Sol-Ark®
LIMITLESS POWER

RESIDENTIAL

8K-2P-L

LATAM

INSTALLATION GUIDE | USER MANUAL

Sol-Ark Library

READ THE INSTRUCTIONS COMPLETELY BEFORE OPERATING THE EQUIPMENT.

Check the grid type before turning ON the unit.

Turn ON and program the unit using only batteries.

The unit will be programmed in 120/240V Split phase at a Frequency of 60Hz, by default.

Not following the instructions may result in permanent damage to the equipment.

Warning

Sol-Ark 8K-2P-L

SOL-ARK 8K – Installation guide & manual

Disclaimer

Unless specifically agreed to in writing, Sol-Ark:

(a) Does not warrant the accuracy, sufficiency or suitability of any technical or other information provided in its manuals or other documentation.

(b) Assumes no responsibility or liability for any loss or damages, whether direct, indirect, consequential or incidental, arising out of the use of such information. Use of such information shall be entirely at the user's risk.

Sol-Ark is not responsible for system failure, damage or injury resulting from improper installation of its products.

Information in this manual is subject to change without notice.

This version is only focused on the inverter labeled as: 8K-2P-L.

Contact us:

Phone	(USA) 1-972-575-8875 ext. (2)
Email	SUPPORT@SOL-ARK.COM
Website	WWW.SOL-ARK.COM

Warning symbols

	**This symbol indicates information that, if ignored, could result in minor injury or equipment damage.**
	**This symbol indicates information that, if ignored, could cause serious injury, equipment damage or death.**
	**This symbol indicates relevant information that is not related to hazard situations.**

Warnings

Read this entire document before installing or using the Sol-Ark 8K inverter. Failure to follow any of the instructions or warnings in this document can result in electrical shock, serious injury, or death. Damage to the 8K inverter is also possible, potentially rendering it inoperable.

High Life Risk Due to Fire or Electrocution – ONLY qualified persons should install the Sol-Ark 8K inverter.

The system must have Ground connections and Neutral connections. Ground MUST be bonded to Neutral ONLY ONCE in the circuit.

Solar PV+/PV- are UNGROUNDED. Note, you may ground PV Racking/Mounts, but doing so directly to the Sol-Ark will likely result in damage in the case of a direct lightning strike to the PV array.

DO NOT connect the grid to the Load Output Terminal Block.

DO NOT reverse the polarity of batteries. Damage WILL occur.

DO NOT exceed 500Voc on any MPPT on the Sol-Ark.

DO NOT use impact drivers to tighten any fasteners on the Sol-Ark.

MUST use Strain Reliefs ON ALL wires entering/exiting the Sol-Ark 8K user area.

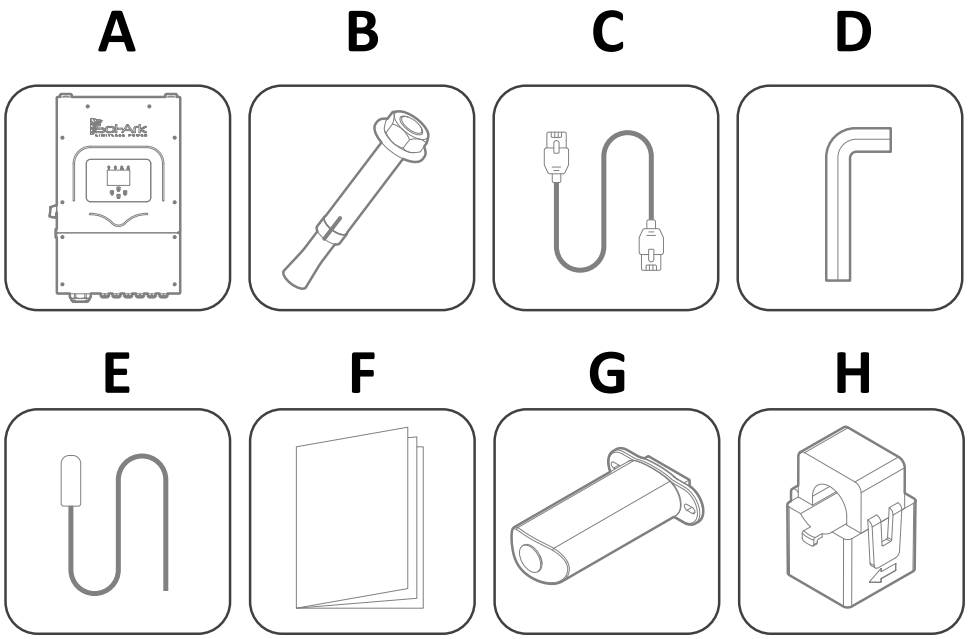
MUST use conduit (or double insulated wire) for AC Wires entering/exiting Sol-Ark 8K user area.

ALL terminals/breakers, including battery, MPPT, and AC Terminal Block inputs, should only have one conductor connecting to them.

Inspect Shipment.

A. The box should include all items shown in the component guide.
B. If there are damages or missing parts, call immediately (USA) 972-575-8875 Ext. 2

Components guide.



Object	Description	Qty
A	8K-2P-L inverter	1
B	Expansion plugs for concrete M8x80mm	4
C	CAT 5E communication cable	1
D	Allen key	1
E	Temperature sensor (3m)	1
F	User manual	1
G	Wi-Fi (Dongle)	1
H	Current transformer sensors (CTs)	2

Sol-Ark®

8K-2P-L

Spec Sheet

Central America & Caribbean

Model: "Sol-Ark-8K-120/230V"

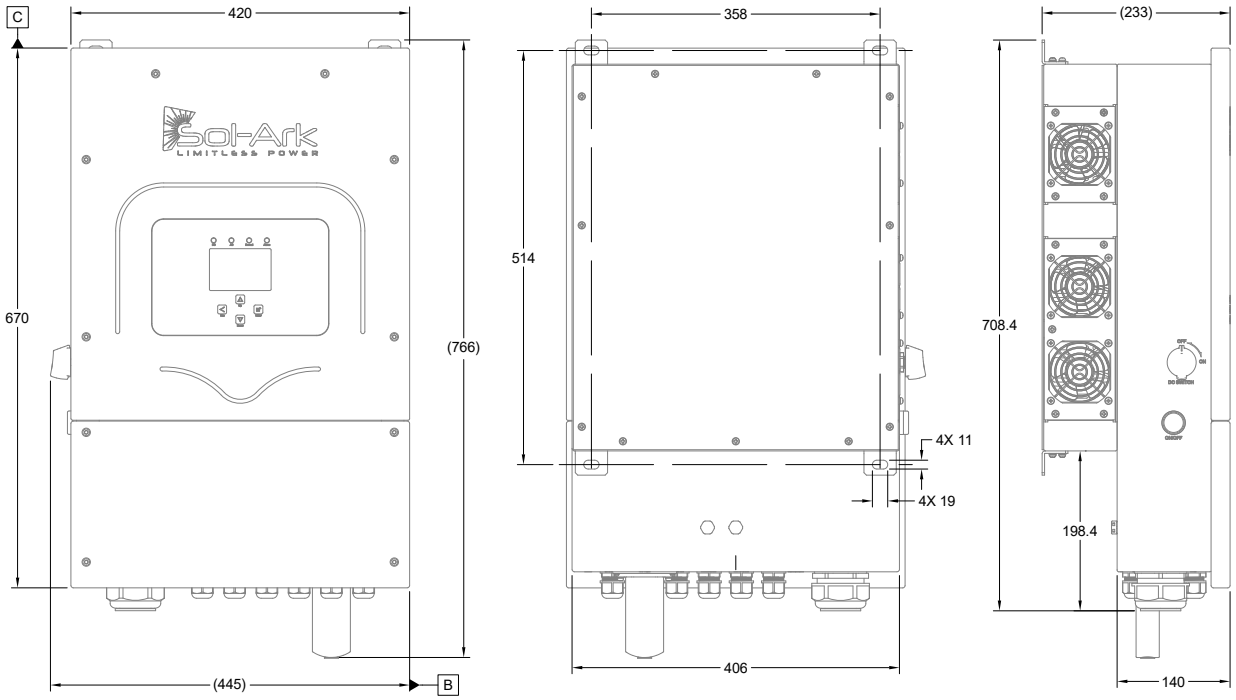
Solar String Input Data	
Max Allowed PV Power	10,400W
PV Input Voltage	370V (100~500V)
PV Input Current	18A + 18A
Starting Voltage / Min Voltage	150V
Number of MPPT / Range (V)	2 / 125-425V
Solar Strings Per MPPT	2 + 2
MPPT Efficiency	99.90%

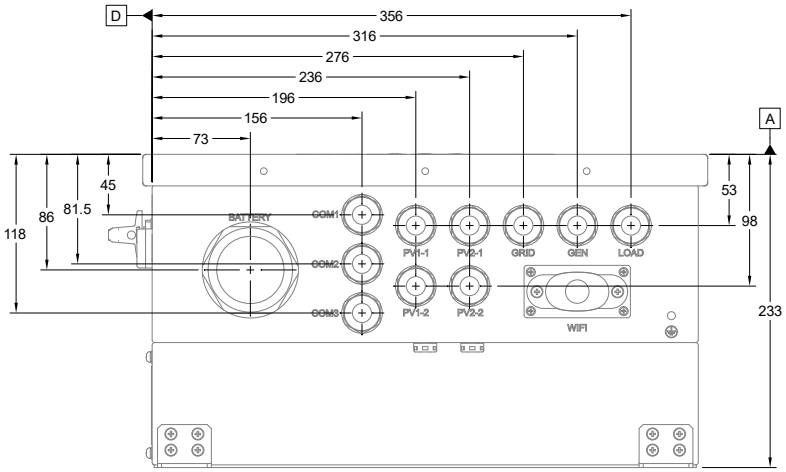
AC Output Data	
Grid Type	Split Phase 120V/240V
Rated AC Output	8,000W
Peak Power (Off-Grid)	12,000VA, 5S
Rated AC Output Current (A)	33.3A
Parallel Stacking	Yes - Up to 9
Frequency	60/50Hz
Max continuous AC passthrough (A)	50A
Max Efficiency	97.6%
Idle Consumption Typical—No Load	60W
Sell Back Power Modes	Limited to Household/Fully Grid-Tied
Design (DC to AC)	Transformerless DC
Response Time (Grid-Tied to Off-Grid)	5ms
Power Factor	+/- 0.8 - 1.0

Battery Input Data (Optional)	
Type	Lead-Acid or Li-Ion
Nominal DC Input	48V
Capacity	50 — 9900Ah
Voltage Range	40V-60V
Continuous Battery Charging Output	185A
Charging Curve	3-Stage w/ Equalization
Grid to Batt Charging Efficiency	96.0%
External Temperature Sensor	Included
Current Shunt for Accurate % SOC	Integrated
External Gen Start Based on Voltage or %SOC	Integrated
Communication to Lithium Battery	CanBus & RS485

General	
Dimensions (H x W x D)	26.4 x 16.5 x 9.2 in
Weight	70.5 lbs
Enclosure	IP65 / NEMA 3R
Ambient Temperature	-25~60°C, >45°C Derating
Noise	<30 dB
Installation Style	Wall-Mounted
Wi-Fi & LAN Communication	Included
Standard Warranty	5 Years

Protections & Certifications	
PV Input Lightning Protection	Yes
Grid Sell Back — UL1741-2010/2018, IEE-E1547a-2003/2014	Yes
Anti-Islanding Protection	Integrated
PV String Input Reverse Polarity Detection	Integrated
Insulation Resistor Detection	Integrated
Residual Current Monitoring Unit	Integrated
Output Over Current Protection	Integrated
Output shorted Protection	Integrated
Surge Protection	DC Type II / AC Type II





Temperature derating.

Optimum: -25°C to 60°C

Derating: >45°C

Shutdown with DC @100°C

Shutdown with AC @82°C

Units expressed in mm

Minimum lateral clearance = 500 mm

Sol-Ark 8K-2P-L torque values application note

Terminal “Load”	1.2 NM
Terminal “Grid”	1.2 NM
Terminal “Gen”	1.2 NM
Neutral / Ground (busbar)	1.2 NM
Cover Screws	3 NM
Battery Connection	10 NM

Do not use impact drivers to tighten any fasteners on the Sol-Ark.

*** AC Input/Outputs**: GRID-Breaker 50A MAX -> 50A passthrough , 6 AWG conductor.

LOAD-Breaker 50A MAX -> 50A passthrough , 6 AWG conductor.

*It is possible to use 10AWG conductors if using the inverter for grid sell only.

Wire gauge should be selected in compliance with your local electrical code.

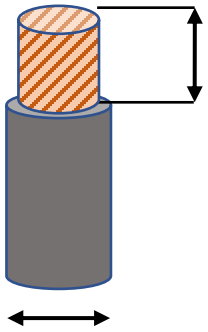
Sensors: 20-24 AWG / CT Sensors: 4m (13ft) included.

Battery temperature sensor: 3m.

RJ45 Cat 5 cable: 2m included.

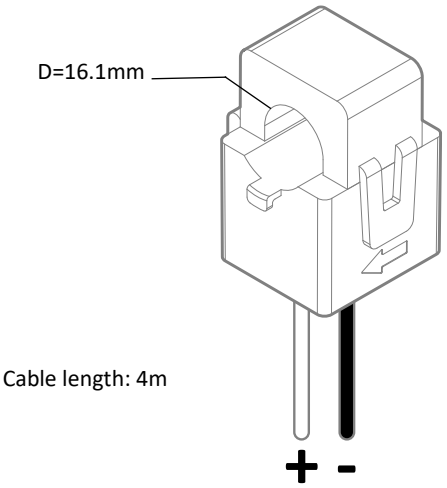
Battery Cables: 2/0 AWG (Based on "Free Air @90°C rating")

Solar panel conductors

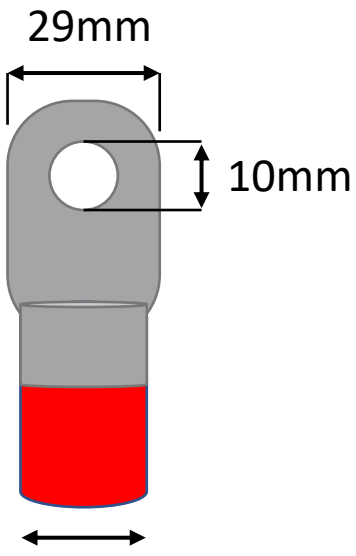


Max distance
0m – 10m: 12 AWG
10m– 90m: 10 AWG

Sensores CT (included)

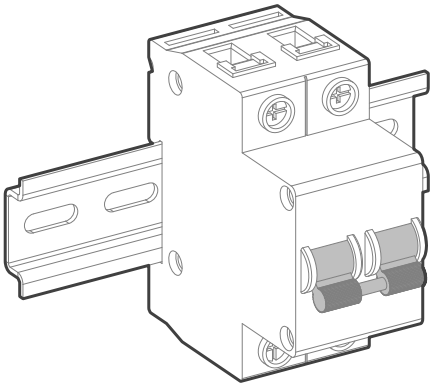


Battery cables

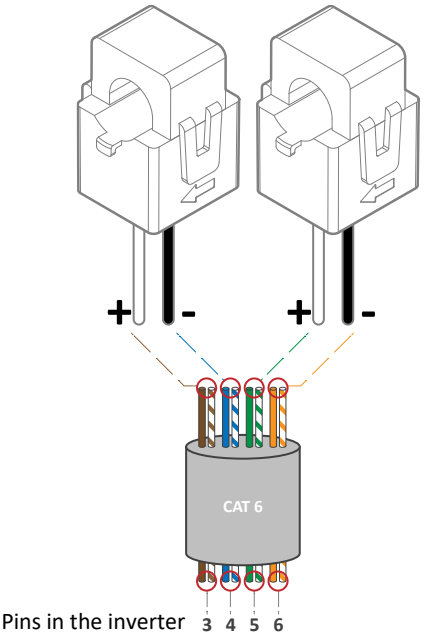


AC breaker

2 pole



CT extension



These Wiring Diagrams are examples of common use-cases for Sol-Ark inverters.

Sol-Ark does not provide custom diagrams; however, you may contact support@sol-ark.com for any questions about existing Wiring Diagrams.

Sol-Ark 8K-2P-L Diagrama estándar 120V/240V

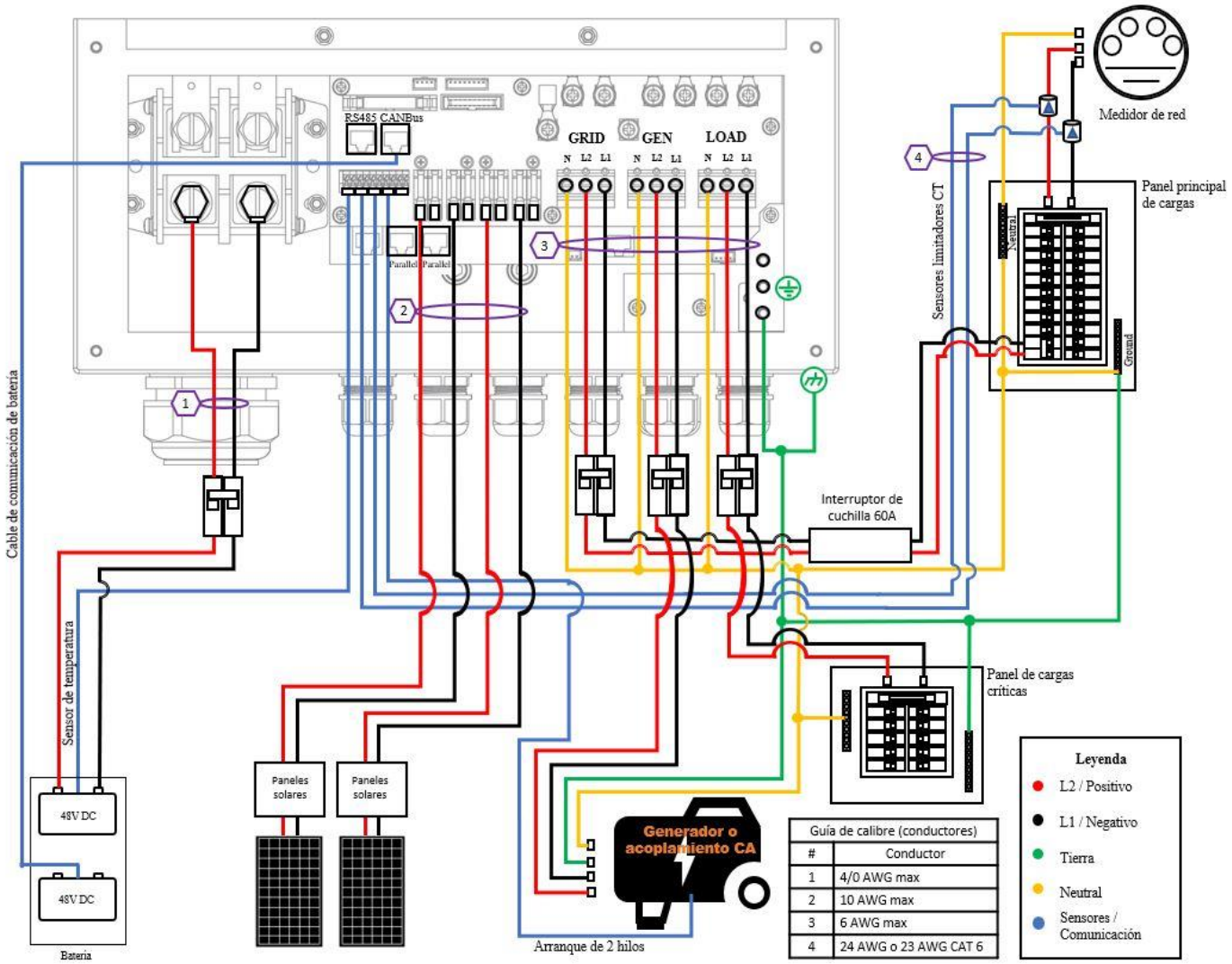


Diagram 1

* La ubicación de la unión de N-G dependerá del código de su localidad

Sol-Ark 8K-2P-L Acoplamiento CA / Micro Inversores - Diagrama estándar 120V/240V

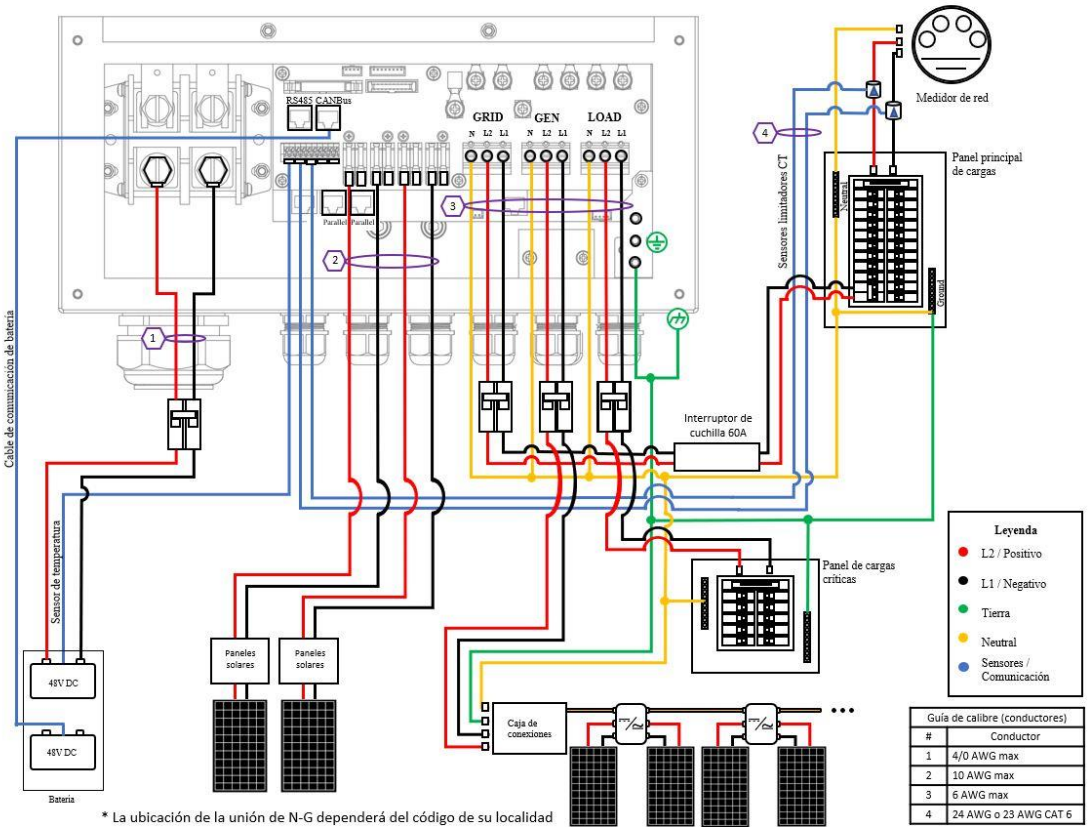


Diagram 2

Sol-Ark 8K-2P-L Acoplamiento CA en lado de cargas / Micro Inversores
Diagrama estándar 120V/240V

