

BSLBATT®

Best Solution Lithium Battery

USER MANUAL

5.1KWH LITHIUM-ION BATTERY



SAFETY GUIDELINES



Work or maintenance on the BSL battery should be carried out by qualified personnel only.

Do not attempt to open or dismantle battery and/or cells.



The electrolyte contained in the battery cells is highly corrosive. In the event of any damage to or leakage from the cells, treat contents with care, do not allow contact with exposed skin or eyes. DO NOT INGEST.



The terminals of the BSL battery should always be considered live, therefore do not place tools or any other items across the terminals. Do not pierce, short or damage the terminals in any way. Do not touch the terminals of the battery.



Fire Hazard: Do not discharge battery below specified minimum level as this poses an increased fire risk. Do not attempt to charge a swollen or damaged battery. In the event of fire, a CO_2 or Dry Powder extinguisher should be used. Class D extinguishers are not suitable.



Dispose of batteries through the proper local regulations. Not suitable for regular refuse/recycling.

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1 Pin out diagram

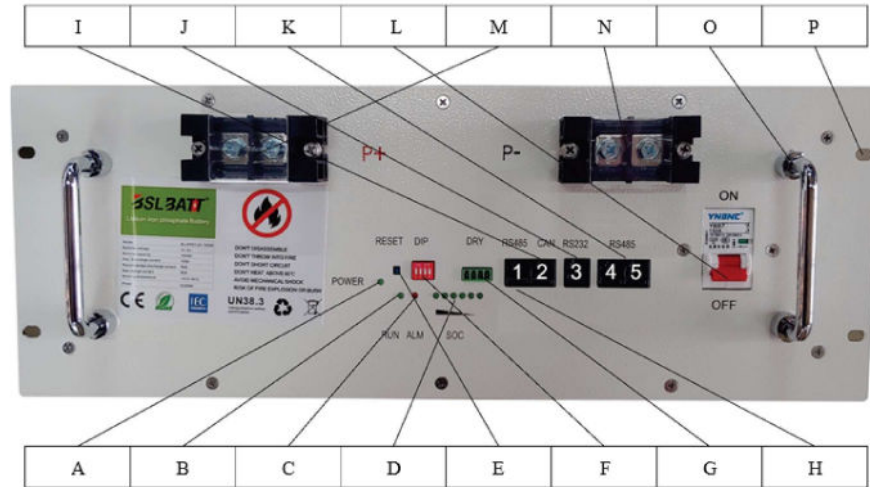


Figure 1: Pin-out diagram for 5.1kWh BSL battery.

- A - Power indicator light
- B - Run light (battery activity)
- C - Alarm indicator light
- D - State of charge indicator lights
- E - Reset switch (BMS Power button)
- F - Dip switches for parallel connection
- G - Dry Contacts (mostly unused)
- H - RS485 Left port (Port 1)
- I - CAN Port (Port 2)
- J - RS232 Port (Unused)
- K - RS485 Right Ports (Ports 4 & 5)
- L - Circuit breaker (terminal power)
- M - Positive terminal
- N - Negative terminal
- O - Carry handles
- P - Mounting holes

2 Battery set-up

2.1 General

2.1.1 Turning battery on and off

The battery can be switched on or off by holding down the small recessed button marked “RESET”.

2.1.2 CAN communication

A VE.Can to CAN-bus BMS “Type B” cable is required for CAN-Bus communication between the BSL battery and the Victron GX device. Some inverters will use different cable configuration, please check this with inverter suppliers. (Black to inverter/GX device, red to battery).

| Function | Victron <u>VE.Can</u> Side (GX) | Battery side |
|----------|---------------------------------|--------------|
| GND | Pin 3 | Pin 2 |
| CAN - L | Pin 8 | Pin 5 |
| CAN - H | Pin 7 | Pin 4 |

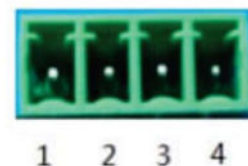
2.1.3 Smart shunt

A Battery Monitoring Device (Victron BMV/Smartshunt) is not required as State of Charge (SOC) is sent to the GX device via the CAN-Bus cable.

