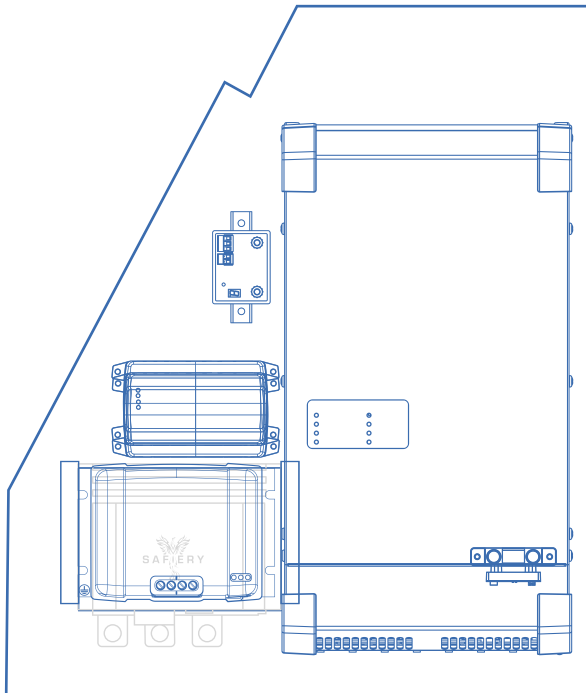




JUPITER C

USER MANUAL



Tomorrow's Technology, Today

WWW.SAFIERY.COM

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Introduction

The **Jupiter** pack can be used as an integrated power conversion, battery charger, monitor, 12V power supply for off road vehicles. It is especially suitable for vehicles with smart alternators (a Euro 5 or 6 smart alternator), which often supplies charging voltage that is too low even with the engine running or in the event of a voltage drop over long cables, controlled charging is crucial.

Controlled charging also protects the alternator in lithium systems from overloading, as the low impedance of lithium batteries results in a high alternator current.

The **Jupiter** is set only to supply power when the engine is running. This is possible thanks to the integrated engine shutdown detection. This eliminates the need to adjust in-vehicle wiring or add an engine detection sensor to determine if charging can start. It also prevents the starter battery voltage from getting too low.

The **Jupiter** is fully programmed and monitored using the VictronConnect App. This also includes remote access via VictronConnect-Remote (VC-R) when connected to a GX device (requires a GX device connection to the VRM Portal) via the integrated VE.Direct port, monitoring via the GX Remote Console or from a PC, Apple computer with macOS or Android device in conjunction with a VE.Direct to USB interface and VictronConnect. Discover all setting and monitoring options in the Setup & monitoring with VictronConnect [15] chapter and the VictronConnect manual.

Silent while vehicle charging

The heat is dissipated through natural convection, eliminating the need for a noisy cooling fan.

Features

Smart alternator compatibility

It is common for vehicle manufacturers to install "smart" ECU (Engine Control Unit) controlled alternators to increase fuel efficiency and reduce emissions. Smart alternators provide variable output voltage and shut down when not needed.

The **Jupiter** has an integrated mechanism that detects whether the engine is running (engine shutdown detection), so the charger is only activated when the alternator is supplying power. This ensures that the charger only draws power when the alternator supplies power. See the Engine shutdown detection [12] chapter for more information.

Separation of the starter battery and the service battery

The Jupiter separates the starter battery from the service battery.

Comprehensive electronic protection

The charger is protected against overtemperature (bottom plate $>90^{\circ}\text{C}$) by reducing the output power when the maximum product temperature is reached.

- Protected against overload
- Protected against short circuit
- Protected against excessive temperatures

Adaptive charging in four stages

The Jupiter is configured by default for a four-stage charging process.

• Bulk — Absorption — Float — Storage

• Bulk

During this phase, the Jupiter supplies as much charging current as possible to quickly charge the batteries.

• Absorption

When the battery voltage reaches the absorption voltage setting, the charger switches to constant voltage aka absorption mode. For lead-acid batteries, it is important that the absorption time is kept short during superficial discharges to avoid overcharging the battery. After a deep discharge, the absorption time is automatically increased to ensure that the battery is fully charged again. For lithium batteries, the absorption time is fixed, 2 hours by default. Fixed or adjustable modes can be selected via the battery settings.

• Float

During this phase, the battery is charged with a trickle charge voltage to keep it in a fully charged state. When the battery voltage drops far below this level, for example, due to a high load for at least 1 minute, a new charge cycle is activated.

• Storage

The battery voltage is maintained at the configured storage voltage, which is slightly reduced compared to the float voltage to minimise gassing and extend battery life whilst the battery is unused and on continuous charge.

Flexible charge algorithm

The Jupiter has fully programmable charge algorithms and eight pre-programmed battery settings. Configurable with VictronConnect.

Adaptive Absorption Time

In adaptive absorption time mode, the correct absorption time is calculated automatically. Configurable with VictronConnect.

Repeated Absorption

To refresh the battery and prevent slow self-discharge while in storage stage over an extended period, a 1-hour absorption charge will automatically occur every 7 days (or as configured).

Adjustable charge current

The charge current is adjustable with a minimum step size of 0.1A. Configurable with VictronConnect.

Low-temperature shutdown

Prevents damage to lithium batteries by turning off the charger at low temperatures. Configurable with VictronConnect.

Input voltage lock-out

Shut down the charger when the input voltage falls below the lock-out value and restart when the input voltage rises above the restart value. Configurable with VictronConnect.

Remote On/Off

The inverter can be switched on and off remotely via the remote on/off connector or the VictronConnect App. Typical applications include a wired switch or a lithium battery with a Battery Management System (BMS) that has an ATC (allowed to charge) output.

Distributed Voltage and Current Control (called DVCC)

The **Jupiter** pack has DVCC built in. When a CAN BMS battery is used like the Safiery 200Ah Lithium, charging currents and voltages are then set automatically; thus, the internal bulk, absorption, and float algorithms are no longer used. Charging or discharging are stopped at low or high cell voltage or low temperature. This automates the whole charging process in an absolutely safe way and extends battery life.

Monitoring locally via a GX device as well as remotely on the VRM Portal

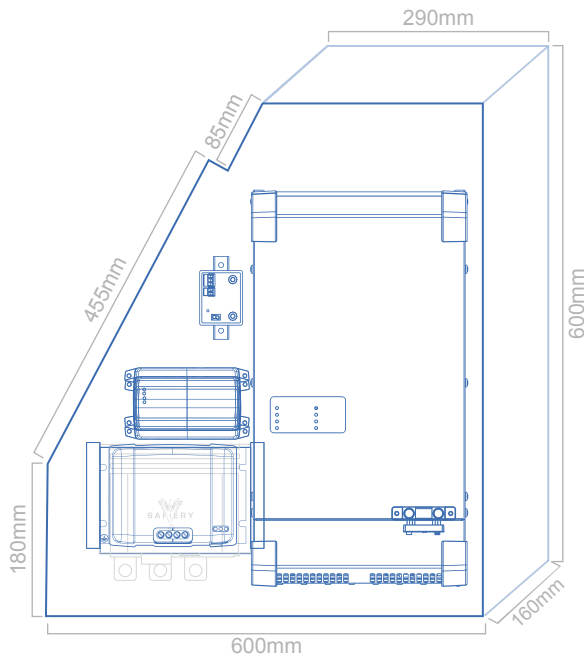
Monitor and control (on/off) the Jupiter via a wired VE.Direct connection from a GX device such as the Cerbo GX, Ekrano GX, or use a PC, Apple computer (requires macOS), or Android device in conjunction with VictronConnect.

If the **Jupiter** is connected to a GX device with internet access, you can also monitor the **Jupiter** remotely via the VRM portal. Predefined widgets with all the necessary parameters are already available in the VRM portal. You can also create your own customised widgets.

