

# Model 330

## Relay Control by Data Industrial Owner's Manual

The **Model 330** is a compact, programmable relay control capable of converting the signal from a Data Industrial flow sensor into a flow switch.

With an onboard microcontroller and digital circuitry, the Model 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 Data Industrial square wave signal, the Model 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 Model 330 is a powerful, competitive priced relay control.

### Model 330 Ordering Matrix

## Installation

### Mechanical installation

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

### Location

Although the Model 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 Model 330 may 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 330 to be attached to DIN 15, 32, 35 mm DIN rail systems.

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



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## Wall Mounting

Optional metal and plastic enclosures are available to mount the Model 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 Model 330 may be fastened to the box cover using double-sided adhesive tape.

## Electrical Installation

All connections to the Model 330 are made to screw terminals on removable headers.

## Power Supply Wiring

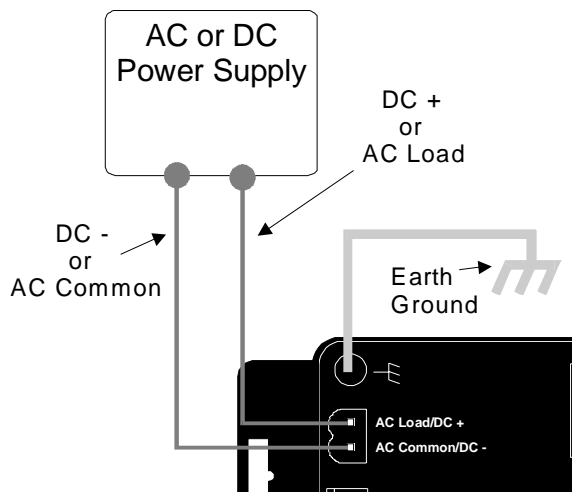
The Model 330 requires 12-24 Volts AC or DC to operate. The power connections are made to the ORANGE header. The connections are labeled beside the header. Observe the polarity shown on the label.

If a Data Industrial plug in type power supply (A-1026 or A-503) is used connect the black/white striped wire to the terminal marked positive (+) and the black wire to the terminal marked negative (-).

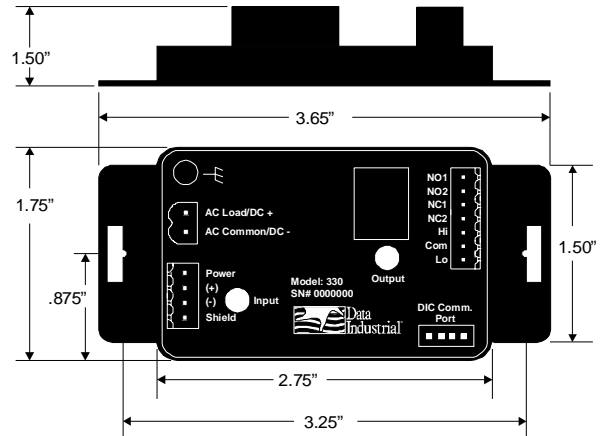
### Note:

**Included with every Model 330 is a 330IK kit containing a screw, lock washer and ground lead to connect the Model 330 to Earth Ground. This will help prevent electrical interference from affecting the Model 330's normal operation.**

