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Technical Support:
Factory telephone support for all Triatek products is provided from 8:00AM-5:00PM EST Monday through Friday by calling 888-242-1922 or 770-242-1922. Product information is also available at www.triatek.com.

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Requirements to set up your Universal Valve Module (UVM) Configuration Software:

1. Link to UVM Configuration Tool file
2. jZip
3. Microsoft.Net
4. Internet connection (if you need to download Microsoft.Net)
5. USB-RS485
6. Visual Basic Power Pack 10

This manual will take you through the initial UVM Configuration Tool installation process, and then through each tab, where you will enter in data specific to your application.

Overview of Lin Module Interface

![Lin Module Interface Diagram]
Installation

1. Open the UVM folder and run the Setup.exe program. The program will first try to install VB Powerpack 10. If this fails to install, use the link below to manually install it (internet connection is required):

   http://go.microsoft.com/fwlink/?LinkID=145727&clcid=0x804

   The software utilizes the Microsoft.Net architecture, and if it is not installed on your computer, the setup program will instigate a download of Microsoft.Net and install it (internet connection is required).

2. When the Setup.exe program installation is complete the Triatek Configuration Program will run.

3. To use the software, you will need a USB-RS485 adaptor cable installed on the computer (Triatek part number 5-300102 or commercially, USB-RS485-WE-1800-BT).

4. Take note of the CommsPort to which the RS485 cable is installed. This can be done by going to Control Panel > Device Manager > Comm Ports. Pull the USB plug out to see which CommPort disappears, and then reappears when the USB is plugged in again.

5. Run the Configuration Program, and if any of the port(s) are not present, the associated port tab will be highlighted red (see Figure 3).

6. To manually change the RS485 CommsPort settings or the ProgrammerPort settings, click either the CommsPort, ProgrammerPort, PowerSupplyPort, OEMProgPort, or MeterPort option on the Main Menu. (see Figure 3).

7. Within the CommsPort dialogue box, select the communications port that the RS485 is connected to and set the Baud Rate to 2400. Click Set (see Figure 1).

   Note: The ProgrammerPort is for a USB connection to a MSP-GANG Programmer by Elprotronics. This programmer and connection is used to flash the MSP430 microprocessor with the UVM operating code. This is already done by the factory, but certain circumstances may require the module to be re-flashed to a later revision.

8. Select the appropriate CommsPort that the MSP-GANG Programmer is connected to. Set the Baud Rate to 115200 (see Figure 2). Click Set to use the selected settings, or Cancel to ignore use of this port (most cases). The other CommsPorts are relevant to factory calibration equipment and may be ignored.

Misc Tab

1. On the Misc Tab of the program (see Figure 3), set the address of the UVM module that you will be interacting with. Addresses 0 - 15 are derived from the DIP switches on the unit (see the UVM Installation Manual for DIP switch settings).

   There may also be an already-set internal soft address (from 16 – 255) that the unit will respond to as well. The units will be set to hardware address 0 when shipped from the factory.

2. Click the Get Revision button to confirm that Comms is present. The revision number will appear in the Misc Tab Module Revision box. Ideally, click the Get All Settings From Device to retrieve what is already set in the controller. This may take about 15 seconds to complete.
Figure 3. Main Menu / Misc Tab
3. A copy of these settings can be saved to your computer by clicking the Save Displayed Values to File button (see Figure 4).

**Note:** This will save the values shown in the fields on the configuration software, not what is in the UVM, unless the Get All Settings From Device button has been clicked (see Figure 4).

On the Misc Tab page, the serial number, module revision, and calibration date can be viewed.

The serial number and calibration date can be changed and programmed into the unit by clicking the Set Serial Number or Set Calibration Date buttons (these buttons are cropped from the Figure 4 screen shot).

The alternate address of the module can be set as well. The unit will respond to both the DIP switch set address and the software set alternate address. The DIP address can be used for initial setup and small clusters of UVMs. If more than 16 units are on the bus, use the software alternate address.

