Törkmar Victron GX Installation Guide

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1 Overview

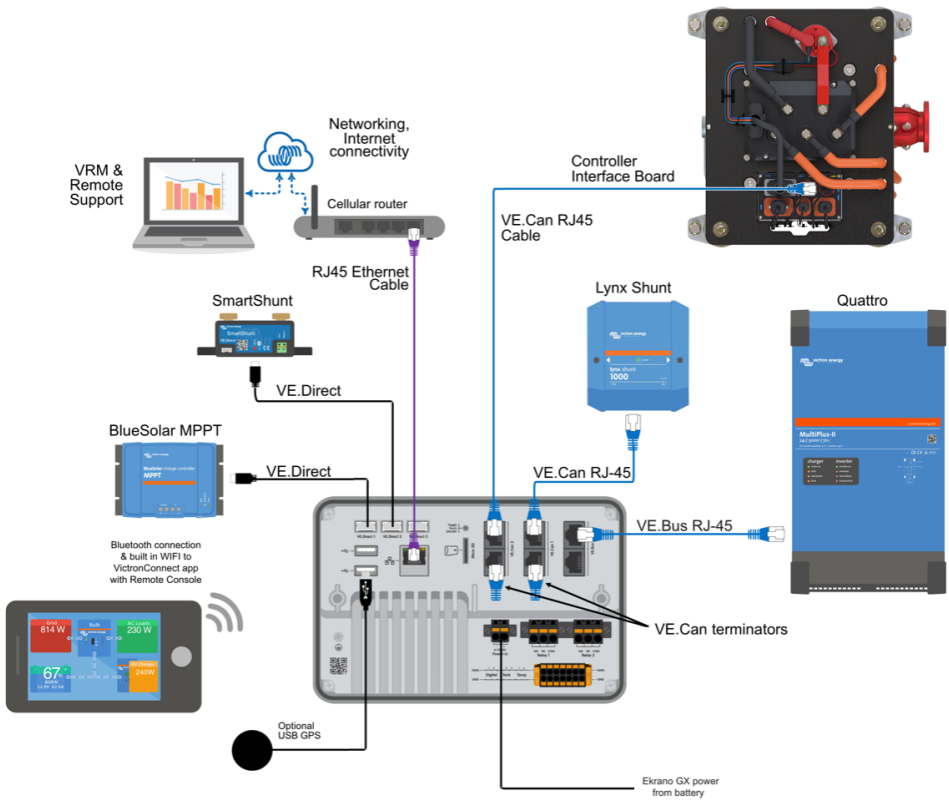
The Törkmar propulsion system is designed to work in conjunction with a Victron GX based electrical management system. There are currently two supported GX devices:

- Victron Ekrano GX with a built-in 7” touch screen (recommended)
- Victron Cerbo GX MK2 (current model) that supports external 5” and 7” touch screens

Note that the Cerbo S GX and the older Cerbo GX model (Part Number BPP900450100) are not recommended due to VE.CAN limitations which may impact certain boat configurations (e.g. those with a VE.CAN shunt). The Ekrano has significantly more processing power than the Cerbo and is therefore recommended for new installations.

