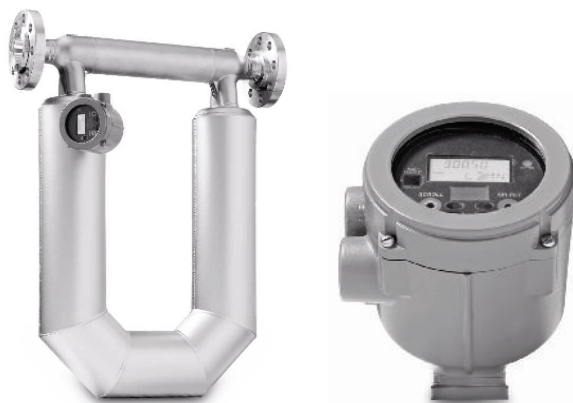


## Product Data Sheet

PS-00830, Rev. D  
March 2009

# Micro Motion® Model 2400S Transmitters with MVD™ Technology

The Model 2400S transmitter provides next-generation MVD™ technology in a compact, space-saving design. Difficult applications become easy with ultra-fast meter response time, the ability to handle high degrees of air entrainment, and built-in smart diagnostics that alert you to problems before they impact your process.



### Integrated architecture designed for easy access to process intelligence

- Provides extensive built-in diagnostics for proactive viewing of process events
- Enables true in-situ meter verification to deliver fast, actionable, simplified performance checks
- Supports PROFIBUS-DP and DeviceNet™ communication protocols for seamless connectivity

### Superior performance in the most challenging applications

- Delivers best two-phase flow capability for batching, loading, and entrained air applications
- Ultra-fast signal processing unlocks unmatched measurement performance

2400S

Compact integral transmitter

1700  
2700

Versatile field-mount transmitter

1500  
2500

Compact control-room transmitter

3300  
3350

Frequency-input discrete controller

3500  
3700

Integrated control & measurement platform



# Micro Motion Model 2400S transmitters

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Micro Motion transmitters and controllers from Emerson Process Management utilize MVD technology to deliver accurate, high-speed multivariable signals. Micro Motion transmitters are available with a wide selection of communication protocols, including 4–20 mA, HART®, Foundation™ fieldbus, PROFIBUS, DeviceNet™, Modbus®, and more. That means you will always be able to receive the process information you need in a format that works for your installation. Micro Motion transmitters also carry advanced diagnostic tools, allowing you to rest easy knowing your process is being monitored correctly.

**MVD technology.** MVD technology makes your Micro Motion flowmeter work smarter. Front-end digital processing dramatically reduces signal noise and gives you faster response time compared to analog devices.

Only MVD technology allows you to:

- Measure multiple variables for accurate process control
- Identify and resolve problems easily with built-in smart diagnostics
- Flexible architecture enables tuning for your application needs
- Upgrade transmitter functionality as needed, without impacting availability

**Model 2400S transmitter.** The Micro Motion Model 2400S transmitter is leading the way among MVD transmitters. The Model 2400S transmitter provides next-generation performance in an innovative, compact package, integrally mounted on a Micro Motion meter. Difficult applications become easy with ultra-fast meter response time, the ability to handle high degrees of air entrainment, and built-in smart diagnostics that alert you to problems before they impact your process.

The Model 2400S transmitter is available with a range of communication options: analog channels or digital communication with PROFIBUS-DP or DeviceNet protocols.

The Model 2400S raises the bar in process measurement by providing outstanding out-of-the-box performance unequaled by any other manufacturer or technology.

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## Contents

Physical specifications. . . . .	3	Host interface . . . . .	7
Power supply – Analog and PROFIBUS-DP . . . .	3	Environmental limits . . . . .	8
Electrical connections . . . . .	3	Environmental effects . . . . .	8
User interface . . . . .	4	Hazardous area classifications. . . . .	8
Input/output signals . . . . .	6	Ordering information. . . . .	9
Digital communications . . . . .	7		

# Physical specifications

Housing	NEMA 4X (IP66/67) polyurethane-painted cast aluminum or 316L stainless steel
Weight	Transmitter is mounted integrally with sensor. For weight of flowmeter, see product data sheet for sensor.
Mounting	Model 2400S transmitters are mounted integrally with sensor. The transmitter can be rotated on the sensor up to 360° in 45° increments.

## Power supply – Analog and PROFIBUS-DP

Self-switching AC/DC input, automatically recognizes supply voltage.  
Complies with low voltage directive 2006/95/EC per EN 61010-1 (IEC 61010-1).  
Installation (Overvoltage) Category II, Pollution Degree 2.

