Installation Manual

Scalable Energy Storage Solutions

Lithium Ferro Phosphate (LFP) Battery Module

Rack Mountable Scalable Energy Solutions

48V 2.9kWh & 4.1kWh Smart BMS



Model Number: GZ48-058-2RU-01Z & GZ48-081-2RU-01Z

Contents

1 SAFETY GUIDELINES 3

1.1 Weight 3
1.2 Risk of Electric Shock 3
1.3 Stored Energy 3
1.4 Qualified Service Personnel Only 3
1.5 Safety Data Sheet (SDS) 3
1.6 Compatibility 3

2 SPECIFICATIONS 4

3 MODULE OVERVIEW AND PIN OUTS 5

3.1 Battery Circuit Breaker Aux Contacts COM/NO/NC 5
3.2 BMS Communications Interface 5
3.3 BMS Digital I/O 5
3.4 DC-POWER IN/OUT J1 7
3.5 Chassis Earthing Point (font and rear connection) 7

4 INSTALLATION PLACEMENT 8

4.1 Installation of Battery Module(s) 9
4.2 Series Connection to Achieve Higher Voltages 10

5 OPERATION 11

5.1 To Turn the Battery Module ON and OFF 11
5.2 Charging the Battery Module 11
5.3 Initialization 12
5.4 Inverter Configuration 12

6 TROUBLESHOOTING 13

7 WARRANTY & SERVICE INFORMATION 15

7.1 Registration 15
7.2 Before Calling for Service 15
7.3 Warranty or Service 15

8 NOTES 16

All rights reserved genZ 2025

1 Safety Guidelines



1.1 Weight

These Battery Modules are heavy (26.6kg & 35.7kg). Any time the Battery Module is required to be handled, be sure to use correct lifting procedures. A two-person lift is recommended.

1.2 Risk of Electric Shock

Hazardous voltages maybe present on parts inside this module. Do not attempt to open or disassemble the module. These Battery Modules contain no user serviceable parts.

1.3 Stored Energy

These Battery Modules can, especially if they are connected in parallel, produce high currents.

1.4 Qualified Service Personnel Only

Repairs and Battery replacement must be performed by qualified service personnel only**.**

1.5 Safety Data Sheet (SDS)

Refer to the SDS that was supplied with this module in case of an accident.

1.6 Compatibility

Installers are recommended to contact genZ and the inverter manufacturer to confirm compatibility of both products before installation.

All rights reserved genZ 2025

2 Specifications

Model	GZ48-058-2RU-01Z	GZ48-081-2RU-01Z
Nominal Voltage (VDC)	51.2	51.2
Nominal Capacity (Ah)	58	81
Nominal Capacity (kWh)	2.9	4.1
Usable Battery Capacity (kWh)	2.9	4.1
Nominal Current (A)	≤ 29	≤ 40.5
[1]Maximum Current – Primary Protection (A, Limited by BMS)	60	60
[2]Maximum Current – Secondary Protection (A, Limited by Circuit Breaker)	< 75	< 75
DC Power (W at Nominal Current)	1484.8	2073.6
Min/Cut-off Charge Current (A)	0.5 < cut-off < 1.0	0.5 < cut-off < 1.0
Maximum Charge Current (A)	29	40.5
Maximum Discharge Current (A)	60	60
Depth of Discharge (DoD)	100%	100%
Recommended Depth of Discharge (DoD)	80%	80%
Operating Temperature Limits (°C)	Charge 0 to 55 Discharge -20 to 60	Charge 0 to 55 Discharge -20 to 60
Operating Humidity (non-condensing)	85%	85%
IP Rating	IP50	IP50
Battery Case Dimensions (mm)	450±4 D x 420±4 W x 88±2 H	570±4 D x 420±4 W x 88±2 H
Terminal Connection	Genuine Anderson SB50 BLUE	Genuine Anderson SB50 BLUE
Weight (kg)	26.6±0.5	35.7±0.5
BMS Over Voltage Cut Off (V, Approx.)	58.4	58.4
BMS Under Voltage Cut Off (V, Approx.)	40	40
BMS Short Circuit Cut Off (A)	250 ± 30 (20ms Trip)	250 ± 30 (20ms Trip)
[3]BMS Over Temp Cut Off (°C)	65	65
Charge Time Approx.	2 hours at 29 A	2 hours at 40.5 A
Self-Discharge	<14% per annum	<14% per annum
Round Trip Charge/Discharge Efficiency	≥ 96%	≥ 96%
Circuit Breaker Compliance	Double Pole, non-polarised, 60A IEC 60947-2	Double Pole, non-polarised, 60A IEC 60947-2
BMS Communications	ZDC Compatible[4]	ZDC Compatible[4]
UN Type Number (Module chemistry)	UN 3480	UN 3480
Lithium Composition	As Lithium Ferro Phosphate, $LiFePO_4$ or LFP	As Lithium Ferro Phosphate, $LiFePO_4$ or LFP
Decisive Voltage Classification (DVC)	Class A	Class A
Casing /Coating	Steel / Satin surf mist industrial coating	Steel / Satin surf mist industrial coating
Country of Manufacture	China	China
Other	Certification: See genz.com.au for details Li Ion IFpR/27/66/[13P16S]E/-10+50/90	Certification: See genz.com.au for details Li Ion IFpR/27/66/[18P16S]E/-10+50/90

