GEB G48100-PR 51.2V 100Ah

LIFEPO4 BATTERY PACK USER MANUAL

Please read this manual carefully before operating

and retain it for future reference.

This manual introduces G48100-PR designed by GEB Technology. Please read this manual before installation of the battery module and follow the instruction carefully during the assembly. Any confusion, please contact GEB Technology immediately for advice and clarification.

CONTENT

1. Safety Precautions

This section describes the safety information that must be observed when working with battery packs. To prevent any damages, or personal injury, and to ensure the performance of the battery packs, please read this section carefully and observe the safety precautions at all times.

1.1 Precautions

- It is very important and necessary to read the user manual carefully before installing or using the product. Failure to do so or to follow any of the instructions or warnings in this document can result in electrical shock, serious injury or death, and could damage the battery, or potentially rendering it inoperable.
- If the battery pack is stored for long time, it is required to charge them every six months, and the SOC should be no less than 90%.
- Please recharged the battery pack within 12 hours, after fully discharged.
- All the battery pack terminals must be disconnected before any maintenance.
- Do not use cleaning solvents to clean battery pack.
- Do not expose battery pack to flammable or harsh chemicals, or corrosive gases or liquids.
- Do not paint any part of battery pack, include any internal or external components.
- Do not expose the battery pack to direct sunlight for extended periods of time.
- Do not connect battery pack with PV solar wiring directly.
- Do not insert any foreign object into any part of the battery pack.

1.2 Warning

- Do not touch the battery pack with wet hands.
- Do not crush, drop or puncture the battery pack.

- Always dispose of the battery pack according to local safety regulations.
- Store and recharge the battery pack in a manner in accordance with this user manual.
- Ensure reliable grounding.
- Do not reverse the polarity when installing.
- Do not short circuit the terminals, remove all jewelry items that could cause a short circuit before installation and handling.
- Disconnect battery from power or loads, and then power off battery before installation and maintenance.
- The battery packs should be not stacked more than specified numbers.
- Continued operation of a damaged battery pack can result in dangerous situation.

2. Introduction

GEB G48100-PR

G48100-PR lithium iron phosphate battery pack is a household renewable energy storage solution developed and produced by GEB Technology. It is a low-voltage DC battery system with an operating voltage of 48V, and works with a low voltage inverter to realize the goal of energy storage for home application.

G48100-PR battery pack supports max. of 16 packs in parallel to expand capacity, which can meet various capacity requirements. It has built-in battery management system (BMS), which can manage and monitor the pack and cells information including voltage, current and temperature. What's more, BMS can balance cells charging and discharging to extend cycle life.

2.1 Features

- Battery cell is 3.2V 100Ah aluminum case prismatic cell.
- Battery cell is made from lithium iron phosphate (LiFePO4) with safety performance and longer cycle life.
- Special designed plastic cell holder, holding 8 cells in series composes a battery module, and two modules in series, then connected with BMS, composes a battery pack.
- BMS has over-discharge, over-charge, over-current, high and low temperature warning and protection functions.
- BMS monitors charge and discharge state, and balance current and voltage of each cell.
- BMS comes with upper computer system for real-time cell and pack voltage, current, temperature, and battery status monitoring and recording.
- Flexible configuration, max. 15 packs can be connected in parallel for expanding capacity and power with 8 DIP switches.
- Working temperature range is from -10℃~50℃ (Charging 0℃~50℃; discharging -10℃~50℃) with excellent discharge performance and cycle life.
- Pre-programmed with multi-protocols, GEB G48100-PR works with multi-brands of inverters.

2.2 Specifications

Basic Parameters	G48100-PR 2
Nominal Voltage (V)	51.2V
Nominal Capacity (Ah)	100Ah @0.5C discharge current 25±2℃
Rated Capacity (Ah)	98-105Ah @0.5C discharge current 25±2℃ 41.6V - 57.6V
Nominal Power (Wh)	5.12KWh
Dimension (mm)	565*440*170mm
Weight (Kg)	56.2±5KG
Discharge Cut-off Voltage (V)	41.6V
Charge Voltage (V)	57.6V
Continuously Charge/Discharge Current (A)	100A @25±2℃
Standard charge/discharge Current (A)	50A @25±2℃
Communication Interface	CAN, RS485
Configuration	2*1P8S
Working Temperature	0～50℃(Charge)
	-10～50℃(Discharge)
	-20～55℃(Storage)
Cell chemistry	Lithium iron phosphate (LiFePO4)
Cycle life	≥80% capacity state after 4800 cycles at 0.5C, 25℃, 100% DOD
IP level	IP 20
Humidity	10% - 85%
Certification	CE, ROHS, MSDS, UN38.3

2.2.1 Recommended Continuously Discharge Current

Temperature	SOC 0% - 20%	SOC 20% - 40%	SOC 40% - 80%	SOC 80% - 100%
-10 - 0℃	10A	10A	50A	50A
0 - 7℃	15A	50A	60A	80A
7 - 15℃	20A	40A	70A	90A
15 - 25℃	30A	70A	100A	100A
25 - 45℃	30A	70A	100A	100A
45 - 50℃	10A	30A	40A	50A
50 - 55℃	5A	15A	20A	30A

2.2.2 Recommended Continuously Charge Current

Temperature	SOC 0% - 20%	SOC 20% - 40%	SOC 40% - 80%	SOC 80% - 100%
-10 - 0℃	10A	10A	8A	5A
0 - 7℃	20A	20A	15A	10A
7 - 15℃	50A	50A	40A	20A
15 - 25℃	80A	80A	60A	30A
25 - 45℃	100A	100A	60A	30A
45 - 50℃	80A	80A	50A	20A
50 - 55℃	50A	50A	40A	15A

2.3 Interfaces

RESET

Reset button: to start the battery pack, hold the button for 2s to turn on battery pack.

