

Lynx Power In

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1. Safety Precautions

1.1. Safety Warnings Lynx Distribution System



Do not work on live busbars. Ensure that the busbar is unpowered by disconnecting all positive battery poles prior to removing the Lynx front cover.



Work on batteries should be carried out by qualified personnel only. Observe the battery safety warnings as listed in the battery manual.

1.2. Transport and Storage

Store this product in a dry environment.

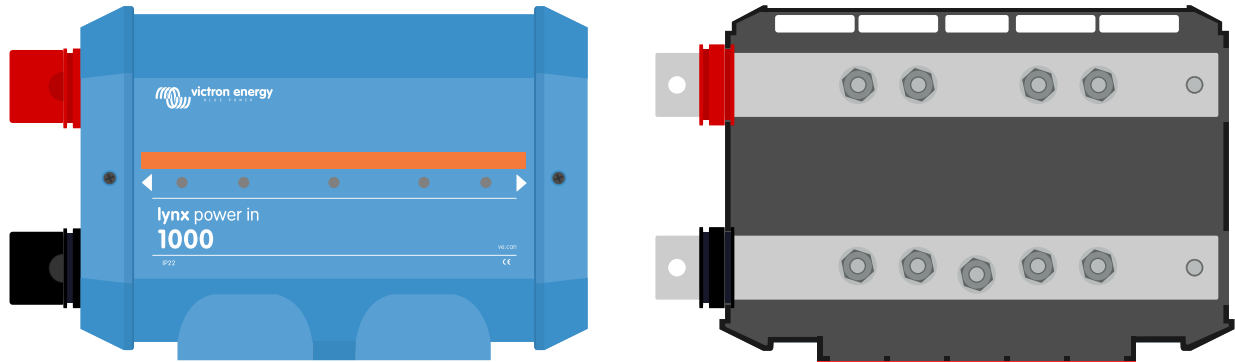
The storage temperature should be: -40°C to $+65^{\circ}\text{C}$.

No liability can be accepted for damage in transit if the equipment is not transported in its original packaging.

2. Introduction

2.1. The Lynx Power In

The Lynx Power In contains a positive and negative busbar with 4 connections for batteries, loads or chargers and a ground connection. It is part of the Lynx Distribution system.



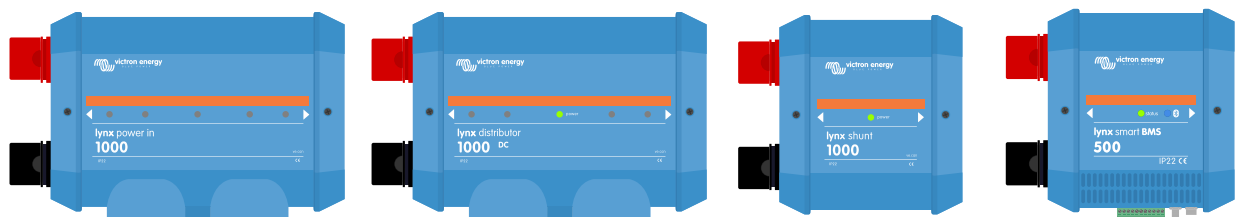
Lynx Power In - with and without cover

2.2. The Lynx Distribution System

The Lynx Distribution System is a modular busbar system that incorporates DC connections, distribution, fusing, battery monitoring and/or Lithium battery management. For more information also see the [DC Distribution Systems product page](#).

The Lynx Distribution System consist of the following parts:

- **Lynx Power In** - A positive and negative busbar with 4 connections for batteries or DC equipment.
- **Lynx Distributor** - A positive and negative busbar with 4 fused connections for batteries or DC equipment together with fuse monitoring.
- **Lynx Shunt VE.Can** - A positive busbar with a space for a main system fuse and a negative busbar with a shunt for battery monitoring. It has VE.Can communication for monitoring and setup with a GX device.
- **Lynx Smart BMS** - For use together with Victron Energy Smart Lithium batteries. It contains a positive busbar with a contactor that is driven by a battery management system (BMS) and a negative busbar with a shunt for battery monitoring. It has Bluetooth communication for monitoring and setup via the VictronConnect App and VE.Can communication for monitoring with a GX device and the VRM portal.