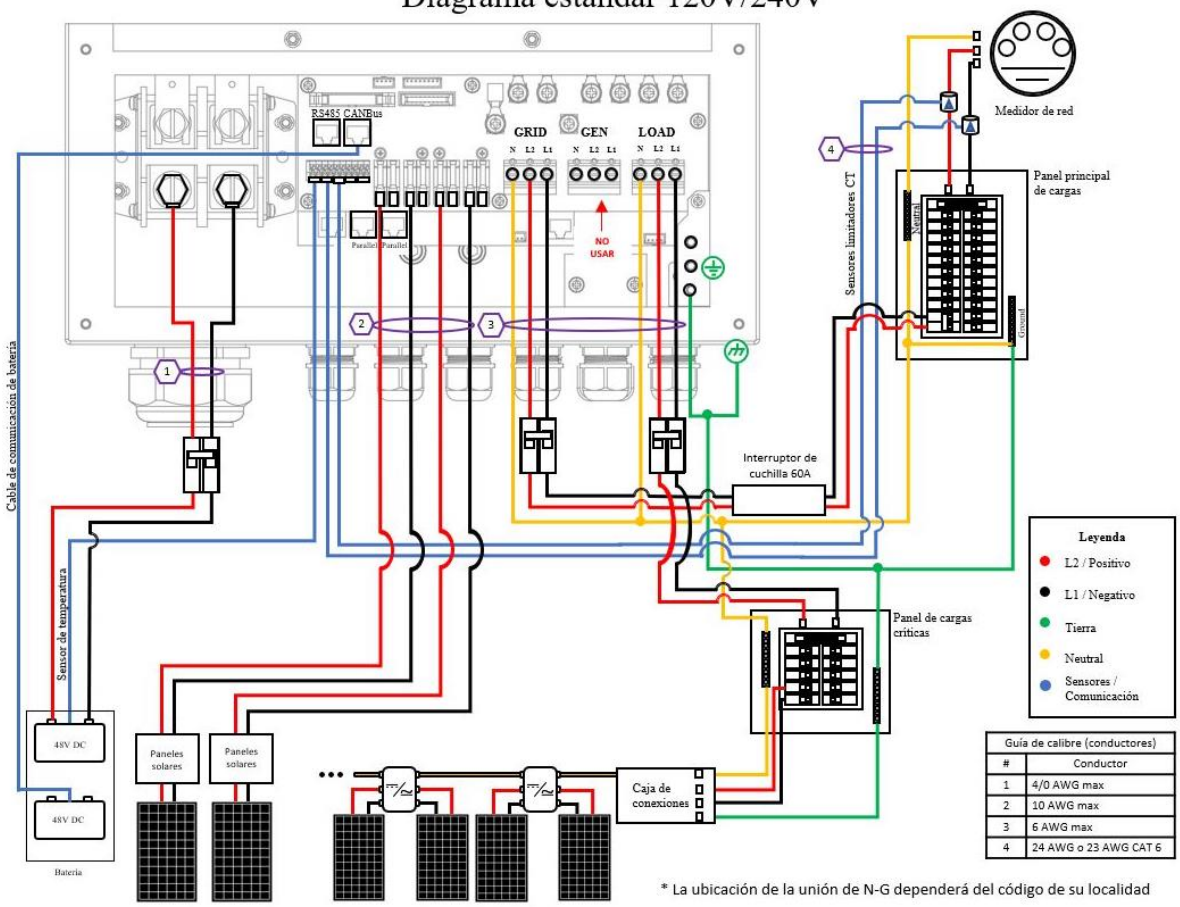


Diagram 3

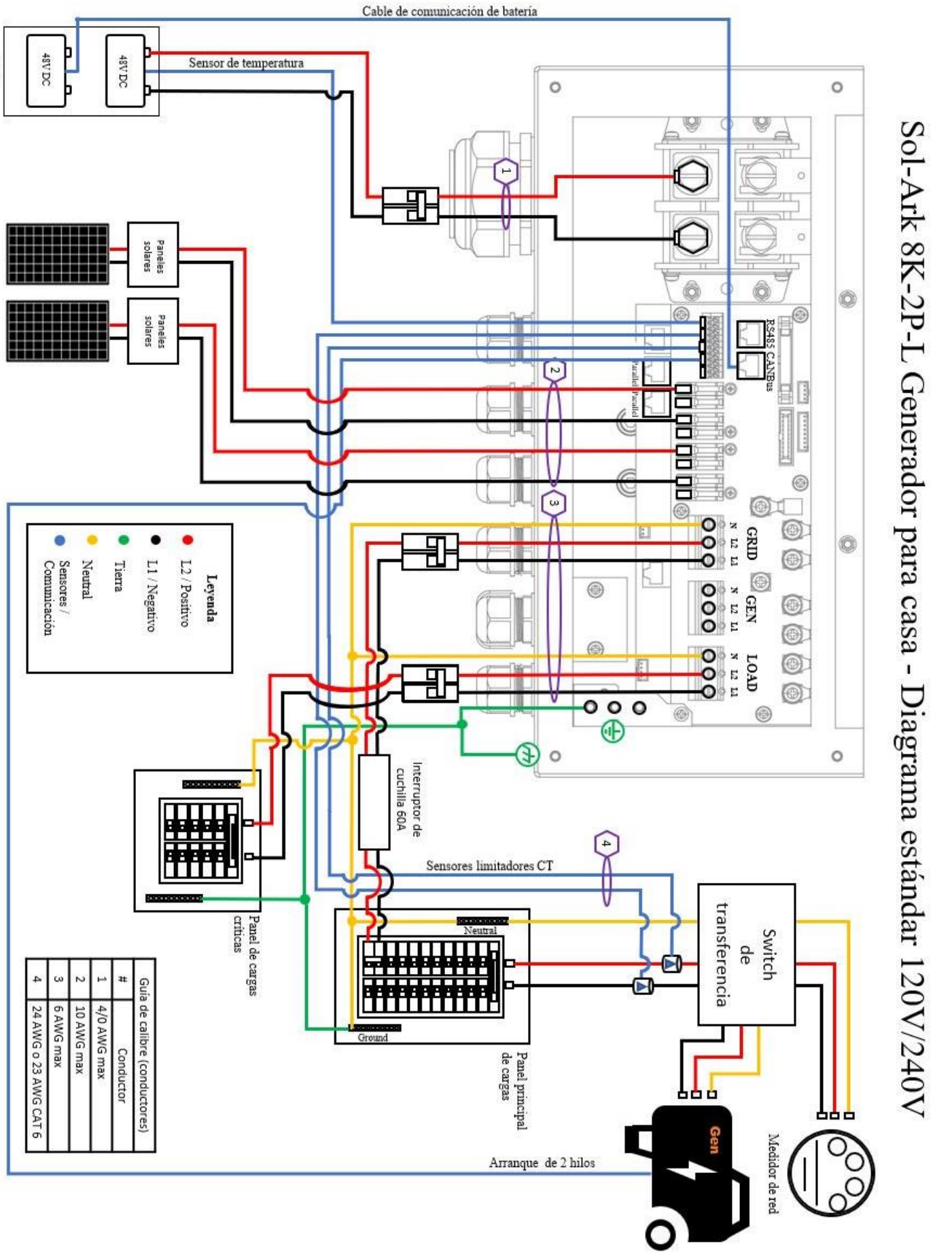
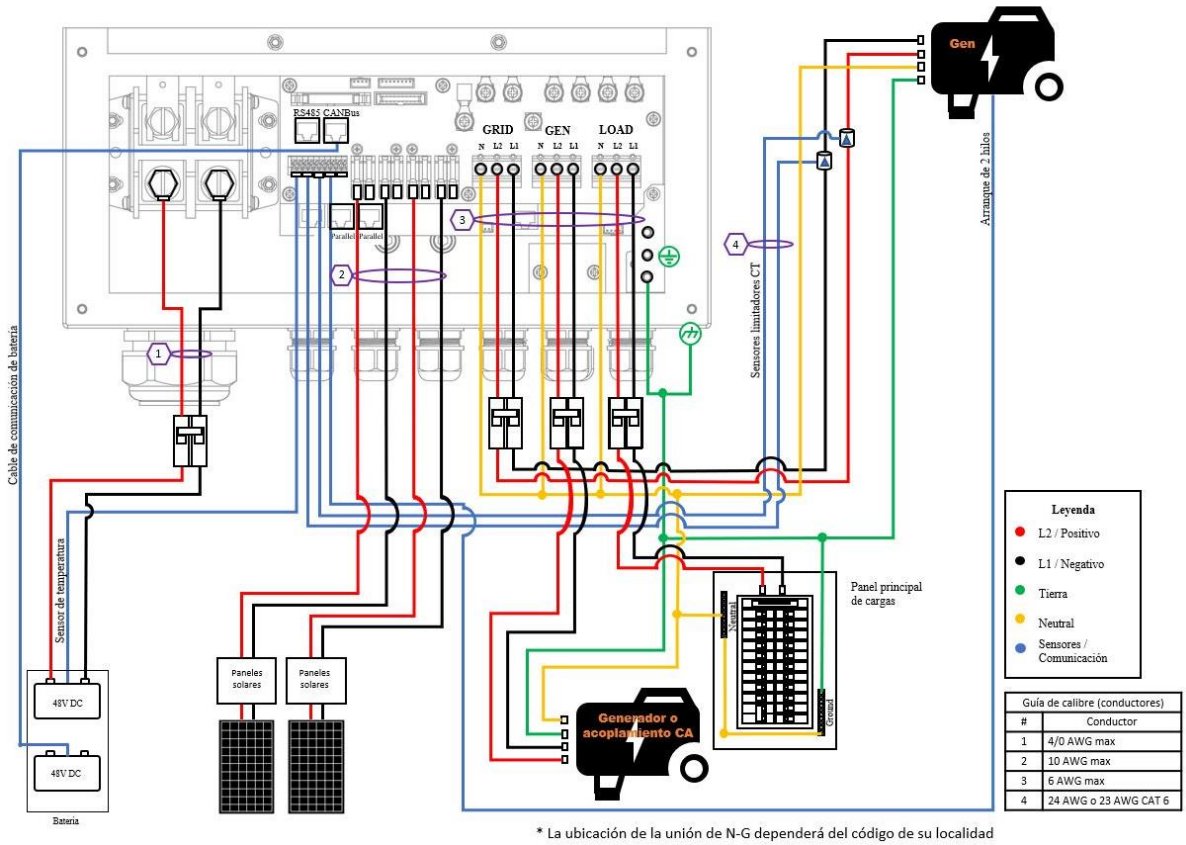

Sol-Ark 8K-2P-L Generador para casa - Diagrama estándar 120V/240V
Cable de comunicación de batería
Batería
48V DC
48V DC
Sensor de temperatura
Paneles solares
Paneles solares
RS485 CANBus
Parallel
Parallel
GRID
GEN
LOAD
N L2 L1
Leyenda
L2 / Positivo
L1 / Negativo
Tierra
Neutral
Sensores / Comunicación
Interruptor de cuchilla 60A
Sensores limitadores CT
Panel de cargas críticas
Neutral
Ground
Panel principal de cargas
Switch de transferencia
Gen
Medidor de red
Arranque de 2 hilos
Guía de calibre (conductores)
Conductor
1 4/0 AWG max
2 10 AWG max
3 6 AWG max
4 24 AWG o 23 AWG CAT 6
* La ubicación de la unión de N-G dependerá del código de su localidad

Diagram 4

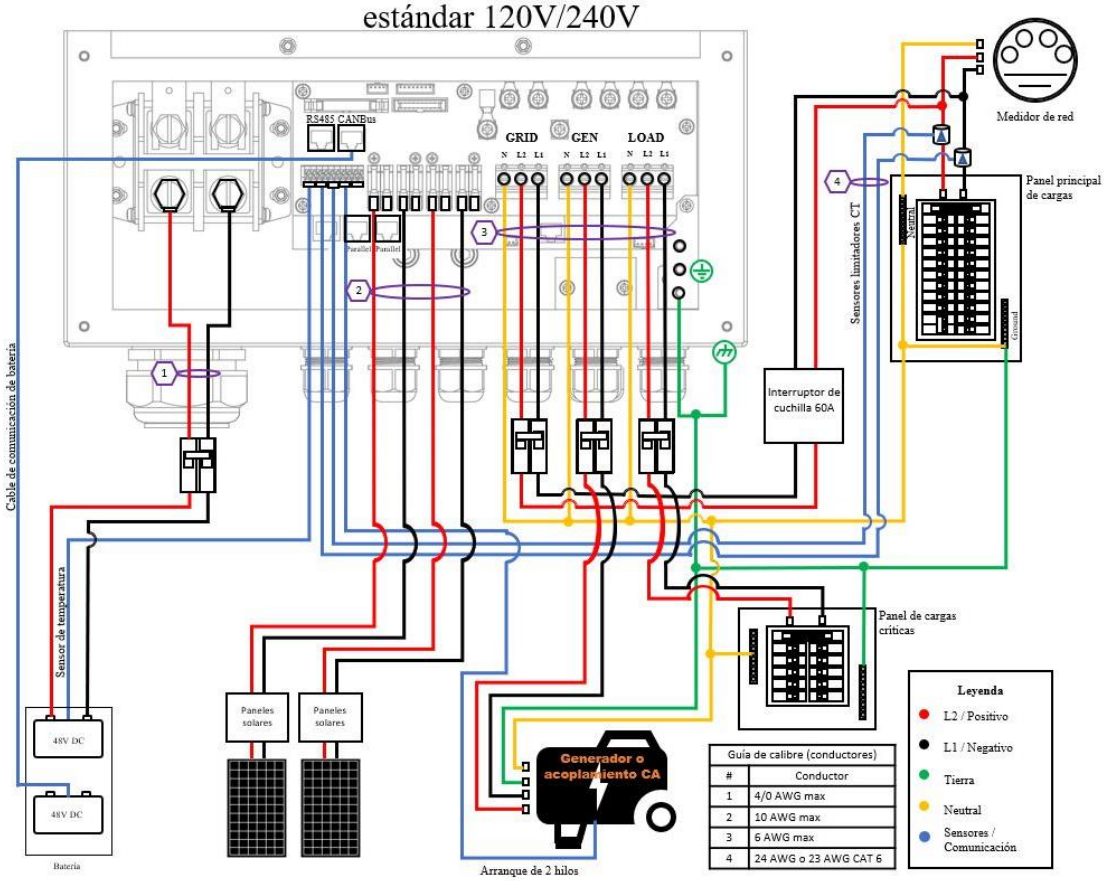
Sol-Ark 8K-2P-L Sistema Aislado de la red- Diagrama estándar 120V/240V



* La ubicación de la unión de N-G dependerá del código de su localidad

Diagram 5

Sol-Ark 8K-2P-L Interconexión en lado de alimentación de la red - Diagrama estándar 120V/240V



* La ubicación de la unión de N-G dependerá del código de su localidad

Diagram 6

NOTA: Antes de encender sistemas en paralelo asegúrese de leer la nota sobre "Sistemas en paralelo".

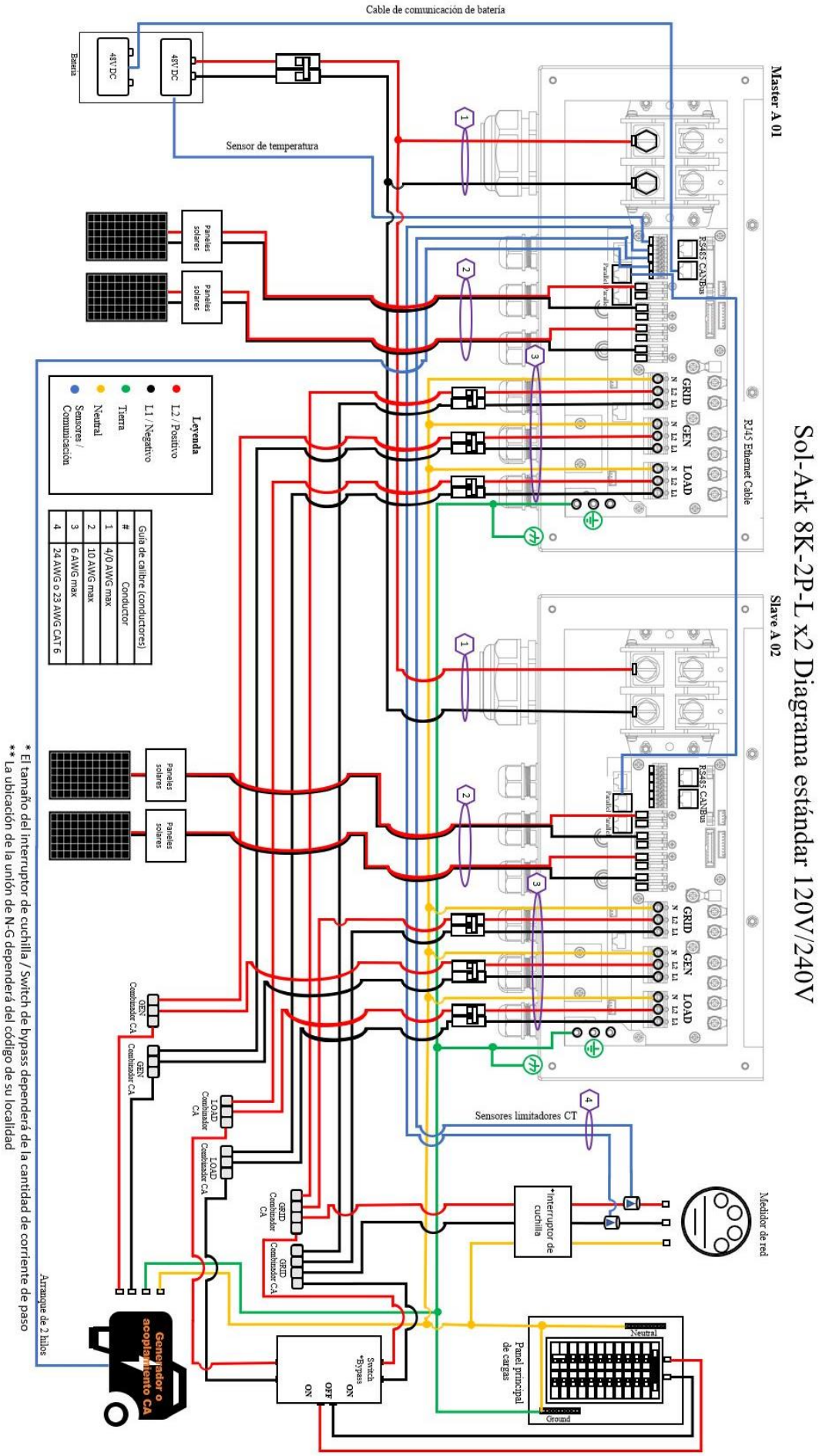


Diagram 7

NOTA: Antes de encender sistemas en paralelo asegúrese de leer la nota sobre "Sistemas en paralelo".

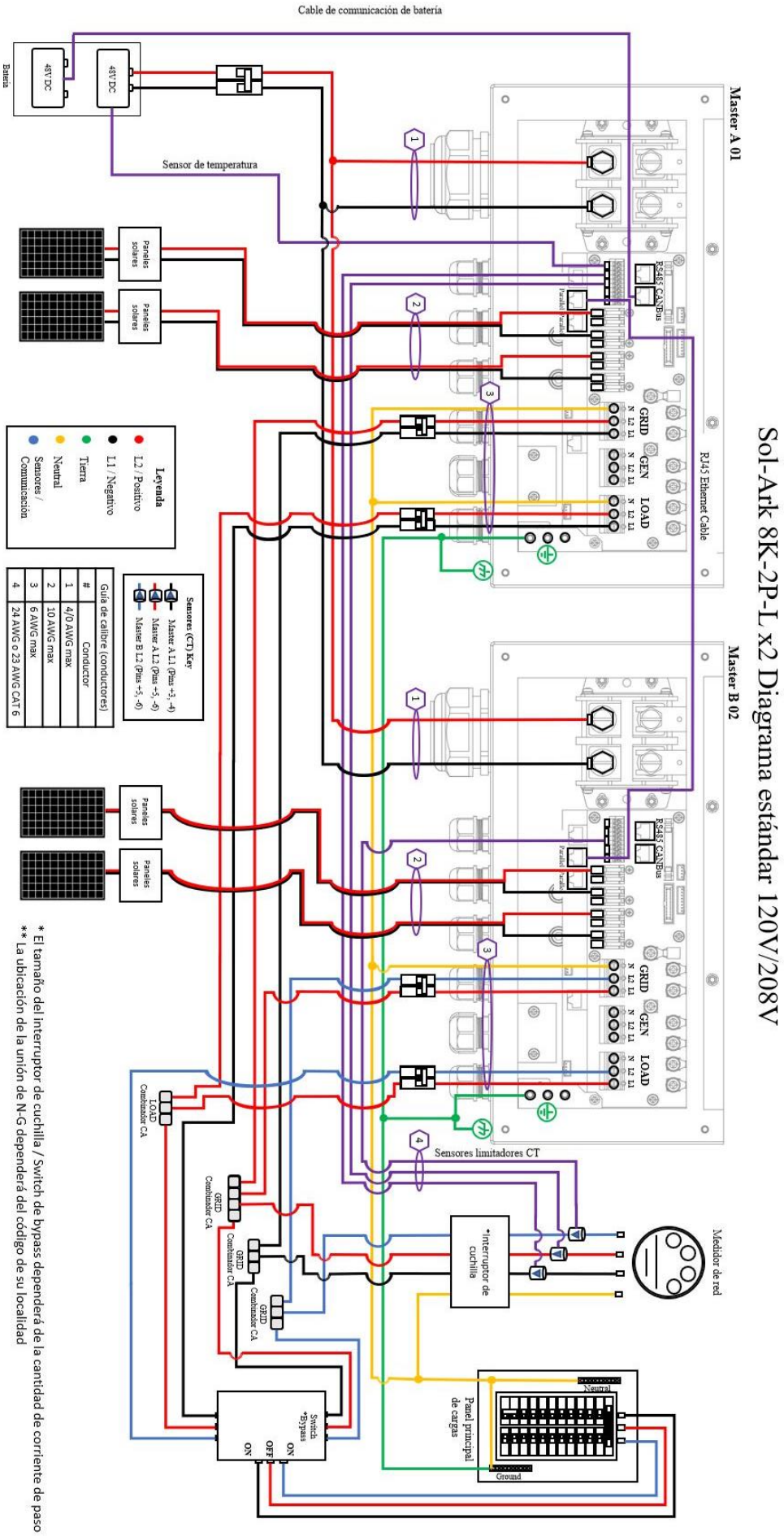
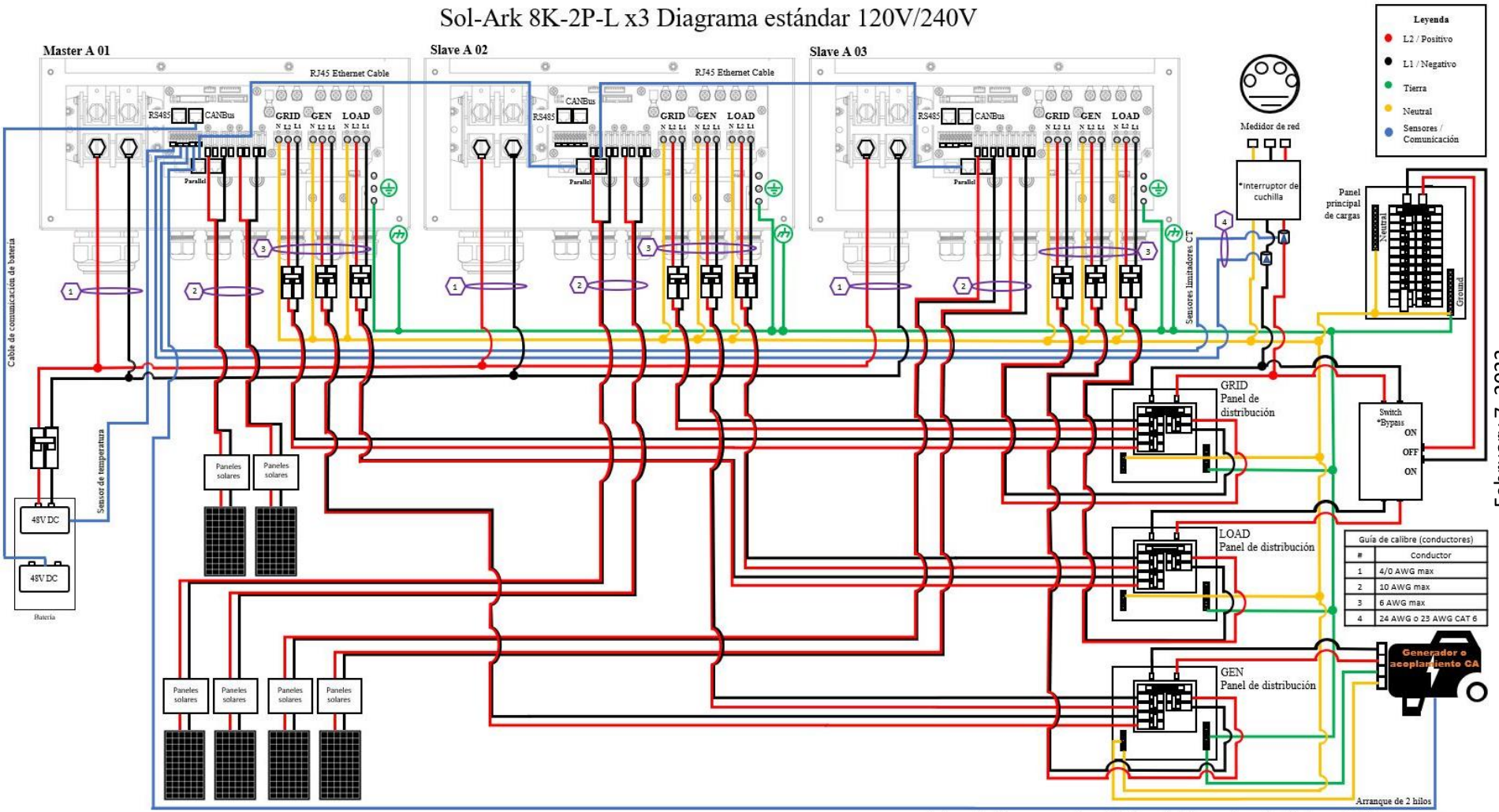


Diagram 8

NOTA: Antes de encender sistemas en paralelo asegúrese de leer la nota sobre “Sistemas en paralelo”.



February 7, 2023

Diagram 9

NOTA: Antes de encender sistemas en paralelo asegúrese de leer la nota sobre “Sistemas en paralelo”.

