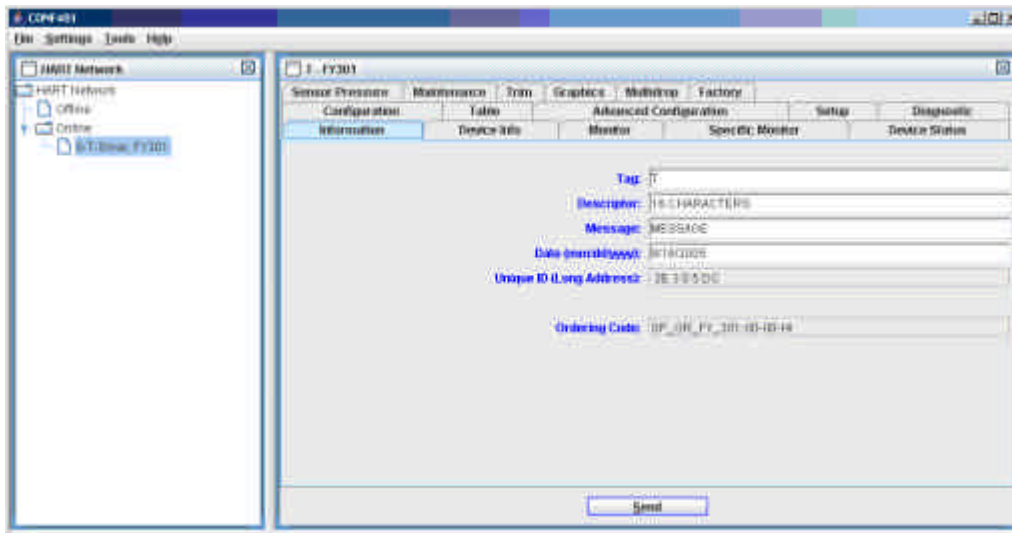


## FY301 integration in CONF401

The FY301 smart control valve positioner is supported in the CONF401 software. The user interface is consistent with other devices managed from the same tool.

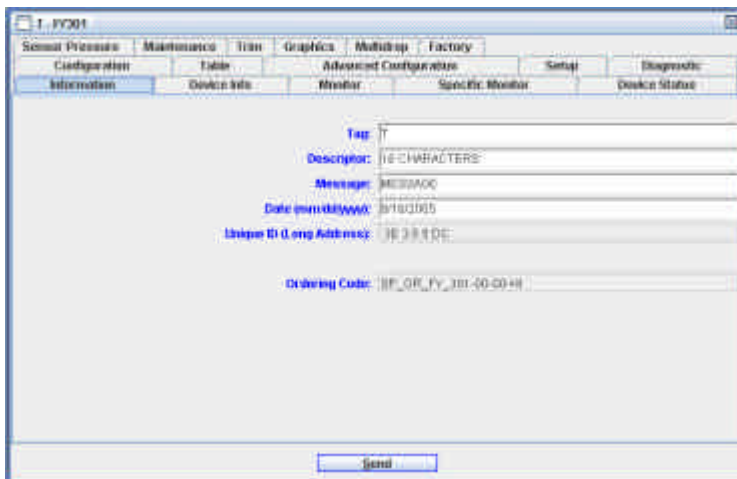


The CONF401 software communicates with FY301 using the HART protocol through a HART interface such as HI311 or HI321 and enables configuration, condition monitoring, diagnostics, and monitoring of operation. It is possible to obtain the information needed to spot problems before they affect the process and determine which control valves need to be rebuilt during the next turnaround.

Servo tuning and advanced setup, maintenance, diagnostics, identification, as well as communication management of FY301 can all be done from the CONF401 software. The CONF401 application makes it possible to quickly change the FY301 configuration during commissioning.

### Information

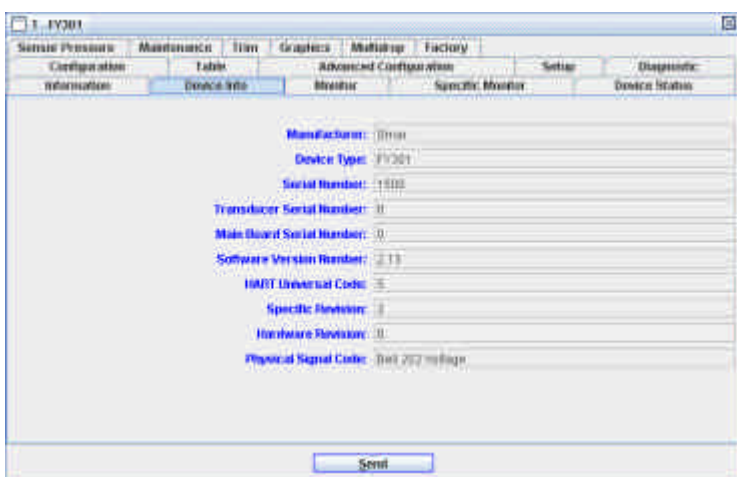
It is possible to retrieve all the identification information from the FY301, eliminating the need to manually "ring-out" the device/wiring during commissioning. This can significantly reduce the commissioning time for a plant having many valves. An 8 character tag, for example "FCV-320", and useful data can be stored, including complete model number, a 16 character application descriptor for example "choke valve SC2", a 32 character message for example "open bypass before stroking" plus a date, which could indicate purchase, last maintenance, or next maintenance etc.



