

4102MMT Modbus Multivariable Transmitter

Features:

- Digital Multivariable Transmitter
- Ethernet and Serial Communications
- PID Controller
- Analog Output
- cULus Class 1, Division 1, Hazardous Area Rating
- 2 year warranty on parts and labor



The 4102MMT Modbus Multivariable Transmitter is the flagship of Control Microsystems' Ethernet transmitter product line, offering precise measurement of process pressure, differential pressure and temperature. As a fully digital transmitter, the product offers a built-in choice of Modbus protocol over serial and/or Ethernet communications, along with an optional PID controller and analog output. With this choice, the 4102MMT can be used in a wide variety of installations including low power transmitters in remote locations or as an addressed device offering control and measurement in an extended Ethernet network.

Overview:

Highly Accurate and Dependable -

The 4102MMT integrates a field proven, high-performance, multivariable sensor with Control Microsystems' implementation of industry-standard Modbus. As a multivariable transmitter, the 4102MMT can measure process temperature, process pressure and differential pressure. The unit is capable of tolerating severe

overpressure conditions with no sensor degradation or zero-shift. The 4102MMT has an accuracy of $\pm 0.05\%$ of span, and long term drift stability of $\pm 0.05\%$ of the URL (Upper Range Limit).

Flexible Communications - With built-in serial and 10BaseT Ethernet ports the 4102MMT provides flexibility for both communications and configuration. The Serial port is RS-232/485 configurable and uses Control Microsystems' native Modbus RTU protocol. It can be used with radios, local displays or communication with other serial devices. The Ethernet port supports four Modbus protocols, two simultaneous connections and extended addressing. In addition, the Ethernet port supports a friendly IP list that enhances security through limiting IP message recognition from specific addresses or address ranges.

Superior Design - The 4102MMT sensor uses a unique biplanar design that allows the transmitter to be installed vertically, while easily integrating to horizontal process connections. Tangential draining and venting keep the sensor cavity clear without the use of side drain connections, regardless of horizontal or vertical installation. An optional integrated LCD unit provides local measurement readouts and

configuration capabilities for any measurement or control variable. The unit can also be calibrated from a remote SCADAPack controller using RealFLO software.

Applications:

As a compact and accurate multivariable transmitter with built-in Serial and Ethernet ports, PID control and an analog output, the 4102MMT can be applied in a wide range of flow measurement and control applications. These can include natural gas flow measurement and production automation, as well as measurement of level, pressure and temperature within storage vessels and pipelines. Depending on the application the 4102MMT can be used in a low power serial mode or as an addressed device using Ethernet on a WAN or LAN based system. From a certification perspective, the unit's cULus Class 1, Div 1, hazardous area rating makes it an ideal product for industrial, petrochemical and below grade municipal applications.

Specifications

Features	
Optional Analog Output	0 - 20mA, 12 bit
Optional PID Controller	Fully configurable control of analog output relative to any measured variable
LCD Interface ¹	Two button control, 2-line interface with 13 characters
Communications	
Serial Port	RS232/485 configurable, 1200 to 38400 baud
Serial Protocol	Modbus RTU
Ethernet Port ²	10BaseT, terminal block connection
Ethernet Protocols ²	Modbus/TCP, Modbus/UDP, Modbus RTU in TCP, Modbus RTU in UDP
Accuracy and Stability	
Differential & Absolute Pressure Accuracy	$\pm 0.05\%$ of span (for spans between 10% and 90% of URL) $\pm (0.005) \times (\text{URL} / \text{Span}) \%$ of Span (spans < 10% URL) ³
Process Temperature Accuracy	$\pm 0.5^\circ\text{F}$ (0.28°C), (not including RTD uncertainties)
Stability	< $\pm 0.05\%$ of URL per year over 5 years
Static Pressure Effect	The zero and span shift for a 1000psi (7MPa) static pressure change is: ZERO Shift $\pm 0.05\%$ of URL, SPAN Shift $\pm 0.1\%$ of reading
Ambient Temperature Effect	Total effect for a 100°F (55°C) change for absolute and differential pressure is: Digital Output: $\pm (0.0625\% \text{URL} + 0.125\% \text{Reading})$
Physical Specifications	
Power	9 to 30 VDC. 225mW with LAN (60mW with Serial communications)
Mass	7.8lb (3.5kg) without process connectors
Certifications	cULus Class 1, Div. 1 Groups B, C and D Hazardous locations cULus Class 1, Div. 2 Groups A, B, C and D Hazardous locations

¹ Button control disabled when setup for calibration through a SCADAPack controller using RealFLO software.

