



## THM1176: THE ONLY HANDHELD 3-AXIS MAGNETOMETERS

The world's most compact 3-axis magnetometer.  
Plugs into desktop, laptop or handheld computers.  
Lightweight, low-power, go-anywhere, measure-anything.

- Comprehensive family of 3-axis sensors
- Field strengths from nanoteslas to 14 T
- DC or AC magnetic fields, up to 1 kHz
- Accuracy: varies by model, on the order of  $\pm 1\%$  in any orientation
- Plug-and-play USB interface
- Sophisticated software, including spectral analysis

Metrolab, the global market leader for precision teslameters

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# THM1176: A BREAKTHROUGH

With its line of high-tech 3-axis sensors, compact construction, USB interface, and sophisticated software, the THM1176 family marks a significant breakthrough in magnetic field measurement. Very low- to very high-strength fields can now be easily measured with a fully standards-compliant instrument that will go anywhere, even into small gaps.

## THE WORLD'S SMALLEST 3-AXIS MAGNETOMETER

This unique magnetometer resembles a cable with a few fat spots. The rugged plastic probes are easy to handle or fit in a fixture. Some models feature a removable cap, revealing the bare sensor and facilitating access to small gaps, as well as a microscopic active volume, closely approximating a point measurement of the magnetic field vector.

Transport and set up anywhere

Get into millimeter – even sub-millimeter! – gaps

Increase positioning accuracy

Obtain consistent measurements in inhomogeneous fields

## A PROBE FAMILY TO MEASURE NANOTESLAS TO 14 T

A comprehensive range of sensors tackles any measurement situation: just choose the one best suited to your application! Accuracy on par with the best bench-top 3-axis magnetometers, 1 kHz bandwidth, sample rates up to 6.8 kSa/s, and sophisticated trigger control take care of the rest.

**THM1176-MF:** primary field of permanent and electro-magnets up to 3 T

**THM1176-LF:** millitesla fringe fields, for safety and compatibility tests

**THM1176-HF:** fields up to 14 T in superconducting magnets

**THM1176-HFC:** sub-millimeter gaps, e.g. between rotor and stator

**TFM1186:** nanotesla disturbances in the earth's magnetic field

## PLUG-AND-PLAY

A standard USB connection makes installing the THM1176 a breeze. The included Windows or Mac software displays the field in numerical, graphical or vector format, and offers data processing, record and playback, and alarms. It also controls all instrument parameters, such as units, trigger mode, trigger rate and oversampling factor.

Measure, plot and record instantly

Optimize instrument parameters

Map a field with point-by-point triggers

Visualize the field direction with vector display

Monitor field strength, with alarms



# IN MAGNETIC MEASUREMENT



An industrial-quality handheld computer offers the same sophisticated software capabilities, in the palm of your hand! You have hours of autonomy with the heavy-duty battery, and full connectivity with USB, Wi-Fi and Bluetooth.

## OPTIONAL HANDHELD KIT



- Free yourself from boxes and cables
- Transfer recorded data to your computer

## SPECTRAL ANALYSIS



The THM1176 software provides instantaneous spectral analysis. You can graphically display the full spectrum, numerically measure selected peaks, and set alarms. In a nutshell, the world's first handheld 3-axis magnetic spectrometer!

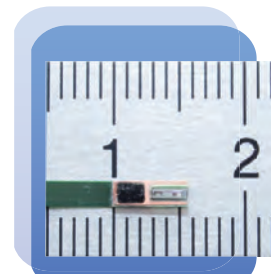
- Analyze magnetic noise
- Identify its source
- Monitor its amplitude and frequency

## CUSTOM SOFTWARE

With its programming tools and standards compliance, THM1176 encourages software customization. The external-trigger module is customizable to synchronize measurements with your hardware, and all kits include source code, full documentation, and a LabVIEW™ API.