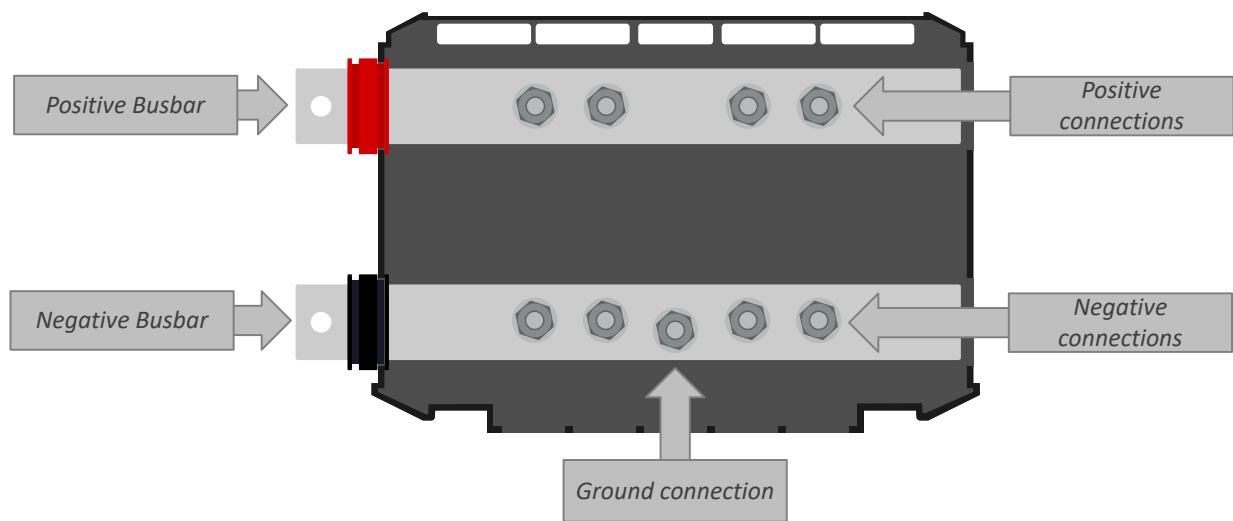
The Lynx modules: Lynx Power In, Lynx Distributor, Lynx Shunt VE.Can and Lynx Smart BMS

3. Features

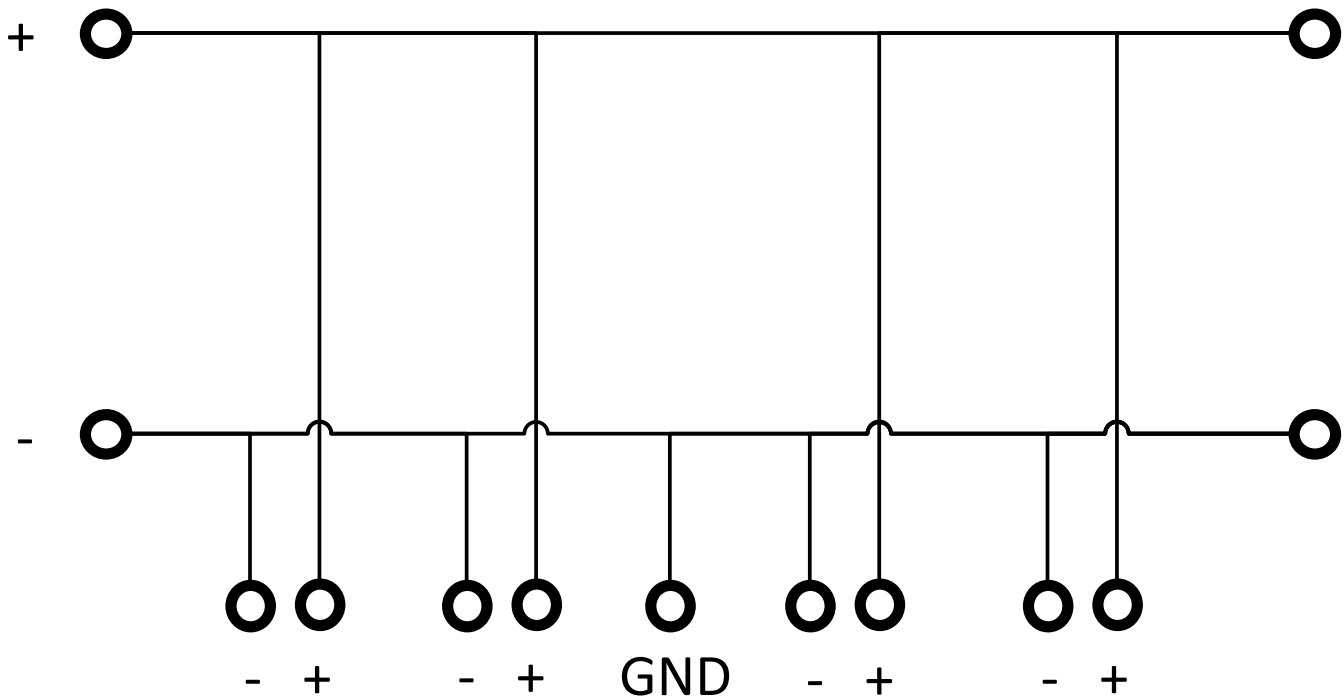
3.1. Internal parts and wiring diagram Lynx Power In

The internal physical parts and the wiring diagram of the Lynx Power In indicating the following parts:

- Positive busbar
- Negative busbar
- Positive connections
- Negative connections
- Ground connection



The internal physical parts of the Lynx Power In



The internal wiring diagram of the Lynx Power In

4. System Design

4.1. Designing a Lynx DC distribution system

A Lynx distribution system usually consists of a single Lynx Shunt VE.Can module or a single Lynx Smart BMS module.

The choice between a Lynx Shunt VE.Can or a Lynx Smart BMS depends on what type of batteries are used in the system. The Lynx Smart BMS can only be used with the Victron Energy [Lithium Smart Batteries](#), while the Lynx Shunt VE.Can is suitable for all other batteries.

Then, single, multiple or a combination of Lynx Distributor modules and/or Lynx Power In modules are added.

