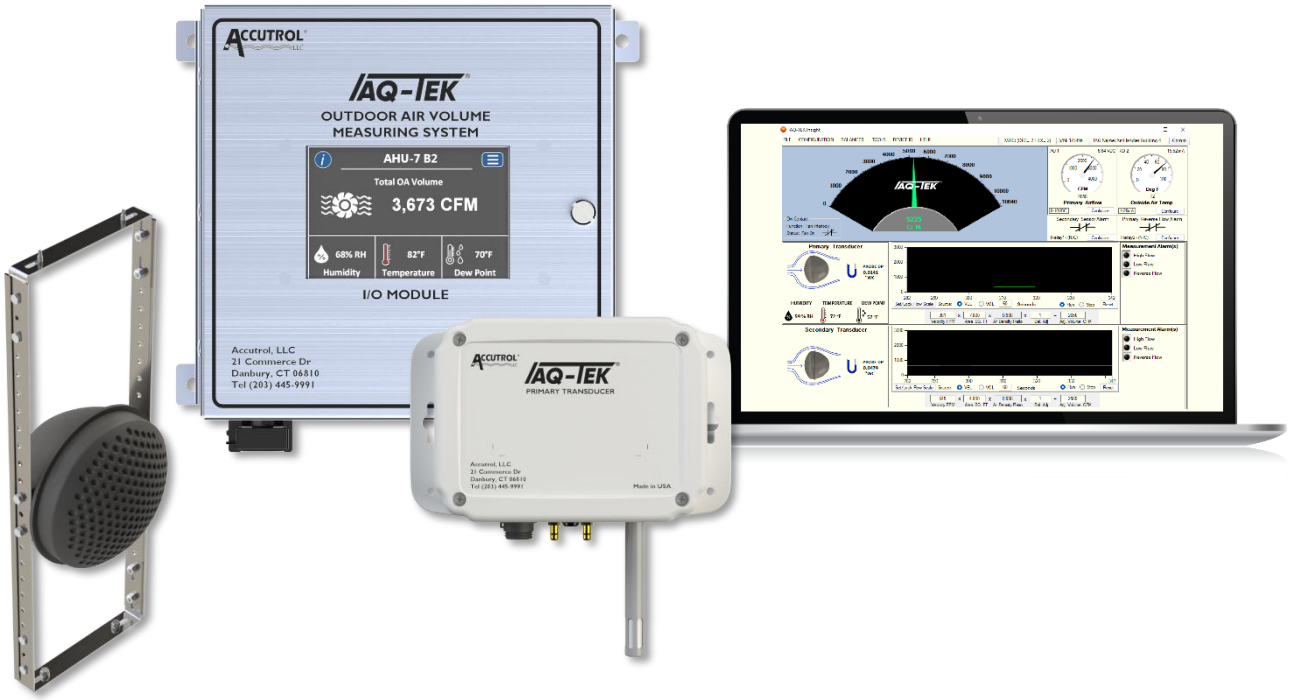
Installation & Operation Manual

Outdoor Air Volume Measuring System



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IAQ-TEK® MANUAL REV C 08-28-2026
ECN 3217

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LIMITED WARRANTY

Accutrol LLC, having its principal place of business at 21 Commerce Drive, Danbury, CT USA ("Manufacturer") warrants it's IAQ-TEK® as follows:

1. Limited Warranty.
Manufacturer warrants that the Products sold hereunder will be free from defects in material and workmanship for a period of thirty-six (36) months from the date of purchase. If the Products do not conform to this Limited Warranty during the warranty period (as herein above specified), Buyer shall notify Manufacturer in writing of the claimed defects and demonstrate to Manufacturer's satisfaction that said defects are covered by this Limited Warranty. If the defects are properly reported to Manufacturer within the warranty period, and the defects are of such type and nature as to be covered by this warranty, Manufacturer shall, at its own expense, furnish, replacement Products or, at Manufacturer's option, replacement parts or services for the defective Products. Shipping and installation of the replacement Products or replacement parts shall be at Buyer's expense.

2. Other Limits.
THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Manufacturer does not warrant against damages or defects arising out of improper or abnormal use or handling of the Products; against defects or damages arising from improper installation (where installation is by persons other than Manufacturer), against defects in products or components not manufactured by Manufacturer, or against damages resulting from such non-Manufacturer made products or components. Manufacturer passes on to Buyer the warranty it received (if any) from the maker thereof of such non-Manufacturer made products or components. This warranty also does not apply to Products upon which repairs have been affected or attempted by persons other than Manufacturer or pursuant to written authorization by Manufacturer. This warranty also does not apply to any product provided by the Buyer and mounted by the Manufacturer to Products.

3. Exclusive Obligation.
THIS WARRANTY IS EXCLUSIVE. The sole and exclusive obligation of Manufacturer shall be to repair or replace the defective Products in the manner and for the period provided above. Manufacturer shall not have any other obligation with respect to the Products or any part thereof, whether based on contract, tort, and strict liability or otherwise. Under no circumstances, whether based on this Limited Warranty or otherwise, shall Manufacturer be liable for incidental, special, or consequential damages.

4. Other Statements.
Manufacturer's employees or representatives' ORAL OR OTHER WRITTEN STATEMENTS DO NOT CONSTITUTE WARRANTIES, shall not be relied upon by Buyer, and are not a part of the contract for sale or this limited warranty.

5. Entire Obligation.
This Limited Warranty states the entire obligation of Manufacturer with respect to the Products. If any part of this Limited Warranty is determined to be void or illegal, the remainder shall remain in full force and effect.

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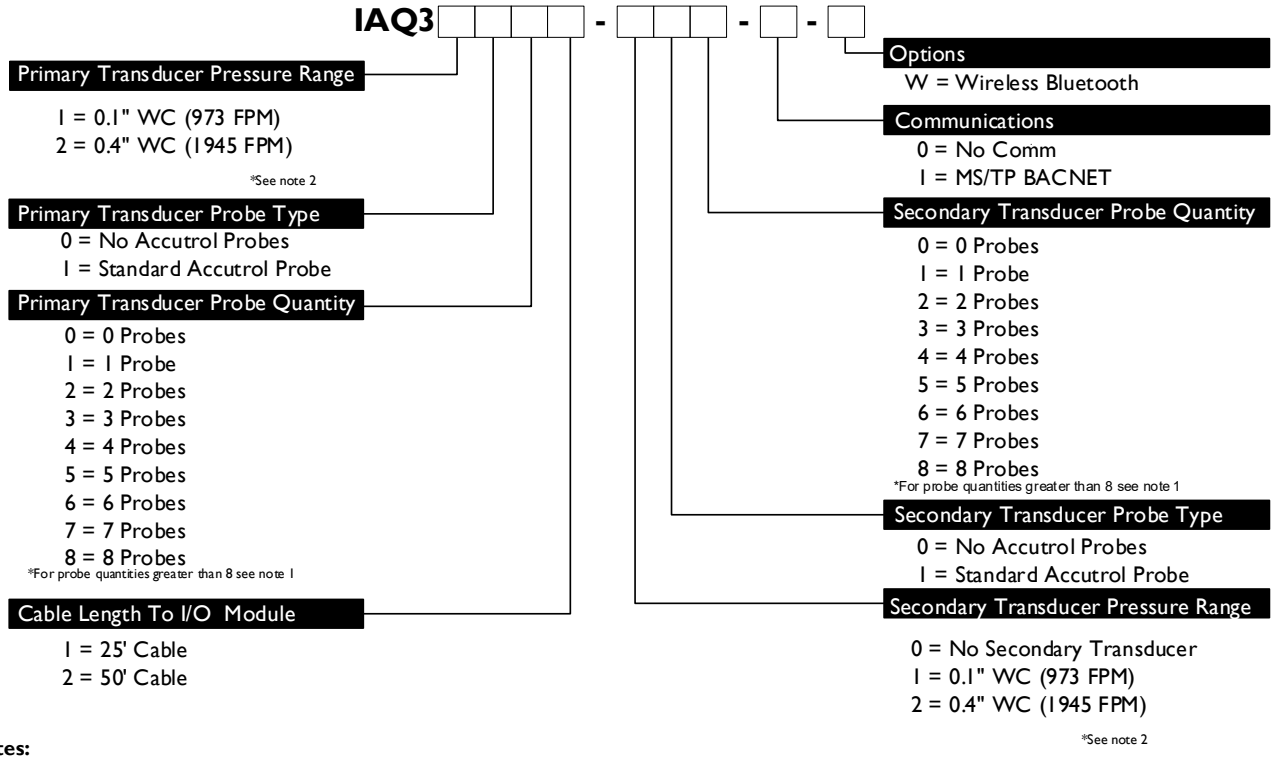
SECTION 1 – INTRODUCTION

The Accutrol® IAQ-TEK® is comprised of a robust I/O Module with a touchscreen display, and an advanced transducer and probe kit that is designed to measure ultra-low-differential pressures with a high degree of precision and excellent long-term stability. Field configuration of the IAQ-TEK is made simple using the Accutrol Insight™ configuration software.

1.1 Model Code



Notes:
1. For additional probe kits, consult the factory.
2. All Velocities for transducer range shown at standard conditions for standard Accutrol probe.

1.2 Parts Included in the IAQ-TEK System

I/O Module w/ Touchscreen

Primary Transducer

Secondary Transducer

(optional)

Accutrol Airflow Probe(s)

I/O Module Cable

Secondary Transducer Cable

(Secondary Transducer required)

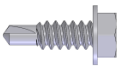
Probe Install Kit with **Mounting Hardware (Accutrol Airflow Probe included)**

1) Mounting Brackets

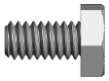
2) End Bracket

3) Diagonal Brace

4) Pneumatic Tubing



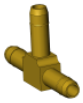
5) Tek Screws



6) Bolts

7) Lock Nuts

8) Lock-Washers



9) "T" Fitting

(2+ Probes Only)

SECTION 2 – IAQ-TEK SPECIFICATIONS

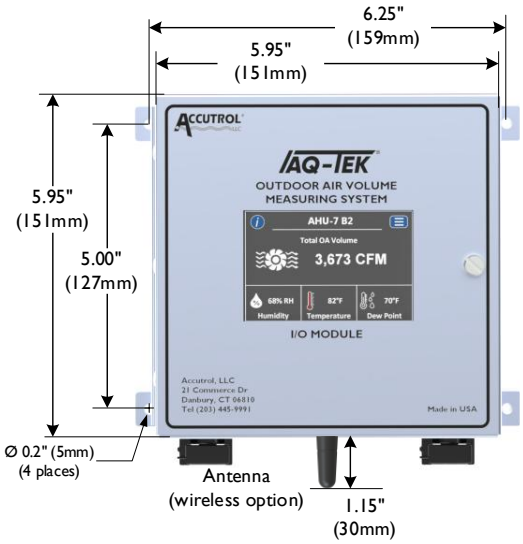
SYSTEM		
System Input Power	24VAC +/-20%, 22VA, 50-60Hz (Class 2 Power Source) or 24 VDC +/- 20%,	
Vel. Range (Standard Accutrol Probe)	0-973 fpm (0.1"wc FS)	0-1945 fpm (0.4"wc FS)
Accuracy	+/- 3% of Reading above 75 fpm	
Compliance	RoHS, CE	
TRANSDUCER		
Pressure Measurement		
Full Scale Range	0.1"wc (25Pa)	0.4"wc (100Pa)
Resolution	0.00000335"wc (0.00083Pa)	0.00001338"wc (0.00333Pa)
Zero Offset (Max)	+/- 0.0004"wc (0.0996Pa)	
Span Accuracy	+/- 1.5% of reading	
Static Error Band	+/- 3% of reading Note: Includes linearity, hysteresis, & repeatability	
Long Term Stability	+/- 0.00008"wc (+/- 0.02Pa) per year max	
Temperature Measurement	Range: -35 to 158 deg F (-37 to 70 deg C)	
	Accuracy: +/- 1.0 deg F (+/- 0.56 deg C)	
	Response Time: 10 sec	
	Long Term Stability: < 0.054 deg F/year (< 0.03 deg C/year)	
Relative Humidity Measurement	Range: 0 to 100%	
	Accuracy: ±2% (10...90% RH non-condensing)	
	Response Time: 10 sec	
	Long Term Stability: < 0.25% RH/year	
Barometric Pressure	Range: 7.7 to 32.2 "hg	
	Accuracy: +/- .007 "hg (for reference only)	
Environmental	Operating Temp Range: -40 to 120 deg F (-40 to 49 deg C)	
	Storage Temp Range: -40 to 150 deg F (-40 to 66 deg C)	
	Humidity: 0 to 95% non-condensing	
Enclosure	IP65; NEMA 4X	
Cable Assembly	Plenum-rated communications cable assembly for harsh environments	
	Operating Temp Range: -40 to 176 deg F (-40 to 80 deg C)	
	IP68 connection to transducer	
Materials of Construction	Enclosure: Polycarbonate Plastic, Silicone Gasket, Stainless Steel Hardware	
	Temp/RH Probe: AISI 316SS with sintered polyethylene 100-micron filter	
	Cable Assembly: PL-PVC plenum rated cable with Polyamide UL94V-0	
I/O MODULE (INTEGRAL		
System Input Power	24VAC +/-20%, 22VA, 50-60Hz (Class 2 Power Source) or 24 VDC +/- 20%,	
Configuration Port	USB 2.0, Isolated, Type C Conn., connect PC with Insight	
Relay Outputs	2 Independent SPST Relay Contacts (Software Configurable)	
	Contact Rating: 2A @ 30VDC, 0.5A @ 60VDC, 0.3A @ 125VAC	
Analog Outputs	2 Analog Outputs (Software Configurable)	
	0-5v, 1-5v, 0-10v, 2-10v, 0-20mA or 4-20mA	
	capable of driving 1 K-ohm load	
Transducer Connection	5-pos. pluggable screw terminal (use factory cable only)	
Touchscreen Display	Type: 3.5" LCD-TFT Resistive touch display with LED backlight	
	Color: RGB 65K colors	
	Active Area: 2.91" x 1.91" (73.91mm x 48.51mm)	
	Resolution: 480 x 320 pixel	
BACnet MS/TP (Optional)	EIA 485 2-wire, BACnet MS/TP, Galvanically Isolated	
	1/8 unit load transceiver impedance	
	Full Master Node State Machine	
	Data Rates 9600, 19200, 38400, 76800 and 115200	
	MAC address is software configurable	
BACnet IP (Optional)	Future	
Status Indicators	LED Indicators for Power, Pressure Sensor, Display, BACnet, & Bluetooth	
I/O Terminal Blocks	Removable Vertical Plugs, Wire Size Range 12-30 AWG	
Bluetooth (Optional)	Bluetooth Version 4.2 or later, connect to PC with IAQ-TEK Insight	
Environmental	Operating Temp Range: -4 to 120 deg F (-20 to 49 deg C)	
	Storage Temp Range: -22 to 176 deg F (-30 to 80 deg C)	
	Humidity: 10 to 90% non-condensing	
PROBE KIT		
Probe	Kydex® T, Fire Rating: UL 94 V-0	
Pneumatic Tubing	Polyethylene Plastic, Plenum Rated, UL 94 V-2	
Tubing Connections	¼" Barb Fittings, Brass	
Mounting Brackets	304 Stainless Steel	
Hardware	18-8 Stainless Steel	

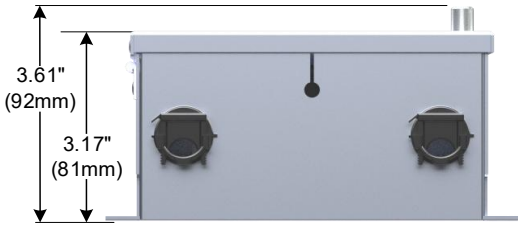
SPECIFICATIONS CONTINUED

Electromagnetic Compatibility	2014/30/EU, EMC Directive EN 61326-1:2013 2014/53/EU, Radio Equipment Directive ETSI EN 301 489-1, V1.9.2 (2011-09) ETSI EN 301 489-17, V2.2.1 (2012)
Product Safety	2014/35/EU, Low Voltage Directive EN 61010-1:2010/A1:2019

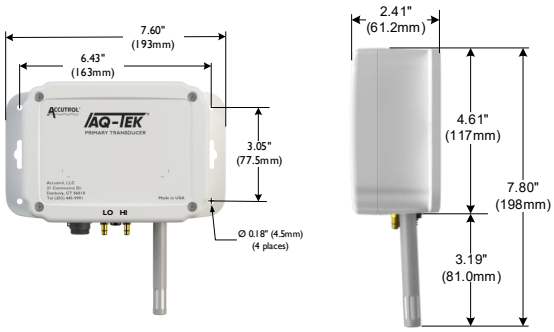
SECTION 3 – PHYSICAL DIMENSIONS

3.1 I/O Module

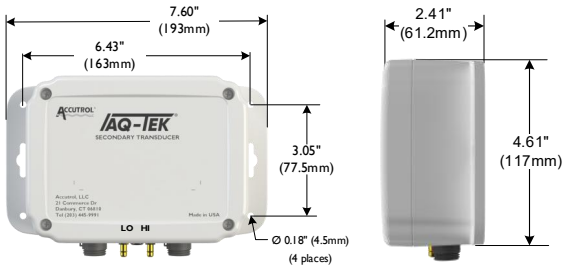




3.2 Transducers

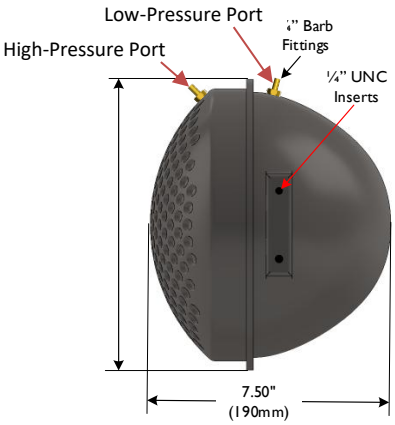


Primary Transducer

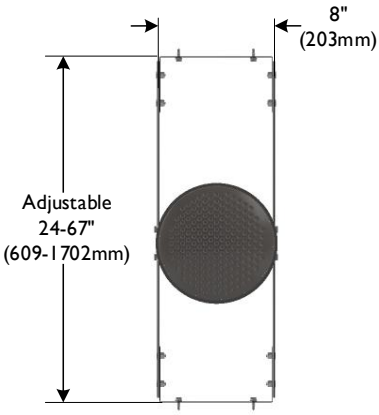


Secondary Transducer

3.3 Accutrol Airflow Probe



Accutrol Airflow Probe

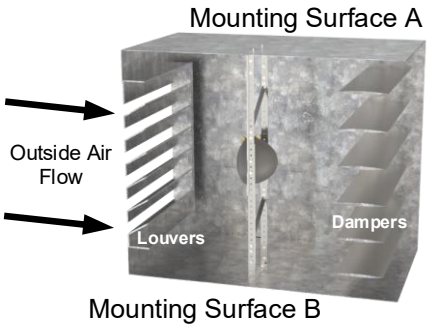


Probe Kit(s)

SECTION 4 – INSTALLATION

4.1 Airflow Probe(s) Installation

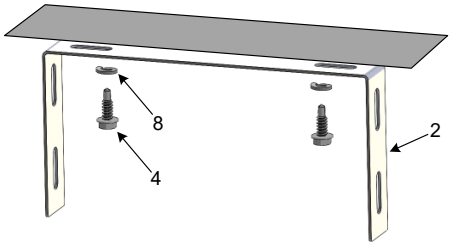
The Accutrol Airflow Probe is to be installed centered, in front of the damper and behind the louver. If multiple probes are required, divide the install area into as many quadrants as there are probes. The probe install location will be the center of each quadrant.



