



## Tilt Measurement Product Overview

### Company Overview

The Fredericks Company is an ISO 9001:2015 certified company founded in 1935. Our facility is located in Huntingdon Valley, Pennsylvania and we are a leading designer and manufacturer of electrolytic tilt sensors and inclinometer assemblies. Because we design and manufacture both the core electrolytic sensing technology and the completed inclinometer assembly at our facility, we maintain full control over the production process of our units. This ensures quality from unit to unit and eliminates any problems associated with parts obsolescence. Electrolytic tilt sensors manufactured at our facility have performed reliably in the field for many years, testifying to the quality of our workmanship.

The long history of The Fredericks Company provides assurance that we will continue to support and manufacture our products in coming years; we also guarantee support of our products for as long as they are being used in our customers' products and the raw materials remain available. Our skilled engineering team has decades of combined experience and can provide in depth implementation recommendations upon request.

### Typical Applications

#### Narrow and Mid-Range

- Dam, building, and bridge construction monitoring
- Geophysical and earthquake monitoring
- Gyroscope leveling
- Laser leveling equipment
- Machine tool leveling
- Mining machinery and safety equipment
- Structural monitoring
- Warp monitoring
- Zero point adjustment

#### Wide Range

- Aerial lift platform leveling monitor or control
- Agricultural equipment
- Antenna positioning
- Blade angle measurement of road graders and pavers
- Chassis level monitoring
- Crane boom angle measurement
- Construction machinery
- Forestry machinery
- GPS compensation
- Hydraulic leveling and stabilization systems
- Oil exploration
- Robotic controls
- Satellite dish alignment
- Solar panel position and elevation control
- Tilt switches and alarms
- Wheel alignment systems

### Electrolytic Tilt Sensors - General Information

Electrolytic tilt sensors from The Fredericks Company provide high accuracy angular position measurement in one or two axes. These sensors require signal conditioning circuitry to provide an angular output. The Fredericks Company offers a variety of low cost signal conditioners to run our electrolytic sensors. Customers can also design their own signal conditioning circuitry; TFC can provide circuit and software design input and analysis upon request.

### 0717 Series Dual Axis Wide Range Metal Sensors

Part Number	Operating Range	Repeatability
0717-4313-99	±50°	±0.05°
0717-4315-99	±60°	±0.05°
0717-4318-99	±60°	±0.1°
0717-4319-99	±50°	±0.1°
0717-4321-99	±40°	±0.1°
0717-4322-99	±45°	±0.1°
0717-4323-99	±50°	±0.1°

### Metal and Glass Single Axis Narrow and Mid-Range Sensors

Part Number	Operating Range	Repeatability
0703-1602-99	±25°	±18 arc seconds
0703-0711-99	±3°	±5 arc seconds
0737-0101-99	±10°	±2 arc seconds
0737-1203-99	±0.5°	±0.5 arc seconds

### Ceramic Wide Range Sensors

Part Number	Operating Range	Repeatability
0728-1025-99	±85°	±0.05°

### Inclinometers - General Information

Inclinometers are an assembly of a signal conditioner and tilt sensor. The assembly provides an output of tilt position in one or two axes through a variety of standard interfaces. Our inclinometers utilize either electrolytic or MEMS technology to sense tilt angle. A regulated power input is available as well as potting for all housed units. Potting provides an environmental protection rating of IP67.

### Inclinometers with Electrolytic Sensors

Part Number	Operating Range	Interface	Housing
0729-1751-99	Up to ±60°	SPI	PCB
0729-1752-99	Up to ±60°	RS-232	PCB
0729-1753-99	Up to ±60°	Analog/PWM	PCB
0729-1754-99	Up to ±60°	RS-485	PCB
0729-1755-99	Up to ±60°	Analog/PWM	ABS
0729-1759-99	Up to ±60°	RS-232	ABS
0729-1760-99	Up to ±60°	RS-485	ABS
0729-1760-04	Up to ±10°	RS-485	ABS

### Inclinometers with MEMS Sensors

Part Number	Operating Range	Interface	Housing
0750-9002-99	±90°	RS-485	Zinc
0750-3002-99	±30°	RS-485	Zinc
0751-9002-99	±90°	Analog	Zinc
0751-3002-99	±30°	Analog	Zinc



