

The 9309-4 is Ideal for Amplifying Fast Analog Signals from Photomultipliers, Electron Multipliers, Photodiodes, and Microchannel Plates.

- Rise Time <1.5-ns (for unipolar  $\pm 25$  mV inputs).
- DC Coupled to allow high counting rates.
- 0 to 10 Adjustable Gain to provide flexible gain requirements.
- Two Outputs for each Amplifier allows simultaneous counting and timing.

Often various fast detection devices have different signal amplitudes that need to be amplified to be counted or time discriminated. The 9309-4 solves this problem with four channels of variable gain amplification up to a gain of 10. Two channels can be cascaded for a gain of up to 100 should your experiment require it. An offset adjustment and DC coupling allow for higher counting rates and less baseline distortion encountered with AC coupled amplifiers. This four channel fast amplifier is ideal for experiments using photomultiplier tubes, electron multipliers, microchannel plates, or photodiodes. Dual outputs from each channel reduce the need for an additional fan-out for counting and timing applications.

### Specifications

The 9309-4 provides four DC coupled bipolar non-inverting fast amplifiers in a single width NIM with adjustable gain in 10 steps. Two outputs for each amplifier are provided. Adjustable offset for each output is via a screwdriver adjustment on the front panel.

#### PERFORMANCE

**Noise** <50  $\mu$ V RMS (referred to the input).

**I/O Delay** <3 ns.

**Crosstalk** 50-DB isolation between channels.

**Input Dynamic Range** 400 mV peak-to-peak.

**Rise Time** <1.5 ns with unipolar input  $\pm 25$  mV amplitude.

**Gain** Adjustable in 11 steps from 0 (no output) to a gain of 10  $\pm 6\%$ .

**Band Width** DC to 250 MHz with  $\pm 25$  mV input, DC to 100 MHz with  $\pm 200$  mV input.

#### INPUTS AND OUTPUTS

**Inputs** One input for each of the four channels accepts up to  $\pm 200$  mV. DC coupled.  $Z_{in} = 50 \Omega \pm 2\%$ . LEMO 00 connector.

**Outputs** Two outputs for each channel provide up to  $\pm 2$  V into  $50 \Omega$ . Output delay is <10 ns. LEMO 00 connector.

#### CONTROLS

**Gain** 11 position switch for each channel controls the gain from 0 (no output) to 10  $\pm 6\%$ .

**Zero** Front panel screwdriver adjustment; input and outputs must be terminated in  $50 \Omega$  for proper adjustment.

#### ELECTRICAL AND MECHANICAL

**Power Required** +6 V, 250 mA; -6 V, 250 mA.

**Weight** Net 0.9 kg (2 lb), Shipping 2.25 kg (5 lb)

**Dimensions** NIM-Standard single width 3.43 x 22.13 cm (1.35 x 8.714 in) front panel per DOE/ER-0457T.

#### ORDERING INFORMATION

Model	Description
9309-4	Quad Fast Amplifier



Specifications subject to change  
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