Equipment Note

Victron GX systems

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Contents

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1 Background

This equipment note describes using an impHub to control and monitor Victron systems . Compatible with the Venus Gx, Cerbo GX and Colour control Gx

Setup and commission your Victron system according to the Victron manuals, following all electrical guidance from the Victron manual. This guide only describes connecting the impHub to a properly commissioned system.

2 Networking

For a Victron system, the impHub talks to the master device directly. The master device fetches data and applies control to any other module configured in the Victron system by addressing the Modbus ID of each module

Both the hub and Victron should be on fixed IPs, either statically assigned or DHCP reserved. In advance of the installation, you will need to request IPs for the following devices:

- impHub
- Victron

You can configure a static IP for the Victron system under the settings/ethernet page on the VRM

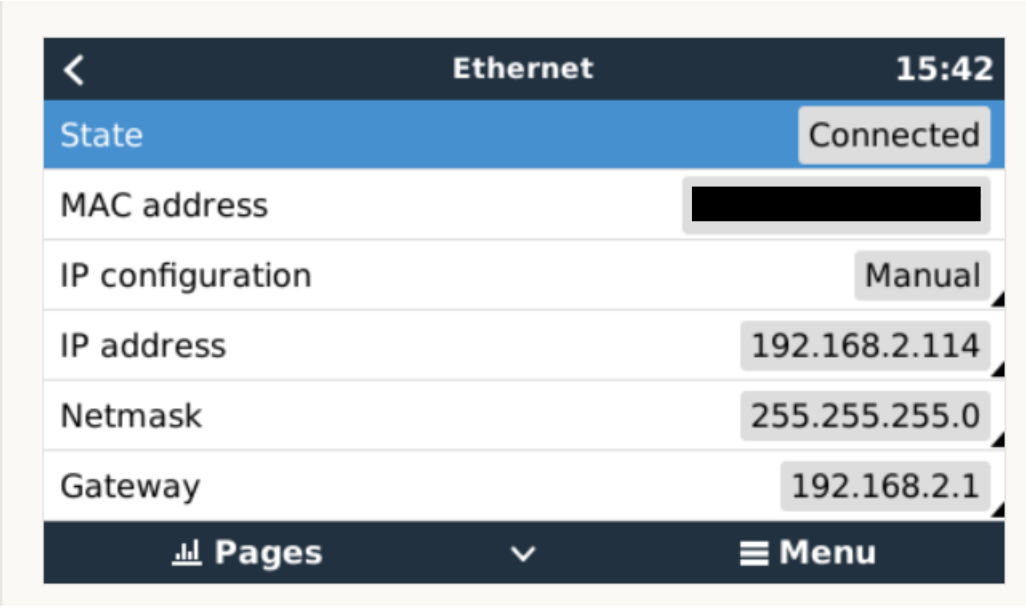


Figure 1: showing the setup of a static network on the Ethernet page

3 Configuring the Victron system

3.1 Checking ESS Availability

On the Victron VRM, there are two locations that need to be checked and configured. Under the settings, first check if the ESS is configured, A diagram has been included to show the page expected if a battery has NOT been configured correctly.