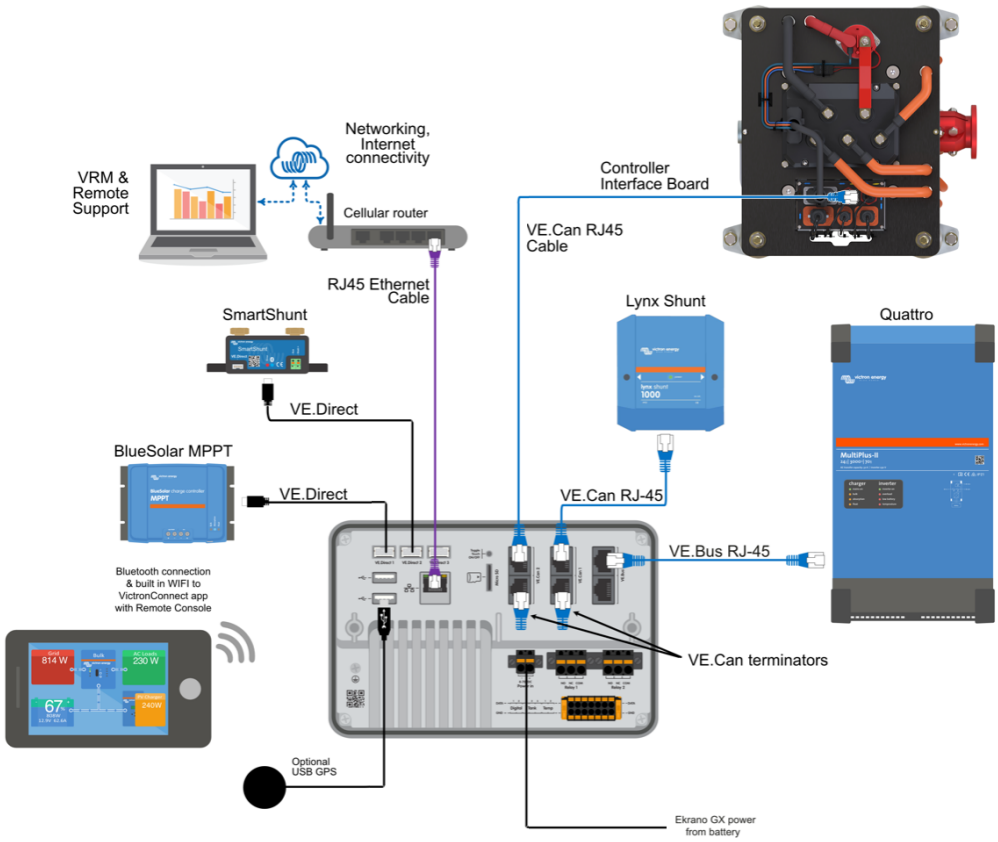
2 GX Device Connections with a Battery Shunt

The following is a guideline for the signalling connections for an installation using either a VE.CAN or VE.Direct battery shunt.



3 GX Device Connections with a BMS

Lithium batteries will generally have an internal or external Battery Management System, many of which can interface to the Victron GX device negating the need for a dedicated battery shunt.



Note that the BMS cable type is dependent on the installed battery or Battery Management System. Victron has a guide to which cable to use which can be found at:

- https://www.victronenergy.com/live/battery_compatibility:can-bus_bms-cable
- Navigate to https://www.victronenergy.com and search for “BMS cables manual”

If the BMS isn’t listed, contact Törkmar or the battery manufacturer

4 GX Cable Description/Specifications

4.1 VE.Direct Cables

If the VE.Direct cables provided by Törkmar are not long enough or need to be replaced, alternative VE.Direct cables can be purchased from any Victron reseller and are available in lengths from 0.3m to 10m with straight/right angle connectors. They are unique to Victron and not interchangeable with any other cable types.

4.2 RJ45 Cables

4.2.1 GX To Motor Controller Interface Board

This uses the standard Victron VE.Can pinouts without power or ground. The RJ45 pin allocations are as follows:

Pin 7	CAN 1 H
Pin 8	CAN 1 L

Pins 7 and 8 should pass straight through both crossover and 'straight' RJ45 ethernet cables allowing almost any to be used to connect the Controller Interface Board to a Victron GX device (i.e. Cerbo or Ekrano).

4.2.2 VE.Bus Cables

These use a serial protocol proprietary to Victron however any good quality 'straight' RJ-45 ethernet cable should work as well as Victron "RJ45 UTP Cables".

4.2.3 VE.Can Cables

These use pins 1, 2, 3 & 6 for power in addition to the signalling on pins 7 & 8. Any good quality RJ-45 cable with 'straight' connections will work fine as will "RJ45 UTP Cables" from Victron.

4.2.4 Straight vs Crossover Cables

RJ-45 terminated ethernet cable come in two main pin-to-pin configurations:

- Straight: Pin 1 connects to Pin1, 2 to 2 etc
- Crossover: Pins 1 and 3 are crossed over as are pins 2 and 6

On modern Ethernet devices either will work however we recommend only using cables that are explicitly sold as 'Straight' for all GX device connections to avoid issues if cables are swapped over. To determine whether an existing cable is 'straight' check that the wire colours to each pin are the same on both ends.

