VE.Bus Error Codes

General

During first installation, and in case of problems, update all devices to the latest firmware. This includes the latest VE.Bus firmware and also the latest firmware in the Color Control GX.

Firmware update instructions:

1. for VE.Bus products
2. for Color Control GX

To restart a system, first switch all units off, one by one. And then switch all units on again. Do this with the On / Off / Charger-only rocker-switch on the front of the device.

VE.Bus Error Codes

Error 1 - Device is switched off because one of the other phases in the system has switched off

One of the phases in a multi-phase system has failed. Commonly because of an Overload or High temperature alarm. When this happens, the other phases will show VE.Bus Error Code 1.

Trouble shooting: Look for the failing phase, which will be the phase that is not showing VE.Bus Error Code 1. And check the LEDs on that phase to find out what the reason was for the shut down.

Diagnosing on VRM First make sure that Automatic alarm monitoring is enabled; that is necessary to create the Overload and Temperature errors in the log. You will see Overload and Temperature alarms occurring at the same time as VE.Bus Error 1.

Note for split- and three-phase systems: VRM, nor the CCGX, will indicate on which phase the overload or the temperature alarm occured. To find out on which unit the error occurs, go to system after it has switched off. And look on the LEDs. The unit with the overload or temperature alarm, will have the corresponding alarm LED lit continuously. The other units will indicate a VE.Bus error, indicating that they miss one unit.

Error 2 - New and old types MK2 are mixed in the system

This should never happen, contact Victron service.

Error 3 - Not all, or more than, the expected devices were found in the system

Possible causes and solutions:

1. This error often follows VE.Bus Error 1. Solution: solve the cause for VE.Bus Error 1. Note that when using an older CCGX (version before v1.40), it can be that the first error is not reported on the Alarm log on VRM. So even when it only lists VE.Bus Error 3, it can very well be that that error was preceeded by VE.Bus Error 1.
2. The system is not properly configured: all VE.Bus devices connected to the VE.Bus network must be configured as one parallel, split- and/or three-phase system. Do not connect two separate VE.Bus systems together.
3. Communication cable error: check the communication cables.

Error 4 - No other device found

The master device is configured to run in a parallel-, split- and/or three-phase system, but cannot find other devices on the bus.

Multiple possible causes:

1. During a system restart

Error 4 can be seen temporarily while the system restarts after an error. Not a real error in that case, no need to investigate.

2. Because of issues in cabling

Faulty cables. Check the communication cables. Don't use self made cables.

Error 5 - Overvoltage on AC out

This problem can occur when the AC wiring of one of the slave units is not connected properly, or not connected at all.

Check the AC wiring.

Error 6 - Error in DDC Program

This means: error in an Assistant. To solve, follow these steps:

1. update VE.Bus firmware in all devices to the latest firmware. Instructions here.
2. download the latest VEConfigure and make sure it has downloaded all the latest Assistants.
3. re-configure the system

Error 7 - VE.Bus BMS detected, but not configured

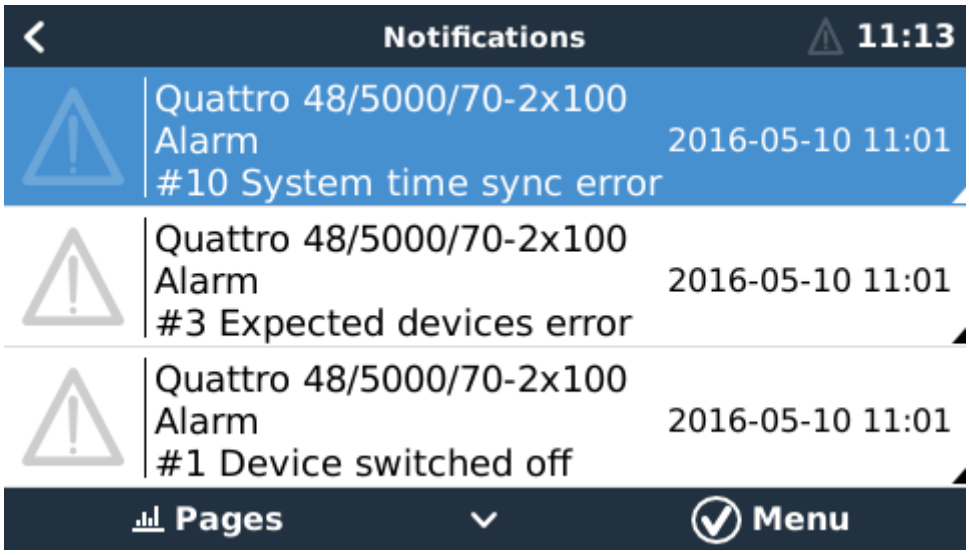
A VE.Bus BMS device is connected but there is no Assistant loaded which handles the VE.Bus BMS.