2.1.4 Dry contacts

Dry Contacts are mostly unused, but for communication with some non-smart systems please see the table below. Working current should be less than 2A, mainly to connect with an external indicator light or buzzer.

| | |
|--------------|---|
| PIN1 to PIN2 | Always open, will close with low battery signal |
| PIN3 to PIN4 | Always Open, will close with fault/protection signal. |



2.1.5 Other ports

Port 1 (RS485) and port 3 (RS232) are used for programming and retrieving information only and must be left open.

2.2 Multiple batteries

2.2.1 Max number of parallel batteries

A maximum of 15 batteries can be connected in parallel. Each battery will require a unique binary address which can be setup via the dip-switches located on the front of the battery.

2.2.2 Installing multiple batteries

When installing more than one battery in parallel, a standard RJ45 patch network cable will be required for inter-battery communication. These cables will need to be connected to port 4 or 5 between all the connected batteries. The ports are paralleled therefore any port can be used for in or out connection.

2.2.3 Cable sizing with multiple batteries

It is recommended to make use of a common rail bus-bar when more than 4 batteries are to be installed. All positive cables running between the battery and bus-bar must be the same length and all negative cables must be the same length. The batteries should be evenly grouped where possible.

The recommended battery cable sizes from the batteries (going to the inverter) in parallel are as follows: 1 battery - $35mm^2$, 2 batteries - $50mm^2$, 3 batteries - $70mm^2$ or $2 \times 35mm^2$, 4 batteries - $95mm^2$ or $2 \times 50mm^2$

2.2.4 Dip switch settings for multiple batteries

| Address | DIP switch position | | | | Note |
|---------|---------------------|-----|-----|-----|------------------|
| | #1 | #2 | #3 | #4 | |
| 0 | ON | OFF | OFF | OFF | stand-alone use |
| 1 | ON | OFF | OFF | OFF | master Pack |
| 2 | OFF | ON | OFF | OFF | Auxiliary Pack1 |
| 3 | ON | ON | OFF | OFF | Auxiliary Pack2 |
| 4 | OFF | OFF | ON | OFF | Auxiliary Pack3 |
| 5 | ON | OFF | ON | OFF | Auxiliary Pack4 |
| 6 | OFF | ON | ON | OFF | Auxiliary Pack5 |
| 7 | ON | ON | ON | OFF | Auxiliary Pack6 |
| 8 | OFF | OFF | OFF | ON | Auxiliary Pack7 |
| 9 | ON | OFF | OFF | ON | Auxiliary Pack8 |
| 10 | OFF | ON | OFF | ON | Auxiliary Pack9 |
| 11 | ON | ON | OFF | ON | Auxiliary Pack10 |
| 12 | OFF | OFF | ON | ON | Auxiliary Pack11 |
| 13 | ON | OFF | ON | ON | Auxiliary Pack12 |
| 14 | OFF | ON | ON | ON | Auxiliary Pack13 |
| 15 | ON | ON | ON | ON | Auxiliary Pack14 |