The Misc Tab also allows the user to read all the settings from the UVM with the Get All Settings From Device button, or write all relevant user settings to the device with the Write All Settings EXCEPT Factory Cal Settings to Device button. If the Write ALL Settings to Device button is used instead, all the settings, including the factory calibration settings will be over-written in the device. **The factory calibration data is specific to each board and should not be overwritten with values from another board.** Previously saved values can be re-loaded with the Load Values from File button, and values read from the UVM and present in the Configuration Tool can be saved with the Save Displayed Values to File button.

A typical sequence would be to connect a UVM, select Get All Settings From Device and then Save Displayed Values to File. This provides a backup copy of the current settings on the device prior to making any changes. A device can be restored to previous saved values by using Load Values from File and then Write All Settings Except Factory Cal Settings, or Write All Settings to Device.

**WARNING:** Take care when using Write All Settings to Device on a new device, as you may overwrite existing calibration information already in the new device.
User Settings Tab

The User Settings Tab (see Figure 5) page is the main tab for the user to configure settings for the UVM, depending on which mode of operation is required and what options are to be enabled.

Use the individual Set buttons for the specific information required to be loaded to the controller.

Note: There is unique factory calibration values already in the UVM for the AI and AO ports that should not be overwritten.

![Figure 5. User Settings Tab](image-url)
User Config Settings

The CFM/Press at 10V field (see Figure 5) sets the control signal and feedback signal scaling into and out of the UVM. If the UVM is configured to operate with a Venturi valve (most cases) then this value represents what CFM the 10V input and output signals represent.

For example, if a value of 1500 is entered, then a 10V signal applied to the IN connection specifies a CFM of 1500 CFM is requested, and a 10V signal from the Vo connection indicates the valve is providing 1500 CFM. This value is set initially by the factory and is matched to the size of the valve attached to the UVM. Typical values are:

- 8 in = 800
- 10 in = 1100
- 12 in = 1600
- 14 in = 2300

The FB Input Filter Factor is a filtering or dampening factor applied to the raw feedback signal from the position feedback sensor on the valve. The typical value is 3.

The SP Input Filter Factor is a filtering or dampening factor applied to the raw control signal applied to the IN connection of the UVM. It has been found that some third party controllers use a PWM method to produce their AO signals. This typically results in a signal that varies by up to 0.5V at 10KHz. The UVM is sensitive to this and results in the actuator jittering between various positions as it follows the (moving) input control signal. This value is typically 10-20, but can be higher (50 or more) for third party controllers with unsteady AO signals. Note that the higher this value, the less responsive the UVM is to sudden changes in the control signal.

The Gain PressSen and Offset PressSen fields are used to scale an optional external pressure sensor so that the sensors output voltage range converts to the appropriate pressure range on the UVM. The use of a pressure sensor as a DP monitor is only active when the Use Press Sens as DP selection is active or checked. The pressure sensor can be used to monitor the DP pressure across the valve and give a 0 CFM output voltage if the pressure falls below the value set in the No Flow Press field (typically 0.6inWg).

When using an analog pressure sensor with a voltage output connected to the Sens_In pin (see UVM Installation Manual), the following scaling should be used:

\[
\text{Gain} = \left(\frac{\text{Ph} - \text{Pl}}{\text{Vh} - \text{Vl}}\right) \times \frac{5}{4095} \\
\text{Offset} = \left(\frac{4095}{5}\right) \times \left(\frac{\text{Vh} - \left(\frac{\text{Vh} - \text{Vi}}{\text{Ph} - \text{Pl}}\right)\times\text{Gain}}\right)
\]

Where Vh is the sensor voltage at the high pressure Ph, and Vi is the low voltage at the low pressure Pl.

Clicking the Calc button (see Figure 5) allows this calculation to be done automatically.

This brings up a calculation dialog (see Figure 6) where the sensor pressure range and output voltages can be entered. The Compute button calculates the Gain and Offset and enters these values in the Gain PressSens and Offset PressSens boxes. If these values are correct, click the Set PressSens Gain and Set PressSens Offset button to send the values to the controller.

Clicking the Calc button (see Figure 5) allows this calculation to be done automatically.

This brings up a calculation dialog (see Figure 6) where the sensor pressure range and output voltages can be entered. The Compute button calculates the Gain and Offset and enters these values in the Gain PressSens and Offset PressSens boxes. If these values are correct, click the Set PressSens Gain and Set PressSens Offset button to send the values to the controller.

