



3-axial USB handheld Teslameter

Developed by SENIS AG and Matesy GmbH



NEW!
WITH
WLAN-MODULE

Description

3MTS is the USB handheld Teslameter developed in cooperation with Matesys' partner company SENIS AG.

The 3MTS incorporates a fully integrated 3-axis Hall Probe, which is integrated in a specially designed carbon-fiber holder to provide the mechanical protection of the probe. The probe holder is 4mm wide and only 1mm thick to allow a measurement of the magnetic field in narrow air gaps. The Hall probe is connected to a compact and light electronic module, providing the measured signal conditioning; the 12bit AD conversion; the device calibration; and an USB connection to the host computer. The Hall probe on-chip temperature sensor allows a temperature

compensated output signal for each three magnetic field components (B_x , B_y and B_z). The easy-to-use Teslameter software running on a MS Windows computer, tablet or smartphone is used for the data acquisition, Teslameter power supply and control and for measured data visualization.

The measured data are visualized in numerical and graphical colored displays, allowing an easy readability and intuitive setup of alarm triggers, hold function and measured data storage. The total value of the magnetic field, as well as all three components of the magnetic field and the probe temperature are displayed. In addition, the min/max values of the magnetic field components can be presented.



3MTS USB Handheld Teslameter / Gaussmeters & Software

Typical Applications

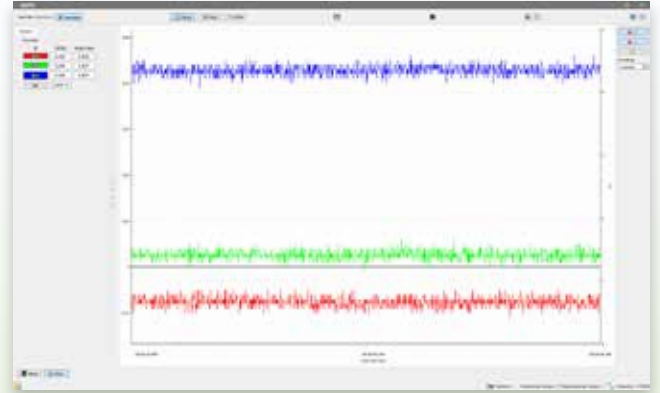
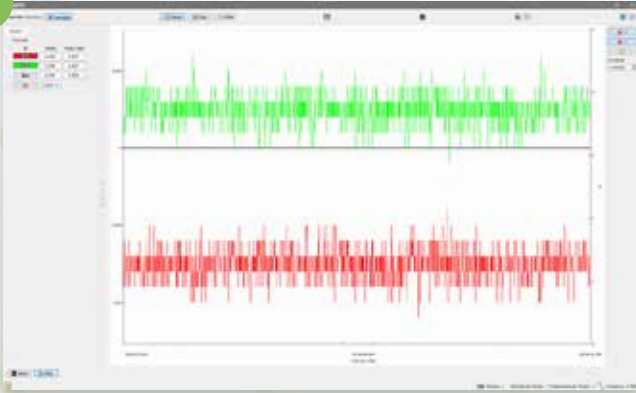
- Quality control and monitoring of permanent magnets & magnet systems
- Measurement of the environmental magnetic field
- Development of magnet systems & process control
- Magnetic field mapping
- Applications in production lines and laboratories

Key features

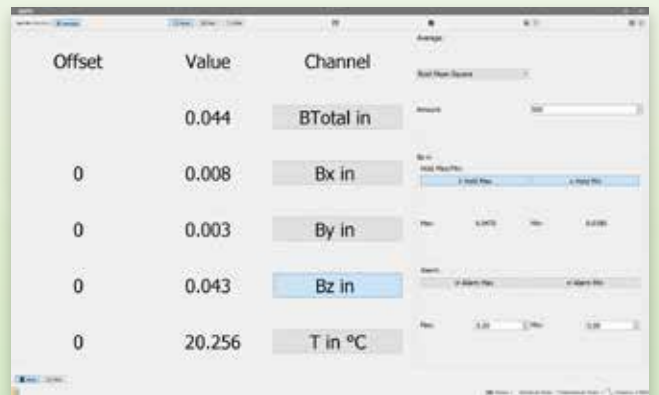
- Teslameter/Gaussmeter with 3-axis Hall probe
- Very compact and light robust plastic packaging
- Carbon-fiber probe holder for extreme robustness and flexibility
- Hall probe thickness, including the holder: 1mm
Calibrated measurement ranges: 0.1T, 0.5T, 2T
- Non-calibrated measurement range: 20T
- Accuracy: better than $\pm 1\%$
- Magnetic resolution: $\pm 20\mu\text{T}$
- Frequency bandwidth: DC to 500Hz
- AD Conversion: 12bit
- **WLAN module**
- Computer Interface: USB2, USB3
- EEPROM for calibration data storing
- User-friendly Teslameter software for PCs, tablets and smartphones
- Numerical and graphical visualization of all three components of the magnetic field, B_x , B_y and B_z as well as B_{Total} , B_{max} , B_{min} and probe temperature
- Alarm, Hold and Zeroing functionality
- Measured data storage
- Working temperature: -20°C - $+85^\circ\text{C}$

