Welcome to
The Fredericks Company

High Performance Products Designed and Manufactured in the USA

Fredericks is a global provider and U.S. manufacturer and designer of high-performance tilt and vacuum measurement products. Built to last, our products are made with state-of-the-art sensing technologies, 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.

Specialty Manufacturing Services That Promise Precision and Partnership

Since 1935, The Fredericks Company has specialized exclusively in tilt and vacuum measurement products. Today, our precise manufacturing processes produce the most accurate and advanced products on the market, ensuring perfection every time. A true specialty service provider, we are willing and eager to put our experience and capabilities to good use, helping OEMs achieve even the most complex designs.

Two Weeks or Less Lead Times

We're committed to maintaining the shortest possible lead times for our customers. We understand the importance of fast delivery for your business continuity; long lead times are not only frustrating, but can result in an immediate halt to your operations, decreasing productivity and causing revenue loss.

How do we get lead times this fast? We provide you with a dedicated customer service representative who handles your order from start to finish. Our team makes sure that you receive everything you need, so we get it right the first time, every time!

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 some of 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.

Women-Owned Small Business

Fredericks is proud to be a Women-Owned Small Business (WOSB). We are ISO 9001:2015 certified and registered with the U.S. State Department as ITAR compliant. All of our products are designed and manufactured at our facility in Huntingdon Valley, PA.
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### Markets We Serve

#### Agricultural Vehicles

#### Medical Equipment

#### Construction Vehicles

#### MEWPs

### Additional Markets

- Construction Tools
- Laser Leveling
- Geotechnical Monitoring
- Structural Monitoring
- RV Leveling Systems
- And More!
Electrolytic Tilt Sensors

Electrolytic tilt sensors measure an angular position with reference to gravity and are used in a wide variety of applications from construction vehicles, seismic monitoring, and medical devices.

We offer several low-cost solutions with a range of measurement up to ±60° with high accuracy from ±0.1 to ±0.001° in one or two axes that are designed and engineered to outperform MEMS-based technology.

Our electrolytic tilt sensors are designed for industrial applications, all-metal, hermetically sealed, and capable of handling the most extreme environments.
### Electrolytic Tilt Sensors

<table>
<thead>
<tr>
<th>Model</th>
<th>Operating Range</th>
<th>Linear Range</th>
<th>Axes</th>
<th>Repeatability</th>
<th>Resolution</th>
<th>Height</th>
<th>Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide-Range Tilt Sensor 0717-4313-99</td>
<td>±50°</td>
<td>±20°</td>
<td>2</td>
<td>±0.05°</td>
<td>≤0.003°</td>
<td>18.8 mm</td>
<td>9.1 mm</td>
</tr>
<tr>
<td></td>
<td>±60°</td>
<td>±25°</td>
<td>2</td>
<td>±0.05°</td>
<td>≤0.003°</td>
<td>18.8 mm</td>
<td>9.1 mm</td>
</tr>
<tr>
<td></td>
<td>±60°</td>
<td>±25°</td>
<td>2</td>
<td>±0.1°</td>
<td>≤0.003°</td>
<td>18.8 mm</td>
<td>9.1 mm</td>
</tr>
<tr>
<td></td>
<td>±50°</td>
<td>±20°</td>
<td>2</td>
<td>±0.1°</td>
<td>≤0.003°</td>
<td>18.8 mm</td>
<td>9.1 mm</td>
</tr>
<tr>
<td></td>
<td>±40°</td>
<td>±40°</td>
<td>2</td>
<td>±0.1°</td>
<td>≤0.005°</td>
<td>14 mm</td>
<td>9.1 mm</td>
</tr>
<tr>
<td></td>
<td>±45°</td>
<td>±45°</td>
<td>2</td>
<td>±0.1°</td>
<td>≤0.005°</td>
<td>14 mm</td>
<td>9.1 mm</td>
</tr>
<tr>
<td></td>
<td>±50°</td>
<td>±50°</td>
<td>2</td>
<td>±0.1°</td>
<td>≤0.005°</td>
<td>14 mm</td>
<td>9.1 mm</td>
</tr>
<tr>
<td></td>
<td>±30°</td>
<td>±10°</td>
<td>2</td>
<td>±0.1°</td>
<td>≤0.001°</td>
<td>8.5 mm</td>
<td>40.6 mm</td>
</tr>
</tbody>
</table>

**Most Popular**

**New Product!**

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**Structural Monitoring Case Study: Resensys**

Delivering the World’s Most Energy-Efficient Wireless Monitoring Solution with the Help of Fredericks’ Electrolytic Tilt Sensors!

Learn more about how the 0703-0711-99 electrolytic tilt sensor helped Resensys offer the world’s most energy-efficient wireless monitoring solution.

Visit frederickscompany.com
Electrolytic Inclinometers

Inclinometers are an assembly of our signal conditioner and tilt sensor products. The assembly provides an easy-to-use end user output in two axes like analog 0 to 5 V DC, SPI, RS-232, RS-485, and UART/TTL.

