FREDERICKS COMPANY
High Performance Sensing Solutions™

Dual Axis RS-485 MEMS Inclinometer
Part Number: 0750-9002-99

Operating Specifications

Interface	RS-485
Supply Voltage	7 V DC to 35 V DC
Supply Current	20 mA
Operating range	±90°
Linear Range	±90°
Axes of Measurement	2
Repeatability	±0.1°
Resolution	0.07° per LSB
Cross-axis Stability	≤4%
Offset Temperature Error	±0.2° @ 0 °C to 70 °C ±0.6° @ -25 °C to 85 °C
Sensitivity Temperature Error	±0.2% @ 0 °C to 70 °C ±0.5% @ -25 °C to 85 °C
Operating Temperature	-40 °C to 85 °C
Storage Temperature	-55 °C to 85 °C
Frequency Response (-3dB)	18 Hz
Time Constant (63.2% of output)	≤55 ms

Physical Characteristics

Housing	Zinc
Electrical Connections	4 Wire
Cable Length	30 cm (11.8")
Weight	60 g (excluding connector)
Length	41 mm (1.61")
Width	46 mm (1.81")
Height	13.5 mm (0.53")
Hole Center	38 mm (1.50")

RS-485 Commands (assume default address 99)

*9914#	X axis output (degrees)
*9918#	X axis average output (degrees)
*9924#	Y axis output (degrees)
*9928#	Y axis average output (degrees)
*9942#	Temperature Output (Celsius)
*9981A25#	Change address (to 25) using password A
*99860#	Change X axis zero offset using password 0
*99870#	Change Y axis zero offset using password 0
*9980#	Read product information
*9989B#	Factory reset (with password B)

Note: see the 0750 series manual for additional commands and details.

Electrical Connections

Red	Supply (+)
Blue	Supply (-)
Green	Factory use only, do not connect
Yellow	RS-485 A (+)
White	RS-485 B (-)

Certifications and Ratings

- RoHS
- IP67 (excluding connector)

Description

The 0750-9002-99 dual axis RS-485 inclinometer sensor utilizes a MEMS sensor for dual axis tilt measurements. It's a durable solution and has an IP67 rating, make it an excellent solution for heavy duty environments such as construction machinery and industrial applications.
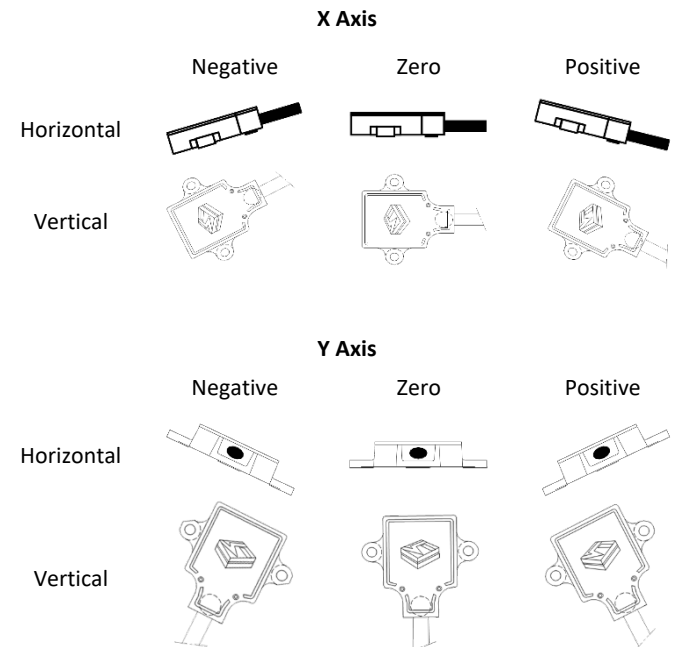
Benefits

- Excellent long-term stability
- Sensing element-controlled frequency response
- Outstanding shock durability
- Harsh environment robustness
- Excellent customer support

Applications

- Solar tracking
- Platform tilt measurement
- Equipment and instrument condition monitoring
- Inclination based position measurement
- Rotational orientation measurement

View a full list of applications on The Fredericks Company website at www.frederickscompany.com.

