

# Troemner Calibration Services – Electrical, Time and Frequency



*Precision & Balance Matched Only By Nature.*



The newest additions to Troemner's portfolio of calibration services are a variety of electrical calibrations, plus time and frequency calibrations. All electrical calibrations are ISO/IEC 17025 compliant and include DC Voltage, DC Current, AC Voltage, AC Current, DC Resistance, Capacitance, and AC/DC Power. Troemner can calibrate most equipment that produces measurements for the above disciplines as well as most multimeters. In addition, Troemner can calibrate most oscilloscopes. Electrical calibrations cover the measurement disciplines found in most multimeters and oscilloscopes.

Ranges and uncertainties are found in the table below.

Troemner also provides Time and Frequency Calibrations for the following devices: timers, stopwatches, frequency/timer counters and synthesizers.

Accuracy for Time and Frequency Calibrations:  $4 \times 10^{-11}$  Hz

## **Facility and Environment**

Troemner's Electrical and Frequency Calibration Laboratory meets ISO 17025 guidelines. Environmental conditions in the laboratory are strictly monitored and controlled.

## **Equipment**

Troemner's Electrical and Frequency Calibration Laboratory is outfitted with the latest state-of-the-art equipment. Equipment includes multi function calibrators for electrical measurements and frequency calibrators using the latest technology in frequency calibrations for time and frequency measurements.

## **Processes**

Troemner can tailor a calibration for your Electrical or Time/Frequency devices if our standard service does not meet your needs.

Troemner NIST Calibration Certificates for Electrical, Time and Frequency Calibrations - A detailed multi-page ISO/IEC 17025 compliant calibration certificate traceable to NIST that contains the following data: "as found", "as left" readings, standards used, uncertainty of measurements, tolerance of device being calibrated, and environmental conditions.



## **Hummingbird Help**

The following pages are Quote/Order forms that can be used to place orders or request quotes via fax or phone. Our customers can also use these forms as a guide to gather the information Troemner requires to efficiently process orders for calibration services. The first Quote/Order form is a cover page, which asks for general company and contact information. This cover page can be used with any or all of the specific calibration service Quote/Order forms.

## **RANGES AND UNCERTAINTIES**

Measurement Discipline	Range	Uncertainty
DC Voltage	0 – 1000 V	5 ppm
DC Current	0 – 20 A	120 ppm
AC Voltage	1 mV – 1000 V Frequency range 10 Hz – 500 kHz	80 ppm
AC Current	30 $\mu$ A – 20 A Frequency range 10 Hz – 500 kHz	200 ppm
Resistance DC	0 – 1 G $\Omega$	40 ppm
Capacitance	190 pF – 110 mF	500 ppm
AC/DC Power	100 $\mu$ W – 10 kW	0.1% of reading
Oscilloscopes	up to 1.1 GHz	$\pm$ 2% to $\pm$ 7% of output