

Tilt Sensors

SOLID STATE, LOW RANGE, ANALOG SERIES

- ▼ Small, Low-Cost, Rugged
- ▼ Vibration Resistant
- ▼ $\pm 20^\circ$ Range, 100 mV/ $^\circ$ output
- ▼ Fully Conditioned Analog Outputs

Applications

- ▼ Scissor Lifts
- ▼ Static Platforms
- ▼ Alignment Systems
- ▼ Laser Leveling



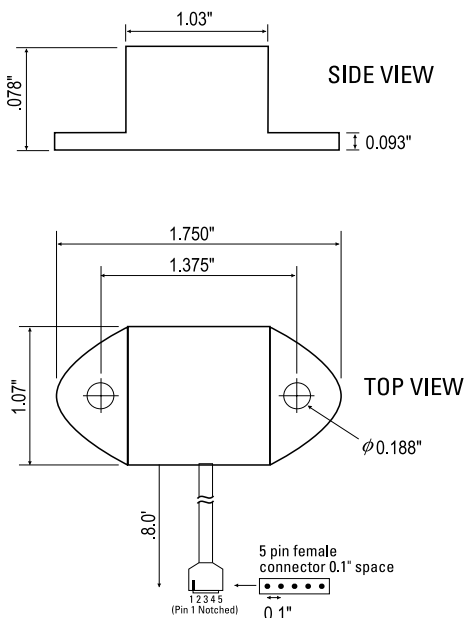
CXTLA01, CXTLA02

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

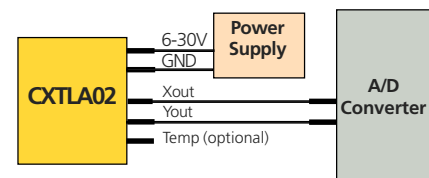
Micro-machined devices, perfected in automotive safety applications, offer several distinct advantages over fluid, electrolytic, and pendulum-based sensors. Like other solid-state devices, they are more reliable than their mechanical counterparts. In a package smaller than many pendulum or fluid sensing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

Unlike other micro-machined devices, the CXTLA Series maintains its accuracy and stability over temperature: $< 2^\circ$ of arc over the range 0° to 70° C. The output can be user corrected for temperature with the -T option, yielding accuracy to within $\pm 0.5^\circ$ over the angular range.

A typical configuration using CXTLA 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 CXTLA is available in a standard nylon or high temperature aluminum package.



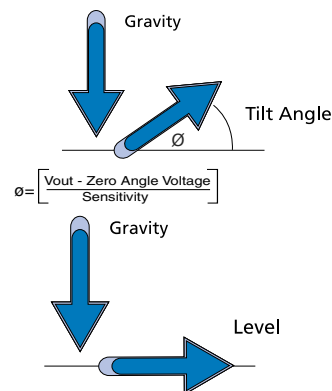
Micromachined Tilt Sensor Element



Typical CXTLA02 Configuration

Specifications	CXTLA01	CXTLA02	Remarks
Performance			
Angular Range (°)	± 20	± 20	
Angular Resolution (° rms)	0.03	0.03	
Sensitivity - small angles (mV/°)	100 ± 10	100 ± 10	Actual value provided with Sensor
Sensitivity Drift (%/°C)	0.01	0.01	
Zero Angle Voltage (Volts)	2.5 ± 0.15	2.5 ± 0.15	Actual value provided with Sensor
Zero Angle Drift (mV/°C)	3	3	Typical
Zero Angle Drift (°/°C)	0.03	0.03	Typical
Non-Linearity (°)	< 0.4	< 0.4	Over ± 20°
Bandwidth (Hz)	6	6	
Alignment (°)	± 1	± 1	Typical
Cross-axis Sensitivity (%)	< 5	< 5	Inclusive of alignment error
Environment			
Storage Temperature (°C)	-55 to +85	-55 to +85	Nylon Package
Operating Temperature (°C)	-40 to +85	-40 to +85	Nylon Package
Storage Temperature (°C)	-55 to +105	-55 to +105	-AL High Temperature Package
Operating Temperature (°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)	.75 x 1.875 x 1.00" (1.91 x 4.763 x 2.54 cm)		
(Aluminum Package)	.95 x 2.00 x 1.20" (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

Figure 1
Sensitivity (V/°)

Principle of Operation

The CXTLA Series Tilt Sensors use a micro-machined 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 CXTLA Sensor

The voltage response of the CXTLA is proportional to the tilt angle.

