Color Control GX FAQ

I cannot switch my Multi/Quattro system on or off from the CCGX

To solve the problem, first find out how the system is connected, and then follow the right step by step instruction below. There are two ways to connect a Multi/Quattro system to a Color Control GX. In most systems they will be connected directly to the VE.Bus port on the back of the CCGX. And, option two, in some systems they are connected to the Color Control GX using a VE.Bus to VE.Can interface.

Step by step instructions when connected to VE.Bus port on the CCGX

1. Update the Color Control to the latest available version. See our blog posts in the firmware category.
2. Do you have a Digital Multi Control or VE.Bus BMS in the system? In that case it is normal that on/off is disabled. See also the VE.Bus related notes in the CCGX manual
3. In case you have had a Digital Multi Control or VE.Bus BMS connected to your system, the Color Control remembers it and even when those accessories have been removed the On/off switch will still be disabled. To clear the memory, execute a Redetect system, the option is in the Multi or Quattro section of the Color Control GX menu.
4. For parallel/three phase systems consisting of more than 5 units: depending on temperature and other circumstances, it might not be possible to switch a system back on after switching it off with the CCGX. As a work around you'll need to unplug the VE.Bus cable from the back of the Ccgx. And plug it back in after starting the VE.Bus system. The real resolution is to install the "CCGX dongle for large VE.Bus systems", partnumber BPP900300100. For details, read its connection instruction.

Step by step instructions when connected to CCGX via VE.Can

1. Update the Color Control to the latest available version. See our blog posts in the firmware category.
2. Update the VE.Bus to VE.Can interface to the latest version. The easiest way to do that is by using Remote firmware update: having a special piece of hardware, the CANUSB, is then not necessary.
3. Do you have a Digital Multi Control or VE.Bus BMS in the system? In that case it is normal that on/off is disabled. See also the VE.Bus related notes in the CCGX manual
4. In case you have had a Digital Multi Control or VE.Bus BMS connected to your system, and it is now no longer connected, the Canbus interface remembers it. Therefore, even after those accessories have been removed, the On/off switch will still be disabled. Clearing this memory is unfortunately not possible yourself, please contact us so we can help you.

Do I need a BMV to see proper battery state of charge?

That depends on the type of system. There are three products that can calculate State Of Charge

(SOC). The CCGX does not calculate SOC, it only retrieves it from the connected devices in order to display it to the user and on VRM.

The three products that monitors SoC are:

1. Battery Monitors, such as the BMVs, the Lynx Shunt, or the Lynx Ion BMS
2. Multi and Quattro inverter/chargers
3. Batteries with built-in batt. monitor and a (mostly canbus-) link to the CCGX.

From simple to complex systems:

Battery and Multi or Quattro (a typical backup system)

No BMV is required: the Multi or Quattro is the only product connected to the battery and has full control over all charge- and discharge currents.

Configuration:

1. Enable and configure the Battery Monitor in VEConfigure.
2. In the CCGX, in Settings → System setup, verify the selected Battery Monitor. It should be set to the Multi or Quattro.

Battery with Multi or Quattro and MPPT Solar Chargers

No BMV is required, as long as all MPPT Solar Chargers are Victron and connected to the CCGX. The CCGX will continuously read the actual charge current from all solar chargers, and send the total to the Multi (or Quattro) which then uses that information in its SOC calculations.

Configuration:

1. Enable and configure the Battery Monitor in VEConfigure.
2. In the CCGX, in Settings → System setup, verify the selected Battery Monitor. It should be the Multi or Quattro.
3. In the same menu, verify that the 'Use solar charger current to improve VE.Bus SOC' is enabled. Note that this is not a setting, it just an indicator of an automatic process.

Note that this feature requires recent firmware versions in both the Multis or Quattros (402 minimum), and the CCGX (v2.06 minimum).

An EasySolar with CCGX built-in

See previous.

Batteries with a built-in battery monitor

In case the system includes a battery with built-in battery monitor and SOC calculation, such as many of the batteries listed here, a BMV is not required.

Configuration:

1. Connect the battery communications cable to the CCGX according to the instructions.
2. In the CCGX, in Settings → System setup, verify that the selected Battery Monitor is the battery.

Note that the Battery Monitor setting in VEConfigure3 is irrelevant. For systems like this, changing this setting has no effect to the charge- or any other mechanisms in this type of system.

Other system types

When there are more chargers, or loads, connected to the battery than just the Multi or MPPT Solar Chargers, a BMV will be required. Examples are:

- House loads in Marine or Vehicle system.
- PWM Solar Chargers
- AC chargers, such as Skylla-is, Phoenix chargers, non Victron chargers, etc.
- Alternators
- DC-DC chargers
- Wind turbines
- Hydro turbines

Configuration:

1. Configure all BMV parameters (see BMV documentation)
2. In the CCGX, in Settings → System setup, verify the selected Battery Monitor. It should be the BMV Battery Monitor.

