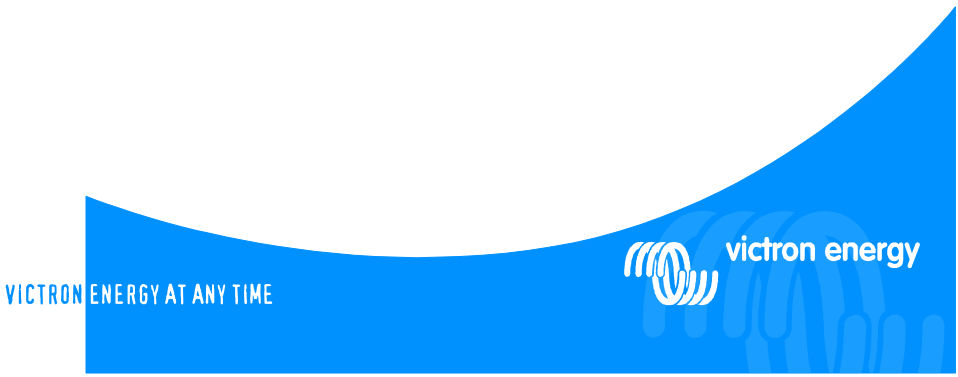
MANUAL

VE.Bus Multi Control Panel

(VBMC)



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1 Quick start

The VE.Bus Multi Control panel (VBMC) is the correct choice if you want to remotely control your Multi system based on VE.Bus.
The VBMC is completely backward compatible so it is also very well suitable to be used with non VE.Bus systems.

Connecting the VBMC to your system is a simple procedure. In most cases just connecting it with a RJ45 cable is sufficient and no extra set-up handling is required.

Use the following table to find out which paragraphs of the next chapter apply to your situation.

Application:	Refer to paragraph(s)
2.1 VE.Bus system (+2.3 External transfer switch (PowerMan))	0 (and 0)
2.2 Non VE.Bus system (+2.3 External transfer switch (PowerMan))	0 (and 0)

Notes:

1) The word “system” refers to an installation of one or more Multis or Quattro’s.
2) To determine whether or not your system is VE.Bus, check the firmware version in the Multi. All Multi firmware versions 15xxyyy, 17xxyyy and 18xxyyy are **non** VE.Bus. (Quattro’s are always VE.Bus.)

2 Standard installations

2.1 VE.Bus system

Installation of the VBMC in a VE.Bus system is really only a matter of connecting the interface cable. No special setup of the VBMC is needed. Scaling to the system is done automatically. (In the unlikely situation that the VBMC is set to a higher limit than is allowed for the system, the system maximum is automatically taken. For example: In a system with a 30A VBMC in combination with a 16 A Multi the shore current maximum is limited to 16A. Even in the case that the VBMC is set to 25A.)

If you have a system with an external transfer switch please continue with paragraph 0.

2.2 Non VE.Bus system

When using the VBMC with non VE.Bus parallel systems, it must be scaled (matched to the system). This can be done by changing the “scaling factor” parameter. Refer to chapter 0 for a description of how to do this.

After correct scaling, the maximum current limit the operator can set is equal to the maximum limit on the VBMC. (There is one rare exception to this rule, see important note 3 in paragraph 0)

If you have a system with an external transfer switch please continue with paragraph 0.

2.3 External transfer switch (PowerMan)

This paragraph deals with systems with 2 AC inputs built with a non-intelligent external transfer switch. This paragraph can be skipped if you have a system with more than one AC input build with VE.Bus. (For instance by using Quattro’s or by using Multis with the extended VE.Bus functionality.) In that case no further adjustments are needed.

If an external transfer switch is placed before the Multis then this switch determines which AC source is used. The Multis do not have any information about the state of the switch. The VBMC provides a way to specify different shore limits for both AC sources.
To achieve this, the VBMC must have information about the state of the external transfer switch. For this purpose a screw connector is placed at the backside of the VBMC.
Normally the VBMC will send the shore current set point as determined by the knob to the Multis. If however the terminals of this screw connector are short circuited the VBMC sends a preconfigured shore limit to the Multis.

The two terminals of the screw connector are to be connected to the PowerMan. An auxiliary relay of the external transfer switch is the normal place. Refer to the transfer switch manual for more information.

