AC Load/DC +

AC Common/DC -

Power Out

(+)

(-)

Shield

Input

Model: 330
SN# 0000000

Data Industrial®

Output

N.O.
ComA
N.C.
ComB
Hi
Com
Low

DIC Comm.
Port

BadgerMeter, Inc.

The **Badger® Series 330** is a compact, programmable relay control capable of converting the signal from a Badger Meter flow sensor into a flow switch.

With an onboard microcontroller and digital circuitry, the Badger Series 330 is programmed from a Windows® based computer program. This eliminates the need to set dip switches or potentiometers and produces precise, accurate and drift free control of the relay outputs. In addition to accepting the Badger Meter square wave signal, the Badger Series 330 can accept other pulse and sine wave inputs.

The compact cast epoxy body measures 1.75" (44mm) x 2.75" (70mm) x 1.5" (38mm) and can easily be mounted to panels, DIN rails or enclosures. With multiple inputs, ease of use and a variety of enclosures, the Badger Series 330 is a powerful, competitive priced relay control.

INSTALLATION
Mechanical installation
The Badger Series 330 transmitter may be surface mounted onto a panel, attached to DIN rails using adapter clips or wall mounted using two optional enclosures.

Series 330 Ordering Matrix

	EXAMPLE:	330	-	xx
Series				
Programmable Local Relay Control		330		
Options				
Transmitter Only				00
W / NEMA 4X Enclosure				01
W / Metal Enclosure				02
W / Plastic Enclosure				03
W / DIN Rail Mounting Clips				04

Location
Although the Badger Series 330 device 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 Badger Series 330 may be mounted to the surface of
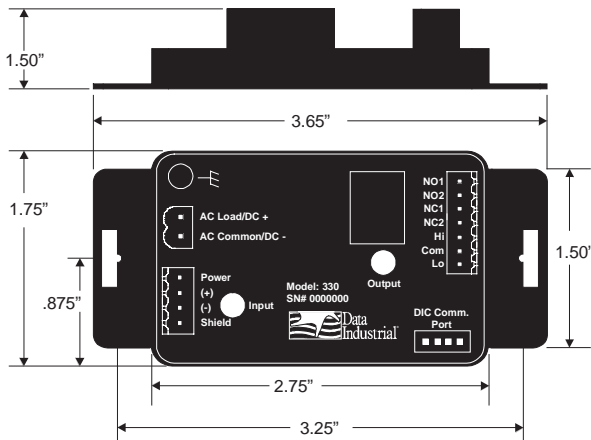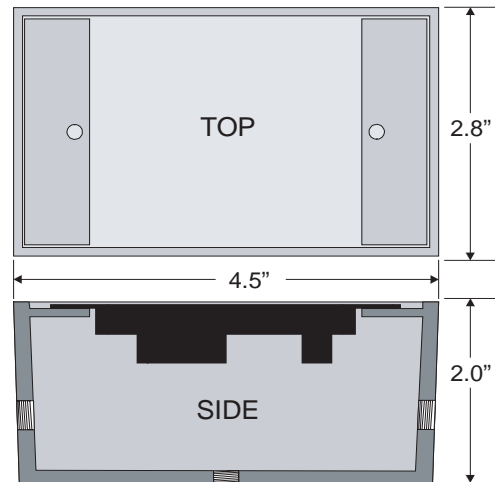

Series 330 Dimensions

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 Series 330 to be attached to DIN 15, 32, 35 mm DIN rail systems.

Wall Mounting
Optional metal and plastic enclosures are available to mount the Badger Series 330 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 may be attached to the enclosure with the terminal headers facing in using the slots in the mounting flanges. As an alternate mounting arrangement, the Series 330 may be fastened to the box cover using double-sided adhesive tape.

Series 330 Optional Enclosure Dimensions

Electrical Installation
All connections to the Badger Series 330 are made to screw terminals on removable headers.