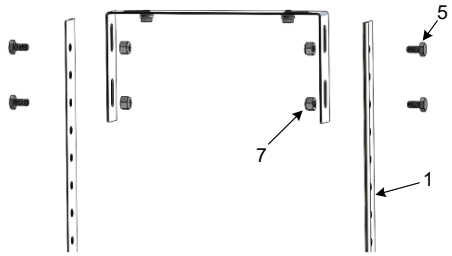
Ensure the back of the probe is at least six inches from the full open damper.

4.1.1 Installation Steps (reference Section 1.3)

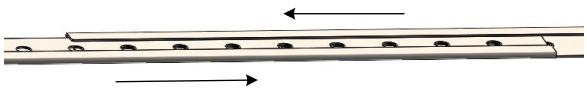
1. Attach end bracket to "Mounting Surface A" using (2) lock washers and (2) tek-screws provided.



2. Attach the (2) mounting brackets to the upper end bracket using (4) ¼ -20x ½ bolts and (4) lock nuts provided.

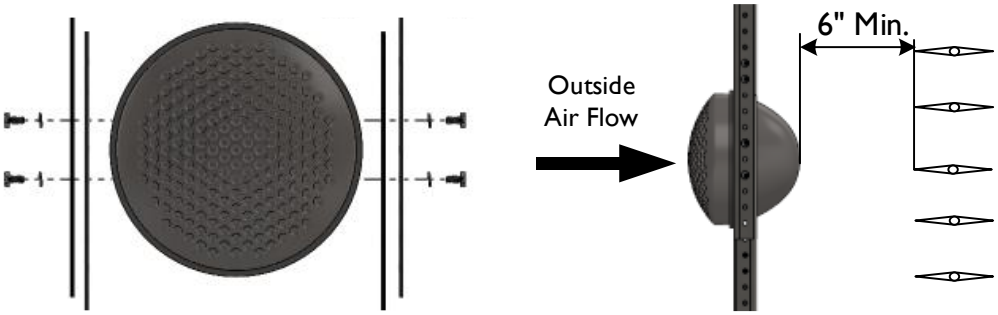


3. If mounting brackets do not reach the lower mounting surface, slide the (2) mounting brackets onto the upper mounting brackets as shown and extend to the lower mounting surface.



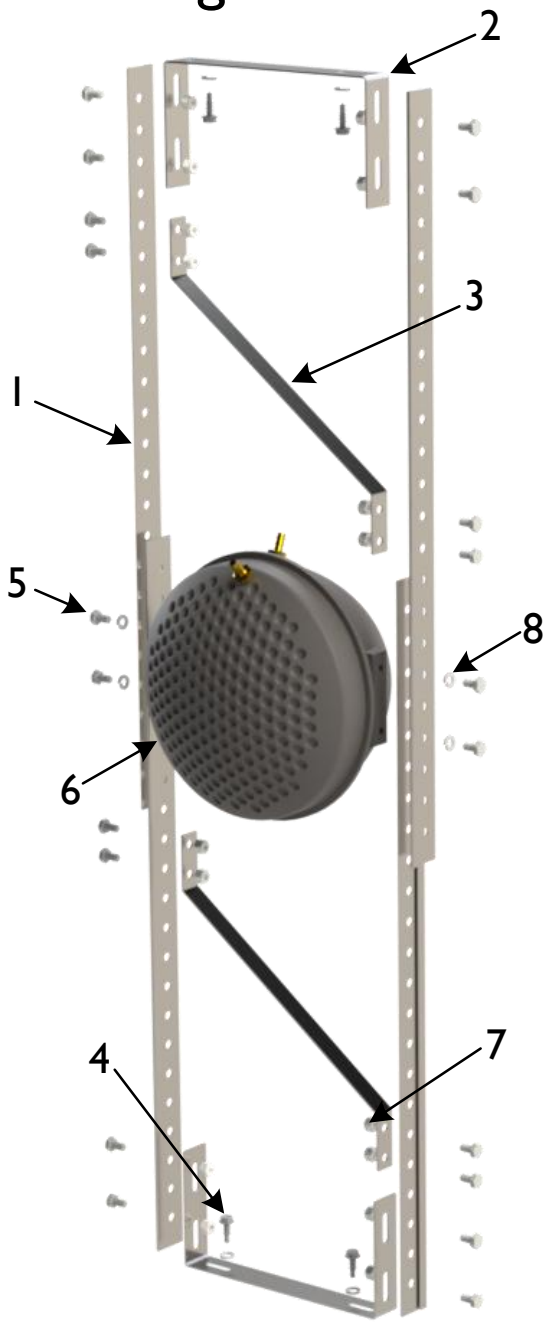
4. Repeat steps 1 and 2 to attach the remaining end bracket to the "Mounting Surface B" and (2) mounting brackets.

5. Locate the probe in-center of the damper and secure to the mounting brackets using (4) ¼-20x ½ bolts and (4) lock-washers provided. Ensure the side of the probe with the dimples is pointing towards the oncoming outdoor air.



6. For installations where the height of the mounting bracket is greater than 40", the diagonal brace is needed to stiffen the fixture. Mount using bolts and lock nuts provided.

Mounting Surface A



Mounting Surface B

4.2 Transducer Installation

The transducer is designed to be mounted in the outdoor air intake plenum. The transducer must be mounted higher than the probe(s) and the tubing to prevent condensation from blocking the pressure signal. No loops are permitted when routing tubing from the transducer to the probe.

Connections pointing towards ground.

4.2.1 Installation Steps

1. Choose a location in the intake plenum where the transducer enclosure can be installed above probes and tubing.
2. All connections are to point towards the ground.
3. Secure the enclosure to the mounting surface using either four #8 or #10 screws (provided by others).

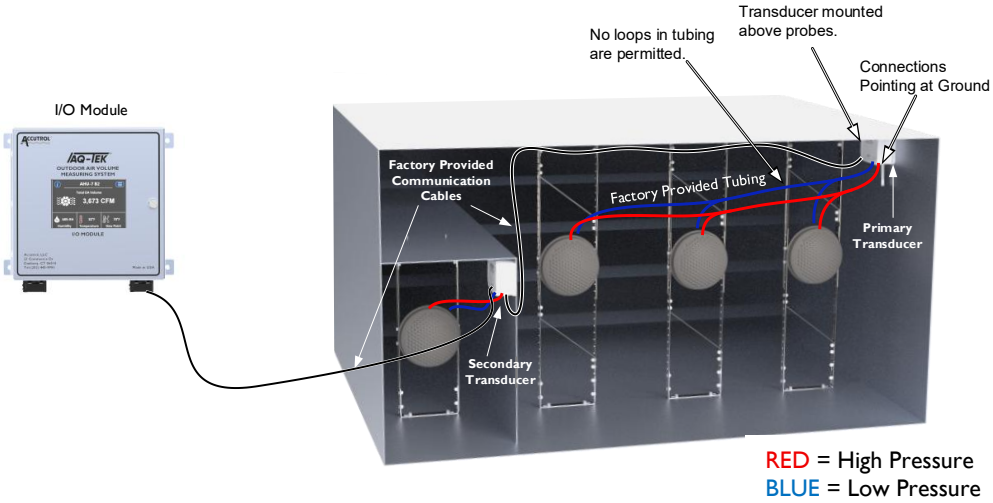
4.3 I/O Module Installation

The I/O Module enclosure includes four flanges with 0.2" diameter holes provided for securing the I/O Module to a wall or panel plate. The I/O Module is intended to be installed in an accessible and visible area to access the touchscreen. This enclosure should be installed in a location protected from the environment unless a waterproof enclosure is purchased.

⚠ ***Warning:*** *Do not install in direct sunlight.*

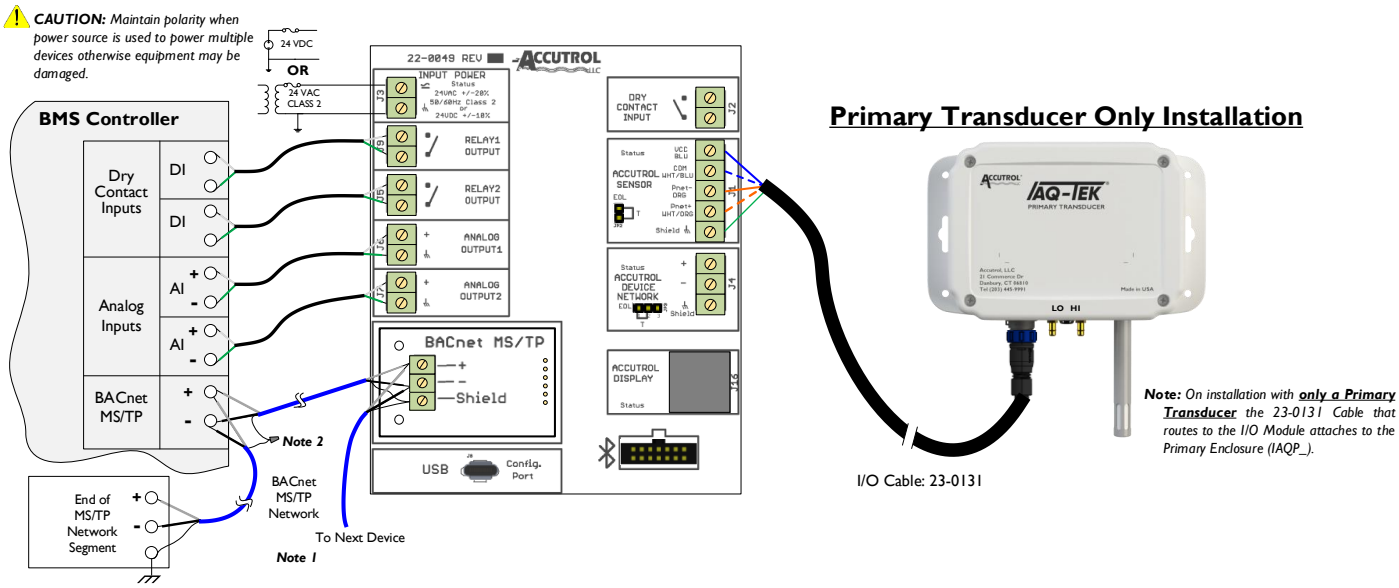
4.3.1 Installation Steps

1. Secure the I/O Module to the mounting surface using either four #8 or #10 screws (provided by others).
2. For sheetrock installation, use the appropriate wall anchors (provided by others).

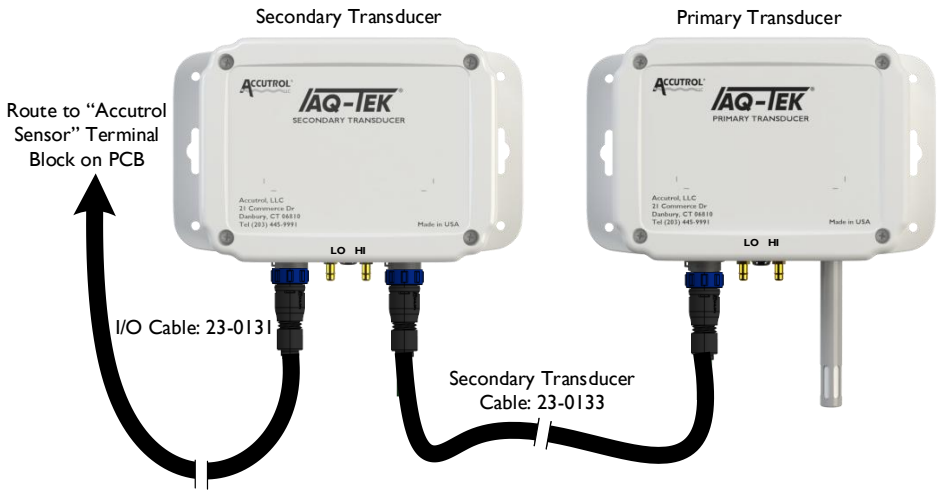


SECTION 5 – WIRING

The IAQ-TEK System can accommodate up to two transducers. The wiring diagram below shows both application types.



Primary and Secondary Transducer Installation



Note: *On installation with a* ***Primary and Secondary Transducer*** *the 23-0131 cable that routes to the I/O Module attaches to the Secondary transducer (IAQS_). Cable 23-0133 connects the primary to the secondary transducer.*

NOTES:

1. BACnet network bias and end-of-line terminations are NOT provided by the IAQ-TEK BACnet MS/TP module. BACnet MS/TP bias and termination shall be provided by others.
2. Tie communications cable shields together and ground at single point only.

IAQ-TEK I/O Module Wiring Table	
24v Input Power	Twisted-pair, 12-30 AWG
BACnet MS/TP Network	Twisted-shielded-pair, low capacitance com cable
Relay Outputs & Dry Contact Inputs	Twisted-pair, 18-22 AWG
Analog Outputs	Twisted-shielded-pair cable, 18-22 AWG

SECTION 6 – IAQ-TEK INSIGHT CONFIGURATION SOFTWARE INSTALLATION

IAQ-Tek Insight is a software configuration tool that provides a means to communicate directly with the IAQ-TEK Outside Air Volume Measuring System. All that's required is a Windows PC or tablet with a USB Port, USB data cable, and the IAQ-Tek Insight Software. For wireless communication, the IAQ-Tek can be ordered with an optional Bluetooth module (-W).

6.1 Minimum Requirements for PC

- PC or Tablet with Windows Version 11 or greater
- Windows region set to English
    - Windows Control Panel → Region → Administrative Tab → System Location Option set to English (United States)
- USB 2.0 Port
- Screen Resolution 1280 x 768 or greater suggested
- USB Type A to USB Type C Data Cable

6.2 Installing the IAQ-Tek Insight Software

Before starting the installation process, close any programs running on the computer.

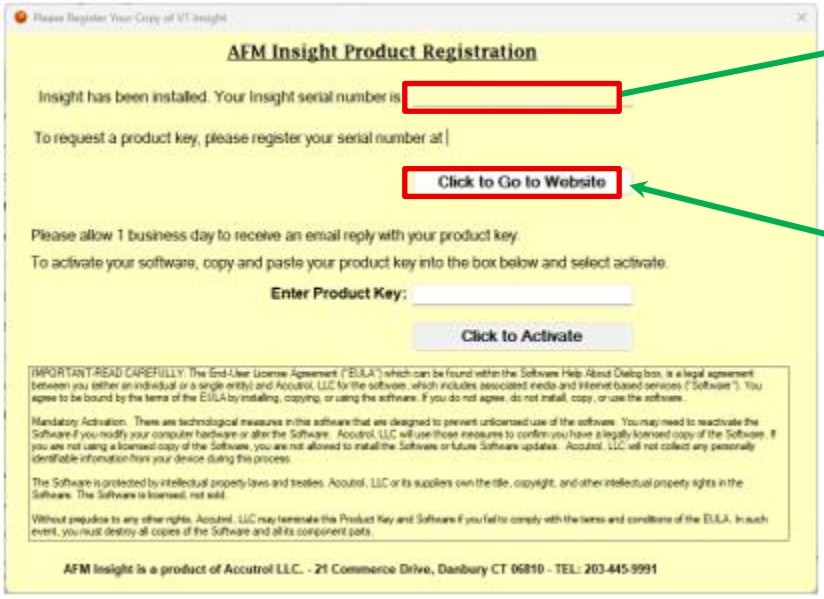
1. Download the Accutrol Software Manager (ASM) from https://www.accutrolllc.com/accuvalve-software-downloads/. If the ASM is already installed, skip to step 3.
2. Go to the downloads folder in the File Explorer app of your PC and Extract All contents from the folder. Once done, install the ASM by executing the Setup File within the extracted AccutrolSoftwareSuite.zip file. A desktop icon will appear.
3. Once installed, launch the ASM using the Desktop Icon.