RS485

RS485 communication interface: RJ45 port, follow RS485 protocol. For transmitting battery pack information between paralleled packs. The first 4 DIP switches (#1, #2, #3, #4) are used for identifying packs' information on software.

CAN

RS485 communication interface: follow CAN BUS protocol, for output pack information to inverter. One pack should be assigned as master pack. And the last 4 DIP switches (#5, #6, #7, #8) to tell how many slave packs are followed. The firs DIP switches are used for identifying slave packs.

ADS

ADS Switch: To setup battery address for identification, and make the communicate between batteries, battery to inverter.

NOTE: There are 8 bit DIP switches, keep the switch on down side means 'OFF', turn up the switch to top side means 'ON'.

ALARM

ALARM light: red LED flash to show the battery alarm status. And red light to show the battery in protection status of abnormal temperature, over-current, or short-circuit.

RUN

Working light: green LED to show the battery working status.

Details as follows,

Battery status	Operating Mode	RUN	ALM	LED Light				Remark
		●	●	●	●	●	●	
Power off	Standby	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Standby	Normal	Solid Green	OFF	According to battery SOC status				Standby mode
Charge Mode	Normal	Solid Green	OFF	According to battery SOC status				
	Over current warnings	Solid Green	Blink type 2					
	Over voltage protection	Blink type 1	OFF	OFF	OFF	OFF	OFF	
	Temperature, over current protection	Blink type 2	OFF	OFF	OFF	OFF	OFF	
Discharge Mode	Normal	Blink type 3	OFF	According to battery SOC status				
	Warning	Blink type 3	Blink type 3					
	Over current, temperature, short-circuit protection	OFF	Solid Red	OFF	OFF	OFF	OFF	Termination of discharge
	Under voltage protection	OFF	OFF	OFF	OFF	OFF	OFF	Termination of discharge

CAPACITY

SOC light: 4 green LED lights to show the capacity status of battery pack. Each LED represents 25% the capacity.

Status	Charge				Discharge			
Capacity indicator	●L4	●L3	●L2	●L1	●L4	●L3	●L2	●L1
0-25%	OFF	OFF	OFF	Blink	OFF	OFF	OFF	Solid Green
25%-50%	OFF	OFF	Blink	Solid Green	OFF	OFF	Solid Green	Solid Green
50%-75%	OFF	Blink	Solid Green	Solid Green	OFF	Solid Green	Solid Green	Solid Green
>75%	Blink	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green	Solid Green
Operating indicator	Solid Green				Blink			

P+/P- Terminals

Power terminals: two pairs of power terminals with the same function, one connect to equipment, and the other one parallel to other battery pack for capacity expanding. For a single pack, both terminals can achieve charging and discharging functions.

Power cable uses 6.0mm power plug with lock button. And can be full rotation.



2.4 Cell Features

2.4.1 Specifications

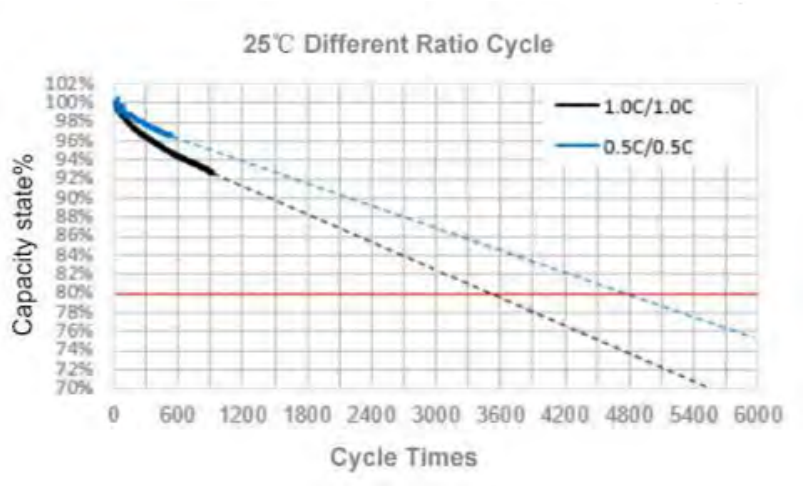
GEB 3.2V 100Ah lithium iron phosphate (LiFePO4) aluminum case prismatic rechargeable battery cell.

Nominal Voltage	3.2V
Nominal Capacity	100Ah
Weight	≤2.25Kg
Self-discharge Rate	≤3.5% per month
Initial Internal Resistance （1KHz）	≤0.35mΩ

Refer to the cell specification for more detailed information.

GEB Technology applies high quality Grade A cells inside the battery box. And did the following designs to prolong the battery pack cycle life.

- Judging by the current testing report below, if the battery pack charging and discharging at 0.2C, the battery pack could reach a cycle life of 6000 times or more at the remaining capacity of 80% capacity state at 25℃ room temperature, 100%DOD.



- The real capacity of each single cell is 105Ah.

