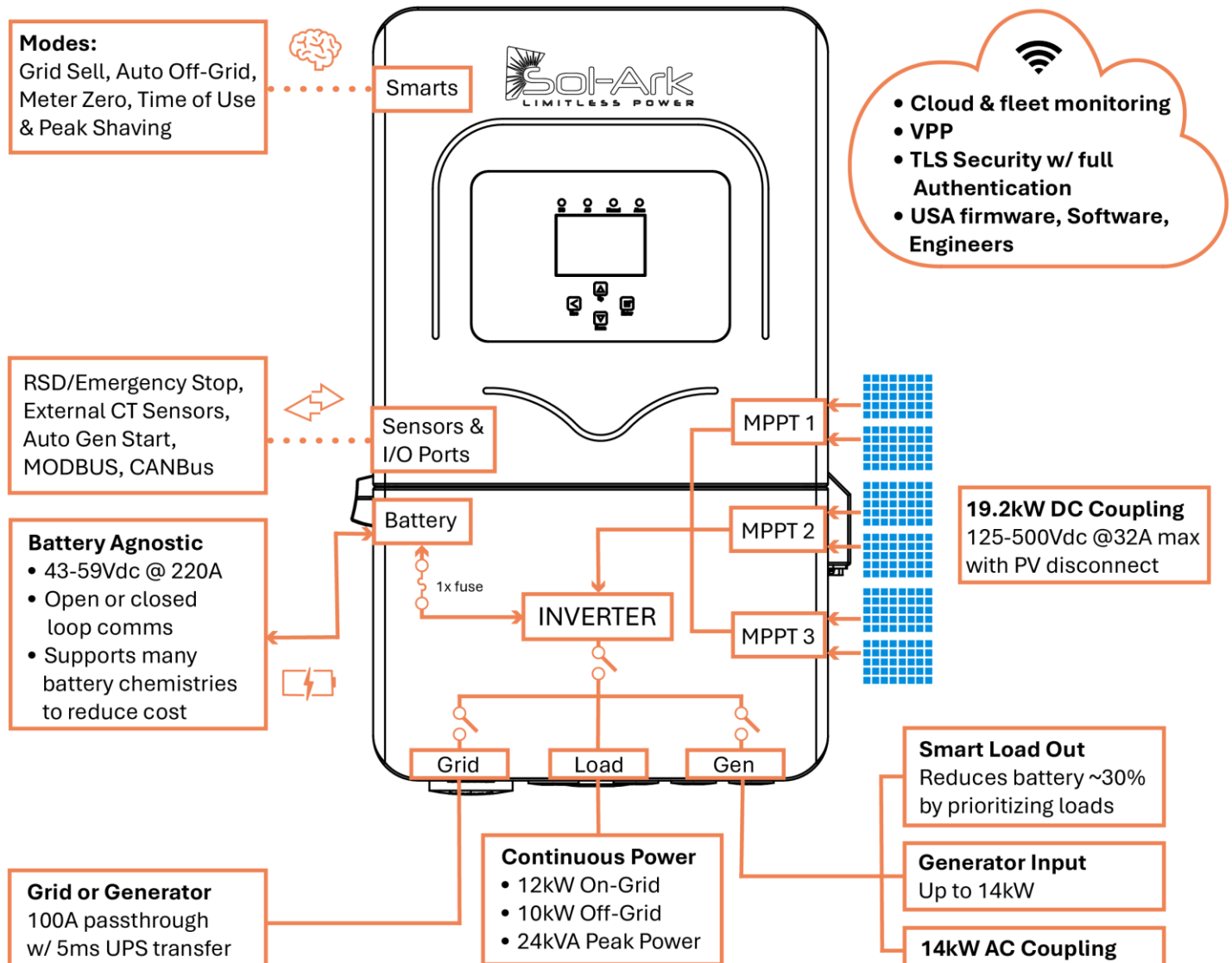
- The **12K Installation QuickStart** section starting on the next page lists the basic steps you need, with a link to more detailed information in the second part of the guide.
- The **More Information** section starting on page 28 provides additional details that you might need.

For full information, see the [12K-2P-LL Installation Manual](#).

12K-2P-LL Installation QuickStart

12K-2P-LL Overview

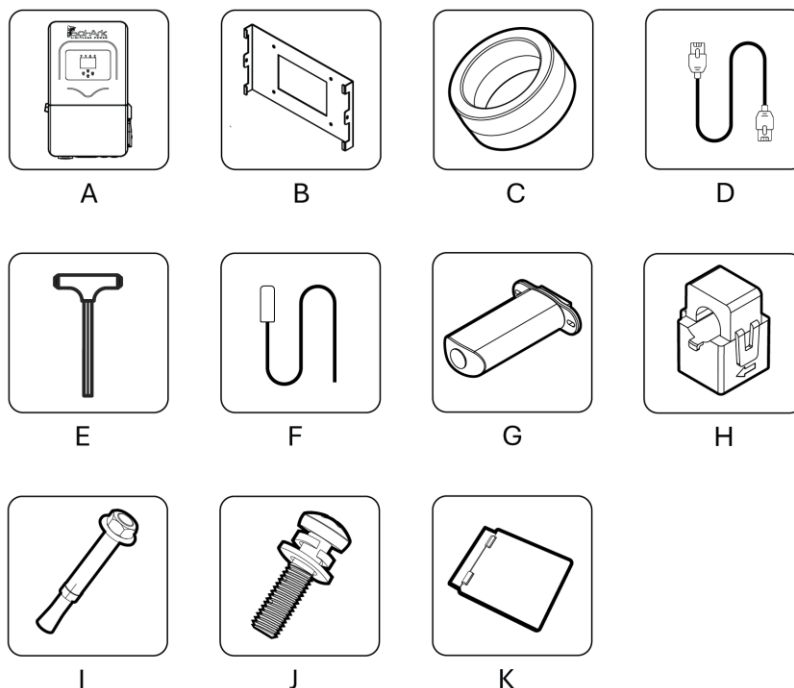
12K-2P-LL
120/240V, 120/208V



12K-2P-LL Installation QuickStart

Before You Start

Step 1. Confirm all items are in the box.



Component	Description	Quantity
A	Sol-Ark Limitless 12K-2P-LL inverter	1
B	Wall mounting bracket	1
C	Filter rings	9
D	CAT 5E communication cable	1
E	5 mm T-type hex key for AC terminals	1
F	Temperature sensor	1
G	Wi-Fi / Ethernet antenna (dongle)	1
H	200A (Ø0.94”) Current Transformers (CT sensors)	2
I	Stainless steel mounting screws M4*12	4
J	Stainless steel anti-collision bolt M8×80	4
K	LCD Sunshade (for outdoor installations)	1

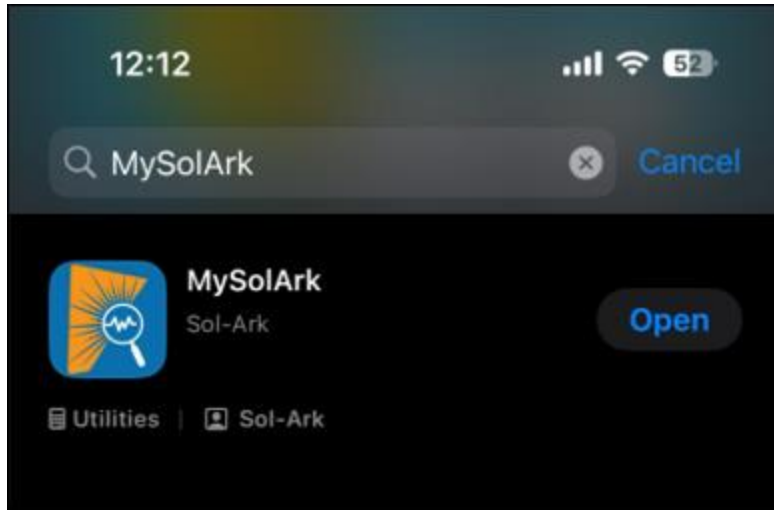
Other item you'll need: Smartphone or Laptop

12K-2P-LL Installation QuickStart

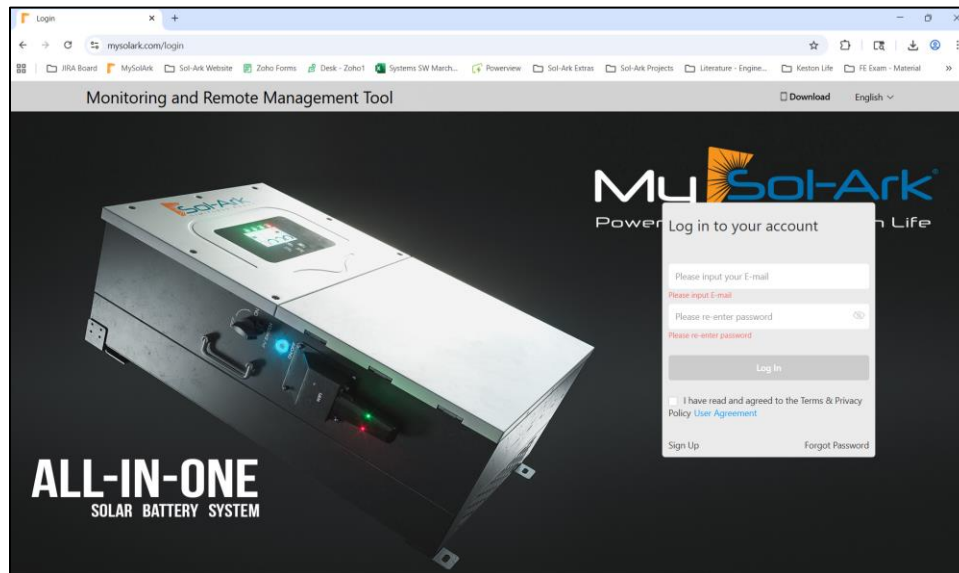
Step 2. Set up MySolArk.

Create a MySolArk Account (MSA) by downloading the app or visiting www.mysolark.com to access the desktop version.

MySolArk in the App Store



MySolArk Desktop on the Sol-Ark Website



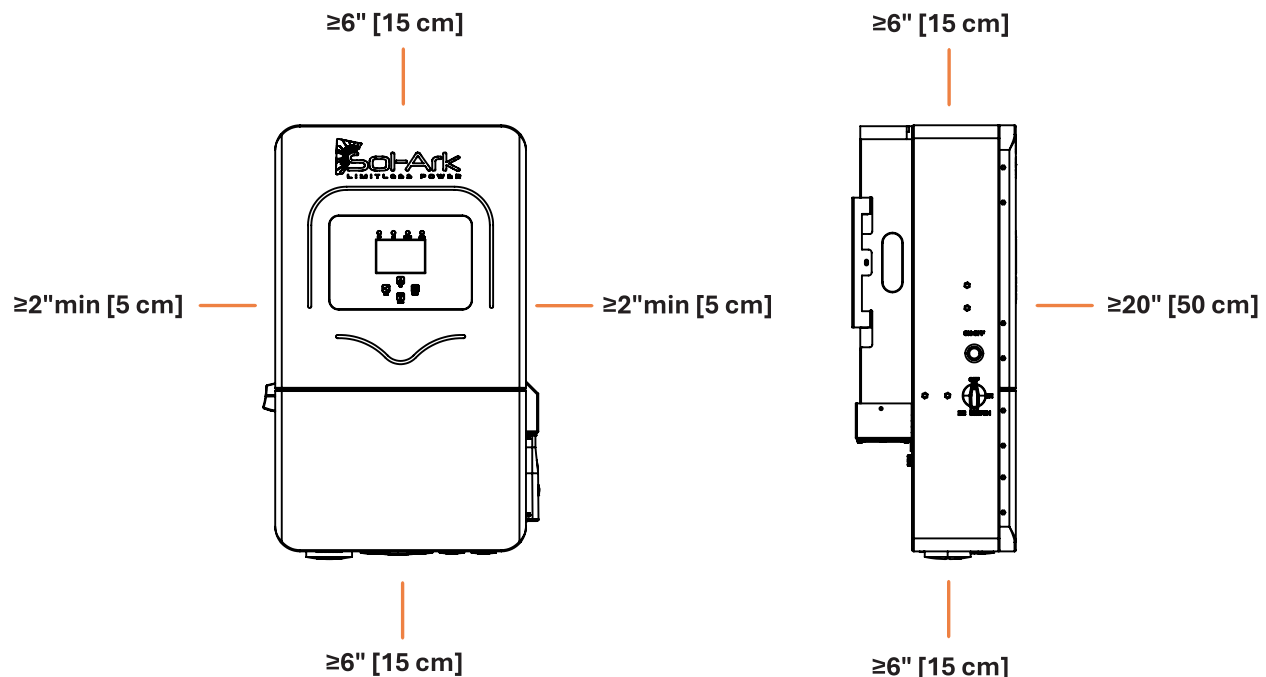
- The email address used will become the primary account for all created plants
- See [Step 19. Create the plant.](#) for more information.

12K-2P-LL Installation QuickStart

Step 3. Prepare the site.

