



**±30 Analog Dual-Axis MEMS Inclinometer**  
**Part Number: 0751-3002-99**

| Operating Specifications     |                                 |
|------------------------------|---------------------------------|
| Interface                    | Analog (0.5 V to 4.5 V)         |
| Supply Voltage               | 7 V DC to 35 V DC               |
| Supply Current               | 8 mA                            |
| Operating range              | ±30°                            |
| Linear Range                 | ±30°                            |
| Axes of Measurement          | 2                               |
| Offset (Output at 0°)        | 2.5 V                           |
| Sensitivity                  | 70 mV/°                         |
| Repeatability                | ±0.1°                           |
| Resolution                   | ≤0.0035°                        |
| Cross-axis Sensitivity       | 3%                              |
| Offset Temperature Error     | ±0.2° @ 0 °C to 70 °C           |
|                              | ±0.6° @ -25 °C to 85 °C         |
| Sensitivity Temp. Dependency | -0.8% to 0.3% @ 0 °C to 70 °C   |
|                              | -1.5% to 0.5% @ -25 °C to 85 °C |
| Operating Temperature        | -40 °C to 85 °C                 |
| Storage Temperature          | -55 °C to 85 °C                 |

| Physical Characteristics |                            |
|--------------------------|----------------------------|
| Housing                  | Zinc                       |
| Electrical Connections   | 4 Wire                     |
| Cable Length             | 30 cm (11.8")              |
| Weight                   | 60 g (excluding connector) |
| Length                   | 41 mm (1.61")              |
| Width                    | 46 mm (1.81")              |
| Height                   | 13.5 mm (0.53")            |
| Hole Center              | 38 mm (1.50")              |

| Ordering Information |   |
|----------------------|---|
| Part Number          | Description                             |
| 0751-3002-99         | MEMS Inclinometer, ±30°, 2 Axis, Analog |

| Related Products |  |
|------------------|--|
| Part Number      | Description                                      |
| 0750-3002-99     | MEMS Inclinometer, ±30°, 2 Axis, RS-485          |
| 0750-9002-99     | MEMS Inclinometer, ±90°, 2 Axis, RS-485          |
| 0751-9002-99     | MEMS Inclinometer, ±90°, 2 Axis, Analog          |
| 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           |
| 0729-1759-99     | 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 0751-3002-99 dual-axis analog inclinometer sensor utilizes a MEMS sensor for dual-axis tilt measurements. It's a durable solution and has an IP67 rating, make it an excellent solution for heavy duty environments such as construction machinery and industrial applications.

**Key Features and Benefits**

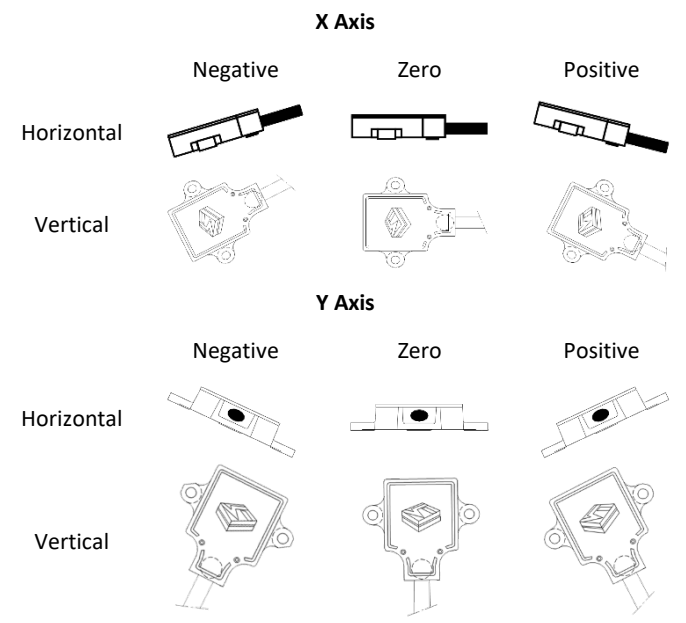
- ±0.1° repeatability, ≤0.0035° resolution, very high accuracy
- -40 °C to 85 °C operating temperature for industrial applications
- Live text and video chat technical support

**Applications**

- Agricultural vehicles and machinery
- Geotechnical and structural monitoring
- Construction tools
- Construction machinery and equipment
- Solar tracking
- Platform tilt measurement
- Equipment and instrument condition monitoring
- Inclination based position measurement
- Rotational orientation measurement

