

1-30L/min Flow Sensor



- ✓ Measure flow from 1 to 30 Liters per minute
- ✓ Sealed integrated magnetic hall effect sensor outputs an electrical pulse with every revolution
- ✓ Standard 1/2 inch nominal pipe connection
- ✓ 5V TTL output
- ✓ 15cm (5.9 inches) cable length
- ✓ Compatible with many Dataq Instruments hardware products including DI-2108, DI-2108-P, DI-4108, DI-4208, and DI-4718B (with appropriate 8B module) models

Flow Sensor Description

Overview

The general Flow Sensor (Dataq part number 2000362) allows Dataq Instruments data acquisition and data logger units to acquire flow rate (L/sec) information. The combination of these two products provides a compact solution, with sensor excitation provided by the data logger. The logger itself allows data to be communicated to a connected PC over either a USB or Ethernet interface. Optionally, many data loggers can store data to a removable USB thumb drive to satisfy stand-alone applications. Even with a connected flow sensor, the data logger channel capacity allows additional channels of information to be acquired and correlated with flow information to satisfy nearly any level of measurement expansion.

Flow Sensor Features

Hall Effect Sensor

A flow sensor sits in line with the water line and contains a pinwheel sensor to measure how much liquid has moved through it. A magnetic hall effect sensor outputs an electrical pulse with every revolution. The hall effect sensor is sealed from the water pipe and allows the sensor to stay safe and dry.

Easy Installation

Standard 1/2 inch nominal pipe connections connect inline with your flow source. Three wire leads easily connect to your data acquisition system.

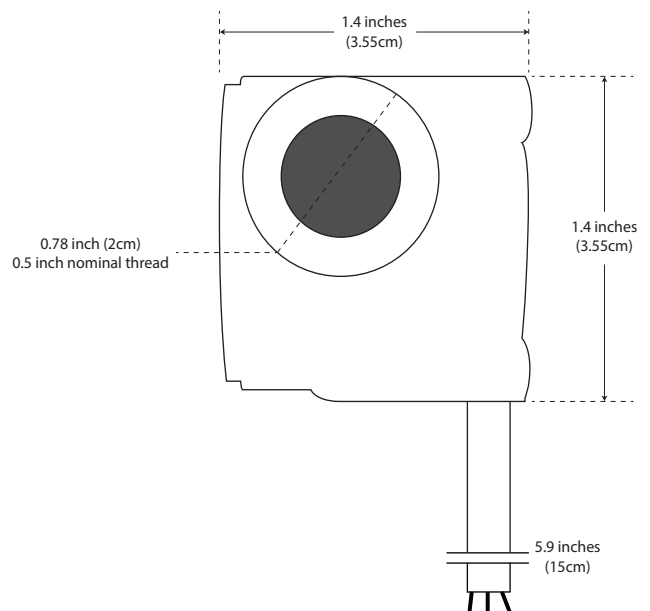
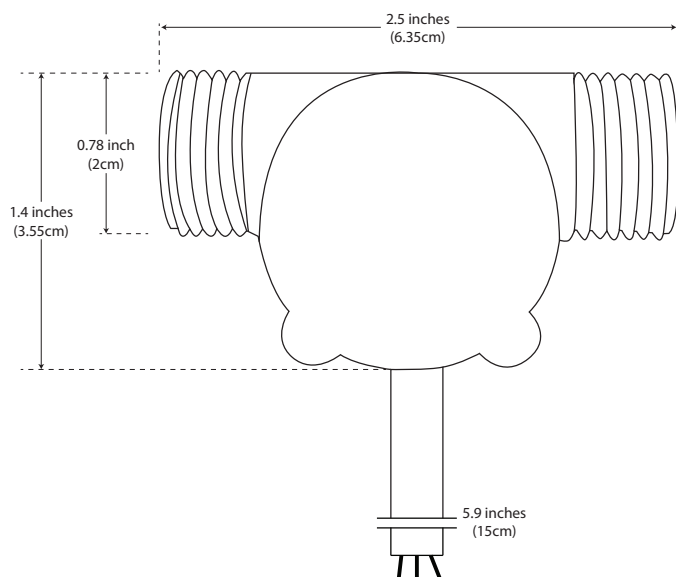
Low Power Consumption

Easily power the flow sensor with the +5V or +15V pin available on most Dataq Instruments data loggers.

