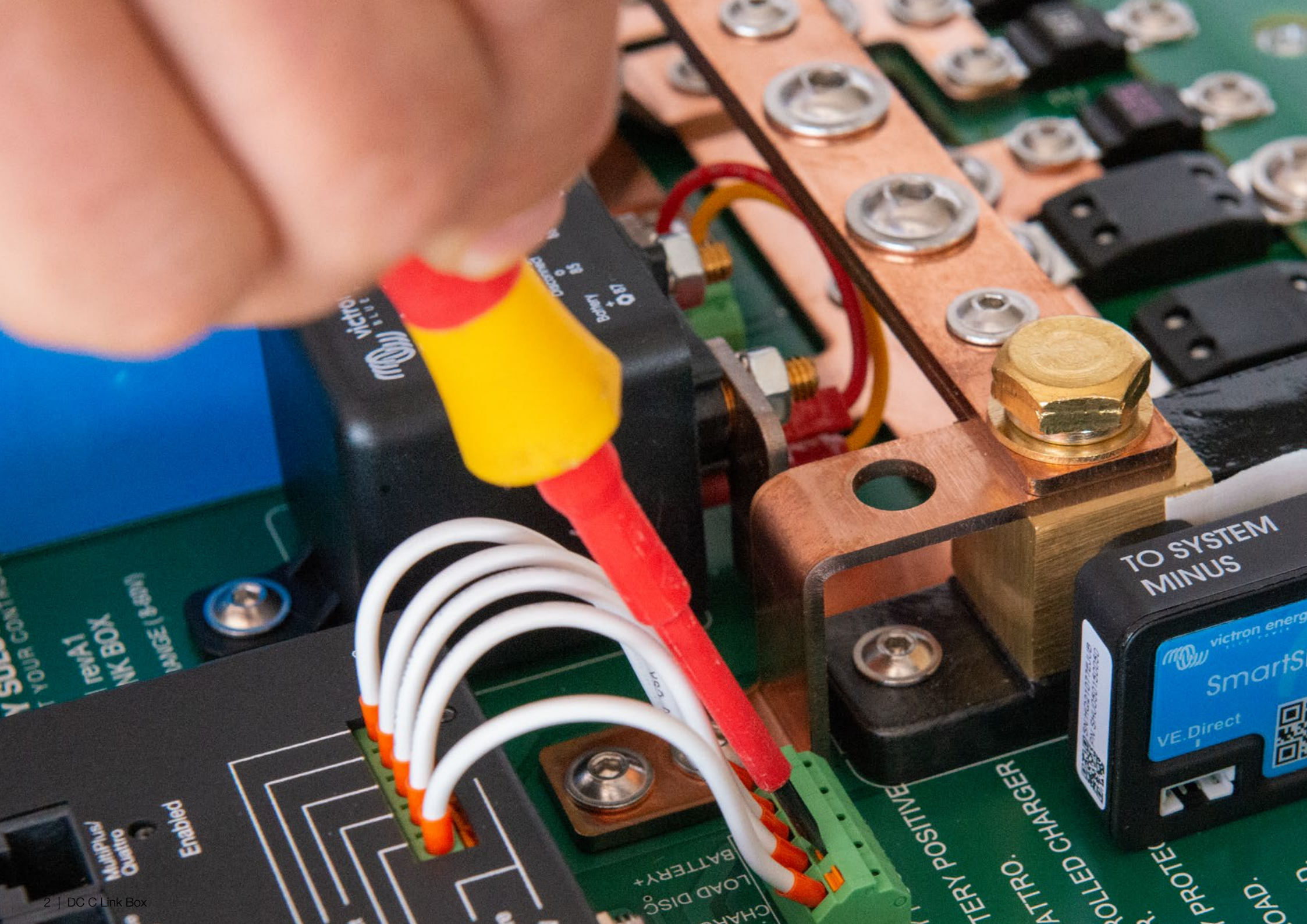
Smart Lithium DC Link Box

for Victron Smart Batteries

ENERGY SOLUTIONS


TO SYSTEM
MINUS
victron energ
SmartS
VE.Direct
Enabled
MultiPlus
Quattro
BATTERY+
LOAD DISC
BATTERY POSITIVE
ATTRO.
ROLLED CHARGER
PROTEC
AD.

