Owner's Guide

Solahart®

Goodwe Energy Storage Systems

ET,EH and GEH Series Inverter &

Lynx Home F-Series G2 Battery

Solahart PV and battery systems must be installed and serviced by a suitably qualified person.
Please leave this guide with the system owner.

Warning: For continued safety of this Battery system it must be installed, operated and maintained in accordance with these instructions and the installation guides supplied with the Battery, Inverter and Battery Interface.

Warning: Only suitably qualified and accredited personnel should perform work on PV and/or Battery systems, such as design, installation, commissioning, maintenance and repairs. Be sure to follow the safety instructions for all system components. It is also important to observe relevant local codes and regulations for health and safety and accident prevention.

Only Solahart parts and Solahart approved parts may be used. No substitute parts may be used without prior approval from Solahart Industries Pty Ltd. Only parts supplied by Solahart Industries Pty Ltd are covered by the Solahart warranty.

The warranty can become void if safety devices are tampered with or if the installation is not in accordance with these instructions.

CONTENTS

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE IMPORTANT SAFETY INSTRUCTIONS

During installation, testing and inspection, adherence to all the safety instructions is mandatory.

SAFETY SYMBOLS

The following symbols are used in this document to highlight important information:

Warning: **Warning** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

Caution: **Caution** indicates potentially hazardous situation which, if not avoided, could result in minor or moderate injury and damage to or destruction of the product.

Note: **Note** indicates additional information intended to assist in the understanding of the text or an important step that leads to optimal results but is not safety or damage related.

GENERAL SAFETY INFORMATION

Warning: Adhere to the instructions in this document in addition to each system component installation guide. Failure to follow any instructions or warnings in the supplied documentation can result in electric shock, serious injury, or death.

Warning: Only qualified personnel should perform work on photovoltaic and Battery systems.

Warning: A Battery can present a risk of electrical shock, fire, or explosion from vented gases. Observe proper precautions.

Warning: Ensure electrical connection / disconnection is performed only when the relevant circuit is isolated. Do not connect / disconnect wiring under load conditions.

Warning: Do not attempt to disassemble, repair, tamper with, or modify any system component.

Warning: Do not expose any component to direct flame or heat sources.

Warning: Do not install any component that is defective, appears cracked, broken, or otherwise damaged.

Warning: Do not install the system in potentially hazardous locations.

Warning: Do not immerse any component in water or other liquids.

Caution: Ensure clearances are maintained around the Battery and System Components. Remove debris and other foreign objects from within the clearances areas.

Caution: Do not place any items on top of the Battery BCU.

Caution: Only Solahart supplied / approved components may be used.

Caution: Keep the Battery and Inverter system turned ON at all times. Do not turn OFF the system when leaving the home for an extended period of time.

ACTIONS TO UNDERTAKE IN THE EVENT OF AN EARTH FAULT ALARM OR TRIPPED AC/DC CIRCUIT BREAKER

Limit access to all parts of the PV and Battery system.

Contact Solahart Service on 1800 638 011 or your nearest Solahart dealer.

ABOUT YOUR BATTERY SYSTEM

INTRODUCTION

This Owner's Guide applies to the GoodWe ET, EH and GEH-Series Inverter, Goodwe Lynx Home F-Series G2 Battery and balance of system components. For more information regarding the specific operation of a PV system, refer to "Owners Guide - Solahart" for PV systems.