- Display application-specific analyses
- Synchronize your measurements
- Integrate THM1176 into your test bench





# THREE-AXIS MAGNETOMETER THM1176 PROBE FAMILY

Model	Typical application	Key specifications	Probe dimensions
THM1176-MF	General purpose	Range 3 T (0.1, 0.3, 1, 3 T) Accuracy $\pm 1\%$ <sup>1</sup> Resolution 0.1 mT	113 x 16 x 10 mm Sensor: 16.5 x 5.0 x 2.3 mm Cable: 3m, optionally 6m
THM1176-LF	Weak/fringe fields	Range 8 mT Accuracy $\pm 20 \mu\text{T}$ Resolution $\pm 2 \mu\text{T}$	113 x 16 x 10 mm Cable: 3m, optionally 6m
THM1176-HF	Very strong fields	Range 14 T (0.1, 0.5, 3, 20 T) Accuracy $\pm 1\%$ <sup>1</sup> Resolution 0.3 mT	113 x 16 x 10 mm Sensor: 16.5 x 5.0 x 2.3 mm Cable: 6m
THM1176-HFC	Narrow gaps	Range 1.5 T (0.1, 0.5, 3, 20 T) Accuracy $\pm 1\%$ <sup>1</sup> Resolution 0.3 mT	0.5 x 2 x 42 mm Cable: 3m, optionally 6m
TFM1186	Earth-field disturbances	Range 100 $\mu\text{T}$ Accuracy $\pm 0.5\%$ , $\pm 100 \text{ nT}$ Resolution 4 nT	30 x 32 x 70 mm Cable: 3m

<sup>1</sup> Accuracy for any field orientation; typically x10 better along primary axes.

## KIT CONTENTS

### Desktop kit:

- 3-axis Hall probe
- Zero-gauss chamber
- Calibration
- CD with acquisition software, source code and manual
- Metrolab software license, including free upgrades



### Handheld kit – in addition:

- Rugged handheld computer
- Heavy-duty battery
- USB instrument adaptor cable
- USB host adaptor cable
- Software licenses from Metrolab and National Instruments
- Carrying case



### Duo kits:

- Any two probes
- Optional handheld computer
- Carrying case



## MEASUREMENT SPECIFICATIONS

**Output:**  $B_x$ ,  $B_y$ ,  $B_z$ , temperature (uncalibrated), timestamp (167 ns resolution)

**Units:** T, mT,  $\mu\text{T}$ , nT, kG, G, mG, MHz<sub>p</sub>, ADC

**Bandwidth:** DC to 1 kHz

**Sample rate** – depends on trigger mode:

Normal: 0.36 Sa/s – 2.3 kSa/s (jitter~1.2  $\mu\text{s}$ )

Timed: 0.36 Sa/s – 5.3 kSa/s (jitter~0.2  $\mu\text{s}$ )

Immediate: ~6.8 kSa/s

Bus:  $\leq$  ~400 Hz

Internal buffer size: 4096 Sa (1 Sa =  $B_x$ ,  $B_y$ ,  $B_z$ )

## SOFTWARE FUNCTIONALITY

- Windows, Mac OS X or Windows Mobile
- Display  $B_x$ ,  $B_y$ ,  $B_z$ , FFT, standard deviation, peak-to-peak, vector display
- Numerical or graphical display
- "Hold" and "Max" functions
- Selection of range, units, trigger mode, trigger rate, oversampling factor and alarm settings
- Zero offset correction
- Save to file, replay from file
- Save and restore settings
- On-line help

## INTERFACE

**USB:** USB 2.0 full speed (12 Mbps), Type A connector

**Driver & protocol:** USBTMC / USB488, DFU, SCPI

**Power:** USB bus, 4.3 – 5.25 V

## OPERATING CONDITIONS

**Operating temperature:** 0 to 40°C

**Storage temperature:** -20 to 60°C

**Magnetic:** electronics < 3 T, handheld computer < 1 T

For detailed specifications, please see <http://www.metrolab.com>.

## WARRANTY, CALIBRATION, CERTIFICATION AND MAINTENANCE

**Warranty:** 2 years

**Calibration interval:** 18 months

**Certification:** CE approved

**Maintenance:** upgradable firmware/software

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