

### 8-channel analog measurement module with sensor excitation

- Measurement ranges voltage  $\pm 10$  mV up to  $\pm 100$  V; current  $\pm 20$  mA
- 8 sensor excitations (bipolar  $\pm 15$  V, up to  $\pm 45$  mA)
- TEDS class 2 support
- Measurement data output to CAN
- Galvanic isolation (inputs, CAN, supply, enclosure)
- Designed for engine compartment applications
- Ruggedized and compact modules for harsh environments



<b>Channel volt</b>	
Measurement range SENS	$\pm 0.01 / 0.1 / 0.2 / 0.5 / 1 / 2 / 5 / 10 / 20 / 30 / 50 / 100$ V
Accuracy at ambient temperature 25 °C	$\pm 0.06$ % (bipolar measurement ranges) $\pm 0.10$ % (unipolar measurement ranges)
Drift for ambient temperature 85 ... 105 °C	$\pm 80$ ppm/K
Drift for ambient temperature 105 ... 125 °C	$\pm 450$ ppm/K (for 10 mV measurement range) $\pm 250$ ppm/K
<b>Channel current</b>	
Measurement range	0 ... 20 mA, $\pm 20$ mA
Genauigkeit bei Umgebungstemperatur 25 °C	$\pm 0.40$ %
Internal shunt resistor	50 $\Omega$
<b>General channel properties</b>	
AD converter	16 bit / SAR (successive approximation register)
Special functions	Offset adjust, during measurement, multiple groups
Oversampling	2 kHz
Channel sampling rates	1 / 2 / 5 / 10 / 20 / 50 / 100 / 200 / 500 / 1000 / 2000 Hz
Aggregate sample rate	16 kHz
Hardware filter (switchable)	Butterworth (8-pole) 150 Hz (M-SENS 8plus/M-SENS 8plus DSP) Accuracy 10 %

Software filter types	Bessel Butterworth Elliptic (8-pole)
Channel impedance	10 M $\Omega$
Software filter (DSP selectable)	6 / 7.5 / 9.96 / 15 / 30 / 39.96 min 1 / 1.25 / 1.67 / 2.5 / 5.0 / 6.67 / 10 / 12.5 Hz 16.67 / 25 / 50 / 66.7 / 100 / 125 Hz (M-SENS 8plus DSP) Accuracy 0.05 %
Channel LED	Yes
Channel LED	Yes Channel LED is flashing during configuration
TEDS	Class 2
<b>Excitation</b>	
Sensor excitation ranges	Bipolar $\pm 2.5$ / $\pm 5$ / $\pm 7.5$ / $\pm 8$ / $\pm 10$ / $\pm 12.5$ / $\pm 15$ V
Accuracy excitation at ambient temperature 25 °C	$\pm 0.25$ %
Accuracy excitation at ambient temperature 85 °C	$\pm 0.40$ %
Accuracy excitation at ambient temperature 120 °C	$\pm 0.50$ %
Drift for ambient temperature -40 ... 85 °C	$\pm 40$ ppm/K
Sensor excitation current	30 mA (for V output $\pm 2.5$ / $\pm 10.0$ V) 45 mA (for V output $\pm 7.5$ / $\pm 15.0$ V) 40 mA (for V output $\pm 5.0$ / $\pm 12.5$ V)
<b>Galvanic isolation</b>	
Input ↔ module power supply	$\pm 100$ V (indefinitely), $\pm 200$ V (short-time, $t < 2$ ms)
Input ↔ CAN	$\pm 100$ V (indefinitely), $\pm 200$ V (short-time, $t < 2$ ms)
Input ↔ enclosure	$\pm 100$ V (indefinitely), $\pm 200$ V (short-time, $t < 2$ ms)
Input ↔ input	$\pm 100$ V (indefinitely), $\pm 200$ V (short-time, $t < 2$ ms)
Input ↔ excitation	$\pm 100$ V (indefinitely), $\pm 200$ V (short-time, $t < 2$ ms)
<b>Device</b>	
Inputs	8
Maximum input protection voltage (channel)	$\pm 100$ V (indefinitely), $\pm 200$ V (short-time, $t < 2$ ms)
Voltage supply	9 ... 36 VDC
Supply voltage thresholds	On 9 $\pm 0.3$ VDC / Off 6 $\pm 0.3$ VDC
Power consumption, typical	3.5 W (all excitations off)
Working temperature range	-40 ... 125 °C (-40 ... 257 °F)
Storage temperature range	-55 ... 150 °C (-67 ... 302 °F)
IP-Code	IP 67 (ISO 20653 - 2013)

Relative humidity	5 ... 95 %
Dimensions	W204 mm x H41 mm x D55 mm (8.03 in x 1.61 in x 2.17 in)
Weight	695 g (1.53 lb)
Configuration interface	CAN high speed
Data transfer rate	Software selectable up to 1 MBit/s (ISO11898-2)
Input sockets	Lemo EGG 1B 307 (7-Pin) ODU series F, size 1 (5-pin)
Status LED	Yes
Derating (decrease of total output power)	-1.25 % /K for ambient temperature > 85 °C
<b>Accessories</b>	
System cable	620-502 520-560 620-561 M-PWR term cable, banana 620-567 M-CAN-ABS
Input cable	600-731 600-866 620-674 670-807 670-810 670-811