Note that the Battery Monitor setting in VEConfigure3 is irrelevant. For systems like this, changing this setting has no effect to the charge- or any other mechanisms in this type of system.

Notes

- Note that this is about showing an accurate state of charge to the user, not about the system working well. A SOC is not necessary for accurate charging, except in cases where an accurate SoC is required, for example when a genset needs to be started and stopped automatically based on battery SOC.
- For hub-2 installations we recommend to <u>not</u> add a BMV to the system. Since it will only confuse the user of the system as there are then two different SOCs being calculated and shown to the user.

More information:

- VRM Portal FAQ - difference between BMV SOC and VE.Bus SOC
- CCGX Manual - configurable parameters. See Battery Monitor selection and Has DC System.

I have no internet, where can I insert a sim-card?

There is no 3G modem in the Color Control, and therefore also no slot for a sim-card. Go to a local

store and buy a 3G router with Ethernet ports. More information in the blog post link below and particularly in the comments section, as more users try differing equipment:

https://www.victronenergy.com/blog/2014/03/09/off-grid-color-control-gx-to-vrm-portal-connectivity/

Note that it is not possible to use a VGR2 or VER for this. Also it will not be possible in the foreseeable future.

Can I connect both a Color Control and a VGR2/VER to a Multi/Inverter/Quattro?

No. Also, instead of this combination, we recommend to use the Color Control GX, and add a 3G or similar mobile router. See the Internet Connectivity chapter in the CCGX manual.

Can I connect multiple Color Controls to a Multi/Inverter/Quattro?

No.

I see incorrect current (amps) or power readings on my CCGX

Examples are:

- I know that a load is drawing 40W from the Multi, but the CCGX shows 10W or even 0W.
- I see that the Multi is supplying a load with 2000W, while in inverter mode, but from the battery only 1850W is being taken. Is those 150W coming out of nowhere?

The general answer is: the Multi and Quattros are not measurement instruments, they are inverter/chargers, and the measurements shown are a best effort delivery.

In more detail, there are several causes for measurement inaccuracies:

1. Part of the power taken from a battery by the inverter is being lost in the inverter, converted into heat: efficiency losses.
2. The Multi does not really measure the power being drawn from the battery. It measures the current at the output of the inverter, and then makes an assumption of the power being drawn from the battery.
3. Watts vs VA: depending on the Multi/Quattro firmware version and also the CCGX firmware version, you are either looking at VAs (the result of calculating AC voltage * AC current) or looking at a Watts measurement. To see WATTS on the CCGX, update your CCGX to the latest version (v1.21 or newer). Also make sure the firmware version in your Multi supports Watts readout, minimum versions are xxxx154, xxxx205 and xxxx300.
4. Multis/Quattros connected to the CCGX via a VE.Bus to VE.Can interface will always reports VAs, not (yet) Watts.

5. If a current sensor assistant is loaded in a Multi/Quattro and no sensor is connected it will return invalid power / kWh values.
6. If a current sensor assistant is loaded in a Multi/Quattro make sure the position is set correctly and the scale match with the dipswitches on the sensor itself.
7. A current sensor assistant measures and reports VAs, not Watts.

Notes for systems with multiple units in parallel:

1. Ccgx version prior to v1.20 use the power and current reported by the master of a phase and multiplied that by the number of devices in that phase. Since version v1.20 the values of all device is summed per phase and hence should be more accurate.

1. This revealed a bug for in the firmware of the multi when running in parallel. Ccgx v1.21 workarounds this, by falling back to the original behavior when it sees an affected firmware version. For better readings the multi's should be updated. The bug has been fixed in VE.Bus firmware version xxxx159, xxxx209, xxxx306. That firmware was released on February 17th 2015.

1. Multi firmware versions since 26xx207 / xxxx300 can also freeze the Power values at a certain moment in time.

Tips to prevent measurement problems:

1. Do not connect VEConfigure while the CCGX is connected
2. VE.Bus is not a 100% plug and play system: if you disconnect the CCGX from one Multi, and very quickly connect it to another, it can result it wrong values. To make sure that this is not the case, use the 'redetect system' option in the Multi/Quattro menu on the CCGX.

There is a menu entry named "Multi" instead of the VE.Bus product name

A VE.Bus system can be completely turned off, including its communication. If you turn a VE.Bus system off, and thereafter reset the CCGX, the CCGX cannot obtain the detailed product name and shows "Multi" instead.

To get the proper name again, go into the Multi menu on the CCGX and set the Switch menu entry to On or in case a Digital Multi Control is present, set the physical switch to On. Note that when there is a BMS, above procedure only works when within battery working voltages.

There is a menu entry named "Multi", while there is no Inverter, Multi or Quattro connected

If a CCGX ever saw a VE.Bus BMS or Digital Multi Control (DMC), it will remember them, until 'Redetect system' is started from the CCGX menu.