Compatibility

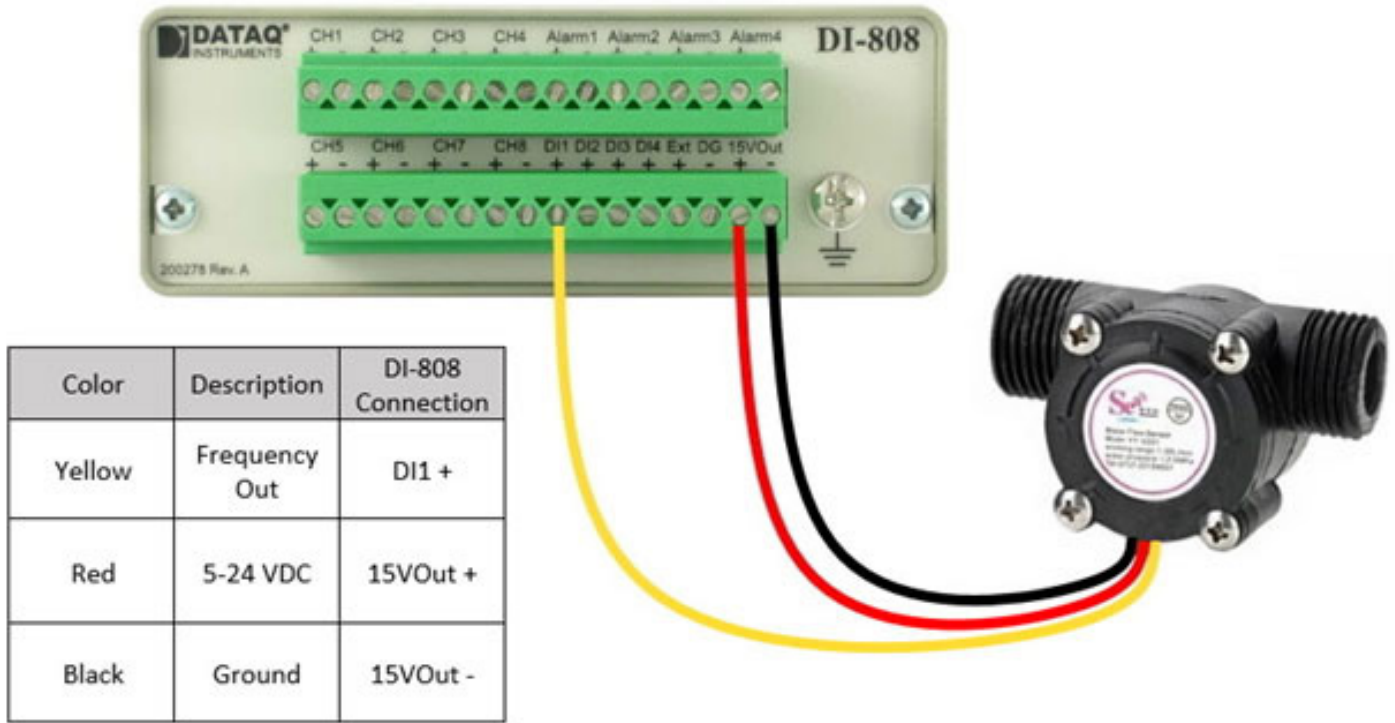
Use the flow sensor with almost any Dataq data logger or data acquisition system including, but not limited to the DI-2108, DI-2108-P, DI-4108, DI-4208, DI-808, DI-4718B (send email to sales@dataq.com for compatibility questions).

2000362 Flow Sensor Dimensional Drawing



Connecting the Flow Sensor to your DI-808 Data Logger

Connect the Red wire to the positive (+) terminal of the 15V supply, and the Black wire to the negative (-) terminal. Connect the Yellow wire to positive (+) terminal of any of the digital inputs (DI1 in this case) to measure Flow Rate.

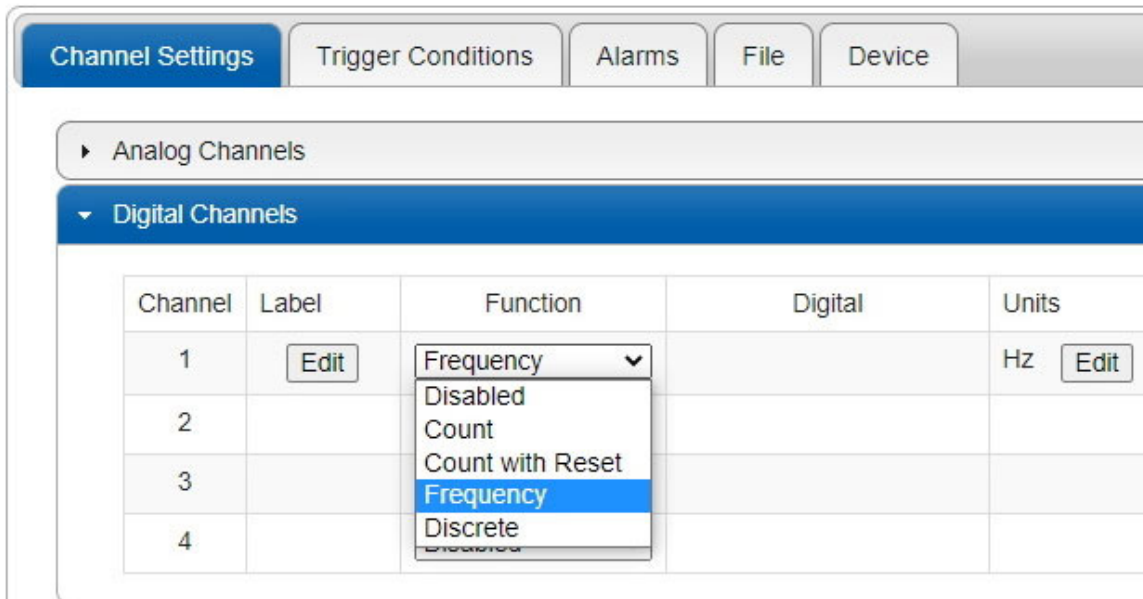


Configuring DI-808s on-board web server for use with your Flow Sensor

Follow these steps to change the settings in the DI-808s on-board web server to get the best flow rate readings from your flow sensor.

