



±3° UART/TTL Dual-Axis Inclinometer

Part Number: **F203-00T-012-01**

Operating Specifications

Digital Interface	UART/TTL
Analog Output	None
Supply Voltage	5.0 V DC ±0.25 V DC
Supply Current	<10 mA @ 5 V DC
Operating Range	±3°
Linear Range	±1°
Axes of Measurement	2
Linearity (±1°)	≤3%
Repeatability	±0.001°
Null Offset	±2°
Long Term Stability/Drift	≤0.005°
Null Temperature Offset	≤0.0005°
Scale Temperature Offset	0.375% per °C
Operating Temperature	-20° to 50 °C
Storage Temperature	-55° to 125 °C
Time Constant (63.2% of final output)	≤1 second

Physical Characteristics

Housing	None
Electrical Connections	8-pin Molex 1054291308
Mating Connector	8-Pin Molex 1053081208
Weight	20 grams
Length	45 mm (1.78")
Width	45 mm (1.78")
Height	17 mm (0.65")

Ordering Information

Part Number	Description
F225-00T-012-01	Inclinometer, ±3°, 2 Axis, UART/TTL

Related Products

Part Number	Description
ApexTwo	Inclinometer, ±60°, 2 Axis, Analog
F203-00A-212-00	Inclinometer, ±3°, 2 Axis, Analog/RS-232
F225-00T-003-01	Inclinometer, ±25°, 2 Axis, UART/TTL
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 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
0729-1767-99	Inclinometer, ±60°, 2 Axis, Analog
0729-1768-99	Inclinometer, ±60°, 2 Axis, RS-232, Molex
0729-1769-99	Inclinometer, ±60°, 2 Axis, RS-485, Molex
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 **F203-00T-012-01** UART/TTL inclinometer utilizes Fredericks **0703-0712-99** narrow range single-axis electrolytic tilt sensors and the 1-6200-013 16-bit UART/TTL signal conditioner. The use of high-accuracy single-axis sensors and 16-bit ADCs makes 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 many markets and applications.

Key Features and Benefits

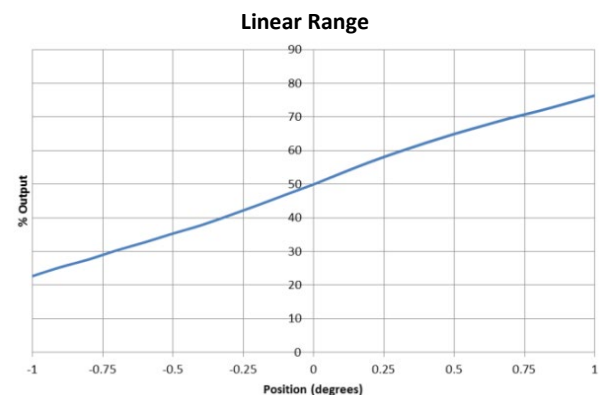
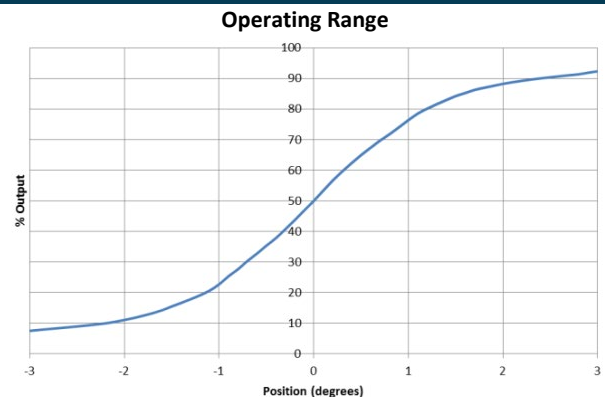
- ±0.001° repeatability, very high accuracy
- ≤0.005° long-term drift with an extremely long life
- Minimal drift compared to MEMS devices
- -20 °C to 50 °C operating temperature for industrial applications
- Live text and video chat technical support

