

## Fiberoptic Displacement Sensor

# Model DMS-RC225

Fiberoptic Cable & Sensor Tip - Actual Size



For The Measurement of Distance, Displacement and Vibration  
for Targets > Ø 5.8 mm

### Features

- 25 mm Operating Range
- Ø 5.7 Fiber Bundle (Spot Size)
- Reflectance Compensated Output
- Ambient Light Rejection



### Tip & Cable Dimensions



### REFLECTANCE COMPENSATION

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**.

### AMBIENT LIGHT REJECTION

Incoming light signals are bandpass filtered at a wavelength of  $850 \pm 22$  nm.

### DISTANCE (GAP) OUTPUT

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 gap calibration tables stored on-board the sensor.

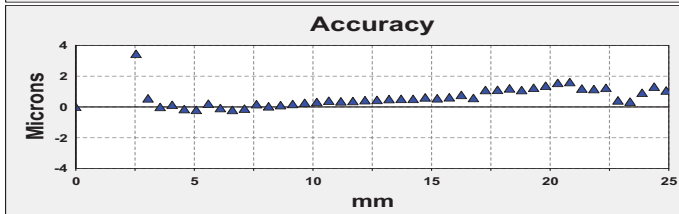
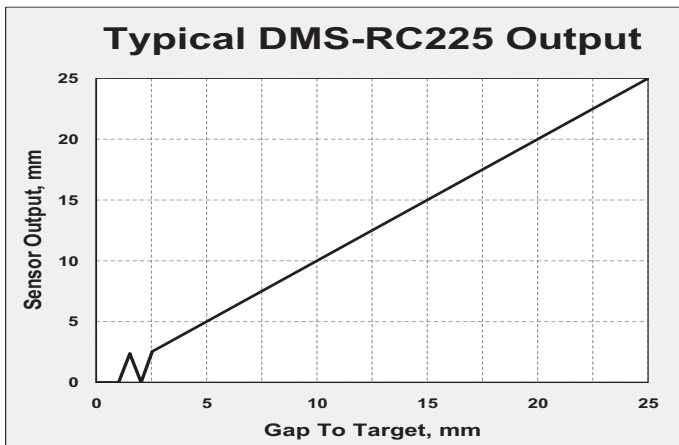
| FEATURE                 | mm     | inch  |
|-------------------------|--------|-------|
| Tip Outer Diameter, Ø B | 7.14   | 0.281 |
| Fiberoptic Area         | Ø 5.72 | 0.225 |
| Tip Length, B           | 38.1   | 1.5   |
| Cable Length, A         | 915    | 36    |
| Cable Diameter, Ø A     | 6.86   | 0.270 |
| Cable Min. Bend Radius  | 38     | 1.5   |

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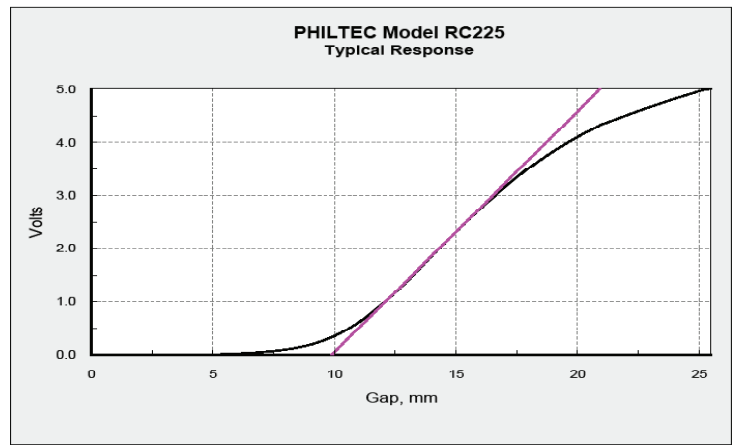
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Precision Dynamic Measurements

DRC225:1



Sensor Accuracy is measured at 2.5 samples/sec.



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, ~9 - 18 mm).