SYSTEM OVERVIEW A – COMPLETE PV AND BATTERY WITH BACKUP SYSTEM

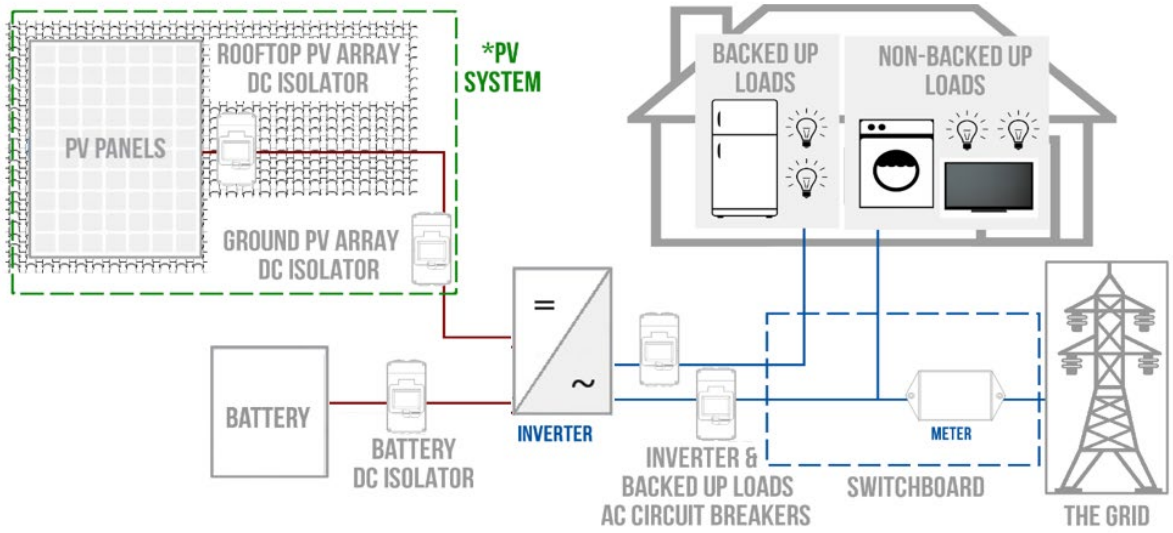


Figure 1 System Overview – Complete PV and Battery With Backup System

The Solahart Complete PV and Battery system consists of the following components:

PV array – generates direct current (DC) power through the conversion of light energy from the sun.

Goodwe ET, EH and GEH Series Inverter – inverts the DC power generated from the PV array or supplied from the Goodwe Lynx F G2-Series Battery into alternating current (AC) power so it can be used in the home or exported to the grid. If configured, the inverter can also supply power to selected backed up loads during grid interruptions.

Note: Both the Inverter and house electrical wiring will need to be configured for backup functionality to operate. Your Solahart dealer will demonstrate and explain the operation of this configuration.

Note: A minimum Battery energy level (depth of discharge) can be reserved in case of a grid outage or just during normal operation. Discuss your requirements with the Solahart dealer to ensure the system is set correctly.

Goodwe Lynx F-Series G2 Battery – stores DC power generated by the PV array so the power can be used when the sun is not shining.

PV Array DC Isolators – provides a means for isolating the PV array.

Battery DC Isolator – provides a means of isolating the Battery.

Inverter AC Isolator – provides overcurrent protection of the inverter and a method of isolating the PV System from the electrical distribution grid.

Inverter Backup Load AC Isolator –provides a means of disconnecting the inverter from the backup loads (if applicable).

Note: It is optional to install an AC grid bypass switch on the Backup Circuit. Please confirm with the installer.

Smart Meter – measures net electrical power to and from the grid.

For more information regarding the specific operation of a PV system, refer to the Solahart Owner's Guide – PV systems.

BASIC SYSTEM OPERATION

The Solahart Complete and Retrofit systems increase energy independence by using the battery to store excess PV energy, which would otherwise be exported to the grid, so it can be used when required.

The Solahart Complete and Retrofit systems are programmed to maximise savings by minimising the power purchased from the grid. If the power delivered by the PV and Battery is insufficient to meet domestic demands, the power necessary to ensure the normal operation of the connected devices is drawn from the grid.

If the energy generated exceeds that required by property demands and the storage capacity of the Battery, your electrical network operator may allow the difference to be directly injected into the grid and become available to other users. Energy injected into the grid can be measured by electricity network operators as either gross (everything generated) or net (excess generated). Injected energy may or may not be purchased by the local electrical network operator according to national and local standards, and regulations.

Warning: Do not overload the backup circuit beyond the system specifications.

Warning: In the event any circuit breakers continue to trip, please contact your Solahart Dealer

Warning: Do not switch the battery off for extended period of time. It might cause damage.