Locate a suitable area to mount the inverter and follow these requirements:

- 6 in. vertical clearance
- 2 in. side clearance
- 6 in. side clearance from another system
- Protect the LCD from direct exposure to UV light
- Operating temperature of -40°F to 140°F



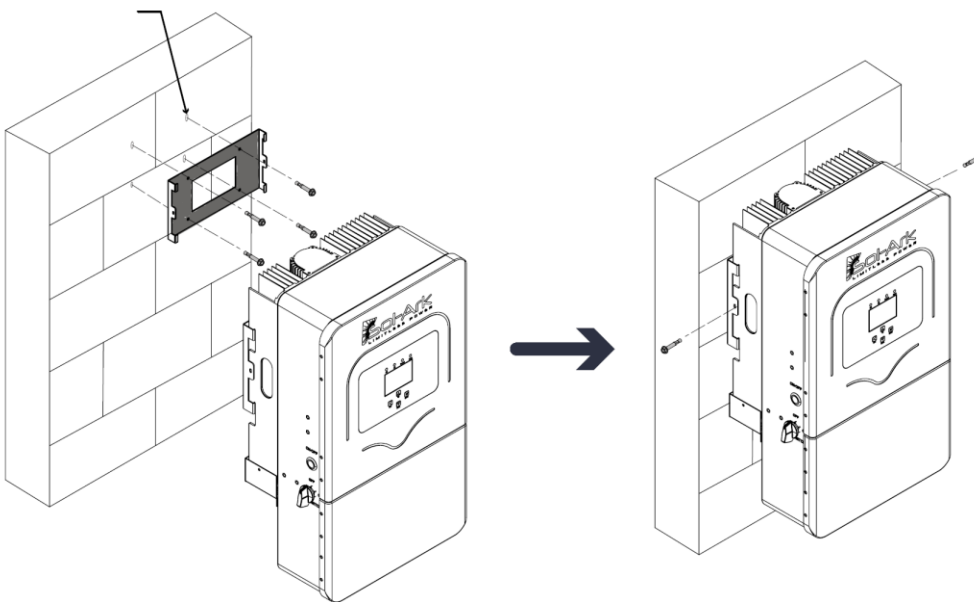
- Under certain conditions, the National Electrical Code® (NEC) requires greater clearances. Use the clearances listed in NEC 2023, paragraph 110.26, and Canadian Electrical Code® CSA C22.1.

The Sol-Ark 12K-2P-LL is a NEMA 3R - IP65 enclosure rated for outdoor installation, but it can also be installed indoors.

12K-2P-LL Installation QuickStart

Step 4. Mount inverter to surface with proper hardware.

- A. Use screws or anchors rated to support the inverter weight (65 lb):
- *For Concrete or Masonry Mounting:* Use a minimum of (5) 3/8 in. expanding anchors (not included)
 - *For Wood Frame Mounting:* Use a minimum of (5) 3/8 in. lag screws with flat washers, making sure to anchor into at least 2 framing members (not included)
 - *For Metal Framing Mounting:* Use a minimum of (5) 1/4 in. self-tapping metal screws with flat washers (not included)
- B. Secure inverter to the wall mounting bracket (3) with the M4x12 mm socket head screws.
- C. The inverter should be mounted in the upright position.
- D. Remove the protective film from the LCD screen.



NOTE: Damage to the LCD screen due to direct sunlight will not be covered by warranty.

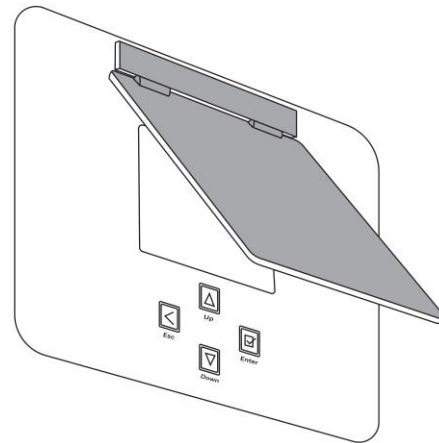
➤ See [Mounting the Sol-Ark \(Step 4 Details\)](#) for additional information.

12K-2P-LL Installation QuickStart

Step 4b. Install the LCD Sunshade (outdoor installations only)

If the Sol-Ark is installed outdoors, attach the LCD Sunshade. This helps prevent screen damage from UV damage.

- A. Peel off the protective film from the inverter's display surface, if it's not already removed.
- B. Make sure the surface is clean and dry before installation.
- C. Attach the base plate:
 - Peel the backing from the double-sided adhesive tape.
 - Align the base plate with the display area. The adhesive is permanent, so confirm the alignment before applying pressure.
 - Press firmly to secure the Sunshade.
- D. Assemble the Sunshade flap:
 - Insert the flap's hinge pins into the hinge slots on the base plate.
 - Verify that the flap opens and closes smoothly.



NOTE: Damage to the inverter's LCD Screen due to direct sunlight exposure will not be covered by warranty.

Need to purchase an LCD Sunshade?

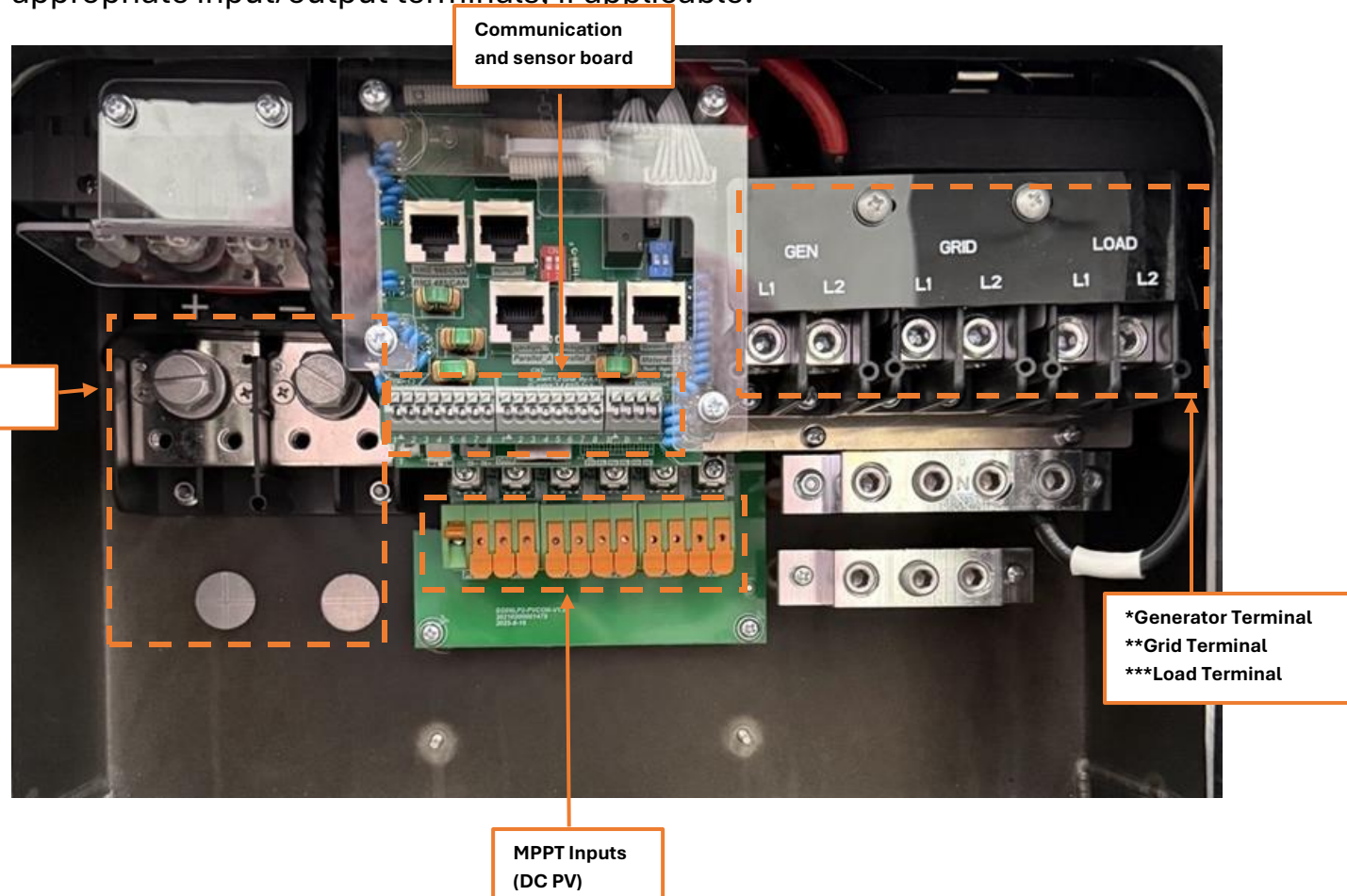
LCD Sunshades were included with Sol-Ark inverters starting on May 4, 2026. If you have an outdoor installation and did not receive an LCD Sunshade, you can purchase one by going to the [Sol-Ark Online Store](#).

12K-2P-LL Installation QuickStart

Inverter Wiring

Step 5. Connect inputs and outputs.

Locate the inputs in the user wiring area and connect all wiring to the appropriate input/output terminals, if applicable.



Notes

- The **GEN** port can also be used for AC Coupling or Smart load output
- The **GRID** port can also be used for a generator
- If your system came with **Filter Rings**, see the [18K Installation Manual](#) for instructions.



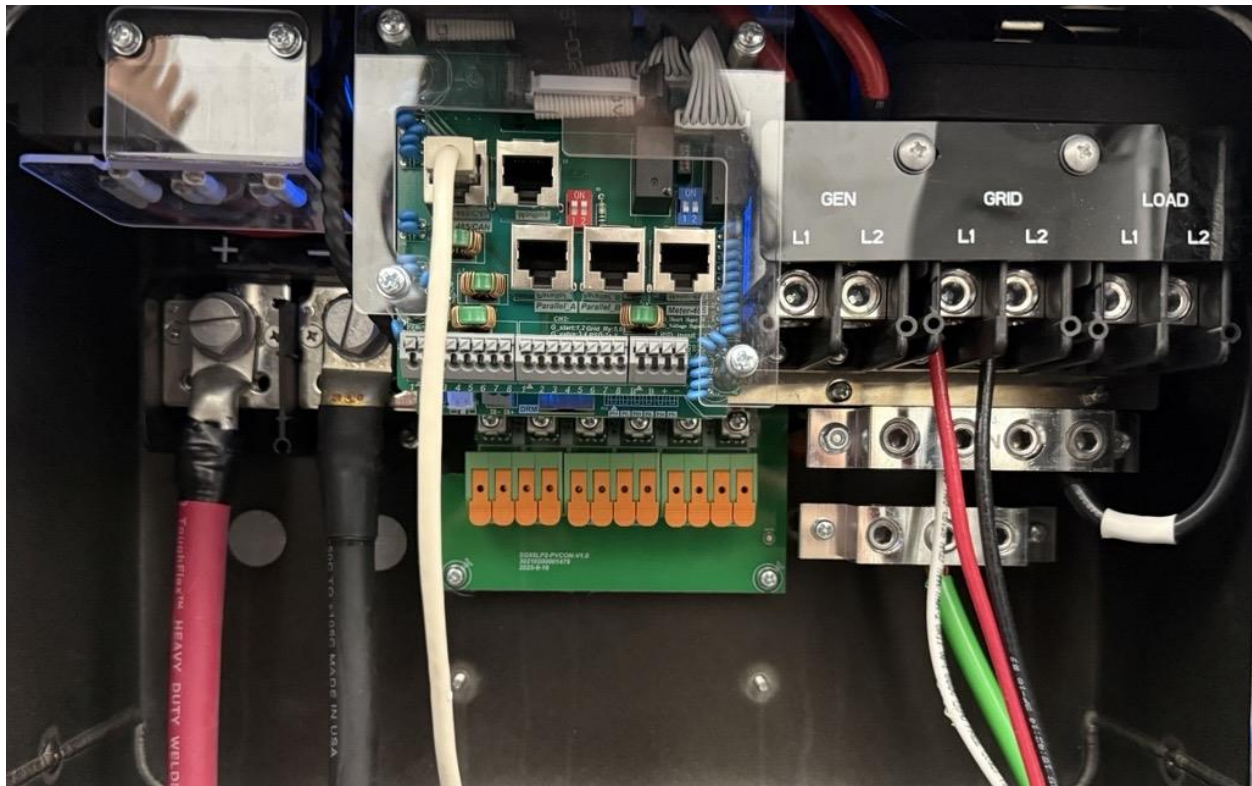
➤ See [Inverter General Description](#) for more information on inverter wiring.

12K-2P-LL Installation QuickStart

Step 6. Check the wiring area.

In the inverter user wiring area, check these:

- Connections have correct torque
- Wire is sized appropriately for the terminal rating and NEC requirements



NOTE: Do NOT have inverter, PV, batteries, or grid/gen AC disconnect closed while checking wires.

- See the [12K-2P-LL Installation Manual](#) for correct torque specifications and terminal wire size range (min-max).

12K-2P-LL Installation QuickStart

Step 7. Integrate batteries with Inverter.

- A. Confirm battery wiring methodology: make sure battery inputs are being used properly.
- B. Verify the polarity of each battery in the battery bank.
- C. For closed-loop operation, use a standard 8-pin Ethernet port, but refer to the battery manufacturer for pin-out requirements if needed.
- D. Connect cable to the **BMS** port for proper closed loop communications.
 - Use only **BMS 485/CAN port**
- See the battery manufacturer documentation for proper communication between multiple batteries.
- For more information on battery wire sizes, see [Connection Requirements \(Step 6 Details\)](#)
- For information on **parallel systems**, see [Considerations for Parallel Systems](#).

12K-2P-LL Installation QuickStart

Step 8. Check Polarity and Voltage.

