

QUICK-START GUIDE

This guide has been created to give the end-user a quick and easy way to engage the different operating modes on the 18kPV ESS. Following the steps listed throughout the document will allow the system to be set into a specific working mode at the end-user's whim.



SCAN FOR UPDATED DOCUMENTS



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1. SAFETY

1.1 SAFETY INSTRUCTIONS



DANGER!

AVERTISSEMENT!

Hazardous Voltage Circuits!

Circuits à tension élevée!

International safety regulations have been strictly observed in the design and testing of the inverter. Before beginning any work, carefully read all safety instructions, and always observe them when working on or with the inverter. The installation must follow all applicable national or local standards and regulations.

Incorrect installation may cause:

- Injury or death to the installer, operator or third party
- Damage to the inverter or other attached equipment

1.2 IMPORTANT SAFETY NOTIFICATIONS

There are various safety concerns that must be carefully observed before, during, and after the installation, as well as during future operation and maintenance. The following are important safety notifications for the installer and any end users of this product under normal operating conditions.

1. **Beware of high PV voltage.** Please install an external DC disconnect switch or breaker and ensure it is in the “off” or “open” position before installing or working on the inverter. Use a voltmeter to confirm there is no DC voltage present to avoid electric shock.
2. **Beware of high grid voltage.** Please ensure the AC switch and/or AC breaker are in the “off” or “open” position before installing or working on the inverter. Use a voltmeter to confirm there is no voltage present to avoid electric shock.
3. **Beware of high battery current.** Please ensure that the battery module breakers and/or on/off switches are in the “open” or “off” position before installing or working on the inverter. Use a voltmeter to confirm there is no DC voltage present to avoid electric shock.
4. **Do not open the inverter while it is operating** to avoid electric shock and damage from live voltage and current within the system.
5. **Do not make any connections or disconnections (PV, battery, grid, communication, etc.) while the inverter is operating.**
6. An installer should make sure to be well protected by reasonable and professional insulative equipment [e.g., personal protective equipment (PPE)].
7. Before installing, operating, or maintaining the system, it is important to inspect all existing wiring to ensure that it meets the appropriate specifications and conditions for use.
8. Ensure that the PV, battery, and grid connections to the inverter are secure and proper to prevent damage or injuries caused by improper installation.



WARNING: To reduce the risk of injury, read all instructions

All work on this product (system design, installation, operation, setting, configuration, and maintenance) must be carried out by qualified personnel. To reduce the risk of electric shock, do not perform any servicing other than those specified in the operating instructions unless you are qualified to do so.

1. Read all instructions before installing. For electrical work, follow all local and national wiring standards, regulations, and these installation instructions.
2. Make sure the inverter is properly grounded. All wiring should be in accordance with the National Electrical Code (NEC), ANSI/NFPA 70.
3. The inverter and system can inter-connect with the utility grid only if the utility provider permits. Consult with your local AHJ (Authority Having Jurisdiction) before installing this product for any additional regulations and requirements for your area.
4. All warning labels and nameplates on this inverter should be clearly visible and must not be removed or covered.
5. The installer should consider the safety of future users when choosing the inverter's correct position and location as specified in this manual.
6. Please keep children away from touching or misusing the inverter and relevant systems.

DISCLAIMER

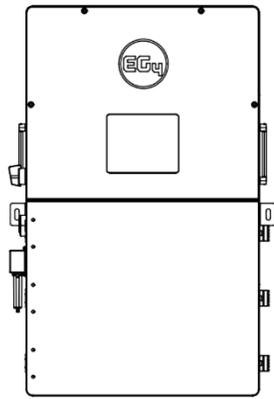
EG4 reserves the right to make changes to the material herein at any time without notice.

Please refer to www.eg4electronics.com for the most updated version of our manuals/spec sheets.

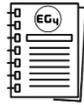
2. PACKING LISTS

The items listed below will arrive with each product shipment:

18kPV:



18kPV Hybrid Inverter



(1) User Manual



(1) Key Set



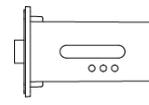
Paperboard



(2) 1" CT



(1) Battery Parallel Comm. Cable (Orange)



(1) Wi-Fi Dongle



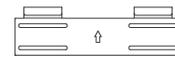
(1) Inverter Parallel Comm. Cable (Grey)



Knockout Plugs

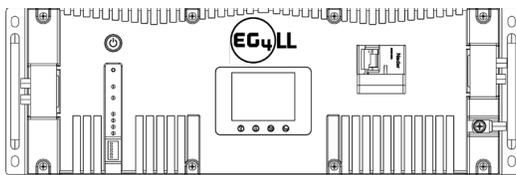


Additional Hardware/Accessories

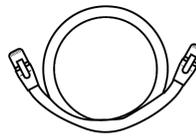


Mounting Hardware

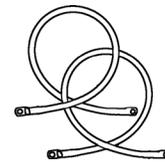
LL-S/V2:



EG4 LL-S/V2

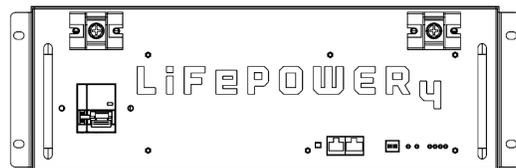


(1) Battery Parallel Comm. Cable



(1) Positive & (1) Negative Power Cable

LifePower4:



EG4 LifePower4

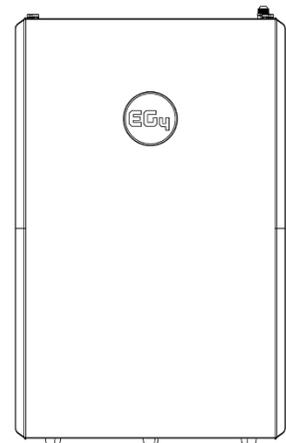


(1) Battery Parallel Comm. Cable

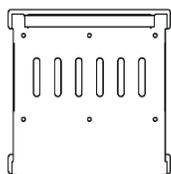


(1) Positive & (1) Negative Power Cable

WallMount All-Weather



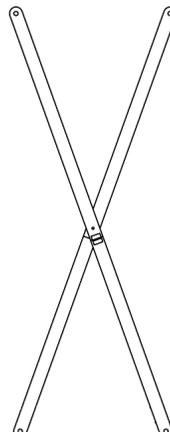
EG4 WallMount All-Weather



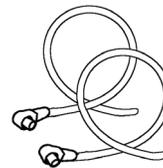
(1) Mounting Bracket



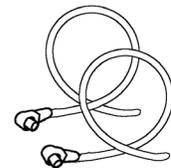
(6) Concrete Expansion Bolts



(1) X-Bracket



(2) Black Power Cables 2/0 AWG (39.4 in.)



(2) Red Power Cables 2/0 AWG (39.4 in.)



(1) Battery to Inverter Communication Cable

2.1 LOCATION SELECTION AND INSTALLATION

Requirements for installation location:

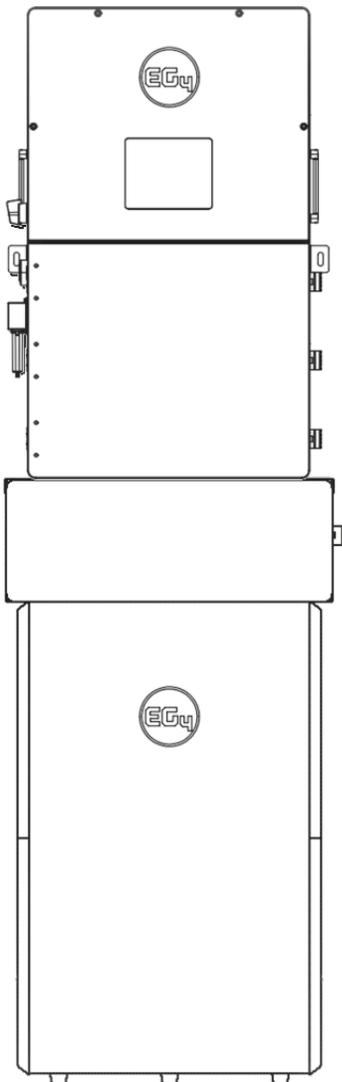
1. The mounting wall must be strong enough to bear the weight of the inverter.
2. Maintain the minimum clearances to allow adequate heat dissipation.
3. Never position the inverter in direct sunlight. Ensure the site is well shaded or placed in a shed to protect the inverter and LCD from excessive UV exposure.
4. Ensure the inverter is mounted upright. Do not mount the inverter at a $>90^\circ$ angle, or upside down.