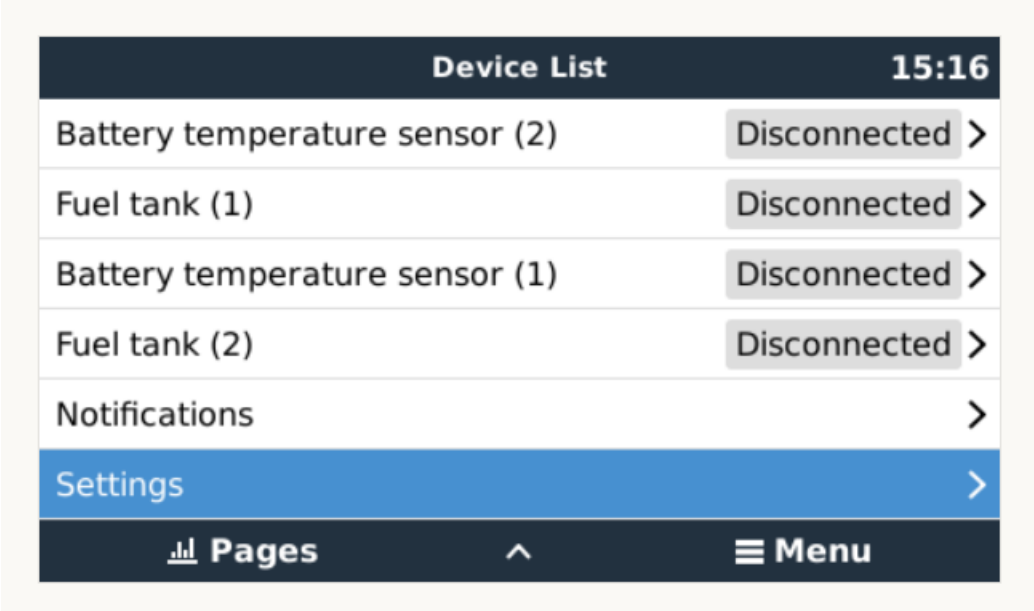


Figure 2: the VRM main page, highlighting the settings

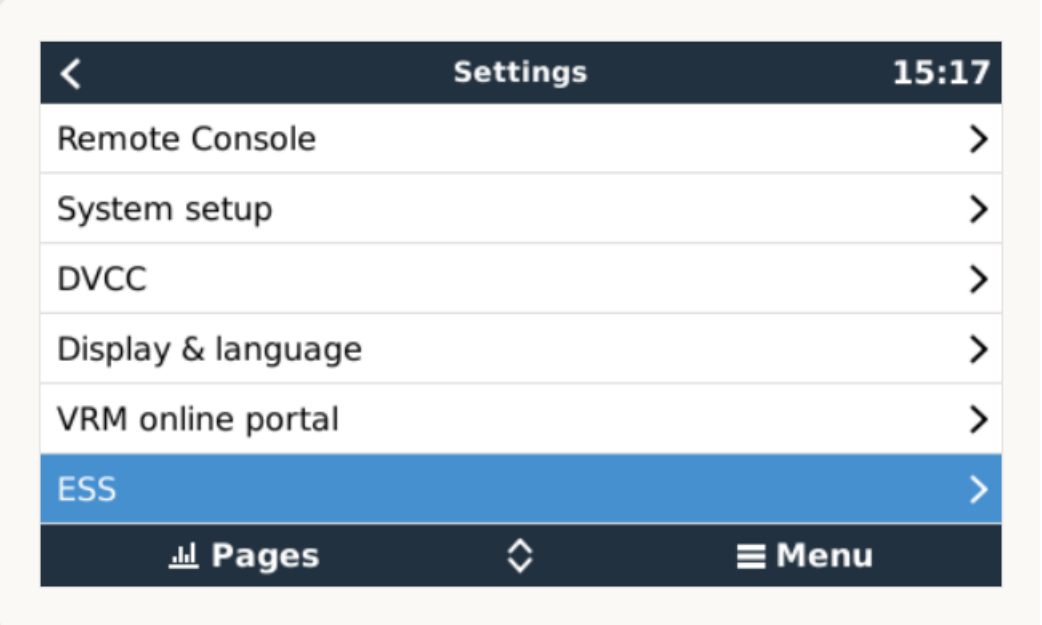


Figure 3: the settings page, highlighting the ESS

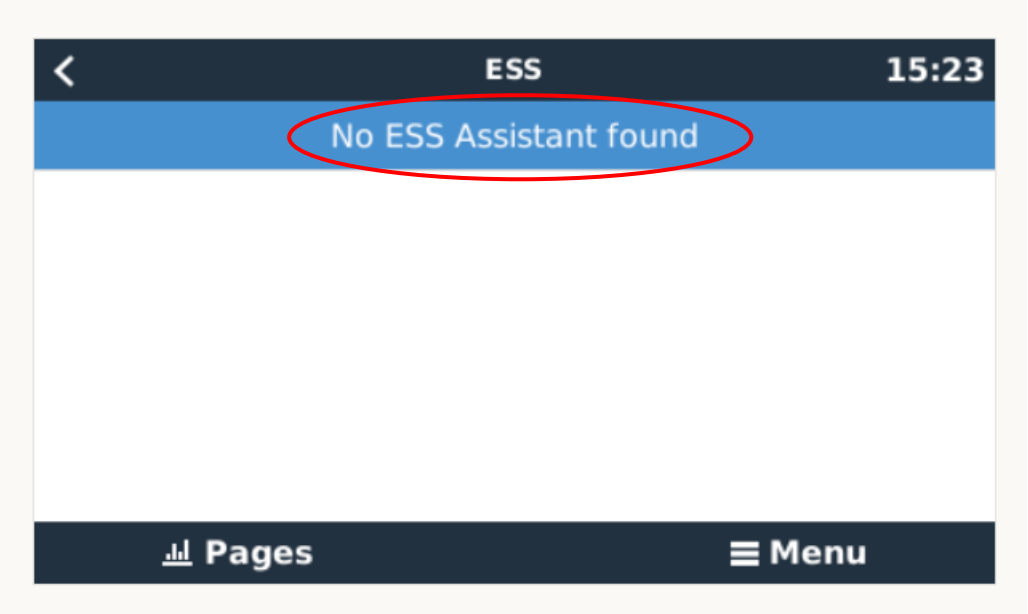


Figure 4: The ESS page, showing that a battery has not been correctly configured

3.2 Checking Modbus Accessibility

For the ImpHub to apply control it communicates with the Victron device via Modbus. This service is turned **off by default** and **needs to be enabled**. In addition, there are services within **Modbus** which have **unit IDs** these are important for configuring the Victron system on the engineering console, so it is best to take note of them.

