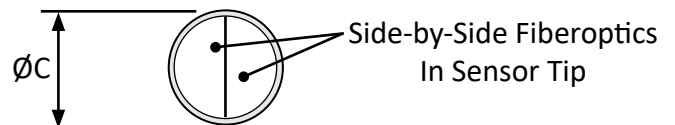# Fiberoptic Displacement Sensor

Model DMS-RC32

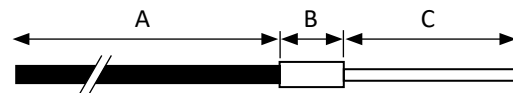Fiberoptic Cable & Sensor Tip - Actual Size

For The Measurement of Distance, Displacement and Vibration
of Targets > Ø 0.81 mm

Features

- Reflectance Compensated Output*
- Ø 0.8 mm Spot Size
- 3 mm Operating Range

Side-by-Side Fiberoptics
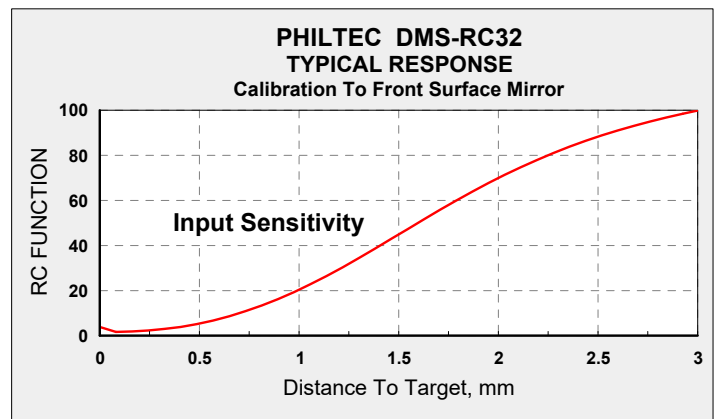In Sensor Tip

ØC

Tip & Cable Dimensions

OPERATING PRINCIPLE. These are reflective type transducers based upon detecting the intensity of reflected light. RC Model sensors have a pair of fiberoptic detectors in the sensor tip. Light reflected off a target follows two separate paths back to the electronics where a ratiometric calculation provides the distance measurement which is independent of varying surface reflectance; i.e., ***reflectance compensated***.

FEATURE	mm	inch
Tip Outer Diameter, Ø C	1.27	0.050
Fiberoptic Diameter	0.81	0.032
Tip Length, C	38.1	1.5
Collar Length, B	12.7	0.5
Collar Diameter, Ø B	4.31	0.170
Cable Length, A	915	36
Cable Diameter, Ø A	3.3	0.130
Cable Min. Bend Radius	12.7	0.5

*These sensors provide a linearized distance output with RS232 or USB communication. Dynamic light signals reflected from target surfaces are converted to distances by comparing the sensor signals to stored gap calibration tables on-board the sensor.

PHILTEC

Typical DMS-RC32 Output
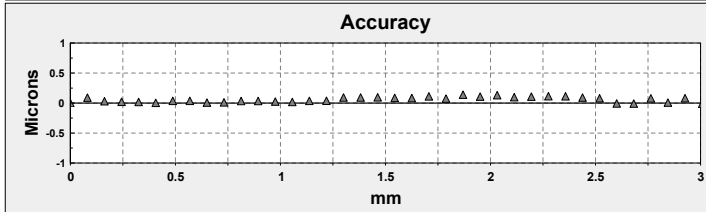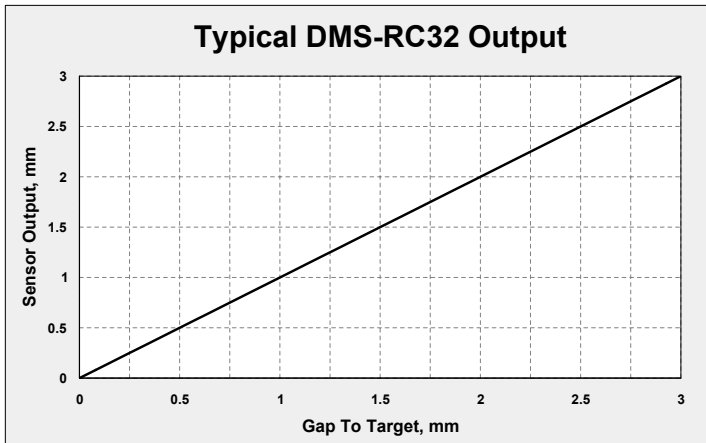
Accuracy

Sensor Accuracy is measured at 2.5 samples/sec.