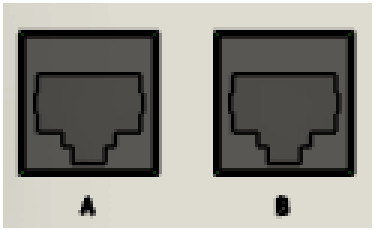
[1] The over and under voltage cut-out may vary from that stated due to the BMS protecting the internal cell voltages ahead of overall pack voltage.
[2] This parameter is configurable within the BMS configuration application.
[3] For charge and discharge rates of 0.5C and operating at 25°C.
[4] Communication with the batteries is managed via the genZ Data Controller (ZDC), allowing multiple batteries and banks to be controlled by a single device. Battery data can be accessed through the ZDC's built-in web interface or integrated with custom solutions via Modbus, SNMP, and other standard protocols. The ZDC operates independently of cloud-based services, running software that is fully developed, maintained, and supported by genZ Australia. It can be easily mounted on a DIN rail or directly onto an enclosure.

All rights reserved genZ 2025

3 Module Overview and Pin Outs



3.1 Battery Circuit Breaker Aux Contacts COM/NO/NC



RJ45 Connector A and B.
Connection internally to a clean set of auxiliary contacts within the circuit breaker. The connections provide a common (COM) and Normally Open (NO).

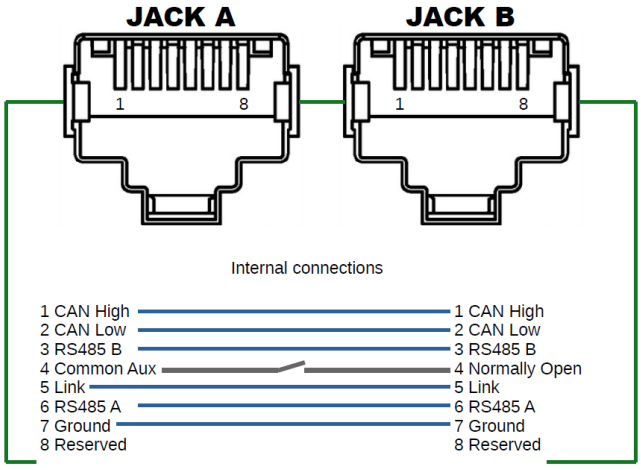
NOTE: That NO is closed when the circuit breaker is in the ON position, and open when in the OFF position.

3.2 BMS Communications Interface

RJ45 connector A and B provides the communications interface for the BMS.

