

In-situ Temperature and Reflectance Measurements for MOCVD, MBE, RTP and High Temperature CVD Applications

For advanced material deposition or fast thermal ramping processes, such as MOCVD, MBE, RTP, and high temperature CVD. The Accufiber®TR instrument fully integrates two sophisticated metrology functions with our class-leading radiation thermometer system:

- Automatic emissivity corrected temperature measurement, and
- Film growth monitoring via dual wavelength reflectance measurements.

Automatic Emissivity Correction

The Accufiber®TR combines the industry leading PhotriX™ radiation thermometers (offering superior signal-to-noise ratio) with integrated reflectometers.

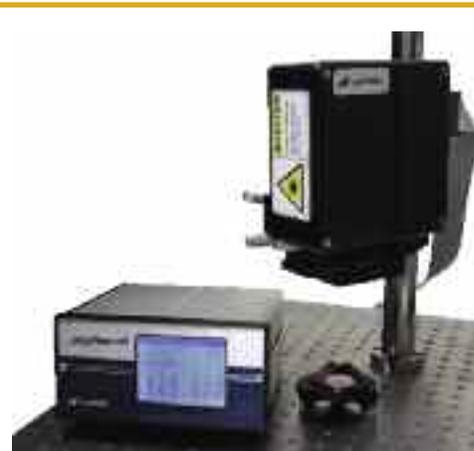
For specular (smooth) surfaces, the deposition surface's emissivity can be calculated from its reflectance. By constantly measuring this reflectance, the Accufiber® TR instrument can automatically perform the emissivity correction in-situ and calculate the surface's true temperature.

Film Growth Monitoring

One of the most common methods for measuring thin film properties is to use reflectance measurements. The Accufiber®TR seamlessly integrates ultra precise reflectance measurements with class leading, lowest signal-to-noise ratio radiation detectors.

It is critical to use both the highest quality measurement systems and shorter wavelengths to offer "superior resolution", especially for thicker films grown for today's optoelectronics.

The Accufiber®TR incorporates two wavelengths, 635nm and 880nm, measured simultaneously. The reflectometer measures the sample with a laser diode at 635nm for thin film growth monitoring and a light emitting diode (LED) centered at 880nm for emissivity correction. The thermal radiation is also measured simultaneously at the 880nm wavelength.



Features

- 635nm laser based reflectance for thin film monitoring
- 880nm IR LED based reflectance for emissivity correction
- High sampling rate (up to 1000 Hz)
- Touch screen interface
 - No computer required
- Fully integrated system
- Ideal for:
 - MOCVD
 - MBE
 - CVD (non-plasma assisted)
 - RTP
- No fiber optic cable needed

Benefits

- Accurate, emissivity corrected temperature measurement
- Precise "fringe" resolution for thin film deposition monitoring
- Easy-to-use product
- Production proven design backed by our experience supporting OEMs for more than 25 years

Specifications

Temperature Measurement

Range	450-1700°C
Speed	100 Hz
Detection Wavelength	880nm
Precision (1 sigma)	1.5°C @ 450°C, 0.25°C @ 600°C and above
Accuracy	±2°C or better

Instrumentation Features

Power Input	Universal VAC
Serial Output	RS-232
Analog Output	4-20 mA
Interface	Touch screen and RS-232
Ambient Environment	5 to 45°C and 10-80% relative humidity
Dimensions: Controller	73mm H X 192mm W X 216.7mm L
Sensor	150mm H X 70mm W X 148mm W
Weight: Controller	2.25 kg
Optical Head	1.75 kg

Reflectance Measurement A (Thin Film Monitoring)

Range	0-100%
Speed	1000 Hz
Detection Wavelength	635nm ±3nm
Light Source	Laser diode
Precision (1 sigma)	0.5%
Tilt Tolerance	<0.75% change with ± 0.1° tilt

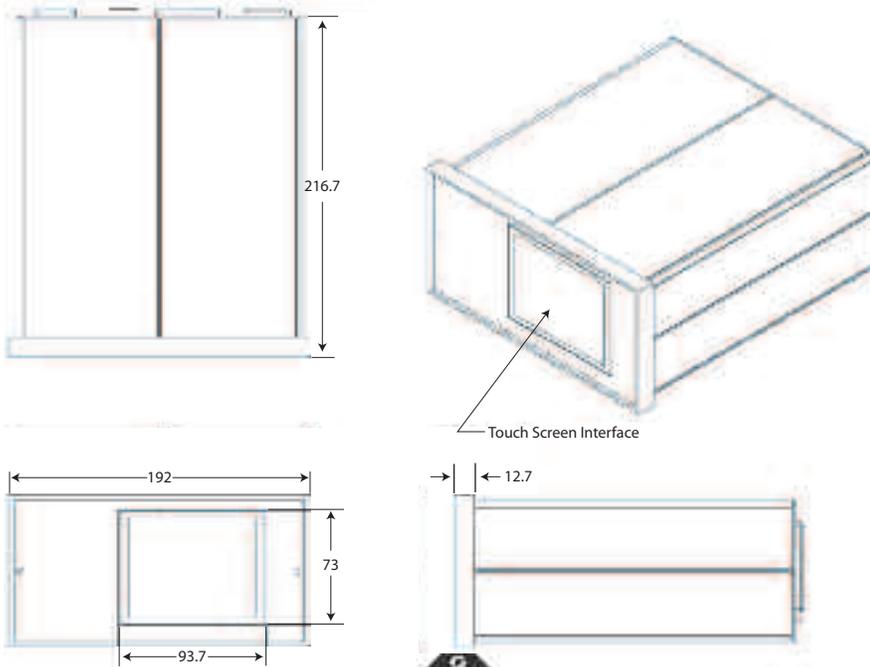
Reflectance Measurement B (Emissivity Correction)

Range	0-100%
Speed	200 Hz
Detection Wavelength	880nm
Light Source	Infrared LED
Precision (1 sigma)	0.3%
Tilt Tolerance	<0.3% change with ± 0.1° tilt

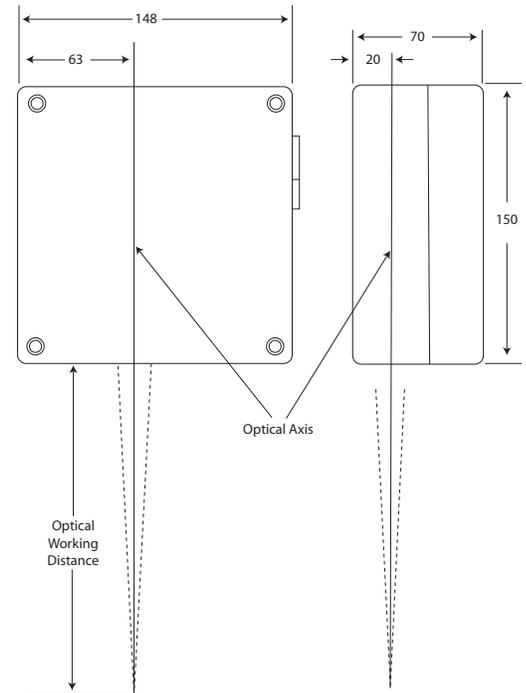
Options

- Controller can support interface to auxiliary PhotriX™ radiation thermometer for PID controller input
- Custom working distance (standard is 150mm)

Panel Mount Controller (1/2 DIN)



Sensor (Dimensions (mm))



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