The Victron Smart Lithium batteries are an incredibly popular solution for Boats, specialist vehicles, off grid, and industrial applications. The BMS (battery management system) provides a pre-alarm on low battery state which allows you to create an alarm or automate recharging of the battery.

The fact that you have separate charge and discharge isolators means you don't lose power to your loads in the event of a charging issue or equally keep your ability to charge when the loads are disconnected due to low battery.

Because the protection devices are separate you can choose variants that have the capacity for your application – this allows you to use the battery at high charge and discharge rates that most 'all in one' batteries can't match. And finally, any complications of an inverter charger attached to the system (Multi or Quattro) are overcome. Inverter Chargers are a problem because they can be a load or a charging source – so should you wire it to the load or discharge protection contactor? The Victron BMS has a data connection to the Multi or Quattro and takes care of controlling it directly – so no need to wire it through either contactor.

So – why do I need a DC link box?

We have developed this DC link box to address some of the challenges in putting together a complete Victron Smart system:

- Fuses for high power equipment – The Quattro, charging sources, supplies to distribution boards etc all need cable protection. We have built all of that into the box so you don't need to assemble fuse banks together.

- Battery Monitor - The Victron Smart Lithium battery does not calculate state of charge – so you need a battery monitor. We have link box versions with a BMV (has it's own display) or Smart Shunt (phone app or viewed via a GX device. Both options are pre-wired

- Negative Bus bar – The negative bus bar is built into the DC link making wiring a breeze.

- BMS – The BMS is pre-installed and pre-wired (including fused power supply)
- Load disconnector – We fit and pre-wire a 220 amp Smart Battery Protect to use as a load protection contactor. This is pre-configured and can also double as a manual, remotely operated, battery isolator switch. It is all pre-wired – just connect your remote switch to the marked control terminals.

