

# **VE.Net to VE 9-bit RS485 protocol Converter (VVC)**

## **USER MANUAL INSTALLATION MANUAL**



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# **1 Introduction**

Victron Energy has established an international reputation as a leading designer and manufacturer of energy systems. Our R&D department is the driving force behind this reputation. It is continually seeking new ways of incorporating the latest technology in our products. Each step forward results in value-added technical and economical features.

## ***1.1 Introduction to VE.Net***

VE.Net stands for Victron Energy Network. It allows all VE.Net compatible devices to communicate with each other. This means that the charger for example can get information from the battery controller to optimize the charge current. It is possible to control and monitor all your VE.Net devices from a single VE.Net compatible control panel. This saves space and allows you to control all your devices from one place.

## ***1.2 The VE.Net to VE 9-bit RS485 protocol Converter (VVC)***

The purpose of the VVC is to combine the powerful control of the VE Configure software, with the simple interface of the VE.Net Panel. With the VVC, you can configure the advanced features, and view status information of your VE 9-bit device from a VE.Net Panel.

## **2 Supported Devices**

The VVC works with the following VE 9-bit RS485 devices:

Phoenix Multi  
Phoenix Multi Plus  
Phoenix Multi Compact  
Phoenix Inverter  
Phoenix Inverter Compact  
Phoenix Charger

## **3 Installation and setup of your VVC**

### ***3.1 Requirements***

To install your VVC, you will need:

- Power cable
- Two UTP cables, each with two RJ45 connectors (one for VE.Net, and one for VE 9-bit RS485)
- VE.Net Panel (VPN) (Must have a software version of 1.07 or higher)

Optionally, you may also wish to connect a traditional remote panel. In this case, you will also need:

- Remote panel
- One additional UTP cable with two RJ45 connectors

## ***3.2 Wiring and jumpers***

To connect the VVC to a VPN or other VE.Net device, use a standard straight UTP cable with RJ45 connectors. The total length of UTP cables in a VE.Net network should not exceed 100 meters.

Connect one of the UTP cables to your chosen device (Phoenix multi, charger etc), and plug the other end into one of the sockets on the VVC labelled VE 9-bit. Use the other cable to connect one of the sockets labelled VE.Net either to your existing VE.Net system, or directly to a VPN. If you are connecting directly to a VPN, jumpers will need to be placed on JP1 and JP2, to allow the VVC to supply power the VPN.

To connect a standard remote panel, remove the jumper (if present) from JP3, and plug the UTP cable into the remote panel, and the other VE 9-bit socket on the VVC. If a remote panel is not being used, then a jumper should be placed on JP3.

When JP4 is placed, connecting the VVC will force the VE 9bit device into a low power state, until the device switch is set. To prevent this behaviour, remove the jumper from JP4.

Removing JP6 forces the VVC to switch off when there is no VE.Net panel connected.

The VVC is supplied with all jumpers placed.

<p><b>Warning:</b> Do not confuse the connectors on the converter. VE 9-bit devices must only be plugged into the sockets labelled VE 9-bit, and VE.Net devices must only be plugged into the sockets labelled VE.Net. Incorrect wiring could result in permanent damage to connected devices.</p>
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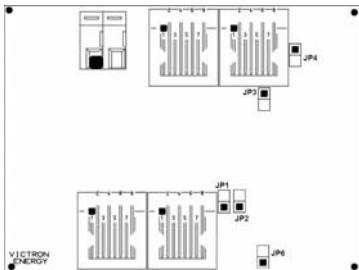


Figure 1 – Jumper locations

Connect the power terminals to the battery using 1.5mm<sup>2</sup> wire.

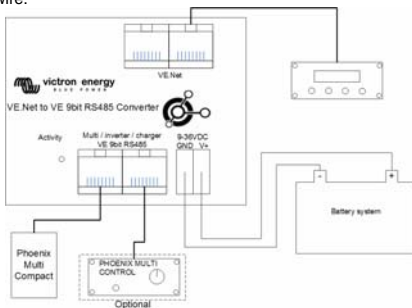



Figure 2 – Wiring diagram

## 4 Using the VVC

When power is first applied to the VVC, the status LED will flash rapidly for approximately 2 seconds. The VVC will then begin communicating with the VE 9-bit device, and determine which features it supports. Whenever there is communication between the VVC and the VE 9-bit device, the status LED will blink slowly.

