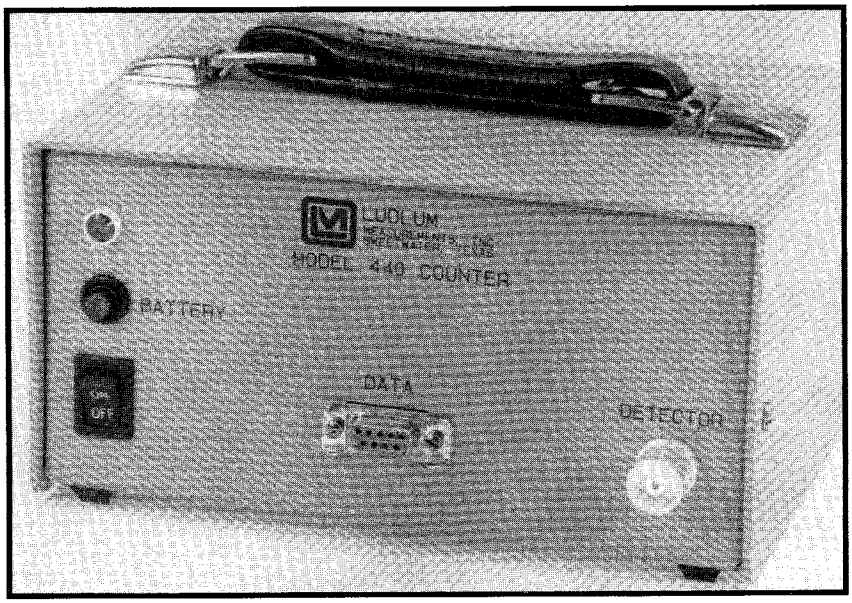
MODEL 440 SERIES COUNTERS

March 1995

The Ludlum Model 440 Series counters are designed to provide the link between radiation detectors and computers. These counters provide 400-2500 Vdc and 2mV to 100 mV thresholds, making these units compatible with most LMI alpha, beta, gamma and neutron detectors. The Model 440 's are not equipped with visual readouts; they have outputs suitable for logging via computers, remote meters, or analog recorders. Output is in the form of pulses per radiation event and a linear 0-3 Vdc voltage output.

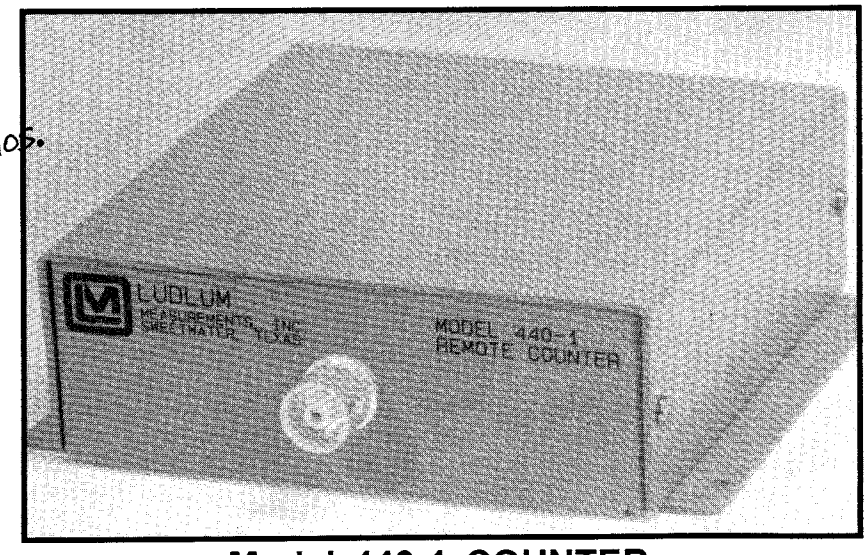
The Model 440 is complete with a power supply, detector HV power supply, high sensitivity amplifier, and detector overload circuitry. This unit operates on AC power, but features a battery backup that will last approximately 25 hours. The 440 provides a built-in trickle charger, which continously charges the battery, when the power is ON. Output is in 0-5 Vdc pulses per radiation event, or a linear 0-3 Vdc analog recorder signal. Additional outputs are a 0-5 Vdc detector overload signal and a high voltage analog readout signal. There are two control signals available to disable the high voltage and to turn the instrument ON/OFF. **Price: $275.00**



Model 440 COUNTER

Model 440-1 has the same specifications as Model 440, except this counter does not have a transformer and is configured in a smaller package. An internal compartment contains a 9 Vdc alkaline battery. An alternative to using the internal battery is to supply 6 to 12 Vdc through a pin on the input connector. **Price: $195.00**

6 mos.