3 Installation of the VE.Bus Multi Control panel

To install your VBMC you will need:

1. One UTP (Unshielded Twisted Pair) cable with two RJ45 connectors (to connect to a Multi or Quattro) available in 5, 10, 15, 20, 25 and 30 meters.
2. If an external transfer switch is used (see paragraph 0) you will also need two wires for connecting the panel to the transfer switch. This connection can be made by using 2 wires of 0.25 – 1.0mm².
   Refer to the transfer switch manual for more information.

3.1 Bus cable

To connect the VBMC to a Multi or Quattro use a standard straight UTP cable with RJ45 connectors.

Note: In case of a non VE.Bus parallel system connect the VBMC to the master Multi.

3.2 Transfer switch wiring

Only when an external transfer switch is used one has to connect a switch to the screw connector on the back of the VBMC. When the switch is open the current limit is controlled by the knob on the front of the VBMC. When the switch is closed the VBMC sends the preset generator current limit to the connected devices. This switch is normally controlled by your shore/generator transfer switch.

Figure 0.1 shows how to connect the VE.Bus Multi Control panel.

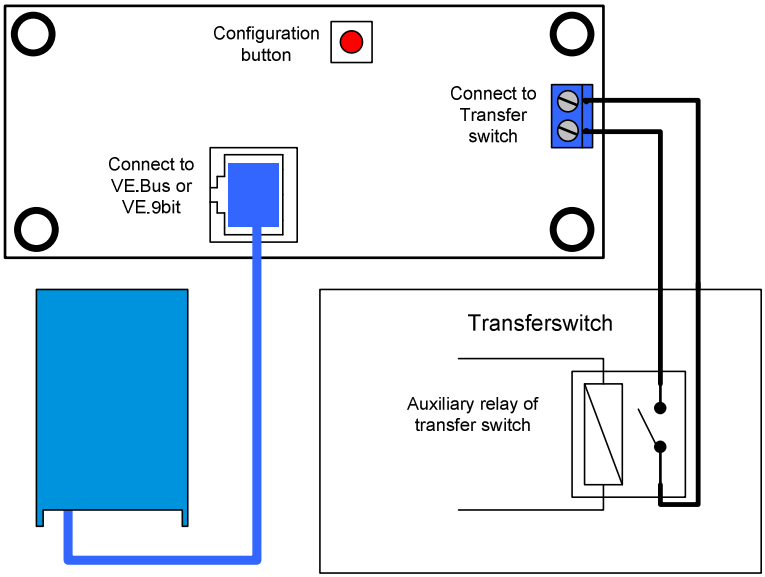

Figure 0.1 - Wiring diagram VE.Bus Multi Control panel

4 Using the VE.Bus Multi Control panel

The VBMC is used to remotely set two different input currents, read out the status of your system and turn on and off the Multis or Quattro's.

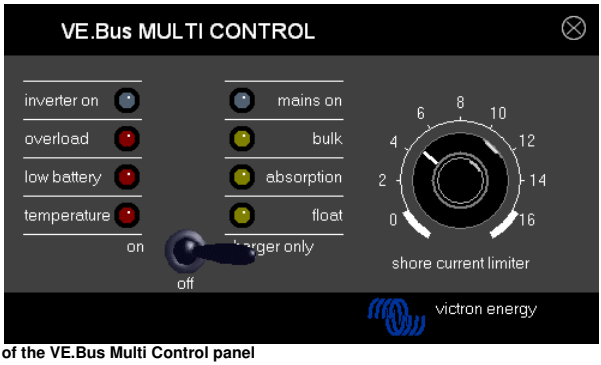

Figure 0.1 Front view of the VE.Bus Multi Control panel

4.1 Turning the system on and off

Use the switch on the front to turn the system on, off or to charger only operation.

4.2 Setting the system input current limit

The shore current is set by the control knob on the VBMC. Turn the knob to the desired value. There are 2 models of the VBMC: a 16 Amp and a 30 Amp. Use the appropriate panel for your system.

The generator current limit can be set during installation. See chapter 0 for detailed instructions.

When PowerAssist is enabled there is a minimum AC input current limit of approximately 2-3Amp per device. Setting a lower limit than this minimum will result in the minimum limit. This is normal Multi/Quattro behaviour. There is a feature in the Multi/Quattro that, when PowerAssist is enabled and the shore current setting from the remote panel is zero amps, the internal transfer relay is opened and the device starts inverting.

4.3 LED brightness

The brightness of the LEDs is controlled automatically using a light sensor. When the ambient light level becomes lower the LEDs will be less bright reducing light emission and power consumption.

