

2100 Series Smart Gauge



Meriam Instrument's 2100 Smart Gauges are micro-processor based pressure sensing devices that can be used to measure pressure, differential pressure (air or gas flow), or hydrostatic level. There are three models in the series: the 2110P is principally for pressure measurements, the 2110L is for level measure and the 2110F is for gas flow measurement. These three units share the same hardware, but have different software programs based on the function.

Manometer Replacement

2100 Smart Gauges can replace Manometers when restrictions on indicating fluids are a problem. Two applications are significant. One application is hydrostatic level measurements using bubblers. The 2100 series is a good replacement because it maintains local indication, adds outputs and utilizes most of the existing system of bubblers and other components. Gauge (GI) models may be directly connected to non-pressurized tanks for direct head measurements. The other application is gas or air flow metering. Examples are heat

treating, aeration, purge and cooling. The 2100 Smart Gauges maintain local indication, add outputs and keep replacement costs down. With external corrections for pressure and temperature, the gauges can also measure mass flow.

Pressure Switch In this application the 2100 has two distinct advantages over mechanical gauges. First, the actual switching point can be precisely set. A user can "see" the set point without having to make trial and error adjustments. Second, it reduces excessive dead band or hysteresis – a common complaint about mechanical gauges. The dead band in the 2100 is user selectable for exact control.

Absolute / Vacuum Measurement Absolute models give resolution to 0.1 mm Hg. Vacuum units have 0.001" Hg resolution over the entire vacuum range. The combination of resolution, 0.05% of full scale accuracy, outputs and low price make the 2100 a good choice for customers in research and development laboratories and process measurement.

Standard Features on the 2100 Series Smart Gauge Family

- **Approvals:** CSA Intrinsically Safe on battery models. CE mark available on battery and 4-20 mA units.
- **NIST Traceable:** NIST certificate supplied with all models.
- **Media compatibility:** Non-isolated Differential sensor (DN) for clean, dry, non-corrosive gases. Isolated Gauge and Absolute sensor (GI and AI) for fluids compatible with 316ss.
- **Process connection:** 1/8" female NPT, 316ss
- **Enclosure:** 4 lbs, 1/4" DIN (3.8" x 3.8" x 6.5") aluminum enclosure with epoxy finish. Standard unit is NEMA 4X on front panel only. Battery and 4-20 mA units are NEMA 4X throughout.
- **Backlight**
- **Damping:** selectable from 0.1 to 50 seconds.
- **Adjustable Deadband:** on SPDT relays
- **Selectable Timeout:** conserves battery
- **Lockout:** prevents inadvertent resetting of gauge configuration.
- **Temperature:**
 - Storage: -40°F to 140°F (-40 to 60°C)
 - Operating: 23°F to 122°F (-5 to 50°C)
- **Pressure Limits:** Twice range on Gauge and Absolute (GI and AI) units. Twice range on Differential (DN) units when pressurized on high side only 20x on 20" sensors when pressurized on high side only and 150 PSI (10.5 Kg/cm²) static when applied to both sides of the sensor simultaneously.
- **Display:** 4 1/2 digit LCD, 0.6" high (15.24mm)
- **Power/Outputs:** Standard unit has selectable 110 VAC 50/60 Hz, 220 VAC 50/60 Hz, or 12 to 28 VDC power. Included are an RS-232C and two set point relays rated 1 amp resistive @24 VDC, .5 amp resistive @ 115 VAC. Options: Lithium battery unit with field replaceable battery board and user defined auto shut-off. 12 to 28 VDC power for 4-20 mA and RS-232 output or 1-5 VDC and RS-232.
- **Accuracy:** ±0.05% of Full Scale(±0.1% FS on 20" H₂O Sensor). This includes the combined effects of linearity, repeatability, hysteresis and temperature

2100 Series Smart Gauge

Model 2110P for DP, P gauge, P absolute, Vacuum

Meriam Instrument's 2110P Smart Gauge is a microprocessor based, programmable, pressure sensing device. The ranges available allow for measurement of pressure, differential pressure, vacuum and absolute pressure. All units are programmed to allow easy configuration of the gauge through the front keypad. The AC powered and 4 to 20 mA units can also be configured through the RS-232C serial communications port.

The SPDT relays on the AC powered models are an ideal choice for process control functions. The 4 to 20 mA outputs on the 24 Vdc model allows the 2110P to be used in both control and recording applications. Both models also have RS-232C communications for high level control and data logging capabilities. Typical applications include use as a test bench gauge, tank level measurement, gas flow measurement and leak testing.