Teslameter Software

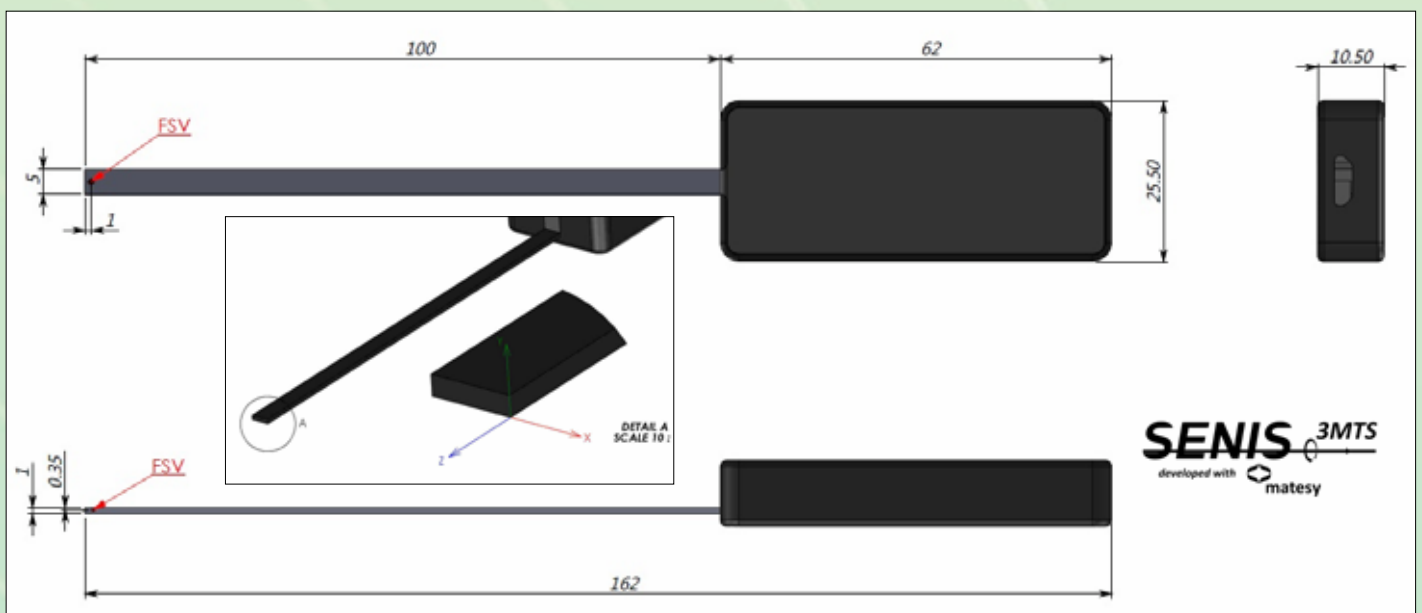
A



B



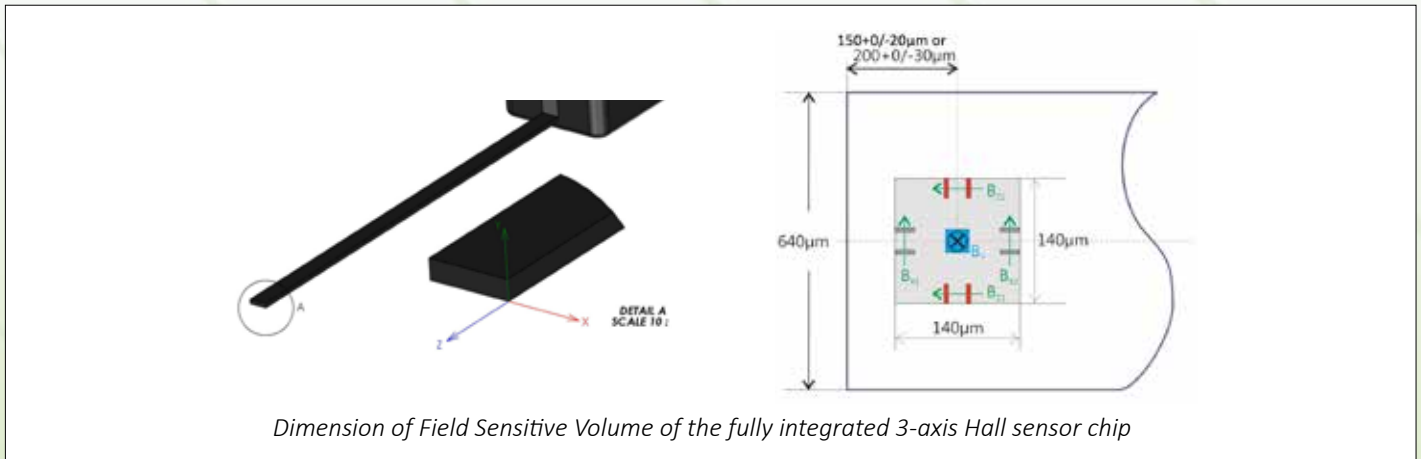
A: Graphical visualization of the measured data (B_x , B_y , B_z , B_{total} , T°); **B:** Numerical presentation of the measured data (B_x , B_y , B_z , B_{total} , T°), as well as Hold function, B_{min} , B_{max} data and alarm function



Standard dimensions of 3MTS Handheld Teslameter, the carbon-fiber probe holder and position of the field sensitive volume (FSV)

Detailed specification - Version 1 (3MTS-1)

Dimension	X (mm)	Y (mm)	Z (mm)
Magnetic field sensitive volume (MFSV):	0.14	0.01	0.14
Position of the Center of MFSV:	-2.5 ± 0.1	0.65 ± 0.05	-1 ± 0.1

