TeslaMeter 2000
The Smart Magnetic Sensor

Features:

- **Probes for Axial or Transverse magnetic fields**
- **Ranges: 2000, 200, 20mT and Auto**
- **Analog and Digital output**
- **4½ Digit LCD readout**
- **Auto shut-off**
- **Temperature compensated sensor**

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Introduction

Tel-Atomic's new pocket size TeslaMeter 2000 is unique for the features offered. The Sensor will measure axial or transverse magnetic fields up to 2000 mT, and can be set for Auto- range. However, if one of the 3 manual ranges is selected, an analog output of 2.5 volts for FSD of each range is possible, making it easy to use with a computer interface.

With the 4 ½ Digit LCD readout you can use the sensor as a stand-alone Magnetic field meter. In addition, the sensor is provided with a USB digital input/output so you can connect it directly to your computer.

An EEPROM inside the probe has been programmed for temperature compensation of non-linearity error. Following a patented method, the unit removes temperature effects of magnetic sensitivity, resistive residual voltage and also all magneto resistive effects. If necessary, the unit can be re-calibrated easily with the help of the zero-gauss chamber.

The TeslaMeter 2000 comes with complete operating instructions, an axial and transverse probe, the zero-gauss chamber as well as an external power supply.

Specifications

Measurement Ranges:	±19.999 mT,	1µT resolution
	±1999.99 mT,	10 µT resolution
	±1999.9 mT,	100µT resolution
Measured value mode:	Constant Magnetic Field [mT]	
	Alternating Magnetic Field up to 500Hz in RMS [mT]	
Magnetic Field Sensor:	Hall Effect GaAs type sensor	
Measurement Probes:	Axial and Radial,	
	12.5mm long,	
	100cm cable with 9 pin "D" type male connector	
DC Range Accuracy:	± 0.05% on each range	
AC Range Accuracy:	± 0.2% on each range	
Resolution:	.001mT	
Range selection:	Manual, Auto	
Digital data format:	ASCII data	
	[±XX,XXmT"CR""LF"], [±XXX,XmT"CR""LF"], [±XXXXmT"CR""LF"]	
Analog output:	± 2.5V max. resolution 128 bit per ±2000mT	
Measuring utilities:	Zero the hall sensor with the "Zero Gauss Chamber".	
	Set offset readout for the current field.	
	Non-Volatile memory for caching the "last used"	
	measurement range and mode.	
User buttons:	Power:	on / off
	Measurement mode:	ac / dc
	Measurement range:	2000mT, 200mT, 20mT, AUTO
	Zeroing:	readout offset / sensor zero
Power Off:	Manual or Auto after 10 min.	
Power On:	Manual	
Total Weight:	200g (including batteries)	
Dimensions (HxWxD):	130mm x 75mm x 26mm	
Display:	4 1/2 digit LCD	
Readout frequency:	4 Hz	
External power supply:	12V, 100mA, DC 2mm power jack	
Supply:	4 x R3 (AAA) type cells	

Operating Procedure

1. Slide open the battery door at the back of the unit.
2. Install the 4 1.5V AAA battery and replace the battery door.
3. Plug the sensor into the connector at the top of the unit.
4. Turn on the TeslaMeter 2000 by pressing the POWER switch for at least 1 sec.

The TeslaMeter 2000 is manually operated by 5 switches.

Power

On and Off switch.

Press once for at least 1 sec: instrument turns On.

Press again: instrument turns Off.

Note: After turning the sensor off, wait at least 5 seconds before turning it on again.

If the "POWER" switch of the TeslaMeter 2000 is not being used or if not connected to USB, the TeslaMeter 2000 switches off automatically after 10 minutes. The display shows "OFF" for about 1sec. to indicate that the instrument is switched off. When the battery is too low, the display indicates "LOBAT" and a few seconds later, the TeslaMeter 2000 switches Off.

When no probe sensor is attached to the connector at the top of the unit, the TeslaMeter 2000 switches Off a few seconds after being switched On.

Range

The values of measurement are displayed in three ranges:

1. 19.999 mT
2. 199.99 mT
3. 1999.9 mT

When the TeslaMeter 2000 is switched On, it is set on the range last used.