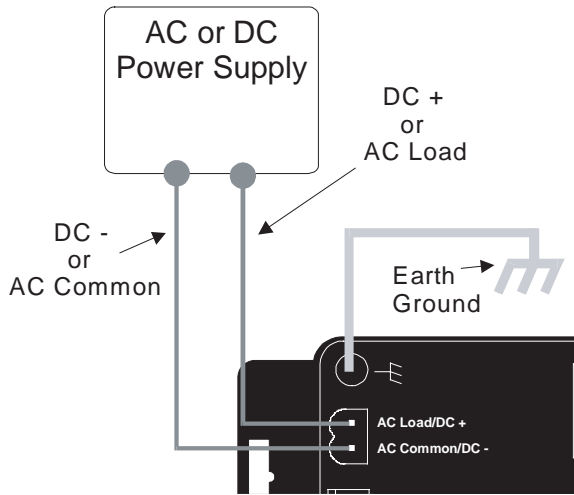### Power Supply Wiring
The Badger Series 330 requires 12-24 Volts AC or DC to operate. The power connections are made to the ORANGE header. The connections are labeled beside the header. Observe the polarity shown on the label.
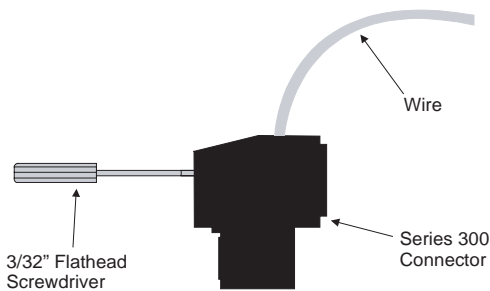
If a Badger Meter plug in type power supply (Model A-1026 or A-503) is used to connect the black/white striped wire to the terminal marked positive (+) and the black wire to the terminal marked negative (-).
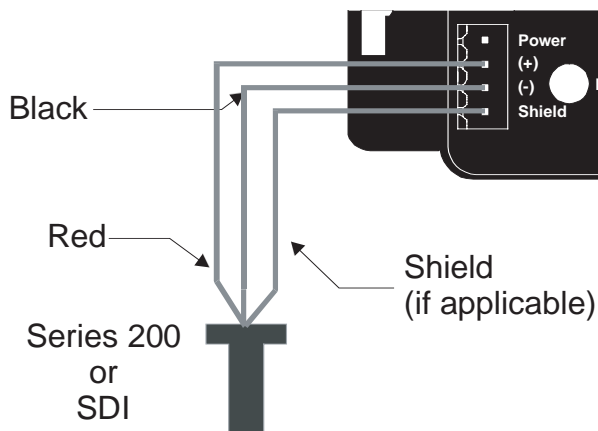
Sample Power Supply Wiring Diagram

**Side View - Typical Series 300
Removable Connector Wiring**

Sensor Wiring

All flow sensor types connect to the four terminal header shown in the "sample sensor wiring diagram."

If sensor is a Badger® Series 200 then:

1) Connect the **Red Wire** of the sensor to **Sensor signal (+)** on the Badger Series 330.
2) Connect the **Black wire** of the sensor to **Sensor signal (-)** on the Badger Series 330.
3) Connect the **Bare wire (if applicable)** of the sensor to the **Shield Terminal** on the Series 330.

If sensor is a Badger Series 4000 then:

1) Connect the **red wire** of the Series 4000 to **Power** on the Series 330.
2) Connect the **black wire** of the Series 4000 to the **Sensor (-)** on the Series 330.
3) Connect the **clear wire** of the Series 4000 to the **Sensor (+)** on the Series 330.
4) Connect the **bare wire** of the Series 4000 to the **Shield** on the Series 330.

### If sensor is a SDI Series with standard frequency (pulse) output then:

1) Connect **terminal 3 (sensor signal)** of the SDI to **Sensor (+)** on the Badger Series 330.
2) Connect **terminal 2 (sensor common)** of the SDI to **Sensor (-)** on the Series 330.
3) Connect the **terminal 1 (shield)** of the SDI to the **Shield** on the Series 330.

If sensor is a Non Badger Meter Flow Sensor:

The sensor input **power** terminal supplies nominal 9.1VDC excitation voltage for 3 wire sensors. Connect sensor **signal +** and sensor **signal -** wires to transmitter terminals.

