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DESCRIPTION

Model 320 from Badger Meter is a compact, programmable transmitter 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 can also accept a sine wave signal, making it a versatile transmitter for numerous applications.

SCOPE AND PURPOSE

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

MECHANICAL INSTALLATION

The Model 320 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 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 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 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 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 can be fastened to the box cover using double-sided adhesive tape.

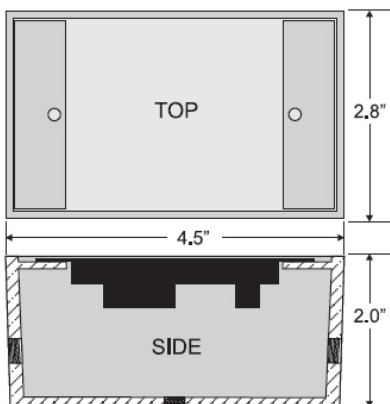


Figure 1: Optional enclosure dimensions

ELECTRICAL INSTALLATION

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

NOTE: Refer to *Figure 2* and *Figure 3* for terminal connections and wiring example.

1. Connect DC power supply positive (+) or AC Line to the terminal marked AC L /DC (+).
2. Connect DC power supply negative (-) or AC Common to the terminal marked AC C /DC (-).

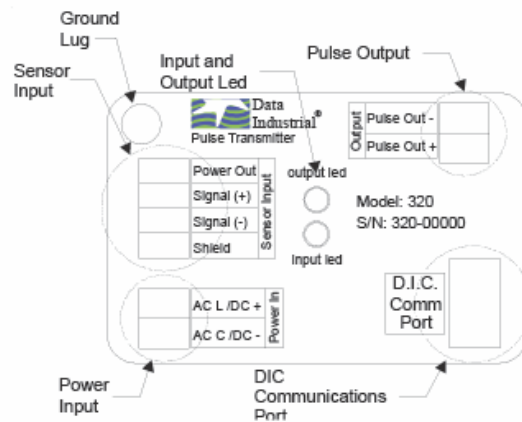


Figure 2: Terminal locations

3. If wiring to a **200** sensor, connect the red wire to the Signal (+) terminal, black wire to the Signal (-) terminal and the shield to the Shield terminal. (Disregard shield for the IR sensors.)

If wiring to a **4000** sensor, connect the red wire to the Power Out terminal, clear wire to the Signal (+) terminal, black wire to the Signal (-) terminal and shield wire to the Shield terminal.

If wiring to a **sine wave output** sensor, consult the factory.

4. Connect Pulse(+) from pulse input device to Pulse Out(+) of the 320, connect Pulse (-) from pulse input device to Pulse Out (-) of the 320.
5. For maximum EMI protection, connect the Model 320 ground lug to the panel ground.
6. Make sure all connections are tight. Then plug the connector into the header.

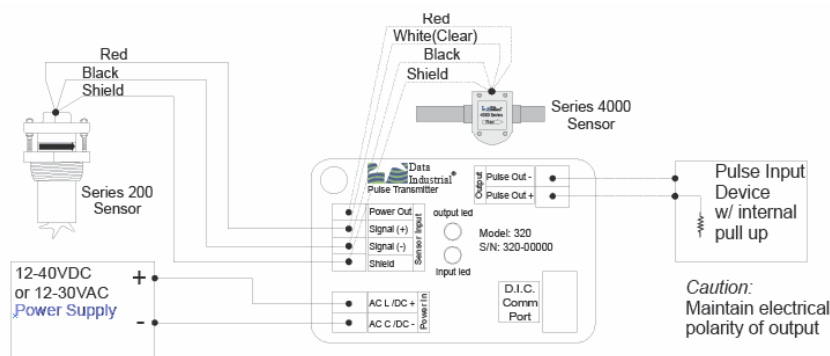


Figure 3: Wiring to a generic pulse device and Model 200 or 4000

NOTE: Included with every Model 320 is a 320 IK installation kit containing a screw, lock washer and ground lead to connect the Model 320 to Earth Ground. This will help prevent electrical interference from affecting the Model 320 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 must be connected to power, and the A301 cable must be connected to the Model 320 Comm port connector and an available DB9 port on the PC.

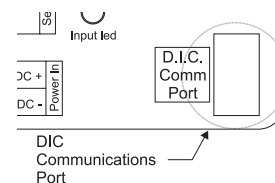


Figure 4: Location of the DIC communication port

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.

Model 320 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 using the A301 communications cable.
 - Plug the A301 cable into the socket labeled "D.I.C 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 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.

