# SCADASense 4203
## Gas Flow Computer

### Features:

- Highly integrated Gas Flow Computer with 32-bit PLC
- AGA-3, 7, 8, V-Cone and API 21.1 compliant
- Two RS-232/485 selectable serial ports
- 1 digital pulse/input/output, 1 analog output - DR version
- 1 digital pulse/input/output, 2 analog inputs, 1 digital output shared with the turbine meter input - DS version
- Modbus master/slave and Modbus EFM protocols
- CSA Class 1, Division 1, Hazardous Area Rating
- IECEx to Exd IIC T6 and ATEX to EEx d IIC T6
- Single Seal Compliance Certification under ANSI/ISA – 12.27.01 *
- RTD connections rated non-incendive in Div 2 areas
- 3 year warranty on parts and labor

The SCADASense 4203 is a highly integrated gas flow computer incorporating a multivariable sensor and a complete PLC. The product is compatible with Control Microsystems' SCADAPack application programs as well as industry standard programming environments including IEC 61131-3. Coupled with a second multivariable transmitter, the 4203 can be used as a two-run gas flow computer.

### Overview:

**Flexible Installation** - The SCADASense 4203 incorporates a highly accurate multivariable sensor that is compact and rugged. The 2-1/8" tap centers enable cost effective use of 3 and 5-valve instrument manifolds. The 4203 flow computer can be installed horizontally or vertically for easy retrofit of any conventional differential pressure transmitter.

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

The product's Single Seal Compliance Certification, under ANSI/ISA – 12.27.01, allows for process sealing between electrical systems and flammable or combustible fluids. *

**Integrated PLC** - With a Control Microsystems' SCADAPack PLC incorporated inside the 4203 body, this product provides a fully programmable platform that can be used in a wide variety of process control applications. Since both of the serial ports can communicate with other devices, the 4203 can scale to accommodate specific needs. Connected to other SCADAPack PLCs, the 4203 can take advantage of expanded I/O capabilities and the wide variety of functions they enable.

### Applications:

With a choice of I/O configurations available, the 4203 can accommodate multiple input and output devices and can be easily expanded for more complex installations. The 4203's two discrete inputs are versatile, the first of which can use level or pulse input up to 10 kHz. The second discrete input has an integral pre-amplifier for use with

turbine meters. An optional analog output can be used for variable speed motor drives, control valves, emergency shutdown and more. Alternatively the 4203 can be ordered with two analog inputs that could be used for measuring tubing and casing pressures in well applications.

The 4203 provides two, fully functional RS-232/485 serial ports that can be used with remote I/O, radios, local displays or other serial devices. The unit provides Modbus master/slave and EFM Modbus as its native protocols. DNP 3.0 is available at no charge and custom protocols can be easily implemented using the C++ programming tools.

As a fully programmable gas flow computer with remote configuration capabilities, the 4203 can be used in a wide range of process control applications including: well optimization, pressure control, odorant injection and more. The CSA Class 1 Division 1 Hazardous Area Rating also makes it ideal for use in petrochemical, industrial and below-grade municipal applications.

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## Specifications

| Functional | |
| --- | --- |
| **Flow Calculations** | AGA-3 1992/2000 orifice plate, V-Cone and AGA-7 turbine meter |
| **Density Calculations** | AGA-8, 1992 (detailed) and NX-19 |
| **Event/Alarm/History Logs** | 35 days hourly history, 35 days daily history, 700 events and 300 alarms (as per API 21.1) |

| Features | |
| --- | --- |
| **Protocols** | Modbus master/slave with store and forward<br>EFM (Enron) Modbus<br>Optional DNP 3.0 |
| **Discrete Input/Output** | One, dry contact, usable for level or pulse inputs to 10 kHz<br>Shared with 0.5 A sinking digital output |
| **Turbine Meter Input** | One turbine meter input with integral pre-amplifier to 10 kHz<br>Shared with 0.5 A sinking digital output (DS version only) |
| **Analog Inputs** | Two 0-5V, 15 bit resolution (DS version only) |
| **Analog Outputs** | One 0-20 mA, sinking, 12 bit resolution (DR version only) |
| **Communication Ports** | Two configurable RS-232/485 ports, 1200 to 115,200 baud |
| **Processors** | One 32 bit ARM microcontroller, 32 MHz clock<br>One sensor interface co-processor |
| **Memory** | 4 Mbytes CMOS static RAM<br>8 Mbytes flash ROM (remotely downloadable)<br>1024 bytes EEPROM |
| **Battery** | RAM memory and clock calendar retained for 2 years |

