

V-Controller / VC-mini user manual

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By Catrinus Feddema
(sixeight at vguitarforums.com)

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Features

V-Controller:

- Advanced midi foot controller with 16 switches, 13 displays and 12 RGB LEDs.
- Two serial midi ports. Midi 1 has a midi out port with midi in and power on extra pins and a separate midi in port. Midi port 2 with parallel RRC2 port (for VG99)
- USB connector for MIDI and firmware updates.
- Connections for four expression pedals or dual switches. Automatically detects the type of pedal connected including if it is a normally open or normally closed external switch(es).
- Option slot for extra hardware. Currently developed:
 - Raspberry pi board which will add four USB host ports!

VC-mini:

- Advanced midi foot controller with 3 switches, 1 display and 3 RGB LEDs.
- Two serial midi ports:
 - Midi 1 out: - For connecting a regular 5 pin midi connector or 7 pin connector. Midi in is wired on spare pins and 9v power in is wired on extra pins of 7 pin connector.
 - Midi 1 in: - For connecting a regular 5 pin midi connector or 7 pin connector. Midi out is wired on spare pins and 9v power out is wired on extra pins of 7 pin connector.
 - Midi 2 out: - For connecting a regular 5 pin midi connector or 7 pin connector. Midi in is wired on spare pins and 9v power in is wired on extra pins of 7 pin connector.
- USB connector for MIDI and firmware updates.
- USB host port, which supports USB hubs!
- 3,5 mm jack connector for an expression pedal or dual switches. Automatically detects the type of pedal connected including if it is a normally open or normally closed external switch(es).

Both devices:

- Currently supported devices:
 - Boss GP-10
 - Roland VG-99
 - Roland GR-55
 - Zoom G3
 - Zoom MS70-cdr
 - Line6 M13
 - Line6 Helix (limited – no patchnames, parameter states, etc.)
 - AxeFX 2 – other Fractal models may work, but are not tested.
 - Boss Katana
 - Kemper Profiling Amp
- Features for these devices (apart from Helix):
 - Automatic detection when connected or disconnected
 - Reading of patch names from these devices.
 - Control of a number of parameters. For the most common parameters the names and current states are read from the devices.

- Control and active reading of assigns (Boss/Roland only)
 - Colour coded effect types
 - Global Tap Tempo: all devices pick up the tempo from the V-Controller.
There is the option to keep this tempo on all patches on all devices.
 - Global tuner for most devices (not possible on GR-55 or Zoom G3)
 - US-20 simulation: smart muting of GP10, GR55 or VG99 by switching off the COSM guitar/synth/normal PU on the devices that are not active.
- The VController has the following switch types:
 - Patch select, bank select, Bank up/down, previous patch / next patch
 - Direct select option for patches.
 - Parameter control (momentary, toggle, three state, four state, five state, range, updown)
 - Assign control (through cc or FC300 emulation for VG99)
 - Mute/unmute
 - Open next page of device
 - Toggle expression pedal
 - Master expression pedal
 - Snapscene – for controlling snapshots on Helix or scenes on AxeFX
 - Looper – for looper control
 - Global tap tempo and set tempo
 - Global tuner
 - Page select, bank select, Bank up/down, previous page / next page
 - Select next device
 - Midi PC/CC/note on/off
- Autobass mode: sends a CC message with the number of the lowest string that is being played (CC #15)
- MIDI connectors can be connected to external Raspberry Pi box.

Making connections to the V-Controller



- USB – Use this port to connect the VController to a PC or Mac. The VController will act as a “class compliant” MIDI device. This USB port is also used for firmware upgrades.
- EXP1-4 / CTRL 1-8 – External input jacks. These support:
 - An expression pedal (tested with Roland EV-5 and Roland DP-10)
 - A normally closed single or dual switch.
 - A normally open single or dual switch.

The type of pedal or switch is detected during power on of the VController. Make sure no external footswitch is pressed when switching on the VController.

- MIDI 1 OUT and IN – To connect to an external MIDI device.
- MIDI 2 IN/OUT and RRC – Midi 2 has in and out wires to the same connector. Details are below. RRC2: use only to connect to a VG-99. Do not connect anything to MIDI-2 in/out when RRC2 is in use!
- DC power jack: connect a “Roland-style” power supply rated at 9 V. The basic VController draws less than 1A. But with an internal or external Raspberry Pi, you will need more power, especially when the Raspberry Pi also powers other devices over USB. To be on the safe side a 2-3A power supply is recommended.

Power can be supplied through the DC power jack, through the RRC2 connector (from the VG99) or through the MIDI 1 or MIDI 2 7-pin connectors.

Always connect both MIDI in and MIDI out as communication between the VController and the devices is bi-directional.

Making connections to the VC-mini



- USB – Use this port to connect the VController to a PC or Mac. The VController will act as a “class compliant” MIDI device. This USB port is also used for firmware upgrades.
- USB host port – Use this port to connect directly to a USB port of a device. Up to 8 devices can be connected through USB hubs.
- MIDI 2 OUT(+IN)– Midi 2 can be used with regular 5 pin MIDI plugs or special 7 pin MIDI plugs. Details are below.
- EXP / CTRL 1-2 – External input jacks. These support:
 - An expression pedal (tested with Roland EV-5 and Roland DP-10)
 - A normally closed single or dual switch.
 - A normally open single or dual switch.

The type of pedal or switch is detected during power on of the VController. Make sure no external footswitch is pressed when switching on the VController.

You will need a 3,5 mm stereo jack to 6,3 mm jack adapter cable or change the connector on your expression pedal or switch to make the connection.



- DC power jack: connect a “Roland-style” power supply rated at 9 V. The basic VC-mini draws less than 500mA. But when the host port also powers other devices over USB, more power is needed. To be on the safe side a 1-2A power supply is recommended
- MIDI 1 OUT(IN) – Same as MIDI 2 OUT(IN).
- MIDI 1 IN (OUT) –

Power can be supplied through the DC power jack, through the RRC2 connector (from the VG99) or through the MIDI 1 OUT or MIDI 2 OUT 7-pin connectors.

Always connect both MIDI in and MIDI out as communication between the VC-mini and the devices is bi-directional.