The battery can be communicated with using the genZ Data Controller (ZDC). Please contact genZ for further information on this product.

Note: A 120Ω termination resistor plug will be required at the end of the final battery per rack. The Termination resistor plug can be acquired from genZ.



3.3 BMS Digital I/O

<u>WARNING:</u> Prior to using this feature, failing to fully understand the technical and electrical requirements and limitations of these input and output connections may result in permanent damage to the BMS and voiding your warranty.



All rights reserved genZ 2025

12 pin pluggable connector that provides access to BMS digital inputs, outputs, 3.3V supply and 'Key' wake. Only 10 of the 12 pins are used, the final 2 pins are not connected.

Note: All digital inputs are hard coded with a digital debounce. For the BMS to recognise any of the input states (high or low) that state will need to be active and stable for at least 5 seconds.

1 **Key+** Placing a short between Key + and Key- will wake the BMS from a deep sleep.

2 **Key-** Placing a short between Key - and Key+ will wake the BMS from a deep sleep.

Note: The 2 'Key' pins are connected internally to a clean set of Auxiliary contacts mechanically linked to the main circuit breaker. Turning the circuit breaker ON effectively places a short across these pins, waking the BMS. Under normal use, do not use these pins for any other purpose.

3 **DI1** This input will turn the discharge MOSFETS off. The input state can be read via the ZDC.

4 **DI2** This input will reset the BMS board number (communications address) to 1. The input state can be read via the ZDC.

Note: The Digital Inputs (DI's) are enabled (high/on/1) by applying a 3.3V supply sourced from pin 9 "3.3V"

5 **DO1** When ON indicates that the BMS is awake/active. Open collector, takes signal to digital ground. This pin is INTERNALLY connected to the batteries push button green LED. The state can be read via the ZDC.

6 **DO2** When ON indicates that there is a level 1 alarm from the BMS. Open collector, takes signal to digital ground. The state can be read via the ZDC.

7 **DO3** When ON indicates that there is a level 2 alarm from the BMS. Open collector, takes signal to digital ground. The state can be read via the ZDC.

8 **S1** Taking this pin to the DIGITAL GROUND (Pin 10) will wake the BMS.



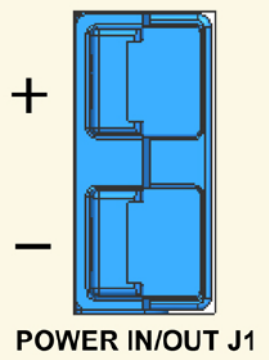
<u>WARNING:</u> Do NOT short the 3.3V to any ground or to supply any external component that requires any current greater than 30mA. Failure to observe this may result in BMS failure and void your warranty.

9 **3.3V** This is the digital 3.3V supply from the BMS.

10 **GND** This is the digital ground and should not be confused with the communications ground, the battery negative (for negative earth systems), battery positive (for positive earth systems) or battery chassis ground.

All rights reserved genZ 2025

3.4 DC-POWER IN/OUT J1



The "POWER IN/OUT J1" connector is a standard Anderson SB50 (Blue) connector. The upper pin is positive, and the lower pin is negative. The SB50 connector is UL rated to 120Amps. Another connector with 2x6AWG pins is supplied with each battery. When installed with a genZ rack/cabinet, the addition connector comes pre-installed in the racks wiring loom. If using an alternative rack/cabinet contact genZ for more information regarding DC bus connection.

It should be noted that Andersons are 'keyed' and as such, blue Andersons will not connect with a different coloured Anderson.

3.5 Chassis Earthing Point (font and rear connection)



This is an earthing point for the chassis of the battery and to be considered as a point for equipotential bonding to other battery modules or the rack/enclosure the battery is installed in. Recommended cable size is 6mm², torqued to 2.7Nm.

Note: This earthing point is not connected to the battery positive, negative, signal ground or digital ground. DC power to/from the battery module is floating.