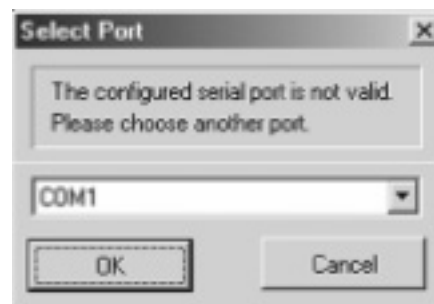


Figure 5: Select the COM port

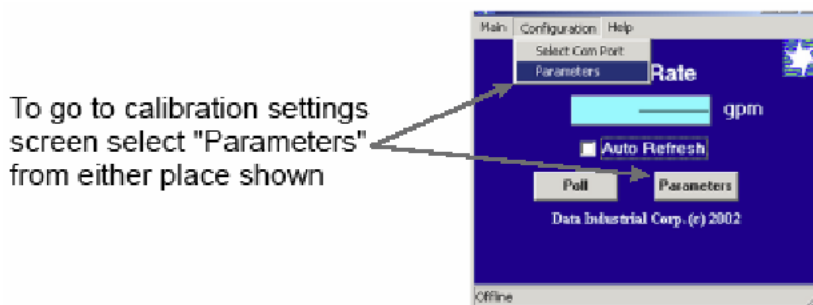


Figure 6: Select Parameters

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

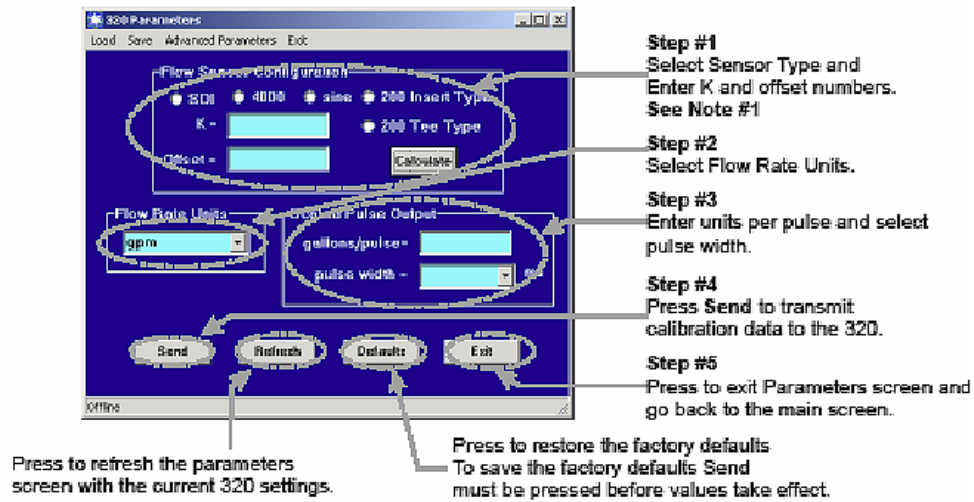


Figure 7: Program using the diagram as reference

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

Power	12...28V AC RMS, 85mA max
	12...40V DC, 30mA max
	Reverse and over voltage protected
Input Frequency	0.4...10 kHz
Transient Suppression	Complies with IEC-801-4 electrical burst, fast transient specification
Pulse Output	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
Temperature	Operating: -29...70°C (-20...158°F)
	Storage: -40...85°C (-40...185°F)

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www.badgermeter.com

The Americas | Badger Meter | 4545 West Brown Deer Rd | PO Box 245036 | Milwaukee, WI 53224-9536 | 800-876-3837 | 414-355-0400
México | Badger Meter de las Americas, S.A. de C.V. | Pedro Luis Ogazón N°32 | Esq. Angelina N°24 | Colonia Guadalupe Inn | CP 01050 | México, DF | México | +52-55-5662-0882
Europe, Middle East and Africa | Badger Meter Europa GmbH | Nurtinger Str 76 | 72639 Neuffen | Germany | +49-7025-9208-0
Europe, Middle East Branch Office | Badger Meter Europe | PO Box 341442 | Dubai Silicon Oasis, Head Quarter Building, Wing C, Office #C209 | Dubai / UAE | +971-4-371 2503
Czech Republic | Badger Meter Czech Republic s.r.o. | Maříkova 2082/26 | 621 00 Brno, Czech Republic | +420-5-41420411
Slovakia | Badger Meter Slovakia s.r.o. | Racianska 109/B | 831 02 Bratislava, Slovakia | +421-2-44 63 83 01
Asia Pacific | Badger Meter | 80 Marine Parade Rd | 21-06 Parkway Parade | Singapore 449269 | +65-63464836
China | Badger Meter | 7-1202 | 99 Hangzhong Road | Minhang District | Shanghai | China 201101 | +86-21-5763 5412