A. Turn ON all batteries

- On the battery, if it has an internal breaker and/or switch, make sure that it's closed
- See the battery manufacturer manual for proper battery startup sequence

B. Check wiring polarity and DC voltage on each input

- Use a multimeter to check (+) and (-) voltage to confirm correct polarity and operating voltage from the battery bank



Parallel Systems Considerations

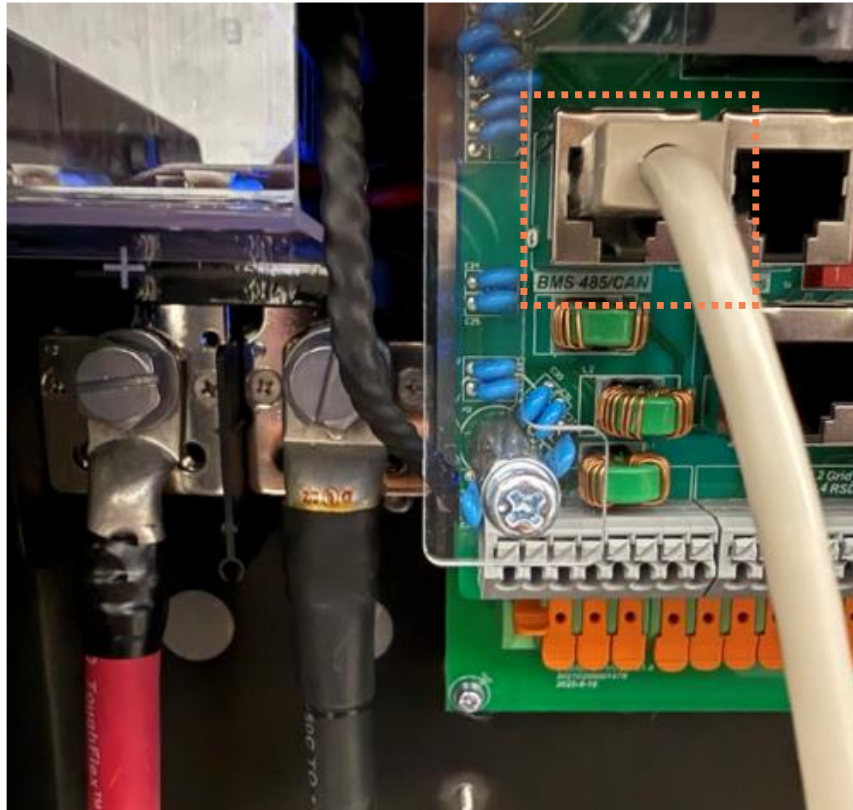
- All AC Inputs/Outputs (**GRID**, **LOAD**, **GEN**) and batteries must be paralleled across all inverters.
- PV Strings are NOT paralleled across inverters.

12K-2P-LL Installation QuickStart

Step 9. Connect Battery Communication Cables

Connect the battery communication cable(s) to the BMS input(s) in the sensor board area.

- Use BMS 485/CAN input.



The BMS 485/CAN port is highlighted above.

- **For battery communication wiring:** See the battery manufacturer's guide to confirm methodology based on the battery module configuration.
- **For closed-loop communication steps:** See the [Low Voltage 48V Residential Battery Integration Guide](#) on the Sol-Ark Knowledge Hub.

12K-2P-LL Installation QuickStart

Step 10. Turn the inverter ON.

Press the inverter ON button and wait for the Normal LED above the screen to light up.



- If you're waiting more than 3 minutes, check battery voltage on terminals to make sure it's within operating voltage.

12K-2P-LL Installation QuickStart

Set Up Batteries

Step 11. Set up battery communications.

On the inverter screen, go to **Settings > Battery Setup** to program battery communications.

- A. Check **BMS Lithium Batt** 01(if applicable); note that the value will vary from 00-09 depending on the battery
- B. Check **Activate Battery** and **Use Batt %** or **Use Batt V Charged**
- C. Tap **OK**

The screenshot shows the 'Batt Setup' screen with the following settings:

Batt	Charge	Discharge	Smart Load
Batt Capacity	400Ah		☐ Use Batt V Charged
Max A Charge	220A		☒ Use Batt % Charged
Max A Discharge	220A		☐ No Battery
TEMPCO	-0mV/C/Cell		☒ BMS Lithium Batt 00
			☒ Activate Battery

At the bottom are 'CANCEL' and 'OK' buttons.

- See your battery manufacturer to confirm that all battery settings are programmed appropriately per the battery specifications.
- **Li-Batt info** shows information sent by the BMS such as battery voltage, charge/discharge current limits, temperature, etc.
- See [Battery Setup screens \(Step 11 Details\)](#) to confirm that all battery settings are programmed appropriately according to the battery specifications.

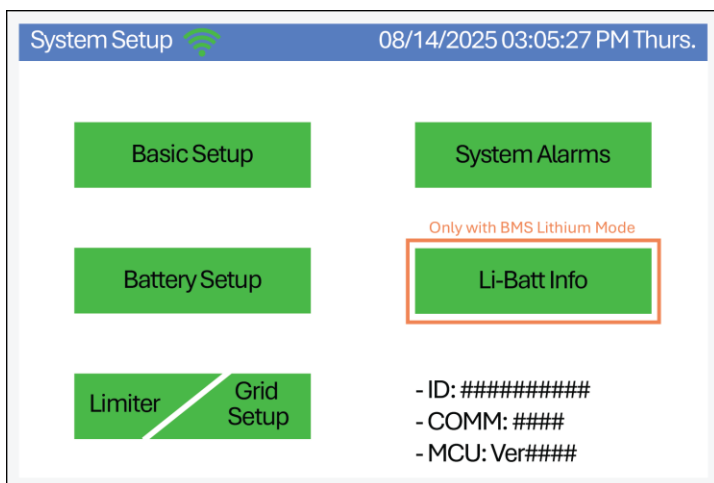
12K-2P-LL Installation QuickStart

Step 12. Check battery communications.

On the Main screen, tap Li-Batt Info to confirm that communication is established between the battery and the inverter.

Check these values to make sure they are correct:

- Voltage
- SOC
- Temperature
- Charge/discharge current limit



0.00 V	0.00 A	0.0 C	0%	0 Ah	
0.0 V	0.0 V	0A	0A	0x00	0x00
Only w/ BMS Lithium Mode					
1. 0.00 V	0.00 A	0.0 C	0.0%	0.0V	0.0A 0 0 0
2. 0.00 V	0.00 A	0.0 C	0.0%	0.0V	0.0A 0 0 0
3. 0.00 V	0.00 A	0.0 C	0.0%	0.0V	0.0A 0 0 0
4. 0.00 V	0.00 A	0.0 C	0.0%	0.0V	0.0A 0 0 0
5. 0.00 V	0.00 A	0.0 C	0.0%	0.0V	0.0A 0 0 0
6. 0.00 V	0.00 A	0.0 C	0.0%	0.0V	0.0A 0 0 0
7. 0.00 V	0.00 A	0.0 C	0.0%	0.0V	0.0A 0 0 0
8. 0.00 V	0.00 A	0.0 C	0.0%	0.0V	0.0A 0 0 0
9. 0.00 V	0.00 A	0.0 C	0.0%	0.0V	0.0A 0 0 0
10. 0.00 V	0.00 A	0.0 C	0.0%	0.0V	0.0A 0 0 0
11. 0.00 V	0.00 A	0.0 C	0.0%	0.0V	0.0A 0 0 0
12. 0.00 V	0.00 A	0.0 C	0.0%	0.0V	0.0A 0 0 0
13. 0.00 V	0.00 A	0.0 C	0.0%	0.0V	0.0A 0 0 0

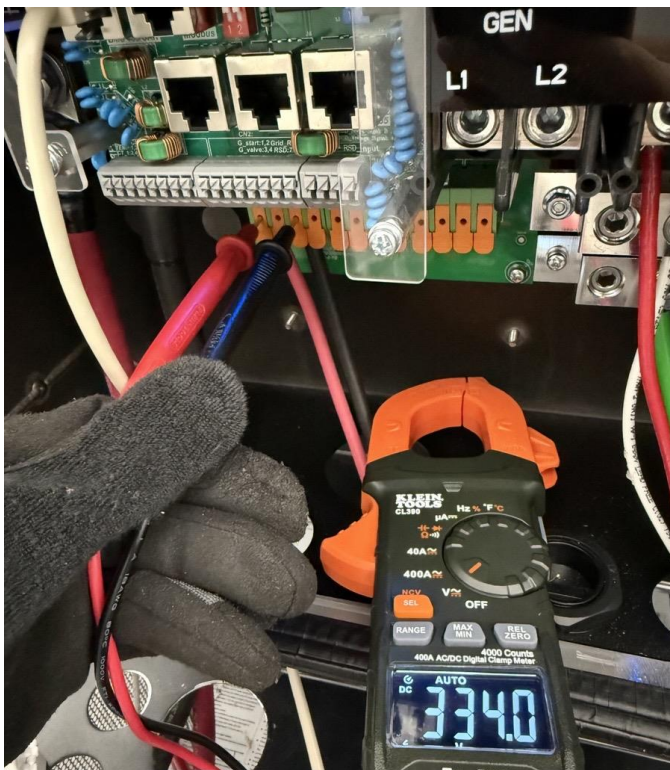
12K-2P-LL Installation QuickStart

Check Inverter Setup

Step 13. Check PV wiring polarity.

For each MPPT:

- A. Check for correct PV wiring polarity input
- B. Ensure expected open circuit voltage (Voc)
- C. Turn ON PV disconnect
- D. Confirm the DC LED is lit above the screen

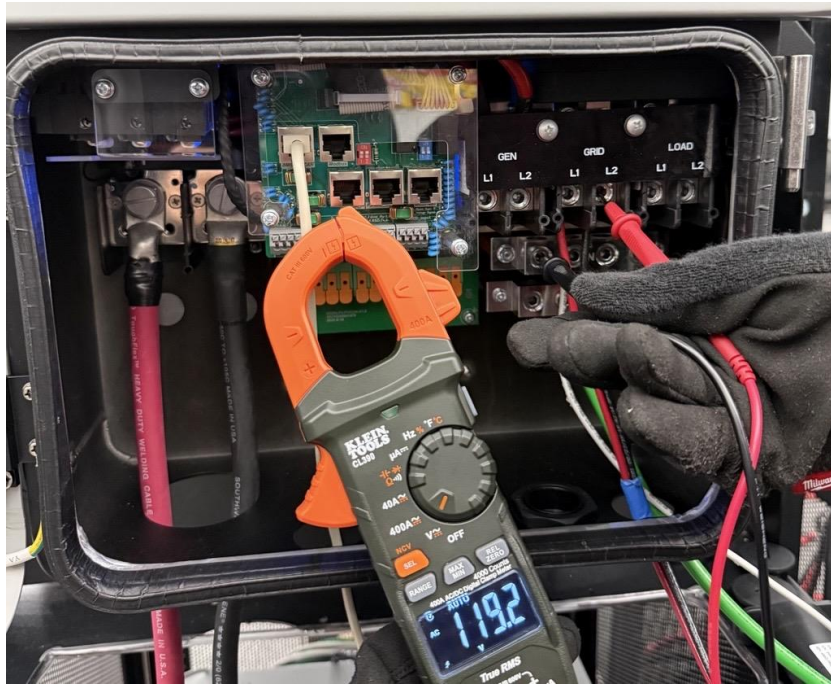


- Make sure the external DC disconnect for PV is turned on.
- If you're using a rapid shutdown device (RSD), see the [12K-2P-LL Installation Manual](#) for instructions.
- See [Connecting PV Modules](#) for more information.

12K-2P-LL Installation QuickStart

Step 14. Confirm Grid AC Voltage.

- A. Turn ON the Grid AC disconnect
- B. Check grid phasing and AC voltage levels. Confirm the AC LED is lit above the screen
- C. For off-grid setups with a generator, turn on the generator and follow the same steps.



Voltage Check with Multimeter

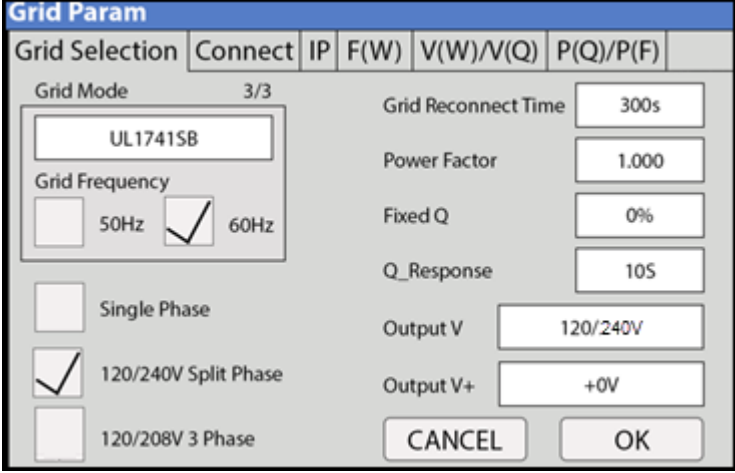
You can use a multimeter and phase tool to validate grid levels coming into terminals.

- **If off-grid configuration with no generator**, ignore steps 15 and 16 starting on the next page.
- **If a generator is present**, use the **GRID** or **GEN** terminal, depending on which is being wired to, and perform the same steps.

12K-2P-LL Installation QuickStart

Step 15. Check Grid Parameters.

On the inverter screen, go to **Settings > Grid Param** and make sure that appropriate parameters are enabled.