HART specific information is included as well.

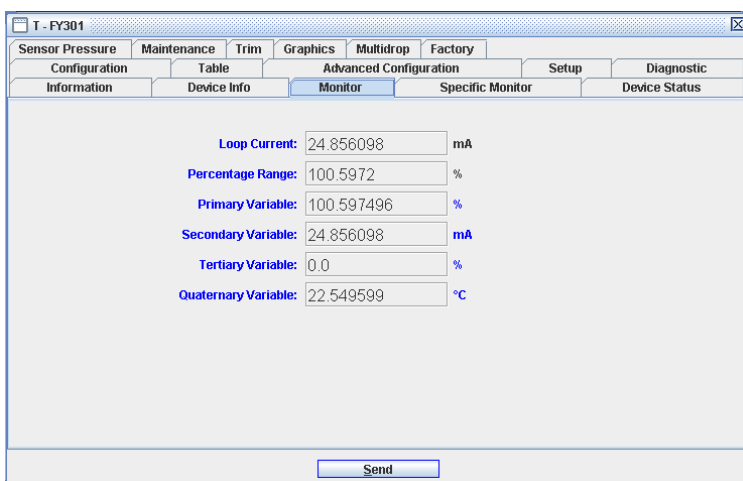
## Device Information

Apart from basic information such as manufacturer and device type, the page includes useful information such as hardware revision, as well as serial numbers for the output transducer module, the main circuit board, as well as for the complete FY301 assembly.



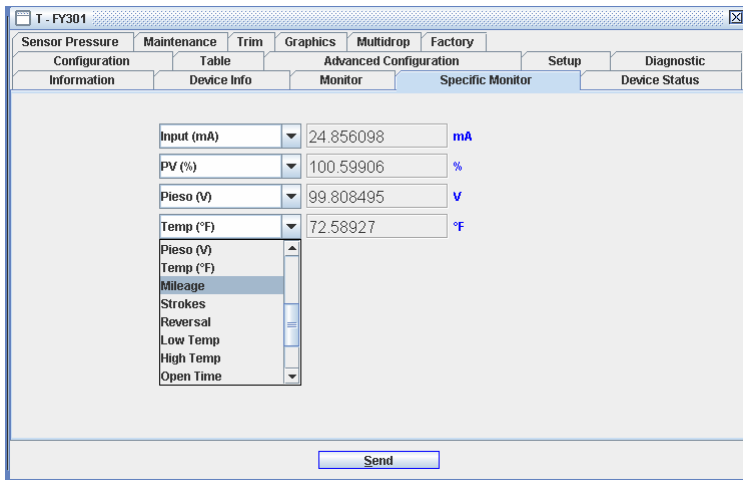
## Monitoring

CONF401 allows online monitoring of the FY301 operation. It is possible to see loop current, desired valve position, and ambient temperature etc.



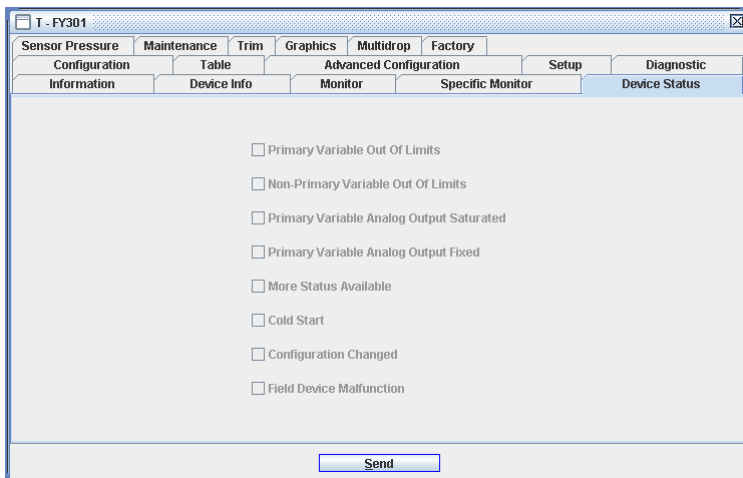
## Special Monitoring

It is also possible to monitor other parameters online such as actual valve position, deviation, supply pressure, actuator pressures, and drive signal etc.