Configuration and monitoring via VictronConnect App and Bluetooth

OVERVIEW

- STAR-Light 10 Channel**
Dimmable LED Dual Colour + RGBW
- 240V AC 15A Power Input**
Charges up to 1750W
- 2000VA Inverter/Charger**
Victron Multiplus II Auto-cutover
- 240V RCBO Protection MAX 9**
Magnetic Highest Quality Off Road
- Victron 5In Touch Screen**
Batteries, Solar, DC-DC, Tanks, Temps
- 50A DC DC Orion XC**
Auto-tunes to any Alternator
- STAR-Switch 8 Button Backlit**
Waterproof Double Press Dual Colour
- Resettable Breaker Switches**
Better than Fuse
- 1000W Solar Panel Ready**
Victron Smart Solar MPPT
- Double Flush GPO**
Switch is 12V Master or Case LED
- Suite 12V USB Outlets**
Double USB A, Type C, QC, Cigarette Lighter
- Tank, Temp - 4 Channels Each**
Alternator temp, Tanks
- 100A Battery - Amphenol Secure**
Click and Connect
- 200A Alternator - Amphenol Secure**
Click and Connect
- 2 Can - NMEA Secure**
Optional Battery, STAR-Switch, STAR-Touch
- 3 Anderson - Plug and Connect**
20A Fridges, 50A Compressors, Solar in



VICTRON GEAR LIST

MultiPlus-II 48V 3kVA



PowerControl	Yes
PowerAssist	Yes
AC Input	Input voltage range: 187-250V
Input frequency	50 Hz

The MultiPlus-II is a multifunctional inverter/charger with all the features of the MultiPlus, plus an external current sensor option which extends the PowerControl and PowerAssist function to 50 A resp. 100 A. The MultiPlus-II is ideally suited for professional marine, yachting, vehicle and land based off-grid applications. It also has built-in anti-islanding functionality, and an increasingly long list of country approvals for ESS application.

[Full technical information](#)


MPPT 100/20 Solar Charge Controller



Rated charge current	20A
Peak efficiency	98%
Battery voltage	112/24/48V

The SmartSolar charge controller will even recharge a severely depleted battery. It can operate with a battery voltage as low as 0 Volts, provided the cells are not permanently sulphated or otherwise damaged.

[Full technical information](#)


Cerbo GX Communication Centre + GX Touch 50 Display



This communication-centre allows you to always have perfect control over your system from wherever you are and to maximise its performance.

Simply access your system via our Victron Remote Management (VRM) portal, or access it directly, using the GX Touch screen on the Jupiter case or the VictronConnect app thanks to its Bluetooth capability.

[Full technical information](#)


Smart Battery Protect



The Smart BatteryProtect disconnects the battery from non-essential loads before it is completely discharged (which would damage the battery) or before it has insufficient power left to crank the engine.

[Full technical information](#)


Smart Shunt Battery Monitor



The SmartShunt is an all in one battery monitor, only without a display. You can conveniently read out all monitored battery parameters, like state of charge, time to go, historical information and much more via the Cerbo GX on the GX Touch display.

[Full technical information](#)


SAFIERY GEAR LIST

SCOTTY AI 3kW 12-48V CANbus Bi-directional DC to DC



- Scotty AI DC DC uses the internal regulator of an alternator. Factory Supplied.
- Scotty AI DC DC does NOT modify or add to the alternator in any way.
- Scotty AI DC DC has an accurate temperature sensor that is placed on the alternator housing.
- When Scotty AI is running, the machine learning logs the alternator temperature operating range.
- AI monitors rate of change of temperature with current, time and voltage to identify out of range conditions.
- When out of range occurs, Scotty AI sets the mode back a level: Hard to Medium, Medium to Soft and Soft to Off.

Full technical information



STAR-Light



CAN wired Bluetooth Wireless 10 Channel 20A Controller.

Up to Eight LED's controlled

- 8 LED's one colour
- 4 LED's two colour
- 2 LED's RGBW

Full technical information



STAR-Switch - Optional Engraved Custom Buttons



STAR-Switch is an IP67 robust 8-Button Switch Block. Built to withstand the toughest conditions. Compact Design: 105x 63x 16mm.

Full technical information



HAGER WBSP2XS-MB SILHOUETTE SERIES GPO

Fan set to 40C°



DoublePowerpoint, Switchplug Combination, With Extra Switch, Single Pole, Flush, Horizontal, 250V 10A, 3 Pin, Matt Black

The additional button is wired as the **Remote ON/OFF** button for the Inverter.



AC Inlet

Scotty Breaker

12V Circuit Breakers

C16 MCB&RCBO

12V Ports



STAR-Light
Breaker

12V
Fridge

High
Power



AC IN

AC OUT



Cigarette
Lighter

Dual
USB

USB C
USB

250A Amphenol Connectors

50A Anderson plugs

50A Anderson plugs



Battery
Negative



Starter
Battery



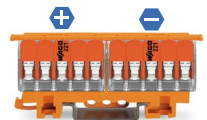
Aux
Battery



Fridge

Solar

HighPower



+

-

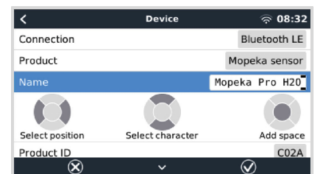
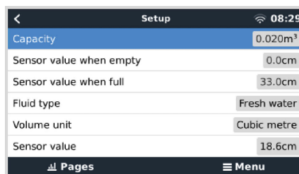
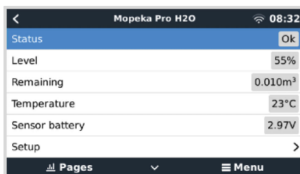
The **Cerbo-S GX** is a powerful member of the GX product family with extensive communication ports and the option to add a touchscreen display for extended functionality. GX products are Victron's state-of-the-art monitoring and control solution that run our Venus OS operating system. It sits at the heart of your energy installation. All the other system-components such as inverter/chargers, solar chargers, and batteries are connected to it. The **Cerbo-S GX** ensures that they all work in harmony.

To monitor and control your system, you can simply access it remotely via our Victron Remote Management (VRM) portal from anywhere in the world using an internet connection. Or access it directly, using the optional GX Touch screen, a web browser, a Multi-Functional Display (MFD) [92] or our VictronConnect app.

The Remote Console [46] serves as the primary control center for monitoring, controlling and managing your system. The **Cerbo-S GX** also provides VRM: Remote firmware updates and allows settings to be changed remotely.

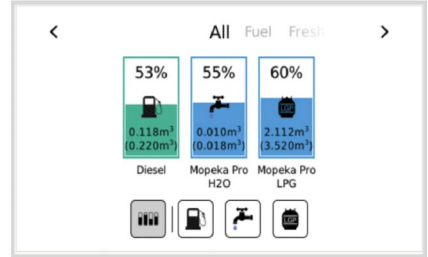
Configuration

1. Go to the Device List menu.
2. Scroll up or down and select the appropriate sensor.
3. Press the right arrow key or space bar on that sensor to open up the sensor Setup menu.
4. Scroll down to Setup and right arrow key or space bar again to open up the sensors Setup menu.
5. In the Setup menu you can change the tank capacity, select the liquid type and volume unit, set up calibration values for empty and full tank levels and read the actual sensor value.
6. After setup, go back to the Sensor overview menu.
7. Scroll down, select Device and press the right arrow key or space bar again to open up the device settings menu.
8. In the Device menu you can assign a custom name to the sensor and read out some additional device information.
9. Repeat steps 1..8 if you want to set up additional sensors.



Tank levels can be monitored at various locations within the GX environment:

- Device List of the GX device
- Sensor overview menu of the GX device
- Graphical overview of the GX device
- VRM Dashboard
- VRM advanced menu widgets
- VRM App widgets



Wireless Bluetooth Ruuvi temperature sensors

The Ruuvi sensor features temperature, humidity and atmospheric pressure streamed wirelessly to the GX device via Bluetooth.

To connect the Ruuvi sensors to the GX device via Bluetooth, the GX device needs Bluetooth functionality. Some GX products already have built-in Bluetooth, all others can easily be retrofitted using a standard USB Bluetooth adapter (see the Victron GX product range overview for GX products that have built-in Bluetooth).

However, an additional USB Bluetooth adapter, also for GX devices with built-in Bluetooth, allows for limited relocation of the Bluetooth radio (via a USB cable extension) close to other supported Bluetooth devices that might not otherwise be reachable.

External USB Bluetooth adapters that have been tested and known to work:

USB Bluetooth adapter				
Insignia (NS-PCY5BMA2)	Logilink BT0037	TP-Link UB400(UN)	Kinivo BTD-400	Ideapro USB Bluetooth adapter 4.0
Ewent EW1085R4	Laird BT820	Laird BT851	-	-

Installation procedure

Make sure that Bluetooth is enabled in the Bluetooth menu (enabled by default).