4.3 Connecting a NMEA2000 GPS

If a NMEA2000 GPS (or any other NMEA2000 marine sensors) have to be added to the network, replace the VE.Can Terminator on VE.Can 2 (the CANBus connected to the motor controller interface) with a VE.Can to NMEA2000 interface cable:

- Part Number: ASS030520200
- https://www.victronenergy.com/cables/ve-can-to-nmea2000-micro-c-male

This can be obtained from Törkmar or a Victron distributor. The NMEA2000 network must be connected to a 12V supply and a single terminator included at the end of the NMEA2000 chain. IMPORTANT: REMOVE THE FUSE ON THE VICTRON NMEA2000 ADAPTOR CABLE – the GX device is operating on 48V which is too high to power a NMEA2000 network. If

the GX device is operating on 24V, it may be compatible with newer NMEA2000 devices; in this case ensure that all devices connected to the NMEA2000 network can support 24V.

For more information check the Victron document “NMEA 2000 & MFD integration guide” or contact Törkmar. This document can be obtained through:

- https://www.victronenergy.com/live/ve.can:nmea-2000:start
- Go to https://www.victronenergy.com and search for “NMEA 2000 & MFD integration guide”

5 Vessel Display Installation on the GX device

Installation of the Törkmar display software hosted on a Victron Cerbo or Ekrano display.

5.1 Requirements

To use the software the following is required:

- A GPS connected to the Cerbo/Ekrano via USB or NMEA2000
- A CANBus connection to the Curtis motor controller to read the motor data
- A motor controller running Törkmar VCL code version 130 or later

5.1.1 Software Compatibility

Please note the following:

- The vessel display screen is only compatible with Cerbo/ Ekrano GX UI V1 (aka Classic UI) and does not yet support UI V2 (aka ‘new UI’). In the very latest GX versions the UI can be selected in Settings->Display & Language -> Onscreen UI. Switching back and forth between the two GUIs will not mess up the custom vessel screen however it will only be available on the Classic (original) UI. The new UI will be supported when Victron allows support of custom screens however there is no firm schedule for this at this point in time.
- Installation of this display software may interfere with other 3rd party UI modifications as many modify the same files. In particular “GUI Mods” and “SetupHelper” installation or updates may fail after the display software is installed (though the display software may work if installed after them).

5.1.2 CanBus Connection

A RJ 45 cable to the Törkmar controller interface board should be connected to a VE.Can port as follows:

- For a Cerbo, one of the two “VE.Can” sockets
- For a Ekrano, one of the two “VE.Can 2” sockets

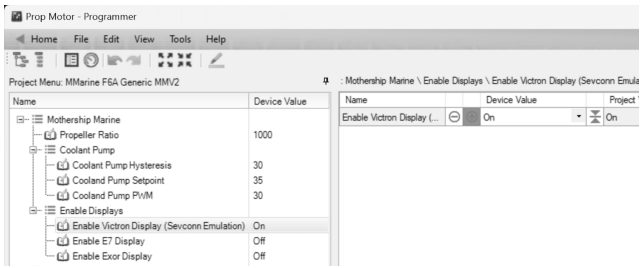
The CAN connection only uses pins 7 and 8 of the RJ45 cable so this should work with any ethernet cable (straight-through or cross-over) though straight-through cables are preferred. There should be no need to add a terminating plug to the empty Can socket on the Victron device.

On the controller interface board, it is recommended that the other end of the RJ45 cable be connected to the outer RJ45 CAN socket (J7) though either will work.