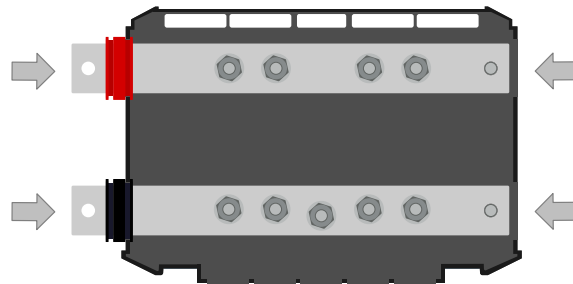
Together they form a continuous negative and positive busbar with DC connections and, depending on the configuration, integrated fuses, a battery monitor and/or lithium battery management.

It is also possible to just use Lynx Power In modules and/or Lynx Distributor modules without a Lynx Smart BMS module or a Lynx Shunt VE.Can modules. This for situations where battery monitoring or battery management is not needed.

4.1.1. Interconnecting Lynx modules

Each Lynx module can connect to other Lynx modules on the left side (M8 hole) and on the right side (M8 bolt).

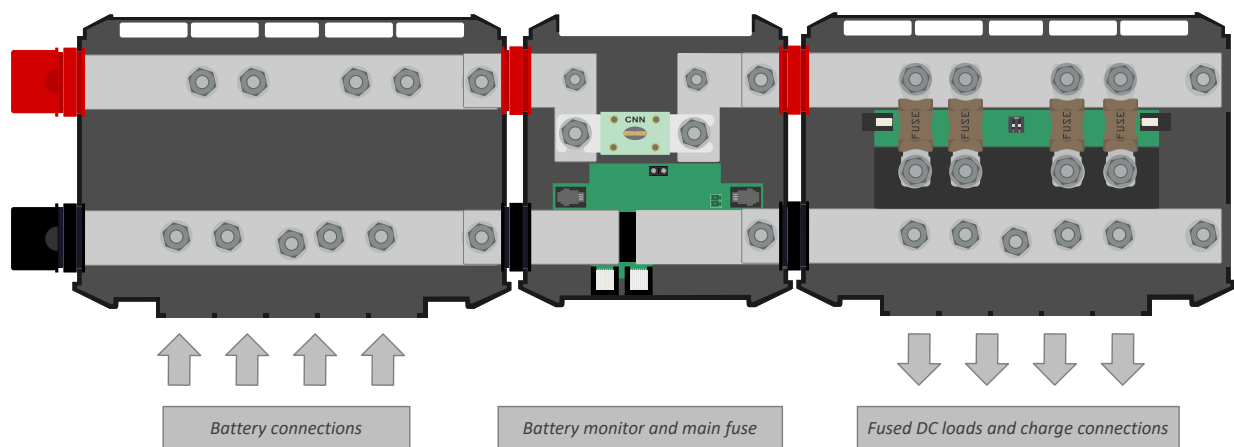
If the Lynx module is the first in line, the last in line or is used by itself, it is possible to connect batteries, loads or chargers directly to these connections. However, we do not generally recommend this because additional insulation and fusing is needed.



Lynx connections: The arrows indicate where the other Lynx modules can connect

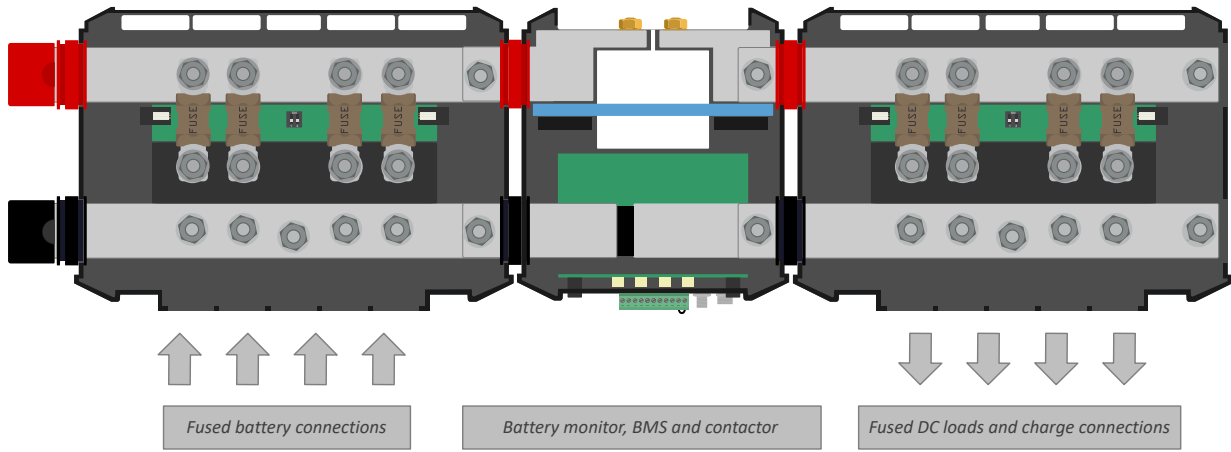
The example below shows a Lynx system consisting out of a Lynx Power In, Lynx Shunt VE.Can and Lynx Distributor. Together they form a continuous busbar, with un-fused battery connections, battery monitor, main system fuse and fused load connections.