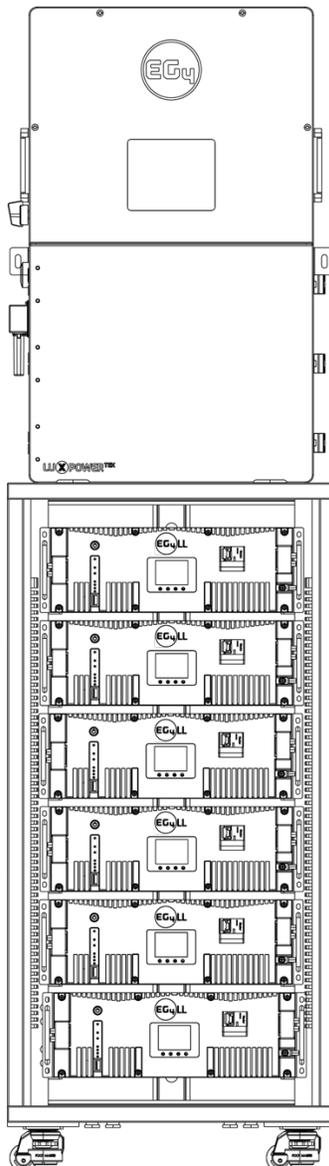
NOTE: The inverter requires a minimum space of 8 in. distance away from other components of the system.

3. ORIENTATION EXAMPLES

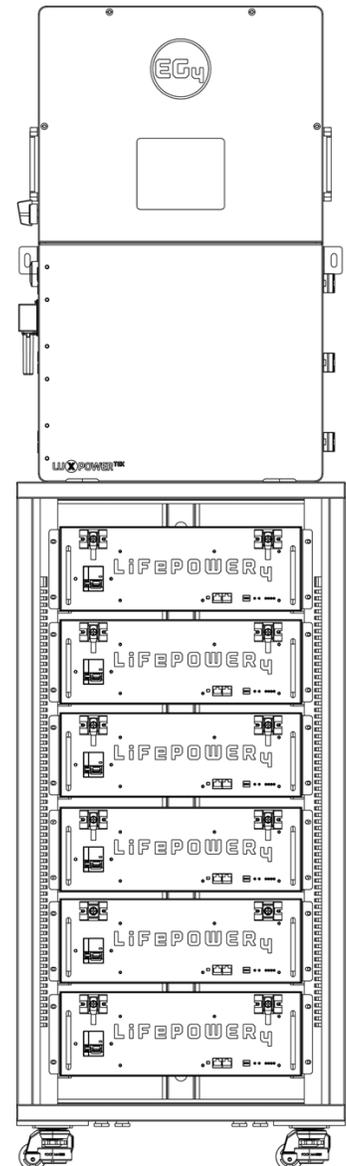
(1) 18kPV + (1) WallMount All Weather battery



(1) 18kPV + (6) EG4 LL batteries



(1) 18kPV + (6) EG4 LifePower4 batteries



DANGER!!!

DO NOT stack the 18kPV on top of the battery racks. The racks are designed to hold the weight of 6 batteries with no additional weight. The images above are for representative purposes only!

3.1 INSTALLING THE INVERTER

The 18kPV is designed to be wall mounted. The mounting location must be a vertical, solid mounting surface, such as concrete or brick, and be able to withstand the weight of the unit. The surface must be made of non-combustible material.

3.1.1 MOUNTING STEPS

Follow the steps below if mounting on brick or concrete:

1. Mark the drill hole positions using the included mounting bracket.
2. Drill four 5/16 in. diameter holes, ensuring the holes are deeper than 2 in.
3. Insert the expansion bolts into the drilled holes and tighten.
4. Use the included nuts and washers packaged together with the expansion bolts to secure the wall-mount bracket to the wall.
5. Using the team-lift technique, hang the inverter on the wall-mount bracket and lock the inverter on the wall using two self-tapping screws (not included) on the top of the inverter. Lock the safety screws on the left and right sides of the inverter.

For installation on concrete board with wooden studs:

- Fasten the mounting bracket to the studs with four heavy duty wood screws. Hang the inverter on the bracket and lock it to the wall with two self-tapping screws (not included).



NOTE: The wood screws and self-tapping screws are not included in the shipment. Installers will need to acquire said screws before installation.

4. PRE-WIRE STEPS AND WIRING (BATT, PV, AC)

4.1 WIRE SIZING

Reference the tables below for wire size and torque recommendations depending on the type of wire and connection.

4.1.1 BATTERY WIRE SIZING

# OF CABLES	CABLE SIZE	MAX. DISTANCE	TORQUE VALUES
2 sets	1/0 AWG (53.5 mm ²)	10 ft.	165 in-lbs. (18.6 Nm)
2 sets	2/0 AWG (67.4 mm ²)	20 ft.	165 in-lbs. (18.6 Nm)
1 set	4/0 AWG (107 mm ²)	10 ft.	Max. 275 in-lbs. (31.1 Nm)
1 set	250 kcmil (127 mm ²)	20 ft.	Max. 275 in-lbs. (31.1 Nm)