After a minute, restart the CCGX: Settings → General → Reboot.

When I type the ip-address of the Color Control into my browser, I see a web page mentioning Hiawatha. Is there more?

Our plan is to at least run a website where you can change settings and see the current status. If all works out as we would like to, there might come be a fully functional version of the online VRM Portal running locally on the Color Control GX. This allows people without an internet connection, or an intermittent internet connection to have the same features and functionality.

I have multiple Solar chargers MPPT 150/70 running in parallel. From which one will I see the relay status in the CCGX menu?

From a random one.

How long should an automatic update take?

The size of the download typically ranges from a few megabytes to 50mb. After download it will install the files which can take up to 5 minutes.

I have a VGR with IO Extender, how can I replace this with a Color Control GX?

It is not yet possible to replace the IO Extender functionality.

Can I use Remote VEConfigure, as I was doing with the VGR2?

Yes, see VE Power Setup manual

The Blue Power Panel could be powered through the VE.Net network, can I also do that with a Color Control GX?

No, a Color Control GX always needs to be powered itself.

What type of networking is used by the Color Control GX (TCP and UDP ports)?

Basics:

- The Color Control GX needs to get a valid IP address from a DHCP server, including a working DNS server and gateway, or a static IP configuration.
- DNS port 53 UDP and TCP
- NTP (time sync) UDP port 123

VRM Portal:

- Data to the VRM Portal is sent via HTTP POST and GET requests to http://ccgxlogging.victronenergy.com on port 80. Sensitive data is sent using HTTPS on port 443 to the same host.

Firmware updates:

- The CCGX connects to http://updates.victronenergy.com/ on port 443.

Remote support (default disabled):

- When enabled, an outbound SSH connection to supporthost.victronenergy.com is maintained. The CCGX will try to connect on port 22, 80 and 443, and the first that works is maintained.
- Enabling Remote Support also enables the sshd daemon, listening for incoming SSH requests on port 22. See next FAQ entry for more information about the Remote Support functionality.

Two way communication (Remote VEConfig and Remote Firmware updates):

- Uses HTTPS (port 443) to the Pubnub servers

MQTT (default disabled):

- When enabled, a MQTT broker is started, which accepts TCP connections on port 1883. The CCGX will also try to connect to the victron MQTT cloud server (mqtt.victronenergy.com) using SSL on port 8883.

Remote Console on VRM (default disabled):

- Remote Console on VRM uses the same reverse ssh tunnel as is used for Remote Support: outbound connection to supporthost.victronenergy.com on port 22, 80 or 443. No port forwarding in routers is necessary to use Remote Console on VRM.
- See here to trouble shoot Remote Console on VRM.

Remote Console on LAN (default disabled):

- Remote Console on LAN requires port 80 (small website hosted on local hiawatha webserver on CCGX). And also requires port 81, which is the listening port for the websocket tunnel to VNC.

Modbus TCP (default disabled):

- ModbusTCP server uses port 502

What is the functionality behind the menu item Remote support (SSH), in the Ethernet menu?

When enabled, the Color Control will open a SSH connection to our secure server, with a reverse tunnel back to the Color Control. Through this tunnel, Victron engineers can login to your Color Control GX and perform remote support. This works when the Color Control GX is installed on an internet connection. The connection will even work when installed behind most firewalls. The SSH connection will be outbound on port 80 to supporthost.victronenergy.com. Remote support function is by default disabled.

I don't see support for VE.Net products in the list, is that still coming?

No.

What is the data usage of the Color Control GX?

Data usage depends heavily on amount of connected products, and behavior and usage of those products. The measurements below are an indication only, and taken from a system with one Color Control GX, one Multi, one BMV and one MPPT. Log interval set to 15 minutes. If you are on an expensive data-plan, do make some fail-safe.

Data consumption per month:

- VRM logging: 15MB download, 45MB upload
- Remote support: 22MB download, 40MB upload
- Update checks: 8MB download, 0.3MB upload (This does not include the update itself)
- 2 way communication: 26MB download, 48MB upload

Mentioned megabytes do not include the download of a Color Control firmware update. Firmware updates of 60MB are not uncommon.

How many AC Current Sensors can I connect in one VE.Bus system?

The current maximum is 9 sensors (since CCGX v1.31). Note that each need to be configured separately with an assistant in the Multi or Quattro to which it is wired.

I love Linux, programming, Victron and the Color Control

GX. Can I do more?

Yes you can! We intend to release almost all code as open source, but we are not that far yet. What we can offer today is that many parts of the software are in script or other non-precompiled languages, such as Python and QML, and therefore available on your Color Control GX and easy to change. Root password and more information is available on request. Contact Matthijs Vader at mvader@victronenergy.com

GPL Note

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