FSi - Footswitch Interface

www.fkmg-circuits.com | marc@fkmg-circuits.com

Overview

Having grown tired of doctored footswitches with dangling 9V batteries, we built the FSI footswitch interface module to fulfill a particular need: to free up our hands while recording into our Eurorack system, and to increase expressive potential during live performances. At 4HP, the FSI is a compact utility that allows for easy implementation of passive footswitches and expression pedals. With a number of voltage ranges and a polarity jumper on the back of the module, the FSI is compatible with most foot controllers. Use the FSI to trigger events, crossfade between patches or sweep filters, all while your hands are busy playing keys or pulling a bow across strings. Please read the specs below before using and enjoy your new module!

Pedal Inputs

The 1/4" footswitch input takes a TS (mono) cable from a passive footswitch/sustain pedal. Similarly, the 1/4" Expression input expects a TRS (stereo) cable from a passive expression pedal. **Do not plug active pedals into this input**. The module sends +5V DC to the footswitch pedal and ±5V DC to the expression pedal. Therefore, plugging in active pedals risks serious damage to the pedal and/or module(s).

During development, we've been using the Yamaha FC-5 electric keyboard footswitch, and the Moog EP-3 expression pedal (in "standard" mode). Most normal "closed" passive foot switches should work, as should most any passive expression pedal.

CV Outputs

The Voltage level switch in the middle of the module determines the CV voltage range that the expression pedal outputs. Note that these levels do not affect the Gate outputs.

Positive voltage levels are indicated by the orange LED, while negative voltages are blue. The bottom right output, puts out the inverse voltage level of the other three outputs (allowing for easy crossfading, for example).

While most Eurorack modules should comfortably take the available voltage ranges, before plugging CV outputs to another module, make sure to check the acceptable incoming voltage range to avoid any potential problems. When sending 0-10V, it is often necessary to attenuate the outgoing voltage down to +5-8V. When in doubt, play it safe and check your manuals.

Gate Outputs

The Gate outputs put out a +5V high gate DC voltage so long as the pedal is down ("open"). The bottom right output puts out the inverted gate of the other three. This means, for example, that when the three outputs are high, the fourth output goes low to 0V, and, when the pedal is released, this output puts out +5V while the others return to 0V. Gate outputs can be used to open channels and to trigger events in modules that expect a voltage up to +5V.

Dimensions: 3U, 4HP, 40mm deep w/ power cable.
Front Panel: 2mm aluminum

Current Draw:
+12V : 12mA
-12V : 4mA

Box contents: 1 FSI Module, QR code card w/ serial number, 2x M3 mounting screws w/ washers, 16-to-10 pin power ribbon cable.

Polarity

To make the FSI compatible with as many passive pedals as possible, we've added a polarity jumper on the back of the module. This allows for some degree of customization of the CV outputs. Both the sleeve and the ring can be manually set to take either ±5V. The module will only work if each the Tip and Sleeve take +5V and -5V respectively, or vice versa (see illustration below). Note that the jumpers **MUST BE CONNECTED VERTICALLY.** Failing to do so may create a short and risks damaging the module.

Front Panel & Insulation

Due to the nature of the circuitry, we took great care to insulate the 1/4" jacks from the front panel. Without this insulation, the voltages being sent to the pedals would short to the ground signal. It is therefore important that you NOT remove the front panel, as it becomes very difficult to reassemble the module safely. If you do absolutely need to, please do so at your own risk, though feel free to reach out with questions and we can try to guide you through it.