Wiring of midi connectors:

Midi 1 OUT(IN) and midi 2 OUT(IN):

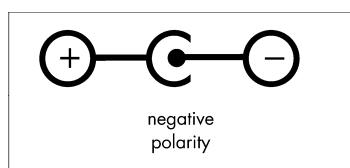
1. MIDI IN PIN +
2. Ground/Shield
3. MIDI IN PIN -
4. MIDI OUT PIN +
5. MIDI OUT PIN -
6. Power IN Positive (+9V)
7. Power IN Negative (GND)



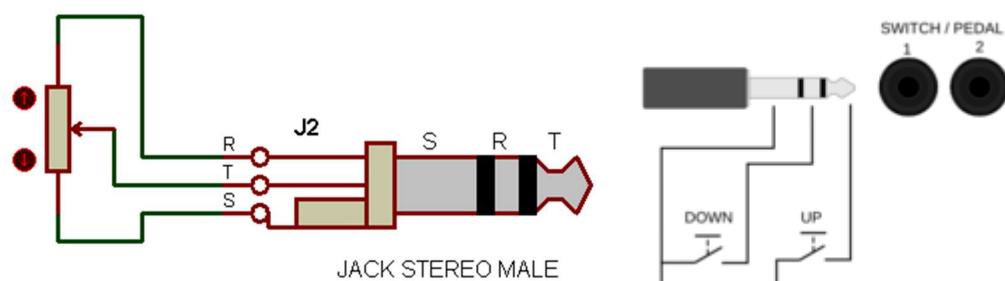
Midi 1 IN:

1. MIDI OUT PIN +
2. Ground/Shield
3. MIDI OUT PIN -
4. MIDI IN PIN +
5. MIDI IN PIN -
6. Power OUT Positive (+9V)
7. Power OUT Negative (GND)

Polarity of DC power barrel:



Wiring of EXP pedal/CTL switch jacks:



Dual switches can also be of the normally-closed type.

Raspberry Pi option

One option is to have a Raspberry Pi (RPi) in the VController option slot. The internal MIDI3 connection is used to connect the RPi to the VController.



It is also possible to put the RPi with the VCBridge software in a separate box. This also works with the VC-mini, though the VC-mini has a USB host port of its own.



The external Raspberry Pi has the following connections:

- Midi IN/OUT is mainly used for MIDI IN, but has MIDI OUT and POWER OUT on extra pins. Always use this port to connect the VController with one wire!
- Midi OUT/IN is mainly used for MIDI OUT, but has MIDI IN and POWER IN on extra pins.
- DC POWER: use this pin to connect a Roland style power supply (9V, 1 Amps)
Do NOT use this port to connect to the RRC2 port of the VG99 or VController!
- Ethernet port: can be used to program the Raspberry Pi.
- Four USB host ports. You can connect these to GP10, GR55, GP10, G5 or MS70cdr. Also a USB to MIDI adapter can be connected here. The Raspberry Pi has not been tested with a USB host.
- 5V micro USB port. This port can also power the Raspberry Pi. It is not possible to remote power the VController through this port. You have to use the main 9V DC Power input for that
- HDMI. You can connect a HDMI monitor here. Together with a USB keyboard the Raspberry Pi can be programmed this way as well.
- 3,5 mm headphone jack. Is not used by the VController software.

When the Raspberry Pi is built inside the VController, only the Ethernet port and the USB ports are available on the outside. Power and MIDI are connected internally. The HDMI and headphone jack are not accessible.

You can hotplug devices to the USB ports or the serial MIDI ports. The RPi is actively detecting the connection of new USB devices.

Basic operation

Switching on the VController

The VController is switched on by pressing the top left switch. It is switched off by holding that switch for three seconds. Alternatively it can be switched on and off by a separate switch at the back. This is an extra hardware option.

The Raspberry Pi (RPi) is powered together with the VController when it is built in. With the RPi in a separate enclosure, the RPi is powered as soon as power is connected to it. After power is applied it will take around 20 seconds before the Linux operation system of the RPi has booted. A green LED will come on when the VCbridge software is running and the RPi is ready to pass on MIDI data to the VController.



Switching on the VC-mini

The VC-mini does not have a power switch. Just connect the VC-mini to an active power supply and it should work.

Automatic device detection

Whenever a supported device is connected to the VController, it will connect automatically as long as Device settings->Enabled is set to DETECT in the settings and both MIDI in and MIDI out are connected. A USB connection is always bi-directional . The VController automatically reads the relevant patch names and parameter states of this device.

Multiple devices can be connected at the same time. It is best to use a different port for every device. All the USB ports on the RPi or on a USB hub connected to the VC-mini are seen as separate ports!!!

The VController sends midi data only to the port where the device is detected. This avoids midi buffer overruns for devices on other ports. Also on a USB hub connected to the VC-mini and Raspberry Pi (internal or external) the midi data is only sent to the USB port that has a device connected. General MIDI data can be sent to all ports.

Manual device detection

Manual connection to devices is necessary for devices that cannot be detected like the Line6 Helix or if for some reason bi-directional communication is not possible. Go to the menu and set Device settings -> Enabled to On or Off for this particular device.

Switches of the V-Controller

The VController has 16 internal switches and 8 external switches. Every switch can execute any number of commands on press. The configuration of all the switches is stored in a page. The VController has a number of fixed pages and a number of programmable pages.

The internal switches are numbered 1 to 16:

Switch 13	Switch 14	Switch 15	Switch 16
Switch 9	Switch 10	Switch 11	Switch 12
Switch 5	Switch 6	Switch 7	Switch 8
Switch 1	Switch 2	Switch 3	Switch 4

By default switch 13 – 16 have the following functions. This can be programmed otherwise:

Switch	Press	Long press
13	Bank down (patch/parameter select) Patch down (assign page)	Open direct select Extra long press – power down
14	Bank up (patch/parameter select) Patch up (assign page)	Open direct select
15	Select next connected device	Open select page for programmed pages or menu
16	Select next page of current device*	Open select page for programmed pages or menu

Select next page of current device: For every device four pages can be set. This switch toggles through the three pages. By default these are set to patch select, parameter select, assign select for Boss/Roland devices. For Zoom there is only one default page. In the device menu, you can change these device pages.

Switches and encoders of the VC-mini

The VC-mini has 3 internal switches, 2 encoders and 2 external switches. Every switch can execute any number of commands on press and/or turn. The configuration of all the switches is stored in a page. The VC-mini has a number of fixed pages and a number of programmable pages.

The internal switches are numbered 1 to 3. The encoders can be turned and pressed. On the VC-mini the encoders are also programmable!

By default switch 1 - 4 have the following functions. This can be programmed otherwise:

Switch	Press
1 + 2	Bank down (patch/parameter select)
2 + 3	Bank up (patch/parameter select)
Long press switch #1 or press encoder1	Select next connected device
Long press switch #3 or press encoder 2	Select next page of current device*
Press both encoders	Open SELECT USER page. From this page you can go to the user pages, the device pages or to the menu.

Select next page of current device: For every device four pages can be set. This switch toggles through the three pages. By default these are set to patch select, parameter select, assign select for Boss/Roland devices. For Zoom there is only one default page. In the device menu, you can change these device pages.

Pressing switches

The VController and VC-mini will detect the press and release of all its switches (also external).