4.1.2 PV WIRE SIZING

CABLE SIZE	MINIMUM INSULATOR VOLTAGE
10 AWG – 6 AWG (Max) (6 mm ² – 16 mm ²)	600V

4.1.3 AC WIRE SIZING

TERMINAL CONNECTION	CABLE SIZE	TORQUE VALUES
GRID	6-4/0 AWG (26.7mm ² -107mm ²)	95-165 in-lbs. (10.7 Nm-18.6 Nm) depending on wire size
GEN	Size according to generator output	95-165 in-lbs. (10.7 Nm-18.6 Nm) depending on wire size
LOAD	6-4/0 AWG (26.7mm ² -107mm ²)	95-165 in-lbs. (10.7 Nm-18.6 Nm) depending on wire size

4.2 MULTIMETER TESTING

Ensure all circuit breakers are open (off). Using a multimeter, check for voltage at all available disconnects and lines. Once no voltage is confirmed, proceed.

4.3 BATTERY TO INVERTER CONNECTION FOR NON-SERVER RACK BATTERIES

1. Ensure all circuit breakers are open (off). Use a multimeter to test the wires and terminals for voltage. If no voltage is present, proceed to the next step.
2. Route the battery power cables.
3. Ensure proper polarity before installing. Once confirmed, install the positive wire to the "BAT +" terminal.
4. Install the negative wire to the "BAT -" terminal.
5. Secure the conduit fitting to the enclosure using the counter nut.
6. Connect the battery positive and negative cables to the inverter's mechanical terminals using an M8 hex wrench while following the proper torque values.

4.4 BATTERY TO INVERTER CONNECTION FOR SERVER RACK BATTERIES

The recommended installation practice with server rack batteries requires the use of external busbars or battery cabinets with busbars. Follow the steps below to install the batteries to an external busbar.



IMPORTANT! Size the battery cables going from external busbar to inverter accordingly!

1. Identify the positive and negative terminals of the battery. Red=positive and black=negative.
2. Remove the M8 terminal bolts. Install the power cables (positive and negative) to the battery terminals. Reseat the M8 bolts once the cables are in place using the proper torque.
3. Install the power cables to the external busbar using proper the torque.
4. Install the power cables from the external busbar to the inverter using the proper torque.

4.5 BMS COMMUNICATIONS

EG4 batteries interface with an inverter by designating a "Master" battery (DIP switch ID No. 1). Depending on the model of battery, the available ID codes range from 1-64 (1-16 for LifePower4). The battery will connect directly to the inverter via an RS485 battery communications cable (see pin-out in Section 3.5.2) or a standard CAT 5, 5e, or 6 cable for closed loop communications with supported non-EG4 inverters using CAN bus protocol.

4.5.1 CLOSED LOOP COMMUNICATIONS: WALLMOUNT AW, LL-S & LL-V2



IMPORTANT FOR LL-S, LL V2 and WallMount:

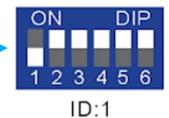
Only the master battery (Address 1) must be set to the inverter protocol; all other batteries must have unique addresses starting at address 2 and ascending in chronological order. You must connect the CAN port of the master battery to the inverter's (or communication devices) BMS communication port.

1. Power off all battery DC breakers and BMS power buttons.
2. The inverter protocol can only be changed with the master battery temporarily set to address 64 (all switches ON. After the dipswitch is changed, restart the battery (with only the BMS power button) for the settings to take effect. (See image) →
3. On the master battery, press and hold the “Return”  key for 5 seconds and release to enter the “Protocol Setting” menu.
4. Select the CAN Protocol. Select EG4/LUX for closed loop communications.



CAN PROTOCOL LIST	
PROTOCOL #	MANUFACTURER
P01-EG4/LUX	EG4/LUX
P02-GRW	Growatt
P03-SLK	Sol-Ark
P04-DY	Deye
P05-MGR	Megarevo
P06-VCT	Victron
P07-LUX	Luxpower
P08-SMA	SMA

5. Change the master DIP switch address back to address 1 for inverter communications & power cycle the BMS. (See image) →



4.5.2 CLOSED LOOP COMMUNICATIONS: LIFEPOWER4



NOTE: To achieve closed loop communications between LifePower4 batteries and the 18kPV inverter, an optional firmware update is required. Navigate to eg4electronics.com or contact the distributor to locate this file.

1. Set the dipswitches on the master battery to address “0” (See image) →
2. Ensure there are no matching addresses throughout the battery bank.
3. Reset the battery BMS using the built-in circuit breaker.



NOTE: For RS485 communications with LifePower4 batteries and the 18kPV inverter, a custom cable must be made. Take a standard Cat5e and up cable and pin the cable as such: Pin 1 will cross to Pin 8 – RS485_B and Pin 2 will cross to Pin 7 – RS485_A.

