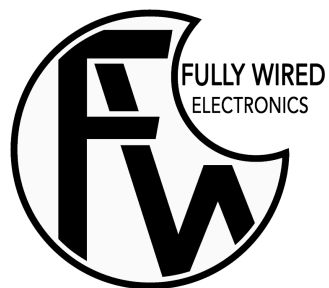


Fully Wired Electronics - Transistor Ladder Filter

User Manual



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Limited Warranty:

Fully Wired Electronics warrants this product to be free of defects in materials or construction for a one year (twelve month) period¹ from the date of purchase². Proof of purchase via a receipt or invoice is required when making a warranty claim.

Malfunction resulting from incorrect power supply voltages, reversed or backwards Eurorack bus board connections, faulty or damaged cables, incorrect patching, general misuse, the modification of the faceplate and/or the products circuitry or any other causes of malfunction that Fully Wired Electronics deems to be at the fault of the user are not covered by this limited warranty. Normal service rates will be applied.

Attempting to alter and/or modify this product in any way will void this limited warranty.

During this one year limited warranty period, all defective products will be repaired or replaced at the discretion of Fully Wired Electronics. Products must be returned directly to Fully Wired Electronics, with the customer paying the cost of transit to Fully Wired Electronics.

Fully Wired Electronics accepts and implies that no responsibility will be taken for harm to person and equipment through the operation of this product.



¹ Unless explicitly sold under the agreement that an extend warranty will be awarded

² For pre-orders this is applicable from the date of shipment rather than the date of purchase

Installation and Safety:

Prior to installing and uninstalling this product, please ensure that your Eurorack power supply is turned OFF. Installing or uninstalling this product without doing so is potentially dangerous, running the risk of causing damage to your equipment and electrocuting yourself. To minimise the possibility of backwards or reversed power supply connections, the module is fitted with a shrouded 10 (2x5) pin header.

Despite this precaution please ensure that both the power cable header, and the power supply headers are orientated correctly. Also ensure that there is NO damage to the power cable being used. A damaged power cable may cause harm to the module, the power supply being used, or yourself!

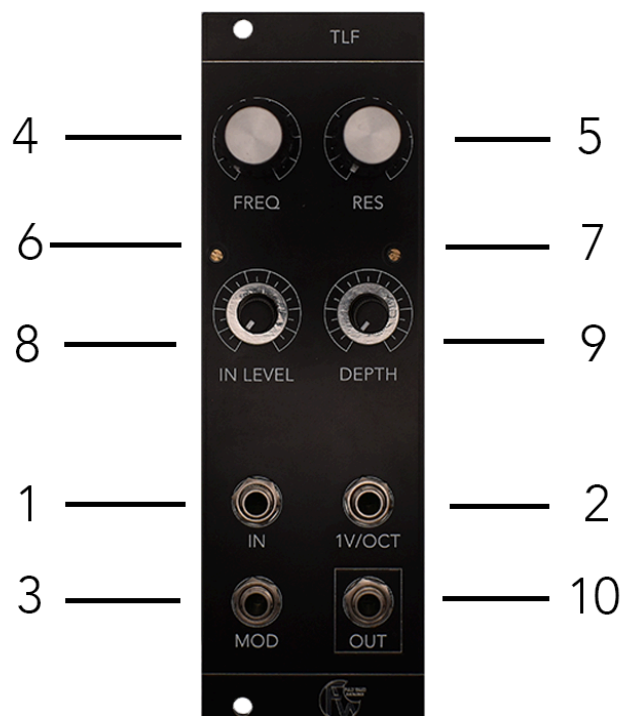
Foreword:

Thank you for purchasing the Fully Wired Electronics - Transistor Ladder Filter. We value all of our customers for their support. Your purchase is greatly appreciated!

Special thanks to everyone who was involved during the development and production of this module, and the journey of Fully Wired Electronics for your help and unwavering support!

Module Overview:

The Fully Wired Electronics - Transistor Ladder Filter is an 8HP 24dB per Octave (24dB/Oct, also denoted as 4 Pole) resonant low pass filter. The Transistor Ladder Filter features one audio input, two modulation inputs and one audio output, as well as four control potentiometers.



1. IN - The jack socket labelled “IN” is the audio input on the TLF. All audio signals that are patched into “IN” are routed through the “IN LEVEL” potentiometer (8), allowing for the audio signal to be attenuated.
2. 1V/OCT - The input labelled “1V/Oct” can be used for 1 Volt per Octave tracking of the filter’s cutoff frequency.

3. MOD - The second modulation input on the Transistor Ladder Filter is labelled "MOD". Much like the "1V/Oct" input (2), the "MOD" input is used to modulate the filter's cutoff frequency. However any signals patched into the "MOD" input are all routed through the "DEPTH" potentiometer (9), allowing for said signals to be attenuated.
4. FREQ - The "FREQ" potentiometer is used to sweep the filter cutoff frequency through the audible frequency spectrum.
5. RES - The "RES" potentiometer is used to set the amount of resonance (also known as emphasis) being applied to the process signal.
6. Frequency Set Trimmer Pot - The Frequency Set trimmer pot, which is located beneath the "FREQ" pot (4) to the left of the module, is used to calibrate the Transistor Ladder Filter.
7. V/OCT Trimmer Pot - The V/Oct trimmer pot, which is located beneath the "RES" pot (5) to the right of the module, is used to calibrate the Transistor Ladder Filter.
8. IN LEVEL - The "IN LEVEL" potentiometer is used to attenuate audio signals that are patched into the "IN" Jack socket (1) before they are processed.
9. DEPTH - The "DEPTH" potentiometer is used to attenuate modulation signals that are patched into the "MOD" jack sockets. This allows you to set the intensity of the cutoff modulation.
10. OUT - The jack socket labelled "OUT" is used to output the resultant processed signal.

Calibration:

While the Transistor Ladder Filter is calibrated when manufactured, you may want to calibrate once more when first powering on the module, as well as periodic calibration to ensure optimum performance³.

1. Set the “RES” pot to its right most position (set to max) so that the filter is self-oscillating, and connect the output of the Transistor Ladder Filter so that you can hear the output signal, or connect it to a tuner. It is recommended that you appropriately connect the output of the TLF to some form of audio interface and use a digital tuner like what you might find in your DAW. This allows you to visually monitor the signal's pitch, whilst being able to hear it.
2. Turn both the Frequency Set trimmer pot (located on the left hand side of the module) and the V/Oct trimmer pot (found on the right) in one direction until you feel or audibly hear them click. Once the click has been heard, turn both pots 15 full rotations in the opposite direction to centrise them.
3. Connect a voltage source which is capable of 1V/Oct tracking into the “1V/OCT” input jack.
4. Using either the “FREQ” pot or the Frequency Set trim pot (located below the “FREQ” pot) to turn the output sine wave to C3 (130.81 Hz). It is recommended that you use the “FREQ” pot to find C3.
5. Once C3 has been located, play C4 (261. Hz) - the equivalent of 1V or 1 octave higher. Whilst alternating between C3 and C4, turn the Frequency Set Trim pot clockwise, and the V/Oct trim pot counter-clockwise until either both notes show ‘C’ on your tuner, or until you are happy with how close the tuning is.

³ Usage may vary between units

Technical Specifications:

- Module Format: 3U
- Module Width: 8HP
- Module Depth: 32mm
- Power:
 - +12v current draw: 27mA
 - -12v current draw: 23mA
 - +5v current draw: 0mA