4. The IAQ-Tek Insight software is included within the Airflow Measurement Insight bundle. So, locate the orange Airflow Measurement icon and double-click on it to download the install folder to your PC. This will launch the user's Default Browser.

5. Extract All contents from the install folder. Once done, execute the Setup File to install the program.

6.3 Software Registration

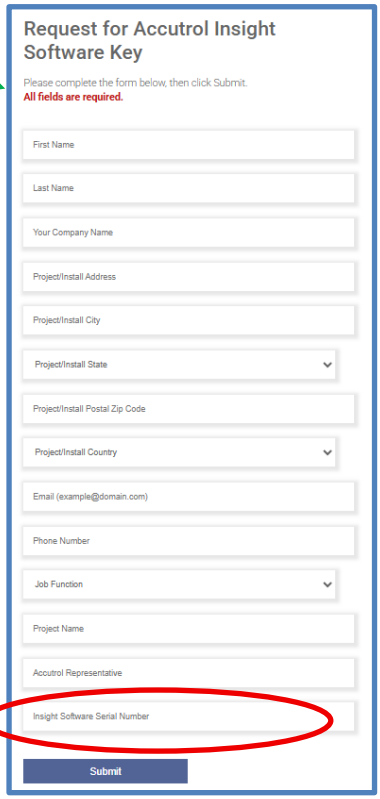
When the **IAQ-TEK Insight Software** is installed, start **IAQ-Tek Insight** from inside the **ASM** to run the application. A registration window will open, copy the Insight serial number, select "Click to Go to Website" and complete the Product Registration Form. Then select "submit".



Copy this Insight serial number (to be pasted into Registration Form).

Select to continue

Fill in all fields as required.



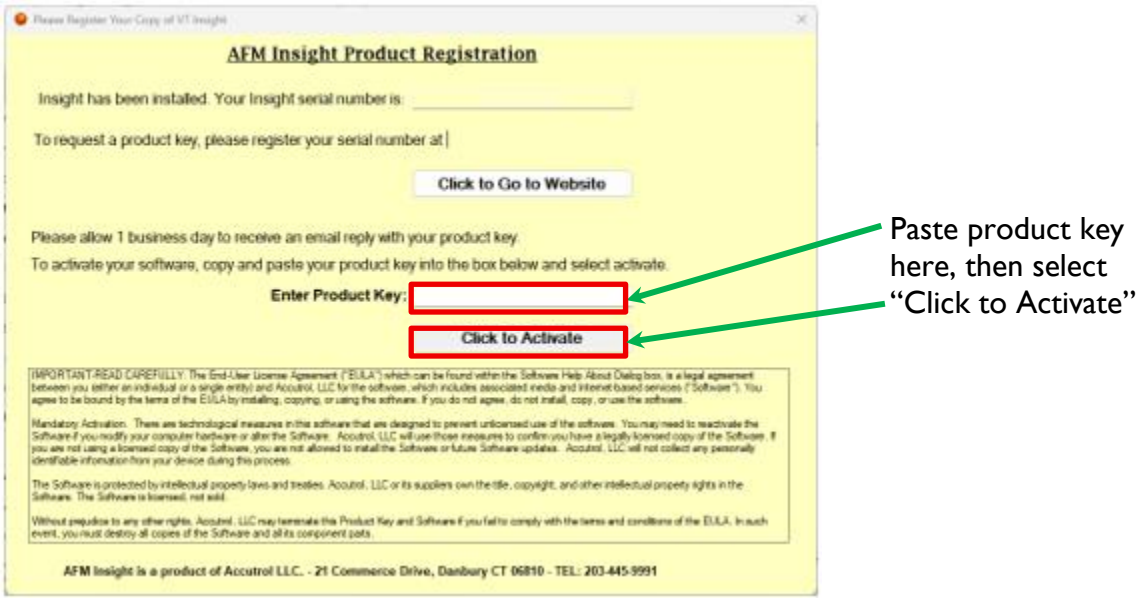
Paste the Insight serial number here.

Note: *The Insight Serial Number is unique to the computer which it was installed on. Therefore, the Registration Key will only function on this one computer. If you require the software to be installed on more than one computer, a request for each computer must be generated separately.*

6.3.1 Insight Software Key

Once you have received the Product Key from Accutrol, you will need to do the following to activate the software.

1. Open the IAQ-Tek Insight application by opening the Accutrol Software Manager and clicking on the Airflow Measurement Insight Icon or go to the Start Menu -> All Apps -> Accutrol LLC -> VT Insight.
2. Copy the Product Key provided in the email from Accutrol, paste it into the "Enter Product Key" field provided on the form, then click on the "Click to Activate" button. You must be connected to the internet during the first launch of IAQ-Tek Insight after a valid Product Key has been submitted.

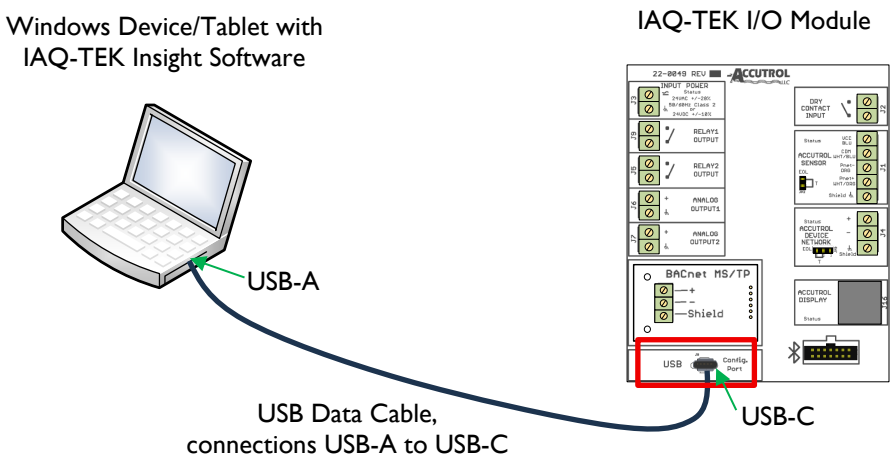


3. You will now be able to use the IAQ-Tek Insight Software on your computer. If you have any problems, contact Accutrol LLC at 203-445-9991.

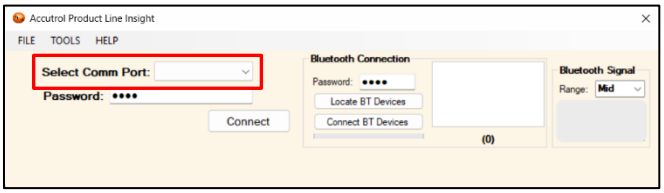
Note: IAQ-Tek Insight will attempt to update itself with the latest released version of software each time it is initiated when the computer is connected to the internet. If you do not wish to update, you will be given a choice to not update each time.

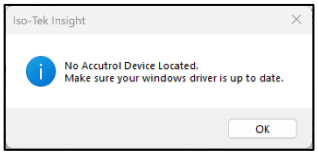
6.4 Connecting to the IAQ-TEK with a USB Cable

6.4.1 Verify the IAQ-TEK system is powered, then connect the PC to the USB port located inside the I/O Module using a USB cable. (Note: This must be a DATA cable. A standard charging cable will not work.)



6.5.2 Open IAQ-TEK Insight and select the appropriate Comm# from the "Select Comm Port" drop-down list on the connection window.

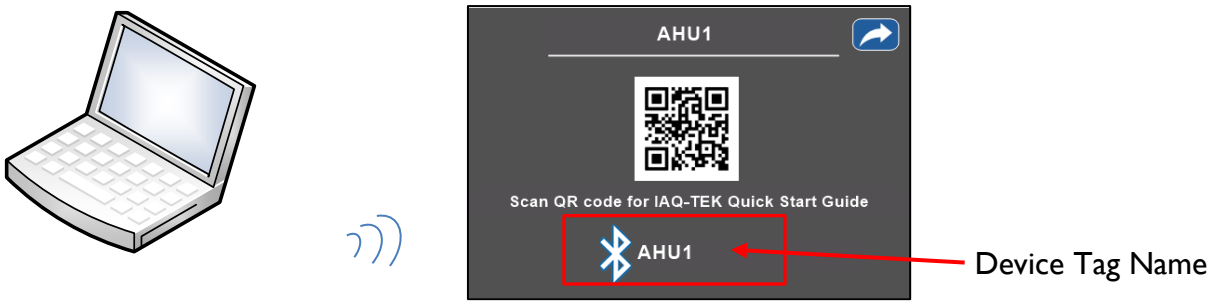




NOTE: If you receive the "No Accutrol Device Located" message shown above, the computer is not able to communicate with the IAQ-TEK over the USB port. First check your USB cable connections. If the USB connections are good, it's likely your computer does not have the appropriate USB driver package installed. Refer to Section 6.5.2.1 for instructions on installing the required USB drivers.

6.6 Connecting to the IAQ-TEK with Wireless Bluetooth (-W option required)

6.6.1 First, verify the IAQ-TEK system has a Bluetooth Module installed (-W). Second, confirm the IAQ-TEK system is powered. Make note of the device tag name that appears on the IAQ-TEK Display which you are attempting to connect to.



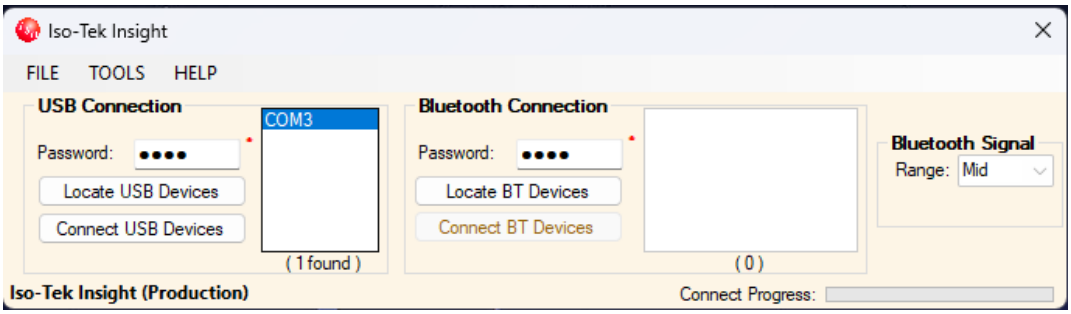
6.6.2 Launch IAQ-TEK Insight and select "Locate BT Devices". Select the discovered device tag name associated with the IAQ-TEK tag name that you would like to connect to. Reference Appendix C for details on the Bluetooth connection.

NOTE: You will be unable to connect using wireless if a USB cable is plugged into the device.

6.5 Connecting to Iso-Tek via Insight Software

To open the Iso-Tek Insight application, double click on the IAQ-Tek Insight icon within the ASM or go to the Start Menu and select Programs > VT Insight.

USB Connection: To communicate to the Iso-Tek via USB connection, select "Locate USB Devices" then select the com port associated with the Iso-Tek that your computer is connected to.



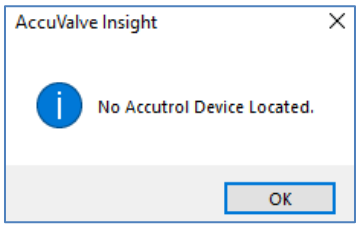
Note: If you are having problems connecting with the device:

- Confirm that your USB cable is a data cable. A standard charging cable will not work. Also confirm that the cable has a USB-A connector on one end and a USB-C on the other.
- Confirm that you have the proper USB driver installed on your computer. Please refer to section 6.5.1 below.

6.5.1 Configuring USB Driver

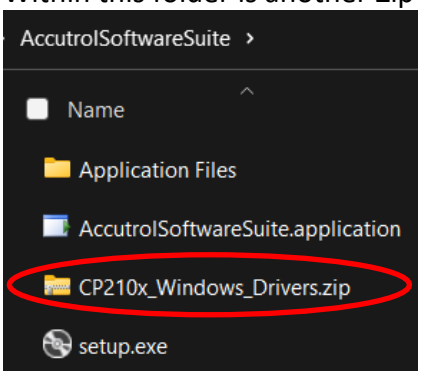
In some instances, the Windows machine being used to run Insight may not be equipped with the appropriate USB driver package needed to connect. This is a possible occurrence with new machines which have never downloaded this driver package. This can be fixed by now downloading the driver package which Accutrol has provided.

If the correct driver is missing, Insight will likely display “No Accutrol Device Located” after clicking “Locate Accutrol USB Devices” despite the PC being connected to the controller board.

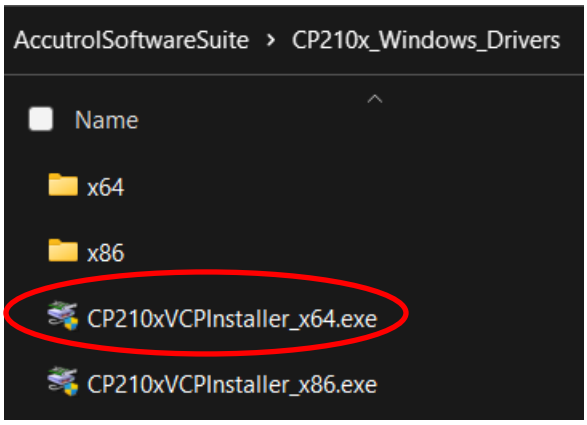


Should troubleshooting indicate that a missing driver is the problem; follow the steps listed below:

1. Navigate to the unzipped Zip file named “Accutrol Software Suite” that was already downloaded to your PC when first installing the ASM.
2. Within this folder is another Zip file called CP210x_Windows_Drivers.zip.



3. Extract the contents of this .zip file and enter the unzipped folder.



4. Find and run the file called “CP210xVCPInstaller_x64.exe” (Note: If you are running windows 10 on an older 32bit computer run "CP210xVCPInstaller_x86.exe").
5. After installation, clicking the locate Accutrol USB Device button should successfully locate a COM port when connected to an AccuValve Controller.

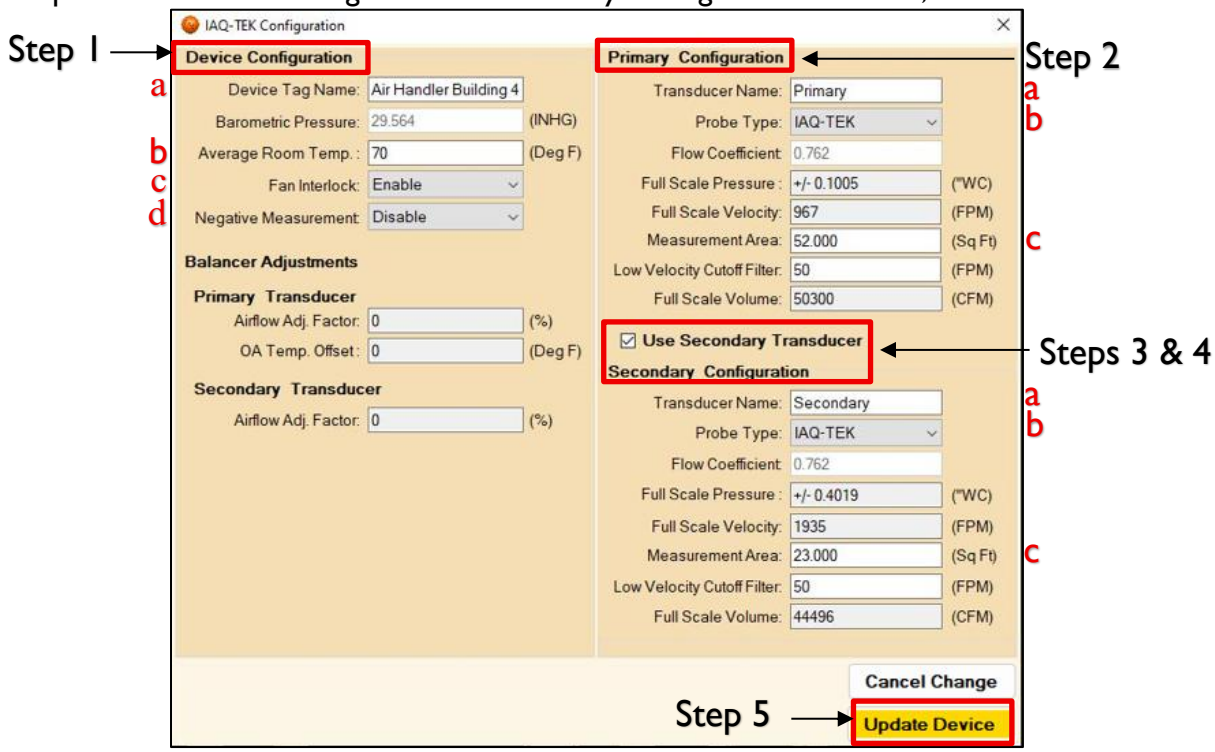
Note: *It may be necessary to restart your PC after installation of the CP210x driver for the install to take effect.*

SECTION 7 – IAQ-TEK INSIGHT

7.1 Power Up

7.2 IAQ-TEK Configuration

After establishing communications with an IAQ-TEK system, the IAQ-TEK Configuration window will appear if the IAQ-TEK has not been previously configured. It is mandatory to complete the Device Configuration and Primary Configuration sections, as shown below.