Relay Output Wiring

The Badger Series 330 is supplied with a removable DPST relay with normally open and normally closed contacts. To wire to the normally closed contacts connect to the terminals "NC1" and "NC2". To wire to the normally open contacts connect to the terminals "NO1" and "NO2". **Note: This relay may be used as a Form C relay. Use a jumper to connect one terminal from each set together as the common terminal.**
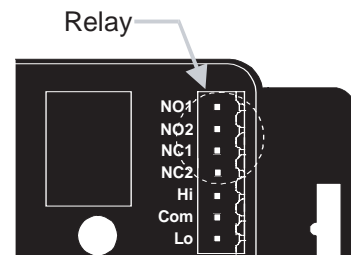
Relay Location

Remote Reset Switch Wiring (if applicable)

The "Hi", "Com", and "Lo" terminals on the Badger Series 330 are used for a remote reset. If the remote reset device provides a momentary dry contact closure - then connect to the "Lo" and "Com" terminals. If the remote reset device provides a momentary voltage (up to the supply voltage to the Series 330) - then connect to the "Hi" terminal.

Remote Reset Location

Sample Sensor Wiring Diagram
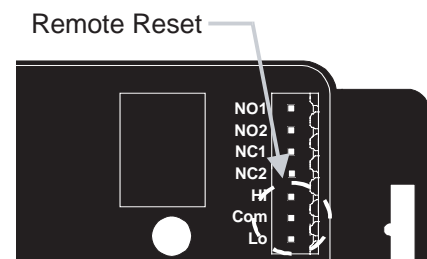
Communications Cable Wiring
Field calibration requires a Badger Meter Series A330 Programming kit (consisting of a custom cable and software) and a PC running Windows® XP or Vista. In order to program, the Badger® Series 330 must be connected to power, and the Series A301 cable must be connected to the Series 330 Com port connector and an available 9-pin Com port on a computer.

Note:
The Badger Meter Series A301 Cable will work with all Series 300 products. However the older version of the cable (A300) does not have sufficient bandwidth to work with the Series 340 transmitters.

Badger Meter provides free programming software updates via the Internet for all Badger Series 300 devices. Go to www.badgermeter.com for these updates.

DIC Com port
**Location of the
DIC Com port**
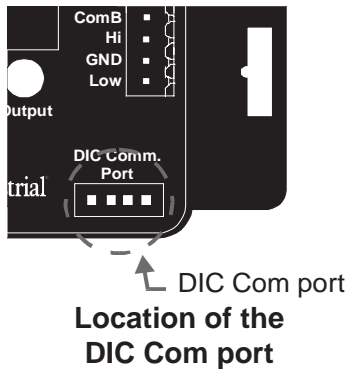
PROGRAMMING
Programming the Badger Series 330 is accomplished by installing the Badger Meter programming software on a computer and entering data on templates of the Windows® based program.

1. Load the interface software into the computer.

2. Connect the computer to the Series 330 transmitter with the Badger Meter Model A-301 communications cable to the socket labeled "D.I.C Com port", taking care to properly align the tab on the plug and socket to maintain polarity. Connect the DB9 connector of the Badger Meter Model A301 communications cable to a PC Com port that has the Series 330 software installed.

3. Connect the Series 330 transmitter to a power supply.

4. Open the interface software and select the appropriate Com port as shown in the dialog box below.
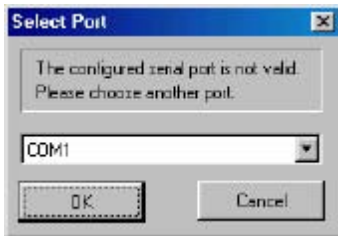
5. Open the Parameters Screen as shown below.

DEFINITIONS:
High Alarm – A condition where if the flow rate exceeds the set point the relay is energized.

Low Alarm - A condition where if the flow rate drops below the set point the relay is energized.

Set Point – The flow rate that will trigger the event. (i.e. energize the relay).

Release Point – The flow rate that will de-energize the relay.

Set Point Delay – A time interval in seconds between the point when the flow rate crosses the set point and the relay energizes.

Release Point Delay - A time interval in seconds between the point when the flow rate crosses the release point and the relay de-energizes.

Latch – A function that will hold the relay in the energized state until reset even if the flow rate crosses the release point.

Remote Reset - Reset is the ability to interrupt all timing functions and return them to the initial programmed settings and/or de-energize the relay coil that has been latched as a result of an alarm function.

This reset may be accomplished by momentarily disconnecting the power supply or connecting an external device to the reset terminals.

