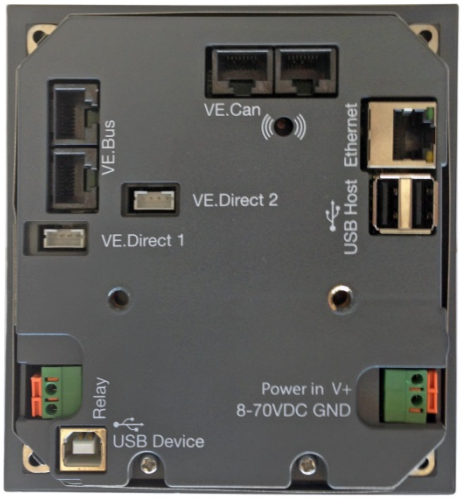
Color Control GX

Firmware version v1.13

www.victronenergy.com







Color Control GX

The Color Control provides intuitive control and monitoring for all products connected to it. The list of Victron products that can be connected is endless: Inverters, Multi's, Quattro's, all our latest MPPTs, BMV-600, BMV-700, Lynx Ion and even more.

VRM Online Portal

Besides monitoring and controlling products on the Color Control GX, the information is also forwarded to our free remote monitoring website: the VRM Online Portal. To get an impression of the VRM Online Portal, visit https://vrm.victronenergy.com/, and try our demo. See also the kWh dashboard screenshot further down in this datasheet.

Future functionality

The Color Control has endless possibilities. To implement all our ideas and wishes will take years. There are therefore many features that are not yet available. Functions marked with 'Future function' will become available later on, as a firmware update. Firmware updates are free of charge, as with all Victron products. Updating the product is easy: the Color Control GX will update itself automatically, as long as it is connected to the internet. Manual updates can be done with a USB stick and microSD cards.

Supported products

- Multi's, including split-phase and three phase systems. Monitoring and control (on/off and current limiter). Changing Multi settings is not yet available.
- Quattro's, including split-phase and three phase systems. Same limitations as Multi's, and some Quattro specific features, such as seeing which input is currently active, are not yet available.
- BlueSolar MPPT 150/70 and the MPPT 150/85. Current solar output is visible on the overview screen, and all parameters are logged to the VRM online portal. Note that the VRM App has a nice overview showing data of the BlueSolar MPPT 150/70 as well. When multiple BlueSolar MPPTs with VE.Can are used in parallel, the Color Control will show all information as one. See also our blog-post about synchronizing multiple MPPT 150/70 solar chargers.
- BMV-600 family can be connected to the VE.Direct ports on the Color Control GX. Use the VE.Direct to BMV60xS cable for that. See our pricelist.
- BMV-700 family can be connected directly to the VE.Direct ports on the Color Control GX. Use the VE.Direct Cable for this. See our pricelist.
- BlueSolar MPPT Solar Chargers with a VE.Direct port (70/15, 75/15, 100/15, 100/30, 75/50, 100/50, 150/35) can be connected to the VE.Direct ports on the Color Control GX. Connecting multiple at the same time is possible. They will all appear as a separate Solar Charger in the device list.
- A USB GPS can be connected to the USB port. Location and speed will be visible on the display, and the data is sent to the VRM Portal for tracking purposes. The map on VRM will show the latest position. Implementation of more advanced racking features on the VRM Portal is expected in 2014-Q1.
- Lynx Ion BMS
- Lynx Shunt VE.Can

Note that there are more options for products which use the VE.Direct ports, such as BMV's and small MPPT's. They can also be connected through USB, useful when more than two products need to be connected. Use an off-the-shelf USB-hub, and the VE.Direct to USB interface, ASS030530000.

Other highlights

- When connected to the internet, the Color Control GX will update itself automatically as if there is a new software version available. It checks for an update every night at 02:00 UTC.
- Multiple languages: English, Chinese, German, Italian, Spanish, French, Swedish and Dutch.