Some functions are triggered by long pressing a switch, holding it for 1 second. It is possible to hold switches that are programmed to control a parameter or cc. The speed of change is increasing as the switch is held down.

Basic operation

Pages

A page on the VController and VC-mini is the current layout of internal and external switches. The VController and the VC-mini have a number of fixed pages and with a number of programmable pages.

By default a number of pages have been assigned to every device. Whenever that device is connected, the first page assigned to the device will be selected.

Navigating the device pages of the VController

By pressing switch 16 on the VController the next page assigned to the device will be selected.

When multiple devices are connected, pressing switch 15 on the will select the next device.

On a patch page switch 13 and 14 control BANK DOWN and BANK UP.

On a parameter page or assign page switch 13 and 14 will select the previous or next page of parameters/assigns.

Navigating the device pages of the VC-mini

By pressing encoder switch 2 or holding switch 3 on the VC-mini the next page assigned to the device will be selected.

When multiple devices are connected, pressing encoder switch 1 or holding switch 1 on the VC-mini will select the next device.

On a patch page pressing switch 1 + 2 or switch 2+3 simultaneously will control BANK DOWN and BANK UP. Banks can also be selected with encoder 1.

On a parameter page or assign page pressing switch 1 + 2 or switch 2+3 simultaneously will select the previous or next page of parameters/assigns. Parameter/assign pages can also be selected with encoder 1.

Direct select mode

On the VController long pressing BANK UP or BANK DOWN will take you to direct select mode. Here you can type the number of the patch you want to go to. For devices with many patches you can press bank up and down to move forward and backward 100 patches in direct select mode.

Direct select mode is not implemented on the VC-mini, as it does not have enough switches.

Controlling parameters

On a parameter page a select number of parameters are available to be changed. The memory of the VController is insufficient to support all possible parameters of a device. More parameters can be added in future firmware updates.

Parameters can be the following types:

Type	Description
Momentary	Press activates and release deactivates parameter
Toggle	Activation and deactivation are toggled
Three state	Run through three values of the parameter
Four state	Run through four values of the parameter
Step	Run through any number of values with a programmable step size
Updown	Pressing will change direction. Holding it will change the value
Range	Used for expression pedals to change the value of the parameter between a minimum and maximum value

The switches on the fixed parameter pages are always of type toggle, step or up/down.

Controlling assigns

The VController can control assigns on the GP10, GR55 and VG99. The other devices do not have any assigns.

On all three devices assigns can be programmed. The VController activates the assigns through CC messages. The cc number of the assign on the device has to match the cc number of the assign on the VController.

Once the cc values match, the assign parameter will be read. When the parameter is known to the VController, its name will be shown on the display. If a parameter is unknown, it can still be controlled, but its name will not be displayed. Instead the assign number is shown.

For the VG99 a lot of extra assigns can be controlled. The FC300 CTL1 – 8 assign, the FC300 EXP1, EXP2, EXP SW1 and EXP SW 2 assigns can be programmed and controlled.

From the VG99 assign page you can choose “More assigns.” Here you can see the parameters that are set to all the internal assigns of the VG99. But these assigns cannot be controlled.

Master expression pedal

The Master Expression Pedal (MEP) can control all sorts of parameters on the VController. The functionality of this pedal changes from device to device.

- The controlled parameter is shown in the switch display that contains the TOGGLE EXPR PEDAL command (by default switch 11).
- When “MEP_also controls” is set in the Global settings, the expression pedal can also change the value in the last selected UPDOWN or STEP parameter field.
- Lastly any value in the VController menu can be changed using the Master expression pedal!

Snapshots and scenes

The VController can select Snapshots on the Helix and scenes on the Fractal AxeFX.

Looper control

The VController can control the looper on the M13, Helix, AxeFX and KPA. The looper of the GR-55 and Zoom G3 are not supported.

Navigating programmable pages on the VController

The VController and VC-mini also have a user page mode, where you can select pages that are programmed by the user.

On the VController long pressing switch 15 or 16 will take you to SELECT USER PAGE. Here you see the user pages and the fixed pages of the VController. Fixed pages have a number greater than 200.

Switch 12 will take you to the MENU.



By default the VController has four example user pages:

Name	Description
GP + GR	To show an example how to navigate two devices on one page. Switch 15 and 16 will do BANK DOWN and BANK UP for the currently selected device. Its name is shown in the main display.
GPVGGR	To show an example how to navigate three devices on one page. Switch 15 and 16 will do BANK DOWN and BANK UP for the currently selected device. Its name is shown in the main display.
FUNCTION TEST	Will show a number of functions that can be programmed to switches
GEN MIDI TEST	Will show the possibilities of using MIDI PC/CC and NOTE ON/OFF commands. Also some custom labels are set.

On all example user pages switch 16 is reserved to go to the next user page (using the command NEXT_PAGE). Switch 15 will take you to the patch page of the next device.

(You may want to reprogram switch 15 to PREV_PAGE if you want more flexibility in navigating the user pages.)

The default user pages serve as an example. You can program your own user pages to tailor the VController for your specific setup.

Navigating programmable pages on the VC-mini

The VController and VC-mini also have a user page mode, where you can select pages that are programmed by the user.

On the VC-mini long pressing both encoder switches will take you to SELECT USER PAGE.



Pressing switch 1 will take you to the first user page.

By default the VC-mini has two example user pages:

Name	Description
GEN MIDI TEST	Will show the possibilities of using MIDI PC/CC and NOTE ON/OFF commands. Also some custom labels are set.
GPGGR	To show an example how to navigate three devices on one page. Switch 1+2 or 3+4 simultaneously will do BANK DOWN and BANK UP for the currently selected device
Page 3	Test of Master expression toggle and set/tap tempo

Turning encoder 1 or holding switch 3 will take you to the next user page.

The default user pages serve as an example. You can program your own user pages to tailor the VC-mini for your specific setup.

Global tempo/tuner

Global tempo will update the tempo on all connected devices. When Glob. Tempo on PC is enabled in the settings, all patches will inherit this tempo.

Long pressing global tempo will enable global tuner. Here all connected devices that support tuner mode will go in tuner mode. Press any switch to exit global tuner mode.

Supported devices

The functionality for the supported devices can differ from device to device. All devices have limitations in the functionality that is exposed through MIDI.

Boss GP-10

Making the connection.

The GP-10 can be connected in the following ways:

- USB host port on Raspberry Pi or VC-mini.
- Serial midi via a Primova MIDX-10/20. Switch off the GP-10 bridge on the MIDX to have full functionality.

MIDI settings on the GP-10

On the GP-10 the MIDI channel should be set at channel 1. Other MIDI channels do not work. This is a bug in the GP-10.