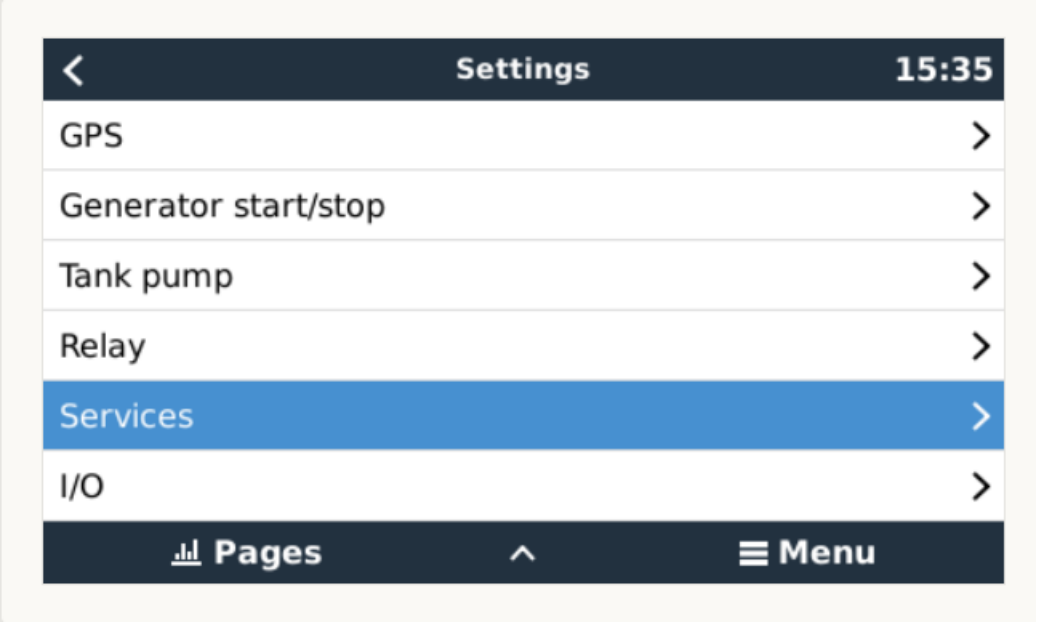


Figure 5: The settings page, highlighting the services

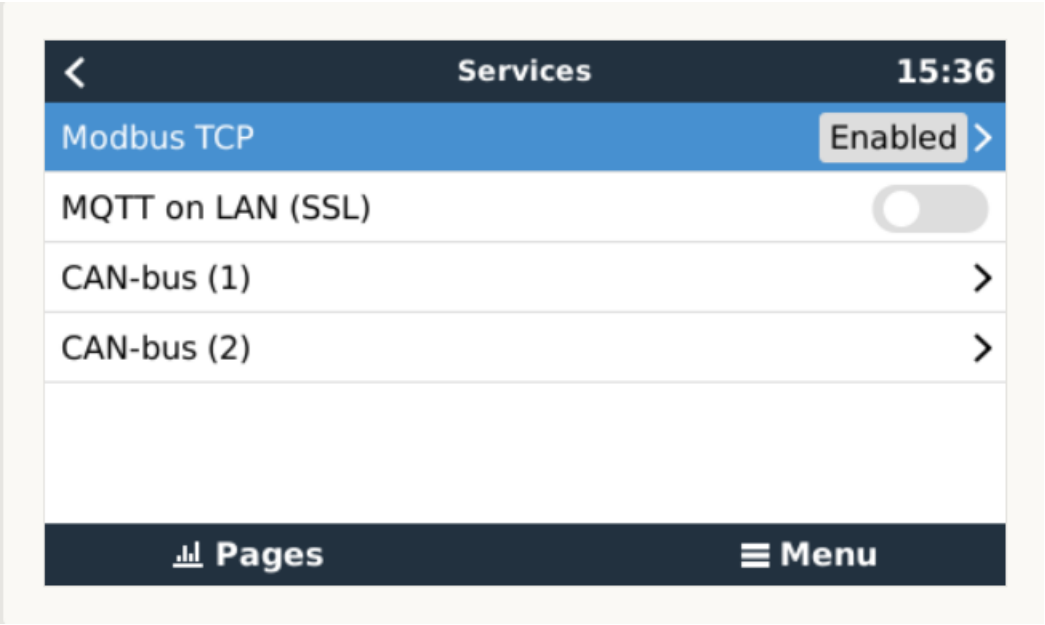


Figure 6: The services page, highlighting Modbus settings

