

CXTA

SOLID STATE, ANALOG SERIES

- Small, Low-Cost, Rugged
- Rapid Response
- $\pm 75^\circ$ Range
- Fully Conditioned Analog Outputs

Applications

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



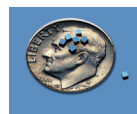
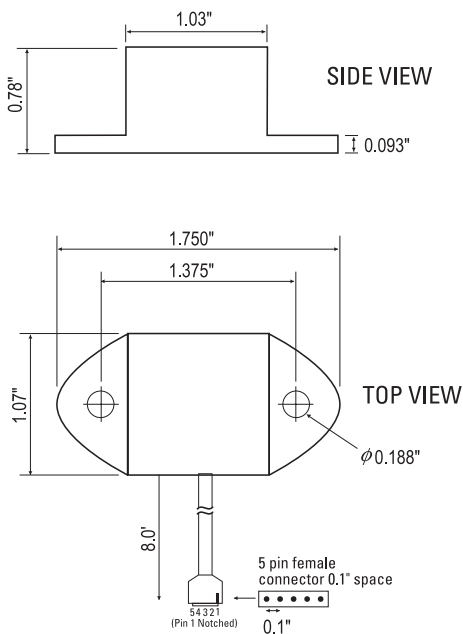
CXTA01, CXTA02

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.

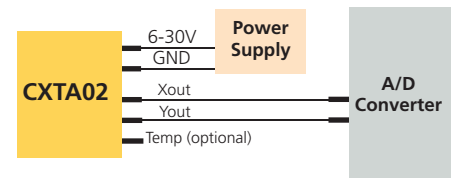
Unlike other micro-machined devices, the CXTA Series maintains its accuracy and stability over temperature: $< 2^\circ$ of arc over the range 0° to 70° C. The output can be user corrected for temperature with the T option, yielding accuracy to within $\pm 0.5^\circ$ over the angular range.

A typical configuration using 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.

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.



Micromachined
Tilt Sensor Element

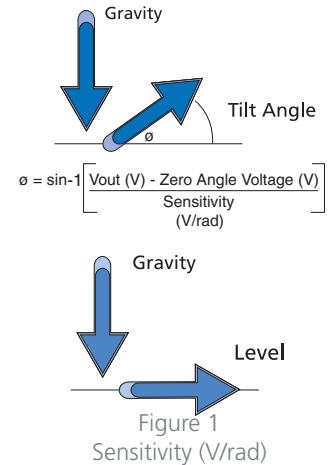


Typical CXTA02 Configuration



| Specifications | CXTA01 | CXTA02 | Remarks |
|-----------------------------------|--|-------------|--|
| Performance | | | |
| Linear Angular Range (°) | ± 20 | ± 20 | |
| Full Angular Range (°) | ± 75 | ± 75 | |
| Angular Resolution (° rms) | 0.05 | 0.05 | |
| Sensitivity - small angles (mV/°) | 35 ± 2 | 35 ± 2 | 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) | 1.0 | 1.0 | Typical |
| Zero Angle Drift (°/°C) | 0.03 | 0.03 | Typical |
| Non-Linearity (°) | < 0.4 | < 0.4 | Over ± 20° 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 (°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) | .78 x 1.75 x 1.07" (1.98 x 4.45 x 2.72 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



Principle of Operation

The CXTA 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 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. MEMSIC provides this information on a calibration sheet with its CXTA products.

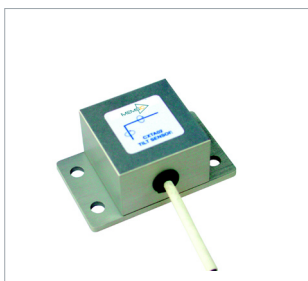
$$\theta = \left[\frac{V_{out} - \text{Zero Angle Voltage}}{\text{Sensitivity}} \right]$$

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 |

Pin Diagram



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 | | | | |
| -T | Temperature Sensor Internal | | | |
| -AL | High Temperature Aluminum Package | | | |

CALL FACTORY FOR OTHER CONFIGURATIONS



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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