Supported commands

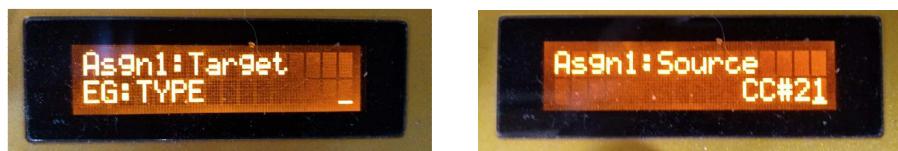
The GP-10 supports the following commands:

- Patch
- Parameter
- Assign
- Mute
- Master expression pedal

For the GP-10 a selected number of parameters are available from the VController and VC-mini.

Using assigns

The GP-10 has 8 user assigns that can be controlled by the VController and VC-mini. We use a cc MIDI message to control the assigns. By default the VController and VC-mini picks CC#21 for assign 1, CC #22 for assign 22, etc. Set the same CC number as source for the assign.



If the target is in the aforementioned parameter list, it will show on the displays. If the source of the assign is not the corresponding cc number, the display on the VController will just show the cc number.



Roland GR-55

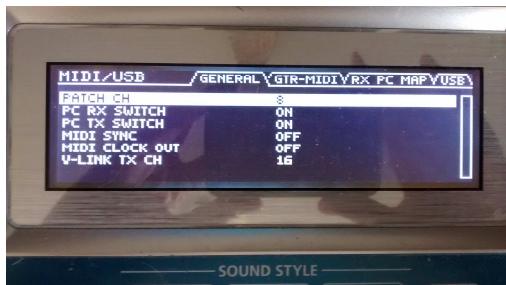
Making the connection.

The GR-55 can be connected in the following ways:

- Two serial midi cables to MIDI1 in and out
- Midi splitter cable to MIDI1 out or MIDI2 out
- Serial midi to USB cable to Raspberry Pi / VC-mini

MIDI settings on the GR-55

Here are my MIDI settings on the GR-55:



Supported commands

The GR-55 supports the following commands:

- Patch
- Parameter
- Assign
- Mute
- Master expression pedal

Parameters and assigns work the same as with the Boss GP-10.

Roland VG-99

Making the connection.

The VG-99 can be connected in the following ways:

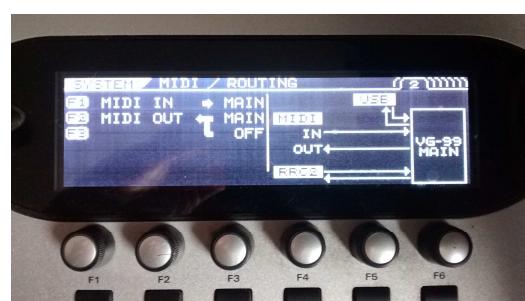
- RRC2 cable on a V-Controller or via a custom made RRC2 to 7-pin MIDI cable to both the VC-mini and the VController.
- Two serial midi cables to MIDI1 in and out
- Midi splitter cable to MIDI1 out or MIDI2 out
- Serial midi to USB cable to Raspberry Pi / VC-mini

* Note: Connecting the VG99 with a single USB cable to the Raspberry Pi or VC-mini has the limitation that the FC300 assigns do not work! For these assigns the VController mimics the FC300. The VG99 does not expect an FC300 to be connected to the USB host port, and therefore it does not work. As a work-around you can connect the VG99 via a MIDI-to-USB adapter to the Raspberry Pi or VC-mini. Then the FC300 assigns work fine.



MIDI settings on the VG-99

Here are the MIDI settings I use on the VG99:



Supported commands

The VG-99 supports the following commands:

- Patch
- Parameter
- Assign*
- Mute
- Master expression pedal

*Only FC300 CTL and Expression pedal assigns and CC assigns can be controlled. The other assigns can only be read, but not controlled.

Boss KATANA

Making the connection.

The KATANA can be connected in the following ways:

- USB host port on Raspberry Pi or VC-mini.
- Serial midi via a Primova MIDX-10/20. Switch off the KATANA bridge on the MIDX to have full functionality.

MIDI settings on the KATANA

On the KATANA the MIDI channel is always set at channel 1

Supported commands

The KATANA supports the following commands:

- Patch
- Parameter
- Master expression pedal

Editing and storing patches on the VController

Almost all parameters of a patch can be edited from the VController. To change a parameter on the VController press switch 10 to open the KATANA EDIT page.



Now select the proper category to make further edits.



Parameters can be changed by pressing switches. The parameters with the arrow signs are UPDOWN switches. Pressing them will change the direction, Holding them will change the value. When you connect an expression pedal to EXP1, parameters can also be changed with the expression pedal.

Press switch 16 to go back to the category screen. Here you can press switch 11 to save the patch to the memory of the VController.



Press switch 9 to set the location of the patch on the VController. Press switch 10 to write the patch. The patch name can also be changed by pressing switch 12.

Editing and storing patches on the VC-mini

Hold switch 3 or press encoder switch 2 to open the Katana FX page.



Now turn encoder 1 to select any parameter of the Katana and then turn encoder 2 to change the value of this parameter.



To save the patch to the internal memory of the VC-mini hold switch 2.

Now turn encoder 2 to select the location where the patch will be stored.

If you want to change the patch name, turn encoder 1 until it reads RENAME. Now edit the name (encoder 1 turn to select the character, turn encoder 2 to change it. Press encoder 2 to jump to 'A', 'a', '0' or space. Press encoder 1 to save the name.

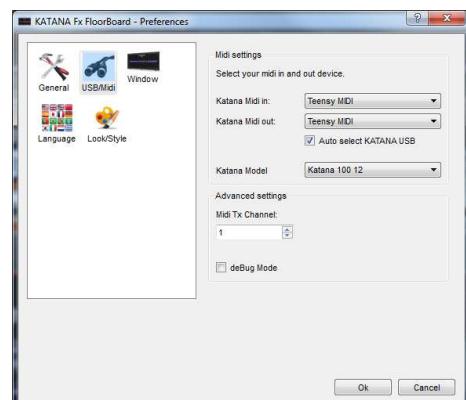
After that turn encoder 1 to select Write. Press or turn encoder 2 to save the patch.

Using Katana FxFloorBoard editor

You can also use Gumtown's Katana FxFloorBoard editor to load patches on the VController or VC-mini. Connect a Mac or computer to the USB port of the VController or VC-mini, which in turn is connected to the Katana.

In the preferences of the editor set the Midi In and Out port to Teensy MIDI:

The Floorboard editor will now restart. Press the connect button to make the connection. The editor does not always read patches well and does give some error messages, but you are able to make changes in the editor or load patches to the Katana and save them on the VController.