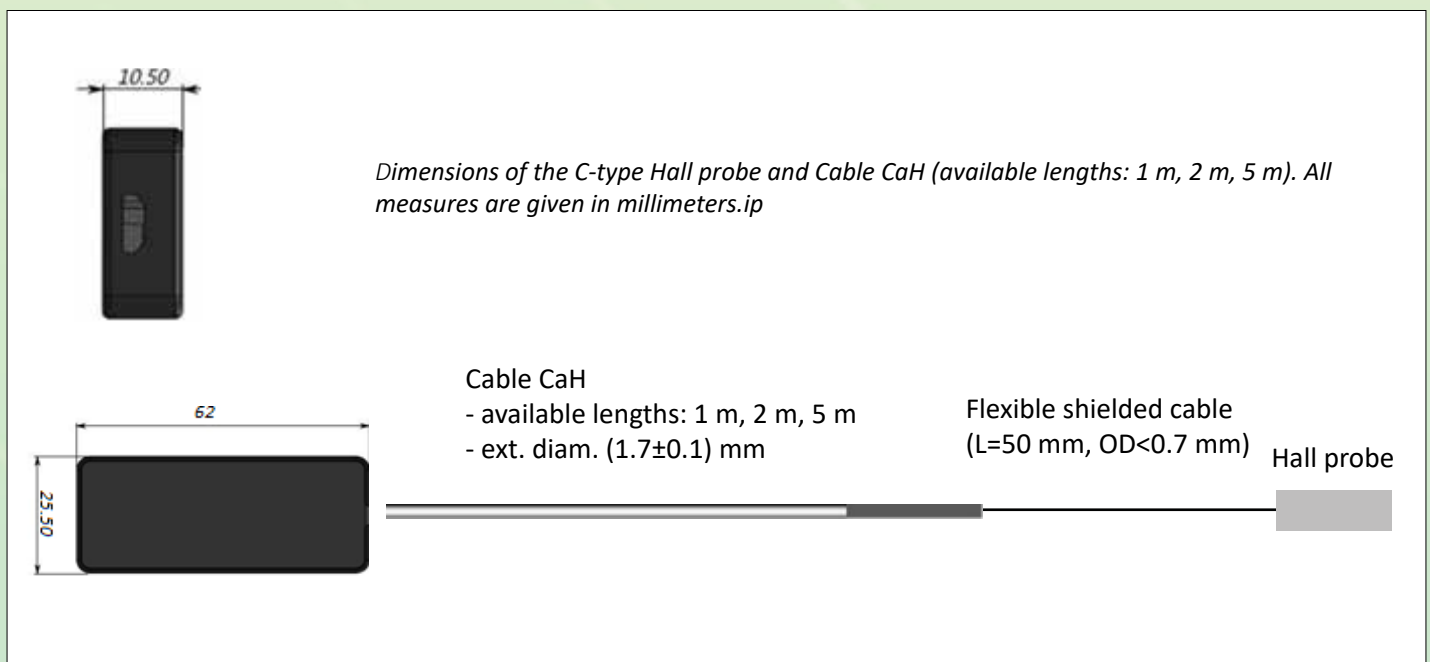