Caution: If a backup changeover switch is not installed and the inverter is not operating, the loads and appliances on the backup circuit will not be supplied power.

Caution: Ensure that the backup reserve limit of the battery system is adjusted to an appropriate setting to provide backup power when the grid out. This can be set within the system monitoring portal.

INVERTER BACKUP CAPACITY

Inverter Model	Max. Backup Continuous Power Output	Peak Backup Power Output	Backup Max. AC Output Current
GW10KL-ET	10.0 kVA	16.5 kVA(60 seconds)	16.5 A
GW15K-ET	15.0 kVA	24.0 kVA(3 seconds)	22.7 A
GW20K-ET	20.0 kVA	32.0 kVA(3 seconds)	30.3 A
GW25K-ET	25.0 kVA	30.0 kVA(60 seconds)	37.9 A
GW29.9K-ET	29.9 kVA	36.0 kVA(60 seconds)	45.5 A
GEH8.6-1U-10	5.0 kVA	10.32 kVA(60 seconds)	39 A
GEH10-1U-10	9500(@220Vac) 10000(@230Vac)	12 kVA(60 seconds)	43.5 A
GW5000N-EH	5.0 kVA	6.0 kVA(60 seconds)	21.7A
GW6000N-EH	6.0 kVA	7.2 kVA(60 seconds)	26.1A

Note: If the load on backup circuits exceed the inverter backup capacity, the inverter will shut down temporarily to protect itself.

- During normal operation, the inverter will restart after 60s.
- During grid outage, the inverter will restart once grid is re-connected.

BATTERY CAPACITY

Battery number	Rated Capacity	Usable Capacity	Nominal Power
X3	9.6 kWh	9.6 kWh	6.72 kW
X4	12.8 kWh	12.8 kWh	8.96 kW
X5	16 kWh	16 kWh	11.2 kW
X6	19.2 kWh	19.2 kWh	13.4 kW
X7	22.4 kWh	22.4 kWh	15.7 kWh
X8	25.6 kWh	25.6 kWh	17.9 kWh
X9	28.8 kWh	28.8 kWh	20.6 kWh

OPERATING PROCEDURE

CHECK BEFORE POWER ON

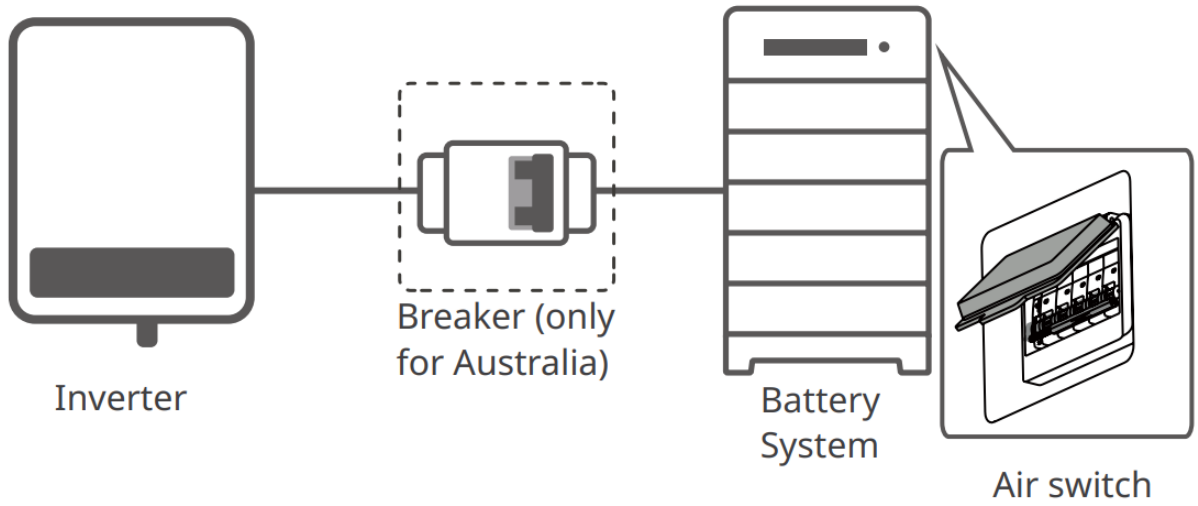
Check the following items before power on to avoid the battery system being damaged.