Go to the Settings → I/O → Bluetooth sensors menu and then click Enable to enable Bluetooth temperature sensors.

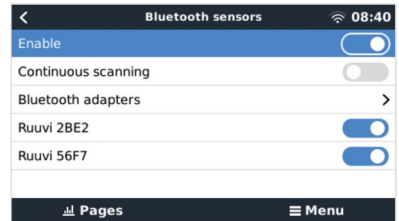
The Ruuvi sensors come supplied with a removable plastic pull tab. This prevents it from discharging while on the shelf. Pull out the plastic tab and the unit will start transmitting its temperature information.



The sensor should appear in the menu, "Ruuvi ####" - with a 4 hexadecimal device ID, enable the specific Ruuvi sensor.

The Bluetooth adapters submenu displays a list of available Bluetooth adapters. The menu option Continuous scanning permanently scans for new Bluetooth sensors. Note that this option affects the WiFi performance of the GX device.

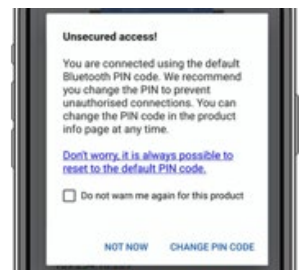
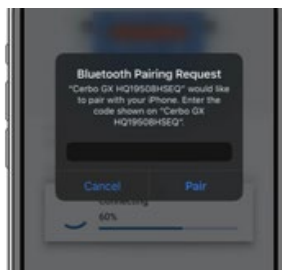
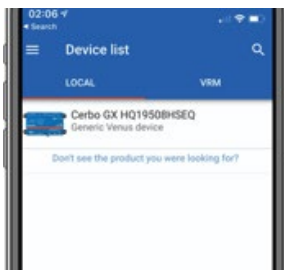
Only enable this option if you need to search for new Bluetooth sensors. Otherwise, leave this option disabled.



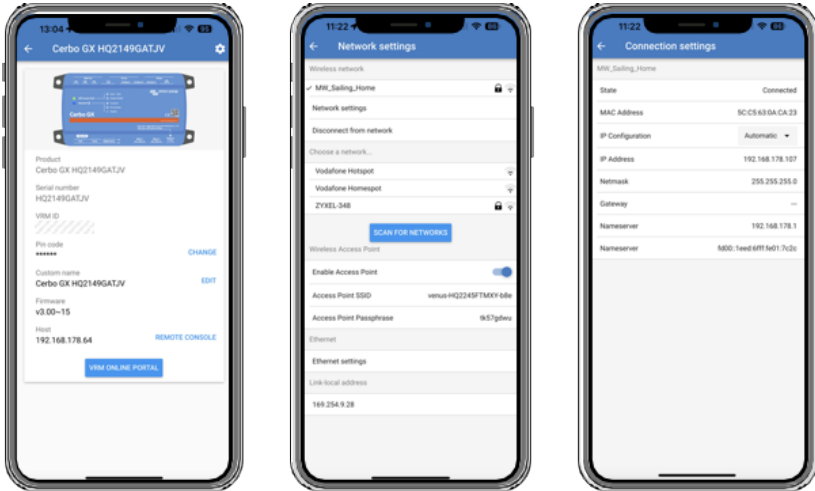
Using VictronConnect via Bluetooth

If you are just getting started for the first time with VictronConnect, you may wish to begin with the VictronConnect manual.

1. Download the latest version of the VictronConnect app onto your Bluetooth compatible device (phone or laptop), and make sure that Bluetooth is enabled.
2. Make sure the Cerbo-S GX is powered on and the Bluetooth LED is blinking.
3. Open the VictronConnect app within 10 meters of the Cerbo-S GX and wait for nearby devices to be discovered.
4. Once discovered, click or tap on the Cerbo-S GX.
5. On first connection you will be asked to enter a Bluetooth PIN code. The default PIN code is 000000.
6. For GX devices that use the default PIN code, you will then be asked to change this insecure default PIN code to a more secure unique code. Please set your unique code, and then put it in a safe place for passwords in case you forget.



From the main device screen it is possible to change the network and ethernet settings, enable or disable the built-in WiFi Access Point, view the system on VRM, or open the Remote Console (requires a WiFi connection to a local network or the access point of your GX device). For the network settings, tap or click the cog wheel icon.



Bluetooth can only be used for initial connection and networking configuration, and cannot connect to other Victron products such as SmartSolar charge controllers. If you need to connect other Victron products, please refer to the [Connecting Victron products \[10\]](#) chapter.

Accessing via built-in WiFi Access Point

This method requires the VictronConnect app to be installed on your smartphone, tablet or laptop.

Steps to connect automatically via the QR Code:

1. Locate the QR code sticker on the side of the Cerbo-S GX
2. Scan the QR code using your phone's camera function, or a QR code scanning app
3. If supported by your phone, this will prompt you to connect you to the WiFi Access point
4. Once connected, open VictronConnect
5. Select the GX device from the list
6. Open the Remote Console

Steps to manually connect:

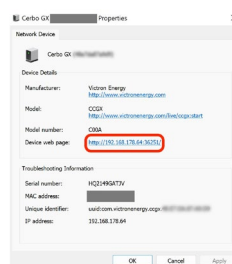
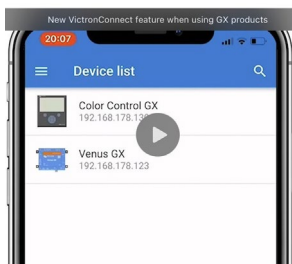
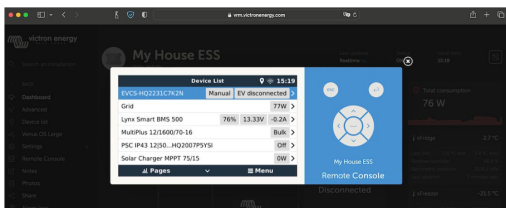
1. Stand as close as possible from the Cerbo-S GX, and no further than a few meters away.
2. Go to the WiFi settings on your phone, tablet or laptop.
3. After searching, the Cerbo-S GX will show up in the list, as Venus-HQ1940DEF4R-3b6. Where HQ... is the serial number as printed on the side of the box.
4. Connect to WiFi using the 'WiFi key' which you will find printed on the side of the box ...and also on a card in the plastic bag. Keep that in a safe place.
5. Open VictronConnect, it will start scanning the WiFi network automatically.
6. Once found, select the GX device from the list.
7. Open the Remote Console

Notes:

- If you cannot use VictronConnect, you can use a web browser and navigate to the IP address <http://172.24.24.1> or <http://venus.local>
- For added security it is possible to disable the WiFi Access Point. See Settings → Wi-Fi → Create access point in the Remote Console.

Instruction video

Watch the step-by-step instruction video on how to connect to a GX device using the VictronConnect app

**Accessing via VRM**

This method requires a working internet connection, both on your phone, tablet or laptop as well as for the Cerbo-S GX. For a new install, this means that it needs to be connected by Ethernet cable.

Step-by-step instructions:

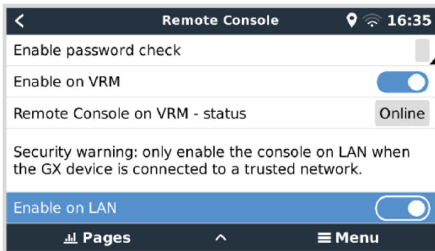
1. First, connect the Cerbo-S GX to the internet by plugging it into a working Ethernet network which has a DHCP server, as most networks do, and which is connected to the internet.

The Cerbo-S GX will immediately connect to VRM.

2. Now go to the VRM Portal, <https://vrn.victronenergy.com/>, and follow the instructions to add the device.

3. Then, once visible on VRM, click on the Remote Console link in the left-hand menu.

The result looks similar to the image above.

