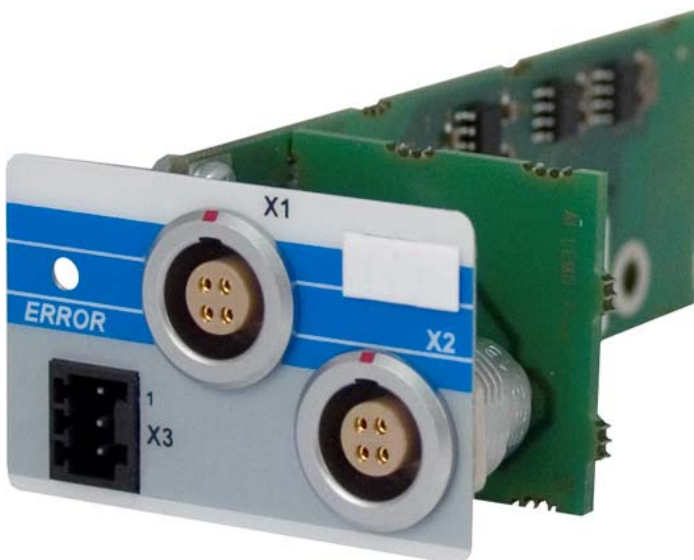


AO Insertable Module

MSR 241



This analog module is used to output voltages in the range of ± 10 V. The module has two channels, each with a short-circuit proof reference voltage of -10 V ... $+10$ V. In addition, each channel has a 24 V supply voltage.

On the diagnostic connector, the output signals can be measured.