Notes for existing VGR2 and VER users

- Opposite to the Victron Global Remote 2 (VGR2) and Victron Ethernet Remote (VER), the Color Control GX stores all data locally during network interruptions. As soon as the connection to the VRM Online Portal is restored, it will automatically send all backlogged data to the portal. Data can then be analyzed on https://vrm.victronenergy.com. This local storage feature can be useful for diagnostics and problem solving as well: leave it for a couple of days in an installation where there are problems, then take it back to the office and connect it to the internet.
- Remote VEConfigure is not yet supported by the Color Control GX. This functionality is expected in 2014 Q2. It will be even better than the VGR2 and VER: it will include support for changing Assistants and their settings.
- The local website, as present on the VER, is not yet supported.
- The Color Control GX has no internal GPRS modem: you cannot insert a sim-card into the Color Control GX. You can use an off-the-shelf GPRS or 3G router instead. See FAQ for a blog post about 3G routers and the data consumption.

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REV 8 – Last update 12 May 2014

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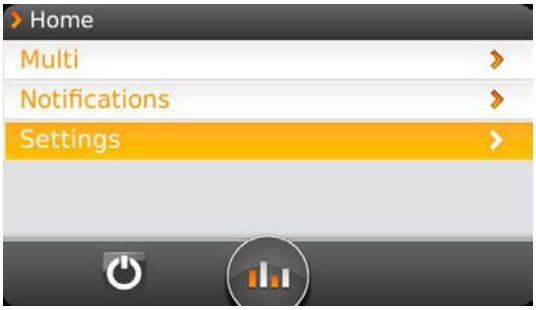
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Color Control GX			
Power supply voltage range	9 – 70V DC		
Current draw	12V DC	24V DC	48V DC
Switched off	0mA	0mA	0mA
Display off	140mA	tbm	tbm
Display at minimum intensity	160mA	tbm	tbm
Display at maximum intensity	245mA	tbm	tbm
Potential free contact	3A / 30V DC / 250V AC (Normally open)		
	Data communication		
VE.Direct	2 separate VE.Direct ports – isolated		
VE.Can	2 paralleled RJ45 sockets – isolated		
VE.Bus	2 paralleled RJ45 sockets – isolated		
USB	2 USB Host ports – not isolated		
Ethernet	10/100/1000MB RJ45 socket – isolated except shield		
	Other		
Outer dimensions (h x w x d)			
Operating temperature range	-20 to +50°C		

Overview - Multi with PV Inverter on output (Hub-2)



