microAeth® MA300 Black Carbon monitor

The microAeth® MA300 is a small, real-time 5-wavelength UV-IR Black Carbon monitor with an 85 sampling location automatic filter tape advance system which allows for 3-12 months of continuous measurements.

The device is a self-contained instrument with built-in pump, flow control, data storage, and 4X the battery capacity of the MA200. The MA300 also features onboard GPS, satellite time synchronization, accelerometer, altimeter/barometer, and sensors for relative humidity and temperature. Wireless communications are provided for network and/or smartphone app integration and connection to other wireless health and environmental sensors. An external GPS antenna is option is available.

The MA300 is designed for extended multi-month measurement campaigns in both stationary and mobile applications The 85 location filter tape cartridge allows for extended continuous sampling of higher concentrations for up to a year depending on the sampling environment conditions and instrument settings.

The spectrum measurement provides insight into the composition of light absorbing carbonaceous particles and helps to distinguish among the different optical signatures of various combustion sources such as diesel, woodsmoke, biomass, and tobacco.

The instrument supports the DualSpot® loading compensation method which corrects for optical loading effects and provides additional information about aerosol optical properties.

Applications

Continuous real-time monitoring	Mobile monitoring
Multi-month monitoring	Personal monitoring
Ambient air monitoring	Indoor air quality
Source apportionment	Woodsmoke
Tobacco	Biomass
Stationary monitoring	Engine testing
Vehicle on-road mobile monitoring	Network monitoring
UAVs & vertical profiling	High concentration / Cookstove monitoring

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Tech Specs

Measurement method	Real-time, 5 wavelength spectrum analysis by measuring the rate of change of transmitted light due to continuous particle deposition on filter. Measurement at 880 nm interpreted as concentration of Black Carbon ('BC'). Measurement at 375 nm interpreted as Ultraviolet Particulate Matter ('UVPM') indicative of woodsmoke, tobacco, and biomass burning.
Measurement wavelengths	880 nm, 625 nm, 528 nm, 470 nm, 375 nm
DualSpot® Loading Compensation	Real-time analysis by measuring the rate of change in absorption of transmitted light due to the continuous collection of aerosol on filter. Simultaneous collection on two spots in parallel at different flow rates.
Timebases	1, 5, 10, 30, 60, 120, or 300 seconds
Flow Rates	Internal pump provides 50, 100, 150, or 200 ml/min
Pump Options	Standard internal diaphragm pump. Optional internal rotary vane pump
Flow Control	Internal mass flowmeters with closed-loop control
Filter Material	Polytetrafluoroethylene (PTFE)
Filter Capacity	MA300 Filter Tape Cartridge with PTFE material (85 sampling locations)
Sensors	Accelerometer, Relative Humidity, Temperature, Altimeter/Barometer
Dimensions	L: 165.20 mm (6.50 in), W: 125.20 mm (4.93 in), D: 39.70 mm (1.56 in)
Weight	700 grams (24.7 ounces)
Memory	16 GB internal flash memory, providing multiple years of data storage
On-board interface	Low Power Screen, 3 Buttons
Location services	Standard GPS with Internal Antenna. Optional External GPS Antenna
Date/Time format	ISO 8601 with satellite synchronization
Wireless	802.11 b/g/n Wi-Fi with AES hardware encryption, Bluetooth Low Energy
Connections	USB 2.0, 3.3V Serial, DC input via barrel jack
Communications	USB and wireless connectivity to cross-platform microAeth® Manager software available on MacOS X and Windows. microAeth Manager software is included and facilitates settings configuration, calibration routines, downloading data, and uploading new instrument firmware.
Battery	Internal 3.6V 12800 mAh rechargeable lithium-ion battery
Recharging	Barrel jack for fast charging via AC adapter (~11.75 hours to full charge, instrument turned off) or USB charging (~25.75 hours to full charge, instrument turned off)
Power Supply Adapter	Input: 100~240 VAC 50/60Hz 0.4A, Output: 5VDC / 2A, with option for Type A, C, G, or I plug
Operating Environment	0 ~ 40 °C operating, non-condensing.
Included	microAeth MA300, Barrel jack AC adapter, USB communication/charging cable, 1 meter sampling hose with swivel tube connector, Lapel clip for sampling hose. Cross-platform microAeth® Manager software, Quick Start Guide, and Manual available by download
Accessories & Consumables	MA300 Filter Tape Cartridge, MA Flow Calibration Kit, microCyclone™ PM2.5 Size-selective Inlet, MA300 Serial data cable