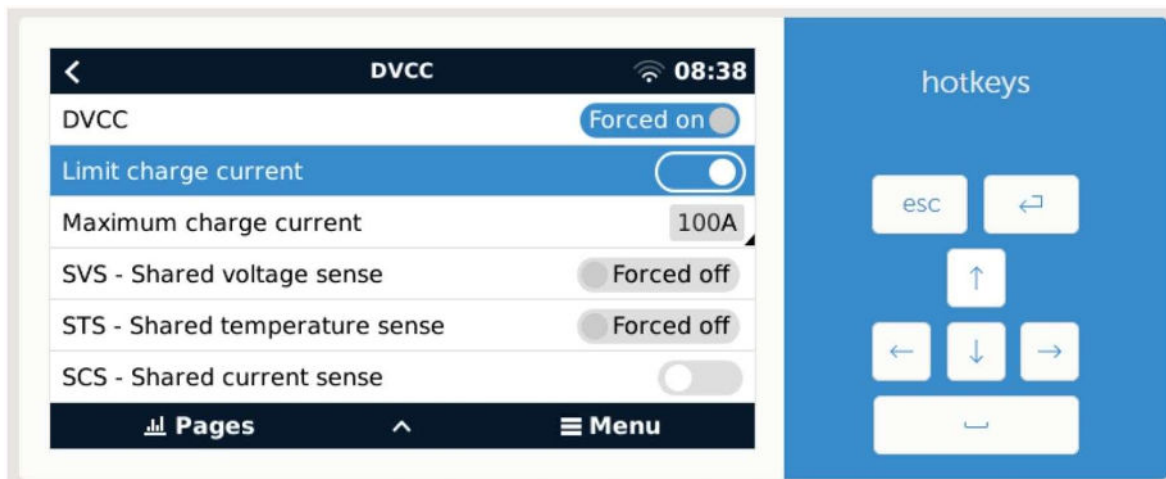
3 Inverter set-up

3.1 Batteries per inverter size

| Inverter size | Recommended N.O. batteries | Minimum N.O. of batteries |
|---------------|----------------------------|---------------------------|
| 15kVA | 4 | 3 |
| 10kVA | 3 | 2 |
| 8kVA | 2 | 2 |
| 5kVA | 1 | 1 |
| 3kVA | 1 | 1 |

3.2 Battery set-up on Victron GX device

1. The VE.Can to CAN-bus BMS Type B cable needs to be connected to the VE.Can port on the GX device and the second unused VE.Can port needs to be terminated with the Victron blue terminator. Ensure that the cable is marked CCGX at the end.
2. Press the enter button on the GX device. This should take you to the device list page. Scroll down to settings, press enter, and scroll to services and press enter again. Navigate to the CAN settings and change the CAN speed from 250 KB to 500 KB.
3. Scroll to DVCC and select Switch DVCC on. Flag SHARED VOLTAGE SENSE and CHARGE LIMIT. Set CCL (charge current limit) to **50 amps/battery**.
4. Navigate back to the device list and the BSL battery should appear on the device list.
5. Select the BSL battery set the parameters as follows:
 - Charge Voltage 54.5V.
 - Charge Current Limit: 80A per battery.
 - Discharge Current Limit: 150A per battery.



3.3 MPPT


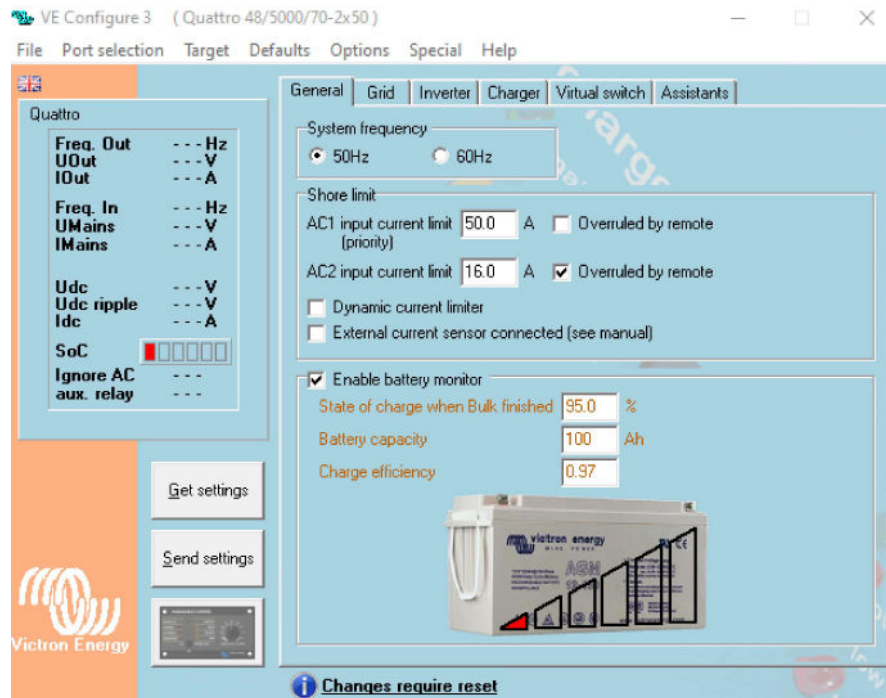
| | |
|---|-------------------------------------|
|  Battery voltage | 48V ▾ |
| Max charge current | 50A |
| Charger enabled | <input checked="" type="checkbox"/> |
| Battery preset | User defined ▾ |
| Expert mode | <input type="checkbox"/> |
| Charge voltages | |
| Absorption voltage | 54.50V |
| Float voltage | 54.60V |
| Equalization voltage | 54.00V |