Figure 1. Example of Interconnected Lynx modules without their covers (Lynx Shunt VE.Can)



Interconnected Lynx modules: Lynx Power In, Lynx Shunt VE.Can and Lynx Distributor

The example below shows a Lynx system consisting out of a Lynx distributor, Lynx Smart BMS and another Lynx Distributor. Together they form a continuous busbar, with fused battery connections, battery monitor, BMS system, contactor and fused load connections

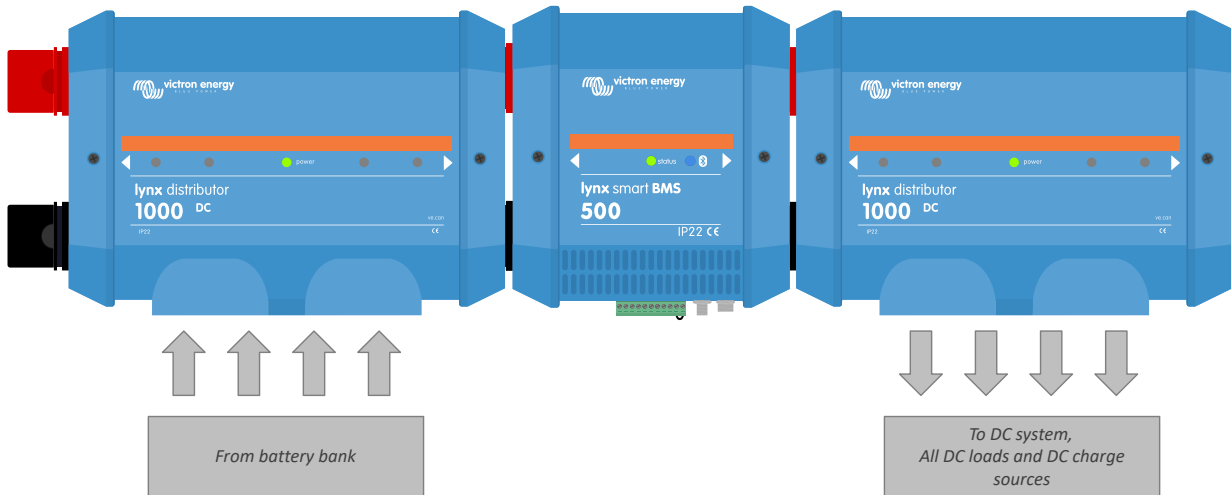


Interconnected Lynx modules: Lynx Distributor, Lynx Smart BMS and another Lynx Distributor

4.1.2. Orientation of Lynx modules

If the Lynx System contains a Lynx Shunt VE.Can or Lynx Smart BMS, the batteries always have to be connected to the left side of the Lynx System and the rest of the DC system (loads and chargers) connect to the right side. This, so the battery state of charge can be correctly calculated.

The busbars in the Lynx modules can heat up during high current events. The generated heat is dispersed via natural convection through the ventilation recesses in the top of the Lynx module. Ideally mount the Lynx modules in an upright position.

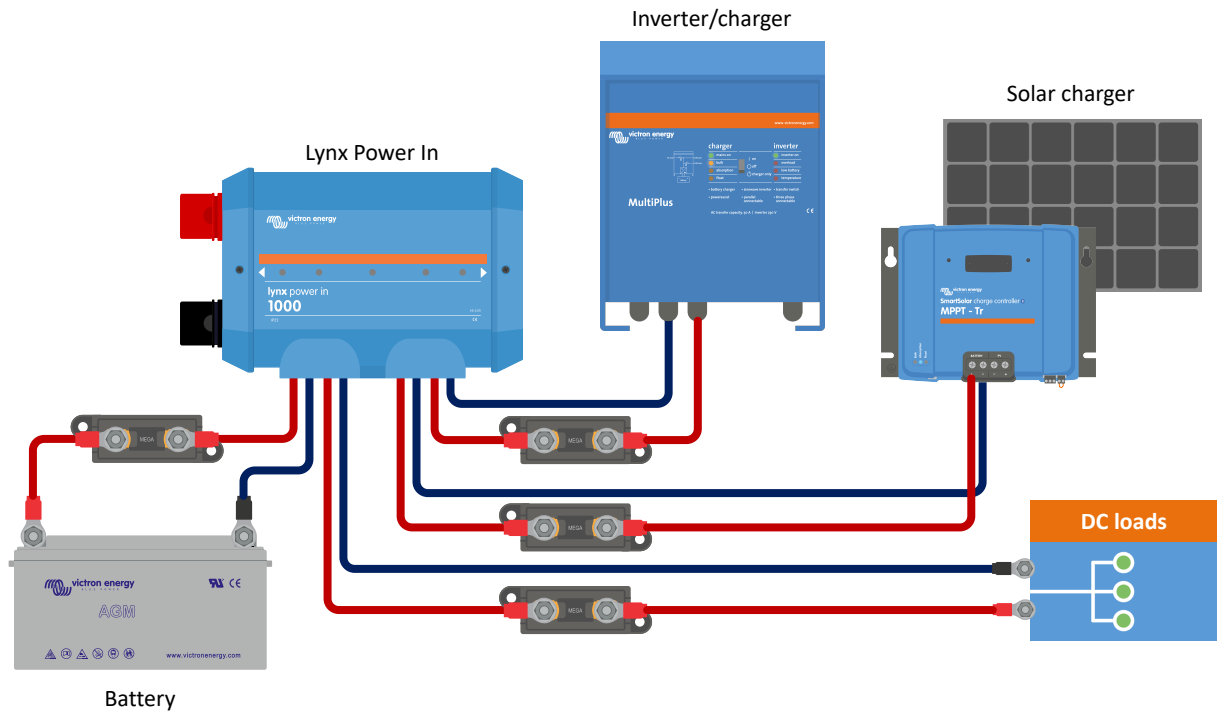


Example of Lynx module orientation: the batteries connect to the left side and all loads and chargers connect on the right side

