
EMS401 DUAL PASS OPACITY/DUST MONITOR



ENVIRONMENTAL MONITOR SERVICE

Quality Manufacturing, Integrity and Dependable Service by Design



PS1



6216

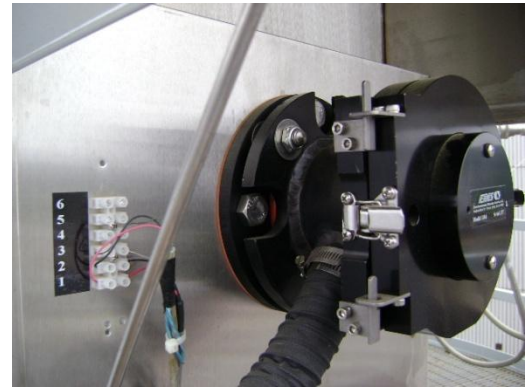
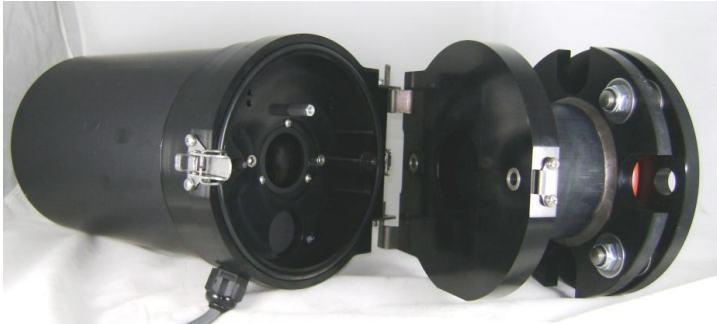


Compliant

Environmental Monitor Service, Inc. PO Box 4340, Yalesville, CT 06492
Ph. 203.935.0102, Fax 203.634.6663 Email: sales@emsct.com

EMS401

The EMS401 is a double-pass Opacity or Dust Monitor which provides continuous, low maintenance, precision measurement of Opacity or Dust (mg/m³). It is designed for monitoring smoke in the exhaust gas of industrial combustion or air filtration processes.



Key Features

- ✓ ASTM D 6216 and 40 CFR 60 PS-1 grade optics
- ✓ Dual beam measurement, immune to ambient light.
- ✓ Manual on-line calibration
- ✓ Opacity Measurement output -5 to 99%
- ✓ Dust Measurement output 0-2000 mg/m³ (Dust Option)
- ✓ Split screen Display of Opacity and Dust (Dust Option)
- ✓ Optical Density 0-2.0 (Dust Option)
- ✓ Lamp life of 70,000 hours guaranteed
- ✓ Field proven reliability with low maintenance
- ✓ Communications via 4-20 mA loop and MODBUS

**Environmental Monitor Service, Inc. PO Box 4340, Yalesville, CT 06492
Ph. 203.935.0102, Fax 203.634.6663 Email: sales@emsct.com**

EMS401

System and Measurement Principle

The EMS401 system consists of an optical transceiver mounted on one side of the stack and a retro reflector mounted on the other. The LSEM (Light Source 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 microprocessor RCU where signals are analyzed. This user friendly controller includes two 4-20mA outputs as well as many user selectable settings.



Shown in Optional NEMA 4x box.

Applications

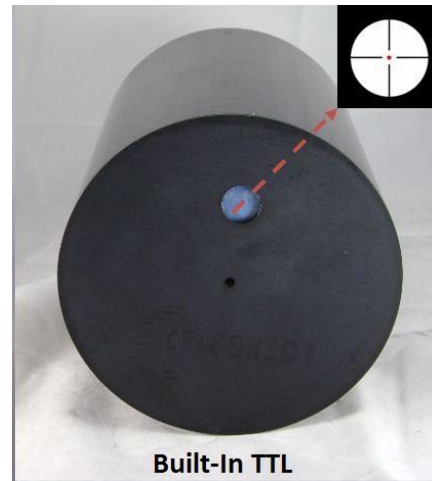
- ✓ Boilers
- ✓ Ductwork
- ✓ Electrostatic Precipitators
- ✓ Filter Bag Houses
- ✓ Refineries
- ✓ Cement Plants
- ✓ Combustion Furnaces
- ✓ Process Industries



**Environmental Monitor Service, Inc. PO Box 4340, Yalesville, CT 06492
Ph. 203.935.0102, Fax 203.634.6663 Email: sales@emsct.com**

EMS401

The EMS401 includes a **built-in TTL** (through-the-lens) alignment system. The alignment target can be viewed through a window on the transceiver. Adjustments to changes in alignment are made by a 3-point alignment system that is integral to the air plenum. This insures optimum reliability while enabling the system to be easily serviced and maintained in the field by plant service personnel.



