Powerlink

Modbus Configuration

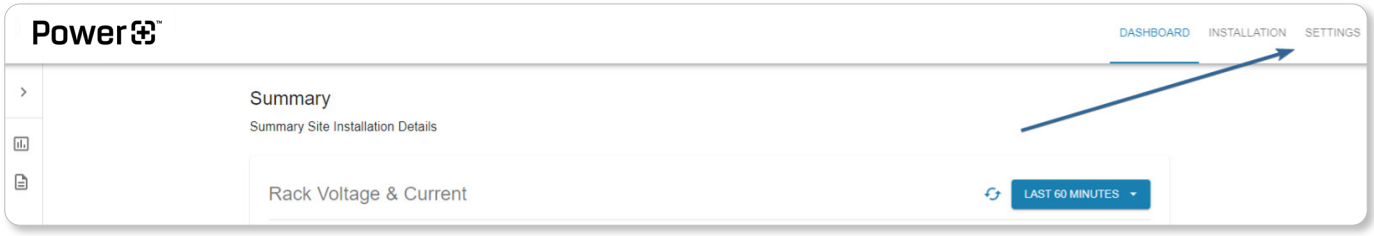
Instructions on how to enable the Modbus service on the Powerlink.

1. Modbus Configurations

1.1 ENABLE MODBUS

The Powerlink modules support the use of Modbus TCP,
the steps for enabling this feature are listed below.

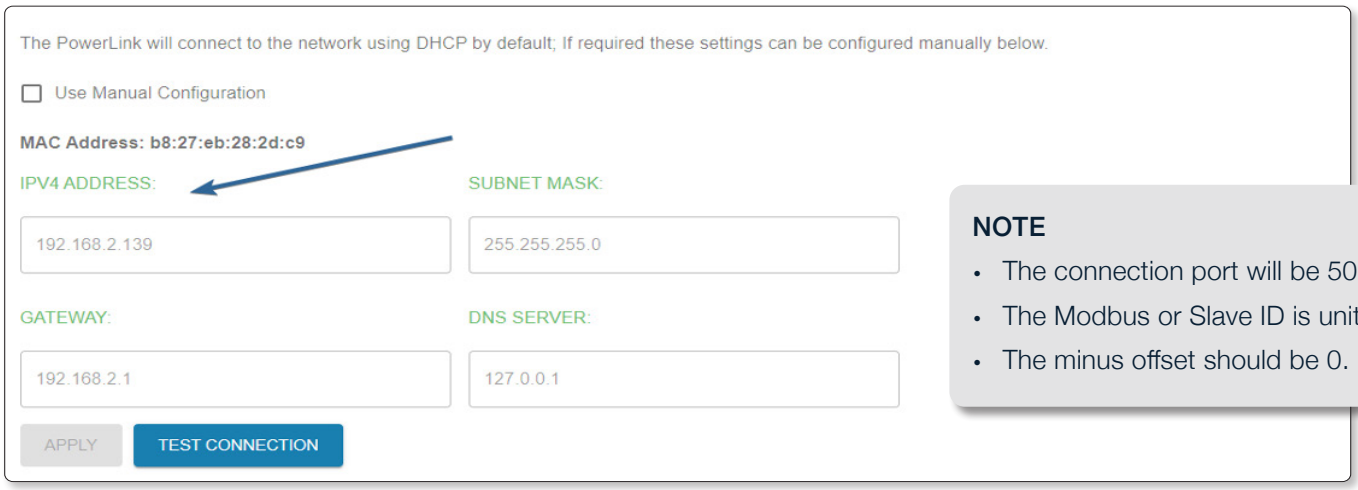
1. Navigate to the provisioning site of the PowerLink, and then to the settings tab in the top right-hand corner.



2. Locate the Modbus settings panel and click the checkbox to enable

Make sure to then click 'Apply'

