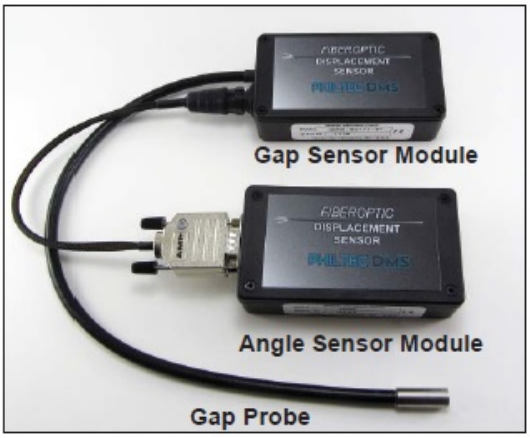
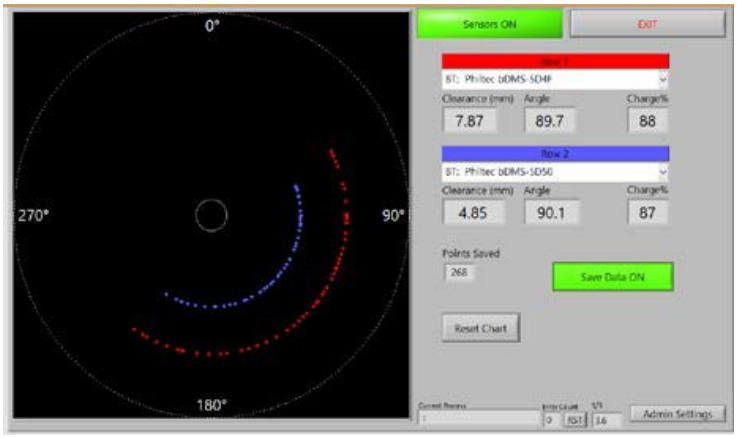
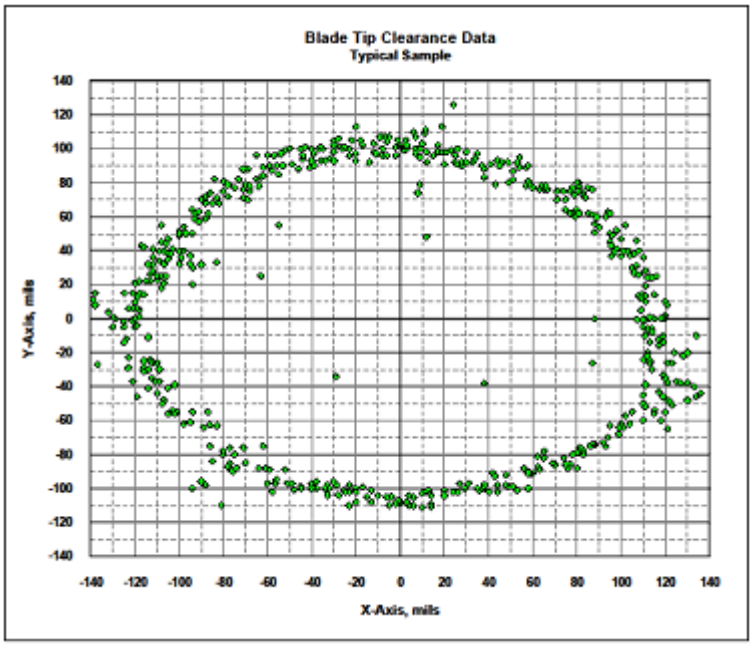
CMS-3400

Turbine Blade Tip-to-Casing Cold Clearance Wireless Measurement System







FEATURES

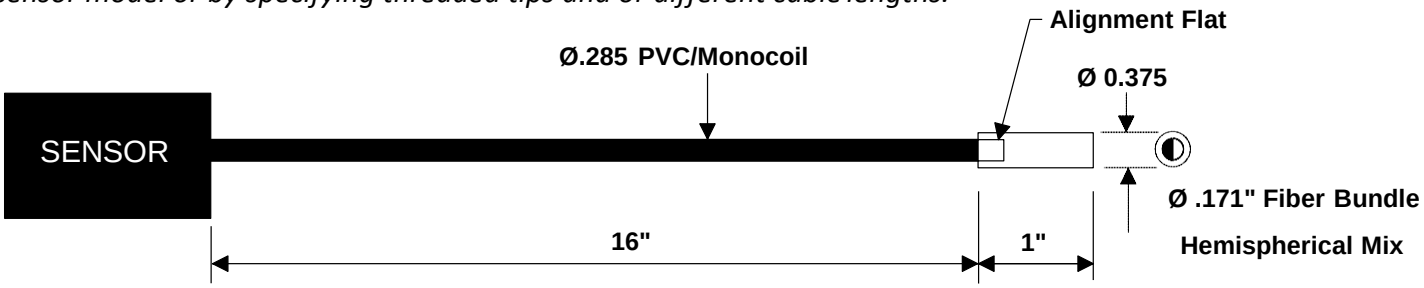
- Non-Contact Fiber Optic Gap Probes
- Angle Sensor Module/Battery Packs
- Wireless Radio Operation
- Windows Tablet with Preinstalled Control Software
- Protective Case for Tablet
- Dual or Quad Channel Operation

Fiber Optic Gap Sensors

Gap Sensors are equipped with Philtec model RC171 sensors. These reflective type transducers, based upon detecting the intensity of reflected light, have a pair of adjacent fiber bundles in the sensor tip. Light reflected off the target follows two separate fiber paths back to the electronics where a ratiometric calculation provides the distance measurement which is indepen- dent of varying surface reflectance; i.e., ***Reflectance Compensated***.