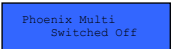
Hold down one of the buttons on the VPN, until it starts up.



New device found  
Restart Panel

If this is the first time you have connected this device to the VVC, you may be prompted to

restart the panel. You should do this now.



Phoenix Multi  
Switched Off

If you have only connected a VPN, then you will now be able to see the VVC's device entry. If

you have other devices connected, you may have to scroll through the list first.

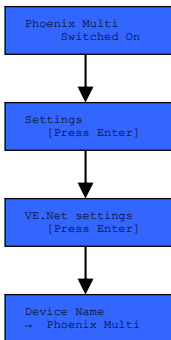
The first line of the VPN will display the type of device you have connected, and the second will show the current state of the device.

Press "Enter" to view the VVC menu. You will now be able to scroll through a list of information and settings relating to the device that you have connected. For more information on the different options, refer to chapter 8.



## 5 Changing the device name

If you have more than one VVC, connected to the same type of device, you may wish to rename one or more of these devices, so that they can be easily distinguished in the panel menu.



To do this, enter the menu of the VVC that you wish to rename, and scroll down until you see the "Settings" menu. Press "Enter" to enter this menu, and then scroll down to the "VE.Net Settings" menu. Press "Enter" once more, to display "Device name". Here, you can press "Enter" to begin editing the name of the device, using the up and down buttons to change the value of each character. Once you have changed the name of the device, you must restart the VPN in order to use the new name. Once you have renamed a device, this name will be remembered until you connect a different device to

the VVC. The custom name will then be overwritten with the name of the new device. If necessary, the name can be changed again, by repeating the steps above.

## 6 Remote Panels

The VVC can work in parallel with a traditional remote panel, such as a Phoenix Multi Control, or Phoenix Charger Control. When a remote panel is connected, it will take control of the shore current limit and the switch setting, so changing these properties on the VPN will have no effect. All other features of the VVC are still available when the remote panel is connected. When the remote panel is disconnected, the VVC will automatically resume control of the switch and shore current settings.

## 7 Alarms

The VVC can cause the VE.Net panel to generate an alarm if a fault is detected on the connected device. The VVC supports 4 alarms: overload, low battery, high temperature, and connection lost. If a fault occurs, the VPN will display a message warning of an alarm, until either the fault is corrected, or the user hides the alarm by pressing "Cancel".

**Note:** If you hide an alarm, you will not be reminded of the problem again.

## 8 Caching

When a setting is viewed on the VPN, the VVC will request the value from the VE 9-bit device, and then send the reply to the VPN. If the VE 9-bit device takes too long to respond

(for example it is busy communicating with the remote panel), the VPN will display the message “Retrieving...”, until the response is received. By enabling caching (under the advanced menu), the VVC will reply with the most recently retrieved value for that setting, whilst it waits for the VE 9-bit device to respond. When the new value is received, it will be sent to the VPN. With caching enabled, values will be shown more quickly, but may not represent the state of the VE 9-bit device exactly. By default, caching is disabled.

## 9 Menu Structure

The VVC menu structure is shown in Figure 3, Table 1 describes in more detail, the contents of each menu.

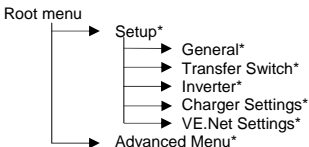


Figure 3 - VVC menu layout

If the panel has been set to “user” access level, items marked with \* are hidden. For more information on access levels, refer to your VPN manual.

**Note:** Only the options supported by the currently connected device will be shown in the menu.

Table 1 – VVC menu summary

Items marked with \* require a panel restart before the changes will be properly registered.

Name	Information / Setting	Details
Root menu		
Device Switch	Setting	Use this to turn the device on or off
Device State	Information	Indicates the current status of the device
Mains AC Voltage	Information	The voltage of the mains power supply.
Mains AC Current	Information	The current being drawn from the mains supply.
Mains AC Power	Information	The power being consumed from the mains supply.
Mains Frequency	Information	The frequency of the mains supply.
DC Voltage	Information	The battery voltage.
DC Current	Information	The DC current flow between the battery and the VE 9-bit device.
Inverter AC Voltage	Information	The voltage being produced by the inverter.
Inverter AC Current	Information	The current drawn from the inverter.
Inverter AC Power	Information	The power consumed from the inverter.

