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## DESCRIPTION

The Model 320 programmable pulse transmitter from Badger Meter® is designed to accept relatively fast unscaled raw pulses from devices like flow sensors, and then output slow-scaled pulses of programmable width, pulse resolution and units of measure. In addition to our standard flow sensors, the Model 320 transmitter can also accept a sine wave signal, making it a versatile choice for numerous applications.

## SCOPE AND PURPOSE

This manual provides instructions for installing and programming the Model 320 transmitter transmitter.

## MECHANICAL INSTALLATION

The Model 320 transmitter can be surface mounted onto a panel, attached to DIN rails using adapter clips or wall mounted using two optional enclosures.

### Location

Although the Model 320 transmitter is encapsulated, all wiring connections are made to exposed terminals. The unit should be protected from weather and moisture in accordance with electrical codes and standard trade practices. In any mounting arrangement, the primary concerns are ease of wiring and attachment of the programming cable. The unit generates very little heat so no consideration need be given to cooling or ventilation.

### Surface Mount Installation

The Model 320 transmitter can be mounted to the surface of any panel using double sided adhesive tape, or by attaching fasteners through the holes in the mounting flanges of the unit.

### DIN Rail Mounting

Optional clips snap onto the mounting flanges, allowing the Model 320 transmitter to be attached to DIN 15, 32, 35 mm DIN rail systems.

### Wall Mounting

Optional metal and plastic enclosures are available to mount the Model 320 transmitter to a wall when no other enclosure is used. The enclosure is first attached to the wall using fasteners through its mounting holes. After wiring, the transmitter can be attached to the enclosure with the terminal headers facing in, using the slots in the mounting flanges. As an alternate mounting arrangement, the Model 320 transmitter can be fastened to the box cover using double-sided adhesive tape.

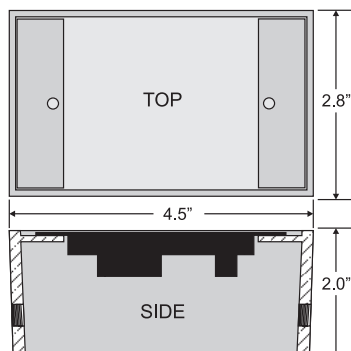


Figure 1: Optional enclosure dimensions

# ELECTRICAL INSTALLATION

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. Refer to *Figure 2* for terminal connections. An example of typical wiring is shown in *Figure 3*.

1. Connect power supply positive (+) or AC Load to terminal marked AC L /DC (+).
2. Connect power supply negative (-) or AC Common to terminal marked AC C /DC (-).
3. If wiring a 200 sensor, connect the red wire to the Red (+) terminal, black wire to Black (-) terminal, and the shield to the Shield terminal (Disregard shield for the IR sensors).
4. If wiring a 4000 sensor, connect the red wire to the Power Out terminal, clear wire to Red (+) terminal, black wire to Black (-) terminal, and shield wire to the Shield terminal.
5. If wiring to a sine wave output sensor, consult the factory.
6. Connect Pulse (+) from pulse input device to Blue (+) of the Model 320 transmitter. Connect Pulse (-) from pulse input device to Blu /Wh (-) of the Model 320 transmitter.
7. For maximum EMI protection, connect the ground lug to panel ground.
8. Make sure all connections are tight, then plug the connector into the header.

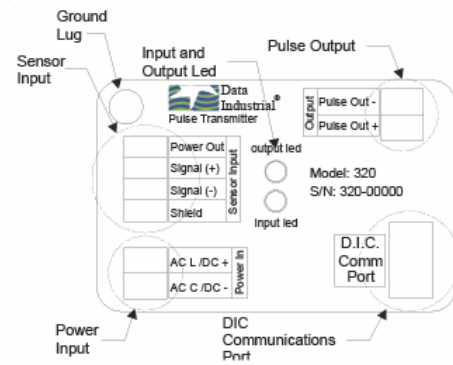


Figure 2: Terminal connections

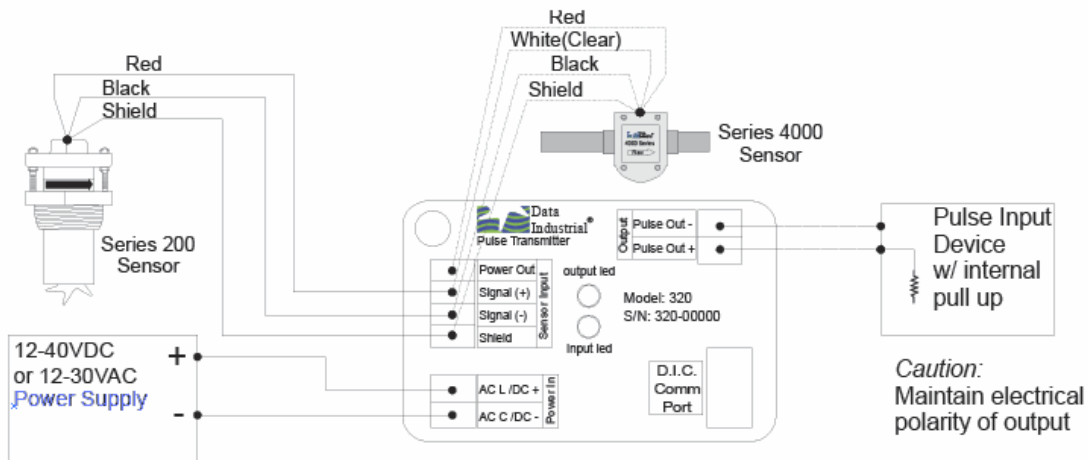


Figure 3: Example of typical wiring

**NOTE:** Included with every Model 320 transmitter is a 320 IK installation kit containing a screw, lock washer and ground lead to connect the Model 320 transmitter to Earth Ground. This will help prevent electrical interference from affecting the Model 320 transmitter normal operation.

