



*Determine pitch, roll and level*

The dual-axis Model 900 is an inexpensive, gravity-referenced clinometer (tiltmeter) with wide dynamic range. Its small size and high precision make it a versatile choice for many measurement and control applications.

Model 900 measures angular position with respect to the stablest of all external references: the vertical gravity vector. Its advanced design assures high repeatability over a standard 40 degree measurement span (90 degree optional span). Model 900 also features a wide input voltage range and signal conditioned analog



*Motion control for factory automation*

outputs. Just install Model 900 and connect it to your voltmeter or data acquisition system. You are ready to begin your measurements!

The sensing element within Model 900 is a glass vial half-filled with a conductive liquid. When the sensor is level, fluid covers five internal electrodes to equal depth. When the sensor tilts, the depth of fluid on each electrode changes, altering the electrical resistance between matched pairs of electrodes. Model 900's surface-mount electronics measure these changes, converting them to DC outputs proportional to the tilt angle.

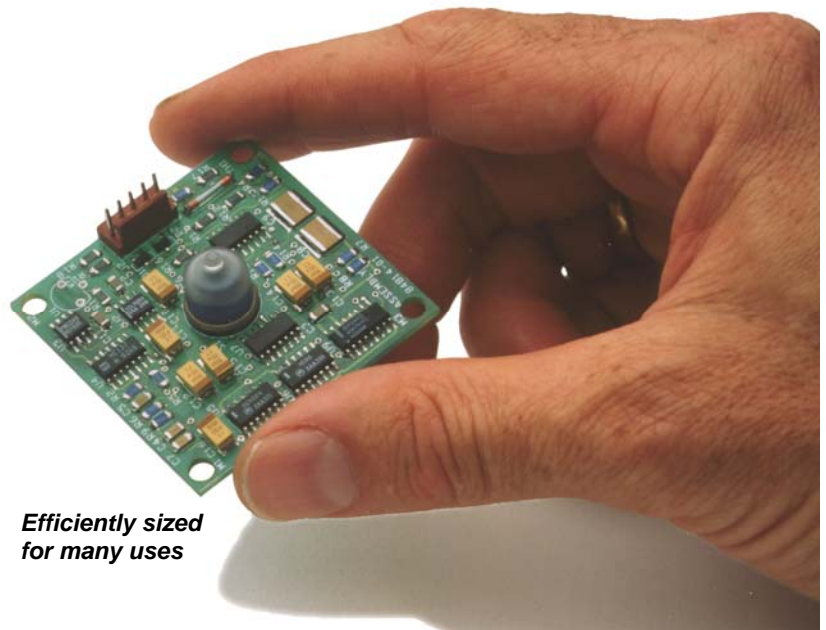
#### **Key features include:**

- ☐ Measures rotation in two orthogonal vertical planes
- ☐ Detailed 21-point calibrations supplied for each axis
- ☐ No mechanical moving parts to break or wear out
- ☐ Optional temperature sensor

Call or fax today for a quotation. For greater precision, ask about our 700-Series tiltmeters.



*Prewired connector supplied with each unit*



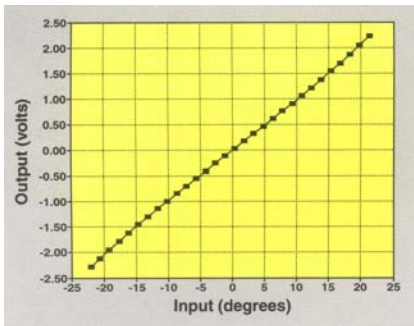
*Efficiently sized for many uses*

**APPLIED  
GEOMECHANICS**

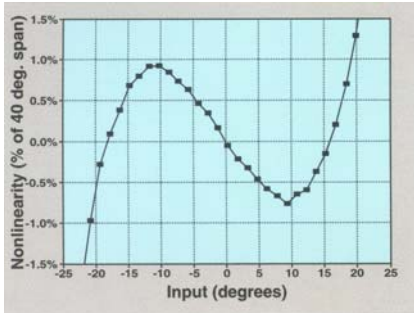
## **Model 900 Biaxial Clinometer**

#### **Use Model 900 for:**

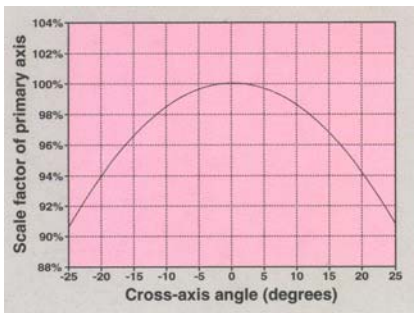
- ☐ Factory automation and robotics
- ☐ Drilling and mining machinery
- ☐ Construction equipment
- ☐ Ships, buoys, ROVs, towfish
- ☐ Land vehicles
- ☐ Aircraft
- ☐ Antennae
- ☐ Any machine or structure