Solution: configure the use of the VE.Bus BMS in one of the Assistants.

Error 10 - System time synchronisation problem

This typically happens during a system restart, and is then not a real error; no need to investigate.

For example this screenshot from the Color Control GX:



The real problem is Error 1. In this example it was caused by switching device L2 off with the front toggle switch. It was then quickly followed by Error 3. And when switching device L2 back on, briefly Error 10 is visible, followed by full recovery.

Note: System restarts can also be triggered when using Remote VEConfigure.

Error 11 - Relay Test Fault - Installation error or possibly relay failure (Multigrid only)

Occurs when the relay test of a Multigrid fails. The relays are automatically self-tested every time before the MultiGrid connects to mains.

Most likely the test fails due to an installation error:

- Please verify whether the incoming AC is a TN network.
- Line and Neutral should be connected to the corresponding L and N input on the Multigrid. A swapped connection results in VE.Bus Error 11
- There should be no external connection between N-out and GND!

Error 11 refers to a fault state where an internal relay check is performed to assess if there is a functioning neutral to earth link in the electrical system. If a neutral earth link is not found, the Multigrid will engage the relay and create this link.

There can only be 1 physical earth neutral link bond in each installation.

In the event of a detected grid outage, the Multigrid will disconnected (“island”) the active AND the neutral on the AC-Input to the inverter. This also serves to remove the earth-to-neutral connection, which needs to then be quickly re-created inside the Multigrid (by the relay) for the AC-Out. This is to maintain safety features on the electrical circuit such as residual current devices (RCDs).

It is important for the operation of this relay, that the neutral links on the AC input and AC output of the Multigrid remain isolated from each other.

If there is a connection detected between these two neutrals, it will trigger Error 11, and the unit will shut down until it is corrected.

If you are adding the Multigrid to existing wiring and intend to seperate the essential (AC-Out) and non-essential (AC-In) loads; It is recommended to disconnect all existing distribution board wiring for these and re-wire the board with them structurally separated and clearly labelled.

To be clear, that is two separated, neutral buses. One for the mains grid supply and one for the AC-Out 'Essential Loads' that will remain on during a grid outage.

It will only take one instance of a load circuit with the active connected to the AC-out, while the neutral is connected to the AC-in neutral bus (or vice versa) to lead to error 11 issues.

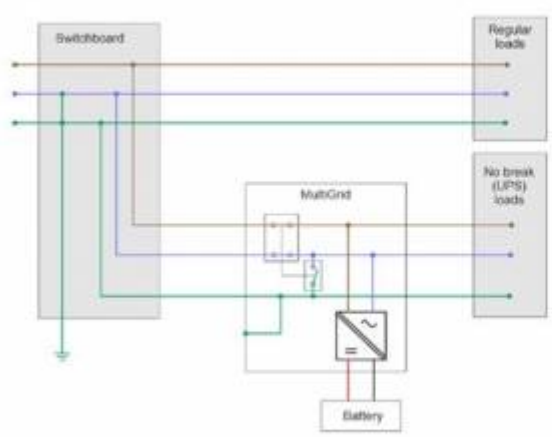
Furthermore, future circuit additions by electricians who are unfamiliar with the separated neutral links could lead to issues arising with an otherwise functioning installed system, and make this fault very difficult to troubleshoot.

If you are not separating the loads into Essential and Non-essential, and all loads will be connected to the AC-Out of the Multigrid, then you will STILL have 2 seperate neutrals. However the ONLY load on the Main Grid Supply neutral will be the Multigrid AC-Input.

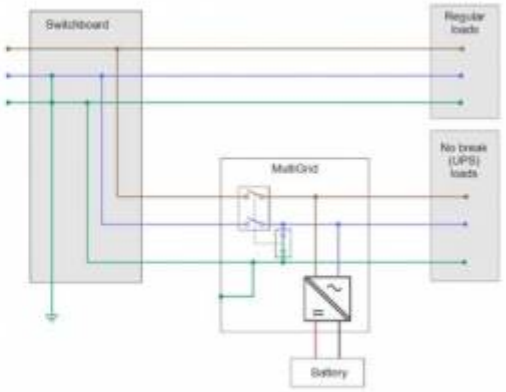
This will still cause the physical earth-to-neutral link on the input to be broken during an outage, and the new earth-to-neutral link to be made by the internal Multigrid relay.