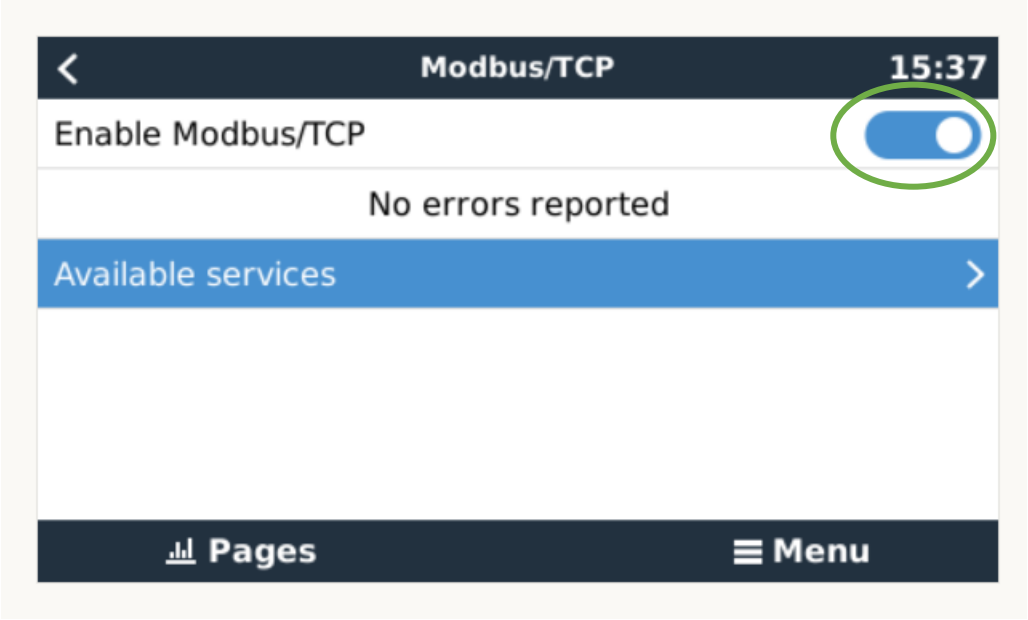


Figure 7: The Modbus settings, with Modbus enabled, highlighting the services

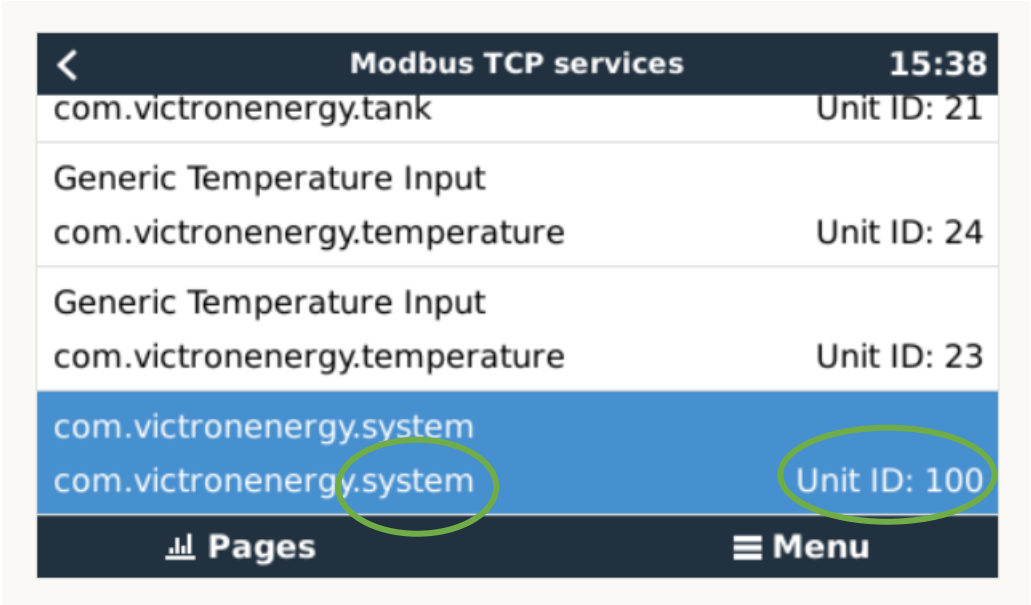