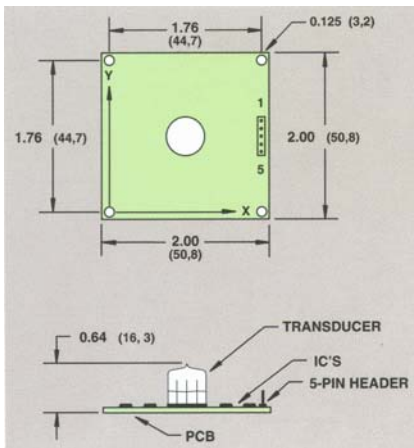
Typical calibration



Typical nonlinearity

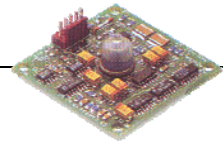


Cross-axis effect on scale factor



Model 900 dimensions, inches (mm)

## Specifications



OUTPUT CHANNELS	±2.5 VDC per channel (single-ended); 0-5 VDC available. Optional temperature channel, -0.4 to +1.0 VDC
ANGULAR RANGE	Model 900-H: ±10 degrees (20 degrees span) or greater Model 900: ±25 degrees (50 degrees span) or greater Model 900-45: ±50 degrees (100 degrees span) or greater
RESOLUTION	0.01 degree of arc
REPEATABILITY	0.02 degree of arc at constant temperature
HYSTERESIS	0.02 degree of arc
LINEARITY	Model 900: 1% over half span; 2.5% over full span. Model 900-45: 7% of full span. Factory polynomials improve linearity by 10x
TEMPERATURE COEF.	+0.05% of reading per °C typical
SCALE FACTORS	Model 900: 10 degrees/Volt typ. Model 900-45: 25 degrees/Volt typ. Model 900-H, 4 degrees/Volt typ. Temp.: 0.1°C/mV, ±0.75°C accuracy
TIME CONSTANT, $T$	0.15 second; output is proportional to $1 - e^{-t/T} = 0.001e^{-t/5000T}$ where $t$ is time in seconds
NATURAL FREQUENCY	10 Hz
OUTPUT IMPEDANCE	270 ohms, short circuit protected
POWER REQUIREMENTS	+8 to +24 VDC (bipolar output) or +10.5 to +26.5 VDC (0-5 VDC output) @ 7 mA, 250 mV peak-to-peak ripple max., reverse polarity protected
ENVIRONMENTAL	-40° to +85°C operating and storage, 0-90% humidity, noncondensing
SIZE & WEIGHT	2 X 2 X 0.64 inches (51 x 51 x 17 mm), 0.5 oz (15 grams); 18 inch (450 mm) cable with connector
MOUNTING	Four 0.125 inch (3.2mm) no. 4 mounting holes, one in each corner
MATERIALS	Liquid filled glass sensor, fiberglass PC board, unpotted assembly

### Angle conversion chart

	Radians	Degrees	Arc minutes	Arc seconds	μradians
1 Radian =	1	57.30	3438	206265	10 <sup>6</sup>
1 Degree =	0.01745	1	60	3600	17453
1 Arc minute =	2.909 x 10 <sup>-4</sup>	0.01667	1	60	290.9
1 Arc second =	4.848 x 10 <sup>-6</sup>	2.778 x 10 <sup>-4</sup>	0.01667	1	4.848
1 μradian =	10 <sup>-6</sup>	5.730 x 10 <sup>-5</sup>	3.438 x 10 <sup>-3</sup>	0.2063	1

### Ordering Information

Model 900-H	±10 degrees range
Model 900-TH	Adds temperature sensor
Model 900	±25 degrees range
Model 900-T	Adds temperature sensor
Model 900-45	±50 degrees range
Model 900-45T	Adds temperature sensor



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Position masts and booms

This document is accurate as of the time of publication. Applied Geomechanics may modify specifications without prior notice to reflect ongoing technical developments.