

# FCB-505 FIRMWARE

The FCB-505 firmware turns the FCB1010 into a dedicated controller for the Boss RC-505 loop station. The firmware can also be used for other purposes, where it is sufficient for the MIDI controller to send a single hardcoded MIDI message on each button press and button release.

With this firmware the FCB1010 doesn't require any programming. All programming is done at the RC-505 side, where you can configure the action linked to each of the foot switches and the function of the 2 expression pedals.

## MIDI implementation chart

The MIDI messages sent by the FCB1010 have the following format :

- All messages are sent on **MIDI channel 13**
- Each of the 12 footswitches sends a ControlChange message with value 127 on switch press, and a second ControlChange message with value 0 on switch release. The sent ControlChange numbers are **CC20 – CC29** for switch 1-10, **CC30** for the UP switch, **CC31** for the DOWN switch.
- The expression pedals send a continuous stream of ControlChange messages on movement, with **CC14** for the left pedal and **CC15** for the right pedal

The FCB-505 firmware also forwards all MIDI received on the MIDI IN connector to the MIDI OUT connector, correctly merging incoming MIDI messages with MIDI messages triggered by FCB1010 footswitches and pedals.

## 7-segment display

At startup the FCB1010 display shows '---'. When you press one of the 12 footswitches, the switch number is displayed. When moving the expression pedals, the value of the transmitted CC messages (which correspond to the pedal position) are briefly shown on the display. A well calibrated pedal will use the full CC value range of 000-127. If this is not the case, proceed with the pedal calibration procedure described below.

## Expression pedal calibration

For correct functioning the 2 expression pedals need to be calibrated. Calibration procedure is identical as with the regular FCB1010 firmware :

- Keep footswitches 1+5 pressed while switching on the FCB1010 power
- Move the left expression pedal to the heel down position. The display shows a hexadecimal value of the pedal position. It will be typically be between 0x10 and 0x1F.
- Press UP and move the left expression pedal to the tip down position. The display still shows a hexadecimal value of the pedal position. It will now typically be between 0xE8 and 0xF8.
- Press UP and move the rightside expression pedal to the heel down position
- Press UP and move the rightside expression pedal to the tip down position
- Press UP to leave calibration mode. The calibration values are stored in non-volatile memory.

## Self test

A self test is available to check the correct functioning of all switches and LEDs. The test can be started by keeping footswitches 1+3 pressed while switching on the FCB1010 power. For testing the MIDI circuits, connect a MIDI cable from MIDI OUT to MIDI IN connector prior to starting the self test.

- Sequentially all LEDs and display segments of the unit are turned on and off
- Next, all switch LEDs and the 2 small LEDs labeled "SWITCH1/2" are turned on simultaneously and can be turned off one by one by pressing the corresponding footswitch.
- Next the 2 internal relays are tested ('A0' is briefly shown, 2 slight clicks can be heard)
- Next the MIDI IN and OUT circuits are tested. The display shows 'A1' if the MIDI circuits are correctly working, 'F1' if the MIDI circuits are defective or if no MIDI cable was plugged in.
- Press a switch to proceed to the expression pedal calibration procedure described above.