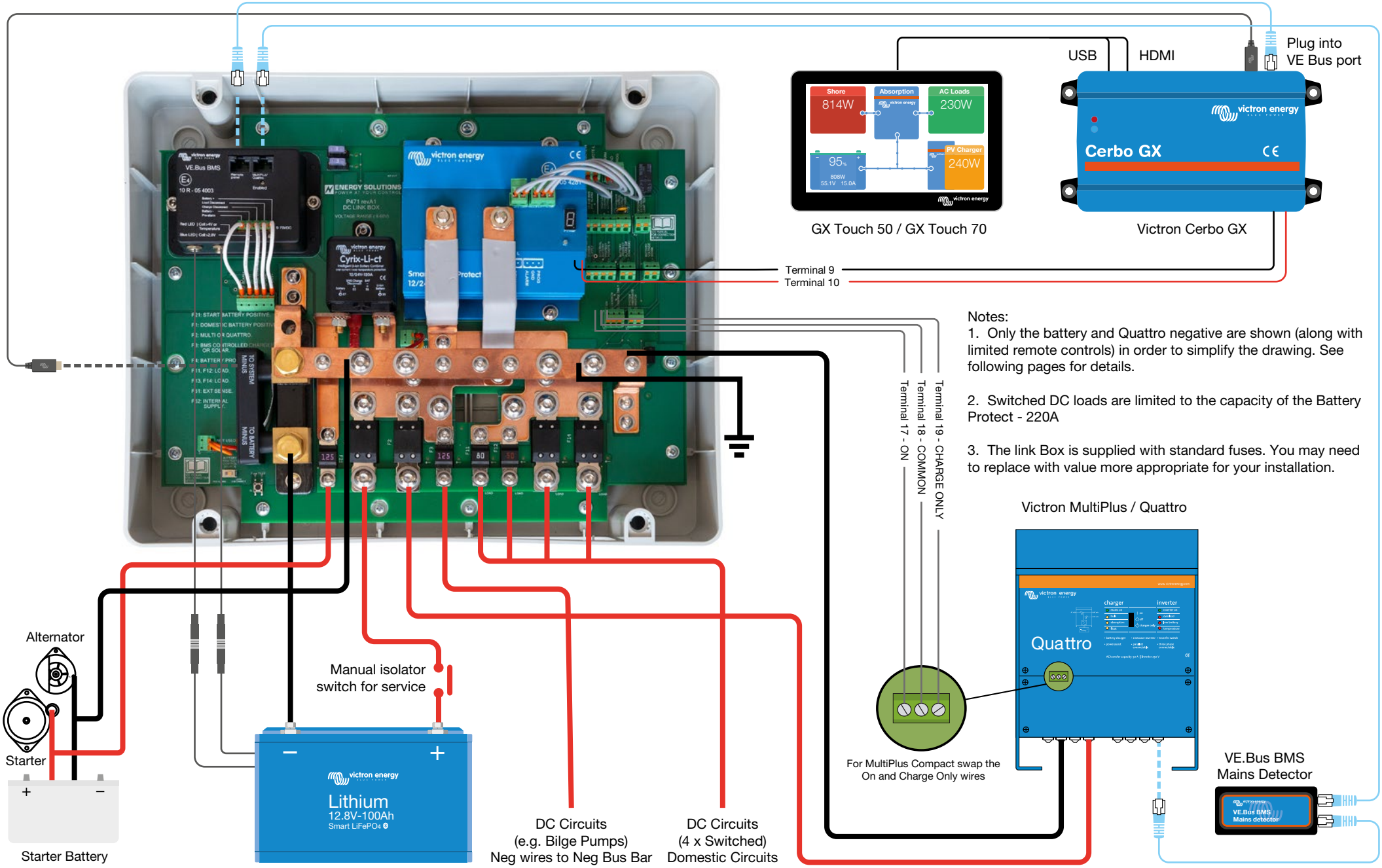
- Cross Charging from a starter battery – We have a Cyrix Li CT split charge contactor pre-installed and wired to the BMS. This allows the automatic cross charging from a chassis / starter battery.

- BMS charge source controls – If you have Victron DC-DC chargers, solar charging you can control these directly from dedicated control terminals on the unit.
- Third party chargers – For systems without a second battery system we offer a build variant with a different Cyrix contactor for third party charging control.

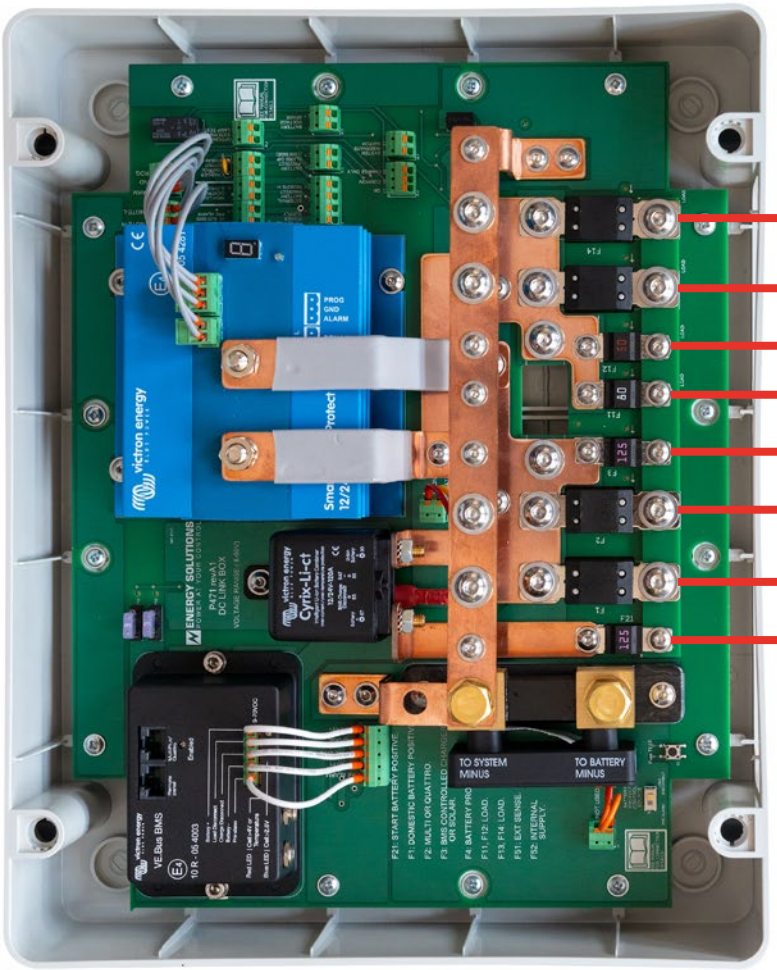
The link box takes all the hassle and worry out of wiring up your valuable Lithium battery system – and provides all of the installation accessories, such as fuses and bus bars, into the bargain.

