

**±25° Analog and RS-232 Dual-Axis Inclinometer**  
**Part Number: 0729-1765-99**

Operating Specifications	
Analog Interface	Analog 0 to 5 VDC
Digital Interface	RS-232
Supply Voltage	7 to 16 V DC
Supply Current	20 mA @ 12 V DC
Operating Range	±25°
Linear Range	±10°
Axes of Measurement	2
Linearity (% of ±10°)	≤1.0%
Repeatability	±0.005°
Resolution	≤0.0003°
Null Offset	±2°
Cross-Axis Sensitivity	≤0.03% per degree
Long Term Stability/Drift	≤0.005°
Null Temperature Offset	0.0002° per °C
Scale Temperature Offset	0.075% per °C
Materials	Contains magnetic materials
Operating Temperature	-40° to +85° C
Storage Temperature	-40° to +100° C
Time Constant (63.2% of final output)	≤1 second

Physical Characteristics	
Housing	None
Electrical Connections	8 pin, 0.1" spacing
Weight	32 grams
Length	45 mm (1.78")
Width	45 mm (1.78")
Height	17 mm (0.65")
Hole Center	39 mm (1.53")

Ordering Information	
Part Number	Description
0729-1765-99	Inclinometer, ±25°, 2 Axis, Analog/RS-232

Related Products	
Part Number	Description
0703-1602-99	Tilt Sensor, ±25°, 1 Axis
1-6200-012	Signal Conditioner, 1 or 2 Axis, Analog/RS-232
F225-00T-003-01	Inclinometer, ±25°, 2 Axis, UART/TTL
0729-1752-99	Inclinometer, ±60°, 2 Axis, RS-232
0729-1753-99	Inclinometer, ±60°, 2 Axis, Analog and PWM
0729-1754-99	Inclinometer, ±60°, 2 Axis, RS-485
0729-1755-99	Inclinometer, ±60°, 2 Axis, Analog
0729-1759-99	Inclinometer, ±60°, 2 Axis, RS-232
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 0729-1765-99 analog and RS-232 inclinometer utilizes Fredericks 0703-1602-99 mid-range single-axis electrolytic tilt sensors and the 1-6200-012 16 bit analog and RS-232 signal conditioner. The use of high accuracy single axis sensors and 16 bit ADCs and DACs make this inclinometer ideal for high precision tilt measurement.

This inclinometer has superior tolerances and unit to unit performance with an economic design, making it an excellent solution for a versatile range of applications in many sectors.

**Key Features and Benefits**

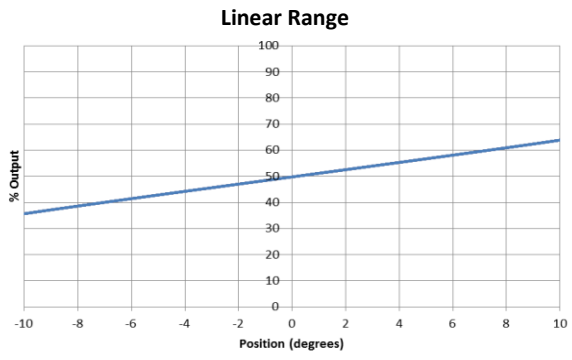
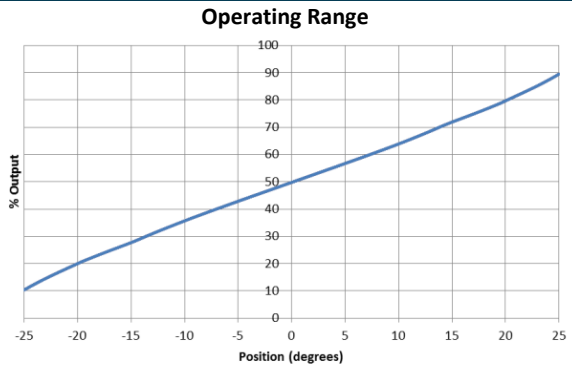
- ±0.005° repeatability, ≤0.0003° resolution, very high accuracy
- ≤0.005° long term drift with an extremely long life
- Minimal drift compared to MEMS devices
- -40 °C to 85 °C operating temperature for industrial applications
- Live text and video chat technical support

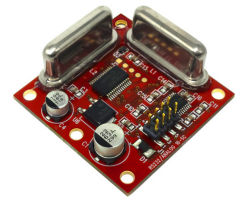
**Applications**

- Geotechnical and structural monitoring
- Construction tools, laser leveling
- Construction machinery and equipment
- Aerial work platforms (AWP), elevating work platforms (EWP)
- Mobile elevating work platforms (MEWPS)

View the full list at [www.frederickscompany.com/markets](http://www.frederickscompany.com/markets).

