

## M-SENS 8

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

- Measurement modes: V, mA selectable for each input
- 8 sensor excitations (bipolar  $\pm 15$  V, up to  $\pm 45$  mA)
- Measurement data output to CAN
- Galvanic isolation (inputs, CAN, supply, enclosure)
- Designed for engine compartment applications
- Toolless module to module connection
- Ruggedized and compact modules for harsh environments



<b>Device</b>	
Maximum input protection voltage (channel)	$\pm 100$ V (indefinitely), $\pm 200$ V (short-time, $t < 2$ ms)
Channel sampling rates	1/ 2/ 5/ 10/ 50/ 100/ 200/ 500/ 1000/ 2000 Hz
Aggregate sample rate	16 kHz
Oversampling	2 kHz
Voltage supply	9 ... 36 VDC
Supply voltage thresholds	Switch-on $9 \pm 0.3$ VDC / Switch-off $6 \pm 0.3$ VDC
Power consumption, typical	3.5 W (all excitations off)
Working temperature range	$-40 \dots 125$ °C ( $-40 \dots 257$ °F)
Storage temperature range	$-55 \dots 150$ °C ( $-67 \dots 302$ °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)
Input sockets	ODU series F, size 1 (5-pin)
<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>General channel properties</b>	
A/D converter	16 bit / SAR (successive approximation register)
Special functions	Offset adjust, during measurement, multiple groups

Channel LED	Available
Flashing mode of channel LED	During configuration - blinking
Channel impedance	10 M $\Omega$
Hardware filter (switchable)	150 Hz (M-SENS 8 / M-SENS 8 DSP)
Hardware filter (switchable)	Accuracy 10 %
Software filter types	Butterworth, Bessel, Elliptic (8-pole)
Software filter (DSP selectable)	6/ 7,5/ 9,96/ 15/ 30/ 39,96/ min
Software filter (DSP selectable)	1/ 1.25/ 1.67/ 2,5/ 5.0/ 6.67/ 10/ 12.5 Hz
Software filter (DSP selectable)	16.67/ 25/ 50/ 66,7/ 100/ 125 Hz (M-SENS 8 DSP)
Software filter (DSP selectable)	Accuracy 0.05 %
<b>Channel current</b>	
Measurement range current	0 ... 20 mA, $\pm 20$ mA
Accuracy at ambient temperature 25 °C	$\pm 0.50$ %
Internal shunt resistor	50 $\Omega$
<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	$\pm 0.30$ %
Accuracy excitation at ambient temperature 85 °C	$\pm 0.50$ %
Accuracy excitation at ambient temperature 120 °C	$\pm 0.70$ %
Sensor excitation current	30 mA (for V output $\pm 2.5 / \pm 10.0$ V)
Sensor excitation current	40 mA (für V Ausgabe $\pm 5.0 / \pm 12.5$ V)
Sensor excitation current	45 mA (für V Ausgabe $\pm 7.5 / \pm 15.0$ V)
Derating (decrease of total output power)	-1.25 % /K for ambient temperature > 85 °C
<b>Channel volt</b>	
Measurement range SENS	$\pm 0.1/ 0.2/ 0.5/ 1/ 2/ 5/ 10/ 20/ 30/ 50/ 100$ V
Accuracy at ambient temperature 25 °C	$\pm 0.15$ % (unipolar measurement ranges)
Accuracy at ambient temperature 25 °C	$\pm 0.10$ % (bipolar measurement ranges)
Drift for ambient temperature -40 ... 85 °C	$\pm 40$ ppm/K
Drift for ambient temperature 85 ... 105 °C	$\pm 80$ ppm/K
Drift for ambient temperature 105 ... 125 °C	$\pm 250$ ppm/K
<b>Accessories</b>	
System cable	620-561.pdf
System cable	620-502.pdf
System cable	620-560.pdf
System cable	620-567.pdf
System cable	620-509.pdf
Input cable	600-807.pdf
System cable	M-CAN-ABS.pdf
System cable	M-DEF-200.pdf
Input cable	600-866.pdf
Input cable	620-674.pdf
Input cable	600-810.pdf