The Remote Console menu

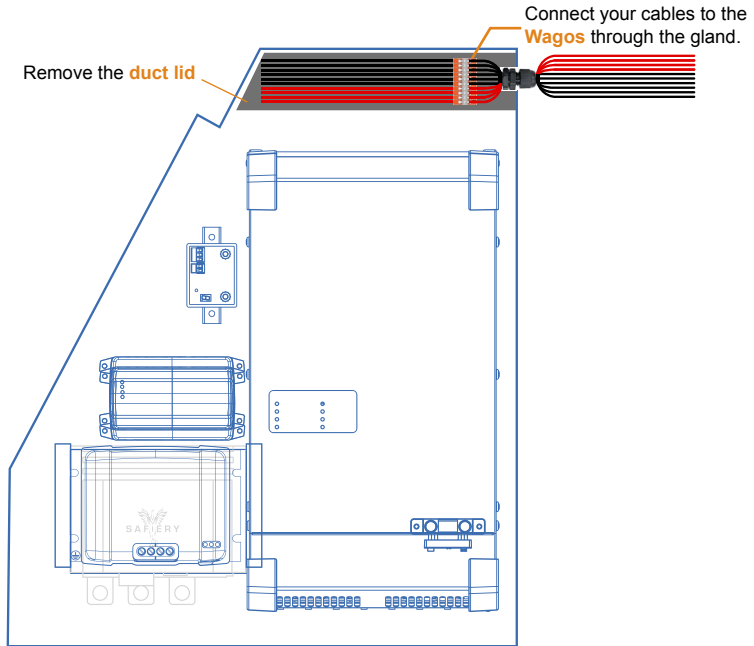
The Remote Console menu (Settings → Remote Console) contains options for controlling access to the Remote Console via LAN/WiFi and VRM and shows the online status of the Remote Console on VRM.

The options in detail:

1. **Disable password check:**
If this option is disabled, there is no password check when accessing the Remote Console.
2. **Enable password check:**
To enable password check, a password must first be assigned. Use this password when accessing the Remote Console. Keep it in a safe place.
3. **Enable on VRM:**
If enabled, the Remote Console can be used via the VRM portal from anywhere in the world. The password check (recommended) also applies if it is activated.
4. **Remote Console on VRM - status:**
5. **Enable on LAN:**
If enabled, the Remote Console can be used via local LAN/WiFi. Mind the security warning.

Note that you need to manually reboot (Settings → General → Reboot) the GX device after changing any of these settings.

STARLIGHT SETUP



STARLIGHT PROGRAMMING



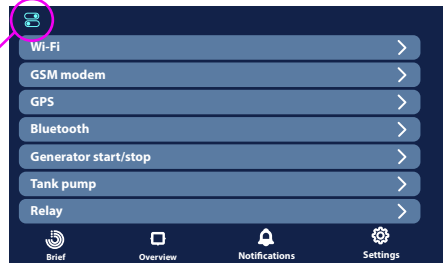
SCAN

safieri.com/product/star-light-wireless-and-wired-4-channel-led-controller

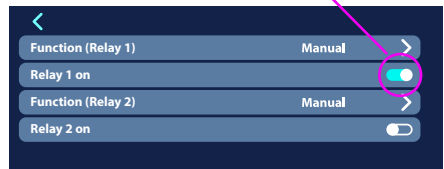
LED BACKLIGHT OPERATION

The LED light can be operated via the touch screen.

Click the **double toggle icon** in the top left corner.



Relay 1 is controlling the LED backlight. Use the toggle to turn it on/off



There is an excellent Youtube Video on programming Starlight



or scan the QR Code

Go here: <https://youtu.be/LZ-ResWF8OE>

Digital Switching of LED Lights Explained

Most LED lights dim on the negative wire. There is a technical reason for this ins LED design. This means:

6 Channels on STAR-Light are **NEGATIVE WIRE CONNECTED CHANNELS**

These are Channels 1, 2 and then 7, 8, 9, 10

For these Channels the positive wire connects to the Wago block that is fed by a **RED** Positive wire. This wire is fused with the 20A breaker on the front of the case.

Example: Dimmable canopy LED in dual colour (may have 1 or 2 positive wires and 2 negative wires: Connect the positive wires to the Positive Wago block at the top of the back of the case. Connect the negative wires to two adjacent channels using the one to one wagos sitting in the duct at the top of the case inside. Select 7&8 or 9&10 or 1&2.

For a single colour LED, use just one channel.

But if LED switches on positive then:

4 Channels on STAR-Light are **POSITIVE WIRE CONNECTED CHANNELS**

These are Channels 3, 4, 5, 6

For these Channels, the negative wire connects to the Wago block that is fed by a **Black** negative wire. This wire is fused with the 20A breaker on the front of the case.

Example: Dimmable canopy LED in dual colour (may have 1 or 2 positive wires and 2 negative wires: Connect the negative wires to the Negative Wago block at the top of the back of the case. Connect the positive wires to two adjacent channels using the one to one Wagos sitting in the duct at the top of the case inside. Select 3&4 or 5&6.

For a single colour LED, use just one channel.

Note in the Configuration using the Smartphone App, the default for the positive channels is "no dimming". If you are dimming, change this section using the App.

RGBW Lights ALWAYS switch on the negative. The channels are:

Red = Channel 9

Green = Channel 10

Blue=Channel 8

White= Channels 7

For these Channels, the positive wire connects to the Wago block that is fed by a RED positive wire. This wire is fused with the 20A breaker on the front of the case.

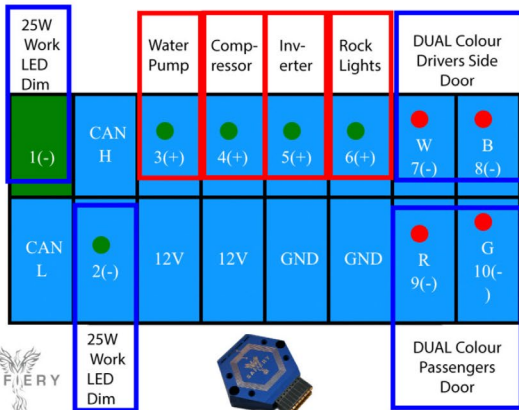
Switching NON-LED devices like water pumps and fans

ONLY the positive channels can be used natively to switch these devices.

This is channels 3,4,5 or 6

The layout below is a typical 4WD with STAR-Light and using the 8 button STAR-Switch on the front of the case. Although there are 10 channels used, double pressing 2 buttons activates the second colour channel. Therefore only 8 buttons are needed for 10 channels.

STAR-light Channel Wiring Typical Canopy
10 Channels but only 8 buttons needed because of DUAL colour Double Press Feature



	Items to be Switched	Suggested Channel	Guide Notes
1	Single Colour LED Light	If Dimmable on negative use negative channels, if positive use positive channels	Current per channels limited to 48W DO NOT USE FOR FRONT LIGHT BAR OF WORK LIGHTS > 48W
2	Front Light Bar	None	Use relay driven by vehicle dimming control and switch if required in cab. Do Not use STAR-Light.
3	Side Work Lights	As per item 1 if less then 48W.	Maximum power all lights on at same time is 10A on negative and 10A on positive. 10A = 120W
	FRock lights	As per item 1	
4	RGBW Light	As per RGBW Setup	Multiple RGBW strips can be combined provided the maximum load when all turn on is < 48W
5	Compressor Single Stage	Channels 3.4.5 or 6 But ONLY to a relay	No direct power connection
6	Compressor Dual Stage	Channels 3.4.5 or 6 But ONLY to a relay	Common use is ARB Dual Stage
7	Water Pump	Channels 3.4.5 or 6 But ONLY is less then 7A	Intermittent use on positive channel
8	Fridge	NEVER use STAR-Light, always wire direct to fridge. Jupiter has dedicated Anderson plug on rear for up to 3 fridges	Reason is there is too much risk someone accidentally turn fridge off on switch and ruins all the food.
9	Travel Buddy Oven	Either use: Channels 3.4.5 or 6 But ONLY to a relay OR Use High Power Anderson at back of Jupiter Case and don't run oven at same time as compressor.	
10	Fans	Channels 3.4.5 or 6	Power less then 48W
11	Other 12V devices	Channels 3.4.5 or 6	Power less then 48W

STAR-Tank RADAR BLUETOOTH SENSORS



STAR-Tank sensor support has been added to Venus OS. These radar sensors use BLE (Bluetooth Low Energy). This wireless technology allows devices to be networked within a range of about 40 meters (with Bluetooth Adapter), while consuming significantly less power than ordinary Bluetooth technology. The expected battery life is 5 years with tank measurement averaging 50%. Battery life is less at around 3 years if tanks average 10% level for example.