Direction of Measurement

X Axis

	Negative	Zero	Positive
Horizontal			
Vertical			

Y Axis

	Negative	Zero	Positive
Horizontal			
Vertical			

Orientation Note

The 0750-9001-99 can measure in 2 different orientations. It is necessary to calibrate the sensor in each axis so the sensor outputs '0' at the zero position before use.
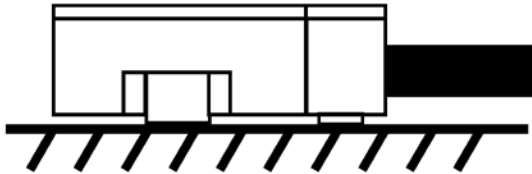
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RS-485 Information

Baud Rate (default 38400)	1200 to 38400
Data Bits	8
Parity	None
Stop Bits	1
Address (default 99)	01 to 99
Maximum Signal Conditioners on Bus	32

Mounting

Mounting Notes

The 0750-9001-99 must be mounted on a flat, smooth surface with 2 M4 screws.

Related Products

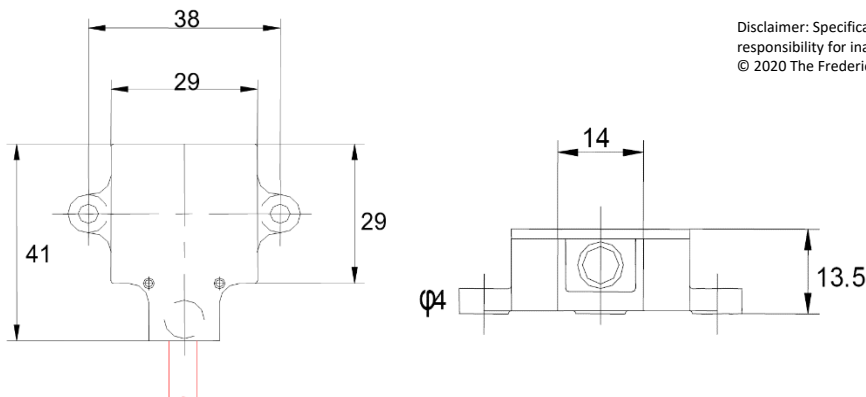| Dual Axis MEMS Inclinometers (Enclosed, IP67)	
0750-3002-99	±30˚ range, RS-485 communications
0751-3002-99	±30˚ range, analog 0.5 to 4.5 V DC output
0751-9002-99	±90˚ range, analog 0.5 to 4.5 V DC output

Dual Axis Electrolytic Inclinometers (Enclosed, IP67)	
0729-1755-99	±60˚ range, analog 0 to 5 V DC output
0729-1759-99	±60˚ range, RS-232 communications
0729-1760-99	±60˚ range, RS-485 communications
0729-1760-04	±10˚ range, RS-485 communications

Dual Axis Electrolytic Inclinometers (PCBA)	
0729-1751-99	±60˚ range, SPI communications
0729-1752-99	±60˚ range, RS-232 communications
0729-1753-99	±60˚ range, analog and PWM output
0729-1754-99	±60˚ range, RS-485 communications

Dimensional Drawings

Example RS-485 Command and Response Byte Values

Retrieve X axis degree of tilt from sensor with address 99, which returns +2.23°.

Command

Byte	0	1	2	3	4	5
ASCII	*	9	9	1	4	#
Hex	0x2A	0x39	0x39	0x31	0x34	0x23

Response

Byte	0	1	2	3	4	5	6	7
ASCII	+	2	.	2	3	°	\<lf>	\<cr>
Hex	0x2D	0x32	0x2E	0x32	0x33	0xA7	0x0A	0x0D

Company Information

Tilt measurement products and sensors that set standards - Fredericks' comprehensive TrueTilt™ tilt sensor product portfolio offers electrolytic tilt sensors, inclinometers, and tilt switches. Patented and engineered to outperform competing technology, our tilt sensors are not just repeatable, but highly accurate with high resolution. Our tilt measurement products have no planned obsolescence and serve industries ranging from construction and RV leveling to aerospace and everything in between.

High performance products designed and manufactured with pride in the USA - For more than 85 years Fredericks has been a global provider and U.S. manufacturer of high-performance tilt measurement products. Built to last, our products are made with state-of-the-art sensing technology, proven processes, and an intrinsic passion for the trade. Offering simple integration and quality and safety benchmarks, our customers benefit not just from standard-setting reliability, but from our commitment to competitive pricing and performance.

Contact Us

The Fredericks Company
2400 Philmont Avenue
Huntingdon Valley, PA 19006 USA

email: sales@frederickscompany.com
web: www.frederickscompany.com
tel: +1 215 947 2500
fax: +1 215 947 7464

ALCYON
ÉLECTRONIQUE

Tel : +33 (0) 1 34 94 77 00
https://alcyonelectronique.fr/

commercial@alcyonelectronique.fr