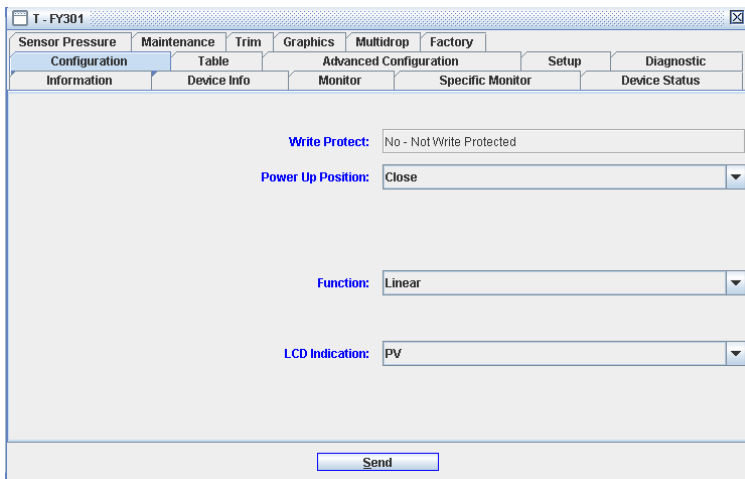
## Device Status

Using the CONF401 software it is easy to see the status of FY301. The status tab includes generic status such as device malfunction, configuration changed flag, and cold start (indicating if power was lost) etc.



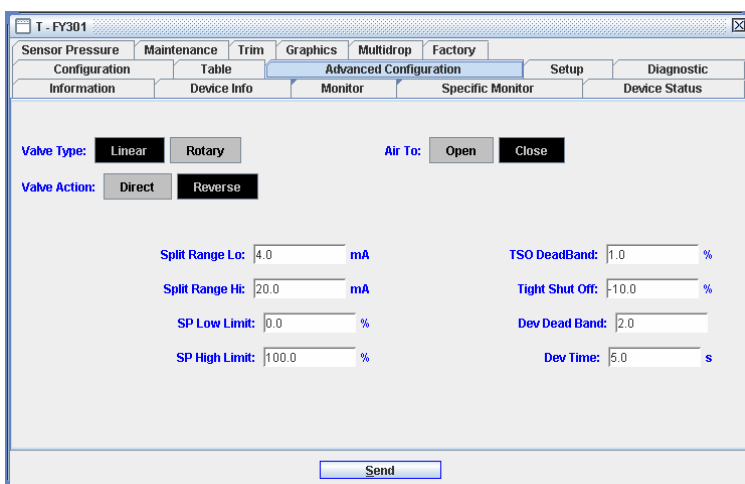
## Basic Configuration

It is possible to see the write protection status (if the jumper in the FY301 has enabled or disabled writes) to determine if the FY301 can be configured in the first place. It is also possible to configure what is shown in the local indicator of the FY301, such as desired valve position or actual valve position. The configuration tab also includes applied flow characterization ("software cam") such as linear, equal-percentage, or quick-opening.



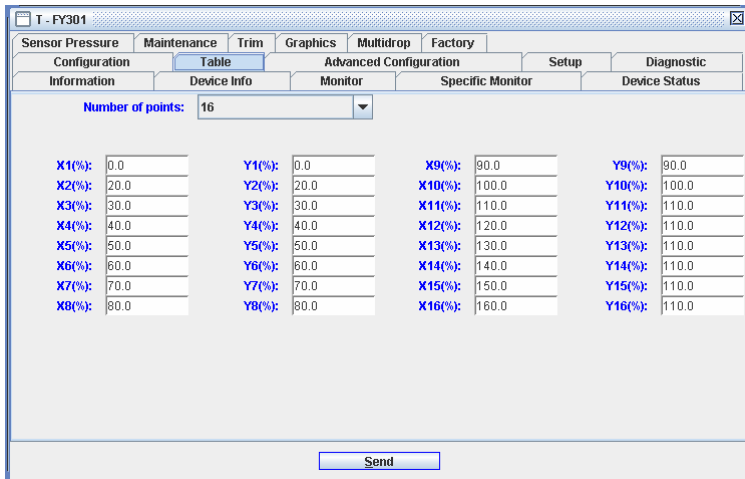
## Advanced Configuration

Much as either linear or rotary can be configured. The input range can also be adjusted allowing for split-range operation. It is possible to set direct/reverse valve action and actuator as air to open/close. Additionally it is possible to configure setpoint limits to prevent a valve from fully opening and fully closing. Lastly, Tight Shut-Off (TSO) can be set to ensure that actuator applies full force to ensure firm seating when closed, particularly important for valves requiring extra torque to close tightly. The TSO dead-band prevents "chattering" when the desired valve position is close to the TSO point.