The screenshot shows the 'Grid Param' settings screen. At the top, there are tabs: 'Grid Selection', 'Connect', 'IP', 'F(W)', 'V(W)/V(Q)', and 'P(Q)/P(F)'. The 'Grid Selection' tab is active. Below the tabs, the 'Grid Mode' is set to '3/3'. The 'Grid Frequency' section has two options: '50Hz' (unchecked) and '60Hz' (checked). The 'Single Phase' option is unchecked, '120/240V Split Phase' is checked, and '120/208V 3 Phase' is unchecked. On the right side, there are several input fields: 'Grid Reconnect Time' (300s), 'Power Factor' (1.000), 'Fixed Q' (0%), 'Q_Response' (105), 'Output V' (120/240V), and 'Output V+' (+0V). At the bottom right, there are 'CANCEL' and 'OK' buttons.

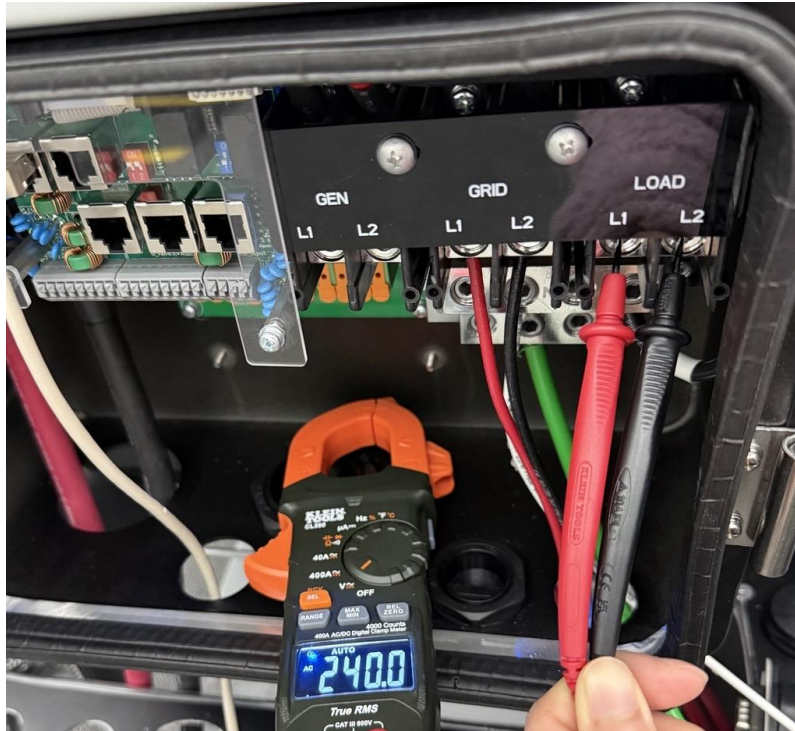
See the [12K-2P-LL Installation Manual](#) to make sure grid settings are correct and changed according to AHJ requirements and applicable levels.

- See [Check Grid Parameters \(Step 15 Details\)](#) for more information on grid settings.

12K-2P-LL Installation QuickStart

Step 16. Check Load AC voltage.

- A. Measure AC voltage at **LOAD** terminals
- B. Turn ON the breaker or disconnect feeding load panel
- C. Check to make sure circuits on the load panel are energized

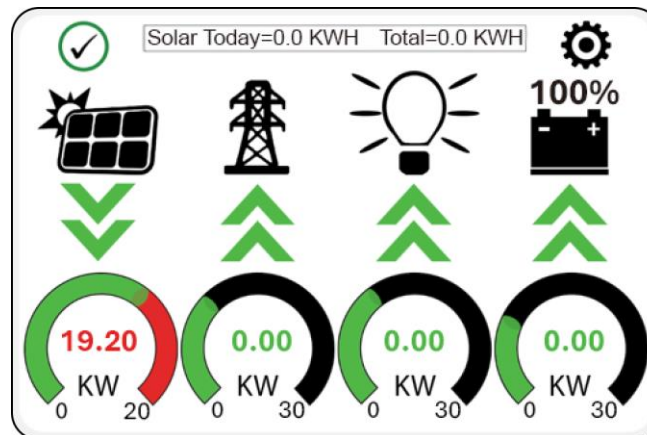


- Take phase-neutral and phase-phase measurements and make sure voltage on **LOAD** terminals is present and matches grid levels, if applicable.
- Make sure voltage on **LOAD** terminals is present and matching grid levels, if applicable.

12K-2P-LL Installation QuickStart

Step 17. Test Island Mode.

- A. Turn the grid AC disconnect to the OFF position. With batteries, the inverter should seamlessly switch to battery backup to load output.
- B. On the main screen of the inverter, click the battery icon to display the detailed voltage screen.



Solar	Grid	INV	UPS LD	Batt
0W	0W	0W	0W	220W
	0.0Hz	60.0Hz	120V	71%
M1: 0V 0.0A 0W	0V	120V	0W	52.94V
M2: 0V 0.0A 0W	HM: 0W	0.7A	120V	I: 4.1 A
	LD: 0W	0W	0W	21.6C
	0V	120V	Gen 0V	TEMP
M3: 0V 0.0A 0W	HM: 0W	0.6A	L1: 0W L2: 0W 0.0Hz	DC: 25.3C AC: 26.0C
	LD: 0W	0W		

- Under **INV** column, make sure L1 and L2 have correct voltage
- Under **Batt** column, make sure battery voltage is present

12K-2P-LL Installation QuickStart

Set Up Wi-Fi

Step 18. Connect the Dongle.

A. Connect the dongle into the **DB-9** Wi-Fi port on the left side of the inverter.



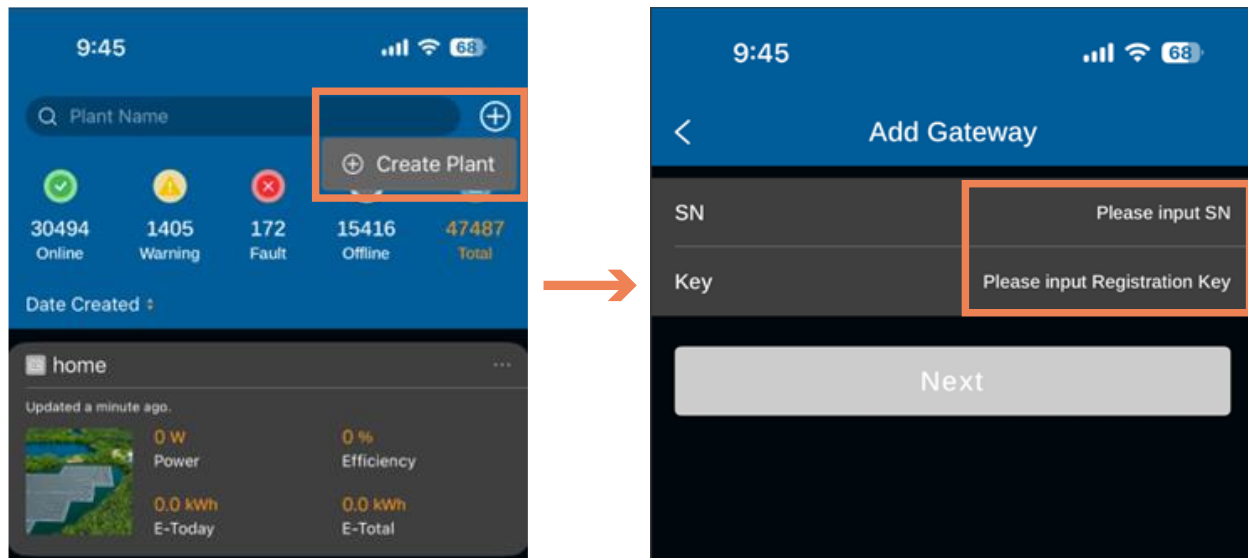
B. A solid **red** LED indicates power to the device.

12K-2P-LL Installation QuickStart

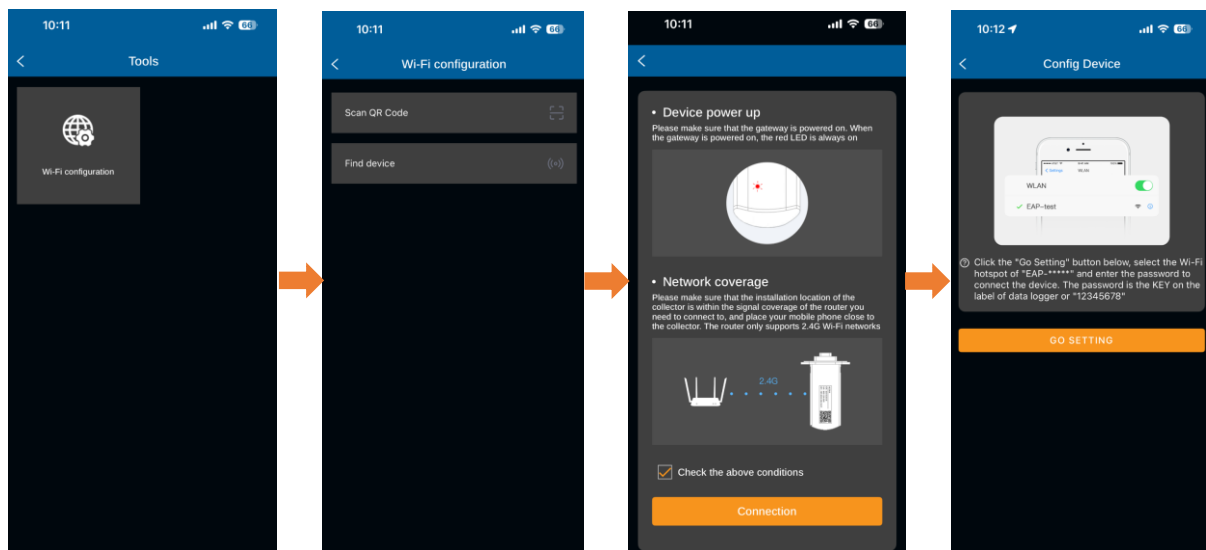
Step 19. Create the plant.

After downloading the **MySolArk** app in Step 2, you can now create a plant.

A. Open the app, scan the QR code, and fill out required fields.



B. Configure the Wi-Fi network to the dongle using MySolArk. A green LED will light on the dongle when the network is connected.



➤ For more information, see [Create a Plant on MySolArk \(Step 19 Details\)](#).

12K-2P-LL Installation QuickStart

Step 20. Check LED status of Dongle.

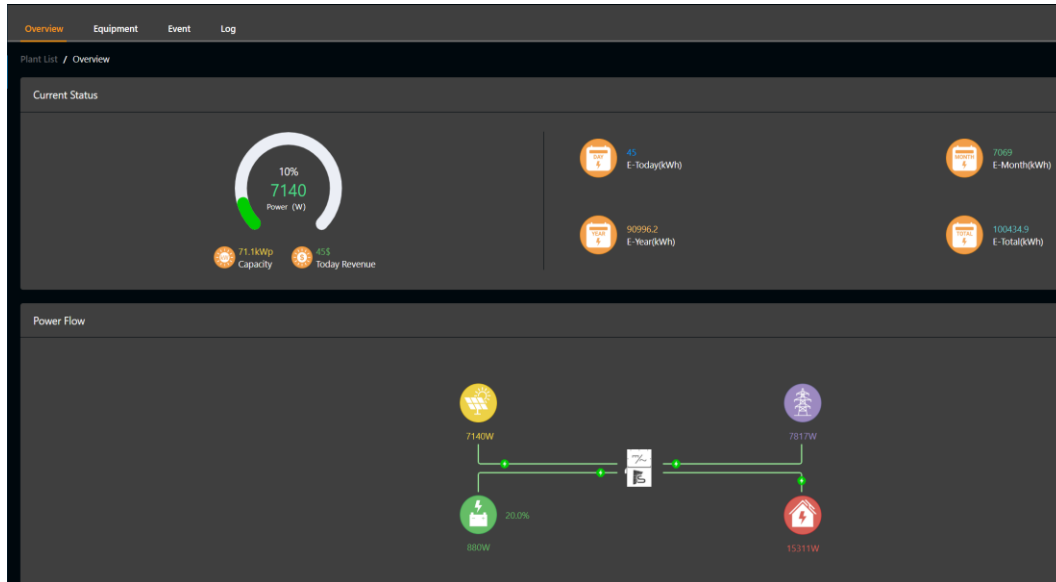


- If unsuccessful, try the steps in [Alternate Method for Connecting to Wi-Fi using IP Address \(Step 18 Details\)](#).

12K-2P-LL Installation QuickStart

Step 21. Check network stability.

In **MySolArk**, review data to ensure the network is stable and power flow data is showing correctly.

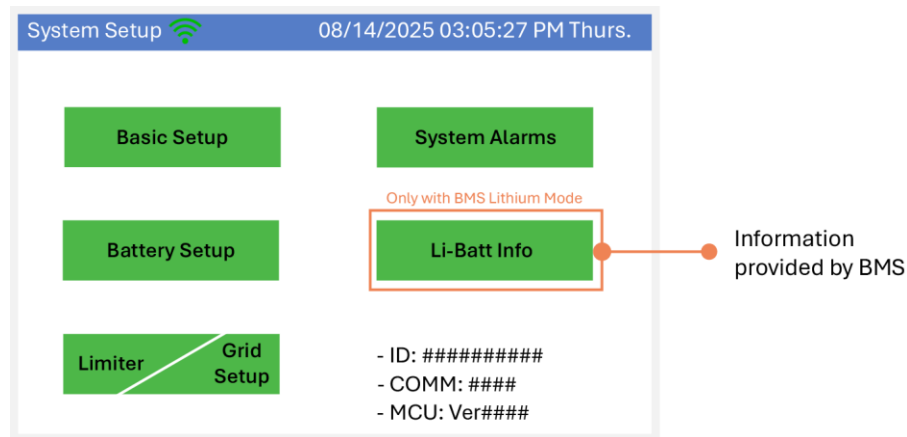


NOTE: MSA data is not real-time, as a data point will populate every 5 minutes. It's recommended to compare the Sol-Ark power flow on the GUI screen against what MSA reports for the created plant.