Note: The DMS-RC225 response has a 'dead band' from 0-7 mm due to the gap between fiber bundles in the sensor tip. Reflectance Compensation is not active in that band.

| Standard Specifications - DMS-RC225 |                  |                           |  |                        |                         |
|-------------------------------------|------------------|---------------------------|--|------------------------|-------------------------|
| Electronics                         |                  | Fiberoptics               |  | USB or RS232           |                         |
| Light Source                        | 850 nm           | Light Beam Spread         | 25°  | Total Range            | 25 mm                   |
| Input Voltage                       | +12 VDC          | Cable Sheathing           | PVC over Steel Monocoil  | Linear Range           | 7 - 25 mm               |
| Input Current                       | 500 ma max       | Tip Epoxy Outgas          | 0.3% @ 200°C<br>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;<br>to 300°C intermittent<br>1-2 hours | Resolution*            |                         |
|                                     |                  |                           |  | ADC AVG = 2            | ** samples/sec    pk-pk |
|                                     |                  |                           |  | ADC AVG = 16           | 5208            50 µm   |
|                                     |                  |                           |  | ADC AVG = 256          | 651             10 µm   |
|                                     |                  |                           |  | ADC AVG = 4096         | 41              0.8 µm  |
|                                     |                  |                           |  |                        | 2.5             0.4 µm  |
| Weight                              | 1.1 kg -2.4 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:

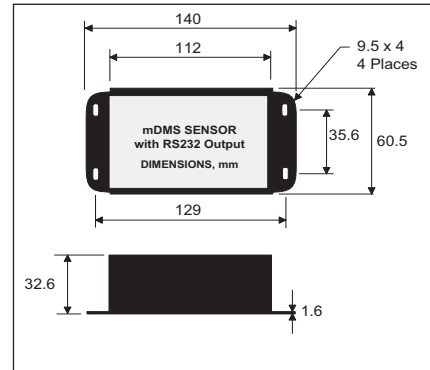
- S/S = 10,416.75 / ADC AVG

## Three Instruments To Choose From:

- **Model mDMS-RC225** ... miniDMS with RS232 output
- **Model muDMS-RC225** ... miniDMS with USB output
- **Model mu2DMS-RC225** ... Two Channel DMS with USB & RS232 outputs



