Meredith

Nu Multi Reference Setup

To get that started, this document presents the most basic Nu multi-channel setup: Meredith —our Nu Multi Reference Guitar.

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Introduction

Use this guide as a use-case reference on how to install and integrate a Nu Multi Pickup, along with other pickups. This is just one example, intentionally kept as simple as possible to get you started quickly. There are many ways to use the Nu system. Hopefully, this guide will give you more ideas. This guide also serves as an installation tutorial. The idea is to start with something simple and incrementally add more features as you gain familiarity with the system. The knowledge you gain from such a basic setup can be utilized and extended to implement more elaborate systems.

Meredith

While Meredith appears to have an SSH pickup configuration, what you are seeing is actually an SSS pickup configuration with a standard pickup at the bridge position alongside a Nu Multi 6. Passive pickups are chosen for this installation: Dimarzio Injector at the neck position, Dimarzio Area ‘67 at the middle position and Dimarzio Chopper at the bridge position. These are all noise-cancelling pickups. The passive pickup system has simple controls: one master volume, one master tone, and a 5-way switch. The output, coming from the master volume, is connected to channel 9

(Ch9) of the Internal Breakout board. A single general-purpose control voltage potentiometer (CVP) is connected to Ch11 for remote control of external devices.

> ✏️ We will not elaborate on the wiring of the passive pickups and associated controls. You can find tutorials on this over the web.

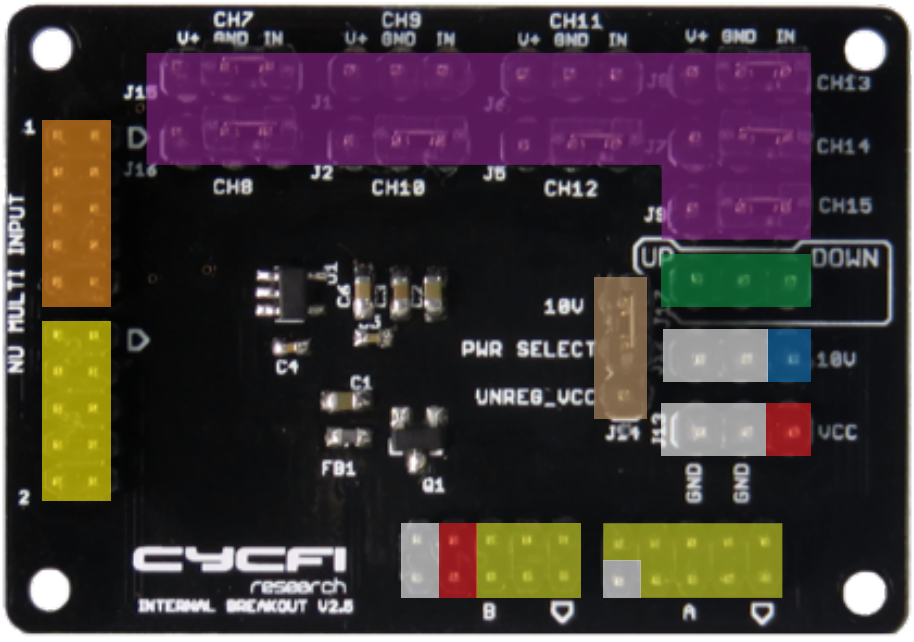
Nu-Multi - Dimarzio Chopper Combo

Internal Breakout

The Nu Multi connects inside the guitar via a multi-pin cable to the Internal Breakout board which provides easy access to all the Nu Multi pins using standard header (2.5mm and 2mm) connectors. The small breakout board includes pins for 15 channels of combined audio and analog control voltages (CV) and switches (SW). Audio inputs can come from the Nu Multi as well as other monophonic sources (e.g. standard guitar pickups). Control voltages and switches allow remote control of volume, tone, patch, or effects. The Internal breakout includes reverse polarity protection plus a low-noise voltage regulator for the Nu Multi, other active pickups, and auxiliary circuits.

> ✏️ **Note:** In this document, the terms “control voltage” and “switch” are abbreviated as CV and SW respectively.