² Available without an Ethernet port.

³ Accuracy stated includes the effects of Linearity, Hysteresis, and Repeatability.

Span and Range Limits for Differential Pressure & Absolute Pressure

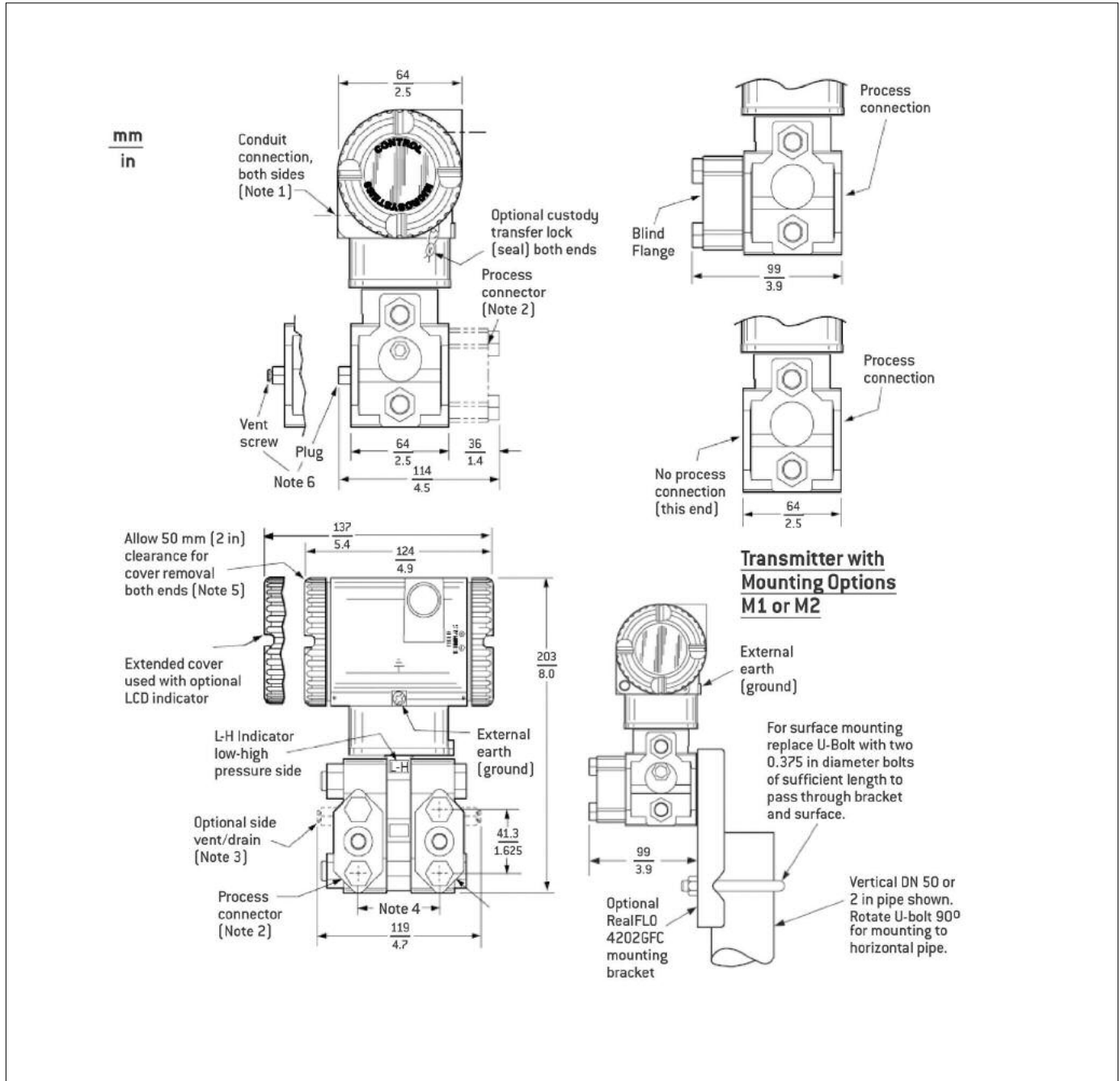
Span Code	Differential Pressure		Absolute Pressure	
	inches of H ₂ O	kPa	psia	MPa
A	0.5 to 30 inH ₂ O	(0.12 to 7.5 kPa)	1 to 100 psi	(0.007 to 0.7 MPa)
B	2 to 200 inH ₂ O	(0.50 to 50 kPa)	3 to 300 psi	(0.021 to 2.1 MPa)
C	10 to 840 inH ₂ O	(2.50 to 210 kPa)	3 to 300 psi	(0.021 to 2.1 MPa)
D	2 to 200 inH ₂ O	(0.50 to 50 kPa)	30 to 1500 psi	(0.21 to 10 MPa)
F	3 to 300 inH ₂ O	(0.75 to 75 kPa)	30 to 1500 psi	(0.21 to 10 MPa)
E	10 to 840 inH ₂ O	(2.50 to 210 kPa)	30 to 1500 psi	(0.21 to 10 MPa)

