



Best Solution Lithium Battery

**BSLBATT & VICTRON
Installation Manual
10.2kw Power Wall
V1.3**



victron energy
BLUE POWER

SAFETY GUIDELINES

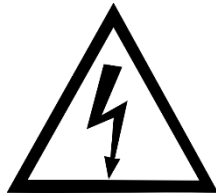


Work or maintenance on the BSLBatt should be carried out by qualified personal only.

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 cells, treat contents with care, do not allow contact with exposed skin or eyes. **DO NOT INGEST!**



The Terminals of the BSLBatt 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 a fire, a CO₂ 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.

Contents

| | |
|--|----|
| SAFETY GUIDELINES | i |
| Contents..... | ii |
| 1. Pin-out Diagram | 1 |
| 2. Battery Set-up..... | 3 |
| 2.1 General..... | 3 |
| 2.1.1 Turning battery on & Off..... | 3 |
| 2.1.2 CAN Communication | 3 |
| 2.1.3 Dry Contacts..... | 3 |
| 2.1.4 Other Ports..... | 3 |
| 2.2 Multiple Batteries | 4 |
| 2.2.1 Max Number of Parallel Batteries | 4 |
| 2.2.2 Installing Multiple Batteries..... | 4 |
| 2.2.3 Cable Sizing with Multiple Batteries..... | 4 |
| 2.2.4 Dip Switch Settings for Multiple Batteries (5.1 kWh, 6.4 kWh, 10.2kWh) | 4 |
| 2.2.5 Dip Switch Settings for Multiple Batteries (8.2 kWh, 15 kWh)..... | 5 |
| 3. Inverter Set-up..... | 6 |
| 3.1 Batteries Per Inverter Size..... | 6 |
| 3.1.1 5.1 kWh (100 Ah) | 6 |
| 3.1.2 6.4 kWh (125 Ah) | 6 |
| 3.1.3 7 kWh (135 Ah)..... | 6 |
| 3.1.4 8.2 kWh (160 Ah) | 6 |
| 3.1.5 8.8 kWh (172 Ah) | 7 |
| 3.1.6 10.2 kWh (200 Ah) | 7 |
| 3.1.7 15 kWh (300 Ah) | 7 |
| 3.2 Battery Set-up on Victron GX Device | 8 |
| 3.3 Battery Set-up on Victron MPPT Device | 9 |
| 4. Inverter Settings (Victron)..... | 10 |
| 4.1 General Tab | 10 |
| 4.2 Grid Tab..... | 11 |
| 4.3 Inverter Tab | 12 |
| 4.4 Charger Tab | 13 |
| 4.5 Assistant Tab (a)..... | 15 |
| 4.6 Assistant Tab (b)..... | 16 |
| 4.7 Assistant Tab (c) | 17 |
| 4.8 Assistant Tab (d)..... | 18 |
| 4.9 Assistant Tab (e)..... | 19 |
| 4.10 Assistant Tab (f)..... | 20 |
| 5. Revision History..... | 21 |

1. Pin-out Diagram

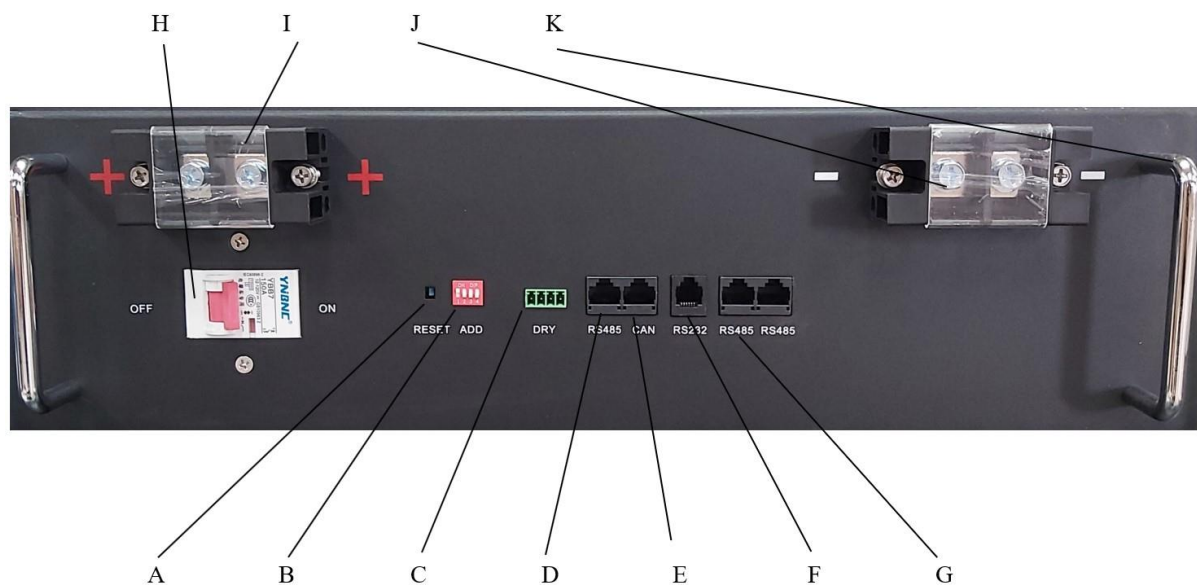
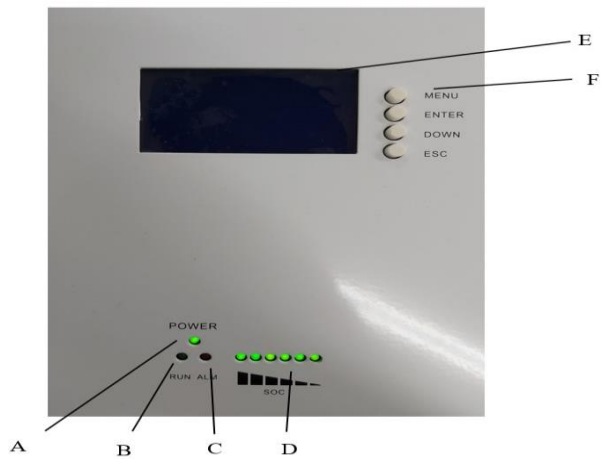