12K-2P-LL Installation QuickStart

Step 22. Check system performance.

If necessary, go through the rest of the settings to program the desired system performance.

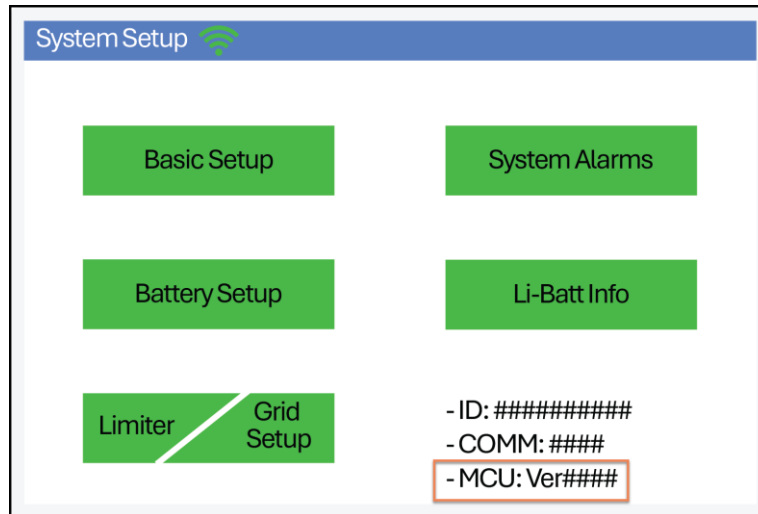


- For information about the different system work modes, go to [System Work Modes \(Step 22 Details\)](#)
- For information about TOU settings, go to [Time of Use \(TOU\)](#)
- For information about peak shaving, go to [Advanced Setting – Grid Peak Shaving](#)

12K-2P-LL Installation QuickStart

Software Updates

- A. On the inverter screen, find the current software version by clicking the gear icon and looking at the bottom right of the screen.



- B. Find the latest software version for your inverter in either of these ways:
- On **MySolArk**, go to the **Equipment** tab.
 - On the Sol-Ark website, go to the [Software Updates](#) page.
- C. If the software version is different than what the website shows, scroll down and submit an **Update Request Form**.
- D. About 30-40 minutes after the update was scheduled, repeat Step **A** to confirm the latest software version.

12K-2P-LL Installation QuickStart

Considerations for Parallel Systems

For multiple inverters, follow the steps for each unit in the system with these additional considerations:

- All AC Inputs/Outputs (**GRID, LOAD, GEN**) should have paralleled connection across all inverters
- Step **8** – PV Strings are NOT paralleled across inverters
- Step **9** – Batteries MUST be paralleled across inverters
- In **Settings**, specify the Parallel Settings on the **Basic Setup** screen.
 - For all units, select the **Parallel** check box
 - On the Master unit, select **Master** and set Modbus serial number to **01**
 - On all Slave units, select **Slave** and set the Modbus serial number counting up from “02, 03, 04...” etc.
 - Make all settings changes at the Master inverter, except for the **Parallel** tab

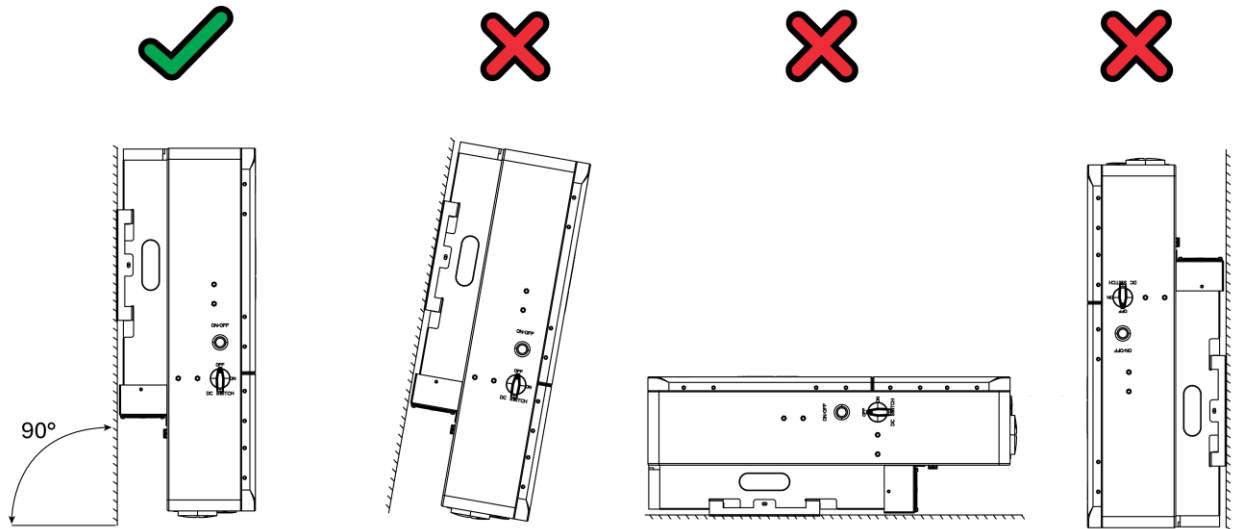
The screenshot shows the 'Basic Setup' screen with the 'Parallel' tab selected. The 'Parallel' checkbox is checked. Under 'Master/Slave', 'Master' is selected with a radio button. The 'Modbus SN' field is set to '00'. On the right, 'Phase A' is selected with a radio button. There are also radio buttons for 'Phase B' and 'Phase C'. Below these, there are checkboxes for 'Meter > Grid' and 'Meter > Load', both of which are unchecked. Under each of these checkboxes is a 'Meter Select' dropdown menu, both of which are set to 'No Meter'. At the bottom are 'CANCEL' and 'OK' buttons.

MORE INFORMATION

More Information

Mounting the Sol-Ark (Step 4 Details)

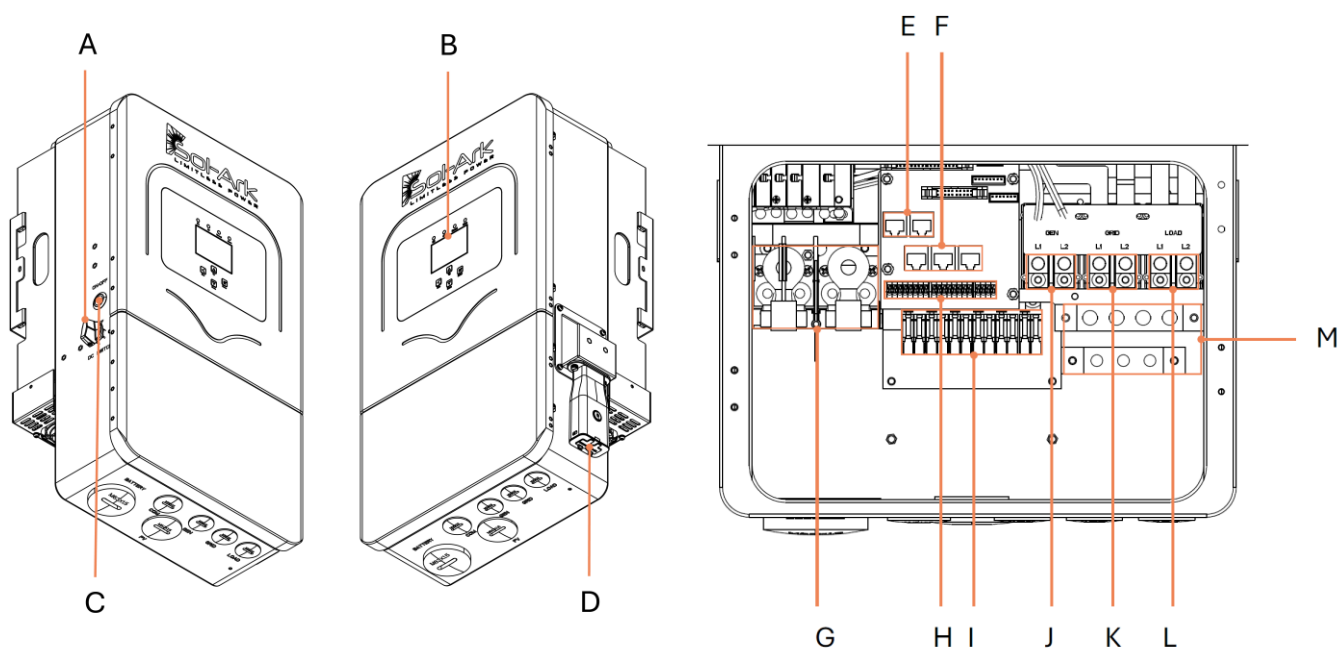
Mount the inverter in the optimal orientation as shown below.



➤ Return to [Step 4. Mount inverter to surface with proper hardware.](#)

More Information

Inverter General Description (Step 5 Details)



Component	Name	Component	Name
A	PV DC disconnect	H	Input pinouts for sensors and accessories
B	LCD touch screen	I	3x MPPT inputs
C	ON / OFF Button	J	(60 A) GEN terminal
D	Wi-Fi / Ethernet dongle	K	(100 A) GRID terminal
E	BMS RJ45 ports (RS485 / CAN)	L	(100 A) LOAD terminal
F	Parallel RJ45 ports	M	GROUND / NEUTRAL Busbars
G	Battery terminals		

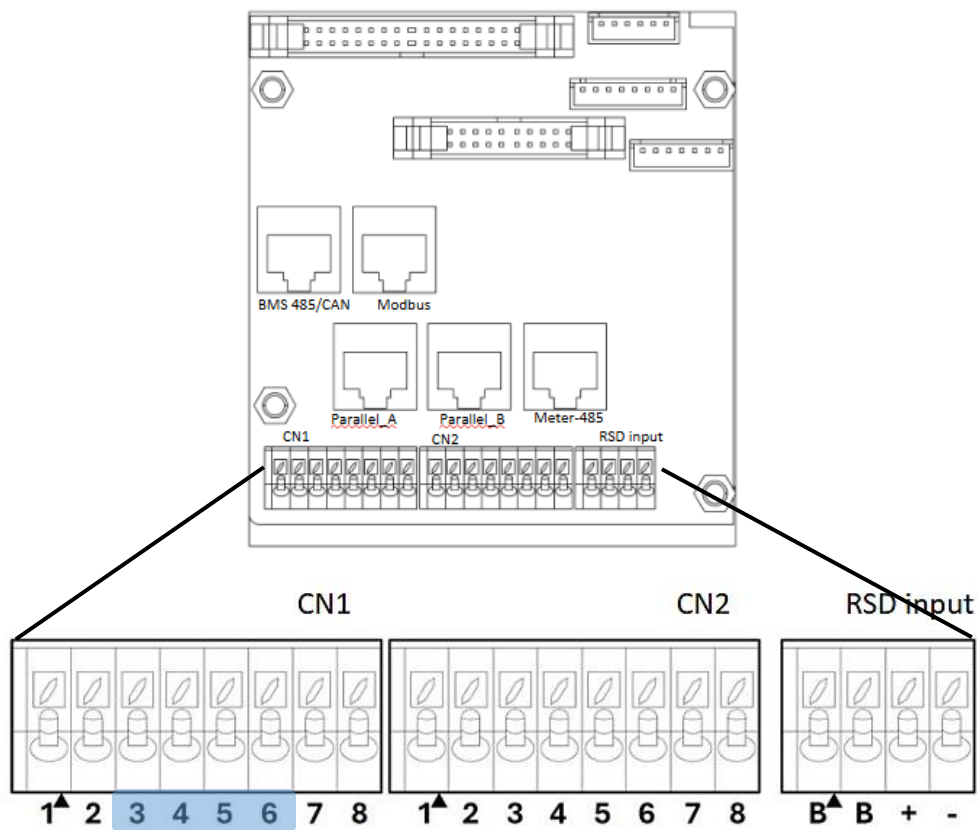
More Information

External CT Sensors (Step 5 Details Continued)

CONN Board CT Sensor Pins

1. Determine whether CT sensors are needed for your installation:
 - Use if system has non-backed loads upstream
 - Use if **Peak Shaving** will be enabled
 - Use for multi-inverter installation
 - Not necessary for whole system backup
 - Not necessary for off-grid unless peak shaving a backup generator into grid port

Limit Sensor Overview



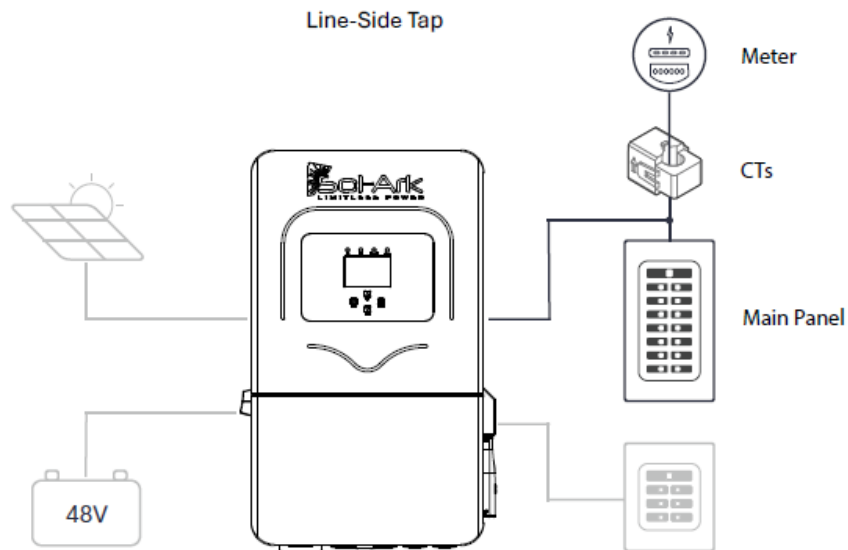
➤ See the [12K-2P-LL Installation Manual](#) for more on the CT sensors board.