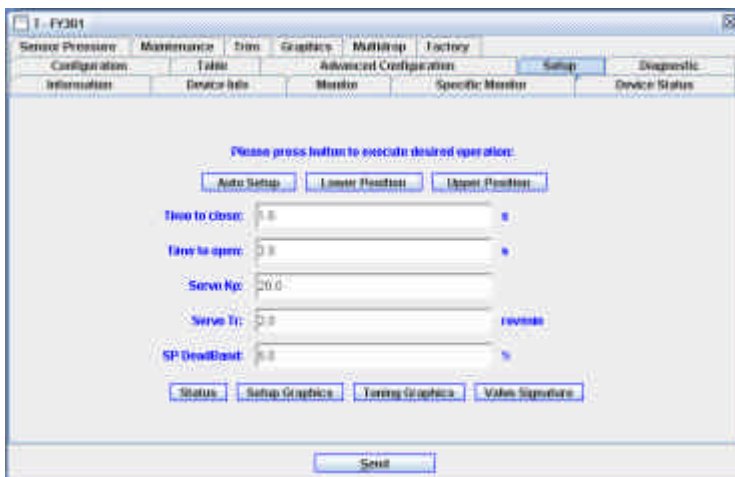
## Custom Applied Flow Characterization

It is also possible to create a custom applied flow characterization by building a table of up to 16 points of percent input vs. flow.



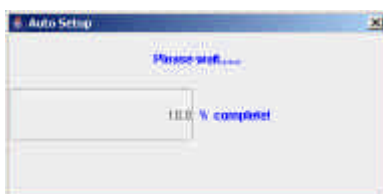
## Setup

The setup tab permits position calibration and tuning. Position calibration can be done automatically or manually. Servo tuning including gain, reset, as well as opening and closing time can be set. The setpoint dead-band sets how big the deviation must be for output action to take place. This can be used to reduce unnecessary valve movement thus reducing wear-and-tear as well as air consumption.



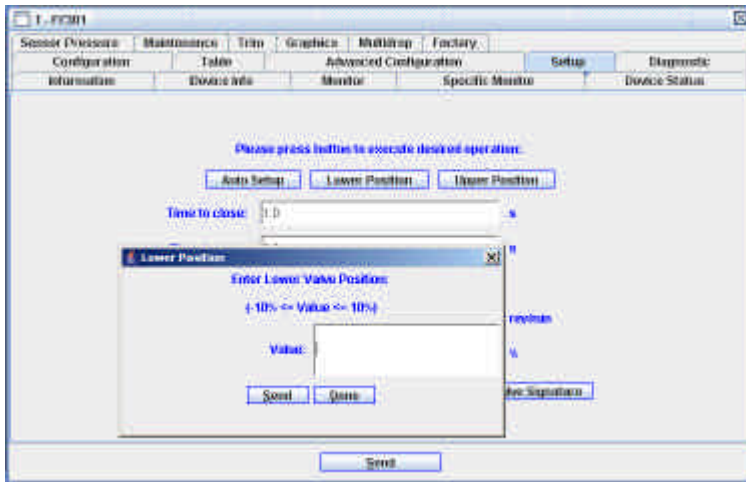
### Automatic Setup

The setup tab allows starting of the automatic calibration procedure for the actual valve position feedback sensor. During this automatic process, which usually takes a minute or two, it is possible to see the progress online.



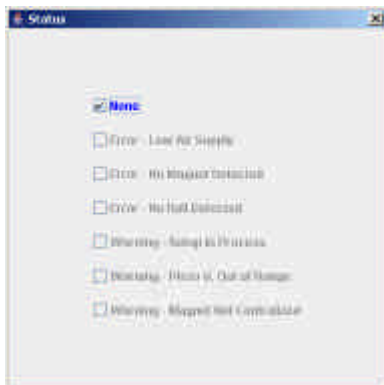
### Manual Setup

The setup tab also allows manual calibration procedure for the actual valve position feedback sensor at the open and closed positions.