![Press Sens Calc dialogue box](Figure 6. Press Sens Calc dialogue box)
The pressure, in inWg, below which the flow in the valve is deemed to be invalid, and should produce a 0 CFM flow feedback signal, is entered in the No Flow Press field (see Figure 5). For Triatek standard flow valves, this value should be 0.6.

The Flow Sw Delay setting (see Figure 5) is used in instances when a DP switch is used with the valve to detect when there is insufficient DP across the valve to produce a reliable CFM. The delay value is in seconds and is the time between when the DP switch detects a low flow and when the UVM zeros out the CFM feedback signal. This value is only relevant when the Use DI as DP or Use Press Sens as DP selection is active or checked.

The Flt Stroke Time (see Figure 5) is for instances when a “floating” (drive up, drive down) actuator is used with the UVM. The actuator counter clockwise (CCW) and clockwise (CW) inputs are connected to the CCW and CW outputs of the UVM. The actuator common and the UVM COM are connected to the “active” and “neutral” respectively of a 24VAC supply. The Float DO is DP Out selection should be un-selected. The Flt Stroke Time is the stroke time of the floating actuator, typically 60 or 90 seconds. It should be noted that floating actuators are not very accurate for using a stroke time to determine position, and as such actual requested CFM and achieved CFM may not match.

The floating actuator can also be used with the feedback sensor, where the valve position is determined entirely by the feedback value and not the stroke time of the actuator. To enable this mode of operation, check the FB (not Time) Float Act selection.

The Float Dead Band (see Figure 5) is the dead band associated with the floating actuator positioning. This value is requested CFM change before the actuator moves to new position.

When the UVM is used with a VAV box, the K factor for the box and the area of the VAV Box are set in the VAV Box K Factor (see Figure 5) and VAV Box Area fields. The use of a UVM with a VAV box is enabled by setting the Unit is VAV Box check box. The pressure sensor input on the UVM is used to provide the flow pressure from the VAV box flow probe. Again, the Gain PressSen and Offset PressSen fields need to be set to calibrate the used pressure sensor.

See the UVM Installation Manual on how to wire the pressure sensor to the UVM. The Use Press Sens as DP check box needs to be un-selected. The UVM is not designed to autonomously control a VAV box. It will accept a 0 - 10V control signal from an OEM controller and interpret this as a 0 - 100% position signal for the actuator, and position the actuator as such (CFM (not Pos) Input should be un-selected).

The UVM will use the flow pressure sensor to provide a 0 – 10V as 0 – xxx CFM feedback signal. It is up to the OEM controller to modulate the actuator and monitor the CFM signal to obtain the desired CFM value. Dynamic pressure, velocity, and flow values can be observed on the Dynamic Values Tab.

Controller State Settings

This area (see Figure 5) selects the various operational states of the UVM. Within this group are Permanent, Non-Permanent, and Status states.

The Permanent settings are settings that can be set/un-set in the UVM and are stored in EEPROM. They retain their state across power losses.

The Non-Permanent states can be set from the tool, but reset back to un-selected when the power to UVM is cycled. They are typically used for overriding and testing.

The Status states are advisory states and are used for debugging.

Permanents

The Use AI Setpoint state (see Figure 5) selects whether the CFM/Positional Setpoint is derived from the Analog IN connection or from a value set by the Configuration Tool. When selected, the value is derived from the appropriately scaled Analog IN value. This would be the typical mode of operation. When de-selected, the setpoint value can be set via the Setpoint field on the Dynamic Values Tab. The IN voltage is ignored in this case.

The Use Press Sens as DP state (see Figure 5) selects whether a connected pressure sensor (see UVM Installation Manual for sensor wiring) is to be used to measure the DP across the valve and determine when the DP is invalid and as such zero the CFM feedback signal. If this state is enabled, then the Gain PressSen, Offset PressSen, and No Flow Press values also need to be valid and set. Use DI as DP; Use

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Digital Sensor, and Unit is VAV Box need to be un-selected. If DP monitoring is required, but a DP switch is to be used in lieu of a pressure sensor, then the Use DI as DP (see Figure 5) check box should be selected and the Use Press Sens as DP should be un-selected. In this case a suitably calibrated DP switch would monitor the pressure across the valve and make/break contact when the pressure falls below the specified value.

