

## HMP60 Temperature and Humidity Probe



- ✓ Measure temperatures from -40°C to +60°C
- ✓ Measure 0% to 100% Relative Humidity
- ✓ Rugged aluminum construction IP rated 65 (dust tight and water jet protection)
- ✓ Low current consumption
- ✓ Easy and affordable RH sensor replacement
- ✓ Compatible with many Dataq Instruments hardware products including DI-808, DI-2008, and DI-710 “H” models

## HMP60 Description

### Overview

The HMP60 sensor allows DI-710 data loggers to acquire relative humidity (RH) and temperature information. The combination of these two products provides a compact solution, with transducer excitation provided by the DI-710 data logger. The logger itself allows data to be communicated to a connected PC over either a USB or Ethernet interface. Optionally, the DI-710 can store data to a removable SD-style memory card to satisfy stand-alone applications. Even with a connected HMP60, the DI-710's 16-channel capacity allows up to 14 additional channels of information to be acquired and correlated with temperature and humidity information to satisfy nearly any level of measurement expansion.

## HMP60 Features

### Low Current Consumption

Because of its low current consumption and short power-up time, the HMP60 is well suited for a multitude of data logger applications.

### Rugged Construction

The aluminum body of the HMP60 is IP-65 classified. The sensor is protected by a membrane filter and plastic grid.

### Easy Installation

The HMP60 probe cable has a screw-on quick connector for easy installation (3 meter cable included). Cable wires connect easily to the screw terminal ports on the front of your compatible Dataq Instruments product.

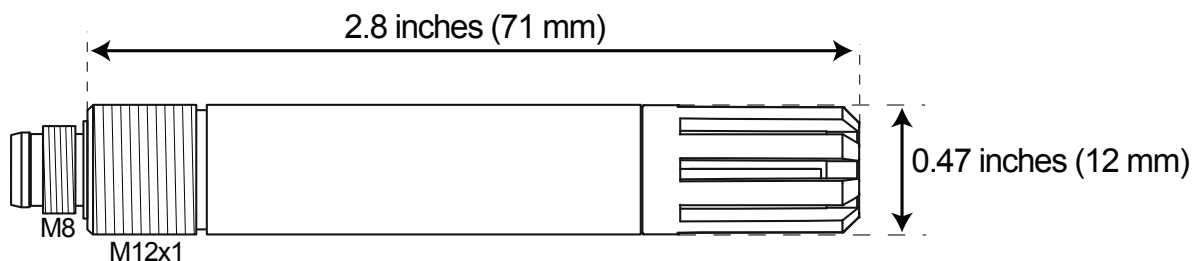
### No Need for Recalibration

The humidity sensor is interchangeable and easily replaced. Instead of re-calibrating the instrument, the RH sensor replacement is faster, easier, and less costly in most situations.

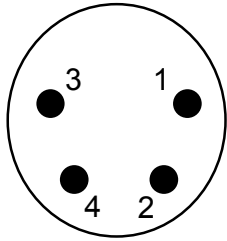
### Compatibility

Use the HMP60 with many Dataq Instruments products including the DI-710 Series (with the "H" gain option), DI-2008, and DI-808. Use DI-8B amplifiers to record with DI-4718B, DI-718B, DI-718Bx, and DI-788 products. The HMP60 can also be used with many other products using an optional power adapter for excitation (Dataq part number 101086).

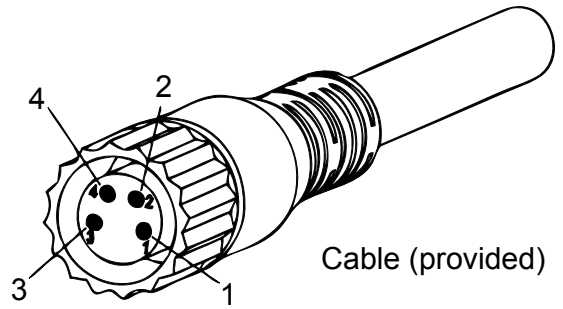
## HMP60 Dimensional Drawing



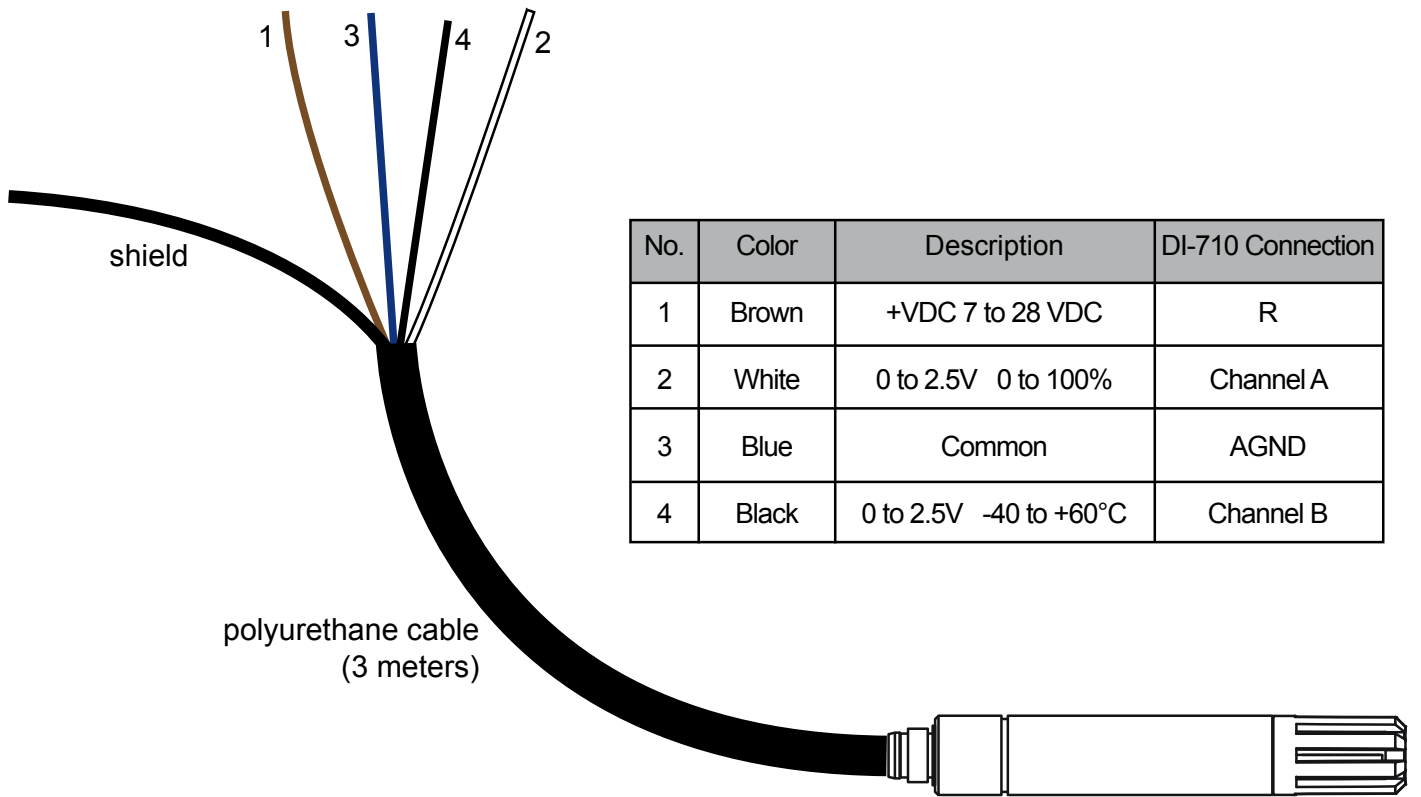
# HMP60 Wiring Code



Pins (at end of probe)