PHILTEC DMS-RC32
TYPICAL RESPONSE
Calibration To Front Surface Mirror

The analog signal input to the sensor's microprocessor (shown above) is converted to a linearized distance output by comparing the input signals to gap calibration tables stored on-board the sensor. The sensor can be gapped for measurements anywhere within the sensor's total operating range. Optimum performance is achieved where the RC input signal has the steepest slope (highest sensitivity, ~0.2 - 2.5 mm).

Standard Specifications - DMS-RC32

Electronics		Fiberoptics		USB or RS232			
Light Source	850 nm	Light Beam Spread	30°	Total Range	3 mm		
Input Voltage	+12 VDC	Cable Sheathing	PVC over Steel Monocoil	Linear Range	0.25 - 3 mm		
Input Current	500 ma max	Tip Epoxy Outgas	0.3% @ 200°C 2.4% @ 300°C	Reflectance Resolution	0.5%		
Bandwidth	5 KHz max	Tip Operating Pressure	10 bar	Temperature Resolution	0.06°C		
Iso-thermal Drift	0.05%	Tip Operating Temperature	-55 to 200°C continuous to 300°C intermittent 1-2 hours	Resolution* ADC AVG = 2 ADC AVG = 16 ADC AVG = 256 ADC AVG = 4096	** Samples/Sec 5208 651 41 2.5	pk-pk 75 nm 50 nm 25 nm 10 nm	
Weight	0.48 kg -1.0 lbs.	Fibers	Glass				

NOTES:
*These specifications represent best case performance where:
- the target is flat, smooth and highly reflective
- the sensor is perpendicular to the target
- the sensor is gapped to its range of highest sensitivity (~mid-range)
- fiberoptic cable lengths are standard and the cables are not connectorized

**DMS Control Software includes a data averaging filter for averaging data samples from:
  2 samples (the fastest rate) to 4096 samples (best resolution).

Internally, the sensor continuously reads target data at a clock rate of 10416.75 Hz.
ADC AVG = the number of internal readings averaged before sending data out to the PC.

Samples/Sec for any ADC AVG setting can be calculated as follows:
- S/S = 10,416.75 / ADC AVG

Custom Hardware To Customer Specifications

Three Instruments To Choose From:

- *Model mDMS-RC32* ... miniDMS with RS232 output
- *Model muDMS-RC32* ... miniDMS with USB output
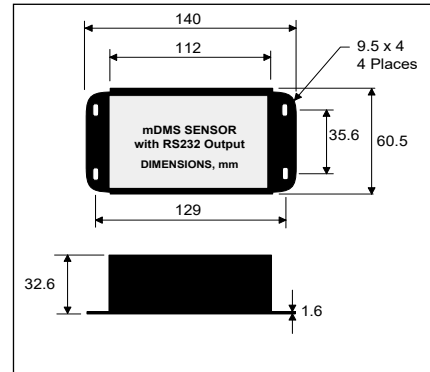- *Model mu2DMS-RC32 ...* Two Channel DMS with USB & RS232 outputs

mDMS-RC32

140
112
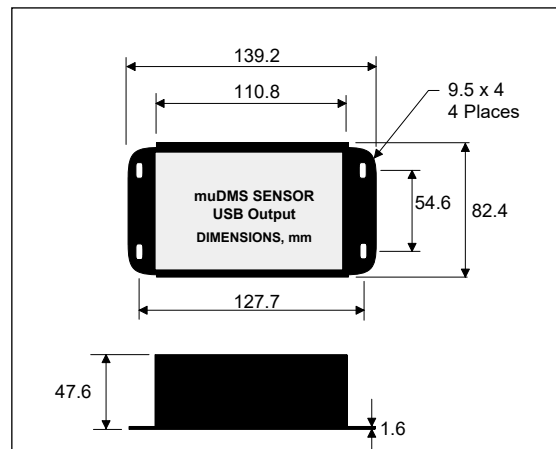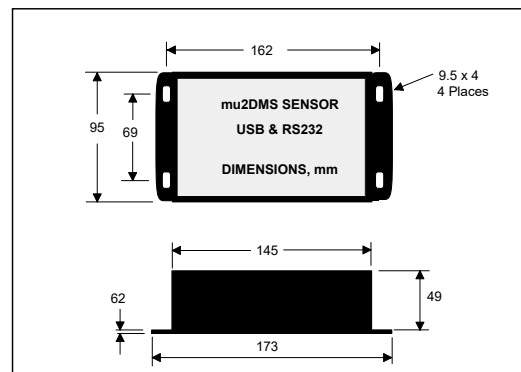9.5 x 4
4 Places