Internal Breakout Pinout

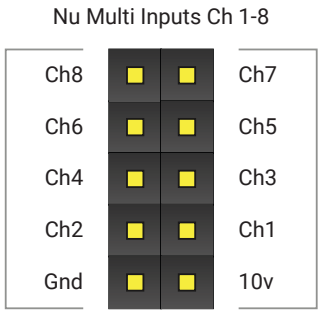


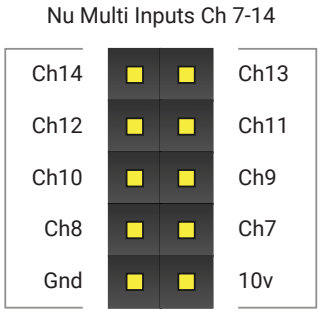
Nu Multi Ch 1-8		Ground	
Nu Multi Ch 7-14		Audio / CV Outputs Ch 1-15	
Aux Audio / CV Inputs Ch 7-15		Unregulated Power	
2-Way Switch Ch 7-8		Regulator Bypass	
Regulated 10v Clean Power			

Legend

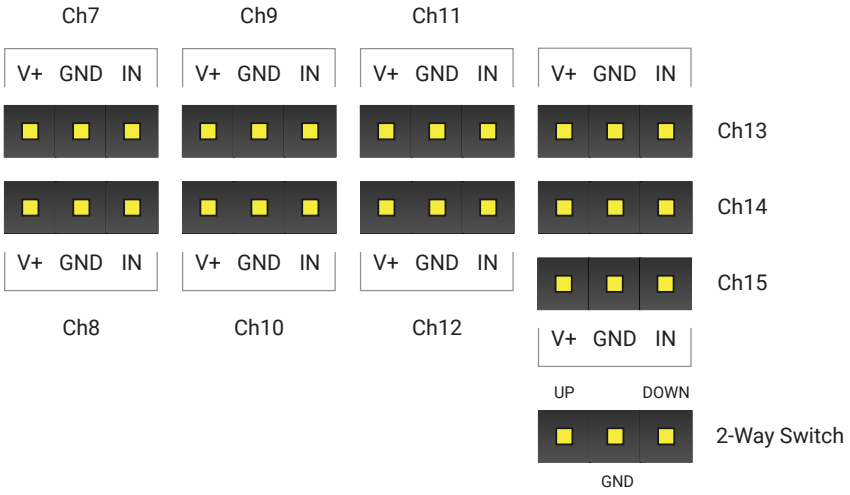
Nu Multi Inputs (Channels 1-14)	Up to 14 audio channels connect to the multi-channel Nu Multi pickups.
Aux Audio / CV Inputs (Channels 7-15)	Standard EMG-style header connectors connect to up to 9 standard monophonic pickups, control voltages (CV) or switches (SW). Some channels are duplicates of the Nu inputs. You can connect to one or the other, but not both.
2-Way Switch Ch 7-8	Special 2-way switch (SW) input for Channel 7 and 8. These channels are duplicates of the Nu and CV channels 7 and 8. You can connect to one or the other, but not both.
Regulated 10v Clean Power / GND	Auxiliary regulated power supply for external user electronics.
Audio / CV Outputs (Channels 1-15)	Channel 1-15 audio/CV outputs.
Unregulated Power	Auxiliary unregulated power supply for external user electronics.
Regulator Bypass	10v Regulator Bypass (see Bypassing the Regulator section for more info).