Step 1. Complete the Device Configuration section.

a) Enter the Device Tag Name.

b) Enter the average room temperature. The average room temperature is where the transducer is installed.

c) If the air handler utilizes a Fan Interlock for where the transducer is installed, enable this feature. For more information refer to section 7.3.6.1.

d) If a Negative (Reverse) Airflow Measurement alarm is desired, enable this option. For more information refer to section 7.3.7.

Step 2. Complete the Primary Configuration section.

a) Enter the Primary Transducer Name.

b) Select the appropriate Probe Type being used. If a 3rd-Party differential pressure airflow probe is being used, select 'Other' and enter the appropriate flow coefficient.

c) Enter the area of the airflow measurement point where the probe(s) is installed.

Step 3. If a secondary transducer is being used, "Use Secondary Transducer" must be enabled.

Step 4. Complete the Secondary Transducer section.

a) Enter the Secondary Transducer Name.

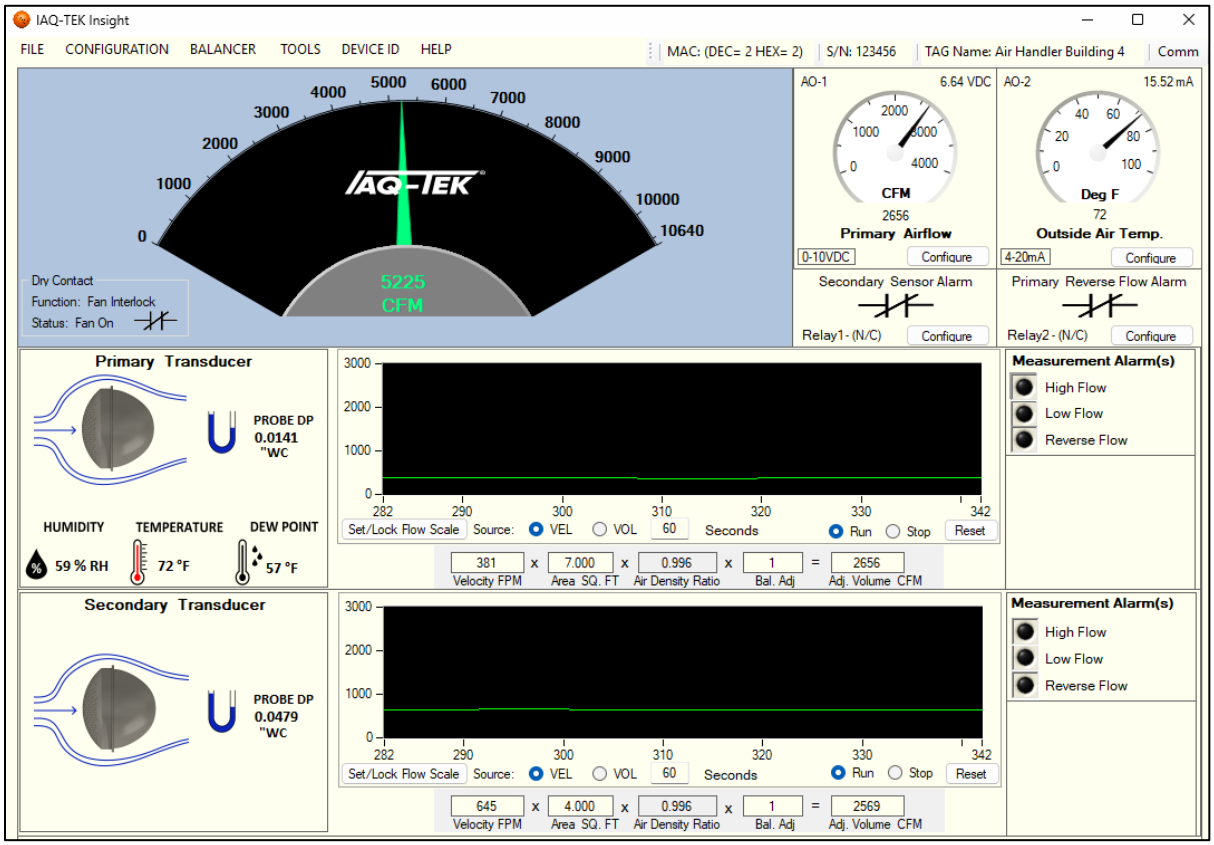
b) Select the appropriate Probe Type being used. If a 3rd Party different pressure airflow probe is being used, select 'Other' and enter the appropriate Flow Coefficient.

c) Enter the area of the measurement point where the probe(s) is installed.

Step 5. Select **Update Device** when done.

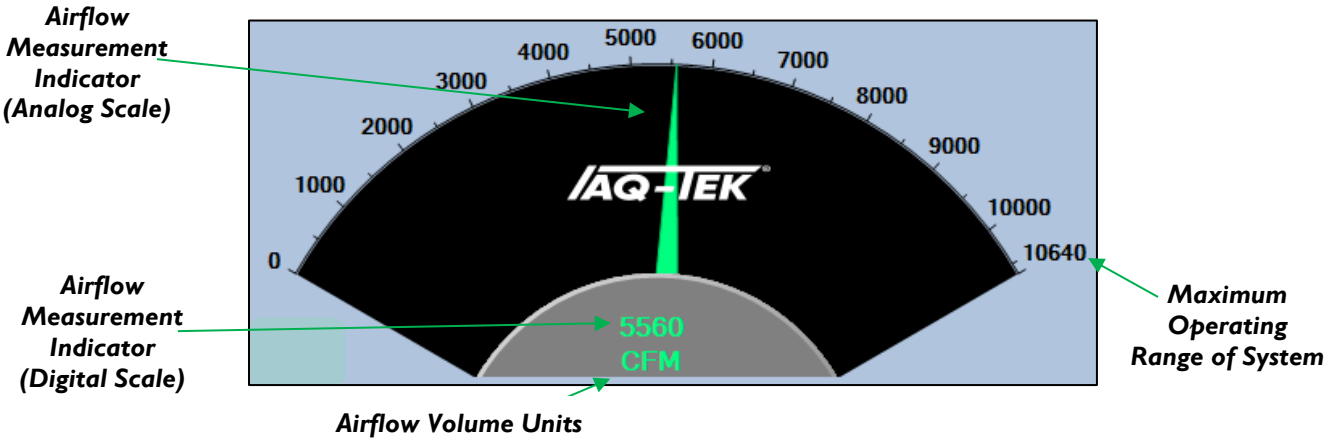
7.3 IAQ-TEK Dashboard

After the initial configuration has been completed and the device has been updated, Insight will display a dashboard based on these selections and entries. A brief description of each Dashboard object is provided on the following pages.



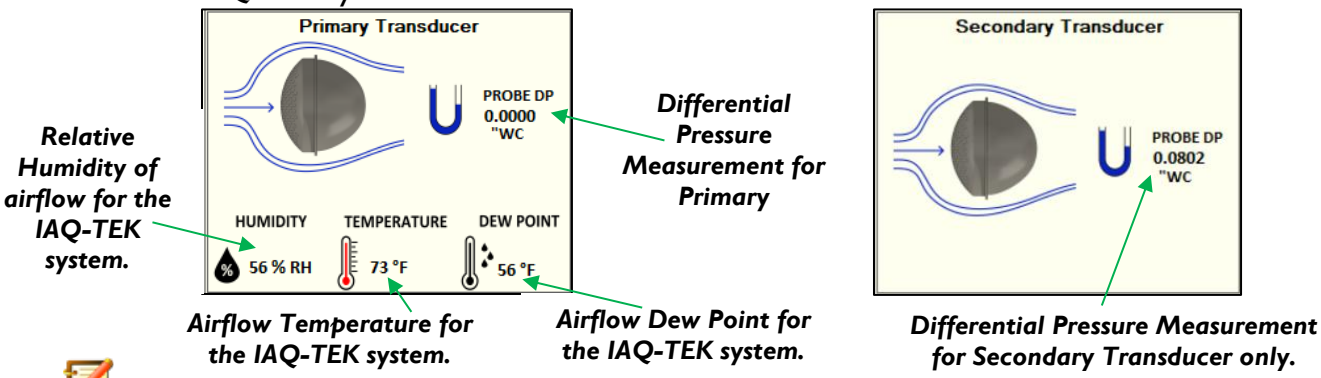
7.3.1 Airflow Volume Gauge

The Airflow Volume Gauge provides the total real-time airflow measurement of the IAQ-TEK system, adding together the Primary and Secondary Transducer measurements, if applicable. The Airflow Volume Gauge is an "information only" object; therefore, no field programming can be accessed through the Airflow Volume Gauge.



7.3.2 Transducer Details

The Transducer section(s) provides real-time measurements of critical parameters of the IAQ-TEK system.



Notes

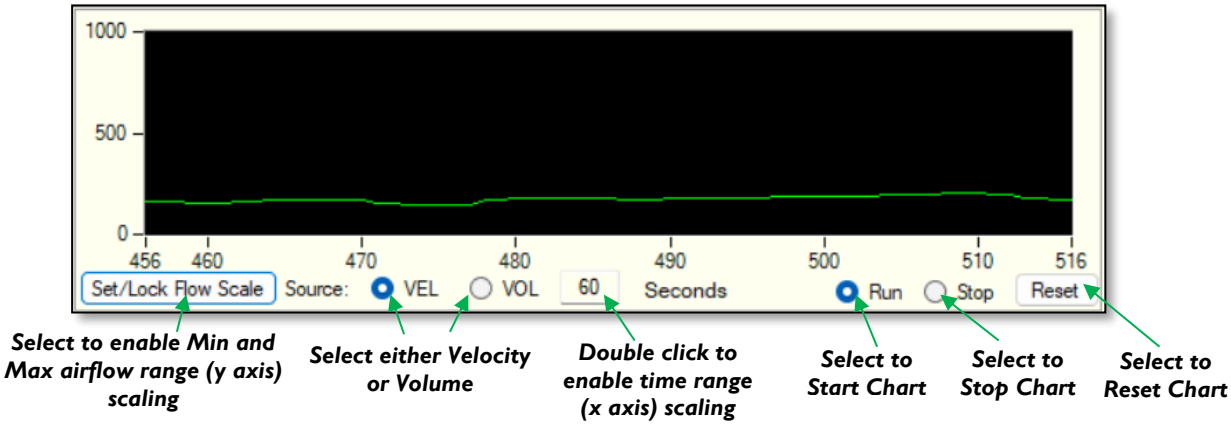
1. *If a Secondary Transducer is present, the Relative Humidity, Temperature, and Dew Point measurements are for the entire IAQ-TEK system, being measured at the Primary Transducer install location.*

7.3.3 Strip Chart

The Strip Chart(s) provides a real-time strip chart plot of their respective Airflow Measurement values with respect to time. The Strip chart is a useful tool for evaluating airflow performance. The time scale (x axis) is adjustable between 10 and 300 seconds and the airflow volume scale (y axis) can be configured to show volume or velocity and the scale can be set for auto range or bound by upper and lower limits.

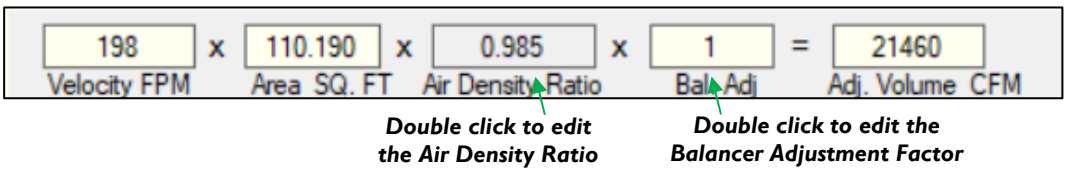
Notes

1. *The Primary and Secondary Strip Chart settings can be configured separately.*

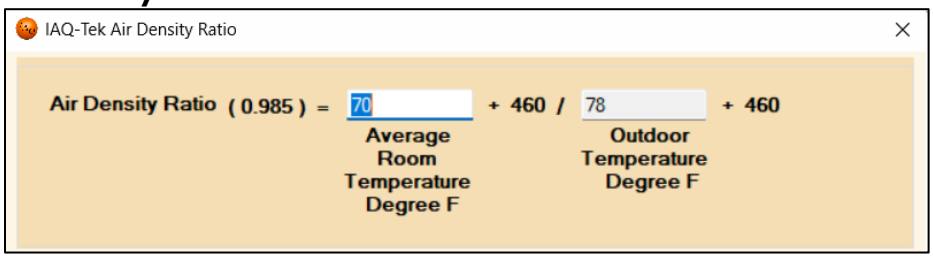


7.3.4 Airflow Volume Calculation

The Airflow Volume for the Primary and Secondary Transducer, if applicable, is calculated using the below equation, respectively.

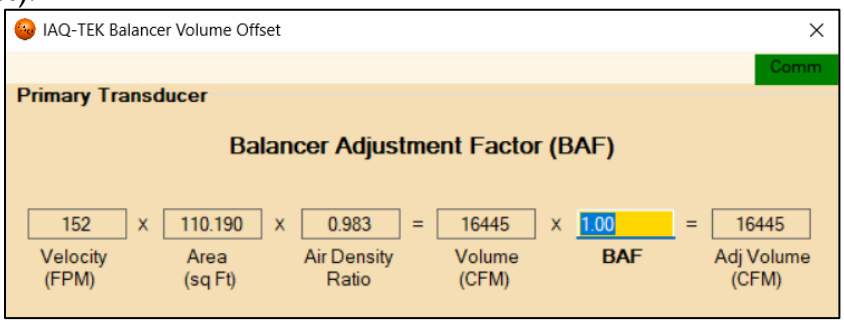


7.3.4.1 Air Density Ratio



7.3.4.2 Balancer Adjustment Factor (BAF)

The Balancer Adjustment Factor (BAF) allows the Balancer to adjust the Transducer (Primary or Secondary) readings, to those observed by the Balancer. The factory default is 1.00 (100%).

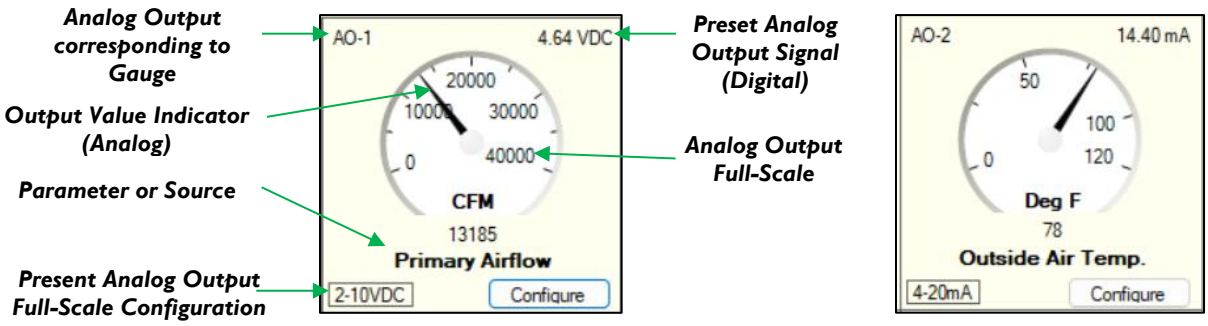


Note

1. *The Balancer Volume Offset window is live; meaning the Velocity, Air Density Ratio, Volume, and Adjusted Volume parameters are all real-time values. This window is refreshing real-time if the Comm indicator, located at the top right corner of the window, is flashing Green and white.* Comm

7.3.5 Analog Output Gauges

There are two Analog Output Gauges, AO-1 and AO-2, provided for indicating the status and configuration of each Analog Output. Both AO Gauges operate in a similar manner, and each can be configured independently. Access to the Analog Output Configuration Menu is provided selecting the "Configure" button.



7.3.5.1 Analog Output Configuration

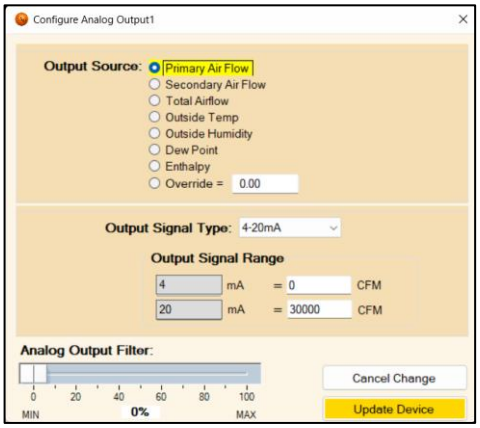
Selecting the "Configure" button on the Analog Output Gauge will open a window that will enable you to enter the configuration parameters available for that Analog Output. The examples provided below explain the parameters available and how to configure each.

Output Source Selected: **Primary Air Flow** sets the AO to correspond with the measured airflow volume of the Primary Transducer.

Output Signal Type: Select from the drop-down list. For this example, 4-20mA is selected.

Output Signal Range: Provides the full-scale range of the AO and the corresponding AO Gauge, which is 30,000 cfm for this example.

Filter: Increasing the filter will smooth out the reading, however it also slows down the response, therefore it should be used with caution.

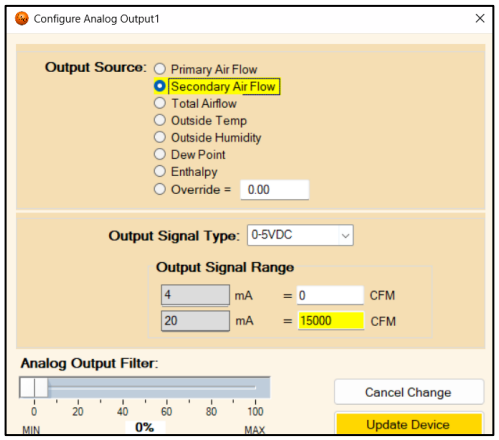


Output Source Selected: **Secondary Air Flow** sets the AO to correspond with the measured airflow volume of the Secondary Transducer, if applicable.