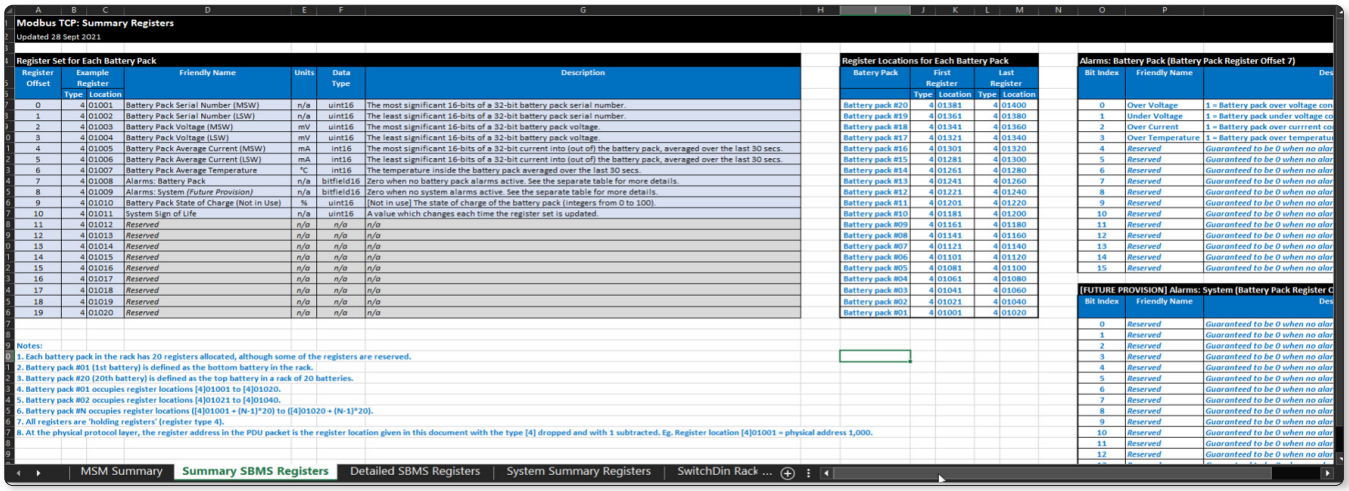
3. You will now be able to connect to the Modbus service via a client, exact configuration will depend on the client used however you will need the IP address of the PowerLink in order to connect, if you are using the hostname of the device to connect you can find the IP address on the settings page under Network > IPV4 Address.



NOTE

- The connection port will be 502
- The Modbus or Slave ID is unit=1
- The minus offset should be 0.

4. Once you are connected you will want to access the registers outlined in the provided “MSM Register Map” spreadsheet.



Modbus TCP: Summary Registers

Updated 28 Sept 2021

Register Set for Each Battery Pack

Register Offset	Example Register Type	Example Register Location	Friendly Name	Units	Data Type	Description
0	4	01001	Battery Pack Serial Number (MSW)	n/a	uint16	The most significant 16-bits of a 32-bit battery pack serial number.
1	4	01002	Battery Pack Serial Number (LSW)	n/a	uint16	The least significant 16-bits of a 32-bit battery pack serial number.
2	4	01003	Battery Pack Voltage (MSW)	mV	uint16	The most significant 16-bits of a 32-bit battery pack voltage.
3	4	01004	Battery Pack Voltage (LSW)	mV	uint16	The least significant 16-bits of a 32-bit battery pack voltage.
4	4	01005	Battery Pack Average Current (MSW)	mA	int16	The most significant 16-bits of a 32-bit current into (out of) the battery pack, averaged over the last 30 secs.
5	4	01006	Battery Pack Average Current (LSW)	mA	int16	The least significant 16-bits of a 32-bit current into (out of) the battery pack, averaged over the last 30 secs.
6	4	01007	Battery Pack Average Temperature	°C	int16	The temperature inside the battery pack averaged over the last 30 secs.
7	4	01008	Alarms: Battery Pack	n/a	bitfield16	Zero when no battery pack alarms active. See the separate table for more details.
8	4	01009	Alarms: System *(Future Provision)*	n/a	bitfield16	Zero when no system alarms active. See the separate table for more details.
9	4	01010	Battery Pack State of Charge (Not in Use)	%	uint16	[Not in use] The state of charge of the battery pack (integers from 0 to 100).
10	4	01011	System Sign of Life	n/a	uint16	A value which changes each time the register set is updated.
11	4	01012	*Reserved*	n/a	n/a	n/a
12	4	01013	*Reserved*	n/a	n/a	n/a
13	4	01014	*Reserved*	n/a	n/a	n/a
14	4	01015	*Reserved*	n/a	n/a	n/a
15	4	01016	*Reserved*	n/a	n/a	n/a
16	4	01017	*Reserved*	n/a	n/a	n/a
17	4	01018	*Reserved*	n/a	n/a	n/a
18	4	01019	*Reserved*	n/a	n/a	n/a
19	4	01020	*Reserved*	n/a	n/a	n/a

Register Locations for Each Battery Pack

Battery Pack	First Register Type	First Register Location	Last Register Type	Last Register Location
Battery pack #20	4	01381	4	01400
Battery pack #19	4	01361	4	01380
Battery pack #18	4	01341	4	01360
Battery pack #17	4	01321	4	01340
Battery pack #16	4	01301	4	01320
Battery pack #15	4	01281	4	01300
Battery pack #14	4	01261	4	01280
Battery pack #13	4	01241	4	01260
Battery pack #12	4	01221	4	01240
Battery pack #11	4	01201	4	01220
Battery pack #10	4	01181	4	01200
Battery pack #09	4	01161	4	01180
Battery pack #08	4	01141	4	01160
Battery pack #07	4	01121	4	01140
Battery pack #06	4	01101	4	01120
Battery pack #05	4	01081	4	01100
Battery pack #04	4	01061	4	01080
Battery pack #03	4	01041	4	01060
Battery pack #02	4	01021	4	01040
Battery pack #01	4	01001	4	01020