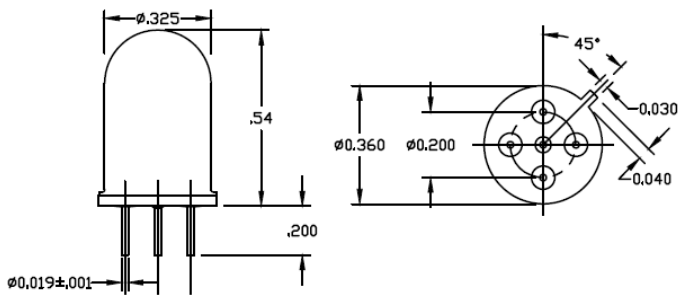
## Tilt Switches - General Information

Tilt switches provide an on/off indication of whether the unit is tilted past a certain angle which is field programmable. The type of output and availability of communications is dependent on the unit. All tilt switches utilize an electrolytic tilt sensor and signal conditioner. They are also enclosed in an ABS plastic housing with potting to provide an environmental protection rating of IP67. They also include a regulated power input.

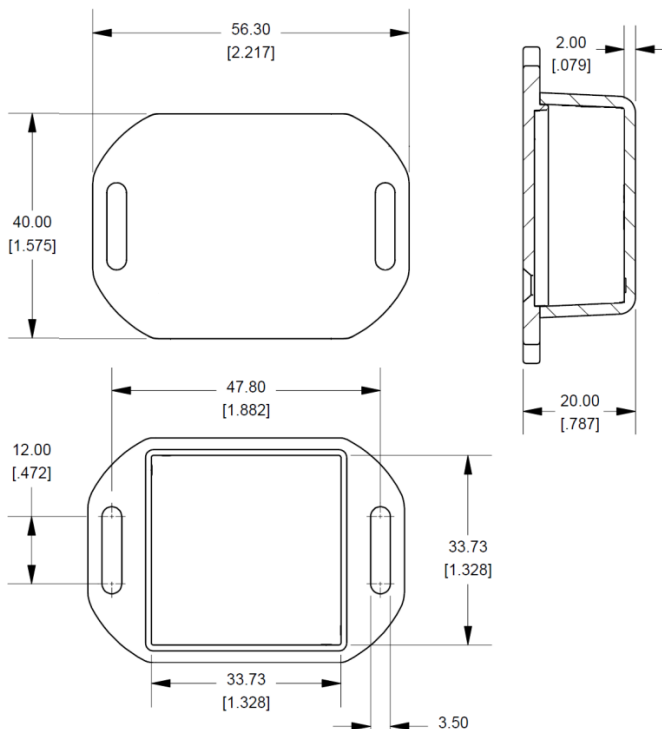
### Tilt Switches

Part Number	Range	Interface	Axes
0729-1763-XX	±1° to ±45°	Relay and RS-232	2
0729-1736-99	±1° to ±35°	Relay and RS-232	2
0729-1757-99	±1° to ±45°	Open Collector	1
0729-1758-99	±1° to ±45°	Open Collector	1

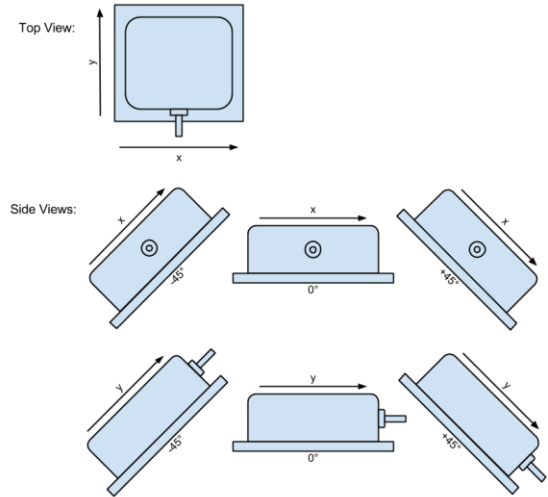
### Typical Electrolytic Tilt Sensor Dimensions



### Typical Inclinometer Dimensions



### Typical Inclinometer Functional Diagram



### Prototypes

The Fredericks Company provides customization of most aspects of existing units in addition to creating new designs. Some of our current projects include expanding our inclinometer line with the prototype units listed below.

### Prototype Inclinometers

Operating Range	Interface	Housing	Axes
±70°	RS-232	Noryl	1
±45°	RS-232	Noryl	2
±25°	TTL	Noryl	2

### Benefits of TFC Tilt Measurement Products

- Low cost with excellent resolution and repeatability
- Very low power consumption
- Extremely long life
- Minimal drift over lifetime compared to MEMS devices
- Superior performance in extreme temperatures and environments
- Excellent customer support
- Manufactured in the United States of America

### Contact Us

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