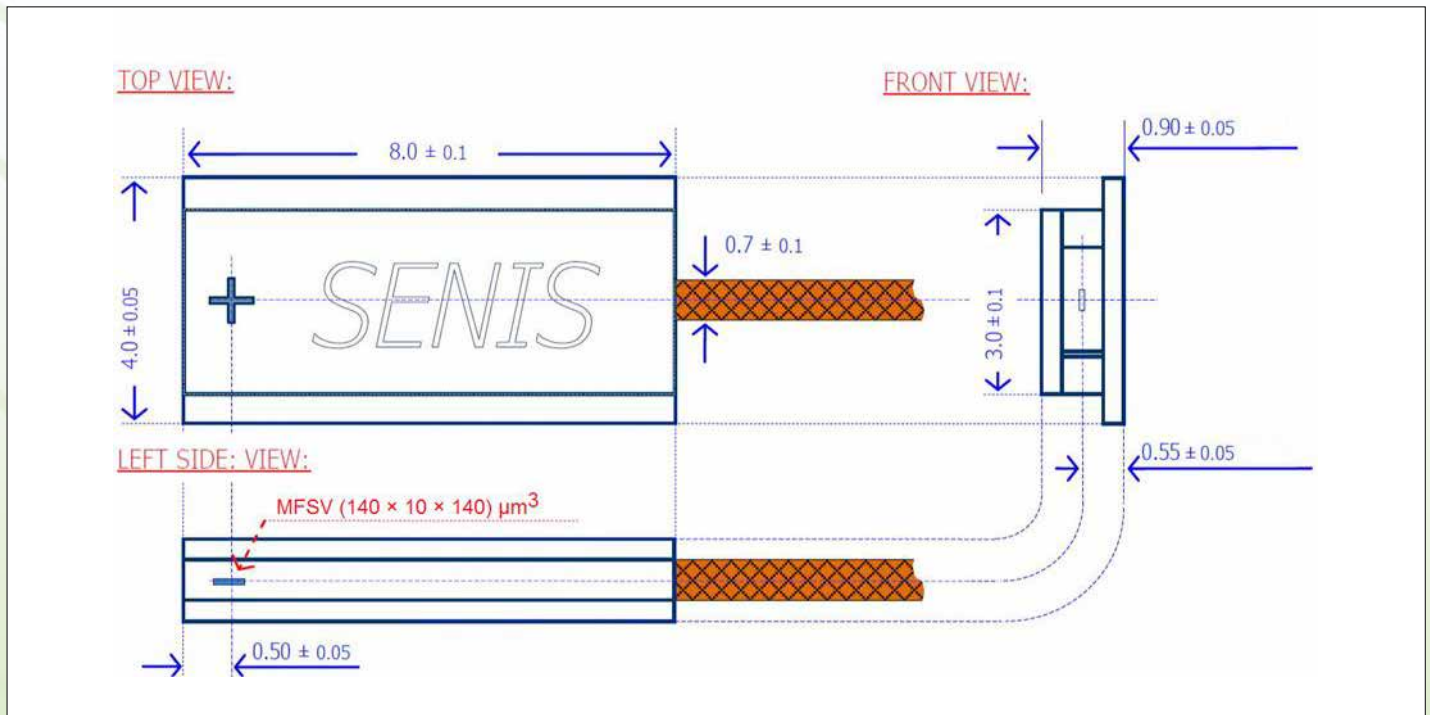


