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

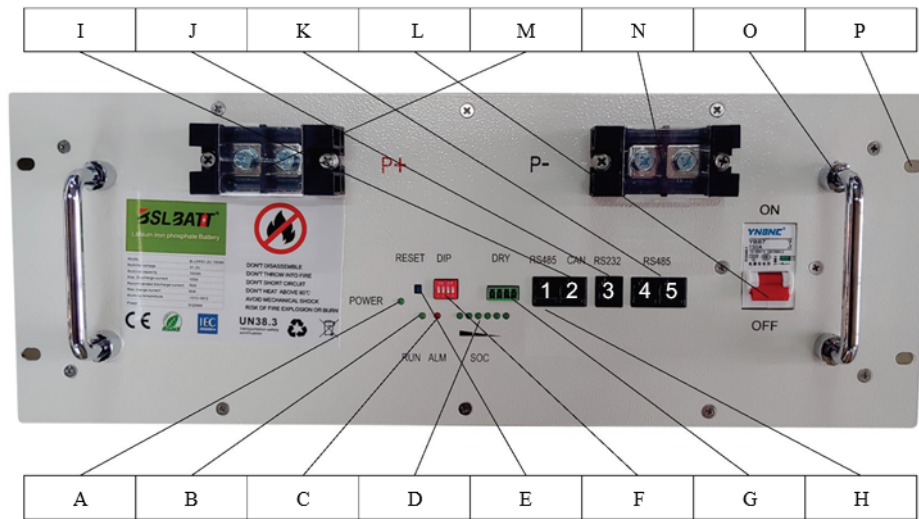

Figure 1: Pin-out diagram for 5.1kWh BSL battery.

  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 VE.Can 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.
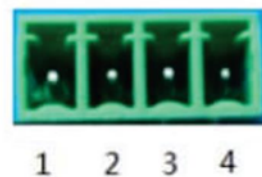
2.1.5 Other ports