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**Direction of Measurement**





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**Electrical Characteristics**

|                               |                |
|-------------------------------|----------------|
| Supply Voltage                | 7 V to 35 V DC |
| Current Consumption           | ≤8 mA          |
| Analog Resistive Output Load  | ≥10 kΩ         |
| Analog Capacitive Output Load | 20nF           |
| Start-up Delay                | 10 ms          |

**Electrical Connections**

|        |                                  |
|--------|----------------------------------|
| Red    | Supply (+)                       |
| Blue   | Supply (-)                       |
| Yellow | X Axis Output                    |
| White  | Y Axis Output                    |
| Green  | Factory use only, do not connect |

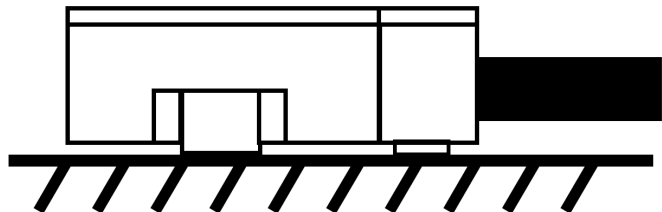
**Voltage to Angle Conversion**

The analog output can be converted to degrees using the following equation:

$$\alpha = \sin^{-1} \frac{V_{out} - Offset}{Sensitivity}$$

Offset and sensitivity can be found in the operating specifications.

**Mounting**



**Mounting Notes**

The 0751-3002-99 must be mounted on a flat, smooth surface with 2 M4 screws.

**Orientation Note**

The 0751-3002-99 can measure in 2 different orientations. It is necessary to calibrate the sensor in each axis so the sensor outputs '0' at the zero position before use.

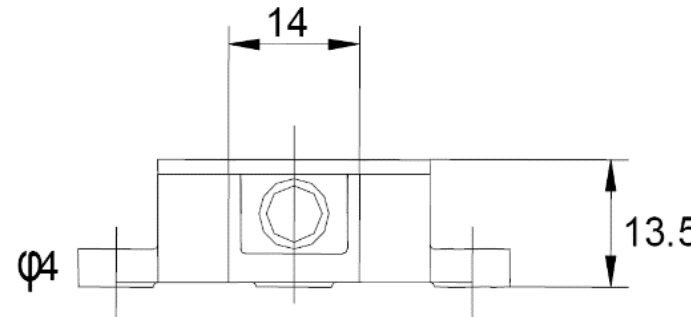
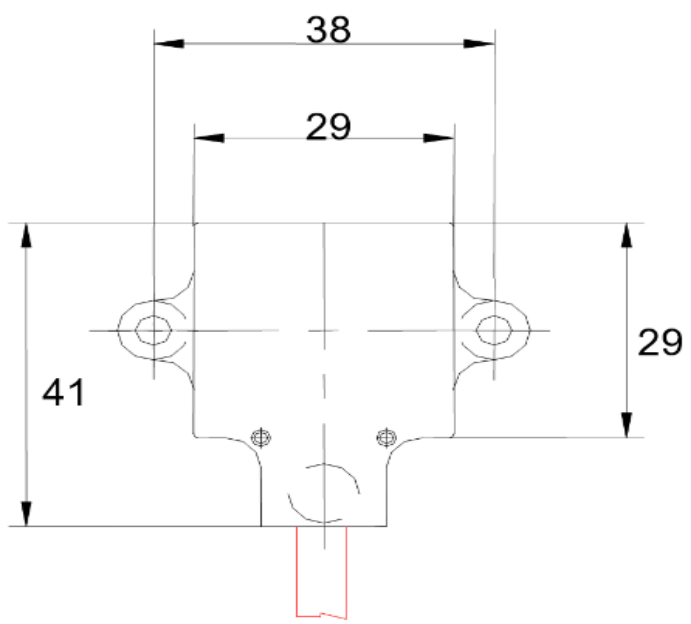
**Certifications and Ratings**

- RoHS Compliant
- IP67 (excluding connector)

**Additional Documentation**

- [AN1003 Configuring Tera Term to Use with TFC Tilt Products Manual](#)
- [0751 Series MEMS Inclinometer Instruction Manual](#)

**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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