

miniPCS™

A Miniature Particle Counter and Sizer

The miniPCS is a self contained, battery-operated optical sensor for remote characterization of particle clouds.

The sensor uses Mie scattering theory to size individual particles passing through its optical probe volume. A differential logarithmic amplifier coupled with a 14-bit digitization makes the miniPCS impervious to fluctuations in illumination and gives it a substantial dynamic range and resolution.

The on-board electronics include a GPS receiver to record time and location, a wireless transmitter/receiver for off-board triggering and health monitoring, and an MMC memory card to record the measurements.

ADVANTAGES OF THE MINIPCS:

- No optical alignment required
- High dynamic range
- Small and lightweight
- Self-contained
- Battery operated
- No pressure drop across the sensor
- Wireless operation
- GPS for time and position

APPLICATIONS INCLUDE:

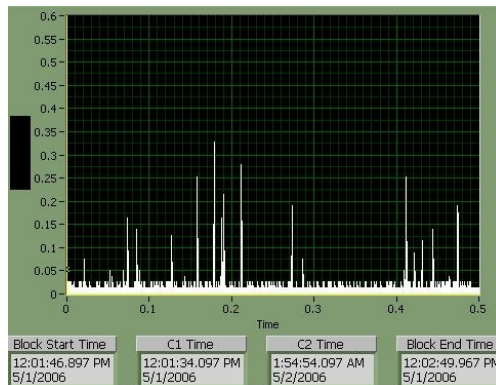
- Atmosphere studies
- Dust cloud and droplet cloud characterization
- Spatially resolved water content measurement
- Balloon, AUV, and aircraft deployment



The miniPCS probe includes all the necessary electronics for remote operation and data acquisition.



The miniPCS in field configuration. The air containing particles is pulled through the probe volume by the pump at the rear. A removable filter ahead of the pump is used collect particle samples.



Example data capture from a miniPCS probe showing peaks indicating the passage of particles. Data is synchronized to GPS time.

MEASUREMENT SPECIFICATIONS	
Particle size range	0.5 to 1000 μm
Max particle concentration	10^5 particles/ cm^3
Max particle speed	15 m/s
Accuracy (size)	10% or 2 μm , whichever is largest

PROBE VOLUME	
Size	50 μm diameter, 2600 μm long
Flow passage diameter	6 mm (.24") ID

PROBE SPECIFICATIONS	
Probe weight	250g
Dimensions	4.33" (110 mm) x 4.33" (110 mm) x 1.96" (50 mm)

LASER SPECIFICATIONS	
Laser power	60 mW
Wavelength	658nm
Laser type	Class IIIb

OPERATING PARAMETERS	
Temperature	-10°C to 70°C
Altitude	< 10,000 ft

OPTIONAL FEATURES	
Wired trigger	
Integrated pump	
High altitude version	
Removable sample collection filter	

POWER REQUIREMENTS	
Probe:	7V DC, 170mA (30mA in sleep mode)
Pump:	7V DC, 150mA

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