- The module inside comes with 16 cells in parallel. And the default setting of BMS pack discharge end voltage is for 15 cells in parallel.

2.5 Advanced Battery Management System (BMS)

The BMS is applied to monitor current, voltage, temperature, protection against over-charge, over-discharge, over-current, over-temperature, under-temperature and short circuit. The BMS provides cell balancing and current limitation during charging process to ensure a reliable safety and performance.

2.5.1 BMS Functions

- Over charge protection
- Over discharge protection
- Over current protection
- Cell balancing
- Temperature protection
- CAN and RS485 communication

Refer to the BMS specification for the detailed information

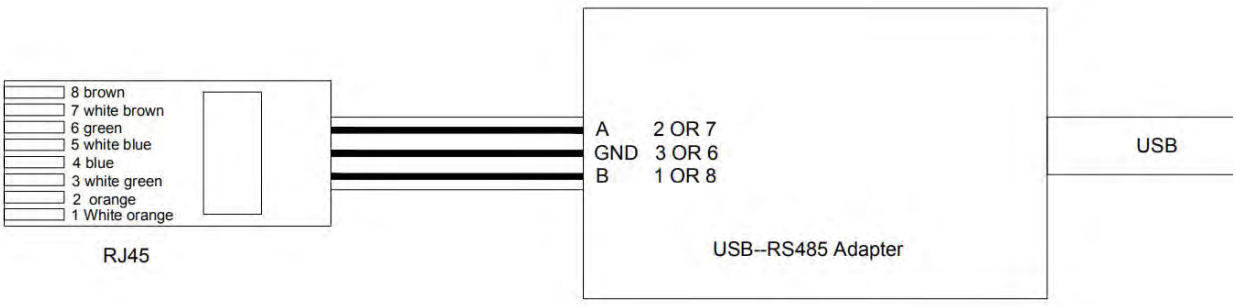
2.5.2 BMS Upper Computer System

Battery pack can be remotely monitored with GEB BATTERYMONITOR software. With this software, battery voltage, cell voltage of single cell and pack, SOC status, cell temperature, voltage differences can be monitoring in real time. Through history record, battery status can be checked afterwards.

First, connect G48100-PR to the master computer with USB-RS485 adapter.

If the adapter needs wiring, follow the wiring diagram.

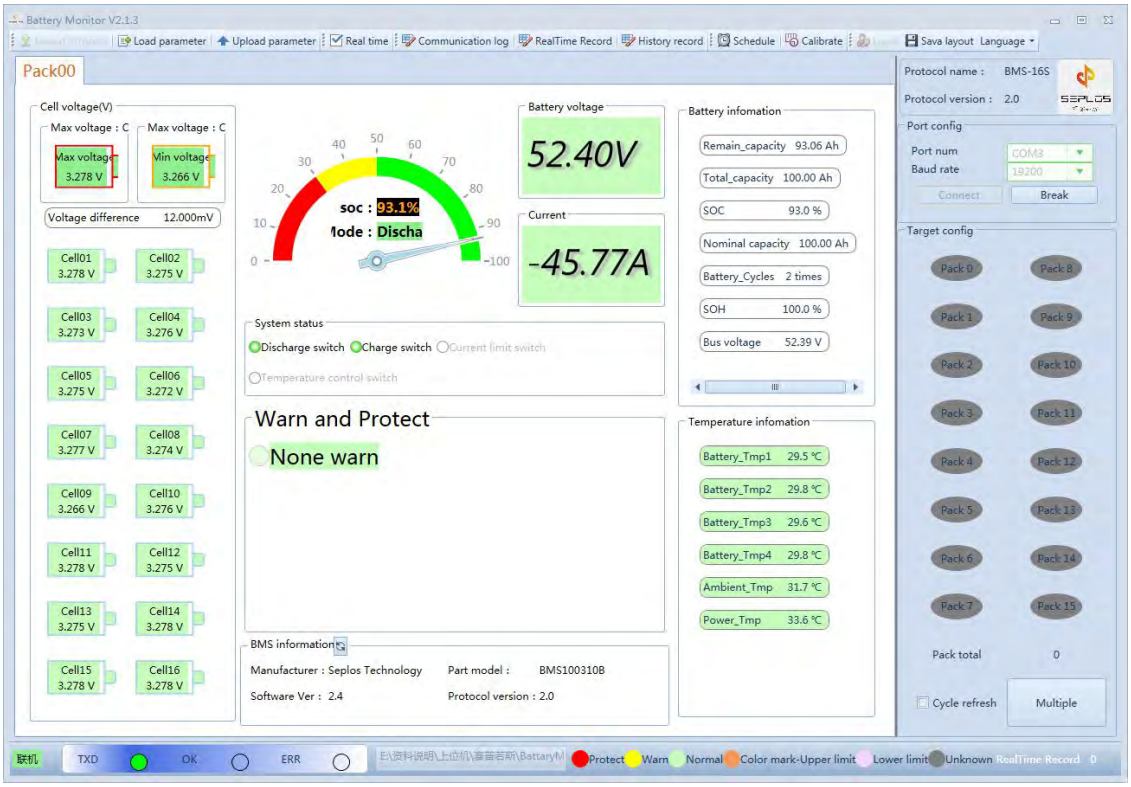
RJ45



Wiring Diagram

Note: Download the software installation guide at Google drive with the following link:

https://drive.google.com/drive/folders/10pxgNLHovcDZRVGrCZsSkfecBrRw-AdW?usp=sharing



Software interface

2.5.3 Compatible Inverters

GEB G48100-PR Battery pre-programmed with multi CAN protocols to compatible with multi-brands of inverters. To make sure that the battery module works perfectly, it would be better to use the compatible inverters listed below.