The normally closed / normally open (NC / NO) mode of operation for the switch can be set with the state of the DP Switch NC. When selected, it is inferred that the DP switch is normally closed and opened when the pressure falls below the specified value.

The Float DO is DP Out (see Figure 5) setting is used to allow the pressure sensor, when used to monitor DP, or the DP sensor state to be reported. This would typically be used to create a pseudo DP switch with a pressure sensor.

Here the pressure sensor and the UVM pressure settings would allow the DO act as the output of a DP switch for use on other controllers to 0 the CFM reading. When this is selected, the floating actuator output control cannot be used. As it would be logical to use the pressure sensor for measuring the valve DP, the Use Press Sens as DP check box should be selected.

The Use Digital Sensor check box will enable a specific digital sensor to be used in lieu of the analog pressure sensor. The digital sensor uses an I2C communications media to talk to the UVM. Normally this setting should be left un-selected. This is a legacy setting and may be removed in future revisions.

The Unit is VAV Box check box is used to set the UVM mode to compute CFM from a VAV box flow probe instead of using a Venturi valve lookup curve. The Gain PressSen and Offset PressSen fields need to be set in order to calibrate the used pressure sensor, and the VAV Box K Factor and VAV Box Area settings need to be accurately set for proper computation of the VAV box air flow.

Use Press Sens as DP typically needs to be un-selected. The sensor pressure, air velocity, and air flow can be viewed under the Dynamic Values Tab.

The Io Used for Min Press setting (see Figure 5) is applicable to UVM revisions (S series) that provide for networked UVM units. This may read as being set, but can be ignored. When selected, and if this UVM is a primary, it will monitor the networked UVM’s DP pressure values (they need to use pressure sensors) and determine the minimum pressure value from all the units.

This scaled minimum pressure value will be output on the Io connection on the UVM. This infers that the actuator cannot be used on this UVM. The minimum pressure value can be used by OEM control systems to regulate the fan system to a value where the lowest valve DP is just above the minimum specified DP value for valid operation.

The normally closed / normally open (NC / NO) mode of operation for the switch can be set with the state of the DP Switch NC. When selected, it is inferred that the DP switch is normally closed and opened when the pressure falls below the specified value.

The FB (not time) Float Act setting applies to when the UVM is using a floating actuator on the CCW and CW connections rather than an analog actuator on the Io connector. When not selected, the floating actuator will determine position purely by keeping track of run time in the up or down direction. For example, 50% position would be an accumulated +UP, -DOWN time equal to half the Flt Stroke Time setting. A floating actuator does not have high positional accuracy as it can slip depending on load. By setting this check box, the actuator is positioned only by use of the UVM / Valve FB sensor reading (via the CFM Table), and not by running times.

The Use DIP Switches check box (see Figure 5), allows the DIP Switch Equivalents settings to either be derived from the DIP switches, or by previously set values by the Configuration Tool. If this check box is selected, then the CFM (not Pos) Output, CFM (not Pos) Input and Reverse Acting (2) selections are derived from the DIP switches 5, 6 and 7 settings. The settings by the Configuration Tool are ignored. If this box is un-selected, then the DIP switches 5, 6, and 7 are ignored and the CFM (not Pos) Output, CFM (not Pos) Input and Reverse Acting (2) settings are set by the Configuration Tool.

DIP Switch Equivalents

The CFM (not Pos) Output check box selects whether the Vo output represents the valve / VAV box CFM determined by the UVM or the valve position determined by the UVM.

The output Vo is obtained from the feedback sensor signal in the non-
VAV case, or obtained from the flow pressure sensor in the VAV case. In the checked state, the feedback signal is first converted to a position and then translated through the CFM curve to a CFM value for the non-VAV box case.

With the VAV, the pressure signal is converted to velocity with the $K \sqrt{P}$ math, and applied to the box area to get flow. This value is then scaled based on the CFM/Press at 10V ranging and output on Vo. If this selection is un-selected, then the signal from the feedback sensor is converted to a position (0 -100%) as before, but this is scaled 0 -100% = 0 -10V and applied to the Vo output. The position valve is not applicable to the VAV box case.

