±60° RS-485 Dual-Axis Inclinometer
Part Number: 0729-1760-99

Operating Specifications

Output	RS-485
Supply Voltage	7 V DC to 16 V DC
Supply Current	20 mA @ 7 V DC
Operating Range	±60°
Linear Range	±25°
Axes of Measurement	2
Linearity (% of ±60°)	≤7.0%
Linearity (% of ±25°)	≤2.0%
Symmetry (±60°)	≤3°
Symmetry (±25°)	≤1°
Repeatability	≤0.1°
Resolution	≤0.003°
Null Offset	≤5°
Cross Axis (Roll) Sensitivity	≤0.025° per degree
Long Term Stability/Drift	≤0.1°
Null Temperature Coefficient	≤0.006° per °C
Scale Temperature Coefficient	0.1% per °C
Materials	Contains magnetic metals
Operating Temperature	-40 °C to 70 °C
Storage Temperature	-40 °C to 70 °C
Temperature Sensor Range	-40 °C to 125 °C
Frequency Response	≤100 ms
Settling Time	≤500 ms

Physical Characteristics

Housing	ABS Plastic
Electrical Connections	12” cable with 24-gauge wire
Weight	47 grams
Length	56.3 mm (2.217”)
Width	40.0 mm (1.575”)
Height	20.0 mm (0.787”)
Hole Center	47.8 mm (1.882”)

Ordering Information

Part Number	Description
0729-1760-99	Inclinometer, ±60°, 2 Axis, RS-485

Related Products

Part Number	Description
0717-4318-99	Tilt Sensor, ±60°, 2 Axis
1-6200-008	Signal Conditioner, 1 or 2 Axis, RS-485
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
0729-1759-99	Inclinometer, ±60°, 2 Axis, RS-232
0729-1765-99	Inclinometer, ±25°, 2 Axis, Analog/RS-232
F225-00T-003-01	Inclinometer, ±25°, 2 Axis, UART/TTL
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

Description

The 0729-1760-99 dual-axis RS-485 inclinometer utilizes a 0717-4318-99 wide-range electrolytic tilt sensor and the 1-6200-008 RS-485 signal conditioner. Its robust plastic housing and epoxy potting provide excellent durability and environmental protection.

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, ≤0.003° resolution, very high accuracy
- ≤0.1° long term drift with an extremely long life
- Minimal drift compared to MEMS devices
- -40 °C to 85 °C operating temperature for industrial applications
- Live text and video chat technical support

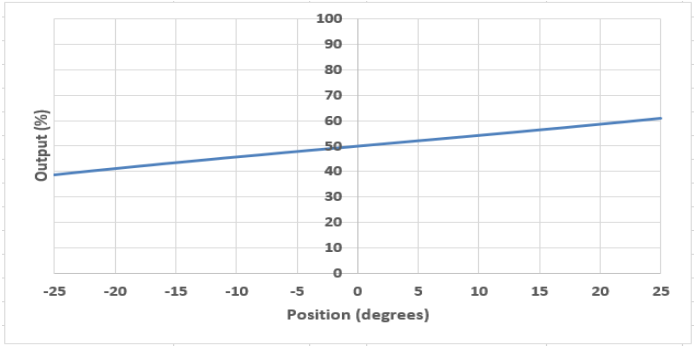
Applications

- Agricultural vehicles and machinery
- Geotechnical and structural monitoring
- Construction tools
- Construction machinery and equipment
- Robotic controls
- Wheel alignment systems

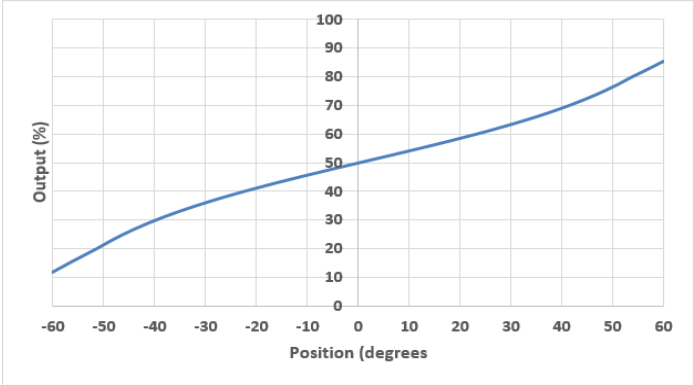
View the full list at www.frederickscompany.com/markets.