Model 440-1 COUNTER

Model 440-2 is a two channel counter with threshold and window controls. High voltage is remotely adjustable. Pulse output is available via RS-485 differential signals. Cable lengths up to 4000' may be used with this unit. **Price: $195.00**

From The Trenches
with David Wyatt
march 1995

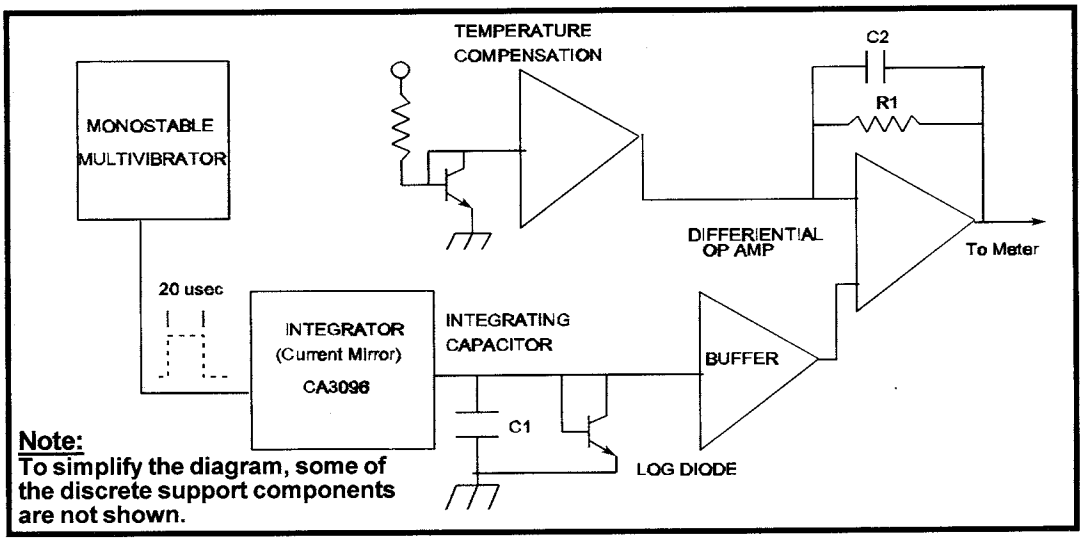
DETERMINING RATEMETER TIME CONSTANTS FOR MDA EQUATIONS

Note: This is part 2 of a three part series covering MDA time constants. Part 1 addressed linear ratemeters controlled by conventional resistor-capacitor (RC) integration components. Part 3 will address microprocessor controlled instruments.

This article will cover response times for discrete component logarithmic ratemeters such as Ludlum Model 395's, 177-50's, 333-2 Air Monitors, 3502/ 3503 Gate Monitors, and Model 300, 300-9, and 355 Area Monitors. Meter response controlled by Microprocessor, will be covered in part 3.

Calculating meter response times for Logarithmic Ratemeters is somewhat more difficult than the linear ratemeters described in the previous article — log ratemeter response time may vary from 2 minutes to less than one second. There are several variables which affect the meter response time of the log-ratemeter circuit: the integrating capacitor used to filter the pulse rate; the incoming pulse rate relationship to the meter dial decade (lower, mid, upper decade); the beginning reference of the response measurement — measured from zero to midscale, lower to mid, zero to upper, etc., and whether a RESET has been initiated before the response time measurement.