AC	<ul style="list-style-type: none"> <li>85–265 VAC</li> <li>50/60 Hz</li> <li>4 watts typical, 7 watts maximum</li> </ul>
DC	<ul style="list-style-type: none"> <li>18–100 VDC</li> <li>4 watts typical, 7 watts maximum</li> </ul>
Fuse	<ul style="list-style-type: none"> <li>IEC 127-1,25 fuse, slow blow</li> </ul>

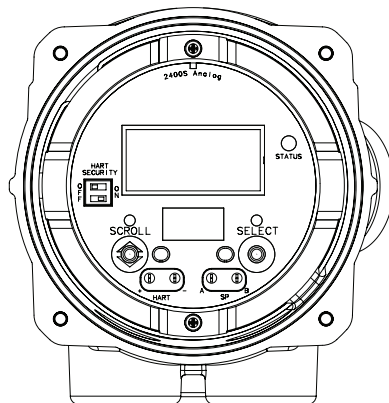
## Electrical connections

<b>Model 2400S Analog</b>	
Input and output connections	Two pairs of wiring terminals for transmitter inputs/outputs. Screw terminals accept solid or stranded conductors, 0,14 to 2,5 mm <sup>2</sup> .
Power connections	One pair of wiring terminals accepts AC or DC power. One internal ground lug for power supply ground wiring. Screw terminals accept solid or stranded conductors, 0,14 to 2,5 mm <sup>2</sup> .
Digital communications maintenance connections	Two clips for temporary connection to the service port. Two clips for temporary connection to HART/Bell 202 terminals.
<b>Model 2400S PROFIBUS-DP</b>	
PROFIBUS-DP segment	One pair of wiring terminals for connection to PROFIBUS-DP segment. Connection type: <ul style="list-style-type: none"> <li>Screw terminals accept solid or stranded conductors, 0,14 to 2,5 mm<sup>2</sup>.</li> <li>Five-pin PROFIBUS-DP M12 (Eurofast) female connector (optional).</li> </ul>
Power connections	One pair of wiring terminals accepts AC or DC power. One internal ground lug for power supply ground wiring. Screw terminals accept solid or stranded conductors, 0,14 to 2,5 mm <sup>2</sup> .
Digital communications maintenance connections	Two clips for temporary connection to the service port.
<b>Model 2400S DeviceNet</b>	
DeviceNet segment	One pre-installed male 5-pin Eurofast connector for I/O and power supply wiring.
Digital communications maintenance connections	Two clips for temporary connection to the service port.

