



FEMTO

Portable battery powered stereo microphone preamp

Thank you for buying our FEMTO microphone preamp. We hope our device will become an essential companion for your sound recordings. This preamp has been designed and manufactured on the basis of extensive and detailed technical and audio considerations.

The Audioroot FEMTO is a high quality battery powered mic preamp that was designed for location sound recording (ENG, EFP, music, etc...). It combines in a single box two high gain – low noise microphone preamps with 48V phantom powering, a 80hz 12dB/oct high pass filter and a beautiful OLED screen for audio and battery level information display. The FEMTO was designed to resist over time and against the harshest environments. The FEMTO's premium electronics are protected by a lightweight powder coated aluminum extruded enclosure. Markings are directly engraved on the aluminum face panels to resist over time. The Audioroot FEMTO is a high gain mic preamp with a default minimum gain setting of +10dB.

The Audioroot FEMTO is a high quality microphone preamplifier of yet very simple use. This unit benefits from the best components available in a small package. The FEMTO has excellent technical and audio characteristics that make it compatible with the best microphones available. This preamplifier was specially designed to be used as an add-on to your favorite analog mixer, digital audio recorder or any other pro audio equipment. The FEMTO is an autonomous device that can be powered using 2 x 9V batteries or an external power source (wall adapter or external Audioroot eSmart Lithium battery).

Warning

Do not try to repair this product or replace any of its elements if this user manual does not give specific instructions on how to do so. This equipment was built with surface mount components and needs special tooling for repair. The removal of the electronic PCB needs special technical skills.

Identification and warranty

The unit's serial number is engraved at the back of the unit. The unit has a one year warranty from date of purchase. Only officially appointed dealers or Audioroot are allowed to warranty repair of Audioroot products. Any damage caused by tampering, misuse or dismantling of the instrument will not be covered by the warranty and could be considered a reason for rendering the warranty null and void. Return shipping fees are always at the customer's charge.

UNPACKING AND INSPECTION

The FEMTO preamplifier products are carefully checked for good condition before being shipped from the factory. Despite the protective carton and rugged design, shipping may damage the unit. Check for possible carton damage when unpacking the unit. Please save the carton for return shipment if required. AUDIOROOT does not warrant against damage caused by returning products in other cartons than the original ones or improperly packing the products. If shipping damage is evident, notify the transportation company immediately. Only the consignee can file a claim with the carrier for shipping damage. AUDIOROOT will fully co-operate in such an event. Be sure to save the carton for the shipper to inspect.

UNIT CONNECTIONS AND CONTROLS:



1. **Left** input gain level adjustment potentiometer. Gain can be adjusted from +10dB to +64dB. Please note that left and right channel gains cannot be stereo linked (ganged) on the Femto
2. On/Off power supply switch. This switch activates internal powering of the unit.
3. Low cut filter selection switch.
 - **OFF** position: filter off line
 - **ON** position: filter in line
4. **Right** input gain level adjustment potentiometer. Gain can be adjusted

from +10dB to +64dB. Please note that left and right channel gains cannot be stereo linked (ganged) on the FEMTO

5. OLED display screen. This screens shows an indication of the audio levels of both channels and voltage of the power supply. The voltage indicator will turn red when the unit is powered from it's internal batteries and if the battery level is to low. The user should then replace the batteries as soon as possible. The low voltage threshold is set to 13.5V (2 x 6.75V). This threshold is compatible with rechargeable Lithium-polymer batteries.
6. Batteries compartment. This compartment is designed to receive 9V 6LR61 or PP3 batteries. Audioroot recommends using alkaline or high power rechargeable lithium-polymer batteries. Please respect the + and - polarities. Never leave batteries in the unit during storage. Use only first choice alkaline or rechargeable batteries.
7. External power DC input connector. The FEMTO ships by default with a Hirose type power input socket connector. Customers can also order the FEMTO with a Switchcraft locking barrel type socket (as seen here on the picture).

The Hirose mating connector reference is HR10A-7P-4P or HR10-7P-4P.

The Switchcraft mating connector reference is 760K.

The FEMTO can be powered thru this connector with an external voltage of 12 to 18V. Internal batteries are automatically disconnected when an external power supply is connected to the unit. The DC IN input is protected against polarity reversal.