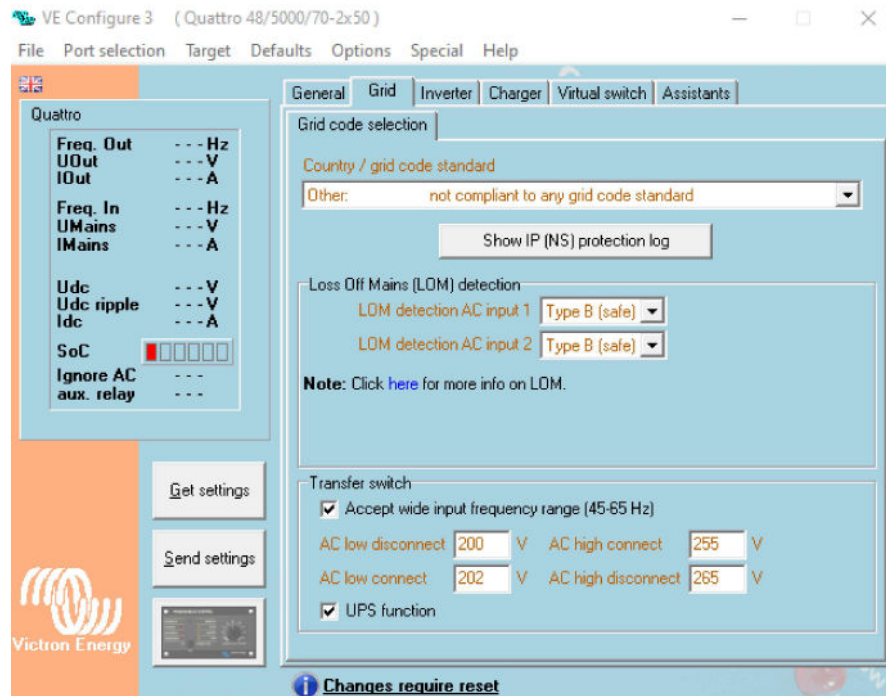
Figure 2: MPPT example

4 Inverter settings (Victron)

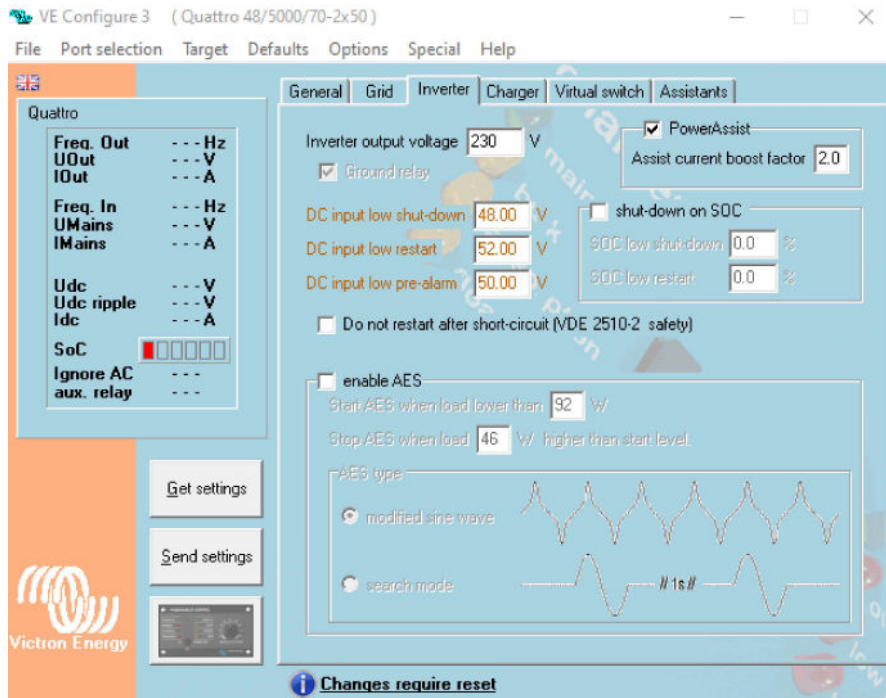