No.	Check Item
1	The inverter is firmly installed in a clean place where is well-ventilated and easy to operate.
2	The PE cable, power cable, communication cable, and terminal resistor are connected correctly and securely.
3	Cable ties are intact, routed properly and evenly.
4	Unused ports and terminals are sealed.

POWER ON THE BATTERY SYSTEM

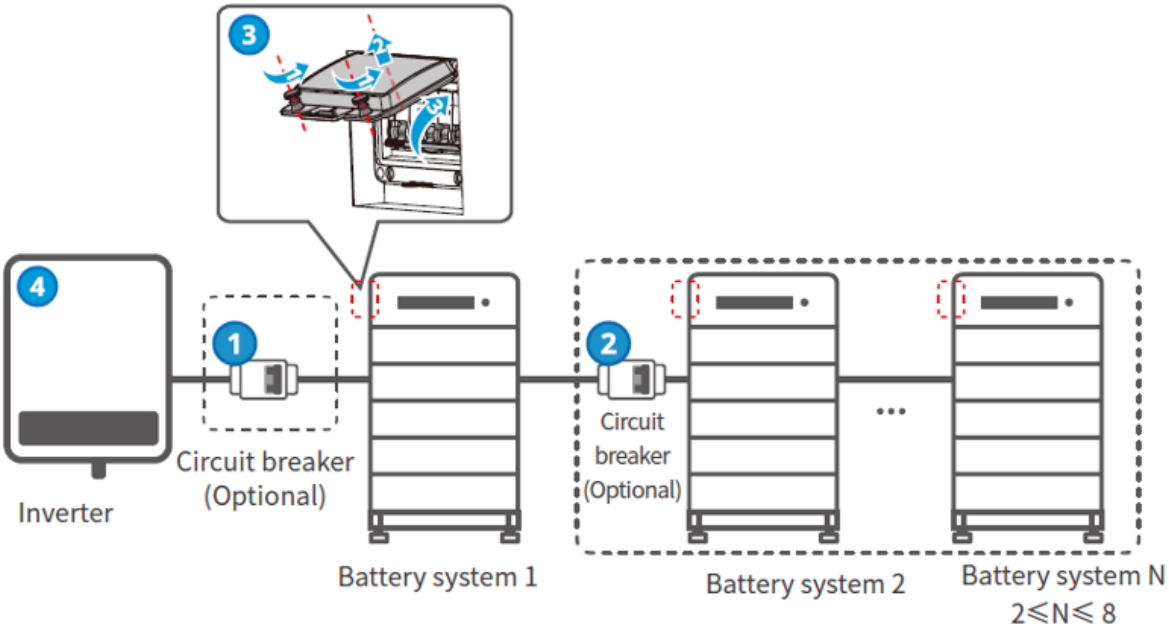
Single Battery System

Turn on the breaker between the inverter and the battery system. Turn on the air switch of the battery system. Turn on the inverter in the system following the instructions in the user manual of the inverter.



Parallel Connected Battery System

1. Turn on the breaker between the inverter and the battery system.
2. Turn on the breakers between the battery systems.
3. Turn on the air switch of the battery systems in turn.
4. Turn on the inverter in the system following the instructions in the user manual of the inverter.



POWER OFF THE BATTERY SYSTEM

Follow the steps below to power off the battery system to prevent the system from being damaged.

Method one:

1. Turn OFF the inverter in the system following the instructions in the user manual of the inverter.
2. Long press the multifunction button indicator for more than 15s, and make sure that the SOC indicator and multifunction button indicator of the PCU are off.

Method two:

1. Turn OFF the inverter in the system following the instructions in the user manual of the inverter.
2. Disconnect the air switch, and make sure that the SCO indicator and multifunction button indicator of the PCU are off

Danger: Power off the battery system before operations and maintenance. Otherwise, the equipment may be damaged or electric shocks may occur.

