

EMS510 PS-1 COMPLIANT OPACITY MONITOR

The EMS510 provides continuous, low maintenance, precision measurement of Opacity. It is designed for monitoring visible smoke in the exhaust gas of industrial combustion or air filtration processes.

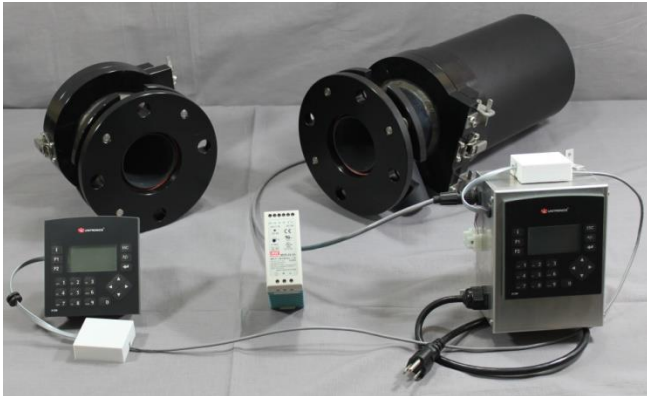


Manufacturing and Servicing Opacity & Dust Monitors Since 1990



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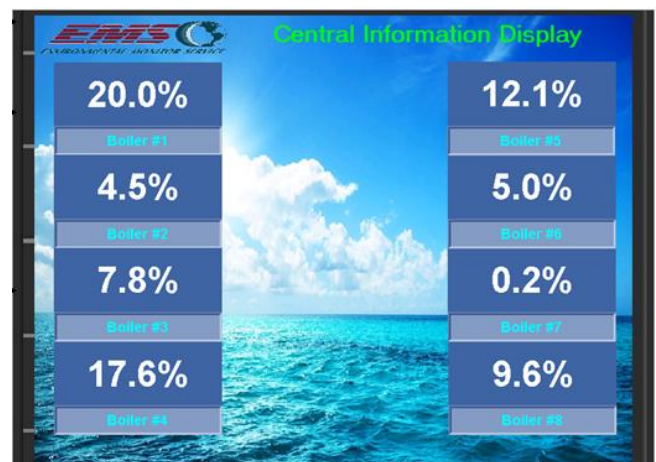
EMS510 OPACITY & DUST MONITOR



Standard System Configuration

Key Features

- ✓ ASTM D 6216 and 40 CFR 60 PS-1 Compliant
- ✓ Available Factory and Field Certification
- ✓ Custom Microprocessor Controlled Transceiver
- ✓ RS485, Modbus Communication, Optional Ethernet and Wireless
- ✓ Dual beam measurement with Green LED Source
- ✓ Automatic (Internal or External) and Manual On-Line Calibration

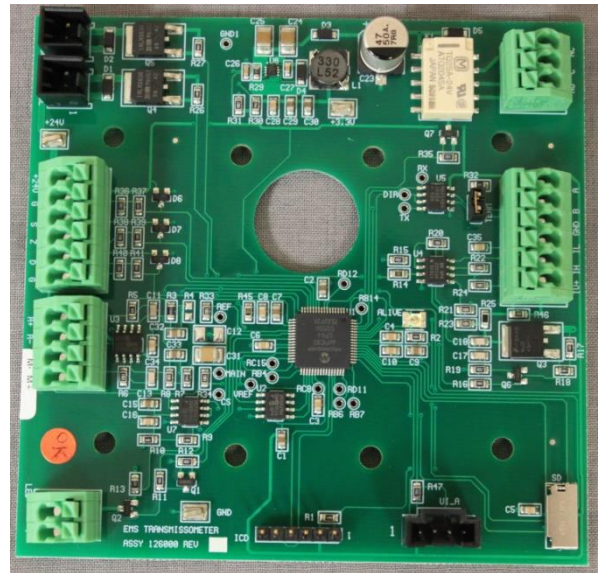


Central Information Display (CID)

EMS510 OPACITY MONITOR

System and Measurement Principle

The EMS510 system consists of an optical transceiver mounted on one side of the stack and a retro reflector mounted on the other. The LSEM (LED Electronic Modulation) measurement beam is projected across the stack to a retro reflector, which reflects it back across the stack. The output of the transceiver is sent to the user interface via Modbus RS485 where the signal is analyzed and displayed. This intuitively designed controller.



Transceiver Microprocessor Board



Applications

- ✓ Power Plants
- ✓ Boilers
- ✓ Electrostatic Precipitators
- ✓ Filter Bag Houses
- ✓ Refineries
- ✓ Cement Plants
- ✓ Combustion Furnaces
- ✓ Process Industries



EMS510 OPACITY MONITOR

Smart Service Module (SSM)

The newly developed **Smart Service Module** is located inside the stainless steel weather cover and utilizes Modbus communication over RS485 (2 wire) cable connected to the transceiver and control unit. Many of the control unit functions are accessible at the sensor location. This service module is useful for trouble shooting, PM/Audits and setup. It also eliminates the necessity for a second technician at the mounting location



Optional Accessories/Services

- ✓ Stainless Steel Weather Covers
- ✓ Customizable CID (Central Information Display)
- ✓ Wireless Communications
- ✓ Custom Engineering
- ✓ Startup, Certification and Preventative Maintenance
- ✓ Procedure 3 Required Off- Stack Zero Kit
- ✓ Certified Neutral Density Filter sales and calibration



Design and performance: Meet or exceeds 40 CFR 60 appendix B, PS-1 and ASTM D 6216	
Spectral Response	Peak 500 to 600nm, less than 10% of peak response outside 400 to 700 nm.
Angle of View/Angle of Projection	AV <4°, AP <4°.
Calibration Error/accuracy	+/- 1% of full scale
Response time	< 10 second
24 Hour Zero/ Calibration Drift	< 0.5% / < 0.5%
Operational Period	In excess of PS-1 required 336 Hrs.
Zero/Span Calibration	Manual or automatic with zero mirror and neutral density filter
Process gas	Up to 750 ° F (400 ° C) standard, higher available-contact factory.