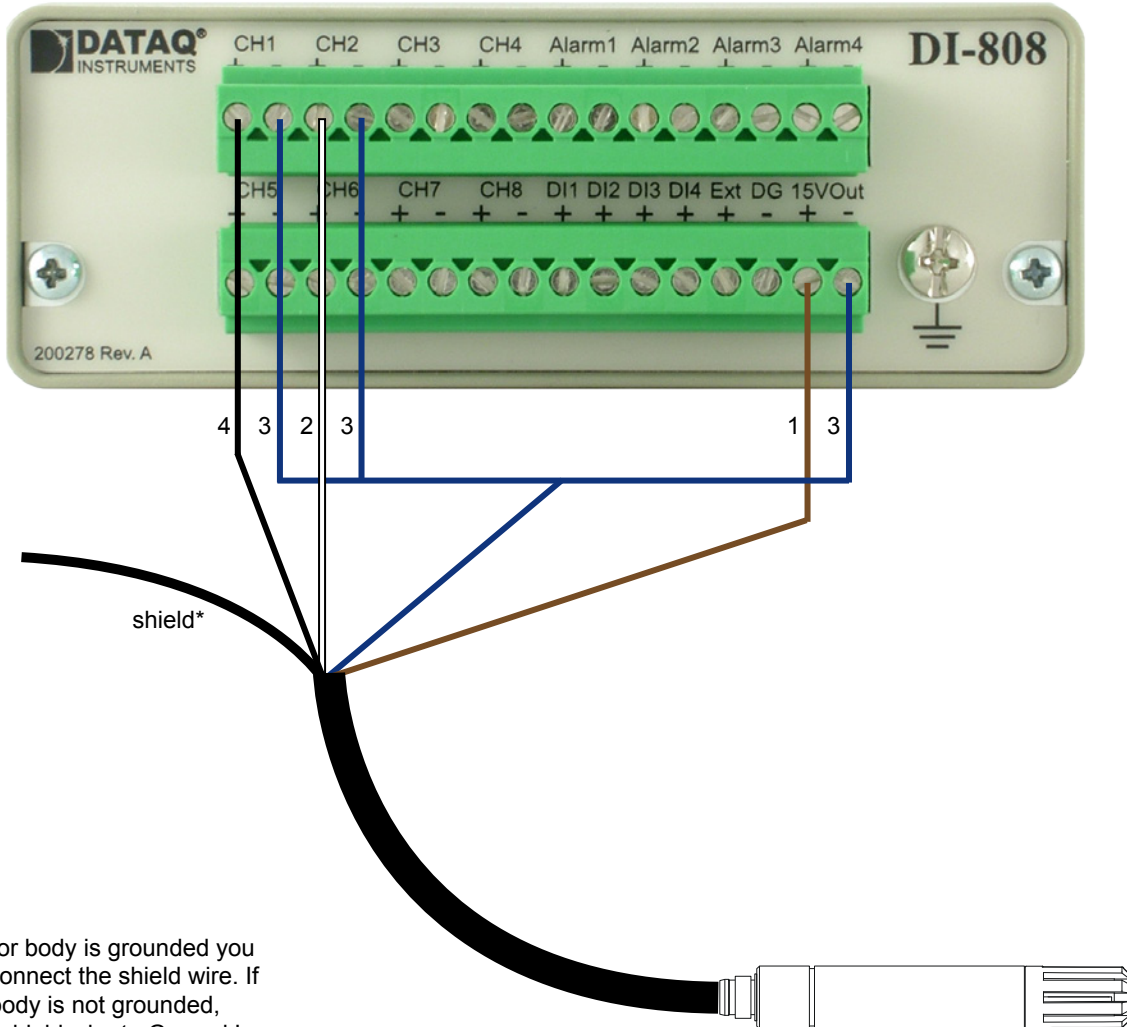
Cable (provided)



No.	Color	Description	DI-710 Connection
1	Brown	+VDC 7 to 28 VDC	R
2	White	0 to 2.5V 0 to 100%	Channel A
3	Blue	Common	AGND
4	Black	0 to 2.5V -40 to +60°C	Channel B

## Connecting the HMP60 to your DI-808 Data Logger

Connect the Brown wire to the positive (+) terminal of the 15V supply. Connect the small Black wire to the positive (+) terminal of any of the analog channels to measure temperature. Connect the White wire to positive (+) terminal of any of the analog channels to measure Relative Humidity. Connect the Blue wire to the negative (-) terminal of the 15V supply and the corresponding negative (-) terminals of both the temperature and humidity channels. The shield wire (larger Black wire) may need to be connected to ground depending on your probe setup.\*



\* If the sensor body is grounded you should not connect the shield wire. If the sensor body is not grounded, connect the shield wire to Ground Lug.

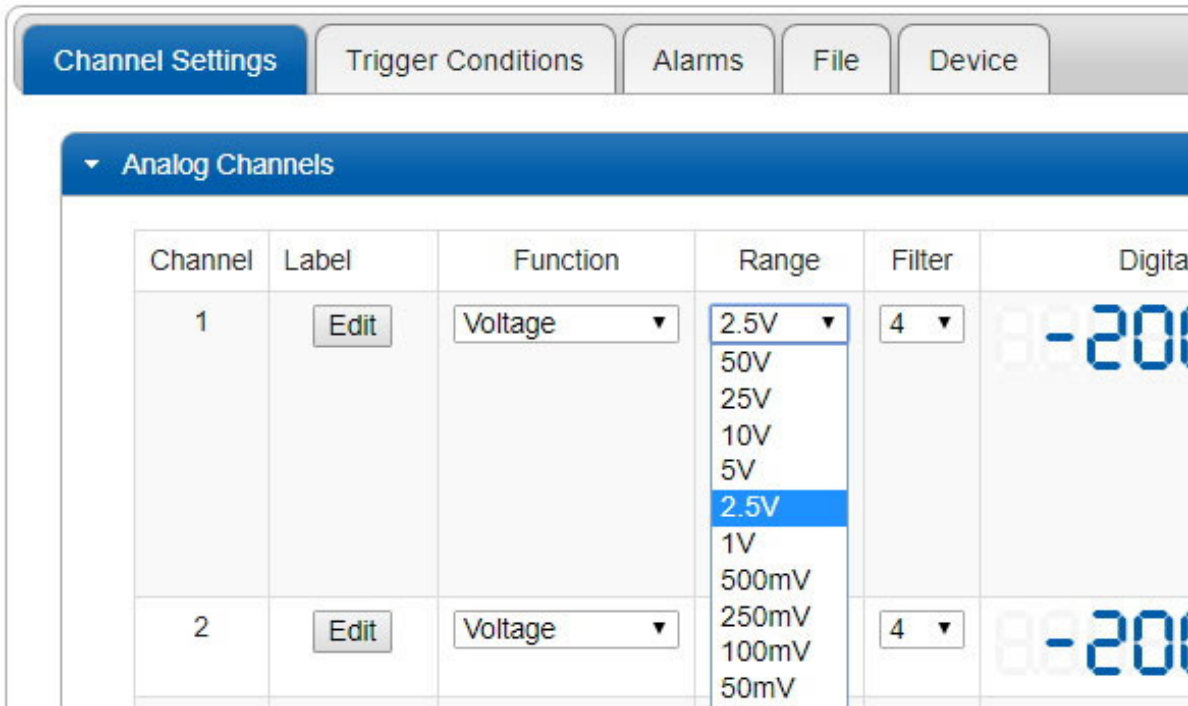
No.	Color	Description	DI-808 Connection
1	Brown	+VDC 7 to 28 VDC	15V Out +
2	White	0 to 2.5V 0 to 100%	Channel B +
3	Blue	Common	15V Out - Channel A - Channel B -
4	Black	0 to 2.5V -40 to +60°C	Channel A +

# Configuring DI-808s on-board web server for use with your HMP60 for Temperature

Follow these steps to change the settings in the DI-808 web interface to get the best temperature readings from your HMP60.

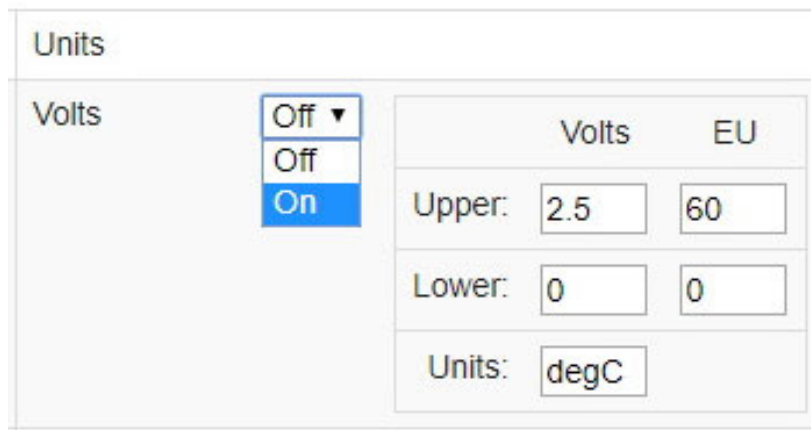
## 1. Change Range

In the Channel Settings tab, select Analog Channels. With the Voltage function selected, choose the 2.5V range.



## 2. Change Engineering Units

In the Units column, turn on Units. Enter 0 (zero) for both Lower Volts and Lower EU. Enter 2.5 for Upper Volts and 60 for Upper EU. Enter degC for Units. Use the image below for reference.