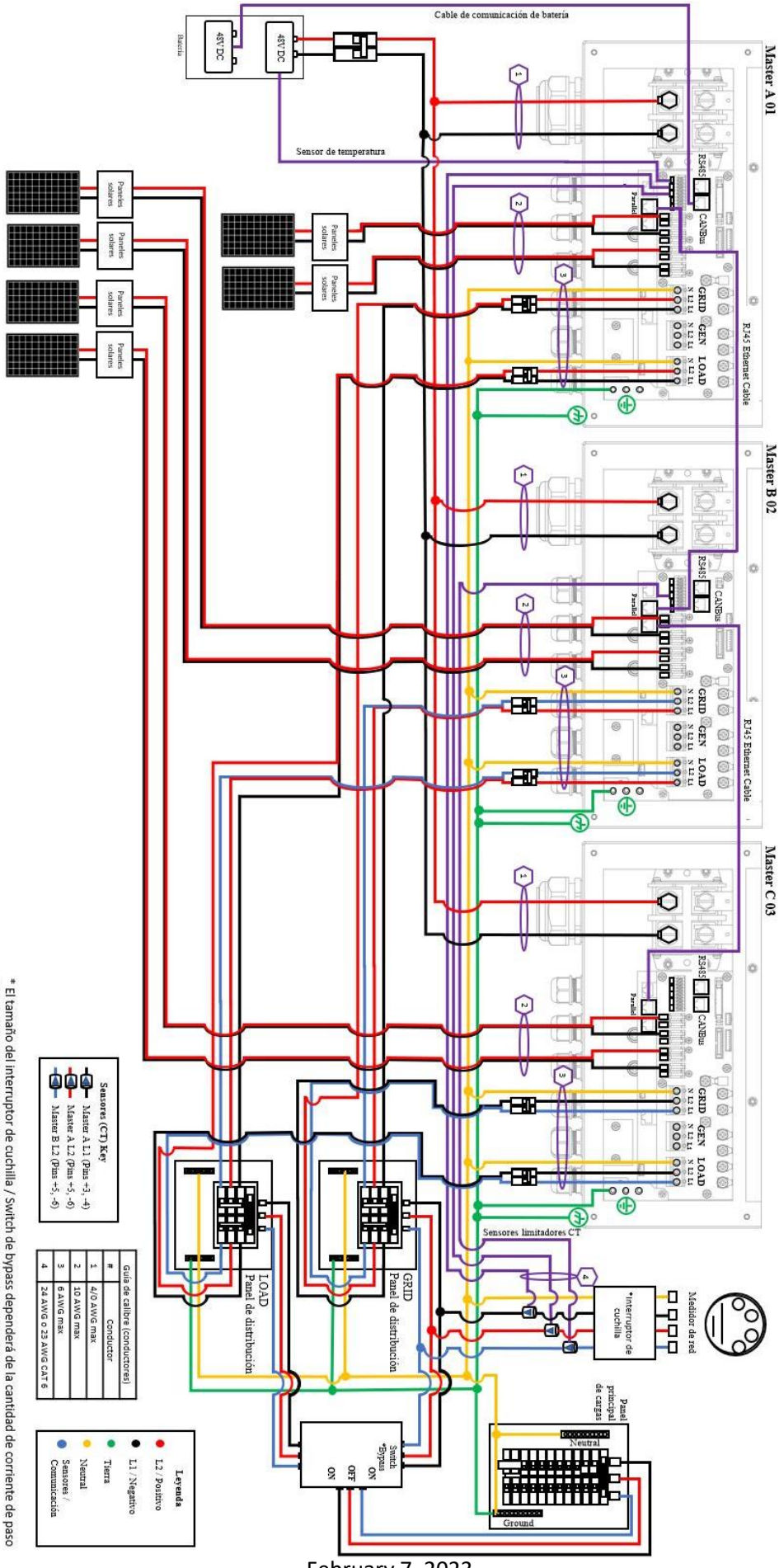
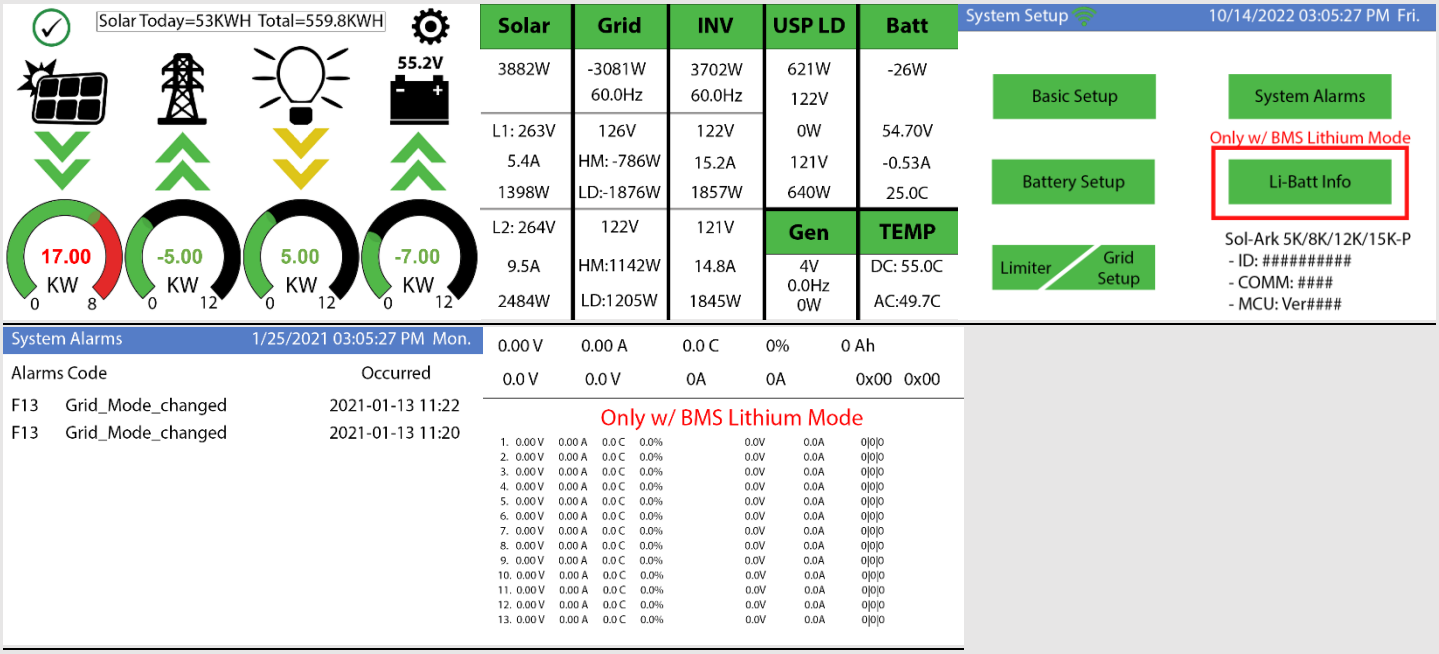
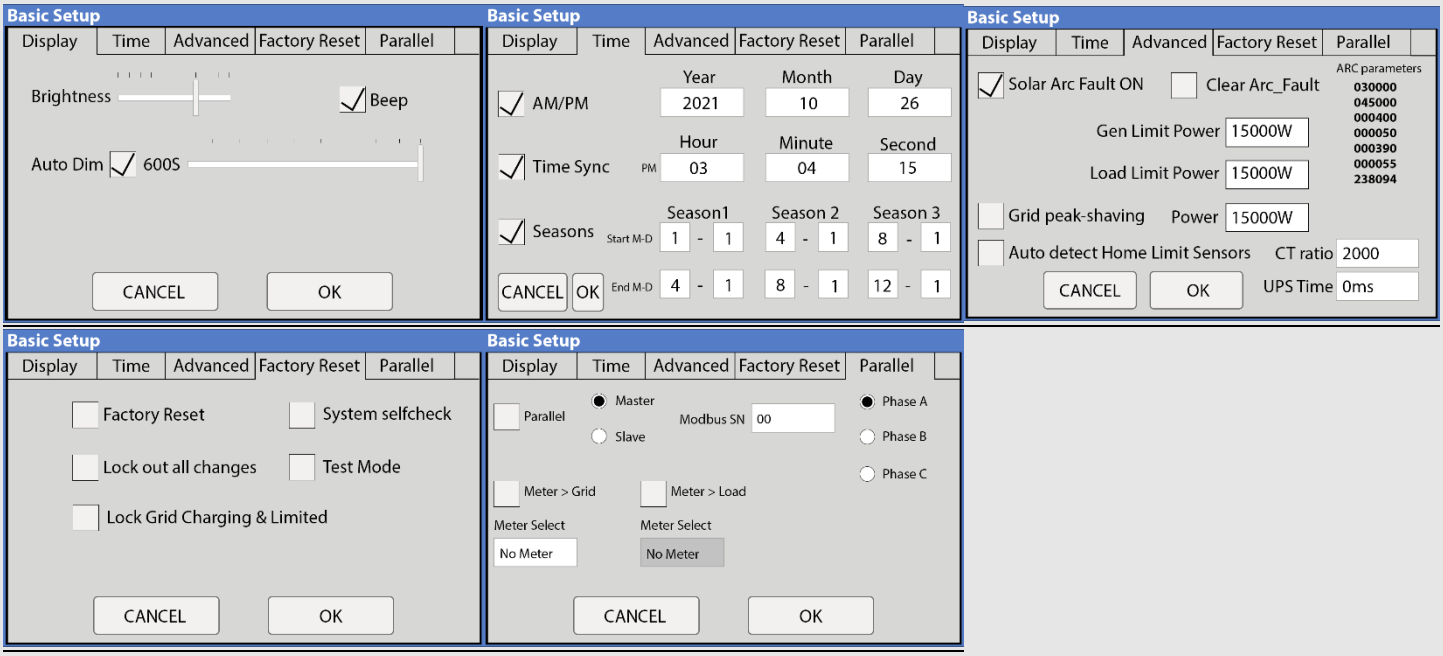


Diagram 10

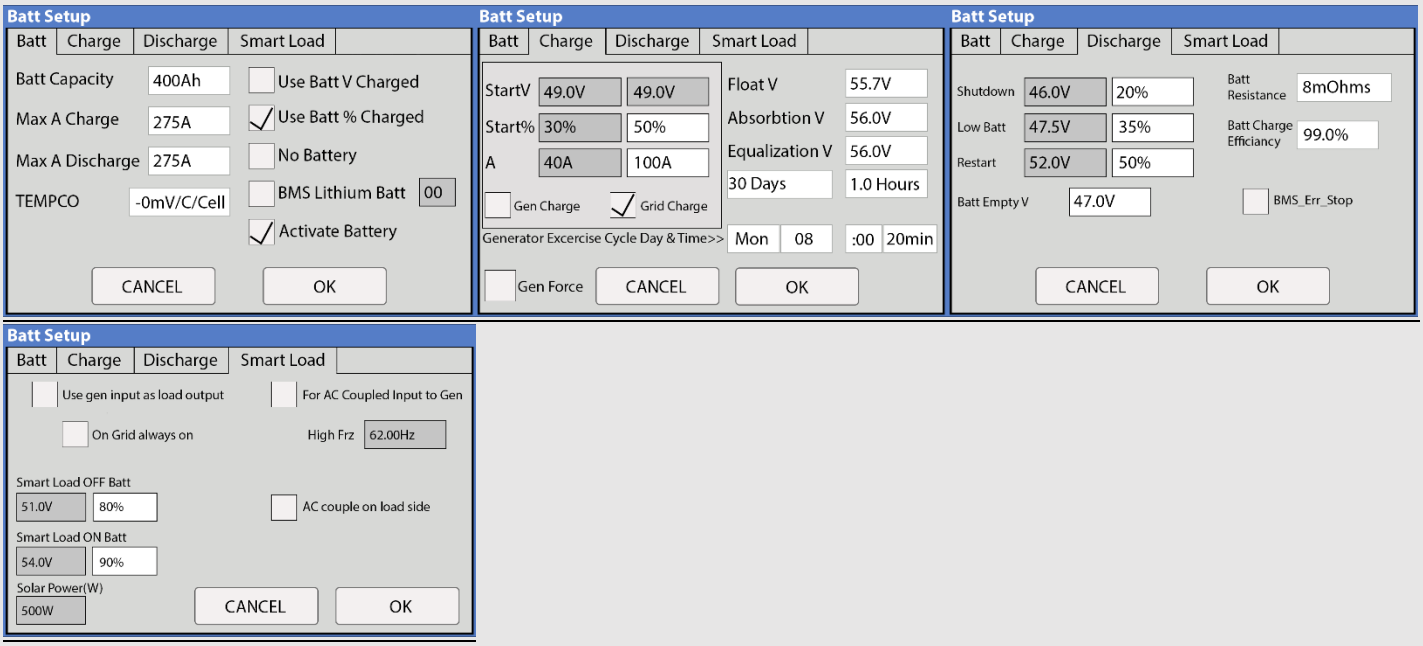
Main Menus



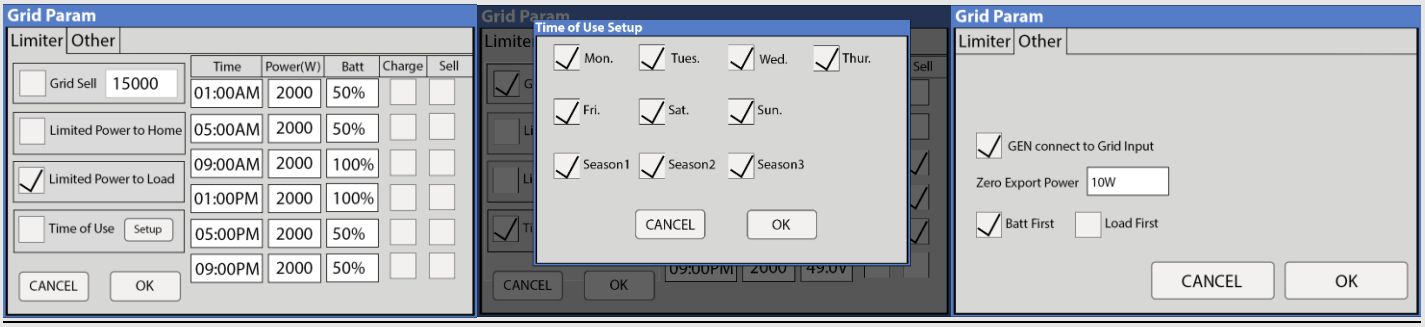
Basic Setup



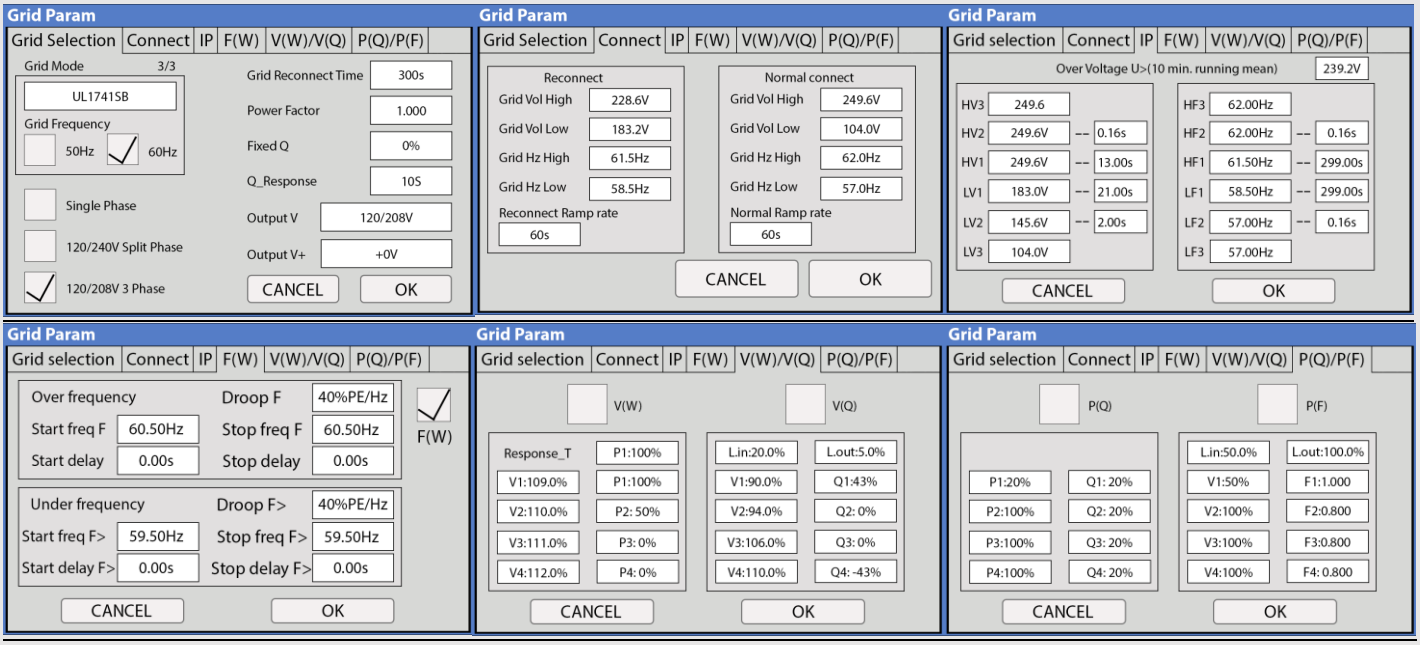
Battery Setup



Limiter



Grid Setup



(All the values shown on this manual are meant for illustration purposes. If you do not know the appropriate setting, contact technical support).

Inverter components

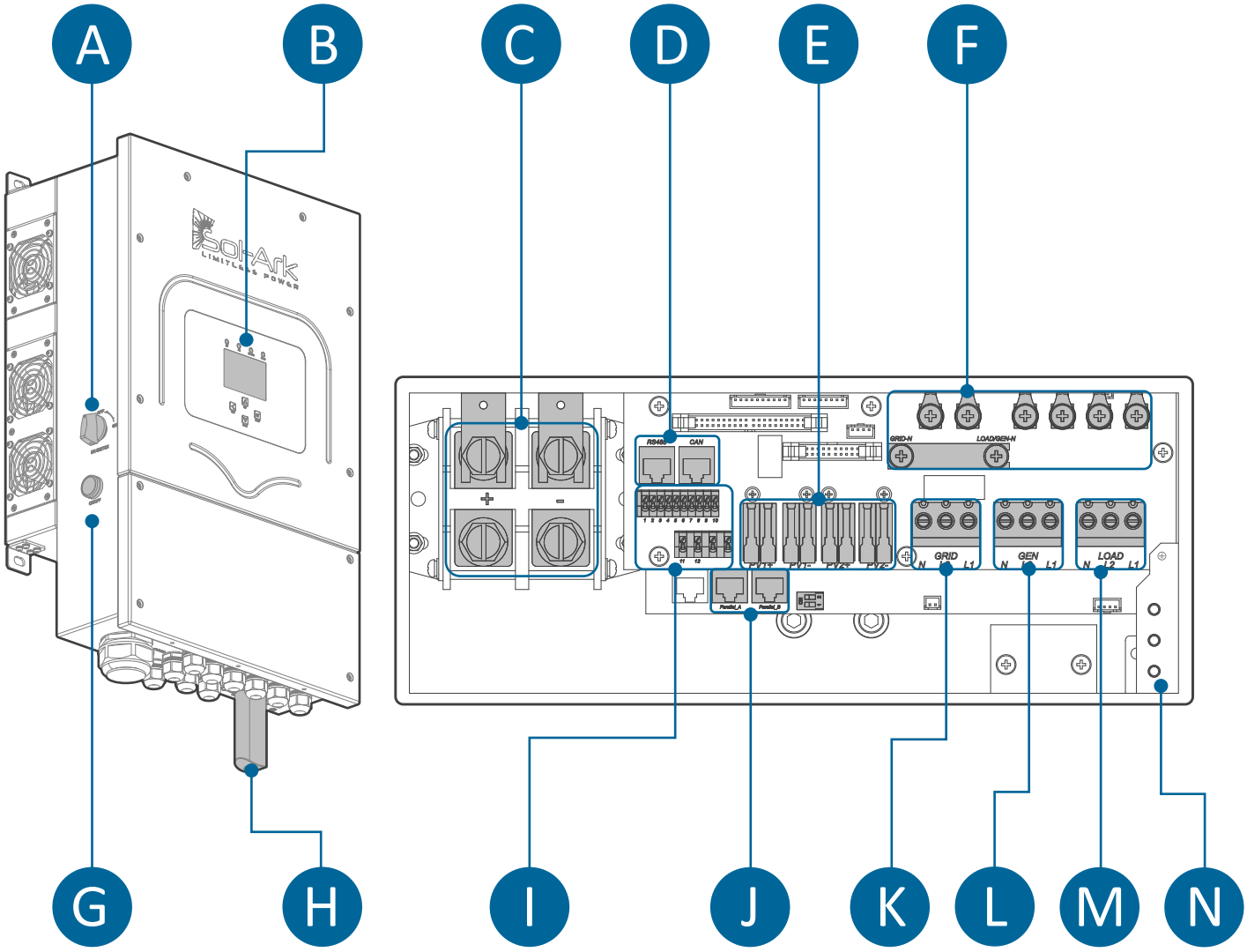


Table 1. Sol-Ark 8K-2P-L parts identification.			
ID	**Element**	**ID**	**Element**
A	PV disconnect	H	WI-FI Dongle
B	LCD screen	I	Sensor input board
C	Battery terminals (+|-)	J	RJ45 port (Parallel A/Parallel B)
D	RJ45 port (BMS)	K	GRID terminal
E	MPPT inputs (PV1+/PV1-) (PV2+/PV2-)	L	GEN terminal
F	Internal AC conductors	M	LOAD terminal
G	ON/OFF Button	N	GROUND Busbar

Backup circuits

A. The sub panel powered by the LOAD terminal will be considered the critical loads panel.
B. You must keep the critical loads panel within the limitations of the unit:
   - It must be sized to cover 8KW in loads.

Mounting the Sol-Ark

Considering the dimensions of the inverter, find a suitable location for the system(s), see Figure (1.1), there must be at least 50cm of upper clearance for proper heat dissipation. Heat transfer is done from bottom to top at a rate of 280W/hr.

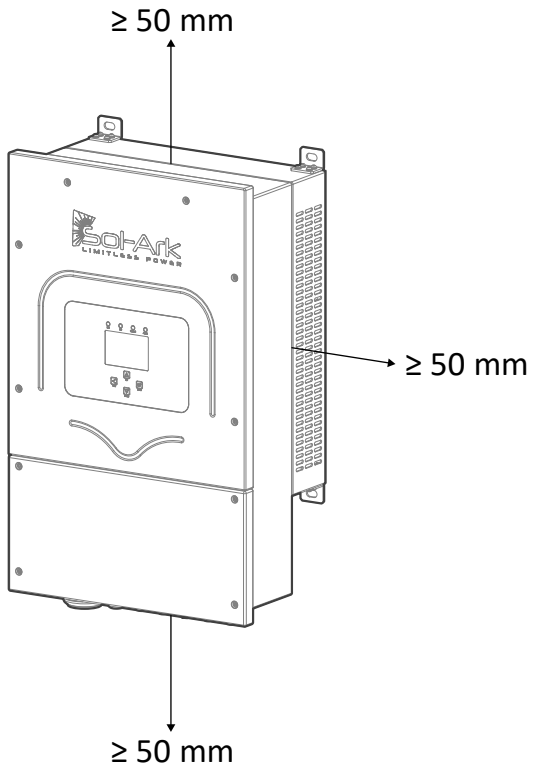


Figure (1.1) Lateral space.

A. NEMA 3R - IP65 enclosure, rated for outdoor installation (can be installed indoors) .
B. **PROTECT LCD screen from direct exposure to UV light.**
C. Mount the Sol-Ark following figure (1.2), ensure Sol-Ark is level and sits properly.
D. System weight= 32kg Securely attach to the wall. You may need expansion plugs-anchors for concrete. In case a different anchorage is required, it must be calculated to support the weight of the equipment.

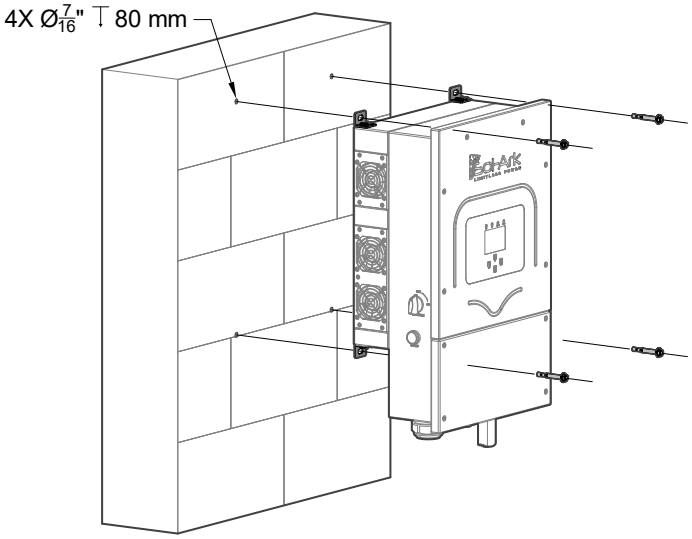


Figure (1.2) Wall mount.

A. Use 2 to 4 screws + washers (choose screw length and surface type) to mount the French cleat.
B. Mount the inverter in the correct position as shown in Figure (1.3).

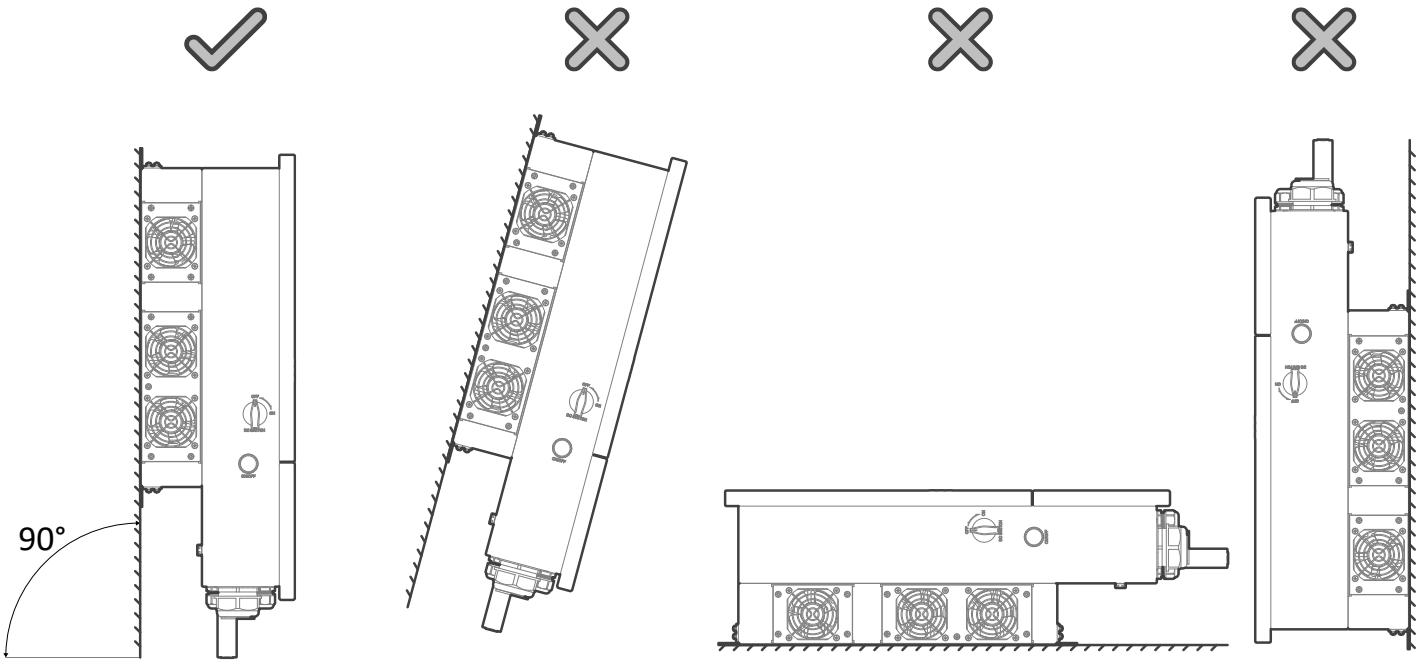


Figura (1.3) Orientación del equipo

Integrating batteries (Sol-Ark 8K-2P-L must be OFF)

A. Connect the batteries as shown in Figure (2.1).
B. External battery disconnects must be OFF. If your battery bank does not include a breaker, maintain the necessary safety measures when handling the cables.

Multi-System install.

a. **All** inverters in a parallel system **MUST** connect to a single battery bank, otherwise the inverters will not function properly.
b. Do not use separate battery banks in parallel systems.