Linear and Operating Range Behavior

Linear Range



Operating Range



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Part Number: 0729-1760-99

RS-485 Settings	
Baud Rate (Default 9600)	1200 to 38400
Data Bits	8
Parity	None
Stop Bits	1
Address (Default 99)	01 to 99
Maximum Signal Conditioners on Bus	32

RS-485 Commands	
***9911#**	X axis output (0 to 65535)
***9921#**	Y axis output (0 to 65535)
***9941#**	Temperature output (0 to 1023)
***9980#**	Read product information
***9981Axx#**	Change address to xx (01 to 99)
***9982D#**	Read user information
***9984Z#**	Set current position as zero
***9984R#**	Clear saved zero position
***9988Rx#**	Change baud rate to x (1 to 6)
***9989B#**	Reset to factory default settings

See the 1-6200-008 manual for additional commands

Electrical Connections	
Red	Supply (7 V DC to 16 V DC)
Black	Supply (Ground)
Yellow	Ground
Green	RS-485 B (+)
Blue	RS-485 A (-)

Example RS-485 Command and Response Byte Values

Retrieve X axis tilt value from a signal conditioner with address 99 which returns 32768 (0° tilt):

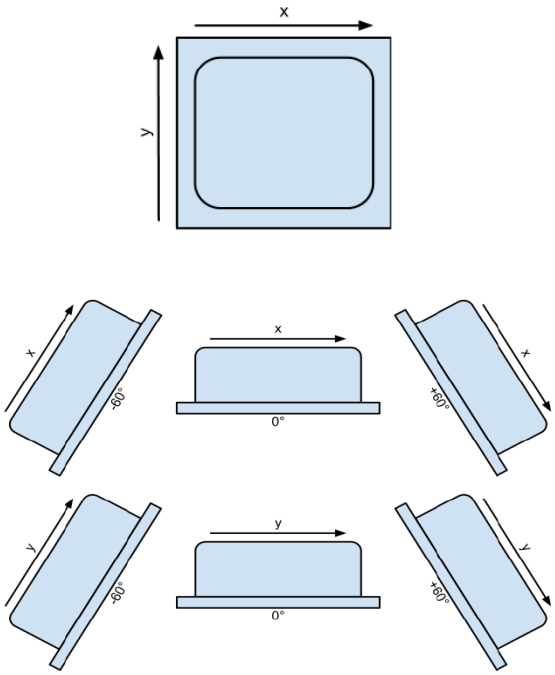
Command

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

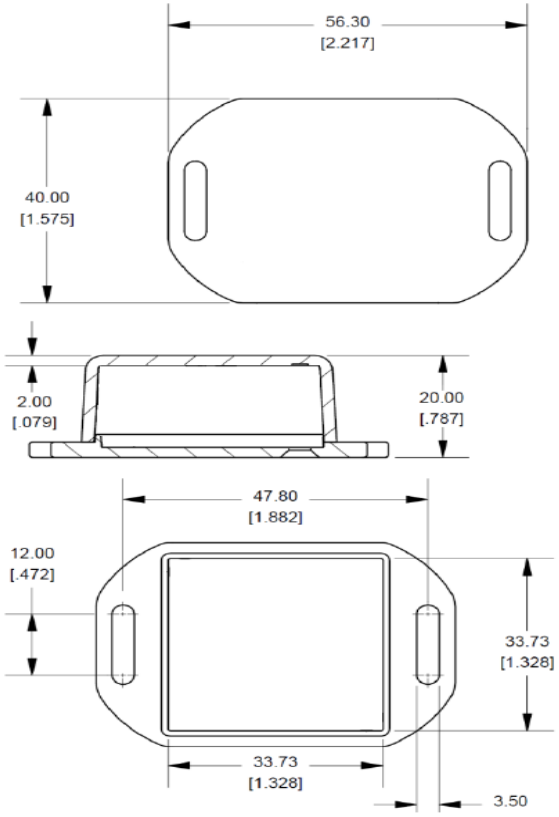
Response

Byte	0	1	2	3	4	5	6
ASCII	3	2	7	6	8	<lf>	<cr>
Hex	0x33	0x32	0x37	0x36	0x38	0x0A	0x0D

Functional Diagram



Dimensional Drawings



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Mounting Notes

The 0729-1760-99 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:

Temperature in °C = (((output/1023)*5)-0.5)/0.01

Certifications and Ratings

- RoHS Compliant
- IP66

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
Manual	1-6200-008 RS-485 Signal Conditioner
Datasheet	0717-4318-99 Wide Range Tilt Sensor
Datasheet	1-6200-008 RS-485 Signal Conditioner

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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