

Design overview

4 channel trans-impedance Amplifier module with selectable gain up to 1000kV/A, DC to 1MHz bandwidth and differential outputs. Also includes a temperature sensor and a power-on relay for remote monitoring.

- Inputs: 4 channel common ground with over current protection.
- Four selectable gains: 125/250/500/1000 kV/A
- Differential outputs: integrated in a D-SUB25.
- Low noise 2.7nA max.
- Bandwidth: DC to 1MHz.
- Output current capability: +/-50mA per channel.

The modules can be installed in a 3U enrackable case with capacity for 4 modules (16-channels in total).



Functional highlights

- The gain can be switched easily using the 4-position DIP Switch in the top face of the board.
- The input Dynamic Range covers a great range of input signals, both positive and negative: from a minimum input signal of -2.7nA (corresponding to the intrinsic noise level) up to -39µA for 125kV/A gain.
- Both input and outputs are protected against over current and short circuit of indefinite duration.
- The crosstalk between adjacent channels is less than 0.1% for the maximum gain and negligible for lower gains.

Applications

- Signal conditioning for ADCs without current-voltage converter stage.
- Front-end for any kind of current output transducers like PMT, SiPM, photo-detectors, APDs...

References

LNATIA v1.0 is being used in:

- Upgrade of the Lost Alpha Diagnostics on JET (Joint European Torus). 4 x 4Ch rack mount unit.

Specification

- 4 channels common ground, over-current and short-circuit protection.
- 50Ω Input Impedance, DC coupled.
- Differential Output, 50Ω series.
- Dynamic Range:
 - +/-40µA
 - +/-20µA
 - +/-10µA
 - +/-5µA
- Selectable Gain:
 - 125 kV/A
 - 250 kV/A
 - 500 kV/A
 - 1000 kV/A
- Máx. Output level: +/-5V
- Bandwidth: DC - 1MHz
- Differential Noise: 2.7nA RMS
- Linearity/Distortion: <2%
- Crosstalk: <0.1% (max. Gain)
- Operating Temperature: -10°C + 80°C
- Current: +/-50mA / channel
- Voltage Supply: +/-5V
- Connectors:
 - Input: BNC
 - Output: D-SUB2

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