Output Signal Type: Select from the drop-down list. For this example, 0-5VDC is selected.

Output Signal Range: Provides the full-scale range of the AO and the corresponding AO Gauge, which is 15,000 cfm for this example.

Filter: Increasing the filter will smooth out the reading, however it also slows down the response, therefore it should be used with caution.

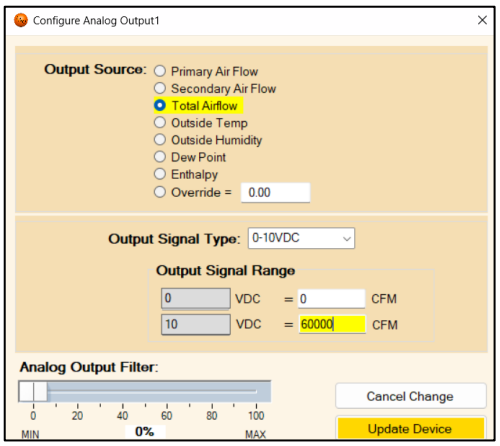


Output Source Selected: **Total Air Flow** sets the AO to correspond with the measured airflow volume of the IAQ-TEK system.

Output Signal Type: Select from the drop-down list. For this example, 0-10VDC is selected.

Output Signal Range: Provides the full-scale range of the AO and the corresponding AO Gauge, which is 60,000 cfm for this example.

Filter: Increasing the filter will smooth out the reading, however it also slows down the response, therefore it should be used with caution.

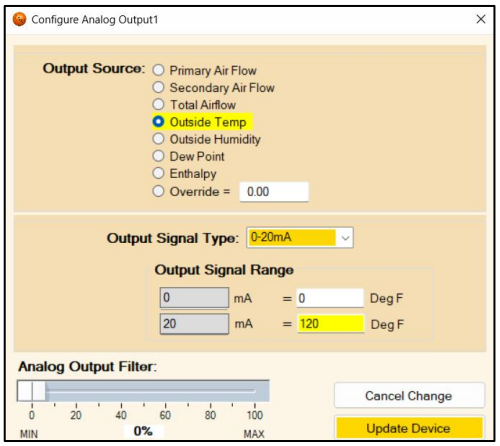


Output Source Selected: **Outside Temperature** sets the AO to correspond with the measured airflow temperature.

Output Signal Type: Select from the drop-down list. For this example, 0-20mA is selected.

Output Signal Range: Provides the full-scale range of the AO and the corresponding AO Gauge, which is 120 Deg F for this example.

Filter: Increasing the filter will smooth out the reading, however it also slows down the response, therefore it should be used with caution.

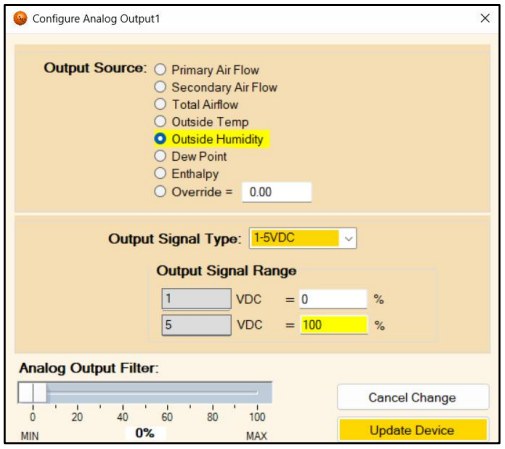


Output Source Selected: **Outside Humidity** sets the AO to correspond with the measured airflow humidity.

Output Signal Type: Select from the drop-down list. For this example, 1-5VDC is selected.

Output Signal Range: Provides the full-scale range of the AO and the corresponding AO Gauge, which is 100% for this example.

Filter: Increasing the filter will smooth out the reading, however it also slows down the response, therefore it should be used with caution.

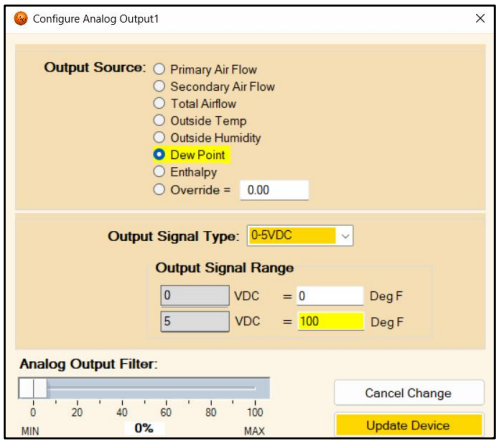


Output Source Selected: **Dew Point** sets the AO to correspond with the measured dew point.

Output Signal Type: Select from the drop-down list. For this example, 0-5VDC is selected.

Output Signal Range: Provides the full-scale range of the AO and the corresponding AO Gauge, which is 100 Deg F for this example.

Filter: Increasing the filter will smooth out the reading, however it also slows down the response, therefore it should be used with caution.

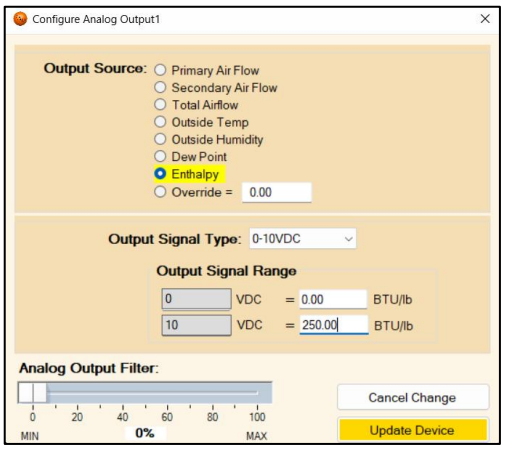


Output Source Selected: **Enthalpy** sets the AO to correspond with the measured enthalpy of the measured air.

Output Signal Type Select from the drop-down list. For this example, 0-10VDC is selected.

Output Signal Range: Provides the full-scale range of the AO and the corresponding AO Gauge, which is 250 BTU/lb for this example.

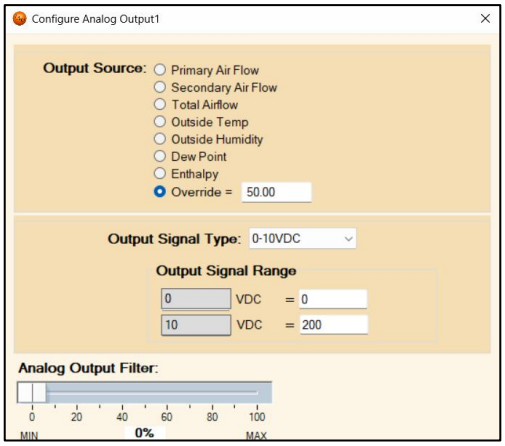
Filter: Increasing the filter will smooth out the reading, however it also slows down the response, therefore it should be used with caution.



Output Source Selected: **Override** sets the AO to correspond with the value entered in the box to the right of the "=" sign.

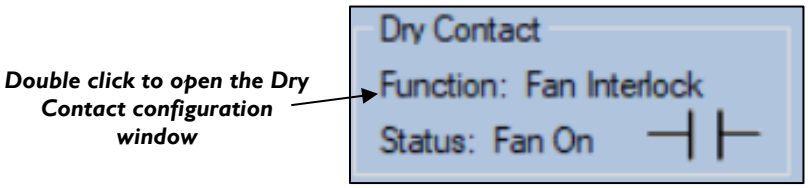
Output Signal Type Select from the drop-down list. For this example, 0-10VDC is selected.

Output Signal Range: Provides the full-scale range of the AO and the corresponding AO Gauge, which is 200 units for this example.
Setting Override = 50.00 with the Output Full Scale set to 200 will result in the OA = 2.50VDC.



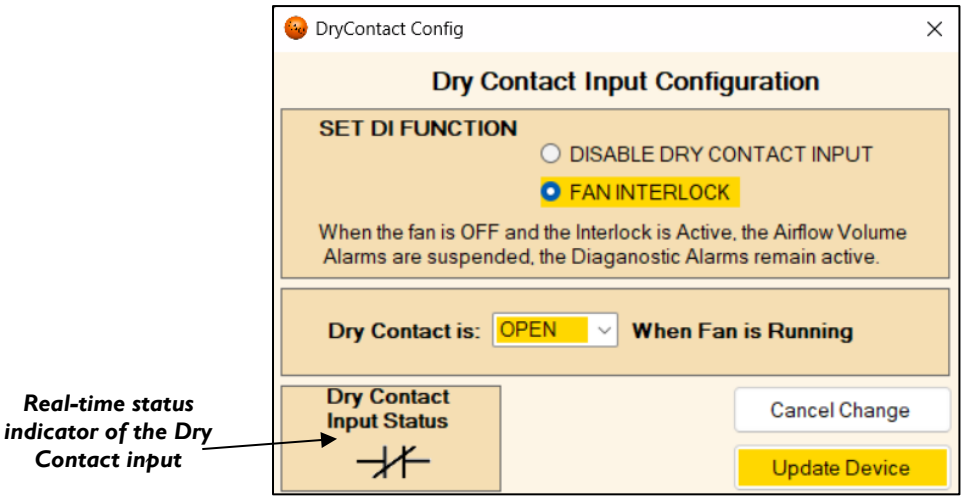
7.3.6 Dry Contact Indicator

The Dry Contact Indicator provides a description of the function the Dry Contact serves as well as a visual indication of the current Dry Contact Input state.



7.3.6.1 Dry Contact Configuration

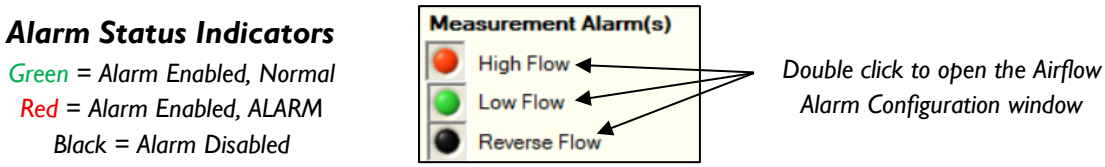
Select to enable/disable the dry contact input depending on if the fan that the IAQ-TEK system is serving has a Fan Interlock option.



7.3.7 Alarms

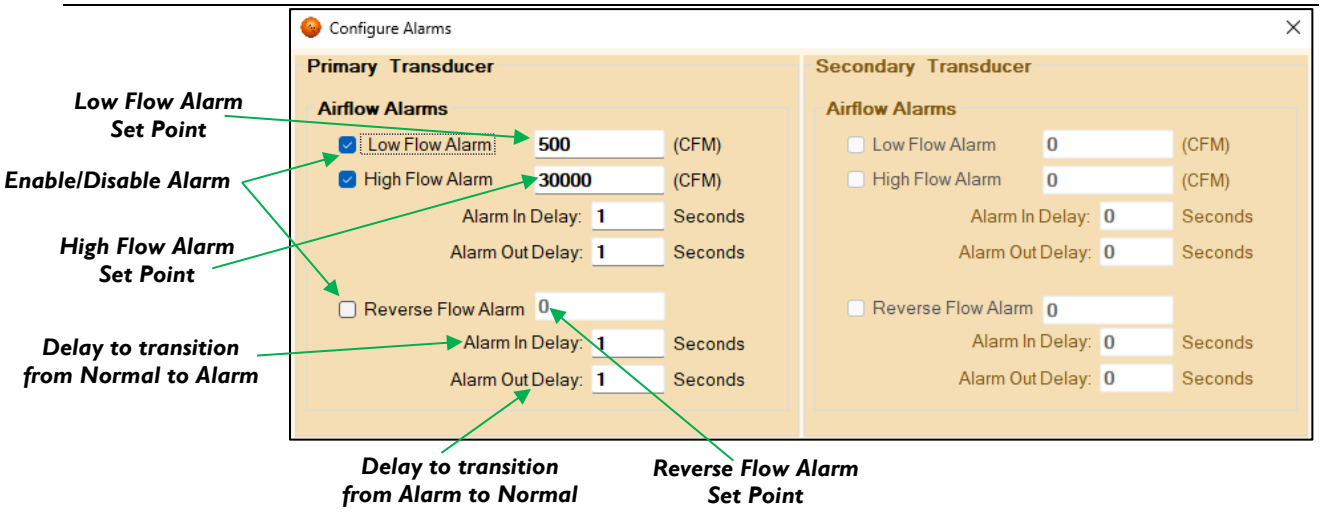
7.3.7.1 Airflow Alarm Status Indicators

The Airflow Alarm Indicator section provides real-time monitoring and a visual indication of the alarm status. To enable/disable, and configure any of the available Airflow Alarms, double click on any of the airflow alarm designators.



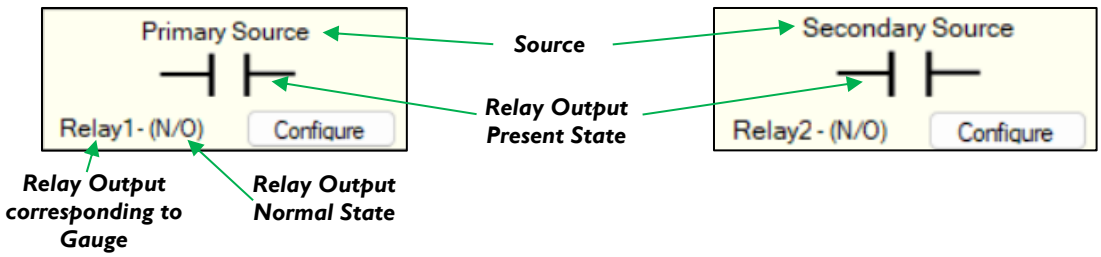
7.3.7.2 Airflow Alarm Configuration

Enable/Disable and configure the available alarms listed in the figure below for each Transducer, if applicable.



7.3.7.3 Relay Output Indicator Diagram

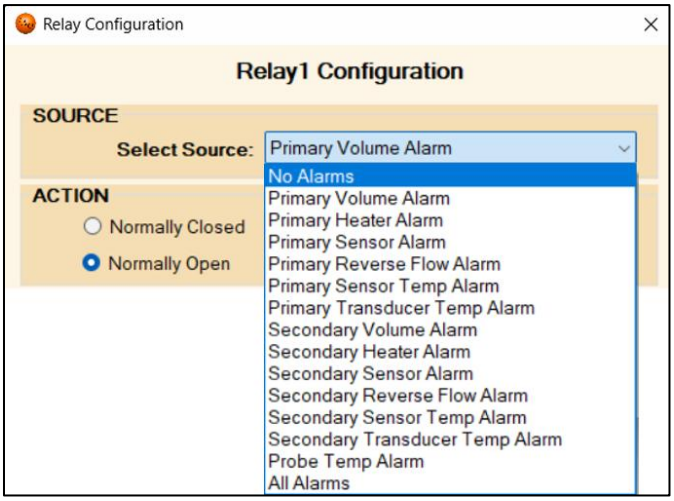
The Relay Output Indicators provide a visual indication of the relay state and a Configuration button to access the Alarm Configuration window.



7.3.7.3.1 Relay Output Configuration

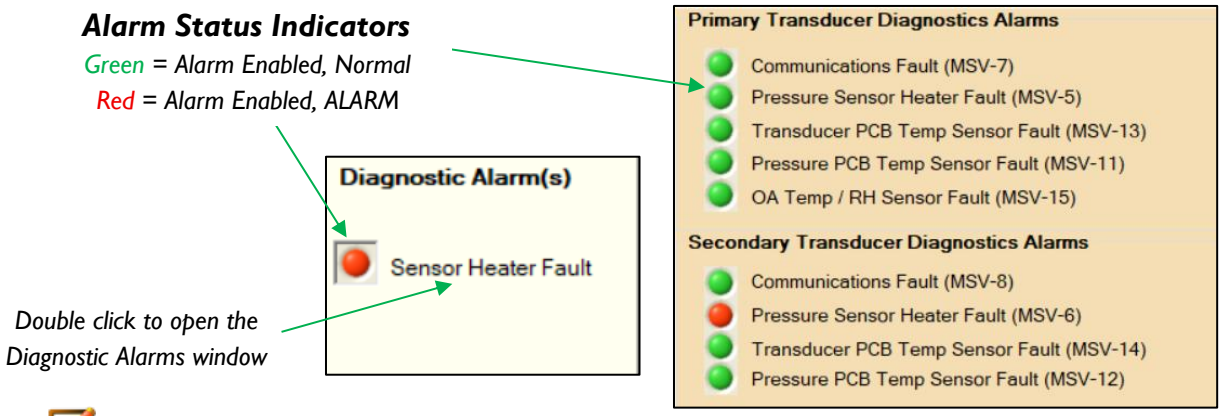
Select the "Configure" button on the Relay Output Indicator to open a window that will allow the configuration of the respective Relay Output.

a. Select the desired Source from the "Select Source" drop-down list.
b. Select the desired condition for when the Relay Output will be in in a normal state.



7.3.7.4 Diagnostic Alarm Status Indicators

The Diagnostic Alarm Indicator section provides real-time monitoring and a visual indication of the alarm status. For a complete list of the diagnostic alarms and their status, double click on the diagnostic alarm designator or go to 'Tools' → 'Diagnostics'.

