

# Model 900 Biaxial Clinometer

- 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
- Automation and robotics
- Drilling and mining machinery
- Construction equipment
- Ships, buoys, ROVs, towfish
- Land vehicles
- Aircraft
- Antennae



## DETERMINE PITCH, ROLL AND LEVEL

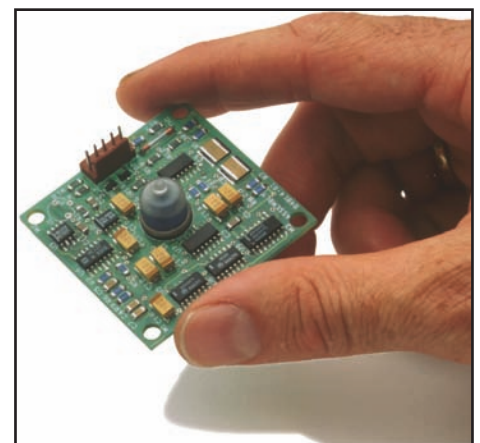
The dual-axis Model 900 is an inexpensive, gravity-referenced clinometer (tiltmeter) with wide dynamic range. Its small size and high precision make it a versatile choice for many measurement and control applications.

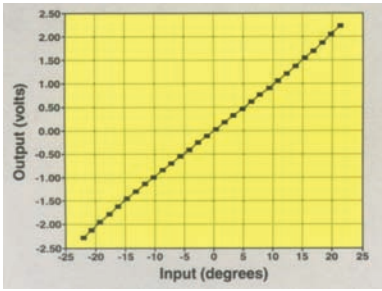


Determine pitch, roll and level

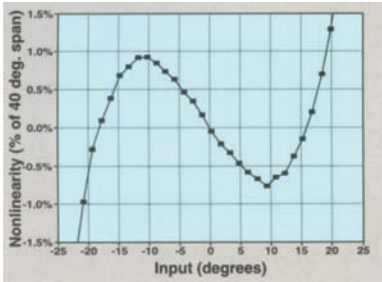
The Model 900 measures angular position with respect to the most stable of all external references: the vertical gravity vector. Its advanced design assures high repeatability over a standard 40 degree measurement span (90 degree optional span). The Model 900 also features a wide input voltage range and signal conditioned analog outputs. Just install a Model 900 and connect it to your voltmeter or data acquisition system. You are ready to begin your measurements!

The sensing element within the 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.

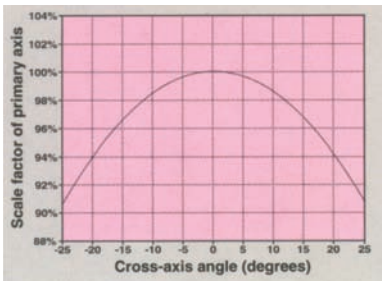




Typical calibration



Typical nonlinearity

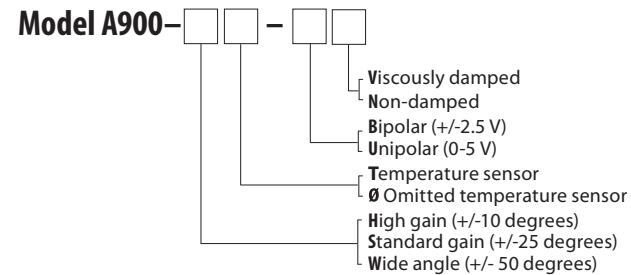


Cross-axis effect on scale factor

## SPECIFICATIONS

<b>OUTPUT CHANNELS</b>	±2.5 VDC per channel (single-ended); 0-5 VDC available. Optional temperature channel, -0.4 to +1.0 VDC
<b>ANGULAR RANGE</b>	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
<b>RESOLUTION</b>	0.01 degree of arc
<b>REPEATABILITY</b>	0.02 degree of arc at constant temperature
<b>HYSTERESIS</b>	0.02 degree of arc
<b>LINEARITY</b>	Model 900: 1% over half span; 2.5% over full span. Model 900-45: 7% of full span. Factory polynomials improve linearity by 10x
<b>TEMPERATURE COEF.</b>	+0.05% of reading per °C typical
<b>SCALE FACTORS</b>	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
<b>TIME CONSTANT, T</b>	0.15 second; output is proportional to $1 - e^{-t/T} - 0.001e^{-t/5000T}$ where t is time in seconds
<b>NATURAL FREQUENCY</b>	10 Hz
<b>OUTPUT IMPEDANCE</b>	270 ohms, short circuit protected
<b>POWER REQUIREMENTS</b>	+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
<b>ENVIRONMENTAL</b>	-40° to +85°C operating and storage, 0-90% humidity, noncondensing
<b>SIZE &amp; WEIGHT</b>	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
<b>MOUNTING</b>	Four 0.125 inch (3.2mm) no. 4 mounting holes, one in each corner
<b>MATERIALS</b>	Liquid filled glass sensor, fiberglass PC board, unpotted assembly

## ORDER CODES:



environmental systems & services  
8 River Street, Richmond VIC 3121 Australia  
T + 61 3 8420 8999 | F + 61 3 8420 8900  
geotechnical@esands.com | [www.esands.com](http://www.esands.com)