Line6 Helix

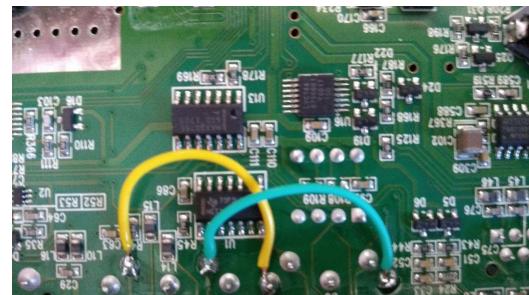
Making the connection.

The Helix can be connected in the following ways:

- Two serial midi cables to MIDI1 in and out
- Single midi cable to MIDI1 OUT with modification of Helix**
- Midi splitter cable to MIDI1 out or MIDI2 out
- Serial midi to USB cable to Raspberry Pi / VC-mini
- USB host port on Raspberry Pi / VC-mini

** The Helix can be connected with a single MIDI cable. To get bi-directional communication, you can make the following modification in the Helix: Connect MIDI out pin 4/5 to Midi in pin 2/3 with two wires.

Now you can use a single MIDI cable to connect MIDI in Helix to MIDI out of the V-Controller of VC-mini. Do make sure the MIDI cable has all pins connected. This usually is the case with MIDI cables, but not always!



MIDI settings on the Helix

By default this is set at channel 1, but it can be changed. Make sure the MIDI settings on the VController match those of the Helix.

Device settings on the VController/VC-mini

The Helix can not automatically be detected by the VController. So a manual connection must be setup. Go into the menu of the VController/VC-mini, select Device menu, select the Line6 Helix, set Enabled to ON and make sure the MIDI port is set to the correct port.



Supported commands

The ZOOM devices supports the following commands:

- Patch
- Parameter
- Snapscene
- Looper
- Master expression pedal

Line6 M13

Making the connection.

The M13 can be connected in the following ways:

- Two serial midi cables to MIDI1 in and out
- Midi splitter cable to MIDI1 out or MIDI2 out
- Serial midi to USB cable to Raspberry Pi / VC-mini

MIDI settings on the M13

By default this is set at channel 1, but it can be changed. Make sure the MIDI settings on the VController match those of the Helix.

After the M13 is connected to the VController or VC-mini the scenes of the M13 are read (scene is the word for patch on the M13). This reading is quite slow, but this is a limitation of the M13.

Supported commands

The ZOOM devices supports the following commands:

- Patch (scene)
- Parameter
- Looper
- Master expression pedal

Fractal devices (AxeFX 2)

Support for the Fractal Axe-FX 2 has been done remotely, as I do not own one myself. A lot of features have not been tested properly. In theory other Fractal devices may work as well, but none of this has been tested. The code of other projects for AxeFX standard, ultra, AX8 and FX8 has been implemented but not tested. The AXEAFX III will definitely not work properly with the VController.

The Axe-FX 2 has not been tested with the VC-mini.

Making the connection.

Fractal devices can be connected in the following ways:

- Two serial midi cables to MIDI1 in and out
- Midi splitter cable to MIDI1 out or MIDI2 out
- Serial midi to USB cable to Raspberry Pi / VC-mini
- USB host port on Raspberry Pi or VC-mini (not tested)

MIDI settings on the Axe-FX

In the Axe-Fx's I/O / MIDI settings page, make sure that "Send Realtime Sysex" is set to ALL.

Supported commands

The AxeFX 2 supports the following commands:

- Patch
- Parameter
- Snapscene
- Looper
- Master expression pedal

Kemper Profiler

Support for the Kemper Profiling amp has been done remotely, as I do not own one myself. A lot of features have not been tested properly. The VController has never been tested with the Kemper Stage.

The KPA has not been tested with the VC-mini.

Making the connection.

The KPA can be connected in the following ways:

- Two serial midi cables to MIDI1 in and out
- Midi splitter cable to MIDI1 out or MIDI2 out
- Serial midi to USB cable to Raspberry Pi / VC-mini

MIDI settings on the KPA

In the Axe-Fx's I/O / MIDI settings page, make sure that "Send Realtime Sysex" is set to ALL.

Supported commands

The KPA supports the following commands:

- Patch
- Parameter
- Looper
- Master expression pedal

The KPA has two modes: browse and perform. Patch change works different depending on the mode the KPA is in:

- In performance mode, the slot can be selected on the VController. Other performances are selected through the bank switches.
- In browse mode, the first five patches will select the first five rigs that are currently selected in browse mode. Any patch with a number greater than five will select rigs. To enable selecting rigs, you need to assign PC numbers to these rigs on the KPA.

ZOOM G3 / MS70-cdr

Making the connection.

The ZOOM devices can be connected in the following ways:

- USB host port on Raspberry Pi or VC-mini.

MIDI settings on the ZOOM devices

ZOOM Midi channel can not be changed. They are always set at channel 1.

Supported commands

The ZOOM devices supports the following commands:

- Patch
- Parameter – only the on/off state of the effects in the 6 slots can be changed.

Advanced functions

US20 emulation

This feature works for GP10, GR55 and VG99. I have these devices connected through a passive GK splitter. US20 emulation allows me to select a patch on one device and have the sound on the other devices switch off. Here the GP+GR and GPVGGR example pages come in handy. Any patch on any device can be selected.

Pressing the switch of the active patch will display “GP10 can be mute” or “GP10 always on.” When a device is “always on”, it will not be switched off by US20 emulation. This will allow several devices to sound at the same time.

Bass mode

With bass mode, you can allow the GP10, GR55 or VG99 to play only the lowest played string of your guitar. You need a patch with a number of specific assigns on these devices to trigger bass mode. Bass mode is always enabled on the VController. It will just send a few cc messages to the device. In the patch you can determine through assigns if you want to act on those cc's or not.

Bass mode will keep track of the lowest string that is played and send the number of that string as a CC number to a device. By default CC 15 is used for bass mode. Guitar to midi has to be switched on on the device for bass mode to work. Guitar to midi has to be in mono mode, not poly! Also chromatic should be switched on.

Here are my settings on each of the devices that support guitar-to-midi:

GP-10	MIDI On/Off: ON Mode: MONO Chromatic: ON Pedal bend: OFF Data thin: OFF String Ch: 1 Dynamics: 10 Play Feel: FEEL 2 LowVeloCut: 4
GR-55	Switch: ON Mode: MONO Chromatic: ON String ch: 1 Data thin: OFF The rest does not matter...
VG-99	Gtr to midi: ON Patch/Mode: MONO Patch/Play feel: STRUM or FEEL4 Patch/Chromatic: TYPE2 System: Bend thin: OFF System: Basic Ch: OFF System: PC mask: OFF

The VController will use the device MIDI channel as has been set in MENU – DEVICE SETTNGS – MIDI channel

If you make the following assigns on the device, bass mode will switch the strings on and off, so that only the lowest string is heard.