1. Change Function

In the Channel Settings tab, choose Digital Channels and select Frequency from the Function pull-down menu.



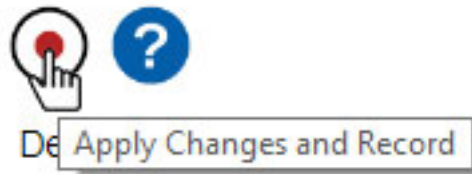
2. Set Calibration

In the Units column, turn on units. Next, enter 246 for Upper > Measured Value and 0.5 for Upper > EU. Enter 0 (zero) for both Lower > Measured Value and Lower > EU. Enter L/sec for Units. Use the image below for reference.

Units													
On <input type="checkbox"/>	<table border="1"><thead><tr><th></th><th>Measured Value</th><th>EU</th></tr></thead><tbody><tr><td>Upper:</td><td><input type="text" value="246"/></td><td><input type="text" value="0.5"/></td></tr><tr><td>Lower:</td><td><input type="text" value="0"/></td><td><input type="text" value="0"/></td></tr><tr><td>Units:</td><td colspan="2"><input type="text" value="L/sec"/></td></tr></tbody></table>		Measured Value	EU	Upper:	<input type="text" value="246"/>	<input type="text" value="0.5"/>	Lower:	<input type="text" value="0"/>	<input type="text" value="0"/>	Units:	<input type="text" value="L/sec"/>	
	Measured Value	EU											
Upper:	<input type="text" value="246"/>	<input type="text" value="0.5"/>											
Lower:	<input type="text" value="0"/>	<input type="text" value="0"/>											
Units:	<input type="text" value="L/sec"/>												
<input type="button" value="Close"/>													

3. Apply Settings

Click the Apply Changes and Record button in the upper left-hand corner of the browser window to apply the changes.



Save Configuration and Record

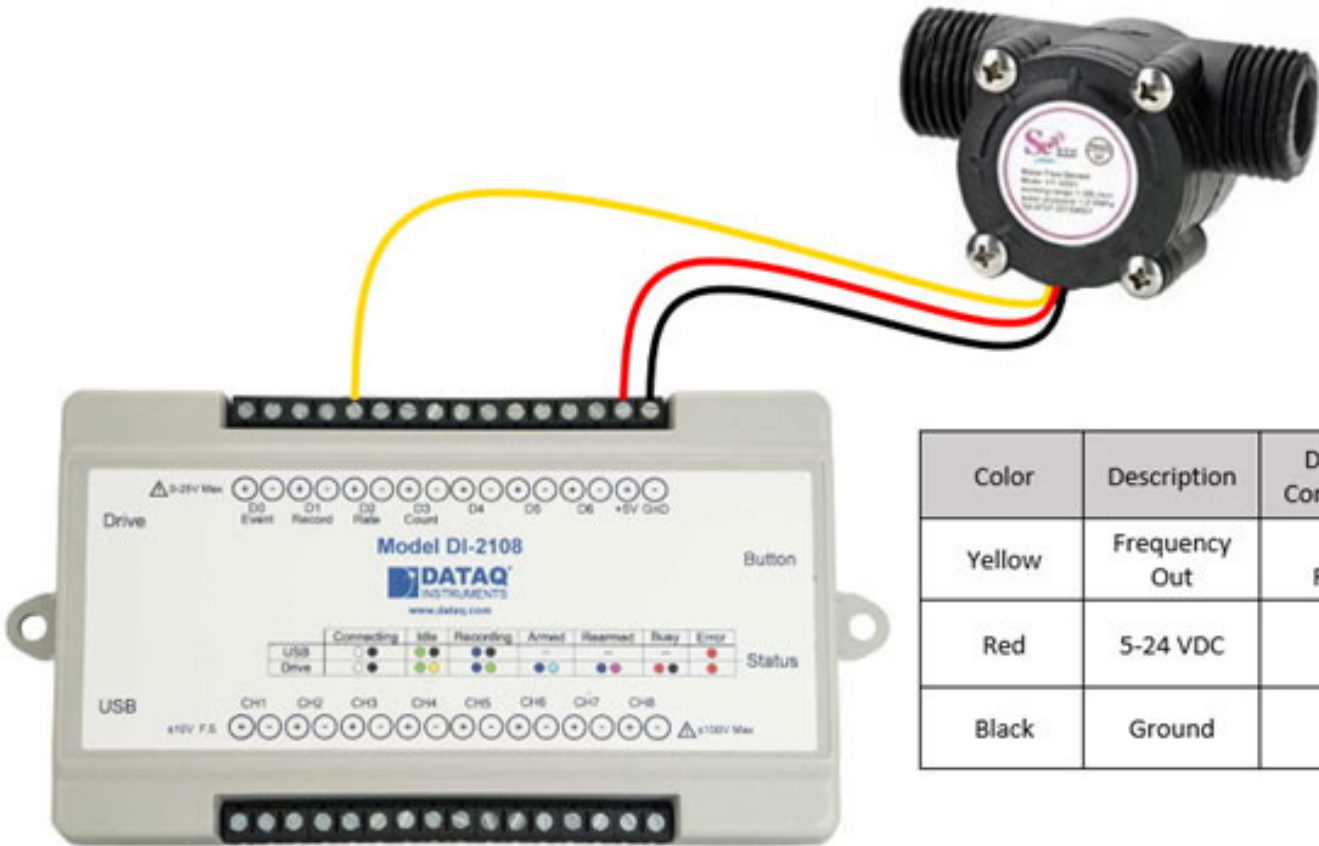
Click "Apply Changes" to save the current settings.

