Measurements at high operating temperatures

THMM classic measurement modules are equipped with 8 or 16 signal inputs for temperature measurements with thermocouples and are designed for applications used under extreme operating temperatures, like e.g. in engine compartments. The measurement inputs are equipped with NiCr-Ni mini thermo connectors. The maximum measurement data rate per channel is 10 Hz.

Measurement module THMC 8 provides 8 measurement inputs and is equipped with one LEMO 2B NiCr-Ni multi-connector. The usage of THMC 8 measurement modules with multi connectors is recommended if the devices need to be changed frequently and rapidly.

**Key features**

- Internal cold junction compensation per channel
- Very good measurement accuracy under difficult temperature ranges and environmental conditions
- Very low power consumption

**Shipping content**

- MiniModule THMM classic
- Configuration software CSMconfig
- Documentation
- Calibration certificate in accordance with DIN EN ISO/IEC 17025

**Maintenance**

- Calibration every 12 months recommended

**Accessories**

- See datasheet "CAN Accessories"
## Technical data

<table>
<thead>
<tr>
<th>Type designation</th>
<th>THMM 8 classic</th>
<th>THMM 16 classic</th>
<th>THMC 8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measurement inputs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement inputs</td>
<td>8 NiCr-Ni</td>
<td>16 NiCr-Ni</td>
<td>8 NiCr-Ni</td>
</tr>
<tr>
<td>Measurement ranges</td>
<td>-100 °C to +1372 °C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal resolution</td>
<td>16 bit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal sampling rate per ch.</td>
<td>1 kHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement data rate / sending rate per channel</td>
<td>1, 2, 5, 10 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HW input filter</td>
<td>low-pass filter 250 Hz 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SW input filter</td>
<td>FIR filter (Finite Impulse Response)</td>
<td>threshold frequency automatically adjusted to measurement data rate</td>
<td></td>
</tr>
<tr>
<td>Input protection 2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operational safety Device safety</td>
<td>±60 V permanent</td>
<td>±100 V permanent, additional ESD protection</td>
<td></td>
</tr>
<tr>
<td>Broken sensor detection</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cold junction compensation</td>
<td>internal reference per channel</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Measurement deviation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gain error at 25 °C</td>
<td>max. ±0.05 % of measured value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offset and scaling error</td>
<td>typ. ±0.1 K max. ±0.3 K ±12 µV</td>
<td>typ. ±0.15 K max. ±0.3 K ±12 µV</td>
<td></td>
</tr>
<tr>
<td>Gain drift</td>
<td>max. ±10 ppm/K</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zero drift</td>
<td>max. ±4 mK/K</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Galvanic isolation</strong> 4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel / channel</td>
<td>500 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAN / channel</td>
<td>500 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAN / power supply</td>
<td>500 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CAN interface</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>CAN interface</td>
<td>CAN 2.0B (active), High Speed (ISO 11898-2:2016) 125 kbit/s to max. 1 Mbit/s, data transfer “free running”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Configuration</td>
<td>via CAN bus with CSMconfig or CSM INCA AddOn settings and configurations are stored in the device</td>
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<tr>
<td><strong>Power supply</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Minimum</td>
<td>6 V DC (-10 %)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>50 V DC (+10 %)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>typ. 1.0 W</td>
<td>typ. 1.4 W</td>
<td>typ. 0.8 W 5)</td>
</tr>
<tr>
<td><strong>LED indicator</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAN</td>
<td>power / status</td>
<td></td>
<td></td>
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### Type designation

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### Housing
- aluminium, gold anodized

### Protection class
- IP65
- IP67

### Weight
- approx. 300 g
- approx. 500 g
- approx. 200 g

### Dimensions (w × h × d)
- approx. 120 × 33 × 50 mm / approx. 120 × 37 × 50 mm (Slide Case)
- approx. 200 × 36 × 50 mm / approx. 200 × 40 × 50 mm (Slide Case)
- approx. 50 × 32 × 50 mm (housing)

### Connectors

#### CAN / power supply
- LEMO 0B, 5-pole, code G

#### Signal inputs
- miniature thermo connectors
- LEMO 2B NiCr-Ni multi-connector

### Operating and storage conditions

#### Operating temperature range
- -40 °C to +125 °C

#### Relative humidity
- 5 % to 95 %

#### Pollution degree
- 3

#### Storage temperature
- -55 °C to +150 °C

### Conformity

![CE Mark](image)

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1. THMC 8: 250 Hz as of hardware revision B, the threshold frequency of previous revisions is 15 Hz.
2. Observe information regarding the intended use. See CSM document "Safety Instructions MiniModules".
3. Further information can be found in the Technical Information document on the subject of "Deviation of Measurement".
4. These MiniModules are designed for measurements in vehicles with 12 V, 24 V, or 48 V on-board power supply systems. The maximum operating voltage at the measurement inputs is 60 V. Not suitable to be directly connected to systems with higher operating voltages, e.g. high-voltage batteries of hybrid or electric vehicles.
5. THMC 8: 0.8 W as of hardware revision B, the typical power consumption of previous revisions is 1.0 W.
6. Optionally available in other variants.

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### additional products

**PT4 evo**

PT4 evo MiniModules are designed for temperature measurements with PT100 and PT1000 elements and are available in different housings.

**HV TH4 evo**

HV TH4 evo MiniModules are especially designed for safe temperature measurements on high-voltage components and are excellently suited for applications in the field of e-mobility.