



# CXTILT02EC

HIGH ACCURACY, DIGITAL SERIES

The CXTILT-Series two-axis inclinometers offer an outstanding combination of resolution, dynamic response and measurement accuracy. The integration of MEMS sensing elements and digital signal processing yields a system that requires no user calibration. Resolution and settling time are programmable, allowing the performance to be optimized for a variety of applications.



Platform Leveling



Precision Tilt Measurements

The CXTILT-Series inclinometers measure the tilt angle (roll and pitch) of an object with respect to the horizontal axis in a static environment. These high performance sensors incorporate two micro-machined low-g accelerometers, one oriented along the X-axis and one along the Y-axis.

The CXTILT02EC provides superior performance in demanding measurement applications, where high accuracy must be maintained over a wide temperature range. The CXTILT02E offers a cost effective solution for limited temperature range applications.

## Features

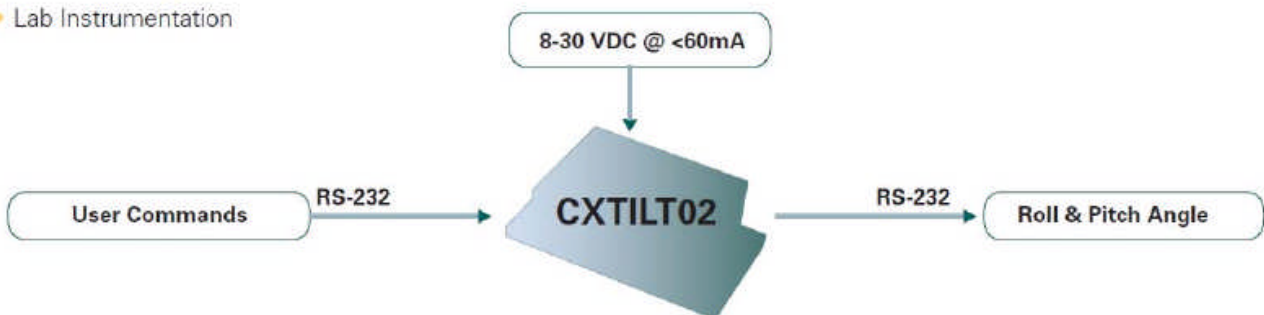
- Roll and Pitch Angle Output
- Accuracy <0.2 deg
- User Programmable Resolution and Settling Time
- RS-232 Serial Digital Interface
- Input Voltage 8-30 VDC
- Rugged Aluminum Package

## Certifications

- RoHS Compliant

## Applications

- Platform Leveling
- Precision Tilt Measurements
- Geo-mechanical Leveling
- Lab Instrumentation





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## Performance

## CXTILT02EC

Sensor	
Accuracy (°)	± 0.2
Angular Range (°)	± 75
Angular Drift w/Temp (°)	0.7
Angular Resolution (°)	See Filter Settings
Settling Time (s)	See Filter Settings
Null Angular Offset (°)	< 0.5
Non-Linearity (%)	< 0.3
Transverse Sensitivity (%)	1

## Specifications

Environment	
Temperature Range (°C)	-40 to +85

Electrical	
RS-232 Interface (Baud)	9600
Supply Voltage (VDC)	8-30
Supply Current (mA)	60

Physical	
Size (in)	4.02 x 2.25 x 1.24
(cm)	10.21 x 5.74 x 3.15
Weight (oz)	5.9
(kg)	0.166
Connector	15 pin sub-miniature high density, male

## Serial Commands

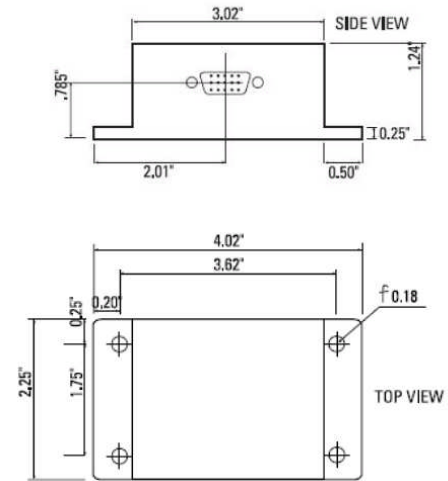
Command	Function Description/Response
R	Reset. Resets the CXTILT firmware to default settings. An ASCII 'H' (72) is sent in response.
G	Get Angle Data Packet. The CXTILT returns its current angular position. The data is in a 6 byte packet (see content of data packet table).
N<0-9>	Set Resolution Level. A 2byte command sequence that configures the CXTILT's internal digital filter. The second byte, an integer of value 0-9, sets the level of filtering (see filter settings table).
C	Continuous Mode: Transfers packet continuously at maximum rate.
S	Stop Continuous Mode

## Ordering Information

Model	Description
CXTILT02EC	Digital Tilt Sensor (-40 to +85°C)

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## Standard Package



## Connector Pin Diagram

Pin	Function
4	Transmit Data
3	Receive Data
1	Ground
11	Input Power

## Content of Data Packet

Byte	Description
0	Header (always 255)
1	Pitch MSB (0-255)
2	Pitch LSB (0-255)
3	Roll MSB (0-255)
4	Roll LSB (0-255)
5	Checksum (8-bit sum of bytes 1-4)

Note: Angles are represented as two's complement 16 bit numbers. +90° corresponds to 32,767. -90° corresponds to -32,768. The 16-bit signed angle can be obtained by this simple 'C' expression: (int) Roll LSB + (int) 256 \* Roll MSB

## Filter Settings

Filter	Fc(Hz)	Tc(s)	Typical Resolution (°)
0	none	none	0.320
1	10.0	0.016	0.101
2	8.0	0.02	0.091
3	4.0	0.04	0.064
4	2.0	0.08	0.045
5	1.0	0.16	0.032
6	.5	0.32	0.023
7*	0.25	0.64	0.016
8	0.125	1.27	0.012
9	0.0625	2.55	0.009

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