

# FCB1010 Phantom Power Adaptor

The Behringer FCB1010 pedal is normally powered by an external cable that plugs into a standard 120 volt 3-prong wall receptacle. While this works fine, it does require a power cable that runs from the FCB1010 pedal to a wall jack. In many stage/live music setups, this is less than convenient as more cables at ones feet is never a good thing.

Internally the FCB1010 pedal actually runs on 10V AC current. If one can get a 10V supply to the right place internally, no external power cable is needed.

Normally the FCB1010 connects to other MIDI gear using the MIDI out connector on the pedal. Standard MIDI cables have 5 wires, but only 3 are actually used for any midi data. This means that the other two can be used to supply the 10V needed for the unit.

The parts needed for this effort are:

2 Female MIDI connectors	
Wire	
10V AC power supply	
Optional switch	

The cost of the parts needed is \$10-\$15 depending on where you get them.

Tools needed include:

- ?? Wire
- ?? Tape
- ?? Soldering tool
- ?? Screw driver

There are many online stores that sell these parts. Many Radio Shack and similar electronics stores also sell the same items. Some online firms that can supply these are:

<http://www.action-electronics.com/>

<http://www.mouser.com/>

## How It Works

A standard MIDI cable will go from the FCB1010 unit to one end of the adaptor. A second standard MIDI cable will go from the other end of the adaptor to what ever MIDI gear you are controlling with the FCB1010.

The power supply will connect to pins 1 and 5 of the connector that goes to the FCB1010. The 10V supply needed will use these 2 wires.

In simple terms, the result connects like the following:

**MIDI Gear** -----~~⌘~~ **Adaptor In**      **Adaptor Out** -----~~⌘~~



The resulting adaptor can be mounted in your rack, mounted inside an enclosure you choose, taped up in a bundle, or any other approach that works for you. I put mine loose inside the rack. I used a short (about 8 inches) MIDI cable from MIDI gear to the adaptor input. I then used a standard 15 foot MIDI cable from the adaptor output to the MIDI connector on the FCB1010. I have permanent power strips mounted inside the rack, so I just plugged the 10V AC supply into the existing power strip.

## Building The Adaptor

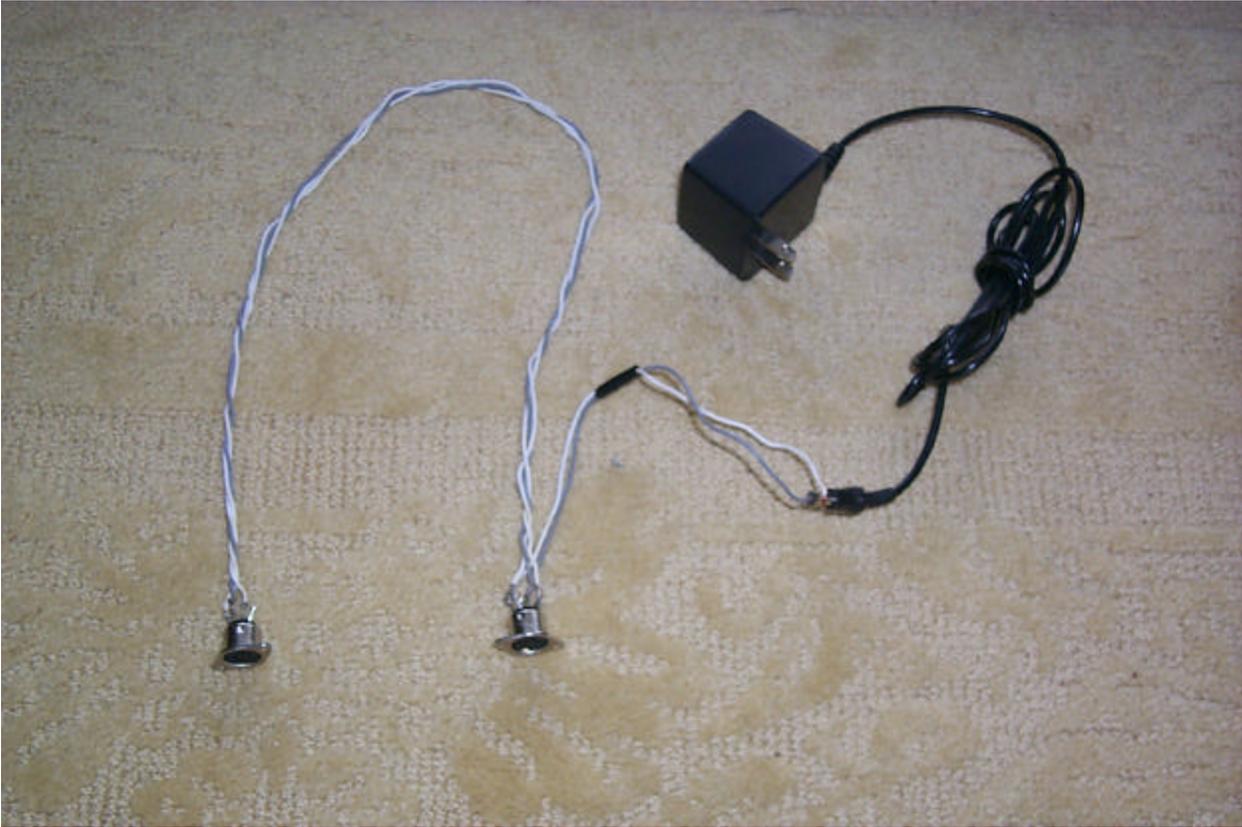
The 5 pin MIDI connector looks like the following:



It has 5 pins on the back and a sixth ground pin not used. The 5 pins used are in the circle. Pins 1 and 5 are used for the 10V supply. The other 3 pins are wired straight through from one connector to the other.

- A. Connect 3 inner pins. Solder a piece of wire from each of pins 2-4 from one connector to the other connector. Be sure each wire connects to the same pin on each end. These wires carry the MIDI data signals.
- B. Connect power supply. Cut any connector off the end of the power supply. Connect one wire to pin 1 on the MIDI connector. Connect the other wire to pin 5.
- C. Tape connections as needed to avoid any other metal or wire touching any connections.

My result looks like the following picture:



## Modifying the FCB1010 Pedal

Modifications are needed internally to use the 10V AC supply coming across pins 1 and 5 to power the FCB1010. There are two ways to do this:

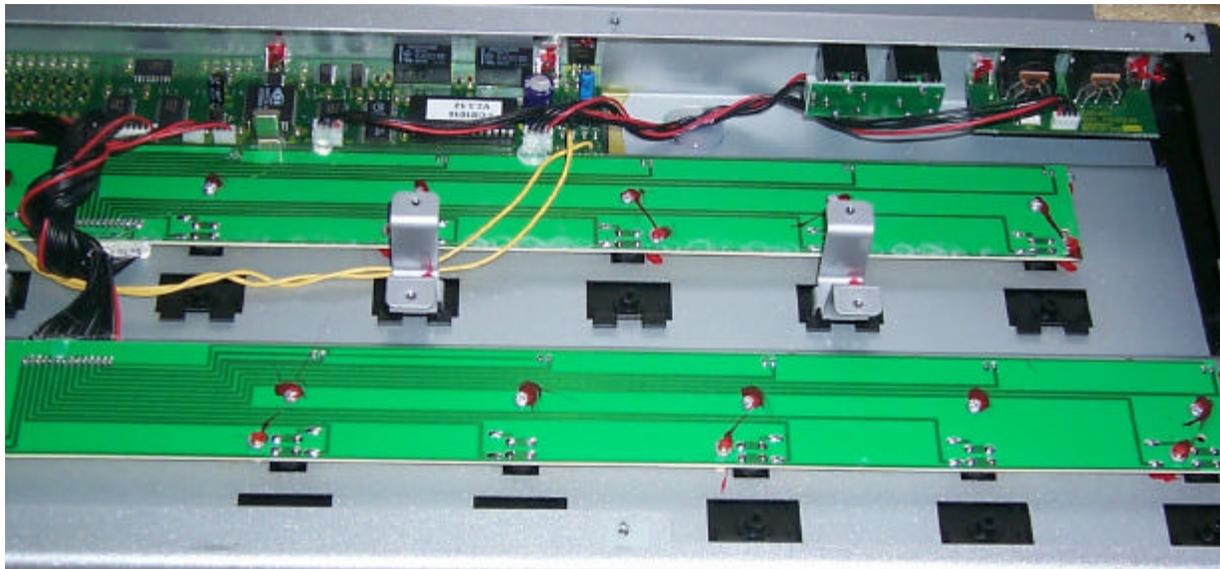
- A. Permanent modification. This means that the ability to use the standard power cord for the FCB1010 is removed. The only to power the unit is via the adaptor.
- B. Switch modification. This includes a new external switch on the FCB to switch between adaptor power control and the use of the standard 3-prong 120V cable.

Approach A is simpler, but more limiting. Approach B is more involved, but far more flexible. Approach B is recommended.