Make five assigns that all have the following settings

Assign target	Assign source	Target min	Target max	Source mode	Act range low	Act range hi
String level 5	CC #15	100	0	MOMENT	5	6
String level 4	CC #15	100	0	MOMENT	4	5
String level 3	CC #15	100	0	MOMENT	3	4
String level 2	CC #15	100	0	MOMENT	2	3
String level 1	CC #15	100	0	MOMENT	1	2

Use these assigns to control the sound of a bass guitar and the bass note will be automatically added to the chord you are playing

If you only want to control three strings, only make the first two assigns and set the level of the top three switches to 0 in the patch.

You can download some example bass mode patches for GP10 / GR55 and VG99 from here:

https://github.com/sixeight7/VController_v3/tree/master/bass%20mode%20patches
To download right button mouse click and choose Save as...

In the GLOBAL SETTINGS you can make specific settings for Bass mode.

I have had the best experience with the GP-10 with velocity setting of 50 and the GR-55, with a velocity setting of 100 on the VController. Also it often helps to disable the assigns for the highest two or three strings (B-E or G-B-E) as they are not really bass notes. This helps to avoid false triggers.

VController / VC-mini menu's

Navigating the menu on the V-Controller

Long pressing switch 15 or 16 will take you to SELECT USER PAGE. Here you can select MENU (switch 12.) Navigating the menu is pretty self-explanatory on the VController.

Values can be changed by pressing switches. The menu values with the arrow signs are UPDOWN switches. Pressing them will change the direction, Holding them will change the value. When you connect an expression pedal to any expression pedal jack the menu values can also be changed with the expression pedal.

Navigating the menu on the VC-mini

Pressing both encoders will take you to the SELECT USER PAGE. Here you can select MENU (switch 3)



On the VC-mini you can navigate the menu with the encoders or with the switches. Look at the menu structure chart below to help you find your way.

Navigating with the encoders:

Turning encoder one will select the next item in the menu.

Pressing encoder one will save and exit the current menu.

Turning or pressing encoder two will select a menu or change the value of the selected menu item.

Navigating with the switches

Pressing switch 1 or 2 will select the previous or next menu item.

Pressing switch 3 will select a menu or change the value of the selected menu item. The menu values with the arrow signs are UPDOWN switches. Pressing them will change the direction, Holding them will change the value. When you connect an expression pedal to any expression pedal jack the menu values can also be changed with the expression pedal

Menu structure

GLOBAL SETTINGS	
US20 Emulation	See US20 emulation
Glob. Tempo on PC	When enabled the global tempo will be written to all connected devices when a patch change is made. This way all patches will keep the same tempo even if you go from one patch to another.
Main display mode	Will determine if the second line of the main display will show the PAGE NAME, PATCH NAME or PATCHES COMBINED. The last option shows a number of characters of all the patches that are currently active and on (in US20 emulation)
MEP also controls	Will set extra control for the Master Expression Pedal. Can be set to UP/DOWN and UP/DN + STEP. After selecting an UPDOWN or STEP parameter control button, the Master Expression Pedal will change the value of this parameter.
Bass mode G2M channel	The Guitar to midi channel (default: 1)
Bass mode device	The device that is used for bass mode
Bass mode CC	The cc number that is used to control bass mode on through assigns on the device (default CC #15)
Bass mode vl	The minimum velocity that is needed to activate a string. Set this value lower if Bass mode does not respond. Set this value higher if higher payed strings are not blocked through bass mode.
SAVE & EXIT	Save changes and exit
Cancel	Do not save changes and exit

DEVICE SETTINGS	
Select device	Will select a device.
Enabled	OFF – device is not detected – always off ON- device is set on manually DETECT – device is actively detected (does not work for all devices)
Midi channel	Set the midi channel of the selected device. Note that GP10, G3 and MS70-cdr have to be on channel 1, otherwise patch change will not work.
Midi port	The VController MIDI port the device is connected to.
Device page #1 Device page #2 Device page #3 Device page #4	Pressing switch 16 on the VController will toggle on default between patch/parameter and assign pages. Here you can set other pages (also user pages!) that will be selected by pressing switch 16.
Colour	Set the colour of patch select LEDs (or backlights) for this device
Is always on	Part of US20 mode.

SAVE & EXIT	Save changes and exit
Cancel	Do not save changes and exit

MIDI SWITCH MENU

To make the switches of the VController / VC-mini controllable by an external midi device.

Select switch	Select the switch.
SW type	OFF: no midi control CC momentary: controlled by a momentary CC command. CC toggle CC range PC
MIDI port	The port the external midi controller is connected to
MIDI channel	The channel of the external MIDI controller
CC	The CC or PC number attached to the selected switch
SAVE & EXIT	Save changes and exit
Cancel	Do not save changes and exit

PROGRAM SWITCHES

See chapter Programming the VController for details

LED SETTINGS

LED brightness	Will set the brightness of the neopixel LEDs. Usually set low as these can be very bright! 255 really hurts my eyes.
Backlight Bright	Brightness of RGB backlights (only works for RGB model)
Virtual LEDs	Show LED state in displays!
FX off is dimmed	When enabled an FX LEDs will dim when it is switched off. This way you can see the colour of the effect type. When disabled an FX LEDs will switch off when it is switched off.
Global colour	Colour used for page and menu selection
BPM colour	Colour of the tap tempo and set tempo LED
MIDI PC colour	Colour of a MIDI PC LED
MIDI CC colour	Colour of a MIDI CC LED
MIDI note colour	Colour of a Midi note LED
SAVE & EXIT	Save changes and exit
Cancel	Do not save changes and exit

FX colours menu

Has the Helix FX colour system by default

GTR/COSM colour	Default: white
PITCH FX colour	Default: cyan
FILTER FX colour	Default: purple
DIST FX colour	Default: pink
AMP FX colour	Default: red
MOD FX colour	Default: blue
DELAY FX colour	Default: green

REVERB FX colour	Default: orange
LOOPER colour	Default: white
WAH colour	Default: cyan
Dynamics colour	Default: yellow
SAVE & EXIT	Save changes and exit

CALIBRATION MENU	
Select exp pedal	Will show the expression pedal that is being calibrated. This value is updated automatically by rocking the connected expression pedal
Set Max (Toe)	Set the expression pedal to toe position and then press this button
Set Min (Heel)	Set the expression pedal to heel position and then press this button
Auto Calibrate	Will delete the current Min and Max setting and allow the expression pedal to auto calibrate on first use.