4.6 PV CONNECTION

- Ensure all circuit breakers are open (off). Use a multimeter to test the wires and terminals for voltage. If no voltage is present, proceed to the next step.
- Strip ¼ in. – 5/16 in. (6 – 8mm) insulation from the PV wire's positive and negative wires.
- (If using stranded wire, use wire ferrules)
- Insert the conduit fitting into the opening for the PV connection and tighten it from the inside using a counter nut.
- Route the PV wires through the conduit fitting and into the inverter.
- Secure the PV wires into the terminals. Verify the connection by lightly tugging on the wires.

4.7 AC CONNECTION

- Ensure all circuit breakers are open (off). Use a multimeter to test the wires and terminals for voltage. If no voltage is present, proceed to next step.
- Strip 5/16 – 3/8 in. (8-10mm) insulation from cables.
- (If using stranded wire, use wire ferrules)
- Secure the conduit fitting to the enclosure using the counter nut of the fitting.
- Fasten the GRID and LOAD cables to the respective terminals (GRID = AC Input, LOAD = AC Output), using an M8 hex wrench. Follow the proper torque values.
- Secure conduit to the conduit fitting.

5. SYSTEM START-UP SEQUENCE FOR COMMISSIONING

Follow the steps below to turn the system on to disable output while finishing commissioning:

1. If equipped, turn on (close) the DC breaker between battery and inverter first. Turn on the “BAT” breaker located in the cable box of the inverter and then power on the battery system.
2. Ensure the PV string voltages are within the operating parameters. Upon confirmation, turn on (close) the PV isolator switch between the inverter and the panel array.
3. Turn on (close) the PV isolator switch on the side of the unit.
4. Make sure Steps 1 and 2 are running properly before turning on the grid power or generator breaker.
5. Ensure the LOAD breaker is open (off) before proceeding to account registration.

Once the steps above are completed, the system will be in the proper state allowing for registry changes. Proceed to account registration.

6. ACCOUNT REGISTRATION

Before using the EG4 Monitoring System, an account must be registered. Follow the steps outlined below for account creating and linking

1. Register the account:
 - a. Visit <https://monitor.eg4electronics.com/> or download the “EG4 Monitor” app to register for an end-user account.
2. When registering the account, provide the following information:
 - a. Customer code: This is the code for a distributor or installer. Please contact the distributor or installer to obtain this code.
 - b. Dongle SN: The serial number is attached to the shell on the sticker.
 - c. Dongle PIN: The PIN is attached to the shell on the sticker.
3. Set the Wi-Fi Password:
 - a. Plug in the Wi-Fi dongle and power on the inverter.
 - b. Wait until the “INV” LED on the module is solid. Once solid, connect the mobile device to the dongle’s Wi-Fi hotspot. The hotspot will be named the same as the SN of the module.
 - c. Open the app and click “DONGLE CONNECT”.
Select the yellow “Refresh” button to display a full list of available networks. Select your home Wi-Fi network and enter your password.
 - d. After selecting “Home Wi-Fi Connect”, the dongle will reset. Once all three LED lights are solid the inverter has successfully connected to the network.

7. FIRMWARE UPDATES

Before commissioning the system, please ensure all components’ firmware is fully up to date. There are two different methods for updating the inverter’s firmware. These two methods are listed below:



NOTE! Contact the distributor for the most recent firmware files!

7.1 INVERTER UPDATE VIA EG4 APP

Before putting the system into operation, ensure the inverter firmware is up to date by following the process below:

1. Open the EG4 Electronics app on your mobile device and select the “DOWNLOAD FIRMWARE” button.
2. Select the correct firmware for the device and select “DOWNLOAD” on the right-hand side to download the file to your mobile device.
3. With the app still running, go to your mobile device’s Wi-Fi settings. Connect the mobile device to the Wi-Fi dongle’s network. The dongle’s network ID will be the same as the dongle’s Serial Number.
4. Return to the home screen of the app and select “LOCAL CONNECT”. Select the “Set” button on the right-hand side of the app and proceed to the next step.
5. Swipe upward on your phone screen until the “Update Firmware” button is visible at the bottom of the app’s display.
6. Choose the correct installation package in the dropdown box and click “UPDATE FIRMWARE” to begin the update process.

7.2 INVERTER UPDATE VIA MONITOR CENTER

Before putting the system into operation, ensure the inverter firmware is up to date by following the process below:

1. Log in to the EG4 Monitor System. Select “Maintenance” and then select “Remote Update”.

- Select the inverter needing the update by SN and select “Standard Update”. The Monitor Center will begin updating both firmware files for the inverter. The latest version of the firmware will be displayed in the bottom-right window.