All rights reserved genZ 2025

4 Installation Placement



The Battery Module must be installed such that it is not exposed to:

- Sources of heat or where the ambient temperature is expected to regularly exceed 55°C
- Extreme cold where the ambient temperature is expected to regularly fall below -10°C
- Direct sunlight
- Rain, water, salt laden air or where the humidity is likely to cause condensation
- A corrosive atmosphere
- Reverse polarity

In addition:

- Do not charge the battery if the temperature of the battery is below 0°C.
- Always charge in accordance with the charge profile as described in this manual
- Do not connect these batteries in series
- Do not connect the batteries where the difference in voltage between any parallel connected battery is ≥0.3V
- Select a location, which will always provide good air circulation for the Battery Module.
- Route cables so they cannot be walked on or damaged.
- Refer to the specifications for specific operating parameters.

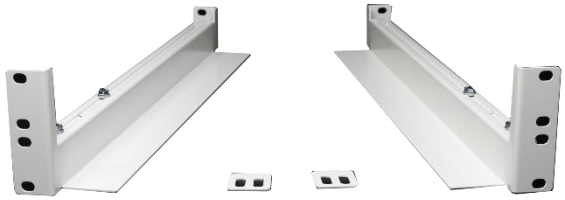
All rights reserved genZ 2025

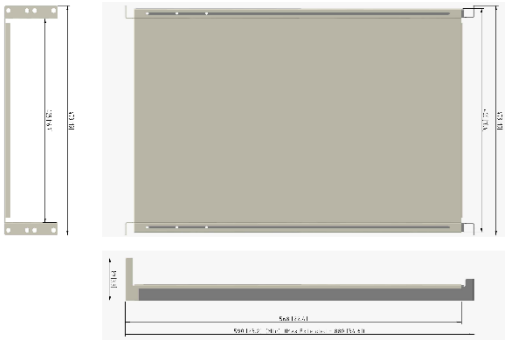
4.1 Installation of Battery Module(s)

NOTE – genZ rack mounted batteries have an IP50 rating. These batteries are for indoor use ONLY or in an outdoor IP rated enclosure. genZ rack mounted batteries are to be used with genZ shelving kits and racks only. If alternatives are used, please contact genZ prior to installation.

For model GZ48-058-2RU-01Z a 600mmx600mm rack is required, and 600mmx800mm for model GZ48-081-2RU-01Z

1. Ensure the cabinet is installed with genZ battery shelving. There are two variants, a full and uni split shelf. If not, install the shelving





2. Start by opening the cardboard battery box, all packaging is recyclable. Remove the battery, remember to also remove the comms linking cable (grey RJ45 cable) and green plug before disposing of the box.

3. Slide the battery into the lowest available shelf of the battery rack, ensure the battery circuit breaker is in the off position (down) then plug the Anderson connector from the battery rack into the battery. Attach the earth wire from the rack to the earthing point of the battery and fix the battery locking tabs.

4. Plug in the supplied 12pin green connector, this may not be used but to prevent it being misplaced we suggest installing it. Place the comms linking cable a side, these will be installed in step 7.

5. Insert the End of Line termination resistor (120Ω) plug to port B. The EOL plug can acquired from genZ.

6. Repeat steps 2-4 until all batteries have been installed.

7. Install the comms linking cable (grey RJ45) into port B of each battery except for the bottom battery. This should already have an EOL plugged in.

8. When initialising and prompt by the ZDC, starting from the top battery of the rack. Plug in the open-end comms linking cable to the below battery's A port.

9. The top battery's port A will be used to link the genZ rack manager.

All rights reserved genZ 2025

4.2 Series Connection to Achieve Higher Voltages

These battery modules are NOT designed for connecting in series. Connecting in series will void your warranty.

All rights reserved genZ 2025

5 Operation

5.1 To Turn the Battery Module ON and OFF

To turn the battery module on, move the circuit breaker 'up'. This will energise the POWER IN/OUT J1 connector. It will also activate the green LED on the front panel with a short delay.