## Communications Cable Wiring

Field calibration requires an A320 programming kit (consisting of a custom cable and software) and a computer (PC) running Windows® 7, XP or Vista. To program, the Model 320 transmitter must be connected to power, and the A301 cable must be connected to the Model 320 transmitter Comm port connector and an available DB9 port on the PC.

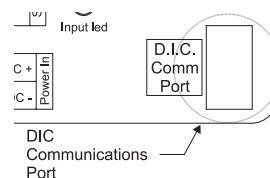


Figure 4: Location of the DIC communication port

**NOTE:** The Data Industrial A301 cable will work with all 300 Model products. However, the older version of the cable (A300) does not have sufficient bandwidth to work with the newer 340 Model Transmitters or SDI Flow Sensors.

## PROGRAMMING

### Disk Installation

Load the software CD into the CD ROM drive of the computer and it should autostart. Select the software to start the installation.

### Web Installation

Free programming software updates are available via the Badger Meter website at [www.badgermeter.com](http://www.badgermeter.com).

### Model 320 Transmitter Programming

To program the Model 320, install the programming software on a computer (PC) and enter data on templates in the Windows® based program.

1. Load the software on the PC.
2. Connect the PC to the Model 320 transmitter transmitter using the A301 communications cable.
  - Plug the A301 cable into the socket labeled "Comm Port," taking care to properly align the tab on the plug and socket to maintain polarity.
  - Then plug the DB9 connector of the A301 communications cable into an available port on the same PC that has the software installed.
3. Connect the Model 320 transmitter transmitter to a power supply.
4. Open the software and select the appropriate COM PORT using the drop-down menu. See Figure 5.
5. Select **Parameters** as shown in Figure 6 to open the Parameters screen.



Figure 5: Select the COM port

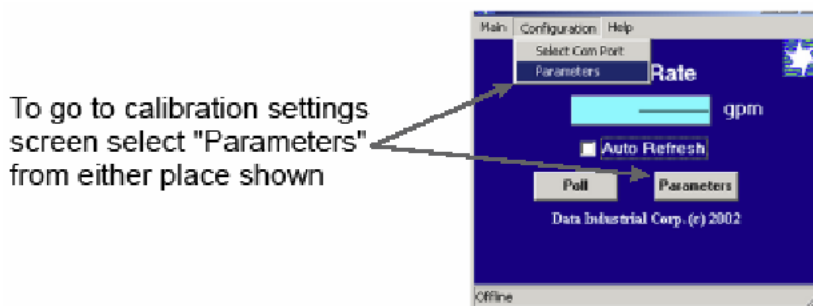


Figure 6: Select Parameters

6. Program using the diagram in *Figure 7* as a reference.

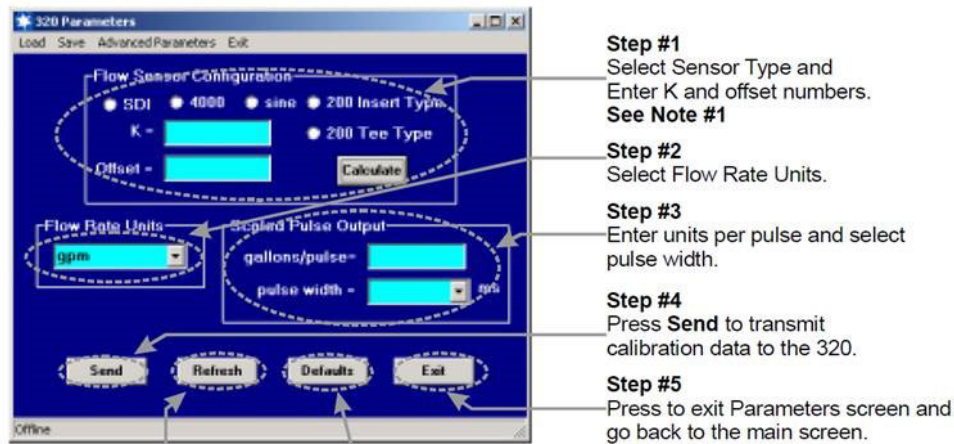


Figure 7: Program using the diagram as reference

**NOTE:**

- If the **SDI** sensor type is selected, the required K and Offset values can be found in the SDI owners manual.
- If the **4000** sensor type is selected, click the drop-down menu and select the sensor from the list that displays.
- **Sine** is provided for connection to sensors with a sine wave output. Consult the sensor manufacturer for the calibration settings.
- If the **200 Insert** sensor type is selected, the required K and Offset can be found in the 200 owner's manual, or press the **calculate** button, enter an inside pipe diameter and press **calculate** to automatically enter the K and Offset values.
- If the **200 tee type** is selected, click the drop-down menu and select the sensor from the list that displays.

## SPECIFICATIONS

<b>Power</b>	12...28V AC RMS, 85 mA max
	12...40V DC, 30 mA max
	Reverse and over voltage protected
<b>Input Frequency</b>	0.4...10 kHz
<b>Transient Suppression</b>	Complies with IEC-801-4 electrical burst, fast transient specification
<b>Pulse Output</b>	Isolated solid-state switch in any standard or custom flow
	Total units adjustable 50 mS to 1.0 second pulse output width in 50 mS increments
	Maximum sinking current: 100 mA at 36V DC
<b>Temperature</b>	Operating: -29...70° C (-20...158° F)
	Storage: -40...85° C (-40...185° F)

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