



±10° RS-485 Dual-Axis Inclinometer
Part Number: 0729-1760-04

Operating Specifications	
Communications	RS-485 half duplex
Supply Voltage	5 V DC regulated
Supply Current	9 mA @ 5 V DC
Operating Range	±10°
Linear Range	±10°
Axes of Measurement	2
Accuracy at 23 °C	±0.1°
Repeatability	±0.1°
Resolution	0.01°
Null Offset	≤5°
Long Term Stability/Drift	≤0.1°
Null Temperature Offset	≤0.006° per °C
Range Temperature Offset	0.1% per °C
Materials	Contains magnetic metals
Operating Temperature	-40° to +70° C
Storage Temperature	-40° to +70° C
Time Constant	≤250 ms

Physical Characteristics	
Housing	ABS Plastic
Electrical Connections	Modular Jack 6P4C (RJ14)
Weight	30 grams
Length	52.5 mm (2.065")
Width	39.5 mm (1.555")
Height	25.4 mm (1.00")

Ordering Information	
Part Number	Description
0729-1760-04	Inclinometer, ±10°, 2 Axis, RS-485

Related Products	
Part Number	Description
0729-1751-99	Inclinometer, ±60°, 2 Axis, SPI
0729-1752-99	Inclinometer, ±60°, 2 Axis, RS-232
0729-1753-99	Inclinometer, ±60°, 2 Axis, Analog/PWM
0729-1754-99	Inclinometer, ±60°, 2 Axis, RS-485
0729-1755-99	Inclinometer, ±60°, 2 Axis, Analog/PWM
0729-1760-99	Inclinometer, ±60°, 2 Axis, RS-485
0729-1765-99	Inclinometer, ±25°, 2 Axis, Analog/RS-232
0729-1763-XX	Tilt Switch, ±1° to ±45°, 2 Axis, Relay/RS-232
0729-1736-99	Tilt Switch, ±1° to ±45°, 2 Axis, Relay/RS-232
0729-1757-99	Tilt Switch, ±1° to ±45°, 1 Axis, Open Collector
0729-1758-99	Tilt Switch, ±1° to ±45°, 1 Axis, Open Collector

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Description

The **0729-1760-04** RS-485 inclinometer utilizes a Fredericks wide range electrolytic tilt sensor and RS-485 signal conditioner. This inclinometer has superior tolerances and unit to unit performance. Its low-profile housing and economic design make it an ideal solution for a versatile range of applications in all sectors.

Key Features and Benefits

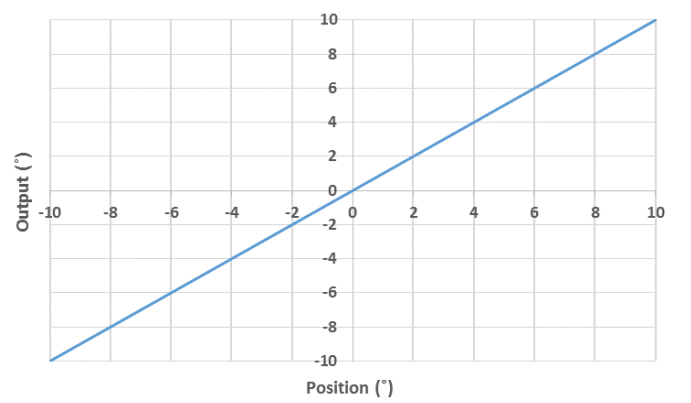
- ±0.1° repeatability, 0.01° resolution, very high accuracy
- ≤0.1° long term drift with an extremely long life
- Minimal drift compared to MEMS devices
- -40 °C to 70 °C operating temperature for industrial applications
- Live text and video chat technical support

Applications

- Aerial lift platform leveling monitor or control
- Satellite dish alignment
- Semiconductor manufacturing

View the full list at www.frederickscompany.com/markets.

Operating Range Behavior





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RS-485 Commands (assume address 01)

:01RA#	X and Y axis angle data
:0111#	X axis raw data (unsigned 16 bits)
:0121#	Y axis raw data (unsigned 16 bits)
:0141#	Temperature raw data (unsigned 10 bits)
:0180#	Product information
:0181Axx#	Change address to xx
:0182Sxxxxxxxxxx#	Enter user information
:0182D#	Read user information
:0184Z#	Save current position as zero
:0184R#	Reset zero (clear offset value)
:0188Rx#	Change baud rate (baud rate code x)
:0189B#	Reset to factory defaults