4.1.3. System Example - Lynx Power In only

In this system a Lynx Power In is used by itself. Multiple Lynx Power In modules can be connected to each other thus creating a longer busbar with more connections for batteries and/or loads.

The Lynx Power in does not contain fuses. All connected load, chargers or batteries need to be fused externally.

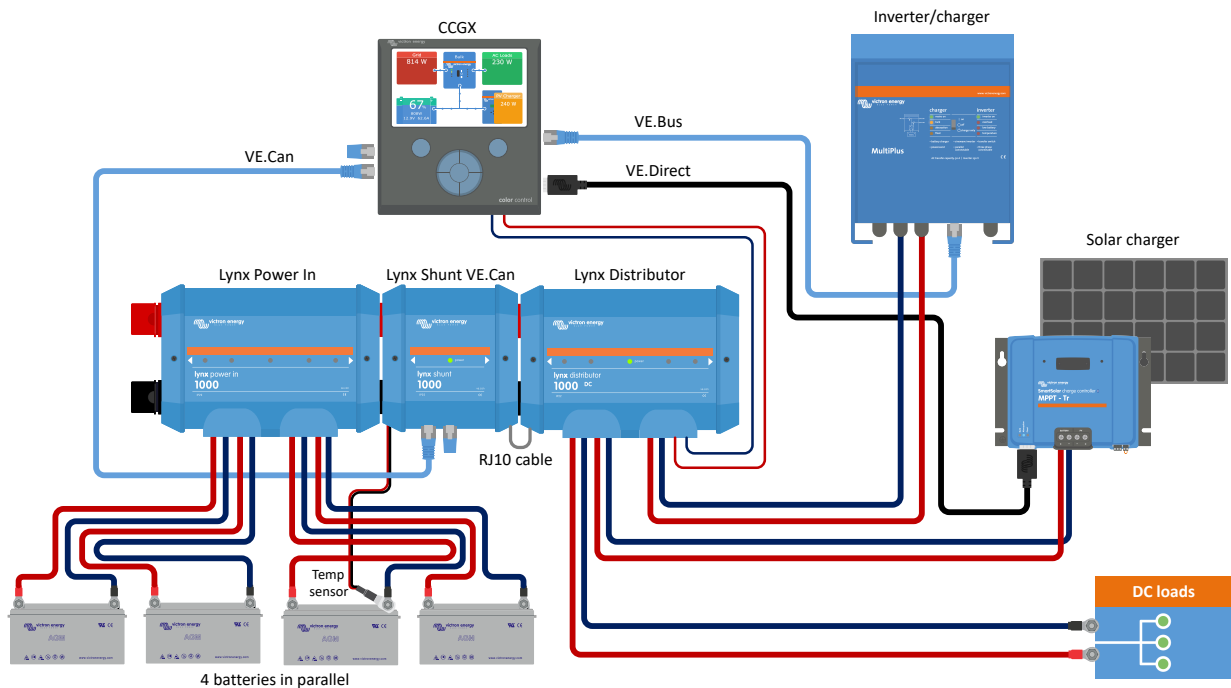


System with a Lynx Power In only

4.1.4. System example - Lynx Shunt VE.Can, Lynx Power In, Lynx Distributor and lead acid batteries

This system contains the following components:

- Lynx Power In with 4 paralleled 12V lead acid batteries.
- Identical cable lengths for each battery.
- Lynx Shunt VE.Can with main system fuse and battery monitor.
- Lynx Distributor with fused connections for inverter/charger(s), loads and chargers. Note that additional modules can be added if more connections are needed.
- CCGX (or other GX device) to read out the battery monitor data.



System with Lynx Shunt VE.Can, lead acid batteries, a Lynx Shunt VE.Can and a Lynx Distributor

4.2. System sizing

4.2.1. Current rating Lynx modules

The Lynx Distributor, Lynx Shunt VE.Can and the Lynx Power In are rated for a nominal current of 1000A, for 12, 24 or 48 System voltages.

To give an idea of how much power the Lynx modules are rated at different voltages, see below table. The power rating will give you an indication how big the connected inverter/charger system can be. Keep in mind that if inverters or inverter/chargers are used, both the AC and DC system will be powered from the batteries. Also be aware that a Lynx Smart BMS or a Lynx Ion (now discontinued) can have a lower current rating.

Table 1. Power rating Lynx modules

	12V	24V	48V
1000A	12kW	24kW	48kW

4.2.2. Fusing

The Lynx Power In does not have spaces for fuses, fusing needs to be done externally. For more information on fuses and fuse holders see the [Fuses & Fuse holders product page](#).