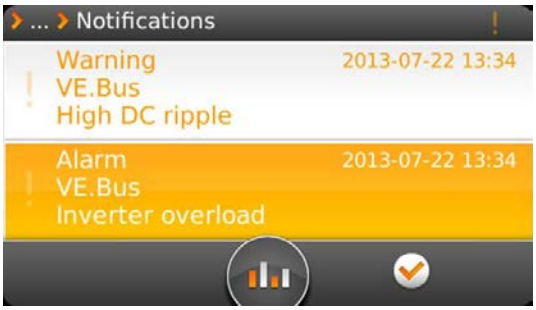
Main menu



Overview - Multi



Alarm notifications



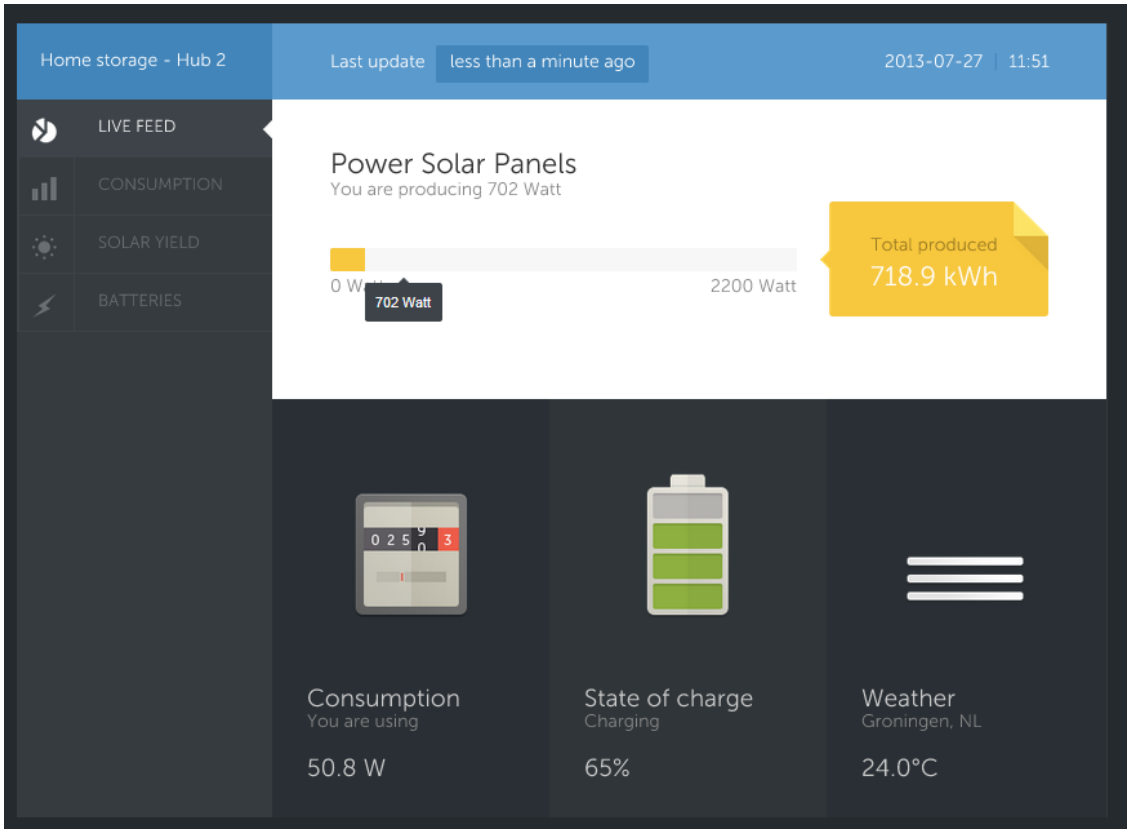
Overview - Multi with MPPT 150/70



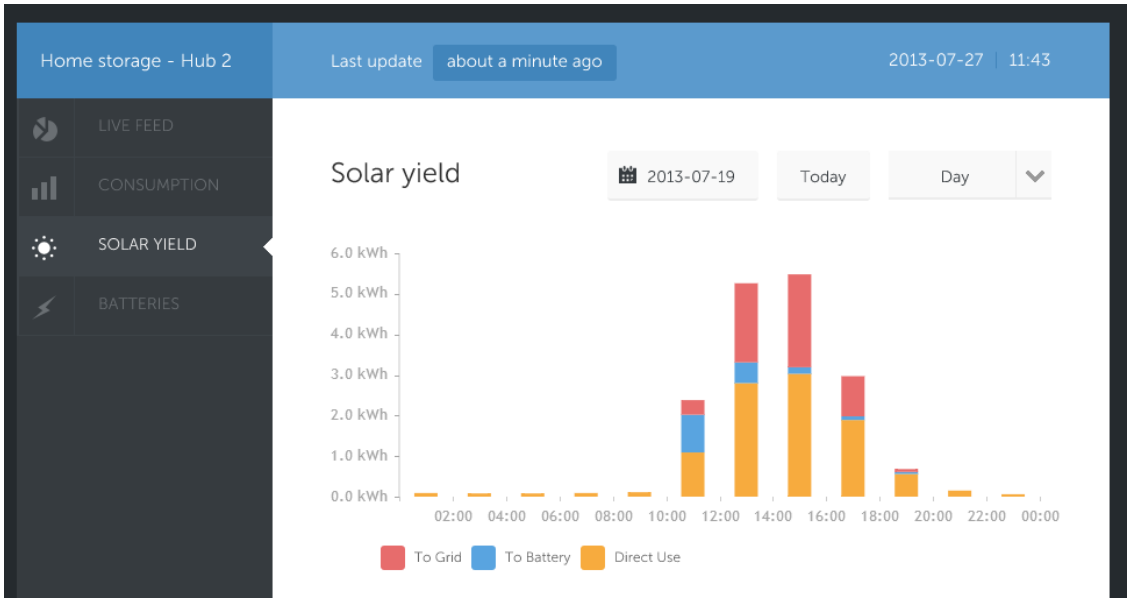
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VRM Dashboard – Live feed