Figure 8: The Modbus services page, showing the system module and its Unit Id

4 Configuring the impHub

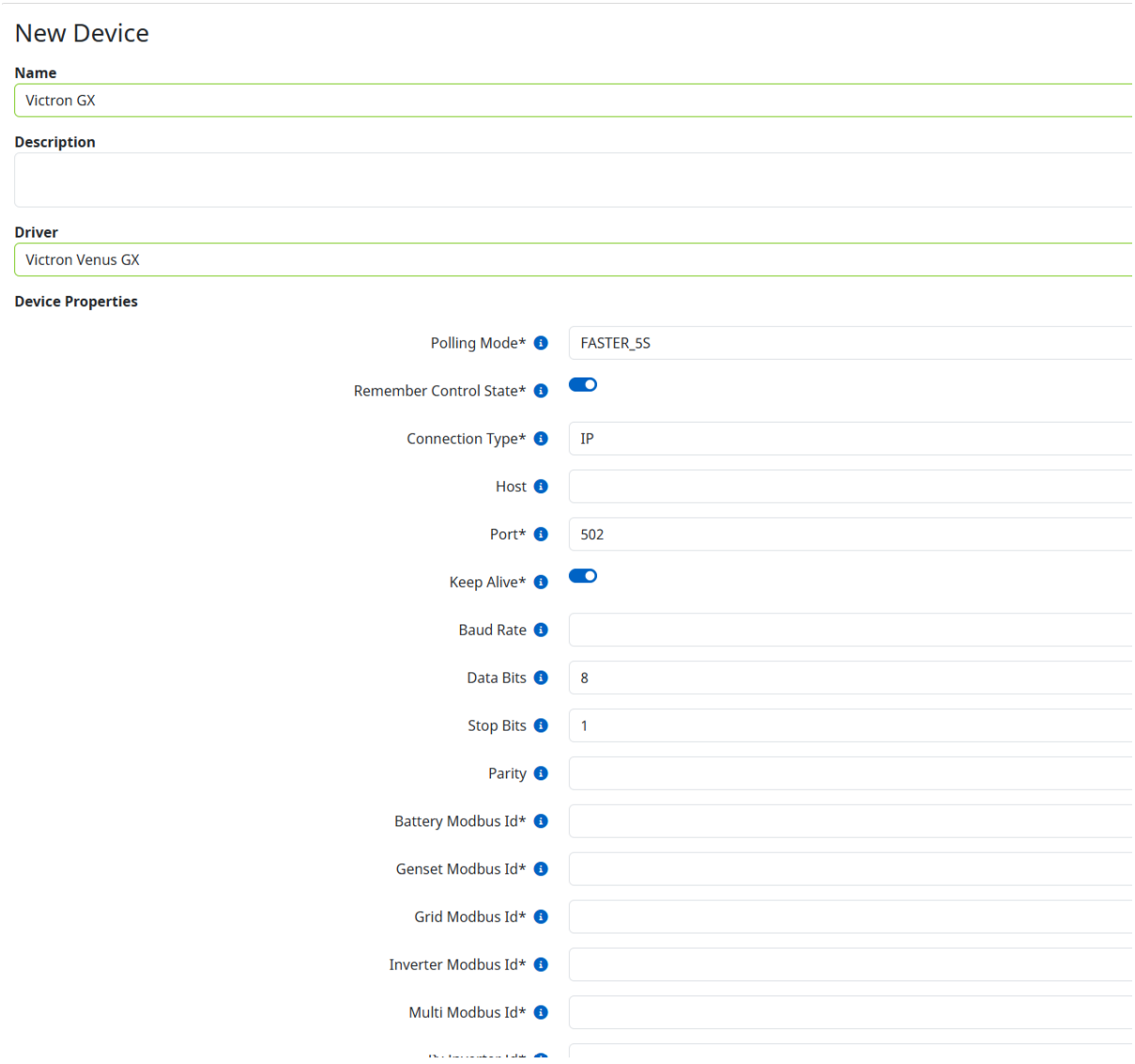
For the impHub you will need to add the following devices:

Device	Driver	Key Settings
Victron main device	Victron Venus GX	Ip of Victron device Modbus ids Polling Mode: FASTEST_1S
Battery	Victron GX Battery	Max capacity

		Max power Minimum Soc Maximum Soc Default stored charge
Battery Meter	Victron GX Battery Meter	Polling Mode: FASTEST_1S
Grid Meter	Victron GX Grid Meter	Polling Mode: FASTEST_1S
Battery Balancer	Battery Balancer	Polling Mode: FASTEST_1S
Solar Meter	Victron GX PV Meter	Polling Mode: FASTEST_1S

4.1 Victron Main Device

Navigate to devices and select the 'Victron Venus GX' from the 'Microgrid' category



When configuring the Modbus IDs it is important they are configured correctly, or none of the systems will function correctly. Each ID added enables more functionality.

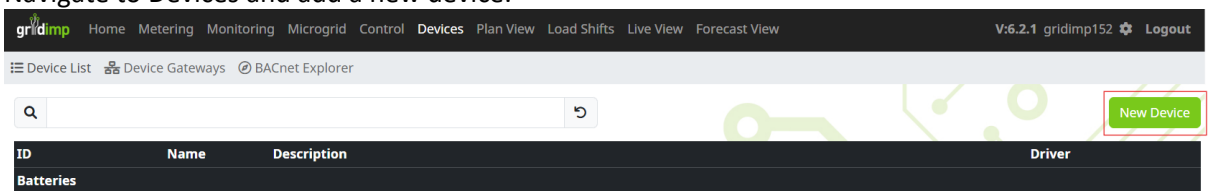
Match the names of the properties to the extension in the Modbus unit id's (See Figure 8 in section 3.2)

Setting	**Recommended Value**
Polling Mode	FASTEST_1S

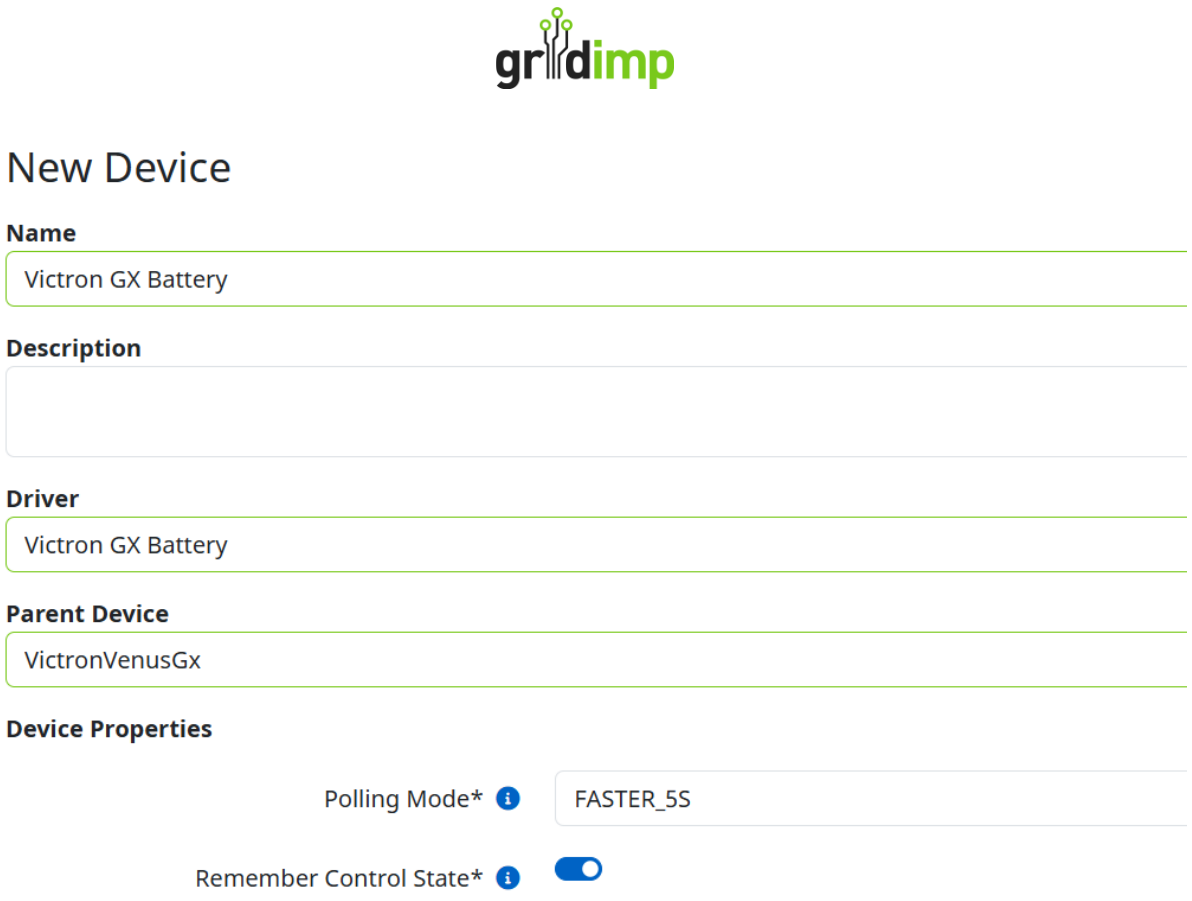
Remember Control State	True
Connection Type	IP
Host	The IP of the Victron
Port	502
Keep Alive	True
Baud Rate	BAUD_RATE_19200
Data bits	8
Stop bits	1
Parity	None
Battery Modbus id	Unit ID of the .battery Modbus extension or 0 if not present
Genset Modbus id	Unit ID of the .genset Modbus extension or 0 if not present
Grid Modbus id	Unit ID of the .grid Modbus extension or 0 if not present
Inverter Modbus id	Unit id of the .inverter Modbus extension or 0 if not present
Multi Modbus id	Unit id of the .multi Modbus extension or 0 if not present
Pv Inverter Modbus id	Unit id of the .pvinverter Modbus extension or 0 if not present
Solar Modbus id	Unit id of the .solarcharger Modbus extension or 0 if not present
System Modbus id	100 unless the unit ID of the .system Modbus extension is different
Vebus Modbus id	Unit ID of the .vebus Modbus extension or 0 if not present

