

opacity and
dust compliance
monitoring



LAND

Combustion & Environmental Monitoring

An **AMETEK**® Company

4500 MkII+

4500MkII+ - Compliance monitoring for opacity and dust

“ outstanding reliability, proven on thousands of instruments installed worldwide”



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

The Model 4500 MkII+ meets the latest and most demanding standards for Continuous Opacity Monitoring Systems.

Designed for compliance monitoring

- Meets or exceeds US EPA requirements for 40CFR60 Sections 13, 17 and App. B PS-1 and PS-11
- Meets or exceeds US EPA requirements for proposed 40CFR60 App. F Procedure 3
- Meets or exceeds ASTM Standard D6216
- TÜV approved to the requirements of 13th BImSchV and TA Luft
- MCerts certified Continuous Emissions Monitoring System

Features and Benefits

- Designed for compliance applications - *Approved to the latest standards*
- High reliability, low maintenance - *No continuously moving parts*
- Automatic in-situ zero and span checking - *Built-in calibration audit jig*
- Patented measurement technology - *Unique “no drift” zero check*
- Easily integrated into plant control system - *RS232 or RS485 serial MODBUS interface*



Applications include:

- Power utilities
- Incineration
- Pulp and paper
- Rock products
- Steel
- Cement
- Glass
- Refineries
- Petrochemical
- Process Industries

Patented Technology

The Model 4500 MkII+ uses a patented highly homogeneous “advanced LED light source”¹ together with a patented “Flood LED”², to achieve the highest levels of stability and accuracy. The “no moving parts” optical system gives the dust emissions monitor exceptional reliability.