Nu Multi Inputs

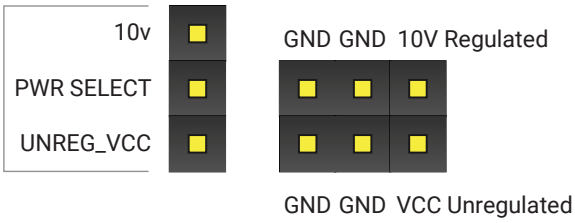




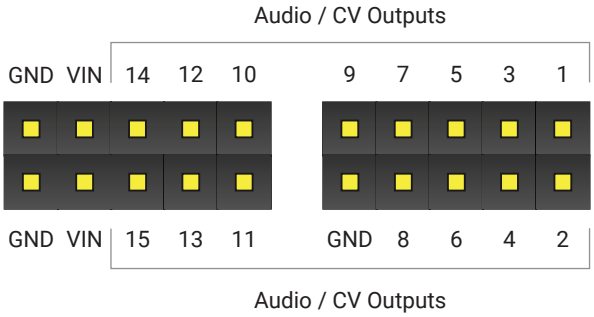
Aux Audio / CV / 2-Way Switch Inputs



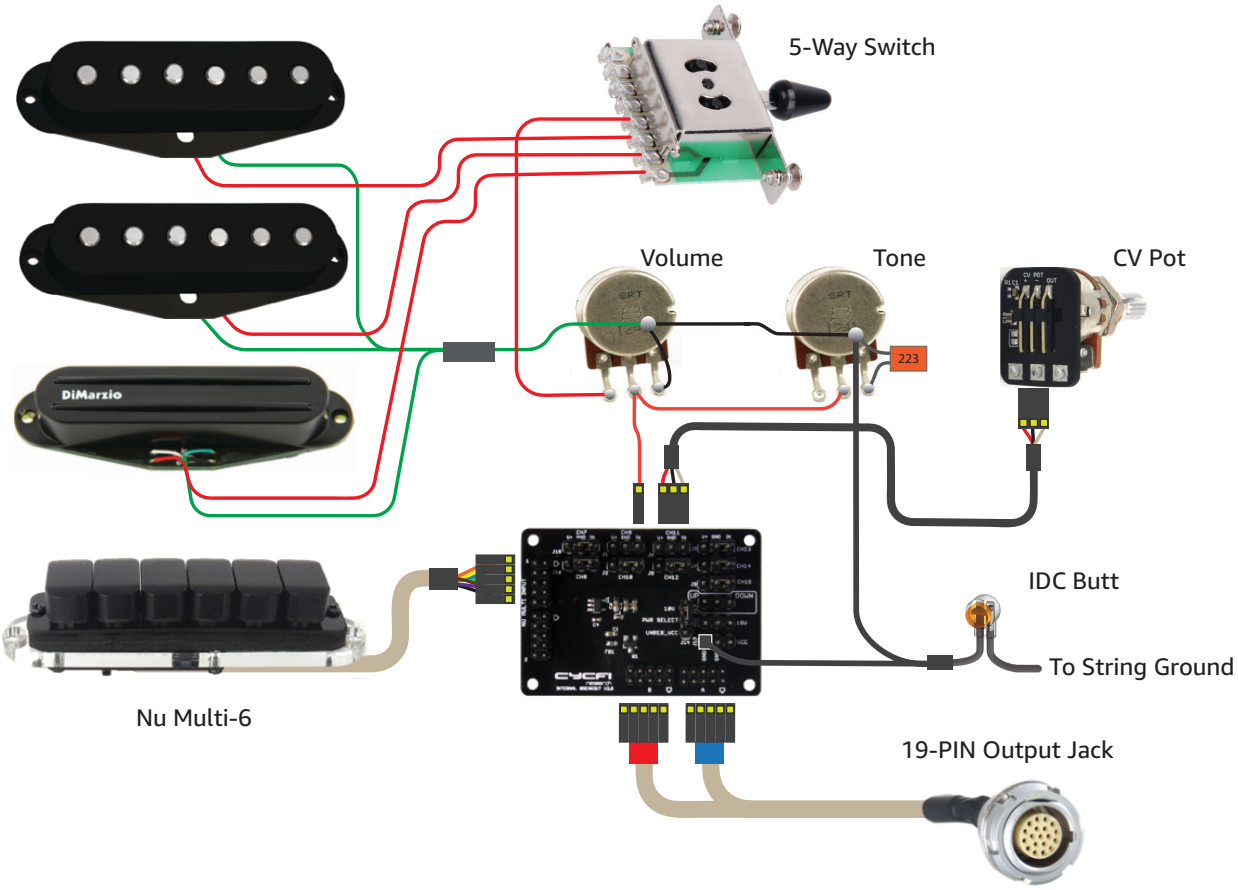
Regulated / Unregulated Power Outputs



Audio / CV Outputs / Power Inputs



Reference Wiring Diagram



The Internal Breakout has inputs for 15 channels of combined audio and analog control voltages and switches, for remote control of volume, EQ, patch or effects. Audio may come from standard mono-pickups or the Nu multichannel pickup. In our case we use Ch9 (See Connecting External Pickups to the Internal Breakout section below) to connect the output of the passive pickup system, coming from the master volume.