The CFM (not Pos) Input check box selects what the 0 -10V signal on the IN input represents. If the box is un-checked, the voltage on the IN connection represents a 0 – 100% positional percentage setpoint for the 0 -10V signal. If 5V were applied, the valve actuator would move to the 50% position.

If the box is checked, then the input voltage is interpreted as a CFM request. The scaling of this interpretation is defined by the CFM/Press at 10V setting.

If, for this instance, this setting was 1500, then 0V in is 0 CFM and 10V is 1500 CFM. The UVM will move the actuator to try to achieve 1500 CFM. The CFM setting is not relevant when the UVM is being used in the VAV mode. This setting should be un-selected for VAV mode use.

The Reverse Acting(2) check box is used to select the Normal/Reverse mode of operation of the UVM. In UVM revisions before 0.7x, checking this box would invert the Io signal to the actuator. In subsequent revisions, checking this box/state inverted both the input SP signal on IN and the actuator output signal on Io.

In this case the IN signal takes 0 -10V to be xxx CFM - 0 CFM. Reverse acting is typically used for exhaust and hood valves. This should be left un-checked for VAV box use. See the UVM Installation Manual for wiring and Normal/Reverse setting recommendations. See Figure 7 for Normal and Reverse modes of operation switch/state settings.

---

**Figure 7. Normal/Reverse settings**
**Non-Permanent**

The Non-Permanent values can be set and cleared with the UVM Configuration Tool, and the UVM will react to their selections. These settings do not retain their selected state when power is removed and re-applied. On power up, they will be inactive/de-selected.

The *Override AO 1 (Vo)* check box is used to disconnect the Vo output from the control logic, and allow the user to set a Vo control value directly. This control is done through the *FeedBack Output field* and *Set Feedback Output Raw Value* button on the Dynamic Values Tab.

To directly control the Vo signal, check the *Override AO 1 (Vo)* check box, then go to the Dynamic Values Tab. On this tab, enter a desired value between 0 and 1000, where 0 is 0 Volts and 1000 is 10.00 Volts, in the *FeedBack Output field*. Click the *Set Feedback Output Raw Value* button to write the value to the AO 1 (Vo) signal.

The *Override AO 2 (Act)* check box is used to disconnect the actuator Io output from the control logic, and allow the Io to be commanded directly. The control is done through the *Actuator Output field* and the *Set Actuator Raw Output Value* button on the Dynamic Values Tab.

To directly control the Io signal, select the *Override AO 2 (Io)* check box, then go to the Dynamic Values Tab. On this tab, enter a desired value between 0 and 1000, where 0 is 4mA (0%) and 1000 is 20mA (100%), in the *Actuator Output field*. Click the *Set Actuator Output Raw Value* button to write the value to the AO 2 (Io) signal.

**CW DO**

The *CW DO* group is used to directly control the CW digital output on the UVM. To override the CW output, check the *Override DO Up* check box. Select the state that the DO should be by clicking either the ON or OFF radio button associated with the CW DO group. Note that the DO is equivalent to relay contacts but in an electronic package. When ON, the output will short to the COM pin on the UVM. The DO can switch either AC or DC signals.

**CCW DO**

The *CCW DO* group is used to directly control the CCW digital (grounding) output on the UVM. To override the CCW output, check the *Override DO Dwn* check box. Select the state that the DO should be by clicking either the ON or OFF radio button associated with the CCW DO group. Note that the DO is equivalent to relay contacts but in an electronic package. When ON, the output will short to the COM pin on the UVM. The DO can switch either AC or DC signals.

**Status**

The *DI State* check box is used for status indication only. Checking the box will have no effect on the UVM. When the *Get All State Settings* button is clicked, the Config Tool will read through all the states that are set and un-set in the UVM. The state of the UVM DI_1 input will be reflected in the final state of this check box.

The *Digital Sensor OK* check box is used for indicating the status of the digital sensor when use of the digital sensor is enabled with the *Use Digital Sensor* check box in the Permanents group. When the *Get All State Settings* button is clicked, the Config Tool will read through all the states that are set and unset in the UVM. The *State of the Digital Sensor* operation will be reflected in the final state of this check box.

