



Model 9309-4 Quad Fast Amplifier

Operating Instructions

DESCRIPTION

Signals from fast detection devices often require extra amplification before they can be counted or used for time discrimination. The ORTEC Model 9309-4 provides four channels of amplification in a single-width NIM. Each channel provides variable amplification to a gain of 10. Two channels can be cascaded for a gain of up to 100 should your experiment require it. DC coupling and an offset adjustment allow for higher counting rates and less baseline distortion than ac-coupled amplifiers.

For signals from arrays of photomultiplier tubes, electron multipliers, microchannel plates, or photodiodes, the Model 9309-4 provides dual outputs from each channel. This reduces 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 with adjustable gain from 0 to 10, in a single-width NIM. Each amplifier has 2 outputs, and each output has a front-panel, screwdriver-adjustable offset.

Performance

Noise <50 μ 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 10 \pm 6%.

Bandwidth dc to 250 MHz with \pm 25 mV input; dc to 100 MHz with \pm 200 mV input.

Inputs and Outputs

Inputs One input per channel accepts up to \pm 200 mV; overvoltage-protected; dc-coupled; $Z_{in} = 50 \Omega \pm 2\%$; input reflections <10%; LEMO 00 connector.

Outputs Two outputs per channel provide up to \pm 2 V into 50 Ω ; output delay <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, one per channel; offset uniformity \pm 4 mV typical, \pm 12 mV maximum. Input and outputs must be terminated in 50 Ω for proper adjustment.

Electrical and Mechanical

Power Required +6 V, 850 mA; -6 V, 850 mA.

Weight Net 0.9 kg (2 lb), shipping 2.25 kg (5 lb).

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

CE Conforms to CE standards low-voltage power directives.



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Quality Control

Before being approved for shipment, each ORTEC instrument must pass a stringent set of quality control tests designed to expose any flaws in materials or workmanship. Permanent records of these tests are maintained for use in warranty repair and as a source of statistical information for design improvements.

Repair Service

If it becomes necessary to return this instrument for repair, it is essential that Customer Services be contacted in advance of its return so that a Return Authorization Number can be assigned to the unit. Also, ORTEC must be informed, either in writing, by telephone [(865) 482-4411] or by facsimile transmission [(865) 483-2133], of the nature of the fault of the instrument being returned and of the model, serial, and revision ("Rev" on rear panel) numbers. Failure to do so may cause unnecessary delays in getting the unit repaired. The ORTEC standard procedure requires that instruments returned for repair pass the same quality control tests that are used for new-production instruments. Instruments that are returned should be packed so that they will withstand normal transit handling and must be shipped PREPAID via Air Parcel Post or United Parcel Service to the designated ORTEC repair center. The address label and the package should include the Return Authorization Number assigned. Instruments being returned that are damaged in transit due to inadequate packing will be repaired at the sender's expense, and it will be the sender's responsibility to make claim with the shipper. Instruments not in warranty should follow the same procedure and ORTEC will provide a quotation.

Damage in Transit

Shipments should be examined immediately upon receipt for evidence of external or concealed damage. The carrier making delivery should be notified immediately of any such damage, since the carrier is normally liable for damage in shipment. Packing materials, waybills, and other such documentation should be preserved in order to establish claims. After such notification to the carrier, please notify ORTEC of the circumstances so that assistance can be provided in making damage claims and in providing replacement equipment, if necessary.

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