Product description

The measurement module HV THMM 4 is especially designed for safe temperature measurements on high-voltage live parts and is therefore excellently suited for mobile and stationary use in the area of e-mobility (electric and hybrid vehicles).

Thanks to the compact and robust design and a very wide operating temperature range, HV THMM 4 can be installed and operated directly in the engine compartment and other constrained spaces, e.g. close to the high-voltage battery and power electronics. HV THMM 4 features a high degree of measurement accuracy over the entire operating temperature range.

Shipping content

- Measurement module HV THMM 4
- Configuration software CSMconfig
- Documentation
- Calibration certificate in accordance with DIN EN ISO/IEC 17025
- HV isolation test certificate

Key features

- NiCr-Ni temperature inputs (K type), with reinforced insulation
- Type approval test according to safety standard DIN EN 61010 by accredited testing laboratory
- Routine test according to safety standard DIN EN 61010
- Very good measurement accuracy for all temperature ranges and environmental conditions
- Operating temperature range: -40 °C to +100 °C

Maintenance

- HV isolation test according to DIN EN 61010 at least every 12 months
- Calibration every 12 months recommended

Accessories

- See datasheet “CAN Accessories” for details.
## Technical data

<table>
<thead>
<tr>
<th>Type designation</th>
<th>HV THMM 4</th>
</tr>
</thead>
</table>

### Inputs
- **Measurement range**: -100 °C to +1372 °C
- **Internal resolution**: 16 bit
- **Internal sampling rate per ch.**: 1 kHz
- **Measurement data rate per ch.**: 1, 2, 5, 10 Hz
- **HW input filter**: low-pass filter 150 Hz
- **SW input filter**: FIR-Filter (Finite Impulse Response), threshold frequency automatically adjusted to measurement data rate
- **Broken sensor detection**: yes
- **Cold junction compensation**: internal cold junction per channel

### Measurement uncertainty
- **Gain error at 25 °C**: max. ±0.05 % of measured value
- **Offset and scaling error**: max. ±0.3 K
- **Gain drift**: max. ±10 ppm/K of measured value
- **Zero drift**: max. ±4 mK/K

### Fields of application
- **1) for measurements in HV environments according to DIN EN 61010-1:2010**
- **Battery voltages**: up to 1,000 V (DC)

### Isolation test
- **Type approval test**: test voltage 3,510 V (AC) according to DIN EN 61010-1:2010
- **Routine test**: test voltage 3,100 V (DC) according to DIN EN 61010-1:2010, isolation test is to be performed at least every 12 months

### Reinforced insulation
- **Channel / channel**: 846 V
- **Channel / CAN**: 846 V
- **Channel / power supply**: 846 V

### Functional insulation
- **CAN / power supply**: designed for supply voltages 12 V and 24 V

### Measurement categories
- **CAT 0**: 846 V
- **CAT II 2)**: 600 V
- **CAT III 2)**: 300 V

### CAN interface
- **CAN 2.0B (active), High Speed (ISO 11898-2:2016)**: 125 kbit/s to 1 Mbit/s, up to 2 Mbit/s 3) with CSMcan interface, data transfer is “free running”

### Configuration
- via CAN bus with CSMconfig or CSM INCA AddOn settings and configurations stored in the device
<table>
<thead>
<tr>
<th>Type designation</th>
<th>HV THMM 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power supply</strong></td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>6 V DC (-10 %)</td>
</tr>
<tr>
<td>Maximum</td>
<td>30 V DC (+10 %)</td>
</tr>
<tr>
<td>Power consumption</td>
<td>typ. 1 W</td>
</tr>
<tr>
<td>LED indicator</td>
<td>power (green), status (red)</td>
</tr>
<tr>
<td><strong>Housing</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>aluminium with HV designation on the front-side (RAL 2003)</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP67</td>
</tr>
<tr>
<td>Ground connection</td>
<td>M6 threaded hole</td>
</tr>
<tr>
<td>Weight</td>
<td>approx. 350 g</td>
</tr>
<tr>
<td>Dimensions (w × h × d)</td>
<td>approx. 130 × 33 × 75 mm / approx. 130 × 38 × 75 mm (Slide Case)</td>
</tr>
<tr>
<td><strong>Connectors</strong></td>
<td></td>
</tr>
<tr>
<td>CAN / power supply</td>
<td>LEMO 0B, 5-pole, code G</td>
</tr>
<tr>
<td>Signal inputs</td>
<td>LEMO Redel 2P, 8-pole, code B (grey)</td>
</tr>
<tr>
<td><strong>Operating and storage conditions</strong></td>
<td></td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-40 °C to +100 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>5 % to 95 % (non-condensing)</td>
</tr>
<tr>
<td>Altitude</td>
<td>max. 5,000 m above sea level (CAT 0)</td>
</tr>
<tr>
<td></td>
<td>max. 3,000 m above sea level (CAT II and CAT III)</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>4</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 °C to +100 °C</td>
</tr>
<tr>
<td><strong>Conformity</strong></td>
<td></td>
</tr>
<tr>
<td>Device safety</td>
<td>DIN EN 61010:2010</td>
</tr>
</tbody>
</table>

1 For details see document “Technical Information: Fields of Application for CSM HV Measurement Modules”.
Please read the CSM document “Safety Instructions HV THMM” additionally!
2 Measurement categories are valid as of hardware revision B002.
3 2 Mbit/s as of hardware revision B000.

**additional products**

**HV TH-TBM**

The 19 inch slide-in module HV TH-TBM 8 /65 is equipped with 8 measurement channels and like HV THMM modules, it has been specifically designed for safe temperature measurements in high-voltage environments. Due to its housing design, this measurement module is particularly suited for measurement applications in test benches.

**HV PTMM 2 and HV PT-TBM 8**

The measurement modules HV PTMM 2 and HV PT-TBM 8 /65 have been designed for precise temperature measurements with PT100 and PT1000 RTD elements in high-voltage environments and are equipped with 2 or 8 measurement inputs in 4-wire-connection, respectively. The 19 inch version HV PT-TBM 8 /65 is particularly suited for measurement applications in test benches.