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.
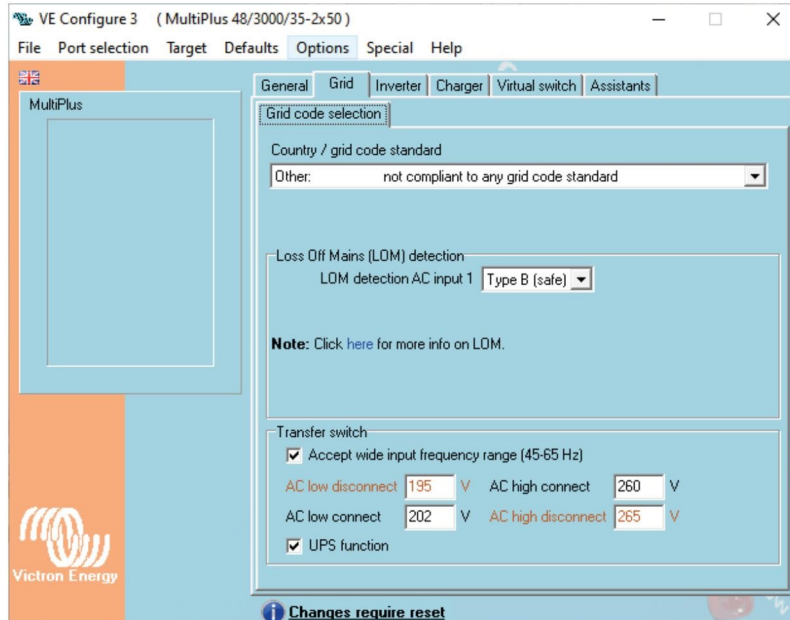   - Discharge Current Limit: 150A per battery.
