updated January 22th, 2020

LoutLin-134 Input module

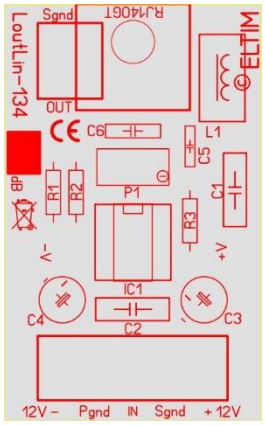
With this module we provide a tiny circuitry with an RCA line output which is buffering this signal in a signal on a low impedance line. While doing so, the signal is less sensitive for hum and noise produced around the connected cable. Besides that the frequency response is way more constant compared to higher impedance lines. It can be directly mounted in a panel with the single nut of the RCA connector mounted.

- **Convert your high impedance line output(s) to a low impedance output.**
- **A constant and known input impedance for the following equipment**
- **A constant and very low output impedance, less sensitive for hum and noise**

With a classy Burr-Brown 134 opamp chip as we use here, we transfer the signal into a very low impedance line. This is a most regular opamp circuit with a non-inverting opamp as used in many professional equipment also. The OPA134 used is known as an audiophile IC. It is mounted on a high quality, milled foot, so you could replace it by about any pin compatible type of your choice.

Purposes

This buffer module can be used to buffer a Line input signal, meaning that the relatively high impedance of a 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.



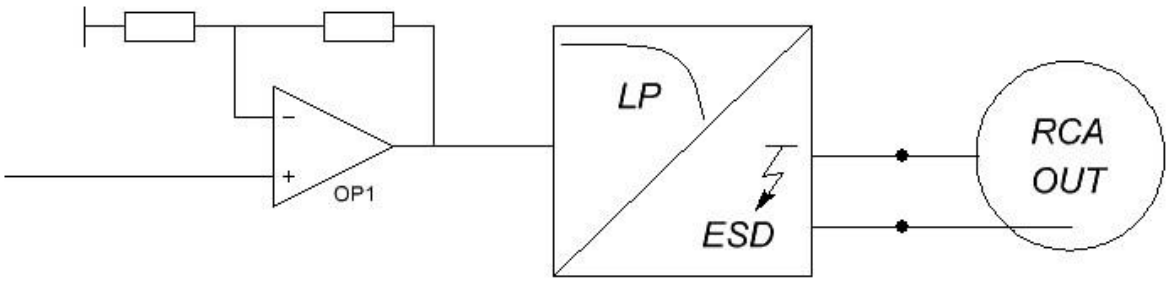
Scale 1:1

Also, the connected equipment only "sees" the buffer output impedance instead of the variable impedance of the potmeter or some electronics, which could result in a change of sound.

The tiny, 55x34mm PCB contains all the parts required. The RCA output connector is at the top. The input signal is connected at the centre bottom 5-pole screw terminal. In most cases a RJ-140GT RCA connector is mounted. Instead, a 2-pole screw terminal could be mounted for internal use.

Principle

The schematics of this module could come right from an "Opamp design book", where a non-inverting opamp make this ELTIM LoutLin-134 line buffer circuit:



The circuit around OP1 operates as a non-inverting buffer circuit, so it only buffers the incoming line signal. The values of these resistors define the gain. We use a classy Burr Brown (TI) OPA-134 J-Fet input opamp. We can change the values (gain) any way wanted, but made ±3dB and ±6dB available as standard options. The IC is laser trimmed in a way that the dc output is below 4mV. There is a trimmer to set 0Vdc output.

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 ±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 15V Zener diodes regulate the internal supply to ±15Vdc. 6mA flows into the IC, the other 9mA via the zeners.

Mounting
This module is normally mounted via the connector. Just mounting this in the chassis plate is sufficient. A drill hole of Ø12mm 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 exchange an existing RCA chassis connector by this module.
Instead of this RCA a 2-pole screw terminal fits. Then a single M3 bolt fixes it.

Gain
The basic model comes with 0dB gain, +3dB, +6dB or special gain settings are optional.

Other impedance and/or Opamp types
Other input impedances on request also, 100k is standard.

We could even mount other pin-compatible opamp types on request. For these modifications, use the comment line in our order form. Since the IC is fitted in a high quality, milled and gold plated foot, exchanging is done easy. You could even mount a Burson Single.

Some figures

Active component:	Burr Brown (TI) OPA134 dual "SoundPlus™" opamp
Input impedance:	100 kohms (lower on request)
Output impedance:	0,01 ohms
Max voltage swing:	V power supply -1,5V
Frequency range:	DC - > 8MHz. (yet LP cut-off due to C2)
Slew rate:	> 20V/uS
Gain:	0dB (±3dB, ±6dB or other on request)
Distortion:	< 0,00008% THD
Noise figure:	< 104dBu
DC-offset:	Laser trimmed < 4mA, adjustable with extra 100k SMD trimmer
Power Supply voltage:	± 4 to 13V @ -12V and +12V connections (7mA) ± 18-75V @ V- and V+ connections (15mA) Higher supply voltages possible with extra series resistors.
Dimensions	55x34x16mm (LxWxH incl. connector)

DIY
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