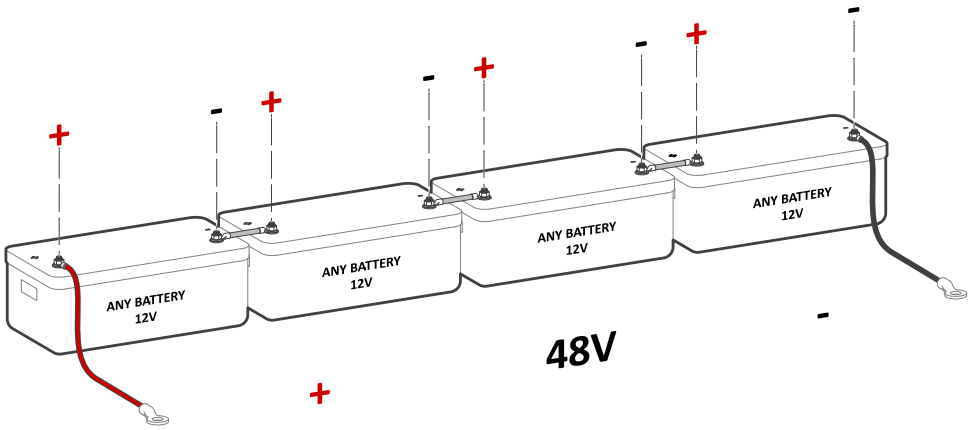


Figure (2.1) Battery bank

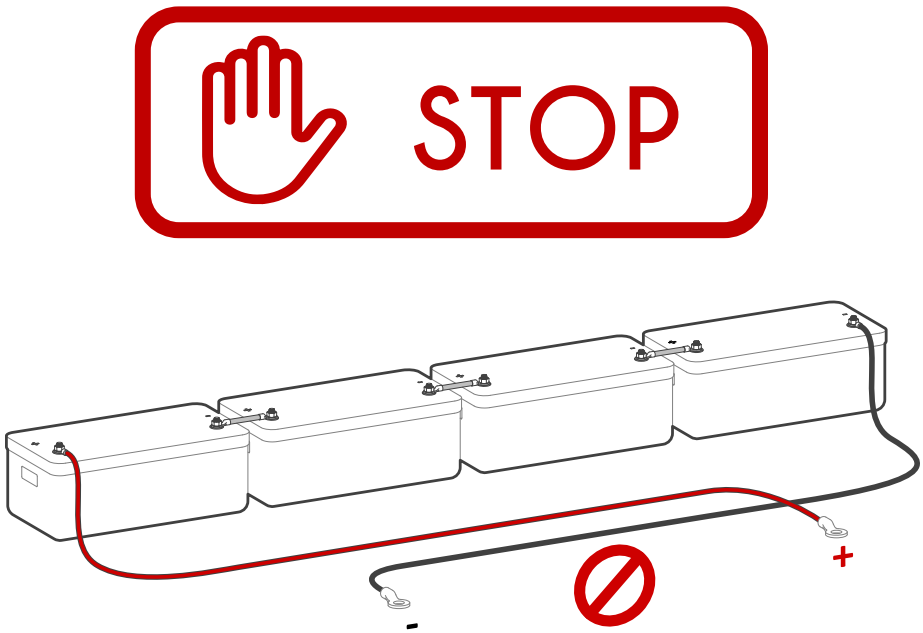


Figure (2.2) Incorrect battery polarity

Sol-Ark 8K-2P-L is a 48v nominal system. **Do not connect the inverter to any other battery configuration**.

If you use 12V batteries, you must not exceed four (4) batteries in series, as shown in **Figure (2.1)**.

The inverter can work with any battery chemistry if it remains within the range of 43V to 63V of operation.

DO NOT reverse battery polarity!

The system will be damaged!

Warranty will be voided.

Grounding connection: It is essential to add a grounding connection directly into the frame, with the goal of protecting the end user in case if experiencing a failure from the original ground conductor.

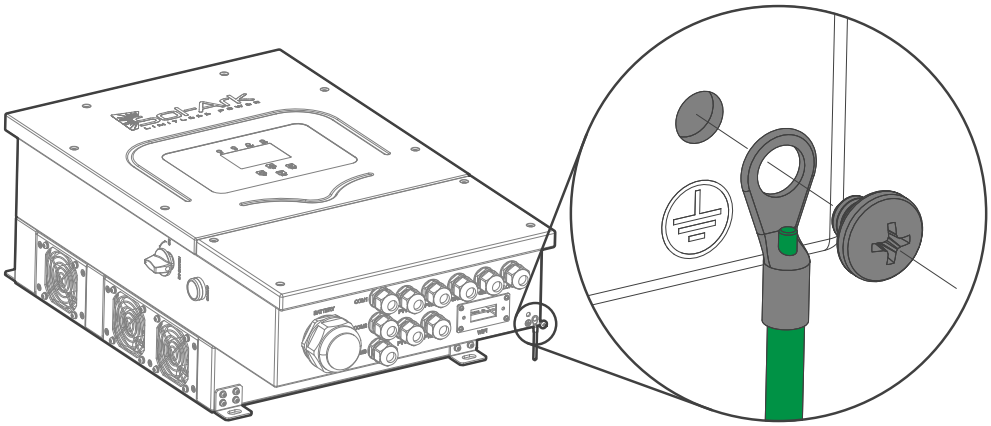


Figure (2.3) Ground connection

NOTE

When the system is installed in off-grid scenarios, the neutral must be connected to ground.

PV panels connection

The inverter has 2 MPPTs that work independently, each MPPT will accept: 18A (self-limiting) / 5.2kW / 500V MAX / 370Voc optimum value).

The unit will suffer permanent damage if Voc > 500V

Before connecting each string make sure the polarity from the array is correct (+, -).

A. Strings in parallel within the same MPPT must have the same design voltage Voc.
   i. If the solar panels are oriented in different directions and connected in the same MPPT, there will be a loss in PV efficiency.
B. It is recommended to ground the mounting frame from the PV array into an external grounding system.
C. Connect the solar panel strings using either of the configurations in the following figures:

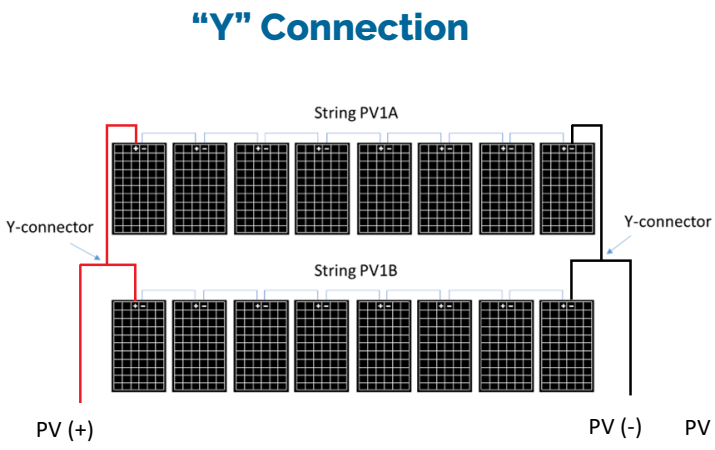


Figure (3.1) "Y" connection

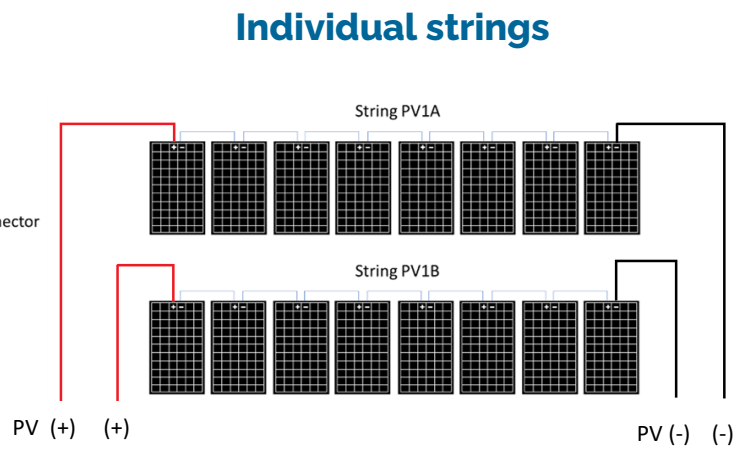


Figure (3.2) Individual conductors

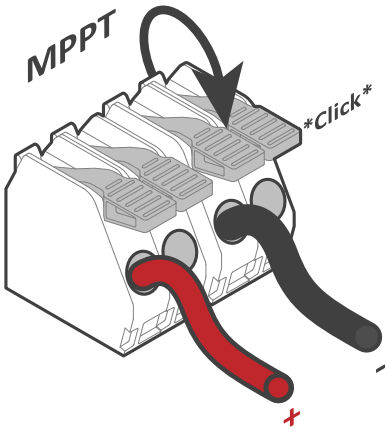


Figure (3.3) Independent string on MPPT

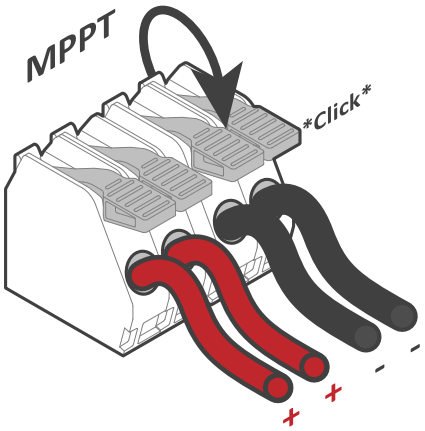


Figura (3.4) Multiple strings on MPPT

Integrating a generator

Generators < 8kW "Gen" input terminal

1. Supports 120V/240V generators only.
2. Connect the generator output to the "GEN" input inside the Sol-Ark 8K-2P-L. You must select the correct grid type before connecting the generator.
3. THD (Total Harmonic Distortion) less than 15% is recommended, but it is not required.
4. The batteries will be charged until the battery bank accepts only 5% of its rated capacity in Amperes. This is equivalent to 90-95% of the SOC.

Weekly Gen Exercise

If your generator has two-wire start compatibility, you will experience weekly generator tests.

This test occurs at 8:00AM (local time) every Monday by default. The test takes approximately 20 minutes to complete. The generator will auto-start and auto-stop.

If you wish, you can disable the test by selecting **:00 / 00 min** in the "Generator exercise Day & Time" option.

Generators > 10kW "Grid" input terminal

1. Supports 220V, 120V/240V Split phase, 120V/208V 3phase, You must select the correct grid type before connecting the generator.
2. Off-grid systems or whole-home generator on ATS (Automatic Transfer Switch) or manual transfer switch connected to the **grid input** terminal require selecting "GEN Connect to Grid Input".
   Home Screen → ⚙ →"Limiter" → "Other" → " [✓] **GEN Connect to Grid Input"** → **"OK"**
3. Off grid system = Keep "Grid sell" off | Only need CT's (on grid side) if using "Grid Peak Shaving" under "Basic Setup" → "Advanced" tab.
4. The batteries will be charged until the battery bank accepts only 5% of its rated capacity in Amperes. This is equivalent to 90-95% of the SOC.

How to improve the generator & Sol-Ark 8K-2P-L compatibility?

Select "**General Standard**", in the "Grid Selection" tab under "Grid Mode", then in the "Connect" tab under "**Normal connect** & **Reconnect**", increase the frequency range to "Grid Hz High=65Hz", "Grid Hz low=55Hz" to avoid disconnections between the generator & Sol-Ark 8K-2P-L. Also increase the voltage range to "Grid Volt High=275V" and "Grid Volt Low=220V". Voltages in the "Normal Connect" section are L-N.

Sol-Ark will not charge the batteries using the generator unless the "Start V" or "Start %" condition is fulfilled. The start condition either V or % will light up in white depending on which control mode is selected under "Battery Setup" → "Use Batt V Charged" or "Use Batt % Charged".

Grid Peak Shaving (for gen connected to grid terminal)

1. Prevents the Sol-Ark 8K-2P-L from overloading generators connected to the grid breaker.
2. Must place the CT sensors so that they measure L1, L2 of the generator output, the arrows on the CT's must point toward the generator.
3. Sol-Ark contributes power above "Power" value threshold to prevent overloading the generator. If the loads exceed the "Power" threshold, Sol-Ark will get the additional power from the PV or the battery.
4. This mode will auto-adjust the "Grid Charge A" to avoid overloads.

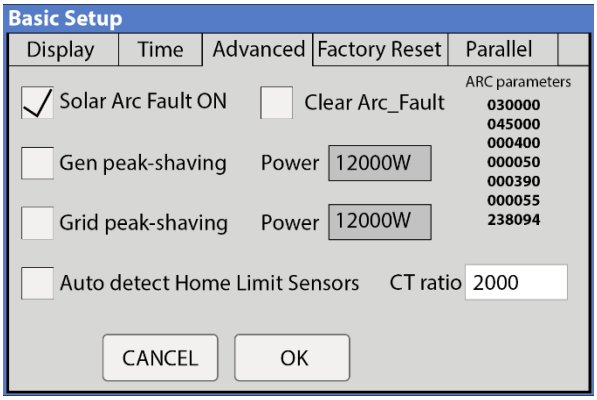


Figure (4.1) Advanced settings

Turning on the generator using "Start V" and "Start %"

1. "Gen charge" is used when the generator is connected to the GEN input breaker.
    a. "Start V" or "Start %" are the values the battery needs to reach to automatically kick on the generator using the two-wire start. You can choose between "Start V" or "Start %" under "Batt Setup".

2. "Grid charge" is used when it is required to charge the battery with the GRID or with a generator connected to the GRID input terminal.
    a. "Start V" or "Start %" are the values the battery needs to reach to automatically kick on the generator hooked up to the GRID input terminal.
    b. To charge the battery with the GRID, you must select "Grid Charge", this option keeps the battery at 100% (if TOU disabled) and it uses the "A" value to control how many amps are pushed in DC from the GRID terminal AC power source.

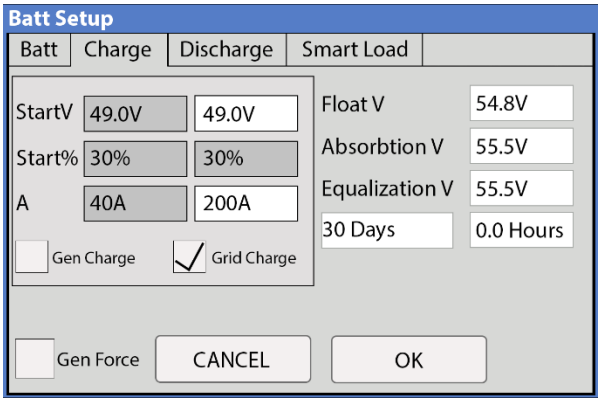


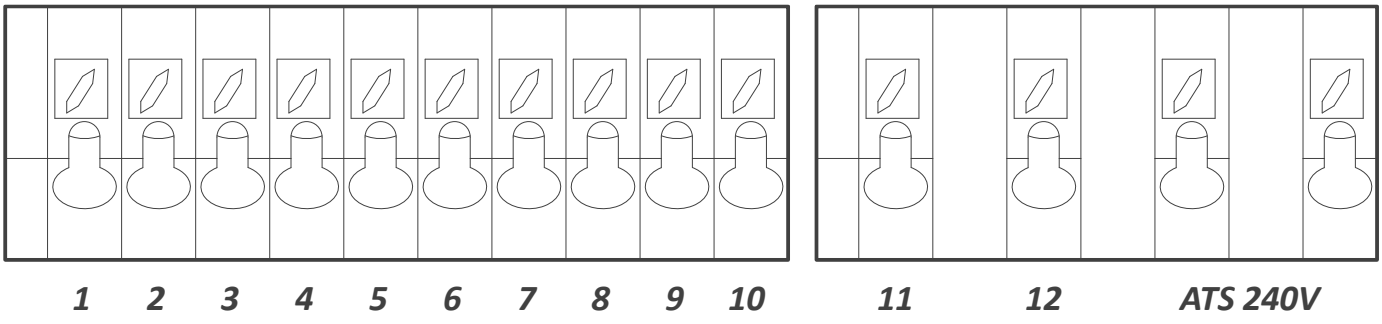
Figure (4.2) Battery charge settings

Gen Charge "A" / Grid Charge "A" (Generator connected to the "GRID" input terminal)

This is how many amps **(DC)** you can push into the battery from generator power. To ensure you do not overload a small generator, you will want to adjust the GEN or GRID Start A value. If connecting more than one Sol-Ark in parallel, multiply the GEN or GRID Start A value by the # of Sol-Arks for actual current value into the battery bank.

Integrating sensors and accessories

Sensor (Located in Sol-Ark 8K-2P-L wiring area)



(1,2) Battery temperature sensor: Only for AGM & Lead acid.

(+3, -4) CT1 & (+5, -6) CT2: Current Transformers (Limiter Sensors).

(7,8) Gen Start Relay: 2 Wire start, dry contact (normally open).

(9,10) Not in use.

(11, 12) 12V DC (100mA max) for RSD transmitters, 12V, 100mA, 1.2W.

(ATS) Not in use.

Figure (5.1) Sensor pin board

Battery Temperature Sensor

- Place the sensor between the batteries with tape (See Figure (4.2)). Place the sensor away from the batteries terminals to prevent it from overheating.
- This sensor has no polarity and helps perform voltage charging adjustments and capacity calculations due to changes in temperature.
- **Note**: Lithium Batteries do NOT require a temperature sensor.

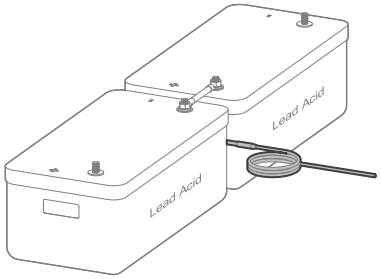


Figure (5.2) Temperature Sensor

Limiter Sensors (CT Sensors)

- Install sensors on incoming electrical service wires on L1, L2 and L3.
- **The arrows printed on the sensors (L1, L2) must point toward the grid** (See Diagrams section).
- **"Limited To Home Mode"** (Zero metering) and "**Peak Shaving Mode"** require CT sensors to work properly.
- To ensure the sensors will fit, please check the incoming wires size (GRID or GENERATOR). If the sensors do not fit, you can order bigger CT's. Contact support: 1-972-575-8875 ext. 2 or support@sol-ark.com
- See page 46 to obtain more information about the different work modes.

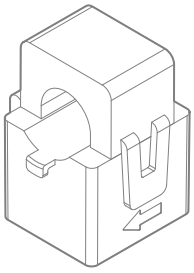


Figure (5.3) CT sensor

GEN Start Signal (Two-wire start)

- The signal comes from a normally open relay that closes when the "Gen Start" state is active.
- If "TOU" (Time Of Use) is enabled, it is necessary to select "Charge" to kick on the generator.

BMS Port (CAN/RS485)

- It is used to connect the battery in closed loop communication with the Sol-Ark 8k-2P-L (review our "Battery Communications Integration Guide" on the Sol-Ark website at www.Sol-Ark.com/support).
- Must use a RJ45 connector.
- RS485 is SunSpec version 4 (will not work with version 3).
- Only use the CAN port for battery BMS communications (the CAN port supports both CanBus protocol and Modbus protocols)

Wi-Fi Antenna (Dongle)

- Remote monitoring and software updates require an internet connection through the Wi-Fi Dongle.

Power Cycle Sequence

1. "**TURN ON**" the external battery disconnect.
2. Make sure that Sol-Ark 12k-3P-L is properly connected to the batteries, solar panels, grid, etc.
3. "**TURN ON**" the external disconnect switch that feeds the GRID terminals and **"TURN ON"** the external GRID breaker that feeds the GRID terminal.
4. Press the power button on the right side of the inverter (see Figure (6.2)).
5. Make sure the solar panel inputs are not connected to ground, then "**TURN ON"** DC disconnect switch.
6. "**TURN ON**" the breaker connected to the "LOAD" input.
7. Reverse the steps to turn the inverter off.

Figure (5.4) Power Cycle Sequence

Powering-Up and testing the Sol-Ark

Check the voltage on each PV input circuit

A. Voltage per string must not be equal or higher than 500V.
B. **DO NOT CONNECT PV+ OR PV- TO GROUND.**
C. Verify polarity in each PV string **(backward polarity shows 0V).**
D. PV input will only turn on the LCD screen. Inverter will not power on without a battery or grid power source.

TURN ON the inverter with at least one power source:
1) PV 2) GRID 3) BATTERY

Check GRID Input Voltage

A. Measure L1, L2 to neutral. Ensure 120Vac (verify grid type selected).
B. Check the voltage between neutral and ground is ~0Vac.
C. Verify voltage between Grid L1 and Load L1 is 0V, same for L2 when the system is grid-tied.

Use the top screws above the terminals to measure the voltage (AC) with a multimeter.

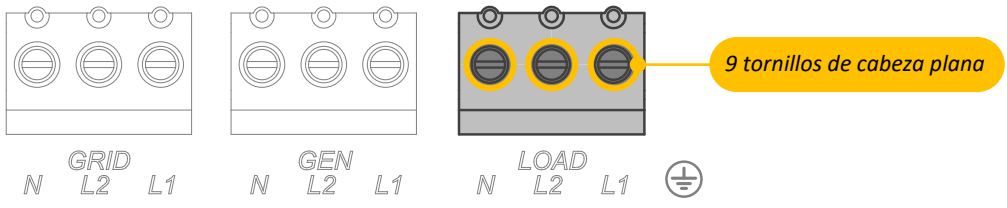


Figure (6.1) AC terminals

Check Battery Voltage

A. Turn “ON” the Battery switch located on the battery module or pack (if using a lithium battery).
B. Turn “ON” the external Battery disconnect (if you have one).
C. The voltage applied to the Sol-Ark battery terminals must be between $43V_{DC}$ - $60V_{DC.}$

Provide Power to Sol-Ark 8k-2P-L

A. Follow the POWER CYCLE SEQUENCE in Figure (5.4)
B. Press the button (green) located on the left side of the inverter.

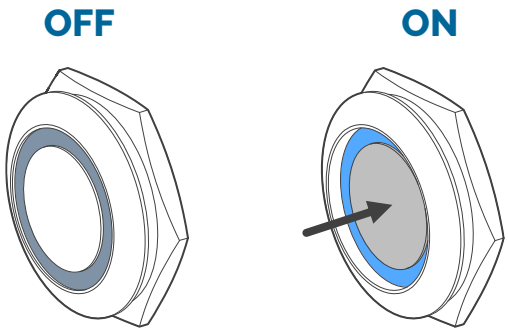


Figure (6.2) ON/OFF button

LED indicators

DC

A. Green = DC Solar Panels are producing.
B. Off = Solar Panels are not producing.

AC

A. Green = Grid is connected.
B. OFF = Grid is not connected.

Normal

A. Green = Sol-Ark 12K-3P-L is working properly.
B. OFF = Sol-Ark 12K-3P-L is not working properly.

Alarm

A. Red = Alarm/ check the alarms menu. **Home Screen → ⚙ → “System Alarms”**
B. OFF = No alarms.

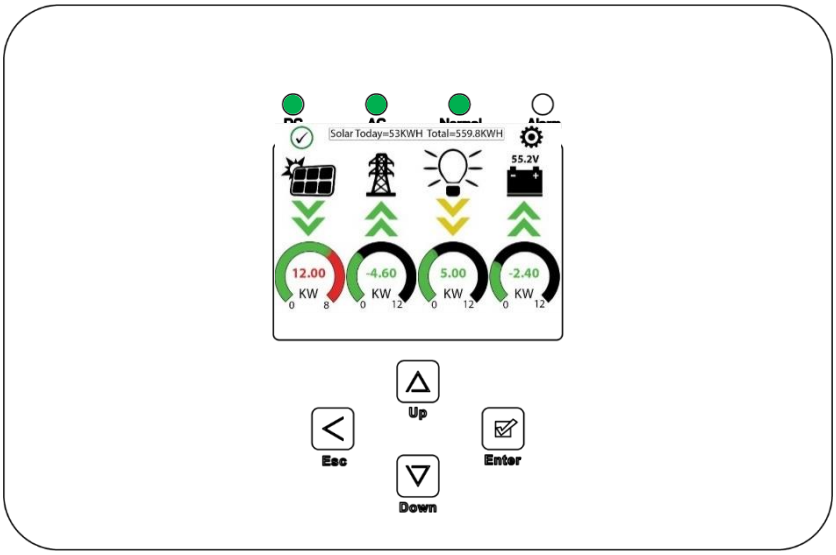


Figure (6.3) LCD Screen

Remote Monitoring Setup

Ethernet connection

A. Remove the plastic enclosure of the dongle by pressing with a flat screwdriver as shown in the Figure (7.1).
B. Insert the ethernet cable through the plastic enclosure and connect the cable to the RJ45 port as shown in the Figure (7.2).
C. Reassemble the dongle housing and plug the dongle into Sol-Ark as shown in the Figure (7.2), secure it with screws. You will see solid red and green lights after a couple of minutes.
D. Register the dongle via the app or: www.mysol-ark.com

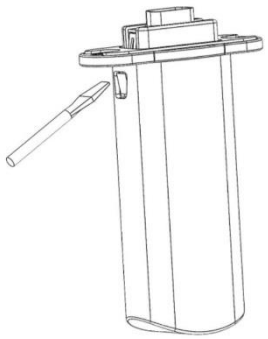


Figure (7.1) Wi-Fi dongle enclosure

Wi-Fi (PC or smart phone)

A. Plug the Wi-Fi dongle into Sol-Ark, use (x2) M4X10 screws as shown in the Figure (7.3).
B. Using your device (smartphone or computer), look for an “EAP” network containing the last five (5) digits of the Dongle Serial Number.
C. Password: 12345678
D. Follow the instructions in: “Login”, page 32.

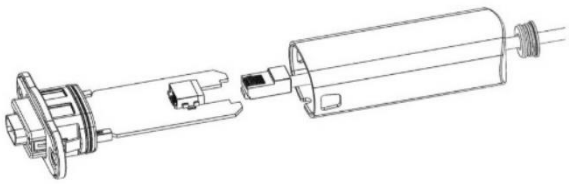


Figure (7.2) Ethernet connection

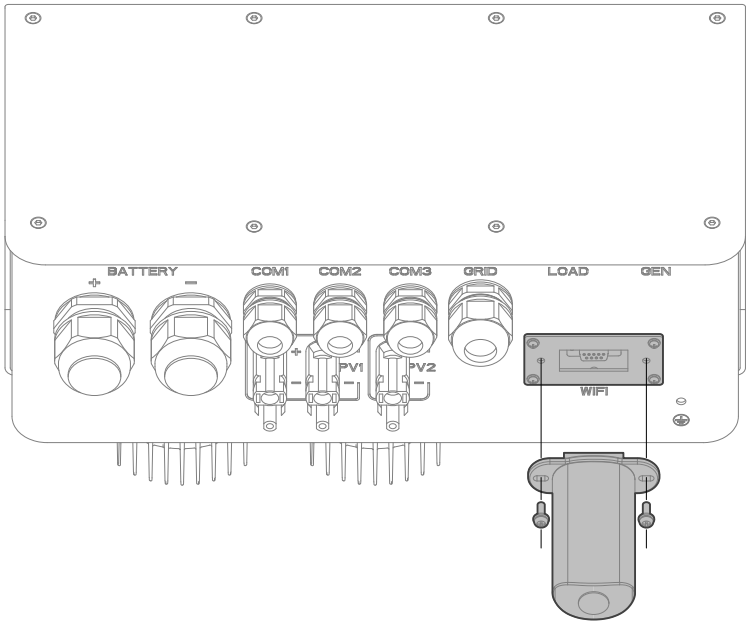


Figure (7.3) Plug in the dongle

IP address setup (PC or smart phone)

Connect to the Dongle Network

A. On your Smart Phone or Computer go to: Settings → Wi-Fi → Select the EAP-XXXXX network → Password= 12345678 (Dongle network does not provide internet, it is just a communication bridge between your device and the dongle).
B. Once your device is connected to the Dongle you will get the following message ("Connected without internet"). This is completely normal because the EAP-XXXXX network does not have access to internet.
C. The EAP-XXXXX network contains the last 5 digits of the Dongle Serial Number, you can find this number on the Dongle label.

