

BinLout-124 XLR balanced in > line out buffer module

With this module we provide a tiny circuitry with an XLR balanced input.

The module is buffering this balanced signal and transforming it in a single signal on a low impedance line.

While doing so, the signal is less sensitive for hum and noise produced inside an electronics cabinet.

It can be directly mounted in a panel with the two screws of the XLR female connector mounted.

- Convert your existing line input(s) to balanced one(s) with a low impedance.
- A constant and known input impedance for the source
- A constant and very low output impedance, less sensitive for hum and noise

With a classy [THAT124x](#) opamp as we use here, we transfer the XLR balanced signal into a single low impedance line signal. This is in fact a most regular opamp circuit with a non-inverting and an inverting input as used in many professional equipment also. But, due to the internal laser trimmed gain setting resistors it performs way better than the regular designs!

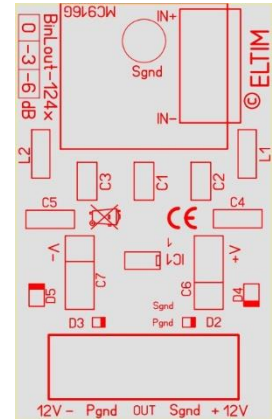
Purposes

This buffer module can be used to convert an XLR balanced input signal into a line signal. At the same time the relatively high impedance of this signal is converted in an extremely low impedance signal. The advantage of this is that it becomes way less sensitive for disturbing signals like hum and noise. Besides that, we are sure that it is a constant value, regardless the load or frequency.

Also, the connected electronics only “sees” the buffer output impedance instead of the possible variable impedance of preceding electronics, which could result in a change of sound.

The tiny, 55x34mm PCB contains all the parts required. The XLR female input connector is at the top. The output at a 5-pole screw terminal.

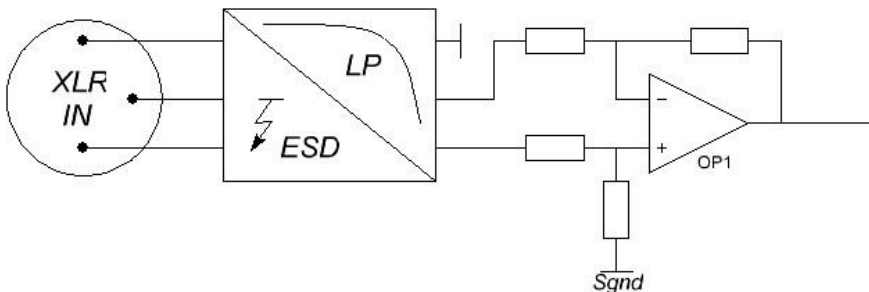
Instead of an input connector, you could mount a 3-pole screw connector for internal use. Fixed with an M3.



Scale 1:1

Principle

The schematics of this module could come right from an “Opamp design book”, where the positive input as well as the negative input are used. This basic opamp circuit makes this ELTIM BinLout-124 buffer circuit.



The circuit around OP1 operates as a non-inverting buffer circuit as well as an inverting buffer. With all resistors the same value, the result of both inputs is shown at the output as:

$$-V_{in-} + V_{in+} = V_{out}.$$

The values of the resistors define the gain and input impedance. The THAT1243 and THAT1246 have other resistor values, resulting in other gain factors. The difference with other regular opamp based circuits is that the gain/impedance defining resistors are laser-trimmed versions, available in the IC already. Due to this and due to the minimal PCB design an amazing CMRR of 90dB can be reached.

We offer values resulting in 0dB, -3dB and -6dB available as standard. Other on request.

Power Supply

There are power supply connections (+12V and -12V) for use in low voltage applications below +/-13V.
Do not use higher voltages here, since these lines are paralleled by 15V Zener diodes which will draw severe currents otherwise!

In a Power Amplifier there is mostly no low supply voltage available, so we arranged some extra's.
Since this module will be used in bridged amps as well, higher PS voltages can be applied to the extra V+/V- pins in the range of $\pm 18 - 75\text{Vdc}$. These are then connected to the amps power supply rails.
15mA Constant Current Diodes (CCD) provide a constant current over this wide voltage range. Then 15V Zener diodes regulate the internal supply to $\pm 15\text{Vdc}$. 6mA flows into the IC, the other 9mA via the zeners.

Mounting

This module is basically mounted via the XLR connector. Just mounting this in the chassis plate is sufficient. A drill hole of $\varnothing 22\text{mm}$ is required.
Since this PCB hardly has any weight, mounting via this connector in the cabinet is sufficient. In fact, mostly you only need to widen the RCA hole and exchange the RCA chassis connector by this module.
We add a letter behind the model number:
X = XLR, S = Screw input connector.



Gain

The basic model comes with 0dB gain, -3dB, -6dB. +3dB or +6dB gain settings can be made on request.

Some figures

Active component:	THAT124x opamp with internal, laser trimmed resistors
Input impedance:	0dB version: 9 kohms, -3dB: 12,2 kohms, -6dB: 13,75kohms
Max voltage swing:	V power supply -2V
Frequency range:	DC - > 8MHz.
Slew rate:	> 12V/uS typ.
Gain:	0dB -3dB -6dB
Distortion:	< 0,0006% THD
Noise figure:	< 104dBu
CMRR:	>90dB @ 60Hz
Power Supply voltage:	± 4 to 13V @ -12V and +12V connections (2mA) $\pm 18-75\text{V}$ @ V- and V+ connections (15mA) Higher supply voltages possible with extra series resistors.
Dimensions	55x34x30mm (LxWxH incl. connector)

For production costs reasons this module is based on SMD parts only, except connectors.
On request we can also make versions with regular components. Longer life cycle and even better sound.

DIY

We like to invite you to visit our [webshop](#) where over 15.000 products can be found, all for high quality audio DIY. You'll find our own wide range of modules, drive units, crossover parts, connectors, cabinets, etc. etc.

***This design is copyrighted
by ELTIM audio BV, Louis Timmers 2020 ©
PE1LTM***

www.eltim.eu