Click "Apply and Record" to save the changes and begin recording.

Click "Cancel" to close this dialog box without saving changes.

Connecting the Flow Sensor to your DI-2108 Data Logger

Connect the Yellow wire to the positive (+) terminal of Rate channel (D2). Connect the Red wire to the +5V terminal, and connect the Black wire to the Ground terminal (GnD).



Color	Description	DI-2108 Connection
Yellow	Frequency Out	D2 Rate +
Red	5-24 VDC	+5V
Black	Ground	GnD

Configuring WinDaq for use with your Flow Sensor

Follow these steps to change the settings in WinDaq Acquisition software to get the best readings from your flow sensor

1. Change Gain (Frequency Range)

With the Rate channel enabled, press F10 or select the menu item Edit > Channel Settings. Click on the Gain Setting that corresponds to 0 to 500 Hz (shown below). Click the OK button to save the setting to that channel.

Channel 10 Settings

Gain	-FS Hz	+FS Hz
2	.0	50000.0
5	.0	20000.0
10	.0	10000.0
20	.0	5000.0
50	.0	2000.0
100	.0	1000.0
200	.0	500.0
500	.0	200.0
1000	.0	100.0
2000	.0	50.0
5000	.0	20.0
10000	.0	10.0

Acquisition Method

Filter

Last Point

Maximum

Minimum

RMS

Frequency

Input Type

Linear

Nonlinear

Thermocouple

Filter Length =

Unipolar Cycles/min

OK Reset EU Cancel

Next Previous

2. Set Calibration

Use Engineering Unit Settings to calibrate your channel. Press Ctrl+F8 or select the menu item Edit > Engineering Unit Settings. Enter 0 (zero) for both Lower Level > Volts and Lower Level > EU. Next, enter 246 for Upper Level > Hz and 0.5 for Upper Level > EU. Enter L/sec for EU Tag. Click the OK button to save the settings. Use the image below for reference.

Channel 10 Engineering Unit Settings

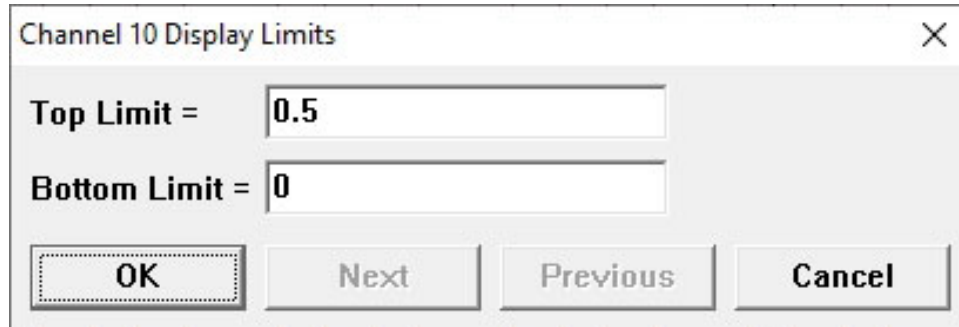
	Hz	EU	EU Tag
Upper Level	<input type="text" value="246.0"/>	<input type="text" value="0.5"/>	<input type="text" value="L/sec"/>
Lower Level	<input type="text" value=".0"/>	<input type="text" value=".0"/>	

Previous OK Next Set Offset Cancel

Configuring WinDaq for use with your Flow Sensor

3. Set Display Limits

Zoom in on your data by setting the display limits. Select the channel then press ALT + F9 or select the menu item Scaling > Limits. Enter a Top Limit and a Bottom Limit to display based on the readings you think you will get. If you do not know what your readings will be you can always enter the maximum readings of the Flow sensor (for flow the top limit is 0.5 and the bottom limit is 0 - as shown below).



