FREDERICKS COMPANY
High Performance Sensing Solutions™

Dual Axis RS-232 Inclinometer
Part Number: 0729-1752-99

Operating Specifications

Interface	RS-232
Supply Voltage	3.3 V DC to 5 V DC
Supply Current	11 mA (3.3 V) 16 mA (5 V)
Analog Input Resolution	16 bits (10 bits oversampled)
Operating range	±60º
Linear Range	±25º
Axes of Measurement	2
Repeatability	±0.1°
Resolution	≤0.003°
Null Offset	±5°
Long Term Stability/Drift	≤0.1°
Null Temperature Coefficient	≤0.006° per °C
Scale Temperature Coefficient	0.1% per °C
Operating Temperature	-40 °C to 85 °C
Storage Temperature	-40 °C to 125 °C
Temperature Sensor Range	-40 °C to 125 °C
Time Constant (63.2% of output)	≤100 ms

Physical Characteristics

Housing	None (PCBA)
Electrical Connections	7 Pin, 2.54 mm (0.1") spacing
Weight	5.5 g
Length	31.8 mm (1.25")
Width	31.8 mm (1.25")
Height	16 mm (0.63")
Hole Center	26.7 mm (1.05")

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, 2, 3, 4, 5	Delay (in seconds) for set intervals
@Z#	Set current position as zero
&C*	Clear saved zero position

Electrical Connections

J1 Pin 1 (+5)	Supply (+)
J1 Pin 2 (C)	Supply (-)
J1 Pin 3 (C)	Ground
J1 Pin 4 (OUT)	RS-232 transmit (TX)
J1 Pin 5 (IN)	RS-232 receive (RX)
J1 Pin 6 (C)	Ground
J1 Pin 7 (C)	Ground
L1	Dual axis sensor connection
J3	Single axis sensor x axis connection
J4	Single axis sensor y axis connection

Certifications and Ratings

- RoHS

Description

The 0729-1752-99 dual axis RS-232 inclinometer includes the 0717-4318-99 Fredericks TrueTilt™ wide-range, dual-axis electrolytic tilt sensors and 1-6200-006 signal conditioning electronics. This inclinometer has superior tolerances and unit to unit performance with an economic design, making it an excellent solution for a variety of applications in many markets and industries.

Benefits

- Exceptionally high resolution, repeatability, and accuracy
- Very low power consumption
- Extremely long service life with less drift than MEMS tilt sensors
- Superior performance in extreme temperatures/environments
- Excellent customer support
- Designed and manufactured in the United States of America

Applications

- Construction, agricultural, and forestry vehicles and machinery
- Aerial work platforms (AWP), elevating work platforms (EWP)
- Mobile elevating work platforms (MEWPS)
- Scissor lifts (height sensor)
- Telescopic and articulating boom lifts (boom angle sensor)
- Solar tracking

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

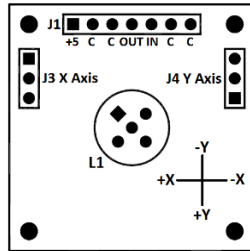### Operating Range Output Behavior

Output (unsigned 16 bit counts) vs Position (°)
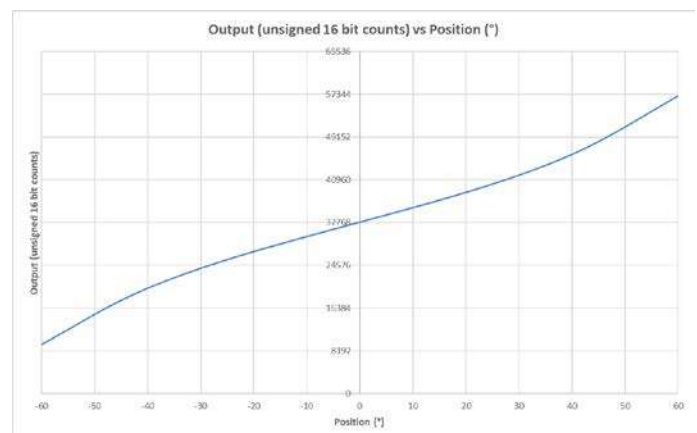
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RS-232 Settings

Baud Rate	9600
Data Bits	8
Parity	None
Stop Bits	1

Pin Diagram and Direction of Measurement

Mounting Notes

The 0729-1752-99 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.

Related Products

Dual Axis Electrolytic Inclinometers (PCBA)

|	
0729-1751-99	±60˚ range, SPI communications
0729-1753-99	±60˚ range, analog and PWM output
0729-1754-99	±60˚ range, RS-485 communications

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 MEMS Inclinometers (Enclosed, IP67)

0750-9002-99	±90˚ range, RS-485 communications
0750-3002-99	±30˚ range, RS-485 communications
0751-9002-99	±90˚ range, analog 0.5 to 4.5 V DC output
0751-3002-99	±30˚ range, analog 0.5 to 4.5 V DC output

Dimensional Drawings
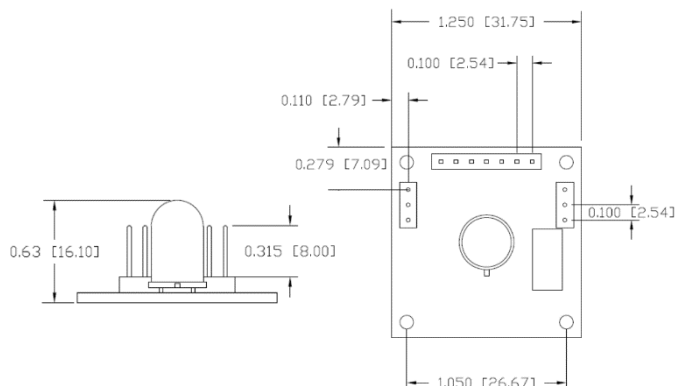
Example RS-232 Command and Response Byte Values

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

Command

Byte	0
ASCII	X
Hex	0x58

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

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)*supply voltage)-0.5)/0.01

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 80 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.

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