smoke

and particulates

monitoring

LAND

Combustion & Environmental Monitoring

An AMETEK® Company

model 4200

smoke and particulates monitor

Key Features and Benefits

- **Small, lightweight and compact -** *easy to locate and install*
- **High reliability, low maintenance -** *no moving parts*
- **Measurement Output in Opacity or mg/m³ -** *flexible configuration*
- **Wide range of optional accessories -** *configure to meet process needs*
- **Simple keypad operation** - *straightforward setup, calibration and diagnostics*

Stability and reliability for continuous monitoring.
Proven economical technology for performance optimisation

Leading Technology

The patented dual LED technology of the Model 4200 has proven itself worldwide as stable, reliable and trouble free. The lightweight and compact design makes it ideal for a wide range of applications. Simple installation, low maintenance and ease of operation ensure immediate results - vital where performance, cost and compliance benefits are of high priority.

Opacity monitoring on a municipal waste incinerator

Dust monitoring on a roadstone coating plant

Flexibility

Particulate measurements are displayed in % opacity or mg/m³. Easy access is provided to all instrument functions, through a removable cover on the Transceiver. All Setup, Calibration, Diagnostics and Alarms settings can be adjusted - to ensure optimum instrument performance.

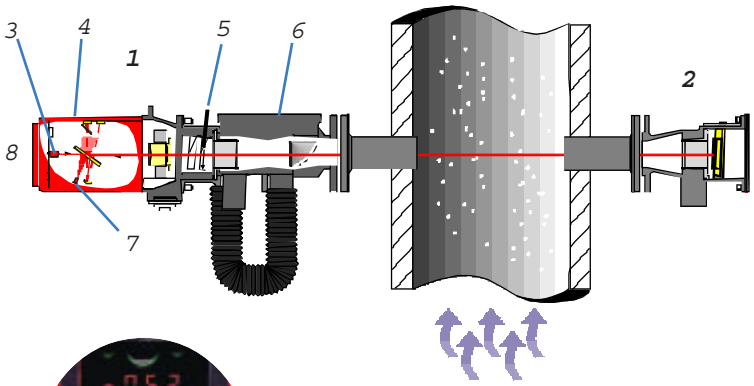
Applications

- Particulate Removal System Efficiency Monitoring
- Combustion Efficiency Monitoring
- Evaluation of Control Processes
- Precipitator Power Optimisation
- Baghouse Performance Monitoring

the Model 4200 is the ideal particulate monitoring tool for multi-process plants with common stacks

Industries

- Power Utilities
- Refineries
- Chemical/Petrochemical
- Incinerators
- Cement Plants
- Roadstone Plants
- Process Industries
- Quarries
- Road Tunnels (visibility)



Key to Schematic

1 *Transceiver*

2 *Retro-reflector*

3 *High Brightness Red LED*

4 *IP65 / NEMA4 enclosure*

5 *Built-in Audit Jig, and Check Reflector*

6 *Optional air-servo operated Fail-safe Shutter*

7 **Patented 'flood LED' technology*

8 *Integral Control Panel*

**The Model 4200 uses the Land patented Flood LED Technique*
UK Patent No. 2287785
U.S. Patent No. 5,617,212

Measurement Principle

The cross-stack, double-pass measuring system comprises a transceiver and retro-reflector unit. The transceiver has a high intensity source LED, which sends a beam of light through a diffuser and onto a beamsplitter. Half of the light is transmitted via a lens to the retro-reflector unit. The light returned is focused on to a measurement detector.

The remaining light reflected by the beam splitter is focused onto a reference detector. The opacity value is calculated from the ratio of the two detected signals.

The instrument alternates between the measurement and flood LEDs every second to eliminate drift and maintain accuracy.