## 3. Apply Settings

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

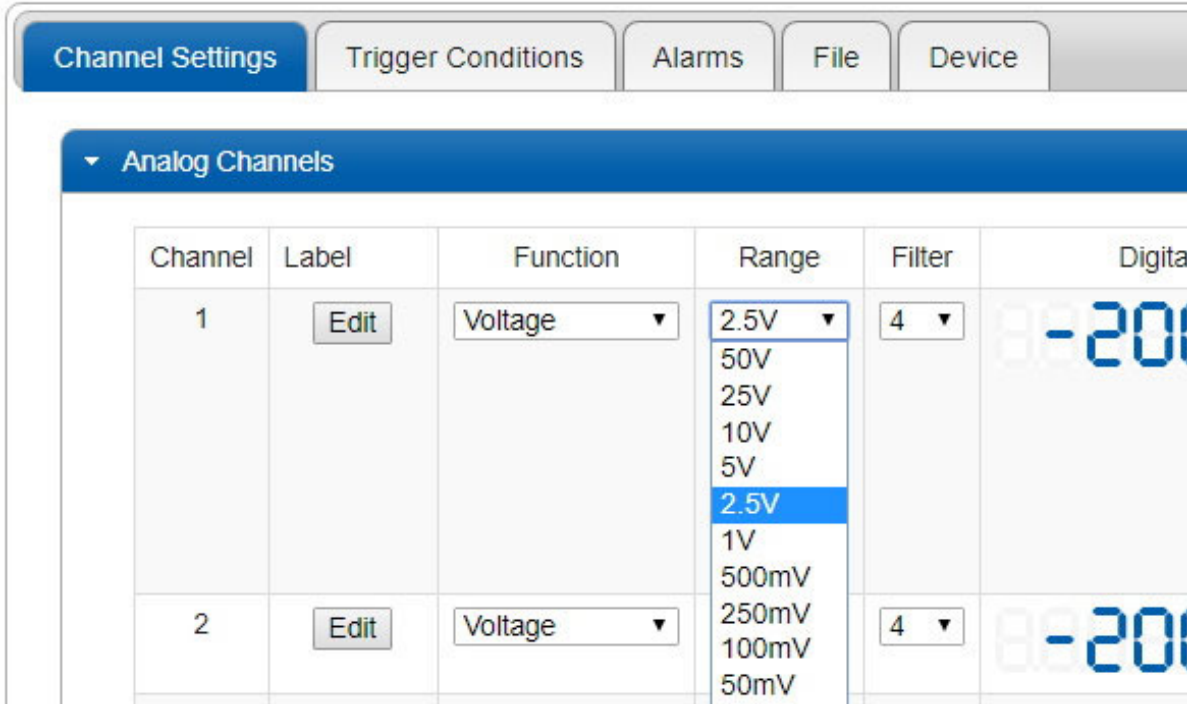


# Configuring DI-808s on-board web server for use with your HMP60 for RH

Follow these steps to change the settings in the DI-808 web interface to get the best RH readings from your HMP60.

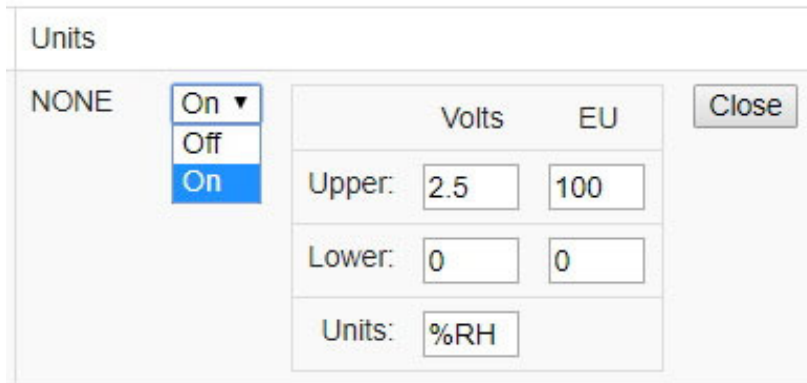
## 1. Change Range

In the Channel Settings tab, select Analog Channels. With the Voltage function selected, choose the 2.5V range.



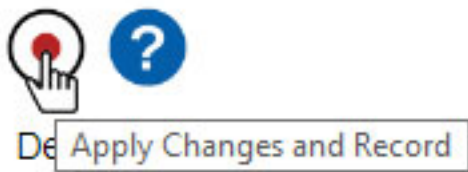
## 2. Change Engineering Units

In the Units column, turn on units. Enter 0 (zero) for both Lower > Volts and Lower > EU. Next, enter 2.5 for Upper > Volts and 100 for Upper > EU. Enter %RH for Units. Use the image below for reference.



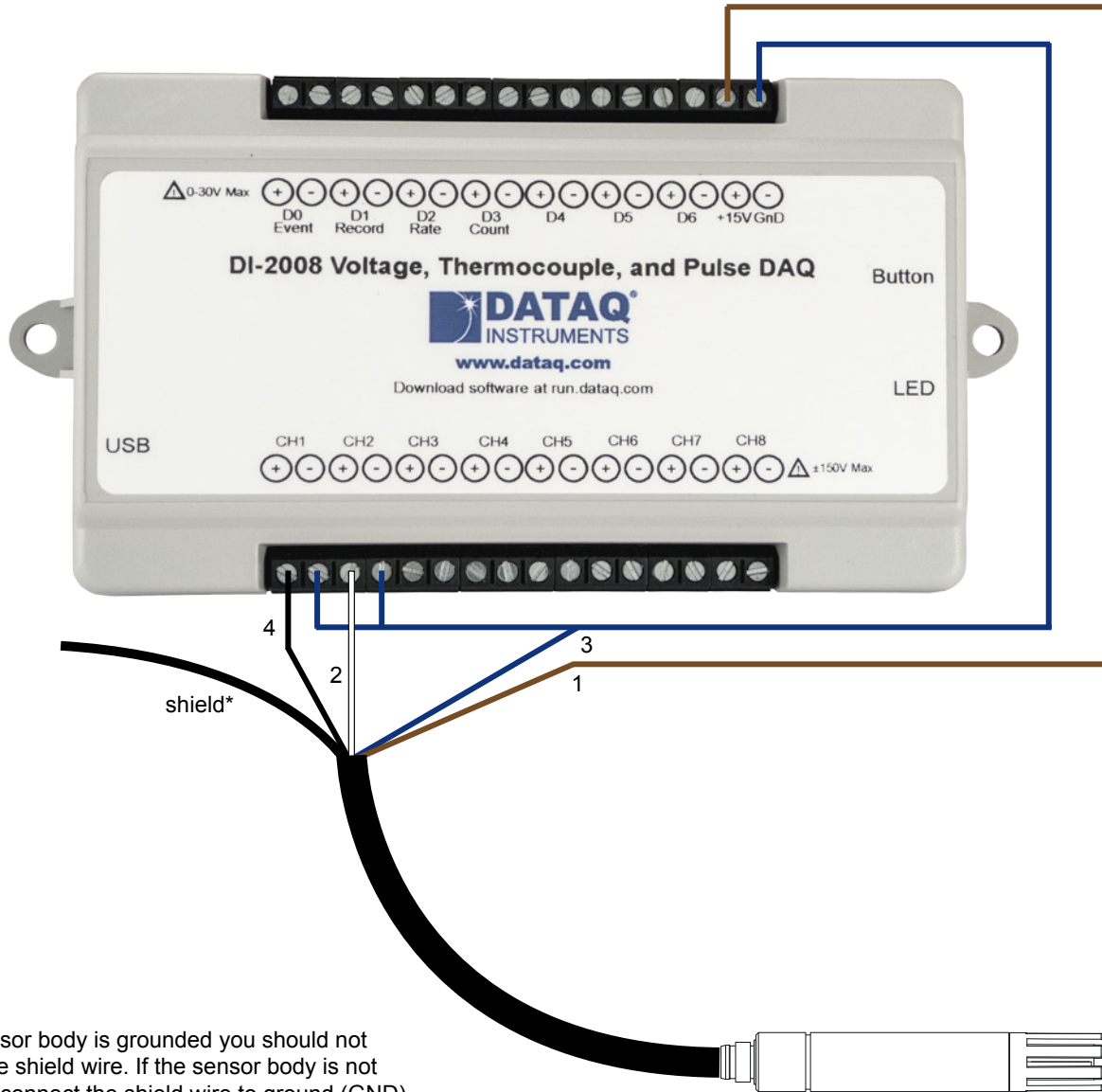
## 3. Apply Settings

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



## Connecting the HMP60 to your DI-2008 Data Logger

Connect the Brown wire to the positive (+) terminal of the built-in +15V supply. Connect the small Black wire to the positive (+) terminal of any of the analog channels to measure temperature. Connect the White wire to positive (+) terminal of any of the analog channels to measure Relative Humidity. Connect the Blue wire to the negative (-) terminal of the +15V supply and the corresponding negative (-) terminals of both the temperature and humidity channels. The shield wire (larger Black wire) may need to be connected to ground depending on your probe setup.\*



