

Continuous Opacity and Dust Monitoring

The EMS WatchDog PS-1 delivers continuous, precision monitoring of opacity and dust (mg/m^3) with minimal maintenance. Designed to surpass US EPA 40 CFR 60, Appendix B, PS-1 specifications, it provides real-time data to support industrial process optimization and environmental compliance.

Engineered for Accuracy. Built for Dependability.



-5 to 99%

Opacity range

5.7 in.

Color touchscreen

4

4–20 mA outputs

6

Programmable relays

Typical Applications

- Power plants
- Boilers
- Refineries
- Cement plants
- Crematoriums
- Combustion furnaces
- Process industries
- Manufacturing industries
- Electrostatic precipitators
- Cement kilns

Key Features

- ASTM D6216 and 40 CFR 60 PS-1 compliant
- Microprocessor-controlled
- Dual-beam measurement with a green LED source
- 5.7-inch color touchscreen user interface
- Stack-mounted SSM for audits and maintenance
- MODBUS RS-485 or 4–20 mA communications
- User-selectable outputs and alarm customization
- PS-1 audit kit for quarterly audits
- Optional stainless-steel weather covers and blowers

System and Measurement Principle

An optical transceiver and retroreflector are mounted on opposite sides of the stack, with a stack-mounted SSM. The LSEM measurement beam crosses the stack and is reflected back. The transceiver sends its output to the touchscreen RCU for analysis. The controller provides five selectable displays, four 4–20 mA outputs, and MODBUS RS-485 communications. The stack-mounted Smart Service Module provides local sensor data, service selections, and fault displays.

Optical System and Controller Specifications

Transceiver and Reflector Specifications

Enclosure	NEMA 4 watertight enclosure.
Sensors	NEMA 4 Anodized Aluminum
Path Length	Distance-dependent.
Optical System	PS-1 Double Pass, LED
Reflector	Type 1
Light Source Aging Compensation	Automatic
Light Source Life	62,000 hours (>7 years); field replaceable
Ambient Temperature Limits	0 to +130°F (-17 to +54°C)
Process Gas	Up to 750°F (400 °C)
Alignment Verification	Built-in through-the-lens system
Mounting Flanges	3-inch IPS, 150# flange
Ambient Light Immunity	Solid-state modulation (Meets ASTM D6216)

EMS WatchDog PS-1 Controller

Enclosure Cutout	IP65/NEMA4X (when panel mounted), 91 x 122.5 mm (3.6" x 4.8"). Power 24Vdc +/- 10%.
Sensors	NEMA 4 Anodized Aluminum
EMS provided 24 VDC supply	Input: 90-240 VAC, 50/60 Hz, 0.55 amp +10%
Color Graphic Display	5.7-inch viewing area, LED backlight
Approvals	CE, UL, cUL
Measurement Ranges	-5 to 99% Opacity
Display Resolution	0.1% for Opacity
Process Display screens	Selectable Display pages.
Battery backup	7 years typical at 25°C
4-20mA Outputs	Four (4), 800 ohms maximum; individually customer-selected full-scale ranges and modes.
Relay Contacts	6 relays for alarms, field-programmable.
Alarm Reset	Automatic and manual.
Cal cycle initiation	Manual on demand, remote-initiated, or Internal Clock.
Opacity Exit Correlation (Lx / 2*Lt)	0.3-1.0
Environment	Operational temperature 0-50°C (32 to 122°F).
Network	Protocol: MODBUS (ASCII or RTU mode), type RS-485

WatchDog PS-1 Smart Service Module SSM

Enclosure	NEMA 4X plastic
Graphic Display	1.5x2.25" Viewing area, LED Backlight
Approvals	CE, UL, cUL
Network	Protocol: MODBUS type RS-485.
RCU Display Resolution	0.1 for Opacity RCU, mg, 0.01 O.D. with DUST RCU
Process Display screens	Local display for Sensor data, Service selections, and Fault displays.
Battery backup	Memory held for 7 years typically at 25°C
Cal cycle initiation	Manual push button
Environment	Operational temperature 0 to 50°C (32 to 122°F)
EMS provides 24 VDC supply	Input: 90-240 VAC, 50/60 Hz, 0.55 amp +10%
2-wire to EMS Control Unit (RCU)	RS485 Modbus to Control Unit

Audit Kit and Weather Cover



PS-1 audit kit for quarterly audits



Optional stainless-steel weather covers