FIRMWARE MENU	
Init settings	Will initialize all menu settings to their default values
Init commands	Will initialize all programmed commands to the four example pages that were on the VController when you first got it.
Init KTN patches	Will initialize all Katana patches stored on the VController to the default patch settings.
Program mode	Will put the Vcontroller in firmware upgrade mode. See Firmware upgrade for details.
Reboot	Will reboot the VController
EXIT	Will exit this menu

Programming the VController/VC-mini internally

On the VController and VC-mini you can program 3000 commands on 200 user pages. Any switch can execute any number of commands. Both internal and external switches, expression pedals and encoders can be programmed

When you press a switch on the VController it will check if there are any commands programmed on the current page for this switch. If no commands are found, the VController will check if there is a command on the default page and execute that one.

I usually program the external switches on the default page. This way these switches will perform the same action on any page. But you do have the option to “override” default behavior on certain pages by programming a command for these switches on these pages. This allows for a very flexible setup.

PROGRAM SWITCHES	
PAGE	Select a page you want to edit. You can also choose the default page or a new page here.
SWITCH	Select the switch on the page. You can choose internal switches, external switches or “on page select” here.
COMMAND	The command you want to edit
EDIT PAGE NAME	Here you can edit the name of the selected page
EDIT SWITCH NAME	Here you can edit the label of the selected switch
EDIT COMMAND	Press this switch to edit the command
MORE...	To clear pages, switches, labels or commands
DECREASE VALUE	Will decrease the value of the last selected parameter (page, switch or command)
EXIT	Will exit this menu

Pressing EDIT COMMAND will take you to the following menu:

PROGRAM SWITCHES	
DEVICE	Common Functions, GP10, GR55, VG990, G3, MS70cdr or Current device. Use current device to make one page suitable for several devices.
COMMAND	Select a command
Parameters...	Depends on the command
DECREASE VALUE	Will decrease the value of the last selected parameter (device, command or parameter)
SAVE CMD	To save the command
EXIT	Will exit this menu

Common commands

The VController has the following common functions:

Command	Parameters	Description
NO COMMAND	-	
PAGE	Type: SELECT, BANK SELECT, BANK UP/DOWN, NEXT, PREVIOUS	Will open the specified page
TAP TEMPO	-	Global tap tempo
SET TEMPO	BPM	Set global tempo to specified value
GLOBAL TUNER	-	Enable global tuner
MIDI PC	Program, channel, port	Send a MIDI program change message to the specified channel and port. Set port to ALL PORTS when port is unknown.
MIDI CC	Number, toggle type, max, min, channel, port	Send a MIDI continuous controller message to the specified channel and port. Set port to ALL PORTS when port is unknown. Toggle types: ONE SHOT: send max value on press, nothing on release MOMENTARY: Send max value on press and min value on release TOGGLE: Send max and min value on subsequent presses TOGGLE_ON: Same, but default LED state is on. RANGE: use this for expression pedals STEP: first press sends min value. Every subsequent press increases value by one until max value is reached. UPDOWN: change parameter between min and max value by holding the switch
MIDI note	Note, velocity, channel, port	Send a MIDI note message to the specified channel and port. Press sends note on message. Release sends note off message
NEXT DEVICE	-	Select the next connected device

Device commands:

Command	Parameters	Description
PATCH	Type: SELECT, BANK SELECT, BANK UP/DOWN, NEXT, PREVIOUS	To select a patch.

PARAMETER	Parameter, Toggle type, Value(s)	Control a fixed parameter on the device. Toggle types: MOMENTARY. Send max value on press and min value on release TOGGLE: Send max and min value on subsequent presses TRISTATE: Select one of three values to the device. FOURSTATE: Select one of four values to the device. STEP: first press sends min value. Every subsequent press increases value by the value entered under step until max value is reached. RANGE: use this for expression pedals UPDOWN: change parameter between min and max value by holding the switch
ASSIGN	Type: SELECT, BANK SELECT, BANK UP/DOWN,	To control an assign on a device. When selecting an assign a default trigger is given. You can choose other cc-numbers if you prefer, but for FC300 controls on the VG99 the default triggers have to be used.
SNAPSHOT/SCENE	Number	Used for selecting snapshots on Helix and scenes on the AxeFX
LOOPER	FUNCTION	Looper control. The following commands can be set: LOOPER_SHOW_HIDE – Hide or show looper on target device LOOPER_PLAY_STOP LOOPER_REC_OVERDUB LOOPER_UNDO_REDO LOOPER_HALF_SPEED LOOPER_REVERSE LOOPER_PLAY_ONCE LOOPER_PRE_POST – works for M13 only LOOPER_REC_PLAY_OVERDUB 9 - KPA looper option LOOPER_STOP_ERASE 10 - KPA looper option
MUTE	-	Mute the device (US20 mode)
SEL DEVICE PAGE	Page	Selects a page and sets the current device.
SEL NEXT PAGE	-	Go to DEVICE PAGE #1 - 4 (see Device settings). Pressing this button again will open the next page of this device.
TOGGLE MASTER EXP	-	Will give a button where the function of the Master Expression Pedal is set.
MASTER EXP PEDAL		Control the master expression pedal. Use this command for expression pedals only.

Using VC-edit

Installing VC-edit for the V-Controller

For PC download the VC-edit zip archive from here:

[https://github.com/sixeight7/VController_v3/blob/master/Firmware/VC-edit for VController v1.2.zip](https://github.com/sixeight7/VController_v3/blob/master/Firmware/VC-edit%20for%20VController%20v1.2.zip)

Unzip the folder and run VC-edit.

For Mac download the VC-edit dmg file from here:

[https://github.com/sixeight7/VController_v3/blob/master/Firmware/VC-edit for VController v1.2.dmg](https://github.com/sixeight7/VController_v3/blob/master/Firmware/VC-edit%20for%20VController%20v1.2.dmg)

Open the dmg by clicking on it and drag VC-edit to your Applications folder on your Mac.

Installing VC-edit for the VC-mini

For PC download the VC-edit zip archive from here:

[https://github.com/sixeight7/VController_v3/blob/master/Firmware/VC-edit for VC-mini v1.2.zip](https://github.com/sixeight7/VController_v3/blob/master/Firmware/VC-edit%20for%20VC-mini%20v1.2.zip)

Unzip the folder and run VC-edit.

For Mac download the VC-edit dmg file from here:

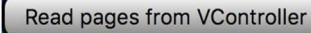
[https://github.com/sixeight7/VController_v3/blob/master/Firmware/VC-edit for VC-mini v1.2.dmg](https://github.com/sixeight7/VController_v3/blob/master/Firmware/VC-edit%20for%20VC-mini%20v1.2.dmg)

Open the dmg by clicking on it and drag VC-edit to your Applications folder on your Mac.