| Sensor Performance | |
| --- | --- |
| **Differential & Absolute Pressure** | Accuracy $\pm$ 0.05% of span (for spans between 10% and 90% of URL) |
| **Digital Output (spans <10% URL)** | Accuracy $\pm$ (0.005)x(URL / Span)% of Span* |
| **Long Term Drift Stability** | < $\pm$ 0.05% of URL per year over 5 years |
| **Temperature Accuracy** | Accuracy $\pm$0.28 ℃ or 0.5 ℉, (not including RTD uncertainties) |
| **Static pressure effect on differential pressure readings** | The zero shift and span shift for a 1000psi (7MPa) static pressure change is:<br>ZERO Shift $\pm$0.05% of URL, SPAN Shift $\pm$0.1% of reading |
| **Ambient temperature effect** | Total effect for a 28℃ (50℉) change within Normal Operating Condition limits for absolute and differential pressure is: Digital Output: $\pm$(0.0625%URL + 0.125%Reading) |

| Power | |
| --- | --- |
| **Supply Requirements** | 9 - 30 VDC, 330 mW typical at 12 VDC in Full Power Mode<br>9 - 30 VDC, 165 mW typical at 12 VDC in Reduced Power Mode |

\*   Accuracy stated includes the effects of Linearity, Hysteresis, and Repeatability

# SCADASense 4203 <span style="float:right">Product Data Sheet</span>

## Model Code
**4203-DR22A101UB2** represents a sample code for a 4203 with DNP3 and IEC 61131-3

| Model | Select: Product Description |
|---|---|
| **4203-** | RealFLO Gas Flow Computer with integrated Multivariable Sensor and Controller, 2 Gas Flow runs, 4MB CMOS RAM |

| Code | Select: Communication Serial Ports |
|---|---|
| **DR** | (2) RS-232 / RS-485, (1) Analog Output (0 - 20mA), (1) RTD Input, (1) Digital Pulse/Input/Output, (1) Turbine Meter Input |
| **DS** | (2) RS-232 / RS-485, (2) Analog Inputs (0-5V), (1) RTD Input, (1) Digital Pulse/Input/Output, (1) Turbine Meter Input/Digital Input/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)** | |
| | **Standard Sensor** | | | |
| **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) |
| **J** | 2 to 200 inH2O | (0.50 to 50 kPa) | 30 to 3000 psi | (0.21 to 21 MPa) |
| **K** | 3 to 300 inH2O | (0.75 to 75 kPa) | 30 to 3000 psi | (0.21 to 21 MPa) |
| **L** | 10 to 840 inH2O | (2.5 to 210 kPa) | 30 to 3000 psi | (0.21 to 21 MPa) |
| | **Low Profile Sensor** | | | |
| **U** | 0.5 to 30 inH2O | (0.12 to 7.5 kPa) | 1 to 100 psi | (0.007 to 0.7 MPa) |
| **V** | 2 to 200 inH2O | (0.50 to 50 kPa) | 3 to 300 psi | (0.021 to 2.1 MPa) |
| **W** | 10 to 840 inH2O | (2.5 to 210 kPa) | 3 to 300 psi | (0.021 to 2.1 MPa) |
| **X** | 2 to 200 inH2O | (0.50 to 50 kPa) | 30 to 1500 psi | (0.21 to 10 MPa) |
| **Z** | 3 to 300 inH2O | (0.75 to 75 kPa) | 30 to 1500 psi | (0.21 to 10 MPa) |
| **Y** | 10 to 840 inH2O | (2.5 to 210 kPa) | 30 to 1500 psi | (0.21 to 10 MPa) |
| **M** | 2 to 200 inH2O | (0.50 to 50 kPa) | 30 to 3000 psi | (0.21 to 21 MPa) |
| **P** | 3 to 300 inH2O | (0.75 to 75 kPa) | 30 to 3000 psi | (0.21 to 21 MPa) |
| **R** | 10 to 840 inH2O | (2.5 to 210 kPa) | 30 to 3000 psi | (0.21 to 21 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 Plugs - NACE Standard MR-01-75 compliant |
| **1** | 1/2" NPT,  Flange Adapter c/w CS Grade B7 bolts |