Model Code

4102-EA22A1010 represents a sample code for a 4102 with Ethernet

Model	Select: Product Description			
4102-	Modbus Multivariable Transmitter			
Code	Select: Communication Serial Ports			
DM	Digital - Modbus Protocol, Jumper selectable RS232 or RS485, de-pluggable screw-type terminal block			
DA	Digital - Modbus Protocol, Jumper selectable RS232 or RS485, de-pluggable screw-type terminal block, 1 Analog Output			
EA	Digital - (1) RS485/232 with Modbus Protocol, (1) 10 BaseT Ethernet with Modbus/TCP protocol, 1 Analog Output			
Code	Process Cover	Sensor Material	Sensor Fill Fluid	Bolts
22	316SS	316SS	Silicone	CS-B7
Code	Select: Differential & Absolute Pressure Span Limit			
	Differential Pressure		Absolute Pressure (Field Configurable for Gauge)	
A	0.5 to 30 inH2O	(0.12 to 7.5 kPa)	1 to 100 psi	(0.007 to 0.7 MPa)
B	2 to 200 inH2O	(0.50 to 50 kPa)	3 to 300 psi	(0.021 to 2.1 MPa)
C	10 to 840 inH2O	(2.5 to 210 kPa)	3 to 300 psi	(0.021 to 2.1 MPa)
D	2 to 200 inH2O	(0.50 to 50 kPa)	30 to 1500 psi	(0.21 to 10 MPa)
F	3 to 300 inH2O	(0.75 to 75 kPa)	30 to 1500 psi	(0.21 to 10 MPa)
E	10 to 840 inH2O	(2.5 to 210 kPa)	30 to 1500 psi	(0.21 to 10 MPa)
Code	Select: Temperature Measurement			
1	Terminal Blocks for Connection of External 100 Ohm Platinum RTD (DIN/IEC)			
Code	Select: Process Connector Type			
0	1/4" NPT, Threaded in Process Cover, includes SS Vents and Screws			
1	1/2" NPT, Flange Adapter c/w CS Grade B7 bolts			
Code	Select: Transmitter Housing Material	Conduit Entry Sizes		
1	Epoxy covered Aluminium	1/2 -14 NPT		
3	316 SS	1/2 -14 NPT		
Code	Select: Approvals			
0	Not Required			
U	cULus Explosion proof. Class 1, Div. 1 & Class 1, Div. 2, Groups A, B, C and D. Approved for Hazardous locations.			
Code	Select: Options			
	DIGITAL INDICATOR - Select One Only			
-L	Digital Indicator with Push Buttons and Ex-proof Window Cover (Black Epoxy)			
-L1	Digital Indicator with Push Buttons and Ex-proof Window Cover (Stainless Steel)			
	UPGRADE TO STAINLESS STEEL PROCESS COVER BOLTS AND NUTS (Replaces CS-B7) - Select One Only			
-B1	316 SS Process Cover Bolts and Nuts			
-B2	17-4 SS Process Cover Bolts and Nuts			
-N	Monel Vents and screws - NACE Standard MR-01-75			

Dimensions



1. Conduit connection 1/2 NPT or PG 13.5, both sides: plug unused connection with metal plug (supplied).
2. Process connectors may be removed and connections made directly to process cover using 1/4 NPT internal thread in process cover.
3. Process cover can be inverted making optional side vents or side drains.
4. Process connectors can be inverted to give either 2.0, 2.125, or 2.25 inch (51, 54, or 57mm) center-to-center distance between high and low pressure connections.
5. Topworks can be rotated to any position within one turn counterclockwise of the fully tightened position.
6. Process cover end plugs are substituted for vent screws when optional side vents (Note 3) are specified.