5 Configuring the VE.Bus Multi Control panel

During configuration 2 parameters can be set:

1) Scaling factor.
   This parameter needs only to be configured with **non** VE.Bus Multis. This parameter is ignored when using VE.Bus Multis.
2) Generator current limit.
   This parameter needs only to be configured when using an external transfer switch (see paragraph 0) and is of no influence otherwise.

5.1 The scaling factor

Configuration of the scaling factor is only needed for non VE.Bus Multis. (All Multi firmware versions 15xxyyy, 17xxyyy and 18xxyyy.) This parameter is ignored when using VE.Bus Multis. See also paragraph 0.

The scaling factor is used to match the currents displayed by the panel to the currents in the system.

The scaling factor is calculated using the formula:
Scaling factor = (NrOfDevices * DeviceType) - 1

The DeviceType is 1 for a 16A model Multi and 2 for a 30A model Multi.
NrOfDevices is all the Multis **including** the master Multi.

Example: You have 4, 30A Multis. The scaling factor is then: (4 * 2) – 1 = 7

The factory default value for the Scaling factor is 0.

Important notes:

1 *Do NOT specify the number of slaves (with VEConfigure) in the Multis when you have specified a Scaling factor other than zero!*
In that case the number of slaves in the Multis must be set to zero!
The system will not work properly if you set the scaling factor in the panel and the number of slaves in the Multis!

2 *When using a split-phase or 3-phase configuration, the NrOfDevices is determined by the number of devices in 1 phase. So for a 3-phase system build with 6 Multis the NrOfDevices=2.*

3 *When using one 16A model Multi with a 30A VBMC the Scaling factor must be set to 0.*
In this case the 30A VBMC behaves as a 16A VBMC. The result is that setting a limit of, for instance, 20A on the VBMC will set a limit of 10A in the Multi. This is for backward compatibility reasons. Please note that this situation is rare since it makes no sense to connect a 30A VBMC to a 16A system.

5.2 The generator current limit

This parameter needs only to be configured when using an external transfer switch (see paragraph 0) and is of no influence otherwise.
The generator current limit can be set from 0 up to about 200 Amps.

The factory default value for the generator current limit is 16 Amps.

Important note:

Small 3000 rpm generator sets of certain brands will overheat when operating for long periods at full load. In some cases the maximum current will have to be set at no more than 70 % of

the rated maximum current. The current limit of 1500 rpm generator sets can in general be set at around 90 % of the rated output current.

5.3 Procedure

Configuration of the 2 parameters is done in three steps. In each step a value from 0-9 must be programmed. During these steps the LEDs display information about the step number and the value being programmed in this step.

5.3.1 Reading the LEDs

The remote panel has 2 columns of LEDs. During configuration each column represents 0-9 according to the table below.

Value	0	1	2	3	4	5	6	7	8	9
LED indication	○	○	○	○	○	○	○	✸	✸	✸
	○	○	○	○	○	✸	✸	✸	✸	✸
	○	○	○	✸	✸	✸	✸	✸	✸	✸
	○	✸	✸	✸	✸	✸	✸	✸	✸	✸

Table 0.1 LED indication for values 0-9

○ means LED is off, ✸ means LED is blinking, ✸ means LED is on

(In text: Each LED represents a value. $0_{(off)}$, $1_{(blink)}$ or $2_{(on)}$. Add the values of the LEDs in a column to obtain the values 0-8. All LEDs flashing means 9)

The left column denotes the current step (1, 2 or 3) while the right column represents the value 0-9 being programmed for this step.

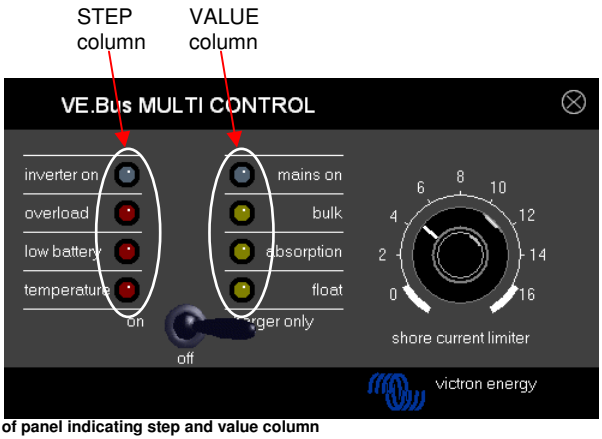

Figure 0.1 Front view of panel indicating step and value column

5.3.2 Entering configuration mode

To enter the configuration mode press the button on the back of the panel (see Figure 0.1) until the bottom LED in the left column starts flashing indicating step 1.