Magnetic and electrical specification

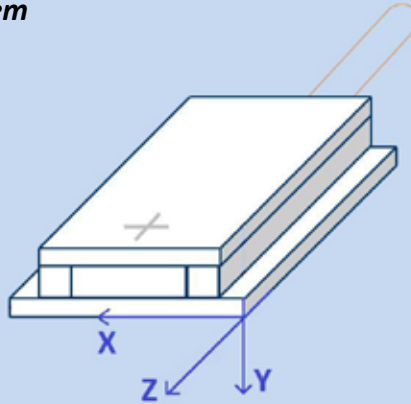
Unless otherwise noted, the specifications summarized in the table below apply for all three measurement channels B_x , B_y , and B_z at the room temperature (23°C) and after a 15 minutes device warm-up time.

Parameter	Value			
Standard measurement ranges:	$\pm 100\text{mT}$	$\pm 500\text{mT}$	$\pm 3\text{T}$	$\pm 20\text{T}$
Linear/Calibrated range of magnetic flux density ($\pm B_{LR}$):	$\pm 100\text{mT}$	$\pm 500\text{mT}$	$\pm 2\text{T}$	$\pm 2\text{T}$
Total Accuracy (@ $B < \pm B_{LR}$):	$\pm 1\%$ of B_{Range}			
Planar Hall Voltage impact (@ $B < \pm B_{LR}$):	$\pm 0.01\%$ of $B_{\text{perpendicular}}$			
Long-term instability:	$\pm 1\%$ over 10 years			
Magnetic Resolution (no averaging):	$\pm 400 \mu\text{T}$	$\pm 1.8 \text{ mT}$	$\pm 11 \text{ mT}$	-
Magnetic Resolution (with averaging; integration time 1s):	$\pm 20 \mu\text{T}$	$\pm 70 \mu\text{T}$	$\pm 320 \mu\text{T}$	
AD Conversion:	12bits			
Sampling frequency [f_s]:	1kHz per measurement channel			
Frequency bandwidth [f_c]:	DC to 500 Hz			
Operating temperature range 3MTS-1:	$-20^\circ\text{C} - +85^\circ\text{C}$			
Operating temperature range 3MTS-2:	Calibrated range (electronic part): -20°C to $+85^\circ\text{C}$ Hall probe with cable: -20°C to $+60^\circ\text{C}$			

Detailed specification - Version 2 (3MTS-2)



Reference Cartesian coordinate system of the integrated C-type Hall probe



Position of the center of MFSV

Dimensions	X [mm]	Y [mm]	Z [mm]
Magnetic field sensitiv volume (MFSV):	0.14	0.01	0.14
Position of the center of MFSV (Figure):	2.0 ± 0.1	-0.55 ± 0.5	-0.5 ± 0.1
Total probe external di-mensions:	4.0 ± 0.05	0.90 ± 0.05	8.0 ± 0.1
Angular accuracy of the axes:	$< \pm 2^\circ$ with respect to the reference surface		
CaH Cable (Construction and characteristics):	Thin Cable:	Copper braided flexible cable, ext. diameter < 0.7 mm	
	Conductor:	Silver plated soft copper core, 7 x 44 AWG	
	Insulation:	PFA (Perfluoro Alkoxy), diameter ≈ 0.3 mm	
	Twisting:	15 x Diameter	
	Shield:	Silver plated soft copper braid	
	Jacket:	PFA (Perfluoro Alkoxy)	
	Service temp.:	$(-196 / +200)^\circ\text{C}$	
	Linear resistance:	1.4 Ω/m	
	Rated voltage:	150 Vac	
RoHS compliance:	Yes		
Total lenght of the CaH cable:	<ul style="list-style-type: none"> - Standard: 1m - Optional 2 m and 5 m 		

Transport case:

- 3MTS Hall probe
- USB Stick with Software
- USB cable

3MTS Version 1



3MTS Version 2



matesy
Magnetic Technologies & Systems

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