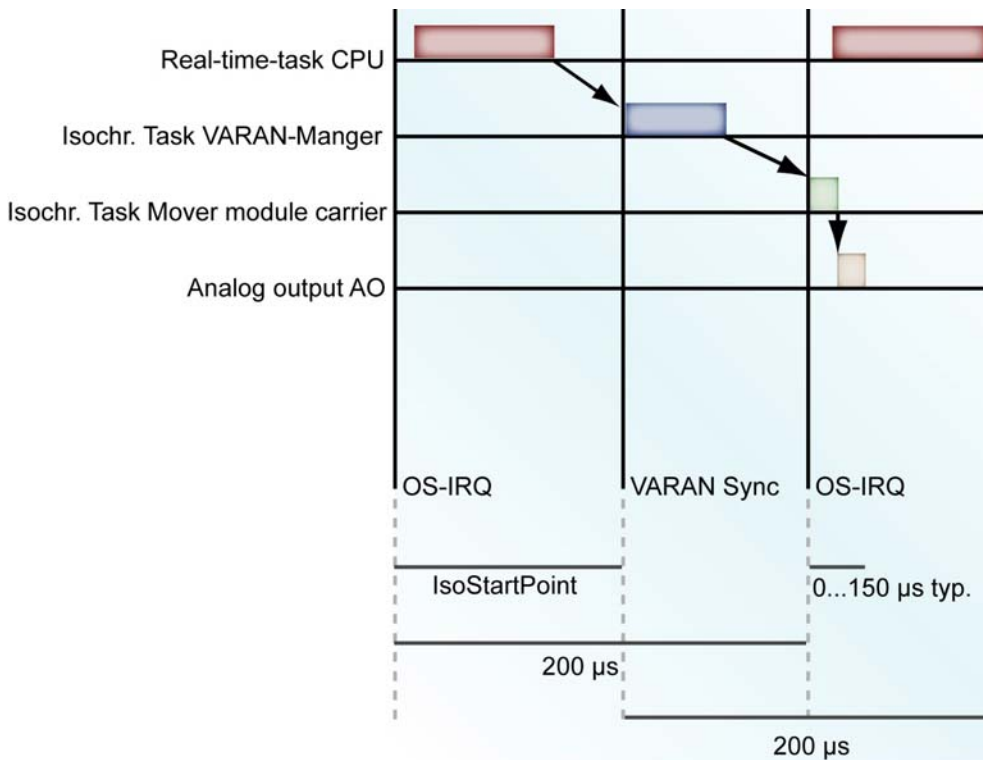
Technical Data

Analog channel specifications

Number of channels	2	
Output range [Volt]	± 10 V DC	
Output range [Digit]	-100.000 ... +100.000 in 0.1 mV increments	
Resolution [Bit]	16	
Resolution [Volt]	333.3 μ V / LSB	
Output voltage capacity	Maximum 10 mA	
Capacitive load of the output voltage	<100 nF	
Short-circuit proof	Yes	
Settling time -10 V ... +10 V	Typically 150 μ s (with a load of 10 k Ω 100 nF)	
Analog channel accuracy of end value	0 – +40 °C Typically ± 0.008 %	0 – +60 °C Typically ± 0.023 %
Status display	ERROR (red) (located on the base)	
Galvanic isolation	500 V DC	

Settling time

Hardware settling time -10 V ... +10 V / +10 V ... -10 V	Typically 150 µs (with a load of 10 kΩ 100 nF)
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Analog channel accuracy

Accuracy based on the final value

Integral nonlinearity error	Typically $\pm 0.003\%$	Maximum $\pm 0.005\%$
Temperature drift 0 °C ... -40 °C 0 °C 60 °C	Typically $\pm 0.005\%$ Typically $\pm 0.002\%$	Maximum $\pm 0.02\%$ Maximum $\pm 0.04\%$
Cross talk between both channels	Typically 0	Maximum $\pm 0.0015\%$
Total error 0 °C ... -40 °C 0 °C 60 °C	Typically $\pm 0.008\%$ Typically $\pm 0.023\%$	Maximum $\pm 0.0265\%$ Maximum $\pm 0.0465\%$
Additional error with a load of 0 ... 1 mA	Typically $\pm 0.001\%$	
Additional error with a load of 0 ... 10 mA	Typically $\pm 0.015\%$	
Long-term drift 1000 h	Typically $\pm 0.65\%$	

Supply voltage

0 ... 60 °C

Output voltage	23,343 V ... 24,330 V ... 25,127 V
Output current / channel	Maximum 100 mA
Total current / base module	Maximum 800 mA
Galvanically isolated	500 V DC

Guidelines for using the Supply Voltage Outputs

When using sensors, the following switching sequence is recommended:
Activate the sensors sequentially with an offset of 100 ms.

Diagnostic connector

Voltage range	±10 V
Load capacity	10 mA
Short-circuit proof	Yes

Miscellaneous

Article number	18-001-241
Hardware version	1.x

Environmental conditions

Storage temperature	-30 – +85 °C	
Operating temperature	0 – +60 °C	
Humidity	0 - 95 %, uncondensed	
EMV stability	According to EN 61000-6-2:2001 (industrial area)	
Shock resistance	EN 60068-2-27	150 m/s ²
Protection Type	EN 60529	IP 00

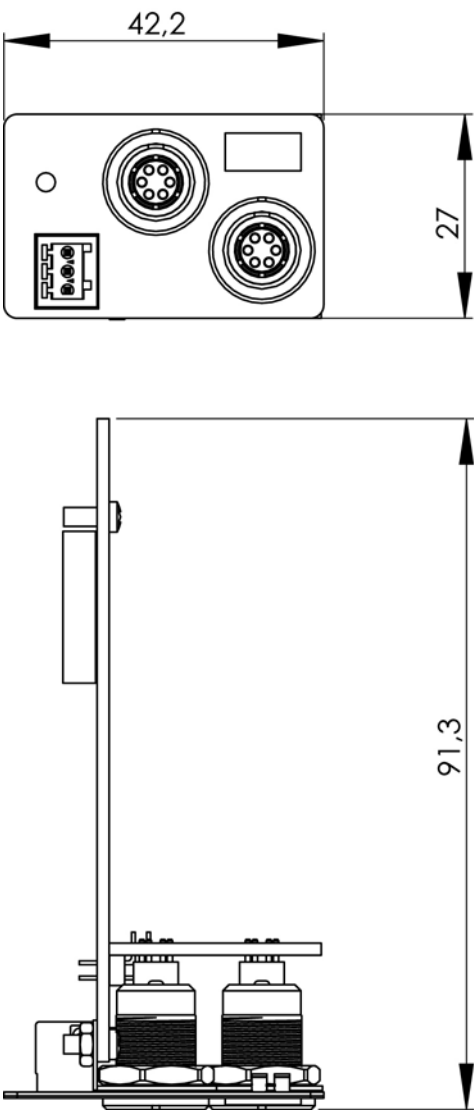
CAUTION:

To ensure the accuracy of the card over a long period of time, annual calibration is necessary to compensate for component aging. This can be in the form of a factory setting or calibration.

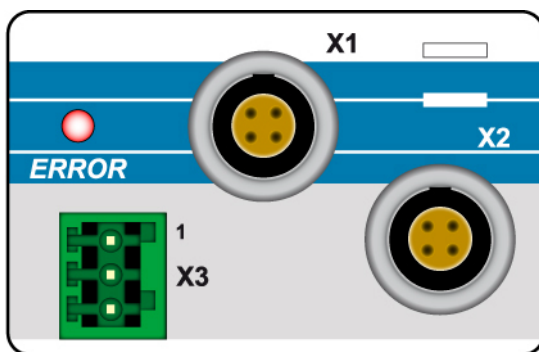
If the aging of the card does not have a significant influence on the application, the annual calibration does not have to be performed. However, Sigmatek then no longer guarantees the specified accuracy.

Also, a minimum warm-up phase of 10 minutes is to be expected!

Mechanical Dimensions

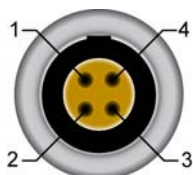


Connector Layout



X1: AO 1

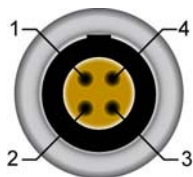
Lemo 4-pin (EGG.1B.304.CLN)



Pin	Function
1	Analog output 1
2	AGND
3	+24 V power supply
4	GND

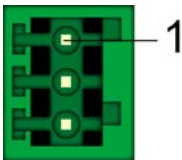
X2: AO2

Lemo 4-pin (EGG.1B.304.CLN)



Pin	Function
1	Analog output 2
2	AGND
3	+24 V power supply
4	GND

X3: Diagnostic
Phoenix 4-pin (MC0,5/3-G-2,5THT)



Pin	Function
1	Analog output 1
2	Analog output 2
3	AGND

Applicable connectors

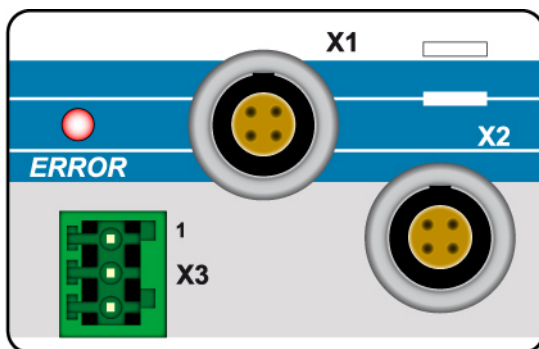
X1 - X2: LEMO FGG.1B.304.CLADxx
X3: PHOENIX FK-MC 0,5/3-ST-2,5

Applicable connection marker



Weidmüller MultiFit MF 10/5 MC CABUR
Order number: 1854510000

Status display



LED number	LED color	Definition
1	RED	Over current or short in the 24 V supply.

Wiring Guidelines

The signals recorded by the analog modules are very small, as compared to the digital signals. To ensure error-free operation, a careful wiring method must be followed.

- The 0 V connection of the supply voltage must be connected with the 0 V assembly point over the shortest route possible.
- The lines connected to the source of the analog signals must be as short as possible and parallel wiring to digital signal lines must be avoided.
- The signal lines should be 2, 3 or 4-pin shielded wires.