Standard Specifications - RC171					
Electronics		**Fiber Optics**		**RS232 Output**	
Light Source	850 nm	Light Beam Spread	25°	Total Range	15 mm
Input Voltage	+12 VDC	Cable Sheathing	PVC over Steel Monocoil	Linear Range	15 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*	** samples/sec / pk-pk
				ADC AVG = 2	5208 / 650 nm
				ADC AVG = 16	651 / 250 nm
				ADC AVG = 256	41 / 80 nm
				ADC AVG = 4096	2.5 / 15 nm

The standard Gap Sensor probe detail is shown here. Gap Sensors can be customized by using a different Philtec sensor model or by specifying threaded tips and or different cable lengths.



DISPLACEMENT PROBE DETAIL

ENCLOSURE DIMENSIONS					
MODULE	**LENGTH, mm**	**WIDTH, mm**	**HEIGHT, mm**	**WEIGHT, Oz.**	**MATERIAL**
Gap Sensor	112.5	60.5	31	11	Aluminum
Angle Sensor	113.8	63.2	28.2	5.5	ABS Plastic

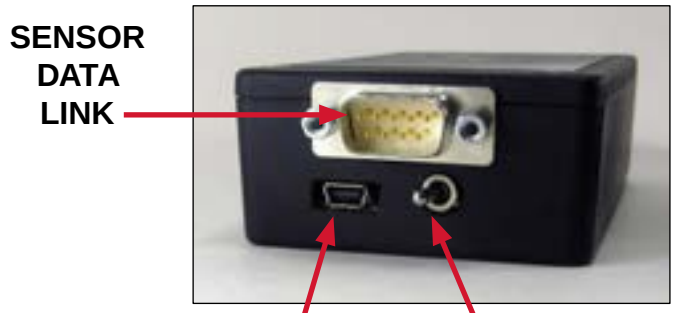
Angle Sensor/Radio Module

Power Requirements
USB @ 500mA

Time to Charge: 4 Hours
Run Time: 10 Hours w/full charge

Standby Mode: 4 Weeks
Run Time: 3 Hours After 4 weeks Standby
Radio Range: Up to 50 Meters Line of Sight

Bluetooth Battery Module



NOTES:
1. To charge the battery, put switch to ON position and connect to a USB port.
2. System enters standby mode after 30 seconds when USB port is disconnected.
3. System awakes when **CMS Software** Opens
4. For shipping and storage, toggle battery switch to Off.

Angle Sensor Measurement

The orientation angle of the Angle Sensor Module is measured with 0.1° resolution, where 0.0° or 360° is at the 12 o'clock position.


Angle Module at 0°

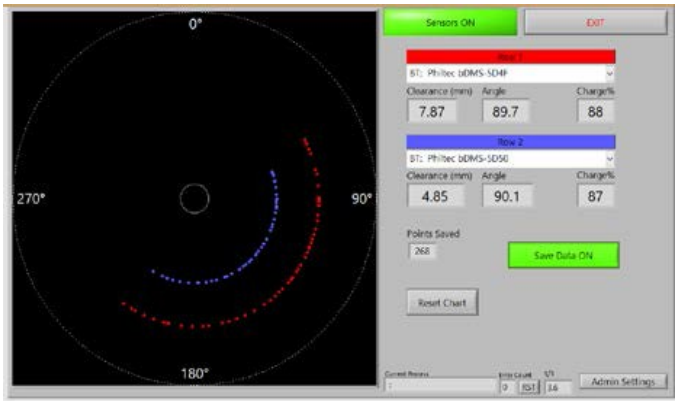
CMS Control Software

The Windows tablet in the CMS-3400 kit has CMS Control Software preinstalled. The program can be started by pressing (or clicking if using a mouse) the CMS Control tile on the Windows Start Screen. The user can choose between three different display screens to view incoming data:

1. Two-Channel Display with Polar Plot

Data from two channels is graphed as received. Allows user to verify that the full circumference has been properly covered by the sensors.

Note: 4 channel version available soon.



2. Two Channel Display with Tare Function

Data from two channels is displayed with tare display and reset.

3. Four-Channel Display with Tare Function

Data from up to 4 channels displayed with tare display and reset.

See software user manual for full description of functions.