- Selection of engineering units: mm Hg, PSI, in. Hg, mbar, Bar, kPa, in. H₂O (20°C, 40°C, 60°F), Kg/cm², cm. H₂O and user defined.
- Range: 20" H₂O differential to 2000 PSIG
2000 mm HG Absolute

Ordering Information 2110P Smart Pressure Gauge

Sensor Type:		Mounting options:	Power/Output options
DN0020	0-20" H ₂ O	01 Panel Mount (standard)	1 110/220 VAC, 24 VDC/RS-232C, and SPDT Relays (Standard)
DN0200	0-200" H ₂ O	02 2" Pipe Mount	2 Batteries / No Outputs
DN2000	0-2000" H ₂ O	03 Portable Handle / Bench Stand	3 24 VDC / 4-20 mA, RS-232C
GI0020	0-20 PSI		4 Batteries w/I.S. approval
GI0200	0-200 PSI		5 Batteries w/CE approval
GI2000	0-2000 PSI		6 Code 3 w/CE approval
AI2000	0-2000 mm Hg		7 24 VDC/ 1-5 VDC, RS-232C, CE approval

Example: 2110P with 200" H₂O Differential pipe mount and Battery Pack 2110P DN0200 02 2

Model 2110L for Bubbler or Head Type Tank Level Measurement

Meriam Instrument's 2110L Smart Gauge is a microprocessor based, programmable, pressure sensing device. It is designed to display tank level in volumetric or mass units based on the hydrostatic head pressure of the fluid in the tank. The 2110L can be used in bubbler systems or for direct head measurement on pressurized or vented tanks. It can be configured for linear tanks such as vertical cylinders or for use on non-linear tanks such as horizontal cylinders and spheres. All units are programmed to allow easy configuration of the gauge through the front keypad. The AC powered and 4 to 20 mA units can also be configured through the RS-232C serial communications port.

SPDT relays on AC powered units and the 4 to 20 mA output on the transmitter models make the 2110L an ideal choice for many level control and recording functions. Both models also have RS-232C communications for additional control and data logging capabilities. The SPDT relays have selectable deadbands to prevent wear on pumps due to constant cycling.



- Selection Of Engineering Units: gallons, pounds, cubic feet, liters, percent, kilograms, cubic meters, in. H₂O and user defined.
- Range: DN: Differential Non-isolated 20", 200", 2000" H₂O
GI: Gauge Isolated 20 PSIG

2100 Series Smart Gauge

Ordering Information 2110L Smart Level Gauge

Sensor Type:

DN0020	0-20" H ₂ O
DN0200	0-200" H ₂ O
DN2000	0-2000" H ₂ O
GI0020	0-20 PSI

Mounting options:

01 Panel Mount (standard)
02 2" Pipe Mount
03 Portable Handle / Bench Stand

Power/Output options

1 110/220 VAC, 24 VDC/RS-232C, and SPDT Relays (Standard)
2 Batteries / No Outputs
3 24 VDC /4-20 mA, RS-232C
4 Batteries w/I.S. approval
5 Batteries w/CE approval
6 Code 3 w/CE approval
7 24 VDC/ 1-5 VDC, RS-232C, CE approval

Example: 2110L with 200" H₂O Differential pipe mount and 4 to 20 output 2110L DN0200 01 3

Model 2110F for Flow Indication of DP Primary Elements



Meriam Instrument's 2110F Smart Gauge is a microprocessor based, programmable, differential pressure sensing device designed to display flow rate when used with a head loss type flow element such as Accutube® averaging pitot tubes, orifice plates or Meriam Instrument's laminar flow elements. The piezoresistive differential pressure sensors are available in three ranges assuring the best accuracy and resolution for an application. The unit calculates flow rate by measuring the DP and using it in algorithms with flow coefficients entered into the unit by the user. All units can be configured through the front keypad. The AC powered and 4 to 20 mA units can also be configured through the RS-232C serial communications port.

SPDT relays on AC powered units and the 4 to 20 mA output on the transmitter models make the 2110F an ideal choice for many control and recording functions. Both models also have RS-232C communications for additional control and data logging capabilities. Typical applications include use as a LFE test bench gauge, air compressor usage monitoring and leak testing.

- Engineering Units: Pounds, cubic feet, liters, percent, kilograms, cubic meters, in. H₂O and user defined units. Minutes or hours time constant can also be displayed

- Range:
DN: Different Non-isolated 20", 200", 2000" H₂O

Sensor Type:

DN0020	0-20" H ₂ O
DN0200	0-200" H ₂ O
DN2000	0-2000" H ₂ O

Mounting options:

01 Panel Mount (standard)
02 2" Pipe Mount
03 Portable Handle / Bench Stand

Power/Output options

1 110/220 VAC, 24 VDC/RS-232C, and SPDT Relays (Standard)
2 Batteries / No Outputs
3 24 VDC /4-20 mA, RS-232C
4 Batteries w/I.S. approval
5 Batteries w/CE approval
6 Code 3 w/CE approval
7 24 VDC/ 1-5 VDC, RS-232C, CE approval

Example: 2110F with 20" H₂O Differential Panel mount and 4 to 20 output 2110F DN0020 01 3