Utilizing our electrolytic tilt sensing technology, these inclinometers have measurement ranges from ±25° to ±60° with repeatability from ±0.005° to ±0.1°.

Our inclinometers offer supply voltages up to 16 V DC, and housed units with potting provide an environmental protection rating up to IP67. The standard flying leads on any of our inclinometers with a cable can be replaced with a custom connector based on your specifications.
### ApexTwo™

**Specifications**
- Operating Range: ±60°
- Linear Range: ±50°
- Axes: 2
- Accuracy: ±0.5°
- Resolution: ≤0.01°
- Supply Voltage: 10 V DC to 30 V DC
- Supply Current: 5 mA @ 12 V DC

#### ApexTwo™ Ordering Information

<table>
<thead>
<tr>
<th>Communications</th>
<th>Connector</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog</td>
<td>Deutsch</td>
<td>F260-21A-018-00</td>
</tr>
<tr>
<td>Analog</td>
<td>Amphenol</td>
<td>F260-212-018-00</td>
</tr>
<tr>
<td>RS-232</td>
<td>Deutsch</td>
<td>F260-212-018-01</td>
</tr>
<tr>
<td>RS-485</td>
<td>Deutsch</td>
<td>F260-214-018-00</td>
</tr>
<tr>
<td>RS-485</td>
<td>Amphenol</td>
<td>F260-214-018-01</td>
</tr>
</tbody>
</table>

### SPI Inclinometer

- Operating Range: ±60°
- Linear Range: ±25°
- Axes: 2
- Repeatability: ±0.1°
- Resolution: ≤0.003°
- Supply Voltage: 3.3 V DC to 5 V DC
- Supply Current: 4 mA @ 3.3 V, 6 mA @ 5 V

### RS-232 Inclinometer

- Operating Range: ±60°
- Linear Range: ±25°
- Axes: 2
- Repeatability: ±0.1°
- Resolution: ≤0.003°
- Supply Voltage: 3.3 V DC to 5 V DC
- Supply Current: 11 mA @ 3.3 V, 16 mA @ 5 V

### Analog/PWM Inclinometer

- Operating Range: ±60°
- Linear Range: ±25°
- Axes: 2
- Repeatability: ±0.1°
- Resolution: ≤0.003°
- Supply Voltage: 3.3 V DC to 5 V DC
- Supply Current: 10 mA @ 3.3 V, 15 mA @ 5 V

### RS-485 Inclinometer

- Operating Range: ±60°
- Linear Range: ±25°
- Axes: 2
- Repeatability: ±0.1°
- Resolution: ≤0.003°
- Supply Voltage: 3.3 V DC to 5 V DC
- Supply Current: 6 mA @ 3.3 V, 9 mA @ 5 V

### UART/TTL Inclinometer

- Operating Range: ±25°
- Linear Range: ±10°
- Axes: 2
- Repeatability: ±0.005°
- Resolution: ≤0.001°
- Supply Voltage: 5 V DC ±0.25 V DC
- Supply Current: <10 mA @ 5 V DC

### Analog/RS-232 Inclinometer

- Operating Range: ±3°
- Linear Range: ±1°
- Axes: 2
- Repeatability: ±0.001°
- Resolution: ≤0.001°
- Supply Voltage: 7 V DC to 16 V DC
- Supply Current: <10 mA

### Most Popular

#### Analog/RS-232 Inclinometer

- Operating Range: ±60°
- Linear Range: ±25°
- Axes: 2
- Repeatability: ±0.1°
- Resolution: ≤0.003°
- Supply Voltage: 7 V DC to 16 V DC
- Supply Current: 20 mA @ 7 V DC

#### Analog/PWM Inclinometer

- Operating Range: ±60°
- Linear Range: ±25°
- Axes: 2
- Repeatability: ±0.1°
- Resolution: ≤0.003°
- Supply Voltage: 7 V DC to 16 V DC
- Supply Current: 20 mA @ 7 V DC

#### RS-232 Inclinometer

- Operating Range: ±60°
- Linear Range: ±25°
- Axes: 2
- Repeatability: ±0.1°
- Resolution: ≤0.003°
- Supply Voltage: 7 V DC to 16 V DC
- Supply Current: 20 mA @ 7 V DC

#### RS-485 Inclinometer

- Operating Range: ±60°
- Linear Range: ±25°
- Axes: 2
- Repeatability: ±0.1°
- Resolution: ≤0.003°
- Supply Voltage: 7 V DC to 16 V DC
- Supply Current: 20 mA @ 7 V DC
Electrolytic Tilt Switches

Our tilt switches are very similar to our inclinometers, but instead of a continuous output, tilt switches have a discrete on/off output from either a relay or an open collector.

