FREDERICKS COMPANY

RS-232 Signal Conditioner for Electrolytic Tilt Sensors
Part Number: 1-6200-006

Operating Specifications[1]

Communications	RS-232
Analog Input Resolution	16 bits (10 bits oversampled)
Operating Range	0% to 100% of sensor range
Supply Voltage	3.3 V DC to 5 V DC
Supply Current	16 mA @ 5 V DC, 11 mA @ 3.3 V DC
Operating Temperature	-40 °C to 85 °C
Storage Temperature	-40 °C to 125 °C
Sensors Controlled	1 or 2
Axes of Measurement	1 or 2
Temperature Sensor Range	-40 °C to 125 °C

Dimensions

Housing	None
Electrical Connections	7 Pin, 2.54 mm (0.1") spacing
Weight	4 g
Length	32 mm (1.25")
Width	32 mm (1.25")
Hole Center	27 mm (1.05")

RS-232 Commands

'X'	X axis output (0 to 65535)
'Y'	Y axis output (0 to 65535)
'T'	Temperature output (0 to 1023)
'S'	Output X, Y, temperature at set intervals
'R'	Stop timed interval output
'1' to '5'	Delay (in seconds) for set intervals
'@' 'Z' '#'	Set current position as zero
'&' 'C' '*'	Clear saved zero position

Electrical Connections

J1 Pin 1 (+5)	Supply (+)
J1 Pin 2 (C)	Supply (-)
J1 Pin 3 (C)	Ground
J1 Pin 4 (OUT)	RS-232 transmit (TX)
J1 Pin 5 (IN)	RS-232 receive (RX)
J1 Pin 6 (C)	Ground
J1 Pin 7 (C)	Ground
L1	Dual axis sensor connection
J3	Single axis sensor x axis connection
J4	Single axis sensor y axis connection

Benefits

- Very low power consumption
- Simple integration
- Excellent resolution and repeatability of measurements
- Superior performance in extreme temperatures and environments
- Excellent customer support
- Manufactured in the United States of America

Description

The 1-6200-006 RS-232 signal conditioner can be used with any Fredericks electrolytic tilt sensor. This signal conditioner can be connected to a dual axis tilt sensor or 1 or 2 single axis tilt sensors to provide single or dual axis position measurement over the sensor's range.

Fredericks 0717 series wide range sensors can be mounted directly to the PCB for a complete inclinometer solution. Single axis sensors must be mounted externally to the PCB and connected with wires.
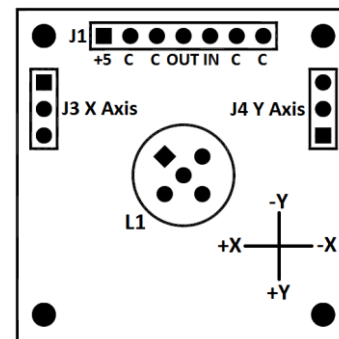
A detailed list of compatible sensors can be found on page 2 in the Related Products section.

Applications

- Recreational vehicle leveling (also known as an RV, caravan, camper van, or motorhome)
- Construction vehicles
- Geotechnical and structural monitoring
- Laser leveling
- Machine tool leveling
- Rail track monitoring
- Satellite positioning

View a full list of applications on The Fredericks Company website at www.frederickscompany.com.

Pin Diagram and Direction of Measurement

Note that the direction of measurement only applies when a dual axis sensor is mounted on the PCB.

Certifications and Ratings

- RoHS Compliant

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:

Temperature in °C = (((output/1023)*supply voltage)-0.5)/0.01

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[1] Visit www.frederickscompany.com for a list of definitions.

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RS-232 Settings

Baud Rate	9600
Data Bits	8
Parity	None
Stop Bits	1

Related Products

Dual Axis Electrolytic Sensors - Metal	
0717-4318-99	±60˚ range, ±0.1˚ repeatability
0717-4319-99	±50˚ range, ±0.1˚ repeatability
0717-4313-99	±50˚ range, ±0.05˚ repeatability
0717-4315-99	±60˚ range, ±0.05˚ repeatability

Single Axis Electrolytic Sensors - Metal	
0703-0711-99	±3˚ range, ±0.001˚ repeatability
0703-1602-99	±25˚ range, ±0.005˚ repeatability

Single Axis Electrolytic Sensors - Glass	
0737-0101-99	±10˚ range, ±0.0006˚ repeatability
0737-1203-99	±0.5˚ range, ±0.0001˚ repeatability
0711-0763-99	±1˚ range, ±0.0008˚ repeatability
0711-0768-99	±3˚ range, ±0.0008˚ repeatability

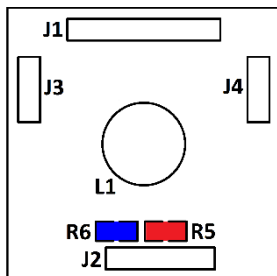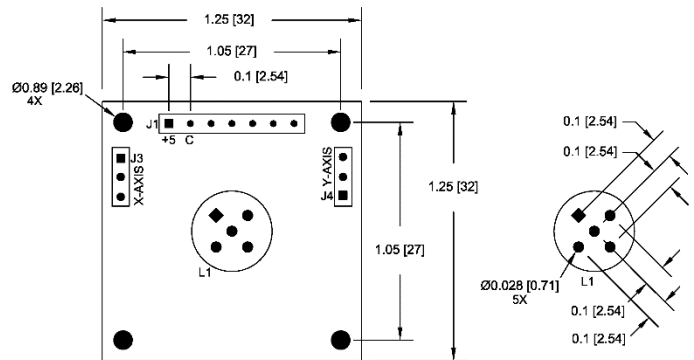| Single Axis Electrolytic Sensors - Glass Encapsulated	
0719-3705-99	±10˚ range, ±0.0006˚ repeatability
0719-3703-99	±0.5˚ range, ±0.0001˚ repeatability
0719-1137-99	±1˚ range, ±0.0008˚ repeatability
0719-1143-99	±3˚ range, ±0.0008˚ repeatability

Board Configuration

The 1-6200-006 signal conditioner can be configured to operate one dual axis sensor or two single axis sensors. This configuration is determined by the resistor values of R5 and R6.

For a dual axis sensor: R5 is 10 kΩ, R6 is not installed. The sensor is connected to L1.

For single axis sensors: R5 is not installed, R6 is 1 kΩ. Sensors are connected to J3 and J4.

Dimensional Drawings

Example RS-232 Command and Response Byte Values

Retrieve X axis tilt value which returns 32768 (0° tilt):

Command

Byte	0
ASCII	X
Hex	0x58

Response

Byte	0	1	2	3	4	5	6
ASCII	3	2	7	6	8	<lf>	<cr>
Hex	0x33	0x32	0x37	0x36	0x38	0x0A	0x0D

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