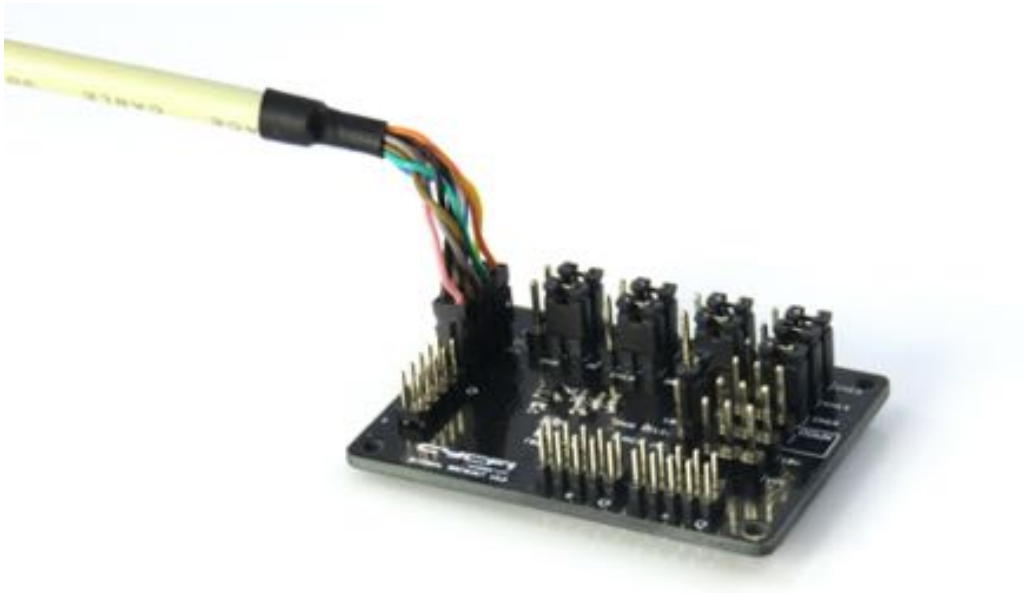
> ✏️ **Note:** While the diagram shows simple wires for the SSS wiring, we actually use shielded wires all throughout (highly recommended).

The Nu Multi pickup connects to the Internal Breakout via multi-core 2mm connectors. For remote control of external devices (such as effects), we also added one CV (Control Voltage) potentiometer, connected to Ch11. This will allow us to send a control voltage over to the MIDI module (See Connecting CV Pots/Switch (SW) below). The Internal Breakout can accommodate up to 9 CV/SW inputs (Ch7 – Ch15 are configurable as audio or CV/SW). Each CV/SW channel is assigned to support specific MIDI messages (See Nexus-GK for more info).

Connecting the Nu Multi

Connect the multi-core cable with the 2×5, 2mm connector to the header at the back of the Nu Multi Pickup. The side of the connector with the triangle symbol should be facing outward just as shown in the image below (emphasized white triangle in the picture). If the small triangle symbol is hard to see, be sure that the orange wire is at the top pin of the upper row of the header, if the pickup is oriented just like in the picture below.

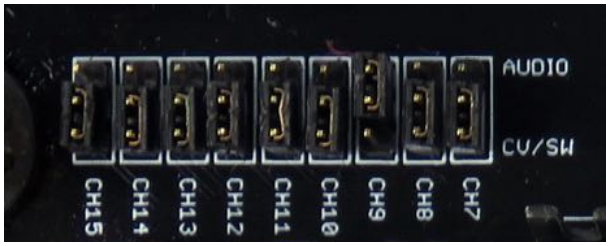
Then, connect the other end of the cable to the Internal Breakout. The side of the connector with the triangle symbol (emphasized white in the picture) should be facing toward the center of the Internal Breakout, just as shown in the image below. Again, if the triangle symbol is hard to see, refer to the orange wire as guide instead.



