Venus OS Extended image: Signal K and Node-RED

(DRAFT - THIS DOCUMENT IS ABOUT NOT YET COMPLETELY FINISHED FUNCTIONALITY)

1. Introduction

This manual documents the extended version of Venus OS, which adds Signal K and Node-RED. For more information on either of the two, see Google.

Status and where this development is going

Currently, these images are available as beta versions. Working well, several users are using this without any issues; and are super happy with the provided functionality.

The remaining work are mostly small improvements, clean ups and testing.

There will be two flavours of Venus OS to install:

1. the normal one as we've been building for years now. With all normal & supported functionality.
2. the large- aka extended flavour. All the same as the normal one, but with addition of Signal K & Node-RED.

Switching between them will be easy: a simple switch in the gui. Updating will be easy as well, the online updates will work, just like they do now for the normal images.

For now not that easy yet: installing and updating is done using the offline install method: with usb stick or sd-card.

Why not keep it all in one like it has been until now? To save download and install time for the (vast majority) of users that will not use these features. And they increase the download (& installed) size enourmously.

More details here:

- https://github.com/victronenergy/venus/issues/378
- https://github.com/SignalK/signalk-server-node/issues/517

2. Where to find support

There is and will be no official support on the functionalities included in this image. For support, turn to the Modifications Space on Victron Community.

3. Requirements

A compatible GX device:

- Cerbo GX
- Venus GX (serial number HQ1842 or later, or upgraded to the large partition layout - more information in Appendix A)
- Octo GX
- MultiPlus-II GX
- EasySolar-II GX

The CCGX and CanVU GX are unfortunately not able to run the extended version.

Venus OS extended is also available for certain RaspberryPi models. Installation files below, and installation & other raspberrypi specific instructions here.

3. How to install

For Venus GX-es with a serial number below HQ1842, first perform the procedure as explained in Appendix A. Warning, it can only be carried out by technical skilled persons.

4. Node-RED

https://nodered.org/docs/tutorials/first-flow

The Node-RED editor is at http:///(ip address):1880 - on most systems, http://venus.local:1880/ will work.

Installing extra nodes

Node-RED comes with a core set of useful nodes, but there are many more available from both the Node-RED project as well as the wider community.

For example nodes that give access to weather data, or with timer functionality, and so forth.

You can search for available nodes in the Node-RED library.

The Victron Pallette and the Dashboard pallette come pre-installed.

Read the Adding nodes to the Pallette - guide by Node-RED to learn how to install and manage node pallettes.

To install new nodes/pallettes requires a working internet access.

Palettes will be installed on the data partition on the GX Device. Which means that they will remain installed when updating Venus OS to a new version.

it is possible to remove self-installed palettes.see the remove button in the palette manager.

its not possible to remove pre-installed nodes; it is possible to disable them.

When installing a newer version of a palette than what is pre-installed in Venus OS, node-red will use that newer version.

Todo add what happens if user has a palette self installed and Venus OS then comes with a newer version pre-installed.

Make sure that there is always 30MB of free space remaining on the data partition. TODO: how can a user see that? Also mem usage / mem free & some cpu stats would be nice to see. Maybe with a dashboard & flow? ;o)

5. Signal K

See here: https://github.com/victronenergy/venus/wiki/Signal-K

Appendix A - Repartioning Venus GX flash memory

The Venus GX has sufficient flash memory to run the Venus OS Extended image. But up until end of 2018 it was produced with a partition layout not suitable to run large versions of Venus OS. This appendix explains how to self update the partitions to the new format. Perform this procedure only when connected via Ethernet. Do not use the built-in WiFi AP to performing this procedure. The AP will not work half way the procedure.

WARNING: this procedure is available and documented here for the benefit of users that are technical enough to perform it. In order to make it possible for them to upgrade their Venus GX to make it compatible with the extended version of Venus OS. Victron offers no support or warranty on this. Running the installer is not something Victron normally asks end-users to do, its for in the factory.

It is impossible to brick the device using this procedure. Its always possible to run the installer again. But, to make the device operational again, also the files must be restored, if anything then with other contents.

Venus GX-es with serial number HQ1842xxxxx and later already have the new partition layout from the factory.

Requirements

- An SD Card
- Computer skills

Note that a USB stick will not work. Installer images can only be ran using an SD Card.

Step A. Enable and obtain root access

See these instructions.

Step B. Secure factory files

Copy below four files to your computer.

- /data/venus/serial-number
- /data/venus/wpa-psk
- /data/venus/part-number
- /data/conf/vrm_auth_token.txt (don't worry if that does not exist, then skip it).

Below commandline instructions show how to do that on linux from the commandline. For Windows try Mobaxterm, or WinSCP. Putty won't work, its not for transferring files. There is Putty SCP (PSCP), as well, but then you need to know how to handle the commandline in Windows. We recommend using the other two.

Procedure on Linux:

```
mkdir my-temp
cd my-temp
mkdir conf
mkdir venus
scp "root@192.168.178.122:/data/venus/*" ./venus/
scp "root@192.168.178.122:/data/conf/vrm_auth_token.txt" ./conf/
```

Background information on the factory files

The first two are needed for the built-in accesspoint to work. Without them, the script that should start it is in an endless loop.

Third file is not used anywhere (at this moment), but easy enough to recreate by hand as well.

Fourth file: without it the system won't be able to send data to VRM anymore. Either make sure to keep that file, or after having booted the new version, go to the VRM Portal, Settings → General. And scroll to the bottom. There will be an option to reset the token. This option is only visible after the portal has received data from the reflashed device.

Step C. Run the installer image

First, download the latest official installer image.

Then, write it to an sdcard (tip: use BalenaEtcher, see Google)

Finally, run the installer by inserting the sdcard containing the installer, and then power up while pressing the small recessed button on the right of the long green connector with, for example, a

paperclip.

There is a bi-color LED on the other side of the same long green connector, indicating the status:

- off, no image found
- red blinking, busy
- green on, done
- red on, error

Side info: see here for more details on installing an image.

Once done, reboot the device, and then re-obtain yourself root access to continue. Note that all is reset, you'll need to go to Remote Console on LAN, then change access level again, enable ssh, change root password, and then login.

Step D. Restore the files

Again, this is how to do it on Linux:

```
scp ./conf/vrm_auth_token.txt "root@192.168.178.122:/data/conf/"
scp ./venus/* "root@192.168.178.122:/data/venus/"

# reboot
ssh 192.168.178.122 reboot
```

Step E. Install extended Venus OS

Now, the Venus GX has been repartitioned, and has a certain version of the normal Venus OS installed. Next step is to install the extended image. Refer to the Installation instruction chapter above.