smoke

and particulates

monitoring

LAND
combustion

the total efficiency concept

model 4200

Key Features

- Direct continuous measurement
- Small, lightweight and compact
- Opacity or mg/m^3
- Patented Dual LED technology*
- Long-life LED source
- No moving parts - minimal maintenance
- Simple installation and setup
- Optional data logging software system

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/m^3. Easy access is provided to all instrument functions, through a removeable cover on the Transceiver. All Setup, Calibration, Diagnostics and Alarms settings can be adjusted - to ensure optimum instrument performance.

Applications

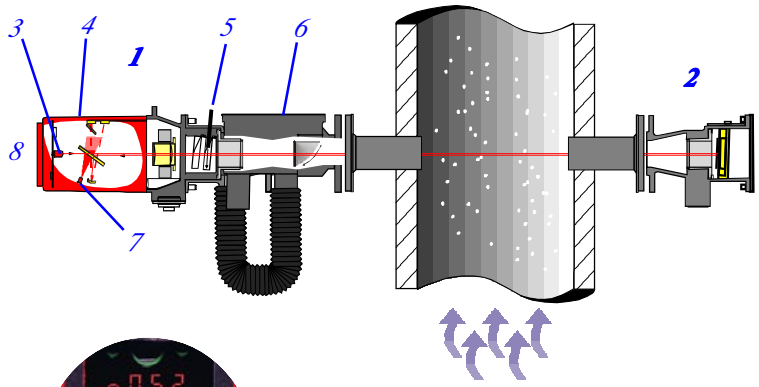
- Particulate Removal System Efficiency Monitoring
- Combustion Efficiency Monitoring
- Evaluation of Control Processes
- Precipitator Power Optimisation
- Baghouse Performance Monitoring

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)

smoke and particulates



Key to Schematic

1 *Transceiver*
2 *Retro-reflector*
3 *High Brightness Red LED*
4 *No moving parts*
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*

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

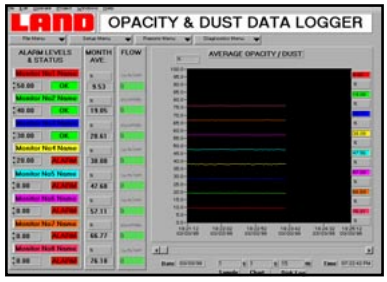
Optional Accessories

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

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

Data Logging Software

The Land Opacity and Dust Data Logger Software is a fully automated Data Acquisition and Reporting system.
The PC-based software system can acquire, log and report upon the status of up to eight Model 4200 monitors.



Opacity 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.

LAND combustion

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Product Specifications

Measuring Technique	Double pass transmissometry
Light source:	Dual LED
Ranges:	User selectable full scale 10 - 100% opacity or 0 to 999mg/m^3
Accuracy:	±2% Opacity (±5% for pathlength >7.5m/25ft)
Response Time:	5 seconds to 90% of final value after step change User set average time: 1sec to 59secs, 1 min to 59 mins 1 hour to 8 hours
Resolution:	±0.25%
Drift:	<2% opacity / dust per month
Angle of Projection:	<5°
Angle of View:	<5°
Misalignment errors:	<2% opacity error over ±0.5 degree misalignment
Pathlength	0.3m to 10m (1ft to 32ft) Minimum flange to flange width 0.6m Software set outlet pathlength correction factor
Calibration	
Method:	Push buttons for setup, calibration alignment mode
Check:	Manual zero and span check
Linearity:	Built-in audit jig
Dust:	Single calibration constant
Environmental	
Operating Temperature:	-20 to +55°C / -4 to +131°F
Safe Temperature:	-40 to +70°C / -40 to +158°F
Flue Gas Temperature:	600°C / 1112°F
Flange Temperature:	200°C / 392°F
Safety:	Conforms to EN 61010
Emissions:	Conforms to EN 50 081
Immunity:	Conforms to EN 50 082
Display	
Type:	Easy access via removeable cover panel on transceiver 4-digit; red LED
Parameters:	0-99.99%; 0-999mg/m^3 also used for configuration and diagnostics
Inputs/Outputs	
Current loop outputs:	0-20, 2-20 or 4-20mA
Relays:	2, System OK, High Alarm
Contact Type/Rating:	Isolated changeover contacts rated at 1A@24V d.c., 0.5A@125V a.c., for System OK and High Alarm
Electrical	
Power Supply:	90-260Va.c., 50-60Hz, 10W
Power Rating:	5W
Air Requirements	
Instrument air:	75-120psi (5-8bar)/Flow 6cfm (170l/min) for air mover option only
Dimensions/Construction	
Transceiver:	404(l) x 127(w) x 157(d)mm/16(l) x 5(w) x 6(d) in
Retro-reflector:	200(l) x 127(w) x 127(d)mm/7.9(l) x 5(w) x 5(d) in
Weight:	Transceiver: 5kg/11lbs; Retro-reflector: 2kg/4.4lbs
Enclosure:	All metal case, sealed to IP65/NEMA4
Options	
Data Logger System:	Software program for logging and correction of data
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
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 Combustion has a comprehensive range of Combustion and Environmental Monitoring Instrumentation.

Approval applies to products designed and manufactured in the UK

A Division of Land Instruments International

http://www.landinst.com/comb/