**MANUAL**

# VE.Bus Multi Control Panel
## (VBMC)

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# 1        Introduction

The VE.Bus Multi Control panel (VBMC) is the correct choice if you want to remotely control a simple Multi system based on VE.Bus.
If more than 1 AC input has to be controlled by the panel or if the transfer currents exceed the maximum of the VBMC, the Digital Multi Control (DMC) should be used instead.

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.

**Note:**
The VBMC is completely backwards compatible so it is also very well suitable to be used with non VE.Bus systems. (The word "system" refers to an installation of one or more Multis or Quattro's.)
This manual describes only VE.Bus systems. Please contact Victron Energy if you need specific information about using this panel with non-VE.Bus systems. 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        Installation

*Without external transfer switch*
Installation of the VBMC in a VE.Bus system without external transfer relay 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.)

*With external transfer switch*
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.)

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. Because this functionality is mainly used to connect a generator this preconfigured shore limit is called 'generator current limit' throughout this manual. Paragraph 4 describes how this limit can be changed.

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

**Wiring**
To install your VBMC you will need:

- An 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.

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- When using an external transfer switch 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.

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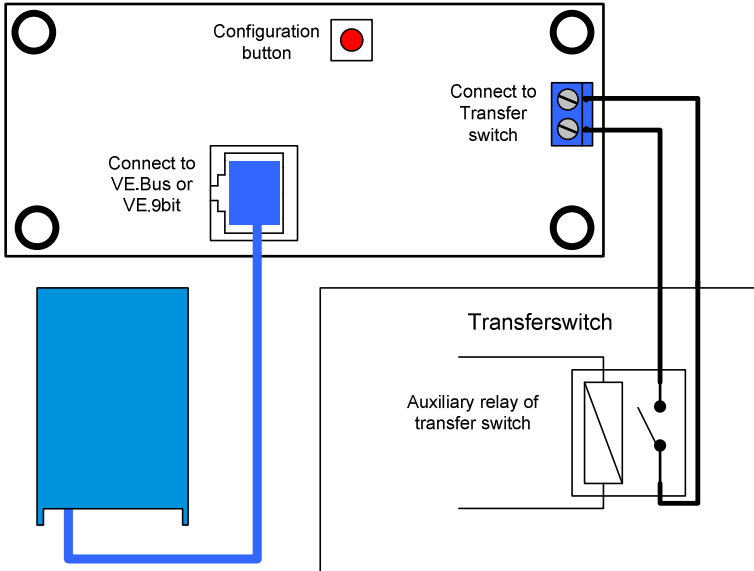
# 3 Using the VE.Bus Multi Control panel

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



## 3.1 Turning the system on and off

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

## 3.2 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.

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 behavior. 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.

## 3.3 LED brightness

For your comfort, 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 which is more pleasant for the eye and reduces power consumption.

# 4 Configuring the VE.Bus Multi Control panel

In most cases the panel will function without extra configuration.
Only when using an external transfer switch or when using non-VE.Bus Multis the panel needs to be configured. During configuration 2 parameters can be set.

### 1 The scaling factor
This parameter is for backwards compatibility only and needs to be set when using non-VE.Bus Multis. Please contact Victron Energy for more information about connecting non-VE.Bus Multis.

### 2 The generator current limit
This parameter needs only to be configured when using an external transfer switch 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.*

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

### 4.1.1 Reading the LEDs
The remote panel has 2 columns of LEDs. During configuration each column represents 0-9 according to the table below.
(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 indicates 9.)

| Value | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|-------|---|---|---|---|---|---|---|---|---|---|
| LED indication | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ✳ | ✴ | ✳ |
| | ○ | ○ | ○ | ○ | ○ | ✳ | ✴ | ✴ | ✴ | ✳ |
| | ○ | ○ | ○ | ✳ | ✴ | ✴ | ✴ | ✴ | ✴ | ✳ |
| | ○ | ✳ | ✴ | ✴ | ✴ | ✴ | ✴ | ✴ | ✴ | ✳ |

○ means LED is off, ✳ means LED is blinking, ✴ means LED is on

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

STEP        VALUE

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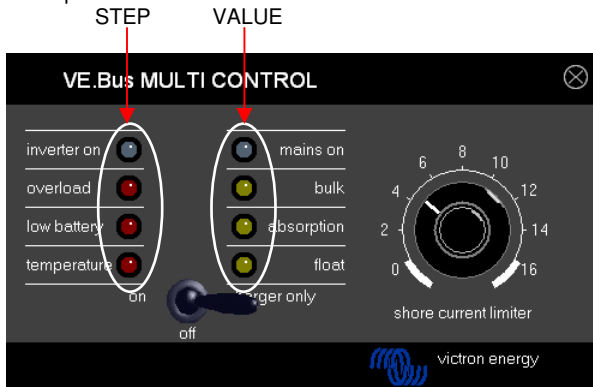
### 4.1.2 Entering configuration mode

To enter the configuration mode press the button on the back of the panel 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.

### 4.1.3 Step 1

The scaling factor is configured in the first step. This parameter is not used in VE.Bus systems so press the button again to proceed to step 2.
(The left LED column will "display" 2, indicating step 2.)

### 4.2.4 Step 2 and 3

Because the generator current limit range largely exceeds the 0-9 range we need two steps to configure the generator current limit. By using 2 steps we can create a value from 0-99. This is done as follows: 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 to 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.

Steps to perform:
- Determine the required generator current limit.
- Divide this value by 2 to obtain the value which must be programmed during step 2 & 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)
- 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 panel will function normally displaying the state of the connected system)

Example for a 230V/4kVA generator (3000 rpm):
A 4kVA/230V 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 assume VE.Bus Multi.
- 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.

**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 | Aluminum |

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