

# Equipment Note Victron GX systems

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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

	Connected
	Manual
	192.168.2.114
	255.255.255.0
	192.168.2.1
~	<b>≡</b> Menu
	~

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.

	Device List	15:16
Battery temperature se	ensor (2)	Disconnected >
Fuel tank (1)		Disconnected $>$
Battery temperature se	ensor (1)	Disconnected $>$
Fuel tank (2)		Disconnected $>$
Notifications		>
Settings		>
<u>네</u> Pages	^	<b>≡</b> Menu
igure 2: the VRM main page, highlighting the settings		



<	Settings	15:17
Remote Console		>
System setup		>
DVCC		>
Display & language		>
VRM online portal		>
ESS		>
<u>ااا</u> Pages	\$	<b>≡</b> Menu
Figure 3: the settings page, hig	gnlighting the ESS	
1	ESS	15:23
< No	ESS ESS Assistant found	15:23
< No	ESS ESS Assistant found	15:23
لا No الا	ESS ESS Assistant found	15:23

#### 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.



<	Settings	15:35
GPS		>
Generator start/stop		>
Tank pump		>
Relay		>
Services		>
I/O		>
<u>네</u> Pages	^	<b>≡</b> Menu
gure 5. The cettings page highl	ighting the convices	

Services
15:36

Modbus TCP
Enabled >

MQTT on LAN (SSL)
Image: CAN-bus (1)

CAN-bus (1)
>

CAN-bus (2)
>

Figure 6: The services page, highlighting Modbus settings



<	Modbus/TCP	15:37
Enable Modbu	JS/TCP	
	No errors reported	$\smile$
Available serv	vices	>
Pag <u>ااا</u>	jes	<b>≡</b> Menu

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

<pre></pre> <pre>&lt;</pre>	Modbus TCP services Itank	15:38 Unit ID: 21
Generic Temperate com.victronenergy	ure Input v.temperature	Unit ID: 24
Generic Temperate com.victronenergy	ure Input v.temperature	Unit ID: 23
com.victronenergy com.victronenerg	.system .system	Unit ID: 100
<u> 네</u> Pages		<b>≡</b> Menu

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

New Device	
Name	
Victron GX	
Description	
Driver	
Victron Venus GX	
Device Properties	
Polling Mode* 🕚	FASTER_5S
Remember Control State* 🕚	
Connection Type* 🜖	IP
Host 🕚	
Port* 🚯	502
Keep Alive* 🕚	
Baud Rate 🚺	
Data Bits 🏮	8
Stop Bits 🕚	1
Parity <b>1</b>	
Battery Modbus Id* 🕚	
Genset Modbus Id* 🏮	
Grid Modbus Id* 🟮	
Inverter Modbus Id* 🕚	
Multi Modbus Id* 🜖	
De la constante da la 🧥	

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 pre-
	sent
System Modbus id	100 unless the unit ID of the .system Modbus extension is dif-
	ferent
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.

gridimp	Home	Metering	Monitoring	Microgrid	Control	Devices	Plan View	Load Shifts	Live View	Forecast View		V:6.2.1 gridim	p152 🍄 Logout
E Device Li	st 뫎 D	evice Gatev	vays 🥥 BAC	net Explorer									
۹								5					New Device
ID		Nam	e D	escription								Driver	
Batteries													

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



## New Device

Name		
Victron GX Battery		
Description		
Driver		
Victron GX Battery		
Parent Device		
VictronVenusGx		
Device Properties		
	Polling Mode* 🔋	FASTER_5S

Remember Control State\* 🔋 🔍

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. Mul-
	tiply 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.



gridim	) Home	Metering	Monitoring	Microgrid	Control	Devices	Plan View	Load Shifts	Live View	Forecast View	<b>V:6.2.1</b> gr	idimp152 🏟	Logout
	ering	Hiera	rchy to measure t	he electricit <u>i</u>	y usage a	cross the s	site. More	0-				0	
G	rid Meter	=+	Battery M Solar Generatio	eter ≡• n ≡•									
The follo	wing mete	r hierarchie	es and individ	ual meters a	ire availab	le to be a	dded to the	hierarchy ab	ove:				5
PI Plan	ant meter	<u></u> =- →	Battery Me	eter ≡•									
+ Ad	d a new m	eter											

## 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:

grildimp		Metering	Monitoring	Microgrid	Control	Devices	Plan View	Load Shifts	Live View	Forecast Vie	w		V:6.2.1 gridimp152 🏟	Logout
Contr	ol B	locks												$\square$
Add a ne	ew Contr	ol Block												
N Mic	IEW J rogrid	Ba	IEW - + attery	NEW Solar		NEW O CHP		NEW HVAC	Stora	NEW Be Heater	NEW Geyser	NEW	NEW J Generic	
Name				Туре	Stati	12	Descripti	on				Me	eter	

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.