Filter Coefficient - An averaging routine that smooths out unstable flow. The non-linear reference scale from 0-9 defaults to a value of 2. Do not change unless flow changes interfere with the control functions.

6. Program using the diagram below as a reference.
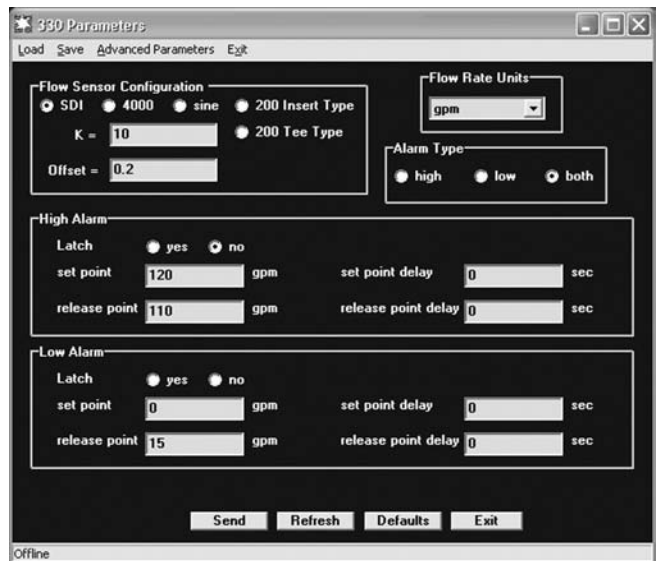
SPECIFICATIONS
Power
Power Supply Options
   12-36 VDC (+/- 10%)
   12-26 VAC (+/- 10%)
Current Draw
   60 mA @ 12 VDC

FLOW SENSOR INPUT
All Sensors
   Excitation voltage 3 wire sensors:
     9.1 VDC 500Ω source
   impedance
Pulse Type Sensors
  Signal Amplitude
    2.5 VDC threshold
  Signal Limits
    Vin < 35V (DC or AC peak)
  Frequency
    0-10kHz
  Pull-up
    2 kΩ
Sine Wave Sensors
  Signal Amplitude
    10 mV p-p threshold
  Signal Limits
    Vin < 35V (DC or AC peak)
  Frequency:
     0-10kHz

RELAY RATING
DPST Contact Ratings
   5A@30VDC
   5A@125VAC
   5A@250VAC

Time Delay
1-9999 second delay between flow point and relay actuation

Transient Suppression
Designed to withstand a 5000 volt 1/2 microsecond, 100KHz ring wave

SENSOR CALIBRATION
Badger Meter
   Use K and Offset provided in sensor owner's manual

Other Sensors
   Check with factory

UNITS OF MEASURE
Flow Measurement Rate
   gpm, gph, l/sec, l/min, l/hr, ft3/sec, ft3/min, ft3/hr, m3/sec, m3/min, m3/hr

PROGRAMMING
Requires PC or laptop running Windows® XP or Vista

Operating Temperature
   -25° C to +70° C
   -20° F to +158° F

Storage Temperature
   -40° C to +85° C
   -40° F to +185° F

Weight
   4.8 oz. with headers installed

Accessories
   Model A-330 programming kit containing software and 3 feet Model A301 cable

   Model A-330-20 programming kit containing software and 20 feet Model A301-20 cable (longer cable may be required for field programming)

FACTORY DEFAULTS

	Default Values	Customer Values
Serial Number	n/a	_____
Version	n/a	_____
Sensor Type	Pulse	_____
K=	1	_____
Offset=	0	_____
Flow Rate Units	gpm	_____
Alarm Type	off	_____
High Alarm Latched	off	_____
High Alarm Set Point	120	_____
High Alarm Set Point Delay	5	_____
High Alarm Release Point	110	_____
High Alarm Release Point Delay	10	_____
Low Alarm Latched	off	_____
Low Alarm Set Point	10	_____
Low Alarm Set Point Delay	5	_____
Low Alarm Release Point	15	_____
Low Alarm Release Point Delay	10	_____
Filter Coeff	2	_____

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Due to continuous research, product improvements and enhancements, Badger Meter reserves the right to change product or system specifications without notice, except to the extent an outstanding contractual obligation exists.

Data Industrial®

Please see our website at **www.badgermeter.com**
for specific contacts.

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