Approach B involves 3 steps:

1. Install an external switch to select adaptor or 120 cable power
2. Connect switch to existing FCB1010 wiring
3. Connect switch to MIDI pins 1 and 5 on existing MIDI connector

Included below is a picture of the inside of the FCB1010 before the modifications were started:



The two yellow wires in the center are the power lines that need to be changed. They connect at the left area to the internal transformer and at the right to the actual circuit board. I will cut them at the half way point. And then attach each pair to the switch to be installed.

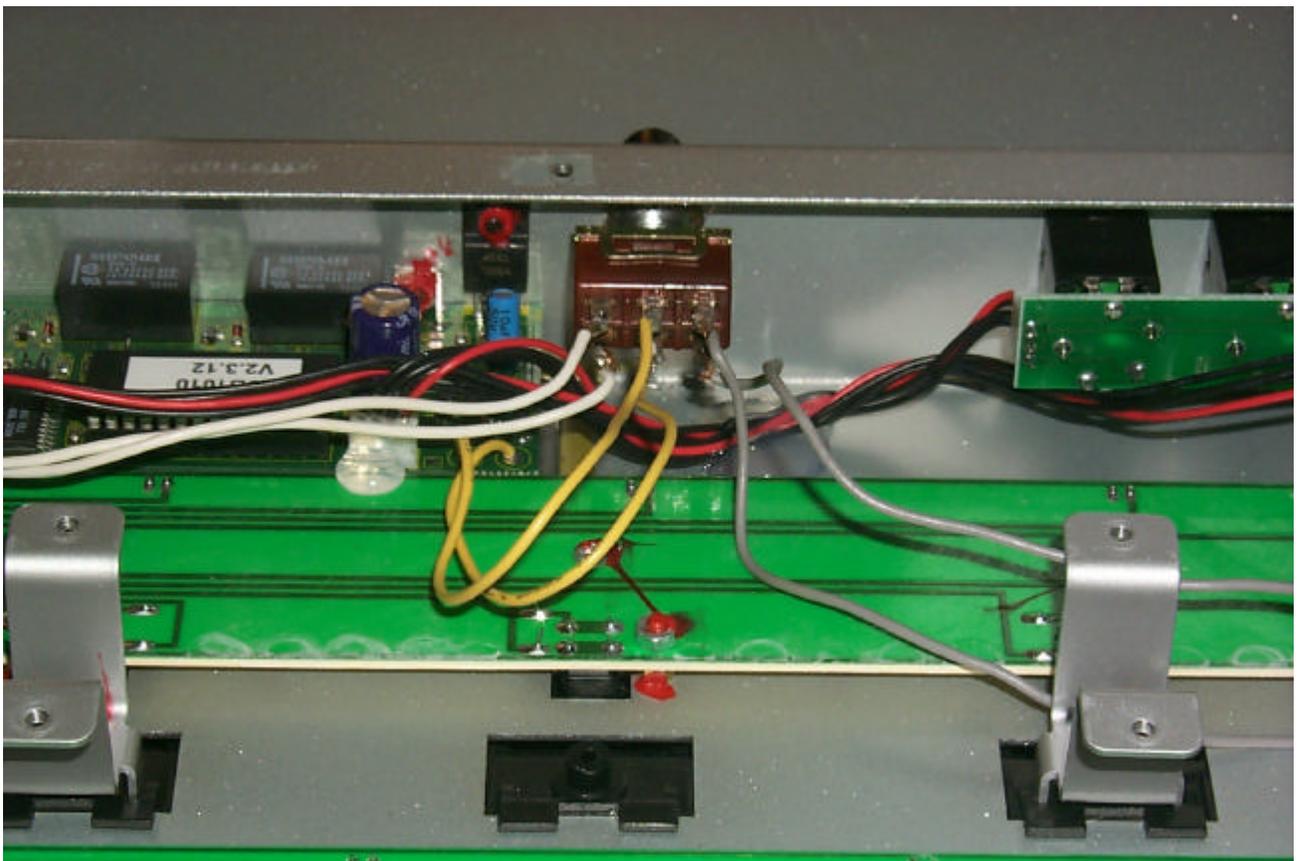
## Step 1 – External Switch

While different switch types can be used, a standard DPDT switch is best. A single hole can be drilled to mount it on the back of the FCB1010.



Select your location for the switch and drill a hole large enough to mount the switch. The actual switch I used was different looking (it's what I had in stock), but works exactly the same way.

See picture below for where I did this.