Alarms: Battery Pack (Battery Pack Register Offset 7)

Bit Index	Friendly Name	Des
0	Over Voltage	1 = Battery pack over voltage con
1	Under Voltage	1 = Battery pack under voltage co
2	Over Current	1 = Battery pack over current co
3	Over Temperature	1 = Battery pack over temperatu
4	*Reserved*	*Guaranteed to be 0 when no alar*
5	*Reserved*	*Guaranteed to be 0 when no alar*
6	*Reserved*	*Guaranteed to be 0 when no alar*
7	*Reserved*	*Guaranteed to be 0 when no alar*
8	*Reserved*	*Guaranteed to be 0 when no alar*
9	*Reserved*	*Guaranteed to be 0 when no alar*
10	*Reserved*	*Guaranteed to be 0 when no alar*
11	*Reserved*	*Guaranteed to be 0 when no alar*
12	*Reserved*	*Guaranteed to be 0 when no alar*
13	*Reserved*	*Guaranteed to be 0 when no alar*
14	*Reserved*	*Guaranteed to be 0 when no alar*
15	*Reserved*	*Guaranteed to be 0 when no alar*

[FUTURE PROVISION] Alarms: System (Battery Pack Register O

Bit Index	Friendly Name	Des
0	*Reserved*	*Guaranteed to be 0 when no alar*
1	*Reserved*	*Guaranteed to be 0 when no alar*
2	*Reserved*	*Guaranteed to be 0 when no alar*
3	*Reserved*	*Guaranteed to be 0 when no alar*
4	*Reserved*	*Guaranteed to be 0 when no alar*
5	*Reserved*	*Guaranteed to be 0 when no alar*
6	*Reserved*	*Guaranteed to be 0 when no alar*
7	*Reserved*	*Guaranteed to be 0 when no alar*
8	*Reserved*	*Guaranteed to be 0 when no alar*
9	*Reserved*	*Guaranteed to be 0 when no alar*
10	*Reserved*	*Guaranteed to be 0 when no alar*
11	*Reserved*	*Guaranteed to be 0 when no alar*
12	*Reserved*	*Guaranteed to be 0 when no alar*

Notes:

1. Each battery pack in the rack has 20 registers allocated, although some of the registers are reserved.
2. Battery pack #01 (1st battery) is defined as the bottom battery in the rack.
3. Battery pack #20 (20th battery) is defined as the top battery in a rack of 20 batteries.
4. Battery pack #01 occupies register locations [4]01001 to [4]01020.
5. Battery pack #02 occupies register locations [4]01021 to [4]01040.
6. Battery pack #N occupies register locations ([4]01001 + (N-1)*20) to ([4]01020 + (N-1)*20).
7. All registers are 'holding registers' (register type 4).
8. At the physical protocol layer, the register address in the PDU packet is the register location given in this document with the type [4] dropped and with 1 subtracted. Eg. Register location [4]01001 = physical address 1,000.

MSM Summary | Summary SBMS Registers | Detailed SBMS Registers | System Summary Registers | SwitchDin Rack ...

1.2 VICTRON VENUS

This document is a reference and guide only. Please see the Victron datasheet for more information about connecting a Venus and Lynx device in a system. To enable this connection you will first need to select Victron Venus from the drop down box under Modbus Server.

1.2.1 BACKGROUND AND POWERLINK BASICS

These instructions provide basic setup information about the Lynx Shunt and the Venus GX, both Victron devices that can be configured to work with the Powerlink. Note that the Lynx Shunt sends data to the Venus GX via CAN Bus and the Venus populates registers on its own Modbus TCP Server, which is accessed via the network.

First the Powerlink needs to be provisioned with the latest firmware, at least v2.0.2. Then the Venus and Lynx must be setup. This includes setting up Venus settings, enabling Modbus TCP and configuring the Lynx for the connected batteries.