# SCADASense 4203 <span style="float:right">Product Data Sheet</span>

## Model Code    **4203-DR22A101UB2** represents a sample code for a 4203 with DNP3 and IEC 61131-3

| Code | Select: Transmitter Housing Material | Conduit Entry Sizes |
|------|--------------------------------------|---------------------|
| **1** | Epoxy covered Aluminium | 1/2 -14 NPT |
| **3** | 316 SST | 1/2 -14 NPT |

| Code | Select: Approvals |
|------|-------------------|
| **U** | CSA Explosion-Proof, Class 1 - Div 1 (Groups B, C, D) & Div 2 (Groups A, B, C, D). Approved - Hazardous Locations. |
| **X** | IECEx to Exd IIC T6 and ATEX to EEx d IIC T6 |

| Code | Select: Protocols and Application Firmware |
|------|--------------------------------------------|
| **A** | Modbus and EFM Modbus Protocol with RealFLO |
| **B** | DNP 3.0 Level 2 Protocol with RealFLO |

| Code | Select: Programming Environment |
|------|---------------------------------|
| **1** | TelePACE Ladder Logic and C++ Language firmware loaded - IEC enabled (Programming Tools sold separately) |
| **2** | IEC 61131-3 and C++ Language firmware loaded - TelePACE enabled (Programming Tools sold separately) |

| 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 - Use only with model codes A, B, C, U, V, W (Use B2 for higher PSI units) |
| **-B2** | 17-4 SS Process Cover Bolts and Nuts |
| | **HIGH PRESSURE OPTIONS - AVAILABLE ON PRESSURE SPAN LIMIT CODES D, E, F, X, Y, Z - Select One Only** |
| **-Y** | High Static Calibration, Absolute Pressure 5300 PSI |

## Dimensions with Standard Sensor
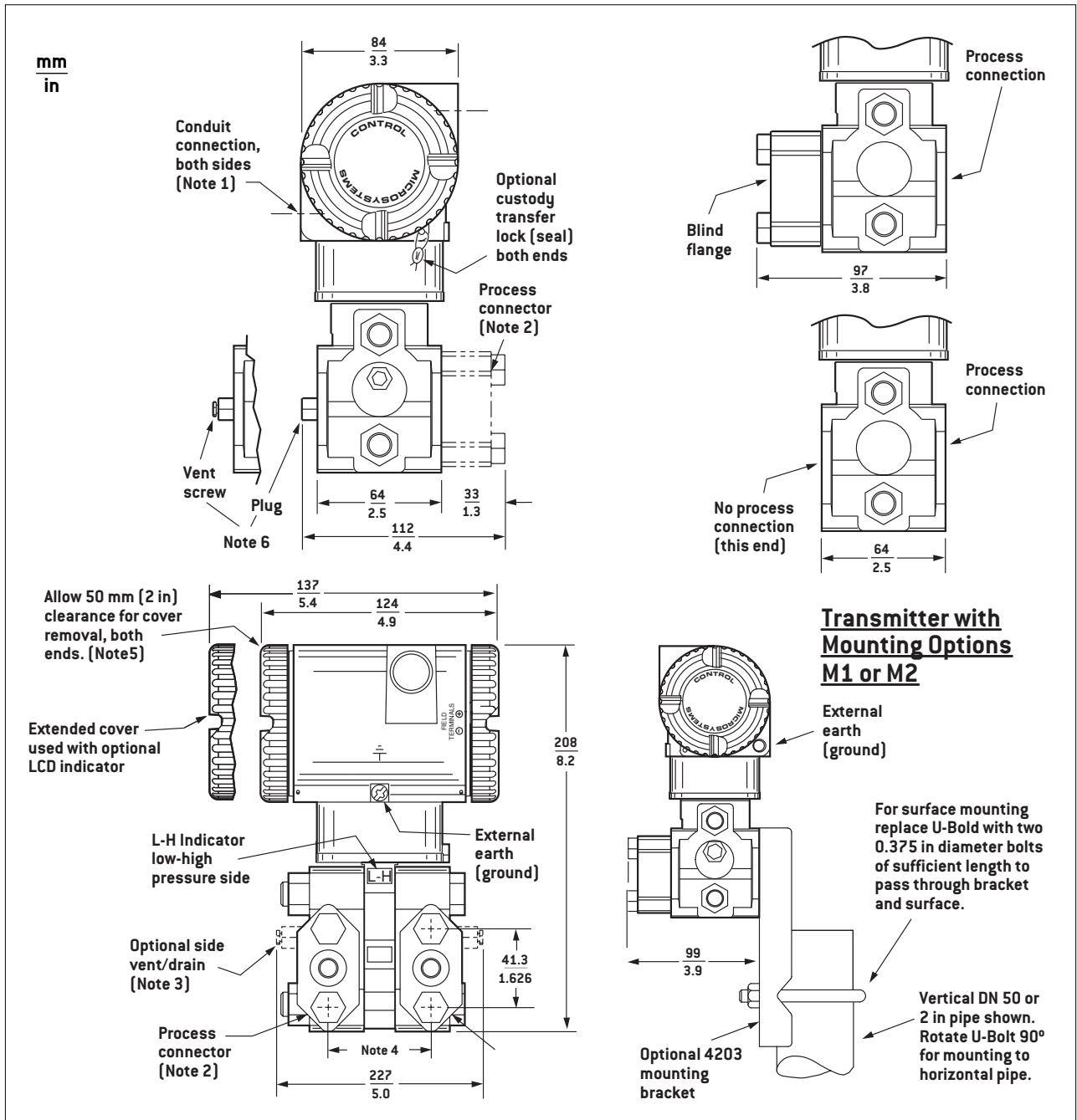


1. Conduit connection 1/2 NPT or PG 13.5, both sides: plug unused connection with metal plug (supplied).

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.