The angle where the tilt switch output switches can be set to specific angle positions in one or two axes, up to ±45° tilt. The trip angle can be set by us at the factory or set and reset by you in the field.

These tilt switches are housed and have optional potting to provide up to IP67 environmental protection. Cables with flying leads and connectors are available with customization based on your requirements.
Dual-Axis Tilt Switch

- Maximum Trip Angle: ±35°
- Minimum Trip Angle: ±1°
- Output: 1 Relay
- Axes: 2
- Repeatability: ±0.1°
- Long Term Stability: ≤0.1°

Single-Axis Tilt Switch

- Maximum Trip Angle: ±45°
- Minimum Trip Angle: ±1°
- Output: 2 Open Collectors
- Axes: 1
- Repeatability: ±0.1°
- Long Term Stability: ≤0.1°

0729-1763-XX

- Dual-Axis Tilt Switch
- Maximum Trip Angle: ±45°
- Minimum Trip Angle: ±1°
- Output: 4 Relays
- Axes: 2
- Repeatability: ±0.1°
- Long Term Stability: ≤0.1°

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- No more emails or phone calls

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Share the products in your cart with a colleague to complete your order!
Signal Conditioners For Electrolytic Tilt Sensors

All of our electrolytic tilt sensors require a basic circuit to generate a tilt angle output. We offer a wide range of compact signal conditioners that have outputs including analog 0 to 5 V DC, SPI, PWM, RS-232, and RS-485 digital communications.

Our signal conditioners include convenient mounting holes and connectors allowing you to simply mount and integrate our circuits in your design. These products have 16-bit outputs to ensure the best accuracy in your application.

We have a team of engineers that are ready to help you design your own signal conditioning circuit that can be integrated into your own PCB. This includes providing sample schematics, PCB layouts, component selection, and firmware.
### Signal Conditioners

#### 1-6200-005

**SPI Signal Conditioner**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications</td>
<td>SPI</td>
</tr>
<tr>
<td>Supply Voltage</td>
<td>3.3 V DC to 5 V DC</td>
</tr>
<tr>
<td>Supply Current</td>
<td>6 mA @ 5 V DC</td>
</tr>
<tr>
<td></td>
<td>4 mA @ 3.3 V DC</td>
</tr>
<tr>
<td>Operating Range</td>
<td>0% to 100% of connected sensor range</td>
</tr>
<tr>
<td>Output</td>
<td>16 bit</td>
</tr>
</tbody>
</table>

#### 1-6200-006

**RS-232 Signal Conditioner**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications</td>
<td>RS-232</td>
</tr>
<tr>
<td>Supply Voltage</td>
<td>3.3 V DC to 5 V DC</td>
</tr>
<tr>
<td>Supply Current</td>
<td>16 mA @ 5 V DC</td>
</tr>
<tr>
<td></td>
<td>11 mA @ 3.3 V DC</td>
</tr>
<tr>
<td>Operating Range</td>
<td>0% to 100% of connected sensor range</td>
</tr>
<tr>
<td>Output</td>
<td>16 bit</td>
</tr>
</tbody>
</table>

#### 1-6200-007

**Analog/PWM Signal Conditioner**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications</td>
<td>Analog 0 to V&lt;sub&gt;dd&lt;/sub&gt;, PWM</td>
</tr>
<tr>
<td>Supply Voltage</td>
<td>3.3 V DC to 5 V DC</td>
</tr>
<tr>
<td>Supply Current</td>
<td>15 mA @ 5 V DC</td>
</tr>
<tr>
<td></td>
<td>10 mA @ 3.3 V DC</td>
</tr>
<tr>
<td>Operating Range</td>
<td>0% to 100% of connected sensor range</td>
</tr>
<tr>
<td>Output</td>
<td>16 bit</td>
</tr>
</tbody>
</table>

#### 1-6200-008

**RS-485 Signal Conditioner**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications</td>
<td>RS-485</td>
</tr>
<tr>
<td>Supply Voltage</td>
<td>3.3 V DC to 5 V DC</td>
</tr>
<tr>
<td>Supply Current</td>
<td>9 mA @ 5 V DC</td>
</tr>
<tr>
<td></td>
<td>6 mA @ 3.3 V DC</td>
</tr>
<tr>
<td>Operating Range</td>
<td>0% to 100% of connected sensor range</td>
</tr>
<tr>
<td>Output</td>
<td>16 bit</td>
</tr>
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</table>

#### 1-6200-012

**Analog/RS-232 Signal Conditioner**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications</td>
<td>RS-232, 0 V DC to 5 V DC</td>
</tr>
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<td>7 V DC to 16 V DC</td>
</tr>
<tr>
<td>Supply Current</td>
<td>20 mA @ 7 V DC</td>
</tr>
<tr>
<td>Operating Range</td>
<td>0% to 100% of connected sensor range</td>
</tr>
<tr>
<td>Output</td>
<td>16 bit</td>
</tr>
</tbody>
</table>