5.1.3 Motor controller Settings **(performed by Törkmar)**

The following must be set on the motor controller to enable the CAN messages supported by the Victron display:

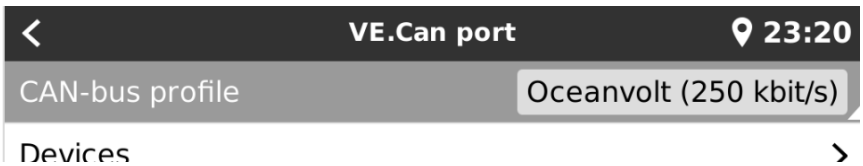
- Ensure that “Enable Victron Display” device value is set to ‘On’ in the motor controller settings. This can only be accessed using the Curtis Integrated Toolkit running on a windows PC (note that unfortunately a license for this software must be purchased from Curtis and is not freely available).
- On the main Curtis Integrated Toolkit display select the “Prop Motor” icon when a connection is made to the motor controller; select the “Parameters” button then navigate to the section named either Törkmar or Mothership Marine.



5.1.4 GX Settings (Ekrano GX or Cerbo GX)

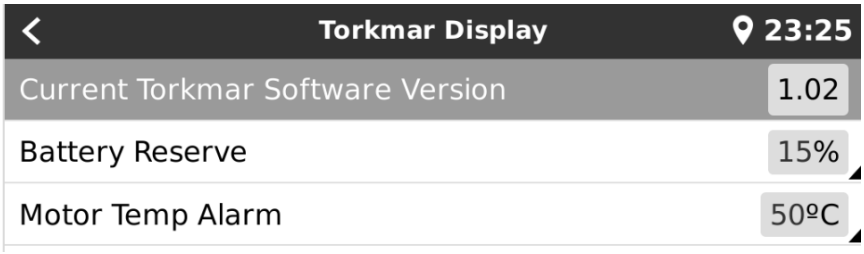
The following should be set on the Victron display using it’s built in menu (directly or using VRM) from the Settings menu

- For an Ekrano navigate to Settings-> Services->VE.Can 2
- For a Cerbo navigate to Settings-> Services->VE.Can
- Set the profile to “Oceanvolt (250kbit/s)”. The other CAN settings can be left at the default values.



At the bottom of the Victron Settings menu the “Torkmar Display” submenu allows the vessel display to be configured/customized. During installation the following should be set (please see the Törkmar Vessel Display user guide for details)

- Battery Capacity (only if battery does not have a BMS connected to the display)
- PV Installed Max power
- Range: Max Distance Number, Assumed Speed and Power



5.1.5 Updating the Törkmar Display Software

If Törkmar recommends updating the software and the Ekrano/Cerbo is connected to the internet, set the last entry in the Törkmar settings, “Update sw on next reboot?” to Y and reboot the unit (Settings->General->Reboot?). It is recommended that any online software release notes be checked before performing this. It sometimes takes two reboots to complete the activation.

Please note, version 1.xx of the Törkmar display software only works with the Victron product running GUI V1 (aka Classic), please check the Victron release notes before updating the display core software to ensure that it doesn’t only run GUI V2.

5.1.6 Installing from USB

On first install first make sure that the Ekrano is using the latest firmware and when the USB is inserted reboot via (Settings->General->Reboot?)

To perform an installation from scratch on a Cerbo or Ekrano, the simplest way is to use a USB stick as follows:

- Using any USB stick (FAT formatted) copy the file “venus-data.tgz” to the top level of the USB stick (this file can be requested from Törkmar).
- Insert the USB stick into one of the regular USB ports on the Cerbo/Ekrano (not the one that powers the Cerbo display) and power cycle or reboot the unit (Settings->General->Reboot?)
- The reboot will take longer than normal. When the GUI is available, scroll to the bottom of the settings menu, check that the Törkmar Display menu item is available and when selected the first entry shows the expected software version. It sometimes takes two reboots to complete the activation.

5.2 Testing the installation

To verify that the vessel display is getting data from the motor, turn on the key-switch and once the motor contactor is heard verify that the display shows the motor temperature. The display can be opened from the pages option on the menu followed by swiping right until the following is shown. Running the motor should show a number on the RPM and kW displays.

If necessary, the correct values can be verified using the Curtis Integrated Toolkit Programmer module – follow the menu items highlighted to view the actual motor parameters. Note that the Törkmar display software displays the total power consumed by the motor and motor controller (this is displayed under the Battery section of the Programmer display).