4.1 General Tab



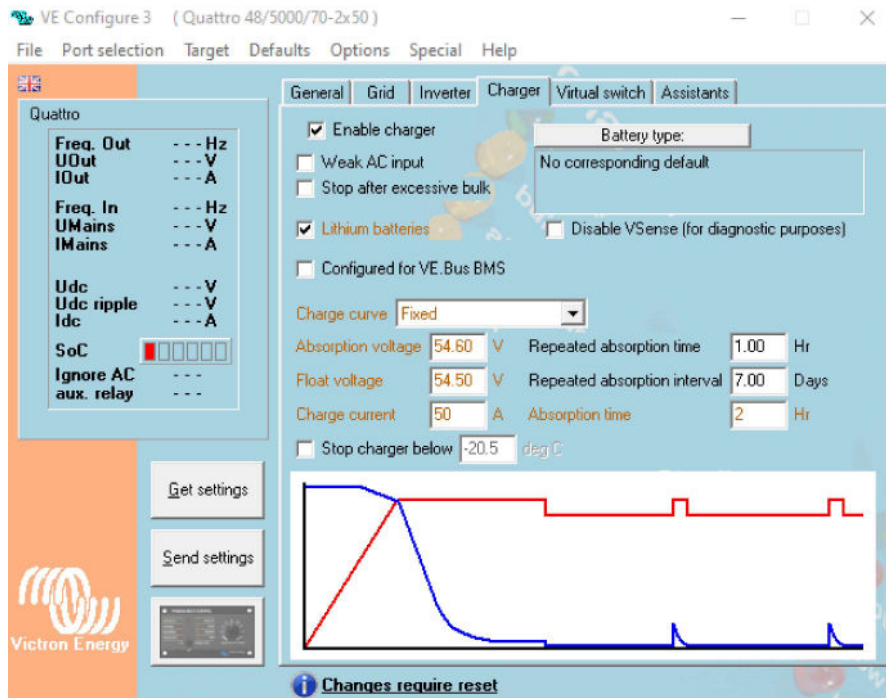
4.2 Grid Tab



4.3 Inverter Tab



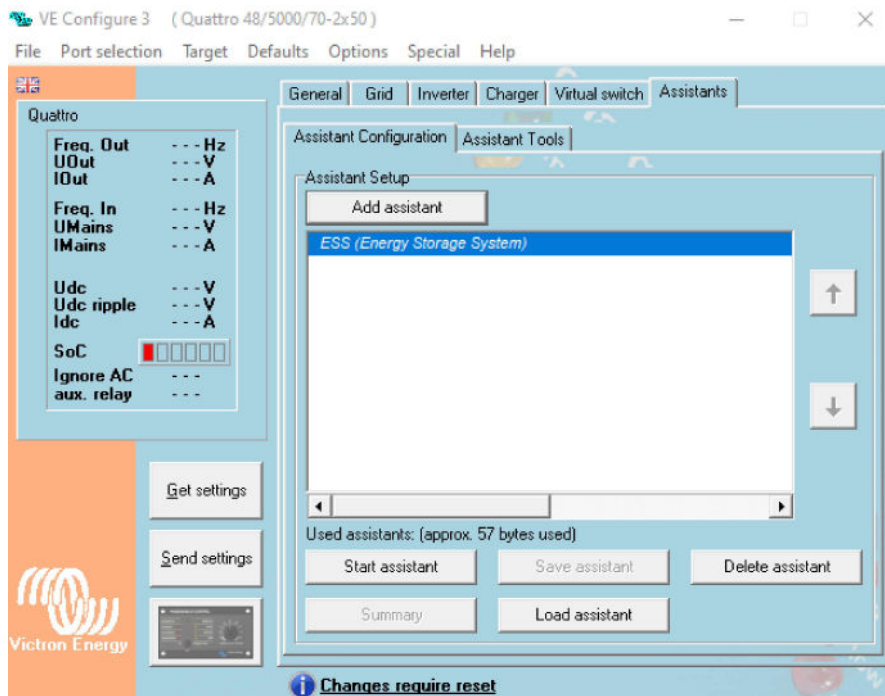