1 US Patent No. 6781695

2 UK Patent No. 2287785

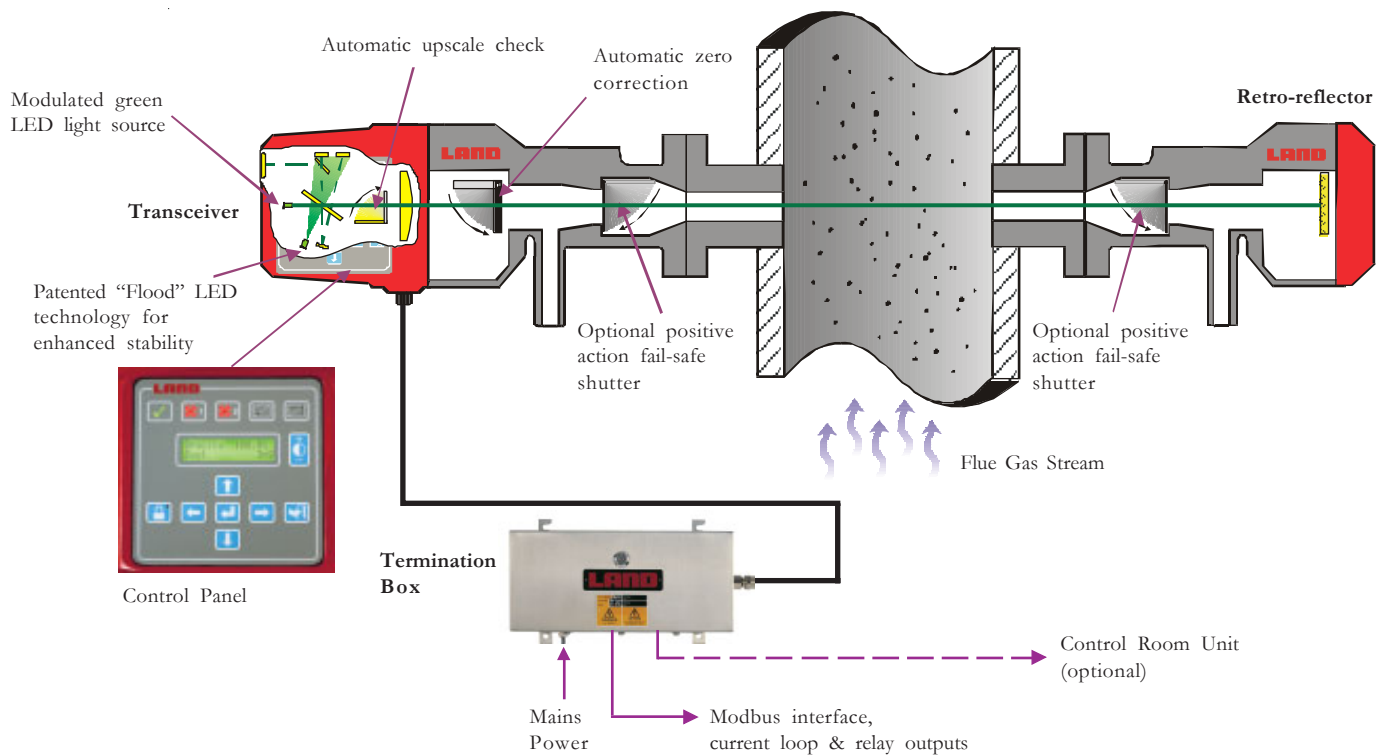
US Patent No. 5617212

Easy 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.

Simple Setup

The integral control panel provides all user setup, control and diagnostic information.



Automatic Calibration

The Model 4500 MkII+ 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.

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 MkII+ fully supports this operation with automatic averaging and calculation.

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Specifications

Measuring

Technique: Cross stack, double pass / path transmissometry
Operating Wavelength: 520 ±20 nm
Light Source: High Intensity LED
Range: Opacity 0 - 20 % to 0 - 100 %; Optical Density 0 - 0.2 to 0 - 3.0
Dust Density 0 - 100 to 0 - 4000 mg/m³ User Selectable
Accuracy: ± 2% Opacity
Linearity: < 2% of range
Resolution: 0.1% Opacity; 0.001 Optical Density; 0.1 mg/m³ Dust
Suitable for stack diameter: 0.6 to 25 m / 2 ft to 82 ft
Installation pathlength: 0.97 to 25 m / 3 ft to 82 ft
Calibration: Automatic zero and upscale calibration
(Selectable interval 1 to 24 hours in 1 hour steps)
Response Time: < 10s (< 2s with no damping)
Calibration Error: < 2% Opacity
(per ASTM D6216)
24 Hour Drift: < 0.3% Opacity
Long Term Drift: < 0.3% Opacity per month
Voltage Variation: < 0.5% Opacity (over 85 - 265 V a.c.)
(per ASTM D6216)
Thermal Stability: < 2% Opacity (over -20 to +55°C / -4 to +131°F range)
Ambient Light Sensitivity: < 2% Opacity
(per ASTM D6216)
Insensitivity to Misalignment: < 1% Opacity for ±0.25° Misalignment

Control Panel

Display: 2 x 16 character reflective backlit LCD with adjustable contrast control
Keypad: 7 Keys for data input
Indicators: System OK, Alarm 1, Alarm 2, Zero calibration, Span calibration

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: IP66 / NEMA4X

Compliance

Measurement Standards: Meets or exceeds US EPA requirements for 40CFR60 Sections 13, 17 and App. B PS-1 & PS-11
Meets or exceeds US EPA requirements for proposed 40CFR60 App. F Procedure 3
Meets or exceeds ASTM Standard D6216
Approvals: MCerts certified Continuous Emissions Monitoring System
TUV Approved to the 13th BImSchV and TA Luft
Safety: Conforms to EN-61010-2
EMC: Conforms to EN-50 081 & EN-50 082

Outputs

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

Electrical

Power Supply: 90 - 260 V a.c. 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
Retroreflector 7.6 kg / 16.8 lb
Termination Box 7.5 kg / 16.5 lb

Options

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

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

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

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Approval applies to products designed and manufactured in the UK

Approval applies in the USA

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