4.2 Battery and Battery Meter

Navigate to Devices and add a new device.



Select the driver “Victron GX Battery”, name the device “Victron Battery” and apply the following settings:



Setting	Recommended Value
Parent Device	The Victron main device
Polling Mode	FASTER_5S
Remember Control State	True
Battery Control Mode	BATTERY_MANAGED
Max Power (kW)	This is the maximum discharge power of the system. Use a value of 30 or 50, depending on which inverter you have. Multiply the inverter power by the number of Inverters.
Max Capacity (kWh)	This is the total installed storage capacity
Soc Limit	True
Minimum SOC	2%
Maximum SOC	99%
Battery Control Mode	BATTERY_MANAGED
Power Smoothing Minutes	1

Add another device, call it “Battery Meter” and choose the driver “Victron GX Battery Meter”. Select the “Victron main device” as the parent device.

4.3 Grid Meter

Add a new device, call it “Grid Meter” and use select the driver “Victron GX Grid Meter”. choose “FASTEST_1S” for the polling speed. All other settings can be left as default.

4.4 Battery Balancer

Add a new device, call it “Battery Balancer” and select the driver “Battery Balancer”. Apply the following settings:

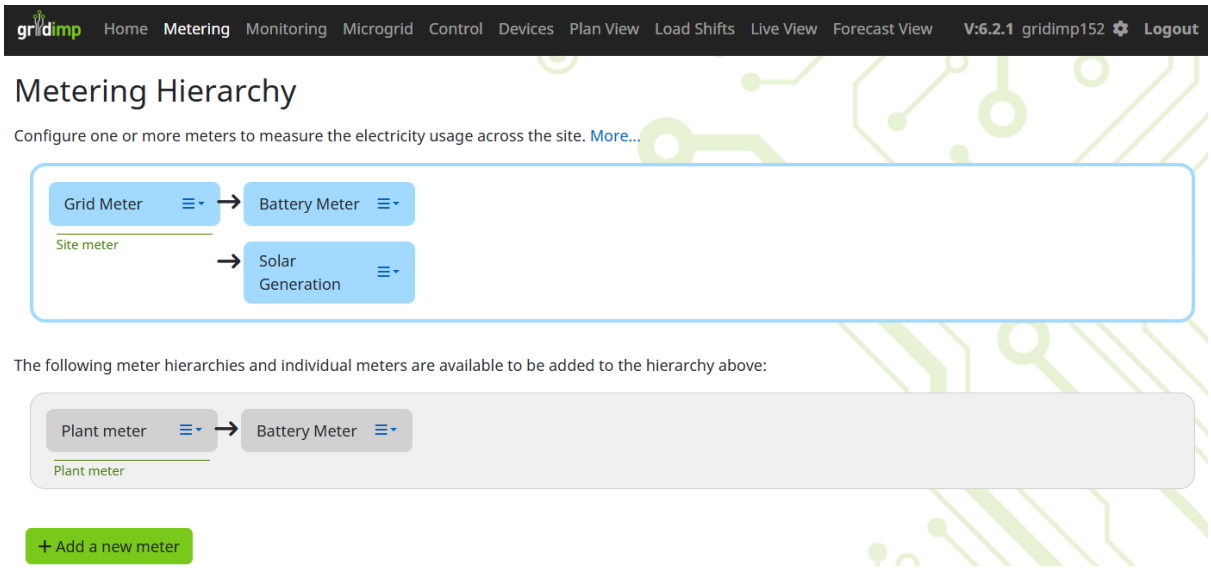
Setting	Recommended Value
Polling Mode	FASTER_5S
Remember Control State	True
Batteries	Add the battery defined in the previous step
Balancing Meter	Add the grid meter, this meter needs to be monitoring the power at the grid connection point
Max Import Power (kW)	The maximum allowed import power for the site at the grid connection point
Max Export Power (kW)	The maximum allowed export power for the site at the grid connection point
Charge Percent	50%
Discharge Percent	50%
Reading Timeout Minutes	5
Safety Margin	10%
Default Peak Setpoint	0
Default Soak Setpoint	0
Default Balancing Point	0