4.4 Charger Tab



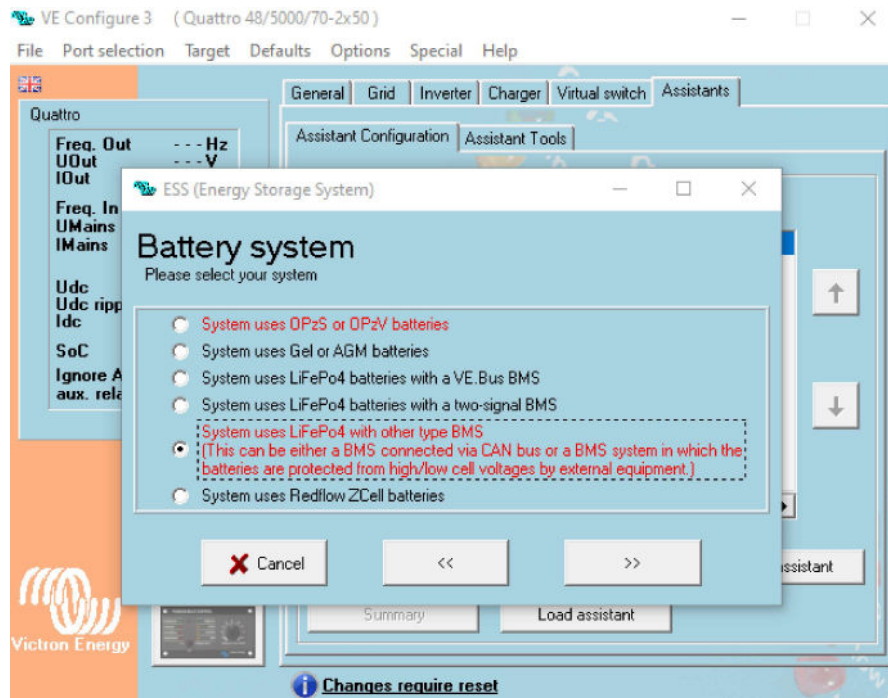
4.5 Assistant tab (a)



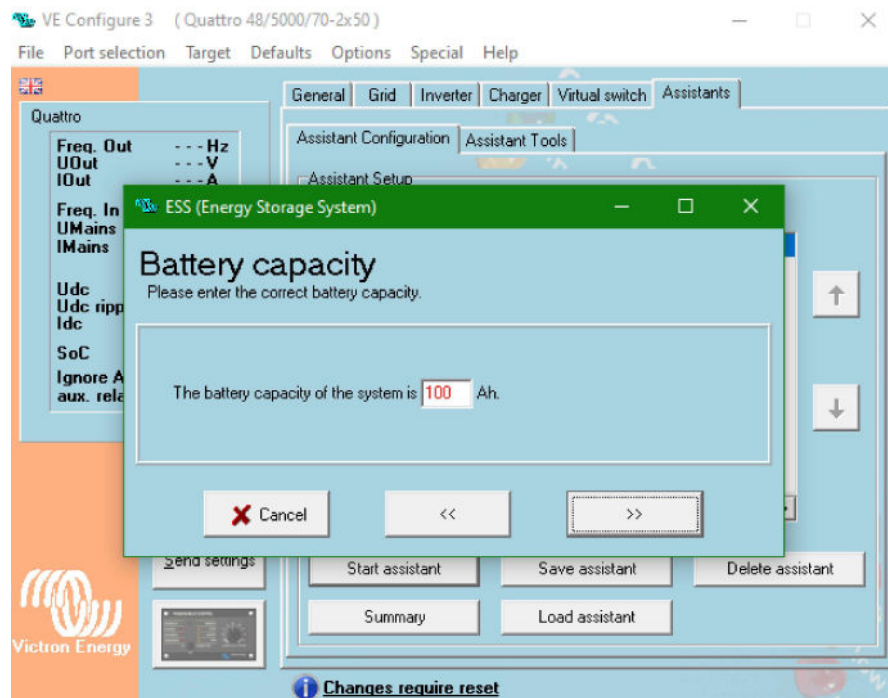
4.6 Assistant tab (b)



