

- Small, Low-Cost, Rugged
- Rapid Response
- ± 75° Range
- Fully Conditioned
  Analog Outputs

## Applications

- Scissor Lifts
- Static Platforms
- Survey Leveling Equipment
- Laser Leveling





## CXTA01, CXTA02

The CXTA single- and dual-axis analog tilt sensors offer resolution, accuracy, and fast response in an inexpensive, easy-to-use package. The CXTA series design centers on a highly stable silicon micro-machined capacitive inclination sensor element. The CXTA series is fully signal conditioned with high level analog output(s), and optional analog temperature signal.

Micro-machined devices, perfected in automotive safety applications, offer several distinct advantages over fluid, electrolytic, and pendulum-based sensors. Like other solid-state devices, they are more reliable than their mechanical counterparts. In a package smaller than many pendulum or fluid raw sensing elements, completely integrated electronics eliminate the need for external components. Unlike other micro-machined devices, the



Micromachined Tilt Sensor Element



A typical configuration using CXTA sensors is shown below. Each module is factory calibrated, tested and includes a calibration sheet. The

module can be securely attached using screws or adhesive. The CXTA is available in a standard nylon or high temperature aluminum package.



Typical CXTA02 Configuration



CXTA

Solid State, Analog Series

Specifications		CXTA01	CXTA02	Remarks	
Performance					
Linear A	ngular Range (°)	± 20	± 20		
Full Angular Range (°)		± 75	± 75		
Angular	Resolution (° rms)	0.05	0.05		
Sensitivi	ity - small angles (mV/ <sup>o</sup> )	35 ± 2	35 ± 2	Actual value provided with Sensor	
Sensitivi	ity Drift (%/ <sup>o</sup> C)	0.01	0.01		
Zero An	gle Voltage (Volts)	2.5 ± 0.15	2.5 ± 0.15	Actual value provided with Sensor	
Zero An	gle Drift (mV/ºC)	1.0	1.0	Typical	
Zero Ang	gle Drift <sup>(0</sup> / <sup>0</sup> C)	0.03	0.03	Typical	
Non-Lin	earity (°)	< 0.4	< 0.4	Over ± 20 <sup>o</sup> not including Arcsine Error	
Bandwidth (Hz)		50	50		
Settling Time (sec)		0.2	0.2		
Alignment (°)		± 1	± 1	Typical	
Cross-axis Sensitivity (%))		< 5	< 5	Inclusive of alignment error	
Environment					
Storage Temperature ( <sup>o</sup> C)		-55 to +85	-55 to +85	Nylon Package	
Operating Temperature ( <sup>o</sup> C)		-40 to +85	-40 to +85	Nylon Package	
Storage Temperature (°C)		-55 to +105	-55 to +105	-AL High Temperature Package	
Operating Temperature ( <sup>o</sup> C)		-40 to +105	-40 to +105	-AL High Temperature Package	
Non-Operating Vibration (g rms)		10	10	20-2 kHz random	
Shock (g)		2000	2000	1 ms, half sine	
Electrical					
Supply Voltage (VDC)		6 - 30	6 - 30	Unregulated	
Current (mA)		4	8		
Physical					
Size	(Nylon Package)	.78 x 1.75 x 1.0	7" (1.98 x 4.45 x 2.72 cm)		
	(Aluminum Package)	.95 x 2.00 x 1.2	0" (2.41 x 5.08 x 3.05 cm)		
Weight (Nylon Package)		1.38 oz (43 gm)			
(Aluminum Package)		2.09 oz (65 gm)			





Specifications subject to change without notice

## Principle of Operation

The CXTA Series Tilt Sensors use a micromachined acceleration sensing element with a DC response to measure inclination relative to gravity. The response of the tilt sensor depends on the magnitude of gravity parallel to the sensor element. The output of the tilt sensor will be an offset voltage plus the voltage response proportional to the amount of gravity measured by the sensor.

## Using the CXTA Sensor

The voltage response of the CXTA is proportional to the sine of the tilt angle.

Accurately measuring tilt angle involves solving the equation shown in Figure 1. To solve this equation the Zero Angle Voltage and Sensitivity must be determined prior to use, and the sensitivity must be converted to V/rad. ACEINNA provides this infor - mation on a calibration sheet with its CXTA products.



For angles less than 20°, the sine function can be approximated by a linear relationship between the Vout and the tilt angle in degrees. Thus the simplified equation for small angle in degrees is:

When the tilt angle is less than 20°, the error from linear approximation will be less than 2%. This is convenient when you don't have or want the computing power to calculate an inverse sine function.

	Pin	Color	Function
	1	Red	Power
	2	Black	Ground
	3	White	Roll
	4	Yellow	Pitch
	5	Green	Temp



**Optional Aluminum Package** 

Ordering Information

Model	Axes	Linear Range	Full Range	Resolution			
CXTA01	x	± 20°	± 75°	0.05°			
CXTA02	X,Y	± 20°	± 75°	0.05°			
OPTIONS							
-Т	Temperature Sensor Internal						
-AL	High Temperature Aluminum Package						

Pin Diagram

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Questi prodotti sono distribuiti e supportati in Italia da:



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