PRODUCT INFORMATION

3-AXIS-MAGNETOMETER

proof.
FEATURES

- Fluxgate magnetometers as sensing elements.
- The sensor arrangement is designed in a way, that the determination of the magnetic flux density refers to one reference point for all three axis.
- Magnetometers with digital interface (RS 232 or CAN) for direct connection to a PC.
- A miniaturized sensor with analogue interface for connection to a PC via a separate sensor electronics.
- Measuring DC magnetic fields and AC magnetic fields up to 1 kHz with a measuring range of 100 µT.
- MAGNETOMAT application software for setting parameters, real-time result display, data sampling and report generation.
- Single or continuous long term measurements.
- Power supply by means of mains adapter or battery pack.

MEASUREMENT METHOD

- Determination of the magnetic flux density as absolute value in three axis.
- The magnetometer can be calibrated traceable to national standards (PTB).
- In case of measuring with more than one 3-axis-magnetometer, gradients can be determined and displayed by means of the application software.

APPLICATIONS

- Long term monitoring and recording of the earth magnetic field.
- Long term monitoring of magnetic environmental conditions, e.g. prior to installation of magnetic sensitive devices like MRI systems
- Setup of magnetometer networks for determination of complex 3-dimensional magnetic fields.
- Detection of magnetic signatures of naval vessels or integrated components as part of the degaussing procedure.
- Detection of anomalies of the earth magnetic field, caused by unexploded ordnance or waste deposits.
COMPONENTS

To complete a measuring kit, the following components are necessary:

- 3-Axis-Magnetometer / Sensor with digital / analogue interface
- Sensor electronics [magnetometer electronics, sensor power supply and ADC] to connect 3-Axis-Sensor with analogue interface
- Power supply [Mains adapter or battery pack]
- PC
- Application software

3-AXIS-MAGNETOMETER, BASIC, RS 232

- 3-Axis-Magnetometer with integrated electronics and digital interface RS 232
- Compact, rugged design, water proof

3-AXIS-MAGNETOMETER, STANDARD, RS 232

- 3-Axis-Magnetometer with integrated electronics and digital interface RS 232
- Interface can be reconfigured to CAN
- Compact, rugged design, water proof

3-AXIS-MAGNETOMETER, STANDARD, CAN

- 3-Axis-Magnetometer with integrated electronics and digital interface CAN
- Interface can be reconfigured to RS 232
- Compact, rugged design, water proof
3-AXIS-SENSOR, MINIATURIZED

- Miniaturized 3-axis sensor with analogue interface for connection to Sensor Electronics
- 3 meter sensor cable
- Compact, rugged design, water proof

MAGNETOMAT® 1.782 SENSOR ELECTRONICS (DESKTOP TYPE)

- Electronics including RS 232 PC interface
- Port 3-A to link 3-axis sensor miniaturized
- Ports S1 and S2 to link 1-axis probes, MAGNETOMAT-type
  (see Product Information MAGNETOMAT 1.782)
- Power supply 12 – 24 VDC
- Socket „TRIG“ as trigger input [connector supplied]
MAGNETOMAT® STANDARD-SOFTWARE

Application software for multi channel magnetic data acquisition (XYZ-Axis) with high sampling rates. Suitable for measurement setup with one or two 3-Axis-Magnetometers and RS 232 interface.

- Real time data display
- Display of absolute and differential values
- Data storage and administration
- Adjustable sampling rate
- Zoom function for data display
- Low pass filter
- Single value selection
- Storage and export of selected values as .csv and .txt file

MAGNETOMAT® NETWORK-SOFTWARE

Application software for multi channel magnetic data acquisition (XYZ-Axis) with high sampling rates, for a CAN-Bus network with up to 32 3-Axis-Magnetometers.

- Various options for screen setup and real time data display of selected channels
- Display of absolute and differential values
- Data storage and administration
- Adjustable sampling rate
- Zoom function for data display
- Low pass filter
- Single value selection
- Storage and export of selected values as .csv and .txt file
Transfer rate, number of integrated magnetometers and network cable length depend on each other. The following table provides a summary of possible configurations.

<table>
<thead>
<tr>
<th>Network cable length [m]</th>
<th>Transfer rate [kBits/s]</th>
<th>Quantity 3-Axis-Magnetometers</th>
<th>Sampling rate [1/s]</th>
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<tbody>
<tr>
<td>500</td>
<td>125</td>
<td>1</td>
<td>237</td>
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<tr>
<td></td>
<td></td>
<td>3</td>
<td>120</td>
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<td></td>
<td>5</td>
<td>60</td>
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<td>20</td>
<td>15</td>
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<tr>
<td>250</td>
<td>250</td>
<td>1</td>
<td>460</td>
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<td></td>
<td></td>
<td>3</td>
<td>237</td>
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<td></td>
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<td>60</td>
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<td></td>
<td></td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>max. 32</td>
<td>7,5</td>
</tr>
<tr>
<td>100</td>
<td>500</td>
<td>1</td>
<td>460</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>237</td>
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<tr>
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<td>5</td>
<td>237</td>
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<td></td>
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<td>10</td>
<td>120</td>
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<td></td>
<td></td>
<td>20</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>max. 32</td>
<td>15</td>
</tr>
</tbody>
</table>

**MAGNETOMAT® CLIENT-SOFTWARE**

Application software for data display on a monitor when manually testing components for their magnetic remanence (absolute value) with one 3-Axis-Magnetometer; optionally display of measured value or measured value combined with strip chart.