Figure 1: Pin-out diagram for 5.1kWh BSL Battery.

| | |
|---|--|
| A | Reset button (Hold for 5sec to reset) |
| B | DIP switches for parallel connection |
| C | Dry contacts |
| D | RS485 port (Port 1) |
| E | CAN port (port 2) |
| F | RS232 programming port (port 3) |
| G | RS485 right ports (ports 4&5) |
| H | Circuit Breaker (Terminal power connect/disconnect) |
| I | Positive terminal |
| J | Negative Terminal |
| K | Carry handles |



| | |
|---|---------------------------------|
| A | Power light |
| B | Run light |
| C | Alarm light |
| D | SOC indicator lights |
| E | Display screen |
| F | Push buttons to adjust settings |

2. Battery Set-up

2.1 General

2.1.1 Turning battery on & Off

The battery can be switched on or off by holding down the small recessed button marked "RESET" for around 3 seconds.

2.1.2 CAN Communication

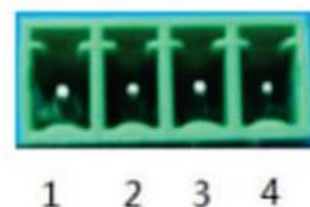
A VE.Can to CAN-bus BMS "Type B" cable is required for CAN-Bus communication between the BSL battery and the Victron GX device. Some inverters will use different cable configuration, please check this with inverter suppliers. (Black to inverter/GX device, red to battery).

| 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 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. |



2.1.4 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 30 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 - 35mm², 2 batteries - 50mm², 3 batteries 70mm² or 2 × 35mm², 4 batteries - 95mm² or 2 × 50mm²

2.2.4 Dip Switch Settings for Multiple Batteries (5.1 kWh, 6.4 kWh, 10.2kWh)

Table 1: Dip-switch set-up for multiple batteries

| Address | DIP Switch Position | | | | Notes |
|---------|---------------------|-----|-----|-----|-------------------|
| | #1 | #2 | #3 | #4 | |
| - | | | | | - |
| 1 | ON | OFF | OFF | OFF | Master Pack |
| 2 | OFF | ON | OFF | OFF | Auxiliary Pack 1 |
| 3 | ON | ON | OFF | OFF | Auxiliary Pack 2 |
| 4 | OFF | OFF | ON | OFF | Auxiliary Pack 3 |
| 5 | ON | OFF | ON | OFF | Auxiliary Pack 4 |
| 6 | OFF | ON | ON | OFF | Auxiliary Pack 5 |
| 7 | ON | ON | ON | OFF | Auxiliary Pack 6 |
| 8 | OFF | OFF | OFF | ON | Auxiliary Pack 7 |
| 9 | ON | OFF | OFF | ON | Auxiliary Pack 8 |
| 10 | OFF | ON | OFF | ON | Auxiliary Pack 9 |
| 11 | ON | ON | OFF | ON | Auxiliary Pack 10 |
| 12 | OFF | OFF | ON | ON | Auxiliary Pack 11 |
| 13 | ON | OFF | ON | ON | Auxiliary Pack 12 |
| 14 | OFF | ON | ON | ON | Auxiliary Pack 13 |
| 15 | ON | ON | ON | ON | Auxiliary Pack 14 |

