

low level

opacity and dust

compliance monitoring



LAND

Combustion & Environmental Monitoring

An **AMETEK**® Company

4500 Premier

High accuracy monitoring for low level dust and opacity

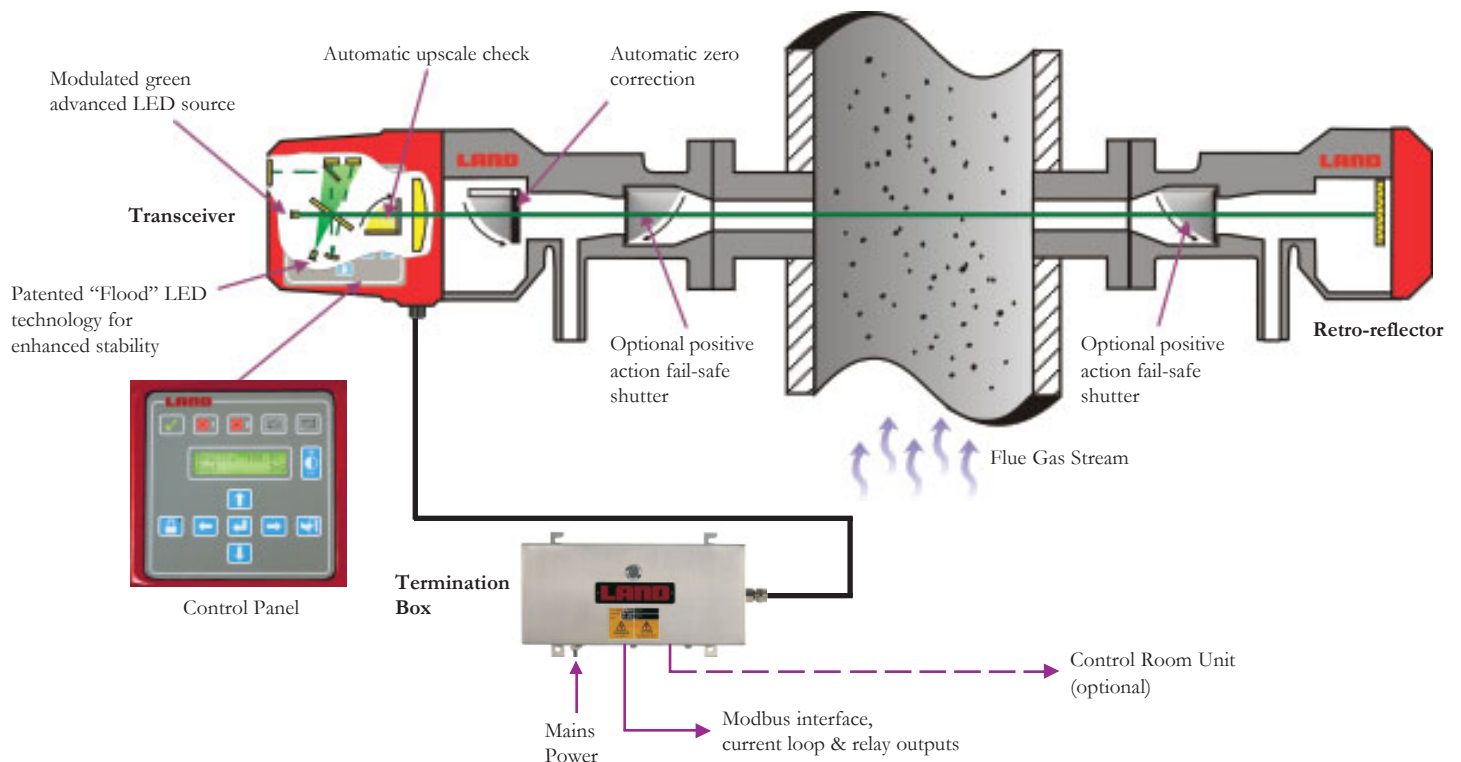
Land is a world leader in dust monitor design and manufacture, with a commitment to continuous product improvement.

The Model 4500 Premier meets the latest and most demanding standards for low level dust monitoring.



Worldwide approvals for compliance monitoring

- Meets or exceeds US EPA requirements for 40CFR60 Sections 13, 17 and App. B PS1
- Meets or exceeds US EPA requirements for proposed 40CFR60 App. F Procedure 3
- Meets or exceeds ASTM Standard D6216
- Meets or exceeds US EPA CPS-001 for 0 to 10 % Opacity monitors
- MCerts certified Continuous Emissions Monitoring System
- TÜV approved to the requirements of the 13th, 17th, 27th & 30th BImSchV and TA Luft 2002



Features and Benefits

- Ultra-low level measurement - *advanced LED design gives 0 to 10 mg/m³ dust density capability*
- Outstanding reliability, low maintenance - *Measures with no moving parts*
- High accuracy and repeatability - *Designed for compliance monitoring applications*
- Patented measurement technology - *Unique “no drift” zero check*
- Automatic in-situ zero and span checking - *Built-in calibration audit jig*
- Range of instrument configurations - *Outputs in opacity, extinction, or dust density*
- Fully user configurable - *Integral control panel for set-up, control and diagnostics*
- Easily integrated into plant control system - *Current loop outputs and Modbus interface*

Patented Technology

The Model 4500 Premier uses a highly homogeneous advanced LED light source⁺ to reduce the effect of misalignment on the measured opacity. Together with the patented* “Flood LED”, it achieves the highest levels of stability and accuracy. The “no moving parts” optical system gives an instrument with exceptional reliability.