VRM Dashboard – Distribution of Solar Yield

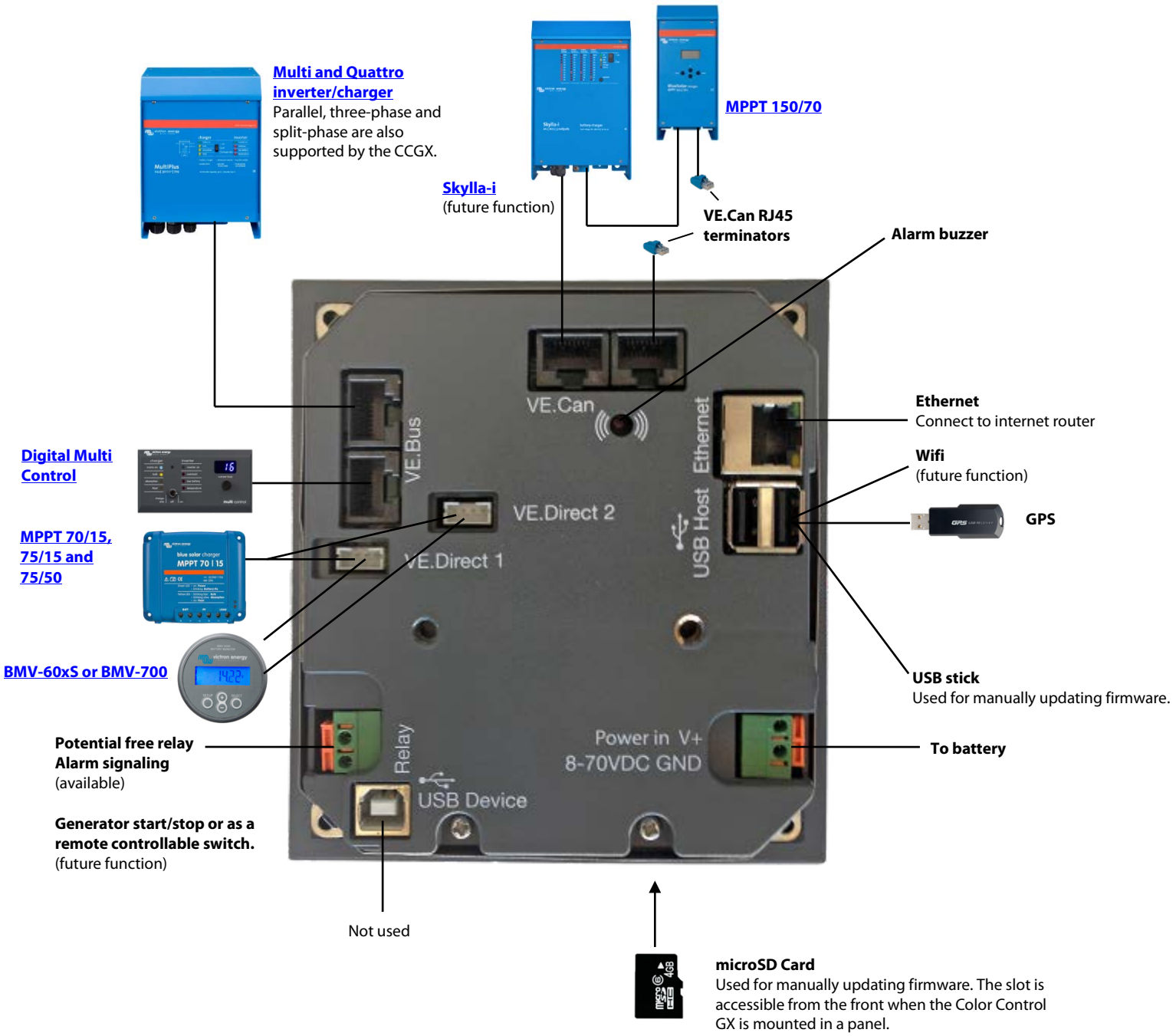


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Color Control GX schematic diagram



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Frequently asked questions

Is there a manual available?
No, the manual is not yet available. As long as it isn't, please use this datasheet.

Are there special instructions for connecting the Color Control to the Internet?
No. Simply connect it to an existing Ethernet network. This network should have support for DHCP, since manual setup of an ip-address is not yet possible in the Color Control. Almost all Ethernet networks have a DHCP server. The identifier that you need to add the Color Control to your account is available in the setup menu. Go to VRM Online portal, and then look at the VRM Portal Identifier.

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 this blog post: http://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, unfortunately you cannot.

Can I connect multiple Color Controls to a Multi/Inverter/Quattro?
No, not yet.

Can I use the Color Control in an installation with a VE.Bus BMS?
Yes, since CCGX firmware version v1.11 you can. Notes:

- Connect the CCGX to the socket labeled 'MultiPlus/Quattro', or to one of the Multi's/Quattro's in the system. Do not connect to the Remote panel socket on the VE.Bus BMS.
- The On/Off/Charger Only switch and the Current limiter options will be disabled in the CCGX menu. To remote control the Multi or Quattro when used with a VE.Bus BMS, add a Digital Multi Control to the system:
- Combining MultiPlus/Quattro with a VE.Bus BMS and a Digital Multi Control is possible. Connect the Digital Multi Control to the RJ-45 socket on the VE.Bus BMS labeled 'Remote panel'.
- Power the Color Control GX through the VE.Bus BMS: connect Power in V+ on the Color Control GX to Load disconnect on the VE.Bus BMS. And connect both negatives to a common Battery -.
- The Color Control checks if a VE.Bus BMS or Digital Multi Control is present on power-up. Once the Color Control GX has seen one of these products, the On/Off/Charger Only switch and the Current limiter options will be disabled until you initiate a Redetect system, found in the Multi menu.

Can I connect the Color Control and a Digital Multi Control to a Multi/Inverter/Quattro?
Yes. Note that the On/Off/Charger Only switch, and the Set shore current option are then net enabled in the CCGX menu.They are overridden by the DMC.

Can I connect multiple BMV's or multiple MPPT's?
Yes. You can even connect an off-the-shelf USB hub to one of the two USB ports, and then use the VE.Direct to USB interface, ASS030530000, to connect many of them. The maximum possible number has not been tested yet.

What do I need to connect a BMV-700 to the Color Control?
A VE.Direct cable.

Are there other ways to connect a BMV-700?
Yes, besides using the simple cable it is also possible to use the VE.Direct to USB cable. Another way is to use the VE.Direct to VE.Can interface. Both options could be useful when you want to connect many BMV's to the same CCGX. Note that the canbus needs to be powered separately as the BMV and the CCGX do not power the canbus.