2.2.5 Dip Switch Settings for Multiple Batteries (8.2 kWh, 15 kWh)

Table 2 Dip-switch set-up for multiple batteries

| Address | DIP Switch Position | | | | | | Notes |
|---------|---------------------|-----|-----|-----|-----|-----|-------------------|
| | #1 | #2 | #3 | #4 | #5 | #6 | |
| - | | | | | | | - |
| 1 | ON | OFF | OFF | OFF | OFF | OFF | Master Pack |
| 2 | OFF | ON | OFF | OFF | OFF | OFF | Auxiliary Pack 1 |
| 3 | ON | ON | OFF | OFF | OFF | OFF | Auxiliary Pack 2 |
| 4 | OFF | OFF | ON | OFF | OFF | OFF | Auxiliary Pack 3 |
| 5 | ON | OFF | ON | OFF | OFF | OFF | Auxiliary Pack 4 |
| 6 | OFF | ON | ON | OFF | OFF | OFF | Auxiliary Pack 5 |
| 7 | ON | ON | ON | OFF | OFF | OFF | Auxiliary Pack 6 |
| 8 | OFF | OFF | OFF | ON | OFF | OFF | Auxiliary Pack 7 |
| 9 | ON | OFF | OFF | ON | OFF | OFF | Auxiliary Pack 8 |
| 10 | OFF | ON | OFF | ON | OFF | OFF | Auxiliary Pack 9 |
| 11 | ON | ON | OFF | ON | OFF | OFF | Auxiliary Pack 10 |
| 12 | OFF | OFF | ON | ON | OFF | OFF | Auxiliary Pack 11 |
| 13 | ON | OFF | ON | ON | OFF | OFF | Auxiliary Pack 12 |
| 14 | OFF | ON | ON | ON | OFF | OFF | Auxiliary Pack 13 |
| 15 | ON | ON | ON | ON | OFF | OFF | Auxiliary Pack 14 |
| 16 | OFF | OFF | OFF | OFF | ON | OFF | Auxiliary Pack 15 |
| 17 | ON | OFF | OFF | OFF | ON | OFF | Auxiliary Pack 16 |
| 18 | OFF | ON | OFF | OFF | ON | OFF | Auxiliary Pack 17 |
| 19 | ON | ON | OFF | OFF | ON | OFF | Auxiliary Pack 18 |
| 20 | OFF | OFF | ON | OFF | ON | OFF | Auxiliary Pack 19 |
| 21 | ON | OFF | ON | OFF | ON | OFF | Auxiliary Pack 20 |
| 22 | OFF | ON | ON | OFF | ON | OFF | Auxiliary Pack 21 |
| 23 | ON | ON | ON | OFF | ON | OFF | Auxiliary Pack 22 |
| 24 | OFF | OFF | OFF | ON | ON | OFF | Auxiliary Pack 23 |
| 25 | ON | OFF | OFF | ON | ON | OFF | Auxiliary Pack 24 |
| 26 | OFF | ON | OFF | ON | ON | OFF | Auxiliary Pack 25 |
| 27 | ON | ON | OFF | ON | ON | OFF | Auxiliary Pack 26 |
| 28 | OFF | OFF | ON | ON | ON | OFF | Auxiliary Pack 27 |
| 29 | ON | OFF | ON | ON | ON | OFF | Auxiliary Pack 28 |
| 30 | OFF | ON | ON | ON | ON | OFF | Auxiliary Pack 29 |

3. Inverter Set-up

3.1 Batteries Per Inverter Size

3.1.1 5.1 kWh (100 Ah)

| Inverter Size | Recommended Batteries | Minimum Batteries |
|---------------|-----------------------|-------------------|
| 15 kVA | 4 | 3 |
| 10 kVA | 3 | 2 |
| 8 kVA | 2 | 2 |
| 5 kVA | 2 | 1 |
| 3 kVA | 1 | 1 |

3.1.2 6.4 kWh (125 Ah)

| Inverter Size | Recommended Batteries | Minimum Batteries |
|---------------|-----------------------|-------------------|
| 15 kVA | 4 | 3 |
| 10 kVA | 3 | 2 |
| 8 kVA | 2 | 2 |
| 5 kVA | 2 | 1 |
| 3 kVA | 1 | 1 |

3.1.3 7 kWh (135 Ah)

| Inverter Size | Recommended Batteries | Minimum Batteries |
|---------------|-----------------------|-------------------|
| 15 kVA | 4 | 3 |
| 10 kVA | 3 | 2 |
| 8 kVA | 2 | 2 |
| 5 kVA | 2 | 1 |
| 3 kVA | 1 | 1 |

3.1.4 8.2 kWh (160 Ah)

| Inverter Size | Recommended Batteries | Minimum Batteries |
|---------------|-----------------------|-------------------|
| 15 kVA | 3 | 2 |
| 10 kVA | 2 | 2 |
| 8 kVA | 2 | 1 |
| 5 kVA | 1 | 1 |
| 3 kVA | 1 | 1 |

3.1.5 8.8 kWh (172 Ah)

| Inverter Size | Recommended Batteries | Minimum Batteries |
|---------------|-----------------------|-------------------|
| 15 kVA | 3 | 2 |
| 10 kVA | 2 | 2 |
| 8 kVA | 2 | 1 |
| 5 kVA | 1 | 1 |
| 3 kVA | 1 | 1 |

3.1.6 10.2 kWh (200 Ah)

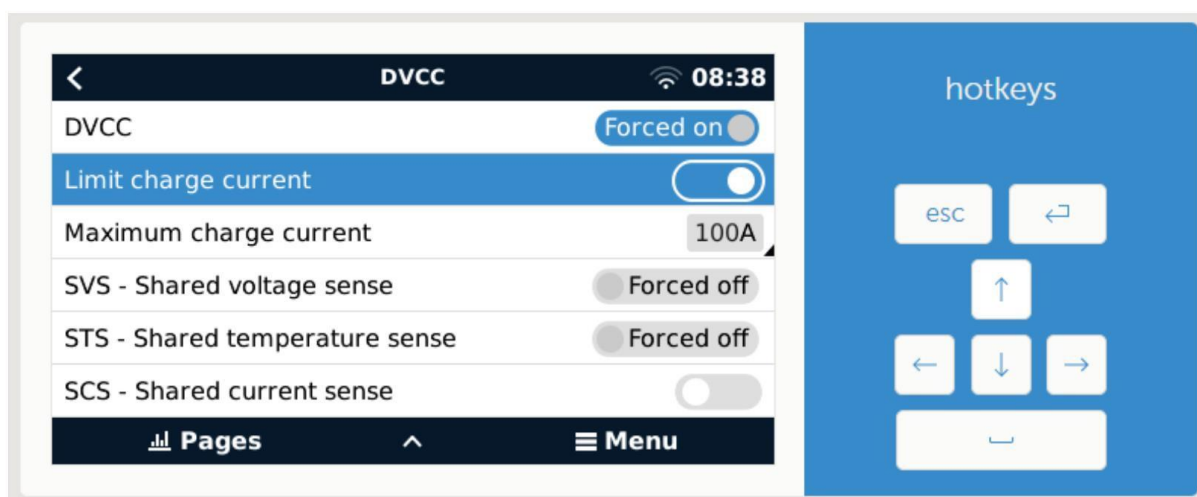
| Inverter Size | Recommended Batteries | Minimum Batteries |
|---------------|-----------------------|-------------------|
| 15 kVA | 4 | 3 |
| 10 kVA | 3 | 2 |
| 8 kVA | 2 | 2 |
| 5 kVA | 2 | 1 |
| 3 kVA | 1 | 1 |