mDMS SENSOR
with RS232 Output
DIMENSIONS, mm

35.6
60.5
129

32.6
1.6

1. mDMS units include:
- Electronics with RS-232 communication

muDMS-RC32

139.2
110.8
9.5 x 4
4 Places

muDMS SENSOR
USB Output
DIMENSIONS, mm

54.6
82.4
127.7

47.6
1.6

2. muDMS units include:
- Electronics with USB communication

mu2DMS-RC32

162
9.5 x 4
4 Places

mu2DMS SENSOR
USB & RS232
DIMENSIONS, mm

95 69

145
62
49
173

3. mu2DMS units include:
- Electronics with USB and RS232 communication
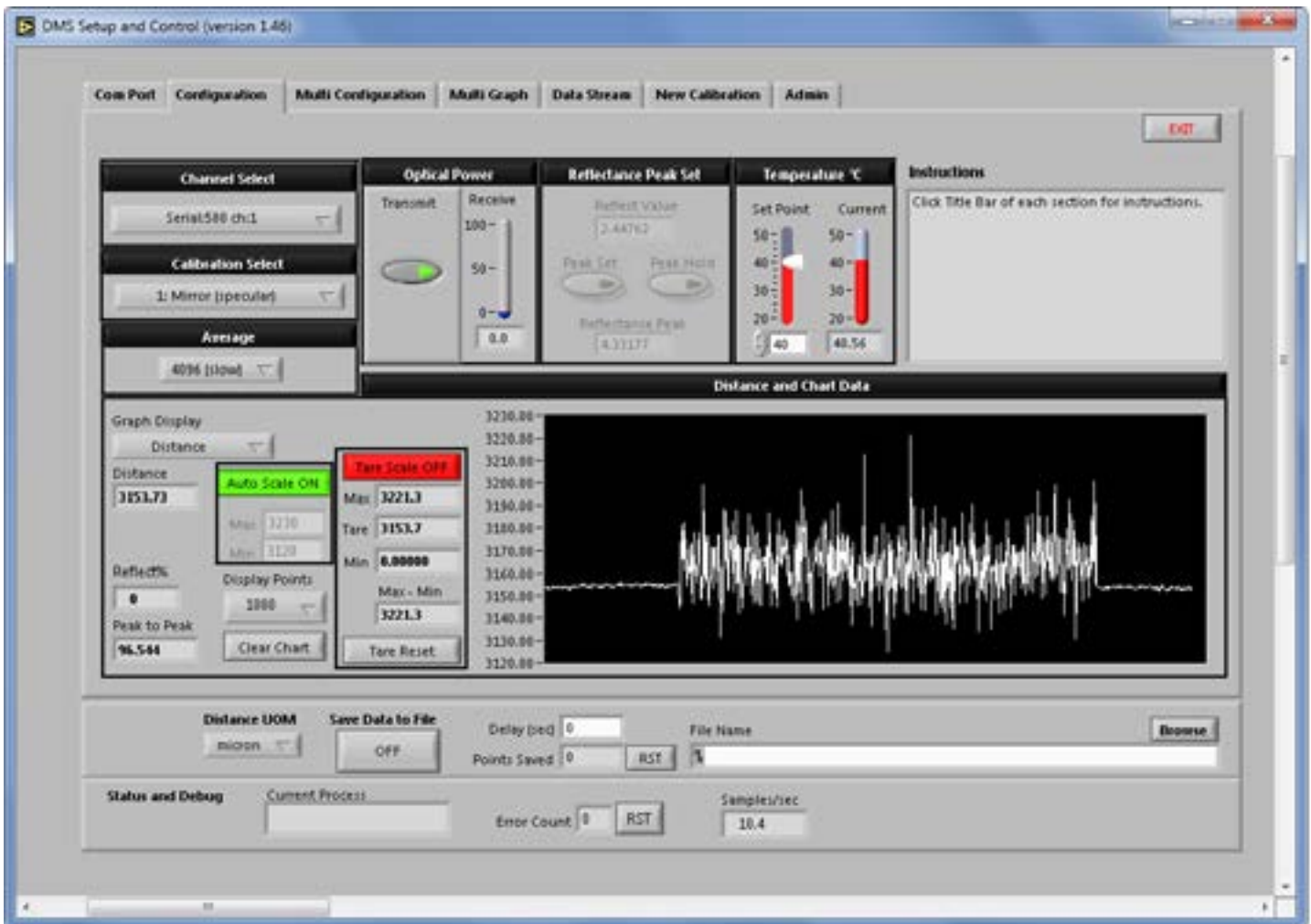
DMS SETUP and CONTROL SOFTWARE

Philtec provides freeware with every digital sensor purchase. This powerful software is a very useful tool for controlling sensors, viewing live data, and for saving data to files.

Sensors have storage capacity for 25 calibration tables. Every new sensor is provided with calibrations to:

1. A front surface mirror
2. A diffuse aluminum target

The DMS software provides means for copying and pasting sensor calibration data, as well as for creating and storing new calibration tables.

SOFTWARE & FIRMWARE UPDATES
DMS sensors can be updated remotely at any PC. The most current edition of software and firmware is posted at http://www.philtec.com/downoalssupport/firmware.html. A short tutorial video link is also available there.