- Display of maximum and minimum peak values
- Display of peak value difference
- Indication of exceeding thresholds
- Display of measuring value in real time
- Data storage and administration
- Adjustable sampling rate
- Low pass filter
- Datalogging and storage of measured values in a text file in tabular form
MEASUREMENT SETUP

A complete measurement setup consists of:

- 3-Axis-Magnetometer with digital interface or 3-Axis-Sensor with analogue interface
- Sensor electronics (magnetometer electronics and ADC) for operation of a 3-Axis-Sensor with analogue interface
- Power supply (Mains adapter or battery pack)
- PC
- Application software

Pict. 1 Measurement setup: One 3-Axis-Magnetometer Basic, RS 232

Pict. 2 Measurement setup: One 3-Axis-Magnetometer Standard, RS 232
Pict. 3 Measurement setup: Three 3-Axis-Magnetometers Standard, CAN

Pict. 4 Measurement setup: One 3-Axis-Sensor Miniaturized incl. sensor electronics 100 μT
TECHNICAL SPECIFICATION

3-AXIS-MAGNETOMETER BASIC AND STANDARD, 3-AXIS-SENSOR MINIATURIZED

Basic

Standard, RS 232 / CAN

3-Axis-Sensor Miniaturized
<table>
<thead>
<tr>
<th><strong>Product Information</strong></th>
</tr>
</thead>
</table>

### Measuring range
100 µT

### Resolution
24 Bit ADC

### Limiting frequency
1 kHz

### Noise
≤ 35 pT/VHz@1Hz

### Temperature drift (@ 50µT)
≤ +/- 1 nT/°C

### Measurement uncertainty, calibrated sensor
+/- 0.5%

### Orthogonality of sensor axis
≤ 0.2°

### Alignment of sensor axis and housing
≤ 0.25°

### Maximum power consumption
3.6 W

### Stabilization time after switching on
≤ 30 min

### Ambient temperature
-25 - +50 °C

### Protection grade
IP 68 - Basic IP 66

### Weight
- 3-Axis-Magnetometer Basic: 0.4 kg
- 3-Axis-Magnetometer RS 232 / CAN: 0.6 kg
- 3-Axis-Sensor Miniaturized: 0.2 kg

All values for 3-Axis-Magnetometer or 3-Axis-Magnetometer Miniaturized connected to Sensor Electronic

### Sensor Electronics

<table>
<thead>
<tr>
<th><strong>Power supply</strong></th>
<th>12 – 24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PC-Interface</strong></td>
<td>RS 232</td>
</tr>
<tr>
<td><strong>Trigger input</strong></td>
<td>5 V TTL/CMOS level trigger on falling edge trigger pulse width = 2/sampling rate</td>
</tr>
<tr>
<td><strong>Dimension (LxWxH)</strong></td>
<td>130x187x100 mm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>Approx. 0.5 kg</td>
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</table>
**POWER SUPPLY**

<table>
<thead>
<tr>
<th>Device</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Mains adapter Basic or Standard</td>
<td>24 VDC, 1 A, 90 – 264 VAC</td>
</tr>
<tr>
<td>Battery pack, rechargeable and charger</td>
<td>NiMH 12 VDC, 3.3 Ah</td>
</tr>
</tbody>
</table>

**CABLES**

<table>
<thead>
<tr>
<th>Cable Type</th>
<th>Specification</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connecting cable</td>
<td>each:</td>
<td></td>
</tr>
<tr>
<td>- 3-Axis-Magnetometer Basic</td>
<td>3m long</td>
<td></td>
</tr>
<tr>
<td>- 3-Axis-Magnetometer Standard RS 232</td>
<td>PC-connector (D-sub 9-p)</td>
<td></td>
</tr>
<tr>
<td>- 3-Axis-Magnetometer Standard CAN</td>
<td>Power supply socket</td>
<td></td>
</tr>
<tr>
<td>Connecting cable, sensor electronics, RS 232</td>
<td>1.8 / 3 m long</td>
<td></td>
</tr>
<tr>
<td>Extension cables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 3-Axis-Magnetometer Standard RS232/CAN</td>
<td>3 / 10 / 15 / 25 m long</td>
<td></td>
</tr>
<tr>
<td>- 3-Axis-Magnetometer Standard CAN</td>
<td>3 / 10 / 15 / 25 m long, terminated</td>
<td></td>
</tr>
<tr>
<td>- 3-Axis-Sensor Miniaturized</td>
<td>3 m long</td>
<td></td>
</tr>
<tr>
<td>T-adapter cable, CAN network</td>
<td>Each cable connection 120 mm long</td>
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</tbody>
</table>

**ACCESSORIES**

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Description</th>
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<tbody>
<tr>
<td>CAN PC interface</td>
<td>CAN express card incl. transceiver</td>
</tr>
<tr>
<td>Termination resistor for CAN network</td>
<td>CAN term 120</td>
</tr>
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</table>

**SOFTWARE**

<table>
<thead>
<tr>
<th>PC requirements for all applications</th>
<th>32 / 64 bit OS</th>
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<tbody>
<tr>
<td></td>
<td>Windows XP SP3</td>
</tr>
<tr>
<td></td>
<td>Windows 7 or higher</td>
</tr>
<tr>
<td></td>
<td>MAGNETOMAT Network</td>
</tr>
<tr>
<td></td>
<td>Win 7 (32 bit)</td>
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</tbody>
</table>