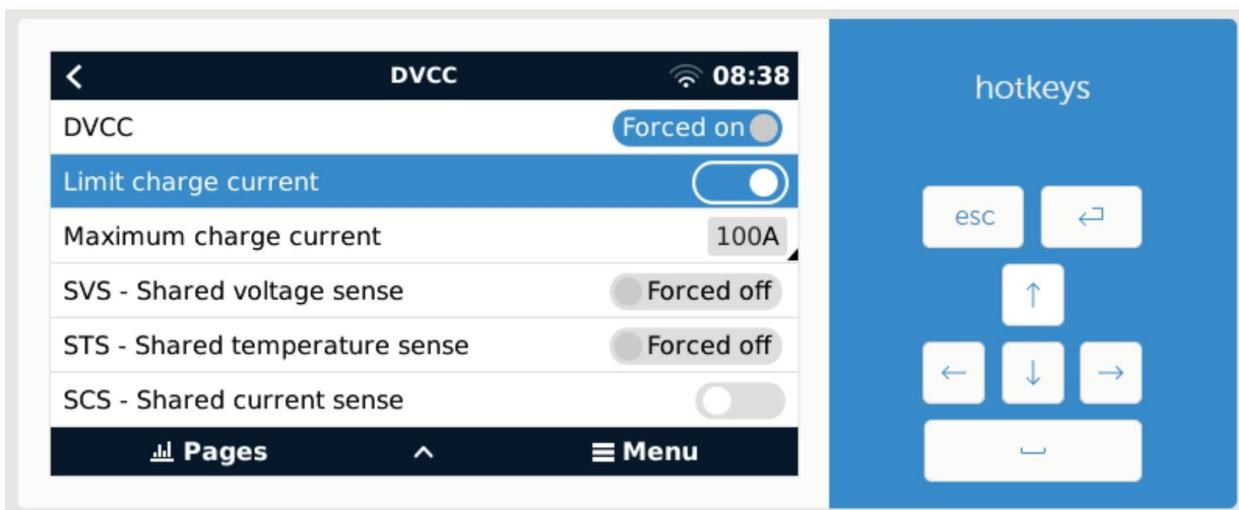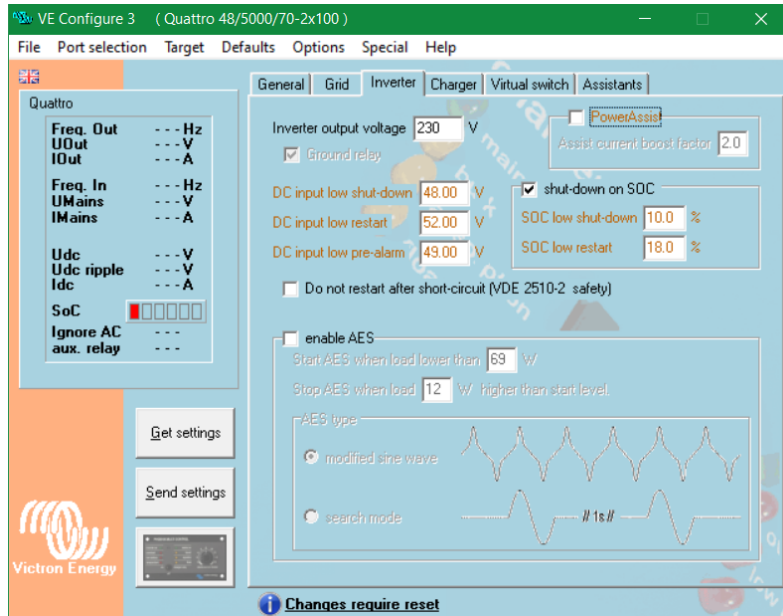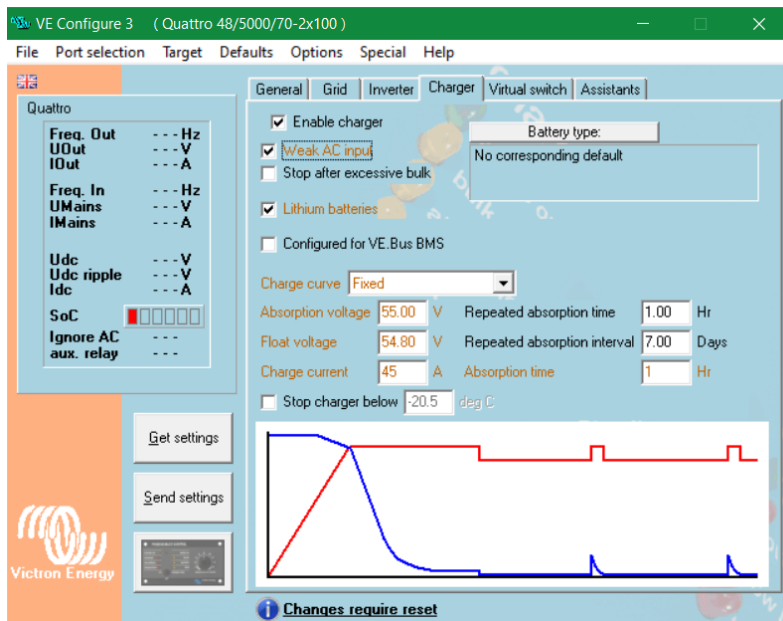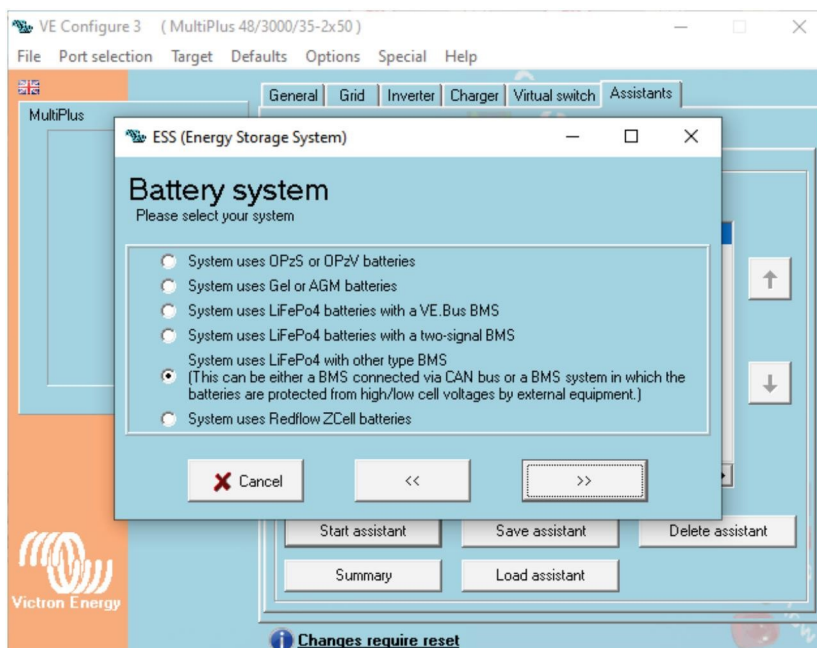
4 Inverter settings (Victron)