The screenshot shows the EG4 Electronics Maintenance interface. The 'Maintenance' tab is highlighted in red. The interface includes a search bar for 'Station' with 'Serial number' selected. Below the search bar are buttons for 'Choose file', 'Upload File', and 'Upload BMS File'. A table lists inverters with columns for Serial number, Dongle, FW Code, Connect Status, and Action. The 'Remote Update' button in the left sidebar is highlighted in red.

	Serial number	Dongle	FW Code	Connect Status	Action
1	1234567890	XX12345678	? XXXX-XXXX	Connected	Update Standard Update
2			?		Update Standard Update
3			?		Update Standard Update
4			?		Update Standard Update
5			?		Update Standard Update
6			?		Update Standard Update
7			?		Update Standard Update
8			?		Update Standard Update
9			?		Update Standard Update

While performing the update, make sure the inverter stays powered on throughout the entire process to ensure the update goes through successfully.

7.3 BATTERY UPDATE

To update the firmware on the battery(s), please navigate to EG4electronics.com to find the latest files. Included in the downloaded file are two guides in PDF format to walk through the steps of each update. **Follow the guides to avoid soft-bricking the battery BMS!**

8. OPERATING MODE DESCRIPTION

The EG4 18kPV is capable of working in several different modes of operation.

Self Consumption Mode: The ESS will operate in a pre-set priority system. In this mode, the user will experience the inverter drawing power from the solar arrays to power the loads. When/if the solar power is insufficient, the inverter will then draw from the battery bank for loads. Only as a last resort will the inverter switch to bypass mode to power loads from AC input.

Battery Backup Mode: The ESS will operate in a pre-set priority system. In this mode, the user will experience the inverter drawing power from the solar arrays to power the loads. When/if the solar power is insufficient, the inverter will then switch to bypass mode to power loads from AC input. The inverter will only power loads with battery when there are no other options.

Grid Sell Back with AC Couple: The ESS will operate with full functionality while still allowing the inverter to sell back to the grid using the GEN port for an AC coupled system.

8.1 SELF CONSUMPTION MODE

Ensure the inverter is in standby mode before making any changes to the system settings.
To achieve the Self-Consumption working mode, please refer to the following setting combinations.

Listed below are the combination of settings to achieve Self-Consumption Mode via the mobile app or monitoring website.



NOTE: *If any settings are missing from the list below, contact the distributor for more information regarding commissioning.*

- Step 1

PV Input Mode

7: PV1&2&3 in



Set

- Step 2

Grid Sell Back

Enable

Disable

- Step 3

Fast Zero Export

Enable

Disable

- Step 4

Run Without Grid

Enable

Disable

- Step 5

Seamless EPS switching

Enable

Disable

- Step 6

On-Grid Cut-Off SOC(%) (?)

25

Set

- Step 7

Charge Current Limit(Adc)

100

Set

- Step 8

Discharge Current Limit(Adc) (?)

100

Set

8.2 BATTERY BACKUP MODE

Ensure the inverter is in standby mode before making any changes to the system settings. To achieve the Battery Backup working mode, please refer to the following setting combinations.

Listed below are the combination of settings to achieve Battery Backup Mode via the mobile app or monitoring website.



NOTE: *If any settings are missing from the list below, contact the distributor for more information regarding commissioning.*

- Step 1

PV Input Mode

7: PV1&2&3 in



Set

- Step 2

Grid Sell Back

Enable

Disable

- Step 3

Fast Zero Export

Enable

Disable

- Step 4

Run Without Grid

Enable

Disable

- Step 5

Seamless EPS switching

Enable

Disable

- Step 6

Charge Current Limit(Adc)

100

Set

- Step 7

AC Charge Enable

Enable

Disable

- Step 8

Start AC Charge SOC(%)

Stop AC Charge SOC(%)

- Step 9

AC Charge Start Time 1 :

AC Charge End Time 1 :

- Step 10

Battery Priority (?)

- Step 11

On-Grid Cut-Off SOC(%) (?)

- Step 12

Discharge Current Limit(Adc) (?)

8.3 GRID SELL BACK WITH AC COUPLE

Ensure the inverter is in standby mode before making any changes to the system settings.
To achieve the Grid Sell Back w/ AC Couple working mode, please refer to the following settings.



NOTE: If any settings are missing from the list below, contact the distributor for more information regarding commissioning.

- Step 1

PV Input Mode

- Step 2

Run Without Grid

- Step 3

Seamless EPS switching

- Step 4

Battery Priority (?)

- Step 5

Charge Current Limit(Adc)

- Step 6

AC Couple

- Step 7

AC Couple Start SOC(%)

AC Couple End SOC(%)

- Step 8

On-Grid Cut-Off SOC(%) (?)

