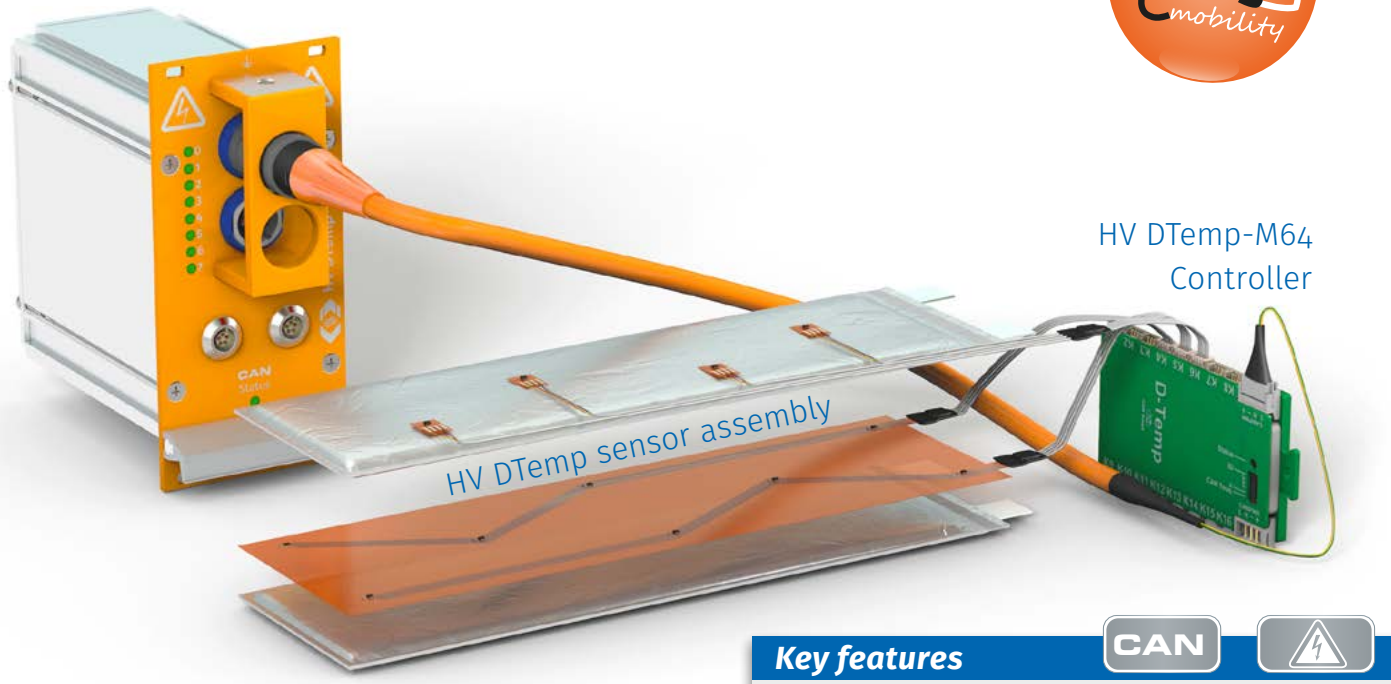
HV DTemp

HV DTemp-P
Central Unit



System description

The **digital HV DTemp Measurement System** was developed to meet requirements which previous analogue measurement systems were unable to fulfill, especially due to spacial restrictions and lack of interference resistance. This makes it ideally suitable e.g. for the validation of HV batteries.

Inside the HV environment, the HV DTemp Measurement System consists of up to 512 miniaturized **IC temperature sensors**, which directly digitize all temperature values, and of up to eight extremely compact HV DTemp Controllers, which are used to address and power the sensors.

Outside the HV environment, only a compact HV DTemp-P **central unit** is required to configure and control the measuring system.

It assigns a separate ID to each of the up to 512 measurement points and sends the measurement data via CAN bus "free running" to the data acquisition software.

Key features

- ***Digital temperature measurement with up to 512 measurement points***
- ***IC temperature sensors***
- ***Miniaturized, exactly positionable and identifiable***
- ***Available as individual sensors, sensor assemblies or as sensors integrated on ultra-thin flexible circuit***
- ***Interference-free, highly accurate temperature measurement***
- ***Extremely low space requirement within HV environment***
- ***Only one connection cable out of the HV environment***
- ***CAN bus Central Unit, 1000 V RMS, HV safe***

Please find more detailed information in our **brochure CSM HV DTemp Measurement System**.

HV DTemp Sensors

With the HV DTemp System, CSM offers different sensor assemblies for temperature measurement. Different geometries are possible:

- single sensors with connection cable for direct connection to a HV DTemp controller,
- sensor assemblies consisting of up to four individual sensors: Connected via connecting cable or with the aid of a small distribution board,
- IC temperature sensors on ultra-thin flexible circuit, which are directly connected to each other with printed circuit paths.