Power socket pinout :

Hirose connector pinout : 1 = (-), 4 = (+)

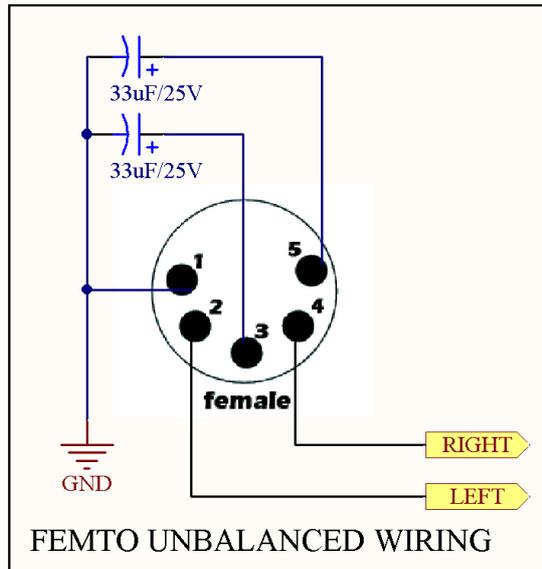
Switchcraft connector polarity : inner = (+) , outer = (-)



8. 48V phantom power switch.

9. **Balanced stereo output connector.** This connector has the following pinout : 1-ground, 2-left_hot, 3-left_cold, 4-right_hot, 5-right_cold. Mating connector : XLR5F.

For unbalanced operation pins 3 and 5 of the XLR 5 connector must be bridged to the ground pin using bypass capacitors as pictured on the following diagram.



10. **Left mic input** connector. This connector has the following pinout : 1-ground, 2-hot signal, 3-cold signal. Mating connector : XLR3M.

11. **Right mic input** connector. This connector has the following pinout : 1-ground, 2-hot signal, 3-cold signal. Mating connector : XLR3M

AUTONOMY:

The autonomy of the AUDIOROOT FEMTO depends directly from the power source (battery type) and microphones connected to the unit. Typical autonomy with 2 iPOWERUS 520mAh lithium-polymer batteries and 2 SCHOEPS CMC64Ug microphones is 5 to 6 hours. This autonomy rises with dynamic microphones, alkaline batteries or an external power source.

AUDIO INPUTS AND OUTPUTS:

The 2 "LEFT" and "RIGHT" XLR input connectors are disposed at the rear of the unit. These inputs are electronically balanced with an input impedance of 5Kohms. Equipement with unbalanced outputs can be connected to the FEMTO by bridging pins 1 and 3 and connecting them to ground. 48V phantom power should be switched off when using unbalanced audio sources with the FEMTO

The preamp's stereo output is also disposed at the rear end of the FEMTO. This output is balanced and is directly compatible with balanced inputs. The FEMTO can be connected to unbalanced inputs such as those found on small handheld flash recorders by wiring the output as described in the diagram above (cold pin outputs on the XLR 5 output connector must be bridged using bypass capacitors to enable unbalanced operation). Please contact us if you need to order custom cables for your FEMTO preamp unit.

Main specifications :

- 2 electronically balanced microphone inputs on full size XLR connectors
- Dual high gain/low noise mic preamp (+10 to + 64dB)
- 48V phantom powering
- 80hz 12dB/oct high pass filter
- Bright OLED screen (sunlight readable)
- Balanced line level output on 1 x XLR5M connector
- High quality audio potentiometers
- Superb powder coated and engraved aluminum enclosure
- Battery operated (2 x 9V) or external DC power source (12 to 18V) via Hirose or Switchcraft connector
- Lightweight – small footprint
- Power efficient (6 hours autonomy with 2 Schoeps CMC64Ug)
- Compatible with [iPOWERUS](#) lipo 9V rechargeable batteries
- Universal 100-240 V wall adapter available
- 95 x 129 x 42mm/ 327 grams

Technical specifications:

- Input impedance : > 5 Kohms
- Min gain : 10dB
- Max gain (Zsource = 50R, Zload =600ohms) : > 64dB
- Distorsion : 0.002% < 40dB gain / 0.006% @ 60dB gain
- Equivalent input noise (EIN) : -129.2dB with Zsource=200Ohms
- Bandwidth (+/- 3 dB) : 15Hz – 20kHz
- Max ouput level (Zload = 600R, Vpower = 16V) : +18dBu
- Power consumption – (external powering = 18V) : 48V off : 44mA / 48V on + 2 Schoeps CMC6Ug : 82mA
- Power consumption – (internal powering) : 48V off : 31mA / 48V on + 2 Schoeps CMC6Ug : 67mA