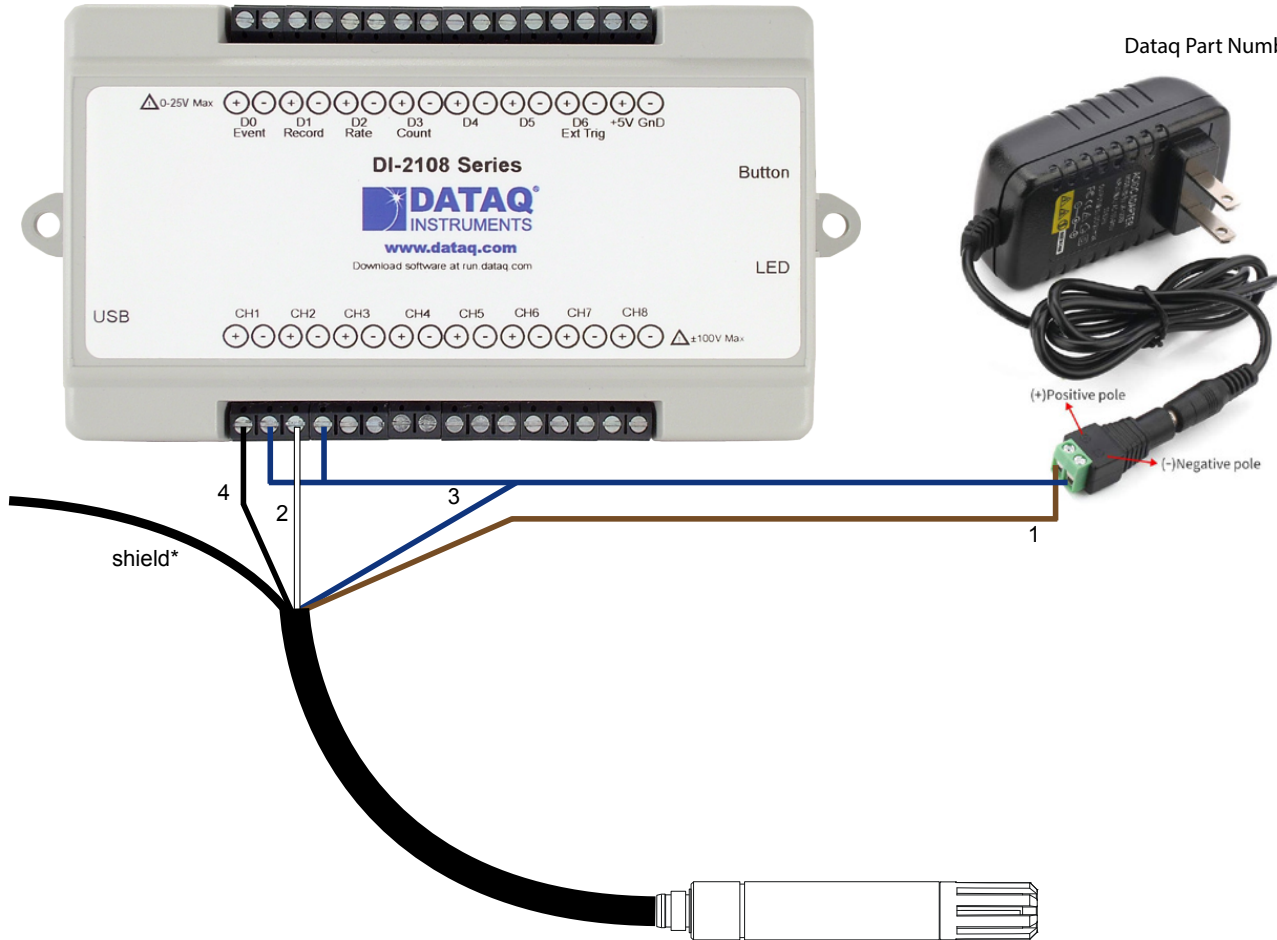
\* If the sensor body is grounded you should not connect the shield wire. If the sensor body is not grounded, connect the shield wire to ground (GND).

No.	Color	Description	DI-2008 Connection
1	Brown	+VDC 7 to 28 VDC	+15V
2	White	0 to 2.5V 0 to 100%	Channel B +
3	Blue	Common	15V Out - Channel A - Channel B -
4	Black	0 to 2.5V -40 to +60°C	Channel A +

## Connecting the HMP60 to your DI-2108-P, DI-4108, and DI-4208 Data Loggers

Connect the Brown wire to the positive (+) terminal of a power adaptor for sensor excitation (sold separately - Dataq part number 101086). Connect the small Black wire to the positive (+) terminal of any of the analog channels to measure temperature. Connect the White wire to positive (+) terminal of any of the analog channels to measure Relative Humidity. Connect the Blue wire to the negative (-) terminal of the power adaptor and the corresponding negative (-) terminals of both the temperature and humidity channels. The shield wire (larger Black wire) may need to be connected to ground depending on your probe setup.\*

Dataq Part Number 101086



\* If the sensor body is grounded you should not connect the shield wire. If the sensor body is not grounded, connect the shield wire to ground (GND).

No.	Color	Description	DI-2108-P Connection
1	Brown	+VDC 7 to 28 VDC	Power +
2	White	0 to 2.5V 0 to 100%	Channel B +
3	Blue	Common	Power - Channel A - Channel B -
4	Black	0 to 2.5V -40 to +60°C	Channel A +

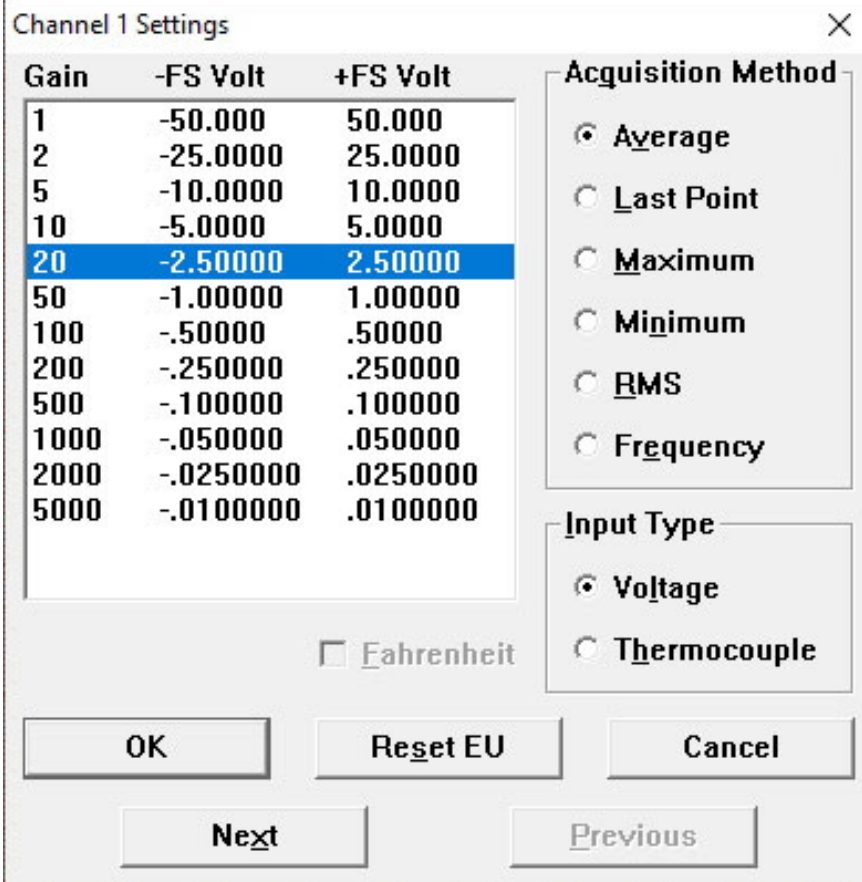


## Configuring WinDaq to Record Temperature with your HMP60

Follow these steps to change the settings in WinDaq Acquisition software to get the best readings from your HMP60 using DI-2008, DI-2108-P, DI-4108, and DI-4208 products using WinDaq Data Acquisition Software.

### 1. Change Gain

Select the channel connected to the temperature signal. Press F10 or select the menu item Edit > Channel Settings. Click on the Gain Setting that corresponds to  $\pm 2.5V$  (shown to the right). Click the OK button to save the setting to that channel. If you are also measuring humidity, select the appropriate channel and perform the same operation.

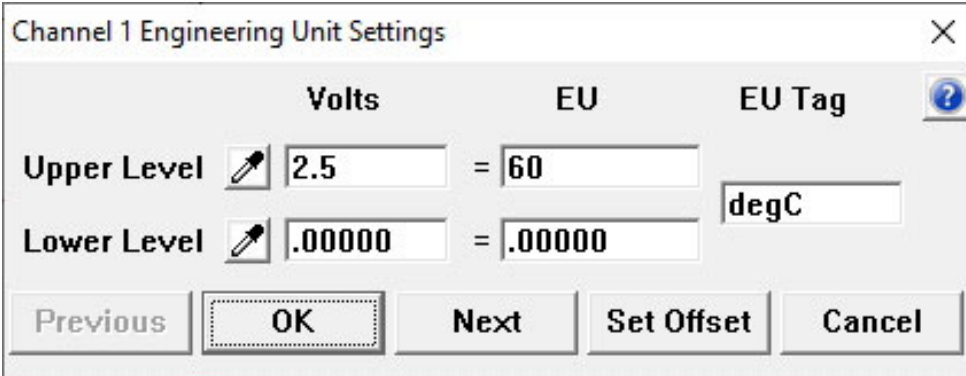


The Channel 1 Settings dialog box displays a table of gain settings and acquisition options. The 'Gain' column lists values from 1 to 5000. The '-FS Volt' and '+FS Volt' columns show the corresponding voltage ranges. The 'Acquisition Method' section includes radio buttons for Average, Last Point, Maximum, Minimum, RMS, and Frequency. The 'Input Type' section includes radio buttons for Voltage and Thermocouple. A checkbox for 'Fahrenheit' is also present. Buttons for OK, Reset EU, Cancel, Next, and Previous are located at the bottom.