**CFM Table Tab**

The CFM Table Tab page (see Figure 8) allows the valve flow curve and the feedback flow curve to be entered and/or changed. The table is organized as three columns, one for actuator position, one for feedback position and the last one for valve CFM.

At the factory, the curve is populated with the actuator position values and the CFM values. When the UVM is attached to the valve and specifically to the feedback sensor, a calibration process is carried out and the feedback entries in the table are placed.

The actuator and feedback entries are entered as a whole number being 10 times the positional value. For instance, a position value of 40.5% would be entered as 405.

The feedback curve is required, as the relationship between the actuator position and the feedback sensor position through the valve linkages is not linear (deviates about 5% in the middle of the curve).

The automatic feedback calibration process through the UVM tool creates the correct feedback values to compensate and correct for this
non-linearity. Typically the actuator and feedback sensor and CFM data would already be entered at the factory for a UVM supplied with a valve.

For units supplied without a valve, the installer can enter the position and CFM values via the tool. Typically they come from the curve supplied with the valve, or from live position / CFM measurements done on site.

Next, enter the positional values and the CFM values in the table and click the Set CFM Entries button. Check that the Actuator Stroke Time value is entered to match the time the actuator takes to travel from 0 to 100%. For a Triatek actuator use 4 seconds. Ensure that the Auto Populate FB Entries check box is checked.

This ensures that the tool not only computes the gain and offset for the feedback sensor, but also enters the corrected position values for each of the defined actuator positions. Before proceeding with the feedback calibration, ensure that the Lo Field Cal and Hi Field Cal entries are acceptable. These two values define the low and high travel points at which to obtain the information used to compute the gain and offset for the feedback curve. The 0 and 100% positions are not used as these points tend not to be on the linear part of the feedback curve.

The feedback calibration process will take an A/D reading at these two positions both from the up-going and down-going direction and take the average. This is to account for any hysteresis in the feedback sensor reading.

There is also a checkbox Do Hysteresis averaging on each curve point that enables the average up and down reading on each of the curves actuator positions for the feedback sensor. This improves accuracy, but will take longer to execute.

With the feedback sensor properly attached and the actuator position curve downloaded to the controller, click the Calibrate FB Sensor button.

The tool will automatically position the actuator at the Hi Field Cal and Lo Field Cal positions, approaching from both directions and getting the average A/D reading from which to compute the gain and offset for the feedback sensor.

It will then position the actuator at each of the position points in the table and take a corresponding reading from the sensor. If the Hysteresis box is checked, it will take readings of the position, approaching from both directions and taking the average. It will convert that into a feedback sensor position and enter it in the table. When complete, the Set Feedback Entries button will become enabled. Click this button to download the values to the controller.

This procedure is relevant to the Triatek style installation where the valve is calibrated to the actuator position and CFM value. With other valve styles, typically in retrofit situations, where the valve information is not from Triatek, the valve may contain a feedback position, or feedback voltages and CFM values. The tool has the provision to open a dialog where feedback voltages and CFM values can be entered. This is done with the Phoenix Valve Volt to Pos button. Click this to bring up the entry chart.

Figure 8. CFM Table Tab
OEM OEM Voltage – CFM Entry

Enter the CFM (Low to High) and the voltages from the valve label. Enter the Min and Max voltages. Click the Compute button, and the position and CFM values will be automatically entered in the Position – Feedback – CFM Table on the main screen. Close the OEM Voltage dialog box if desired.

Updated Position – CFM Entry

Select the CFM Table Tab and click the Set CFM Entries and Set Feedback Entries buttons to download the values to the controller.

As the CFMs are accurate to the feedback sensor position and not the actuator position, calibration of the feedback will be done to the actuator. In this case check the This is Phoenix Valve Data check box. Ensure that the Auto Populate FB Entries check box is checked.

This ensures that the tool not only computes the gain and offset for the feedback sensor, but that it also enters the corrected position values for each of the defined feedback positions.

Check that the Actuator Stroke Time value is correctly set and click the Calibrate FB Sensor button. Wait while the valve moves to 100%, then 0% and then to each of the defined feedback positions.

