SCI-2021

Portable Dust Monitor

Description

The SCI-2021 Portable Dust Monitor utilizes state of the art light-scattering principle (near FEM) to measure the mass concentration of particulate matter ($PM_{2.5}$, PM_{10}, and PM_1). When the sampling airflow passes through a uniformly illuminated light sensitive area, the dust particles in the airflow will produce scattered light. Then the scattered light flux in a certain range will be collected and projected onto the photoelectric converter from which the electrical signal is related to the mass concentration of the measured particles. The content of particulate matter in the ambient air will be calculated from the measured scattered light intensity. The SCI-2021 monitor is an ideal solution for particulate monitoring in construction sites, factories, mines, near road sites, etc.

Applications

- Supplementary Equipment of Monitoring Stations
- Industrial Fence Line Monitoring
- Construction Site Dust Control
- Pollution Source Tracing
- Traffic Pollution Monitoring
- Emergency Monitoring
- Air Quality Model Validation
- Community Based Monitoring
- Pollution Migration Mapping

Features

- Wall AC power
- High accuracy and precision
- Pump sampling
- Dynamic heating technology
- Auto light path cleaning
- Auto zero drift calibration
- Touchscreen and second-wise real-time data display
- Self-diagnosis and alarm system
- Local data storage and USB data access
- Wi-Fi, Bluetooth, Ethernet, Serial Port

PM Technical Specifications

Range		0 – up to 10,000 μg/m^3 (user configurable)
Parallelism		⩽10%
Compared with Gravimetric Measurement	Slope	1 ± 0.15
	Intersect	0 ± 10 μg/m^3
	R^2	⩾ 0.93
Lowest Detection Limit		5μg/m^3 (1h), 1μg/m^3 (24h)
Resolution		0.1 μg/m^3
Data Interval		1 second
Averaging Interval		user-configurable among 1 minute, 30 minutes, 1 hour, and 2 hours

Other Parameters Features

Display	Colored touchscreen and GUI
Data Storage	Local storage
Communication	GMS; USB flash drive; RS232 or 485 serial port communication
Sampling System	Active Pump Sampling
Sampling Rate	2 liter/minute (0.528 gallon/minute)
Heating & Moisture Mitigation	Dynamic heating
Auto Calibration	Auto zero drift calibration
Troubleshooting	Self-diagnosis and alarm system
Power	AC (110 – 120) V / (50 – 60) Hz
Operating Environment	T: -20 – 45℃ (-4 – 113 ℉) ; RH: 0% – 100% (w/o condensation)

Sample Data

Four units of the SCI-901 (labeled as Sensor #2, #3, #4, and #5) were co-located with a Metone BAM 1020 referential equipment in a testing chamber from 15 December 2020 to 22 December 2020. No calibration was performed throughout the test period. The 6 high concentration peaks were generated in the chamber during the test period. The data of the SCI-2021 showed a very strong linear correlation with the referential BAM 1020, with PM_{10} R^2 of ~0.99. The time series and linearity plots of the results are shown in Figure *1*.

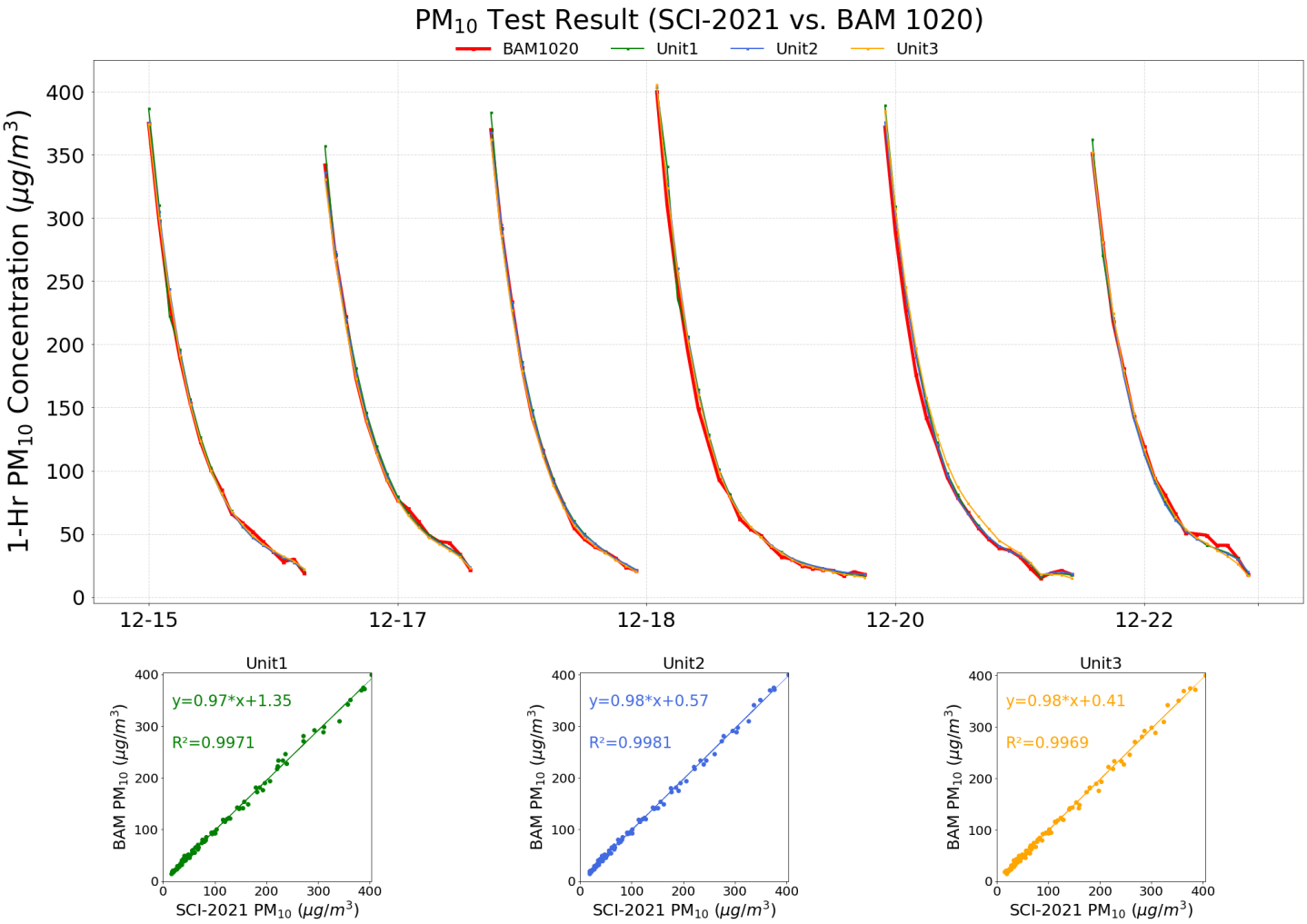

Figure 1: Test Result of PM_{10}