Note: Different models of inverters may comes with different protocols and designing even for the same brand. For some models, a firmware updating is required for perfect communication.

Pre-programmed CAN Protocol list:

- Goodwe-V1.5
- Pylon-V1.3
- Growatt-V1.05
- Victron CANBUS_PROTOCOL
- LUXPOWER_CAN Protocol

- Sofar_REV5
- SMA_EN_10

Communicate inverters list (CAN Protocol):

- ✓ Goodwe
- ✓ Growatt (Growatt inverter comes with both CAN and RS485 protocol models. Please confirm before purchase.)
- ✓ Victron
- ✓ Voltronic (Voltronic inverter comes with RS485 protocol only. Please confirm with your sales representative before purchase.)
- ✓ Phocos (Phocos inverter comes with RS485 protocol only. Please confirm with your sales representative before purchase.)
- ✓ LUXPOWER
- ✓ Sofar
- ✓ DEYE
- ✓ Sermatec
- ✓ RENAC
- ✓ TBB POWER
- ✓ SOLIS
- ✓ SMA
- ✓ FoxESS

Inverter Settings:

Battery information would be synchronized to the inverter through CAN communication. If the inverter do not support CAN communication, the following parameters need to be modified before connecting with battery system.

Charging Settings:

Parameter	Setting
Battery type	Lithium
Charge curve	Fixed
Absorption voltage	57.6V
Float voltage	55V
Absorption time	1Hr

Note:

1. Make sure to double check the float voltage after completing Assistants, and if necessary set it back to 55.0V.

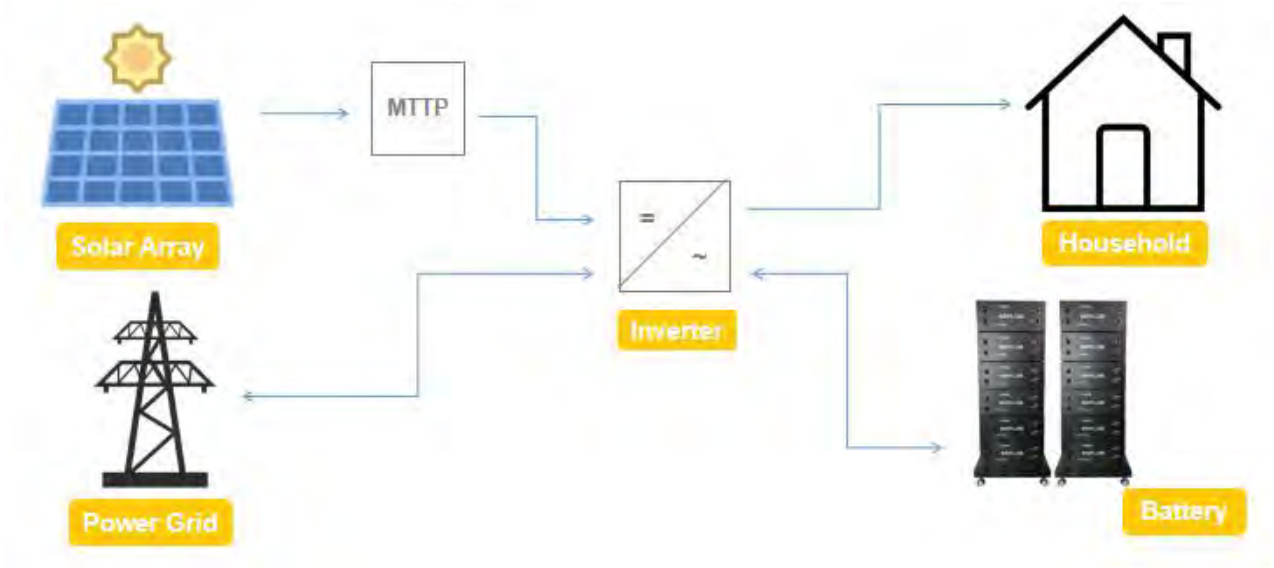
2. For off-grid use, ignore the 'BMS assistant required' warning.