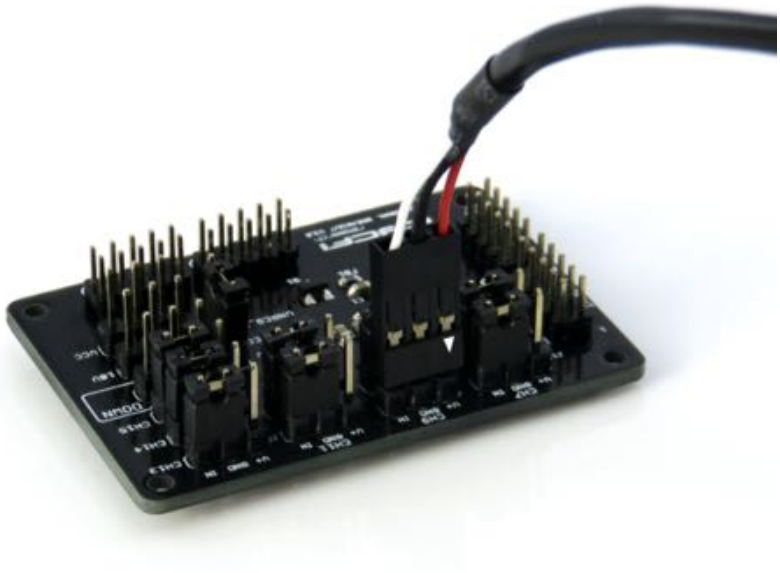
You can also find a white pentagon mark at the top right side of the multichannel headers (image at the right). This serves as an additional guide for proper orientation. The triangle symbol or the orange wire must be connected to the pin adjacent to this mark.

Connecting External Pickups

There are up to 9 channels available (Ch7 – Ch15) that you can use to connect external pickups on the Internal Breakout. These channels are configurable to be either audio input or CV/SW input in the Nexus-GK Main board (See picture at the right). If you intend to connect an external pickup or audio source to one of these channels, be sure that the shunt in the Nexus-GK Main board is configured as audio input for that channel (See Nexus-GK for more info).



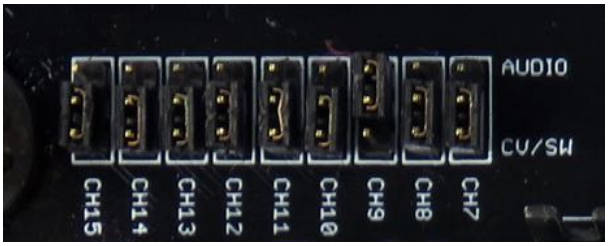
The Internal Breakout pinouts for external pickups are EMG compatible. When connecting an active pickup, remove the factory installed shunt for the desired channel and insert a 3-pin cable.



When connecting a passive pickup, you can use a 2-pin cable, for output and ground/shield.

Connecting CV Pots and CV Switch

Up to 5 channels (Ch10 – Ch15) are available for connecting CV potentiometers and a 5-way CV switch in the Internal Breakout. These channels are configurable for either audio input or CV input in the Nexus-GK Main board. If you intend to connect a CV potentiometer or CV switch, be sure that the shunt in the Nexus-GK Main board is configured as CV input (Picture at the right. (See Nexus-GK for more info).

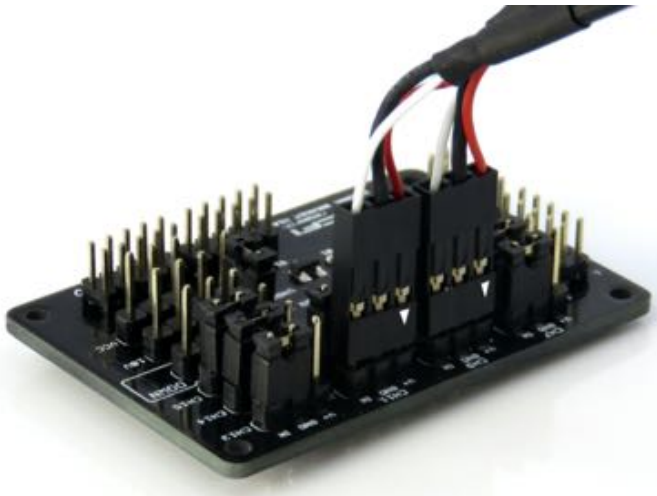


Nexus-GK Audio/CV/SW Config

✏️ **Note:** Unused audio and CV channels should be tied to ground with a shunt in the Internal Breakout. These shunts are preinstalled from the factory for all auxiliary channels (Ch7 – Ch15).