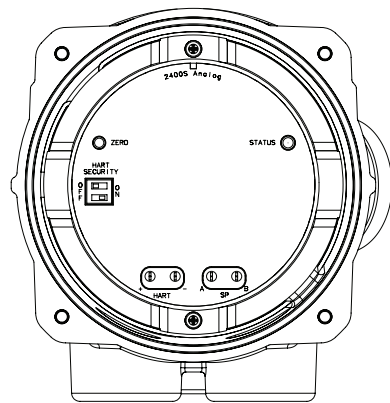
# User interface

Model 2400S Analog

With display

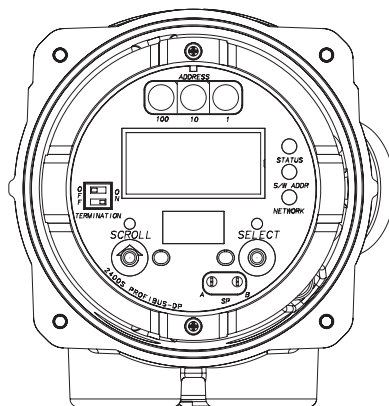


Without display

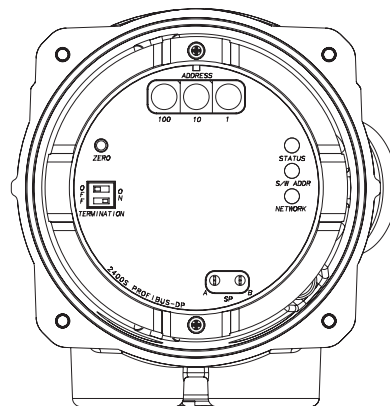


Model 2400S PROFIBUS-DP

With display

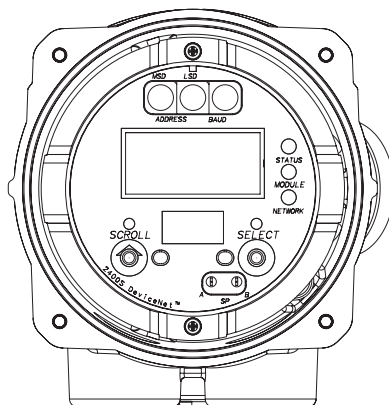


Without display

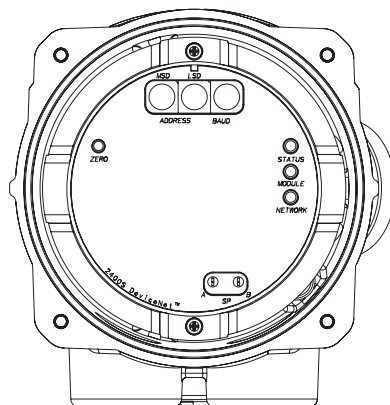


Model 2400S DeviceNet

With display



Without display



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## Interface functions

All models with or without display	<ul style="list-style-type: none"> <li>• Suitable for hazardous area installation.</li> <li>• User interface module can rotate 360° on the transmitter in 90° increments.</li> <li>• Three-color status LED on user interface module indicates flowmeter condition at a glance, using a solid green, yellow, or red light. Zero in progress is indicated by a flashing yellow light.</li> <li>• Two clips for service port connections (requires removing transmitter housing cover).</li> </ul>
Model 2400S Analog with or without display	<ul style="list-style-type: none"> <li>• Two clips for HART/Bell 202 connections (requires removing transmitter housing cover).</li> <li>• HART security switch (requires removing transmitter housing cover).</li> </ul>
Model 2400 PROFIBUS-DP, with or without display	<ul style="list-style-type: none"> <li>• Three rotary switches for selecting network address (network address is also software-selectable).</li> <li>• DIP switch for enabling internal termination resistor.</li> <li>• Address and network LEDs that indicate PROFIBUS-DP status.</li> </ul>
Model 2400 DeviceNet, with or without display	<ul style="list-style-type: none"> <li>• Three rotary switches for selecting network address and baud rate (network address and baud rate are also software-selectable).</li> <li>• Module and network LEDs to indicate DeviceNet status.</li> </ul>
All models with display	<ul style="list-style-type: none"> <li>• Depending on purchase option, transmitter housing cover has glass or plastic lens.</li> <li>• User interface module includes LCD panel. LCD line 1 displays process variable; line 2 displays engineering unit of measure.</li> <li>• Display update rate is user-configurable: 1 to 10 seconds at 1-second increments.</li> <li>• Display backlighting may be adjusted or turned off.</li> <li>• Operator access to transmitter menus is provided via optical switches that are operated through the lens. LED indicators show when a “button” has been pressed.</li> <li>• Infrared port allows access to service port from serial port IrDA without removing transmitter housing cover.</li> </ul>
All models without display	<ul style="list-style-type: none"> <li>• Transmitter housing cover is all metal (no lens).</li> <li>• Access to user interface requires removing transmitter housing cover.</li> <li>• Zero button allows flowmeter zero from field (requires removing transmitter housing cover).</li> <li>• No IrDA port.</li> </ul>