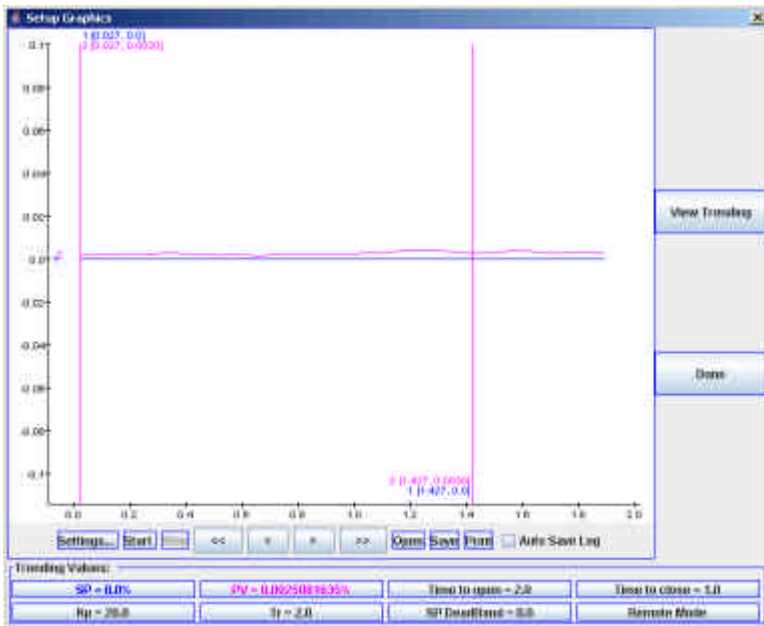
### Setup Status

If the automatic setup procedure for valve position feedback sensor calibration fails, the setup status can be used to diagnose the problem. Probable causes indicated include insufficient supply pressure, magnet missing or misaligned, position sensor failure, and piezo base out of calibration. This makes it easier to correct the problem and get the valve up and operating faster.



### Trend

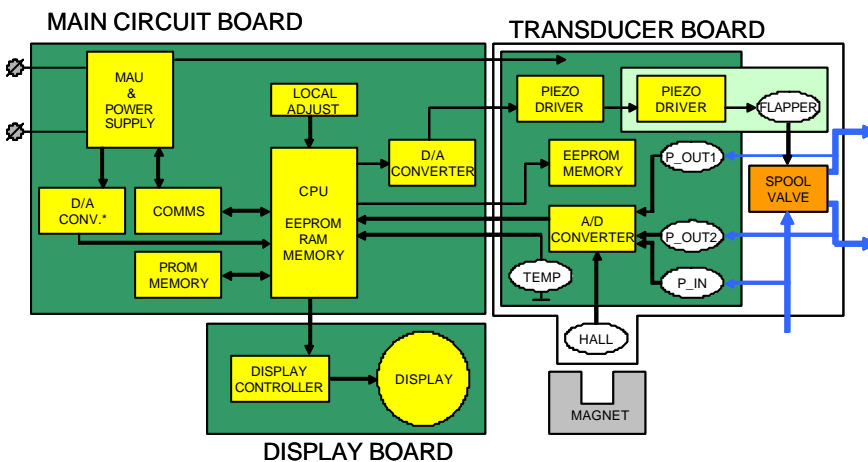
A graphical trend of up to four simultaneous variables can be displayed. For example, desired valve position, actual valve position, drive signal, and actuator pressure. The trend chart allows detection of slow response or oscillation as a result of poor tuning or setup. The FY301 can then be tuned accordingly.



It is possible to change the default scale in order to zoom in on an area of interest. It is possible to save the plot as a file. A saved plot can be opened. It is possible to overlay two plots to compare current characteristics with a past benchmark to detect change in dynamics which is a leading indicator of wear and fouling.

## Valve Performance Analysis

If the FY301 is fitted with the /K1 option for pressure sensors for advanced diagnostics, it is possible to see the pressure for pneumatic supply and in the high and low chambers of the actuator. This can be used to detect loss of supply air or clogging of the air filters as well as leaks or broken diaphragm.