3.1.7 15 kWh (300 Ah)

| Inverter Size | Recommended Batteries | Minimum Batteries |
|---------------|-----------------------|-------------------|
| 15 kVA | 2 | 2 |
| 10 kVA | 2 | 1 |
| 8 kVA | 1 | 1 |
| 5 kVA | 1 | 1 |
| 3 kVA | 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% of battery capacity.
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: 100A per battery. (Recommended 80Ah)
 - Discharge Current Limit: 150A per battery. (Constant 125Ah)



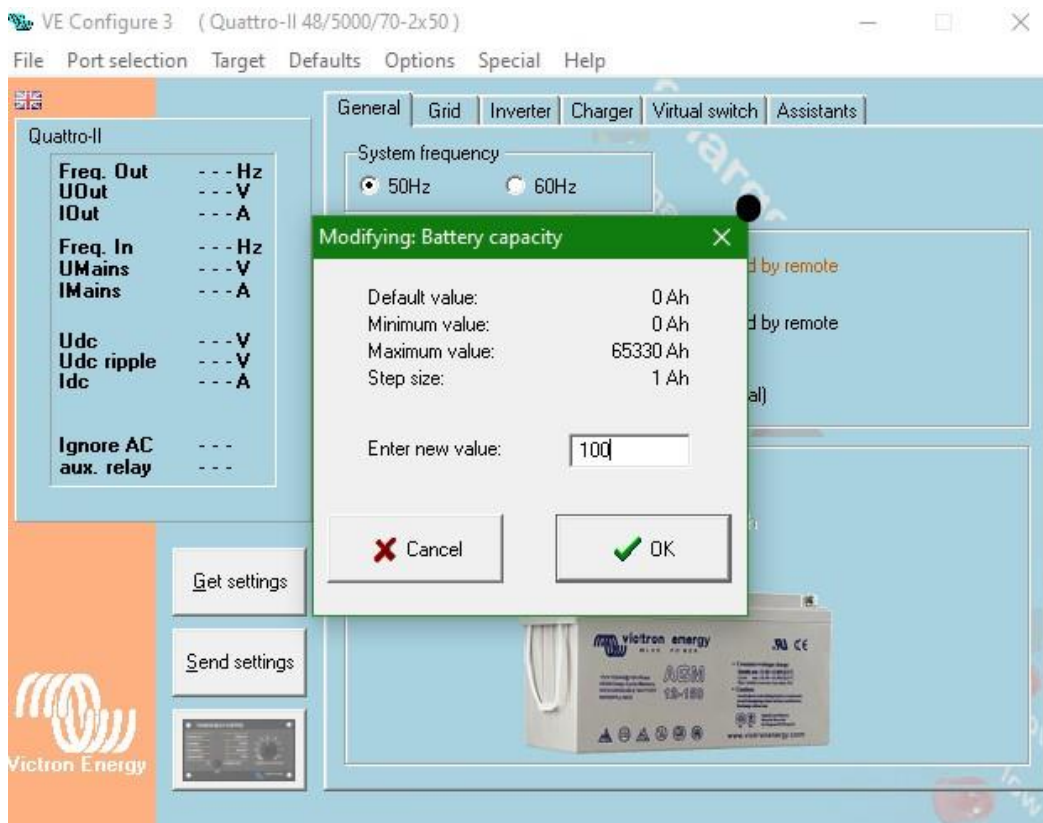
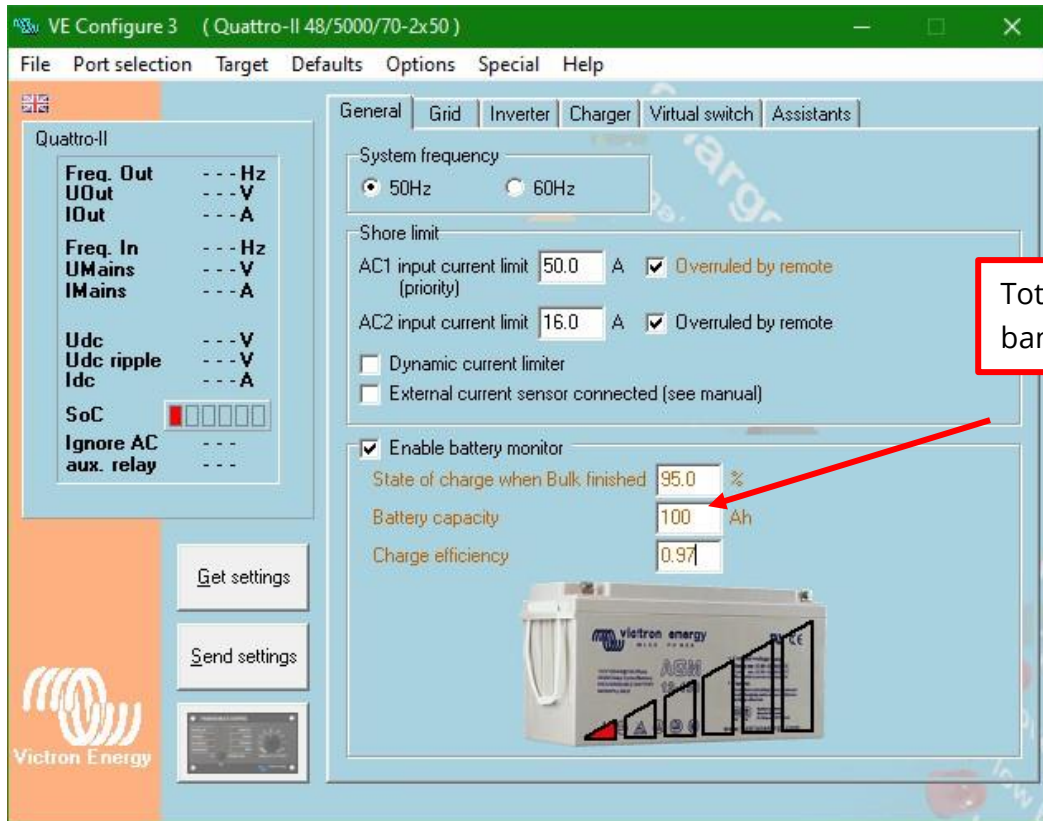
3.3 Battery Set-up on Victron MPPT Device