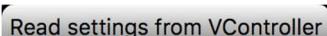
Using VC-edit

Whenever you open VC-edit it will show a default configuration. This will allow new users to explore the VController.

To read the configuration of the VController, press the following buttons:

 Read pages from VController

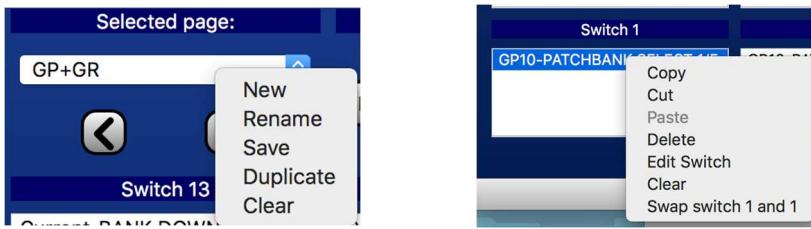
on the Page commands tab or on the External switch commands tab. Both buttons do exactly the same. Only one has to be pressed.

 Read settings from VController

on the Settings tab of the VController.

Or you can open a .vcd file, by going to File – Open or pressing control – O on PC or command-O on a Mac.

Now you can change the configuration of the VController. You can find the VC-edit commands in the top menu where also the keyboard shotcuts are given. Also right clicking on the selected page combobox or on the switch command lists will give you context menus.



The order of the commands can be changed by dragging them in the switch command lists. Also commands can be copied by dragging them from one command list to another.

With the arrow left and right keys you can navigate between the Command fields.

You can open the command editor by double clicking a command field or by pressing enter on your keyboard.

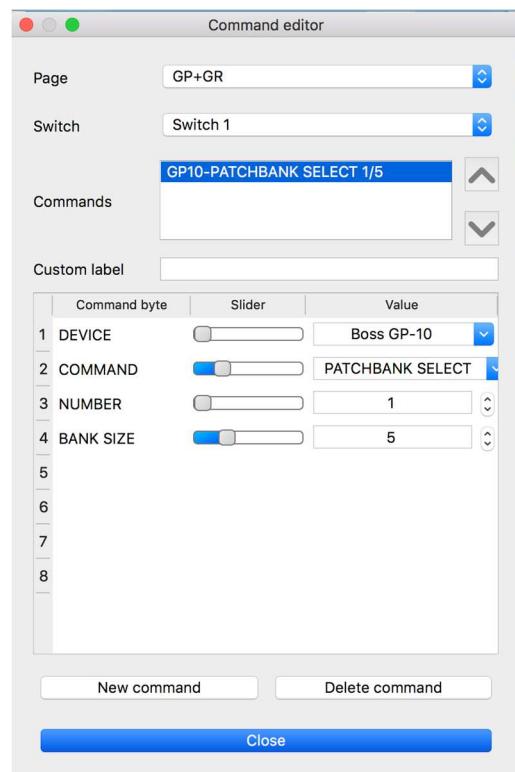
In the command editor you can use the sliders and combo boxes to change values of the commands.

The order of the commands can be changed by pressing the up and down button on the right of the Commands list.

With the buttons at the bottom of the command editor you can create new commands or delete them.

The command editor must be closed before the main VC-edit window becomes responsive again.

When the programming of commands is done, press **Write pages to VController** to upload the full configuration to the VController.



Changing settings

On the Settings tab you can find the settings of the VController. Always press **Read settings from VController** before making changes, so you do not accidentally change settings on the VController to the default settings of VC-edit.

Press the triangles to open the setting categories:

Setting | Value | Slider

▼ General Settings

US20 Emulation	OFF	<input type="button" value="▼"/>
Glob.tempo on PC	ON	<input type="button" value="▼"/>
Main display mode	PATCH NAME	<input type="button" value="▼"/>
Master Expression Pedal also controls	NONE	<input type="button" value="▼"/>
Bass mode G2M channel (1 - 16)	1	<input type="button" value="^"/> <input type="button" value="▼"/>
Bass mode device	Boss GP-10	<input type="button" value="▼"/>
Bass mode CC number (0 - 127)	15	<input type="button" value="^"/> <input type="button" value="▼"/>
Bass mode min velocity (0 - 127)	100	<input type="button" value="^"/> <input type="button" value="▼"/>

► LED Settings
► I FD FX colours

The screenshot shows the 'General Settings' section of the VController software. It includes a table with rows for US20 Emulation (OFF), Glob.tempo on PC (ON), Main display mode (PATCH NAME), Master Expression Pedal also controls (NONE), Bass mode G2M channel (1 - 16) set to 1, Bass mode device (Boss GP-10), Bass mode CC number (0 - 127) set to 15, and Bass mode min velocity (0 - 127) set to 100. There are also sections for LED Settings and I FD FX colours.

After changing settings, press **Write settings to VController** to upload them to the VController.

Firmware updates.

Updating the VController or the VC-mini

Find the latest firmware for the VController on Github:

https://github.com/sixeight7/VController_v3/tree/master/Firmware/Compiled

In this folder you can download a hex file. Right click on the hex file and select Save as...

To install the firmware on the VController you need the following tool:

<https://www.pjrc.com/teensy/loader.html>

Follow the instructions on the PJRC website to install the tool for your operating system.

To install the firmware, take the following steps:

1. Connect the VController or VC-mini to your computer using a USB cable
2. On the VController/VC-mini go to the MENU and choose FIRMWARE MENU – Program Mode. The VController is now ready to receive the firmware.
3. Start the Teensy loader. You should see the following three buttons:



4. Press the first button to open the hex file.
5. Press the second button to upload it to the VController
6. Press the third button to reboot the VController. This should reboot the VController/VC-mini with the new firmware.

The procedure above describes how to upload already compiled firmware to the VController. There will be a guide soon, that will show you how to install the full Arduino IDE and the procedure to compile and upload the firmware yourself.

Updating the Raspberry Pi

You can contact me to download a newer version of the RPi configuration. I am still developing a good way to offer these images online.

The default password for Debian Jessie is on the RPi (user: pi, password: raspberry). Proceed at your own risk.

Specifications

VController:

Weight	3.350 grams
Dimensions:	343 x 232 x 70 mm
(depending on bends and switches)	
DC power:	9V at 500mA (1A with internal RPi)
Measured current:	240 mA (basic model with Buydisplay displays)

RPi enclosure:

Weight:	175 grams
Dimensions:	114 x 85 x 33 mm
DC power:	9V at 500mA (1A with VController powered as well) 5V at 1A though the micro USB is also possible, but the VController cannot be powered this way.
Measured current:	150 mA (with no external devices connected)

VC-mini:

Weight:	? grams
Dimensions:	129 x 80 x 48 mm
DC power:	9V at 500mA (1A with USB devices as well)
Measured current:	? mA (with no external devices connected)