STAR-Tank sensors feature phased co-herent radar sensing for non-pressurised tanks. They suite black water tanks, even with foam above the liquid line. The sensors are attached to the top of the tank. The liquid level, temperature and sensor battery voltage are streamed wirelessly to the GX device.

STAR-Tank reports at 60 second intervals. Pressing the button on top of **STAR-Tank** accelerates the reporting to a 10 second interval for 10 minutes. This is to aid commissioning. It also confirms the radar functionality is operating with a quick flash of the LED around the button.

The radar sensor is approved with FCC for USA and is CE and UKCA approved.

The temperature value can be used to trigger the temperature relay function on the GX device with relays to initiate stirrers of heaters in tanks as well as notification of this.

To connect **STAR-Tank** sensors to the GX device via Bluetooth, the GX device needs Bluetooth functionality. Some GX products already have built-in Bluetooth, all others can easily be retrofitted using a standard USB Bluetooth adapter (see the Victron GX product range overview for GX products that have built-in Bluetooth).

However, an additional USB Bluetooth adapter, also for GX devices with built-in Bluetooth, allows for limited relocation of the Bluetooth radio (via a USB cable extension) close to other supported Bluetooth devices that might not otherwise be reachable.

USB Bluetooth adapters that have been tested and known to work:

USB Bluetooth adapter

Insignia (NS-PCY5BMA2)	Logilink BT0037	TP-Link UB400(UN)	Kinivo BTD-400	Ideapro USB bluetooth adapter 4.0
Ewent EW1085R4	Laird BT820	Laird BT851	-	-

Installation



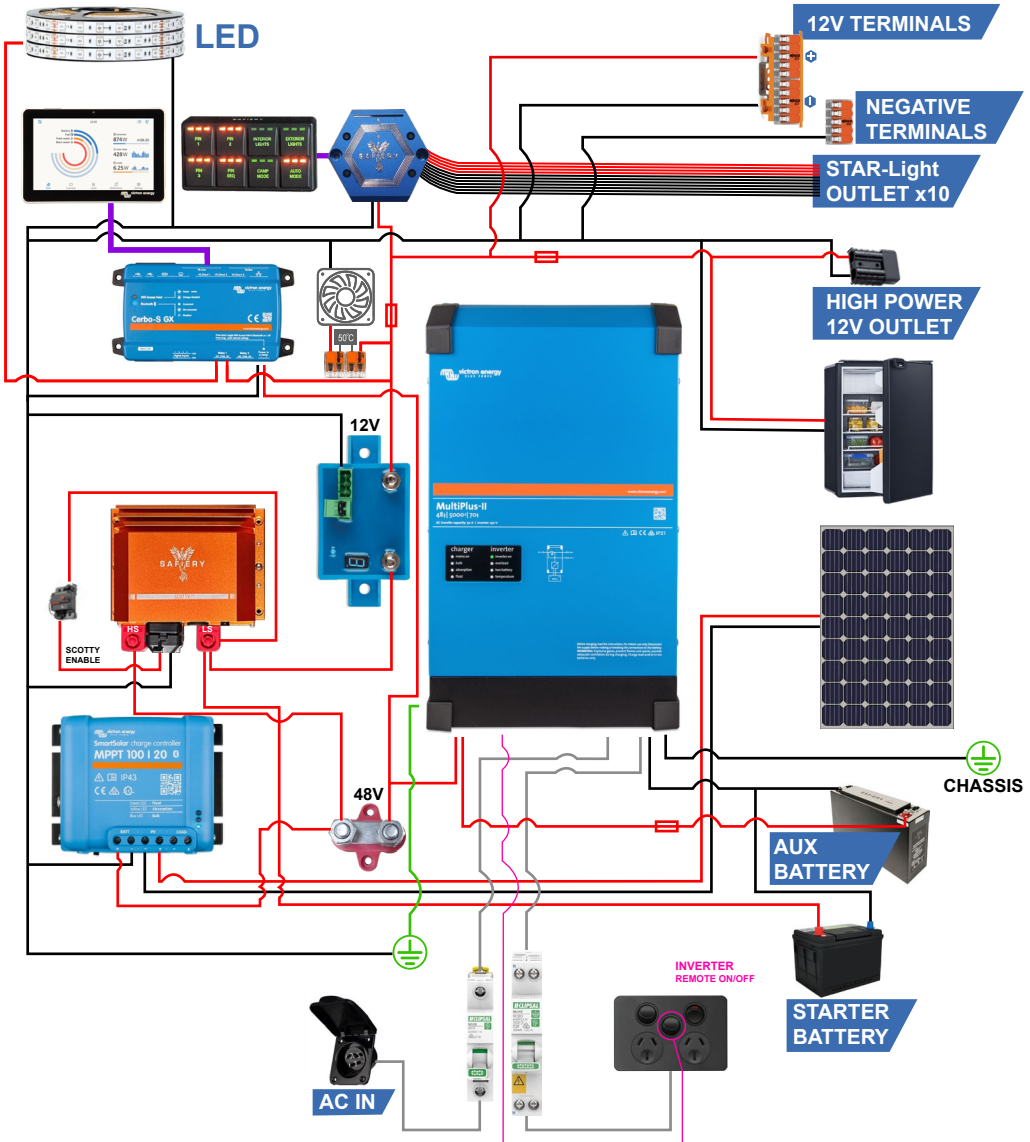
Device List		08:29
AC load	61W	>
Diesel	53%	>
Fresh water tank (34)	23°C 55%	>
LPG tank (35)	15°C 65%	>
MPPT 75/15 rev2 beta	4W	>
MPPT 150/35 rev2 BS	22W	>
Pages  Menu		

The installation of the STAR-Tank sensor is very simple. First, however, the sensor must be installed according to Safiery's installation instructions.

Then the installation and configuration is done in the GX device as described below.

- 1 Make sure Bluetooth is enabled in the Bluetooth sensors menu (enabled by default).
- 2 Go to Settings → I/O → Bluetooth sensors menu.
- 3 Move the Enable slider to the right to enable Bluetooth sensors.
- 4 To find your STAR-Tank sensor, scroll down until you see them.
- 5 To activate the sensor, move the slider to the right. It should now appear on the Device List.
- 6 Repeat steps 1..5 for more than one sensor.

WIRING DIAGRAM



SAFETY INSTRUCTIONS



SAVE THESE INSTRUCTIONS – This manual contains important instructions that shall be followed during installation and maintenance.



Danger of explosion from sparking and danger of electric shock

General

Please read the safety instructions below before installing and using the Jupiter to avoid risks of fire, electric shocks, personal injuries or equipment damage.

This product is designed and tested in accordance with international standards. The equipment should be used for its designated application only and in accordance with the specified operating parameters.

Installation

For electrical work, follow the local national wiring standards, regulations and these installation instructions.

Install the product in a heatproof environment. Ensure therefore that there are no chemicals, plastic parts, curtains or other textiles, etc. in the immediate vicinity of the equipment.

It is normal for the Jupiter to get hot during operation. Keep any objects that are heat-sensitive away.

Never install or use the product at sites where gas or dust explosions could occur.

Use flexible multi-stranded copper cables for the connections (UL: Class I; IEC: Class 5).

The installation must include a fuse in accordance with the recommendations in the table [Cable type recommendations](#) [5].

Operation, service and maintenance

Ensure that the equipment is used under proper operating conditions.

This device is not to be used by persons (including children) with reduced physical, sensory or mental capabilities or lack of experience and knowledge unless they have been given supervision or instruction.

Always provide proper ventilation during charging.

Avoid covering the Jupiter 12/12-50A DC-DC battery charger.

Never place the battery charger on top of the battery during charging.

Prevent sparks close to the battery. A battery being charged could emit explosive gasses.

Refer to the battery manufacturer's specifications to ensure that the battery is suitable for use with this product. The safety instructions of the battery manufacturer must always be observed.

In addition to this manual, the system operation or service manual must include a battery maintenance manual applicable to the type of batteries used.

Do not use the device if it shows any signs of damage or does not function properly.

Do not use the Jupiter if it is broken, defective, cracked, damaged, or malfunctioning.

The Jupiter contains no serviceable parts.

Regular maintenance of the Jupiter is not required.