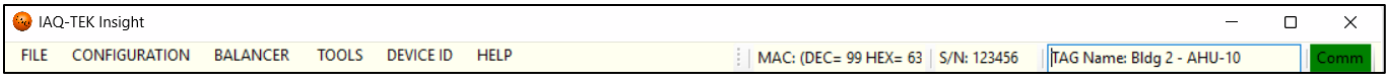


Note

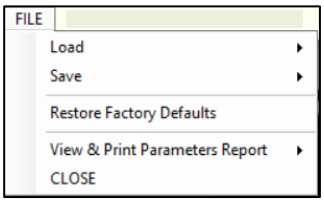
1. *The Diagnostic Alarm(s) section will only be present if an alarm condition is active. This will appear under the Measurement Alarm(s) section for the respective transducer.*

7.4 Dashboard Menu

The area located along the top of the dashboard provides access to menu items in addition to displaying information about the device such as; MAC Address, Serial Number, Tag Number, and USB/Bluetooth Comm status. Each of the menu's and included items are shown below.



7.4.1 File



7.4.1.1 Load

7.4.1.1.1 From Transmitter Flash Memory

Selecting this option will load the configuration file that resides in the IAQ-TEK transmitter's nonvolatile memory (FLASH) into the IAQ-TEK transmitter's volatile memory (RAM).

7.4.1.1.2 From File

Selecting this option will allow the user to load a configuration file that resides in a nonvolatile storage device (i.e. hard drive or USB Flash Drive) to the IAQ-TEK transmitter's volatile memory (RAM).

7.4.1.2 Save

7.4.1.2.1 To Transmitter Flash Memory

Selecting this option saves the configuration file that resides in the IAQ-TEK transmitter's volatile memory (RAM) to the IAQ-TEK transmitter's nonvolatile memory (FLASH).

Note

1. This feature is available by clicking 'Update Flash'

when it appears at the bottom right corner on the dashboard.

7.4.1.2.2 To File

Selecting this option saves the configuration file that resides in the IAQ-TEK transmitter's volatile memory (RAM) to a nonvolatile storage device (i.e. Hard drive or USB Flash Drive).

7.4.1.3 Restore Factory Defaults

Selecting this option will load the original factory configuration file that resides in a protected portion of the IAQ-TEK transmitter's nonvolatile memory (FLASH) to the IAQ-TEK transmitter's volatile memory (RAM).

7.4.1.4 View & Print Parameters Report

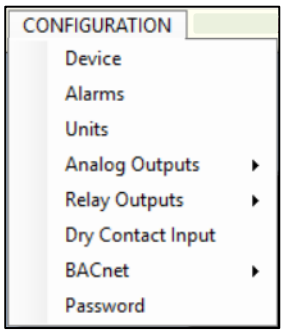
7.4.1.4.1 From Device

Select to view and print a timestamped PDF document of the primary configuration parameters which reside in the IAQ-TEK transmitter's nonvolatile (FLASH) memory.

7.4.1.5 Close

Selecting this option closes the Dashboard and disconnects the communications.

7.4.2 Configuration Menu Items



7.4.2.1 Device

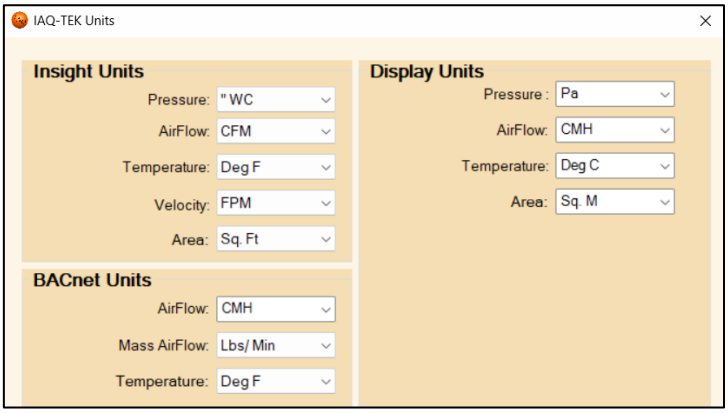
Click to open the initial IAQ-TEK Configuration window. Refer to section **7.2 IAQ-TEK Configuration** for more information.

7.4.2.2 Alarms

Click to open the Alarm Configuration window. Refer to section **7.3.7 Alarms** for more information.

7.4.2.3 Units

Click to open the Units window. This window provides a means to set the units for multiple key measurements either locally within the Insight software, locally at the I/O Module display, or for BACnet. Each item can be configured to provide different units.



7.4.2.4 Analog Outputs

Click to open an Analog Output configuration window. Refer to section **7.3.5.1 Analog Output Configuration** for more information.

7.4.2.5 Relay Outputs

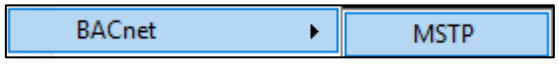
Click to open a Relay Output configuration window. Refer to section **7.3.7.3.1 Relay Output Configuration** for more information.

7.4.2.6 Dry Contact Input

Click to open the Dry Contact Input configuration window. Refer to section **7.3.6.1 Dry Contact Input Configuration** for more information.

7.4.2.7 BACnet

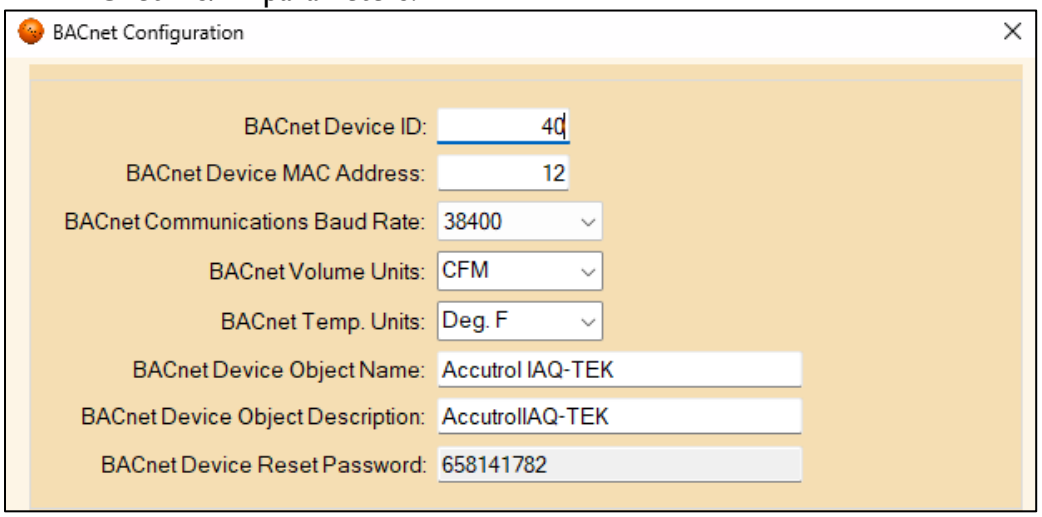
BACnet communications provides a means for setting the IAQ-TEK BACnet parameters. Click to select from the available BACnet options (only one can be active at a time). The BACnet type will depend on which BACnet option is installed, if applicable. The example to the right shows BACnet MS/TP installed and active.



7.4.2.7.1 BACnet MS/TP

7.4.2.7.1.1 BACnet MS/TP Configuration

The BACnet MS/TP Configuration window provides the means for setting the IAQ-TEK BACnet MS/TP parameters.



Notes

1. *BACnet MS/TP is only available if model code includes "-1".*
2. *By default, the BACnet Communications Baud Rate is set to 'Disabled'.*
3. *BACnet Device ID:*
    a. *The BACnet MS/TP Device Instance Number cannot be greater than 4,194,303.*
4. *BACnet Device MAC Address must be between 1-128.*
5. *BACnet Device Reset Password:*
    a. *Each IAQ-TEK transmitter, if equipped with a BACnet MS/TP module, has a unique password which is stored in non-volatile memory. This password is required when issuing a "transmitter reinitialization command" over BACnet.*

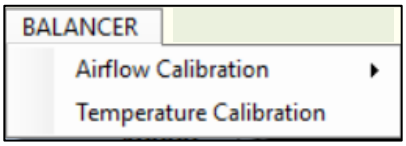
7.4.2.8 Password

Select to open the Password configuration window. This password can be enabled or disabled. If enabled, the password can be configured in order to lock down the **User Configuration** options, section **8.1.3**, found at the I/O Module Display so that only authorized personnel can make limited necessary adjustments to the IAQ-TEK system.

Notes

1. *If the IAQ-TEK system has not been previously configured, the password will be enabled until the unit is configured either through the I/O Module Display or by using IAQ-TEK Insight.*
2. *The Factory Default password is **1234**.*

7.4.3 Balancer Menu Items

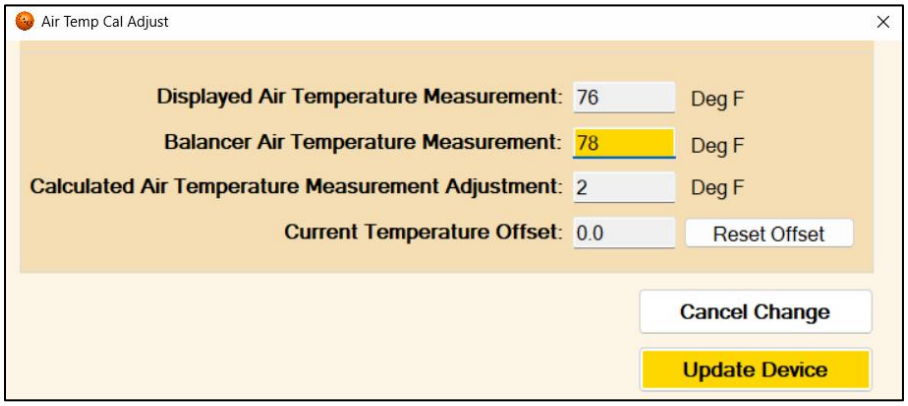


7.4.3.1 Airflow Calibration

Click to open the airflow calibration window for either the Primary Transducer or Secondary Transducer, if applicable. Refer to section **7.3.4.2 Balancer Adjustment Factor (BAF)** for more information.

7.4.3.2 Temperature Calibration

Click to open the temperature calibration window. This window provides the means for the Balancer to make an adjustment to the temperature measurement based on the readings observed by the Balancer.

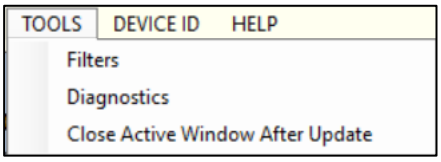


Notes

1. *The IAQ-TEK provides the **Display Air Temperature Measurement**; this field is not editable.*
2. *Enter the measured air temperature taken by the Balancer in the box next to **Balancer Air Temperature Measurement**.*
3. *The Offset will be automatically calculated. If the offset value is correct, click Update Device* Update Device *to implement this change.*

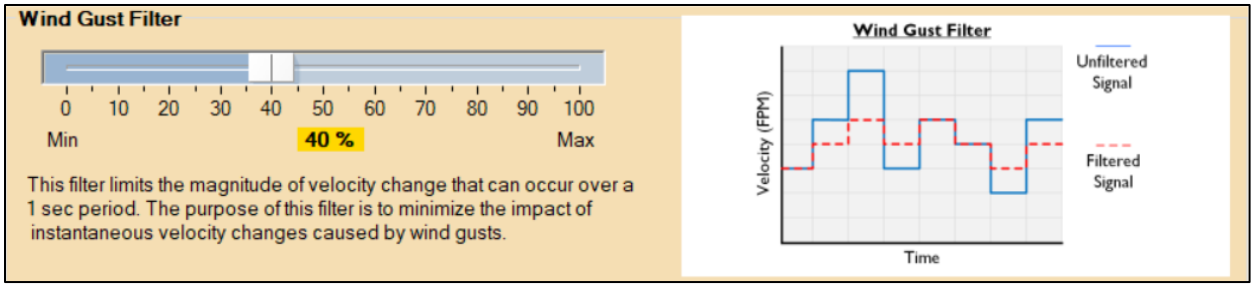
7.4.4 Tools Menu Items

7.4.4.1 Filters

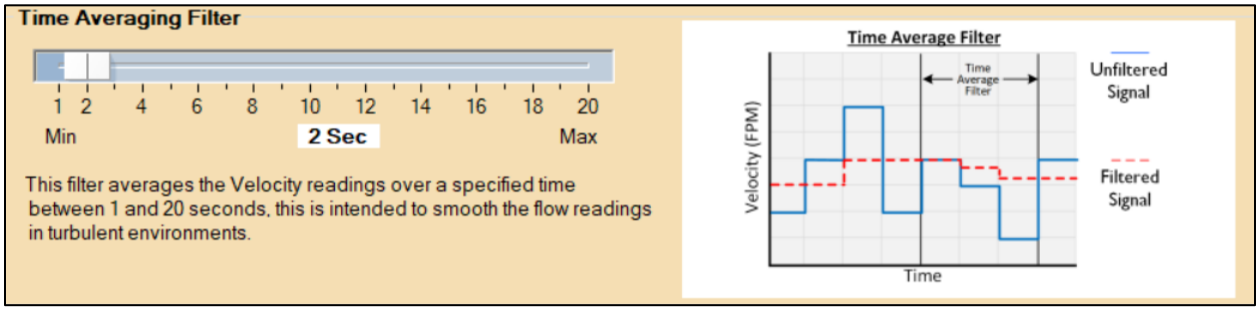


The following filter options allow the user to adjust and fine-tune the IAQ-TEK system based on installation conditions.

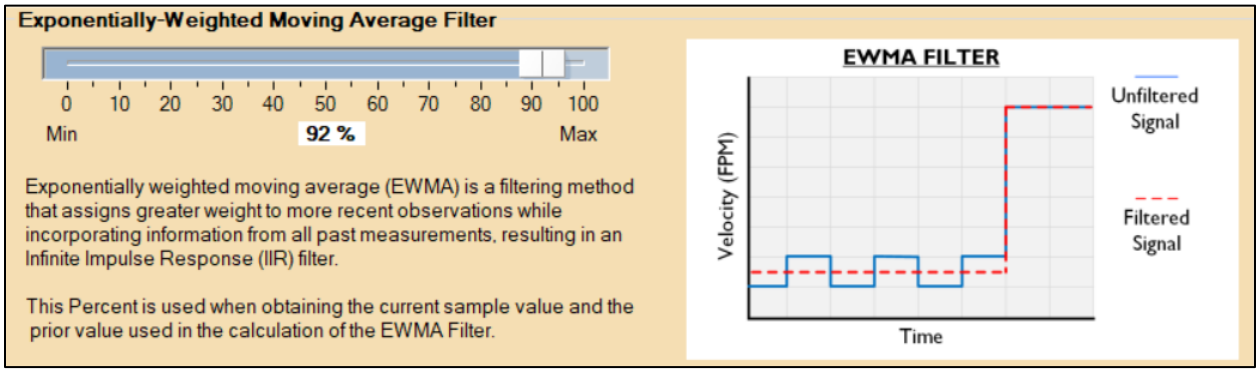
7.4.4.1.1 Wind Gust Filter



7.4.4.1.2 Time Averaging Filter



7.4.4.1.3 Exponentially-Weighted Moving Average Filter



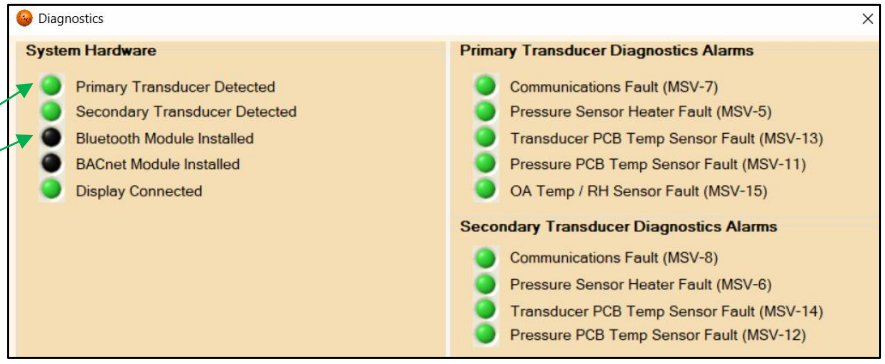
7.4.4.2 Diagnostics

The Diagnostics window provides real-time monitoring and a visual indication of the status for system hardware.

1. **System Hardware:** Provides status on whether the associated hardware is detected
2. **Transducer Diagnostic Alarms:** Provides status on the present condition of various components associated with the transducer, respectively.

System Hardware Status Indicator

Green = Detected
Black = Not Detected



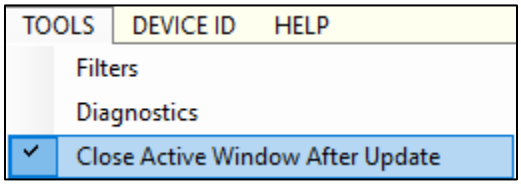
Diagnostic Alarm Status Indicators

Green = Alarm Enabled, Normal
Red = Alarm Enabled, ALARM
Black = Alarm Disabled (Secondary Transducer feature only)

If a Diagnostic Alarm is present, contact Accutrol Technical Support at 203-445-9991.