To install a CV pot or a CV switch, connect a 3-pin cable to the header with the triangle symbol (emphasized white in the picture) facing outward from the board.

Then remove the shunt for the desired channel, in the Internal Breakout, and connect the other end of the cable with the triangle symbol (emphasized white in the picture) facing outward from the Internal Breakout.

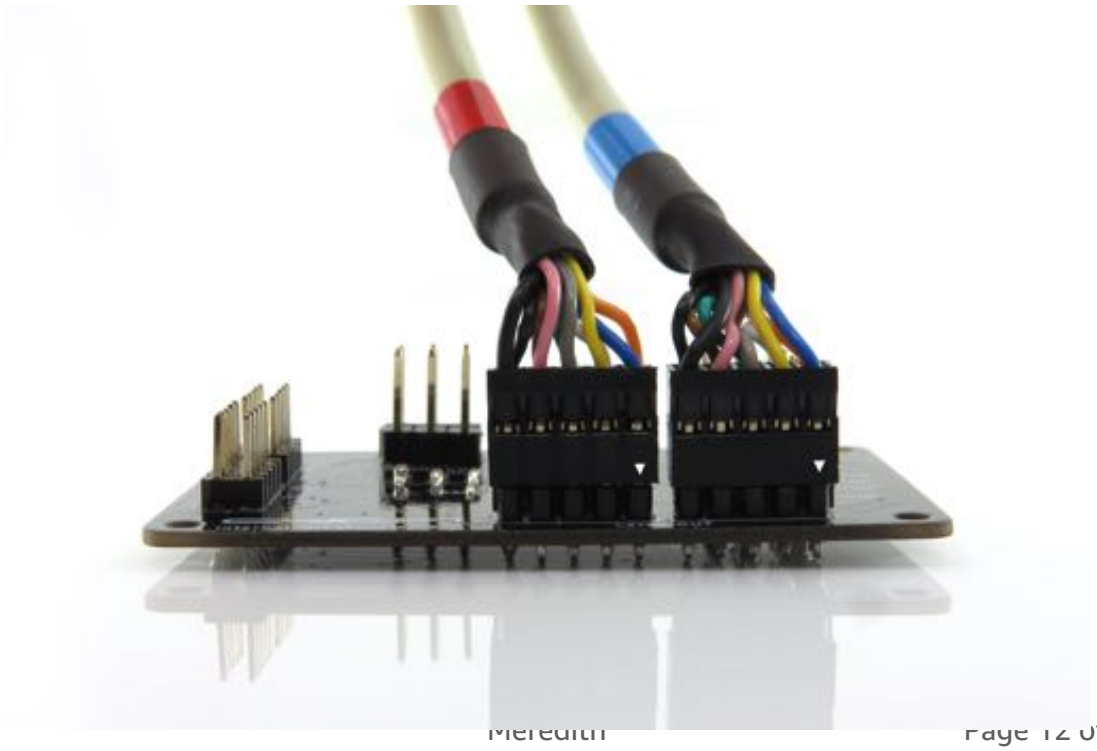


⚠️ **Warning:** Be careful with the polarity. Connect the cables exactly as shown above. The CV pot and CV switch do not have reverse polarity protection and reversing the connection will damage the electronics.

Connecting the 19-pin Output Jack

19-pin Output Jack

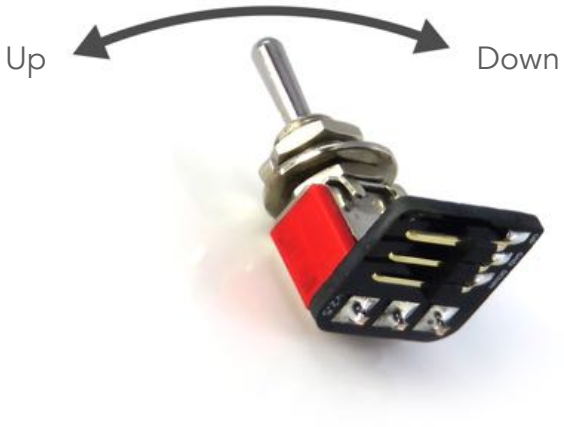
The 19-pin output jack (above) has two connectors, one marked red and the other marked blue. The connector marked blue connects to the right header while the connector marked red connects to the left header as shown in the picture below.