**Operating and Linear Range Output Behavior**





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**Electrical Connections**

Pin 1	GND
Pin 2	GND
Pin 3	Vcc
Pin 4	GND
Pin 5	RX
Pin 6	X
Pin 7	Y
Pin 8	TX

**RS-232 Settings**

Baud Rate	9600 (default, selectable up to 115200)
Data Bits	8
Parity	None
Stop Bits	1

**RS-232 Commands**

'x' or 'X'	X axis output (0 to 65535)
'y' or 'Y'	Y axis output (0 to 65535)
't' or 'T'	Temperature output (0 to 1023)
's' or 'S'	Output X, Y, temperature at set intervals
'r' or 'R'	Stop timed interval output
'1' to '5'	Set delay (in seconds) for set intervals
'v' or 'V'	Product information and version
'B1' to 'B5'	Set baud rate to: 'B1' – 9600
	'B2' – 19200
	'B3' – 38400
	'B4' – 57600
	'B5' – 115200
'?'	List all commands

**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:

$$\text{Temperature in } ^\circ\text{C} = (((\text{output}/1023)*5)-0.5)/0.01$$

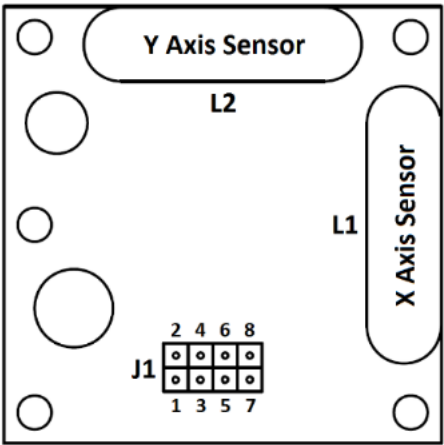
**Mounting Notes**

The **0729-1765-99** 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.

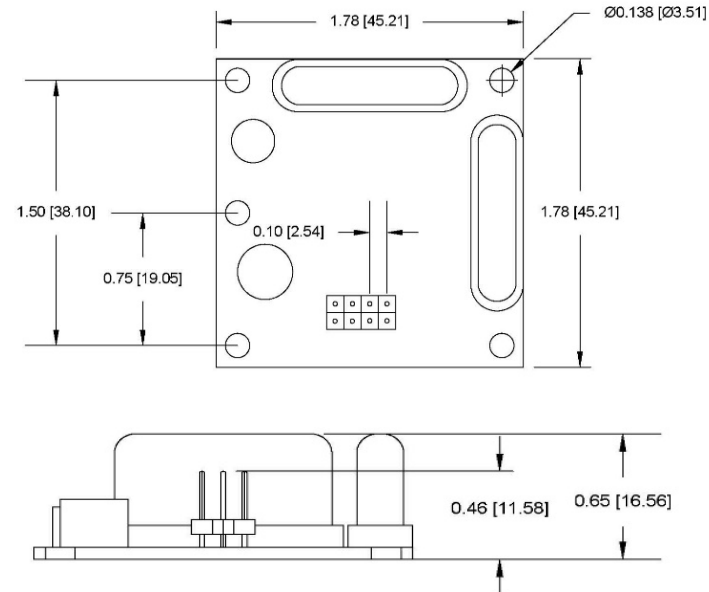
**Additional Documentation**

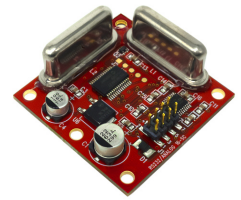
AN1000	<a href="#">Electrolytic Tilt Sensor Excitation</a>
AN1001	<a href="#">Temperature Compensation of Electrolytic Tilt Sensors</a>
AN1003	<a href="#">Configuring Tera Term to Use with TFC Tilt Products</a>
AN1005	<a href="#">Converting Tilt Angle to Degrees</a>
Article	<a href="#">Structural Monitoring Case Study: Resensys</a>

**Direction of Measurement**



**Dimensional Drawings**





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**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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