Happy installing!!

Typical marine or vehicle installation with separate engine start battery with the same nominal voltage as the domestic battery.



Battery and equipment positive connections



Switched circuit 4 M8 ring terminal 125A Fuse

Switched circuit 3 M8 ring terminal 150A Fuse

Switched circuit 2 M5 or M6 ring terminal 50A Fuse

Switched circuit 1 M5 or M6 ring terminal 80A Fuse

Permanent circuit 2 (e.g. Bilge Pumps) M5 or M6 ring terminal 125A Fuse

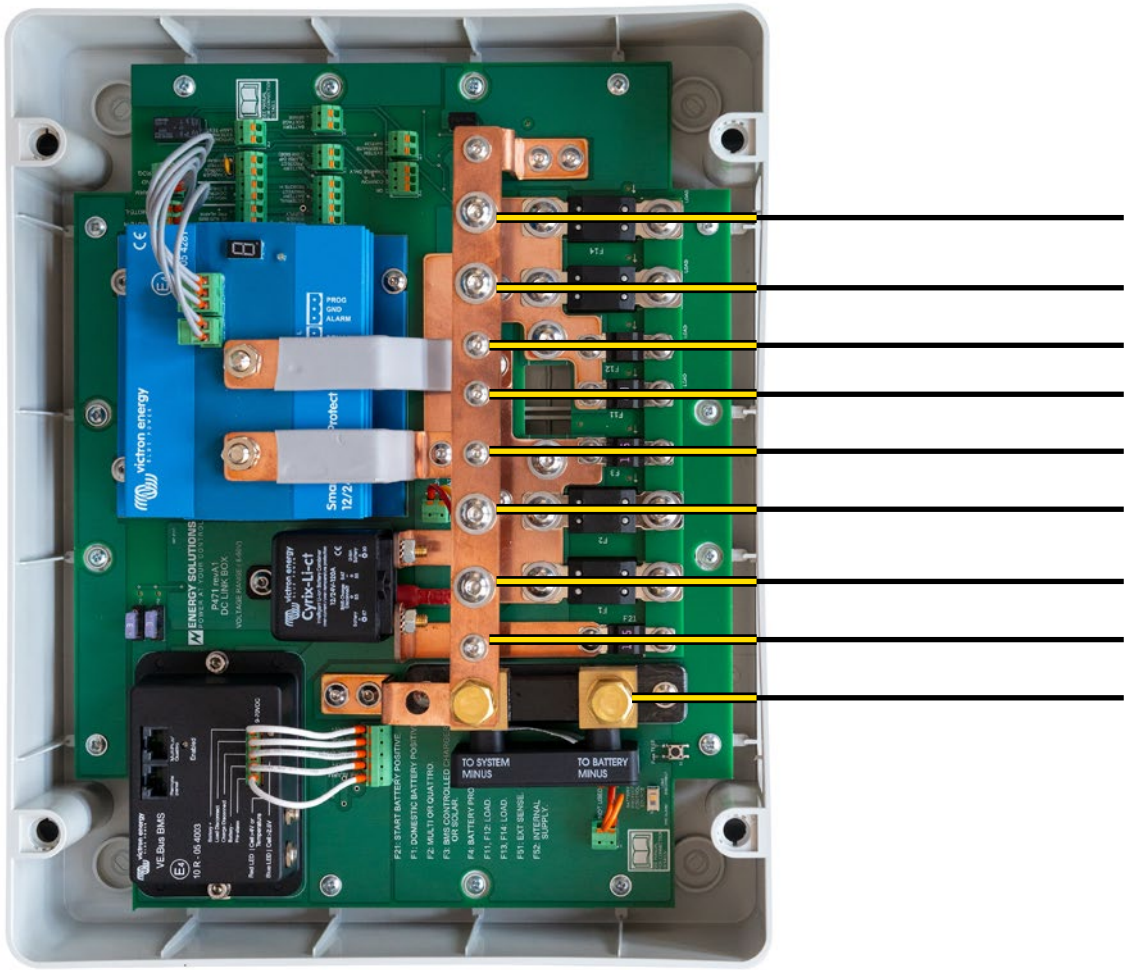
Permanent circuit 1 (e.g. Multi or Quattro) M8 ring terminal 300A Fuse