## Dimensions with Low Profile Sensor
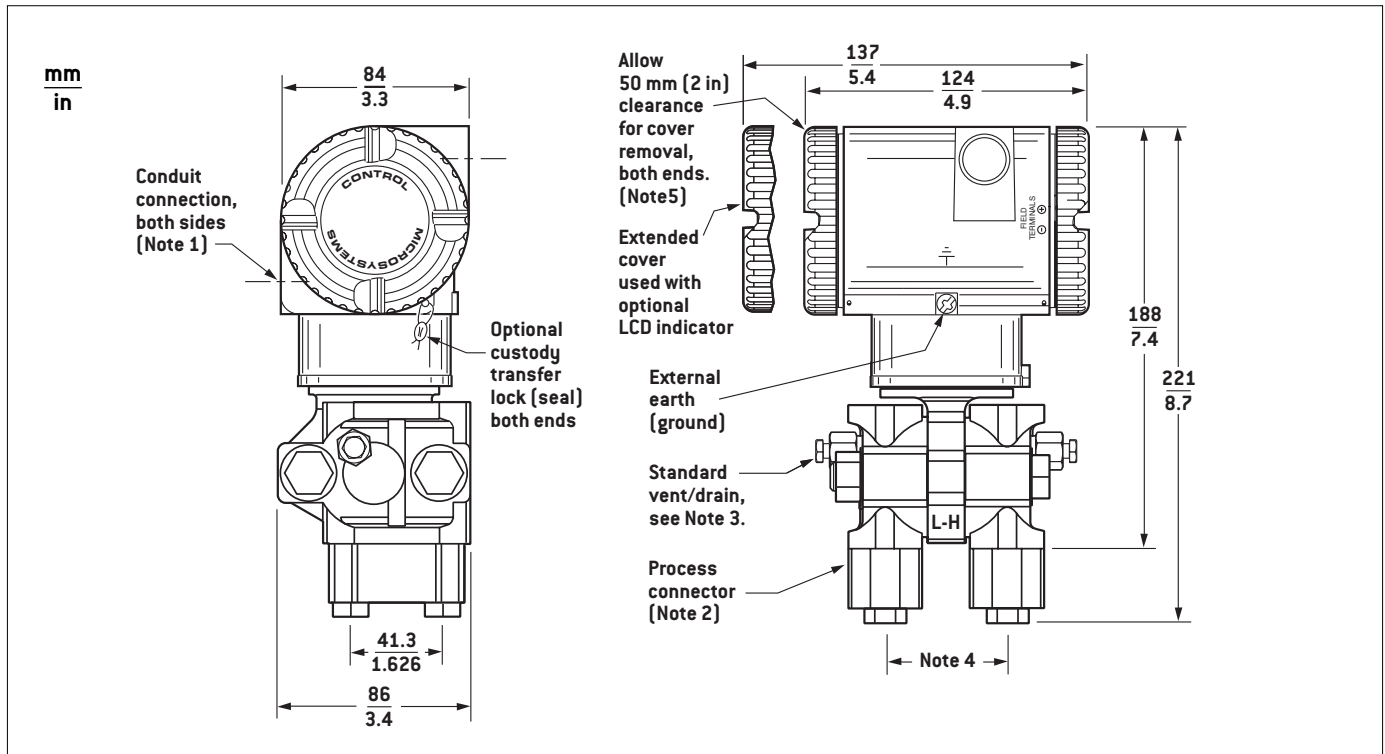


1. Conduit connection 1/2 NPT, PG 13.5, or M20, both sides: plug unused connection with metal plug (supplied).

2. Process connectors may be removed and transmitter mounted directly on a manifold, or connections made directly to process cover using 1/4 NPT internal thread in process cover.

3. The transmitter's low profile structure LP1 is shown in the vertically upright position. Note the location of the standard vent/drain screw. In this configuration the transmitter can be vented or is self-draining. Also recommended is a horizontal installation where the installed orientation can be set to allow for venting or draining.

4. Process connectors can be inverted to give either 51, 54, or 57 mm (2.0, 2.125, or 2.25 in) 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.