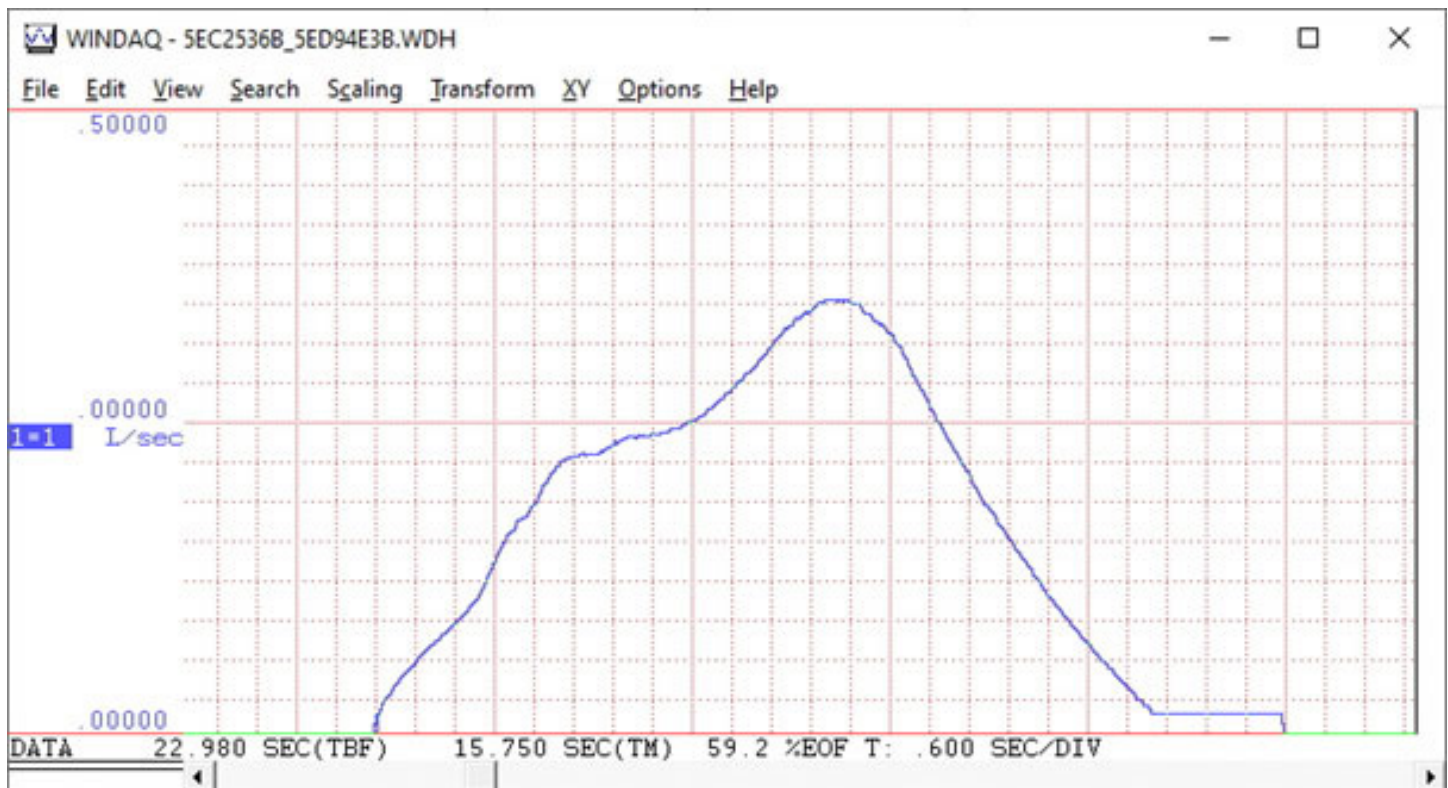
Channel 10 Display Limits

Top Limit = 0.5

Bottom Limit = 0

OK Next Previous Cancel

With the Flow Sensor connected to the data logger, and WinDaq configured to display flow rate, you're ready to acquire data.