Always use fuses with the correct voltage and current rating. Match the fuse rating to the maximum voltages and currents that potentially can occur in the fused circuit. For more information on fuse ratings and fuse current calculations see the [Wiring Unlimited book](#).



The total value of the fuses of all circuits should not be more than the current rating of the Lynx module, or the Lynx model with the lowest current rating in case of multiple Lynx modules are used.

4.2.3. Cabling

The current rating of the wires or cables used to connect the Lynx Power In to batteries and/or the DC loads has to be rated for the maximum currents that can occur in the connected circuits. Use cabling with a sufficient core surface area to match the maximum current rating of the circuit.

For more information on cabling and cable thickness calculations see the [Wiring Unlimited book](#).

5. Installation

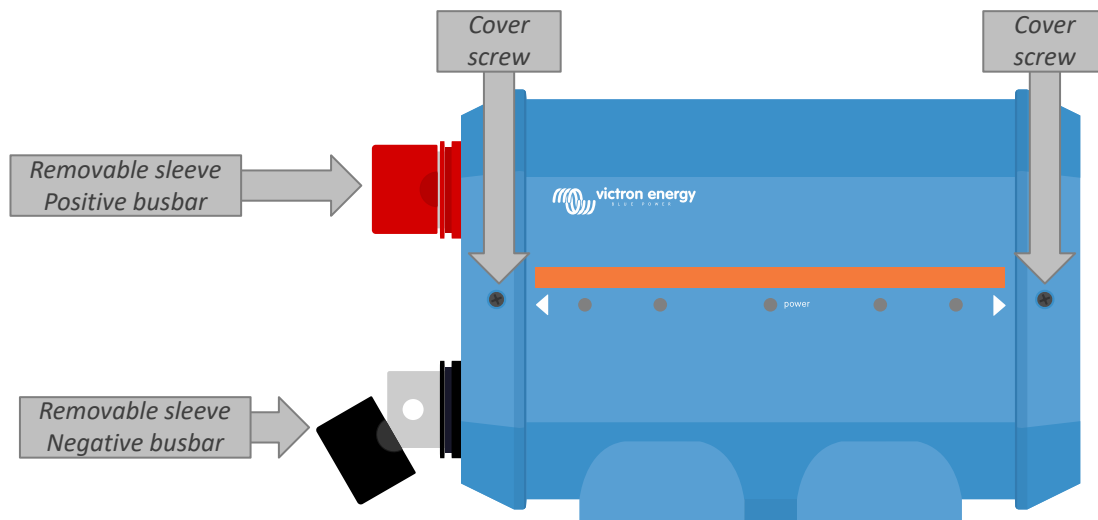
5.1. Mechanical connections

5.1.1. Lynx module connection features

The Lynx module can be opened up by unscrewing 2 cover screws.

The contacts on the left side are covered by a removable rubber sleeve.

Red is the positive busbar and black is the negative busbar.



Location of front cover screws and the removable sleeves

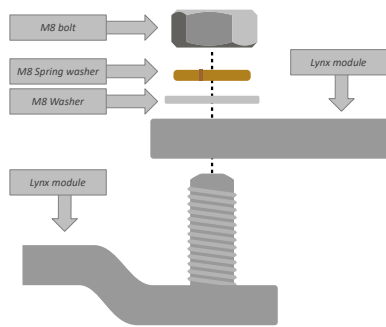
5.1.2. Mounting and interconnecting Lynx modules

This paragraph explains how to attach several Lynx modules to each other and how to mount the Lynx assembly into its final location.

For a mechanical drawing of the housing, with dimensions and the location of the mounting holes, see the appendix of this manual.

These are the points to take into consideration when interconnecting and mounting Lynx modules:

- If Lynx modules are going to be connected to the right and if the Lynx module is fitted with a plastic barrier on the right side, remove the black plastic barrier. If the Lynx module is located as the most right module, leave the black plastic barrier in place.
- If Lynx modules are going to be connected to the left, remove the red and black rubber sleeves. If the Lynx module is located as the most left module, leave the red and black rubber sleeves in place.
- If the Lynx system contains a Lynx Smart BMS or Lynx Shunt VE.Can, the left side is the battery side and the right side is the DC system side.
- Connect all Lynx modules to each other using the M8 holes and bolts on the left and right. Take care that the modules correctly slot into the rubber joiner recesses.
- Place the washer, spring washer and nut on the bolts and tighten the bolts using a torque of 14Nm.
- Mount the Lynx assembly in its final location using the 5mm mounting holes.

Figure 2. Connection sequence when connecting two Lynx modules

Correct placement of the M8 washer, spring washer and nut.

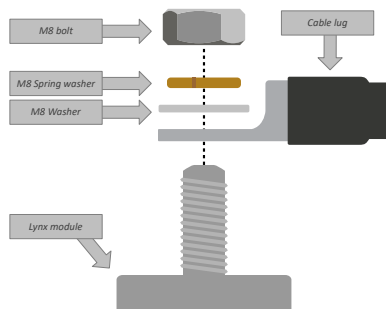
5.2. Electrical connections

5.2.1. Connect DC wires

This chapter might not apply if the Lynx module is connected to other Lynx modules, like can be the case for the Lynx Smart BMS or the Lynx Shunt VE.Can.