Inverter Settings

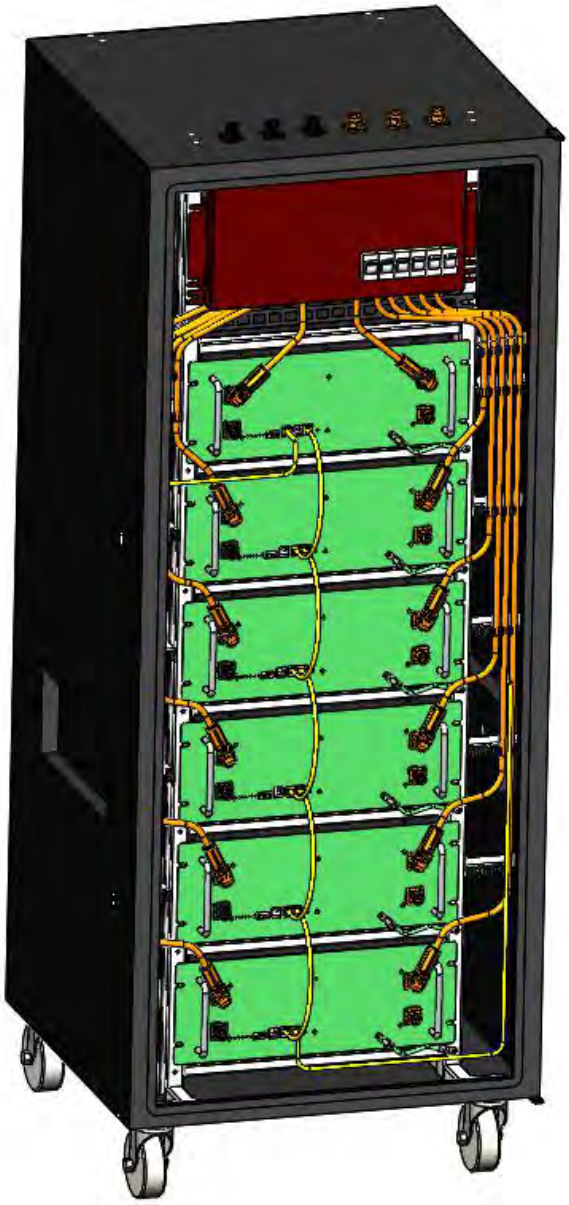
Parameter	Setting
DC input low shut-down	43V
DC input low restart	47V
DC input low pre-alarm*	47V

3. Installation

3.1 Application



3.2 Battery pack wiring (Single Phase/Split Phase)



4. List

4.1 Packing list

Item	Description	Quantity	Picture
1	Battery Pack 5.12KWh	1 PCS	
2	Parallel cable with plus orange and black 240mm	1 SET	
3	RJ45 cable, yellow 300mm	1 PCS	
4	Ground cable, M6 screw hole 190mm	1 PCS	
5	Packing list	1 PCS	/

4.2 Optional accessories list

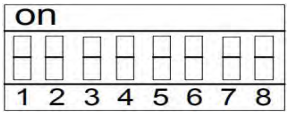
1	Adapter	RS485 to USB adapter	optional	
2	Cable	Pack to inverter power cable 1500cm, positive and negative other length cables optional	optional	
		RJ45 cable 1500cm	optional	

5. Appendix

5.1 RS485 DIP address setup demonstration.

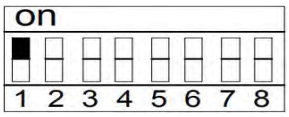
Single pack: No need to set DIP address.

G48100-PR

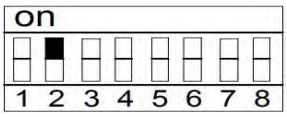


Multiple G48100-PR packs in parallel:

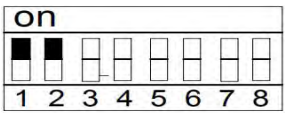
G48100-PR 1



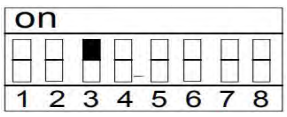
G48100-PR 2



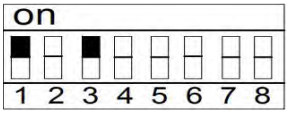
G48100-PR 3



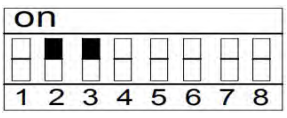
G48100-PR 4



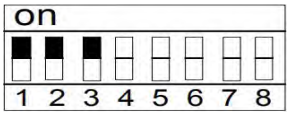
G48100-PR 5



G48100-PR 6

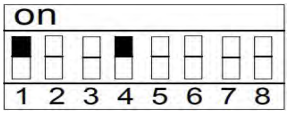


G48100-PR 7

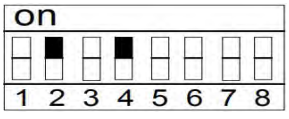


G48100-PR 8

G48100-PR 9

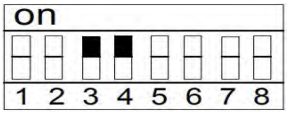


G48100-PR 10

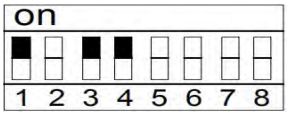


G48100-PR 11

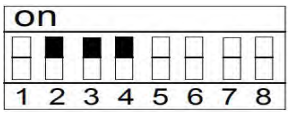
G48100-PR 12



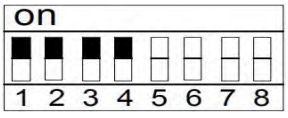
G48100-PR 13



G48100-PR 14