7.4.4.3 Close Active Window

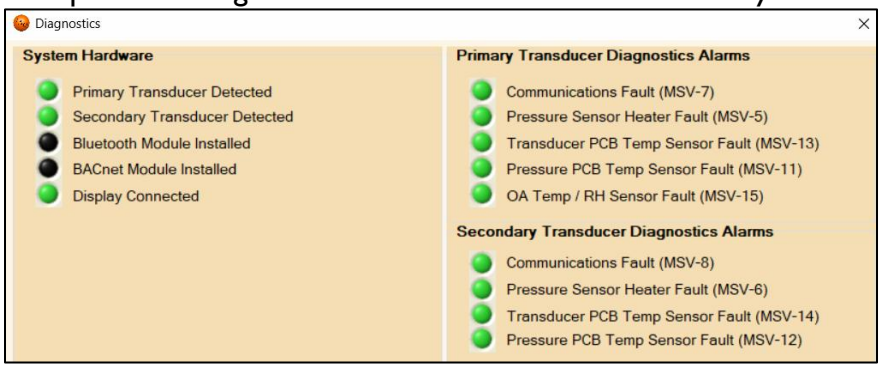
The **Close Active Window** feature, when enabled, will automatically close the current window after the **Update Device** button is clicked. If this feature is not enabled, the active window will remain open until the user closes the window.



7.4.5 Device ID Menu Items

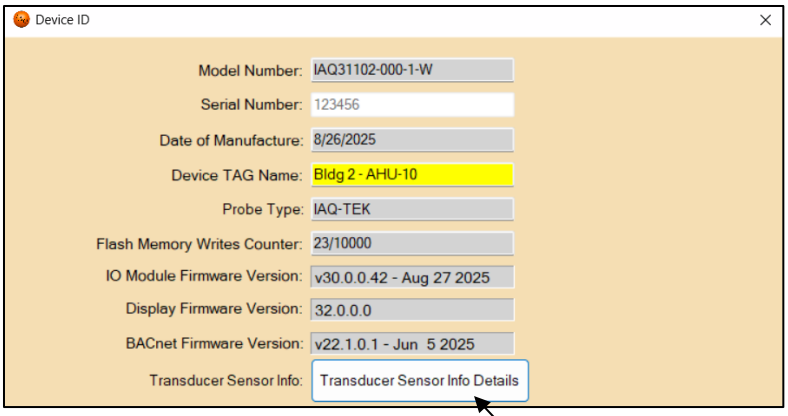
7.4.5.1 System Info

System Info opens the Diagnostics window to show the status of system hardware.



7.4.5.2 Device Identification

The **Device Identification** window provides general information regarding the IAQ-TEK system.



Click for specific Transducer Sensor information

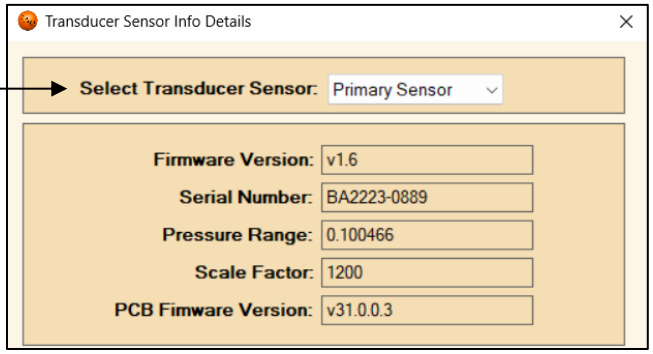
Notes

a) The Device TAG Name can be configured in this window.

7.4.5.2.1 Transducer Sensor Information

The **Transducer Sensor Information** window will provide unique information related to the transducer sensor.

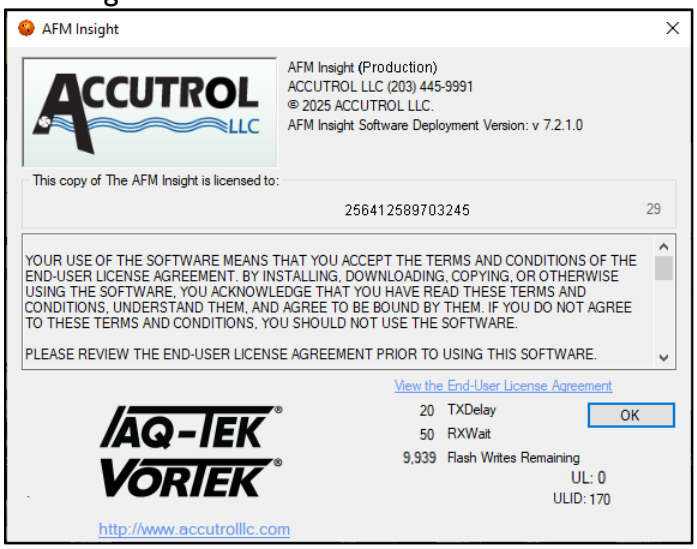
Select Transducer Sensor from drop-down list



7.4.6 Help

7.4.6.1 About

The **About** window dialog box is shown below.



SECTION 8 – I/O MODULE - TOUCHSCREEN DISPLAY

8.1 Startup

8.1.1 As-Shipped Display

The IAQ-TEK system ships from the factory with limited configuration. The system requires field start up. If field startup has not occurred, the IAQ-TEK display will show the screen below.

(-W option required)

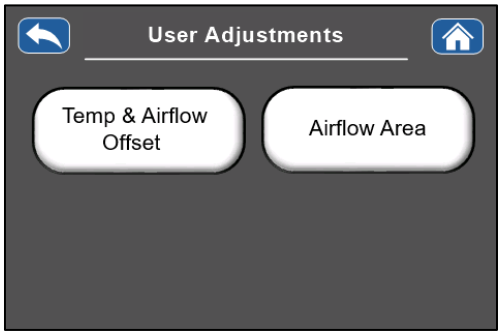
Tap on located in the upper right corner on the display to proceed with initial startup through the display. For full configuration, connect to the IAQ-TEK system using IAQ-TEK Insight via USB cable or Bluetooth.

8.1.2 Personal ID Number

The IAQ-TEK display is password protected when it leaves the factory. Only authorized personnel with a valid Personal ID Number will be able to gain access to the display. The factory default Personal ID Number is 1234. Tap on located in the upper right corner on the display to submit the password.

8.1.3 User Adjustments

Tap on any of the available options to configure.



8.1.3.1 Airflow Area

Tap on **Airflow Area** to adjust the area dimension for the Primary and Secondary install locations, if applicable.

8.1.3.2 Temp & Airflow Offset

Tap on **Temp & Airflow Offset** to adjust either the outside air temperature measurement, the Primary airflow measurement, or the Secondary airflow measurement, if applicable.

Notes

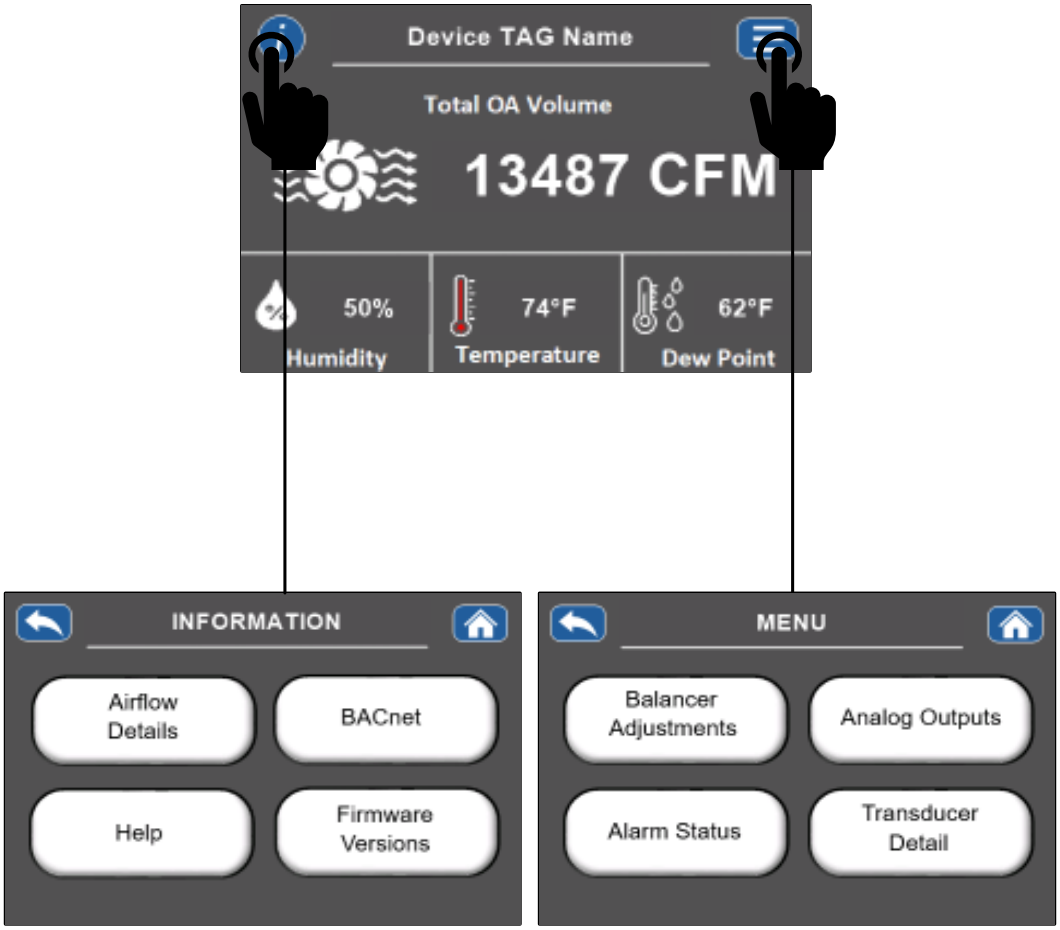
a) The current Balancer Offset for each parameter is listed underneath of the respective measurements.

   i. The factory default Balancer Offset value for Outside Air Temperature measurement is zero.

   ii. The factory default Balancer Adjustment Factor (BAF) for the Primary and Secondary Transducer is 1.00.

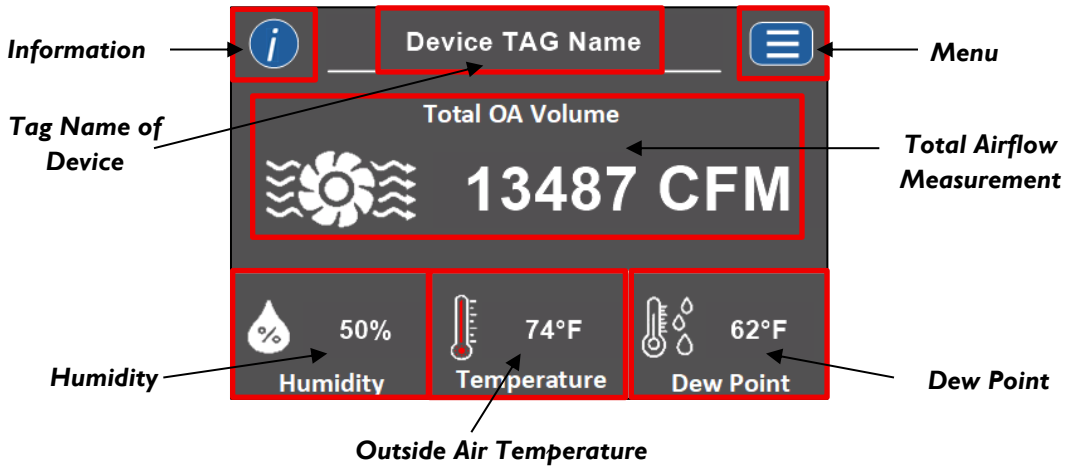
8.2 Menu Navigation

The basic menu hierarchy for the IAQ-TEK touchscreen display is shown below.



8.3 Home Screen

An example of the Home Screen for the IAQ-TEK display is shown below.



Notes

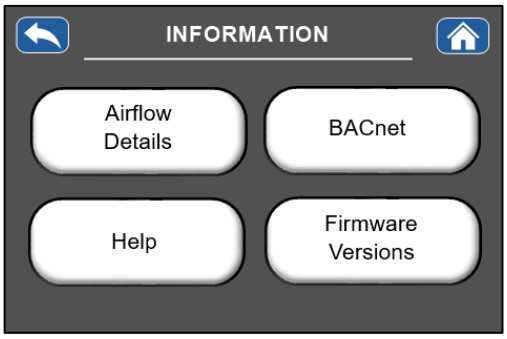
a) Tapping on or below **Total OA Volume** will open the Airflow Details screen.

8.3.1 Visual Alarm Status

If an alarm, airflow or diagnostic, is active, the **Total OA Volume** fan icon on the home screen will change to a red alarm bell. Tap on the alarm bell to open the Alarms screen. On the Alarms screen, the active alarm will be highlighted red.

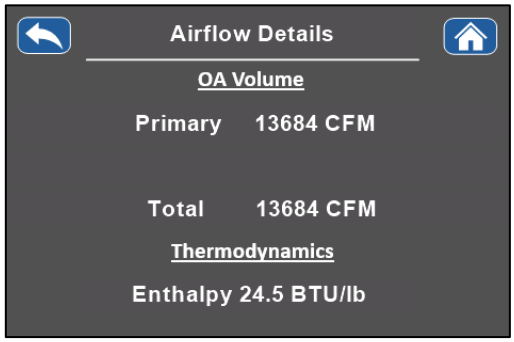
8.4 Information

For information regarding the IAQ-TEK system, tap on the icon at the top left corner of the screen.



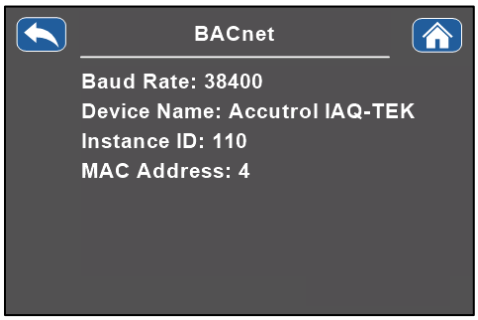
8.4.1 Airflow Details

The **Airflow Details** screen shows each transducer flow (Primary and Secondary, if applicable) as well as the total airflow. A Thermodynamics section is also included at the bottom of this screen showing Enthalpy.



8.4.2 BACnet

The **BACnet** screen shows the general BACnet settings for the IAQ-TEK system. This screen is view-only. Changes to the BACnet configuration must be made using the IAQ-TEK Insight software.

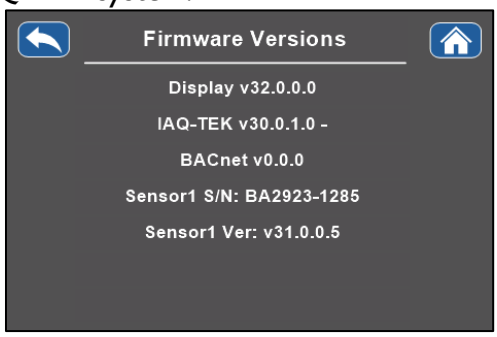


8.4.3 Help

The **Help** screen provides a QR code for the IAQ-TEK Quick Start Guide. Scan the QR code with a mobile phone or device.

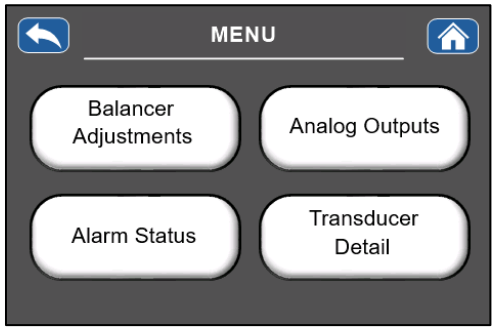
8.4.4 Firmware Versions

The **Firmware Versions** screen provides the version levels of the associated equipment for the IAQ-TEK system.



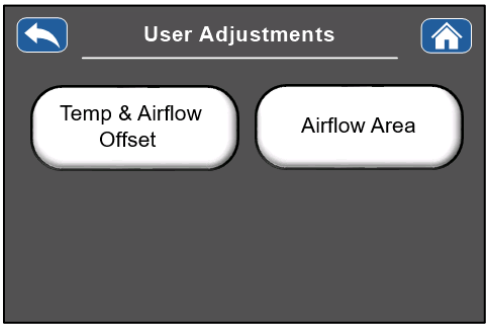
8.5 Menu

Tapping the icon will open a menu.



8.5.1 Balancer Adjustments

Tapping Balancer Adjustments will open another screen where user adjustments can be made to different measurements.



Notes

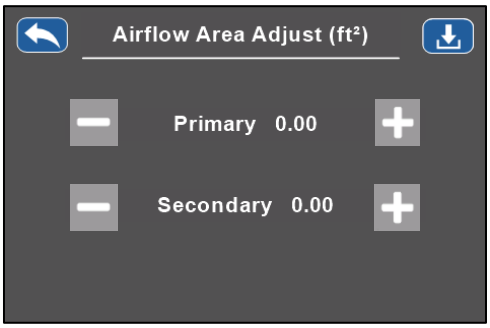
a) After making changes, tap on located at the upper right corner of the screen to save the changes.

b) Tap on located at the upper left corner of the screen to discard any changes made.

c) Tap on to increase the value. Tap on to decrease the value. Tap and hold the respective icon to progressively ramp the change of the value.

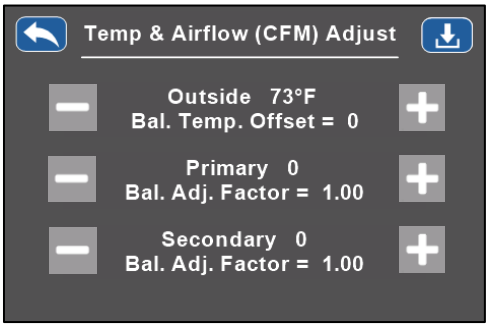
8.5.1.1 Airflow Area

Tap on **Airflow Area** to adjust the area dimension for the Primary and Secondary install locations, if applicable.