The screenshot displays the 'Settings' menu of a Victron MPPT device. At the top, there is a status bar with icons for VoWiFi, 4G, signal strength, Wi-Fi, and battery level (75%), along with the time 12:23. Below the status bar is a blue header with a back arrow and the word 'Settings'. The main menu consists of several rows, each representing a different setting:

- Battery voltage:** Set to 48V (dropdown menu).
- Max charge current:** Set to 100A.
- Charger enabled:** A blue toggle switch is turned on.
- Battery preset:** Set to 'User defined' (dropdown menu).
- Expert mode:** A grey toggle switch is turned off.
- BMS controlled:** Set to 'Yes' with a right-pointing arrow.
- Charge voltages:** A section header for the following three items:
 - Absorption voltage:** 55.00V (checked with a green checkmark).
 - Float voltage:** 54.80V (checked with a green checkmark).
 - Equalization voltage:** 54.00V.
- Equalization:** A section header for the following two items:
 - Automatic equalization:** Disabled.
 - Manual equalization:** A blue button labeled 'START NOW' is visible.
- Voltage compensation:** A section header for the following item:
 - Temperature compensation:** Disabled.
- Battery limits:** A section header for the following item:
 - Low temperature cut-off:** 2°C (checked with a green checkmark).

4. Inverter Settings (Victron)

4.1 General Tab



4.2 Grid Tab

The screenshot shows the 'VE Configure 3' software window for a 'Quattro-II 48/5000/70-2x50' inverter. The 'Grid' tab is selected, showing various configuration options.

Quattro-II Status Panel:

- Freq. Out: --- Hz
- UOut: --- V
- IOut: --- A
- Freq. In: --- Hz
- UMains: --- V
- IMains: --- A
- Udc: --- V
- Udc ripple: --- V
- Idc: --- A
- SoC: [Progress bar]
- Ignore AC aux. relay: ---

Grid Tab Settings:

- Grid code selection:** Country / grid code standard dropdown menu set to 'Other: not compliant to any grid code standard'. A button 'Show IP (NS) protection log' is present.
- AC input related settings:**
 - AC input 1: Above selected gridcode plus LOM B (safe)
 - AC input 2: Above selected gridcode plus LOM B (safe)
- Note:** Click [here](#) for more info on LOM.
- Transfer switch:**
 - Accept wide input frequency range (45-65 Hz)
 - AC low disconnect: 205 V
 - AC high connect: 253 V
 - AC low connect: 212 V
 - AC high disconnect: 258 V
 - UPS function

Buttons: Get settings, Send settings.