What do I need to connect a BMV-600 to the Color Control?
A BMV-60xS to VE.Direct cable

Are there other ways to connect a BMV-600?
Yes, besides using the simple serial cable it is also possible to use the VE.Can to NMEA2000 cable together with a BMV-60xS to NMEA2000 interface. Both options could be useful when you want to connect many BMV's to the same CCGX. Note that the canbus needs to be powered separately, as the BMV and the CCGX do not power the canbus.

Can I connect my MPPT 70/15, 75/15, 100/15 and/or 75/50?
Yes. Since Color Control version v1.08. Note that these MPPT's need to run v1.09 or later. Contact Victron Service for update instructions and files.

Note on the MPPT 70/15: the 70/15 needs to be from year/week 1308 or later. Earlier 70/15's are not compatible with the CCGX, upgrading MPPT firmware will not help. To find the year/week number, look for the serial number which is printed on a label on the back. For example number HQ1309DER4F means 2013, week 09. Every MPPT 70/15's currently shipped from our warehouse is of the required newer version.

How can, in inverter mode, the power shown on the AC output be higher than the power drawn from DC?
The Multi is not a real measurement instrument, and all different measurements, especially AC and DC current measurements, can be a little bit off the mark. Also all measurements are currently VA's. Especially in parallel and three-phase installations you will see wrong values. In 2014-Q2 we expect to have new Multi firmware versions available that will provide (more accurate) Watts measurements.

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 will 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 functionalities.

In the setup menu, there are different types of firmware version at the 'Update to' setting. What is that?
When the Color Control has a working internet connection, it will check for firmware updates daily. If a new version is available, it will automatically update itself. To allow testing, we defined two types of firmware versions:

- Latest release (default)
  These are the official, well tested, firmware versions.
- Latest release candidate
  As soon as we have implemented enough new functionality and/or bug-fixes, we put them together and work towards and official release. The major step in this process is making a release candidate. Select this if you are part of the beta test-group.

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?
No, the Color Control GX does not yet support Remote VEConfigure. Re-enabling Remote VEConfigure is our top priority at the moment. We expect to finish that in 2014-Q2.

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 ports, UDP ports)

- The Color Control GX needs to get a valid IP address from a DHCP server, including a working DNS server and gateway. A static IP configuration option will be added soon.
- DNS port 53 UDP and TCP.
- Sending data to the VRM Portal is done with HTTP POST and GET requests to http://vrm.victronenergy.com/, on port 80 and https://vrm.victronenergy.com/ on port 443.
- Firmware updates: the CCGX connects to http://updates.victronenergy.com/ on port 80.
- For time syncing, the CCGX uses the NTP protocol, UDP port 123.
- Remote support –default disabled– makes an outbound SSH connection to supporthost.victronenergy.com on port 80. And, when remote support is enabled, it also listens for incoming SSH requests on port 22. See below for more information about the Remote support functionality.

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. Below measurements are an indication only, and taken from a system with one Color Control GX, one Multi and one BMV. Log interval set to 15 minutes. If you are on an expensive data-plan, do make some fail-safe.

Data consumption per month: 14.9MB download, 9.5MB upload, 24.4MB total

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

Can you tell me more about the GPS functionality?

Yes. You can use an off-the-shelf USB-GPS. Plug it into one of the two USB sockets. After a while, can take up to a minute, the Color Control GX will automatically recognize the GPS, and add it to the settings menu. The location is automatically sent to the VRM Online Portal, where it is used to show the position on the map. More track and trace features, such as a geo-fence, will be added to the VRM Portal later.

The CCGX supports GPS modules that work with the NMEA0183 command-set, as almost all do. Both 4800 and 38400 baud. Tested for compatibility:
Globalsat BU353-W SiRF STAR III 4800 baud
Globalsat ND100 SiRF STAR III 38400 baud
Globalsat BU353S4 SiRF STAR IV 4800 baud
Globalsat MR350 + BR305US SiRF STAR III 4800 baud

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.

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