4810

Non-Contact Capacitance Gauging Instrument & Series 2800 Capacitive Probes

- Sub nanometer resolution for ultra-precise measurements
- Exceptional temperature stability
- Wide variety of precision capacitive sensors available
- Standard analog outputs for easy connection to A/D boards
- Large standoff distances allow safe gauging of delicate parts
- Superior price and performance
- Portable, lightweight

Description

The 4810 is a single channel instrument that provides an analog display of probe displacement on the front panel. The 4810 provides analog output via a BNC jack on the front panel for easy connection to oscilloscopes, spectrum analyzers or computer based A/D boards. The 4810, along with the 2800 series family of standard and custom probes, uses an advanced capacitive gauging technology to provide exceptional resolution, large operating ranges and large standoff distances. The large, easy-to-read front panel display makes the 4810 an ideal production tool for operations requiring visual verification of measurements.

Features

Sub nanometer resolution for ultra-precise measurements

Exceptional temperature stability for a wide variety of environmental measurement applications

Wide variety of precision capacitive sensors for measuring even the most difficult size and shape target

Standard analog outputs for easy connection to A/D boards

Large standoff distances allow safe gauging of delicate parts

Superior price/performance

Patented PhaseLock™ probe driver circuitry for improved accuracy on ungrounded targets and applications such as thickness

Selectable filters for maximum resolution: 10 Hz, 100 Hz, 1 kHz, 10 kHz

Probes are interchangeable with straightforward recalibration

Portable, lightweight

Applications

- Non-contact, non-destructive measurements
- Precision dimensional gauging
- X-Y positioning
- Real-time in-process measurements
- Slide and spindle runout
- In-process sheet thickness
- Vibration analysis
- Servo-loop positioning systems
- Wear measurements
- Precision alignment
- Ultra high vacuum measurements
- Ultra high stability
- Go/no go gauging

Laser calibration

High-precision individual unit calibration at factory using Microsense-developed laser interferometry system. Calibration traceable to NIST. Performance graph included.

Options

Operating ranges

- Operating ranges can be user specified to optimize resolution for a specific application.
- Optional “driven target” mode significantly improves resolution.
- Optional Ultra High stability system for the most demanding long term measurements

Series 2800 probes

Microsense LLC has developed a new, lower cost family of high performance capacitive sensors providing a greater temperature stability and measurement linearity.

Measurement ranges from 20 microns to 2 millimeters are available in standard products. Custom probe configurations are available to met unique applications requirements.

MicroSense

4810 - Specifications

Performance

Measurement Range

± 10 microns to ± 1000 microns full scale, depending on probe selection.

Measurement resolutions

Typically better than 20 PPM of full scale range @ 1kHz.
Resolutions of better than 1 PPM are attainable:

Typical Resolutions (RMS, nm)

Sensor ø (mm)	Range ± µm	Bandwidth (Hz)	Resolutions (nm)	PPM	Optional Driven Target
5	30	10	0.05	0.83	N
5	30	1000	0.16	2.7	N
5	250	1000	7.0	14.0	N
5	250	1000	4.0	8.0	Y
1	30	1000	2.5	41.6	N
1	30	1000	1.2	20	Y
1	30	100	0.7	11.6	N
1	30	100	0.4	1.6	Y

Actual resolution depends on probe selection, bandwidth and operating range. Resolution improves with larger sensor area, reduced bandwidth and smaller range. Detailed specifications are provided with probe information

Linearity

Typically better than 0.025% over full scale range, depending on probe model and operating range Detailed

Stability

- Standard systems offer excellent stability. Typical stability is on the order of 100 PPM over 1 F or 200 PPM per PC.
- Optional high stability system: For the most demanding applications where stability over weeks and months is required to assure accuracy and productivity. Typical stabilities are on the order of 50 PPM over 6 months. Systems come with special stability testing, temperature and humidity correction coefficients.

Bandwidth

Standard 1 kHz
Jumper Selectable 10 Hz, 100 Hz, 10 kHz .

Inputs/Outputs

Probe inputs

Single, accepts Series 2800 probe family.

Analog Output

Standard ± 10 volts for full scale range

Optional ± 5 v, 0-10 v

Drive Synchronization

For multi-unit applications. Sensors may be driven in or out of phase.

Limits

User adjustable digital outputs for detecting overrange and measurement limits.

Adjustments/Indicators

Front panel adjustments

Calibration adjustment for scale factor.
Offset adjustment for zero setting. Limit settings.