Gain	-FS Volt	+FS Volt
1	-50.000	50.000
2	-25.0000	25.0000
5	-10.0000	10.0000
10	-5.0000	5.0000
20	-2.50000	2.50000
50	-1.00000	1.00000
100	-.50000	.50000
200	-.250000	.250000
500	-.100000	.100000
1000	-.050000	.050000
2000	-.0250000	.0250000
5000	-.0100000	.0100000

### 2. Set Calibration

Use Engineering Unit Settings to calibrate your channel. Select the channel connected to temperature signal. 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 2.5 for Upper Level > Volts and 60 for Upper Level > EU. Enter degC for EU Tag. Click the OK button to save the settings. Use the image below for reference.



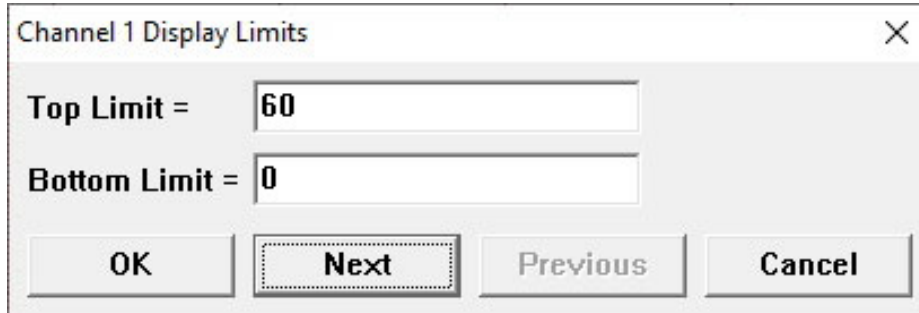
The Channel 1 Engineering Unit Settings dialog box shows fields for Volts, EU, and EU Tag. The Upper Level is set to 2.5 Volts and 60 EU. The Lower Level is set to .00000 Volts and .00000 EU. The EU Tag is set to degC. Buttons for Previous, OK, Next, Set Offset, and Cancel are at the bottom.

	Volts	EU	EU Tag
Upper Level	2.5	60	degC
Lower Level	.00000	.00000	

## Configuring WinDaq to Record Temperature with your HMP60 (continued)

### 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 HMP60 (for temperature the top limit is 60 and the bottom limit is 0 - as shown below).



Channel 1 Display Limits

Top Limit =

Bottom Limit =

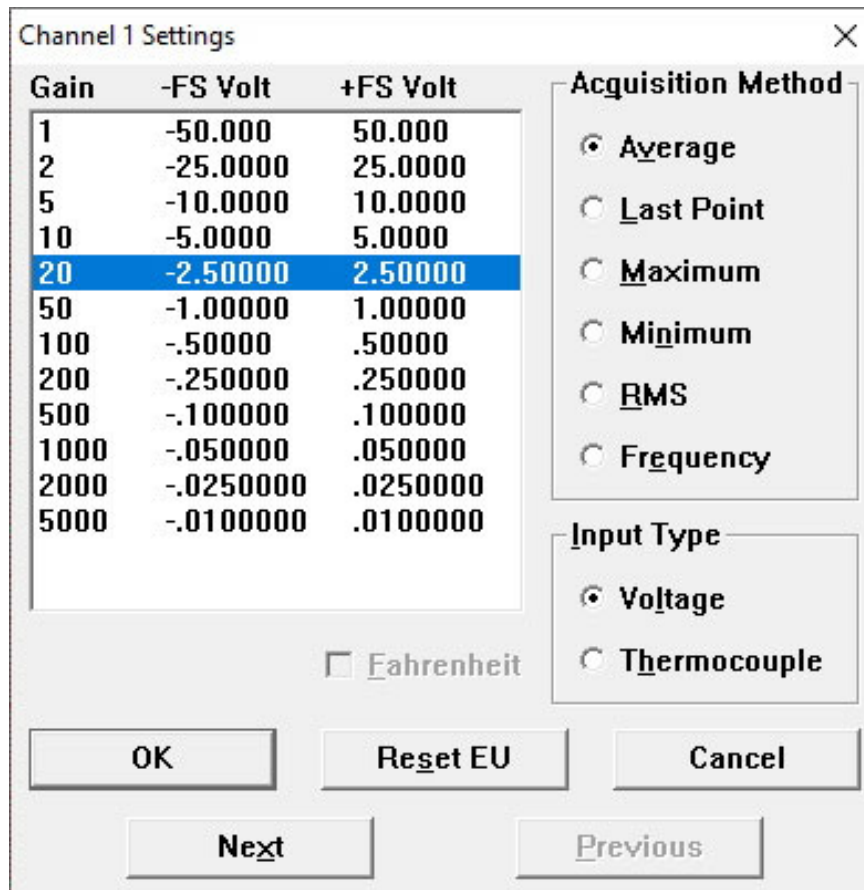
OK Next Previous Cancel

## Configuring WinDaq to Record Humidity with your HMP60

Follow these steps to change the settings in WinDaq Acquisition software to get the best readings from your HMP60 using DI-2008, DI-2108-P, DI-4108, and DI-4208 products using WinDaq Data Acquisition Software.

### 1. Change Gain

Select the channel connected to the relative humidity signal. Press F10 or select the menu item Edit > Channel Settings. Click on the Gain Setting that corresponds to  $\pm 2.5V$  (shown to the right). Click the OK button to save the setting to that channel. If you are also measuring humidity, select the appropriate channel and perform the same operation.



Channel 1 Settings

Gain	-FS Volt	+FS Volt
1	-50.000	50.000
2	-25.0000	25.0000
5	-10.0000	10.0000
10	-5.0000	5.0000
20	-2.50000	2.50000
50	-1.00000	1.00000
100	-.50000	.50000
200	-.250000	.250000
500	-.100000	.100000
1000	-.050000	.050000
2000	-.0250000	.0250000
5000	-.0100000	.0100000

Fahrenheit

Acquisition Method

- Average
- Last Point
- Maximum
- Minimum
- RMS
- Frequency

Input Type

- Voltage
- Thermocouple

OK Reset EU Cancel

Next Previous

## 2. Set Calibration

Use Engineering Unit Settings to calibrate your channel. Select the channel connected to relative humidity signal. 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 2.5 for Upper Level > Volts and 100 for Upper Level > EU. Enter %RH for EU Tag. Click the OK button to save the settings. Use the image below for reference.

	Volts	EU	EU Tag
Upper Level	2.5	100	%RH
Lower Level	.00000	.00000	

Buttons: Previous, OK, Next, Set Offset, Cancel

## 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 HMP60 (for relative humidity the top limit is 100 and the bottom limit is 0 - as shown below).