You will need to run two seperate Active and two seperate Neutral wires to the Multigrid, one for the AC-In and one for the AC-out. They will share the same common earth.

Multigrid internal wiring diagram



when grid is present



during a grid failure

If the failure is not triggered by one of the above conditions a hardware failure might be the cause, contact your Victron dealer.

Error 14 - Device cannot transmit data

Most probably a short circuit in the communication cables.

Another possibility, very rare though, is a broken component on the board. Return the device to the nearest service point for repair.

Error 16 - VE.Bus dongle is missing

Update firmware to latest version: VE.Bus dongles are no longer necessary.

Instructions here.

Error 17 - Original Master Missing

This error can only occur on systems with multiple devices installed per phase. For example a single phase installation with two or more devices in parallel, or a three-phase installation with six or more devices.

Error 17 will only appear on slaves. You'll see it when its phase-master is no longer communicating on the VE.Bus network.

- In some cases this error can be seen temporarily while using Remote VEConfigure to write a new configuration.
- Otherwise, the most likely cause is bad cabling/contacts on the VE.Bus: Check cabling and contacts. Make sure to also inspect the female RJ-45 sockets, instead of only the cabling: Sometimes badly mounted RJ45 cable connectors prevent the spring-contacts in the female RJ45 connectors on the Multis to properly make contact.

If nothing can be found and the failure persists a hardware error might be the cause. Contact your distributor, and also report the exact LED indication of the Master and all slaves in that phase.

Error 18 - AC Over-voltage on the output of a slave while switched off

Solution: check if AC wires are not swapped by accident. There can never be voltage on the AC out when a unit is switched off.

Error 22 - This device cannot function as a slave

This device is an obsolete and unsuitable model. It should be replaced.

Error 24 - Switch-over system protection initiated

There is a back-feed (or 'anti-islanding') relay present on the AC input of each unit. This relay is automatically opened during periods of AC input loss (e.g. grid or generator failure) as a safety mechanism to avoid the back-feeding of AC energy 'upstream'.

Error 24 is raised when a Multi or Quattro detects current flowing through a back-feed relay during a period when the relay should be open - which means that the relay did not open when it should.

This should not occur in a correctly installed and sized system. Possible causes in order of probability:

1. There is too much AC load connected at the moment the relay needs to switch off. This large current will prevent the relay contacts from opening.

   Solution: remove excessive load.

2. The AC input voltage slowly drops before it is being rejected by the Multis. Typically happens in installations with a genset. Especially when combined with AC loads that increase their current draw when the AC voltage drops: at the moment the Multis or Quattros decide to switch off, the current through the relays is too high to open them.

   Solution: Make the Multis or Quattros disconnect earlier: increase lower limit of AC input voltage in VEConfigure3. For example to 210 VAC. The factory setting is 180 VAC.

3. The back-feed relay has a hardware failure (and is stuck 'on')

   Solution: Replace faulty unit.

Diagnostic notes for multi-unit clusters showing error 24

With all Multis or Quattros set to 'off' on their front panel rocker switches and with AC power presented to the input of the system, there should be no AC present on the AC-1 output terminals.

If AC *is* present on the output side while the units are switched off, this energy is flowing via the stuck back-feed relay. AC is also being back-fed into the inverter output circuitry as a result, and this may result in all units audibly 'humming' (even though they are set to be 'off').

In a parallel-wired cluster, one faulty relay will make it appear that all units wired in parallel are faulty. To determine which unit is really at fault, power the cluster down and un-wire all AC inputs and all AC outputs. Then apply DC battery power and configure each unit into standalone mode so that it starts to invert and present power to its AC output. Any unit where there is *also* AC energy present on the *input* terminals has a stuck back-feed relay and needs to be replaced.

Error 25 - Firmware incompatibility

Make sure to use the same firmware in all devices.

Solution: update all devices to the latest available firmware. Instructions here.

Error 26 - Internal error

Should not occur. Switch all equipment off, and then on again; it will then resume operation. Contact Victron Energy if the problem persists.

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