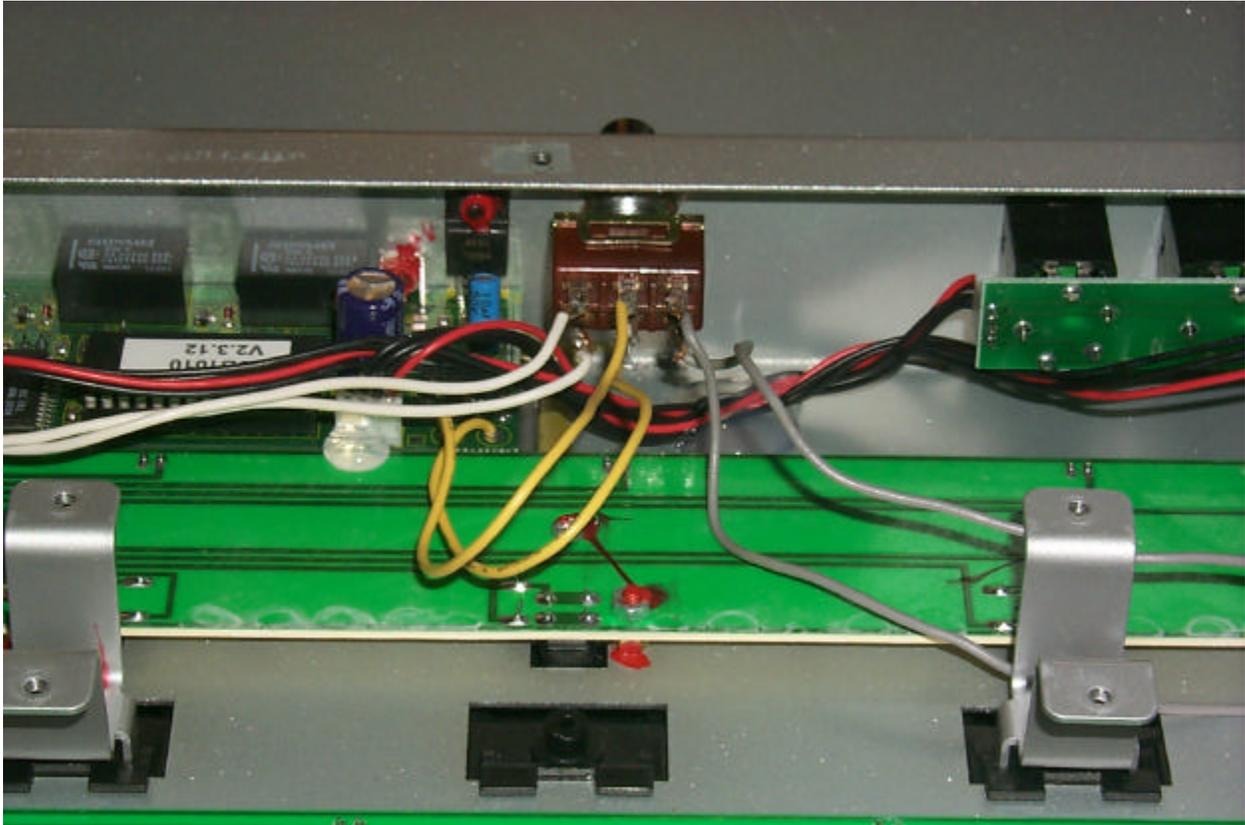


## Step 2 – Switch To Existing Wiring

Connect the middle two pins of the switch to the two yellow wires that connect to the circuit board. This is the part that supplies AC power to the board from one source or the other.

Connect the other two yellow wires (that come from the transformer area) to one of the outside sets of pins for the switch.

See picture below for wiring at this stage.



### **Step 3 – Switch To MIDI Pins 1,5**

Solder a pair of wires to pins 1 and 5 of the MIDI output connector. Connect the other end of this pair of wires to the remaining pins on the switch.

See picture below for wiring connection to the MIDI jack.



When the dust settled, the entire insides looks like this:



## Operational Testing

Put it all back together and then try each combination using your external switch.

- ?? When the 120 cord is connected, and the switch set for external 120V power, the unit should light up with no MIDI cable connected.
- ?? When the 120 cord is connected, and the switch set for MIDI adaptor power, the unit should NOT light up with no MIDI cable connected.
- ?? When selected for MIDI adaptor power, the MIDI cable is connected, and adaptor power supply plugged, the unit should light up.

Shown below is a picture of the FCB1010 running off the external supply via adapter wiring.



I will be mounting the power supply and cables inside my rack so that only the MIDI cable comes out for connection to the FCB1010.