Push the air switch to restart the battery.

Warning: Depending upon the system there may be more than one PV Array DC Isolator.

Warning: To effectively isolate the wiring between the AC Isolator and switchboard, the Solar Supply Main Switch located in the switchboard must also be in the OFF position.

Warning: PV Array DC Isolators do not de-energise the PV array and array cabling.

Caution: If the Solahart Battery system is expected to be OFF for longer than one month, refer to the instructions supplied with the Battery.

GEH, ET AND EH SERIES INVERTER STATUS IS INDICATED BY SEVERAL LEDS, PLEASE REFER TO THE FOLLOWING TABLE FOR DETAILS.

INDICATOR	COLOR	STATUS	EXPLANATION
SYSTEM			ON = System is ready
			BLINK = System is starting up
			OFF = System is not operating
BACK-UP			ON = Back-up is ready / power available
			OFF = Back-up is off / on power available
BATTERY			ON = Battery is charging
			BLINK 1 = Battery is discharging
			BLINK 2 = Battery is low / soc is low
			OFF = Battery is disconnected / not active
GRID			ON = Grid is active and connected
			BLINK = Grid is active but not connected
			OFF = Grid is not active
ENERGY			ON = Consuming energy from grid / buying
			BLINK 1 = Supplying energy to grid / zeroing
			BLINK 2 = Supplying energy to grid / selling
			OFF = Grid not connected or system not operating
COM			ON = BMS and meter communication ok
			BLINK 1 = Meter communication ok, BMS communication fail
			BLINK 2 = BMS communication ok, meter communication fail
			OFF = BMS and meter communication fail
WiFi			ON = WiFi connected / active
			BLINK 1 = WiFi system resetting
			BLINK 2 = WiFi not connect to router
			BLINK 4 = WiFi server problem
			OFF = WiFi not active
FAULT			ON = Fault has occurred
			BLINK1 = Overload of back-up / Output / reduce load
			BLINK4 = CT wiring fault
			OFF = No fault

Note: Refer to GoodWe GEH and EH Series inverter user manuals for simple troubleshooting procedures.

Note: If the Inverter LED Status indicates a FAULT, contact your nearest Solahart Dealer.

BATTERY STATUS

The battery status is indicated by several LEDs, please refer to the following table for details.

Button Indicator	Status
Green	Standby or Working
Red	Alarming or Faulty

7.4.1 Normal Status

Button Indicator	SOC Indicator	Description
Idle: green light double blink Standby: green light single blink Working: steady green		SOC<5%
		5%≤SOC<25%
		25%≤SOC<50%
		50%≤SOC<75%
		75%≤SOC<95%
		SOC≥95%

NOTICE

- The SOC indicator keeps on when charging.
- The SOC indicator single blinks when discharging.

Note: Refer to GoodWe Lynx F G2 Series battery user manuals for simple troubleshooting procedures.

Note: If the Battery LED Status indicates a FAULT, contact your nearest Solahart Dealer.