Dust monitoring on a coal-fired boiler

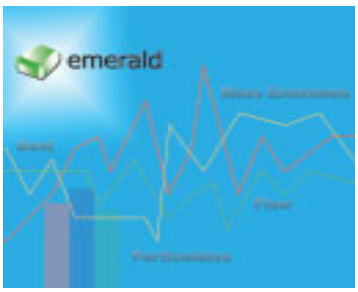
Dust monitoring on a cement plant

Optional Accessories

- Data Acquisition and Reporting Software
- Air-Blower/Mover Systems
- Automatic Fail Safe Shutter
- Certified Neutral Density Filters for Calibration
- Flange Mounted Optical Alignment Tool
- Weatherproof Covers

Data Acquisition and Reporting Software

A fully automated Data Acquisition and Reporting system is available to log, display and output measurement data at pre-determined intervals. The PC-based software system is both simple to use and highly flexible, using the power and simplicity of Windows™. Configuration and operation are fully menu-controlled and most routine functions can be fully automated. Data capture can be made from multiple instruments.



Dust readings from each instrument are logged at user-definable intervals, and can be combined with volume flow readings to generate total emitted mass if required. Alarm levels are configurable separately for each channel to give the operator an immediate indication of excessive emissions.

Further Information

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Specifications

Measuring System

Technique:	Double pass / path transmissometry
Operating Wavelength:	623 ± 20 nm
Light source:	High intensity red LED
Ranges:	Opacity: 0 - 20 % to 0 - 100% Dust Density: 0 - 100 to 0 to 999 mg/m^3
Linearity:	< 2 % of range*
Resolution:	0.1 % Opacity; 0.1 mg/m^3 Dust Density
Drift:	< 3 % of range per month
Angle of Projection:	< 5°
Angle of View:	< 5°
Response Time:	5 seconds to 90 % of final value
Averaging:	Selectable from 1 s to 59 s, 1 min to 59 min, or 1 hr to 8 hrs
Suitable for Stacks:	0.3 to 9.7 m diameter / 1 to 32 ft
Flange-to-flange Pathlength:	0.6 to 10 m / 2 to 33 ft
Calibration:	Manual zero & upscale check
Method:	Built-in audit jig
Dust:	Single calibration constant

** Performance reduced for pathlengths > 7.5 m / 25 ft*

Control Panel

Display:	4-digit; red LED
Keypad:	4 keys for data input; easy access via removable cover panel
Status indicators:	System OK, Alarm, DC Power

Environmental

Operating Temperature:	-20 to +55 °C / -4 to +131 °F
Max. Flue Gas Temperature:	600 °C / 1112 °F higher temperature available
Max. Flange Temperature:	200 °C / 400 °F
Environmental Rating:	IP65 / NEMA4

Compliance

Safety:	Conforms to EN 61010
EMC:	Conforms to EN 50 081 and EN 50 082

Outputs

Analogue output:	0, 2 or 4-20 mA current loop, fully isolated
Relay outputs:	System OK, High Alarm
Contact Type/Rating:	Isolated changeover contacts rated at 1A@24V d.c., 0.5 A@125 V a.c.

Electrical

Power Supply:	90 - 260 V a.c., 50/60Hz, (universal input) (additonal for typical purge blower 110 V or 230 V, 50 or 60 Hz, 500 W)
Power Rating:	5 W

Air Requirements (only for air mover option)

Instrument air:	5 - 8 bar / 75 - 120 psi ; 170 Nl/min / 36 cfm

Mechanical Data

Dimensions (H x W x D)	
Transceiver :	157 x 127 x 404 mm / 6 x 5 x 16 in
Retro-reflector:	127 x 127 x 200 mm / 5 x 5 x 8 in
Weight	
Transceiver:	5 kg / 11 lb
Retro-reflector:	2 kg / 4.4 lb

Options

Air Blower/Air Mover	A range of purge air supply options is available
Fail Safe Shutter	Protects the instrument if the purge air supply fails
Weather Covers:	Additional protection for severe environments
Data Logger System:	Software program for logging and correction of data
Alignment Tool:	Flange mounted light source and target for use during installation
Calibration Filters:	Certified neutral density filters for instrument linearity check

Continuous Product Development may make it necessary to change these details without notice

LAND

www.landinst.com

LAND has a comprehensive range of Combustion and Environmental Monitoring Instrumentation.

Approval applies to products designed and manufactured in the UK

Approval applies in the USA

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