**mDMS-RC225**

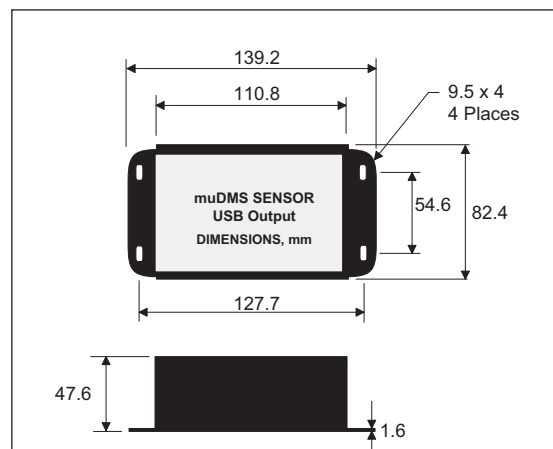


**1. mDMS units include:**

- Electronics with RS-232 communication



**muDMS-RC225**

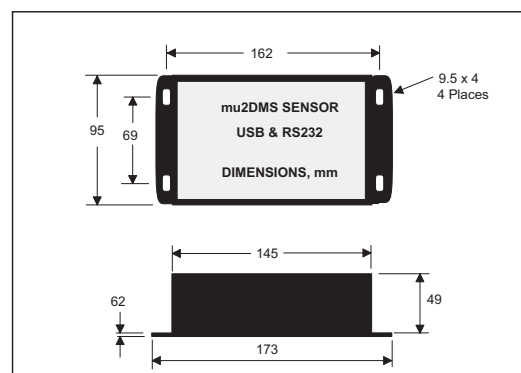


**2. muDMS units include:**

- Electronics with USB communication

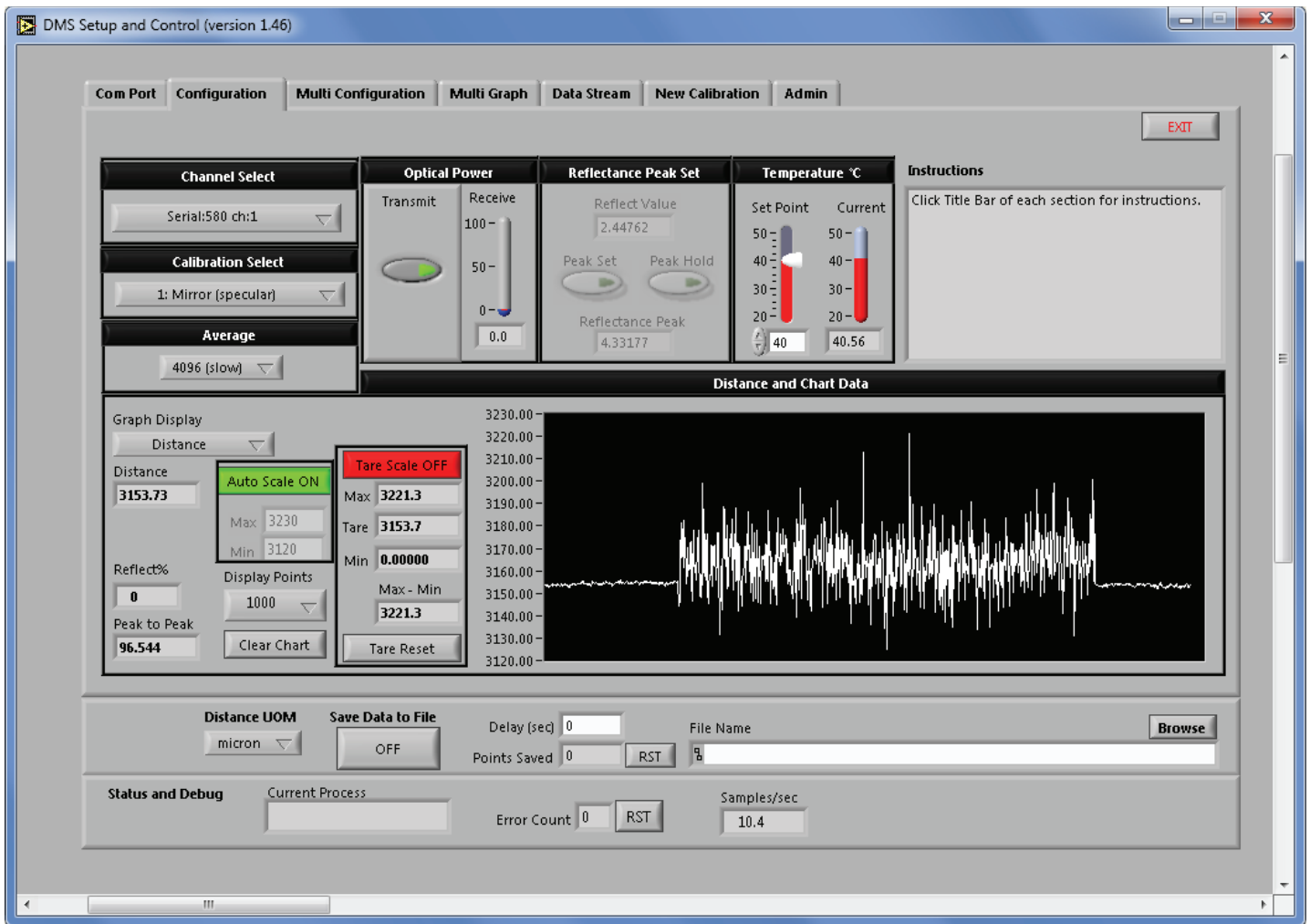


**mu2DMS-RC225**



**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://philtec.com/downloadssupport/firmware.html>. A short tutorial video link is also available there.