Avoid moisture, oil/soot/vapours, and keep the device clean.

Clean the front side of the Jupiter using a dry cloth.

3.1. Mounting

- Mount vertically on a non-flammable surface, with the power terminals facing to rear.
- For optimum performance, a minimum of 2cm space should be kept free around the clear cover of Jupiter to allow air circulation.

3.2. Cable type recommendations

For correct connection of a cable to the input/output screw terminals, stranded wires with flexible cores can be used according to: Cables with twisted cores are very stiff, which means that they are rarely used in practice. The table below provides an overview of how to recognise the different wire classes.

ALWAYS Connect a negative wire from the battery negative terminal to the vehicle chassis ground. The connection needs to be bolted on clean finished bare metal. After bolting it can be sprayed with protection anti-corrosion material.

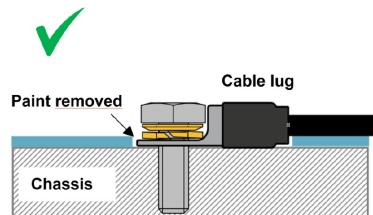
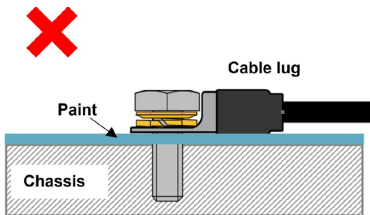
Recommended Wire Size		
Nominal cross-section	Alternator < 5m Negative to chassis ground	Alternator > 5m but < 10m Negative to chassis ground
One 50A DC DC	50mm ² / 0 AWG	70mm ² / 00 AWG
Two 50A DC DC for 100A total	Double Above	Double Above
ALWAYS Connect a negative wire from the battery negative terminal to the vehicle chassis ground		

3.3 GND connection

In many cases, the GND connection is connected to the chassis via a cable lug. For a low-impedance connection, the cable lug must have direct contact with the metal of the chassis, the contact surface must therefore be free of paint, see below images.



Make sure the GND connection on the vehicle's chassis has a low impedance.



1. the force on the wire, thereby maintaining a gas-tight contact pattern during heating and cooling cycles over time. Take the time to do it right. This is important. This is a UL486 test requirement and a requirement for all factory and field installations.

OPERATION, CONFIGURATION AND MONITORING

4.1. Engine shutdown detection

The engine shutdown detection mechanism simplifies your Jupiter system by detecting if the engine is running without wiring additional switches or sensors. The factory default setting will work with most conventional and smart alternators but can be re-configured with the VictronConnect App.

Configuring engine shutdown detection is determined by the alternator voltage. Conventional alternators will generate a fixed voltage (e.g. 14V), whereas the voltage of smart alternators can vary between 12.5V to 15V. Smart alternators in a regenerative braking system often show large voltage variations.

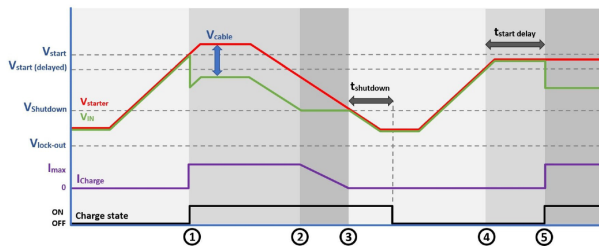
Engine shutdown detection is only active in charger mode. The feature can be configured, disabled and reactivated as described in the [Engine shutdown detection & input voltage lock-out \[18\]](#) section. In power supply mode, the Input voltage lock-out determines when the output is active.

4.2. Engine shutdown detection sequence

The following procedure describes the operation of the engine shutdown detection sequence.

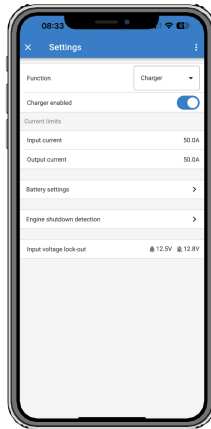
Engine shutdown detection sequence

1. 0 → 1: If the engine runs, the alternator voltage will ramp up. When $V_{\text{starter}} > V_{\text{start}}$, charging is enabled.
2. 1 → 2: The input current produces a voltage across the input cable (V_{cable}); this voltage reduces the voltage measured by the charger (V_{IN}). If $V_{\text{IN}} > V_{\text{shutdown}}$, the charger will operate at I_{max} .
3. 2 → 3: If $V_{\text{IN}} \leq V_{\text{shutdown}}$, the charge current will be reduced to prevent V_{IN} to drop below V_{shutdown} .



4. 3 → 4: If $V_{\text{IN}} < V_{\text{shutdown}}$ for longer than 1min (t_{shutdown}), "engine off" is detected and charging is disabled. If $V_{\text{IN}} > V_{\text{shutdown}}$ before t_{shutdown} runs out, charging remains enabled.
5. 4 → 5: If $V_{\text{start}}(\text{delay}) < V_{\text{IN}} < V_{\text{start}}$, charging is enabled after t_{start} delay (configurable).

4.2.1. Engine shutdown detection & input voltage lock-out



Engine shutdown detection

To configure engine shutdown detection settings, open VictronConnect, connect to your Jupiter and from the status page press the cog icon to get to the Settings page.

The following settings can be changed with VictronConnect:

Engine shutdown detection enabled/disabled: The engine shutdown detection is always enabled by default whenever the charger mode is selected. When the function is disabled or when power supply mode is selected, the engine is considered to be running, so no shutdown detection will take place.	Engine shutdown detection enabled When disabled, the engine is always considered to be running. 
Alternator type: For the type of alternator you can choose between "Smart alternator", "Regular alternator" and "User defined". When the "Smart alternator" option is selected, the default values for the smart alternator will be applied to the engine shutdown detection settings. The same will happen when "Regular alternator" option is selected. When any of the settings differs from the default values of the last two option, the "User defined" option will be selected. Default: smart alternator.	Smart Alternator Regular Alternator User defined
Start voltage (V_{start}): At this level, charging starts immediately. Default: 14V.	Start voltage When the input voltage reaches this level, the engine is immediately considered to be running, allowing the charge procedure to start. 14.00 CANCEL OK
Delayed start voltage ($V_{\text{start(delay)}}$): Smart alternators can generate a lower voltage when the engine is running, therefore a lower start level is necessary for these systems. To ensure that the starter battery is recharged after starting the engine, charging of the auxiliary/service battery is delayed during this condition. The energy used during starting must be replenished to ensure that the starter battery remains properly charged. Default: 13.3V (smart alternator) and 13.8 (regular alternator).	Delayed start voltage When the input voltage is above this level for more than the "Delayed start voltage delay", the engine is considered to be running, allowing the charge procedure to start. This delay is useful to allow the starter battery to be recharged after starting up the engine. For example, 13.30 CANCEL OK

Delayed start voltage delay ($t_{\text{start delay}}$): Recharge time for the starter battery during start voltage mode. Example: If the starter draws 150A for 5 seconds to start the engine, approx. ~0.2Ah is drawn from the starter battery. If, during engine idling, the alternator can only generate 20A, it takes $150\text{A}/20\text{A} \times 5\text{s} = 37.5\text{s}$ to recharge the starter battery. Default: 120 seconds.

Delayed start voltage ...

(Delay to be used for the "Delayed start voltage".)

— 120s +

CANCEL OK

Shutdown voltage (V_{shutdown}): This level corresponds with the engine being off. This keeps the starter battery fully charged and provides a hysteresis with respect to the start level. The hysteresis must be large enough to prevent V_{IN} to drop to V_{shutdown} which would result in charge current reduction. Action will be taken after t_{shutdown} runs out (1 minute); this allows charging during temporary low voltage conditions. Default: 13.1V (smart alternator) and 13.5V (regular alternator).

Setting range for start and stop voltages: 9 to 17V

Shutdown voltage

When the input voltage gets below this level for more than 60s, the engine is considered to be shutdown, making the charging procedure stop.

— 13,10 +

CANCEL OK

Input voltage lock-out

Setup input voltage lock-out: Input voltage lock-out is the minimum level at which charging is allowed, below this level charging stops immediately. Default (in charger mode): lock-out: 12.5V / restart: 12.8V. Default (in power supply mode): lock-out: 10.5V / restart: 12V.