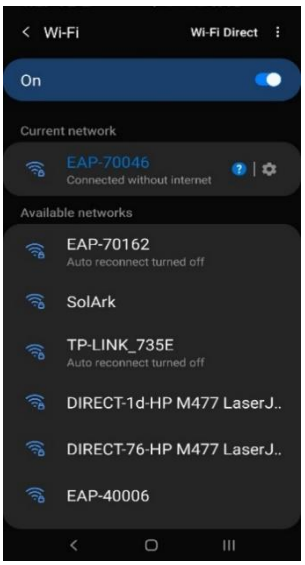


Figure (7.4) EAP Network.

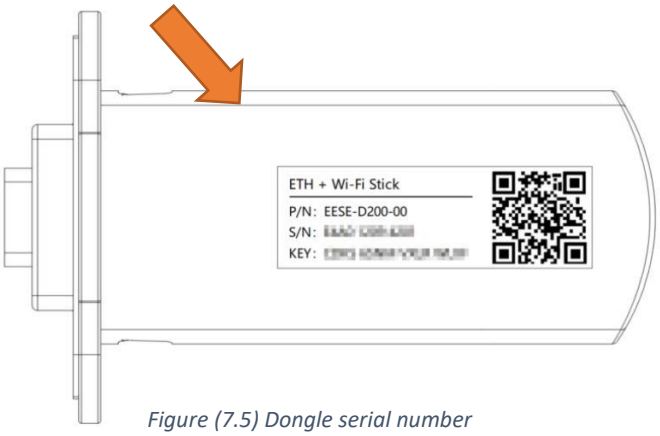


Figure (7.5) Dongle serial number

EAP-XXXXX Network Password= 12345678

Disclaimer: The Wi-Fi dongle does not have internet; it needs an external internet provider. You still need to be connected to the dongle for this process.

The dongle is compatible with Wi-Fi signal broadcasted at 2.4 GHz (it is not possible to use 5G).

“Login” to Web Portal using ANY Search Browser

A. Once your device is connected to the dongle, open any browser (Safari, Google, Chrome, etc.)
B. On the address bar (http://.....), type the following IP address: 10.10.10.1 as shown in the Figure (7.6). If you can’t access the configuration page, try again with a computer.
C. Scroll down to the "Wlan Connection" section, Figure (7.7).
D. Press the “Scan” button to search local networks.

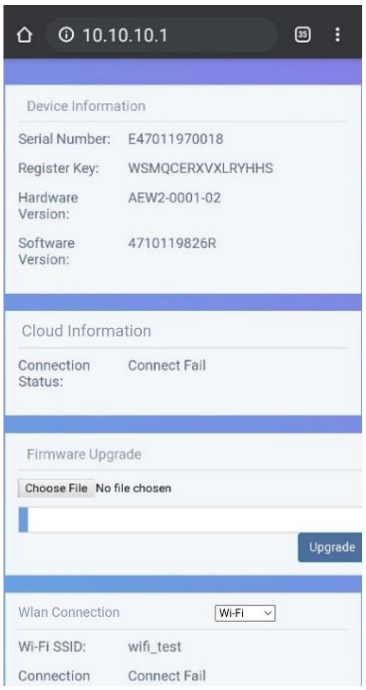


Figure (7.6) IP address.

Select Your HOME Network

A. Once you press “Scan” you should be able to see the Wi-Fi Home network, Figure (7.7), (router should not be located more than 29 feet away, it is only possible to connect to 2.4GHz networks).
B. Select the Wi-Fi home network and type the network password.
C. Select “Connect”.
D. DO NOT SELECT THE EAP NETWORK.

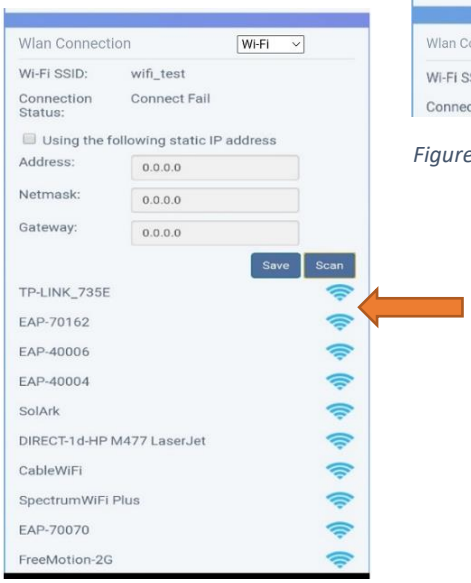


Figure (7.7) Scan networks.

Save Your Information.

Click on SAVE to save your information as shown in the Figure (7.8).

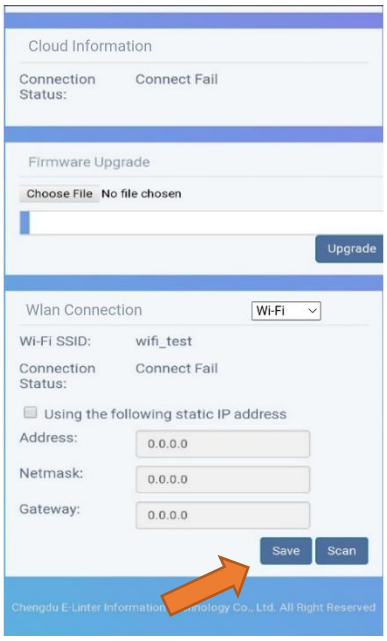


Figure (7.8) Save information

NOTE: If successful you should see a red and green light on the dongle showing a solid connection, Figure (7.9).

RED LED: Connected to Sol-Ark and has power.

GREEN LED: Connected to router and server.

FLASHING GREEN LED: Connected to router but not server (usually a VPN or Firewall issue, ports 80 and 51100 must be enabled).

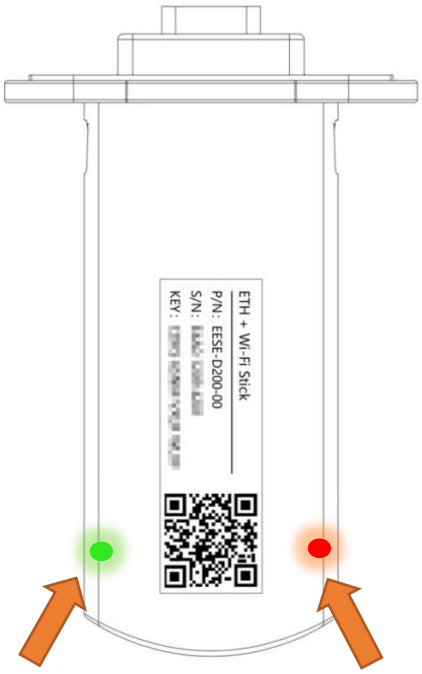


Figure (7.9) Wi-Fi dongle lights

Disclaimer

Connecting the Wi-Fi dongle using the IP address 10.10.10.1 to your home Wi-Fi network is only meant to provide internet access to the inverter.

You must still create a PowerView account

You can access PowerView on a computer with the following link:

http://www.mysol-ark.com

App for Smart Phone (PV Pro).

iPhone: (PV Pro)

Figure (7.10) IOS app

Android

Figure (7.11) Android app

Installers

It is recommended that the installer creates the plant and share it later with MANAGER permission to the owner of the system.

Once created, the installer or the homeowner can share the plant and assign Manager permissions on "My Plants" section, select "…" -> "Share" -> "Add Account".

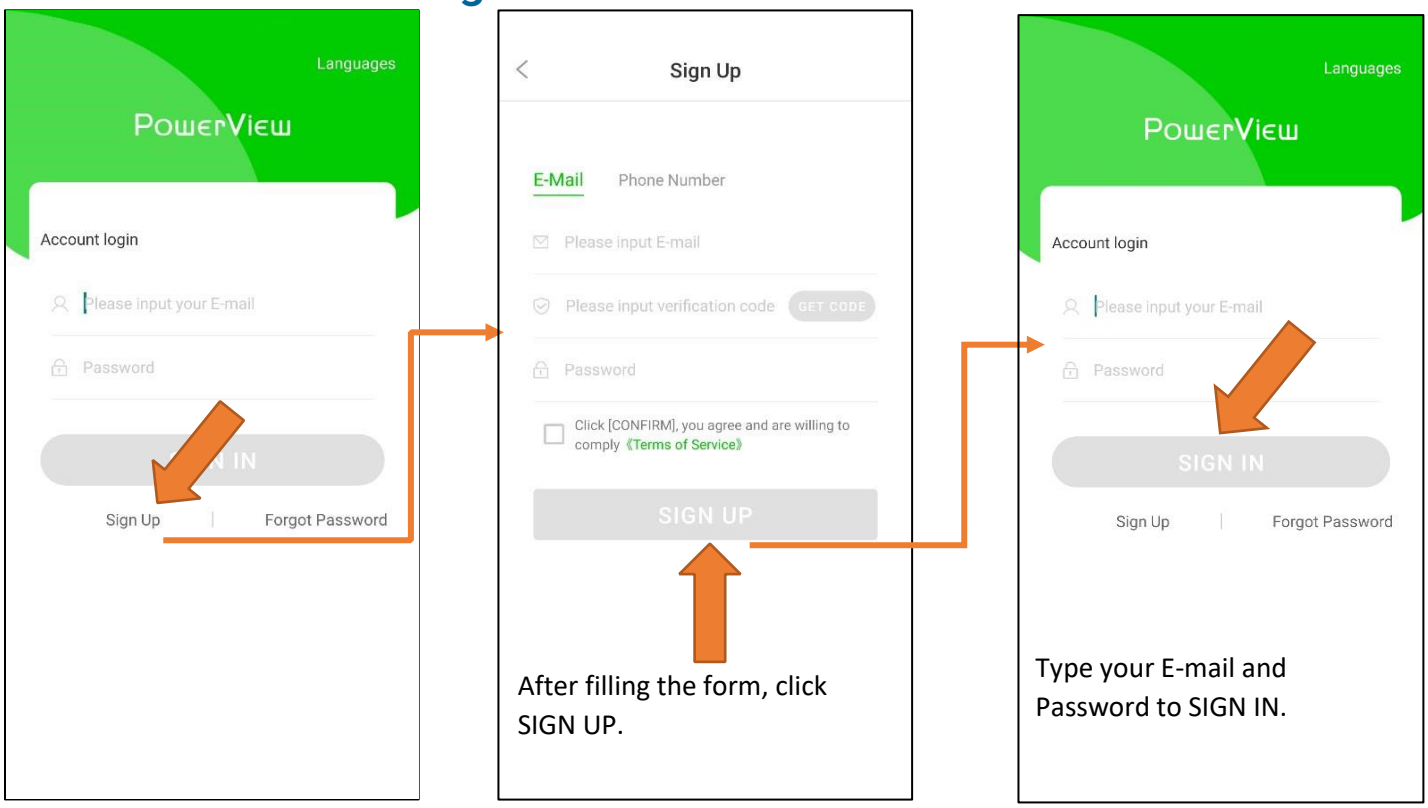
TIP: If you want to share a plant, a PowerView account with the new email must be created.

Video tutorial

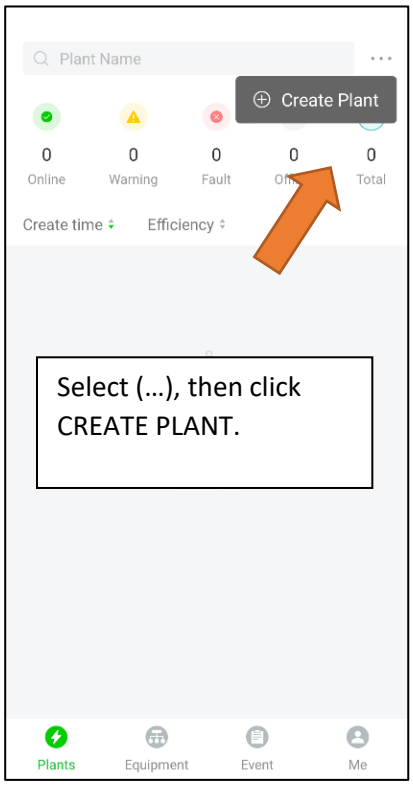
PV Pro web page – Tutorial Video

Figure (7.12) QR code

Create an Account and Sign In



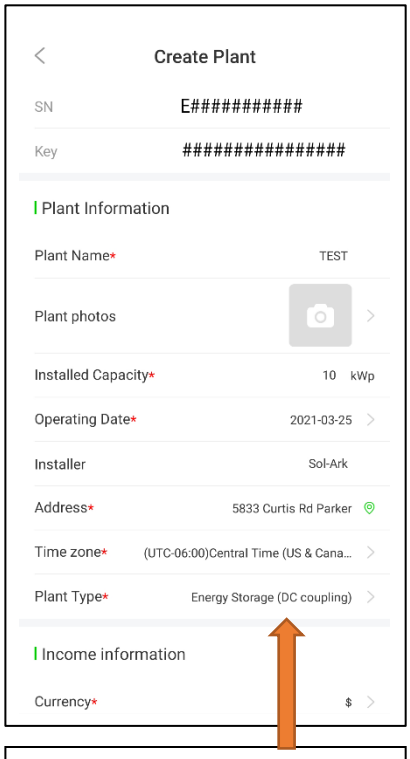
Add a Plant



Select (…), then click CREATE PLANT.

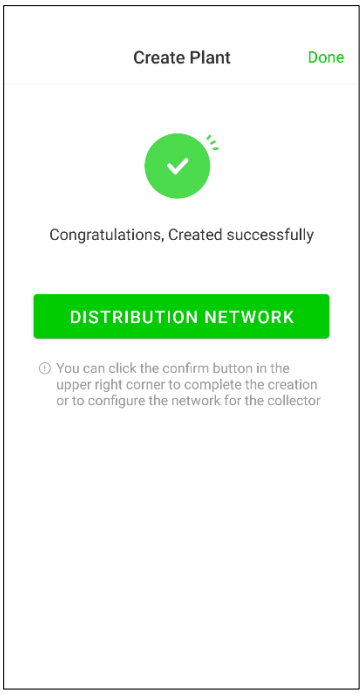
Scan the QR code or type manually the S/N and KEY.

Figure (7.13) Serial number

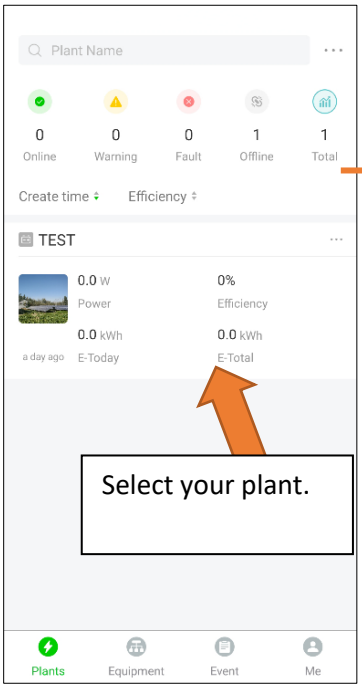


On Plant Type, **always** select Energy Storage (DC Coupling).

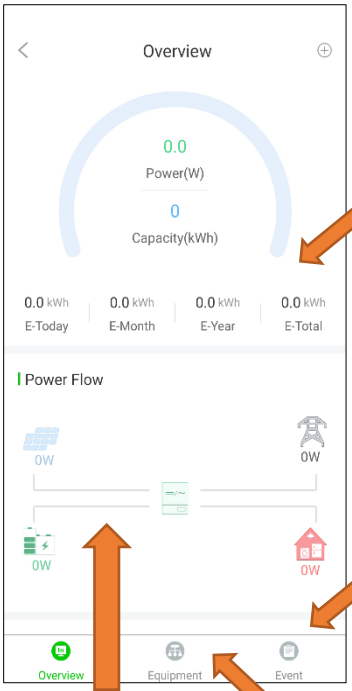
If Wi-Fi paired with IP Address (10.10.10.1 method) – select DONE.



Remote Monitoring On PV Pro (PowerView)-(https://pv.inteless.com)



Select your plant.



Energy Generation.

Alarms.

Power Flow.

System information and programming.

Attention

If you are installing parallel systems, DO NOT create a plant for each inverter.

Create one plant for the Master unit.

Under "Equipment" click on the "…", then hit "Add Gateway", type the S/N and Key of the Slave's dongle.

Connect to the Internet using PV Pro.

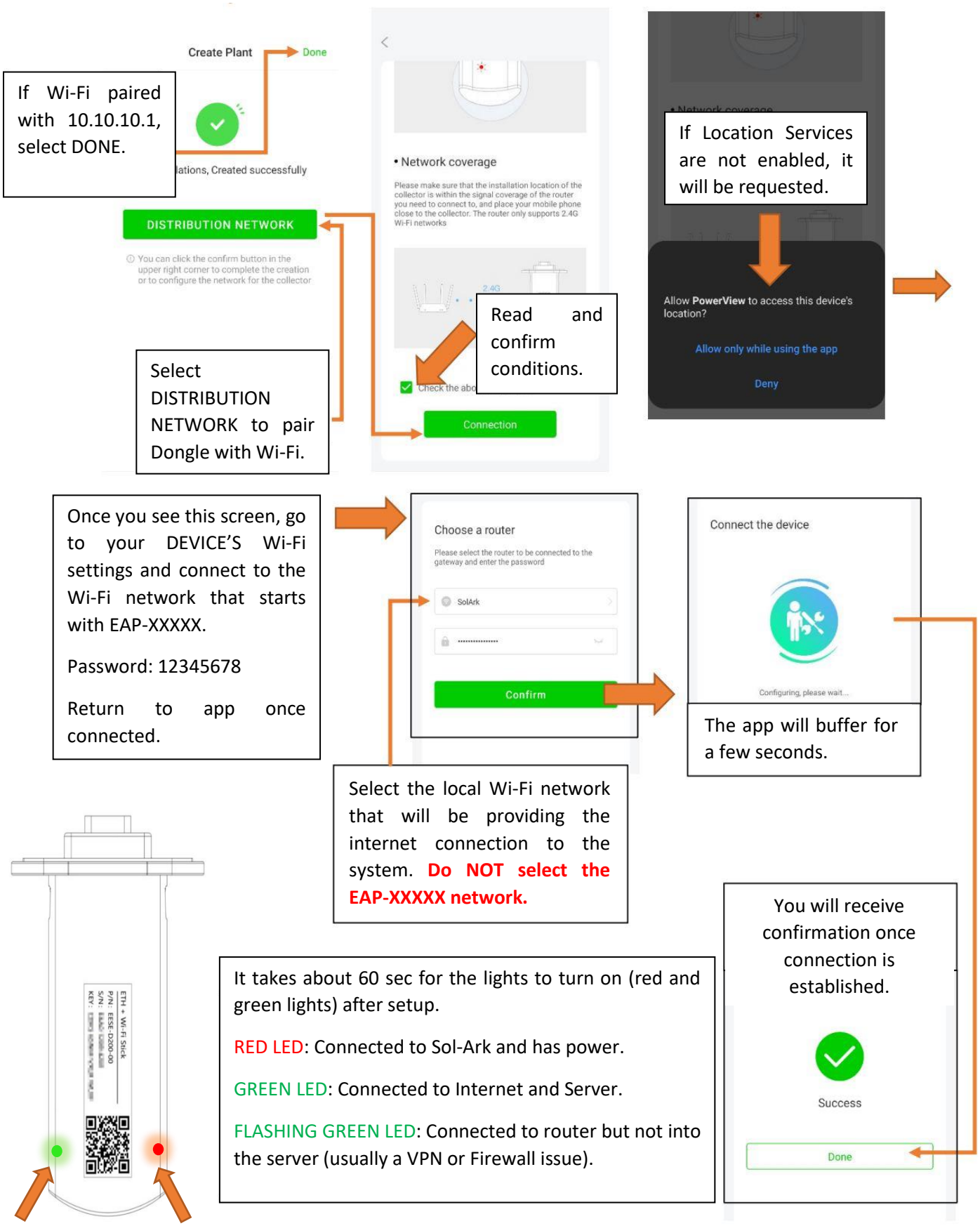
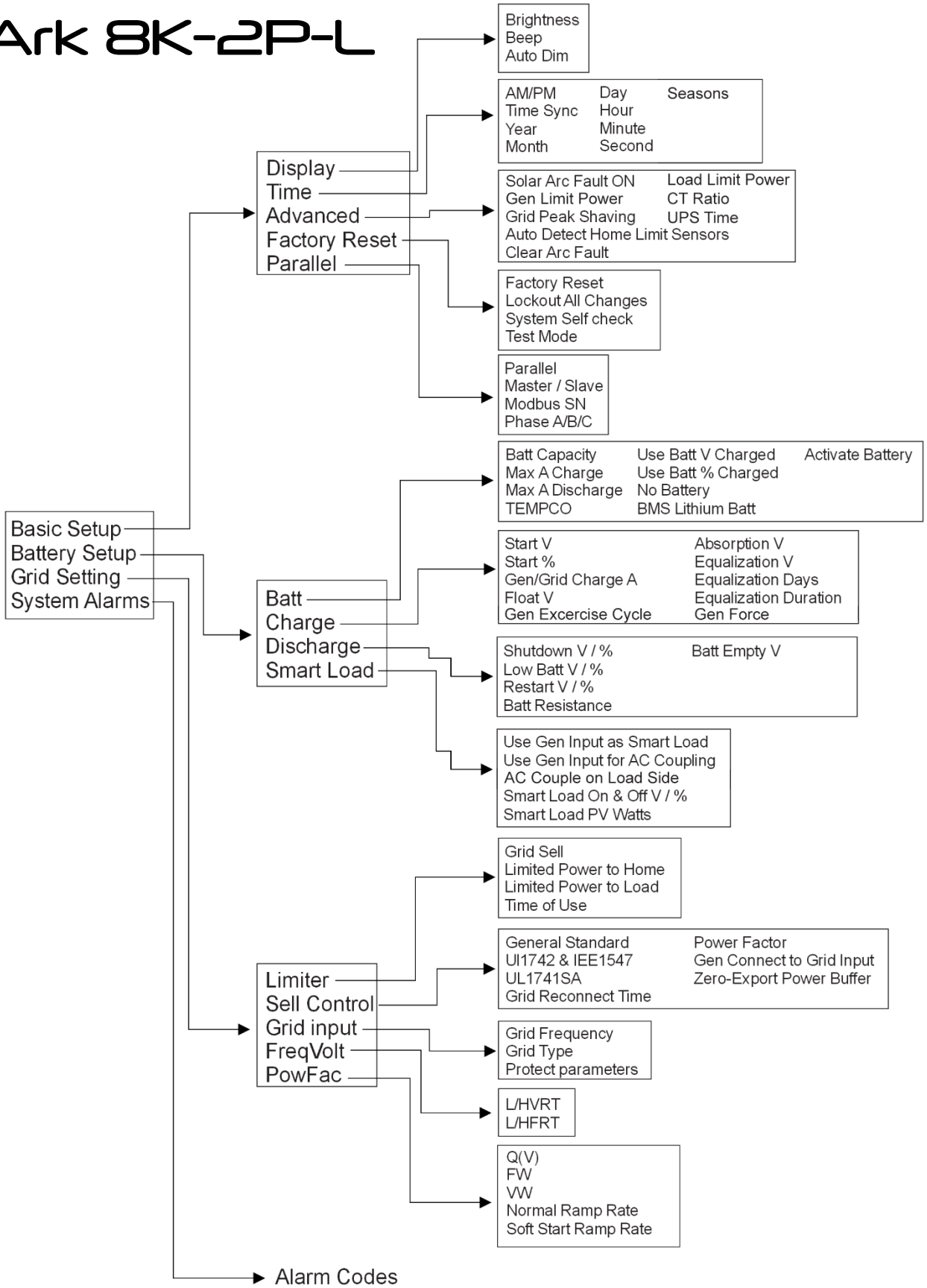


Figure (7.14) Wi-Fi dongle lights

Sol-Ark 8K-2P-L



Main Screen (Touchscreen)

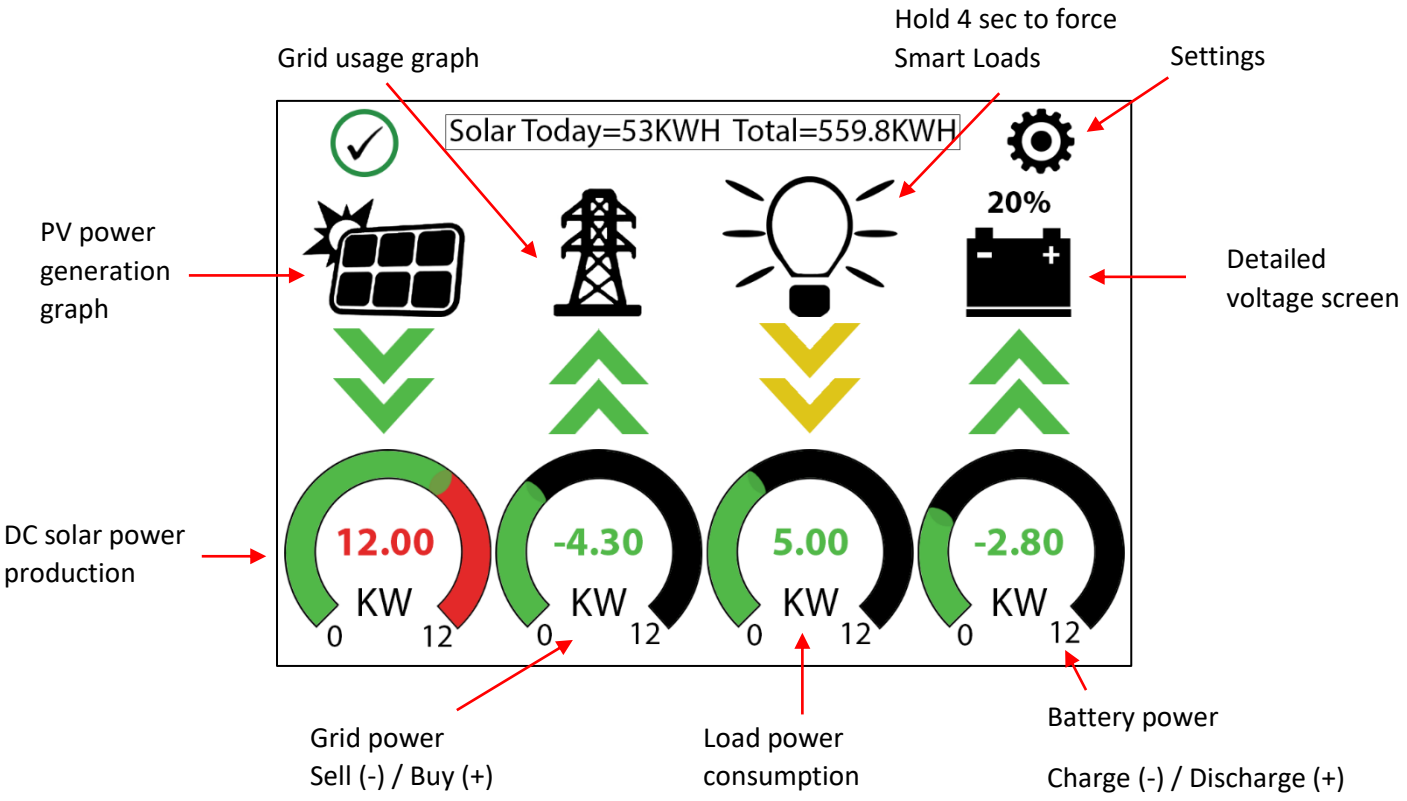


Figure (8.1) Main screen

Detailed voltage screen

- Top row = Total power per column.
- Middle row = MPPT1 Voltage, Amps and Watts.
  (Note: Voltage in "Solar" column not to exceed 500V).
- Bottom row = MPPT2 Voltage, Amps and Watts.
  (Note: Voltage in "Solar" column not to exceed 500V).
- Battery temperature will show -20°C if the temperature sensor is not connected.
- DC Temp = Temperature of DC side of the unit.
  - Batt → AC
  - PV → Batt
  - AC → Batt

Solar	Grid	INV	USP LD	Batt
3882W	-3081W 60.0Hz	3702W 60.0Hz	621W 122V	-26W
L1: 263V 5.4A 1398W	126V HM: -786W LD:-1876W	122V 15.2A 1857W	0W 121V 640W	54.70V -0.53A 25.0C
L2: 264V 9.5A 2484W	122V HM:1142W LD:1205W	121V 14.8A 1845W	**Gen** 4V 0.0Hz 0W	**TEMP** DC: 55.0C AC:49.7C

Figure (8.2) Detailed volts view

- AC Temp = Temperature of AC conversion side.
  - Batt → AC
  - PV → AC
- "GRID" Column = power in the grid.
  - If selling to the Grid, Watts = negative (-)
  - If buying from the Grid, Watts = positive (+)
  - HM = power detected by the external current sensors. L1-L2-L3
  - LD = power detected using internal sensor on "Grid" terminals.