Footer: Changes require reset

4.3 Inverter Tab

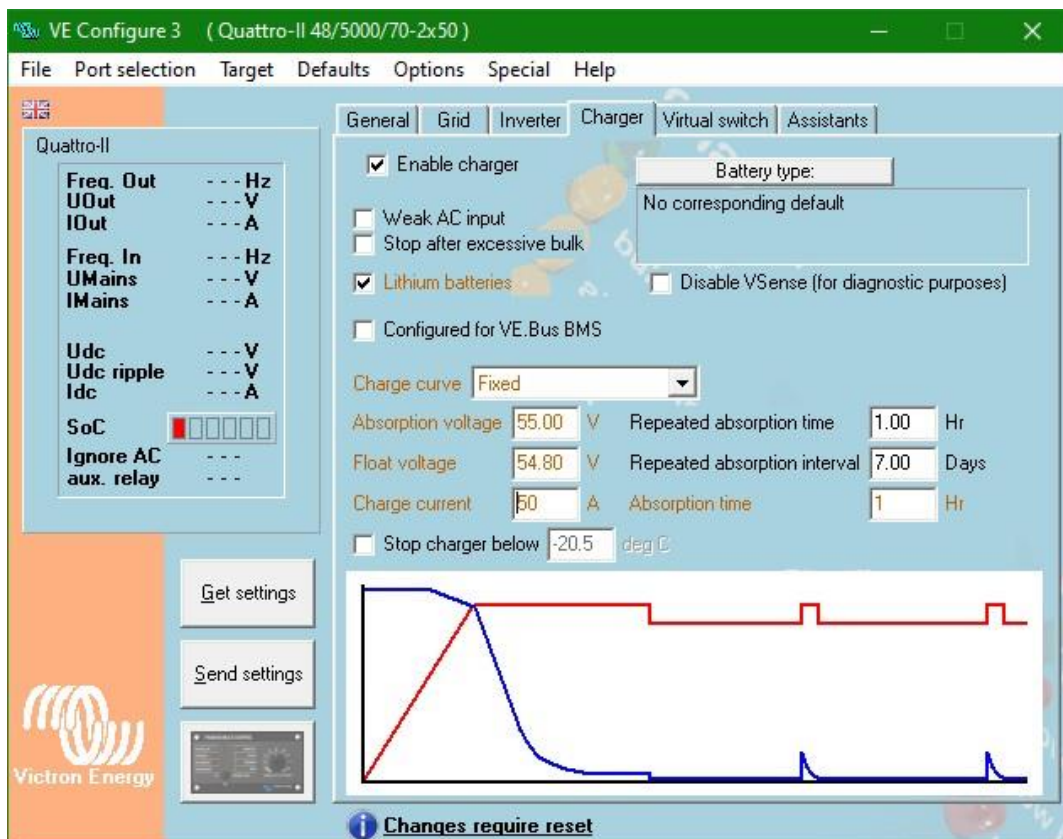
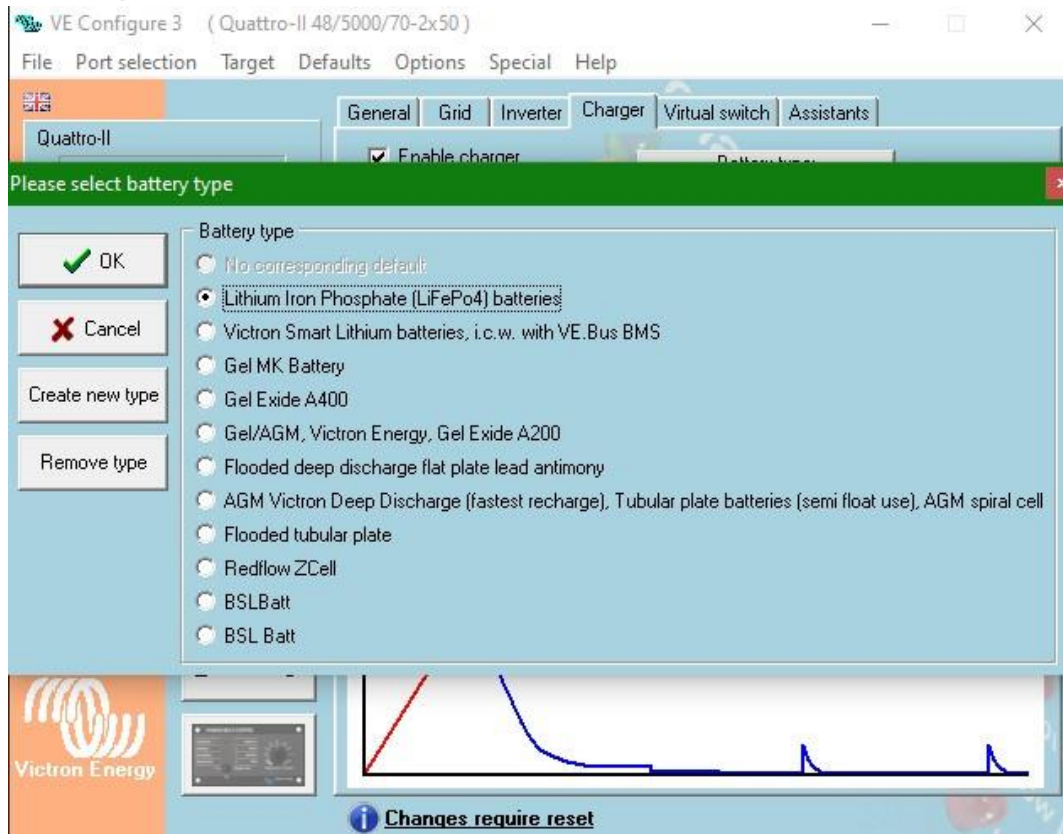
The screenshot shows the 'VE Configure 3' software window for a 'Quattro-II 48/5000/70-2x50' inverter. The 'Inverter' tab is selected, showing the following settings:

- General:**
 - Inverter output voltage: 230 V
 - Ground relay
 - DC input low shut-down: 48.00 V
 - DC input low restart: 52.50 V
 - DC input low pre-alarm: 51.00 V
 - Do not restart after short-circuit (VDE 2510-2 safety)
- Assistants:**
 - PowerAssist
 - Assist current boost factor: 2.0
 - shut-down on SOC
 - SOC low shut-down: 0.0 %
 - SOC low restart: 0.0 %
- enable AES:**
 - enable AES
 - Start AES when load lower than: 92 W
 - Stop AES when load: 46 W higher than start level.
 - AES type:
 - modified sine wave
 - search mode

The sidebar on the left shows status indicators for Freq. Out, UOut, IOut, Freq. In, UMains, IMains, Udc, Udc ripple, Idc, SoC, Ignore AC, and aux. relay. The bottom status bar indicates 'Changes require reset'.

Take Note: Shutdown on SOC optional but recommended to untick, inverter will use battery Voltage instead.

