Product description

CSM’s HV PTMM 2 measurement module features two measurement inputs in 4-wire-connection for PT100 and PT1000 sensors and has been especially designed for precise temperature measurements in high-voltage environments.

HV PTMM 2 is excellently suited for measuring the temperature of individual battery cells and battery packs in high-voltage batteries. Due to the thin-film design of special foil PT sensors, it is possible to precisely monitor the temperature of battery cells, even under very limited space conditions.

Key features

- 2 inputs in 4-wire connection for PT100 and PT1000 sensors with reinforced insulation
- Individual PT coefficients can be entered for best possible sensor adjustment
- Type approval test according to safety standard EN 61010 by an accredited test laboratory
- Routine test according to safety standard EN 61010
- Low power consumption typ. 1 W

Shipping content

- Measurement module HV PTMM 2
- Configuration software CSMconfig
- Documentation
- Calibration certificate
- HV isolation test certificate

Maintenance

- HV isolation test at least every 12 months, see EN 61010 for scope of testing
- Calibration every 12 months recommended

Accessories

- See datasheet “CAN Accessories”
# Technical data

<table>
<thead>
<tr>
<th>Type designation</th>
<th>HV PTMM 2</th>
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</table>

## Measurement inputs
- 2 inputs in 4-wire connection for PT100 and PT1000 sensors, configurable via software

## Measurement ranges
- -50 °C to +100 °C and -100 °C to +500 °C

## Internal resolution
- 16 bit

## Internal sampling rate per ch.
- 8 kHz

## Measurement data rate / sending rate per channel
- 1, 2, 5, 10, 20, 50, 100 Hz adjustable per module or per channel via configurable CAN identifier

## HW input filter
- 4th order Butterworth filter (threshold frequency approx. 2.5 kHz)

## SW input filter
- FIR filter (Finite Impulse Response) threshold frequency automatically adjusted to measurement data rate

## Channel-specific comments
- Free text consisting of up to 100 characters per channel

## Linearization
- Via individual PT coefficients R0, A, B and C

## Measurement current
- PT100: 500 µA, PT1000: 400 µA

## Measurement deviation
- Gain error at 25 °C: max. ±0.1 % of measured value
- Offset and scaling error: max. ±0.25 K (PT100) / ±0.175 K (PT1000)
- Gain drift: max. ±10 ppm/K of measured value
- Zero drift: max. ±3 mK/K

## Fields of application
- For measurements in HV environments
- For details see document: "Technical Information: Fields of Application for CSM HV Measurement Modules"

## Working voltages
- Up to 846 V DC

## Isolation test
- Type approval test: by external accredited test laboratory
- Routine test: test voltage 3,100 V DC 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

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

## Configuration
- Via CAN bus with CSMconfig or CSM INCA AddOn, settings and configurations stored in the device

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<table>
<thead>
<tr>
<th>Type designation</th>
<th>HV PTMM 2</th>
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<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 / status</td>
</tr>
<tr>
<td><strong>Housing</strong></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 C (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>Operating altitude</td>
<td>max. 5,000 m above sea level</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>EN 61010-1:2010</td>
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<tr>
<td><strong>Device safety</strong></td>
<td></td>
</tr>
</tbody>
</table>

1 As of hardware revision A003. For older hardware revisions, a frequency of 5 kHz applies.
2 Further information can be found in the Technical Information document on the subject of “Deviation of Measurement”. In interference-polluted environments, additional measurement errors can occur.
3 Please read the CSM document “Safety Instructions HV PTMM 2”
4 According to EN 61010-1:2010
5 Optionally available in other variants
6 The measurement modules are designed for cable lengths < 3 m.

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**additional products**

**HV TH4 evo**

CSM’s HV TH4 evo measurement module is especially designed for safe temperature measurements with type K sensors on high-voltage live parts and is therefore excellently suited for mobile and stationary use in e-mobility applications (electric and hybrid vehicles).

**PTMM 4 evo**

CSM’s PTMM 4 evo measurement module features four measurement inputs for PT100 and PT1000 RTD elements used in non-high-voltage environments. The module is available in different housings.