Note: Opposite values in "Grid" or "HM" indicate incorrectly installed CT sensors.

PV power generation graph

A. Display power production over time for the PV array.
B. Use up/down buttons to navigate between days.
C. Month view/ year view/ total production.

Grid usage graph

A. Displays power drawn from grid (+) / sold to the grid (-).
B. Values above the line indicate "power bought" from the grid.
C. Values bellow the line indicate "power sold back" to the grid.
D. This view can help to determine when the peak power is used from the grid.

System setup menu

ID = Serial number of the unit.

COMM = LCD screen software version.

MCU = Inverter firmware version.

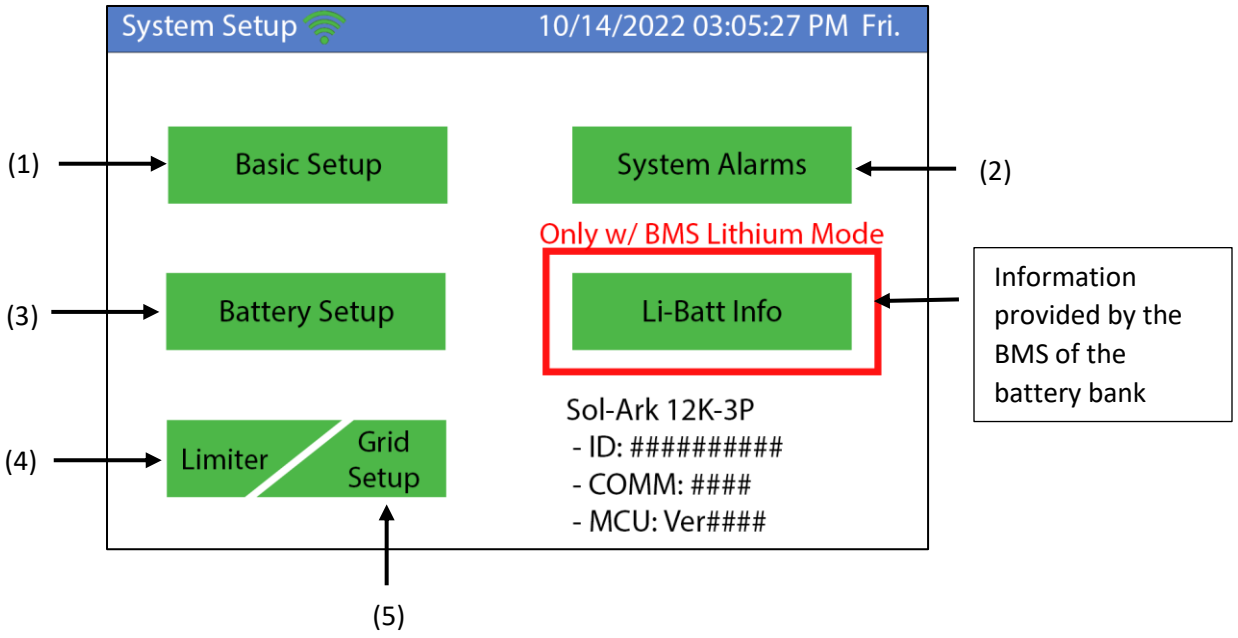


Figure (8.3) System Setup menu

(1) Basic Setup

Display

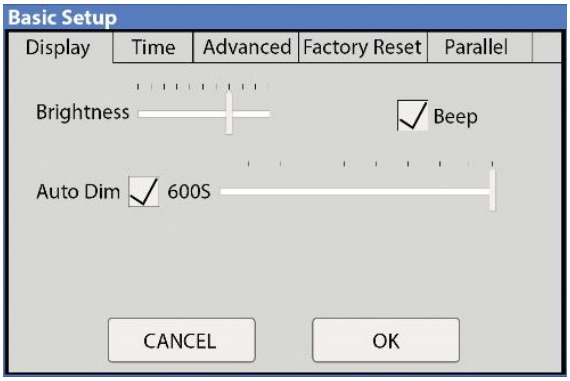


Figure (9.1) Basic setup

Brightness: Brightness adjustment (+, -).

Auto Dim: Must be enabled for the warranty to cover the LCD screen.

Beep: Enable / disable the alarm sound in case of failure.

Time

Time sync: Set the date and time for the system. (Enable "Time sync" is recommended).

Seasons: Set seasons for TOU (Time of Use) to follow, up to 3 seasons with chronological order.

Advanced

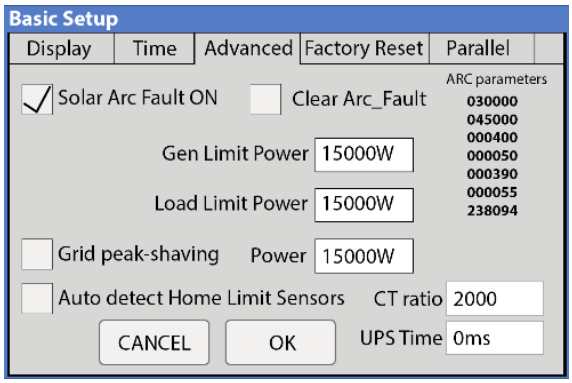


Figure (9.2) Advanced setup

Solar Arc Fault: Arc fault detection algorithm on the MPPTs.

Clear Arc Fault: Command to clear the fault caused by an arc fault. Required every time the unit throws an F63 – Arc Fault alarm.

Gen Limit Power: Sets the Sol-Ark threshold to keep the power drawn from the generator below the threshold. The inverter will reduce the charge power rate to the batteries if this value is reached.

Load Limit Power: Sets the total AC output power from the batteries to the LOAD terminal of the Sol-Ark. The default value is always the maximum output of the inverter production.

Grid Peak Shaving: Sets the Sol-Ark's threshold to begin contributing power from batteries to keep the power drawn from the grid below that value.

Auto detect home Limit Sensor: Command that helps to detect the correct polarity from the CTs sensors.

CT Ratio: Ratio from CT sensor input/output, the default value is 2000/1. **DO NOT** change this value or you will void the inverter warranty.

Factory reset

Restrictions: All the elements in this menu need to previously be authorized by technical support.

Parallel

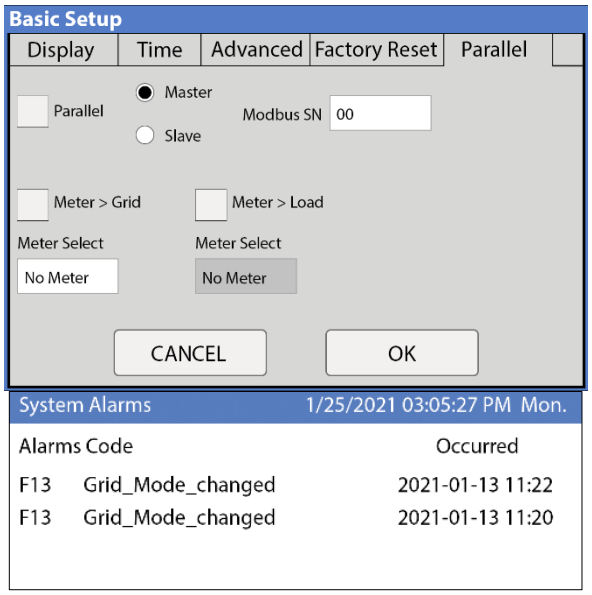


Figure (9.4) System alarms

Parallel: Enable whenever you have more than one system connected – one unit needs to be set as a "Master", the second one as a "Slave", and so forth.

MODBUS SN: Identification number for each system configured in parallel (1,2,3,4,n).

(2) System Alarms

Lists all recorded system alarms in descending, chronological order, as shown in Figure (9.4).

(3) Battery Setup

Batt - (Battery)

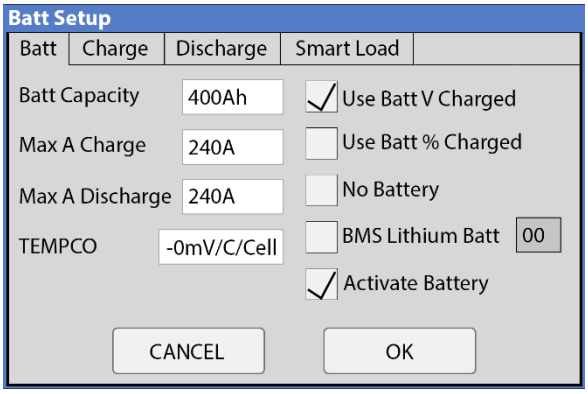


Figure (9.5) Battery setup

Batt Capacity: Battery charge capacity connected to the system; value expressed in Amp Hour (Ah).

NOTE:

- Batteries in series -> the voltage increases.
- Batteries in parallel -> the capacity increases (Ah).

Max A Charge: Sets the max charge rate for the batteries, this value also sets max PV charge to Battery, 240A hardware limit.

- Suggested 20% to 30% of battery capacity for lead-acid chemistry.

Max A Discharge: Sets the max discharge rate for battery bank, 240A max (for off-grid mode, the battery bank will discharge 120% of this value per 10 seconds for a surge before the inverter shuts down to prevent battery damage).

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

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

Use Batt % Charged: The inverter uses algorithms measuring power in and out to measure a true value for state-of-charged %. It compensates for aging batteries.

No Battery: The "No Battery" option must be selected when the inverter does not have battery connected. A **power cycle sequence** is required when selecting this option.

BMS Lithium Batt: Allows closed-loop communication with batteries included in our battery integration guide.

Activate Battery: This option must be selected if there is a battery attached to the system.

Charge

Float V: Voltage that the system maintains in the batteries once they are fully charged.

Absorption V: Voltage that the system uses to charge the batteries.

- Absorption will stop at 2% of the capacity of the battery bank and then drop to float.
- Example: A 400 Ah 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 and it is used to balance internal cells (lithium batteries don't need to equalize).

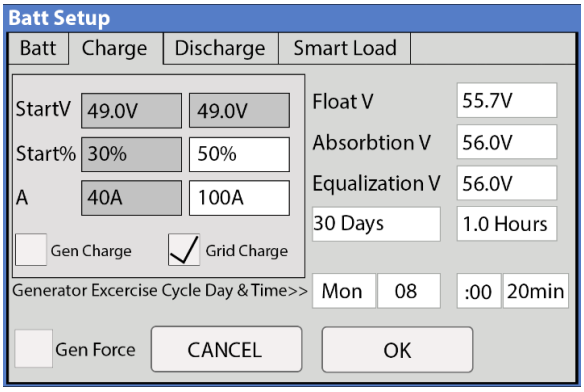


Figure (9.6) Charge setup

Days: The period between equalization cycles.

Hours: The period taken to equalize batteries.

NOTE: If "Hours" = 0 hours, system will not equalize batteries.

Gen Charge: Uses the "Gen" input of the system to charge the battery bank from a generator.

Start V: Voltage at which the system will AutoStart a generator to charge the batteries (the generator must have "auto" mode and dry-contact, normally-open, two-wire start capabilities).

Start %: Percentage S.O.C (state of charge) at which the system will AutoStart a generator to charge the battery bank (the generator must have "auto" mode and dry-contact, normally-open, two-wire start capabilities).

A: Charge rate from the generator wired up into the system in amps (DC). 100A of DC is equivalent to 22.5A of AC approx.

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

1. **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.
2. **Generator connected to "Grid" input:** It will be necessary select "GEN connect to Grid input". The system will use "Start V", "Start%" and "A" conditions, the inverter will stop charging at 95% SOC approx.

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

The generator must have a two-wire start connected to Sol-Ark and operate in "Auto" mode. To disable the exercise, set the duration length to 0 minutes.

Gen Force: When enabled, the inverter will close the dry-contact two-wire start and hold it closed for as long as enabled. Typically used to test the auto-start function of the generator.

Discharge

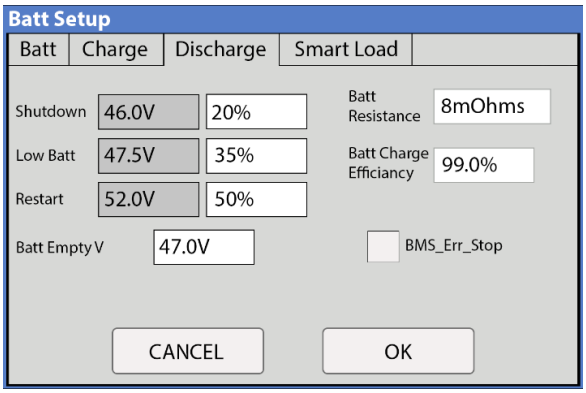


Figure (9.7) Discharge setup

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

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

Restart: Battery voltage at which AC output will resume conversion DC to AC after reaching "shutdown" voltage.

Batt Resistance: Internal resistance in 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, associates a voltage to 0% charge. This value determines the lowest % SOC limit.

Smart Load - (GEN terminal)

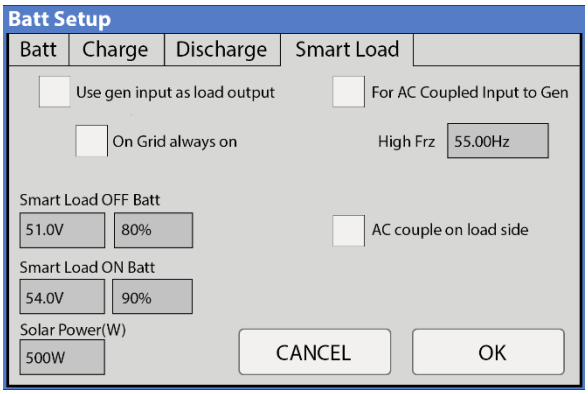


Figure (9.8) Smart Load

A. This mode uses the Gen input connection as an output that only receives power when the battery exceeds a user programmable threshold or when the unit is connected to the grid.
B. When “Use gen input as load output” is enabled the “GEN” terminal turns into an output to power high-power loads such as a water heater, irrigation pump, AC unit, pool pump, etc.
C. When “On Grid always on” is enabled, the “GEN” terminal will always receive power when the grid is connected, regardless of battery charge.

Smart Load OFF Batt: Battery voltage or % at which the Gen terminal will stop receiving power.

Smart Load ON Batt: Battery voltage or % at which the Gen Load will start receiving power.

Solar Power (W): The system waits to turn on the Smart Load until enough PV power is produced.

AC Coupling Settings (For AC coupled input)

NOTE: Maximum AC coupling combination = 4kW AC + 10.4 kW DC

Figure (9.9) AC-coupled combined input

A. To use the “GEN” or “LOAD” input terminal as an AC-coupled input for micro inverters or string grid-tied inverters, check the appropriate box according to your connection: "For AC Coupled Input to Gen” or “AC couple on load side”.
B. The meaning of “Smart Load OFF Batt” and “Smart Load ON Batt” change in this mode.

Smart Load OFF Batt: The % SOC at which the AC-coupled inverter(s) are shut down when in off-grid mode.

90% recommended.

Smart Load ON Batt: The % SOC at which the AC coupled inverter(s) are turned on when in off-grid mode.

When On-Grid, the AC coupled inverter will always be on, selling any extra power back to the grid. The system work mode “Limited to Home” **will not work** with the PV modules using AC coupling.

To use the “LOAD” terminal for AC coupling microinverters or string grid tie inverters

You must select "AC couple on load side".

A. The GEN terminal is not used (even though the GEN terminal is not physically being used for this mode, AC coupling on the “LOAD” terminal prevents the use of the “GEN” terminals for any other purpose).
B. Wire as shown in diagram labeled "Load side AC coupling example ".

(4) Limiter

Limiter

The Sol-Ark 12K-3P-L inverter will simultaneously utilize different available power sources to satisfy the loads demand in the electrical service panels (critical loads panel / main service panel). The following work modes allow the user to determine how to generate the power and where to utilize it.

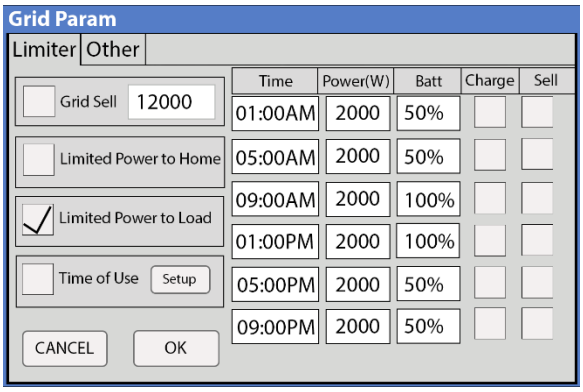


Figure (10.1) Limiter

Grid Sell: The inverter will produce as much power as it has available from PV array according to the programming. The maximum power that can be sold into the grid will be 12000 Watts.

General description:

1. This mode allows your inverter to sell back to the grid all the excess power generated from the PV arrays without limitation.
2. The inverter will only show loads connected to the "LOAD" terminal.
3. The inverter will show sell back as all the power going out to the "GRID" terminal.

Limited Power to Home (Zero Metering): This mode limits the energy being produced by the inverter to satisfy the home load demand (critical load panel + main service panel). In this mode, the inverter delivers power to the "LOAD" terminal (critical loads panel) + the "GRID" terminal (main service panel). To prevent grid sell back when powering the main service panel, it is important to install the external CTs sensors which allow the inverter to calculate the loads in the main service panel that is connected to the "GRID" terminal. This system work mode is useful for users that don't have a permit to sell back. See section "Limiter Sensors (CT Sensors)" for proper external CT placement.

General description:

1. Power is delivered to the whole home without selling back the excess to the grid (required if no permit to sell back from the utility company).
2. The external CTs sensors must be installed to work correctly with this system work mode.
3. The loads shown by the system will be the addition of the **main service panel** + **critical loads panel**.
4. This system work mode is MANDATORY with parallel Sol-Ark systems – allows an optimal power distribution between the inverters.
5. **Energy Priority:** 1. Solar PV Power | 2. Grid Power | 3. Batteries (down to "Shutdown" %) | 4. Generator (must meet the conditions from "Gen Charge" column).

Limited to Home + Grid Sell: This configuration will not limit PV production and will have better power distribution control with parallel systems and single inverter systems. The system will calculate the true loads in the critical loads panel (LOAD terminal) and in the main service panel (GRID terminals). The inverter will also sell back all the excess solar power to the grid and will show the real power pushed into the grid (it is important to mention that the CTs sensors have +/ - 3% error). CTs sensors MUST be installed. See section "Limiter Sensors (CT Sensors)" for proper external CT placement.

Limited Power to Load: This mode limits the solar power production to cover the loads demand connected to the "LOAD" terminals (critical loads panel). In this system work mode, the system IGNORES the loads in the main service panel, the inverter will not deliver any power to the "GRID" terminal.

General description:

1. The inverter will only cover the loads connected to the “LOAD” terminal.
2. It will NOT produce more power than the loads require.
3. This work mode will NOT deliver power through the “GRID” terminal (will NOT sell back).
4. The loads reported by the inverter will be only the ones in the critical loads panel (“LOAD” terminal).
5. This system work mode is recommended for off-grid applications.
6. **Energy Priority:** 1. Solar PV Power | 2. Grid Power | 3. Batteries (down to “Shutdown” %) | 4. Generator (must meet the conditions from “Gen charge” column).

Limited to Load + Grid Sell: This configuration will NOT limit PV production; it can only be used with single inverter systems. The inverter will calculate only the loads connected to the “LOAD” terminal and will sell back excess solar. If there is a main service panel wired up into the “GRID”, the inverter will NOT be able to calculate the true value of the total home consumption and grid sell back. This system work mode is recommended when the installation only has whole home backup.

Time Of Use (TOU): Using this system work mode combined with “Limited Power to Home” or “Limited Power to Load” allows the inverter to discharge the batteries to deliver power to the home and reduce the power consumption from the grid during specific time intervals. The battery discharge will cover the calculated load demand with the threshold discharge power rate set in the “Power(W)” column. You can configure six different discharge rates (Watts) and depth of discharge from the battery (V or %).

General description:

A. Use your batteries to reduce the power consumption during defined periods by user.
B. **Energy Priority:** 1. Solar PV Power | 2. Batteries (down to programmed discharge V or %) | 3. Grid Power | 4. Generator.

Time: During these hours the system will provide power from the battery to the grid or the home. The 6-time intervals MUST follow a chronological order.

Power(W): This is the maximum discharge power (adjustable in Watts) the Sol-Ark will draw from the battery during the time intervals.

Batt: Voltage or percentage battery state-of-charge at which the system stops using the batteries. The system will discharge the battery down to the programmed % or voltage. If “Charge” is checked, the “Batt” value will also be the upper threshold at which the inverter will charge the battery with an AC power source (grid or generator).

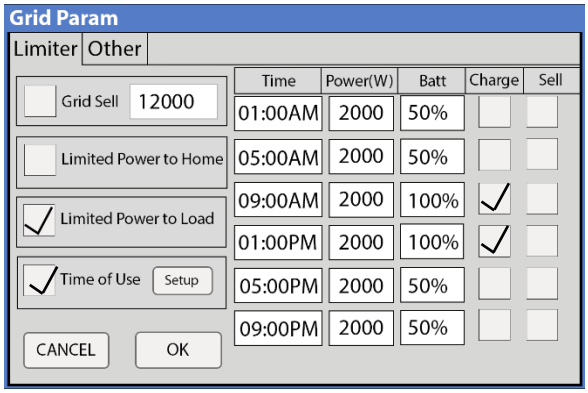


Figure (10.2) Time Of Use

Charge: Allows the batteries to charge from an external AC power source, such as a generator or grid, during the hours selected, up to the voltage or % configured. If the external AC power source is a generator, it is also necessary to meet the condition “Start V” or “Start %” located in the Battery Setup to begin charging from a generator. The PV array will charge the batteries at 100% regardless of the “Charge” box in TOU. Do NOT enable “Charge” and “Sell” at the same time.

Sell: The “Sell” box in TOU forces the battery to discharge and deliver the power to the loads and through the “GRID” terminal, at a constant rate for the selected period, determined by “Power(W)”. “Grid Sell” must also be enabled. Do NOT enable “Charge” and “Sell” at the same time.

Other

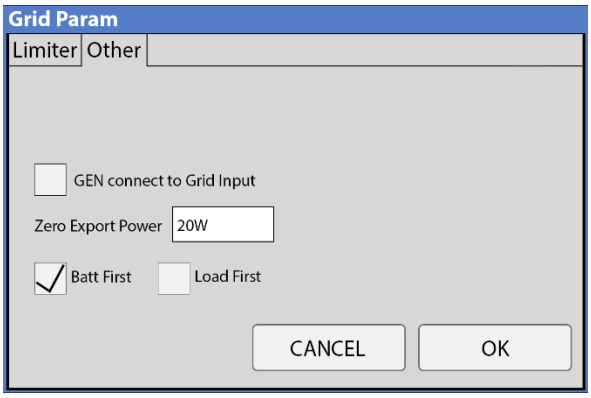


Figure (10.3) Other

GEN Connect to Grid Input: Enable this option if you have a generator wired up into the "GRID" terminal.

Zero Export Power: Minimum power imported from the grid having loads connected, this option will avoid the sell back to the grid from the inverter if there is not a permit to sell back or net metering agreement, it can be set between 1 – 100W (recommended 20W).

Batt First: Set the charge priority for the system, the solar PV power will be delivered first to charge the battery (it is recommended to check "Batt First" because it is the most efficient option).

Load First: Set the charge priority for the system, the solar PV power will be delivered to cover the loads consumption first, then the remaining will charge the battery.

