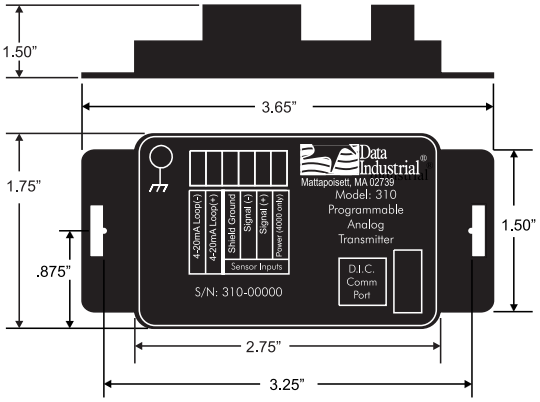
Badger® Model 310	Programmable Loop-Powered Analog Transmitter	Technical Brief

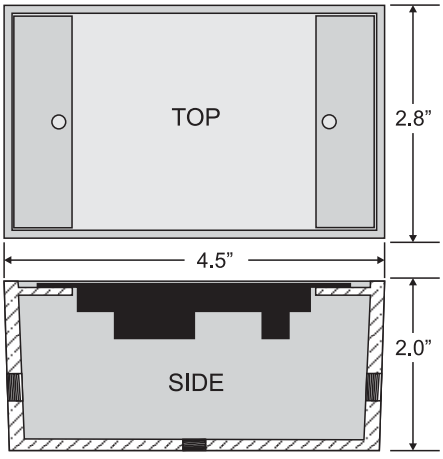
The Badger Model 310 is a loop powered, programmable transmitter capable of converting the signal from Badger Meter flow sensors to a linear 4-20mA analog signal. In addition to our standard square wave signal, it can also accept a sine wave making it a versatile transmitter for numerous applications.

With an onboard microcontroller and digital circuitry, the Badger Model 310 is programmed from a computer eliminating the need to adjust potentiometers to produce precise, accurate and drift free signals. This will save both time and money by lowering overall maintenance times. This model also has an integral filter that the user can specify as 0 (to show true sensor readings) or 10 (for maximum dampening).

The compact cast epoxy body measures 1.75" (44mm) x 2.75" (70mm) x 1" (25mm) and can easily be mounted to panels, DIN rails or enclosures. With multiple inputs, ease of use and a variety of enclosures, the Badger Model 310 is a powerful and competitive transmitter for many of today's demanding applications.



Transmitter Only



Optional Enclosure (Ver. 310-02 and 310-03)

EXAMPLE:	310	-	xx
SERIES			
Programmable Analog Transmitter	310		
OPTIONS			
Transmitter Only			00
W / NEMA 4X Enclosure			01
W / Metal Weathertite Enclosure			02
W / Plastic Weathertite Enclosure			03
W / DIN rail Mounting Clips			04

Badger® Model 310 Ordering Matrix

SPECIFICATIONS

Power Requirements:
Loop Input Voltage 9-35Vdc

Input Frequency:
0.4 to 10 KHz

Load Resistance
Max 750Ω@24Vdc

Output Response Time
Varies with filter

Temperature (operating):
-29°C to 70°C
-20°F to 158°F

Temperature (storage):
-40°C to 85°C
-40°F to 185°F

Accuracy
± 0.04% of reading over entire span

Linearity
0.1% of full scale

CALIBRATION

Units can be calibrated at our facility or easily programmed in the ?eld. Field calibration requires a Badger® Model A301-20 Programming kit (consisting of a custom cable and software) and IBM compatible computer running a Windows® based operating system. In order to calibrate, the Badger® Model 310 must be connected to the loop for power, and the A301-20 cable must be connected to an available 9-pin Com port on the computer.

Once the software is loaded and communications with the transmitter are established, the following parameters are entered in the setup screens:

1. Units of measure
2. K and Offset values - selected from the sensor owners manual or for insert style sensors entering the pipe I.D. allows the software to calculate the K and Offset values.
3. The ?ow rate represented by 4mA.
4. The ?ow rate represented by 20mA.

An added feature is a user selectable ?lter. Set for the minimum (0) the transmitter reacts to actual ?ow input. Set at the maximum (10) the transmitter provides the greatest dampening possible.

Once the values are set, the “send” command loads the transmitter.

All programming can be saved with a ?le name for later reference.

WIRING

Per standard wiring practices, the loop power must be off before making any wire connections. The terminal strips have removable plug-in connectors to make wiring easier.

1. Refer to Figure 1 for terminal connections.
2. Connect loop power supply positive (+) to terminal marked 4-20mA loop(+).
3. Connect terminal marked 4-20mA loop(-) of Badger Model 310 to positive analog terminal of input device (Chart Recorder, PLC, etc..)
4. Connect negative analog terminal of input device to loop power supply negative.
5. Wiring a Badger Model Series 200 sensor, connect the red wire (signal) to Signal (+) terminal, black wire (ground) to Signal (-) terminal, and the shield to Shield Ground terminal (Disregard shield for the IR sensors). If the sensor is not a Badger Model Series 200, then go to step 6.
6. Wiring a Badger Series 4000 sensor, connect the clear wire (signal) to Signal (+) terminal, black wire (ground) to Signal (-) terminal, shield wire to Shield Ground terminal, and red wire (power) to Power (4000 only) terminal.
7. For maximum EMI Protection, connect Badger Model 310 ground lug to panel ground.
8. Ensure that all connections are tight, then plug connector into header.

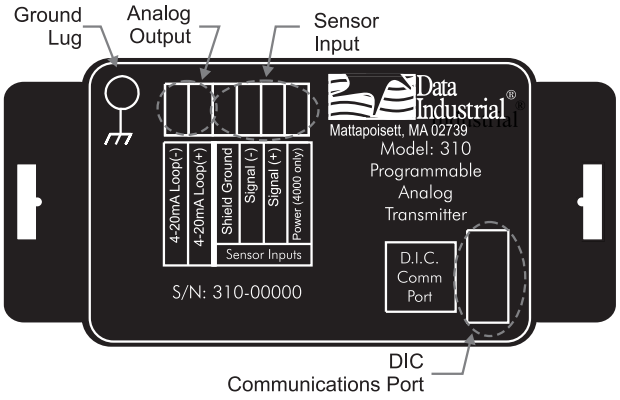


Figure 1: Model 310

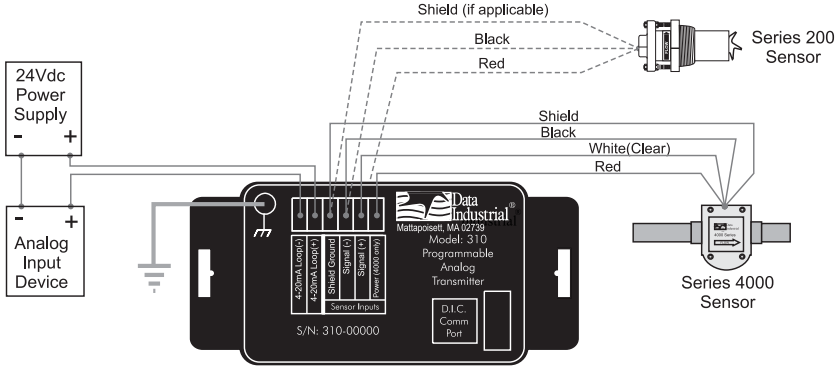


Figure 2: Wiring Model 310 to Series 200 or 4000 and Analog Loop

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