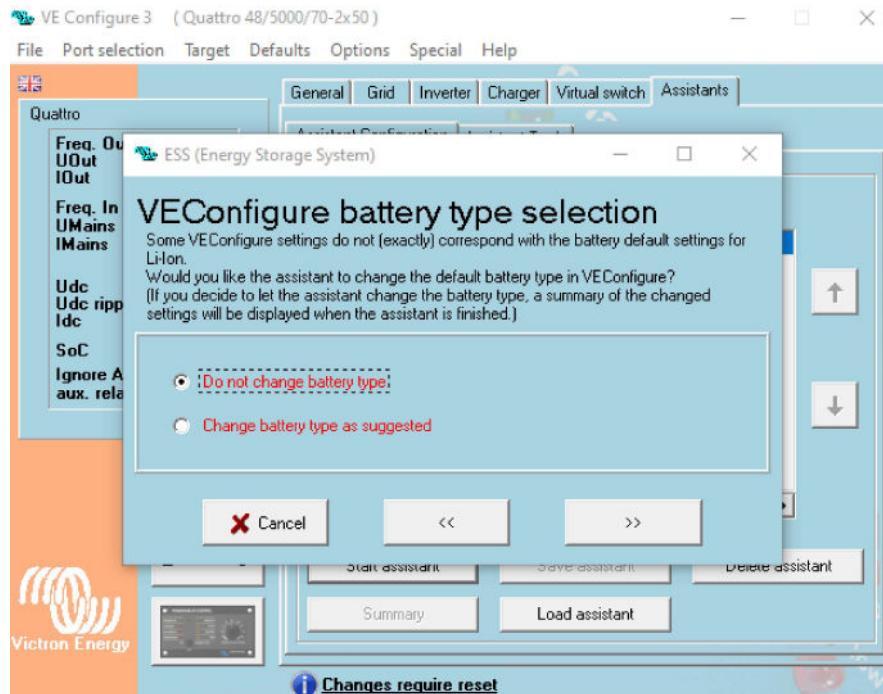
4.7 Assistant tab (c)



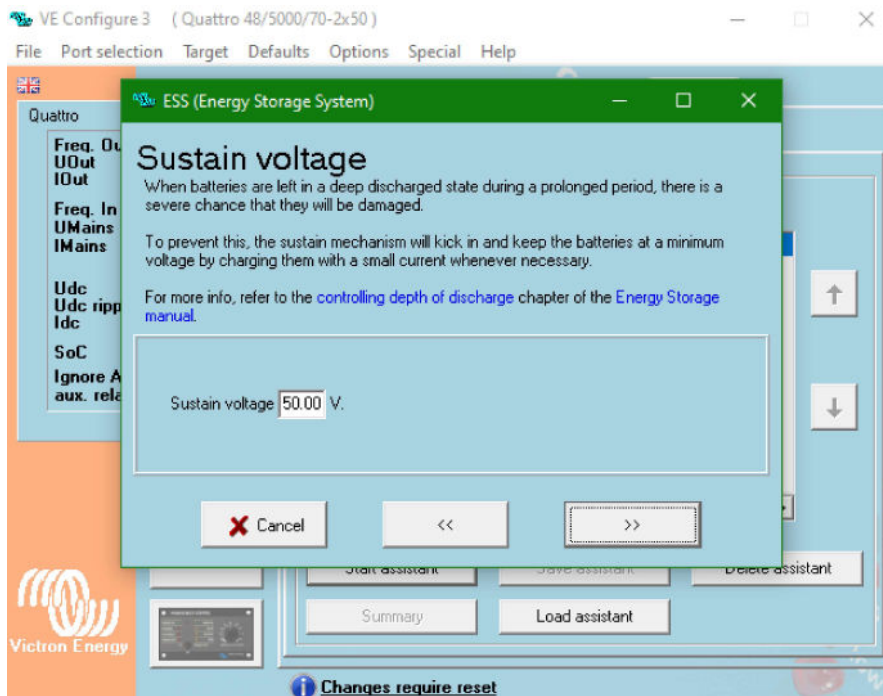
4.8 Assistant tab (d)