By pressing "RANGE" the unit toggles from the last range used to Auto ranging (display shows blinking dot) to 1999.9 (display shows 0.0) to 199.99 (display show 0.00) to 19.999 (display shows 0.000).

Note: If the magnetic field being measured is greater than the chosen range, then the LED will read FUL.

Zero Cal

This button allows one to calibrate the Hall sensor offset. The user has to place the probe in the Zero Gauss Chamber, then press the button "ZERO CAL". The Hall sensor offset is then measured and memorized. The new set of Offsets remain after switching off the TelsaMeter

2000. The Zero Cal function is not to be used to zero the Hall sensor offset when the sensor is in a given magnetic field. (See offset)

Offset

This button allows one to zero the readout value when the sensor is in a given magnetic field. The readout offset is then measured and memorized. The new Offset does not remain in memory after switching off the TeslaMeter 2000. This function is used to show small variations in large background fields. When activated, the relative function displays deviation from a specific setpoint.

AC/DC

This button switches the TeslaMeter 2000 to measure the constant / alternating magnetic field.

Press once : instrument is in AC measuring mode

Press again: instrument is in DC measuring mode

The AC measuring mode calculates the alternating part of the measured magnetic field value and displays the result in True RMS.

In the DC mode either a + or – sign will appear in front of the number. In the AC mode no sign will appear with the number.

Software Instillation

Place the CD in your computer.
Run Setup.exe and follow the instructions.

Software Operating Instructions

Please note: The software is designed to record data. Analysis of data needs be done in a spreadsheet.

Connecting the TeslaMeter 2000 to the computer.
Immediately to the left of the "Current Magnetic Induction" screen you will see the number and the type (axial/transversal) of the probe connected to the TelsaMeter 2000.

Recording Data
To start recording data simply press the ***start*** button located in the tool bar in the lower screen. Data is taken at a constant rate of 1 Hz. Up to 2 hours (7200 data points) of data can be taken. The screen has a "data width" of 60 seconds. The last 60 seconds of data is seen on the screen; however, by pressing the ***left/right*** arrow button on the tool bar at the bottom of the screen one can scroll through all of the data points.

Additionally by pressing the **F1** key the graph will toggle between the selected data screen and a

complete graph of data since recording began. The **F1** key is operative during both the collecting of data as well as for displaying data after data collection has been stopped.

After pressing **F1** and displaying all of the data you can "zoom" in on a special region of interest. Press the **SHIFT** key and with the mouse choose the region of interest you want to examine. Press the **"R"** key to return to the normal screen.

Press the ***stop*** button in the tool bar to terminate data collection.

Please note: Both the x and y axis are auto ranging.

Saving Data

If you choose to save data it will be automatically exported to your spreadsheet in a CSV or in a TXT with TAB spaces format. You can open this data with the spreadsheet program for further data analysis.

Recording a Second Run

To record a second set of data simply press ***start***. The screen will clear and data recording will begin again.

Manual Recording

If you want to manually record data click on the ***manual*** button on the tool bar. With the cursor on the **manual** button each time the left mouse button is pressed, data will be recorded. You can also record data by simply pressing the **ENTER** key. The x axis is now "points" instead of time. To end data recording press ***stop***.

*Please note: Even though data is taken only when the **manual** button is selected the "Magnetic Induction Screen" continues to update at the 1Hz rate.*

Data is saved in the manual mode as described earlier.

Ranges

When the range button on the TeslaMeter 2000 is pressed the software will reflect this change.

Please note: If the TeslaMeter 2000 is on, for example, the 200 mT range and the magnetic field exceeds this level "FULL" will appear on the LED screen. However, the software can still continue to collect data up to about a 50% over range.

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Declaration of Conformity

According to ISO/IEC Guide 22 and EN 45014.

We, ASONIK
declare under our sole responsibility that the product:

Hand held magnetic field meter,
Named: Smart Magnetic Sensor,
Type: SMS-102,
Input/Output: RS232 Interface

is in conformity with the following standard(s) or other normative documents(s):

LVD - (EN 50366:2004(U), EN 50106:2000, EN60950-1:2001 EN 50371:2004, EN 60335-1:1999/2002/2004, EN 61010-1:2001, EN 61187:2003)

EMC - (EN 55014-1:2004, EN 55014-2:1999, EN 55024:1998)

ROHS - (2002/95/EC, 2005/618/EC)

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