



## ±60° RS-232 Dual-Axis Inclinometer

### Part Number: 0729-1759-99

#### Operating Specifications

Output	RS-232
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 85 °C
Storage Temperature	-40 °C to 125 °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
0729-1759-99	Inclinometer, ±60°, 2 Axis, RS-232

#### Related Products

Part Number	Description
0717-4318-99	Tilt Sensor, ±60°, 2 Axis
1-6200-006	Signal Conditioner, 1 or 2 Axis, RS-232
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 0729-1759-99 dual-axis RS-232 inclinometer utilizes a 0717-4318-99 wide-range electrolytic tilt sensor and the 1-6200-006 RS-232 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

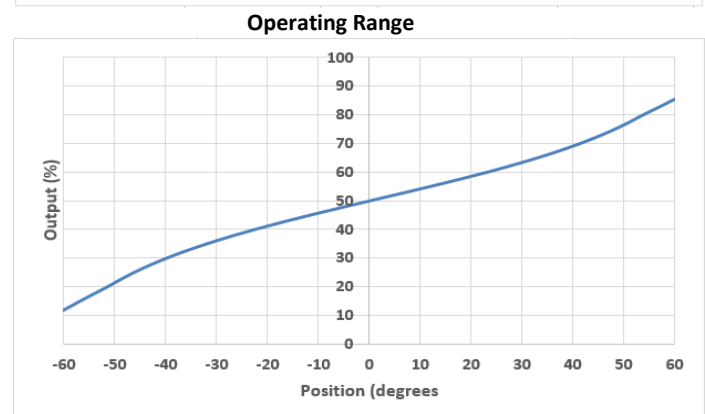
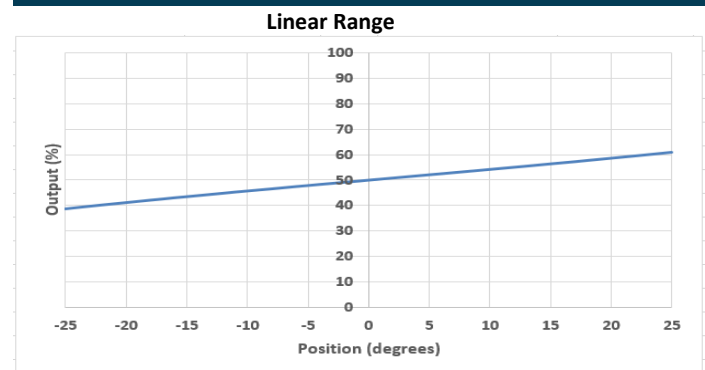
- ≤0.1° repeatability, ≤0.003° resolution, very high accuracy
- ≤0.1° long term drift with an extremely long life
- Minimal drift compared to MEMS devices
- -40 °C to 85 °C operating temperature for industrial applications
- Live text and video chat technical support

#### Applications

- Agricultural vehicles and machinery
- Geotechnical and structural monitoring
- Construction tools
- Construction machinery and equipment

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#### Linear and Operating Range Behavior





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**RS-232 Settings**

<b>Baud Rate</b>	9600
<b>Data Bits</b>	8
<b>Parity</b>	None
<b>Stop Bits</b>	1

**RS-232 Commands**

'X'	X axis output (0 to 65535)
'Y'	Y axis output (0 to 65535)
'T'	Temperature output (0 to 1023)
'S'	Output X, Y, temperature at set intervals
'R'	Stop timed interval output
'1' to '5'	Delay (in seconds) for set intervals
'@' 'Z' '#'	Set current position as zero
'&' 'C' '*'	Clear saved zero position

**Electrical Connections**

<b>Red</b>	Supply (7 V DC to 16 V DC)
<b>Black</b>	Supply (Ground)
<b>Yellow</b>	Ground
<b>Green</b>	RS-232 transmit (TX)
<b>Blue</b>	RS-232 receive (RX)

**Example RS-232 Command and Response Byte Values**

Retrieve X axis tilt value which returns 32768 (0° tilt):

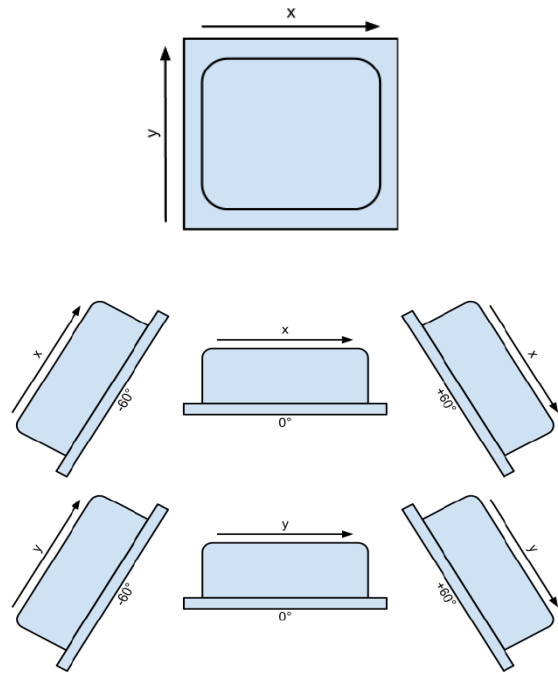
**Command**

<b>Byte</b>	<b>0</b>
<b>ASCII</b>	X
<b>Hex</b>	0x58

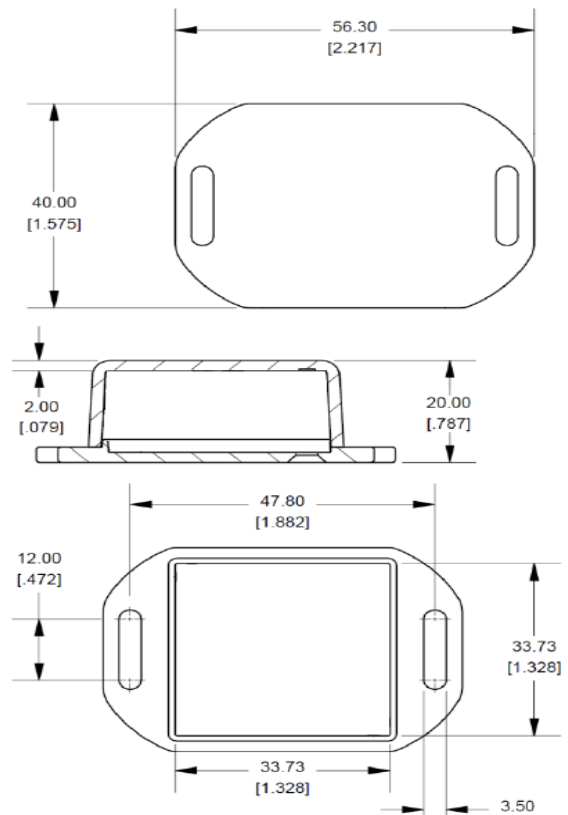
**Response**

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

**Functional Diagram**



**Dimensional Drawings**





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**Mounting Notes**

The 0729-1759-99 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:

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

**Certifications and Ratings**

- RoHS Compliant
- IP66

**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>
Datasheet	<a href="#">0717-4318-99 Wide Range Tilt Sensor</a>
Datasheet	<a href="#">1-6200-006 RS-232 Signal Conditioner</a>

**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.

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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.

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