When 'forced charging' is enabled, current will be drawn from the starter battery if the engine is not running. Setting the lock-out level very low or deactivating the input voltage lock-out can result in a depleted starter battery.

To setup input voltage lock-out, two criteria are important:

- **Minimum alternator voltage:** A smart alternator can operate at very low alternator voltage (<12.5V) e.g. when the vehicle accelerates. Charging during this low voltage is allowed during t_{shutdown} as shown in "engine shutdown detection sequence 3→4". If charging must remain enabled during this period, the lock-out level must at least be set below the minimum alternator voltage.

Note: When the input undervoltage period exceeds t_{shutdown} , engine shutdown detection will disable charging.

- **Voltage drop across the input cable:** As seen in "engine shutdown detection sequence 1→3", V_{IN} will be lowered by V_{cable} . When the alternator voltage drops quickly (smart alternator), the voltage control needs some time to reduce charge current and keep V_{IN} at V_{shutdown} . During this adjustment period, V_{IN} can even drop below $V_{\text{lock-out}}$, which activates the undervoltage protection and stops charging. To prevent this, $V_{\text{lock-out}}$ must be set as follows: $V_{\text{lock-out}} \leq V_{\text{shutdown}} - V_{\text{cable}}$.

Example: Calculate the input cable voltage drop:

- Distance between starter battery and charger: 5m
- $V_{\text{shutdown}} = 13,1\text{V}$. Recommended wire gauge: 16mm²
- Cable resistance: ~1,1 mΩ/m @20 °C, thus $R_{\text{cable}} = 1,1\text{m}\Omega \times 10\text{m} (2 \times 5\text{m}) = 11\text{m}\Omega$
- At a maximum input current of 50A, this results in:
- $V_{\text{cable}} = 11\text{m}\Omega \times 50\text{A} = 550\text{mV}$
- $V_{\text{lock-out}} \leq V_{\text{shutdown}} - V_{\text{cable}} = 13,1\text{V} - 550\text{mV} = 12,55\text{V}$.

Cable connections, external fuses, temperature, etc. influence the total cable resistance.

Input voltage lock-out

When the input voltage falls below this level, the input will be deactivated until the input voltage rises above restart value.

Input voltage lock-out ☒

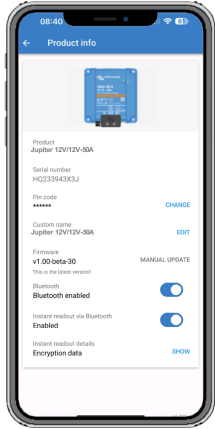
A. Lock-out value — 12,5V +

B. Restart value — 12,8V +

CANCEL OK

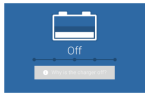
4.2.2. Product information page

By clicking the  button on the top right of the Settings menu, it is possible to access the product information screen:

Product shows the Jupiter model.	
Serial number shows the serial number of the unit.	
Pin code allows the pin code to be changed. This is recommended to be done so settings and information won't be easy to access.	
Custom name allows you to change a custom product name to your liking. By default, the product name "Jupiter" plus the serial number is displayed.	
Firmware shows the firmware version currently installed on the device and also allows the charger to be updated if required.	
Bluetooth: Bluetooth is enabled by default and can be disabled if necessary. To re-enable Bluetooth, please see the "How to disable and re-enable Bluetooth" chapter in the VictronConnect manual .	
Note that re-enabling Bluetooth requires a VE.Direct to USB interface connection between the Jupiter and a PC, Mac or Android device. iOS devices such as the iPhone and iPad do not support serial USB devices.	
Instant readout via Bluetooth: Use the slider to disable/enable Instant readout.	
Instant readout details: Displays the MAC address and encryption key for the unit.	

4.2.3. Monitoring

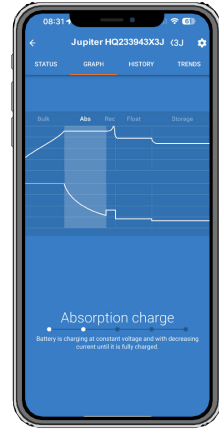
4.2.4. Charger mode - Status screen

Jupiter [serial number] or a specified custom name confirms the connected device.	
Mode icon: indicates which mode the Jupiter is operating in (in this case Charger Mode).	
Charger State:	
• Bulk: During this stage, the Jupiter supplies the set charging current to quickly charge the batteries. When the battery voltage reaches the Absorption voltage setting, the Jupiter activates the Absorption stage. • Absorption: From this stage, the Jupiter switches to the constant voltage mode, where a pre-set absorption voltage suitable to the battery type (see Charger mode - Battery settings [16]) is applied. When the Absorption time has elapsed, the Jupiter activates the Float stage. • Float: During this stage, the float voltage is applied to the battery to maintain a fully charged state. When the battery voltage drops below Re-bulk voltage for at least 1 minute, a new charge cycle will be triggered. • Storage: During this phase, storage voltage is applied to the battery. If the battery has been connected to the battery charger for more than 48 hours, further lowering the charging voltage can prevent corrosion in lead-acid batteries. • Other possible states depending on the system and battery settings are: Off (engine not running or other reason), Repeated absorption, Equalize, Auto-equalize, BatterySafe, External control (controlled by a BMS), Power Supply Mode	
Output voltage: Voltage measured at the output terminals of the device.	
Output current : Output amperage.	
Output power: Output power in Watts.	
Input Voltage: Voltage measured at the input terminals of the device.	
Input current: Current drawn by the charger.	
Input power: Input power in Watts.	
Why is the charger off?: Appears below the battery icon and indicates the reason why the Jupiter is turned off.	

4.2.5. Charger mode - Graph screen

Jupiter [serial number] or a specified custom name confirms the connected device.

Charger State Graph: indicates the current charging state of the Jupiter and provides a short description of the current state.



4.2.6. History screen

The history page shows a summary of the charge cycles over the previous 30 days. Swipe the screen to the right or left to show any of the 30 days. Each column represents a cycle. Tapping on one of the bars reveals further information about duration and current for each of the charge states. Other items are:

Status

Elapsed

Charge: The accumulated charge current

Maintain: The current that keeps the battery fully charged during the float or storage phase.

Type: Battery profile used

Vstart: The lowest battery voltage at the start of the charge cycle

Vend: The lowest battery voltage at the end of the charge cycle

Operation time: Accumulated run time of the Jupiter

Cycles started: Number of charge cycles started

Cycles completed: The number of charge cycles completed (must have reached float or storage voltage stage)

Charged Ah: Total amphotours charged with the Jupiter



4.2.7. Trends screen

The VictronConnect app allows data to be displayed graphically via the trends screen. The prerequisite is that the VictronConnect app must be open and connected with the Jupiter. The data is not stored permanently. The following parameters can be displayed:

- Input voltage
- Input current
- Input power
- Output voltage
- Output current
- Output power
- Battery temperature (only if it is provided by an external device, for example, a BMW via a VE.Smart Network).



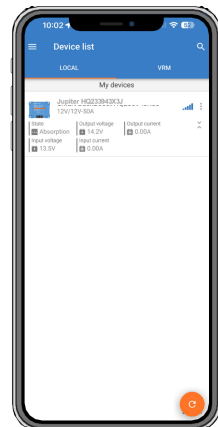
- Input Voltage (V)
- None
 - Input Voltage (V)
 - Input Current (A)
 - Input Power (W)
 - Output Voltage (V)
 - Output Current (A)
 - Output Power (W)
 - Battery Temperature (°C)

4.2.8. Instant readout over BLE

VictronConnect can display key data of the Jupiter (and other compatible smart products) on the Device list page without the need to connect to the product. This includes visual notifications of warnings, alarms, and errors that enable diagnostics at a glance. Please see the [Instant Readout chapter](#) in the VictronConnect manual for more information and how to set it up.