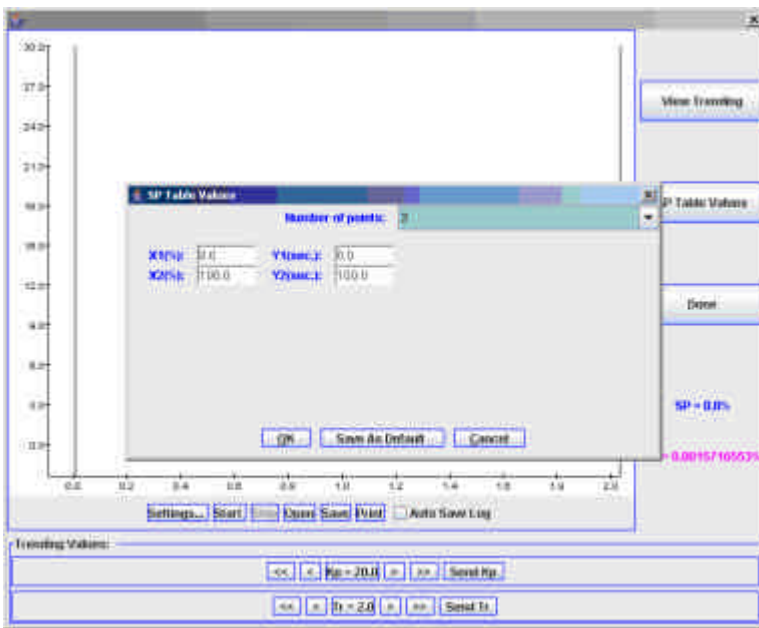


Advanced control valve diagnostics and performance analysis takes the guesswork out of maintenance. It is possible to verify the control valve condition to determine if there is need for valve maintenance or if it is working properly. Rather than wasting time on valve which are OK, it is now possible to allocate resources where really needed.

## Step Response

The step response test verifies the dynamic response of the valve. It is possible to evaluate how well the valve responds and tracks the controller. If valve is not operating at optimum performance, it can be tuned to reduce dead-time, dead-band, and overshoot etc. thus reducing process variability. This improves the quality and value of the product the plant produces. CONF401 permits you to

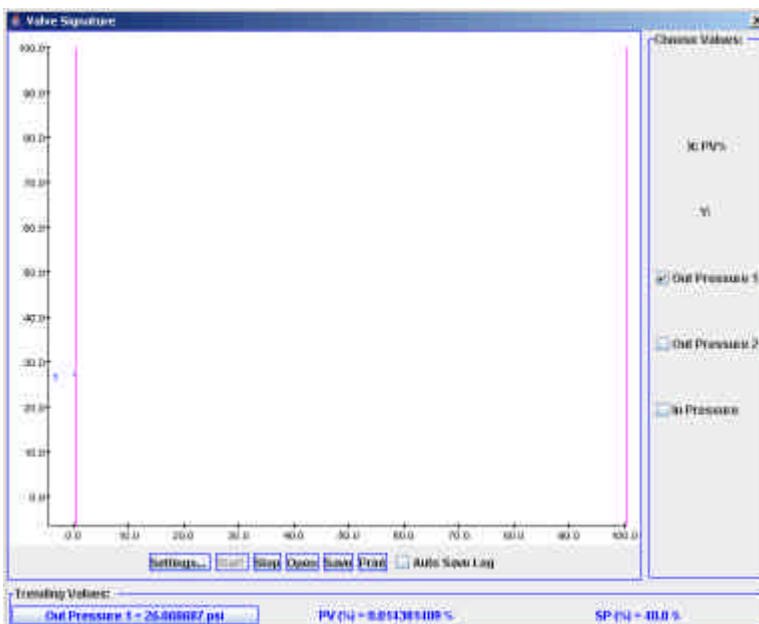
build a test profile with desired number of steps, step sizes, and dwell time, which can be incrementing and decrementing thus moving the valve in both directions.



It is possible to change the default scale in order to zoom in on an area of interest. It is possible to save the plot as a file. A saved plot can be opened. It is possible to overlay two plots to compare current characteristics with a past benchmark to detect change in dynamics which is a leading indicator of wear and fouling.

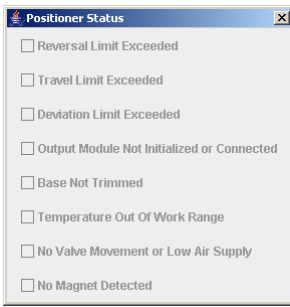
### Valve Signature

The valve signature plots actual valve position vs. actuator pressure. From this graph it is possible to see dead-band and shutoff capability.



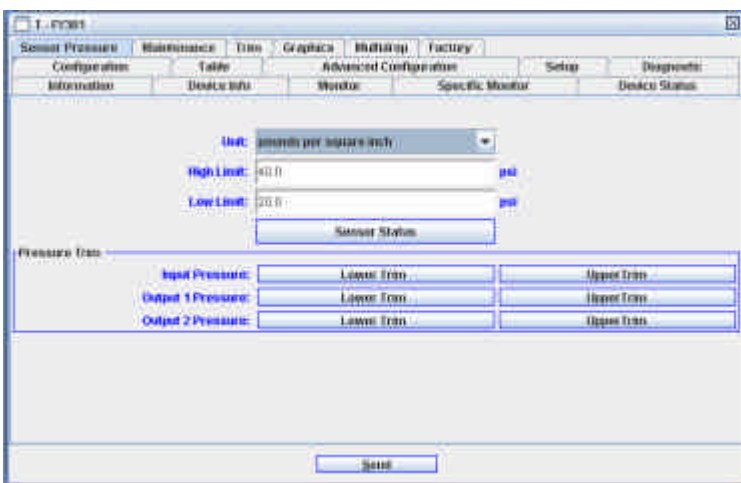
It is possible to change the default scale in order to zoom in on an area of interest. It is possible to save the plot as a file. A saved plot can be opened. It is possible to overlay two plots to compare current characteristics with a past benchmark to detect change in dynamics which is a leading indicator of wear and fouling.