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# Input/output signals

<hr/>	
<b>Model 2400S Analog</b>	
Channel A	<p>One active or passive 4–20 mA output</p> <ul style="list-style-type: none"><li>• Not intrinsically safe</li><li>• Isolated to <math>\pm 50</math> VDC from all other outputs and earth ground</li><li>• Maximum load limit: 820 ohms</li><li>• External (passive) power: 12 to 30 VDC, 24 VDC typical</li><li>• Can report mass flow, volume flow, density, temperature, or drive gain</li><li>• Output is linear with process from 3,8 to 20,5 mA, per NAMUR NE43 (February 2003)</li></ul>
Channel B (configurable)	<p>One active or passive frequency/pulse output</p> <ul style="list-style-type: none"><li>• Not intrinsically safe</li><li>• Can report mass flow or volume flow, which can be used to indicate flow rate or total</li><li>• Scalable to 10000 Hz</li><li>• Power:<ul style="list-style-type: none"><li>- Internal (active): +24 VDC <math>\pm 3\%</math> with a 2,2 kohm internal pull-up resistor</li><li>- External (passive): +30 VDC maximum, +24 VDC typical</li></ul></li><li>• Output is linear with flow rate to 12500 Hz</li></ul> <p>One active or passive discrete output</p> <ul style="list-style-type: none"><li>• Not intrinsically safe</li><li>• Can report five discrete events, flow switch, forward/reverse flow, calibration in progress, or fault</li><li>• Power:<ul style="list-style-type: none"><li>- Internal (active): +24 VDC <math>\pm 3\%</math> with a 2,2 kohm internal pull-up resistor</li><li>- External (passive): +30 VDC maximum, +24 VDC typical</li></ul></li><li>• Maximum sink capability: 500 mA</li></ul> <p>One active or passive discrete input</p> <ul style="list-style-type: none"><li>• Not intrinsically safe</li><li>• Power:<ul style="list-style-type: none"><li>- Internal (active): +24 VDC, 10 mA maximum source current</li><li>- External (passive): +3 to 30 VDC maximum</li></ul></li><li>• Can reset all totals, reset mass total, reset volume total, start/stop totals, or start sensor zero</li></ul>
<b>Model 2400S PROFIBUS-DP</b>	<p>Digital 2-way PROFIBUS-DP signal. Certified by Profibus User Organization (PNO).</p>
<b>Model 2400S DeviceNet</b>	<p>Digital 2-way DeviceNet signal. Certified by Open DeviceNet Vendor Association (ODVA).</p>
<hr/>	

# Digital communications

<b>All versions</b>	
Service port	One service port for temporary connections (requires removing transmitter housing cover) Uses RS-485 Modbus signal, 38,4 kilobaud, one stop bit, no parity Address: 111 (not configurable)
Wireless	If transmitter has display, service port can be accessed via serial port IrDA without removing transmitter housing cover.
<b>Model 2400S Analog</b>	
HART/Bell 202	HART signal is superimposed on the milliamp output (Channel A), and is available for host system interface: <ul style="list-style-type: none"><li>• Frequency: 1,2 and 2,2 kHz</li><li>• Amplitude: to 1,0 mA</li><li>• 1200 baud, one stop bit, odd parity</li><li>• Address: 0 (default), configurable</li><li>• Requires 250 to 600 <math>\Omega</math> resistance</li></ul>
<b>Model 2400S PROFIBUS-DP</b>	
PROFIBUS-DP	Digital 2-way communication protocol <ul style="list-style-type: none"><li>• Automatically recognizes network baud rate</li><li>• Address selectable by 3 rotary switches, or software selectable</li></ul>
<b>Model 2400S DeviceNet</b>	
DeviceNet	Digital 2-way communication protocol <ul style="list-style-type: none"><li>• Address and baud rate selectable by 3 rotary switches (2 to select address, 1 to select baud rate), or software selectable</li></ul>

## Host interface

<b>Model 2400S Analog</b>	
	ProLink® II v2,5 (or later) from Micro Motion supports full device configuration. HART DD file supports all functionality.
<b>Model 2400S PROFIBUS-DP</b>	
	<ul style="list-style-type: none"><li>• ProLink II v2,5 (or later) from Micro Motion supports full device configuration.</li><li>• GSD file conforming to the PROFIBUS-DP specification<ul style="list-style-type: none"><li>- Provides PROFIBUS Class 1 Master functions</li><li>- Enables reading and controlling all process data</li></ul></li><li>• DD file conforming to PROFIBUS EDDL specification<ul style="list-style-type: none"><li>- Provides PROFIBUS Class 2 Master functions</li><li>- Enables device configuration</li><li>- Supports Siemens Simatic PDM</li></ul></li></ul>
<b>Model 2400S DeviceNet</b>	
	<ul style="list-style-type: none"><li>• ProLink II v2,5 (or later) from Micro Motion supports full device configuration.</li><li>• EDS file conforming to the DeviceNet specification:<ul style="list-style-type: none"><li>- Enables device configuration</li></ul></li></ul>






# Environmental limits

Ambient temperature limits	Operating and storage: –40 to +60 °C Below –20 °C, LCD responsiveness decreases and LCD may become difficult to read. Above 55 °C, some darkening of the LCD panel might occur. ATEX requires limiting ambient temperature to below 55 °C.
Humidity limits	5 to 95% relative humidity, non-condensing at 60 °C
Vibration limits	Meets IEC68.2.6, endurance sweep, 5 to 2000 Hz, 50 sweep cycles at 1,0 g

# Environmental effects

<b>All models</b>	
EMI effects	Meets EMC directive EN 61326 Industrial Complies with NAMUR NE21 Version: 10.02.2004
<b>Model 2400S Analog</b>	
Ambient temperature effect	On mA output: ±0,005% of span per °C

