

IMAP100 | AirPhoton Inverse Multi-Angle Polarimeter

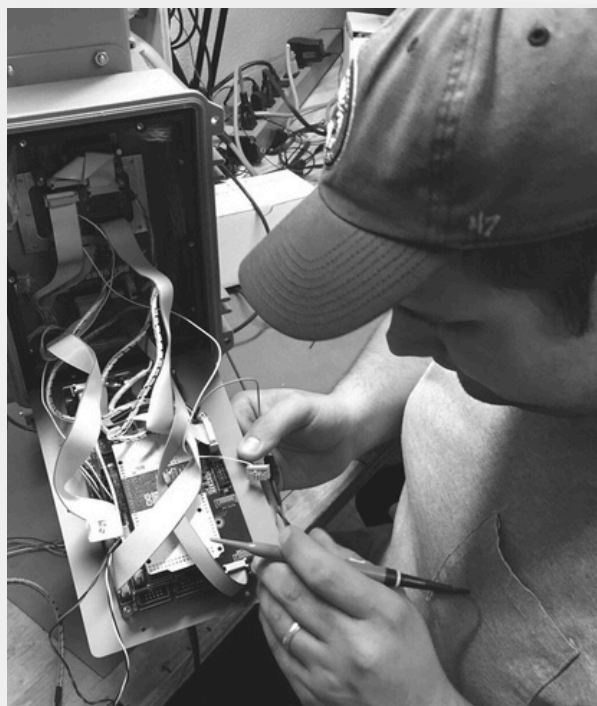


The IMAP100 (Inverse Multi-Angular Polarimeter with Polarization) Nephelometer measures polarized scattered light at multiple angles and at multiple wavelengths.

As with our other instruments, we use our feedback flow control system to collect data at multiple size cuts ranging from PM1 to PM10. Owing to the small size of the sampling chamber and the overall efficiency of the system, this allows us to determine a full optical particle size distribution every minute.

This advanced instrument collects a huge amount of data thanks to its cutting-edge technology: 3 wavelengths x 8 angles x 2 polarization orientations x 4 aerodynamic size cuts. We highly suggest using IMAP100 for an in-depth understanding of particulate properties. Given its unique combination of aerodynamic and optical sizing, it can be used to effectively connect satellite and ground-based measurements for comprehensive air quality research.

To manage all of this detailed information, we use the GRASP data retrieval algorithm which allows us to accurately determine: particle mass, size distribution scattering phase function, polarization phase function, real refractive index of the particles, sphericity factor of the particles.



AirPhoton instruments are deployed globally by:



Jet Propulsion Laboratory
California Institute of Technology

The IMAPI00 measures polarized scattered light from a laser at 8 discrete angles ranging from 5 to 170 degrees. This is done via a pair of optical fibers positioned at each of these angles. The fibers transmit the scattered light from the sample chamber to a camera module that collects the light for processing and analysis



Capabilities

- Complete size distribution measurement every 5min.
- Particle mass
- Full phase function
- The real refractive index of the particles
- Sphericity factor

Suggested use

We suggest IMAPI00 for in-depth understanding of particulate properties. Given its unique combination of aerodynamic and optical sizing can be used to connect satellite and ground based measurements for air quality research.

Specifications

- Instrument size: 33.9" x 15.0" x 12.6" / 86 x 38 x 32cm
- Inlet height: 43.3" / 110cm
- Flow rate: 2 to 16 LPM (Alaric AE102-2)
- Data: Saved to internal hard drive. Real-time access via Ethernet, RS2323 and RS485.
- Calibration: Built-in clean reference cycle.
- Gas calibration: CO₂ and clean air every 3-6 months depending on operating conditions.
- Power: Mains AC power. 120 or 240-Volt systems (50 and 60Hz). 600 W maximum load. A 5-Amp circuit breaker is included that also acts as the on-off switch.
- Time resolution: 1 min averaging (recommended); 15 sec averaging (minimum).
- Angular ranges measured: 8 View angles centered at 5° (unpol.), 10.6°, 31.8°, 52.9°, 95.3°, 116.5°, 137.6°, 158.8°
- Instantaneous field of view < 7.5°
- Wavelengths: (3) 450 nm, 520 nm and 638 nm
- Polarization orientations: 2 Parallel and perpendicular to the scattering plane.
- Size measurements: Independent optical and aerodynamic size measurements.
 - Aerodynamic: 4 Size bins selected up to PM10 (possible every 5 min)
 - Optical: Continuous function from 0.05 to 15um (possible every 1 min)