More Information

External CT Sensors (Step 5 Details Continued)

CONN Board

- A. Confirm CTs are sized appropriately for amperage of service used
- B. Determine the distance from CT placement to CONN sensor board input in case an extension is needed
- C. Install CTs between meter and line side tap
- D. If using a generator, install CTs between the generator and Sol-Ark inverter AC input
- E. Verify correct A and B phase from the AC power source before clamping the CTs
- F. Make sure CTs are oriented correctly, with the arrow facing away from Meter or Generator
- G. Check HM values on detailed volt screen to ensure correct power readings



- See the [12K-2P-LL Installation Manual](#) for more information on external CTs.

More Information

External CT Sensors (Step 5 Details Continued)

Wiring the CT Sensor

Be sure to use the correct pin out for external CT wiring on CN1. Confirm on the detailed voltage screen that power flow is correct by reviewing the HM values for each phase. Positive (+) values indicate power being imported, and negative (-) values indicate power being exported.

- A. Connect CT1 of line L1 to pins **3** (white) & **4** (black) of the pin board (CN1).
- B. Connect CT2 of line L2 to pins **5** (white) & **6** (black) of the pin board (CN1).
- C. Keep the wires twisted (white-black) throughout the connection.
- D. If the wires need to be extended, use a CAT 6 (shielded) cable to make an extension.

More Information

External CT Sensors (Step 5 Details Continued)

Generator Dry Contact

If applicable, use pins **1** and **2 on CN2** for generator auto-start:

- Dry contact relay that is Normally Open (NO)
- Closes based on the Grid/Gen start battery SOC/V setpoint being triggered in battery settings
- Optional battery setting **Gen Force** is recommended to test the generator's 2-wire start functionality
- Do NOT induce power through these pins or non-warranty damage may occur.

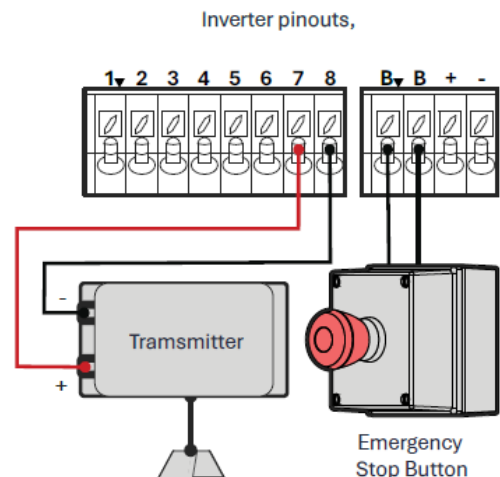
Emergency Stop

A. Rapid shutdown compliance requires using pins **B+** and **B-** to initiate the emergency stop of the system when activated.

- An open circuit that closes when the push button is activated
- Causes loss of voltage on **LOAD** output, loss of 12 V_{DC} on pins **7** and **8**, and PV voltage

B. Optional 12 V_{DC} supply energize rapid shutdown transmitters using pins **7** and **8**

- 100m A limit for sensor pins, so must verify specifications of transmitter current
- If >100m A is required, then energize the transmitter of a circuit on **LOAD** output (may require 120 V_{AC} to 12 V_{DC} power supply)



More Information

Connection Requirements (Step 6 Details)

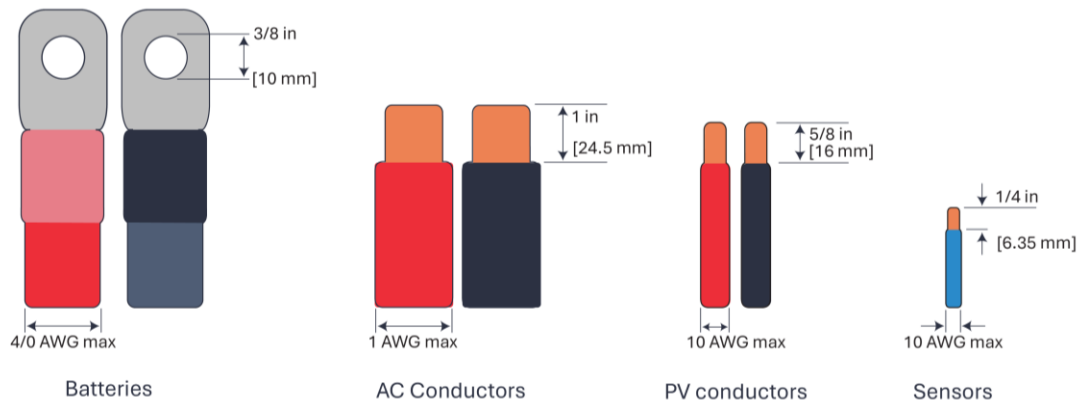
AC/DC Connection Requirements

All wire runs should be sized to be at or below a 2.5% voltage drop at full load. Equipment wire sizing must comply with the NEC or local electrical code.

Port	Terminal Rating	Terminal Wire Size Range (min-max)
GRID	100A AC	2 – 1 AWG
LOAD	100A AC	2 – 1 AWG
GEN	60A AC	4 – 1 AWG
MPPT	60A ISC	10 AWG
Battery	300A DC	2/0 – 4/0 AWG

Sensors and Communications Requirements

Component	Wire Size Range	Max Distance
CT Sensor	18-23 AWG	0' – 10' [3 m]: 23 AWG included 10' – 150' [50 m]: CAT6 extendable
Communications	24 – 23 AWG	0' – 100' [30 m]: 24 AWG 100' – 400' [120 m]: 23 AWG
RJ45 Parallel Communication	CAT 5E or better	0' – 7' [2.1 m]: Included 7' – 20' [6m]: Extendable



More Information

Connection Requirements (Step 6 Details Continued)

Fastener Torque Table

NOTE: Do not use impact drivers to tighten any fasteners on the inverter.

Description	Torque [in-lb]	Torque [Nm]
Battery terminals	46 in-lb	5.2 Nm
GEN terminal	26.5 in-lb	3 Nm
LOAD terminal	26.5 in-lb	3 Nm
GRID terminal	26.5 in-lb	3 Nm
Ground/Neutral Busbars	26.5 in-lb	3 Nm

➤ Return to [Step 7. Integrate batteries with Inverter.](#)

More Information

Battery Communications (Step 9 Details)

The Limitless 12K inverter can establish closed-loop battery communication through an RJ-45 port labeled **BMS 485/CAN**. Communication with the battery BMS will depend on the wiring of the battery bank and the wiring to the Sol-Ark inverter.

➤ For more information, see the [Sol-Ark Low Voltage Battery Integration Guide](#)

More Information

Turn Inverter On (Step 10 Details)

Power-ON Sequence

- A. Turn ON the battery and external battery switch (if applicable)
- B. Press the inverter power button and wait for the normal LED to light
- C. Turn ON the PV Disconnect and wait for the DC LED to light
- D. Turn ON the external grid AC Disconnect or breaker feeding **GRID** input and wait for the AC LED to light
- E. Turn ON the external load AC Disconnect or breaker feeding backup load panel

Power-OFF Sequence

- A. Turn OFF the external load AC Disconnect or breaker feeding backup load panel
- B. Turn OFF the external grid AC Disconnect or breaker feeding **GRID** input
- C. Turn OFF the PV Disconnect
- D. Press the inverter power button and wait for the normal LED to turn OFF
- E. Turn OFF the Sol-Ark Battery Breaker and external battery switch (if applicable)

More Information

Battery Setup screens (Step 11 Details)

The image displays four screenshots of the 'Batt Setup' software interface, showing different tabs and settings for battery configuration.

- Top Left Screenshot:** Shows the 'Batt' tab with fields for 'Batt Capacity' (400Ah), 'Max A Charge' (220A), 'Max A Discharge' (220A), and 'TEMPCO' (-0mV/C/Cell). It also includes checkboxes for 'Use Batt V Charged', 'Use Batt % Charged', 'No Battery', 'BMS Lithium Batt' (checked), and 'Activate Battery' (checked). Buttons for 'CANCEL' and 'OK' are at the bottom.
- Top Right Screenshot:** Shows the 'Discharge' tab with fields for 'StartV' (49.0V), 'Start%' (60%), 'A' (10A), 'Float V' (55.9V), 'Absorption V' (55.9V), 'Equalization V' (55.9V), and '30 Days' (1.0 hours). It also includes checkboxes for 'Gen Charge' and 'Grid Charge', and a 'Generator Exercise Cycle Day & Time' field (Mon 08 :00 4 min). Buttons for 'CANCEL' and 'OK' are at the bottom.
- Bottom Left Screenshot:** Shows the 'Smart Load' tab with fields for 'Shutdown' (46.0V), 'Low Batt' (47.5V), 'Restart' (53.0V), 'Batt Empty V' (47.0V), 'Batt Resistance' (8mOhms), 'Batt Charge Efficiency' (99.0%), and 'BMS_Err_Stop' (checked). Buttons for 'CANCEL' and 'OK' are at the bottom.
- Bottom Right Screenshot:** Shows the 'WindTurbine' tab with checkboxes for 'Use gen input as load output', 'On Grid always on', 'For AC Coupled input to Gen', and 'AC couple on grid side'. It also includes fields for 'High Frz' (62.00Hz), 'Smart Load OFF Batt' (51.0V), 'Smart Load ON Batt' (54.0V), and 'Solar Power (W)' (500W). Buttons for 'CANCEL' and 'OK' are at the bottom.

Batt

Batt Capacity: Specifies the capacity of the battery bank in Amp Hour (Ah).

- Batteries in series → Voltage adds up (V).
- Batteries in parallel → Capacity adds up (Ah).

Max A Charge: Sets the maximum charge current (A) rate to the batteries when charged from solar power → 220A max allowed.

Max A Discharge: Sets the maximum discharge current (A) rate from the batteries → 220A max allowed.

More Information

Battery Setup (Step 11 Details Continued)

TEMPCO: Temperature coefficient used in conjunction with the battery temperature sensor to adjust optimal voltages for lead-acid batteries.

NOTE: Lithium batteries do not require a TEMPCO setting (-0 mV/C/Cell).

Use Batt V Charged: Displays battery charge in terms of voltage.

Use Batt % Charged: Displays battery charge in terms of %. The inverter uses algorithms measuring power in and out to estimate a true value for state-of-charge %. It compensates for aging batteries.

No Battery: This option MUST be selected if there is no battery. A power cycle sequence is REQUIRED when selecting this option.

BMS Lithium Batt: Allows closed-loop communication with the tested batteries included in Sol-Ark's [Battery Integration Guide](#). See www.sol-ark.com/battery-partners for complete list of compatible batteries.

Activate Battery: This option MUST be selected if the system has batteries, especially Lithium batteries.

Charge

Float V: Lower steady voltage at which the battery is maintained after being fully charged. Set according to manufacturer specs.

Absorption V: Constant voltage used to charge the battery.

- Absorption will stop at 98% of the capacity of the battery bank and then drop to the Float setpoint.
- Example: A 400Ah battery will stop charge reaching 392Ah.

Equalization V: Voltage that the system uses to generate a calculated overcharge, utilizing a higher voltage or equal to the absorption to remove the generation of sulfates in batteries. Used to balance internal cells.

NOTE: Most Lithium batteries do not need to equalize.

More Information

Battery Setup (Step 11 Details Continued)

Days: The period between equalization cycles.

Hours: The period taken to equalize batteries.

NOTE: If **Hours** is set to **0** hours, the system will not equalize batteries.

Gen Charge: Uses the **GEN** AC source to charge the battery bank.

- **Start V:** Voltage at which the system will auto-start and allow a generator or AC source to charge the battery.
- **Start %:** SOC at which the system will auto-start and allow a generator or AC source to charge the battery.
- **A:** Maximum rate of charge to the batteries (per terminal) from the generator or AC source (DC amps). Set value according to the generator size.

Grid Charge: There are two scenarios in which this option is used:

- **Grid connected to GRID input:** The inverter will limit the charge rate to the set value in “**A**” and the battery will charge to 100% SOC.
- **Generator connected to GRID input:** It will be necessary to select ☒ **GEN connect to Grid input**. The system will use **Start V**, **Start%**, and **A** conditions to charge the battery and stop charging at 95% SOC. Adjustable upper limit if Time of Use is enabled.

Gen Exercise Cycle (Day & Time): Set a weekly generator exercise schedule. (Day of the week/time/duration length).

Gen Force: Test function for generator auto-start. Enable and press OK to close normally open relay (pins 1, 2 on CN2) and force the generator on. Disable and press **OK** to disengage. The generator will not provide power during this test if grid power is available.

NOTE: The gen must be in automatic mode if applicable and must have a two-wire start (dry-contact, normally open) connected to the Sol-Ark. To disable the Gen exercise, adjust the time duration to 0 min.

More Information

Battery Setup (Step 11 Details Continued)

Discharge

Shutdown: Battery voltage or % at which the inverter will shut down to protect the battery from an over discharge situation (battery symbol on the home screen will turn red).

Low Batt: Low battery voltage or % (battery symbol on the home screen will turn yellow). Stopping point for TOU.

Restart: Battery voltage or % at which AC output will resume after previously reaching shutdown.