Connecting the 2-Way Switch

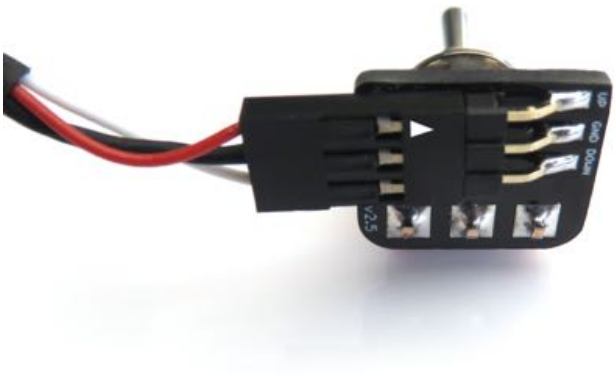
The 2-Way switch is an ON-OFF-ON momentary toggle switch suitable for program change ±1. Unlike typical toggle switches, it is momentary and does not lock to either ON positions. Flick it up or down to increment or decrement the program change number.

The Meredith Nu Multi Reference Guitar does not make use of the 2-Way switch,

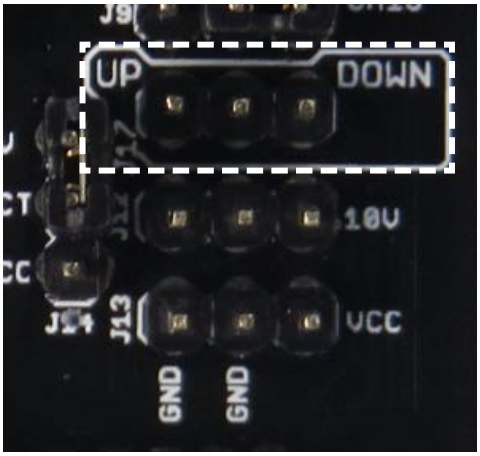


but if you intend to use the Nexus' GK module, with support electronics for the standard 13-Pin Roland cable, the Internal Breakout board has a special connector for the switch which maps to Roland's SW1, SW2 program up/down switch.

To install the 2-Way switch, connect a 3-pin cable to the header with the triangle symbol (emphasized white in the picture) facing outward from the board.



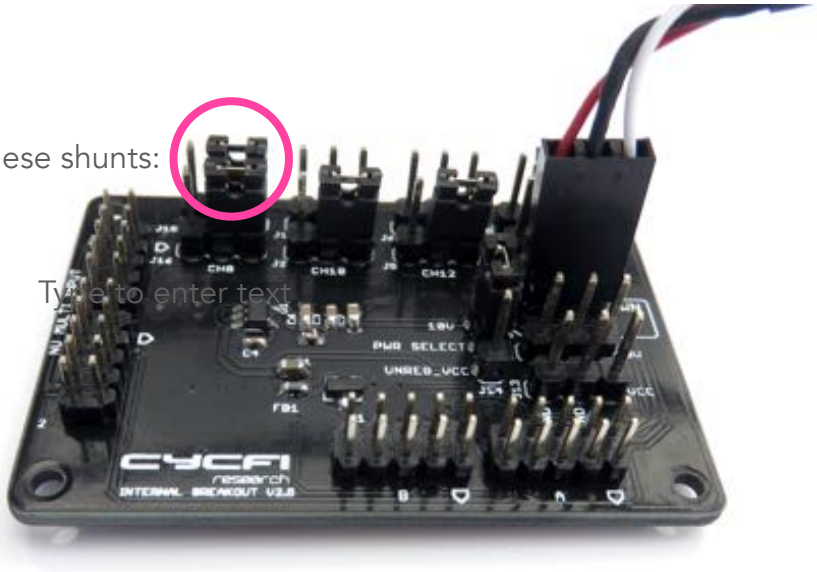
Connect the other end of the cable with the triangle symbol (emphasized white in the picture) to the special connector with the “Up” and “Down” markings in the Internal Breakout:



The side with the red wire connects to “Up”, while the side with the white wire connects to “Down”, as shown in the picture below.

