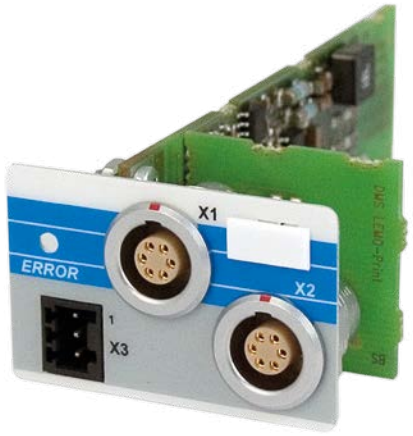
DMS Insert Module
MSR 281



This input module is used to measure the expanding or compression of strain gauges with a Wheatstone bridge. The module has two channels, each with a short-circuit proof excitation voltage of 3.333 V. The measurement range of the Wheatstone bridge is 3 mV/V. Other measuring ranges starting from 1.5 mV/V are available on request. The strain gauges can be connected with 4 or 6-wire technology. Drift correction (zeroing) is Possipble.

The processed input signals can be measured over the diagnostic connector. The signals on the diagnostic connector are for diagnostic purposes only and cannot be calibrated.

Analog Channel Specifications

Number of channels	2
Excitation voltage	3.333 V
Measurement range	3 mV/V
Bridge resistance	100-5000 Ω
Measurement range [Digit]	±100.000
Resolution [Bit]	16
Sensor break detection	yes
Input filter	8 kHz (-3 dB) -60 dB/decade
Conversion time per channel	≤ 25 µs
Common mode range	1-2.3 V
Analog channel accuracy from end value, 25 °C	typisch ±0.0565 %
Status display	ERROR (red) (located on the base)
Converter	18-bit Serial SAR
Galvanic isolation	500 V DC

Analog Channel Accuracy

Integral non-linearity	typically ±0.008 %	maximum ±0.02 %
Noise voltage	typically ±0.046 % ≙ 1.4 µV rms	maximum ±0.056 % ≙ 1.7 µV rms
Cross talk from previous channel -10 mV ... +10 mV	typically ±0.0025 %	maximum ±0.0035 %
Temperature drift 0 ... +40 °C 0 ... +60 °C	typically ±0.065 % typically ±0.15 %	maximum ±0.2 % maximum ±0.45 %
Total error +25 °C 0 ... +40 °C 0 ... +60 °C	typically ±0.0565 % typically ±0.1215 % typically ±0.2065 %	maximum ±0.0795 % maximum ±0.2795 % maximum ±0.5295 %
Effects of the supply line resistance. ΔR = ±1 % from the bridge resistance 4-wire measurement 6-wire measurement	 typically ±1 % typically ±1 ppm	 maximum ±1 % maximum ±3 ppm
Long-term drift 1000 h	typically ±0.007 %	

Drift Correction

Turn-on time	typically 80 ms	maximum 120 ms
Turn-off time	typically 105 ms	maximum 160 ms

Excitation Voltage

Rated voltage +25 °C	+3.333 V	
Initial accuracy +25 ° C	typically ±0.05 %	maximum ±0.3 %
Temperature drift 0 °C ... +40 °C 0 °C ... +60 °C	typically ±0.01 % typically ±0.025 %	maximum ±0.03 % maximum ±0.05 %
Total error 0 °C ... +40 °C 0 °C ... +60 °C	typically ±0.06 % typically ±0.075 %	maximum ±0.33 % maximum ±0.35 %
Additional error under load R_{Bridge} = 5 kΩ R_{Bridge} = 100 Ω	typically 0.0003 % typically 0.03 %	maximum 0.0015 % maximum 0.06 %
Long-term drift 1000 h	typically ±0.007 %	
Maximum load (per channel)	35 mA	
Short-circuit proof	yes	

Diagnostic Connector

Voltage range with cable break	-5 V ... +5 V (≙ -10 mV ... +10 mV) ca. +14 V
Load capacity	10 mA
Short-circuit proof	yes

Article Number and Miscellaneous

Article number	18-001-281	
Hardware version	1.x	

Environmental Conditions

Storage temperature	-30 ... +85 °C	
Operating temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
Shock resistance	EN 60068-2-27	150 m/s²
Protection type	EN 60529	IP00

Notes