

# DSP-523 & MT-263 Calibration and Accuracy

January 29, 2009

Justin Faulk

Calibration is done with a Helmholtz coil that produces a 55 Hz sinusoidal magnetic field. The geometry of the Helmholtz coil gives an area of uniform magnetic flux, which is calculatable based on the size of the coil and current driven through it. This allows for precise calibration based on quantifiable measurements, which gives close to NIST traceability. NIST traceability will be achieved in the near future with addition of traceable current meters. Calibrating at 55 Hz allows for accuracy at both 50 Hz (Europe) and 60 Hz (North America) power grid frequencies.

## Verifying Calibration

Calibration procedures were verified by pulling one random unit of each model number from stock. A uniform 60 Hz sinusoidal magnetic field was produced with a Helmholtz coil, and the measurements from each unit was compared with a NIST-traceable gaussmeter (model UHS from Alphalab, Inc). The UHS meter has NIST traceable calibration, guaranteed  $\pm 5\%$  45 to 5,000 Hz. All measurements are in milliGauss.

<u>UHS</u> (NIST Traceable)	<u>MT-263</u>		<u>DSP-523</u>	
<u>Measured</u>	<u>Measured</u>	<u>% Diff</u>	<u>Measured</u>	<u>% Diff</u>
2.24	2.16	-3.57%	2.14	-4.46%
11.8	11.34	-3.90%	11.26	-4.58%
47.9	46.4	-3.13%	45.7	-4.59%
106.8	105.5	-1.22%	102	-4.49%
213	207.1	-2.77%	202.5	-4.93%

**Result:** Both models DSP-523 and MT-263 showed accuracy within 5% of the NIST-Traceable standard meter.