For all DC connections the following applies:

- All cables and wires connected to the Lynx module need to have been fitted with M8 cable lugs.
- Pay attention to the correct placement of the cable lug, washer, spring washer and nut on each bolt when attaching the cable to the bolt.
- Tighten the nuts with a torque moment of 14Nm.

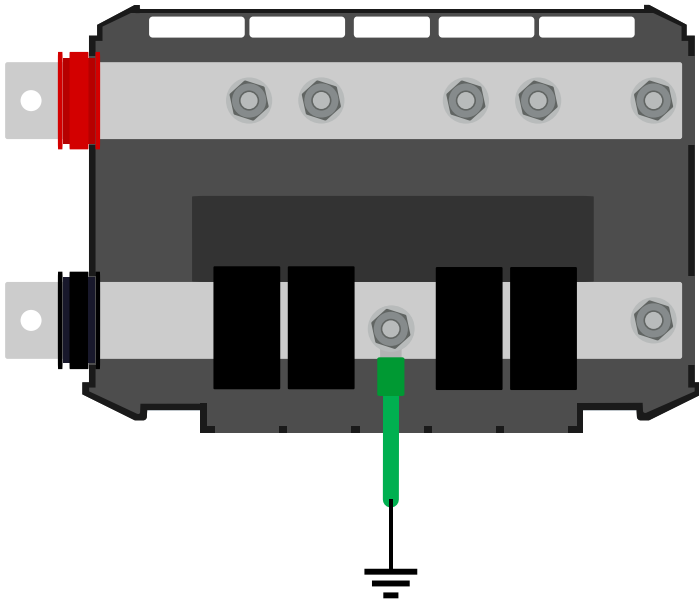
Figure 3. Correct mounting sequence DC wires

Correct placement of the M8 Cable lug, washer, spring washer and nut

5.2.2. Ground and Negative connections

Connect the ground wire

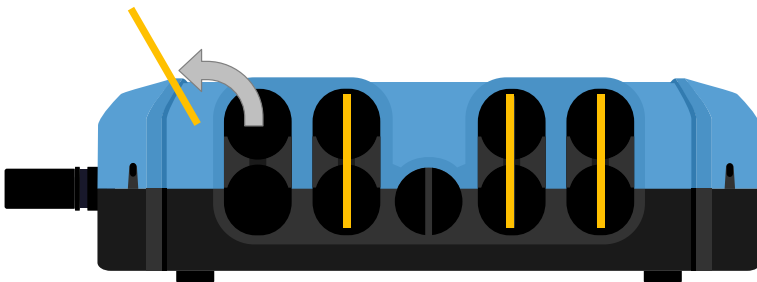
This only applies if the system requires a ground connection. There should only be one ground connection per system. The ground connection should be made after the Lynx Smart BMS, Lynx Shunt VE.Can or battery monitor shunt. For more information on system grounding see the [Wiring Unlimited book](#).



Ground connection Lynx power In

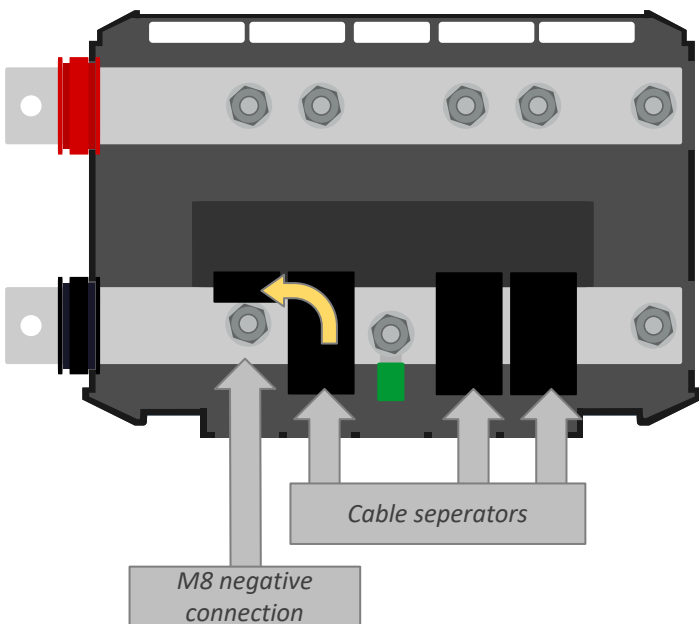
Connect the negative wires

Remove the cable separator post if the wire diameter exceeds 10mm.