# Hazardous area classifications

<b>CSA C-US</b>		Class I Division 2 Groups A, B, C, D Class II Division 2 Groups F and G
<b>ATEX</b>		
Analog or PROFIBUS-DP	 	II 3 G Ex nAC II T5 (Zone 2) II 3 D IP66/IP67 T70°C
DeviceNet	 	II 3 G Ex nA II T5 (Zone 2) II 3 D IP66/IP67 T70°C
<b>IECEX</b>		
All models		Ex nAC II T5



# Ordering information

Model	Product description
2400S	Micro Motion Coriolis MVD transmitter
Code	Mounting/housing material
I	Integral mount transmitter / Polyurethane-painted aluminum
J	Integral mount transmitter / 316L stainless steel
Code	Output options / Power supply
A	One mA, one configurable output / 18 to 100 VDC and 85 to 265 VAC, self-switching
C <sup>(1)</sup>	DeviceNet (bus powered)
D	PROFIBUS-DP / 18 to 100 VDC and 85 to 265 VAC; self switching
Code	I/O terminations
1	Compression screw terminals
Code	Display
1	Dual line display for process variables and totalizer reset, glass lens
3	No display
4 <sup>(2)</sup>	Dual line display for process variables and totalizer reset, non-glass lens
Code	Conduit connections
B	1/2-inch NPT – no gland
C	1/2-inch NPT with brass/nickel cable gland
D	1/2-inch NPT with stainless steel cable gland
E	M20 – no gland
F	M20 with brass/nickel cable gland
G	M20 with stainless steel cable gland
L	DeviceNet 5-pin Eurofast connector in M20 housing
M	DeviceNet 5-pin Eurofast connector in 1/2-inch NPT housing
Code	Approvals
M	Micro Motion standard (no approval)
2	CSA Class I Div. 2 (U.S.A. and Canada)
L	ATEX II 3 G/D, Zone 2
3 <sup>(3)</sup>	IECEEx, Zone 2
Continued on next page	

(1) Requires selecting conduit connection option L or M.

(2) Not available with approval codes 2, L, or 3.

(3) Available only with output/power option code A.

## Ordering information *continued*

Code	Language
A	Danish installation manual and English configuration manual
D	Dutch installation manual and English configuration manual
E	English installation manual and English configuration manual
F	French installation manual and French configuration manual
G	German installation manual and German configuration manual
H	Finnish installation manual and English configuration manual
I	Italian installation manual and English configuration manual
J	Japanese installation manual and English configuration manual
M	Chinese installation manual and Chinese configuration manual
N	Norwegian installation manual and English configuration manual
P	Portuguese installation manual and English configuration manual
S	Spanish installation manual and Spanish configuration manual
W	Swedish installation manual and English configuration manual
C	Czech CE requirements, English installation manual, and English configuration manual
B	Hungarian CE requirements, English installation manual, and English configuration manual
K	Slovak CE requirements, English installation manual, and English configuration manual
T	Estonian CE requirements, English installation manual, and English configuration manual
O	Polish CE requirements, English installation manual, and English configuration manual
U	Greek CE requirements, English installation manual, and English configuration manual
L	Latvian CE requirements, English installation manual, and English configuration manual
V	Lithuanian CE requirements, English installation manual, and English configuration manual
Y	Slovenian CE requirements, English installation manual, and English configuration manual
Code	Software options 1
Z	Flow and density variables (standard)
G <sup>(1)</sup>	Enhanced density measurement
A <sup>(1)</sup>	Petroleum measurement
Code	Software options 2
Z	No software options 2
C	Meter verification, structural integrity method
Code	Factory options
Z	Standard product
X	ETO product
Typical model number: 2400S I A 1 1 B M E Z C Z	

(1) Software options A and G are available only with output option codes C and D.



# Micro Motion—The undisputed leader in flow and density measurement



World-leading Micro Motion measurement solutions from Emerson Process Management deliver what you need most:

## Technology leadership

Micro Motion introduced the first reliable Coriolis meter in 1977. Since that time, our ongoing product development has enabled us to provide the highest performing measurement devices available.

## Product breadth

From compact, drainable process control to high flow rate fiscal transfer—look no further than Micro Motion for the widest range of measurement solutions.

## Unparalleled value

Benefit from expert phone, field, and application service and support made possible by more than 600000 meters installed worldwide and over 30 years of flow and density measurement experience.

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