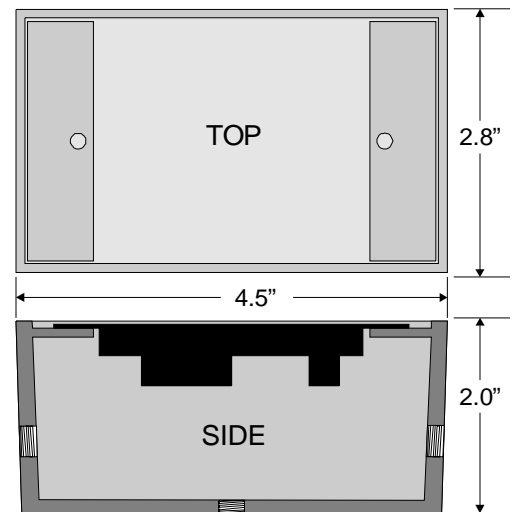
### Sample Power Supply Wiring Diagram



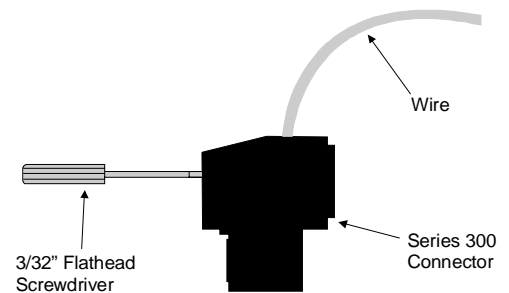
## Model 330 Dimensions



## 330 Optional Enclosure Dimensions



## Side View - Typical 300 Series Removable Connector Wiring

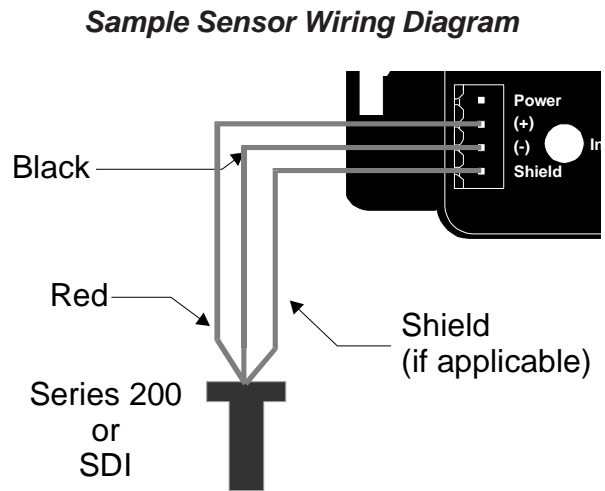


## Sensor Wiring

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

### If sensor is a 200 Series or M Series then:

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



### If sensor is a 4000 Series then:

- 1) Connect the **Red wire** of the 4000 to **Power** on the Model 330.
- 2) Connect the **Black Wire** of the 4000 to the **Sensor (-)** on the Model 330.
- 3) Connect the **Clear Wire** of the 4000 to the **Sensor (+)** on the Model 330.
- 4) Connect the **Bare Wire** of the 4000 to the **Shield** on the Model 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 Model 330.
- 2) Connect **Terminal 2 (Sensor Common)** of the SDI to **Sensor (-)** on the Model 330.
- 3) Connect the **Terminal 1 (Shield)** of the SDI to the **Shield** on the Model 330.

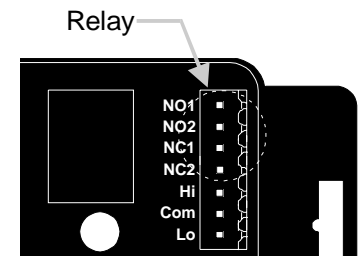
### If sensor is a Non Data Industrial Flow Sensor:

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.

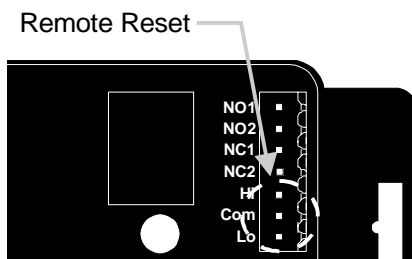
## Relay Output Wiring

The Model 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 Location



### Remote Reset Switch Wiring (if applicable)

The "Hi", "Com", and "Lo" terminals on the Model 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 Model 330) - then connect to the "Hi" Terminal.

### Communications cable wiring

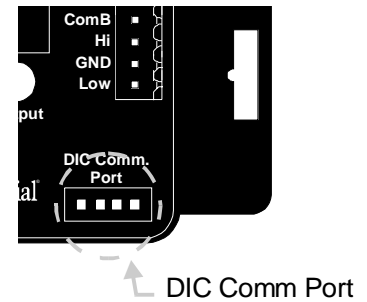
Field calibration requires a Data Industrial A330 Programming kit (consisting of a custom cable and software) and a PC running Windows® 9x, ME, NT, 2000 or XP. In order to program, the Model 330 must be connected to power, and the A301 cable must be connected to the Model 330 Comm port connector and an available 9-pin COM port on a computer.

**Note:**

***The Data Industrial A301 Cable will work with all 300 Series products. However the older version of the cable (A300) does not have sufficient bandwidth to work with the 340 Series Transmitters.***

Data Industrial provides free programming software updates via the Internet for all of 300 Series devices. Go to [www.dataindustrial.com](http://www.dataindustrial.com) for these updates.

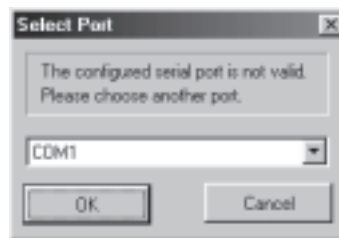
### Location of the DIC Communication Port



