ORTEC®

855
Dual Amplifier

- **Two Model 575A Amplifiers in a one-wide NIM for energy spectroscopy with multiple detectors**
- **For scintillation detectors, proportional counters, and semiconductor detectors**
- **Selectable shaping time constants (0.5, 1.5, and 3 µs)**
- **Gated active baseline restorer for high-count-rate applications**
- **Automatic baseline restorer threshold control**

The ORTEC Model 855 Dual Amplifier is an economical, general-purpose dual amplifier in a one-wide NIM module. The low-input noise, selectable shaping time constants, and gain range allow operation with semiconductor detectors, proportional counters, and scintillation detectors in a variety of applications. The high performance and low cost of the Model 855 allow a wide range of uses in such fields as research, environmental monitoring, and teaching.

The Model 855 incorporates an automatic gated baseline restorer (BLR) that causes the system resolution to be nearly independent of input counting rates. The gated baseline restorer includes a discriminator that operates the sensing circuits, that normally establish the baseline reference for the multichannel analyzer. Performance of the spectrometer often depends on the precision of the setting of the BLR threshold. The Model 855 offers the convenience of an automatic threshold control that typically gives results as good as, or better than, those the most experienced operator could achieve manually.

The pulse-shaping networks in the Model 855 produce semi-Gaussian-shaped output pulses resulting in improved noise performance and reduced amplifier resolving time. The shorter resolving time permits higher counting rates than in amplifiers with classical RC pulse-shaping networks. The Model 855 provides a 10-V linear output with excellent dc stability for both unipolar and bipolar output pulses.

Specifications*

PERFORMANCE

GAIN RANGE Continuously adjustable from 5 to 1250.

PULSE SHAPE Semi-Gaussian on all ranges with peaking time equal to 2.2τ, 50% pulse width equal to 3.3τ, and pulse width at 0.1% level equal to 4.0 times the peaking time. Bipolar crossover = 1.5τ.

INTEGRAL NONLINEARITY For 1.5-µs shaping time, <±0.05%.

NOISE <5 µV rms referred to the input using 3-µs unipolar shaping; <7 µV using 1.5-µs shaping; both for a gain ≥100.

TEMPERATURE INSTABILITY
Gain <±0.0075%/°C, 0 to 50°C.
DC Level <±30 µV/°C, 0 to 50°C.

BIPOLAR CROSSOVER WALK <±5 ns at 0.5-µs shaping for 50:1 dynamic range, including contribution of an ORTEC Model 552 Single-Channel Analyzer.

OVERLOAD RECOVERY Recovers to within 2% of rated output from X300 overload in 2.5 nonoverload pulse widths using maximum gain for unipolar output. Same recovery from X500 overload for bipolar.

RESTORER Gated active baseline restorer with automatic threshold circuit to provide the threshold level as a function of signal noise to the baseline restorer discriminator.

SPECTRUM BROADENING Typically <10% FWHM for a ^{60}Co 1.33-MeV gamma line at 85% of full scale for an incoming count rate from 1 to 50,000 counts/s. Unipolar output, 1.5-µs shaping.

SPECTRUM SHIFT Peak position shifts typically <0.02% for a ^{60}Co 1.33-MeV gamma line at 85% of full scale (measured at the unipolar output, 1.5-µs shaping, 1 to 50,000 counts/s).

CONTROLS

FINE GAIN Ten-turn precision potentiometer with graduated dial for continuously variable direct-reading gain factor of X2.5 to X12.5.

COARSE GAIN Six-position switch selects feedback resistors for gain factors of 2, 4, 10, 20, 40, and 100.

SHAPING TIME Three-position printed wiring board (PWB) jumpers, easily accessible through side panel, select time constants for active pulse-shaping filter network of 0.5, 1.5, or 3 µs.

POS/NEG A PWB jumper selects either Pos or Neg input pulse polarity.

PZ ADJ Screwdriver-adjustable potentiometer to set the pole-zero cancellation for input decay times from 30 µs to ∞.

INPUT

INPUT BNC Front- and rear-panel connectors accept either positive or negative pulses with rise times of 10 to 650 ns and decay times of 30 µs to ∞; Z_{in} = 1000 Ω dc-coupled; linear maximum 2 V; absolute maximum 20 V.

OUTPUTS

UNI Front-panel BNC connector with Z_o <1 Ω and rear-panel connector with Z_o = 93 Ω. Short-circuit proof; full-scale linear range from 0 to +10 V; active filter shaped; dc-restored with dc level adjustable to ±15 mV.

BI Front-panel BNC connector with Z_o <1 Ω and rear-panel connector with Z_o = 93 Ω. Short-circuit proof; positive lobe leading and full-scale linear range of 0 to +10 V; active filter shaped.

PREAMP POWER Rear-panel standard ORTEC power connector (Amphenol 17-10090) mates with captive and noncaptive power cords on all ORTEC preamplifiers.

AMETEK®

ELECTRICAL AND MECHANICAL

POWER REQUIRED +24 V, 83 mA; –24 V, 70 mA; +12 V, 125 mA; –12 V, 140 mA.

WEIGHT
Net 1.5 kg (3.3 lb).
Shipping 3.1 kg (7.0 lb).

DIMENSIONS Standard single-width NIM module 3.43 X 22.13 cm (1.35 X 8.714 in.) per DOE/ER-0457T.

Related Equipment

The ORTEC Model 855 Amplifier accepts linear pulses from, and furnishes power to, any standard ORTEC preamplifier or equivalent. Its output pulses may be used for linear signal analysis, using any of the ORTEC modular instruments and multichannel analyzers.

Ordering Information

To order, specify:

Model	Description
855	Dual Amplifier

*These specifications apply to each section of the Model 855 Dual Amplifier.

†Measured with an HPGe detector having good rise time characteristics.

Specifications subject to change
110320

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