The size and shape of the flexible circuit as well as the exact arrangement of the sensors are determined by individual customer requirements. 20 and more sensors on one flexible circuit can be realized.

Technical data

Function	temperature acquisition
Dimensions (w × h × d)	approx. 1.5 mm × 0.5 mm × 1 mm (single IC temperature sensor)
Available options	The IC temperature sensors are available as standard **individual sensors**, mounted on ultra-thin flexible circuit with connecting cable, or as **sensor assemblies** of up to four sensors. Ultra-thin flexible circuit with integrated IC temperature sensors are produced according to exact placement specifications for specific customers and projects.
Measurement range	-40 °C to +125 °C
Internal resolution	16 bit
Measurement uncertainty	max. ±0.1 °C (operating temperature -20 °C to +50 °C) max. ±0.15 °C (operating temperature -40 °C to +70 °C) max. ±0.2 °C (operating temperature -40 °C to +100 °C)
Calibration	calibrated by the manufacturer; metrological traceability according to NIST
Operating temperature range	-40 °C to +125 °C

HV DTemp Controller

The HV DTemp Controllers provide the addressing of and power supply for the temperature sensors. They each have 16 port inputs. Up to four sensors per port can be connected to a M64 controller, making a total of 64 sensors. With the M16 Controller, the number of sensors per port is limited to one sensor.

Up to eight HV DTemp Controllers can be cascaded, and they are so compact that they can easily be integrated into a battery housing.

Technical data

Type designation	**HV DTemp-M Controller**
Function	control and bundling of up to 64 temperature measurement points
Dimensions (w × h × d)	approx. 45 mm × 75 mm × 10 mm
Color	green
Inputs	16 digital inputs each for one sensor (M16) or sensor assembly with up to 4 sensors (M64), sensor type: IC sensor
Operating temperature range	-40 °C to +125 °C

HV DTemp-P Central Unit

The high-voltage safe DTemp-P Central Unit controls the entire system and is the basis of every HV DTemp setup. It is the only component outside of the HV environment. Due to the two galvanically isolated inputs, the system can be used in two different electrical potential areas at the same time. From each of these inputs only one HV safe connection cable leads to the corresponding HV DTemp Controller.

Technical data

Type designation	**HV DTemp-P Central Unit**
Function	control of the entire system, CAN bus user interface
Inputs	2 digital inputs for up to 8 controller modules (512 measurement points), basic equipment: support of one HV DTemp Controller
Measurement data rate / sending rate	1, 2, 5, 10, 20 Hz
Available options	extension to 2, 4 and 8 HV DTemp Controllers
Fields of application [1)]	measurements in HV environment [2)]
Working voltages	up to 1,000 V RMS
Routine test	test voltage [2)] 3,100 V DC, performance of an isolation test at least every 12 months
Reinforced insulation [2)]	
Input / input	1,000 V RMS
Input / CAN	1,000 V RMS
Input / power supply	1,000 V RMS
Functional insulation	
CAN / power supply	designed for 12 V and 24 V supply voltages
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 transmission "free running"
Configuration	specified via the supplied configuration document (DBC), or can be configured via the optional configuration software DTEMPconfig, settings and configuration are stored in the module
LED indicator	
CAN	power / status
Measurement channels	status of the connected controllers
Power supply	
Minimum	6 V DC (-10 %)
Maximum	30 V DC (+10 %)
Power consumption	950 mW
Housing	aluminum with HV designation on the front-side (RAL 2003)
Protection class	IP65
Ground connection	M6 threaded hole
Mounting	19 inch
Weight	approx. 500 g

Type designation	**HV DTemp-P Central Unit**
Dimensions (w × h × d)	12 HP (approx. 61 mm) 3U (approx. 129 mm) 100 mm (+25 mm protective bracket)
Connectors	
CAN / power supply	LEMO 0B, 5-pole, code G
Signal inputs	LEMO Redel 2P, 8-pole, code C (blue)
Operating and storage conditions	
Operating temperature range	-40 °C to +125 °C
Relative humidity	5 % to 95 % (non-condensing)
Operating altitude	max. 5,000 m above sea level
Pollution degree	3
Storage temperature	-40 °C to +125 °C
Conformity	CE (in preparation)
Device safety	EN 61010-1:2010

[1] Please also read the CSM document “Safety Instructions HV DTemp”

[2] According to EN 61010-1:2010

Shipping content

- Measurement system HV DTemp
- Configuration document (DBC)
- Documentation
- HV isolation test certificate for HV DTemp-P

Maintenance

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

Accessories

- See "CAN Accessories" datasheet

CSM GmbH Germany is certified.

ISO 9001, ISO 14001
Certified Integrated Quality and Environmental Management System
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