The advantage is:

- Better range than a regular Bluetooth connection
- No need to connect to the smart product
- Key data at a glance
- Encrypted data



4.3. Jupiter 5 in Touch Screen

Device List			08:39
A VM-3P75CT HQ23183CME		93.0 W	>
Lynx Smart BMS HQ2318PR5D3	79%	26.69V	-0.4A >
MultiPlus-II 24/3000/70-32		Bulk	>
Orion XS 12/12-50A HQ233943X3J	12.00V	0.0A	0W >
PSC IP43 24 25...HQ2230FQPF2		Off	>
SmartSolar Charger MPPT 75/15		0W	>
Pages			Menu

Monitoring Vehicle Charging

To get to the Jupiter detail page, tap the Orion in the Device List or select the Orion using the cursor keys and then press the right cursor key. The detail page offers the following options:

Switch: Turns the Jupiter on and off. Depending on the configuration made in VictronConnect, either charger or power supply mode will be started.

Input: Shows the input voltage, current and power as measured at the input terminals.

Battery: Shows the output voltage, current and power as measured at the output terminals.

State: Displays the current status of the charger or power supply mode. Possible states depending on the device mode and settings are:

Off (engine not running, or other reason, check the Off reason in VictronConnect), Bulk, Absorption, Float, Storage, Repeated-absorption, Equalize, Auto-equalize, BatterySafe, Ext. control (controlled by a BMS), Power Supply.

Network status: This can be either Slave if controlled by DVCC or Standalone device if not controlled by DVCC.

Error: If the Jupiter is in an error state, the error code will be displayed here.

Overall history: Provides an overview of operation time, number of charge cycles, charged Ah, etc.

Charge cycle history: Provides an overview of the last 30 charging cycles.

Device: Provides additional device information and allows to assign a custom device name.

Orion XS HQ233943X3J			15:14
Switch 			
Input	13.53V	0.0A	0W
Output	12.00V	0.0A	0W
State	Ext. control		
Network status	Slave		
Error	#0 No error		
Overall history	1		
Charge cycle history	2		
Device	3		
Pages		Menu	

Overall history			08:41
Operation time	5d 14h		
Charged Ah	13Ah		
Cycles started	3		
Cycles completed	2		
Nr of power-ups	9		
Nr of deep discharges	0		
Pages			Menu

Charge cycle history			08:41
Cycle 8			
Status			Completed
Elapsed time			3.4h
Charge / maintain (Ah)	10Ah	0Ah	
Battery (V _{min} /V _{end})	13.46V	14.21V	
Error	#0 No error		
Cycle 9			
Status			software reset
Elapsed time			1.1h
Pages			Menu

Device			08:42
Connected	Yes		
Connection	USB		
Product	Orion XS 12/12-50A HQ233943X3J		
Name	Orion XS 12/12-50A HQ233943X3J		
Product ID	0x43F0		
FW version	v1.00		
VBM instance	230		
Serial number	HQ233943X3J		
Pages			Menu

If there is a large ambient temperature difference between Jupiter and battery, the battery will be charged at the wrong voltages.

Trouble Shooting

5.1.1. Insufficient alternator power

Check if the Jupiter reaches the float charge stage. To investigate, look at the history tab in the VictronConnect app. The histogram displays how long the batteries have been charged in the Bulk, Absorption and Float stages for the last 40 cycles. If you click on one of the histogram columns, you will see a breakdown of the charge stages.

Use the charge times to see if the alternator power rating is properly sized for your requirements. A system which never reaches the float stage could have the following issues:

- Not enough power during idling: The power output of an alternator can be reduced to ~50% during idling.
- Too much load
- Overheated alternator causing it to reduce power output

5.1.2. Bluetooth issues

Please note that it is highly unlikely that the Bluetooth interface is faulty. The problem is most likely caused by something else.

Use this section to quickly rule out some of the common causes of Bluetooth issues. For a full troubleshooting guide see the [VictronConnect manual](#).

- **Check if Bluetooth is enabled**

It is possible to enable/disable Bluetooth in the product settings. To re-enable:

Connect to the Jupiter via the VE.Direct port. Navigate to the controller settings and then to Product info. Re-enable Bluetooth.

- **Check if the controller is powered up**

Bluetooth is active as soon as the Jupiter is powered up. This

can be checked by looking at the LEDS:

If all LEDS are off, the unit is not powered up.

If any of the LEDS are on, blinking or pulsing at a few seconds interval, the unit is powered up and Bluetooth should be functional.

- **Check that Bluetooth is in range**

In open space, the maximum Bluetooth distance is about 20 meters. In a build-up area, inside a house, a shed, a vehicle or a boat this distance can be a lot less.

- **The Windows VictronConnect app does not support Bluetooth**

The Windows version of the VictronConnect app does not support Bluetooth. Use an Android, iOS or macOS device instead. Or alternatively, connect using a VE.Direct to USB interface.

- **The controller is missing in the VictronConnect device list**

Some steps to try to resolve this issue are:

Press the orange refresh button at the bottom of the VictronConnect device list and check if the Jupiter is now listed.

Only one phone or tablet can be connected to the Jupiter at any given time. Make sure no other devices are connected and try again.

Try to connect to another Victron product, does this work? If that also does not work, there probably is an issue with the phone or tablet.

Rule out any issues with the phone or the VictronConnect app by using another phone or tablet and try again.

If still unresolved, refer to the VictronConnect manual.

- **PIN code lost**

If you have lost the PIN code, you will need to reset the PIN code to its default PIN code. This is done in the VictronConnect app:

Navigate to the Device list of the VictronConnect app.

Enter the Jupiter's unique PUK code as printed on its product information sticker. Click on the option symbol next to Jupiter listing.

A new window will open, which allows you to reset the PIN code back to its default: 000000.

- **How to communicate without Bluetooth**

In case Bluetooth is not functional, turned off or unavailable, VictronConnect can communicate via the unit's VE.Direct port. Or, if the unit is connected to a GX device, VictronConnect can communicate via VRM.

MANUFACTURER'S WARRANTY

Manufacturer's Warranty period to the original purchaser for these periods of time from the date of purchase:

"VICTRON" products: 5 years from the date of purchase for all electronic products excluding Victron batteries*

"METEOR" (Safiery 48V Lithium Batteries with Safiery software) products:

3 years from the date of purchase for Lithium Battery Products that are installed in a "NON-CANbus" controlled environment and charged using bulk/absorption and float voltage settings.

5 years from the date of purchase for Lithium Battery Products that are installed in a "CANbus" controlled environment WITH Victron charging and CANbus control of charging devices and these devices charge the batteries based on the CANbus commands from the Dyness Lithium battery. Access must be given to Safiery Pty Ltd to the Victron "VRM" (Victron Remote Management) to verify the correct installation of the CANbus configuration and operation.

"SIMARINE" products: 3 years from the date of purchase*

"SAFIERY" sensors, electronic and electrical products: 2 years from the date of purchase*

"SAFIERY LITHIUM BATTERY" : 3 years from the date of purchase

Lithium chemistry degrades because of Chemical Ageing:

Time: With acceptable charging and discharging, even with CANbus control, approximately 2-3% of the battery nominal capacity degrades every year in a cumulative effect. Without CANbus control, this percentage may be double. This is not warranty.

Cycling with deep discharge: Deep discharges over 80% will accelerate Chemical Ageing. Deep discharges of 90-100% require immediate battery recovery for continued operation. A deep discharge left unattended is not warranty.

Elevated temperatures: A fully charged Lithium Battery stored at around 40°C loses approximately 30-35% of its capacity in a year without being used. This is not Warranty.

Stored at high State of Charge: A fully charged Lithium Battery stored at around 90-100% State of Charge loses approximately 15-25% of its capacity in a year without being used. This is not Warranty.

Higher Capacity chargers than specified and higher capacity discharges than specified are harmful and reduce battery life to half.

More info about warranty: safiery.com/warranty

GET IN TOUCH

QLD HQ:
45/8 Distribution Court,
Arundel QLD 4214
+61(07) 2102 25 53
service@safiery.com

SOCIALS

[Instagram.com/safiery.global](https://www.instagram.com/safiery.global)
[youtube.com/@Safiery](https://www.youtube.com/@Safiery)

THE 3 MOST COMMON CALLS ARE:

1. Flattened our batteries - use solar to recover to minimum voltage. Only use 240V AC power after reaching minimum voltage.
2. AC Inverter/Charger will not charge. Usually because the AC In line has an earth fault on the supply side and Safiery systems will not charge unless there is a properly connected earth AND the Active power in is wired correctly at the power supply. Common on farm stays.
3. Inverter not working. Usually because it is switched to "Charge Only" and it will not operate as inverter. Simply switch to "on" position.