(5) Grid Setup

Grid Selection

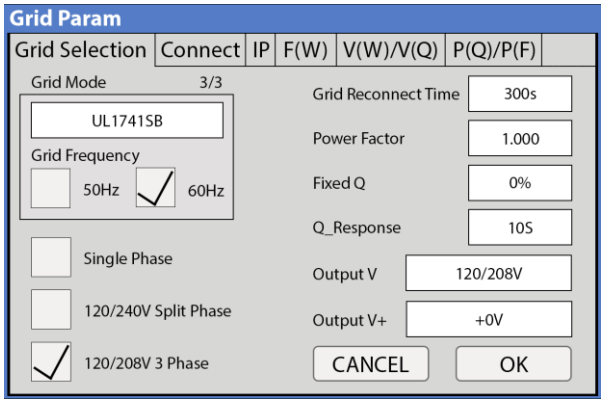


Figure (10.4) Grid Selection

General Standard: Allows more flexible adjustments to the grid parameters, such as widening frequency, to keep the inverter connected to the grid (useful when a generator is connected).

UL 1741 & IEEE1547: Enables sell compliant functionality.

UL1741SA: Enables F(W), voltage, and power factor control to sell back to utility. Useful for AC coupled inverters.

Grid Frequency: Frequency of the AC sine wave (the system is configured to 50Hz, must be adjusted to 60Hz).

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

Power Factor

The power factor can be adjusted from 0.8 to 1.0 (Call technical support if you need to modify this value).

Connect

Normal connect: Protect parameters for the grid, this can only be used with “General Standard”. The voltages shown in this menu correspond to L-N voltage (the maximum difference grid voltage value is +/- 10V).

Reconnect: Protect parameters for the grid after a grid disconnect. This can only be used with “General Standard”. The voltages shown in this menu corresponds to L-L voltage (the maximum difference grid voltage value is +/- 10V).

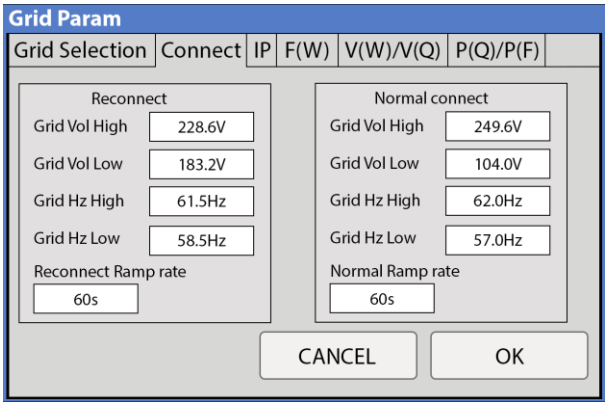


Figure (10.5) Connect Setup

IP- F(W)-V(W)/V(Q)-P(Q)/P(F) reserved

If connecting to a utility of 120/240V Split Phase and/or connecting multiple inverters, L1 and L2 will be specific phases and MUST match:

- L1 inverter 1 with L1 inverter 2 - same for “Grid” and “Load”.
- L2 inverter 1 with L2 inverter 2 – same for “Grid” and “Load”.

A power cycle sequence is required every time the inupt/output voltage is changed.

CT sensors enable smooth operation of the system work mode “Limited to home” and the “Grid peak-shaving” mode. The sensors let the inverter calculate the power demand in the main service panel located between the utility meter and the “GRID” terminal.

CT Sensor Installation

- The CT sensors need to be installed on L1-L2 and must be placed between the utility meter and the main service panel, with the embossed arrows pointing in the direction of the meter.

CT Sensor size

- Every Sol-Ark includes a pair of 5/8” CT sensors (measures up to 100A and can fit up to 2/0 AWG service wires).
- There are 15/16” (measures up to 200A for 4/0 AWG wire size) and 2” (measures up to 400A) sensors available for purchase if needed). Contact technical support if you required bigger CT’s: +1(972) 575-8875 Ext 2

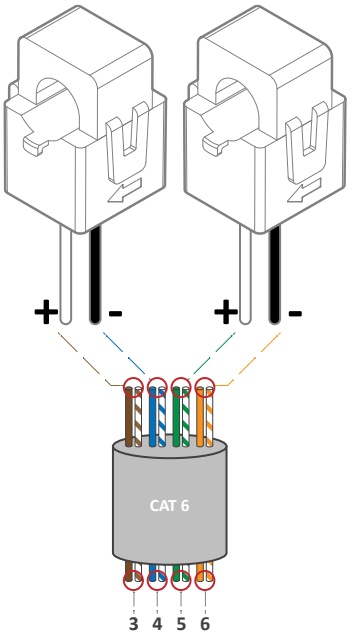


Figure (11.1)

Example of CT extension

Wiring the CT sensor

- Connect CT1 from phase L1 to pin 3 (white), 4 (black).
- Connect CT2 from phase L2 to pin 5 (white), 6 (black).
- Keep the wires twisted (white-black) throughout the connection.
- If the wires need to be extended, use CAT 6 (shielded) cable use both twisted pair wires look at Figure (11.1).

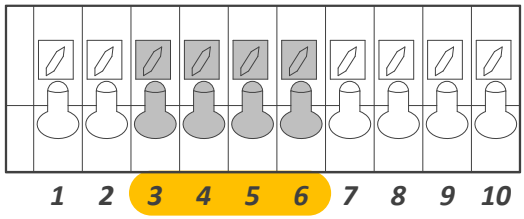


Figure (11.2) CT’s sensor board

CT sensor direction

- There is an embossed arrow on the CT sensor.
- The arrow must be pointing toward the meter (in 120/208V points in direction of the inverter).

Peak Shaving mode

“Grid peak shaving” require the CT sensors to be installed. To use this function with a generator, the generator must be wired up into the “GRID” terminal.

CT Ratio

Set the CT ratio. The Sol-Ark CT ratio is 2000/1. **DO NOT** change this value or you will lose the warranty for the inverter.

Parallel systems 120V/240V Split phase

- Each inverter will include 2 CT sensors.
- You will only connect the CT sensors to the inverter designated as the “MASTER”.
- For parallel systems you **MUST** use the system work mode **“Limited to home”,** so it is essential to install the CT sensors.

Automatic CT's Limit Sensors Configuration

"Auto detect Home Limit Sensors"

This option **requires batteries**, AC coupled inverters need to be OFF during the detection test. If this test is done with connected AC-coupled systems, you will need to do a factory reset.

Install the CT sensors as described in "Wiring Diagrams" section. A battery connection and grid power is required before starting the automatic configuration.

Instructions:

⚙ → Press "**Basic Setup**" → Select "**Advanced**" → Select "**Auto detect Home Limit Sensors**" and press "**OK**".

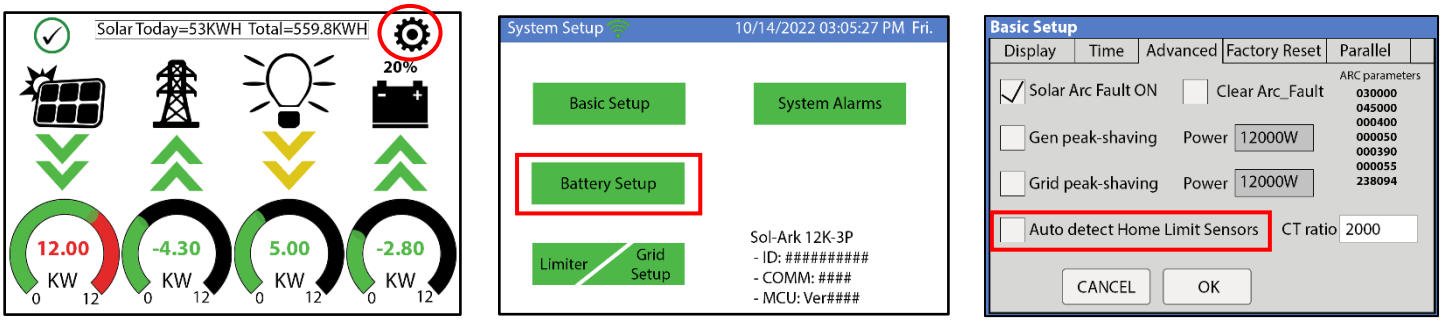


Figure (11.3) Automatic detection guide for the limiter sensors

For 10 to 15 seconds, the inverter will perform a test. The inverter will alternate the current distribution between phases L1 and L2 determining the correct polarity of the sensors.

CT sensor troubleshooting

- If you are exclusively using "Limited power to Home" HM values will read close to zero or positive. Keep in mind all sensors have a 3% error.
- To avoid selling power to the utility use "Zero Export Power" equal or greater than 20W.
- Pulling power from the grid will show HM values (+) in Watts.
- Using grid sell will turn HM values to (-).

Figure (11.4) Auto detect home limit sensors.

Off-Grid Install Tips

A. Limiter (CT) sensors are not required for completely Off-Grid installs unless using “Grid Peak Shaving” with a generator connected to the grid input terminal.

B. The generator should be connected to the grid input breaker so that you may use the “Smart Load” function on the “Gen” terminal.

C. When off-grid, there is no need for a transfer switch. Connect the load output of the Sol-Ark to the whole home.

D. Do not use “Grid Sell” mode Off-Grid. Only Limited power to load (default) in systems with only 1 inverter, and Limited Power to Home with paralleled in

E. The “Auto Gen-Start” function is a dry-contact, normally-open 2-wire switch (closes the circuit when needing charging).

1. Auto Gen-start will be triggered when the battery voltage (V) or percent (%) reaches the level programmed in the Battery Setup menu. Then, the generator will continue to charge the batteries until they are about 95% full before turning the generator off. Without Time of Use, this 95% value is not programmable.
2. When using the Sol-Ark to control a generator, an exercise function will turn on the generator once a week on Monday mornings at 8 AM for 20 min. This exercise is to maintain the internal generator batteries.

F. When using a Generator in an off-grid situation, we recommend changing the Grid mode to “General Standard” and changing the “Grid Reconnect Time” under the Sell Control tab of the Grid Setup menu to 30 seconds; otherwise, the Sol-Ark will not charge from the generator until it has been on for at least 5 minutes per the default value of 300 seconds.

G. In the Connect tab under “Reconnect” and “Normal connect”, change the frequency to a range of 55Hz – 65Hz. Widening the range will reduce the number of disconnections from fluctuations in a generator’s frequency. See Figure (11.6) for more details.

H. Under the “**Grid Setup**” menu → **Limiter** → **Other**, make sure to check the “GEN connected to Grid Input” box.

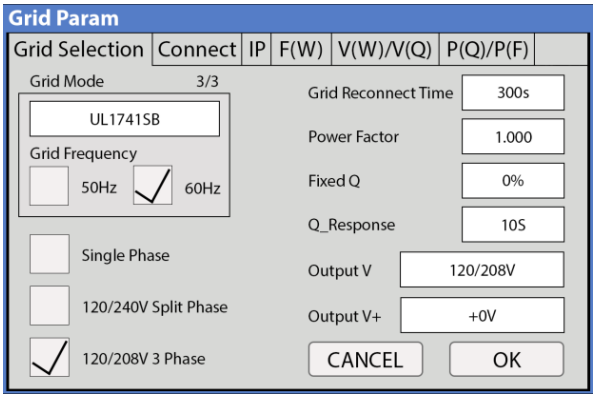


Figure (11.5) Grid mode

No Battery Install Tips

A. Under Battery setup, select “No Battery” & disable “Activate Battery” (the system will fault and start beeping).

B. A complete Power Cycle as shown in Figure (5.4) is required when changing the battery mode to “No Battery” settings.

C. Under “Grid Setup”, select “Grid Sell” and disable all other modes.

D. Touch the Battery Icon to see the Detailed Volts View to verify your inputs & outputs.

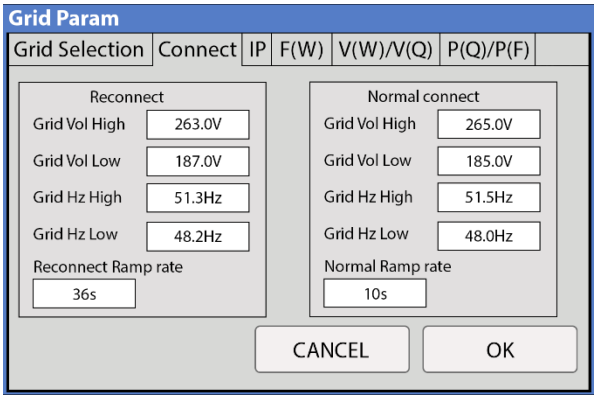


Figure (11.6) Voltage /Frequency range

Charge controller

4-Stage Charging

The MPPT has a 4-stage battery charging algorithm for rapid, efficient, and safe battery charging. Figure (12.1) below shows the stage sequence.

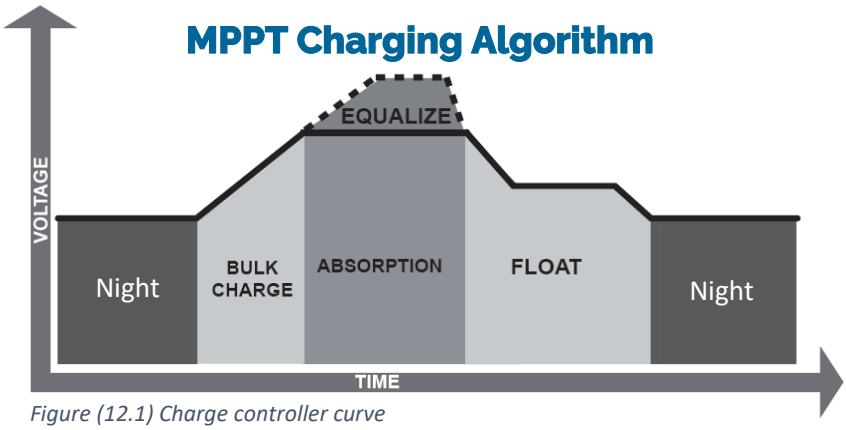


Figure (12.1) Charge controller curve

Bulk Charge Stage

In the Bulk Charge stage, the battery is not at a 100% state of charge and has not yet reached the Absorption voltage setpoint. The controller will deliver 100% of available solar power to recharge the battery.

Absorption Stage

When the battery has reached the absorption voltage setpoint, the Sol-Ark inverter uses constant-voltage regulation to maintain battery voltage at the absorption setpoint, preventing overheating and excessive battery gassing. The battery is allowed to come to a full state of charge at the absorption voltage setpoint. Absorption lasts until batteries charge at 98% of the programmed Ah size.

Float Stage

After the Absorption stage charges the battery fully, the MPPT reduces the battery voltage to the float voltage setpoint. If the batteries have 100% charge, there can be no more chemical reactions and all the charging current turns into heat and gassing. The Float stage provides a meager rate of maintenance charging while reducing the heating and gassing of a fully charged battery. The purpose of float is to protect the battery from long-term overcharge.

- Batteries in series: **ADD VOLTAGES.**
- Batteries in parallel: **ADD AMP-HOURS (Ah).**

Battery Charging Setpoint Examples (48V Nominal)

Battery Type	Absorption Stage	Float Stage	Equalize Stage (every 30 days for 3 hr)
AGM / PCC	(57.6V)	(53.6V)	(57.6V)
Gel	(56.4V)	(54.0V)	
Wet	(59.0V)	(55.0V)	(59.0V)
Lithium	(54.6V)	(54.3V)	-

Calculating Battery Bank's Amp-Hours (AGM)

Num. of batteries	Voltage / Battery	Amp Hours / battery	Amp-Hr @48V (Chain of 4 batteries of 12V in series)	Max Charge/ Discharge Amp
4	12V	230Ah	230Ah	100A
8	12V	230Ah	460Ah	200A
12	12V	230Ah	690Ah	275A

Follow all battery manufacturer-specified values to ensure proper charging and discharging.

Sol-Ark PCC-230 (AGM)

Batt Capacity: 230Ah x #Parallel_Batteries
(1 parallel = 4 Batt in series, 2 = 8 Batt, 3 = 12 Batt, 4 =16 Batt)
Max A Charge: 100A x #Parallel_Batteries
Max A Discharge: 100A x #Parallel_Batteries
Max A Grid Charge: 50A x #Parallel_Batteries
TEMPCO: -5mV/C/Cell
Float V: 53.6V
Absorption V: 57.6V
Equalization V: 57.6V
Equalization Days: 30
Equalization Duration: 3 Hours
Shutdown V / %: 47.0V & 20%
Low Batt V / %: 47.5V & 35%
Restart V / %: 52.0V & 50%
Battery Resistance: 35mOhms (8 Batt) or 25mOhms (16 Batt)
Battery Charge Efficiency: 99%
Battery Empty Voltage: 45V

Generation 2 Fortress Battery-eVault18.5KW

Batt Capacity: 360Ah x #Parallel_Batteries
Max A Charge: 185A (100A for better lifespan) x #Parallel_Batteries
Max A Discharge: 185A x #Parallel_Batteries
Max A Grid Charge: 100A x #Parallel_Batteries
TEMPCO: 0mV/C/Cell
Float V: 56V
Absorption V: 56V
Equalization V: 56 V
Equalization Days: 0
Equalization Duration: 0 Hours
Shutdown V / %: 51V & 10%
Low Batt V / %: 51.4V & 20%
Restart V / %: 51.8V & 25%
Battery Resistance: 5mOhms
Battery Charge Efficiency: 98%
Battery Empty Voltage: 49V

Simpliphi Power: PHI 3.8 Battery 48V

Batt Capacity: 75Ah x #Parallel_Batt
Max A Charge: 37.5A x #Parallel_Batt (20A for better lifespan)
Max A Discharge: 37.5A x #Parallel_Batt (20A for better lifespan)
Max A Grid Charge: 20A x #Parallel_Batt
TEMPCO: 0mV/C/Cell
BMS Lithium Batt: Not Selected
Float V: 54V
Absorption V: 56V
Equalization V: 56V
Equalization Days: 30
Equalization Duration: 2 Hours (tops off battery)
Shutdown V / %: 50.2V & 20%
Low Batt V / %: 50.6V & 30%
Restart V / %: 51.0V & 50%
Battery Resistance: 24mOhms ÷ (# of batteries)
Battery Charge Efficiency: 99%
Battery Empty Voltage: 46V

Examples of TOU (Time Of Use)

Table (1) TOU Example

Time	Watts	SOC	Charge	Sell
1:00AM	1500*	70%		
5:00AM	1500*	70%		
9:00AM	1500*	70%		
1:00PM	1500*	100%		
4:00PM	1500*	70%		
9:00PM	1500*	70%		

These settings will charge the batteries off solar only. Discharge the batteries down to a minimum of 70% full. Limited To Home mode will not sell to the grid from the batteries (only the home will use battery power). The 100% time slot is to ensure that the batteries are properly fully charged each day.

Table (2) TOU Example

Time	Watts	SOC	Charge	Sell
1:00AM	6000*	40%		
5:00AM	6000*	40%		
9:00AM	6000*	40%		
1:00PM	6000*	40%		
5:00PM	6000*	40%		
9:00PM	6000*	40%		

These settings will charge the batteries off solar only. Discharge the batteries down to a minimum of 40% full. Limited To Home mode will not sell to the grid from the batteries (only the home will use battery power).

Table (3) TOU Example

Time	Watts	SOC	Charge	Sell
1:00AM	6000*	40%		
5:00AM	6000*	40%		
9:00AM	6000*	40%		
1:00PM	6000*	40%		x
5:00PM	6000*	40%		x
9:00PM	6000*	40%		

These settings will charge the batteries off solar only. Discharge the batteries down to a minimum of 40% full.

Between the hours of 1PM to 5PM, the inverter will discharge the batteries to sell back to the grid at a constant rate of 6000W until the batteries reach the SOC of 40%.

*This value must consider the discharge capacity of your batteries

Note for battery communication with MODBUS/CANBus

Use the following information at your own risk. Any damage caused by the improper use of the communication protocols will not be covered by warranty. Modbus map available upon request for reading operations only (contact technical support).

RJ45 configurations:

No.	RS485 PORT	CAN PORT
1	RS485	--
2	Meter_CON	GND
3	GND	--
4		CANH
5		CANL
6	GND	--
7	RS485A	--
8	RS485B	--

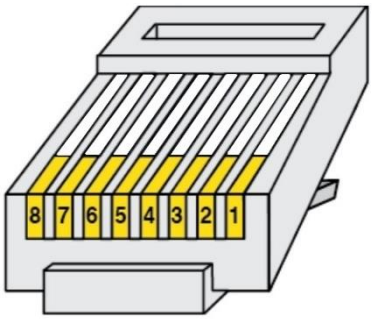


Figura 13.1 RJ45 port configuration.

Battery integration guide can be found in: www.sol-ark.com/support/

Before enabling parallel operations

A. Make sure all units in parallel have the same software version.
B. Verify "**COMM**" and "**MCU**" on System Setup, Figure (13.1).
C. Go to https://www.sol-ark.com/software-update/ to schedule an update or call/email Tech Support for assistance: support@sol-ark.com
D. Parallel systems REQUIRE a joint battery bank. If you do not have a battery, keep all Sol-Ark's out of parallel and set every System to Grid Sell Mode.
E. All INPUTS/OUTPUTS must be shared among all inverters, except for DC solar inputs.

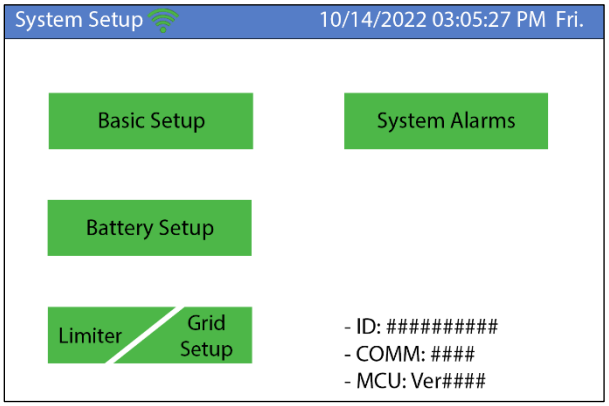


Figure (13.1) Firmware Version

DIP switches configuration in parallel systems

In parallel systems, set the "DIP Switches" as shown in Figure (13.2) according to Table 4.

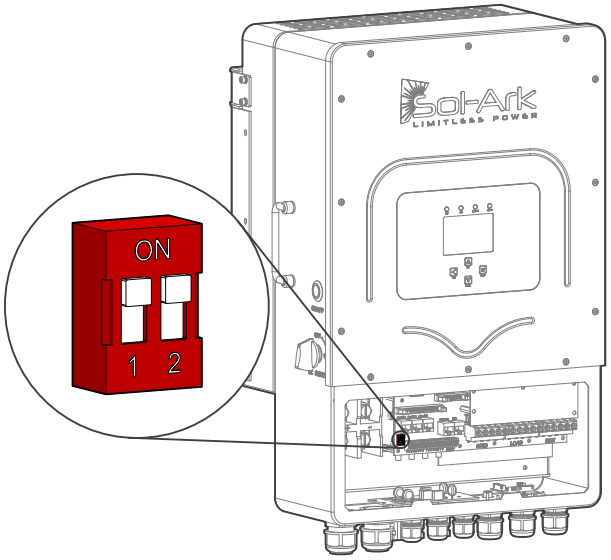


Figura (13.2) DIP Switches

Table 4. DIP switch configuration for parallel systems

# of inverters in parallel	1	2	3	4	5	6	7	8
Inverter 1 (Master)	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
Inverter 2		ON	ON	ON	ON	ON	ON	ON
Inverter 3			OFF	ON	ON	ON	ON	ON
Inverter 4				OFF	ON	ON	ON	ON
Inverter 5					OFF	ON	ON	ON
Inverter 6						OFF	ON	ON
Inverter 7							OFF	ON
Inverter 8								OFF

Parallel systems Sol-Ark 8K-2P-L @ 120V/240V outputs

# of inverters in parallel	Continuous output power with PV (kW)	Continuous output power with batteries (kW)	Grid "Pass Through" (A)	Peak power 5 sec (KVA)
1	8	8	50	12
2	16	16	100	24
3	24	24	150	36
4	32	32	200	48
5	40	40	250	60
6	48	48	300	72
7	56	56	350	84
8	64	64	400	96
9	72	72	450	108

Parallel systems Sol-Ark 8K-2P-L @ 120V/208V 3Phase

# of inverters in parallel	Continuous output power with PV (kW)	Continuous output power with batteries (kW)	Grid "Pass Through" (A)	Peak power 5 sec (KVA)
1*	8	8	50	12
2**	16	16	100	24
3	24	24	150	36
6	48	48	300	72
9	72	78	450	108

*2 phases **3Phase-unbalanced

Parallel systems programming sequence

- Program each one of the units with parallel option under **"Basic Setup" → "Advanced".**
- Assign a System as "Master"| Modbus SN: 1
- Assign all other units as "Slave" | Modbus SN: 2,3,4…etc.
- There must be communication between the inverters using the RJ45 cable (yellow ethernet cable) in daisy-chain configuration between ports: "Parallel_A" or "Parallel_B" from Master into Slave.
- Do a power cycle.
- Turn on the "Slave" unit(s), then turn ON the master.
- You will get F29 and F41 until all inverters are ON.
- All inverters must be connected into the same battery bank.

When integrating a generator, it must be connected to all the systems in parallel. The inverter assigned as "Master" will control the two-wire start feature.

Parallel configuration (Example on a 3 phase System-Balanced). Phase A-B-C

A 3 phase balanced system required 3 units at least, as it is shown in Figure (13.2), each inverter will be in charge if a phase.

