

Dual Axis Analog and RS-232 Inclinometer

Part Number: **0729-1765-99**



Operating Specifications¹

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
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	20 grams
Length	45 mm (1.78")
Width	45 mm (1.78")
Height	17 mm (0.65")
Hole Center	39 mm (1.53")

Electrical Connections

Pin 1	GND	RS-232 ground
Pin 2	GND	Analog output ground
Pin 3	Vcc	Supply voltage (+)
Pin 4	GND	Supply voltage (-)
Pin 5	RX	RS-232 receive
Pin 6	X	X axis analog out (0 V to 5 V DC)
Pin 7	Y	Y axis analog out (0 V to 5 V DC)
Pin 8	TX	RS-232 transmit

Certifications and Ratings

- RoHS

Benefits

- Very low power consumption
- Extremely long life
- Highly precise and accurate
- Minimal drift over lifetime compared to MEMS devices
- Excellent resolution and repeatability
- Superior performance in extreme temperatures and environments
- Excellent customer support

Description

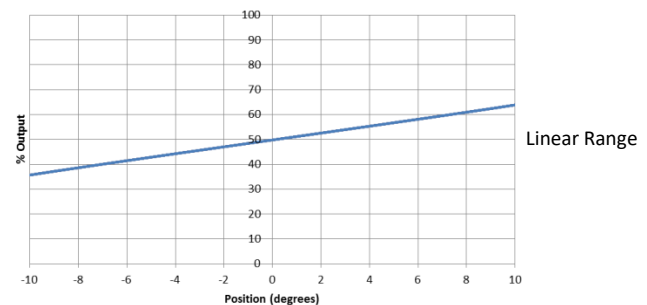
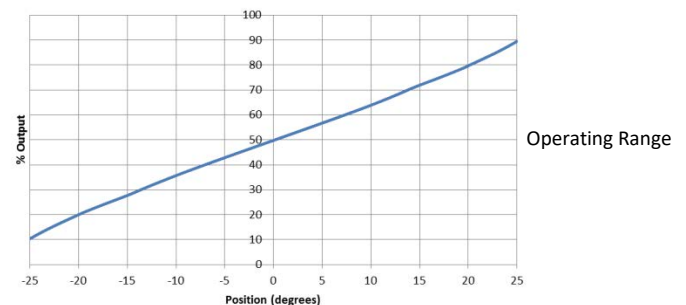
The **0729-1765-99** analog and RS-232 inclinometer utilizes Fredericks **0703-1602-99** TrueTilt™ mid-range single axis electrolytic tilt sensors and the **1-6200-012** 16 bit analog and RS-232 signal conditioner. The use of high accuracy single axis sensors and 16 bit ADCs and DACs make this inclinometer 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.

Applications

- Aerial lift platform leveling monitor or control
- Railway monitoring
- Robotic controls
- Satellite dish alignment
- Solar panel position and elevation control
- Wheel alignment systems

View a full list of applications at www.frederickscompany.com.

Operating and Linear Range Output Behavior



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¹ See [application note AN 1002](#) for operating specification definitions.



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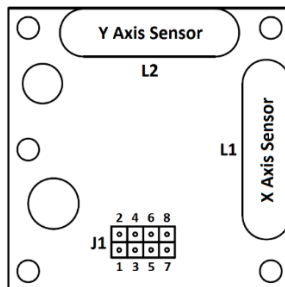
RS-232 Settings

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' ²	Product information and version
'B1' to 'B5' ²	Set baud rate to: 'B1' – 9600
	'B2' – 19200
	'B3' – 38400
	'B4' – 57600
	'B5' – 115200
'?' ²	List all commands

Direction of Measurement



Related Products

Signal Conditioners (PCB, no sensor)

1-6200-005	SPI interface
1-6200-006	RS-232 interface
1-6200-007	Analog/PWM interface
1-6200-008	RS-485 interface

PCB Inclinometers (sensor mounted on PCB, no enclosure)

0729-1751-99	SPI interface
0729-1752-99	RS-232 interface
0729-1753-99	Analog/PWM interface
0729-1754-99	RS-485 interface
0727-1765-99	Analog/RS-232 interface

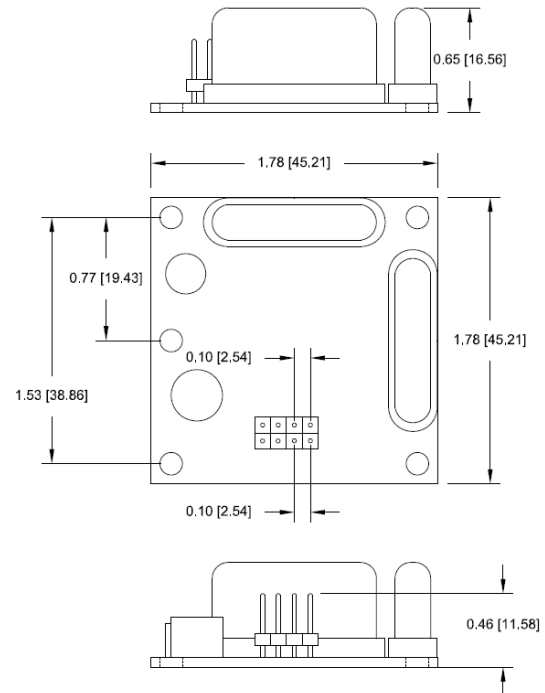
Environmentally Sealed Inclinometers (IP66 or higher rating)

0729-1755-99	Analog interface
0729-1759-99	RS-232 interface
0729-1760-99	RS-485 interface

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.

Dimensional Drawings



Additional Documentation

- [AN 1001 – Temperature Compensation of Electrolytic Tilt Sensors](#)
- [AN 1005 – Converting Tilt Angle to Degrees](#)
- [AN 1006 – Obtaining Measurements from TFC Signal Conditioners](#)

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² Firmware v2.1.0+ only