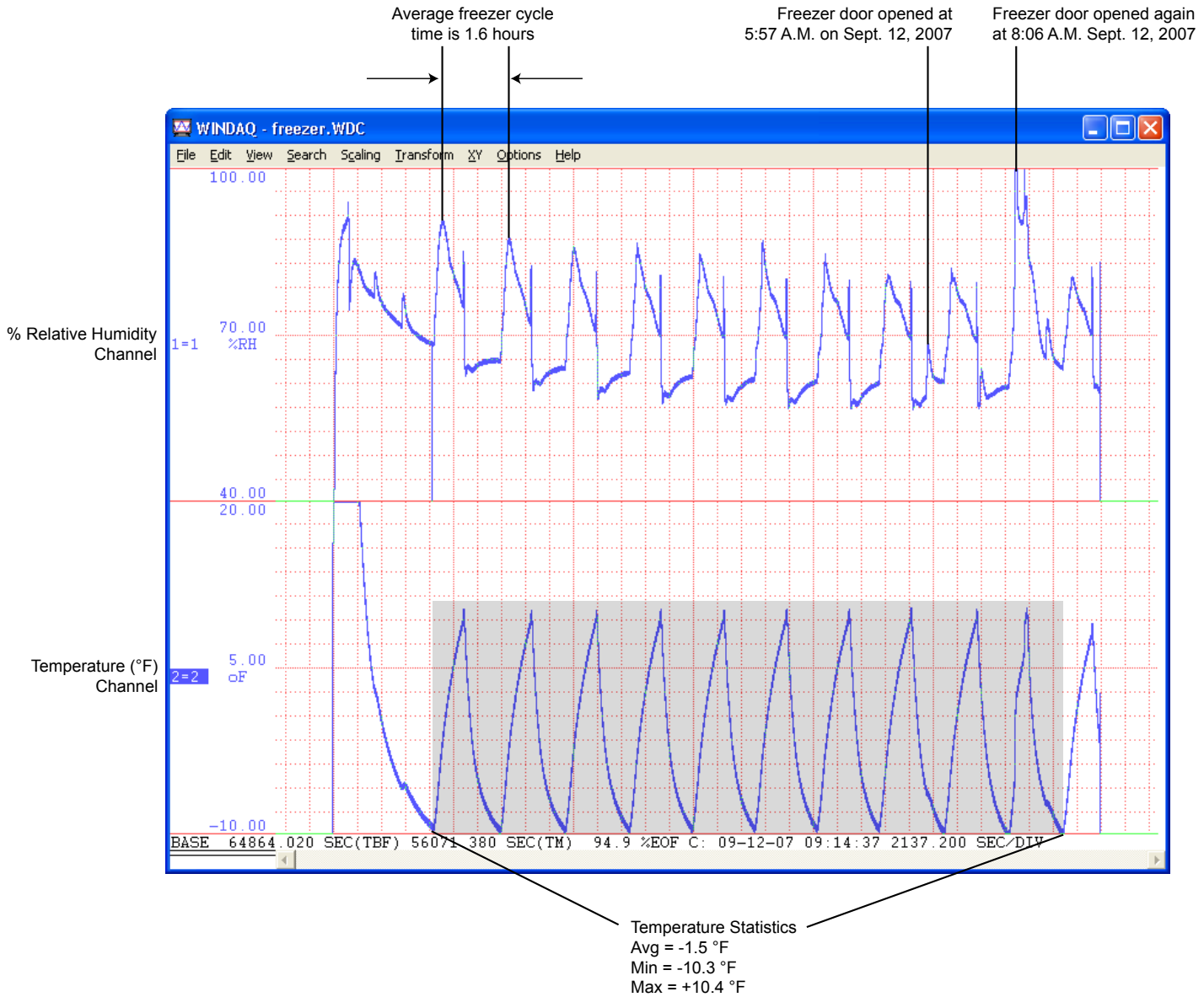
Top Limit = 100

Bottom Limit = 0

Buttons: OK, Next, Previous, Cancel

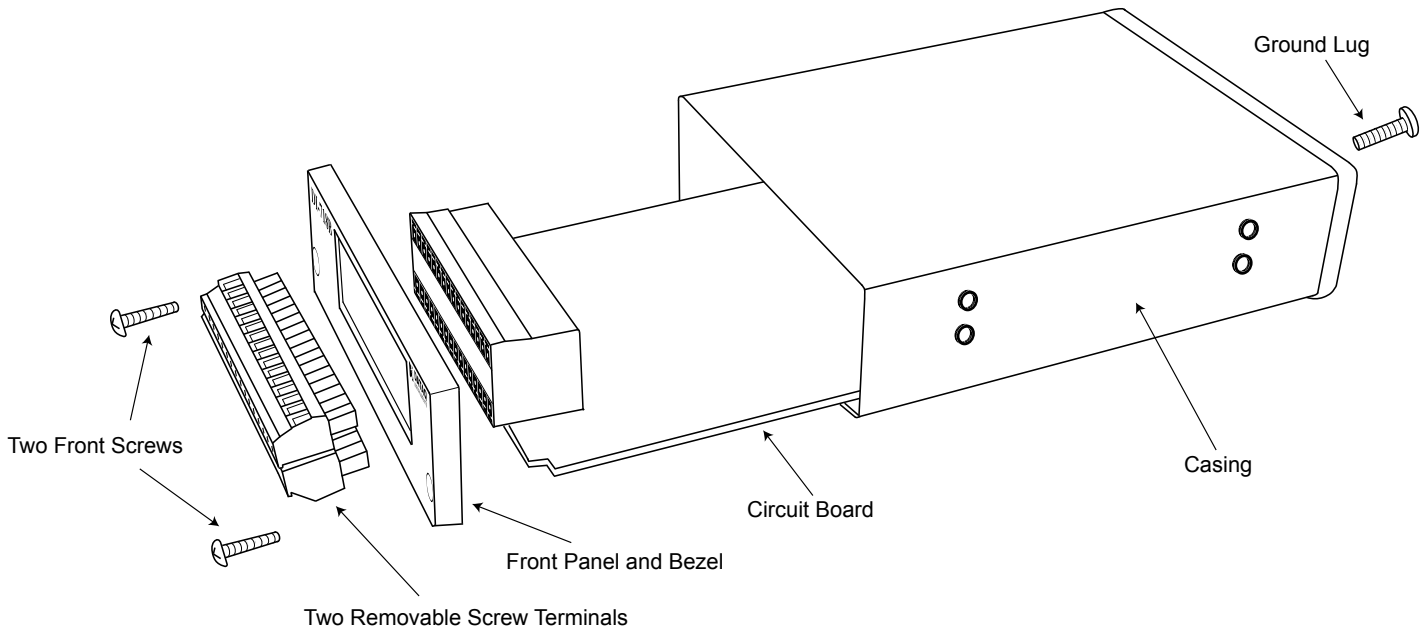
## Viewing Temperature and RH Data in Windaq Waveform Browser

This screen shot of WinDaq Playback software shows a temperature and humidity recording from a freezer using the HMP60 sensor. The data logger operated in stand-alone mode, continuously collecting data to a removable USB drive for approximately eighteen hours. The graphic shows the entire session compressed on to one screen width for a bird's eye view of all recorded information. Items of interest, all derived from WinDaq Playback software, are shown.

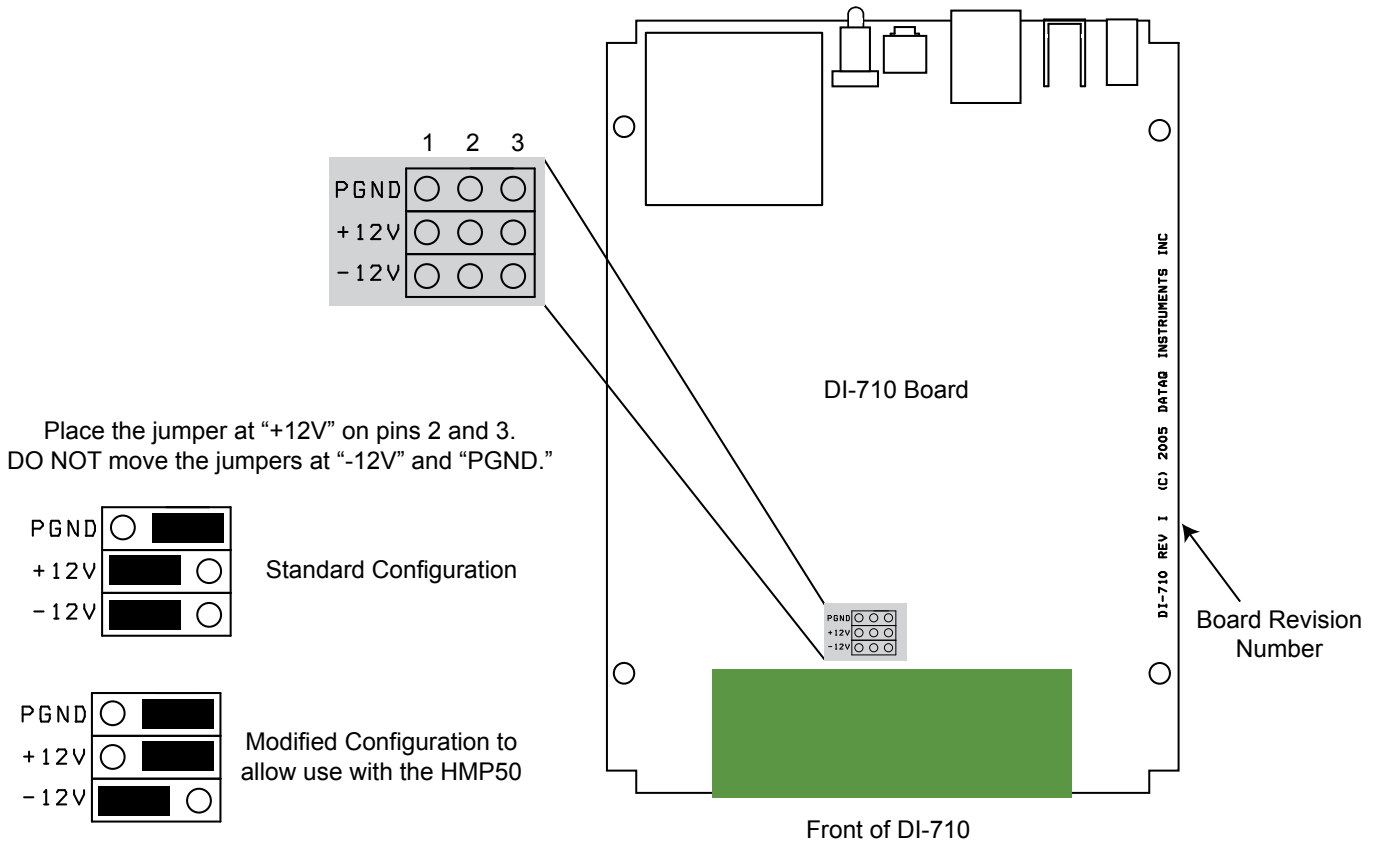


## Board Compatibility and Configuration of your DI-710

Earlier versions of the DI-710 are not compatible with the HMP60. Access the circuit board to determine the board revision. (1) Remove the two front screws and the screw terminal blocks. (2) Remove the front panel and bezel. (3) Remove the ground lug at the rear of the instrument. (4) Pull the circuit board from the case.