4.4 Charger Tab





4.5 Assistant Tab (a)

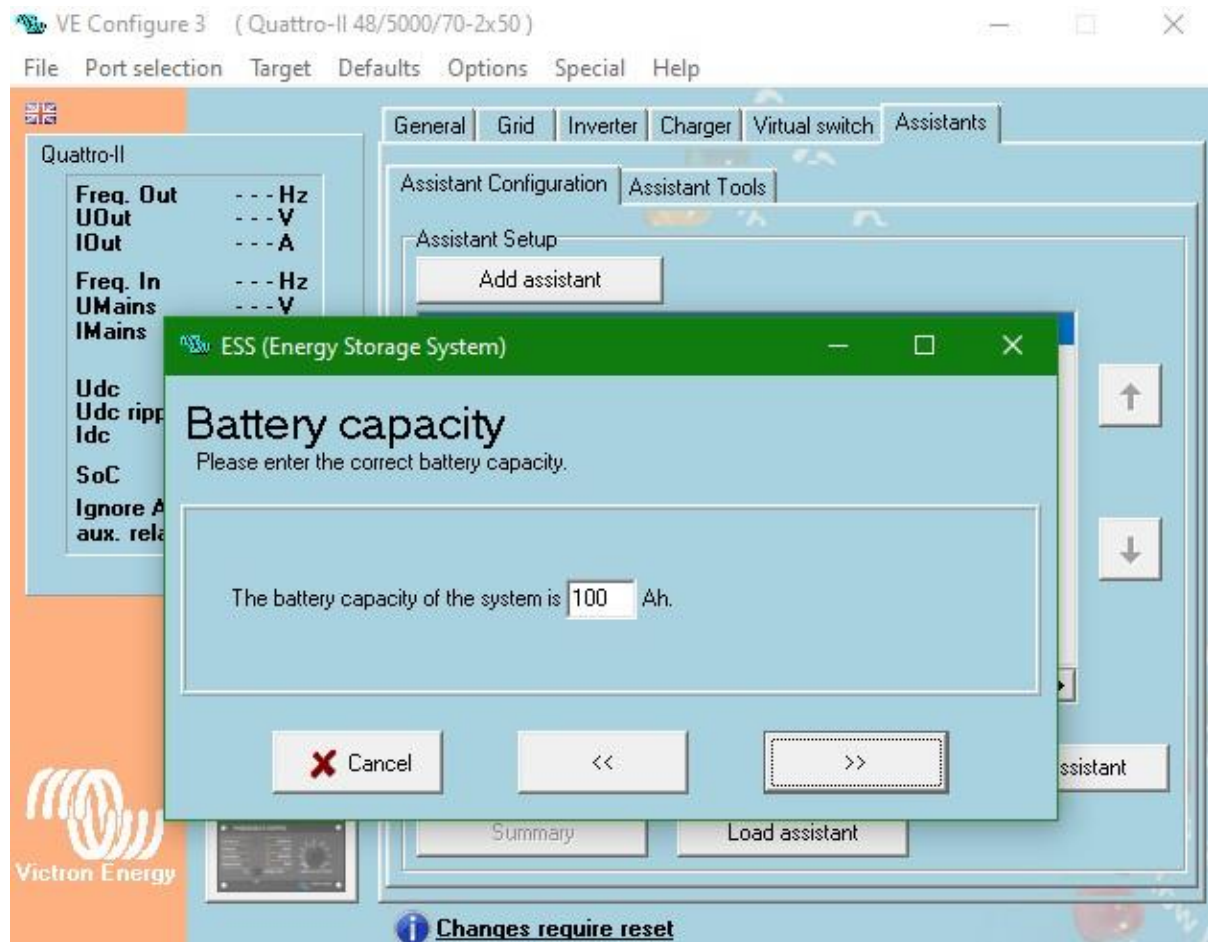
The screenshot displays the 'VE Configure 3' software window for a Quattro-II 48/5000/70-2x50. The interface is divided into several sections:

- Left Panel (Quattro-II):** Contains various status indicators and settings:
 - Freq. Out: --- Hz
 - UOut: --- V
 - IDout: --- A
 - Freq. In: --- Hz
 - UMains: --- V
 - IMains: --- A
 - Udc: --- V
 - Udc ripple: --- V
 - Idc: --- A
 - SoC: A progress bar with 5 segments, the first is red.
 - Ignore AC aux. relay: ---
- Bottom Left:** Features the Victron Energy logo and two buttons: 'Get settings' and 'Send settings'.
- Top Menu:** Includes 'File', 'Port selection', 'Target', 'Defaults', 'Options', 'Special', and 'Help'.
- Assistant Configuration Tab:** The active tab, containing:
 - 'Assistant Setup' section with an 'Add assistant' button.
 - A list box containing 'ESS (Energy Storage System)'.
 - Navigation arrows (up and down) on the right side of the list box.
 - 'Used assistants: (approx. 57 bytes used)' text below the list box.
 - Buttons for 'Start assistant', 'Save assistant', 'Delete assistant', 'Summary', and 'Load assistant'.
- Bottom Status Bar:** Displays an information icon and the text 'Changes require reset'.