The Model 395 log-ratemeter circuit will be used for discussion:



Amplified detector pulses are coupled to the monostable multivibrator. The pulse width output of the multivibrator is fixed at approx. 20 µs. The count rate on a four decade meter dial at 1/4 full scale (first decade) will equal approx. 120 cpm.

The 20 µs pulse width equates to 0.004% duty cycle for the 120 cpm pulse rate — the current sourced in to the log diode is equal to approx. 0.1 µA. This current will increase by a factor of 10 for each decade with full scale at approx. 100 µA.

The time constant is calculated by dividing the voltage dropped across the log diode (measured at buffer output) by the current for the particular decade to obtain the approximate resistance for the R x C calculation.

Example: The Vdc at the buffer output equals 0.46 at 1/4 full scale, divided by 0.1 µA gives an approx. resistance of 4.6 megohms. The integrating capacitor is a 22 µF — $(22 \times 10^{-6}) \times (4.6 \times 10^{6}) = 101$ seconds (1 time constant = 63% of the full charge). With integrated current increasing by decade — 1 µA 10.1 sec., 10 µA 1 sec., and 100 µA 0.1 sec.

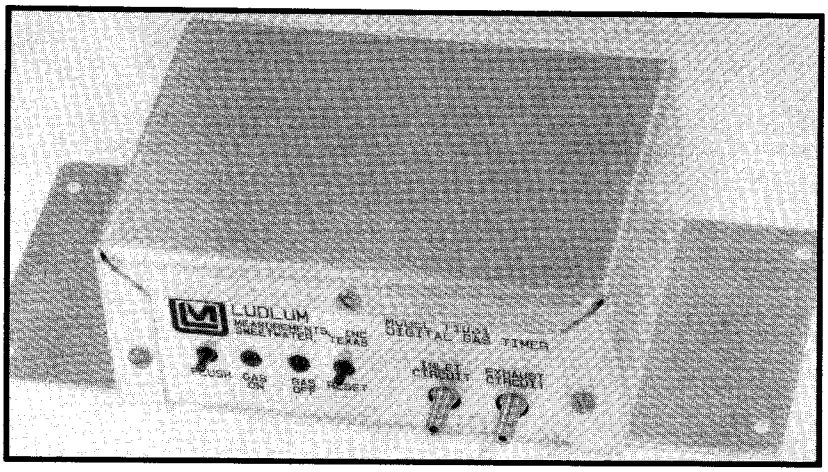
Note C2 and R1 (4.7 µF and 165k ohms respectively) on the differential op amp feedback in the illustration— when the response is below 1 second (3/4 decade and above for the example) the time constant of these two components override the logarithmic integrator.

The example above is calculated from zero (C1 completely discharged). If the response time is measured from, say background, the response will be faster. Some of the log circuits have the reset components tied directly to the integrating capacitor which shunts the signal to ground when a RESET is initiated; therefore, whether the response is measured after a RESET or radiation background can make substantial difference. In conclusion, with all of the variables associated with the logarithmic time constant/response time measurements, the most efficient method is to measure the operating region of interest at the 10% and 90% points of final reading.

If you missed Part 1 of this series, please call and we will send you a copy!

MODEL T1031 / T1031-1 GAS TIMER

Introducing the Model T1031 and T1031-1 Gas Timers. march 1995



Most gas flow systems do not need constant gas flow for normal operation. Gas timers may be used to control the gas flow to such things as gas flow detectors, laundry monitors, portal monitors, hand and foot monitors, etc... LMI offers two gas timers to regulate the gas flow system. Both Models regulate the gas by using two solenoids with adjustable timers from 1 - 99 minutes.

Model T1031 solenoid circuit is normally closed and requires power before the gas will flow to your system. The Model T1031-1 solenoid circuit is normally open and will not shut-off gas in the event of power loss.

Both feature separate GAS ON (green LED) and GAS OFF (red LED) indicators to display the flow status. The system may be flushed by pressing the FLUSH push button. The above indicators will be simultaneously illuminated indicating system flush. A reset push button enables the user to re-initiate the timer function. The Model T1031 and the T1031-1 operate from a 115 volt AC transformer (12 volt DC).

PRICE: $ 250.00 ea.

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