4.1 General Tab
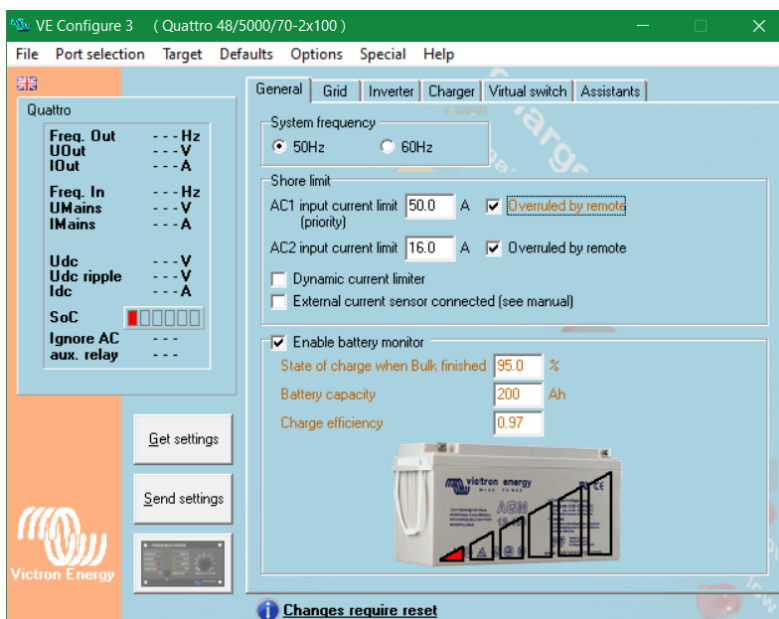
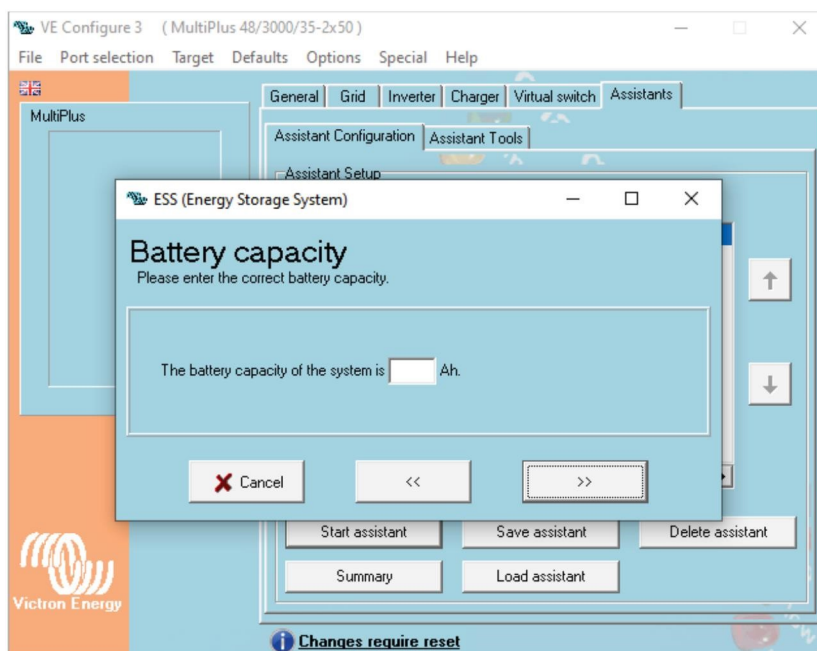
4.2 Grid Tab

4.3   Inverter Tab

4.4   Charger Tab