## Actuator Pressure

If the FY301 is fitted with the /K1 option for pressure sensors for advanced diagnostics it is also possible to configure alarm limits for high and low supply pressure. This can be used to detect loss of supply air or clogging of the air filters. Pressure sensors in the FY301 transducer measure the supply pressure, and the pressure in the actuator chambers.



## Pressure Alarm

CONF401 shows the status of the supply pressure



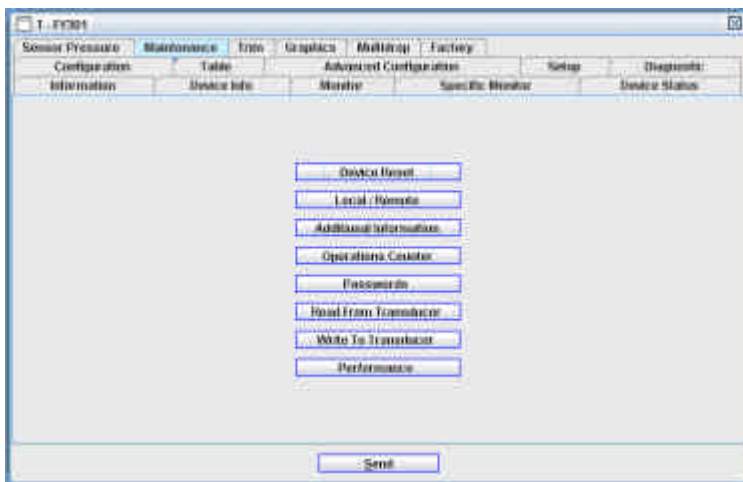
## Pressure Sensor Trim

It is possible to trim (calibrate) the reading of the three pressure sensors in two points each.



## Maintenance

From the maintenance tab it is possible to reset the FY301, hand operate the valve, review the number of configuration changes made, password protect FY301, and test response time etc.



## Override

It is possible to put the FY301 in local (hand) mode in which the desired valve position can be entered from CONF401, overriding the signal from the control system received through the 4-20 mA current loop. In local mode the valve can be stroked to any position regardless of controller output, for example for test and verification.



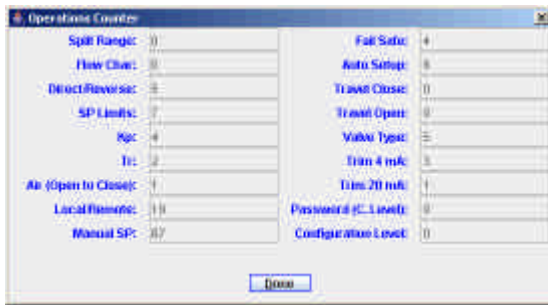
## Response Time

The valve performance in terms of opening and closing response time can be measured. When compared to original installed performance, this can be an indicator of deteriorating valve package condition.



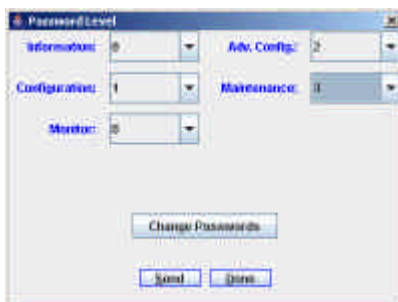
## Change Counter

It is possible to see the number of changes made to the FY301 configuration. This can be used to detect tampering and for audit and reporting purposes, particularly useful in regulated industries.

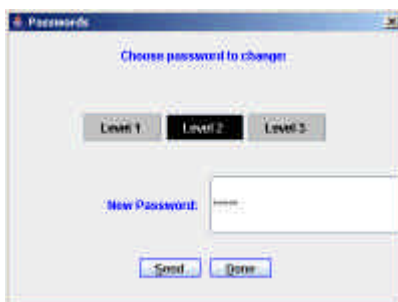


### **Password Protection**

To prevent inadvertent tampering with the FY301 it is possible to configure up to three passwords with different level access rights for the various aspects of the configuration.

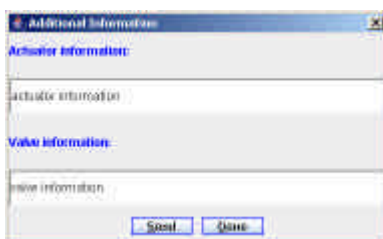


When the CONF401 user wants to access a particular aspect of the FY301 configuration, the user will be prompted to enter the password. The password levels and the passwords can be changed freely.