- Step 9

Discharge Current Limit(Adc) (?)

9. DOUBLE CHECK ALL WIRING/VOLTAGES/AMPS

Once all settings are configured to achieve Self-Consumption mode, check all voltages at all available disconnects as an added safety step before outputting power from the inverter.

Ensure all circuit breakers are open (off). Using a multimeter, check voltages at all available disconnects. Once 0V on all lines are confirmed, proceed to full system start-up.

10. FULL SYSTEM START-UP

Follow the steps listed below for proper start-up sequence of the ESS:

1. If equipped, turn on (close) the DC breaker between battery and inverter first. Turn on the "BAT" breaker located in the cable box of the inverter and then power on the battery system.
2. Ensure the PV string voltages are within the operating parameters. Upon confirmation, turn on (close) the PV isolator switch between the inverter and the panel array.
3. Turn on (close) the PV isolator switch on the side of the unit.
4. Make sure Steps 1 and 2 are running properly before turning on the grid power or generator breaker.
5. Power on the LOAD breakers on the inverter.

11. FULL SYSTEM SHUTDOWN

Follow the steps listed below for proper shutdown sequence of the ESS:

1. Turn off (open) the grid breaker feeding the inverter.
2. Turn off the LOAD breaker.
3. Turn off the PV Isolator Switch.
4. Turn off the BAT breaker.

Once the LCD powers down, the ESS has shutdown.

12. INVERTER TROUBLESHOOTING

Please follow the troubleshooting steps in the tables below when encountering any faults and/or errors on the inverter.

12.1 ERROR/WARNING CODE TABLES

CODE	DESCRIPTION	TROUBLESHOOTING
E000	Internal Communication Fault	Restart inverter. If error persists, contact the distributor
E002	Bat On Mos Fail	Restart inverter. If error persists, contact the distributor
E003	CT Fail	Restart inverter. If error persists, contact the distributor
E008	CAN communication error in parallel system	Ensure CAN paralleling cables are connected to proper ports between inverters
E009	No master in parallel system	Check parallel setting for Master/Slave to ensure there is only one Master set
E012	UPS output short circuit	Check if the load has a short circuit. If not, turn loads off and reset the system
E013	UPS reserve current	Restart inverter. If error persists, contact the distributor
E016	Relay fault	Restart inverter. If error persists, contact the distributor
E017	Internal communication fault 2	Restart inverter. If error persists, contact the distributor
E018	Internal communication fault 3	Restart inverter. If error persists, contact the distributor
E019	Bus voltage too high	Check if PV input voltage is >480VDC
E020	EPS connection fault	Check if Inverter and AC connection is installed correctly
E021	PV voltage too high	Check if PV input voltage is >480VDC
E022	Over current internal	Restart inverter. If error persists, contact the distributor
E024	PV short	Check PV connections for short circuit
E025	Temperature too high	The internal temperature of the is too high. Turn the inverter off for 10+ minutes and restart the system. If error persists, please contact the distributor
E026	Internal Fault	Restart inverter. If error persists, contact the distributor
E028	Sync signal lost in parallel system	Ensure CAN paralleling cables are connected to proper ports between inverters
E029	Sync trigger signal lost in parallel system	Ensure CAN paralleling cables are connected to proper ports between inverters
E031	Internal communication fault 4	Restart inverter. If error persists, contact the distributor

CODE	DESCRIPTION	TROUBLESHOOTING
W000	Battery communication failure	Check the battery settings to ensure they are set for your specific battery type. Check the battery communications cable for proper pinning/installation.
W001	AFCI Com failure	Restart Inverter. If the error persists, contact the distributor
W002	AFCI High	Check each PV string for correct open circuit voltage and short circuit current. If the PV strings are in good condition, please clear the fault on inverter LCD
W003	Meter communication failure	Check communications cable. Contact your distributor if error persists
W004	Battery BMS fault	The inverter is receiving incorrect information from battery's BMS. Restart batteries and ensure the communication cable is installed correctly. If error persists, please contact the distributor
W006	RSD Active	Check if the RSD switch is pressed
W008	Firmware mismatch	Contact the distributor/installer for Firmware update
W009	Fan Stuck	Check if the fan is operable
W012	Bat on Mos	Restart the inverter. If error persists, please contact the distributor
W013	Over temperature	The temperature of inverter is nearing the high limit
W015	BatReverse	Double check battery connections to inverter. If error persists, contact the distributor
W018	AC Frequency out of range	Check AC frequency to ensure it is in the operable range
W019	AC inconsistent in parallel system	Ensure the AC input is from a common source and installed to each inverter in parallel. If error persists, contact the distributor
W020	PV Isolation low	Restart inverter. If error persists, contact the distributor
W025	Battery voltage high	Battery voltage is nearing the high limit
W026	Battery voltage low	Battery voltage is nearing the low limit
W027	Battery open	Check the battery voltage via multimeter. Ensure all wires are correctly installed to inverter and battery
W028	Inverter overload	Inverter is running beyond max. output
W029	Inverter voltage high	Restart inverter. If error persists, contact the distributor
W031	Inverter VDC high	Restart inverter. If error persists, contact the distributor