Pid Type	DUAL_POINT
Pid Kp	0.8
Pid Ki	0.3
Pid Kd	0.3
Has Curtailment	False

4.5 Solar Metering

Add a new device, call it “Solar Generation” and select the driver “Victron GX PV Meter”. choose “FASTEST_1S” for the polling speed. All other settings can be left as default.

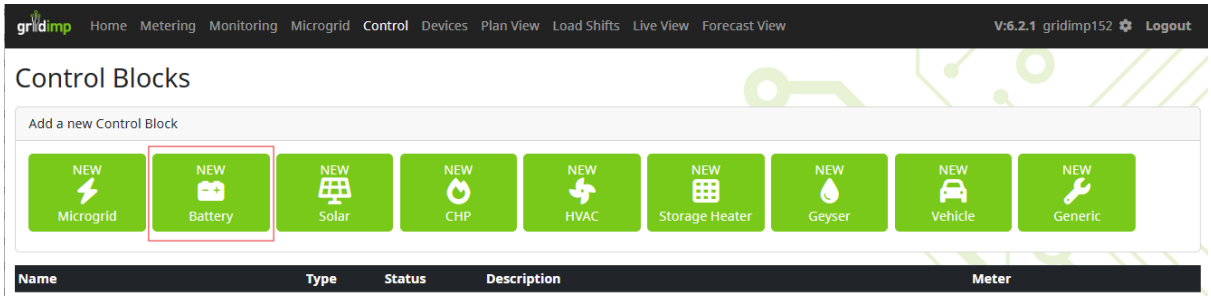
4.6 Metering Hierarchy

Next, you need to configure the metering hierarchy. Navigate to the page “Metering” and select the “Grid Meter” you set up as the “Site Meter”. Then add below this the “Battery Meter” and “Total Solar Generation” that you created.



4.7 Battery Control Block

Navigate to the Control page and click on the "New Battery" to add a new battery control block. Name the battery control block "Battery Control Block" and use the following settings:



Setting	Recommended Value
Meter	Battery Meter
Minimum Reward (p/kWh)	7p/kWh – you can adjust this to represent the amortized cycle cost of the battery if this information is available
Carbon Intensity (gCO2/kWh)	0
Battery Policy	MCP1 – Variable Tariff MCP2 – Flat Tariff
Balancing Meter	Grid Meter
Balancer Device	Battery Balancer

4.8 Solar Control Block

If there is solar generation on site, then navigate to the Control section on click on the "New Solar". Name the battery control block "Solar Control Block" and use the following settings:

Setting	Recommended Value
Meter	Total Solar Generation
Forecast Name	Solar Forecast
Latitude	The Latitude of the Site (You can find this on impCloud under the associated Fiscal Meter)
Longitude	The Longitude of the Site
Elevation	Elevation of the site, the default value is 20m
Timezone	The time zone of the size default is “EUROPE_LONDON”

You then need to specify the installed system, in terms of inverters, strings and panels. Note that you must select “open rack” for the rack type.