Applications

- Geotechnical and structural monitoring
- Construction tools, laser leveling
- Construction machinery and equipment

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

Operating and Linear Range Output Behavior



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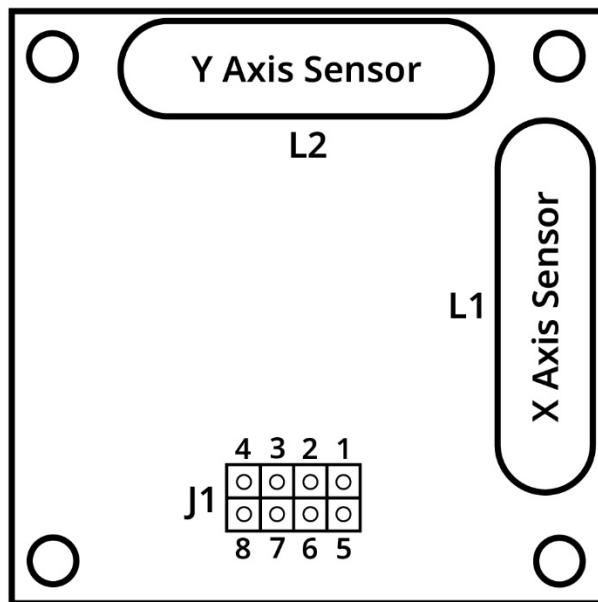


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Electrical Connections

Pin 1	Gnd	Ground
Pin 2	Vcc	Supply Voltage (+)
Pin 3	TX	UART/TTL Transmit
Pin 4	NC	No Connection
Pin 5	Gnd	Ground
Pin 6	Gnd	Ground
Pin 7	NC	No Connection
Pin 8	RX	UART/TTL Receive



UART/TTL Settings

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

UART/TTL Commands

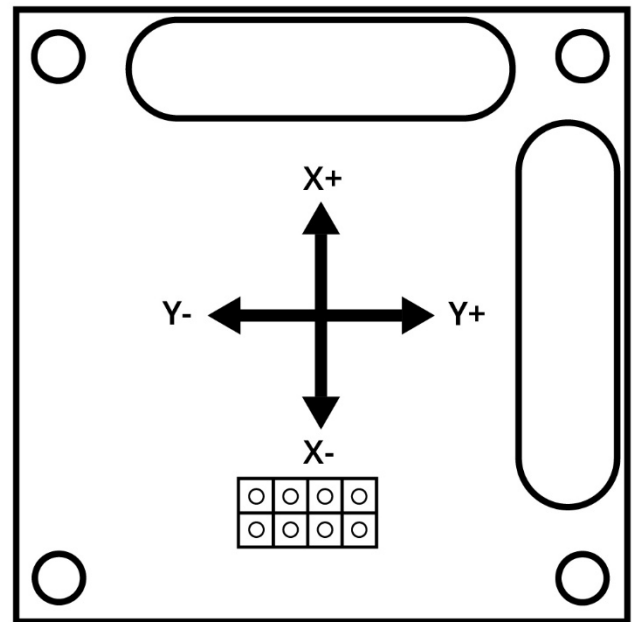
'x' or 'X'	X axis output (0 to 65535)
'y' or 'Y'	Y axis output (0 to 65535)
't' or 'T'	Temperature output (0 to 1023)
's' or 'S'	Output X, Y, temperature at set intervals
'r' or 'R'	Stop timed interval output
'1' to '5'	Set delay (in seconds) for set intervals
'v' or 'V'	Product information and version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

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

Direction of Measurement



Mounting Notes

The **F203-00T-012-01** 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	Electrolytic Tilt Sensor Excitation
AN1001	Temperature Compensation of Electrolytic Tilt Sensors
AN1002	Definitions of Electrolytic Tilt Sensor Operating Specifications
AN1003	Configuring Tera Term to Use with TFC Tilt Products
AN1005	Converting Tilt Angle to Degrees
AN1006	Obtaining Measurements from TFC Signal Conditioners

Certifications and Ratings

- RoHS compliant



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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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