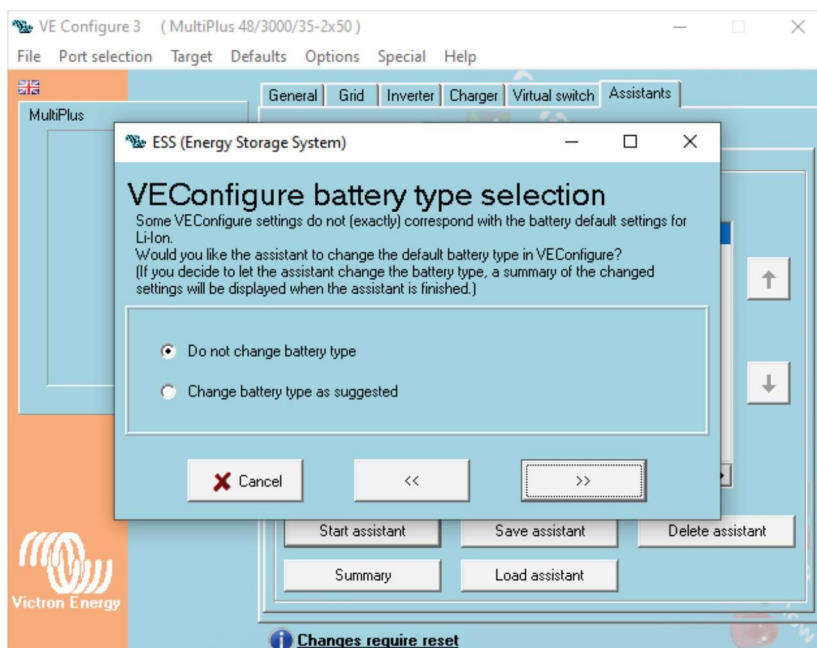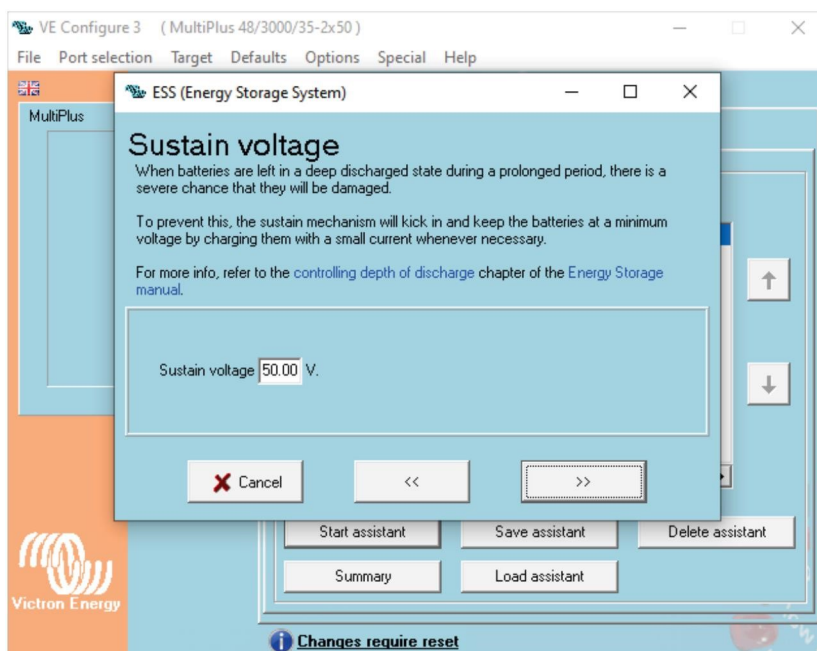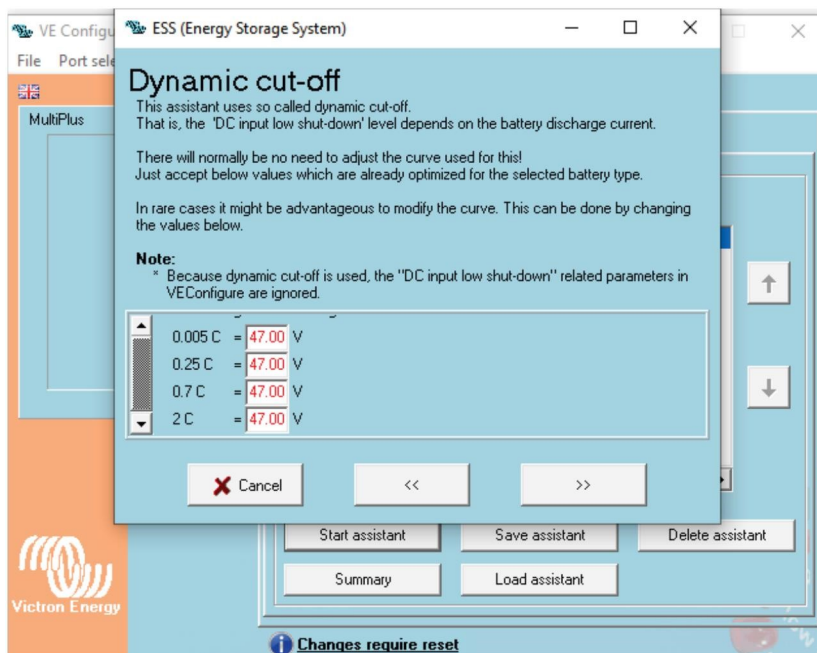## 4.5   Assistant tab (a)
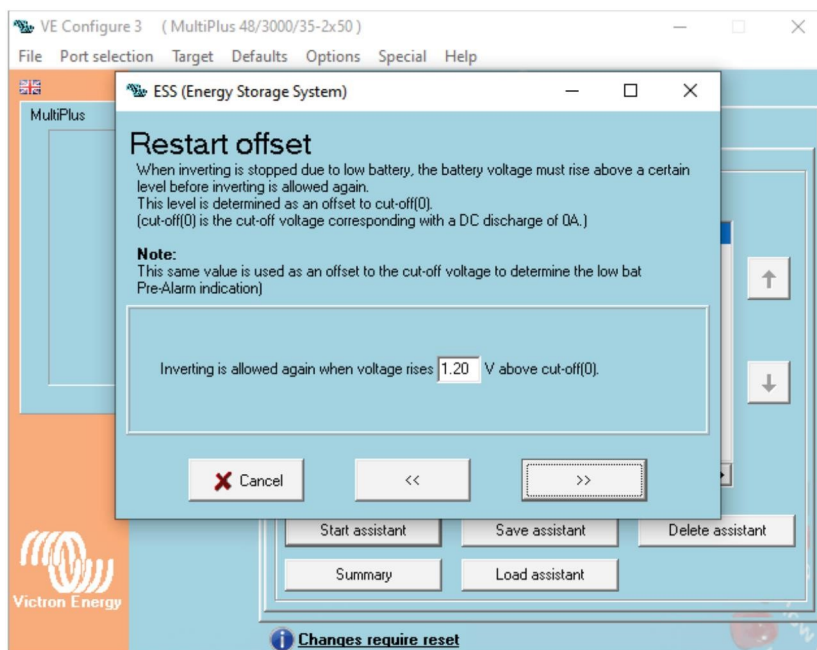