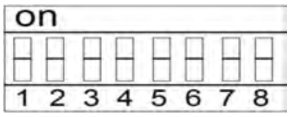


G48100-PR 15

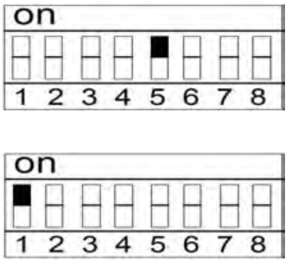


5.2 CAN BUS DIP address setup demonstration.

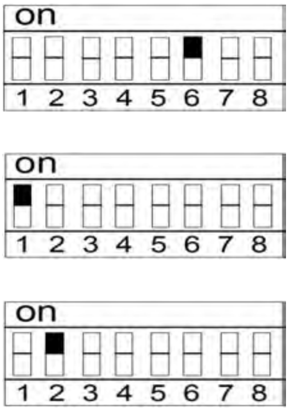
1 Pack



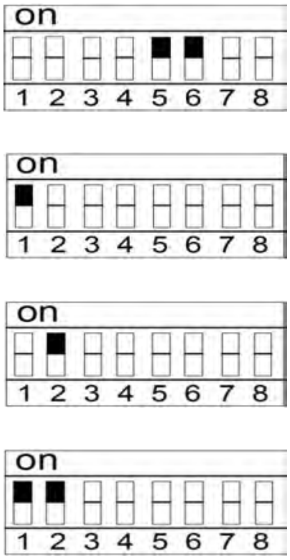
2 in Parallel



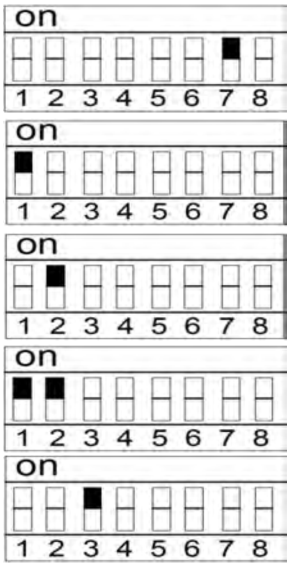
3 in Parallel



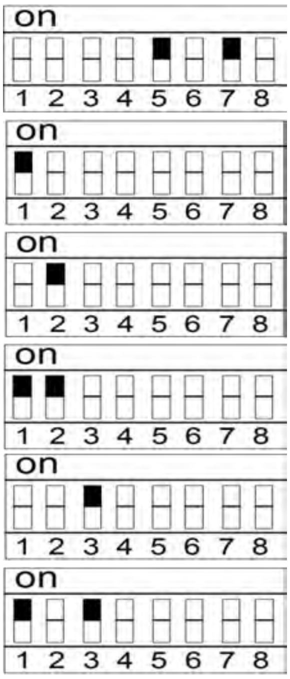
4 in Parallel



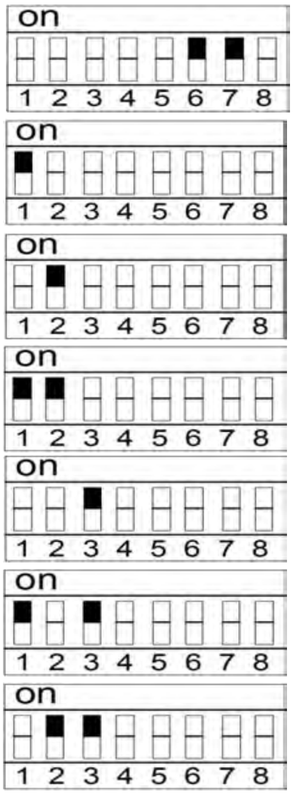
5 in Parallel



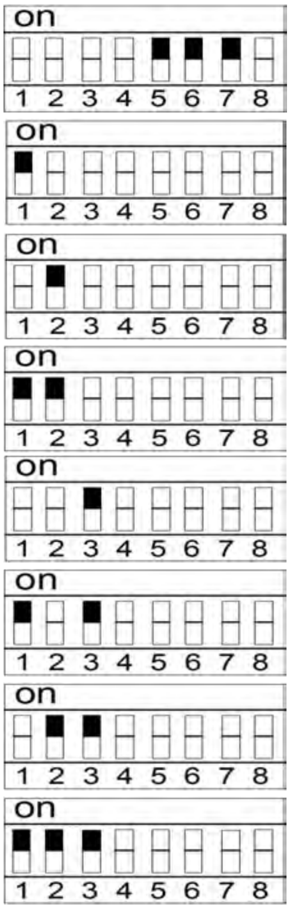
6 in Parallel



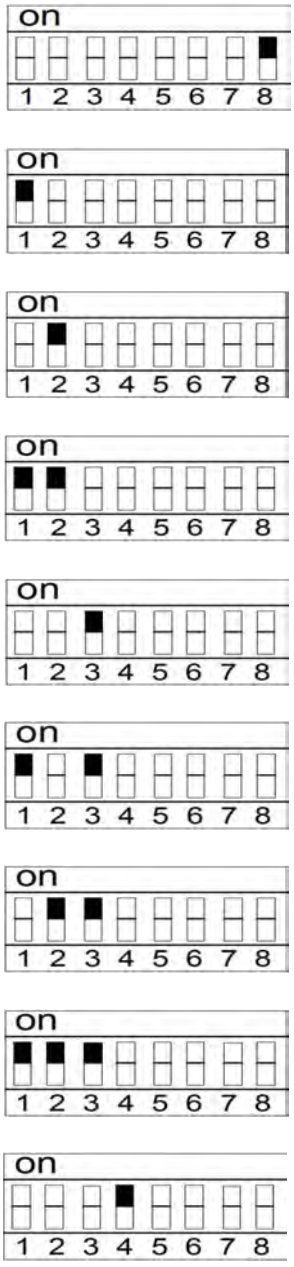
7 in Parallel



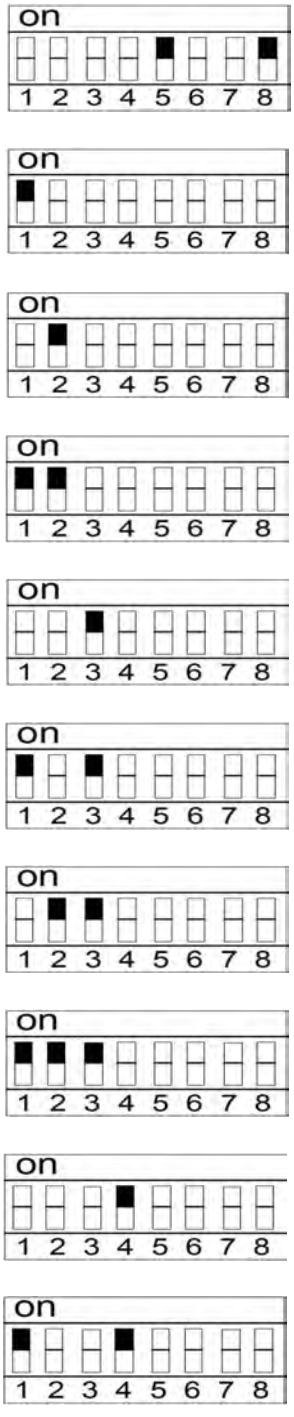
8 in Parallel



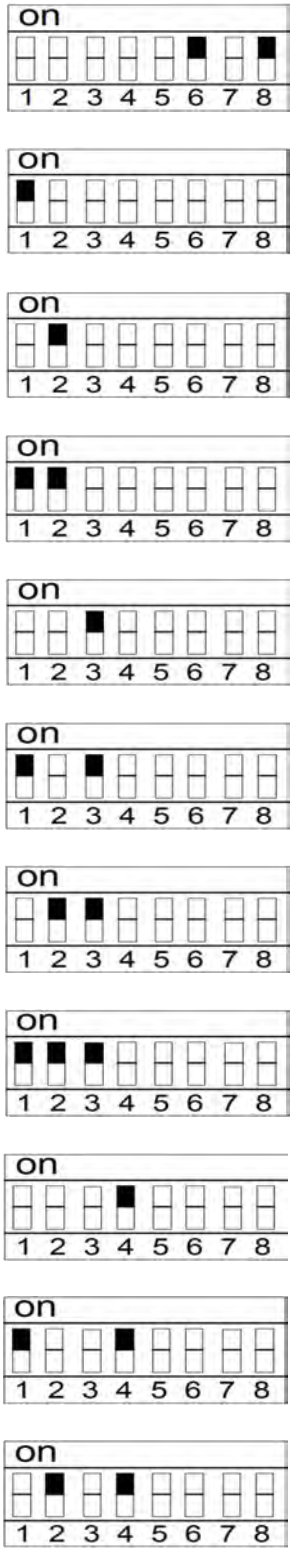
9 in Parallel



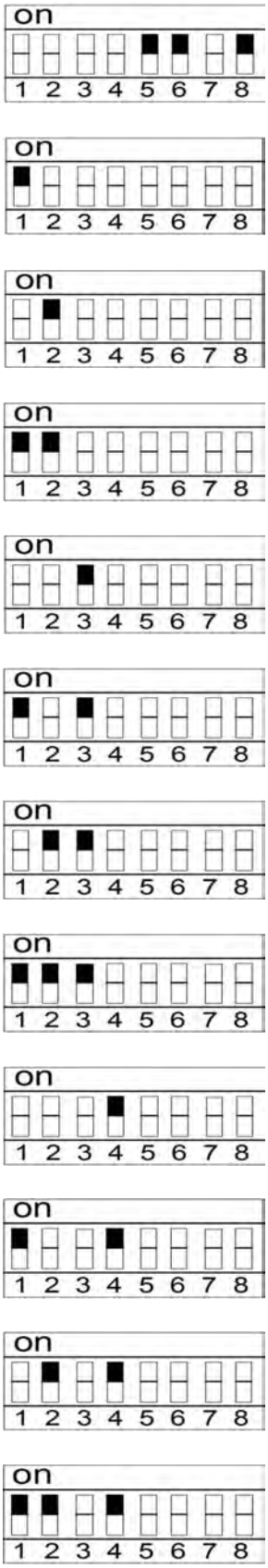