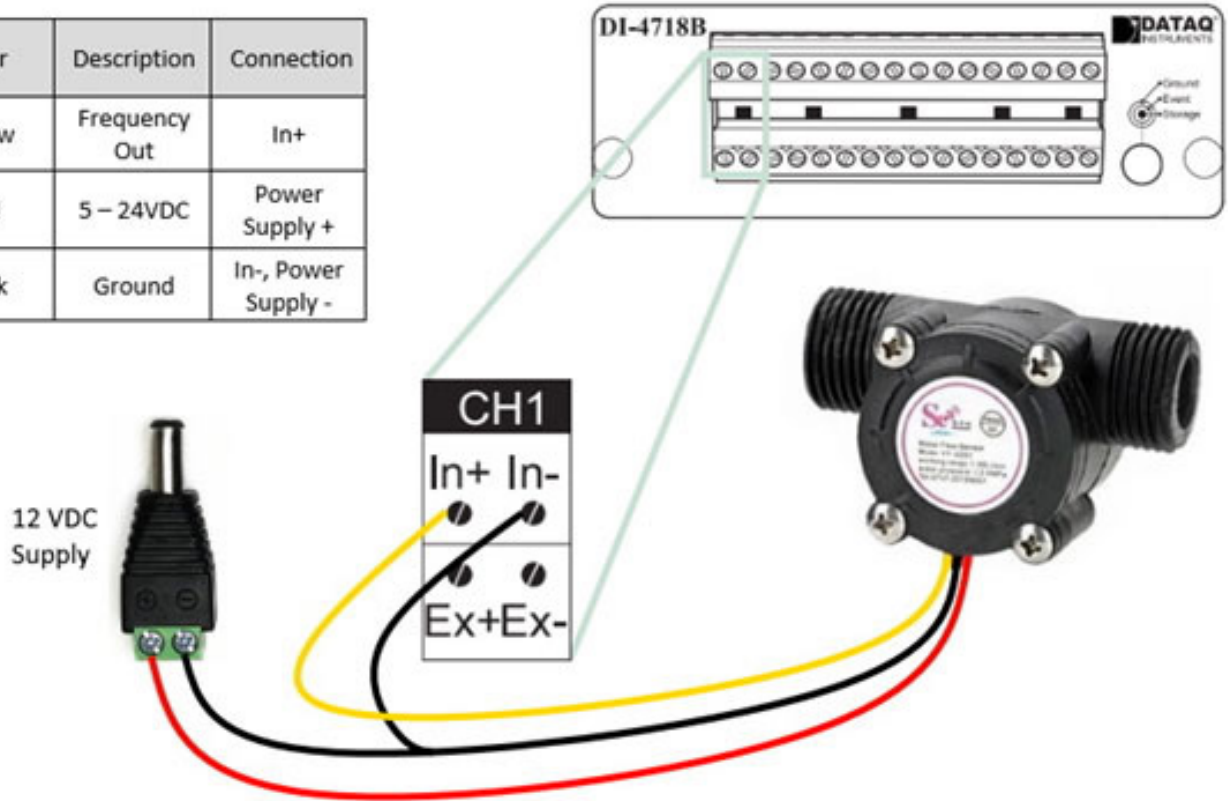


Note that connection and configuration for the Flow Sensor is the same for all contemporary DATAQ data loggers, including but not limited to the DI-2108-P, DI-2008 and DI-4108/4208. All feature a Rate channel Use comparable settings for setup in Stand-alone mode.

Connecting the Flow Sensor to your DI-4718B Using a DI-8B45-01 Amplifier

You can use a DI-4718B along with a 0 to 500Hz DI-8B45-01 frequency amplifier and an AC/DC adaptor (part #101087) to acquire flow rate data from the sensor. With a DI-8B45-01 frequency amplifier plugged into channel one of the DI-4718B, connect the Yellow wire to the In+ terminal, the Red wire to the positive (+) terminal of the 12 VDC supply and the black wire to both the In- terminal on the DI-4718B and the negative (-) terminal of the 12 VDC supply.

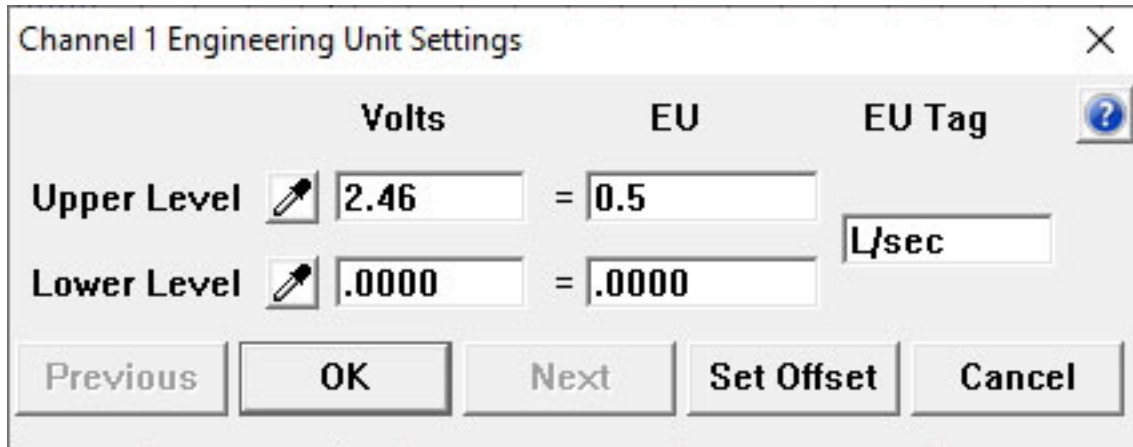
Color	Description	Connection
Yellow	Frequency Out	In+
Red	5 – 24VDC	Power Supply +
Black	Ground	In-, Power Supply -



Configuring WinDaq for use with your Flow Sensor

1. Set Engineering Units

Since the DI-8B45-01 amplifier outputs 5V at 500Hz, and our flow sensor has a maximum frequency output of approximately 246Hz, press Ctrl+F8 or select the menu item Edit > Engineering Unit Settings and enter 2.46 for Upper Level > Volts and 0.5 for Upper Level > EU. Enter L/sec for EU Tag and click the OK button to save the settings. Use the image below for reference.



The screenshot shows the 'Channel 1 Engineering Unit Settings' dialog box. It has a title bar with a close button (X) and a help button (?). The dialog is organized into columns: 'Volts', 'EU', and 'EU Tag'. There are two rows of input fields. The first row is for 'Upper Level', with a value of '2.46' in the 'Volts' column, an equals sign, and '0.5' in the 'EU' column. The second row is for 'Lower Level', with a value of '.0000' in the 'Volts' column, an equals sign, and '.0000' in the 'EU' column. The 'EU Tag' column contains the text 'L/sec'. At the bottom of the dialog are five buttons: 'Previous', 'OK', 'Next', 'Set Offset', and 'Cancel'.