Domestic Battery Input M8 ring terminal 500A Fuse

Starter Battery Input M5 or M6 ring terminal 125A Fuse

Notes:
1. The Link Box is suitable for 12V or 24V systems, HOWEVER the starter battery and domestic battery need to have the same nominal voltage.

Battery and equipment negative connections



M8 ring terminal

M8 ring terminal

M5 or M6 ring terminal

M5 or M6 ring terminal

M5 or M6 ring terminal

M8 ring terminal

M8 ring terminal

M5 or M6 ring terminal

Domestic Battery Input M10 ring terminal

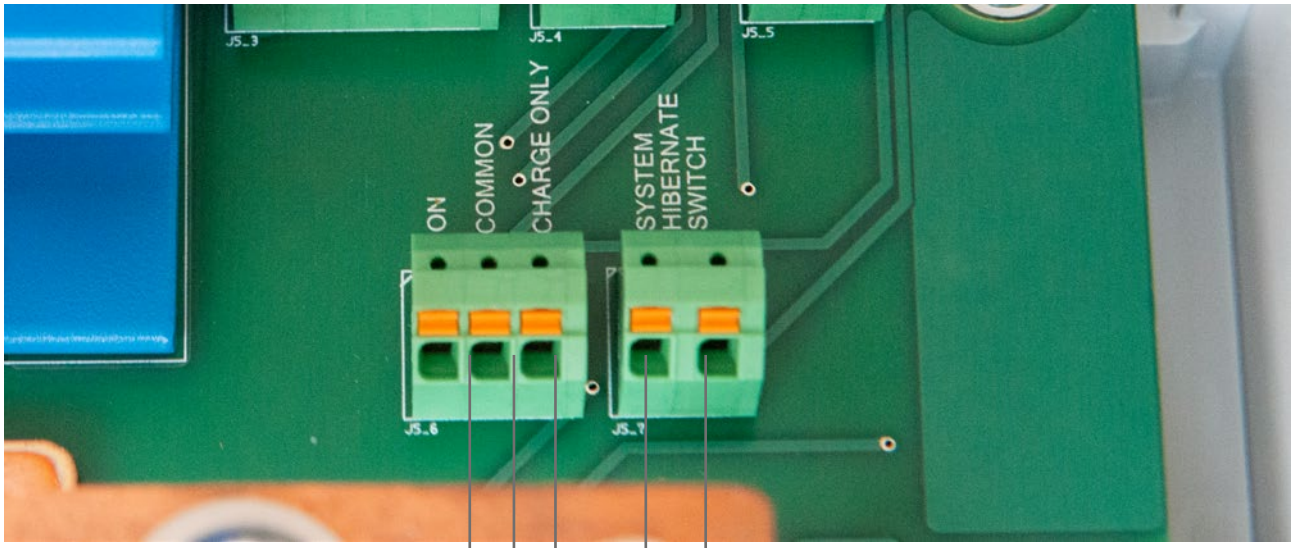
Connection Notes:

All battery negatives other than domestic battery negatives connect to this bus bar.

This includes the negative of the starter battery, (to common the negative systems). The negatives must not be linked elsewhere as this will stop the battery monitor working correctly.

If a bond to the vehicle chassis / boat hull or ground plate is required it should be made from this negative bus bar.

Customer connections terminals 17 to 21



Connection Notes:

17, 18 & 19 Anticipated as standard connection for most systems with a Multi or Quattro

20 & 21 Anticipated as standard connection for most systems

Terminal 21

Terminal 20

Notes:
1. Customer supplied remote latching switch. This controls the switched outputs via the battery protect – a remote battery isolator switch. The operation of this remote switch also controls the Quattro function, as described below.

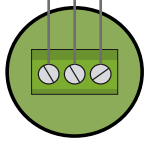
Terminal 19 - CHARGE ONLY

Terminal 18 - COMMON

Terminal 17 - ON

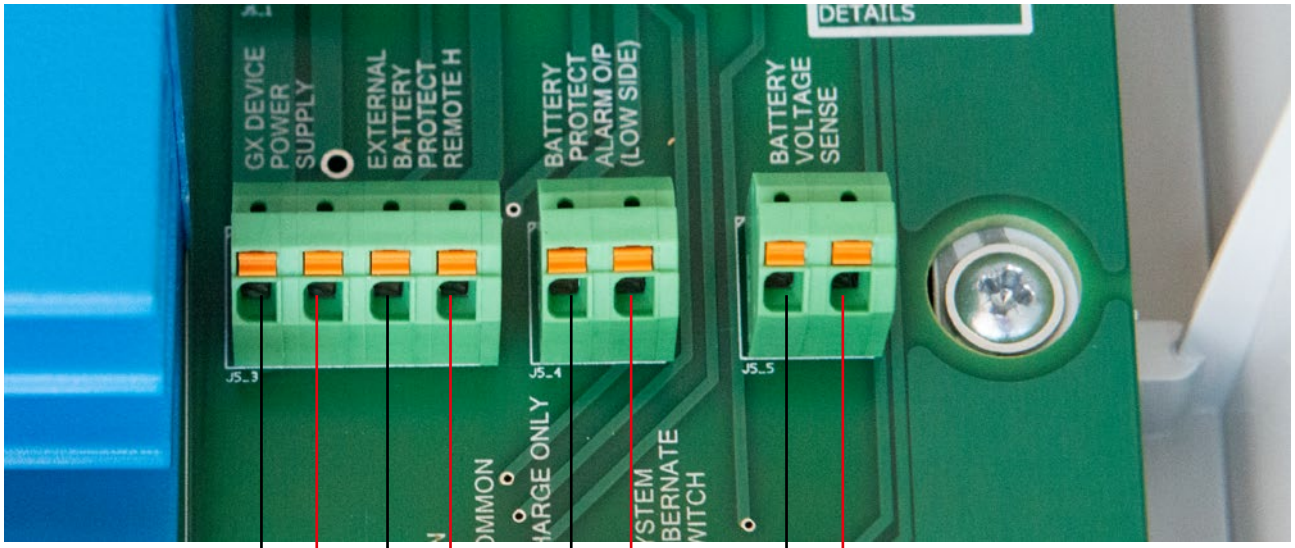
Notes:
1. Connecting 17 to 19 to the remote ON/OFF/CHARGER ONLY terminals in the Multi will provide the following functionality.