Batt Resistance: Internal resistance of mOhms from the battery bank. Used in % SOC batt calculations.

Batt Charge Efficiency: Value provided by battery manufacturer. Used in % SOC batt calculations.

Batt Empty V: Sets the empty voltage and associates this voltage to 0% SOC. This value determines the lowest % SOC limit.

BMS_Err_Stop: Enables system stop when there is a loss of battery communications.

IMPORTANT: Continuous **GEN** input/output of **60A. DO NOT EXCEED.**

More Information

Battery Setup (Step 11 Details Continued)

Smart Load

- A. This mode uses the **GEN** input as a load output that delivers power when the battery exceeds a user programmable threshold or when the Sol-Ark is connected to the grid.
- B. When ☒ **Use gen input as load output** is enabled, the **GEN** input turns into an output to power high-power loads such as a water heater, irrigation pump, AC unit, pool pump, or any other load.
- C. When ☒ **On Grid always on** is enabled, the **GEN** terminal will always output power as long as the grid is connected, regardless of battery charge.
 - **Smart Load OFF Batt:** Battery voltage or % at which the **GEN** terminal will stop outputting power.
 - **Smart Load ON Batt:** Battery voltage or % at which the **GEN** terminal will start outputting power.
 - **Solar Power (W):** Amount of PV production needed before **GEN** terminal starts outputting power.

More Information

Battery Setup (Step 11 Details Continued)

AC Coupling Settings - (for AC Coupled Input)

- A. Grid-tied systems with AC coupled solar arrays must have the ☒ **Grid Sell** check box enabled. Be sure you are allowed to sell back to the grid.
- B. To use the **GEN** terminal as an AC coupling input for micro inverters or string inverters, enable the check box ☒ **For AC Coupled Input to Gen.**
- C. In off-grid systems, the Sol-Ark will use frequency shifting to control the AC coupled solution based on the battery SOC. The meaning of **Smart Load OFF Batt** and **Smart Load ON Batt** will change in this mode.
 - **Smart Load OFF Batt:** The % SOC at which the AC coupled inverters turn OFF. **90% recommended.**
 - **Smart Load ON Batt:** The % SOC at which the AC coupled inverters turn ON. **80% recommended.**

➤ Return to [Step 11. Set up battery communications.](#)

More Information

Connecting PV Modules (Step 12 Details)

NOTE: The Sol-Ark 12K-2P-LL has 3 independent MPPTs that support up to 2 PV strings each. MPPTs can handle a maximum VOC of 500V and an ISC of 60A but will self-limit and operate at 32A max.

- A. Max Usable PV Power = 19.2 kW ($\pm 5\%$) | Max input power per MPPT = 6.4 kW | Max recommended input voltage per MPPT = 425 VOC | Max input current per MPPT = 32A (self-limiting).
- B. Design for an input current of 32A per MPPT. The inverter will self-limit beyond 32A. If ISC exceeds 60A, damage will occur.
- C. PV Source Circuit max voltage of 500 V_{DC}; damage can occur with PV strings whose open-circuit voltage exceeds 500 V_{DC}

NOTE: Strings in parallel on the same MPPT must have the same designed open-circuit voltage (Voc); the system will be limited to the lowest string voltage.

- PV1 A/B must have the same Voc.
- If the solar panels are oriented in different directions and connected in the same MPPT, there will be a loss in PV efficiency.

NOTE: According to NEC Art 690.43, exposed non-current-carrying metal parts of PV module frames, electrical equipment, and conductor enclosures of PV systems shall be connected to an equipment grounding conductor. All grounding conductors and grounding electrodes should be installed according to NEC Art 690.47 or as required by the AHJ.

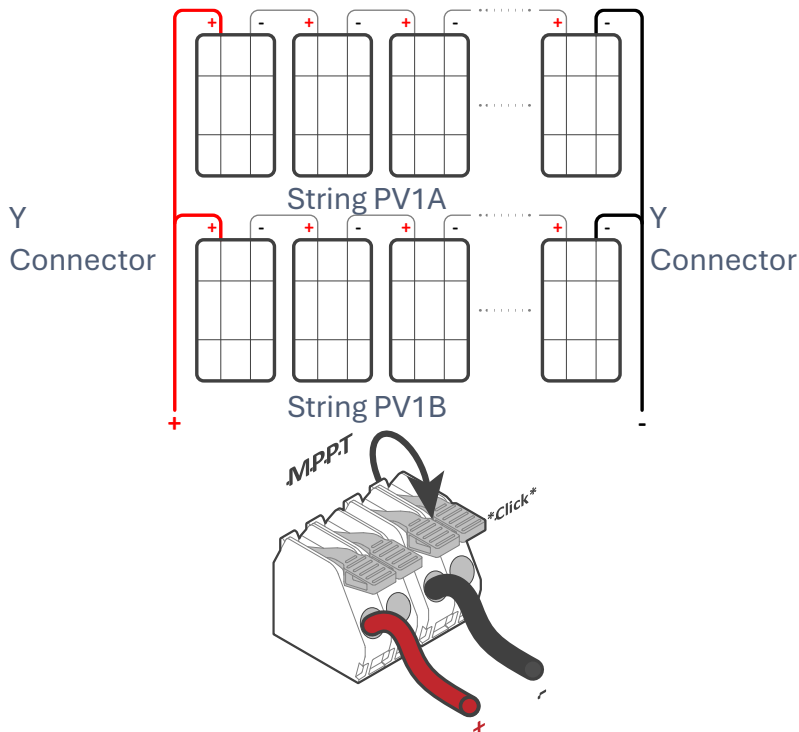
- D. For ground-mounted arrays, Sol-Ark recommends installing an auxiliary grounding electrode placed near the array to ensure optimal earth-to-ground resistance of the grounding system. This auxiliary electrode would need to follow the requirements of NEC Art 250.54.

More Information

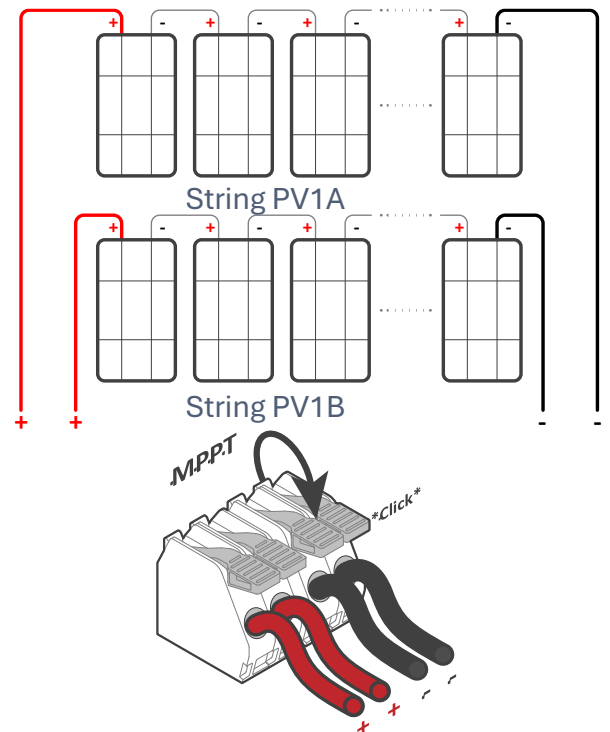
Connecting PV Modules (Step 12 Details Continued)

- A. Connect the solar panel strings using either of the following configurations:

“Y” connection



Individual strings



- Return to [Step 13. Check PV wiring polarity.](#)

More Information

Check Grid Parameters (Step 15 Details)

The 'Grid Param' interface consists of six panels. The top-left panel shows 'Grid Mode' set to 'UL1741SB', 'Grid Frequency' at 60Hz, and '120/208V 3 Phase' selected. The top-right panel shows 'Reconnect' and 'Normal connect' settings for voltage and frequency. The middle-left panel shows 'Over Voltage U>(10 min. running mean)' at 132.0V and various HV/LV voltage and frequency limits. The middle-right panel shows 'Over frequency' and 'Under frequency' droop and frequency settings. The bottom-left panel shows 'V(W)' and 'V(Q)' parameters for four phases. The bottom-right panel shows 'P(Q)' and 'P(F)' parameters for four phases.

Grid Selection

Grid Mode: Tap and use navigation arrows to cycle through different grid modes:

General Standard: Applies general grid interconnection standards. Enables grid frequency and voltage adjustments. (Useful for off-grid applications with backup generators).

UL1741 & IEEE1547: Applies UL 1741 and IEEE 1547 grid interconnection requirements and standards.

More Information

Check Grid Parameters (Step 15 Details Continued)

SRD-UL-1741: Applies UL 1741SB grid interconnection requirements and standards.

Grid Frequency: Frequency of the AC sine wave.

Grid Reconnect Time: The amount of time in seconds the inverter will wait before reconnecting to the grid.

Fixed PF: Allows for power factor correction, ± 0.8 to 1.0

Fixed Q: Allows for power factor correction based on desired reactive power percentage.

Grid Level: Tap and use navigation arrows to cycle through different nominal grid voltage levels.

NOTE: Grid level must be selected according to nominal grid voltage.

These are the most common Grid levels:

- LN:120 V_{AC} LL:240 V_{AC}
- LN:120 V_{AC} LL:208 V_{AC}

More Information

Check Grid Parameters (Step 15 Details Continued)

Connect

Reconnect: Parameters used to determine an allowable range of frequency and voltages to dictate a reconnection to the grid after initial grid loss.

Frequency and voltages must be within these margins during **Grid Reconnect Time** to allow grid reconnection.

NOTE: Parameters will be set automatically based on selected grid mode compliance, unless **General Standard** is selected.

Normal connect: Parameters used to determine an allowable range of frequency and voltages to retain connection to the grid following a reconnect and normal operation.

NOTE: Parameters will be set automatically based on selected grid mode compliance, unless **General Standard** is selected.

- Reconnect Ramp Rate: Reconnection power ramp time in seconds.
- Normal Ramp Rate: Startup power ramp time in seconds.

IP

HV1/HV2/HV3: Overvoltage protection point.

LV1/LV2/LV3: Undervoltage protection point.

HF1/HF2/HF3: Over frequency protection point.

LF1/LF2/LF3: Under frequency protection point.

F(W)

F(W): Enables the use of Frequency-Watt. The Sol-Ark regulates its power output to the grid as a function of the frequency to support grid stabilization during over and under-frequency conditions.

More Information

Check Grid Parameters (Step 15 Details Continued)

Droop F: Percentage of inverter's nominal power increase / decrease per Hertz (Hz).

Start freq F: Frequency at which the inverter will start decreasing active power by the programmed Droop F percentage.

Stop freq F: Frequency at which the inverter will stop decreasing active power by the programmed Droop F percentage.

V(W) / V(Q)

V(W): Enables the use of Volt-Watt. The Sol-Ark regulates active power output to the grid as a function of voltage to support stabilization during over and under-voltage conditions.

V(Q): Enables the use of Volt-VAr. The Sol-Ark regulates reactive power output to the grid as a function of the voltage to support stabilization during over and under-voltage conditions.

V, P & Q: Percentage of nominal grid voltage (V) to which the Sol-Ark will reduce its active power (P) or reactive power (Q).

P(Q) / P(F)

P(Q): Enables the use of Watt-VAr to regulate reactive power output according to programmable active power parameters.

P(F): Enables PF regulation according to programmable active power parameters.

NOTE: Follow electrical grid code before changing grid settings.

➤ Return to [Step 15. Check Grid Parameters.](#)

More Information

Test Island Mode (Step 17 Details)

The graphic shows the detailed voltage screen when performing island test.

Solar	Grid	INV	UPS LD	Batt
0W	0W 0.0Hz	0W 60.0Hz	0W 120V	220W 71%
M1: 0V 0.0A 0W	0V HM: 0W	120V 0.7A	0W 120V	52.94V I: 4.1 A
M2: 0V 0.0A 0W	LD: 0W 0V	0W 120V	0W Gen 0V	21.6C TEMP
M3: 0V 0.0A 0W	HM: 0W LD: 0W	0.6A 0W	L1: 0W L2: 0W 0.0Hz	DC: 25.3C AC: 26.0C

Details screen

➤ Return to [Step 17. Test Island Mode.](#)

More Information

Alternate Method for Connecting to Wi-Fi using IP Address (Step 18 Details)

You can configure a Wi-Fi network through an IP address.

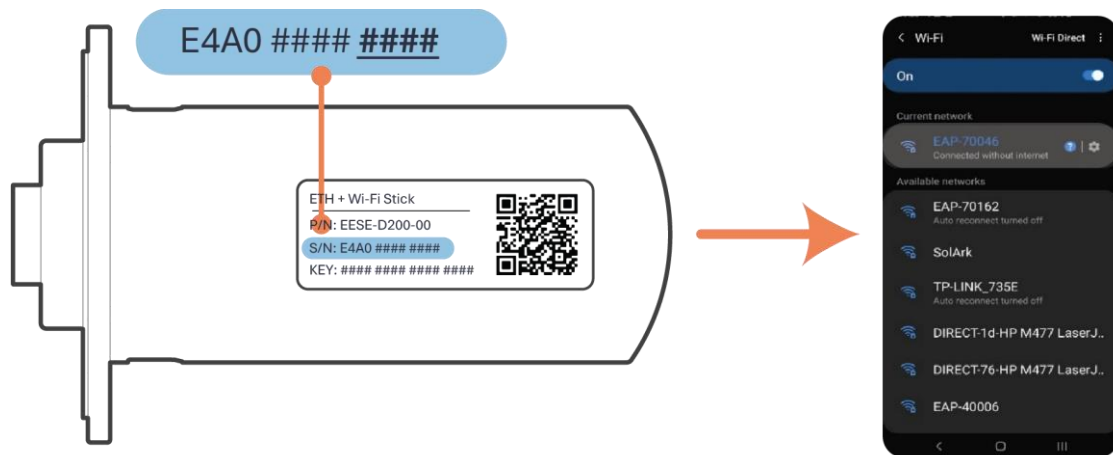
1. On a Smartphone or Computer, connect to the **EAP-#####** network. Go to: **Settings > Wi-Fi > EAP-##### network**.
2. Type in the password, which depends on the product you received:

If you see “KEY” printed on the dongle, the 16-digit password is printed there

If there is no “KEY” printed on the dongle, the password is **12345678**

The EAP-##### network contains the last 5 digits of the Dongle serial number. You can find this number on the label.