2. Set Display Limits

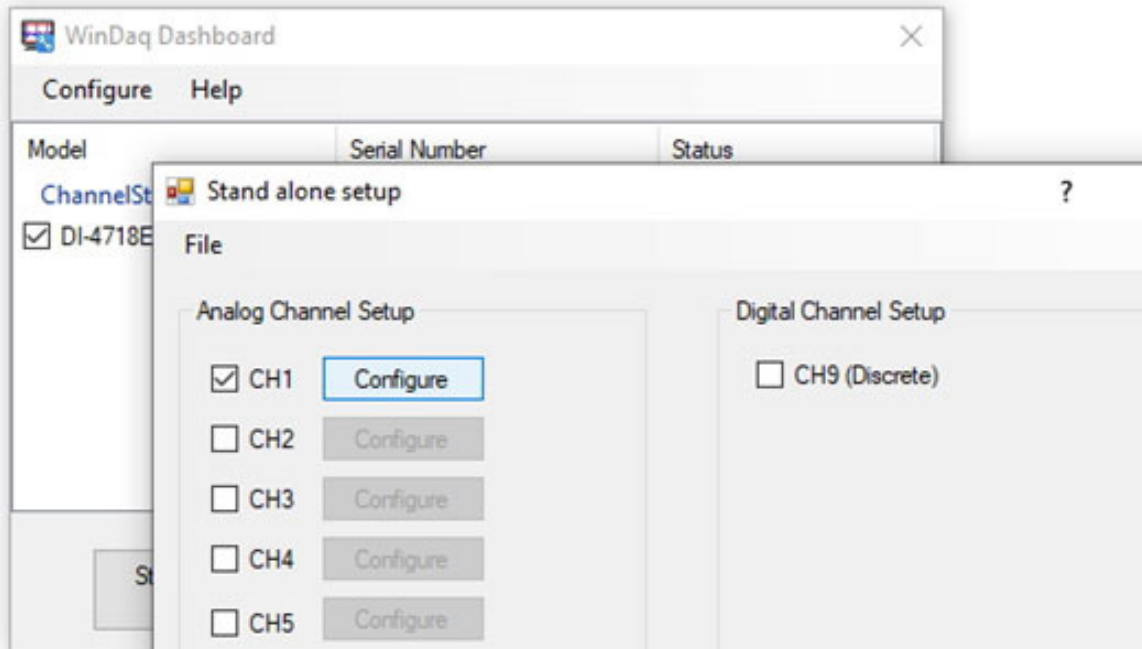
Once again, to zoom in on your data, set the display limits. Select the channel then press ALT + F9 or select the menu item Scaling > Limits. Enter a Top Limit and a Bottom Limit to display based on the readings you think you will get. If you do not know what your readings will be you can always enter the maximum readings of the Flow sensor (for flow the top limit is 0.5 and the bottom limit is 0 - as shown below).



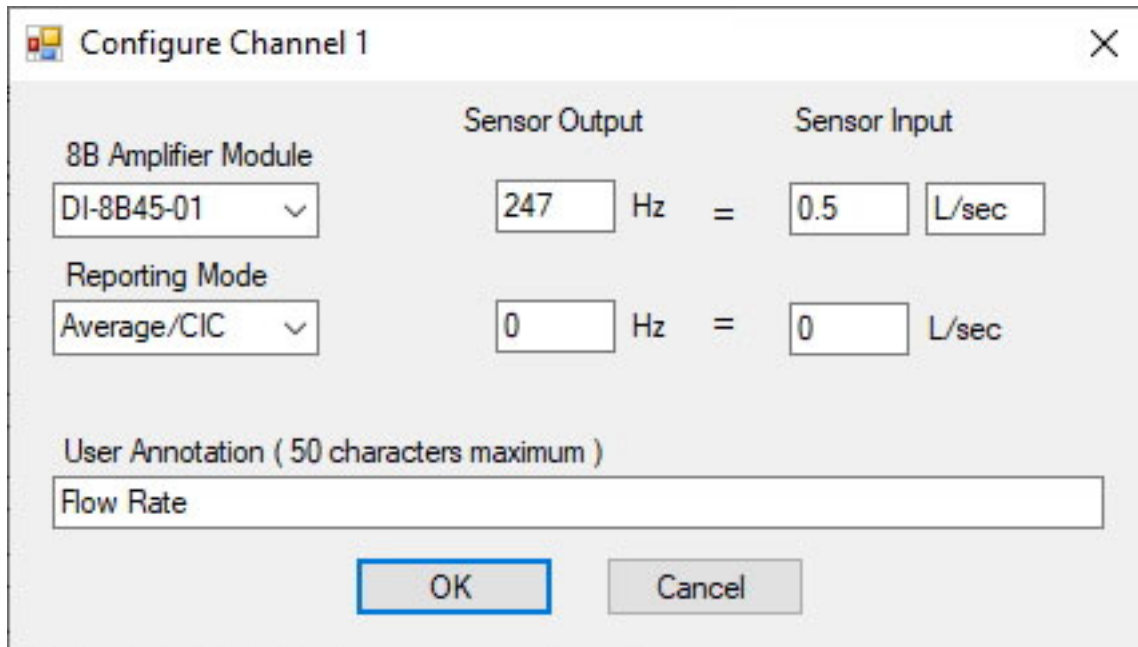
The screenshot shows the 'Channel 1 Display Limits' dialog box. It has a title bar with a close button (X). The dialog contains two input fields. The first is labeled 'Top Limit =' and contains the value '0.5'. The second is labeled 'Bottom Limit =' and contains the value '0'. At the bottom of the dialog are four buttons: 'OK', 'Next', 'Previous', and 'Cancel'.

Configuring Stand-alone setup for use with your Flow Sensor

Run the WinDaq Dashboard and select 'Stand Alone Setup' from the 'Configure' pull-down menu.

