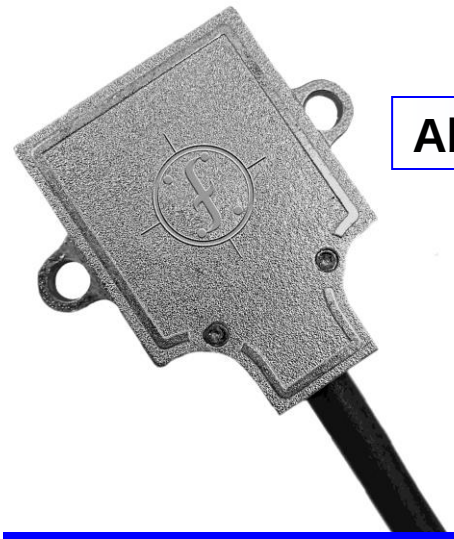

0751 Series

Absolute Stand Alone Inclinometer

0751 Dual axis Analog output

FEATURES

√ Silicon 3D MEMS sensor
√ Dual axis inclination measurement (X and Y)
√ Measuring ranges ±30° and ± 90°
√ 0.1° Accuracy
√ 0.0035° resolution (10 Hz BW, analog output)
√ Sensing element controlled over damped
√ Frequency response (-3dB 18 Hz)
√ Robust design, high shock durability (20000g)
√ Unrelated 7….35V supply
√ RoHS compliant

BENEFITS

√ Excellent long term stability
√ Sensing element controlled frequency response
√ Outstanding shock durability
√ Harsh environment robustness

APPLICATIONS

√ Platform leveling and stabilization
√ 360° vertical orientation measurement
√ Leveling instruments
√ Cabin leveling
√ Solar panel control systems

For Customized product please contact The Fredericks Company

ELECTRICAL CHARACTERISTICS

Parameter	Condition	Min.	Typ	Max.	Units
Supply voltage		7	16	35	V
Current consumption			5	8	mA
Analog resistive output load	Vout to Vdd or GND	10			kOhm
Analog capacitive output load	Vout to Vdd or GND			20	nF
Start-up delay	Reset and parity check			10	ms

PERFORMANCE CHARACTERISTICS

Parameter	Condition	0751-9002-99	0751-3002-99	Units
Measuring range (1)	Nominal	+/-90 _/-1	+/-30 +/-0.5	° g
Supply voltage		7…35	7…35	V
Offset (Output at 0g) (2,5)		2.5	2.5	V
Offset calibration error	Max deviation	+/-1	+/-1	°
Sensitivity	Between 0…..1°	2 35	4 70	V/g mV/°
Sensitivity calibration error		+/-1.5	+/-1.5	%
Offset temperature error	-25…..85°C 0…..70°C	+/-0.6 +/-0.2	+/-0.6 +/-0.2	° °
Sensitivity temperature (5) dependency	-25…..85°C 0…..70°C	-1.5….+0.5 -0.8….+0.3	-1.5….+0.5 -0.8….+0.3	% %
Typical non-linearity	Sinus output	N/A	+/-0.1	°
Frequency response (3)	-3dB LP (2	18	18	Hz
Ratio error	Vdd = 4.75….5.25V			%
Cross-axis sensitivity (4)	Max.	3	3	%

Typical values @ ambient temperature unless otherwise specified.

Note1. The measurement is limited by the sensitivity and offset.
Note2. Offset specified as Output @ 0°.
Note 3. The frequency response is determined by the sensing element's internal gas dampening
The output has true DC (OHz) response.
Note 4. The cross-axis sensitivity determines how much inclination, perpendicular to the measuring axis, couples to the output
Note 5. Mounting position should be calibrated. See measuring positions

MEASURING POSITIONS

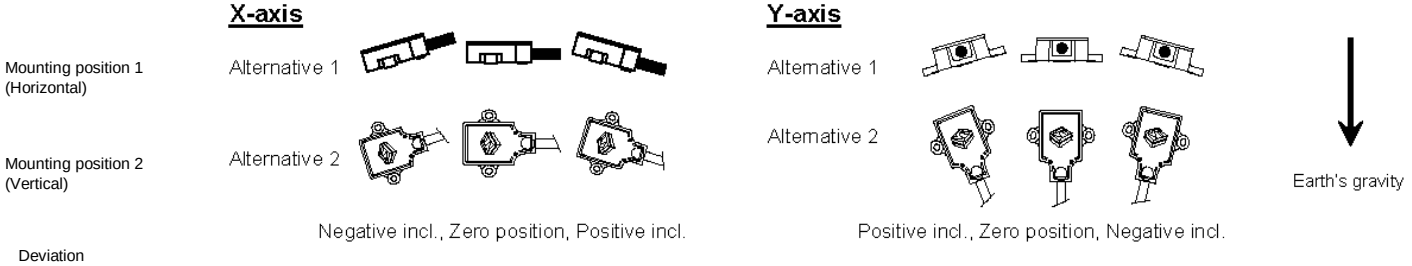

Figure 1. Positions

Notes:
» It is important that the part is parallel to the mounting plane, and that the output equals zero value when sensor is in the zero position
» Zero position: Please note the picture above, which provides information on how the output of the accelerometer behaves in different circumstances when assembled. Please also note that you can rotate the part around the measuring plane for optimum mounting location

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Absolute Stand Alone Inclinometer

Voltage to Angle Conversion

Analog output can be transferred to angle using the following equation for conversion

$$\alpha = \arcsin\left\{\frac{V_{Dout} - Offset}{Sensitvity}\right\}$$

Where: Offset = output of the device at 0° inclination, Sensitivity is the sensitivity of the device and V_{Dout} is the output of the 0751. The nominal offset is 2.5 V and the sensitivity is 4 V/g for the 0751-3002 and 2 V/g for the 0751-9002.

ELECTRICAL CONNECTIONS

SOFTWARE LEVELS

Wire color	Name	Function
Blue	GND	Ground
Red	Vdd	Power supply
Yellow	Out X	X-axis output
White	Out Y	Y-axis output
Green	NC	Not Connected

MECHANICAL SPECIFICATIONS

MOUNTING

Cable length:	30 cm
	Oc
Cable type:	UL/CSA listed,
PUR black Cable diam.:	6±0.2mm
Leads:	5 x 0.14mm^2
Total weight:	Approx. 60 grams
Protection class:	IP66
Housing:	Zinc casting with passivation
Mounting	The sensor module is to be mounted on a flat and smooth surface with 2 screws, dimension M4. Mounting torque 5 ±1Nm

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