ELTIM high-end Buffer/converter modules

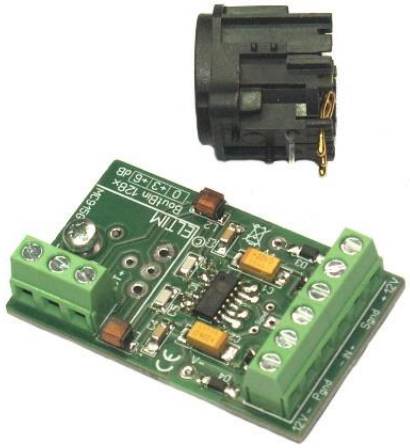
updated February 21th, 2020

BoutBin-128x Balanced in > XLR balanced out buffer module

With this module we provide a tiny circuitry with is buffering a balanced signal and feeding it to a Balanced (XLR) output. It can be directly mounted in a panel or used internal.

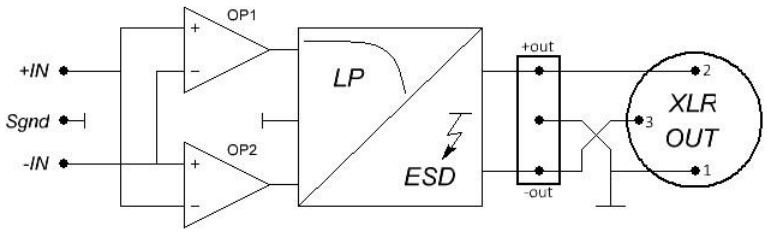
- **Buffer your balanced output(s), protect for ESD, remove line unbalances and block interfering signals.**
- **While using it, CMRR is at a remarkable high level of 90dB.**

With the THAT 128x chip as we use here, we buffer a balanced signal and feed it into an XLR male (out) chassis connector. This module has an amazing voltage swing capability up to 15Vrms into 600 ohms / 300pF, so suitable for long cables as well !
The output is double ESD safe and LC-filters block possible RF-interference.
The output connector is a high quality gold plated XLR male connector.
Instead, we can also mount a 3-pole screw connector.
The module wiring is done via a 6-pole screw terminal.



Since the required eight (laser trimmed) resistors around the opamps are in the IC, the schematics as well as the (double sided) PCB look very simple indeed.
80% of the back and upper half top ground plane is signal grounded for lowest noise floor.
All parts other than the IC are output filtering and power supply (SMD) parts.
Due to different available IC models with different resistor values, we can supply versions with 0dB, +3dB and +6dB gain.

Both balanced input signals are buffered by very high quality Opamps, both present in the THAT128x IC. Besides these opamps there are also 8 laser trimmed resistors in the IC.
The precision of these resistors define the balance quality of the signals. These resistors are trimmed within ±0,005%, the only way to reach a CMRR ratio of 90dB as this IC performs. With regular resistors and IC's this is, also due to PCB/parts inductive/ capacitive behaviour, way too high tolerances, etc. by far not as good as with our solution.



ESD- and filtering parts prevent any mishap while connecting it and/or use it in a strong RF-interfered area.
Due to its buffer function with very high quality output stages, the output impedance is known and stable.
The output Z very low and can handle 300pF line capacitance.

Due to this characteristics, also long cables can be used.
The balanced output signal can be used to feed electronics with balanced inputs, like a (pre)amplifier, DSP or ADC. With the new (2020) PCB design you can choose for a screw- or XLR-male output connector.

If you f.e. have a quite basic preamplifier where potentiometer runners or f.e. DACT attenuators directly feed the output, the output impedance is not constant and due to this also the frequency behaviour differs.
By connecting this module, the overall sound quality will increase significantly. Basically, because now the output impedance is constant no matter the runner position and/or frequency and very low. Also, the connected cable quality and length has way less influence on the signal quality.

Power Supply

There are power supply connections (+12V and -12V) for use in low voltage applications, ± 4 - 13V.
If you persist in using voltages around ±14-18V, remove the 15V zenerdiodes, since these lines are paralleled by 15V Zener diodes which will draw severe currents otherwise! The IC itself can handle voltages up to ±18V.

Since this module will be used in power amplifiers as well, higher PS voltages can be applied to the extra V+/V- pins in the range of ±18 - 75Vdc. 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 the 15V zener diodes regulate the internal supply to ±15Vdc. 6mA flows into the IC, the other 9mA via the zeners.

Mounting

This module is available with the gold plated, male (MC915G) XLR output connector, with a chassis drill hole of Ø 22mm. Since this PCB hardly has any weight, mounting the XLR male connector to the cabinet chassis is sufficient.

For internal use we now also can supply a version with all screw terminals.
Then the module is mounted with a single M3 bolt.
The internal input and power supply connections are via a 6-pole screw terminal at the other end of the double sided (2x 35um) PCB.
We use uncommonly wide tracks, far wider than we see everywhere else.
Also, ¾ of the available copper is grounded for best noise figures.
Note that supply- and signal ground are separated. You can connect them via two solder pads.

Models

We provide versions with different amplification values:
0dB (mostly 1Volt, Hifi/High-End), +3dB (2 Volt, some ref. eq.) and +6dB (4 Volt line signal, mostly P.A.).
Normally we supply the 0dB variant, +3/+6dB on request. Its just a matter of IC type mounted.
For further explanation of the functioning we like to refer to the datasheet of this THAT 128x IC.

- ELTIM BoutBin-1280 XLR Balanced in/balanced out with 0dB gain
- ELTIM BoutBin-1283 XLR Balanced in/balanced out with +3dB gain
- ELTIM BoutBin-1286 XLR Balanced in/balanced out with +6dB gain

An additional letter indicates connector type: X = XLR, S = screw.

Some figures

Output impedance:	BoutBin-1280:	9,0 kohms
	BoutBin-1283:	10,5 kohms
	BoutBin-1286:	12,0 kohms
Output impedance:	50 ohms	
Max. capacitive load:	300pF	
Max voltage swing:	V power supply -2,5V (27,5dBu max)	
Frequency range:	> 7,5MHz.	
Slew rate:	> 15V/uS	
Distortion:	< 0,0006% THD	
Noise figure:	< 104dBu	
CMRR:	> 90dB @60Hz under all circumstances	
Power supply voltage:	± 3 - 13V @ ±12V connections, 6mA	
High voltage supply:	± 18 – 75Vdc @ +V/-V connections, 15mA	
Dimensions	55x34x27mm (LxWxH)	

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.

www.eltim.eu