8.5.1.2 Temp & Airflow Offset

Tap on **Temp & Airflow Offset** to adjust either the outside air temperature measurement, the Primary airflow measurement, or the Secondary airflow measurement, if applicable.

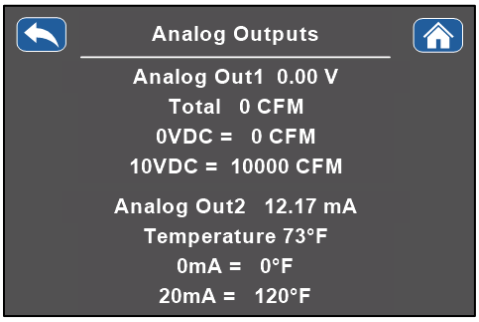


Notes

a) The current Balancer Offset for each parameter is listed underneath of the respective measurements.
b) The factory default Balancer Offset value for Outside Air Temperature measurement is zero.
c) The factory default Balancer Adjustment Factor (BAF) for the Primary and Secondary Transducer is 1.00.

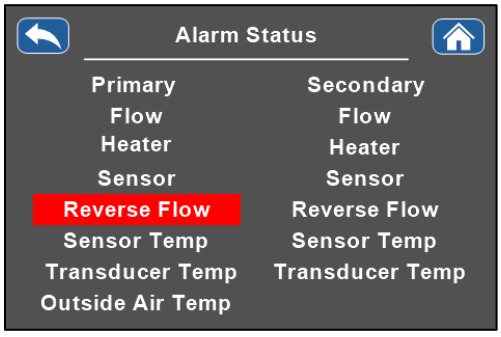
8.5.2 Analog Outputs

Tap on **Analog Outputs** to view the configuration of each analog output as well as the present output signal.



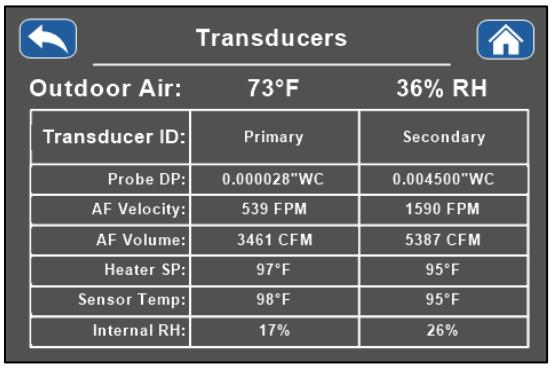
8.5.3 Alarm Status

Tap on **Alarm Status** to view a list of available alarms for the IAQ-TEK system. If an alarm is active, or in alarm, the alarm will highlight red.



8.5.4 Transducer Detail

Tap on **Transducer Detail** for detailed information regarding the Primary and Secondary transducer, if applicable.



Transducer ID:	Primary	Secondary
Probe DP:	0.000028"WC	0.004500"WC
AF Velocity:	539 FPM	1590 FPM
AF Volume:	3461 CFM	5387 CFM
Heater SP:	97°F	95°F
Sensor Temp:	98°F	95°F
Internal RH:	17%	26%

SECTION 9 – MAINTENANCE

The IAQ-TEK system does not require any preventative maintenance.

9.1 Cleaning the Accutrol Airflow Probe

The Accutrol Airflow Probe can be wiped down with a damp cloth to remove any surface particulates.

APPENDIX A – THEORY OF OPERATION

A.1 Theory of Operation

The IAQ-TEK uses a **High Pneumatic Impedance Sensor (HPIS®)** which refers to the sensor's ability to avoid contamination due to the extremely small amount of air that flows through it. What makes the HPIS unique is that it incorporates a micro-flow-channel etched into the silicon wafer. This architecture makes the flow channel substantially smaller than other thermal-based-flow-through sensors, thereby eliminating the disadvantages normally associated with this type of sensor (see Figure 1).

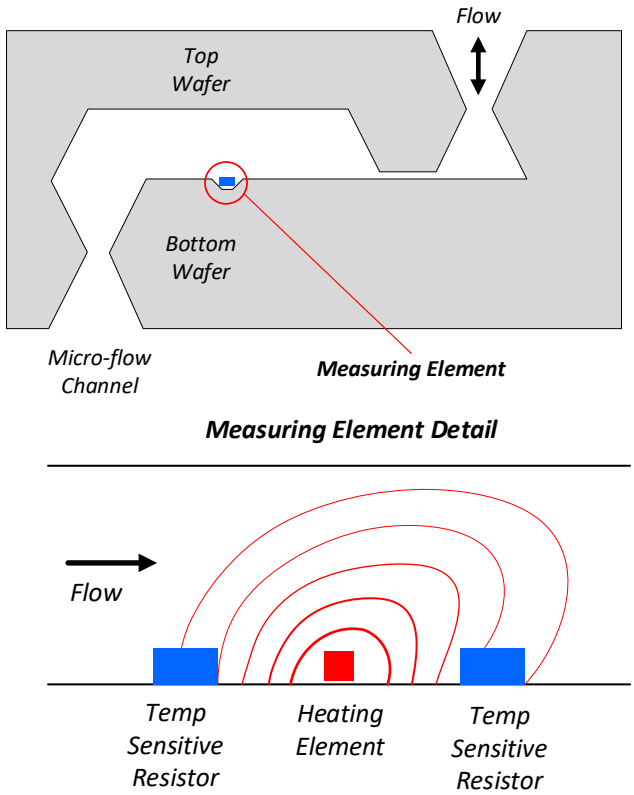


Figure 1 – HPIS Sensing Element Used in the IAQ-TEK

Advantages of HPIS®

The HPIS combines the best performance features of the diaphragm-based-dead-ended and thermal-based-flow-through type sensors. The disadvantages normally associated with flow-through sensors have been addressed through the high input pneumatic impedance of the micro-flow channel which virtually eliminates airflow through the sensor. The airflow through the microchannel with a DP = 0.10" WC (25 Pa) is only 0.000005 CFM resulting in an inlet velocity with a high pneumatic impedance (~15kPa/(ml/s)) and a high immunity to dust contamination compared to other flow-based pressure sensors.

APPENDIX B – BACnet MS/TP

BACnet® is a standard data communication protocol designed specifically for building automation and control networks. The IAQ-TEK uses the BACnet MS/TP (Master-Slave/Token Passing) protocol which is a type of MAC layer implemented using the EIA-485 signaling standard. The performance of the MS/TP network is heavily influenced by the network traffic load, the assignment of MS/TP node addresses and the network configuration parameter *Nmax_info_frames* and *max_master*. Additionally, it is imperative the physical network layer is properly configured (cabling, EOL terminations, bias, etc...) and is verified to be reliable otherwise the network performance can be compromised.

B.1 BACnet Objects

The IAQ-TEK supports a collection of BACnet-visible objects. In addition to a Device object whose instance is programmed by writing to the current Object_Identifier or the "wildcard" Object_Identifier whose instance is 4194303, the IAQ-TEK supports several standard object types as described herein. The following table defines the visible objects. The PV column indicates whether the Present_Value is Read Only "R", Writable "W" or a Commanded "C" point.

The standard objects; DEV, AI, AV, BI, BV, and MSV support required properties for those object types. Object_Name is writable with provision for 64-character maximum length names. BI Inactive_Text and Active_Text, and MSV State_Text are writable.

Each AI/AV object's Units property automatically changes to the appropriate unit for US or SI measurement based on the value of MSV1 and MSV2. Internally Present_Values are stored in US units and converted to/from SI units only when read or written.

Standard object property values other than Present_Value shall be derived as follows:

Object_Identifier:	generated automatically from request
Object_Type:	generated automatically from request
Object_Name:	writable
Polarity:	always NORMAL
Units:	MSV1, MSV2 and MSV16 (Reference BACnet Tables below)
State_Text, Inactive_Text: Active_Text	writable
Status_Flags:	always {FALSE,FALSE,FALSE,FALSE}
Event_State:	always NORMAL
Out_Of_Service:	always FALSE

Objects; AI, AV, shall support the COV_INCREMENT property which shall be writable.

B.2 IAQ-TEK BACnet Points List

DESCRIPTION		OBJECT ID	PV	UNITS TYPE
Device Object		Dexxx		-
Analog Inputs				
Primary Intake Airflow Volume		AI-1	R	Flow
Secondary Intake Airflow Volume		AI-2	R	Flow
Outside Air Temperature		AI-3	R	Temp
Flash Writes Remaining **(Ref Section B.2.1)**		AI-4	R	Integer
Primary Intake Mass Flow Measurement		AI-5	R	Flow
Secondary Intake Mass Flow Measurement		AI-6	R	Flow
Total Intake Airflow Volume		AI-7	R	Flow
Total Intake Mass Flow Measurement		AI-8	R	Flow
Outside Air Dew Point		AI-9	R	Temp
Outside Air Enthalpy		AI-10	R	Thermo
Outside Air Humidity		AI-11	R	%
Barometric Pressure		AI-12	R	In Hg
Analog Values				
Unsubscribed COV Interval		AV-1	R/W	Seconds
Primary Flow Measurement Adjust		AV-3	R/W	%
Secondary Flow Measurement Adjust		AV-4	R/W	%
Primary High Flow Alarm Limit		AV-5	R/W	Flow
Primary Low Flow Alarm Limit		AV-6	R/W	Flow
Secondary High Flow Alarm Limit		AV-7	R/W	Flow
Secondary Low Flow Alarm Limit		AV-8	R/W	Flow
Primary Reverse Flow Alarm Limit		AV-9	R/W	Flow
Secondary Reverse Flow Alarm Limit		AV-10	R/W	Flow
Binary Inputs				
Fan Status		BI-1	R	Binary
Binary Values				
Commit to Flash **(Ref Section B.2.1)**		BV-1	R/W	Binary
Multi-State Values				
Airflow Units	Airflow Volume Units: 1=CFM, 2=CMS 3=CMM,4=CMH	MSV-1	R/W	Integer
Mass Flow Units	1 = Lbs/Min, 2 = Kg/Min	MSV-2	R/W	Integer
Primary Flow Alarm Status	1 = Normal, 2 = High Alarm, 3 = Low Alarm	MSV-3	R	Integer
Secondary Flow Alarm Status	1 = Normal, 2 = High Alarm, 3 = Low Alarm	MSV-4	R	Integer
Primary Heater Alarm Status	1 = Normal, 2 = Alarm	MSV-5	R	Integer
Secondary Heater Alarm Status	1 = Normal, 2 = Alarm	MSV-6	R	Integer
Primary Pressure Sensor Alarm Status	1 = Normal, 2 = Alarm	MSV-7	R	Integer
Secondary Pressure Sensor Alarm Status	1 = Normal, 2 = Alarm	MSV-8	R	Integer
Primary Reverse Flow Alarm Status	1 = Normal, 2 = Alarm	MSV-9	R	Integer
Secondary Reverse Flow Alarm Status	1 = Normal, 2 = Alarm	MSV-10	R	Integer

Primary Pressure Sensor Temp Alarm Status	1 = Normal, 2 = Alarm	MSV-11	R	Integer
Secondary Pressure Sensor Temp Alarm Status	1 = Normal, 2 = Alarm	MSV-12	R	Integer
Primary Transducer Temp Alarm Status	1 = Normal, 2 = Alarm	MSV-13	R	Integer
Secondary Transducer Temp Alarm Status	1 = Normal, 2 = Alarm	MSV-14	R	Integer
Outside Air Temperature Alarm Status	1 = Normal, 2 = Alarm	MSV-15	R	Integer
Temperature Units	1 = Degree F, 2 = Degree C	MSV-16	R/W	Integer

IAQ-TEK BACnet Points List Notes

Note 1*: The IAQ-TEK module includes a USB port and an optional Bluetooth transceiver to provide local connectivity for configuring the IAQ-TEK using the PC based software tool "Insight". For BACnet operation, the PC USB and/or Bluetooth must be disconnected from the monitor to avoid communication conflicts.*

B.2.1 Save Active Configuration to Nonvolatile Flash Memory

The IAQ-TEK has both volatile (RAM) and nonvolatile (Flash) memory types. RAM memory has an infinite number of write cycles, however Flash memory has a finite number of write cycles which if exceeded will damage the device. Any values in RAM are lost when the device is powered down. The values stored in Flash memory are copied to RAM memory during the power up sequence.

Writing a value of one (1) to the BACnet Object BV1 will cause the IAQ-TEK device to copy the values stored in RAM to Flash memory, which is retained through power cycles. To protect the microprocessor from damage due to excessive flash writes, the IAQ-TEK limits the number of flash write cycles to 10,000.

B.2.2 Unsubscribed COV

The AV-1 object Present_Value shall specify an interval in whole seconds at which the IAQ-TEK shall periodically issue Unsubscribed COV Notifications as local segment broadcasts. An AV-1 value of zero shall disable this behavior. When non-zero, the Unsubscribed COV shall also be issued if the Present_Value of any object changes by more than the COV_INCREMENT for the corresponding object. If COV_INCREMENT is zero for a given object, it shall also disable Unsubscribed COV for that object, even if AV-1 is non-zero.

B.2.3 COV

The IAQ-TEK supports a pool of 40 subscription resources that may be applied to track COV subscriptions for change of value of any of the objects. Each subscription shall include the objectID, the last transmitted value, the remaining subscription lifetime in seconds, the subscriber process ID, a flag indicating whether confirmed or unconfirmed notifications should be used and the (network number, MAC address) of the subscriber.

APPENDIX C – BLUETOOTH

The IAQ-TEK Outdoor Air Volume Measuring System is offered with an optional Bluetooth module that provides wireless connectivity between the IAQ-TEK and configuration PC equipped with Bluetooth ver 4.2 or later. IAQ-TEK systems that are Bluetooth enabled have a -W suffix on the end of the model code which specifies the I/O module includes the optional Bluetooth module which is required for wireless communication.

Minimum Requirements for PC or Tablet

- Windows 11 Operating System
- Bluetooth Version 4.2 or later
- IAQ-TEK Insight Software Version 7.2.1.0 or later

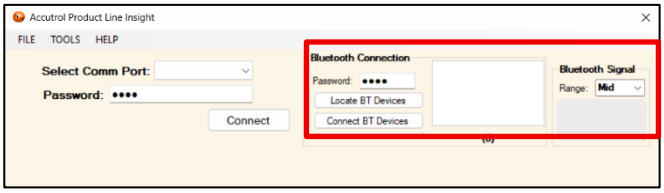
Note: *Bluetooth signals are influenced by environmental factors such as; distance between devices, RF interference caused by other devices, objects in the area, and building construction. Because the IAQ-TEK is typically installed in locations that have sheet metal duct work, metal trusses, ceiling grids, and concrete with metal mesh; Accutrol recommends technicians carry a long-range Bluetooth transceiver such as the AIRcable Host XR5 Bluetooth dongle which will provide superior performance over the PC's internal Bluetooth transceiver.*

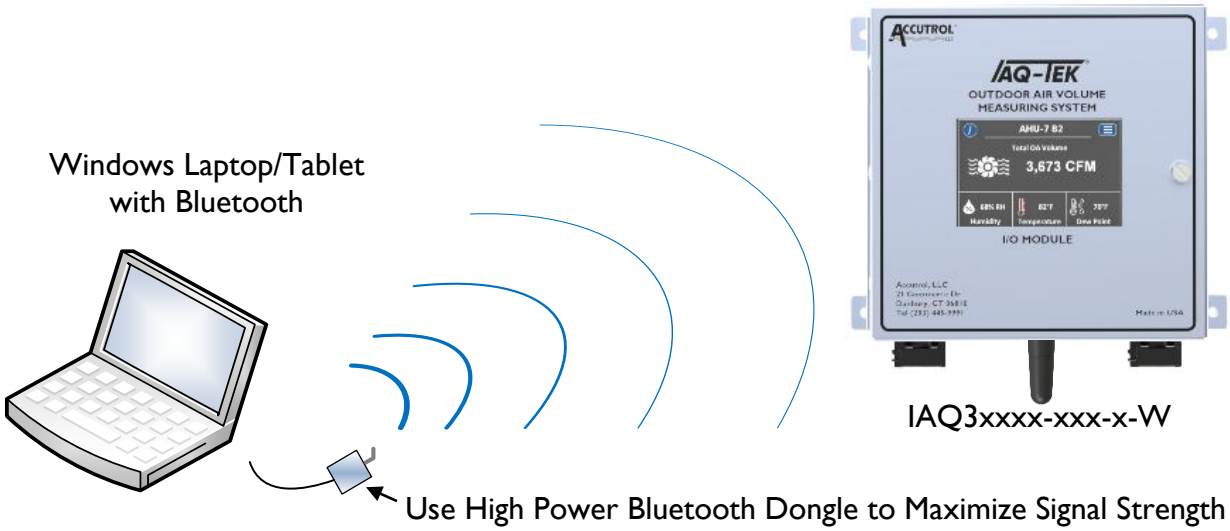
Note: *Do not attempt to upgrade the device firmware over the Bluetooth connection.*

To Connect to the IAQ-TEK with Bluetooth (-W option required)

Launch the IAQ-TEK Insight application and select "Locate BT Devices". Only Bluetooth enabled Accutrol devices within range will be discovered and listed by their TAG names. Double-click on the appropriate device to connect.

Note: *Changing the Tag name via Bluetooth will reset the Bluetooth Connection*





End of IAQ-TEK Installation and Operation Manual