When system is hibernated, terminals 20 & 21 not connected, the Quattro will be set to Charger only. When terminals 20 & 21 are connected, the Quattro will be set to ON (standard Inverter/Charger operation).



For MultiPlus Compact swap the On and Charge Only wires

Customer connections terminals 9 to 16



Connection Notes:

9 & 10 Standard connection

11 & 12 Advanced connection

13 & 14 Advanced connection

15 & 16 Standard connection

Terminal 16 - BATTERY POS - V Sense

Terminal 15 - NEGATIVE - V Sense

Notes:
1. Dedicated fused supply for Voltage Sense input on Quattro or Multi

Terminal 14 - BATTERY POS

Terminal 13 - NEGATIVE

Notes:
1. Battery Protect alarm output. Consult Energy Solutions if wanting to use this output.

Terminal 12 - BATTERY POS

Terminal 11 - NEGATIVE

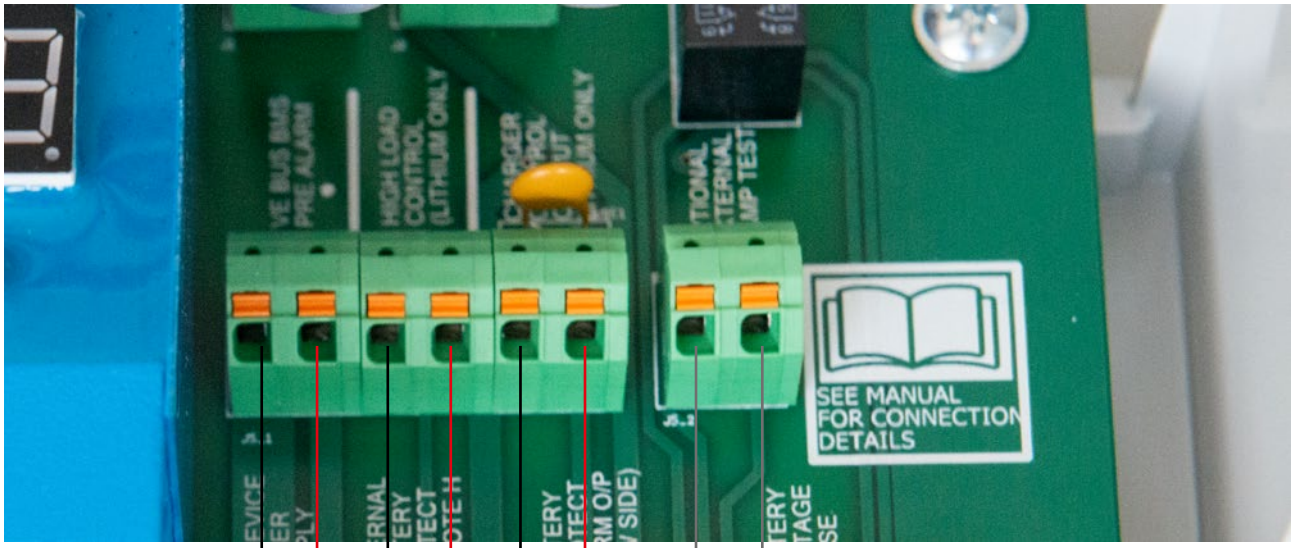
Notes:
1. Switched battery supply for powering GX accessories (e.g. GX 4G Dongle) or controlling a second Battery Protect

Terminal 10 - BATTERY POS - GX Device

Terminal 9 - NEGATIVE - GX Device

Notes:
1. Dedicated fused supply to GX Device. (Color Control, Venus or Cerbo)

Customer connections terminals 1 to 8



Terminal 8
Terminal 7

Terminal 6 - BATTERY
Terminal 5 - NEGATIVE

Terminal 4 - BATTERY
Terminal 3 - NEGATIVE

Terminal 2 - BATTERY POS
Terminal 1 - NEGATIVE

Connection Notes:

1 & 2 Advanced connections

3 & 4 Advanced connections

5 & 6 Advanced connections

7 & 8 Advanced connections

Notes:
1. Remote, momentary, fuse test button (Duplicates push button mounted on PCB

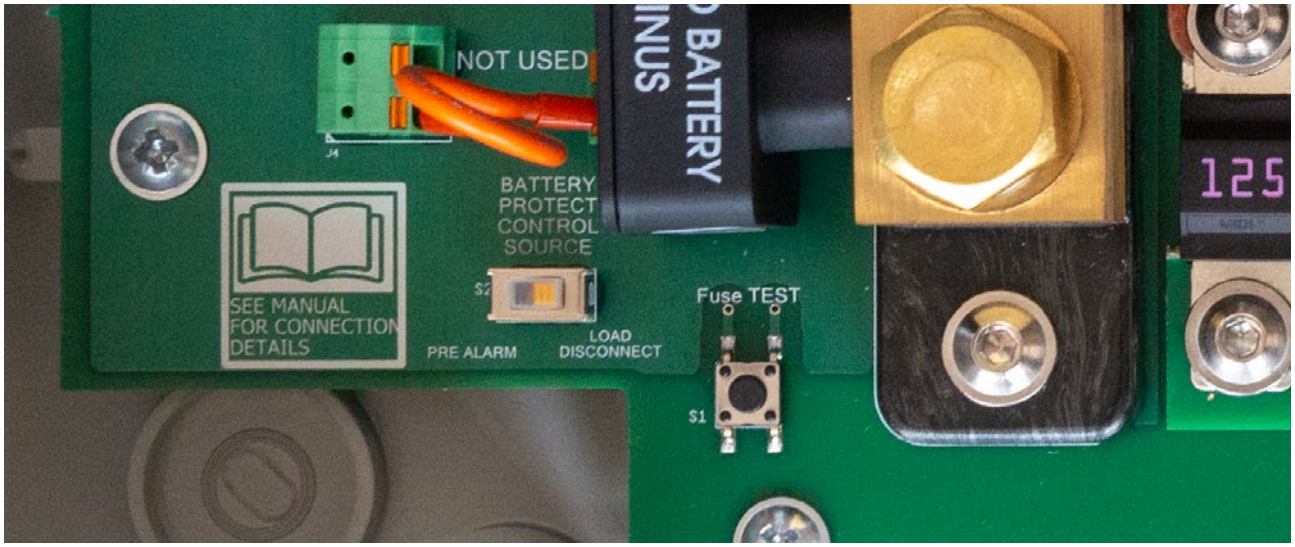
Notes:
1. **Charger Control Output.** This output is live (at battery voltage) when the batteries accept a charge. It can be used to control an external charging source. Examples include Cyrix Li Charge , Orion Tr Smart DC-DC Charger.

Notes:
1. **High Load Control.** This output is live (at battery voltage)until the battery hits the Pre-Alarm voltage. It can be used to control non essential circuits, reserving power when battery is low for essential equipment.

2. To operate correctly this requires Battery Protect control source to have Load Disconnect selected

Notes:
1. **VE Bus BMS Pre Alarm.** This output is live at battery voltage)when the battery hits the pre-alarm voltage. It can be connected to a sounder or other alarm.

User selections switches and test buttons



Notes:

Fuse Test
Press this button to check the status of fuses 2 to 14, if a remote test button is required it can be connected to terminals 7 & 8

Battery Protect Control Source
The Battery Protect acts as the main battery isolator. It is controlled by a customer remote switch, connected to terminals 20 & 21, and also by the Lithium Battery BMS. The BMS has two low battery alarm points - Load Disconnect and Pre-Alarm. You can use this selector switch to choose which threshold is used to disconnect the DC loads.

Selecting Pre-Alarm will disconnect loads earlier and leave more reserve capacity in the battery.

Notes

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