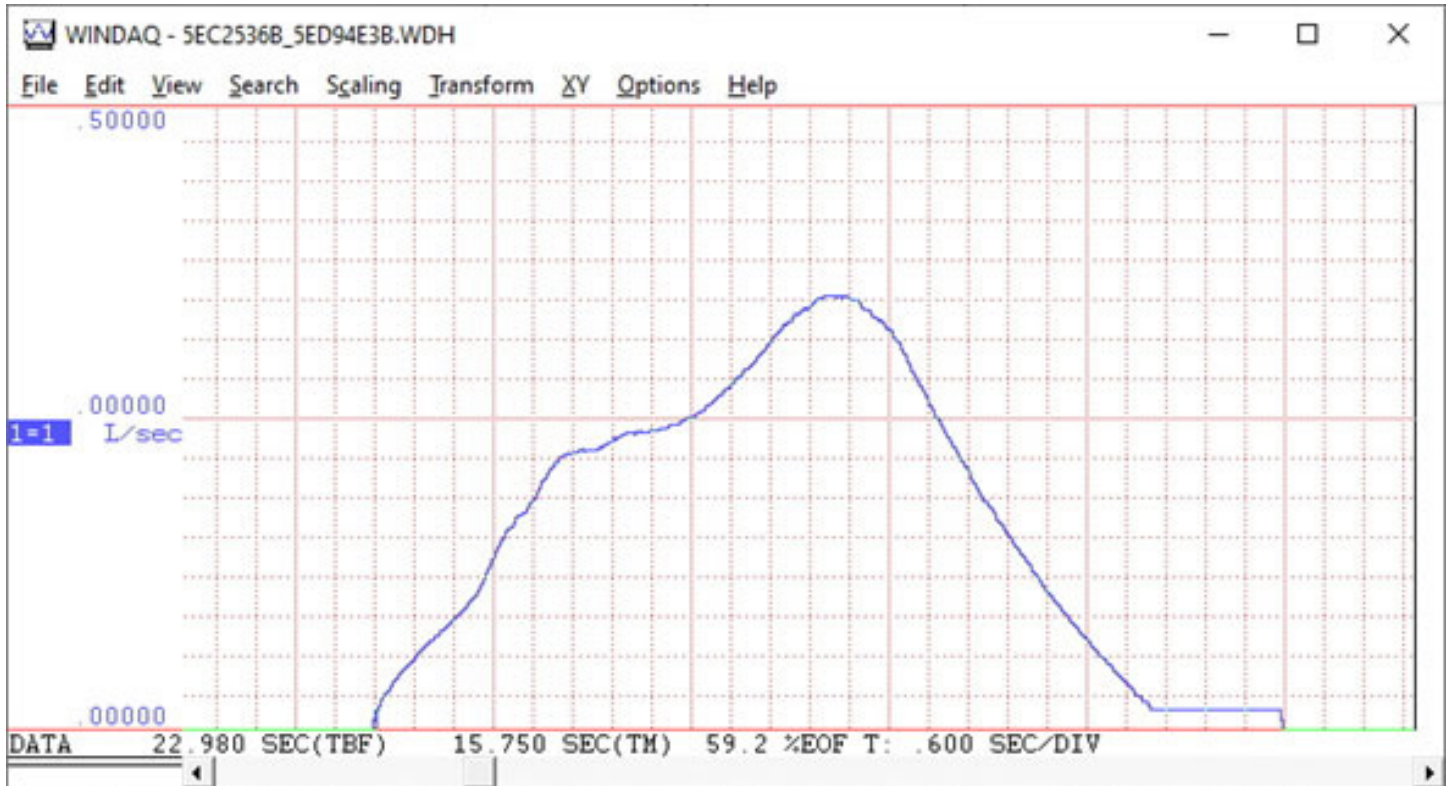


In the Configure window, enter 247 and 0 for Sensor Output, and 0.5 and 0 for Sensor Input (as shown below). Change engineering units to 'L/sec'.



Configuring Stand-alone setup for use with your Flow Sensor

Here we see a Flow rate waveform (in L/sec) recorded to the USB flash drive in stand-alone mode.



Specifications (sensor only)

Measurement Range:	1 to 30 Liters/Minute	Output fall time:	0.18us
Sensor Type:	Hall Effect	Flow rate pulse characteristics:	Frequency (Hz) = 7.5 * Flow rate (L/min)
Working Voltage:	5 to 18V DC (min tested working voltage 4.5V)		
Max current draw:	15mA @ 5V	Durability:	minimum 300,000 cycles
Output Type:	5V TTL	Cable length:	15cm
Working Temperature range:	-25 to +80°C	Pipe Connections:	1/2" nominal pipe connections, 0.78" outer diameter, 1/2" of thread
Working Humidity Range:	35%-80% RH		
Accuracy:	±10%	Overall Dimensions:	Size: 2.5" x 1.4" x 1.4"
Maximum water pressure:	1.75 MPa	Wiring:	Red for +5V Black for GND Yellow for CH+
Output duty cycle:	50% +/-10%		
Output rise time:	0.04us		

Ordering Guide

Description	Order Number
2000362 Flow Sensor measures 1 to 30L/minute.	2000362



DATAQ Instruments, Inc.
241 Springside Drive
Akron, Ohio 44333
Phone: 330-668-1444
Fax: 330-666-5434

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