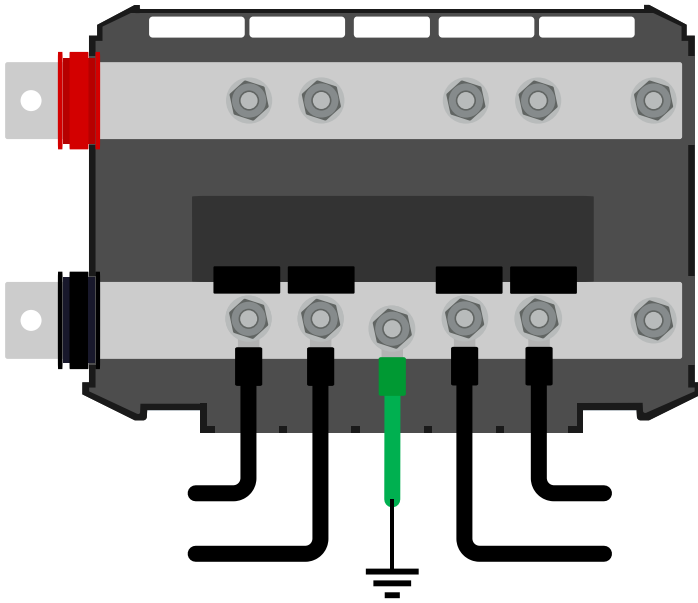


The cable separator posts are indicated in yellow

To reach the negative connections swing the black cable separators upwards. The black cable separators can be temporary removed by pulling them away from the Lynx Power In at a slight sideways angle in case better access is needed.



Flip up the cable separator to reach the negative connections



Negative connection Lynx Power In

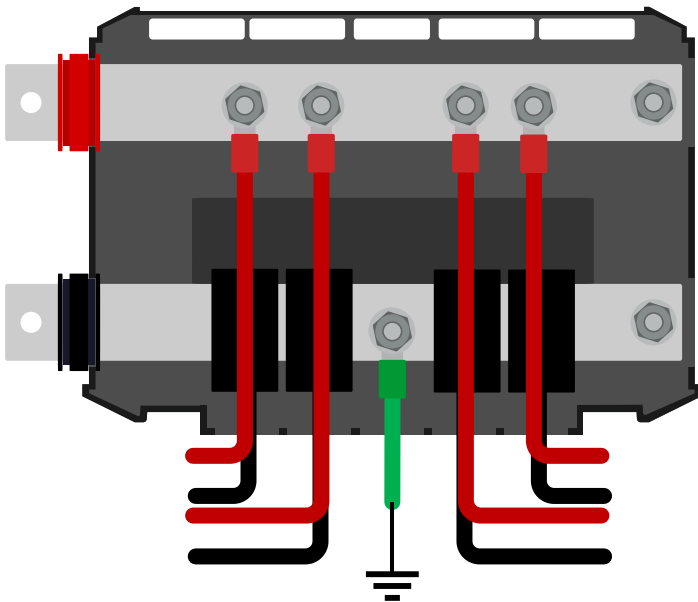
5.2.3. Positive connections



Before making any positive connections, make sure that the positive wires are not powered. Disconnect all positive cables from the battery prior to connecting them to the Lynx module. This to prevent accidental short circuits.

Connect all positive wires.

Power the Lynx system by connecting the positive battery pole(s).



Connecting the positive wires Lynx Power In

6. Commissioning the Lynx Power In

Commissioning the Lynx Distributor

Commissioning sequence:

- Check polarity of all DC cables
- Check cross sectional area of all DC cables
- Check if all cable lugs have been crimped correctly
- Check if all cable connections are tight (don't exceed maximum torque)
- Tug slightly on each battery cable to check if the connections are tight and if the cable lugs have been crimped correctly.

7. Troubleshooting and Support

Consult this chapter in case of unexpected behaviour or if you suspect a product fault.

The correct troubleshooting and support process is to first consult the common issues as described in this chapter.

Should this fail to resolve the issue, contact the point of purchase for technical support. If the point of purchase is unknown, refer to the [Victron Energy Support webpage](#).

7.1. Cabling issues

Cables heat up

This can be caused by a wiring or connection issue. Check the following:

- Check if all cable connections are tightened with a torque moment of 14Nm.
- Check if all fuse connections are tightened with a torque moment of 14Nm.
- Check if the surface area of the cable core is large enough for the current through that cable.
- Check if all cable lugs have been crimped correctly and are tight enough.

Other cabling issues

For additional information about issues that can arise from bad or incorrect cabling, cable connections or wiring of battery banks refer to the [Wiring Unlimited Book](#).

8. Warranty

This product has a 5-year limited warranty. This limited warranty covers defects in materials and workmanship in this product and lasts for five years from the date of original purchase of this product. To claim warranty the customer must return the product together with the receipt of purchase to the point of purchase. This limited warranty does not cover damage, deterioration or malfunction resulting from alteration, modification, improper or unreasonable use or misuse, neglect, exposure to excess moisture, fire, improper packing, lightning, power surges, or other acts of nature. This limited warranty does not cover damage, deterioration or malfunction resulting from repairs attempted by anyone unauthorized by Victron Energy to make such repairs. Non-compliance with the instructions in this manual will render the warranty void. Victron Energy is not liable for any consequential damages arising from the use of this product. The maximum liability of Victron Energy under this limited warranty shall not exceed the actual purchase price of the product.

9. Technical specifications Lynx Power In

Power	
Voltage range	9 - 60Vdc
Current rating	1000A

Connections	
Busbar	M8

Physical	
Enclosure material	ABS
Enclosure dimensions (hwxwd)	290 x 170 x 80mm
Unit weight	2.1 kg
Busbar material	Tinned copper
Busbar dimensions (hwx)	8 x 30mm

Environmental	
Operating temperature range	-40°C to +60°
Storage temperature range	-40°C to +60°
Humidity	Max. 95% (non-condensing)
Protection class	IP22

10. Appendix