Inverter Frequency	Information	The frequency of the inverter output.
Shore cur. limit	Setting	The maximum current to draw from the shore supply.
Charge current	Setting	The maximum percentage of the charge current setting to utilise.

General menu		
Sys. Frequency	Setting	The frequency of the mains supply in your region.
Number of Slaves	Setting	Number of slaves in a parallel system.
Enable Multiphase	Setting	The multi is part of a multi-phase system.
Leader Multiphase	Setting	Set this multi to be a leader in a multi-phase system
Phase Setting	Setting	The phase configuration of the mains supply.

Transfer Switch menu		
Wide Input Freq.	Setting	Allows the AC input frequency to be anywhere from 45 – 65 Hz
AC Low Discon.	Setting	The voltage at which the transfer switch will disconnect the AC supply, and switch to the inverter.
AC Low Connect	Setting	The voltage above the disconnect voltage at which the transfer switch will re-connect the AC
AC High Discon.	Setting	See AC Low Discon.
AC High Connect	Setting	See AC Low Connect
Ground Relay	Setting	Enable this for systems with an earth leakage circuit breaker
AC Waveform Check	Setting	Enables or disables the fast checking of the AC waveform. Disabling this will result in slower transfer speeds, but will be more tolerant of poor input signals.
Dyn. Cur. Lim.	Setting	When enabled, the inverter will be started if the load increases rapidly, to avoid voltage drops as the generator adjusts to the new load.

Inverter menu		
Inverter Voltage	Setting	The desired output voltage of the inverter.
DC Low Shutdown	Setting	The inverter will switch off when the battery voltage drops to this level.
DC Low Restart	Setting	The inverter will restart when the battery voltage rises this far above the shutdown voltage.
AES	Setting	Reduces the current drawn when the inverter load is low, but can take more time to switch to full load.
Power Assist	Setting	If enabled, the inverter will start up if the current consumption becomes too high, to prevent tripping the external breaker.
Boost Factor	Setting	Used to calculate the required current during power assist.

Charger Settings menu		
Enable Charger	Setting	Switch the charger on or off.
Charging Chars	Setting	Select which charging algorithm should be used.
Battery Type	Setting	Select the type of battery that is connected.
Charge Current	Setting	The amount of current used to charge the battery.
Absorption Voltage	Setting	Specify the absorption voltage to be used when charging.
Float Voltage	Setting	Specify the float voltage to be used when charging.
Max Abs Time	Setting	Specify the maximum period of time the absorption phase should last.
Storage Mode	Setting	Enable this setting to use a voltage set point of 13.2V (for a 12V system); otherwise the normal float voltage will be used.
Rep Abs Interval	Setting	Specify the interval between repeated absorptions
Rep Abs Time	Setting	Specify the duration of repeated absorption pulses.



Stop after 10 hr	Setting	Enable this setting to prevent overcharging damaged batteries. Disable this setting if your battery requires a bulk period of more than 10 hours.
Weak AC Input	Setting	Enable this setting if poor A.C. input cause charging problems.

VE.Net Settings menu		
*Device Name	Setting	The name that will appear in the VPN's device menu.
Device Address	Information	The device address for the VVC.
Software Version	Information	The firmware version of the VVC.

Advanced menu		
DC Voltage RMS	Information	Displays the measured ripple voltage of the DC input.
Max AC cur. in	Setting	That value that will be used for the shore current limit, if no VVC or remote panel are connected to the multi.
Auto Shore Curr.	Setting	If this setting is enabled, when the shore current is connected, the shore current limit will be automatically displayed.
*Shore cur. range	Setting	Configure the range for the shore current limiter (usually 16A)
System Defaults	Setting	Restore all setting to their default values.
Software Version	Information	The software version of the VE 9-bit device
Cache values?	Setting	Enable or disable value caching.
PMC present	Information	A phoenix multi control (or other remote panel) has been detected.
Device Type	Information	The type of device connected.
System voltage	Information	The detected voltage of this system (12/24V)
*Reinit Menu	Setting	Reinitialise the VVC menu.





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