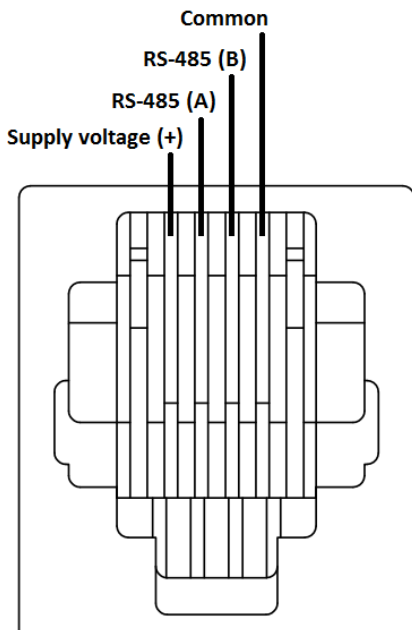
Baud Rate Codes

1	1200
2	2400
3	4800
4	9600 (standard)
5	19200
6	38400

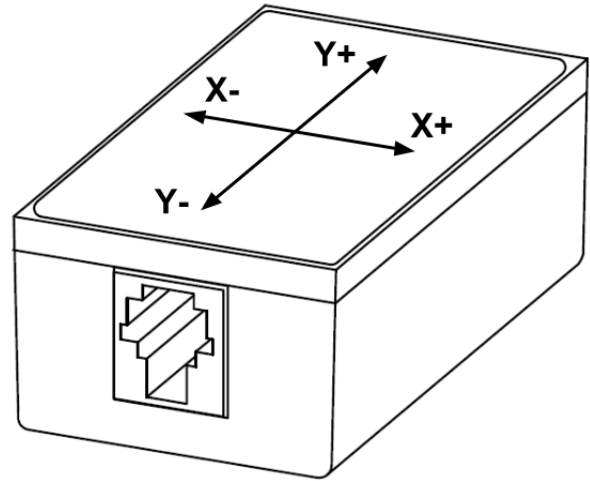
:01RA response is :01RA+/-XXXX+/-YYYY# where XXXX is the current x axis tilt position in degrees (multiplied by 100), and YYYY is the current y axis tilt position in degrees (multiplied by 100).

Electrical Connections

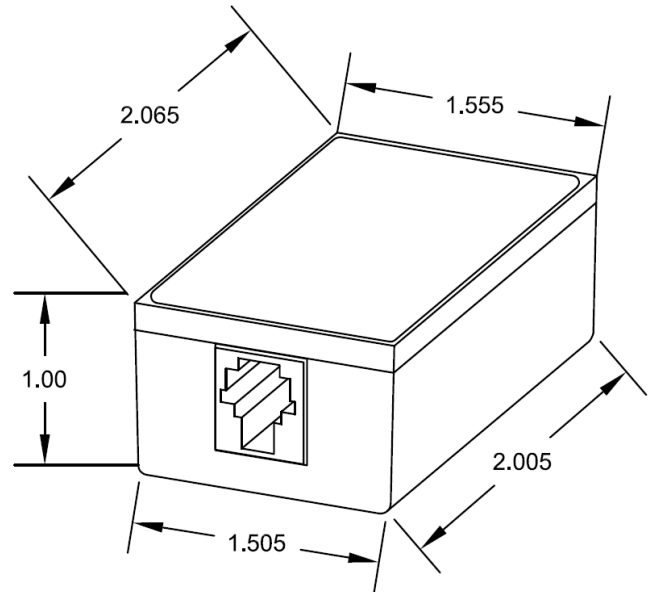
Pin 1	Supply voltage (+)
Pin 2	RS-485 (A)
Pin 3	RS-485 (B)
Pin 4	Common



Functional Diagram



Dimensional Drawings





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Mounting Notes

The 0729-1760-04 and all inclinometers in this series must be mounted horizontally (parallel to the surface of the earth and perpendicular to the force of gravity). For best performance, isolate the unit from vibrations when mounting it.

Converting Temperature Values

The board temperature output is a 10-bit value (0 to 1023). To convert that value to a temperature in °C, use the following equation:

$$\text{Temperature in } ^\circ\text{C} = (((\text{output}/1023) * \text{supply voltage}) - 0.5) / 0.01$$

Certifications and Ratings

- IP40

Additional Documentation

AN1000	Electrolytic Tilt Sensor Excitation
AN1001	Temperature Compensation of Electrolytic Tilt Sensors
AN1003	Configuring Tera Term to Use with TFC Tilt Products
AN1005	Converting Tilt Angle to Degrees

Company Information

Specialty Manufacturing Services That Promise Precision - Since 1935, The Fredericks Company has been a global provider and U.S. designer and manufacturer of the highest performance tilt and vacuum measurement products on the market, with manufacturing processes that ensure the reliability of our products.

Tilt Measurement Products and Sensors That Set Standards - Fredericks’ comprehensive tilt measurement product portfolio offers [electrolytic tilt sensors](#), [inclinometers](#), and [tilt switches](#). Engineered to outperform competing technology, our tilt sensors are accurate and repeatable with excellent resolution. Our tilt measurement products have no planned obsolescence and serve industries ranging from [construction](#) and [RV leveling](#) to aerospace applications and everything in between.

A Partnership That Prioritizes Uptime, Lead Time, and Service - Fredericks guarantees customer satisfaction and our “not too big, not too small” operation is what enables us to offer a true partnership experience. Our dedicated representatives and engineers offer exceptionally responsive service and the fastest lead times in the industry, knowing that uptime is the key to your success. With anytime access to our leadership team and solutions that enhance your products, you will feel the Fredericks difference.

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