## Programming

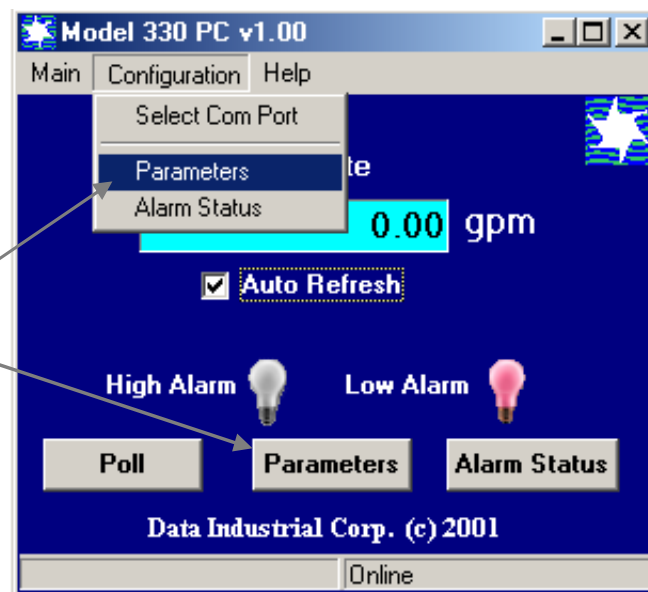
Programming the Model 330 is accomplished by installing the Data Industrial programming software on a computer and entering data on templates of the Windows® based program.

1. Load the interface software into the computer.
2. Connect the computer to the Model 330 transmitter with the Data Industrial A-301 communications cable to the socket labeled "D.I.C Comm Port", taking care to properly align the tab on the plug and socket to maintain polarity. Connect the DB9 connector of the Data Industrial A301 communications cable to a PC com port that has the Model 330 software installed.
3. Connect the Model 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.

To go to the calibration settings screen press "Parameters" from either place shown.



## 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 diagram below as a reference.

The screenshot shows the 'Parameters' screen of the Data Industrial Model 330. The screen is divided into several sections: 'Flow Sensor Configuration' at the top, 'Alarm Type' in the middle, and 'High Alarm' and 'Low Alarm' sections at the bottom. Each section contains input fields for 'set point', 'release point', 'set point delay', and 'release point delay'. There are also checkboxes for 'latched' and 'off'. At the bottom of the screen are buttons for 'Send', 'Refresh', 'Defaults', and 'Exit'. Annotations with arrows point to specific elements on the screen, corresponding to the steps listed on the left and right.

**Step 1**  
Select the flow sensor type (pulse, sine, 4000) and enter in a k and Offset. **See note #1.**

**Step 2**  
Select the desired flow rate units.

**Step 3**  
Select the desired Alarm Type (high, low, both off).

**Step 4**  
Enter in the high or/and low alarms. **See Note #2.**

**Step 5**  
Press send to transmit calibration data to the 330.

**Step 6**  
Press to exit parameters screen and to go back to main screen.

Press to refresh the parameters screen with the current 330 settings.

Press to restore the factory default settings to the screen. Must press "send" before values take effect.

## **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 micro-second, 100KHz ring wave

## **SENSOR CALIBRATION**

### **Data Industrial:**

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® 9x, ME, NT, 2000, XP

### **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:**

A-330 programming kit containing software and 3' A301 cable.

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

FACTORY DEFAULTS

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



## **Warranty**

Data Industrial Corporation ("Seller") of 11 Industrial Drive, Mattapoisett, Massachusetts 02739-0740, U.S.A., warrants to the original purchaser of its product that such product manufactured by Data Industrial Corporation shall be free from defects in materials or workmanship when installed, serviced and operated according to Data Industrial Corporation instructions or in other such normal use. This warranty is effective for a period of 12 months from the date of installation by the Purchaser or 18 months from the date of shipment by the "Seller" whichever occurs or terminates first. This limited warranty does not cover damage or loss resulting from corrosion or erosion caused by acids or other chemicals or by severe environmental conditions or negligent or improper installation or improper operation, misuse, accident, unauthorized repair or substitution of components other than those provided by the "Seller", and does not cover limited life components such as bearings, shafts, impellers where wear rate is a function of application and environment. Any component not manufactured by the "Seller" but included in its products shall not be covered by this warranty and is sold only under such warranty as the manufacturer may provide.

If Buyer or Purchaser wishes to make a claim hereunder, he shall send written notice of any defect within the warranty period, to "Seller" at the above address. "Seller" may at its sole option instruct Buyer to ship subject part, postage prepaid, to the "Seller" at above address or authorize a representative to inspect the part on site. "Seller" will at its sole option repair or replace any defective product covered by this warranty. If Buyer makes repairs or alterations to any product or part covered by this warranty without "Sellers" prior written approval, this warranty shall be null and void.

The foregoing shall constitute Buyers or Purchasers sole and exclusive remedy against "Seller", and no other remedy, including but not limited to, incidental or consequential damages for personal injury, loss of fluids, gases or other substances or for loss of profits or injury to property or person shall be available to the Buyer or Purchaser. The warranty extended herein shall be in lieu of any other implied warranty of merchantability or fitness for a particular purpose, and seller shall bear no liability for representatives or retail sellers. In no event shall Data Industrial Corporation be liable for any contingent, incidental, or consequential damage or expenses due to partial or complete inoperability of its product.

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