⁺US Patent No. 6781695

*UK Patent No. 2287785



Easy Auditing

Periodic performance verification could not be simpler. The built-in audit jig accepts standard optical filters, and the zero alignment can be confirmed without removing the instrument from the stack.



Dust Density

Dust density monitors must be calibrated by comparison with an isokinetic sample test, as proposed in PS-11. The Model 4500 Premier fully supports this operation with automatic averaging and calculation.

Quick Installation

The stainless steel Termination Box has a single, pre-terminated cable for connection to the instrument itself. All customer connections are made using simple terminal rails inside the box.

Automatic Calibration

The Model 4500 Premier is fitted with a fully automatic zero checking and drift compensation system. An automatic span check mechanism confirms the instrument calibration at user defined intervals.

Simple Setup

The integral control panel provides all user setup and control. Detailed diagnostic information can be accessed through the key panel.

Applications include:

- Incineration
- Power utilities
- Pulp and paper
- Cement and roadstone
- Steel (Electric Arc Furnace)
- Glass
- Refineries
- Petrochemicals
- Process Industries

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Specifications

Measuring

| | |
|---|--|
| Technique: | Double pass/path transmissometry |
| Operating Wavelength: | 520 ± 20 nm, High Intensity LED |
| Range (User selectable): | Opacity 0 – 10 % to 0 – 100 %; Optical Density 0 – 0.1 to 0 – 3.0 Dust Density 0 – 10 to 0 – 4000 mg/m ³ |
| Accuracy: | ± 0.5 % opacity |
| Linearity: | < 2 % of range |
| Resolution: | 0.1 % Opacity; 0.001 Optical Density; 0.1 mg/m ³ Dust |
| Drift: | < 1 % of range per month |
| Suitable for Stacks diameter: | 0.6 to 9.7 m / 2 to 32 ft |
| Installation Pathlength: | 0.97 to 10 m / 3 to 22 ft (option to 20 m / 66 ft) |
| Calibration: | Automatic zero and upscale calibration |
| Response Time: | < 10s (< 2s with no damping) |
| Calibration Error per ASTM D6216: | < 1 % opacity |
| 24 Hour Drift: | < 0.3 % opacity |
| Long Term Drift: | < 0.3 % opacity per month |
| Voltage Variation per ASTM D6216: | < 0.2 % opacity (over 85 - 264 V a.c.) |
| Thermal Stability per ASTM D6216: | < 0.3 % opacity (over -20 to +55 °C / -4 to +131 °F range) |
| Ambient Light Sensitivity per ASTM D6216: | < 0.3 % opacity |
| Insensitivity to Misalignment: | < 0.2 % opacity for ±0.25 ° misalignment |
| Zero Correction: | Automatic correction for zero drift |
| Averaging: | Selectable from 10 secs to 24 hours (in 1 second steps) |

Environmental

| | |
|------------------------|--|
| Operating Temperature: | -20 to 55 °C / -4 to 131 °F (-40 °C / -40 °F with optional heater) |
| Max. Flue Gas Temp.: | 600 °C / 1112 °F |
| Max. Flange Temp.: | 200 °C / 392 °F |
| Environmental Rating: | IP65 / NEMA4X |

Compliance

| | |
|------------------------|---|
| Measurement Standards: | Meets or exceeds US EPA requirements for 40CFR60 Sections 13, 17 and App. B PS1 Meets or exceeds US EPA requirements for proposed 40CFR60 App. F Procedure 3 Meets or exceeds ASTM Standard D6216-03 Meets or exceeds US EPA CPS-001 MCerts certified Continuous Emissions Monitoring System TÜV approved to the requirements of the 13 th , 17 th & 30 th BImSchV and TA Luft 2002 |
| Safety: | Conforms to EN-61010-2 |
| EMC: | Conforms to EN-50 081 & EN-50 082 |

Outputs

| | |
|-------------------|--|
| Modbus Interface: | RS232 or RS485 |
| Analog Outputs: | Two isolated 4-20mA current outputs. Independently configurable as Opacity, Dust Optical Density, Calibration Drift or OPLR |
| Relay Outputs: | System OK, Span calibration, Zero calibration, Alarm 1, Alarm 2, Maintenance |
| Relay Rating: | 1 A @ 24 V d.c., 1 A @ 240 V a.c. |

Electrical

| | |
|---------------|--|
| Power Supply: | 100 – 240 V a.c.+10%, -15%, 50 – 60 Hz |
| Power Rating: | 10 W |

Mechanical Data

| | |
|------------------------|--------------------------------------|
| Dimensions (HxWxD) | |
| Transceiver | 220 x 220 x 520 mm / 9 x 9 x 20.5 in |
| Retro-reflector | 220 x 220 x 320 mm / 9 x 9 x 12.6 in |
| Termination box | 180 x 400 x 120 mm / 7 x 16 x 5 in |
| Weight Transceiver | 15.2 kg / 33.5 lb |
| Weight Retro-reflector | 7.6 kg / 16.8 lb |
| Weight Termination Box | 7.5 kg / 16.5 lb |

Options

| | |
|------------------------------|---------------------|
| Air Blower Units | Control Room Unit |
| Automatic Fail-safe Shutters | Alignment Tool |
| Weather Covers | Calibration Filters |

Continuous product development may make it necessary to change these details without notice

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An **AMETEK** Company

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



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