Note: The connected Multis or Quattro's switch to Inverter only when the configuration button is pressed and during configuration mode.

5.3.3 Step 1

The scaling factor is configured in the first step. The programmed value corresponds directly to the scaling factor so:

- Turn the knob on the front panel until the right LED column displays (according to Table 0.1) the desired value for the scaling factor.
- Then press the button to proceed to step 2. (The left LED column will “display” 2, indicating step 2.)

5.3.4 Step 2 and 3

Because the generator current limit range largely exceeds the 0-9 range we use two steps to configure the generator current limit. By using 2 steps we can create a value from 0-99. This is quite easy. In step 2 we program the tens and in step 3 we program the units. For example to configure a value of 68 we program 6 in step 2 and 8 in step 3.

Important: A range of 0-99A for the generator current limit is not enough cover all systems. Therefore the panel multiplies the programmed value by 2 to obtain the generator current limit. So programming for instance 95 (in steps 2 a 9 and in step 3 a 5) will result in a generator current limit of 2x95=190A.

- Determine the required generator current limit. Divide this value by 2 to obtain the value which must be programmed during step 2 and 3.
- Turn the knob until the right LED column “displays” the correct value for step 2.
- Press the button to proceed to step 3. (The left LED column will “display” the value 3 indicating step 3.)
- Turn the knob until the right LED column “displays” the correct value for step 3.
- Press the button to exit configuration mode and make the new settings effective. (The LEDs on the panel will function normal again displaying the state of the connected system)

5.4 Configuration Examples

Two examples are given to help you understand the setting of the parameters.

5.4.1 Example: Two 16A VE.Bus Multis + 230V/4kVA generator (3000 rpm)

For this configuration the scale factor does not need to be set since we are using VE.Bus Multis. A 4kVA generator can supply a maximum current of 17,4A. Using the 70% safety margin we will set the generator current limit to 12A. To set the configuration, using either a 16A or 30A panel, do the following:

- Press and hold the configuration button until the bottom LED in the left column starts flashing indicating step 1.
  This step can be ignored because we have VE.Bus Multis.
- Press the button to go to the next step.
  (The lower left LED will turn on indicating step 2.)
- Determine the value for step 2 by dividing the required generator current by 2.
  12/2 = (0)6.
  Because this is lower than 10 the value to be set during step 2 is 0.
  The value to be set during step 3 is 6.
- Turn the knob until all LEDs in the right columns are off. Setting the value for step 2 to 0.
- Press the button to go to step 3.
- Turn the knob until the bottom 3 LEDs in the right columns are on. Setting the value for step 3 to 6.
- Press the button to finalize the configuration.

5.4.2 Example: Four 30A non VE.Bus Multis + 120V/13kVA generator (1500 rpm)

For this configuration the 'scale factor' must be calculated. The NrOfDevices is 4, the DeviceType is 2 so the scale factor is (4 x 2) – 1 = 7
A 13kVA generator 120V can supply a maximum current of 108,3A. Using the 90% safety margin we will set the generator current to 98A. To set the configuration, using either a 16A or 30A panel, do the following:

- Press and hold the configuration button until the bottom LED in the left column starts flashing indicating step 1.
- Turn the knob until the right column "displays" 7.
  (Bottom 3 LEDs on and the top LED flashing.)
- Press the button to go to step 2.
  (The lower left LED will turn on indicating step 2.)
- Determine the value for step 2 by dividing the required generator current by 2.
  98/2=49.
  So the value to be set during step 2 is 4 and the value to be set during step 3 is 9.
- Turn the knob until the right column "displays" 4. (refer to Table 0.1)
- Press the button to go to step 3.
- Turn the knob until the right column "displays" 9. (refer to Table 0.1)
- Press the button to finalize the configuration.

Appendix 1 Technical data

Supply voltage range	9 ... 70VDC	
Supply current	Standby	Active
@12V	<5mA	<30mA
@24V	<5mA	<15mA
Operating temperature range	0 ... 50°C	
Dimensions	65 x 120 x 55mm	
Net weight	120 gram	
Material:		
Body	Aluminium	

victron energy

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