4.6   Assistant tab (b)
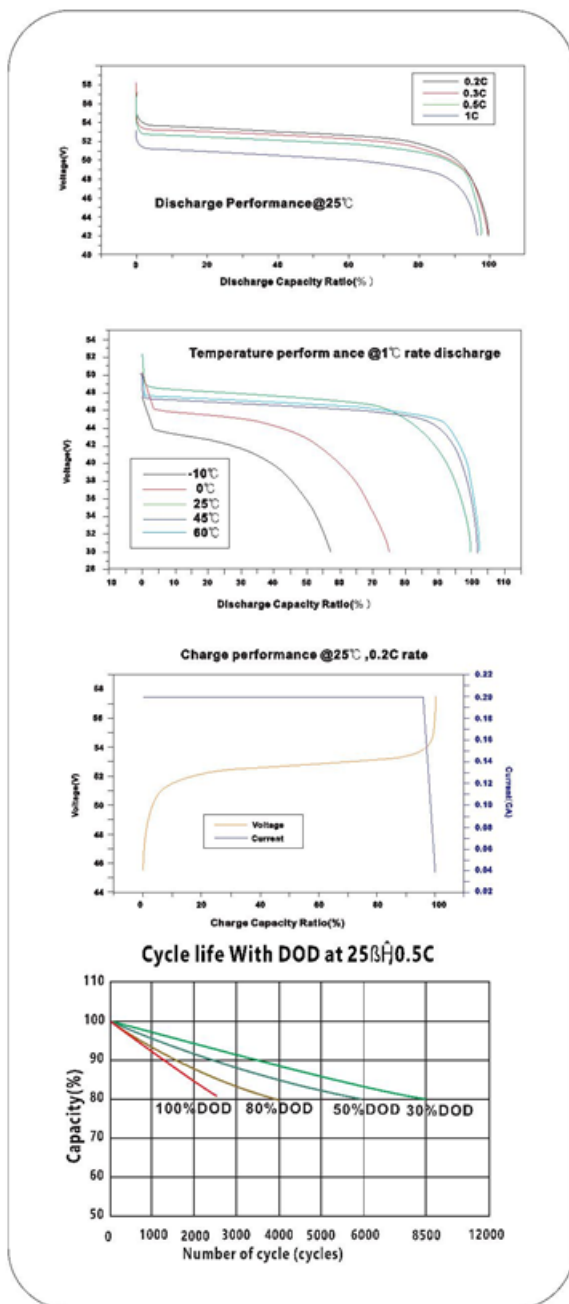
4.7   Assistant tab (c)

4.8   Assistant tab (d)

4.9   Assistant tab (e)

4.10   Assistant tab (f)

5   Other specifications

Discharge Performance@25℃

Temperature perform ance @1℃ rate discharge

Charge performance @25℃ ,0.2C rate

Cycle life With DOD at 25ß₣)0.5C

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
RecommendDischarge current	90A
Voltage at end ofDischarge	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

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