13. BATTERY TROUBLESHOOTING



NOTE: *The software downloaded depends on the battery model. LL-S, LL V2 and WallMount All Weather batteries use BMS Tools. LifePower4 batteries use BMS Test.*

13.1 BMS TOOLS

The PC software “*BMS Tools*” provides real-time battery analysis and diagnostics for the LL-S, LL V2 and WallMount All Weather batteries. The battery cannot communicate with BMS Tools and a closed loop inverter at the same time.

13.2 BMS TEST

The PC software “*BMS Test*” provides real-time battery analysis and diagnostics for the LifePower4 model of EG4 batteries. The battery cannot communicate with BMS Test and a closed loop inverter at the same time.

Scan the codes below to download the corresponding software. Included in the files are individual PDF instructions.

BMS Tools



BMS Test



BMS Tools (Mac)



BMS Test (Mac)



13.3 WARNING/PROTECTION CODES TABLES (LL-S, V2 AND ALL WEATHER)

When the ALM light on the battery control panel is on, it means that the battery has given an alarm or has been protected from potential damage. Please check the cause of the failure through the app or BMS Tools and take appropriate measures or go directly to the battery site to troubleshoot.

BMS Tools alarms are shown in the table below:

STATUS	NAME	DEFINITION	ACTION
Warning/ Protect	Pack OV	Pack over-voltage	Module needs to be discharged to lower its voltage.
	Cell OV	Cell over-voltage	Check individual cell voltage in BMS Tools.
	Pack UV	Pack under-voltage	Module needs to be charged.
	Cell UV	Cell under-voltage	Check individual cell voltage in BMS Tools.
	Charge OC	Charge over-current	Incoming current needs to be reduced.
	Discharge OC	Discharge over-current	Discharge current is too high; lower loads.
	Temp Anomaly	Temperature anomaly	Check ambient and module temperature.
	MOS OT	MOSFET over-temperature	BMS temperature is too high. Power off module and cool down location.
	Charge OT	Charge over-temperature	Power off module and cool down location.
	Discharge OT	Discharge over-temperature	Power off module and cool down location.
	Charge UT	Charge under-temperature	Power off module and warm up location.
	Discharge UT	Discharge under-temperature	Power off module and warm up location.
Warning	Low Capacity	Low battery capacity	Module needs to be charged.
Warning	Other Error	Error not listed	Contact the distributor
Protect	Float Stopped	Float Stopped	Contact the distributor
Protect	Discharge SC	Discharge short circuit	Discharge current is too high, turn BMS and breaker off and back on to reset. Lower loads

FAULT	ANALYSIS	ACTION
Inverter communication failure	Check communication port connection, and battery ID setting.	Input proper “host” battery DIP switch address, and power cycle the battery.
No DC output	Open breaker, or battery voltage is too low.	Check battery breaker or charge the battery.
Power supply unstable	Battery capacity is not at full power.	Check for proper battery cable connection.
Battery cannot be charged fully	DC output voltage is below the minimum charge voltage.	Check the charging settings on the inverter to ensure they match battery requirements.
ALM LED always on	Short circuit	Disconnect the power cable and check all cables.
The battery output voltage is unstable.	Battery management system does not operate normally.	Press the reset button to reset the battery, then reboot the system.
ALM LED flashes 20 times with SOC 1 LED on.	Unbalanced voltage within a cell	Deep discharge the battery bank (<20% SOC), then charge battery bank fully.
ALM LED flashes 20 times with SOC 2 LED on.	Unbalanced temperature	Contact the distributor.
ALM LED flashes 20 times with SOC 3/4 LED on.	BMS damaged	Contact the distributor.
Different SOC value of batteries in parallel operation.	No issue	Deep discharge the battery bank (<20% SOC), then charge battery bank fully.
Low voltage protection with no LED on	BMS is in low voltage protection, and is in sleep mode	Contact the distributor.
Deeply discharged with “RUN” LED on	The battery voltage is too low to start BMS.	Contact the distributor.



NOTE: *If any of the warnings or faults from both tables persist, please contact the distributor for additional troubleshooting steps.*



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