Severe Weather Cover:	
Material	308 Stainless Steel
Quick release pins	2 for bottom and 2 for top release.
Mounting	3 inch IPS, 150# flange. Others available.
Standard Blower	Single phase, 110/220VAC 50/60Hz
Max stack pressure	+/- 5 inch WC, with the proper installation of purge blowers.
Wind Speed	< 60 mph
Ambient temperature limits	-40°F to 130°F (-4°C to 54°C)
Protection for	Transceiver and Retro-reflector components; purge blowers.

EMS510 Opacity Control unit:		Environmental Monitor Service, Inc.	
Enclosure	IP65/NEMA4X (when panel mounted), 96x96x64mm (3.8" x 3.8" x2.58"). Power 24Vdc +/- 10%.		
EMS provided 24Vdc Supply	Input: 90-240 VAC, 50/60 Hz, 0.55 amp +10%;		
Graphic Display	1.5x2.25" Viewing area, LED Backlight		
Approvals	CE, UL, cUL		
Measurement Ranges	-5 to 99% Opacity		
Display Resolution	0.1% for Opacity		
Process Display screens	3 Selectable pages, Instant, average, split screen.		
Battery back up	7 years typical at 25°C		
S.D. Card	Optional - Back up by SD memory card.		
4-20mA Outputs	Two (2), 800 ohms max individually customer selected F.S. ranges and modes.		
Relay Contacts	6 relays for alarms, Field programmable.		
Alarm Reset	Automatic and manual.		
Cal cycle initiate	Manual on demand, Remote initiated or Internal Clock.		
Opacity Exit Correlation (Lx / 2*Lt)	0.3 to 1.0		
Environment	Panel mounted IP65 / NEMA4X (front panel), Operational temperature 0 to 50°C (32 to 122°F), Storage temperature -20 to 60°C (-4 to 140°F), Relative Humidity (RH) 5% to 95% (non-condensing)		
Network	Protocol: MODBUS (ASCII or RTU mode), type RS-485		

EMS510 Smart Service Module	Environmental Monitor Service, Inc.
Enclosure	Stainless Steel when in EMS WC, NEMA 4X plastic when stand alone.
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, Fault displays.
Battery back up	7 years typical at 25°C
Cal cycle initiate	Manual, Remote and Internal Clock.
Environment	Panel mounted IP65 / NEMA4X (front panel), Operational temperature 0 to 50°C (32 to 122°F), Storage temperature -20 to 60°C (-4 to 140°F), Relative Humidity (RH) 5% to 95% (non-condensing)
EMS provided 24Vdc Supply	Input: 90-240 VAC, 50/60 Hz, 0.55 amp +10%
Network	Protocol: MODBUS (ASCII or RTU mode), type RS-485, optically isolated, RS-232.
2-wire to EMS Control Unit	RS485 Modbus to Control Unit

EMS510 Order Sheet		
	Part # instructions: Choose one number from the left from each category to create the part number. Example EMS510-1-3-5-10-22, 24	
1	EMS510 Standard Opacity, PS-1 Optics, Smart Service Module, Auto Zero/Span solenoid Microprocessor system.	
Controller Options		
3	Standard Controller with Snap-in (8 Relays, 8 Digital Inputs and 2 Analog (4-20 mA) Outputs.	
4	Standard Controller (RS485 Communications)	
Measurement Path Length		
5	Retro Assembly 3-15Ft.	
6	Retro Assembly >15Ft to 21Ft.	
7	Retro Assembly >21Ft to 40Ft.	
8	Retro Assembly >40Ft to 50Ft.	
9	Retro Assembly >50ft	
Weather covers and Air Purge		
10	Severe Weather Cover pair: Stainless Steel Construction.	
11	Severe Weather Covers with Single Air Purge Blower: Stainless Steel Construction. 25' of hose included.	
12	Severe Weather Covers with Dual Air Purge Blowers: Stainless Steel Construction	
13	Opacity Remote Blower w/Airflow Switch Mounted in Stainless Steel 24Hx20Wx19D Weather Cover.	
14	Indoor Opacity Sensor Mounting Plate: 24Hx20W with a Single Air Purge Blower, Air Flow Switch, Tee for Transceiver & Retro Air Supply.	
15	RB-1 Opacity spare or Remotely mounted blower 0.25hp, Air flow switch, Blower air filter, and connection hardware.	
16	RB-2 Opacity Remotely Mounted Blower 0.67 HP. w/Air Filter & Flow Switch	
17	Additional Cost to Replace Standard Purge Blower with Heavy Duty.67hp, 50in Max H2O Pressure Purge Blower	

18	Pair of Opacity Air plenum Plant Air Adaptors, accepts 1/4" or 1/2" NPT	
19	Set of Two Negative Draft Filter Assemblies for Opacity Monitors	
20	None or N/A	
21	Set of Two Negative Draft Filter Assemblies for Opacity Monitors	
PS-1 Certification		
22	EPA 40 CFR 60 PS-1 and ASTM D 6216 Opacity Factory Certification Report	
23	None or N/A	
Audit Kit		
24	Micro-turn 200 Opacity Audit Kit and On-Line Reflector Test Kit: Includes 3 Neutral Density Filters with Values to Meet PS-1 in Hard Carrying Case.	
25	None or N/A	