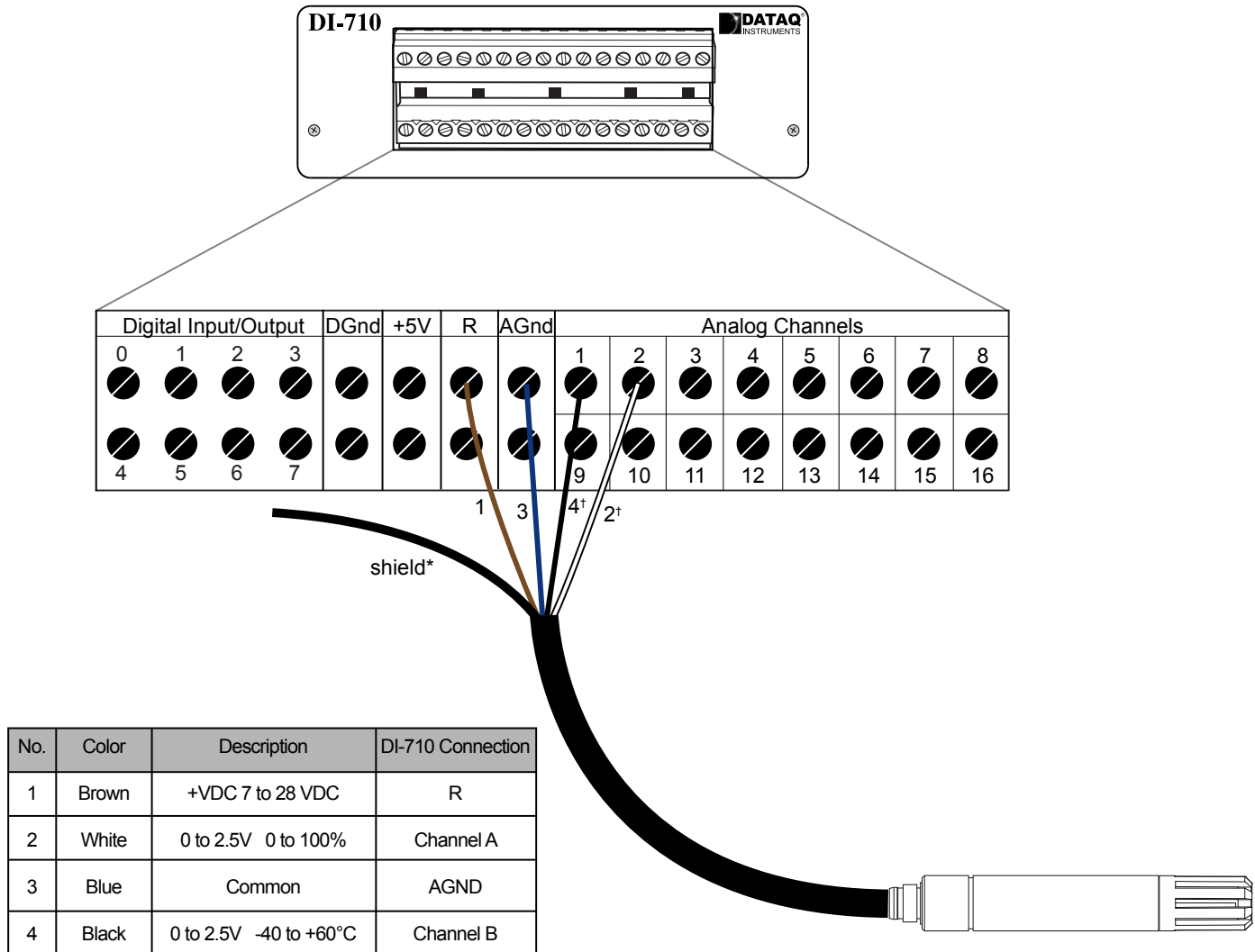


An easy way to determine compatibility is the presence of the “+12V” jumper. If there is a +12V jumper your board is compatible, if there is not a +12V jumper, your board is not compatible. Another way to determine compatibility is by looking at the board revision number. If you have a USB model, board revisions I and later are compatible. If you have an Ethernet model, board revisions F and later are compatible. If you determine your board is compatible set the +12V jumper as shown below. The “+12V” jumper must be moved from the 1 and 2 pins to the 2 and 3 pins. This is the **ONLY** jumper you should change.



## Connecting the HMP60 to your DI-710 Data Logger

Connect the Brown wire (1) to one of the Reserved screw terminal ports (R). Connect the Blue wire (3) to one of the analog ground screw terminal ports (AGnd). Connect the White wire (2) to any analog channel port to measure Relative Humidity. Connect the small Black wire (4) to any analog channel port to measure temperature. The shield wire (larger Black wire) may need to be connected to analog ground depending on your probe setup.\*



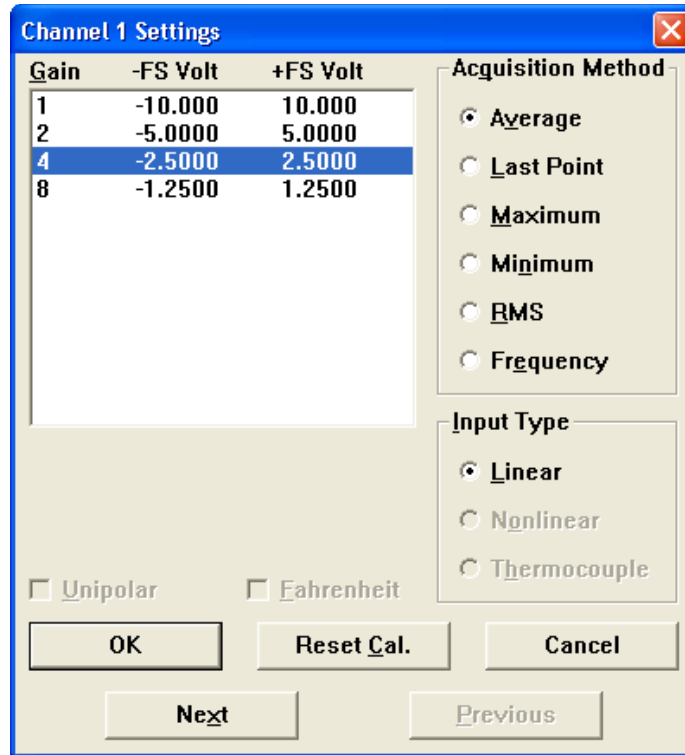
\* If the sensor body is grounded you should not connect the shield wire. If the sensor body is not grounded, connect the shield wire to analog ground (AGnd).  
 † Wires 2 (white) and 4 (black) can connect to any free Analog Channel.

## Configuring WINDAQ® for use with your HMP60

Follow these steps to change the settings in WINDAQ Acquisition software to get the best readings from your HMP60.

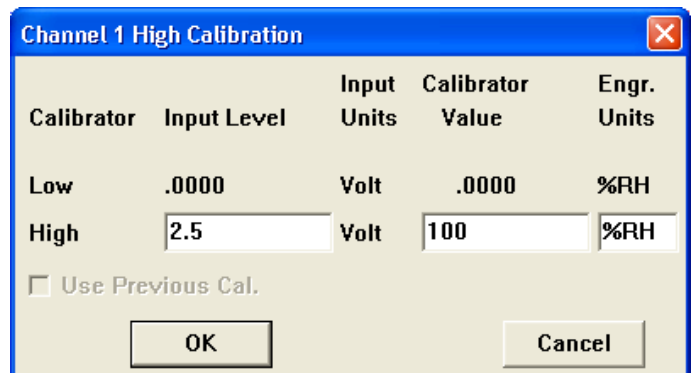
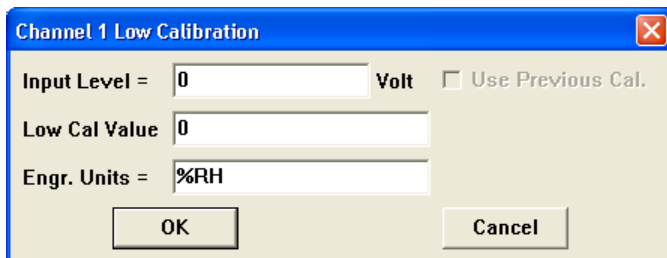
### 1. Change Gain

Select the channel connected to RH. Press F10 or select the menu item Edit > Channel Settings. Click on the Gain Setting 4 (shown to the right). Click the OK button to save the setting to that channel. If you are also measuring temperature, select the appropriate channel and perform the same operation.