Accurately measuring tilt angle involves solving the equation shown at Figure 1. To solve this equation the Zero Angle Voltage and Sensitivity must be determined prior to use. Crossbow provides this information on a calibration sheet with its CXTLA products.

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

Pin Diagram



Optional Aluminum Package

Ordering Information

Model	Axes	Full Range	Resolution	
CXTLA01	X	± 20°	0.03°	
CXTLA02	X,Y	± 20°	0.03°	
OPTIONS				
-T	Temperature Sensor Internal			
-AL	High Temperature Aluminum Package			

CALL FACTORY FOR OTHER CONFIGURATIONS

SUNSTAR 商斯达实业集团是集研发、生产、工程、销售、代理经销、技术咨询、信息服务等为一体的高科技企业，是专业高科技电子产品生产厂家，是具有 10 多年历史的专业电子元器件供应商，是中国最早和最大的仓储式连锁规模经营大型综合电子零部件代理分销商之一，是一家专业代理和分销世界各大品牌 IC 芯片和电子元器件的连锁经营综合性国际公司，专业经营进口、国产名厂名牌电子元件，型号、种类齐全。在香港、北京、深圳、上海、西安、成都等全国主要电子市场设有直属分公司和产品展示展销窗口门市部专卖店及代理分销商，已在全国范围内建成强大统一的供货和代理分销网络。我们专业代理经销、开发生产电子元器件、集成电路、传感器、微波光电元器件、工控机/DOC/DOM 电子盘、专用电路、单片机开发、MCU/DSP/ARM/FPGA 软件硬件、二极管、三极管、模块等，是您可靠的一站式现货配套供应商、方案提供商、部件功能模块开发配套商。商斯达实业公司拥有庞大的资料库，有数位毕业于著名高校——有中国电子工业摇篮之称的西安电子科技大学（西军电）并长期从事国防尖端科技研究的高级工程师为您精挑细选、量身订做各种高科技电子元器件，并解决各种技术问题。

更多产品请看本公司产品专用销售网站：

商斯达中国传感器科技信息网：<http://www.sensor-ic.com/>

商斯达工控安防网：<http://www.pc-ps.net/>

商斯达电子元器件网：<http://www.sunstare.com/>

商斯达微波光电产品网：[HTTP://www.rfoe.net/](http://www.rfoe.net/)

商斯达消费电子产品网：<http://www.icasic.com/>

商斯达实业科技产品网：<http://www.sunstars.cn/>

传感器销售热线：

地址：深圳市福田区福华路福庆街鸿图大厦 1602 室

电话：0755-83370250 83376489 83376549 83607652 83370251 82500323

传真：0755-83376182 (0) 13902971329 MSN: SUNS8888@hotmail.com

邮编：518033 E-mail:szss20@163.com QQ: 195847376

深圳赛格展销部：深圳华强北路赛格电子市场 2583 号 电话：0755-83665529 25059422

技术支持：0755-83394033 13501568376

欢迎索取免费详细资料、设计指南和光盘；产品凡多，未能尽录，欢迎来电查询。

北京分公司：北京海淀区知春路 132 号中发电子大厦 3097 号

TEL: 010-81159046 82615020 13501189838 FAX: 010-62543996

上海分公司：上海市北京东路 668 号上海赛格电子市场 2B35 号

TEL: 021-28311762 56703037 13701955389 FAX: 021-56703037

西安分公司：西安高新开发区 20 所(中国电子科技集团导航技术研究所)

西安劳动南路 88 号电子商城二楼 D23 号

TEL: 029-81022619 13072977981 FAX:029-88789382