Dynamic Values Tab

The Dynamic Values Tab (see Figure 12) provides a set of buttons and fields to access dynamic values within the controller.

This is typically used for fault finding and performance debugging. Output override values can also be set from here. If so selected, a "soft" setpoint can also be entered here.
Values displayed include calculated values such as CFM, position, pressure, etc., and also raw A/D values from the AI inputs. The values do not automatically update, they need to have their associated Get XX button clicked to force a value to be read.

The SetPoint entry displays the current converted setpoint for the actuator as a (times 10) percentage value. If the input, as defined under the User Settings Tab is set to CFM (not Pos) Input = checked, then the incoming voltage is interpreted as a CFM and parsed through the valve curve as a CFM to position.

The resulting percentage (times 10) position is displayed in the SetPoint field when the Get Setpoint button is pushed. Depending on the state of the CFM (not Pos) Input check box, a CFM or position value can be entered into the Setpoint field, and passed to the controller when the Set Setpoint button is pushed.

The passed value will only have effect if the Use AI Setpoint on the User Settings Tab is un-checked. If it is checked, the UVM will use the voltage on the IN input as the CFM/Position setpoint. This field can be used for operational fault finding without having to have a variable voltage source.

Figure 12. Dynamic Values Tab
The FeedBack field is used to show the position of the feedback sensor as a percentage (by 10) value. The value will only be accurate if the feedback sensor has been calibrated (at the factory or by the user). In normal operation, this value should be close to the Get SetPoint value.

The Pressure value displays the converted value from the pressure input connection. This value is only accurate when the pressure input has been calibrated and the Gain PressSen and Offset PressSen on the User Settings Tab have been calculated and sent to the UVM board. See the User Settings Tab section (page 7) of this document as to how to calculate the gain and offset for the pressure sensor. Click the Get Pressure button to read the current pressure.

The VAV Velocity field shows the calculated FPM from the velocity pressure as derived from the pressure input. The pressure sensor should be previously setup and calibrated for this to be accurate.

This value shows 0 if the Unit is VAV Box is un-checked. Also the VAV Box K Factor entry needs to have a valid entry (downloaded to the UVM) for the specific flow probe being used on the VAV box.

The UVM calculates the velocity value by getting the flow pressure from the pressure input, square rooting it and multiplying it by the K factor (if the Unit is VAV Box is checked). Click the Get VAV Velocity button to read the current VAV velocity.

The This CFM value is the current CFM being derived in this UVM. The value could either be the CFM computed from the feedback sensor in conjunction with the valve curve, or the CFM computed from the VAV velocity times the VAV Box Area (if the Unit is VAV Box is checked). Click the Get Current CFM button to read the current CFM.

The Summed CFM value is the value of CFMs of other UVMs which are communication replicas of this unit. The primary UVM will request CFM values from up to 16 other (replica) UVMs and sum those values together.

It will also include the CFM value of the primary (this) UVM. If this UVM is not part of a valve or VAV box, care should be taken to ensure that a 0 local CFM value is generated internally for This CFM. This function is only applicable to a special summing revision of the UVM code, and will typically not be the standard code release. Click the Get Summed CFM button to read the current total system CFM.

The Float Pos value is the positional (computed) value of a floating actuator, if attached. The CW and CCW outputs will drive a floating actuator open and closed based on the Flt Stroke Time value under the User Settings Tab.

The UVM will compute the effective position from this stroke time and the time the actuator has been running open or closed. Floating actuators are normally not very accurate, and as such this value may not match the actual actuator position. Click the Get Time Float Pos button to read the current floating actuator assumed position.

The Raw AI 1 (SP) fields display information as to the raw value on the IN (SetPoint) analog input. The first field is the actual A/D count from the IN analog input. The second field is the input value as a percentage of the total possible input range.

Typically the input value will be between 0 and 4095. The second field is the input A/D as a percentage of 4095. The third field is (4095 – A/D input) as a percentage of 4095. The values can be used as a rough guide as to where the input signal is relative to the full range.

The Raw AI 0 (Fb) fields display information as to the raw value on the feedback sensor analog input. The first field is the actual A/D count from the feedback analog input. The second field is the input value as a percentage of the total possible input range.