### 2. Set Calibration

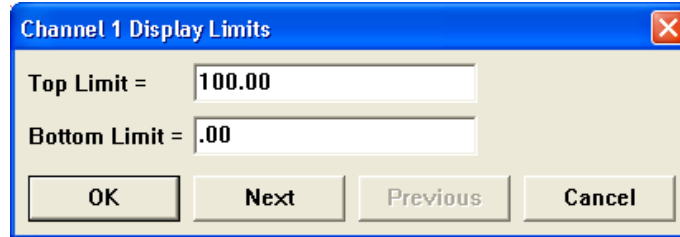
Use the High/Low calibration method to calibrate your channel. Select the channel connected to RH. Press the F9 key or select the menu item Edit > Low Calibration. Enter "0" for both Input Level and Low Cal Value. Enter %RH for Engr. Units. Click the OK button to save the settings. With the same channel selected press the F11 key or select the menu item Edit > High Calibration. Enter 2.5 for the Input Level. Enter 100 for the Calibrator Value. Click OK to save the settings. Use the images below for reference.



To set the Temperature Channel follow the procedures above but for the Low Calibration values enter: Input Level = 0; Low Cal Value = -40; Engr. Units = degC. For the High Calibration values enter: Input Level = 2.5; Calibrator Value = 60.

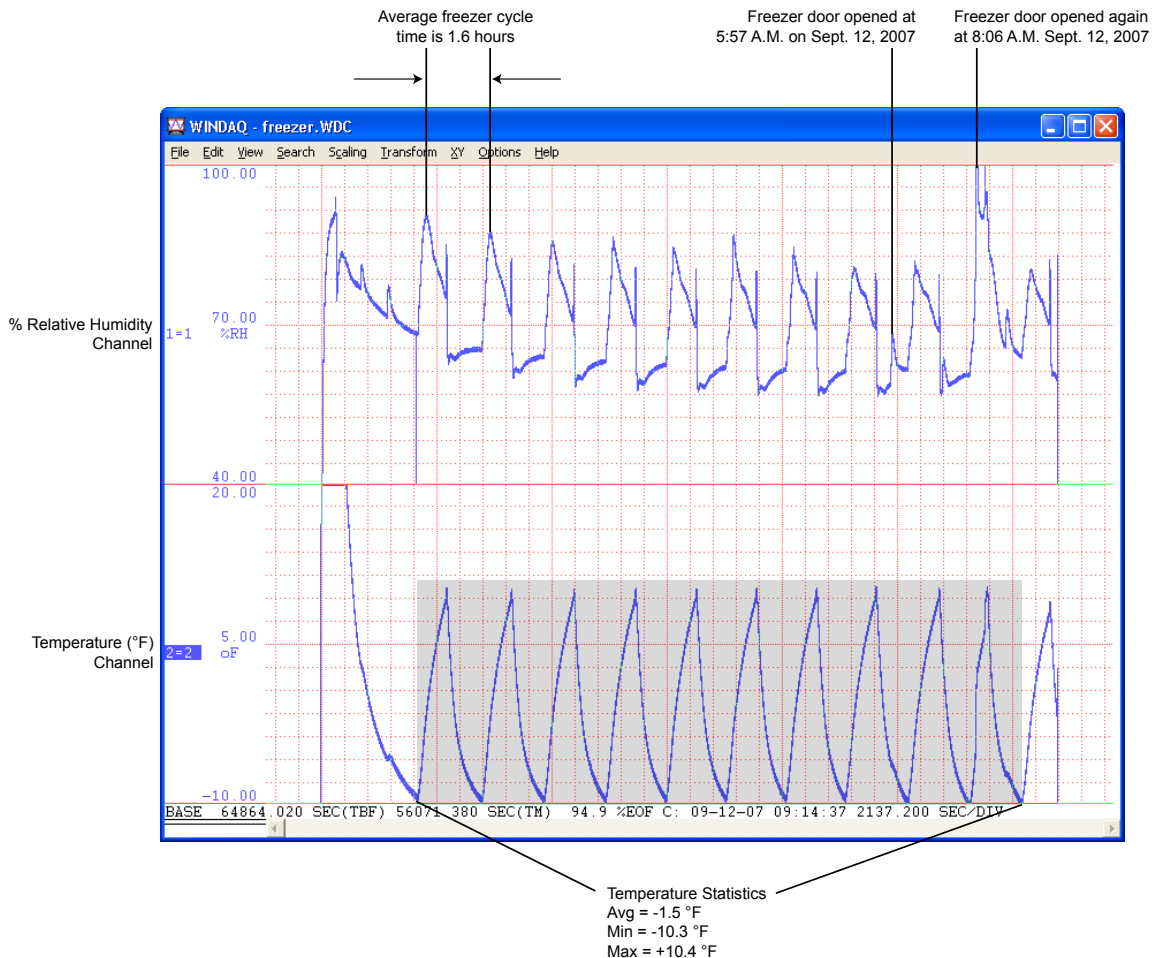
## 3. Set Display Limits

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 HMP60 (for %RH the top limit is 100 and the bottom limit is 0 - as shown below).



## 4. Analysis

This screen shot of WinDaq Playback software shows a temperature and humidity recording from a freezer using the DI-710 and a HMP60 sensor. The 710 operated in a stand-alone mode, continuously collecting data to a removable SD-style memory card for approximately eighteen hours. The graphic shows the entire session compressed on to one screen width for a bird's eye view of all recorded information. Items of interest, all derived from WinDaq Playback software, are shown.





## Specifications\*

Relative Humidity		Temperature	
<b>Measurement Range:</b>	0 to 100% RH	<b>Measurement Range:</b>	-40°C to +60°C
<b>Typical Accuracy: (0 to +40°C)</b>	0 to 90% RH: ±3% RH 90 to 100% RH: ±5% RH	<b>Accuracy over temperature range: (-40 to +60 °C)</b>	±0.6°C
<b>Typical Accuracy: (-40 to 0°C and +40 to +60°C)</b>	0 to 90% RH: ±5% RH 90 to 100% RH: ±7% RH	<b>Dew Point</b>	
<b>Inputs and Outputs</b>		<b>Measurement Range:</b>	-40°C to +60°C
		<b>Typical accuracy: (0 to +40°C)</b>	±2 °C (when dew point depression < 15 °C)
		<b>Typical accuracy: (40 to 0°C and +40 to +60°C)</b>	±3°C (when dew point depression < 10°C)
		dew point depression = ambient temperature - dew point	
<b>Operating Voltage:</b>	5 to 28 VDC	<b>Mechanical</b>	
<b>Power Requirements:</b>	56mW	<b>Materials body:</b>	chrome coated aluminum
<b>Settling time at power up:</b>	150ms	<b>grid/filter:</b>	chrome coated ABS plastic
<b>Start-up time at operating voltage:</b>	<14 V: 1 s; >14 V: 4 s	<b>cable:</b>	polyurethane or FEP
<b>Outputs:</b>	0 to 2.5 VDC (equals 0% to 100% RH and -40°C to +60°C)	<b>Body thread:</b>	M12x1 / 10 mm
<b>External loads:</b>	R <sub>L</sub> min 50kΩ	<b>Grid thread:</b>	M11x1 / 5mm
<b>Environment</b>		<b>Cable connector:</b>	4-pin M8 female
<b>Operating Relative Humidity:</b>	0% to 100% RH	<b>Weight:</b>	3.5 oz (99 grams) includes cable
<b>Operating/Storage Temperature:</b>	-40°C to +60°C	*Sensor Only. logger inaccuracy not included in these specifications.	
<b>Electromagnetic compatibility :</b>	Complies with EMC standard EN61326-1, Basic immunity test requirements		

## Ordering Guide

Description	Order Number
HMP60 RH (0 to 100%) and temperature (-40°C to +60°C) sensor.	HMP60

### Accessories

Description	Order Number	Description	Order Number
Spare 3-meter cable	CBL-HMP60	Spare RH sensor with membrane filter	SNSR-HMP60
Spare plastic grid and membrane	FLTR-HMP60	Spare mounting nuts, Hex-M12x1, pair	NUT-HMP60



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

### Data Acquisition Product Links

(click on text to jump to page)

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