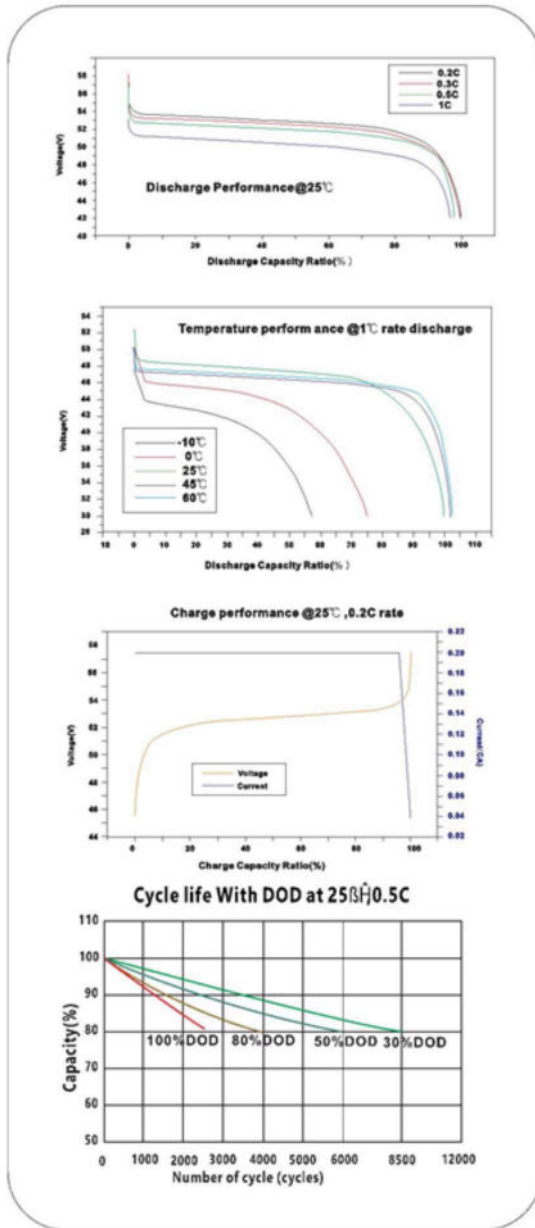
4.9 Assistant tab (e)



4.10 Assistant tab (f)



5 Other specifications



| ELECTRICAL SPECIFICATIONS | |
|----------------------------------|---------------|
| Nominal Voltage | 51.2V (16S) |
| Nominal Capacity | 100 AH |
| Energy | 5120 WH |
| Efficiency | 99% |
| Self Discharge | <1% per Month |
| DISCHARGE SPECIFICATIONS | |
| Max. Discharge current | 105A |
| Max. continues Discharge current | 90A |
| Recommend Discharge current | 90A |
| Voltage at end of Discharge | 47-48V |
| TEMPERATURE SPECIFICATIONS | |
| Discharge Temperature | (-20~60) |
| Charge Temperature | (0~45) |
| Storage Temperature | (-20~55) |

| MECHANICAL SPECIFICATIONS | |
|----------------------------|------------------|
| Dimensions (L x W x H) | 442*520*177MM |
| Weight | 45KG |
| Case Material | Steel |
| Cell Type | Prismatic |
| Chemistry | LiFePO4 |
| CHARGE SPECIFICATIONS | |
| Recommended Charge Current | 50A |
| Maximum Charge Current | 80A |
| Recommended Charge Voltage | 55V |
| COMPLIANCE SPECIFICATIONS | |
| Certifications | CE (battery) |
| | UN38.3 (battery) |
| | ROHS2.0 (cells) |
| Shipping Classification | UN 3480, CLASS 9 |

www.lithium-battery-factory.com

6 Revision history

| Version | Date | Editor | Changes |
|---------|----------|--------------|--|
| 1 | Nov 2021 | D. E. Cornew | - |
| 1.1 | Nov 2022 | D. E. Cornew | Updated Victron configuration settings. - MMPT tab added. |

Table 1: Version changes