⚠️ **Important**: Make sure there are no shunts placed on the Ch7 and Ch8 3-pin headers when using the 2 way switch. The the 2-way switch will not function if the shunts are not removed.

Remove these shunts:



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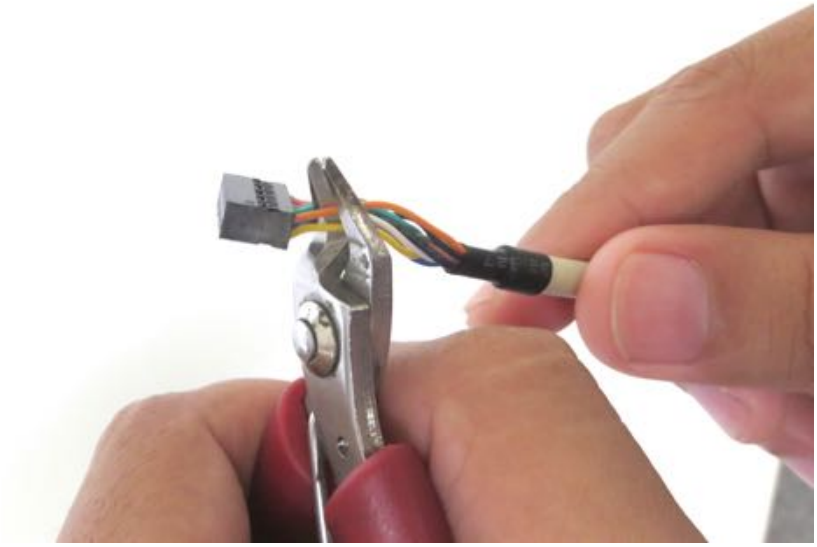
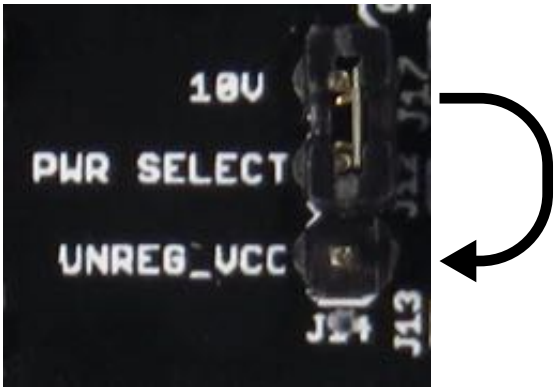
✏️ **Important: For Nu Multi 6 pickups released before June 2020, your Nu Multi will not function with the 2-way switch directly.** To use older Nu Multi pickups with the 2-way switch, you need to modify the the multi-core cable

(cable used to connect the Nu multi to the Internal Breakout) by cutting the orange and yellow wires:



Bypassing the Regulator

The Internal Breakout includes a 10v ultra low-noise voltage regulator. The Nu Multi, however, can accept up to 18 volts maximum. If you wish to take advantage of the higher supply capabilities of the Nu Multi to further increase the audio headroom, it is possible to bypass the built-in 10v regulator and instead do the voltage regulation yourself, using a higher voltage source. To do this, move the PWR SELECT shunt to the UNREG_VCC side. Image at the right.



Regulator Bypass

⚠ **If you decide to bypass the regulator, make sure you supply the Nu Multi with a well regulated and very clean power source.**

Grounding

Assuming you have a guitar ground wire connected to string ground (typically the bridge), connect this wire to the supplied 2-Wire IDC Butt. Splice the end of the wire connected to the single-pin header (provided in the package) with the end of the guitar ground wire going to the string ground. To do this, insert the bare wires inside the wire-butt connector and crimp the connector with a pair of pliers until it snaps to make a firm connection.

After splicing, insert the end of the cable with the single pin header to a GND pin located in the internal breakout board (Image at the right). This connects your string, bridge and guitar cavities to ground and helps reduce noise. (Note: Ensure that the bridge and cavities are connected to the guitar ground wire.)