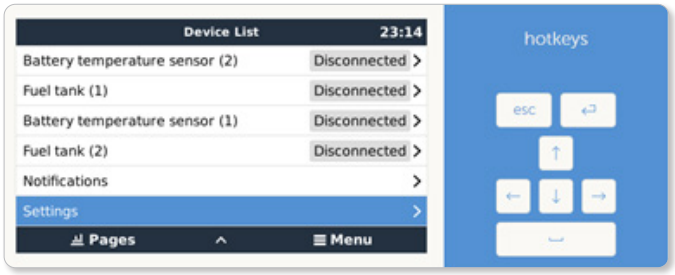
1.2.2 COMMUNICATIONS CONNECTIONS

1. Connect the shunt to the Venus device via CAN bus, a network cable is used for this connection. On the Venus side, the top VE.Can connector is used and a provided CAN bus terminator is used on the bottom input (see right image).
2. Note the power cables in the bottom right. See datasheet for power specifications. These cables power the Venus. The shunt is powered by the SBMS batteries.

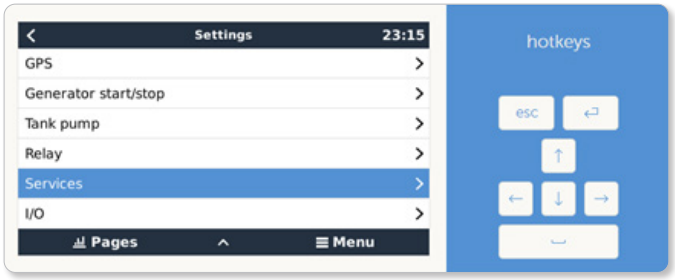
3. On the Lynx Shunt, connect the CAN bus on the right side, or the side away from the large metal terminals and the CAN terminator on the left (See below image).
4. Follow the datasheet to correctly connect with the SBMS batteries.

1.2.3 ENABLING THE MODBUS TCP

1. Connect to venus.local or via the devices IP address
2. On the main page, scroll down to settings.



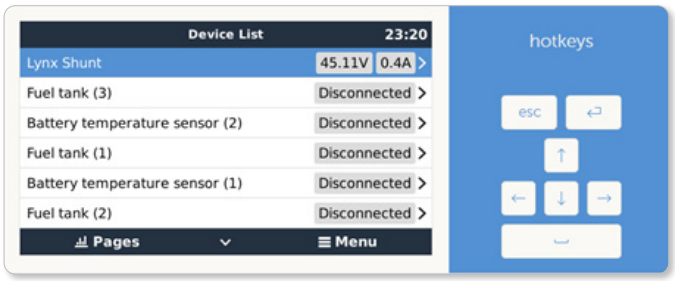
3. Under settings, scroll down (a bit) to services.



4. Ensure sure Modbus TCP is Enabled.

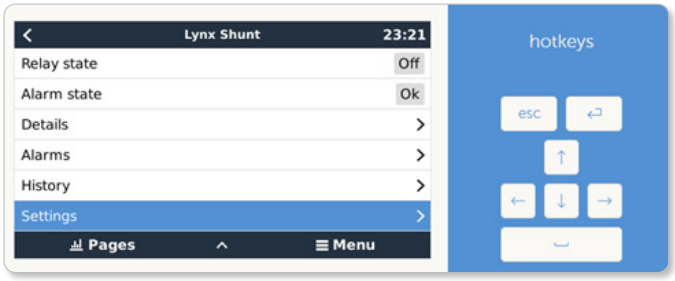
1.2.4 CONFIGURING LYNX SHUNT BATTERY SETTINGS

1. Connect to venus.local or via the devices IP address.
2. First verify the Shunt is shown. At the top of the main page: Device List, the shunt should appear with a seen voltage and current.

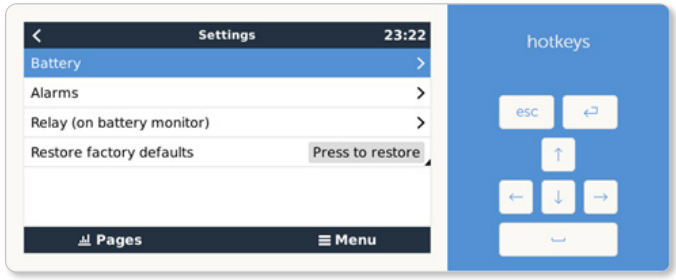


3. There will likely be no SOC because it has not synced yet. Select the device to see further details.

4. Scroll Down to Settings for the Shunt.



5. Select Battery to set Battery Specific Settings (including Capacity which will vary by rack size and battery type, and voltage which will vary by battery type). Any other settings that should be set should be provided by PowerPlus Energy.



1.3 VICTRON BMV

Simply connect the USB for VE.Direct USB Cable from the BMV-700 series to the Powerlink. The Powerlink will handle settings for the installed battery rack. This means the SBMS count and the SBMS type select on the Powerlink Provisioning Website must be accurate.

Of note, default values are programmed for Battery Characteristics. These should be changed for SBMS batteries based on hardware characteristics. To change them, add a migration to SBMS Database and update the values. The values auto programmed are from the SBMS Database.

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