

- Linear and logarithmic modes
- 10 to 10⁶ counts/min ranges
- 5-decade log range
- 0 to 100% zero suppression
- Positive or negative inputs (50 ns minimum width)
- Wide choice of time constants
- Optional audible output
- Low-rate counting from <10 counts per minute to 10 million counts per minute



The ORTEC Model 449A is the same module as shown, except that it has no audio volume or threshold control.

The ORTEC Model 449A Log/Lin Ratemeter provides two modes of operation: linear and logarithmic. The linear mode has 11 full-scale ranges from 10 to 10⁶ counts/min in 1-3-10 steps. The 5-decade log mode covers the range from 10 to 10⁶ counts/min in a single span. These selections permit logical operation of the instrument when measuring low, medium, or high steady pulse rates or when monitoring rates that vary through a wide range.

The unique, circular front-panel meter provides excellent readability for both modes because of the longer effective scale inherent in its 240° movement and because of the 2% accuracy of its indications.

Zero suppression is provided for up to 100% of any linear range. Any relatively constant background in the counting rate can be subtracted from the data by adjusting this control. Also, a suppressed zero will permit observation of rates that are beyond the nominal full-scale limit with greater accuracy than could be obtained by switching to a higher range. The choices between 7 linear and 2 log time constants is a further aid in accurately reading the rate of incoming signals.

The Model 449A measures the rate of either positive or negative input signals with a wide variety of pulse shapes. This provides the user with maximum flexibility in the selection of sources for input signals.

In addition to the front-panel meter indications, outputs are provided for both current and voltage recorders, as well as a high-level voltage output for control or monitor applications.

The Model 449A is available with an optional built-in audible output (Model 449A-2), which has a sound frequency that is variable as a function of count rate. The range of sound frequencies is effectively 0 to 500 Hz and corresponds directly to the full-scale range of the front-panel meter. The audible output includes a threshold control to totally suppress all sound until the input rate exceeds the preselected audio threshold and a

separate audio volume control to allow either local or relatively remote audible monitoring of observed rates.

For control and/or alarm applications, the Model 449A can operate an accessory device through its analog input.

Specifications

PERFORMANCE

LINEAR RANGES 11 ranges from 10 to 10⁶ counts/min full scale in 1-3-10 steps.

Dead Time <100 ns on the 10⁶ range; <0.3% of average pulse spacing up to the 3 X 10⁴ range; ≤1% on the 10⁵ and 3 X 10⁵ ranges.

Rated Overload Maintains full-scale output for X300 overload or 10⁷ counts/min, whichever is smaller.

Temperature Instability <±0.05%/°C.

Nonlinearity ≤±0.15% from 10 to 3 X 10⁴ counts/min range; ≤±1.5% from 10⁵ to 10⁶ counts/min.

Time Constants 7 selectable time constants, 0.03 to 30 s in 1-3-10 steps.

Zero Suppression 0 to 100% of full scale; nonlinearity of ≤±0.25%.

LOGARITHMIC RANGE One 5-decade range for 10 to 10⁶ counts/min.

Temperature Instability ≤±0.25% of full scale per °C.

Analog Output Error ≤±2.5% of full scale.

Standard Deviation ~15% with Log Short time constant; ~5% with Log Long time constant.

Slewing Rate Dependent on input rate; for any rate change. Log Short-time constant provides 10 times faster response than Log Long-time constant.

CONTROLS

RANGE 12-position switch selects the full-scale range and either linear or logarithmic mode; linear ranges are 0 to 10 counts/min through 0 to 10⁶ counts/min in 1-3-10 steps; log range is 10 to 10⁶ counts/min.

TIME CONSTANT 9-position switch selects an integrating time constant of 0.03, 0.1, 0.3, 1, 3, 10, or 30 s for linear ranges from 10 to 3 X 10⁴ counts/min or for any of these values divided by 10 for 10⁵, 3 X 10⁵, and 10⁶ ranges; Short and Long for the log range.

ZERO SUPPRESSION 10-turn precision potentiometer to suppress the zero-reference level for any linear range from 0 to 100%; the same full-scale span is effective above the preselected zero-reference level.

INPUTS

Accepts either positive or negative input signals with amplitude ≥±3 V and width ≥50 ns; ±30 V maximum; UG-1094/U BNC connectors on both front and rear panels.

449A/449A-2 Log/Lin Ratemeter

OUTPUTS

PANEL METER 240° circular movement with 8.9 cm (3.5 in.) deflection; accuracy 2% of full scale; three scale markings, 0–1 and 0–3 for linear ranges and 10–10⁶ in five decades for log range.

ANALOG OUTPUT 0 to +10 V full scale, dc-coupled with 100-Ω output impedance; UG-1094/U BNC connector on rear panel.

RECORDER OUTPUT (A) Voltage output with 100-mV full scale; dc-coupled with 100-Ω output impedance; binding post connectors on rear panel.

RECORDER OUTPUT (B) Current output with 1-mA full scale; dc-coupled with 10-kΩ output impedance; binding post connectors on rear panel.

OPTION

449A-2 AUDIBLE OUTPUT OPTION This option is in addition to the regular specifications of Model 449A.

AUDIO OUTPUT A tone of variable frequency is furnished through a chassis-mounted speaker; the frequency increases from essentially 0 to 500 Hz, corresponding to the proportional meter deflection.

AUDIO THRESHOLD A 1-turn control mutes the audible output until the input rate exceeds the setting of the control and permits the output to be heard for all higher rates; range is 0 to 100% of selected full scale, linear, and log.

AUDIO VOLUME A 1-turn control adjusts the amplitude of the audible output from a near-inaudible level to a level that can be heard above normal laboratory ambient noise.

ELECTRICAL AND MECHANICAL

POWER REQUIRED +24 V, 50 mA; –24 V, 35 mA; +12 V, 30 mA; –12 V, 45 mA.

WEIGHT

Net 1.5 kg (3.5 lb).

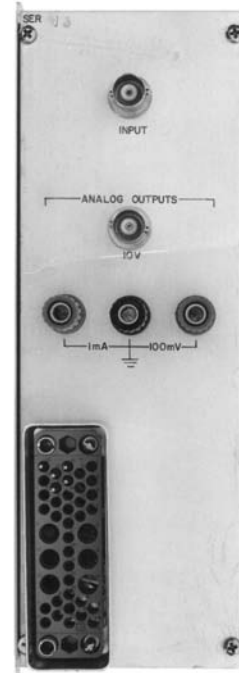
Shipping 2.5 kg (5.5 lb).

DIMENSIONS NIM-standard double-width module 6.90 X 22.13 cm (2.70 X 8.714 in.) per DOE/ER-0457T.

Ordering Information

To order, specify:

Model	Description
449A	Log/Lin Ratemeter
449A-2	Log/Lin Ratemeter with audible output



Specifications subject to change
081607

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www.ortec-online.com

Tel. (865) 482-4411 • Fax (865) 483-0396 • ortec.info@ametek.com
801 South Illinois Ave., Oak Ridge, TN 37831-0895 U.S.A.
For International Office Locations, Visit Our Website

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