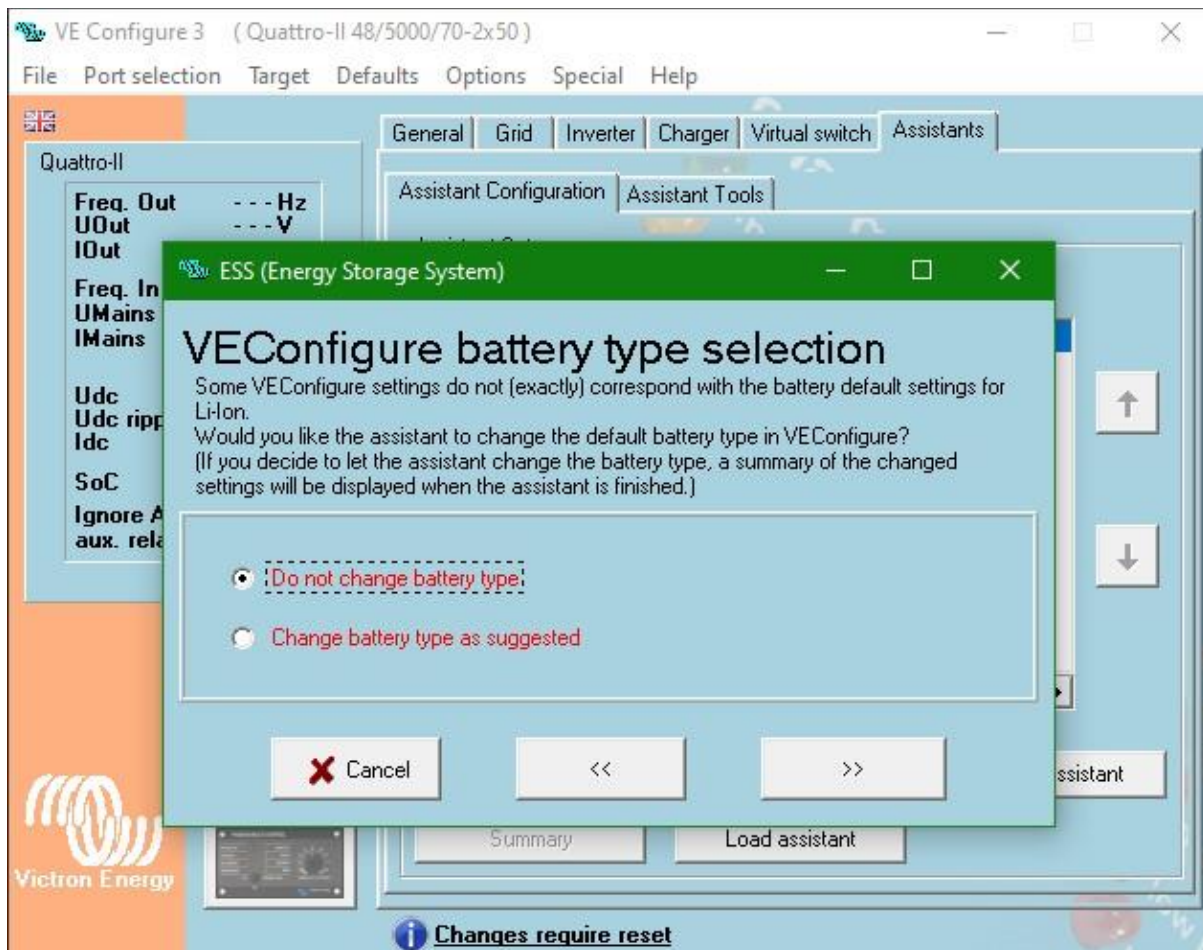
4.6 Assistant Tab (b)



4.7 Assistant Tab (c)



4.8 Assistant Tab (d)



4.9 Assistant Tab (e)

VE Configure 3 (Quattro-II 48/5000/70-2x50)

File Port sel ESS (Energy Storage System)

Dynamic cut-off

This assistant uses so called dynamic cut-off.
That is, the 'DC input low shut-down' level depends on the battery discharge current.

There will normally be no need to adjust the curve used for this!
Just accept below values which are already optimized for the selected battery type.

In rare cases it might be advantageous to modify the curve. This can be done by changing the values below.

Note:
* Because dynamic cut-off is used, the "DC input low shut-down" related parameters in VEConfigure are ignored.

Cut off voltage for a discharge current of:

| | | | |
|---------|---|-------|---|
| 0.005 C | = | 47.00 | V |
| 0.25 C | = | 47.00 | V |
| 0.7 C | = | 47.00 | V |
| 2 C | = | 47.00 | V |

Cancel << >>

Summary Load assistant

Changes require reset

4.10 Assistant Tab (f)

The screenshot shows the VE Configure 3 software interface for a Quattro-II 48/5000/70-2x50. The 'Assistants' tab is active, and the 'ESS (Energy Storage System)' window is open. The 'Restart offset' parameter is being configured. The text in the window reads:

Restart offset
When inverting is stopped due to low battery, the battery voltage must rise above a certain level before inverting is allowed again.
This level is determined as an offset to cut-off(0).
(cut-off(0) is the cut-off voltage corresponding with a DC discharge of 0A.)

Note:
This same value is used as an offset to the cut-off voltage to determine the low bat Pre-Alarm indication)

Inverting is allowed again when voltage rises V above cut-off(0).

Buttons: Cancel, <<, >>

Buttons: Summary, Load assistant

Bottom status bar: Changes require reset

5. Revision History

| Version | Date | Editor | Changes |
|---------|----------|-----------------------------|---|
| 1 | Nov 2021 | D. E. Cornew | - |
| 1.1 | Feb 2022 | P. J. Andrew | - Address 0 column removed from Dip switch settings for multiple batteries (Tables 1 and 2) - Formatting |
| 1.2 | Nov 2022 | P.J. Andrew D. E. Cornew | - Update on BSLBatt Branding. - Formatting. - Update VE.Configure Inverter Tab. (4.3) - Update VE.Configure Charger Tab. (4.4) - Updated to include 300Ah |
| 1.3 | Jun 2023 | P.J. Andrew, N. Jones | - Format overhaul - Readded Images. - Removed 4.11 & 4.12 |