10 in Parallel



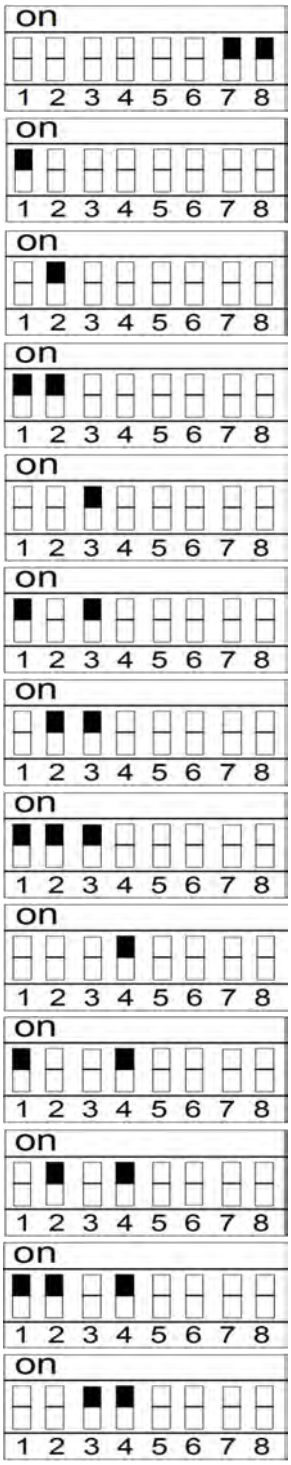
11 in Parallel



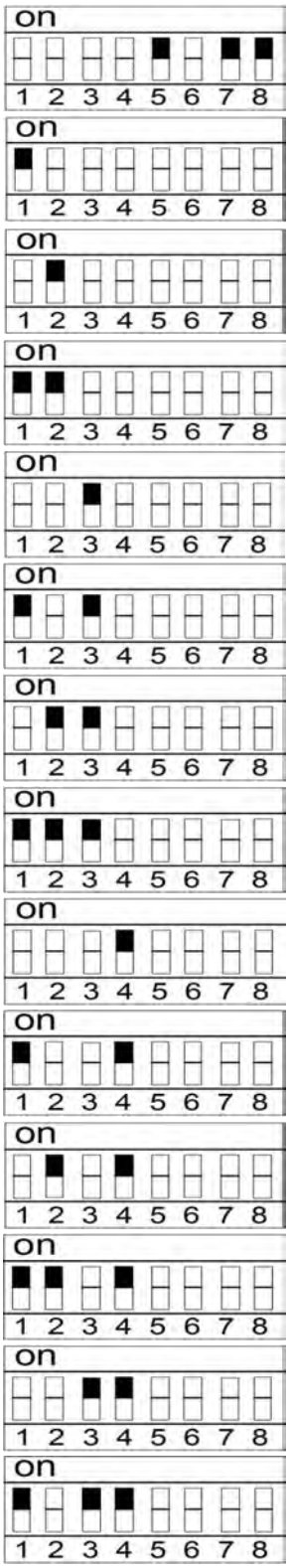
12 in Parallel



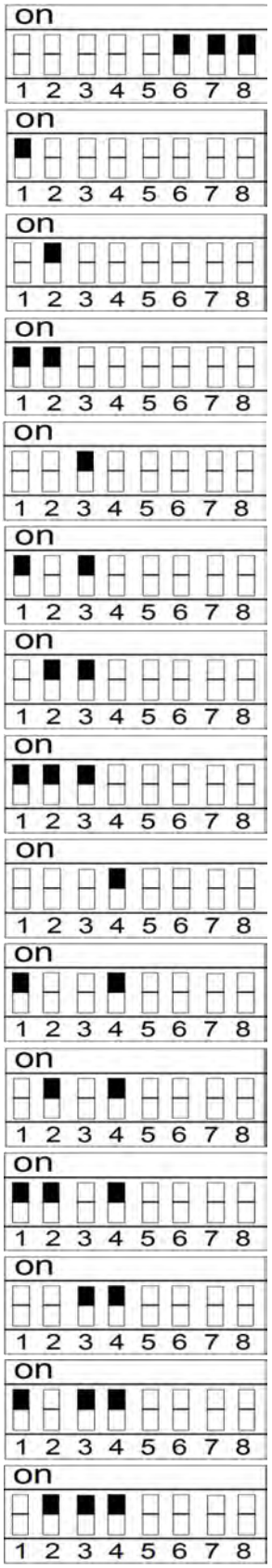
13 in Parallel



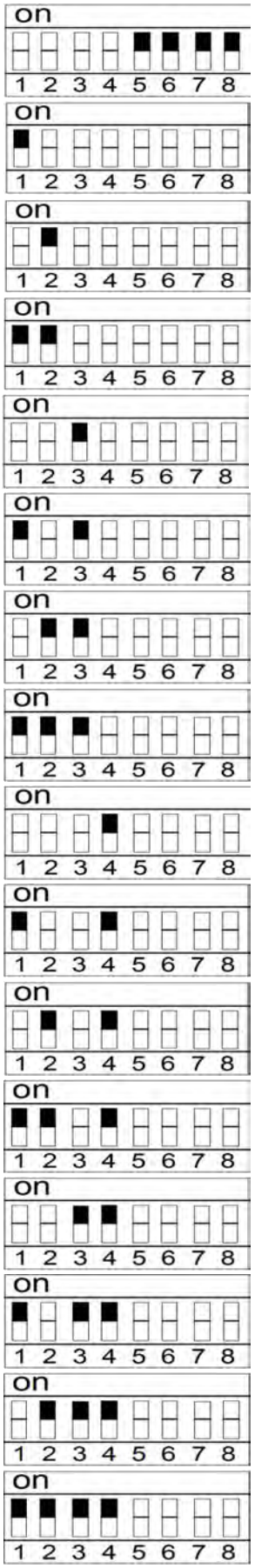
14 in Parallel



15 in Parallel



16 in Parallel



Scan the QR code to get connected with GEB Technology

GEB ON FACEBOOK

GEB WEBSITE

This document is subject to change without notice.

4th Floor, Building 5, Mingkunda Industrial Park, 38 Huachang Road, Dalang Street,
Longhua District, Shenzhen 518109, Guangdong Province, PR China
TEL: +86-0755-81762723/81762725
E-mail: sales@gebattery.co
http://www.gebbattery.com