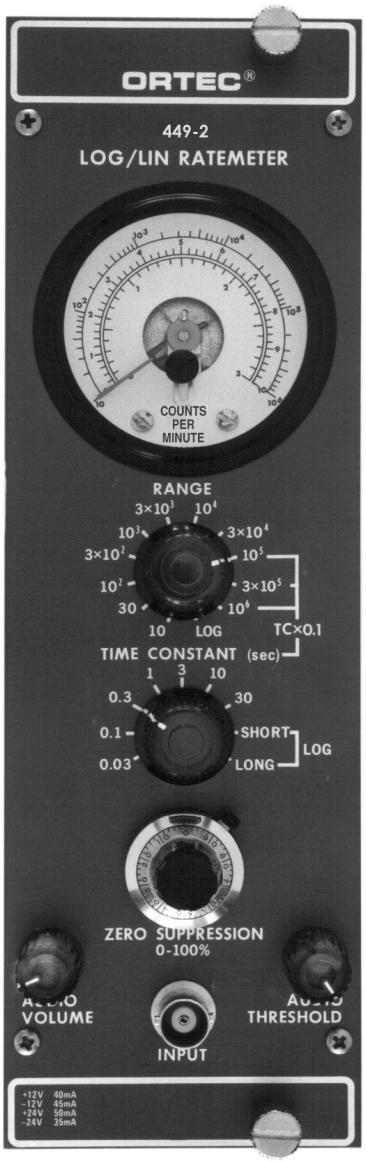
ORTEC®

AMETEK®

449/449-2
Log/Lin Ratemeter

- **Linear and logarithmic modes**
- **10 to 10^6 counts/sec 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 second to 10 million counts per second**



The ORTEC Model 449 Log/Lin Ratemeter provides two modes of operation: linear and logarithmic. The linear mode has 11 full-scale ranges from 10 to 10^6 counts/sec in 1-3-10 steps. The 5-decade log mode covers the range from 10 to 10^6 counts/sec 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 449 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 449 is available with an optional built-in audible output (Model 449-2), 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 fullscale 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 449 can operate an accessory device through its analog input.

Specifications

PERFORMANCE

LINEAR RANGES 11 ranges from 10 to 10^6 counts/sec full scale in 1-3-10 steps.

Dead Time <100 ns on the 10^6 range; <0.3% of average pulse spacing up to the 3 X 10^4 range; ≤1% on the 10^5 and 3 X 10^5 ranges.

Rated Overload Maintains full-scale output for X300 overload or 10^7 counts/sec, whichever is smaller.

Temperature Instability <±0.05%/°C.

Nonlinearity ≤±0.15% from 10 to 3 X 10^4 counts/sec range; ≤±1.5% from 10^5 to 10^6 counts/sec.

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 10^6 counts/sec.

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/sec through 0 to 10^6 counts/sec in 1-3-10 steps; log range is 10 to 10^6 counts/sec.

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 10^4 counts/sec or for any of these values divided by 10 for 10^5, 3 X 10^5, and 10^6 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.

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 10–10^6 in five decades for log range.

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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

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

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

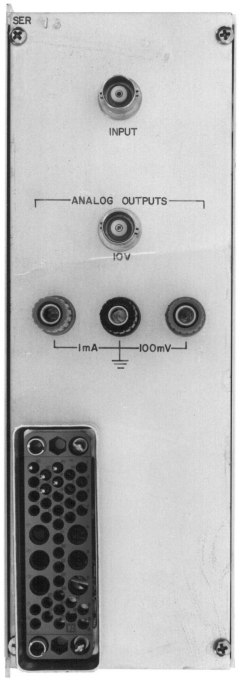
POWER REQUIRED +24 V, 50 mA; –24 V, 35 mA; +12 V, 30 mA; –12 V, 45 mA.

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

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



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Specifications subject to change
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