To turn the battery module off, move the circuit breaker 'down'. This will de-energise the POWER IN/OUT J1 connector. It will also de-activate the green LED on the front panel if no communication to the Battery Module is in use.

If the green LED does not illuminate when the circuit breaker is in the 'ON' position after a short delay, go to the trouble shooting section of this guide.

5.2 Charging the Battery Module

These battery modules should only be charged by an approved charger that is designed to charge LFP chemistry, at the correct voltage, current and charge profile.

The charging profile described below is designed to achieve **maximum number of cycles/life** of the battery module.

5.2.1 Operating temperature

An ambient temperature of 23 to 27 Celsius is the ideal temperature for the operation of the battery. Operating outside of these temperatures will affect cycle life, capacity and possibly the warranty.

5.2.2 Charging and Dis-charging current

Commence a charge or dis-charge cycle where the current is limited (Constant Current or CC) at 0.5C

- 29 Amps (for model GZ48-058-2RU-01Z)
- 40.5 Amps (for model GZ48-081-2RU-01Z)

5.2.3 Balance voltage

- Applicable to all models of 48V modules

Charge the battery module at a Constant Current (CC) until the module voltage reaches 57.6±0.2 Volts.
Continue charging at a constant voltage of 57.6±0.2 Volts for a minimum of 30 minutes, up to 120 minutes. This will then allow the cells to 'balance' their terminal voltage.
If the charge current drops to anywhere between 0.5 and 1.0 Amps, the charge current can be terminated.
Alternatively, the charge cycle can be terminated anywhere between 30 to 60 minutes.
At the completion of the above charge profile, the battery can either be stored or placed on a float charge.

It recommended that the batteries are balanced every charge and no longer than 1 week between every charge. This is to ensure accurate state of charge (SoC) predictions and balancing performance.

All rights reserved genZ 2025

5.3 Initialization

1. Once battery connection is complete, calibrate the system by fully charging and balancing the batteries as per sections 5.2.2 and 5.2.3.

5.4 Inverter Configuration

Information on configuration parameters for certain inverter can be found on our website, if you are unable to locate your inverter from our website, please contact genZ at service@genz.com.au and we will provide compatible inverter configuration instructions as per installers request.

All rights reserved genZ 2025

6 Troubleshooting

SYMPTOM / FAULT	POSSIBLE CAUSE	POSSIBLE SOLUTION
NO OUTPUT VOLTAGE AT IN/OUT J1 POWER CONNECTOR	CIRCUIT BREAKER TURNED OFF/TRIPPED	TURN ON THE CIRCUIT BREAKER
	BMS UNDER VOLTAGE, IN PROTECTION MODE, OUTPUT OFF	RECHARGE THE BATTERY AND RECHECK FOR CORRECT OUTPUT VOLTAGE
	BMS OVERCURRENT, IN PROTECTION MODE, OUTPUT OFF	CHECK FOR SHORT CIRCUITS OR EXCESSIVE CURRENT DRAW
	BMS OVER VOLTAGE, IN PROTECTION MODE, OUTPUT OFF	CHECK FOR CHARGING CIRCUIT SUPPLYING EXCESSIVE CHARGE VOLTAGE
	BMS OVER TEMPERATURE, IN PROTECTION MODE, OUTPUT OFF	CHECK AND INVESTIGATE REASON FOR HIGH TEMPERATURE
	OTHER	RETURN TO GENZ FOR SERVICE
GREEN LED NOT ILLUMINATING WHEN CIRCUIT BREAKER ON	BMS UNDER VOLTAGE, IN PROTECTION MODE, OUTPUT OFF	RECHARGE THE BATTERY AND RECHECK FOR CORRECT OUTPUT VOLTAGE
	BMS OVERCURRENT, IN PROTECTION MODE, OUTPUT OFF	CHECK FOR SHORT CIRCUITS OR EXCESSIVE CURRENT DRAW
	BMS OVER VOLTAGE, IN PROTECTION MODE, OUTPUT OFF	CHECK FOR CHARGING CIRCUIT SUPPLYING EXCESSIVE CHARGE VOLTAGE
	BMS OVER TEMPERATURE, IN PROTECTION MODE, OUTPUT OFF	CHECK AND INVESTIGATE REASON FOR HIGH TEMPERATURE
	BATTERY VOLTAGE TOO LOW	RECHARGE THE BATTERY MODULE
	OTHER	RETURN TO GENZ FOR SERVICE