Front panel LED indicators

Power, + limit, - limit

Physical Dimensions

18 cm- L x 11 cm-W x 4 cm-H
(7.0" x 4.25" x 1.5")

Weight

0.5 kg (1.1 lbs)

Operating Environment

Temperature

5° C to 50° C (41° F to 122° F)

Humidity

0 to 95% RH, non condensing

Power Requirements

90 - 240 VAC, Standard Microsense Universal Low Noise Power Supply with IEC Connector included with Instrument

Probe Selection

Accepts Series 2800 and 2900 passive probes

Series 2800 Passive Probes

MicroSense

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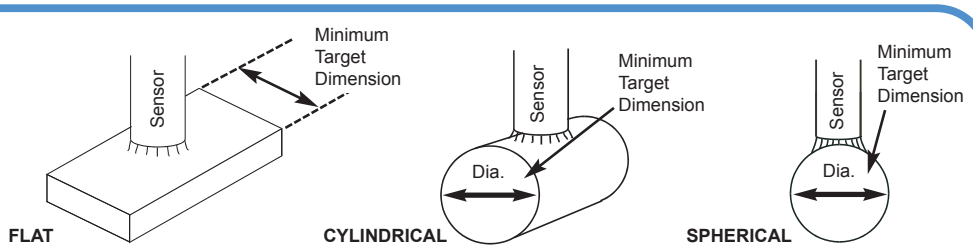
Lowell, Ma. 01852
Phone: (978) 843 7670
Fax: (978) 843 7670
e-mail: sales@adetech.com

Probe Selection Procedure

Steps **Guidance**

1

Identify Target Shape and Minimum Target Dimension by observing item to be measured and comparing with the guidance illustrations.



2

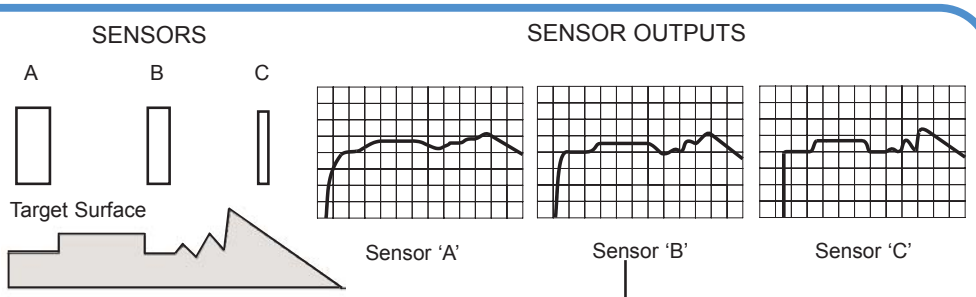
Calculate Maximum Sensor Diameter
(Note: This dimension is less than the minimum target dimension because all of the "spreading" electric field needs to be on the target surface.)

Minimum Target Dimension X Shape Constant = Maximum Sensor Diameter

_____ X { 0.60 for Flat Target / 0.25 for Cylindrical Target / 0.20 for Spherical Target } = _____

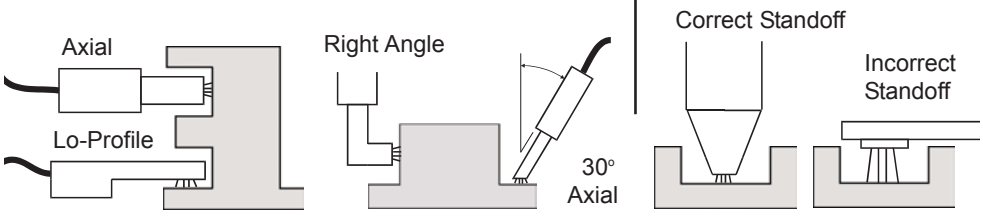
3

Determine Optimum Sensor Size from step 2 answers
For best overall performance select the **larger** sensor size option. However, smaller sensor sizes may be preferred if surface profile or flatness of a textured surface is being measured, or if measurements are being made near a target edge.



4

Select Probe Style
Axial style is usually preferred, however other styles are available to facilitate target access. Refer to the probe diagrams on the preceding pages.



5

Determine Probe Ordering Information
Use answers 2,3, and 4 above for probe and sensor size. Consult sensor drawings.

Refer to the following pages for the correct probe choice

Note: On special request, probes can be custom designed to suit specific customer needs. Consult the factory.