3. A message such as “Connected without internet” appears when the device is connected to the EAP-#####.



Locating the Dongle Network Name

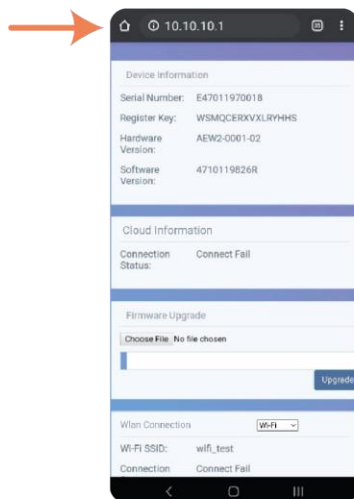
NOTE: The Wi-Fi dongle does NOT provide internet access. It needs an external internet provider to connect to. The dongle is compatible with Wi-Fi signal broadcasted at 2.4 GHz (it is not compatible with 5 GHz networks).

More Information

Alternate Method for Connecting to Wi-Fi using IP Address (Step 18 Details Continued)

4. After you're connected, open an internet browser on the same device, such as Safari, Chrome, Firefox, Edge, or any other browser.
5. On the address bar (http://.....), type the IP address: **10.10.10.1** as shown in the figure below. If you cannot access the configuration page, try again on a different device.
6. Scroll down to the "**Wlan Connection**" section and tap the **Scan** button to scan for local Wi-Fi networks.
7. Nearby Wi-Fi networks will appear. Select the local network you want to connect to, input your credentials, and tap **Connect**.
8. Once connected, a "Connection Successful" message will appear. Tap the **Save** button next to **Scan** to save settings.
9. Wait about 5 minutes. The dongle will connect to the Wi-Fi network and will then have access to MySolArk.

NOTE: DO NOT connect to the EAP-##### network as that is the Wi-Fi dongle itself. The device does not provide internet access.



a. Internet Browser IP Address



b. Wi-Fi Network Scan

➤ Return to [Step 18. Connect the Dongle.](#)

More Information

Create a Plant on MySolArk (Step 19 Details)

1. **Download and install the MySolArk app** for Android or Apple smartphones. QR codes are provided below.



Google Play Store

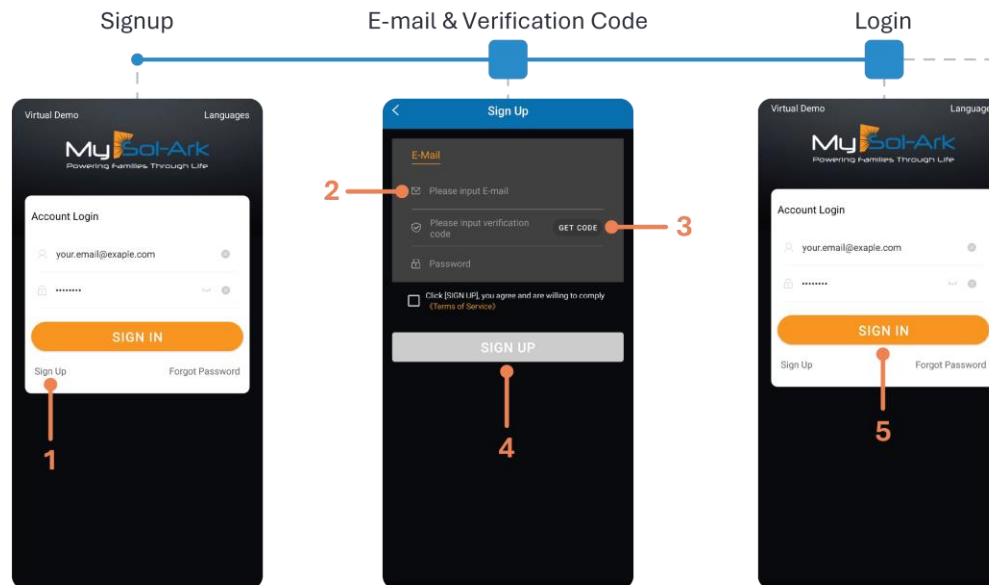


MySolArk



Apple App Store

2. Create a MySolArk account and log in.



More Information

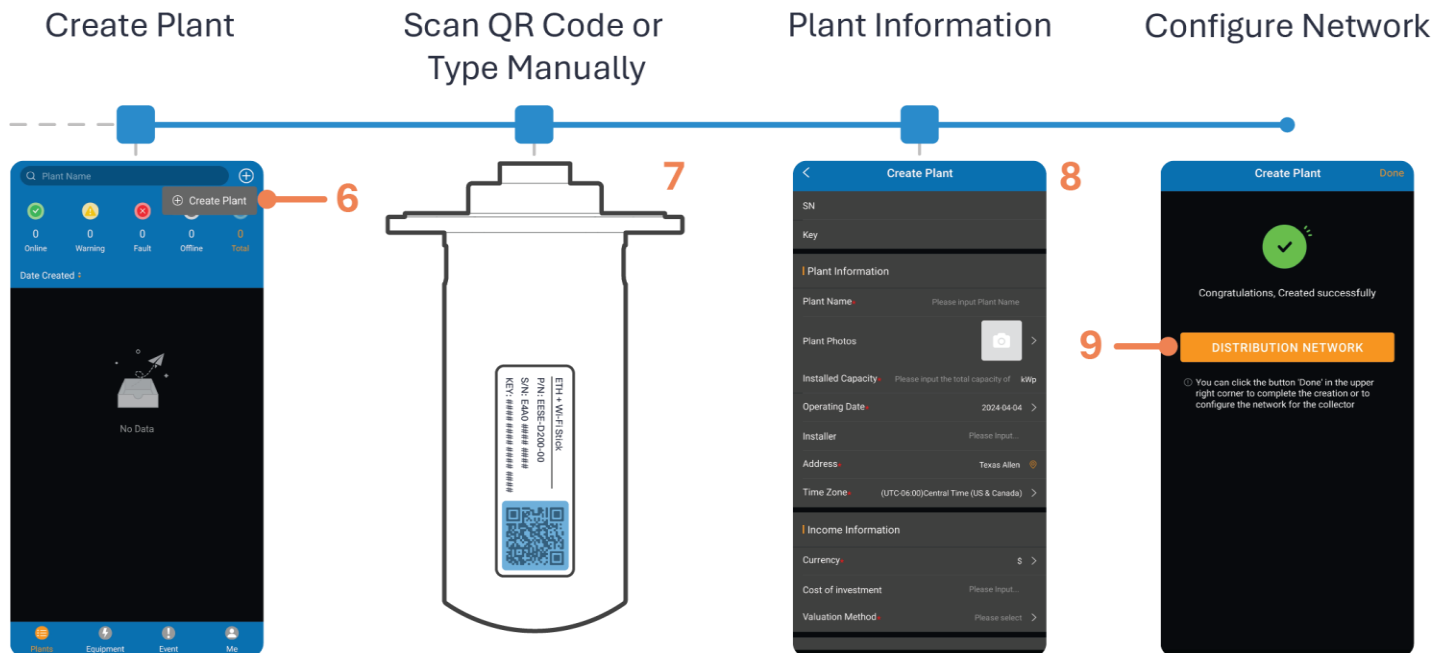
Create a Plant on MySolArk (Step 19 Details Continued)

1. Create the Plant.

For Installers:

- A. Create the plant and configure the system before sharing it with the owner.
- B. After creating and configuring the plant, the installer can share and grant manager permissions to the owner by navigating to **My Plants** → ... → **Share** → **Add Account**.

The homeowner must create their own MySolArk account first.

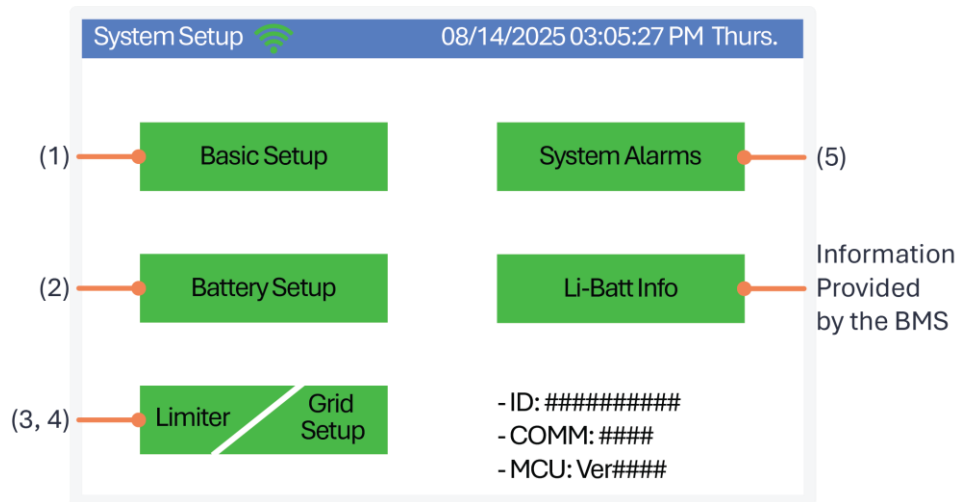


➤ Return to [Step 19. Create the plant.](#)

More Information

System Work Modes (Step 22 Details)

To access different work modes, go to **System Setup** → **Limiter** tab (3).



Limiter Param	
Limiter	Other
☐ Grid Sell	12000
☐ Limited Power to Home	
☒ Limited Power to Load	
☐ Time of Use	Setup
CANCEL OK	

Time	Power(W)	Batt	Charge	Sell
01:00AM	2000	50%	☐	☐
05:00AM	2000	50%	☐	☐
09:00AM	2000	100%	☐	☐
01:00PM	2000	100%	☐	☐
05:00PM	2000	50%	☐	☐
09:00PM	2000	50%	☐	☐

Grid sell mode

Allows excess produced PV to back-feed GRID input to the utility

- Will not export power with loss of grid
- Will not export if inverter detects generator
- Maximum amount of power is determined by programmed wattage

More Information

System Work Modes (Step 22 Details Continued)

Limited Power to Home

Allows inverter to track total backup and non-backed up loads using external CTs

- If grid sell is NOT enabled with LPH, inverter will back-feed **GRID** input with excess PV to zero non-backed loads
- If grid sell is enabled with LPH, inverter will back-feed all excess PV through **GRID** input and system will correct report export amount

Limited Power to Load

Allows inverter to track backup load power from only the **LOAD** terminals

- If grid sell is NOT enabled with LPL, inverter will limit PV to cover only backup loads
- If grid sell is enabled with LPL, inverter will back-feed **GRID** input with excess PV to the grid sell power amount

More Information

System Work Modes (Step 22 Details Continued)

Time of Use (TOU)

The main purpose of TOU mode is for batteries to assist with load demand.

Found in the **Limiter** tab, Time of Use mode is used in conjunction with **Limited Power to Home** or **Limited Power to Load** and optionally **Grid Sell** if excess PV power is allowed to backfeed the grid. The main purpose of TOU mode is for batteries to assist with load demand.

TOU mode has six different time slots over a 24-hour period to control the batteries charge/discharge behavior during operation:

Power(W) column is the max amount of power batteries will send.

- Corresponding **Sell** box will force the continuous amount of power from batteries
- Corresponding **Charge** box will allow that amount of power to charge batteries from grid/generator (grid or gen charge)

Batt (%/V) column is the upper/lower limit for batteries to discharge/charge.

- With NO **Charge** or **Sell** box enabled, the batteries will discharge to cover loads down to this %/V
- When **Charge** is enabled, batteries will charge to the programmed %/V if below that value
- When **Sell** is enabled, batteries will discharge down to the programmed %/V

More Information

System Work Modes (Step 22 Details Continued)

Advanced Setting – Grid Peak Shaving

Allows system to limit the amount of power imported through the GRID input. The batteries will be used as the primary source to keep peak shaving value from being exceeded.

- Can be used for a generator wired in **GRID** input to avoid overload scenarios
- Forces TOU settings to be enabled, so must program time slots accordingly
- It's recommended to use external CTs with this feature and enable **Limited to Home** on the **Limiter** tab

The screenshot shows the 'Basic Setup' menu with several tabs: Display, Time, Advanced, Factory Reset, and Parallel. The 'Advanced' tab is selected. In the 'Advanced' tab, there are several settings:

- ☐ Solar Arc Fault ON
- ☐ Gen peak-shaving
- ☐ Grid peak-shaving (set to 8000W)
- ☐ Auto detect Home Limit Sensors
- Clear Arc_Fault (button)
- ARC parameters (list): 030000, 045000, 000800, 000050, 000530, 045000, 000100, 238094
- CT ratio (set to 2000)
- UPS Time (set to 0ms)
- CANCEL (button)
- OK (button)

Return to [Step 22. Check system performance.](#)