Unlike the IN signal which goes from 0 -10V (0 – 4095) during normal operation, the feedback signal may use only a portion of this range depending on where the feedback sensor is positioned and what angular range the actuator uses on the valve.

The Raw AI 2 (Press) fields display information as to the raw value on the analog sensor (pressure) analog input.

The first field is the actual A/D count from the press sensor analog input. The second field is the input value as a percentage of the total possible input range.
Typically the input value will be between 0 and 4095. The second field is the input A/D as a percentage of 4095. The third field is \((4095 - \text{A/D input})\) as a percentage of 4095. The values can be used as a rough guide as to where the input signal is relative to the full range. This input is used as the raw input prior to scaling of an analog pressure sensor.

Each of the input A/D count sections have a voltage field that indicates the approximate voltage at the input based on the A/D and the calibration factors on the Factory Cal page.

The FeedBack Output field is used to check or control (when overridden) the Vo signal that is used as the 0 -10V feedback signal to the third party controller. Clicking the Get Feedback Output Raw Value button will return the raw value \((0 - 4095)\) being sent to the D/A for the Vo channel. If the Vo channel is overridden by checking the Override AO 1 (Vo) on the User Settings Tab, the output on Vo can be set by the user (for debug). Enter a value between 0 and 1000 (100.0%) in the feedback text box and click Set Feedback Output Override Value button so that the Vo output goes to a value between 0 and 10V.

The Actuator Output field is used to check or control (when overridden) the Io signal that is used as the 4 -20mA actuator control signal. Clicking the Get Actuator Output Raw Value button will return the raw value \((0 - 4095)\) being sent to the D/A for the Io channel. If the Io channel is overridden by checking the Override AO 2 (Act) on the User Settings Tab, the output on Io can be set by the user (for debug). Enter a value between 0 and 1000 (100.0%) in the Act text box and click Set Actuator Output Override Value button so that the Io output goes to a value between 4 and 20mA.

The two output sections also have a voltage field that show the approximate voltage out based on the control value and calibration factors on the Factory Cal section.

Factory Config Settings Tab

See Figure 13.

![Figure 13. Factory Config Settings Tab](image-url)

Due to continuous improvement, Triatek reserves the right to change product specifications without notice.
Internal Configuration Settings

This tab and the fields under it are for use by the factory to program and calibrate the AI and AO channels. It contains the gain and offset settings for each of the channels. **These values should not be adjusted unless instructed by Triatek.**

The entries show a value as obtained during factory calibration and an acceptable range for the value. If the value is within range it will have a yellow background. If it is out of range, then the background will be red.

In some instances the user may adjust these to correct any voltage errors that there may be. Instructions for this modification are included in a “Procedure to Check I_O on a UVM Board” document. (See Figure 14).

The **Auto Calibrate** button is used by the factory to automatically adjust the gain and offset values for each of the analog channels during calibration. This process requires specialized test equipment to operate correctly.

Device Programming

This field is used to load new firmware into the UVM controller. It requires specialized programming equipment to operate correctly. **This should only be used under instruction from Triatek.**

Calibration Import Tab

See Figure 15.

Module Calibration Info

This tab and fields are used for factory setup of the UVM. It allows the importation of the valve curves and valve data for inclusion in the UVM storage and for creating valve summary labeling. There is no user relevant fields on this tab, and as such it **should not be accessed without instruction from Triatek.** Calibration of the feedback sensor can be achieved from the CFM Table Tab.
Figure 15. Calibration Import Tab
Headquartered in Norcross, Georgia, Triatek has been on the forefront of designing and manufacturing innovative airflow solutions for critical environments since 1985. Triatek provides complete end-to-end solutions for healthcare facilities and laboratories including Venturi valves, room pressure controllers, fume hood controllers, monitors, sensors, actuators, and more all designed to seamlessly integrate into a facility’s building automation system.

Triatek’s customer service is unparalleled. Our product support system includes on-site installations, phone support, repairs, calibrations, and in-depth training sessions.

From our knowledgeable engineers and sales team to our talented field technicians, Triatek goes above and beyond to ensure our products are installed correctly and our customers’ critical environments are working properly.