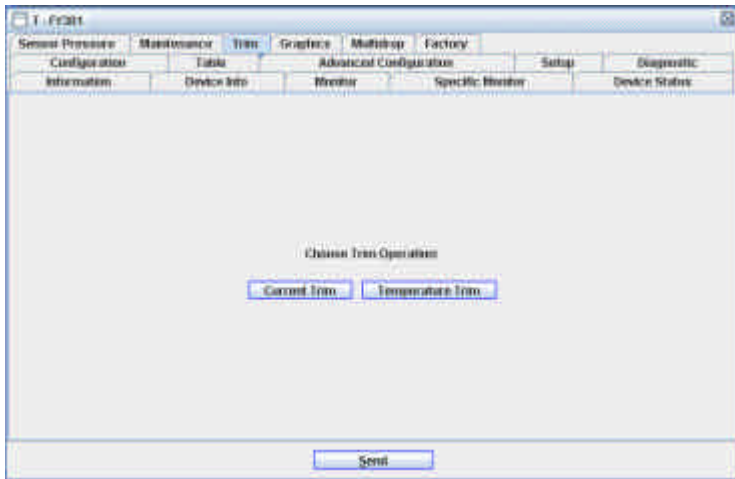
### **Valve Package Information**

It is possible to store information regarding the valve and actuator which the FY301 is mounted on. This may include for example make and model.



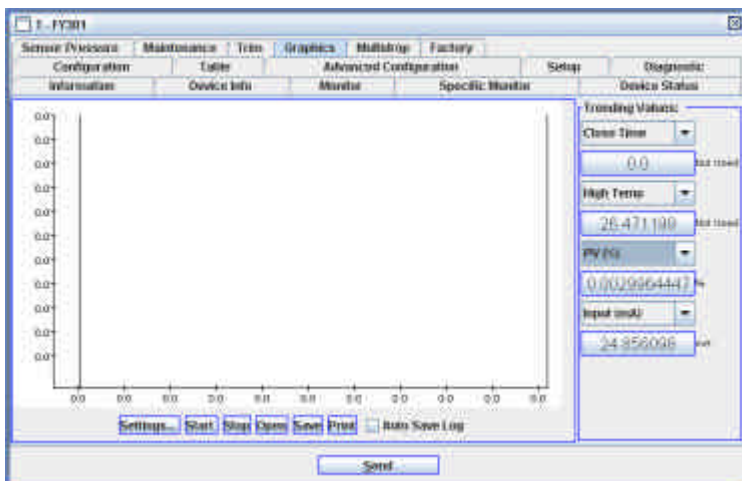
### **Trim**

Trim is rarely used because it involved no mechanical parts and therefore drift is negligible. It is possible to calibrate (trim) the A/D converter for the loop current input to ensure that the desired valve position matches the 4-20 mA current signal. It is also possible to correct the reading of the ambient temperature sensor in the transducer module.



## Trend

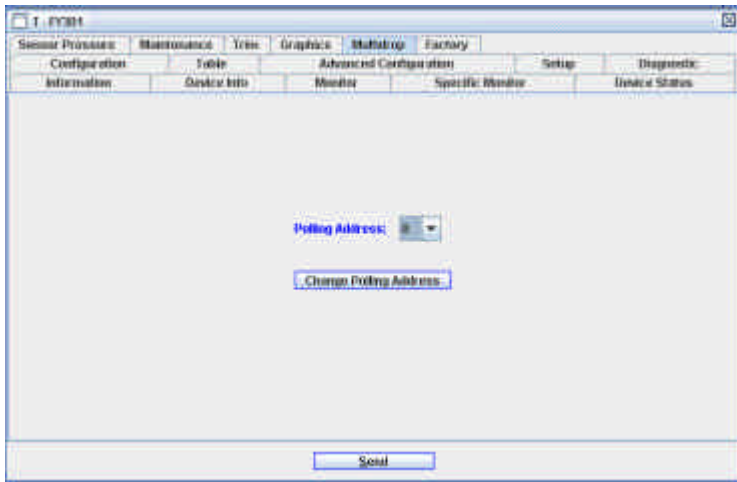
A graphical trend of up to four simultaneous variables can be displayed. For example, desired valve position, actual valve position, drive signal, and actuator pressure. The trend chart allows detection of slow response or oscillation as a result of poor tuning or setup. The FY301 can then be tuned accordingly.



It is possible to save the plot as a file. A saved plot can be opened. It is possible to overlay two plots to compare current characteristics with a past benchmark to detect change in dynamics which is a leading indicator of wear and fouling.

## Multidrop

The multidrop tab enables management of the communication aspects of FY301. It is possible to set the polling address.



A number of restrictions apply to using FY301 in multidrop mode