All rights reserved genZ 2025

SYMPTOM / FAULT	POSSIBLE CAUSE	POSSIBLE SOLUTION
CIRCUIT BREAKER TRIPS	EXCESSIVE DISCHARGE CURRENT	USING A CLAMP METER, CHECK THAT THE CURRENT BEING DRAWN FROM THE BATTERY MODULE IS LESS THAN 60AMPS. REFER TO INFORMATION/WARNING REGARDING STATE OF CHARGE
	EXCESSIVE CHARGE CURRENT	USING A CLAMP METER, CHECK THAT THE CURRENT BEING SUPPLIED TO THE BATTERY MODULE IS LESS THAN 60AMPS. REFER TO INFORMATION/WARNING REGARDING STATE OF CHARGE
	OTHER	RETURN TO GENZ FOR SERVICE
BATTERY MODULE FAILING TO CHARGE OR HOLD CHARGE	INSUFFICENT CHARGE VOLTAGE/CURRENT	CHECK FOR FAULTY CHARGER, POOR CABLING OR LOOSE CONNECTORS
	SOLAR OR OTHER CHARGER NOT CONFIGURED CORRECTLY	REFER TO THE MANUFACTURER OR THE SOLAR OR MAINS CHARGER
	BATTERY CHARGER MAY WELL BE FAILING TO START A CHARGE CYCLE. THIS MAY OCCUR WITH SOME SMART CHARGERS THAT REQUIRE SEEING AT LEAST SOME VOLTAGE FROM A BATTERY	CHECK WITH CHARGER MANUFACTURER OR SUBSTITUTE THE CHARGER FOR A DIFFERENT TYPE OR USE A DC POWER SUPPLY SET TO THE CORRECT CHARGE VOLTAGE AND CURRENT
	OTHER	RETURN TO GENZ FOR SERVICE

All rights reserved genZ 2025

7 Warranty & Service Information

Please refer to the Battery Module Product Manual for detailed information regarding warranty.

7.1 Registration

It is important that you maintain a record of your purchase details relating to the battery. Details such as, the model number, serial number of the battery module(s), place of purchase and/or who installed it.

7.2 Before Calling for Service

Verify that the charger and load are operating correctly. Refer to the “Troubleshooting” section of this guide.

If you believe that the battery module is not delivering its rated *capacity (Please refer to the Battery Module Product Manual) the battery module may be considered faulty if it fails to deliver less than 70% of its rated capacity during the warranty period.

*Note: Some chargers/inverters display the capacity of a battery module or the battery system. These calculated values can be inaccurate for several technical reasons and as such should not be relied on.

Refer to the genZ website at www.genz.com.au for full details of the warranty on this product.

7.3 Warranty or Service

In the unlikely event that you believe the module is faulty, contact the place of purchase or dealer/distributor first. If you cannot reach your dealer, or if they cannot resolve the issue, please visit the genZ web site at www.genz.com.au for contact details for technical support.

Please ensure that you have the following information available:

a) Where and when the unit was purchased.
b) The model number.
c) Serial number of your module.
d) Information on the nature of the failure.

http://www.genz.com.au

All rights reserved genZ 2025

8 Notes

Serial Number:
Model Number:
Place of Purchase:
Date of Purchase:
Owner:



genZ Energy Pty Ltd

Western Australia

Email: info@genz.com.au
Web: www.genz.com.au