SOC Indicator status	Fault	Solutions
	Battery Overvoltage	Power off and wait for 2 hours. Contact the after-sale service if the problem persists.
	Battery Undervoltage	Contact the after-sale service.
	High Cell Temperature	Power off and wait for 2 hours. Contact the after-sale service if the problem persists.
	Low Charging Temperature	Power off and wait for the temperature to recover. Contact the after-sale service if the problem persists.
	Low Discharging Temperature	Power off and wait for the temperature to recover. Contact the after-sale service if the problem persists.
	Overcurrent Charging	Restart the battery. Contact the after-sale service if the problem persists.
	Overcurrent Discharging	Restart the battery. Contact the after-sale service if the problem persists.
	Low Insulation Resistance	Contact the after-sale service.
	Temperature Difference Exception	Power off and wait for 2 hours. Contact the after-sale service if the problem persists.
	Voltage Difference Exception	Restart the battery and leave it for 12 hours. Contact the after-sale service if the problem persists.
	Inconsistent Cell	Contact the after-sale service.
	Wire Harness Exception	Restart the battery. Contact the after-sale service if the problem persists.
	Relay Connection Failure	Restart the battery. Contact the after-sale service if the problem persists.
	Relay Adhesion	Restart the battery. Contact the after-sale service if the problem persists.
	Cluster Fault	Check the battery model. Contact the after-sale service if the battery model is incorrect.
	Interlock Failure	Check whether the termination resistor is installed properly and restart the battery. Contact the after-sale service if the problem persists.
	BMU Communication Fault	Restart the battery. Contact the after-sale service if the problem persists.
	MCU Internal Communication Fault	Restart the battery. Contact the after-sale service if the problem persists.
	Air Switch Adhesion	Contact the after-sale service.
	Precharge Failure	Restart the battery. Contact the after-sale service if the problem persists.
	Relay Overtemperature	Power off and wait for 2 hours. Contact the after-sale service if the problem persists.
	Current Diverter Overtemperature	Power off and wait for 2 hours. Contact the after-sale service if the problem persists.
	Reverse Connection Fault	Contact the after-sale service.
	Microelectronic Fault	Contact the after-sale service.

ELECTRICAL SAFETY

SAFETY REQUIREMENTS

The voltages and currents produced by the Inverter & Battery system can be dangerous. Do not tamper with system cabling under any circumstances.

UNIQUE HAZARDS OF DC ELECTRICITY

Batteries typically operate using DC electricity. Once the current is flowing, breaking or opening a connection (e.g. disconnecting a DC cable from the Inverter) can cause a DC electrical arc. Unlike arcs occurring in conventional low voltage AC wiring, DC arcs are not self-extinguishing. They are a potentially lethal burn and fire hazard, capable of creating high temperatures that can destroy contacts and connectors.

EARTH FAULTS

An earth fault is a system fault where a short circuit is formed between the DC circuitry of the PV and Battery system and earth. As the system owner, please be aware of the method of communication of earth faults on your system. Refer to Earth Fault Alarms in the Solahart Owner's Guide for PV systems.

MAINTENANCE

GENERAL

The Solahart Inverter & Battery system has been designed for minimal and easy maintenance.

Note: Ensure that you have monitoring access to your Inverter & Battery System. If you do not, contact your nearest Solahart Dealer.

For recommended maintenance of the PV system, refer to the Solahart Owner's Guide for PV systems.

RECOMMENDED MAINTENANCE SCHEDULE

⚠ WARNING

- Contact after-sales service for help if you find any problems that may influence the battery or the hybrid inverter. Disassemble without permission is strictly forbidden.
- Contact after-sale service for help if the copper conductor is exposed. Do not touch or disassemble privately because the high voltage danger exists.
- In case of other emergencies, contact after-sales service as soon as possible. Operate following the instructions or wait for the after-sales service personnel.

Maintaining Item	Maintaining Period
Check whether the locking brackets are secured, tighten it if not.	Once every 6 months
Check whether the outer enclosure is broken. Repair the painting or contact after-sales service if there is any broken.	Once every 6 months
Check whether there is an exposed cable. Replace the exposed cable or contact the after-sales service for help.	Once every 6 months
Check whether there is any dust around the battery module. Clean the dust if there is any to avoid affecting heat dissipation.	Once every 6 months
Check whether there is any liquid or pest near the battery to avoid intrusion in a long term.	Once every 6 months

SOLAHART PV SYSTEM AND/OR BATTERY WARRANTY - AUSTRALIA ONLY

The PV System, the Battery, and any other components supplied by Solahart are covered by a limited warranty given by Solahart Industries Pty Ltd.

The warranty is in addition to any rights and remedies that you may have under the Australia Consumer Law. Solahart offers national service through its Dealer network. Solahart will repair or replace parts subject to the terms of the Limited Warranty. Solahart, in addition can provide preventative maintenance and advice on the operation of the PV System. You can contact Solahart on 1800 638 011 to arrange a service call or to find out details about this warranty.

The most recent version of the Solahart can be found on the Solahart website at:

https://www.solahart.com.au/why-solahart/solahart-warranty/

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