Optional Accessories

- ✓ Stainless Steel Weather Covers
- ✓ Air Blower/Mover System
- ✓ Certified Neutral Density Filter sales and calibration
- ✓ Flange Mounted Optical Alignment Tool
- ✓ Upgrade Kits for Many Competitors Models

Transceiver/ Reflector:	
Enclosure	NEMA 4 watertight enclosure. Power 120/240VAC, 50/60Hz. +/- 10%, Transceiver 65va, Service Module 60va.
Path Length	Standard 2 to 15 feet, 0.6 to 4.6 meters. (Optional - Up to 50Ft based on application)
Optical System	Double Pass
Reflector	Distance dependent
Light Source Aging Compensation	Automatic
Light Source Life	62,000 hours (> 7 years) Field replaceable without removal
Ambient Temperature Limits	-40 to +130° F (-40 to +54° C) (Cold weather option available).
Process Gas	Up to 750° F (400° C),
Alignment Verification	Built-in through-the-lens system standard
Mounting Flanges	3 inch IPS, 150# flange. Others available.
Ambient Light Immunity	Solid-state modulation (Meets ASTM D6216)

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.

**Environmental Monitor Service, Inc. PO Box 4340, Yalesville, CT 06492
Ph. 203.935.0102, Fax 203.634.6663 Email: sales@emsct.com**

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.

EMS401 Opacity Control unit:	
Enclosure	IP65/NEMA4X (when panel mounted), 96x96x64mm (3.8" x 3.8" x2.58"). Power 24Vdc +/- 10%.
Power Requirements	24VDC (±4%), 40mA max. per unit.
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	Selectable pages, Opacity
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.
Clear Path Calibration	Manual Zero/Span
OPLR (Exit Correlation Lx / 2*Lt)	0.3 to 1.0
Environment	Inside cabinet IP20 / NEMA1 (case), 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, optically isolated, RS-232.

**Environmental Monitor Service, Inc. PO Box 4340, Yalesville, CT 06492
Ph. 203.935.0102, Fax 203.634.6663 Email: sales@emsct.com**

EMS401 Dust Control unit:	
Enclosure	IP65/NEMA4X (when panel mounted), 96x96x64mm (3.8" x 3.8" x2.58"). Power 24Vdc +/- 10%.
Power Requirements	24VDC ($\pm 4\%$), 40mA max. per unit.
Graphic Display	1.5x2.25" Viewing area, LED Backlight
Approvals	CE, UL, cUL
Measurement Ranges	0-2000/Actual mg ³ , -5 to 100% Opacity, 0-2 Optical Density
Display Resolution	0.1 for Opacity and Actual mg ³ , 0.001 O.D.
Process Display screens	Selectable pages, mg/opacity, O.D.
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.
Clear Path Calibration	Manual Zero/Span
OPLR (Exit Correlation Lx / 2*Lt)	Fixed (single pass)
Environment	Inside cabinet IP20 / NEMA1 (case), 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, optically isolated, RS-232.

**Environmental Monitor Service, Inc. PO Box 4340, Yalesville, CT 06492
Ph. 203.935.0102, Fax 203.634.6663 Email: sales@emsct.com**

EMS401 Order Sheet		
	Part # instructions: Choose one number from the left from each category to create the part number. Example EMS401-1-3-8-21, MSRP \$10,391.00	
EMS401 System		
1	EMS401 Opacity calculation Microprocessor control unit, Premium Dual Beam Transceiver System.	\$5,850.00
2	EMS401 Dust calculation Microprocessor control unit, Premium Dual Beam Transceiver System.	\$5,850.00
Measurement Path Length		
3	Retro Assembly 3-15Ft.	\$750.00
4	Retro Assembly >15Ft to 21Ft.	\$750.00
5	Retro Assembly >21Ft to 40Ft.	\$1,500.00
6	Retro Assembly >40Ft to 50Ft.	\$1,800.00
7	Retro Assembly >50ft	Call
Weather covers and Air Purge		
8	Severe Weather Covers for series 400: Stainless Steel Construction.	\$2,535.00
9	Severe Weather Covers for series 400 with Single Air Purge Blower: Stainless Steel Construction.	\$3,950.00
10	Severe Weather Covers for series 400 with Dual Air Purge Blowers: Stainless Steel Construction.	\$4,800.00
16	Pair of Opacity Air plenum Plant Air Adaptors, accepts 1/4" or 1/2" NPT	\$80.00
17	Set of Two Negative Draft Filter Assemblies for Opacity Monitors	\$87.00
18	None or N/A	0
Opacity On Line Audit Test Kits		
20	None or N/A	0
21	Micro-Turn 200 On-Line Test Reflector Kit with Nominal 9%, 37% and 84% Neutral Density Filters in Hard Carrying Case.	\$1,606.00
24	N.D. filter (value as needed) fits in retro air plenum during a clear condition.	\$350.00

Environmental Monitor Service, Inc. PO Box 4340, Yalesville, CT 06492
Ph. 203.935.0102, Fax 203.634.6663 Email: sales@emsct.com