

M-SENS 2

4-channel analog input module with sensor excitation

- Measurement modes: V, mA selectable for each input
- 4 sensor excitations (unipolar 15 V, up to ± 60 mA)
- TEDS Class-2 supported
- 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



Channel volt	
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	± 0.05 % (bipolar measurement ranges) ± 0.13 % (unipolar measurement ranges)
Drift for ambient temperature -40 ... 85°C	± 40 ppm/K
Drift for ambient temperature 85 ... 105 °C	± 80 ppm/K
Drift for ambient temperature 105 ... 125 °C	± 120 ppm/K
Channel current	
Measurement range	0 ... 20 mA, ± 20 mA
Accuracy at ambient temperature 25 °C	± 0.30 %
Internal shunt resistor	50 Ω
General channel properties	
Special functions	Offset adjust, during measurement, multiple groups
AD converter	16 bit / SAR (successive approximation register)
Oversampling	4 kHz
Channel sampling rates	1 / 2 / 5 / 10 / 20 / 50 / 100 / 200 / 500 / 1000 / 2000 Hz
Aggregate sample rate	8 kHz
Hardware filter (switchable)	250 Hz (M-SENS2 250Hz/M-SENS2 250 Hz DSP), Butterworth (8-pole) 500 Hz (M-SENS2/M-SENS2 DSP), Butterworth (8-pole) Accuracy 10 %

Software filter types	Bessel Butterworth Elliptic (8-pole)
Channel impedance	10 MΩ
Software filter (DSP selectable)	100 / 125 / 166.67 / 250 (M-SENS2 250Hz DSP) 100 / 125 / 166.67 / 250 / 500 (M-SENS2 DSP) 6 / 7.5 / 9.96 / 15 / 30 / 39.96 min 1 / 1.25 / 1.67 / 2.5 / 5.0 / 6.67 / 10 / 12.5 / 16.67 / 25 / 50 / 66.7 Hz Accuracy 0.05 %
Channel LED	No
TEDS	Class 2
Excitation	
Sensor excitation ranges	Unipolar 2.5 / 5 / 7.5 / 10 / 12.5 / 15 V
Accuracy excitation at ambient temperature 25 °C	±0.20 %
Accuracy excitation at ambient temperature 85 °C	±0.40 %
Accuracy excitation at ambient temperature 120 °C	±0.60 %
Sensor excitation current	60 mA, short-circuit proof (software controlled)
Galvanic isolation	
Input ↔ module power supply	±100 V (indefinitely), ±500 V (short-time, t < 2 ms)
Input ↔ CAN	±100 V (indefinitely), ±500 V (short-time, t < 2 ms)
Input ↔ enclosure	±100 V (indefinitely), ±500 V (short-time, t < 2 ms)
Input ↔ input	±100 V (indefinitely), ±500 V (short-time, t < 2 ms)
Input ↔ excitation	±100 V (indefinitely), ±500 V (short-time, t < 2 ms)
Device	
Inputs	4
Maximum input protection voltage (channel)	±100 V (indefinitely), ±200 V (short-time, t < 2 ms)
Voltage supply	6 ... 36 VDC
Supply voltage thresholds	On 9 ±0.3 VDC / Off 6 ±0.3 VDC
Power consumption, typical	3.0 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	W106 mm x H43 mm x D60 mm (4.17 in x 1.69 in x 2.36 in)
Weight	420 g (0.93 lb)

Configuration interface	CAN high speed
Data transfer rate	Software selectable up to 1 MBit/s (ISO11898-2)
Housing material	Aluminum, gold anodized
Input sockets	Lemo EGG 1B 306 (6-Pin) ODU series F, size 1 (5-pin) S11F1C-T05MJG0-2500
Output sockets	LEMO 0B,9-pol./P,30°
Status LED	Yes
Accessories	
System cable	620-502 M-CAN cable SUBD/S Term. 620-560 M-CAN cable 620-561 M-PWR term cable, banana 620-567 M-CAN/PWR term cable SubD/S, banana M-CAN-ABS
Input cable	600-866 SENS LEMO 1B7p cable BNC/P 620-674 SENS LEMO 1B6p I-measure cable open 670-817 SENS LEMO 1B 6p TEDS cable open 670-807 SENS LEMO 1B 6p cable open