



Weatherford®

Production Optimization

SS 4102 Modbus® Multivariable Transmitter

Weatherford's production optimization division presents the SS 4102 Modbus multivariable transmitter providing precise measurements 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 proportional-integral-derivative (PID) controller and analog output. With this choice, the transmitter 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 transmitter integrates a field proven, high-performance, multivariable sensor with Weatherford's implementation of industry-standard Modbus. The multivariable transmitter can measure differential pressure and process temperature and pressure. The unit is capable of tolerating severe overpressure conditions with no sensor degradation or zero-shift. The transmitter has an accuracy of $\pm 0.05\%$ of span and long term drift stability of $\pm 0.05\%$ of the upper range limit (URL).

Flexible Communications—With built-in serial and 10BaseT Ethernet ports, the transmitter provides flexibility for both communications and configuration. The serial port is RS-232/485 configurable and uses native Modbus remote terminal unit (RTU) protocol. It can be used with radios, local displays or in 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.



Modbus is a registered trademark of Modbus Organization, Inc.



SS 4102 Modbus Multivariable Transmitter

Overview (continued)

Superior Design—The sensor uses a unique bi-planar 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 controller using RealFLO™ gas flow computer (GFC) software.

The resistance temperature detector (RTD) connections are approved as non-incendive when the unit is mounted in a Division 2 area. This allows the use of a low-cost RTD connection instead of expensive explosion-proof termination boxes.

Features, Advantages and Benefits

- Digital multivariable transmitter
- Ethernet and serial communications
- PID controller
- Analog output
- UL Class I, Division 2, Groups A, B, C and D for use in hazardous locations
- RTD connections rated non-incendive in Division 2 areas
- Three-year warranty on parts and labor

Applications

The compact and accurate multivariable transmitter with built-in serial and Ethernet ports, PID control and an analog output 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 transmitter can be used in a low-power serial mode or as an addressed device using Ethernet on a WAN or LAN based system.

RealFLO is a trademark of Kimray Inc.





SS 4102 Modbus Multivariable Transmitter

Span and Range Limits for Differential and Absolute Pressure

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

Specifications

Features	
Optional Analog Output	0 to 20 mA, 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/RS485 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 and absolute pressure accuracy	±0.05% of span (for spans ≥10% of URL) ±(0.005) x (URL/span)% of span (spans <10% URL) ³
Process temperature accuracy (°F/°C)	±0.5 (0.28), not including RTD uncertainties
Stability	<±0.05% of URL per year over five years
Static pressure effect	ZERO Shift ±0.05% of URL, SPAN Shift ±0.1% of reading for 1000 psi (7 MPa)
Ambient temperature effect	Total effect for a 100°F (55°C) change for absolute and differential pressure is: Digital Output: ±(0.0625% URL + 0.125% Reading)
Physical	
Power	9 to 30 Vdc, 225 mW with LAN (60 mW with serial communications)
Mass (lb./kg)	7.8 (3.5) without process connectors
Certifications	
	c(CSA)us Explosion proof, Class I, Division 1, Groups B, C and D Hazardous Locations c(CSA)US Class I, Division 2, Groups A, B, C and D Hazardous Locations IECEX to Exd IIC T6 ATEX to EEx d IIC T6 RTD connections rated non-incendive in Division 2 areas

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

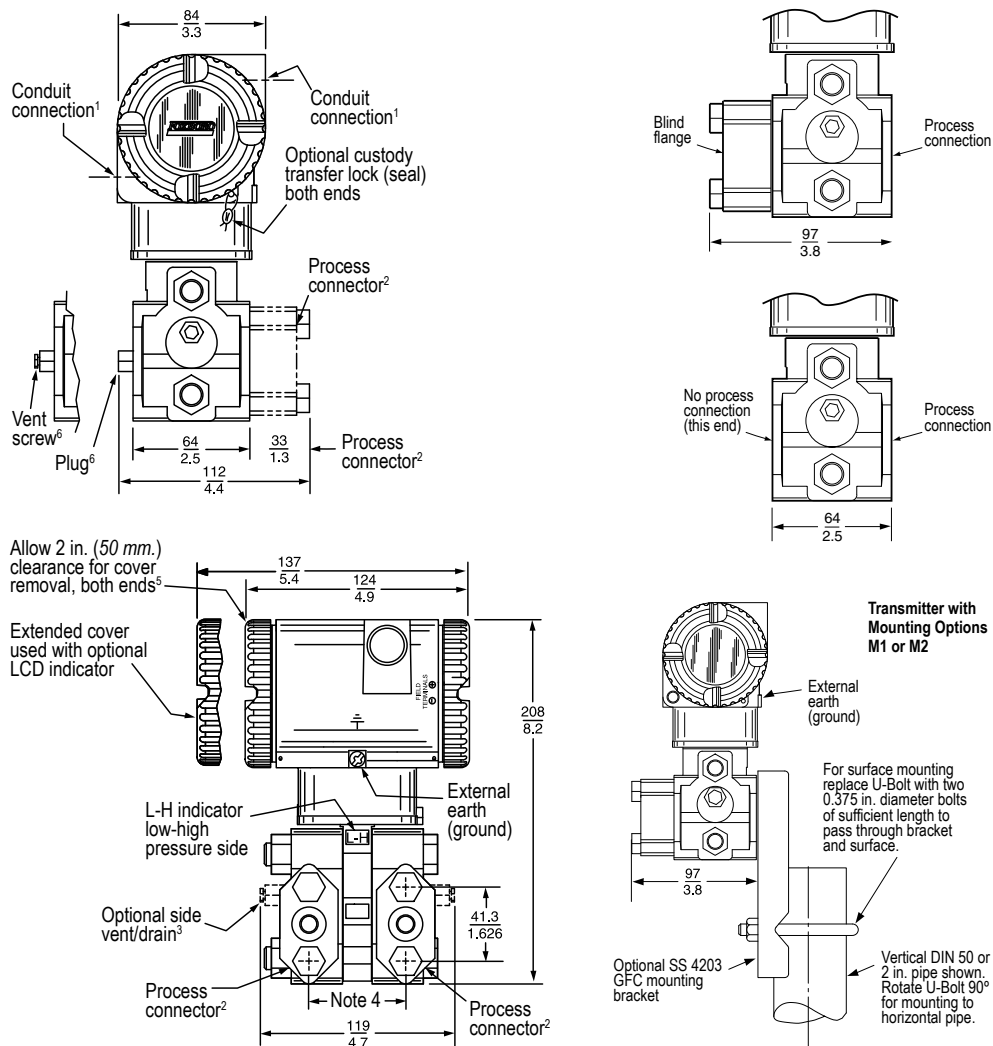
²Available without an Ethernet port

³Accuracy stated includes the effects of linearity, hysteresis and repeatability



SS 4102 Modbus Multivariable Transmitter

Dimensions



1. Conduit connection $\frac{1}{2}$ NPT or PG 13.5, both sides: plug unused connection with metal plug (supplied).
2. Process connectors may be removed and connections may be made directly to process cover using $\frac{1}{4}$ 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 57 mm) 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.