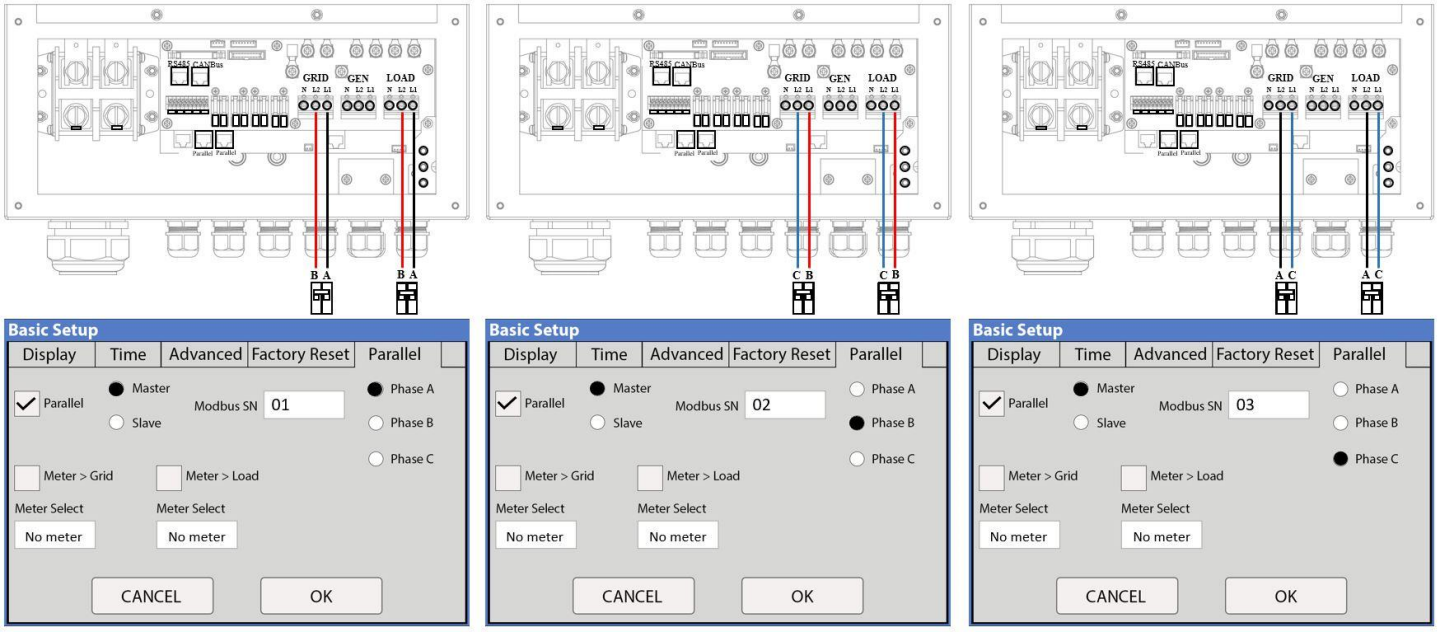


Figure (13.2) 3 Phase configuration.

In 3 phase systems we can use 2 phases out of 3 in case of not receiving a balanced System see pg. 59.

If a System goes into a fault state, all units will shut down and self-reboot. If the fault persists 5 consecutive times, the system will need a manual restart. Follow the Power Cycle Sequence in Figure (4.4).

1 inverter @120V/208V 3 phase using 2 phases out of 3

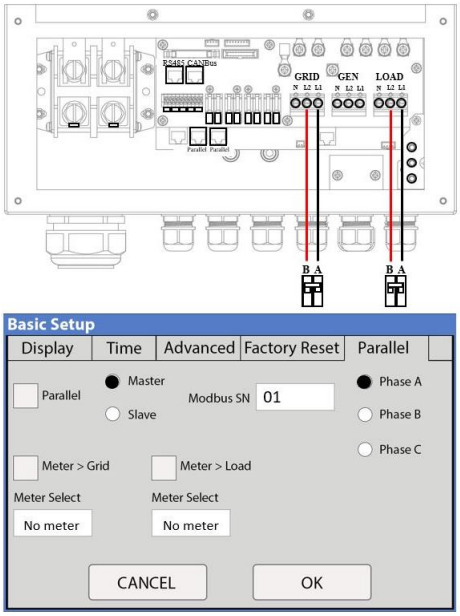


Figure (13.3) 3 phase programming

2 inverters @ 120V/208V 3 phase using 2 phases out of 3

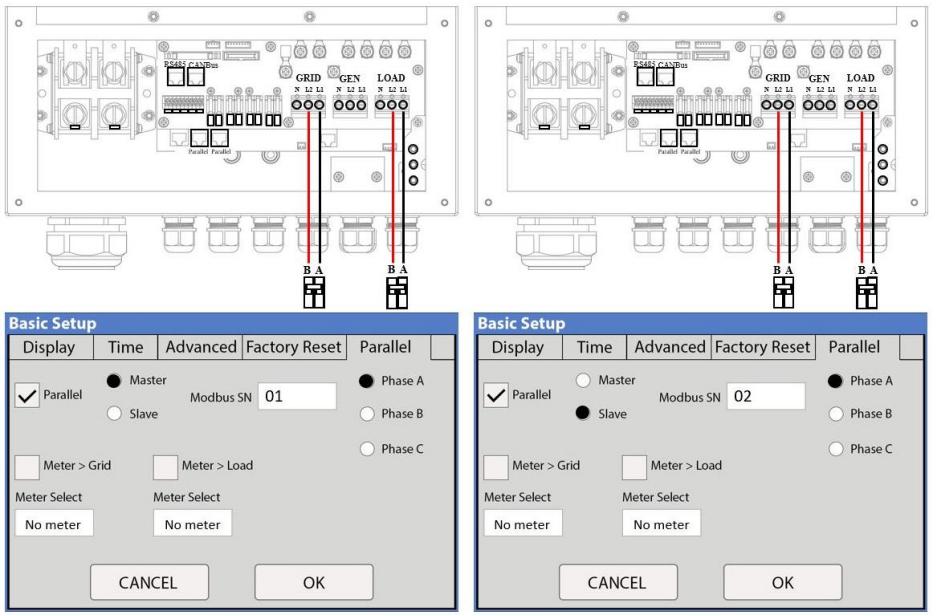


Figura (13.4) 3 phase programming

2 inverters @ 120V/208V 3 phase using 3 phases out of 3

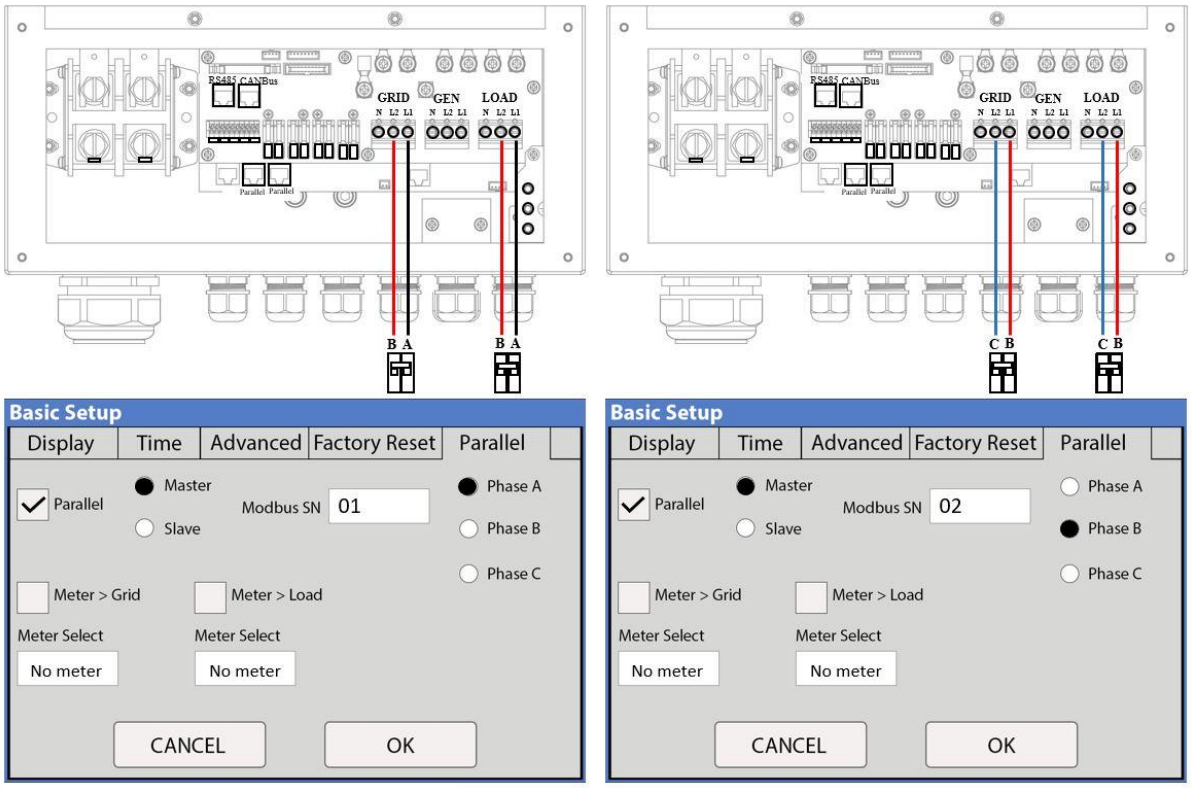


Figure (13.5) 3 phase programming

Troubleshooting guide with phase sequence.

If the screen of your Sol-Ark inverter shows the error shown in Figure (13.6), ensure the phase sequence follows A-B-C convention. The message “Grid Phase Wrong” is displayed when the inverter does not detect the correct phase rotation. This situation can cause overloads faults in the system (F18, F26, F34) even with the “Load” disconnected and **will cause damage** to the equipment if it is not corrected.

In 3 phase systems it is recommended to use a rotational tester (1-2-3 , A-B-C).

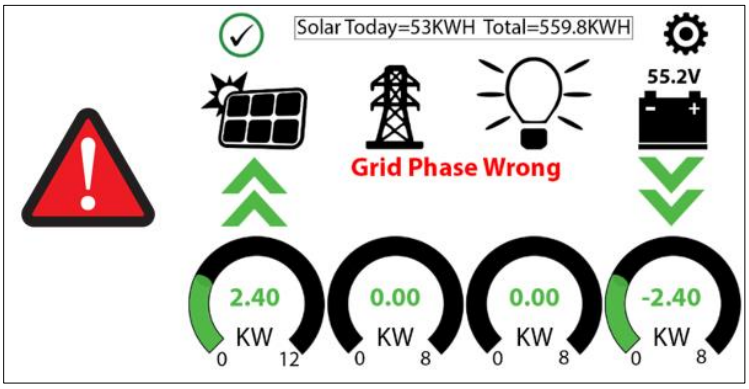


Figure 13.6 Grid phase wrong.

3 Phase systems with multiple Sol-Ark inverters.

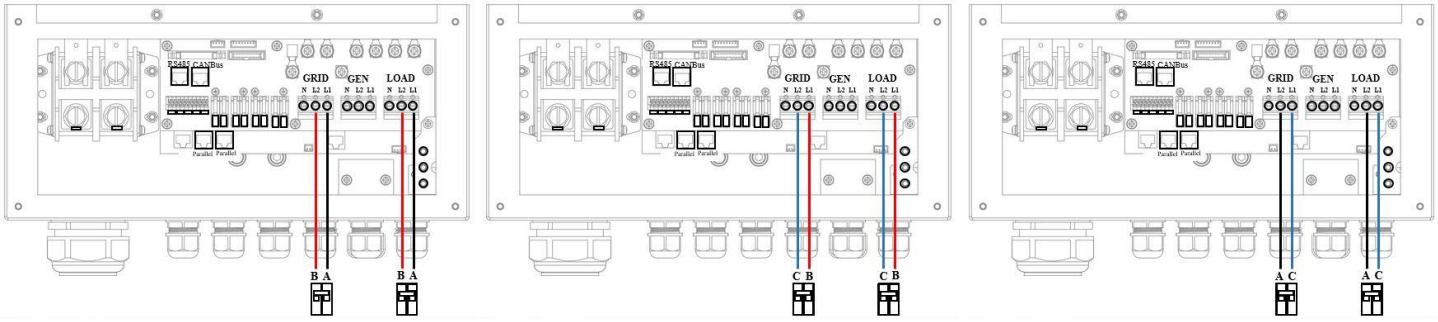


Figure (13.7) Phase sequence

How to find the incorrect phase?

- Measure L2 from “GRID” from inverter (1) to L1 “GRID” from inverter (2) , should be 0V AC.
- Measure L1 from “GRID” from inverter (1) to L2 “GRID” from inverter (3) , should be 0V AC.
- Measure L2 from “GRID” from inverter (2) to L1 “GRID” from inverter (3) , should be 0V AC.
- Same process should be done for “LOAD” side.
- Measuring voltage different than 0V AC mean it is not the same phase.
- **Sol-Ark can only receive direct rotation“↻” (clockwise).**

Be sure to check both, “GRID” and “LOAD” terminal connections; both must be correct. If the error persists you will need to check your AC connection beyond the inverter and you will need to verify that the phases are correctly labeled from your meter.

LCD is not powering on

- Check all connections – at least one of the following power sources is required: PV/Grid/Battery
- Try pressing the power button, touchscreen, or navigation buttons

Panels are connected, but DC Light is not on

- PV voltage must be 150V-500V | It's night

Panels are not producing

- Check for proper wiring on all solar panel connections
- Turn PV disconnect "ON"
- Check that the PV input voltage is not greater than 500V
- If the system says PV = 0V, check PV polarity

Panels are not producing much power

- PV Wire Strip Length: 5/8". Your batteries are charged; you can test Grid Sell to verify.

The system does not keep batteries charged

- Check the charge setting in the Charge Menu

Auto Gen-Start is not working

- Check to make sure your generator is compatible with Auto Start
- Make sure that the Auto Gen Start wire is adequately connected to the Sol-Ark 8K and the generator

Normal LED isn't on

- Sol-Ark 8K is in pass-through-only mode, only a Grid connection.
- Sol-Ark 8K is not working correctly (Call us)

The alarm light is on

- Check the system alarms menu to identify the alarm

Grid HM value is negative when it should be positive (only applies in limited home mode)

- Limiter Sensors are backwards, L1/L2 sensors are swapped, or incorrectly wired L1/L2 sensors. Try Auto Learn.

AC Overload Fault or Bus Unbalance Fault

- Check Transfer Switch/Subpanel wiring
- Check for large loads that consume more than the inverter rating (EX: AC units over 3 tons)

The system connects to grid and quickly disconnects

- With a DMM, verify your Neutral wire connection (should be 0Vac referenced to GND)
- Check your Freq is set to 60Hz, and the 8K measures 120V on L1 vs. N / L2 vs. N
- If overloading: verify 120V/240V grid input and load output wires are not swapped.

DC Overload Fault

- Check PV voltage
- Make sure you have not wired more than two (2) solar strings in parallel

System is beeping

- Check the System Alarms menu to see which alarm has been triggered. Most alarms will self-reset.
- There is no battery connected. If not using a battery, select “No Battery” and disable “Activate Batt” in Batt menu.
    - Turn off the center button, remove AC Grid and PV Power for the 30s (screen is dead), and then power up to fully reset the system.

Battery cable sparks when connected

- Put the built-in battery breaker in the off position before connecting or disconnecting batteries.

Battery symbol on the home screen is red

- The battery is under-Voltage or over-Voltage Battery symbol on the home screen is yellow
- The battery is low, or the charge/discharge current is close to the programmed limit (which is ok)

Grid symbol on the home screen is yellow

- Grid parameters are out of specified range or grid is down

System has restarted

- It happens if the system is overloaded, battery voltage is greater than 63V, or Software update

Batteries were connected backwards

- The battery breaker will trip. It can cause damage!

Why is the LCD screen still on when the power button is off?

- If PV or Grid power is connected, LCD stays on, but the inverter and loads are off.

The Batt % meter is not reaching 100%

- The system needs to go through a small discharge/charge cycle first to calibrate the battery

Generator setup is reading 0Hz

- Generator frequency is out of frequency range. Select "General Standard" instead of UL1741. Then widen the frequency range to 55Hz-65Hz.

Color Touchscreen is Frozen

- Press and hold the escape button [⇩] for 7-10 seconds

Sol-Ark 8K-2P-L error codes

Fault	Instruction	Common Cause/Remedy
F1	DC Inversed Failure	If you have parallel systems and turn one system off, you with get this notification. **NOT** a fault.
F8	GFDI_Relay_Failure	Current Leakage from inverter AC output to Ground, check Ground and neutral are connected at the main panel
F13	Grid_Mode_change	It can happen when not using batteries or if Grid Input settings are changed. This is a notification, **NOT** a fault. If you switch from No Batt to Battery mode, power the system down completely to restart.
F15	AC_OverCurr_Failure	It is usually caused by Loads too large for the Inverter. If off-grid, the battery discharge amps are programmed too low. Overloads can result in F15, F18, F20, or F26.
F16	GFCI_Failure	Ground fault. Check PV+ or PV- wiring (which must be ungrounded). Exposed PV conductors + rain can also cause. Check that the neutral line and Ground are not double-bonded (common with portable generators).
F18	Tz_Ac_OverCurr_Fault	Overloaded the Load Output (reduce loads) or overloaded a generator (reduce Gen Start A see pg. 33). Wiring Short on the AC Side can also cause this error. Overloads can result in F15, F18, F20, or F26.
F20	Tz_Dc_OverCurr_Fault	It is typically caused by DC current from the battery that is too large (ex: 4 Ton AC Unit) or too much PV current (3 or more strings in parallel). Overloads can result in F15, F18, F20, or F26.
F22	Tz_EmergStop_Fault	Initiated Emergency Stop; see sensor pinout table.
F23	Tz_GFCI_OC_Fault	PV Ground fault. Check PV+ or PV- wiring (which must be ungrounded or damage can occur). Typically caused by pinched PV wire grounding the PV+ or PV-. Grounded PV wire can cause F20, F23, or F26.
F24	DC_Insulation_Fault	An exposed PV conductor combined with moisture is faulting (can cause F16, F24, F26).
F25	AC_Active_Batt_Fault	No battery connection to the Inverter, and Activate Battery is enabled. Disable Activate Battery in settings while no battery is connected.
F26	BusUnbalance_Fault	Too much load on one leg (L1 or L2) Vs. the other leg or DC loads on the AC output when off-grid. Grounded PV +/- wire can cause F20, F23, or F26.
F29	Parallel_CANBus_Fault	Usually, a communication error for parallel systems, check cables, and MODBUS addresses (pg. 44)
F30	AC_MainContactor_Fault	Contact Sol-Ark.com
F31	Soft_Start_Failed	Soft Start of the large motor failed
F34	AC Overload Fault	AC Overload or load shorted. Reduce heavy loads.
F35	AC_NoUtility_Fault	Grid connection lost
F37	DCLLC_Soft_Over_Cur	Software DC overcurrent
F39	DCLLC_Over_Current	Hardware DC overcurrent
F40	Batt_Over_Current	Batteries exceeded their current discharge limit
F41	Parallel_System_Stop	If one system faults in parallel, this normal fault will register on the other units as they disconnect from the grid
F45	AC_UV_OverVolt_Fault	Grid under voltage causes a disconnect. This will self-reset when the grid stabilizes.
F46	Parallel_Aux_Fault	Cannot communicate with other parallel systems. Check Master = 1, Slaves are 2-9, ethernet cables are connected.
F47	AC_OverFreq_Fault	Grid over Frequency (common in power outages) causes a disconnect. Will self-reset when grid stabilizes.
F48	AC_UnderFreq_Fault	Grid under Frequency (common in power outages) causes a disconnect. Will self-reset when grid stabilizes.
F55	DC_VoltHigh_Fault	PV may be higher than 500V. Battery voltage should not be above 59V or 63V (depending on the model).
F56	DC_VoltLow_Fault	Batteries are overly-discharged, the Inverter is off grid and exceeded the programmed batt discharge current by 20%, or Lithium BMS has shut down. If battery settings are incorrect, this can also happen.
F58	BMS communication fault	Sol-Ark is programmed to BMS Lithium Battery Mode but cannot communicate with a BMS
F60	Gen_Volt_or_Fre_Fault	Generator Voltage or Frequency went outside the allowable range
F61	Button_Manual_OFF	The parallel Slave system turned off without turning off the Master
F63	ARC_Fault	It can be a poor PV connector/connection. And sometimes a false alarm due to powerful lightning storms.
F64	Heatsink_HighTemp_Fault	Check that the built-in fans are running; the ambient temperature may be too high. Ensure proper clearance (pg. 6).

Install verification checklist

For the installer to complete AFTER the system is operational. The purpose is to protect the installer, homeowner, and inverter. This checklist must be filled out and submitted to register your warranty, please visit: https://www.sol-ark.com/register-your-sol-ark/

1. Is the 8K installed in a location where the LCD is protected from direct sunlight and has 50 cm clearance from the sides for cooling? **Y/N**
2. Are all the battery lugs tightened? **Y/N**
3. 8K should connect to the grid, load/Grid breakers ON, batteries connected, PV input on, and ON button on. With the Inverter running, the Backup load's panel and Grid-connected:
   A. Did any breakers trip? **Y/N**
   B. Did the inverter overload? **Y/N**
4. If you have problems, please take pictures of these and email them to: support@sol-ark.com
   A. Battery icon screen, showing a table of detailed voltages.
   B. Sol-Ark 8K with batteries and the user wiring area
5. Load and solar test
   A. Press the battery icon for the detailed voltages screen.
   B. Is the batt temp sensor working? **Y/N**
   C. Turn on many loads for the Backup circuits. Are solar panels producing enough power to match the load (provided there is enough sun)? **Y/N**
   D. Program Full Grid Sell Mode. If there are enough panels and sun or light loads in the entire house, the Grid HM measurements will be negative on both L1/L2. Are they negative (solar selling back to the grid)? **Y/N**
   E. Program limited power to home mode. The Grid HM sensors will be near zero or slightly positive. Are they both near zero and canceling out the whole home power? **Y/N**
   F. You have verified the limit sensors are correctly installed. An auto-learn function corrects any mistakes in CT limiter wiring (batteries are required and grid type 120/240V). Program in the correct Grid mode the customer will use.
6. Did you program the correct Ah for the battery bank and max Amps charge/discharge? **Y/N**
7. Did you program the correct battery charge voltages for your battery type? **Y/N**
8. Turn off the AC breaker so 8K operates in an off-grid mode for several minutes. Are appliances still powered? **Y/N**
9. Turn off the PV input, running only on batteries for several minutes. Are appliances still powered? **Y/N**
10. Turn on the PV input and AC Grid inputs.
11. Did you set up the Wi-Fi plug to the customer's internet? **Y/N**
12. Absolutely important for software updates. Did you help the customer register system on monitoring app? **Y/N**
13. Does the customer have a standby generator or a small portable Generator? **Y/N**
    A. Did you turn off UL1741/IEEE1547 (use General Standard) and reprogram grid freq. range to 55-65Hz? **Y/N**
    B. Did you enable Gen charging and adequately set the charge current if using a small gas generator on Gen inputs? **Y/N**
14. If EMP protected, did you install EMP Suppressors on essential appliance cords? **Y/N**

This checklist must be filled out and submitted to register your warranty. Please visit:

https://www.sol-ark.com/register-your-sol-ark/

_____	_____	_____
Installer Name	Installer Signature	Date
_____	_____	_____
Customer Name	Customer Signature	Date

Limited Warranty: Sol-Ark 8K-2P-L

5-Year Limited Warranty for SOL-ARK (Portable Solar LLC) Products. Sol-Ark provides a Ten-year (5) limited Warranty ("Warranty") against defects in materials and workmanship for its Sol-Ark products ("Product"). The term of this warranty begins on the Product(s) initial purchase date, or the date of receipt of the Product(s) by the end user, whichever is later. This must be indicated on the invoice, bill of sale from your installer. This warranty applies to the original Sol-Ark Product purchaser and is transferable only if the Product remains installed in the original use location. Please call Sol-Ark to let us know if you are selling your Home and give us name and contact of the new owner.

The warranty does not apply to any Product or Product part that has been modified or damaged by the following:

- Installation or Removal (examples: wrong voltage batteries, connecting batteries backward, damage due to water/rain to electronics, preventable damage to solar wires.)
- Alteration or Disassembly.
- Normal Wear and Tear.
- Accident or Abuse.
- Unauthorized Firmware updates/software updates or alterations to the software code.
- Corrosion.
- Lightning: unless using EMP hardened system, then Portable Solar will repair the product.
- Repair or service provided by an unauthorized repair facility.
- Operation or installation contrary to manufacturer product instructions.
- Fire, Floods, or Acts of Nature.
- Shipping or Transportation.
- Incidental or consequential damage caused by other components of the power system.
- Any product whose serial number has been altered, defaced, or removed.
- Any other event not foreseeable by Portable Solar, LLC

Contact Us: 1-972-575-8875

For Info/Purchasing:

sales@sol-ark.com **| ext.1**

For Tech Support/Warranty Claim:

support@sol-ark.com **| ext.2**

For Administrative Help | ext.3

Sol-Ark (Portable Solar LLC) liability for any defective Product, or any Product part, shall be limited to the repair or replacement of the Product, at Portable Solar LLC discretion. Sol-Ark does not warrant or guarantee workmanship performed by any person or firm installing its Products. This warranty does not cover the costs of installation, removal, shipping (except as described below), or reinstallation of Products or parts of Products. LCD screen and fans are covered for 5 years from date of purchase.

THIS LIMITED WARRANTY IS THE EXCLUSIVE WARRANTY APPLICABLE TO SOL-ARK (PORTABLE SOLAR LLC) PRODUCTS. SOL-ARK EXPRESSLY DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTIES OF ITS PRODUCTS. SOL-ARK ALSO EXPRESSLY LIMITS ITS LIABILITY IN THE EVENT OF A PRODUCT DEFECT TO REPAIR OR REPLACEMENT IN ACCORDANCE WITH THE TERMS OF THIS LIMITED WARRANTY AND EXCLUDES ALL LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION ANY LIABILITY FOR PRODUCTS NOT BEING AVAILABLE FOR USE OR LOST REVENUES OR PROFITS, EVEN IF IT IS MADE AWARE OF SUCH POTENTIAL DAMAGES.

Return Policy - No returns will be accepted without prior authorization and must include the Return Material Authorization (RMA) number. Please call and talk to one of our engineers to obtain this number at 972-575-8875.

Return Material Authorization (RMA) A request for an RMA number requires all of the following information: 1. Product model and serial number; 2. Proof-of-purchase in the form of a copy of the original Product purchase invoice or receipt confirming the Product model number and serial number; 3. Description of the problem; 4. Validation of problem by Technical Support, and 5. Shipping address for the repaired or replacement equipment. Upon receiving this information, the Sol-Ark representative can issue an RMA number. Any product that is returned must be brand new, in excellent condition and packaged in the original manufacturer's carton with all corresponding hardware and documentation. Returns must be shipped with prepaid freight and insured via the carrier of your choice to arrive back at Portable Solar within 30 days of your initial delivery or pick-up. **Shipping charges will not be refunded.** All returns are subject to a 35% restocking fee. **No returns will be accepted beyond 30 days of original delivery.** The value and cost of replacing any items missing (parts, manuals, etc.) will be deducted from the refund. If you have any questions regarding our return policy, please email us at sales@sol-ark.com or call us at the number above during regular (M-F) business hours.

Sol-Ark 8K-2P-L Install Operational Verification Checklist Questionnaire must be filled out, signed, and dated to secure full warranty coverage.